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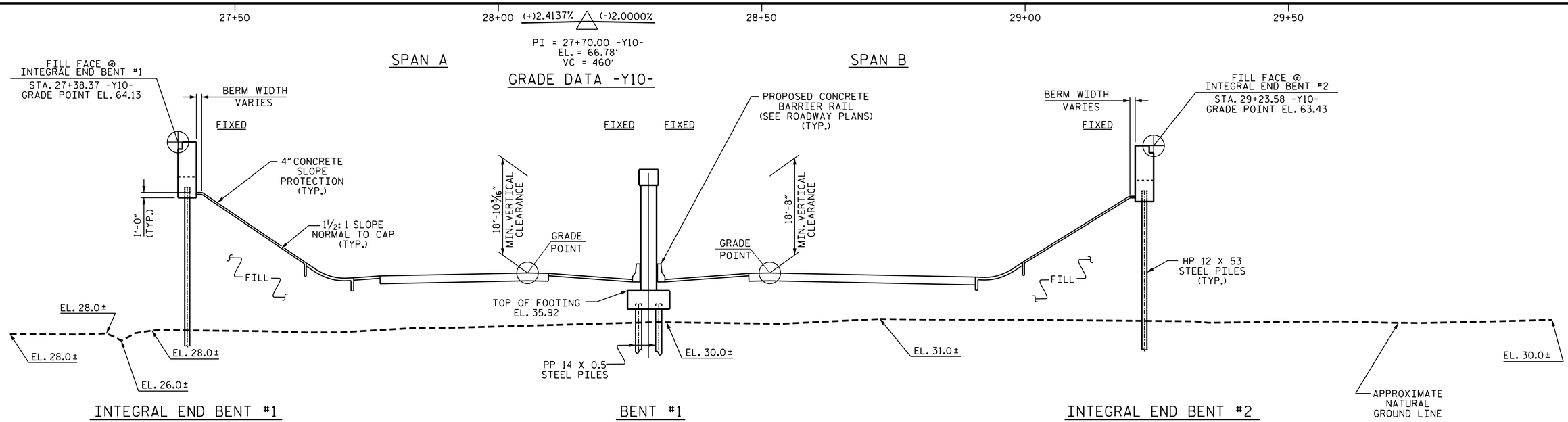
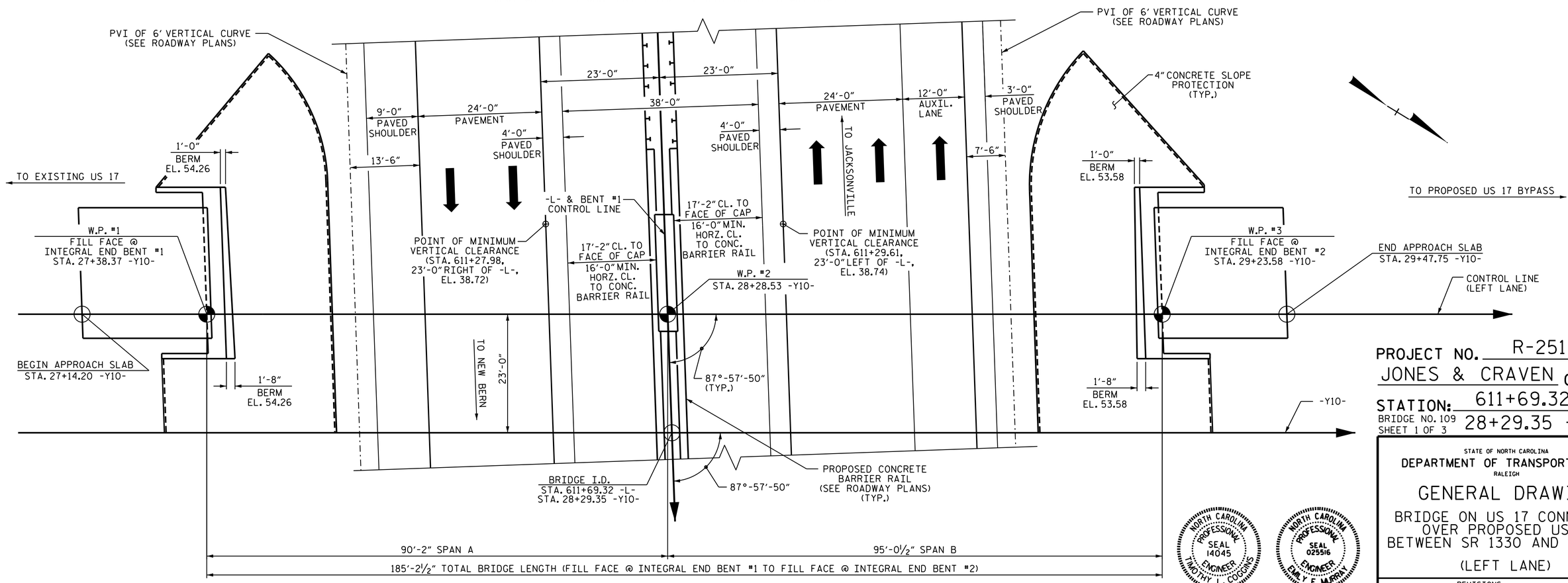


SECTION ALONG CONTROL LINE (LEFT LANE)

SECTION AT INTEGRAL END BENTS AND BENT ARE AT RIGHT ANGLES.



PLAN

(FOUNDATION NOT SHOWN FOR CLARITY)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 611+69.32 -L-

BRIDGE NO. 109 28+29.35 -Y10-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 17 CONNECTOR OVER PROPOSED US 17 BETWEEN SR 1330 AND SR 1224

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-001
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins — DEFD4A83D48FA47B...
3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
DocuSigned by: Emily Murray — CAE897AEDC5B4E0...
3/23/2015

DRAWN BY : D. G. ELY DATE : 12/2014
CHECKED BY : N. RUFFIN DATE : 01/12/15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02/2015

23-MAR-2015 12:50
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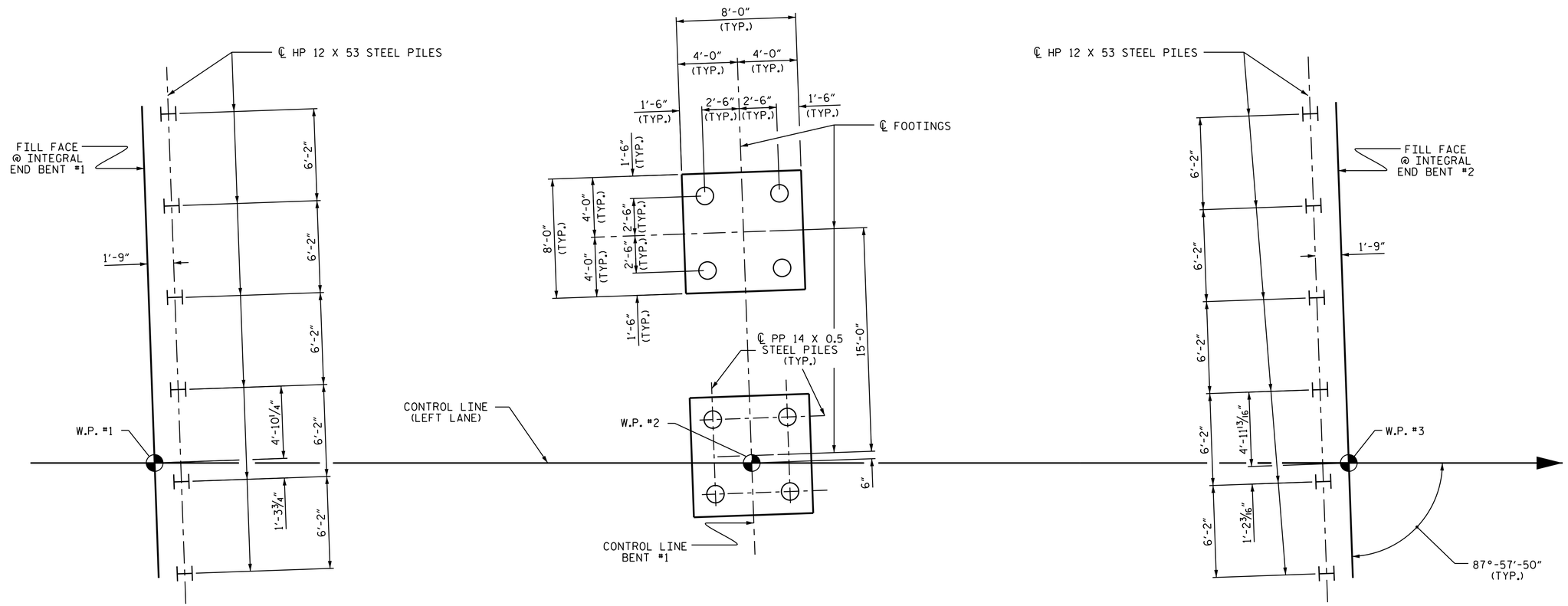
kpaschal

STR. #15



INTEGRAL END BENT #1 | BENT #1 | INTEGRAL END BENT #2

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF CAP AND FOOTING)
(FOOTING DIMENSIONS AND PILE LAYOUT ARE TYPICAL FOR EACH FOOTING.)

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRIVE PILES AT INTEGRAL END BENT No. 1 AND INTEGRAL END BENT No. 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

PILES AT BENT No. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 155 TONS PER PILE.

DRIVE PILES AT BENT No. 1 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILES.

INSTALL PILES AT BENT No. 1 TO A TIP ELEVATION NO HIGHER THAN -20 FEET.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT INTEGRAL END BENT No. 1 AND INTEGRAL END BENT No. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

STEEL PIPE PILE INSIDE FIT CONICAL POINTS ARE REQUIRED FOR STEEL PIPE PILES AT BENT No. 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 59,500 FT-LBS TO 96,800 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT No. 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

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

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED AT INTEGRAL END BENT No. 1 OR INTEGRAL END BENT No. 2. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 611+69.32 -L-
28+29.35 -Y10-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 17 CONNECTOR OVER PROPOSED US 17 BETWEEN SR 1330 AND SR 1224

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-002
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : D. G. ELY DATE : 12/2014
CHECKED BY : N. RUFFIN DATE : 01/12/15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02/2015

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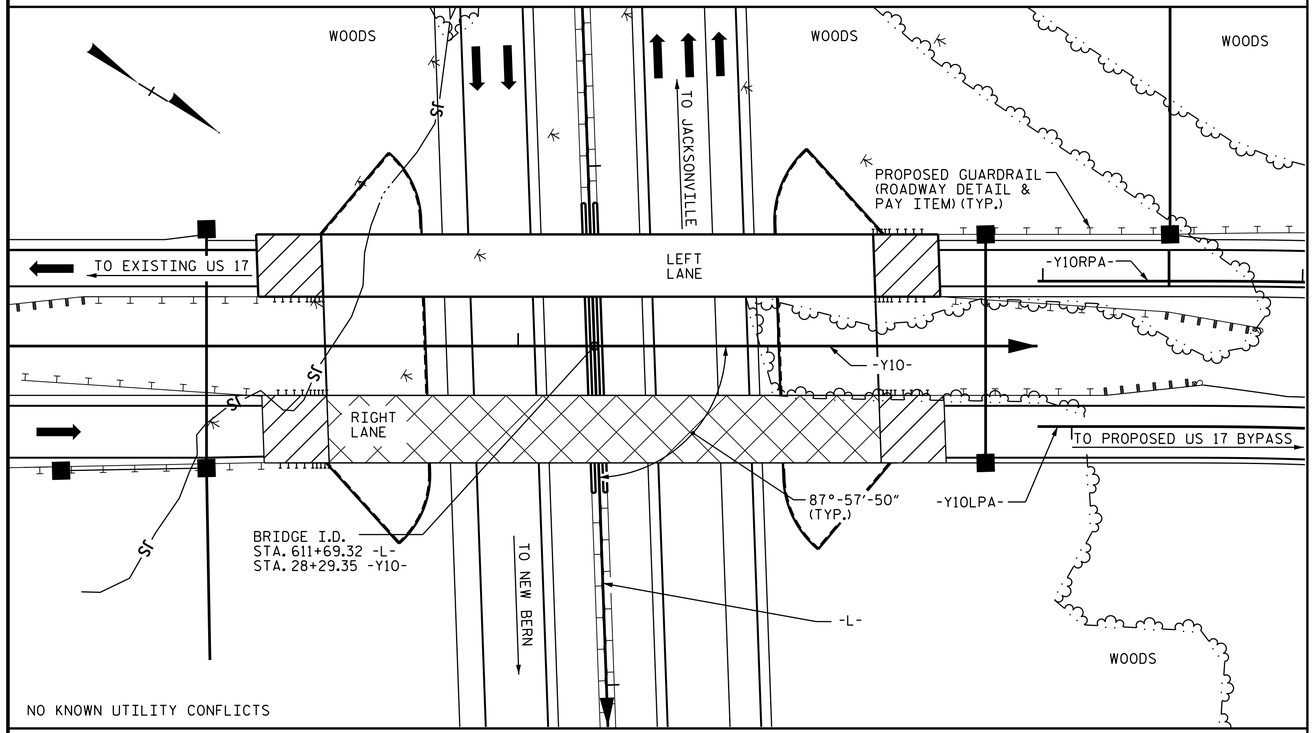
STR. #15

BM 32: RR SPIKE IN 7"PINE, STA. 608+78.00 -L-, 849' LEFT, ELEV. 36.79'.



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		HP 12 x 53 STEEL PILES		PP 14 X 0.5 STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	EA.	SQ. FT.	SQ. FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	No.	LIN.FT.	No.	LIN.FT.	EA.	EA.	LIN.FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE		5,047	4,883		LUMP SUM			6	546.88							367.08		LUMP SUM
INTEGRAL END BENT #1				22.3		3,098				6	420			6	3		274	
BENT #1				40.7		5,631	786					8	600	8	4			
INTEGRAL END BENT #2				22.3		3,149				6	420			6	3		263	
TOTAL	2	5,047	4,883	85.3	LUMP SUM	11,878	786	6	546.88	12	840	8	600	20	10	367.08	537	LUMP SUM

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 611+69.32 -L-
28+29.35 -Y10-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 17 CONNECTOR OVER PROPOSED US 17 BETWEEN SR 1330 AND SR 1224

(LEFT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48F447B...

3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-003
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : D. G. ELY DATE : 12/2014
CHECKED BY : N. RUFFIN DATE : 1/12/15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02/2015

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STR. #15

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	(#) CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD (%LL) FACTORS	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)	LIVELOAD (%LL) FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	(1)	1.05	--	1.75	0.884	1.40	A	ER	43.644	0.923	**1.05**	A	I	8.729	0.80	0.884	1.12	B	ER	46.084	
		HL-93(Opr)	N/A	--	1.36	--	1.35	0.884	1.81	A	ER	43.644	0.923	1.36	A	I	8.729	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	(2)	1.37	49.299	1.75	0.884	1.89	A	ER	43.644	0.923	**1.37**	A	I	8.729	0.80	0.884	1.53	B	ER	46.084	
		HS-20(Opr)	36.000	--	1.78	63.906	1.35	0.884	2.46	A	ER	43.644	0.923	1.78	A	I	8.729	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.59	48.509	1.40	0.884	5.52	A	ER	43.644	0.923	4.16	A	I	8.729	0.80	0.884	3.59	B	ER	46.084	
		SNGARBS2	20.000	--	2.62	52.339	1.40	0.884	4.04	A	ER	43.644	0.923	2.93	A	I	8.729	0.80	0.884	2.62	B	ER	46.084	
		SNAGRIS2	22.000	--	2.45	53.979	1.40	0.884	3.79	A	ER	43.644	0.923	2.71	A	I	8.729	0.80	0.884	2.45	B	ER	46.084	
		SNCOTTS3	27.250	--	1.79	48.677	1.40	0.884	2.74	A	ER	43.644	0.923	2.07	A	I	8.729	0.80	0.884	1.79	B	ER	46.084	
		SNAGGRS4	34.925	--	1.47	51.318	1.40	0.884	2.26	A	ER	43.644	0.923	1.70	A	I	8.729	0.80	0.884	1.47	B	ER	46.084	
		SNS5A	35.550	--	1.44	51.138	1.40	0.884	2.22	A	ER	43.644	0.923	1.71	A	I	8.729	0.80	0.884	1.44	B	ER	46.084	
		SNS6A	39.950	--	1.31	52.343	1.40	0.884	2.02	A	ER	43.644	0.923	1.56	A	I	8.729	0.80	0.884	1.31	B	ER	46.084	
		SNS7B	42.000	--	1.25	52.390	1.40	0.884	1.92	A	ER	43.644	0.923	1.52	A	I	8.729	0.80	0.884	1.25	B	ER	46.084	
	TRUCK TRACTOR SEMI-TRAILOR (TTST)	TNAGRIT3	33.000	--	1.60	52.632	1.40	0.884	2.46	A	ER	43.644	0.923	1.86	A	I	8.729	0.80	0.884	1.59	B	ER	46.084	
		TNT4A	33.075	--	1.60	52.899	1.40	0.884	2.47	A	ER	43.644	0.923	1.82	A	I	8.729	0.80	0.884	1.60	B	ER	46.084	
		TNT6A	41.600	--	1.30	54.026	1.40	0.884	2.01	A	ER	43.644	0.923	1.60	A	I	8.729	0.80	0.884	1.30	B	ER	46.084	
		TNT7A	42.000	--	1.30	54.618	1.40	0.884	2.01	A	ER	43.644	0.923	1.57	A	I	8.729	0.80	0.884	1.30	B	ER	46.084	
		TNT7B	42.000	--	1.33	56.016	1.40	0.884	2.07	A	ER	43.644	0.923	1.49	A	I	8.729	0.80	0.884	1.33	B	ER	46.084	
		TNAGRIT4	43.000	--	1.28	54.927	1.40	0.884	1.98	A	ER	43.644	0.923	1.45	A	I	8.729	0.80	0.884	1.28	B	ER	46.084	
		TNAGT5A	45.000	--	1.21	54.381	1.40	0.884	1.87	A	ER	43.644	0.923	1.43	A	I	8.729	0.80	0.884	1.21	B	ER	46.084	
		TNAGT5B	45.000	(3)	1.20	53.887	1.40	0.884	1.85	A	ER	43.644	0.923	1.38	A	I	8.729	0.80	0.884	**1.20**	B	ER	46.084	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

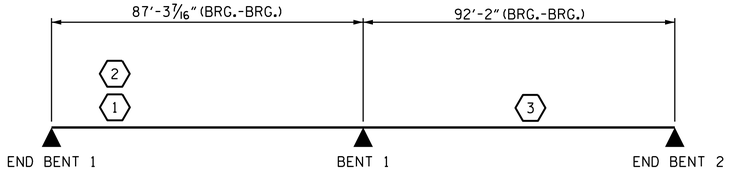
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

ASSEMBLED BY :	M.D.PISO	DATE : 08-26-14
CHECKED BY :	K.P.SEDAI	DATE : 09-26-14
DESIGN ENGINEER OF RECORD:	K.KOUCHEKI	DATE : 02/2015
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM

23-MAR-2015 12:51
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kpaschal

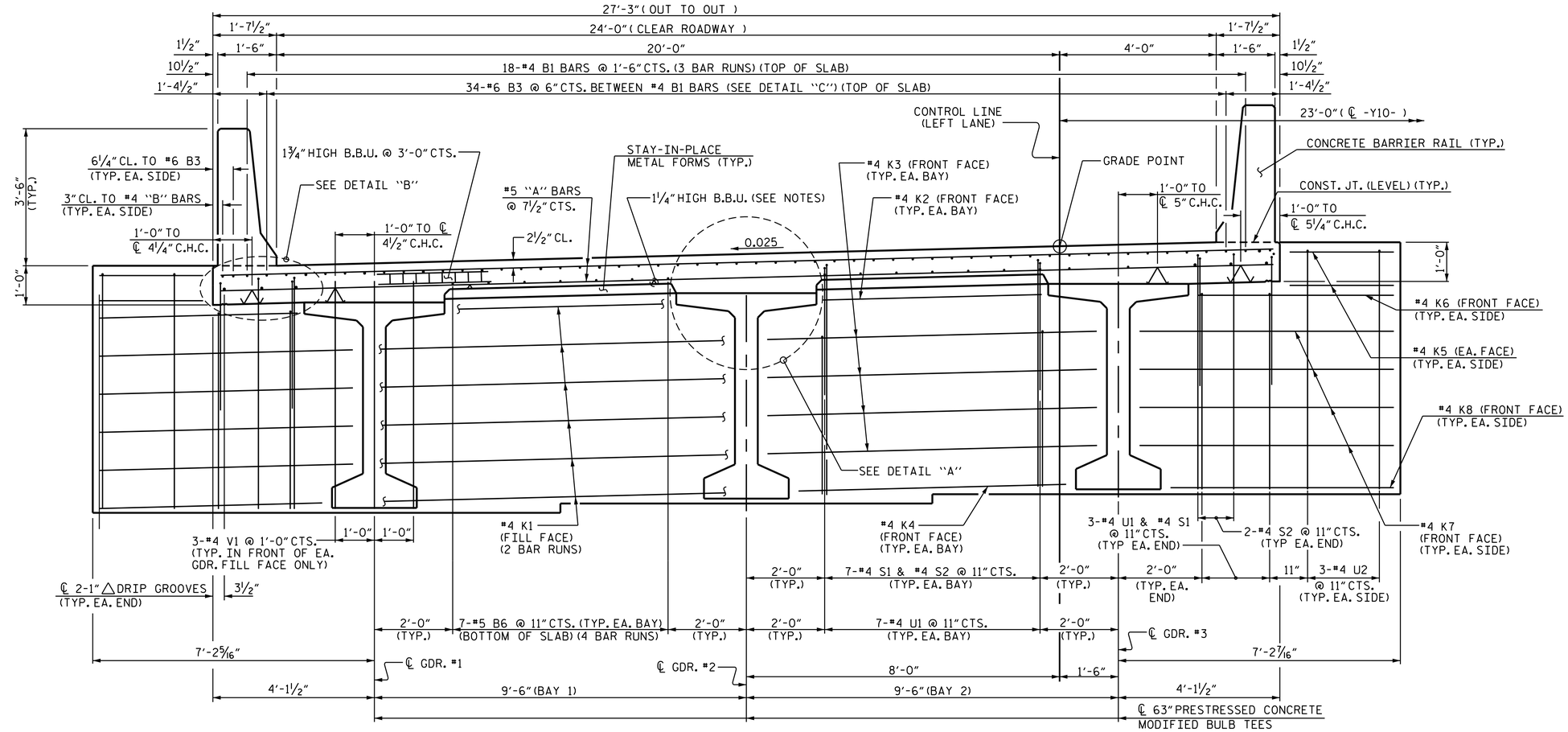
NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-004
1			3			TOTAL SHEETS
2			4			30

STR. #15 STD. NO. LRFR1



TYPICAL SECTION @ INTEGRAL END BENT

NOTE: #4 U1, #4 U2, #4 S1, #4 S2 BARS & #4 V1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP

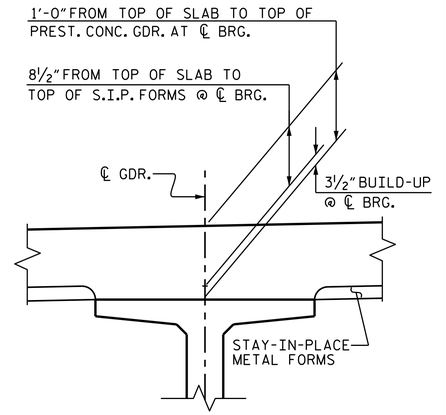
NOTES:

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.

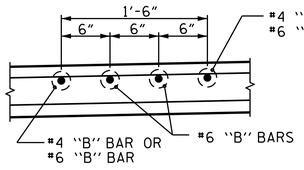
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

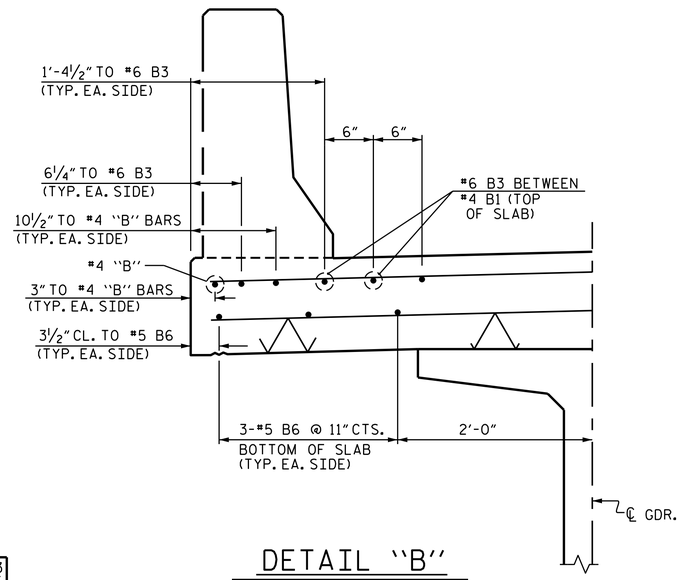


DETAIL "A"



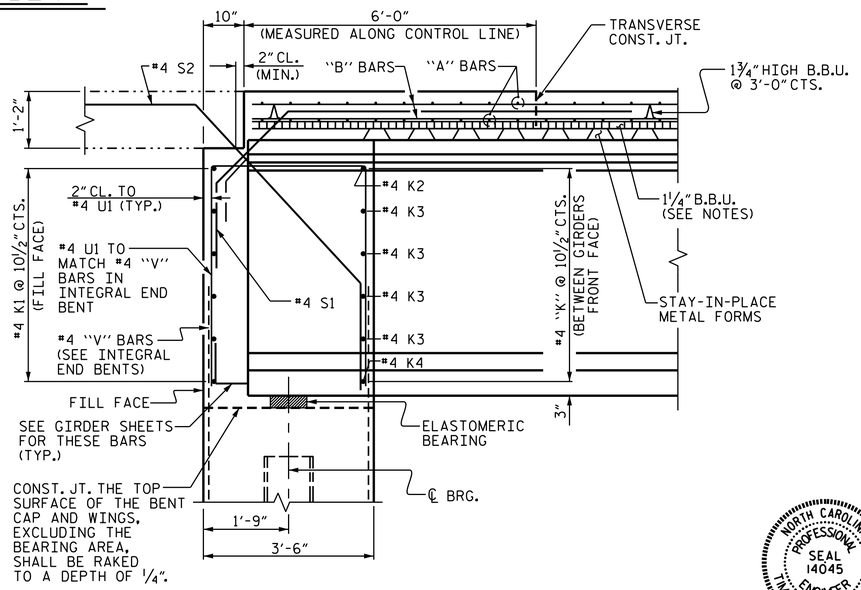
DETAIL "C"

SHOWING TOP OF SLAB "B" BAR SPACING @ INTEGRAL END BENT OR INTERIOR BENT



DETAIL "B"

SHOWING REINFORCING STEEL @ OVERHANG (TYP. EA. SIDE)



END OF GIRDER DETAIL @ INTEGRAL END BENT

(#4 "V" BARS IN FRONT OF GIRDER NOT SHOWN)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEF04A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-005
1			3			TOTAL SHEETS
2			4			30

STR. #15

DRAWN BY : M.D.PISO DATE : 07-02-13
CHECKED BY : K.P.SEDAI DATE : 09-05-14
DESIGN ENGINEER OF RECORD : Golamreza Kouchekian DATE : 02/2015

23-MAR-2015 12:51
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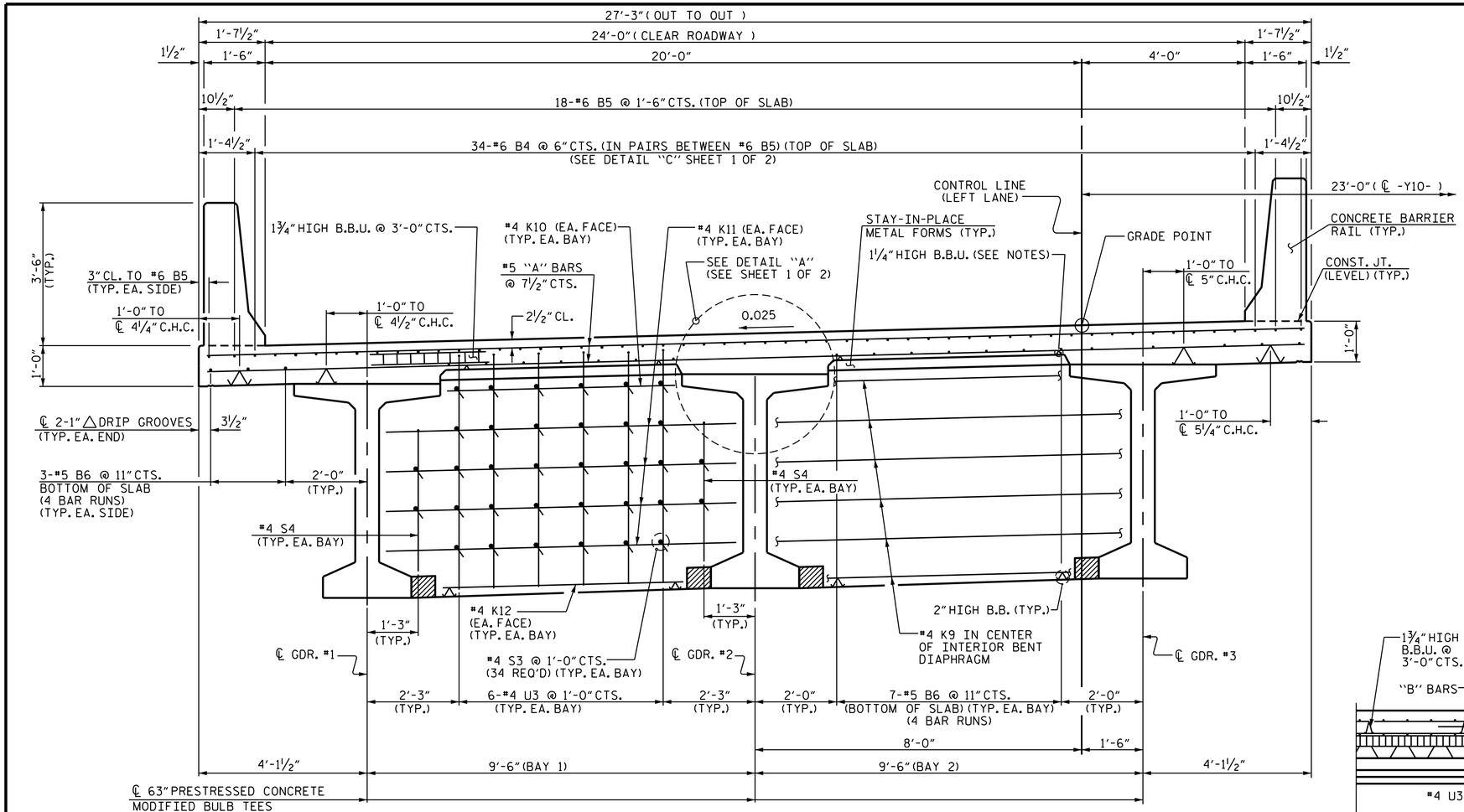
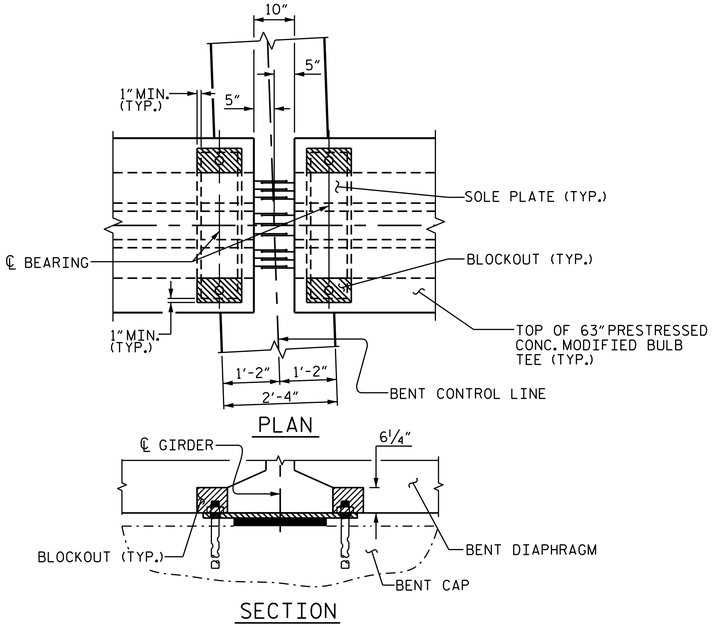
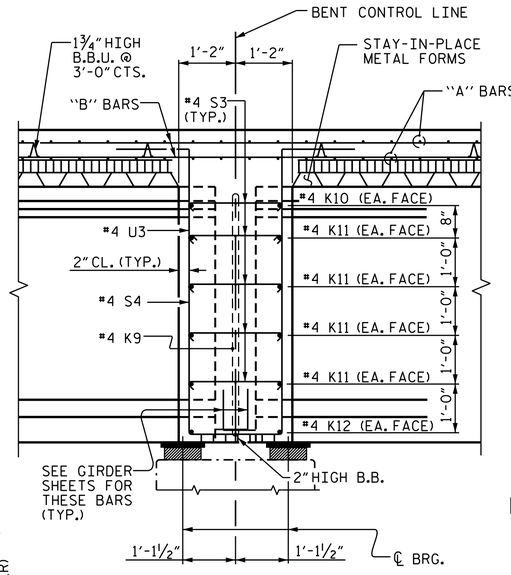
kpaschal



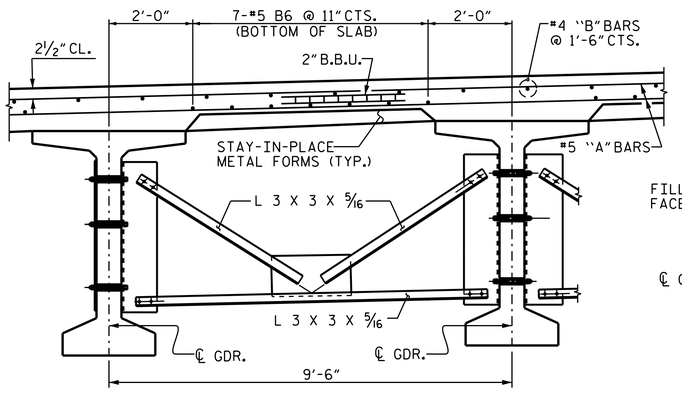
TYPICAL SECTION @ CONTINUOUS BENT DIAPHRAGM



BENT DIAPHRAGM BLOCK-OUT DETAIL

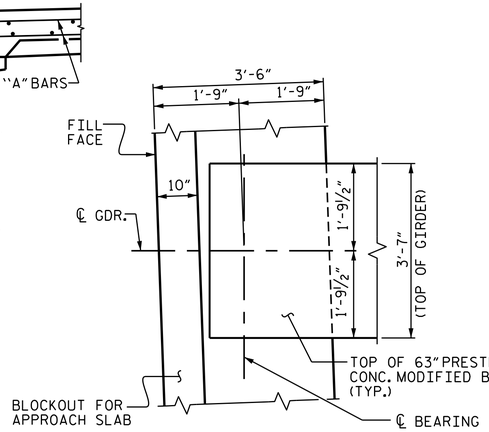


SECTION @ INTERIOR BENT DIAPHRAGM

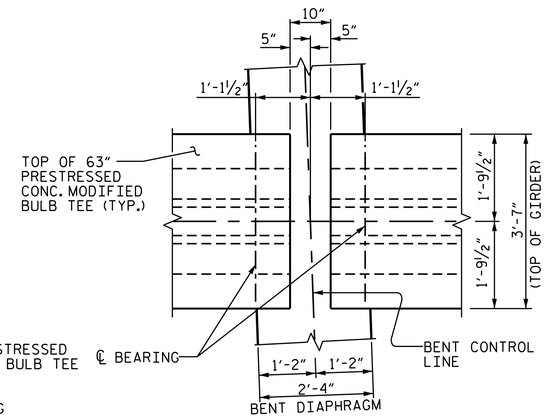


PARTIAL TYPICAL SECTION @ INTERMEDIATE DIAPHRAGMS

SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS.



END BENT DIAPHRAGM



BENT DIAPHRAGM

PLAN

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-006
1			3			TOTAL SHEETS
2			4			30

STR. #15

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins 3/23/2015

DRAWN BY :	M.D.PISO	DATE : 07-02-13
CHECKED BY :	K.P.SEDAI	DATE : 09-05-14
DESIGN ENGINEER OF RECORD :	GholamrezaKouchekiDATE :	02/2015

23-MAR-2015 12:51
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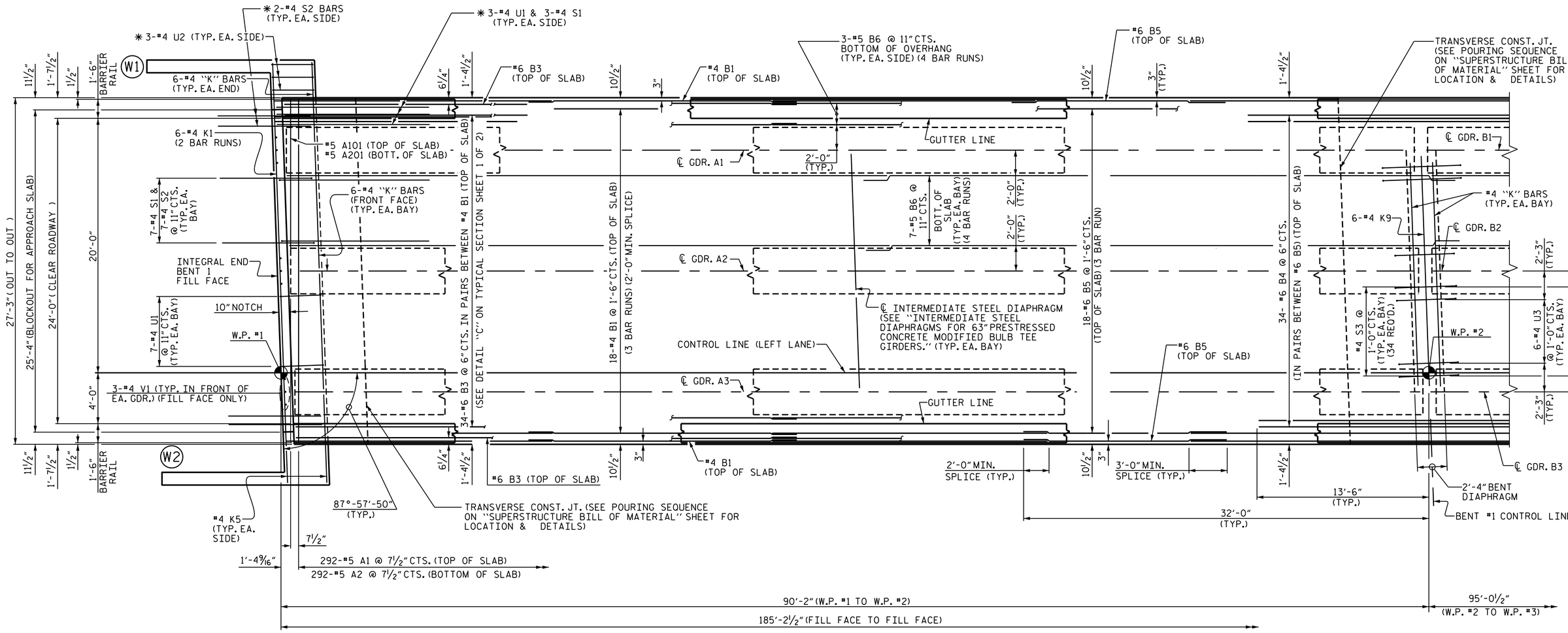
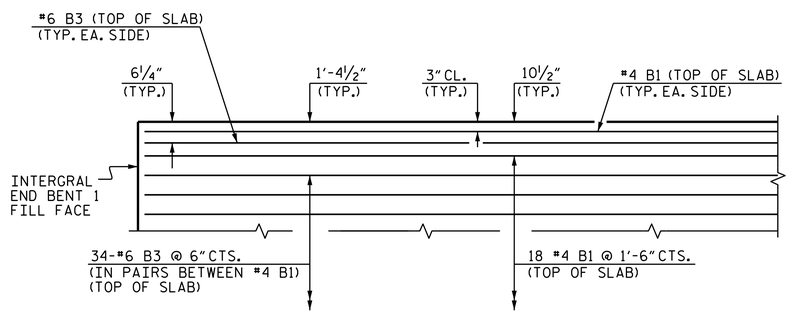
kpaschal

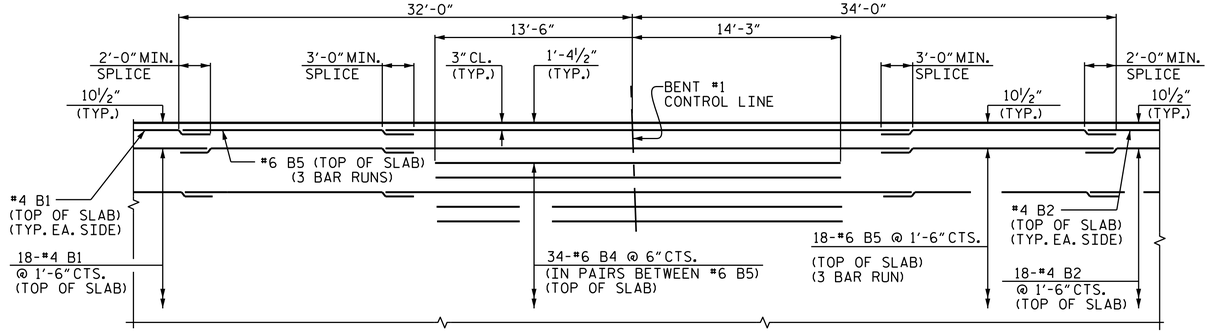


PLAN OF SPAN A

✱ #4 U1, #4 U2, #4 V1 #4 S1 & #4 S2 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP FOR TOP OF SLAB REINFORCING DETAILS, SEE "REINFORCING STEEL LAYOUT"



TOP REINFORCING STEEL @ END BENT #1



TOP REINFORCING STEEL @ BENT #1

REINFORCING STEEL LAYOUT

DRAWN BY : M.D.PISO DATE : 07-22-13
CHECKED BY : K.P.SEDAI DATE : 09-05-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

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NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tom Coggins DEFD4A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

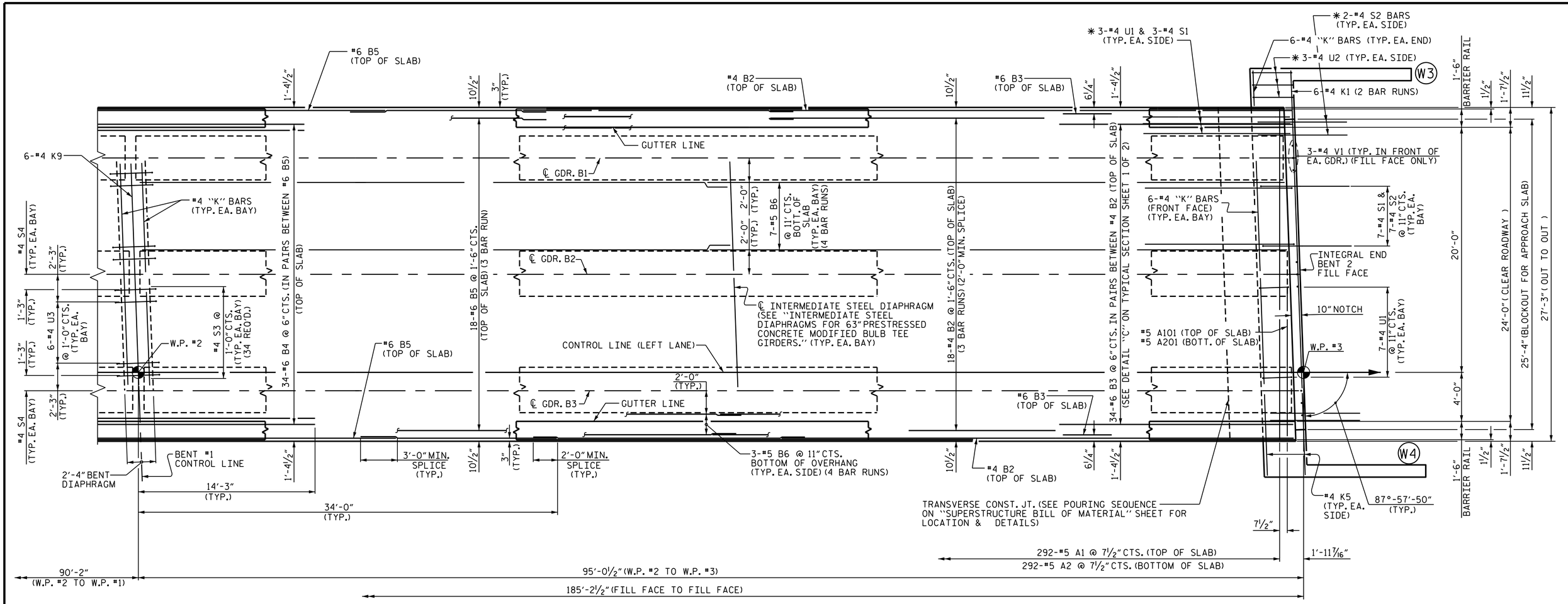
SUPERSTRUCTURE

PLAN OF SPAN A

(LEFT LANE)

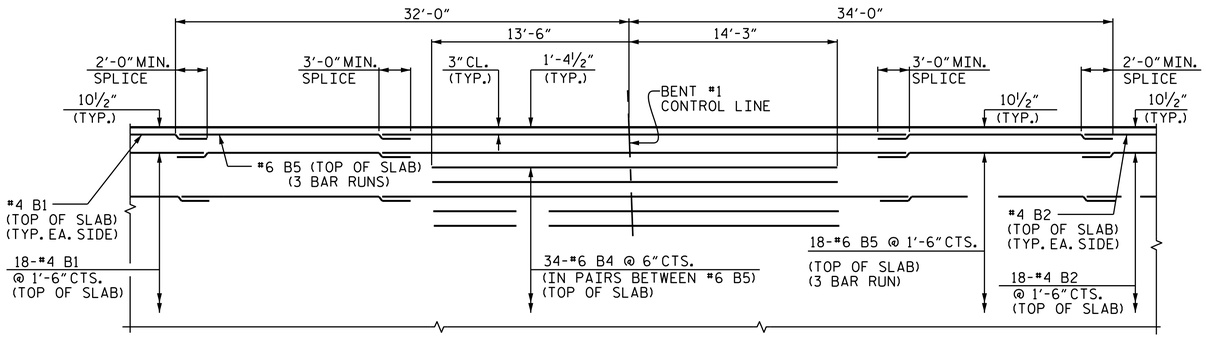
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-007
1			3			TOTAL SHEETS
2			4			30

STR. #15

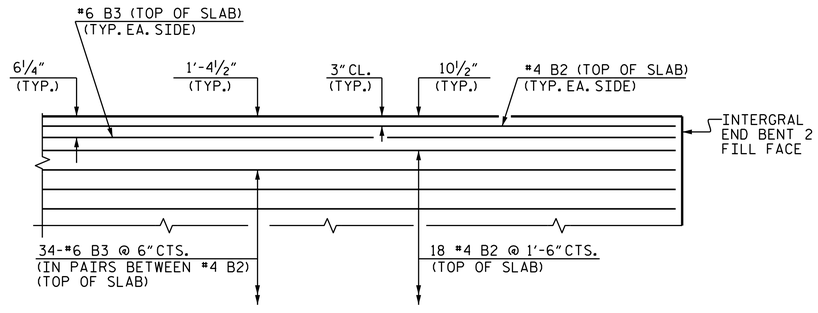


PLAN OF SPAN B

#4 U1, #4 U2, #4 V1 #4 S1 & #4 S2 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP FOR TOP OF SLAB REINFORCING DETAILS, SEE "REINFORCING STEEL LAYOUT"



TOP REINFORCING STEEL @ BENT #1



TOP REINFORCING STEEL @ END BENT #2

REINFORCING STEEL LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
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3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 2 OF 4

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-008
1			3			TOTAL SHEETS
2			4			30

STR. #15

DRAWN BY :	M.D.PISO	DATE : 07-22-13
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DESIGN ENGINEER OF RECORD:	R.KOUCHEKI	DATE : 02/2015

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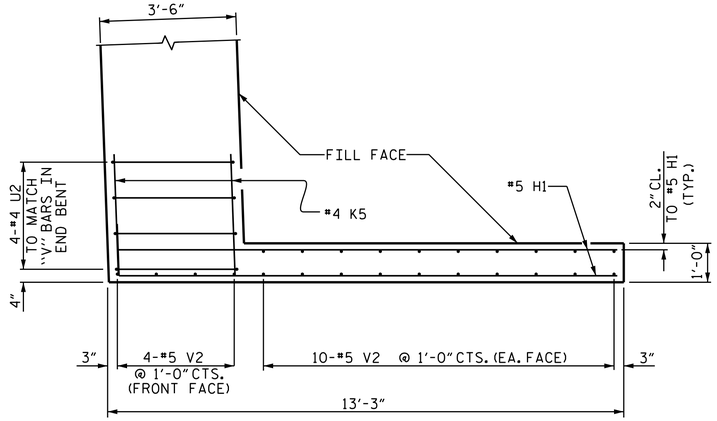
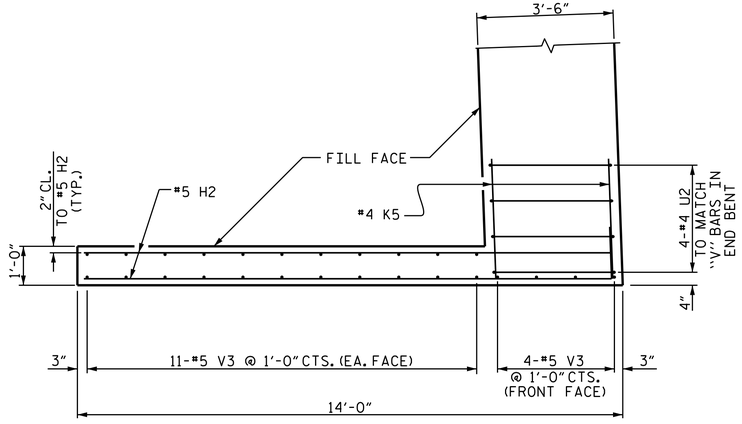
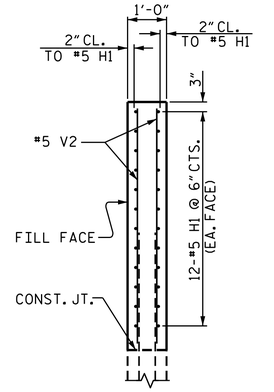
kpaschal



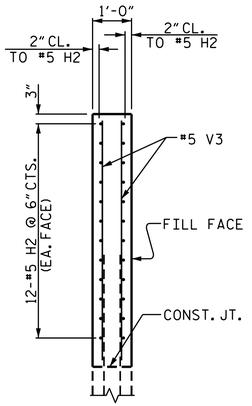
PLAN W1



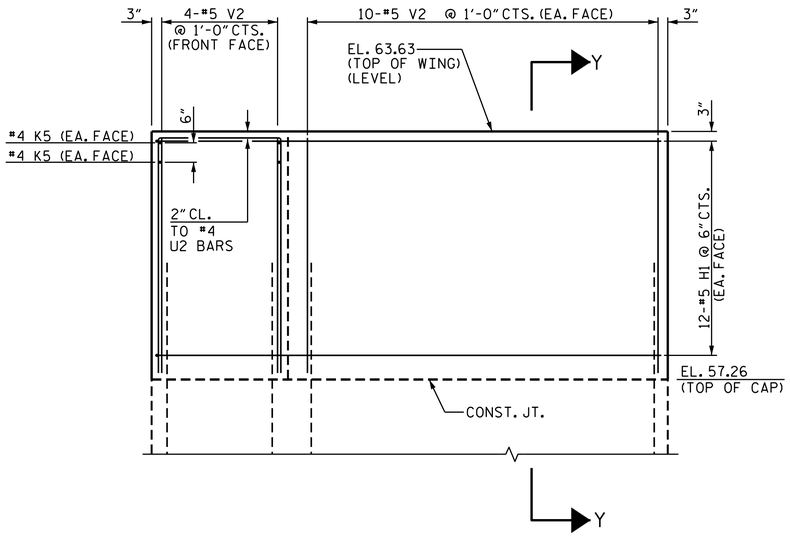
PLAN W2



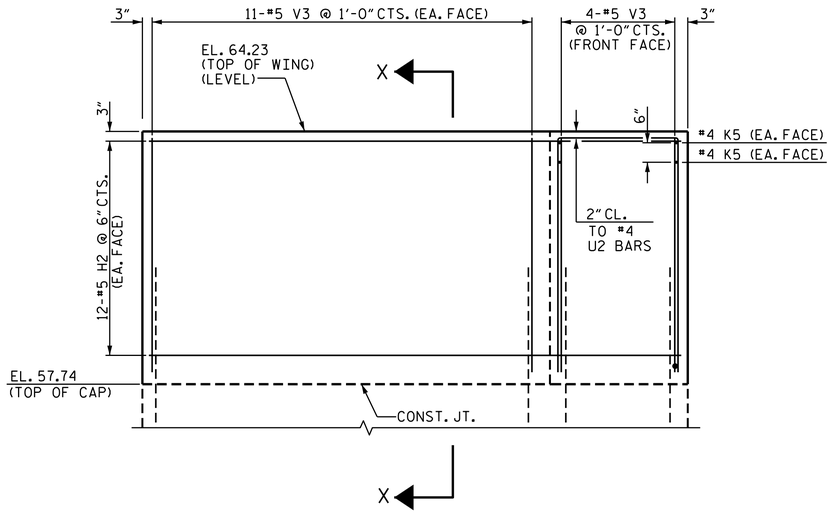
SECTION Y-Y



SECTION X-X



ELEVATION W1



ELEVATION W2

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

(LEFT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-009
1			3			TOTAL SHEETS
2			4			30

STR. #15

DRAWN BY : M.D.PISO DATE : 07-22-13
CHECKED BY : K.P.SEDAI DATE : 08-04-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

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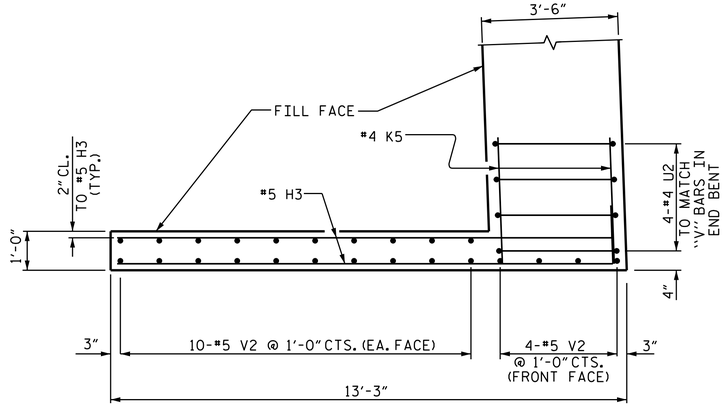
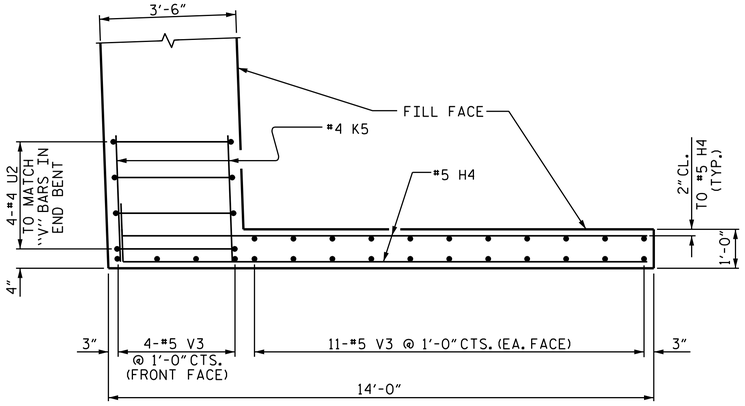
kpaschal



PLAN (W3)



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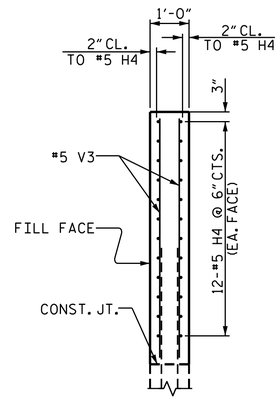
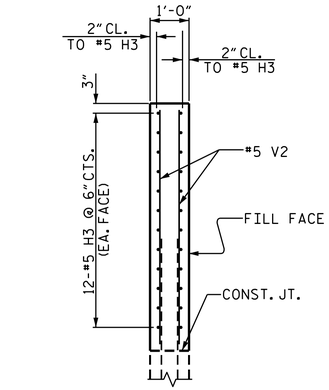
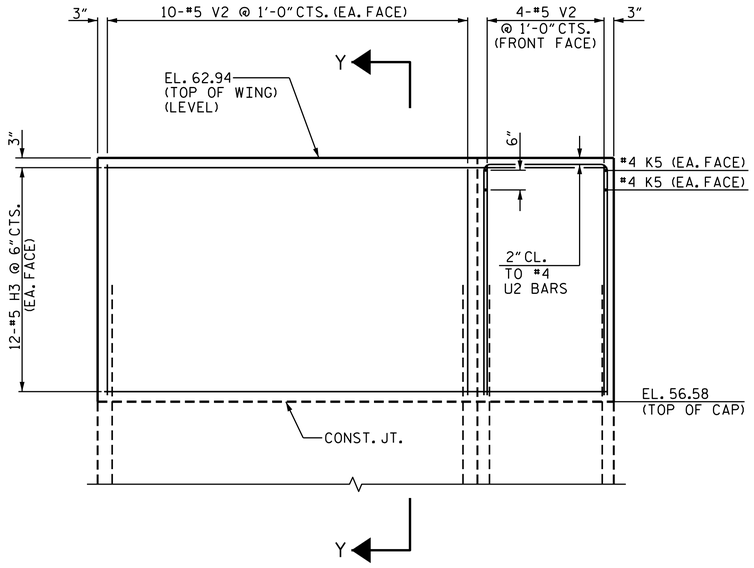


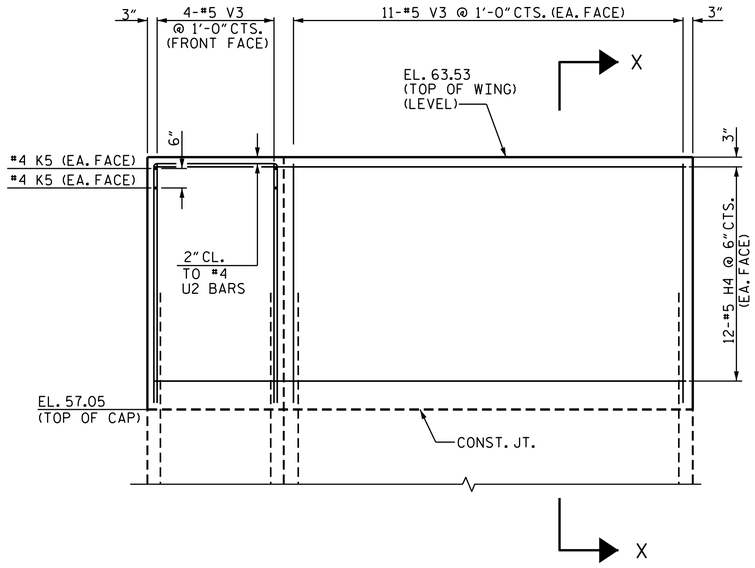
SECTION X-X



SECTION Y-Y



ELEVATION (W3)



ELEVATION (W4)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-010
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

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3/23/2015

DRAWN BY : M.D.PISO DATE : 07-22-13
CHECKED BY : K.P.SEDAI DATE : 08-04-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

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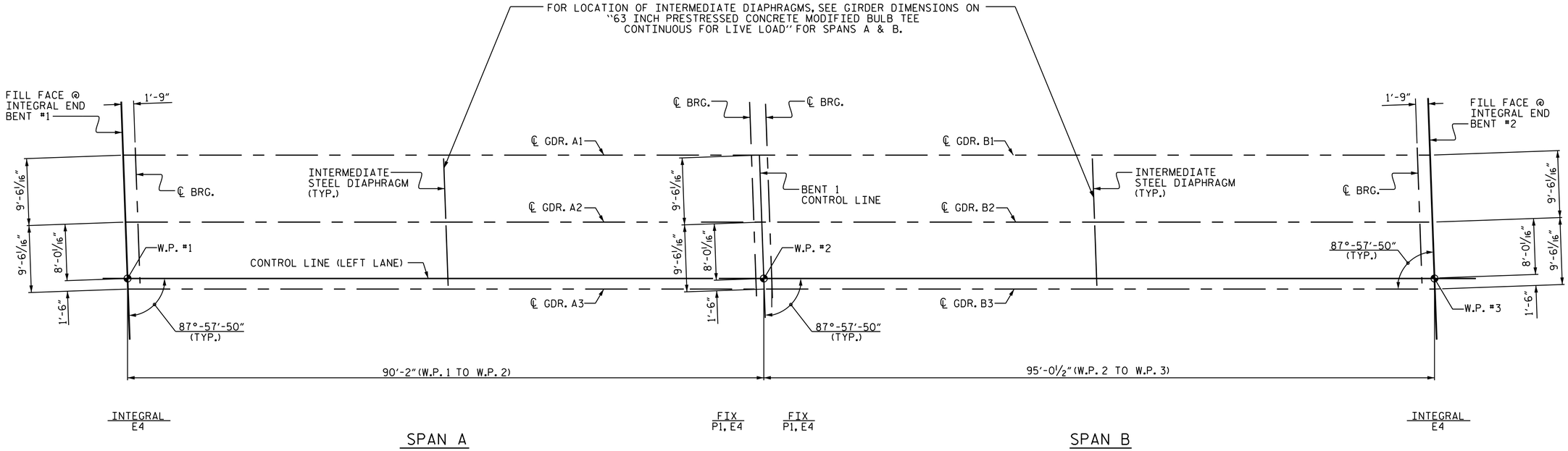
STR. #15



FRAMING PLAN

FOR INTERMEDIATE STEEL DIAPHRAGMS
SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS"

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-011
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

DRAWN BY : M.D.PISO DATE : 07-31-13
CHECKED BY : K.P.SEDAI DATE : 08-04-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

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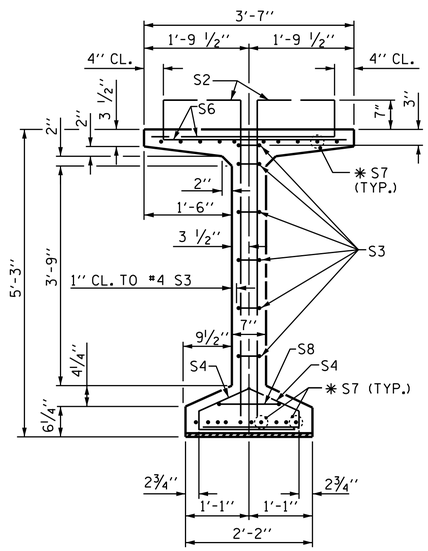
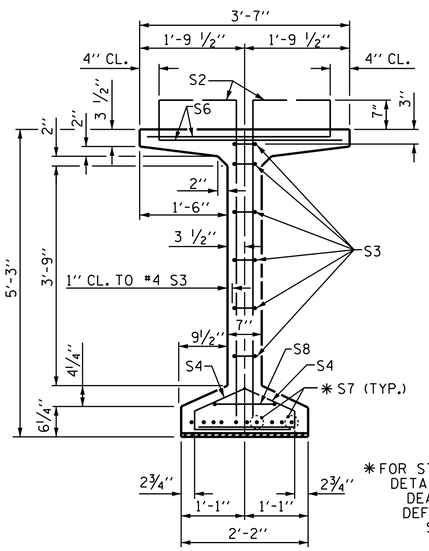
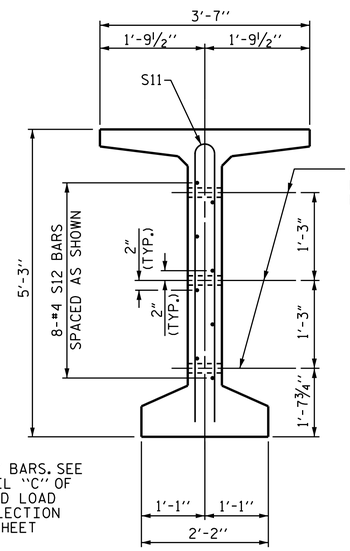


SECTION A-A



SECTION B-B

* FOR S7 BARS. SEE DETAIL "C" OF DEAD LOAD DEFLECTION SHEET

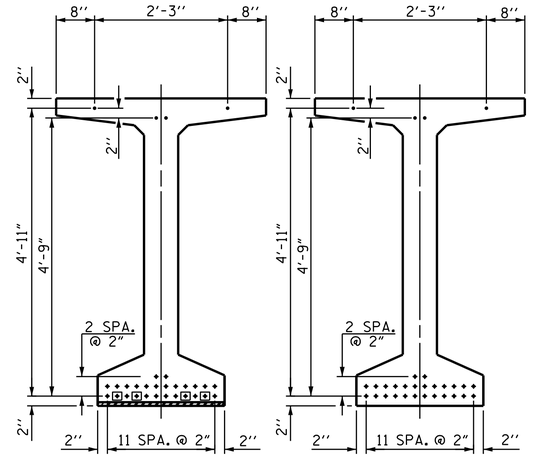


SECTION C-C

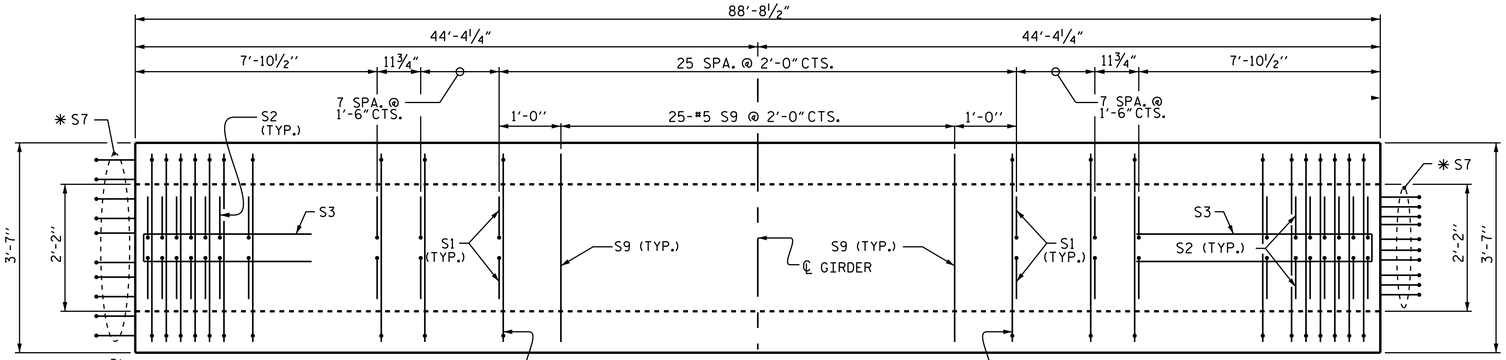
(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

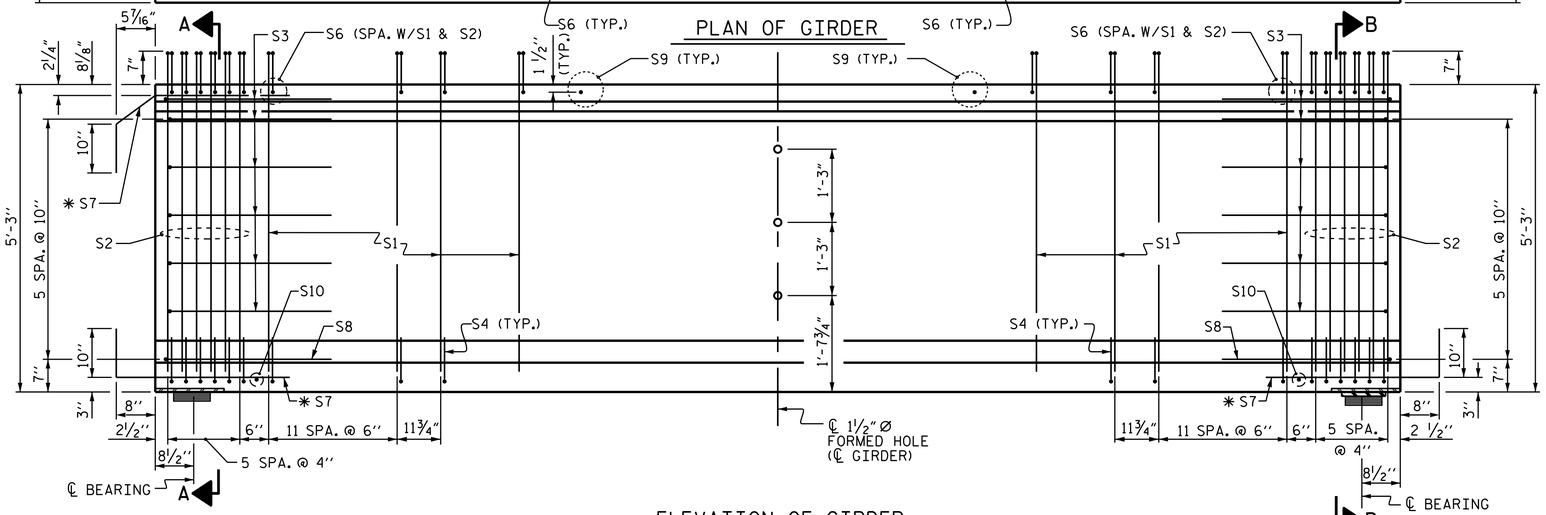
- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER



0.6" Ø LOW RELAXATION STRAND LAYOUT

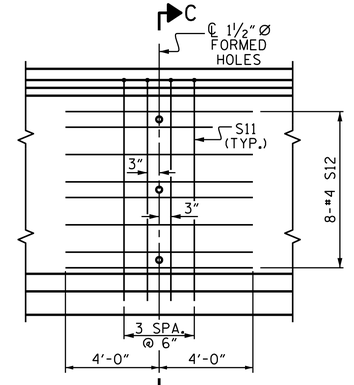


PLAN OF GIRDER



ELEVATION OF GIRDER

INTEGRAL END BENT



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 3

0.6" Ø L. R. GRADE 270 STRANDS

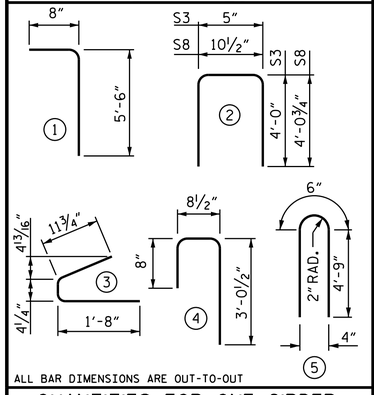
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	128	#4	1	6'-2"	527
S2	24	#5	1	6'-2"	154
S3	12	#4	2	8'-5"	67
S4	76	#4	3	3'-0"	152
S6	152	#5	4	4'-5"	700
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	25	#5	STR	3'-3"	85
S10	2	#3	STR	1'-10"	1
S11	4	#5	5	10'-0"	42
S12	8	#4	STR	8'-0"	43

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER	1905	17.6	30

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
3	88'-8 1/2"	266'-1 1/2"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN A (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-012
1			3			TOTAL SHEETS
2			4			30

DESIGN ENGINEER OF RECORD:	R.KOUCHEKI	DATE :	02/2015
ASSEMBLED BY :	M.D.PISO	DATE :	07-06-13
CHECKED BY :	K.P.SEDAI	DATE :	08-26-14
DRAWN BY : EEM 2/6/97	REV. 5/1/06R		TLA/GM
CHECKED BY : VAP 2/6/97	REV. 10/1/11		MAA/GM
	REV. 6/13		MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

23-MAR-2015 12:51
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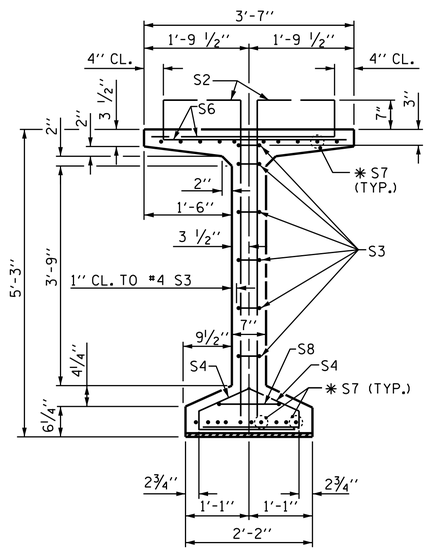
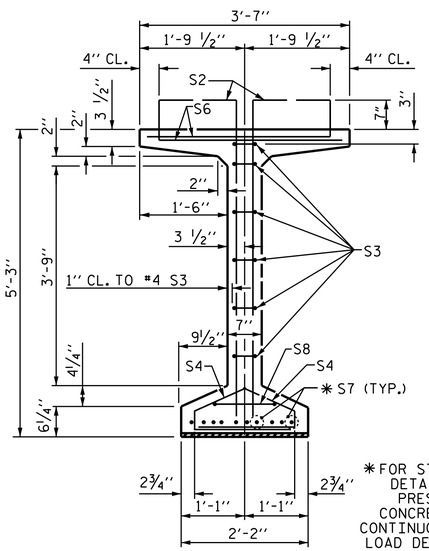
kpaschal

STR. #15

STD. NO. PCG7 (Sht. 2)

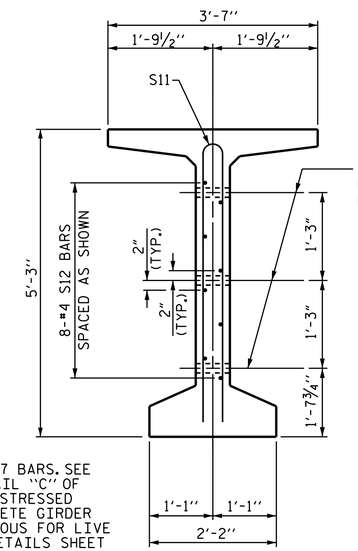


SECTION A-A



SECTION B-B

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

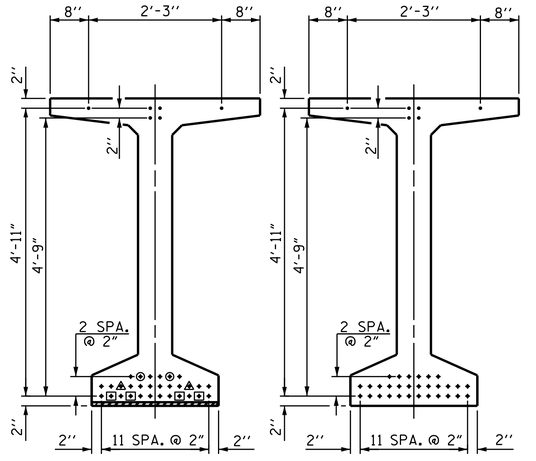


SECTION C-C

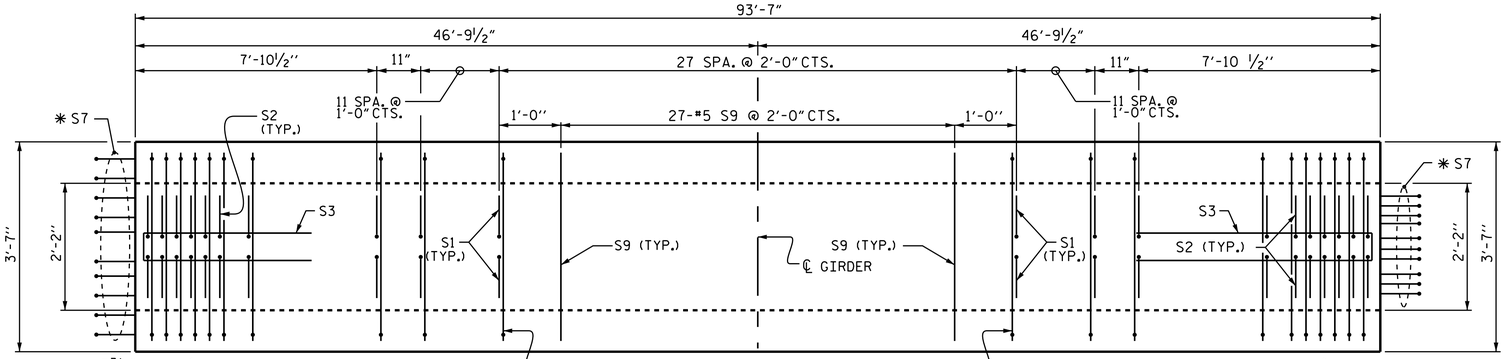
(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

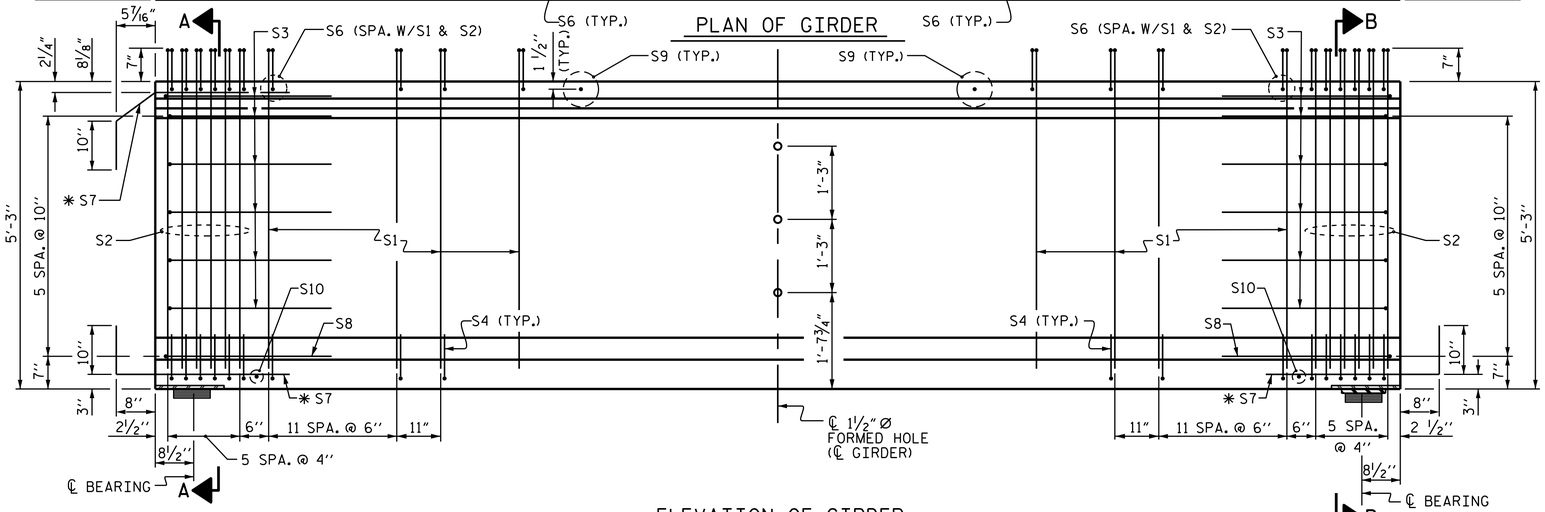
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ▲ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



0.6" Ø LOW RELAXATION STRAND LAYOUT



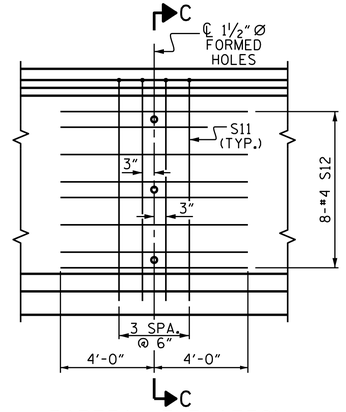
PLAN OF GIRDER



ELEVATION OF GIRDER

INTEGRAL END BENT

FIX



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 3

0.6" Ø L. R. GRADE 270 STRANDS

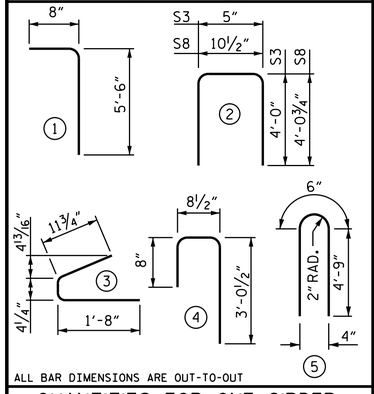
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	148	#4	1	6'-2"	610
S2	24	#5	1	6'-2"	154
S3	12	#4	2	8'-5"	67
S4	76	#4	3	3'-0"	152
S6	172	#5	4	4'-5"	792
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	27	#5	STR	3'-3"	92
S10	2	#3	STR	1'-10"	1
S11	4	#5	5	10'-0"	42
S12	8	#4	STR	8'-0"	43

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER	2087	18.5	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
3	93'-7"	280'-9"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
63" PRESTRESSED CONCRETE
MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPAN B
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-013
1			3			TOTAL SHEETS
2			4			30

DESIGN ENGINEER OF RECORD:	R.KOUCHEKI	DATE :	02/2015
ASSEMBLED BY :	M.D.PISO	DATE :	07-06-13
CHECKED BY :	K.P.SEDAI	DATE :	08-26-14
DRAWN BY : EEM 2/6/97	REV. 5/1/06R		TLA/GM
CHECKED BY : VAP 2/6/97	REV. 10/1/11		MAA/GM
	REV. 6/13		MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

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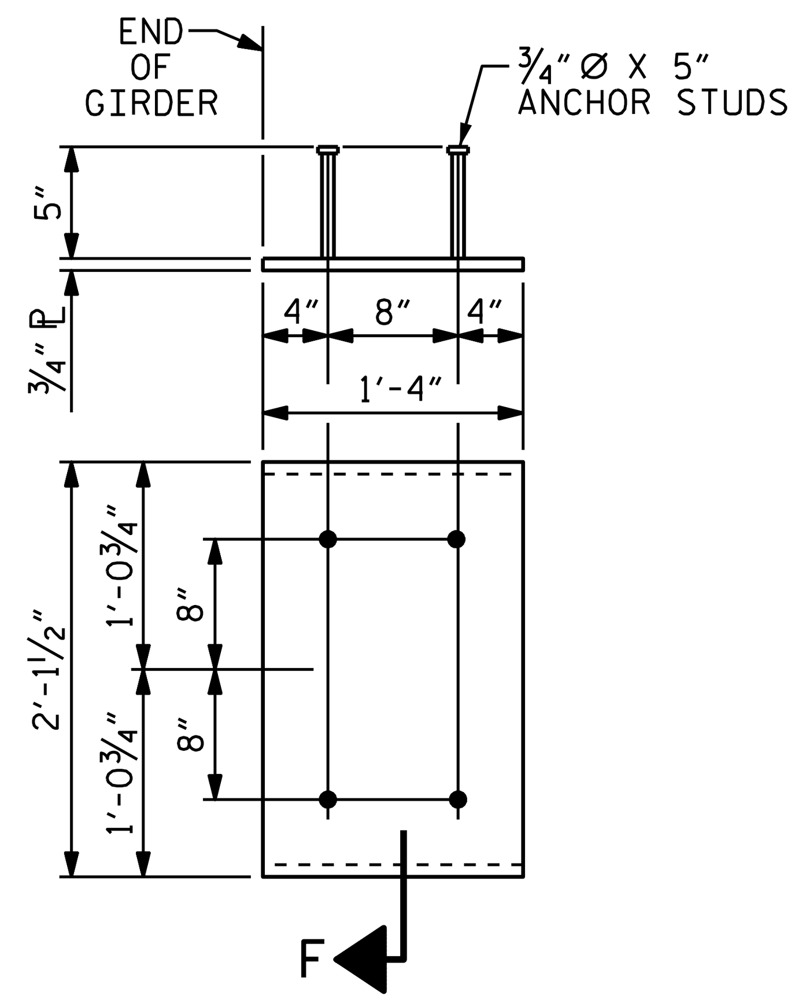
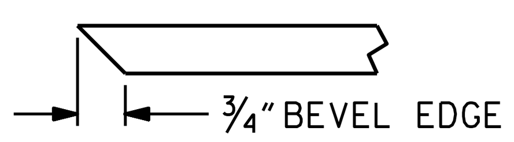
STR. #15

STD. NO. PCG7 (Sht. 2)



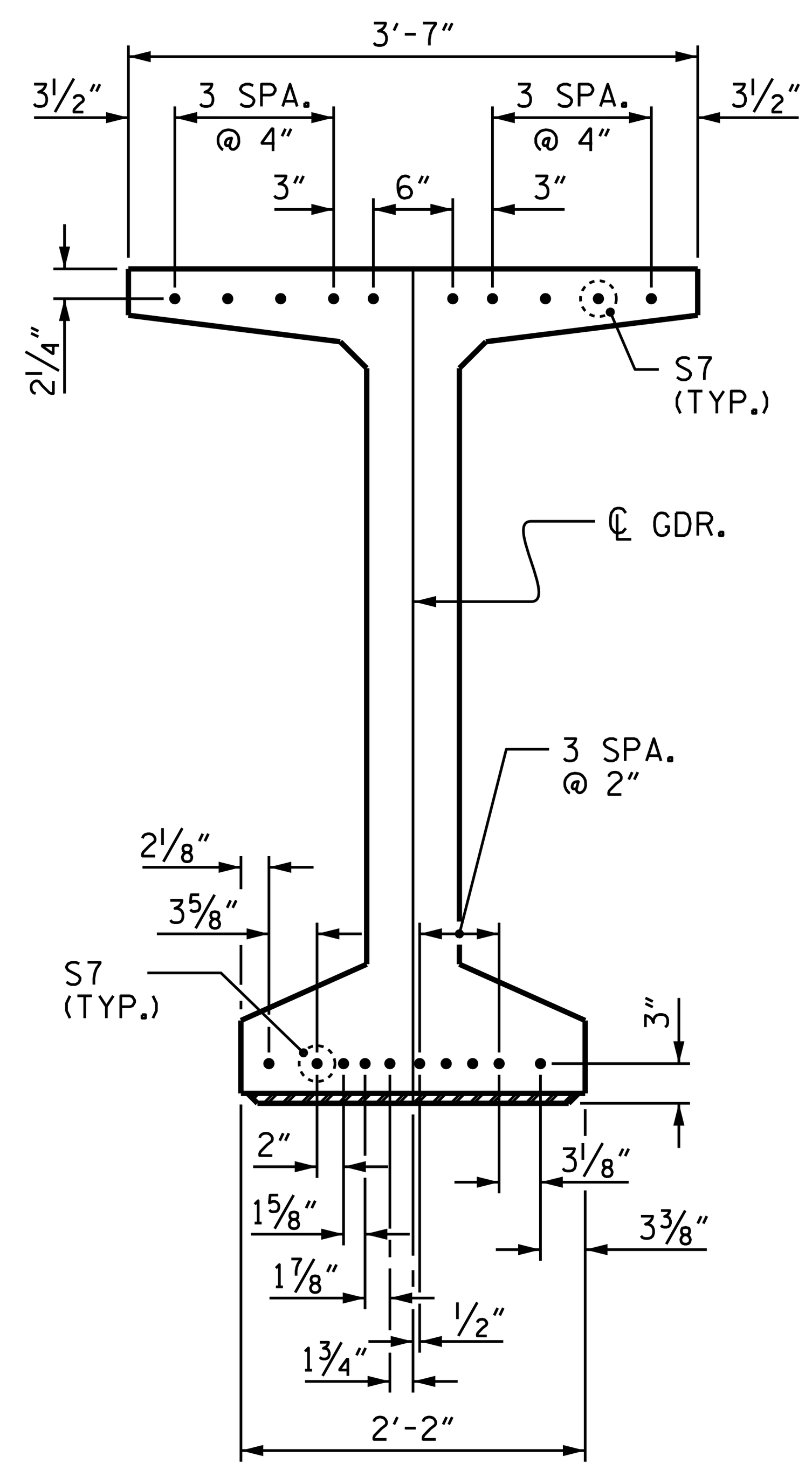
EMBEDDED PLATE "B-1" DETAILS FOR 63" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)



DETAIL "C"

(FOR 63" MODIFIED BULB TEES)

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 6000 PSI (SPAN A) & 6200 PSI (SPAN B)

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

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

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

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6" LOW RELAXATION		GIRDER 1										
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.051	0.096	0.131	0.154	0.162	0.154	0.131	0.096	0.051	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	-0.024	-0.045	-0.062	-0.073	-0.077	-0.073	-0.062	-0.045	-0.024	0.0
FINAL CAMBER	↑	0.0	5/16"	5/8"	13/16"	1"	1"	1"	13/16"	5/8"	5/16"	0.0

* 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 SPAN B

0.6" LOW RELAXATION		GIRDER 1										
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.055	0.104	0.142	0.167	0.175	0.167	0.142	0.104	0.055	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	-0.030	-0.056	-0.077	-0.091	-0.095	-0.091	-0.077	-0.056	-0.030	0.0
FINAL CAMBER	↑	0.0	5/16"	9/16"	3/4"	15/16"	15/16"	15/16"	3/4"	9/16"	5/16"	0.0

* 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 SPAN A

0.6" LOW RELAXATION		GIRDER 2										
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.051	0.096	0.131	0.154	0.162	0.154	0.131	0.096	0.051	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	-0.025	-0.046	-0.064	-0.074	-0.078	-0.074	-0.064	-0.046	-0.025	0.0
FINAL CAMBER	↑	0.0	5/16"	5/8"	13/16"	15/16"	1"	15/16"	13/16"	5/8"	5/16"	0.0

* 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 SPAN B

0.6" LOW RELAXATION		GIRDER 2										
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.055	0.104	0.142	0.167	0.175	0.167	0.142	0.104	0.055	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	-0.030	-0.058	-0.079	-0.092	-0.097	-0.092	-0.079	-0.058	-0.030	0.0
FINAL CAMBER	↑	0.0	5/16"	9/16"	3/4"	7/8"	15/16"	7/8"	3/4"	9/16"	5/16"	0.0

* 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 SPAN A

0.6" LOW RELAXATION		GIRDER 3										
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.051	0.096	0.131	0.154	0.162	0.154	0.131	0.096	0.051	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	-0.024	-0.046	-0.063	-0.074	-0.078	-0.074	-0.063	-0.046	-0.024	0.0
FINAL CAMBER	↑	0.0	5/16"	5/8"	13/16"	15/16"	1"	15/16"	13/16"	5/8"	5/16"	0.0

* 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 SPAN B

0.6" LOW RELAXATION		GIRDER 3										
TENTH POINTS		0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE)	↑	0.0	0.055	0.104	0.142	0.167	0.175	0.167	0.142	0.104	0.055	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0.0	-0.030	-0.057	-0.078	-0.092	-0.096	-0.092	-0.078	-0.057	-0.030	0.0
FINAL CAMBER	↑	0.0	5/16"	9/16"	3/4"	7/8"	15/16"	7/8"	3/4"	9/16"	5/16"	0.0

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

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
DEAD LOAD DEFLECTION
(SPANS A & B)
(LEFT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins 3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-014
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : M.D.PISO DATE : 09-19-14
CHECKED BY : K.P.SEDAI DATE : 09-24-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

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STR. #15

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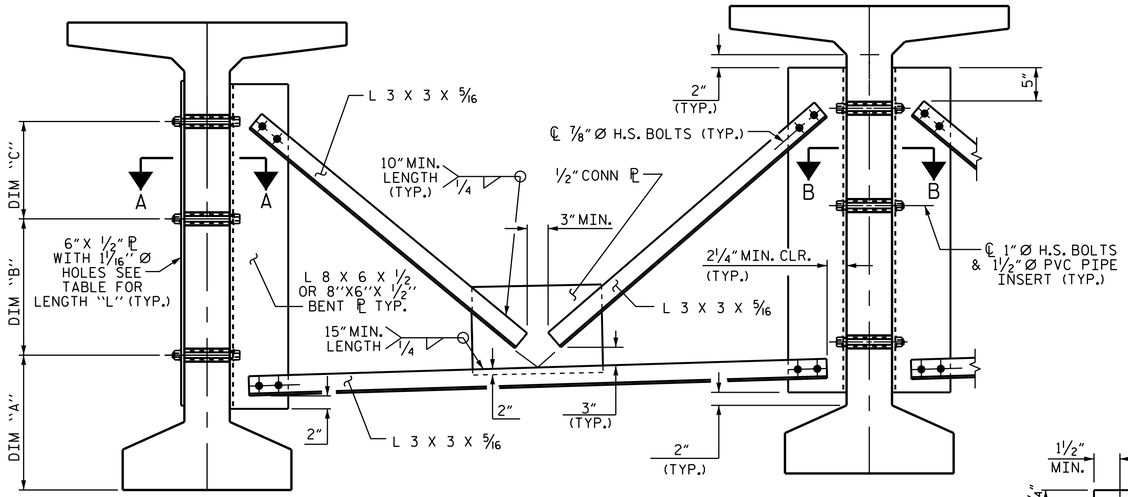
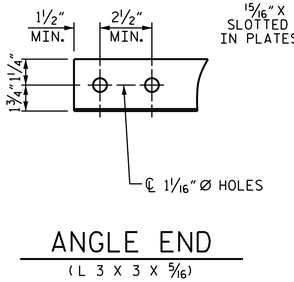


PART SECTION AT INTERMEDIATE DIAPHRAGM

(63" BULB TEE GIRDER SHOWN)



ANGLE END

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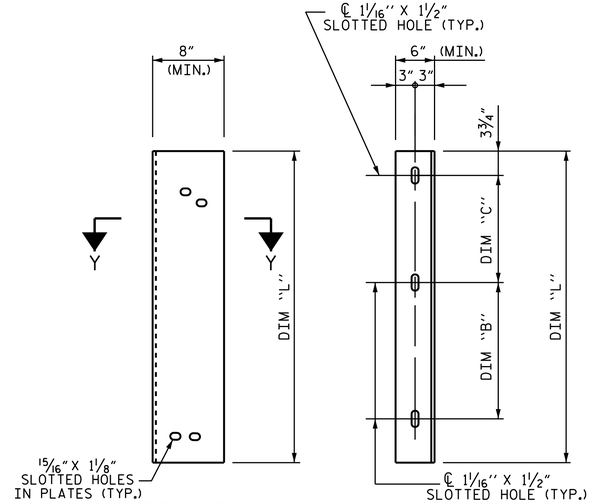
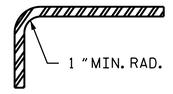




SECTION Y-Y

CONNECTOR PLATE DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

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

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

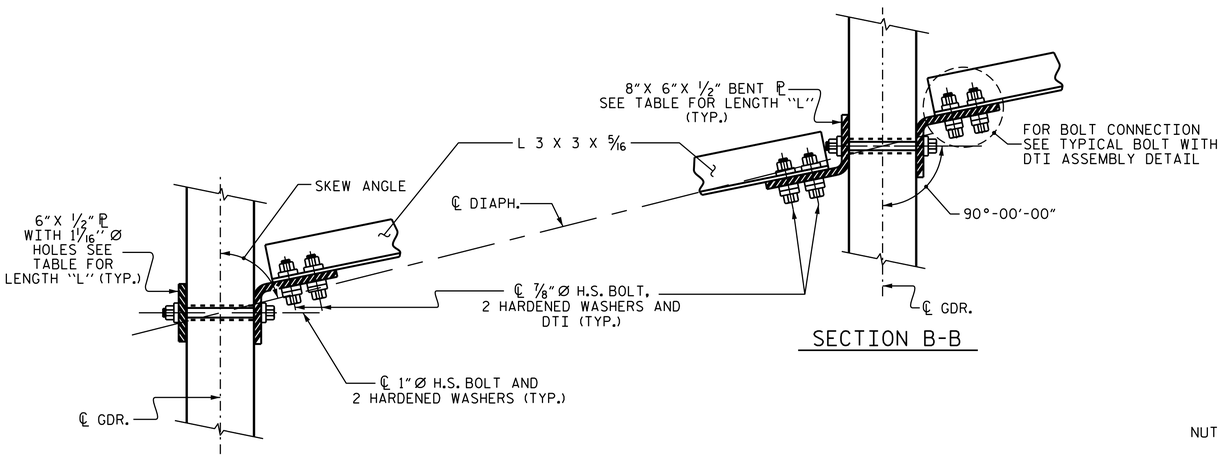
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

TABLE

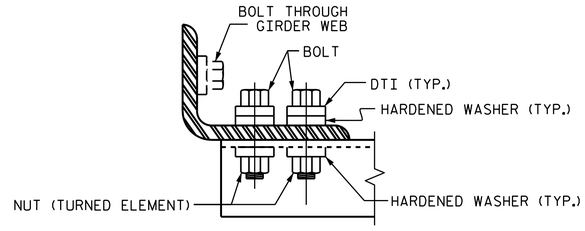
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-7 3/4"	1'-3"	1'-3"	3'-5"



SECTION B-B

SECTION A-A

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
INTERMEDIATE
STEEL DIAPHRAGMS
FOR 63" MODIFIED BULB TEE
PRESTERSSD CONCRETE GIRDERS
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-015
1			3			TOTAL SHEETS
2			4			30

STR. #15 STD. NO. PCG11 (SHT 2)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEF04A8D46FA47B...
3/23/2015

ASSEMBLED BY : M.D.PISO	DATE : 09-10-14
CHECKED BY : K.P.SEDAI	DATE : 09-19-14
DRAWN BY : RWW 11/09	ADDED 11/23/09R
CHECKED BY : GM 11/09	REV. 10/1/11 MAA/GM

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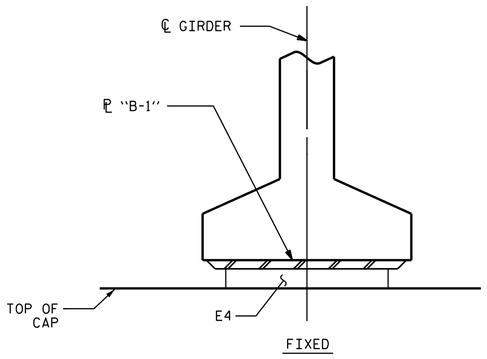
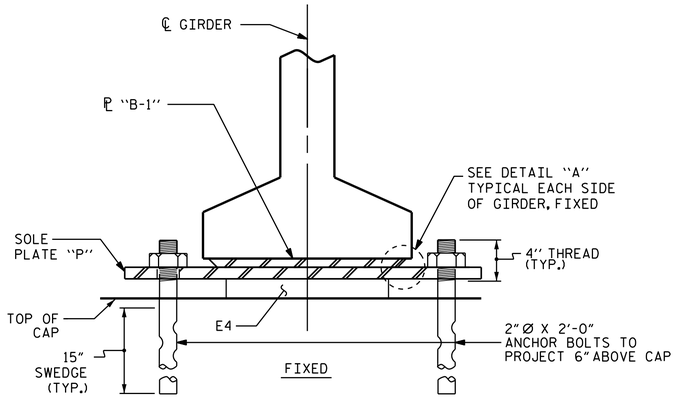
kpaschal



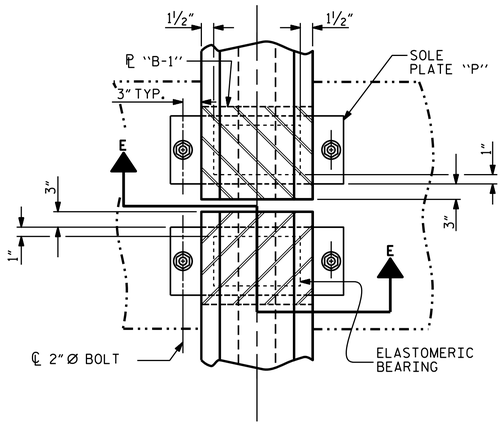
SECTION @ END BENT

SHOWING SECTION AT END BENT



SECTION E-E

SHOWING SECTION AT BENT



TYPICAL PLAN

(SHOWING CONTINUOUS BENT)

NOTES

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

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.

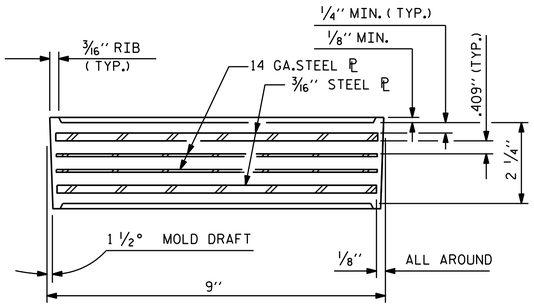
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

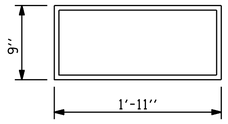
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



TYPICAL SECTION OF ELASTOMERIC BEARINGS

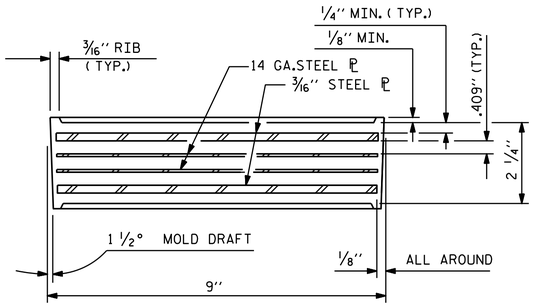


E4 (6 REQ'D.)

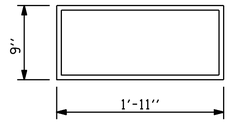
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

(AT END BENTS)



TYPICAL SECTION OF ELASTOMERIC BEARINGS

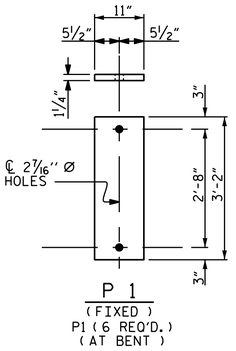


E4 (6 REQ'D.)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

(AT BENT)



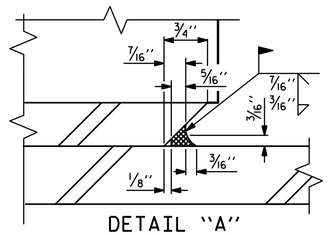
P 1

(FIXED)

P1 (6 REQ'D.)

(AT BENT)

SOLE PLATE DETAILS ("P")



DETAIL "A"

LOAD RATINGS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

ASSEMBLED BY :	M.D.PISO	DATE : 09-18-14	
CHECKED BY :	K.D.SEDAI	DATE : 09-24-14	
DESIGN ENGINEER OF RECORD :	R.KOUCHEKI	DATE : 02/2015	
DRAWN BY : EEM 2/97	REV. 10/1/11	MAA/GM	
CHECKED BY : VAP 2/97	REV. 6/13	AAC/MAA	
	REV. 1/15	MAA/TMG	

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-016
1			3			TOTAL SHEETS
2			4			30

STR. #15

STD. NO. EB4 (SHT 1)

23-MAR-2015 12:51

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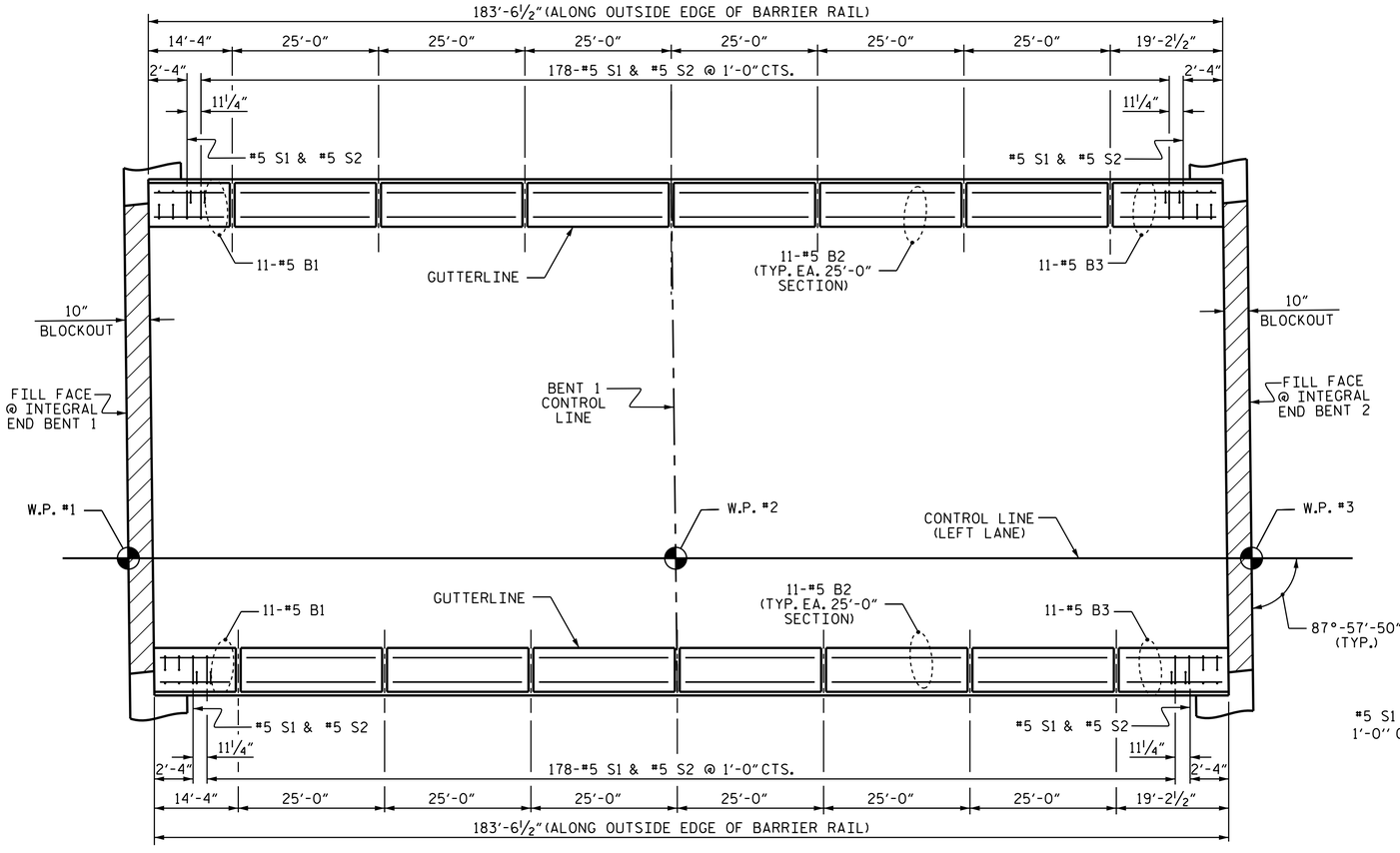
kpaschal



PLAN

NOTES

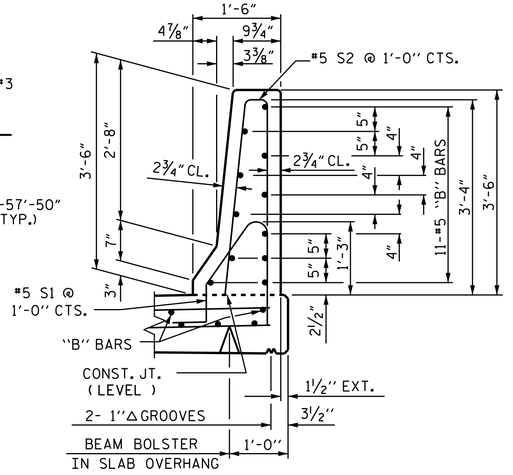
THE BARRIER RAIL IN A EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

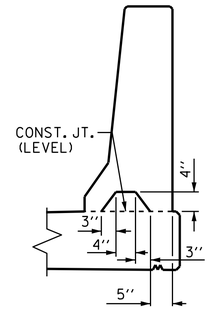
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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

#5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE ½" EXPANSION JOINT MATERIAL IN RAIL.

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



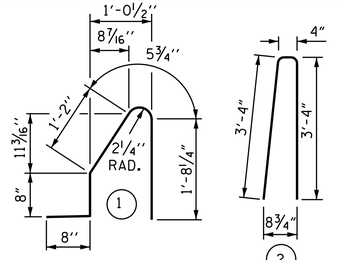
SECTION THRU RAIL

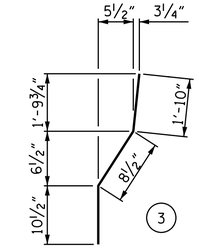


SECTION S-S

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

BAR TYPES





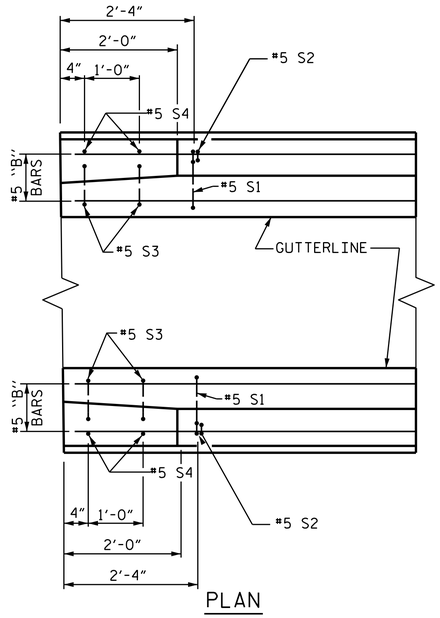
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

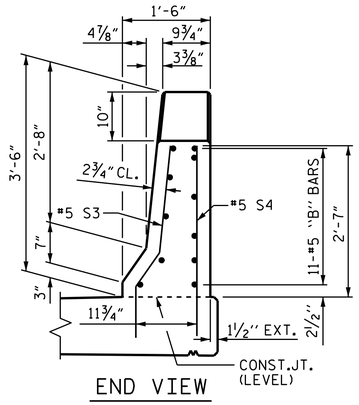
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	22	#5	STR	13'-11"	319
* B2	132	#5	STR	24'-7"	3385
* B3	22	#5	STR	18'-9"	430
* S1	360	#5	1	4'-8"	1752
* S2	360	#5	2	7'-0"	2628
* S3	8	#5	3	3'-5"	29
* S4	8	#5	STR	3'-3"	27

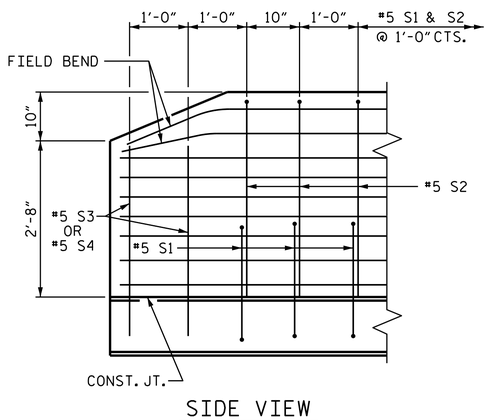
* EPOXY COATED REINFORCING STEEL	8570 LBS.
CLASS AA CONCRETE	50.3 CU. YDS.
CONCRETE BARRIER RAIL	367.08 LIN. FT.



PLAN



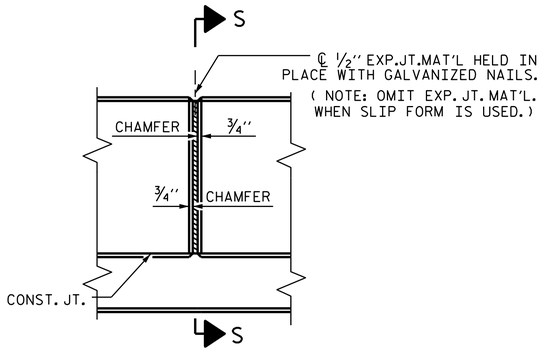
END VIEW



SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

(LEFT LANE)

DRAWN BY : D. G. ELY	DATE : 2/3/15	DRAWN BY : ARB 5/87	REV. 10/1/11 MAA/GM
CHECKED BY : G.DICKEY	DATE : 2/4/15	CHECKED BY : SJD 9/87	REV. 7/12 MAA/GM
DESIGN ENGINEER OF RECORD: GhplamrezaKouchek	DATE : 2/2015		REV. 6/13 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-017
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COCCONS

DocuSigned by: Tim Coggins DEF04A804BFA47B...

3/23/2015

23-MAR-2015 12:51
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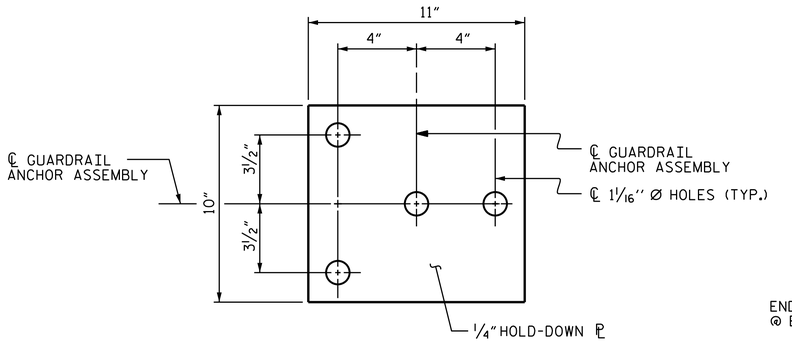
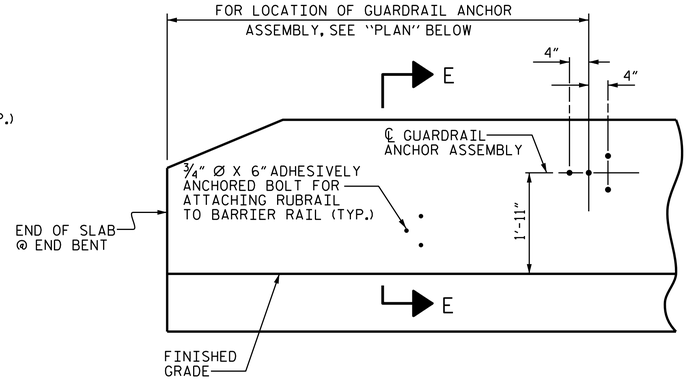
kpaschal

STR. #15

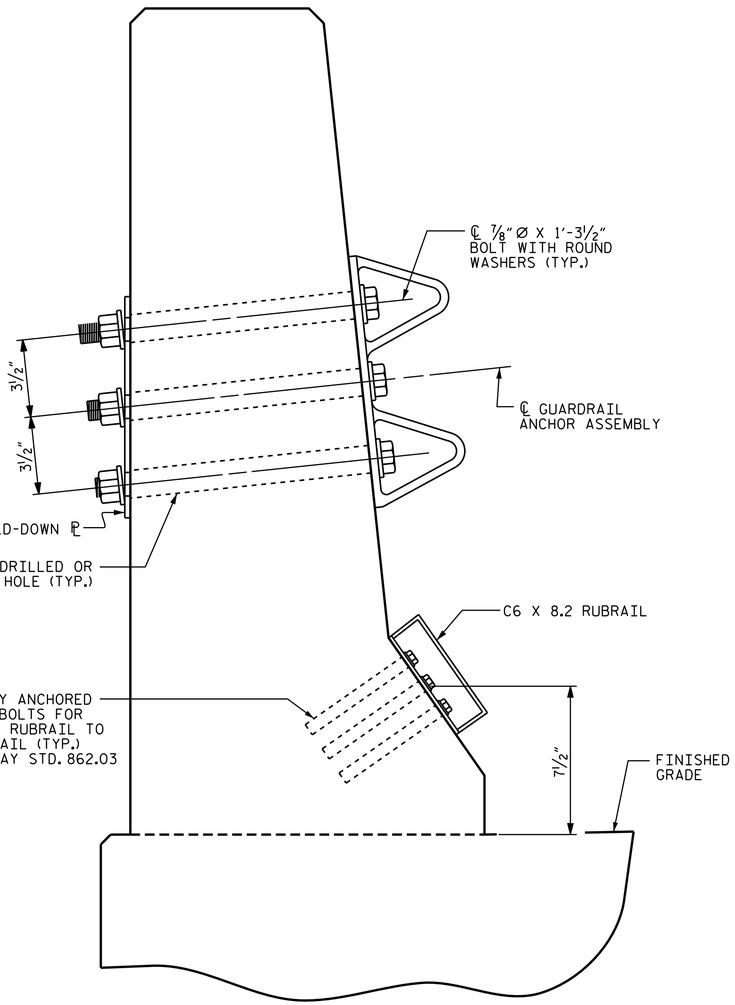
STD. NO. CBR1 (SHT 1)



PLAN

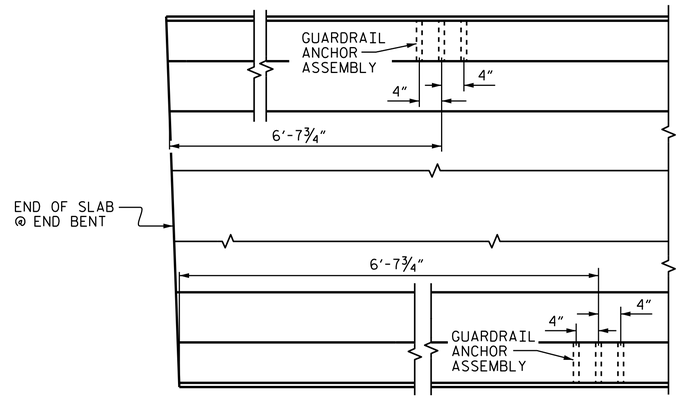


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

NOTES

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

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

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

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

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

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

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

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

SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-018
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

ASSEMBLED BY : M.D.PISO	DATE : 08-06-13		
CHECKED BY : K.P.SEDAI	DATE : 08-24-14		
DRAWN BY : TLA 5/06	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 5/06	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

23-MAR-2015 12:51
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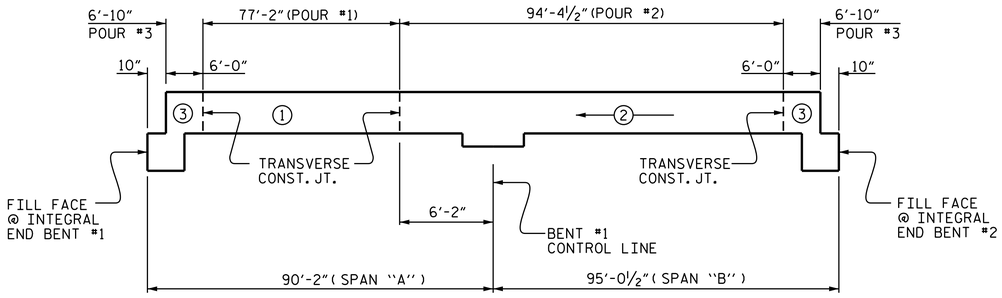
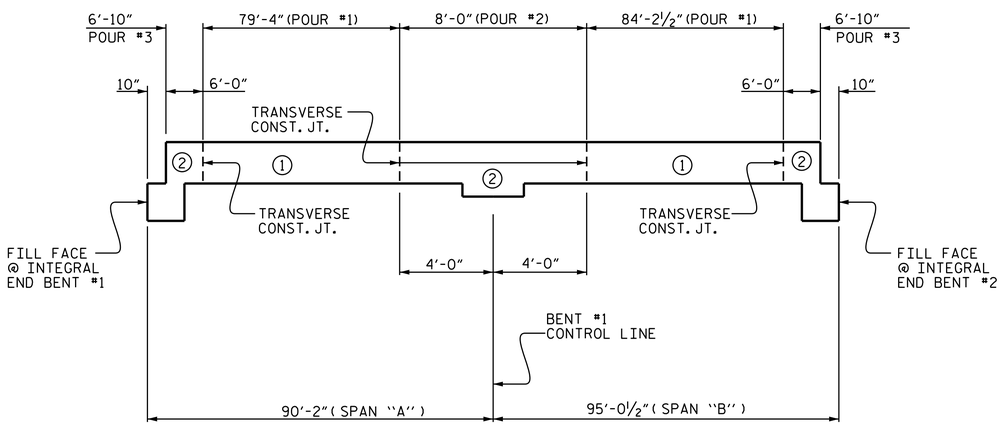
kpaschal

STR. #15 (SHT 1a) STD. NO. GRA2



POURING SEQUENCE

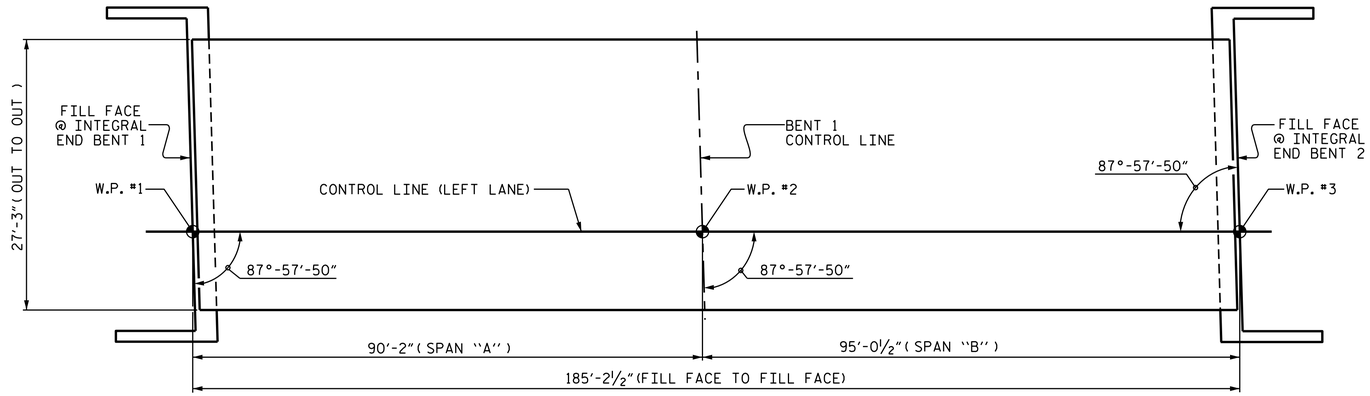
POUR ③ INCLUDES 6'-10" SECTION OF TH BRIDGE DECK AND UPPER PART OF INTEGRAL END BENTS AND WINGS.



OPTIONAL POURING SEQUENCE

POUR ② CAN NOT BE POURED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUN STRENGTH OF 3000 PSI.

AT END BENTS POUR ② INCLUDES 6'-10" SECTION OF THE BRIDGE DECK AND UPPER PART OF INTEGRAL END BENTS AND WINGS.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5,047)

ASSEMBLED BY :	M.D.PISO	DATE :	08-16-13
CHECKED BY :	K.P.SEDAI	DATE :	07-24-14
DESIGN ENGINEER OF RECORD :	Gholamreza Kouchekian	DATE :	02/2015
DRAWN BY : JMB 5/87	REV. 8/16/99	RWW/LES	
CHECKED BY : SJD 9/87	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,036 SQ.FT.
BRIDGE DECK	3,847 SQ.FT.
TOTAL	4,883 SQ.FT.

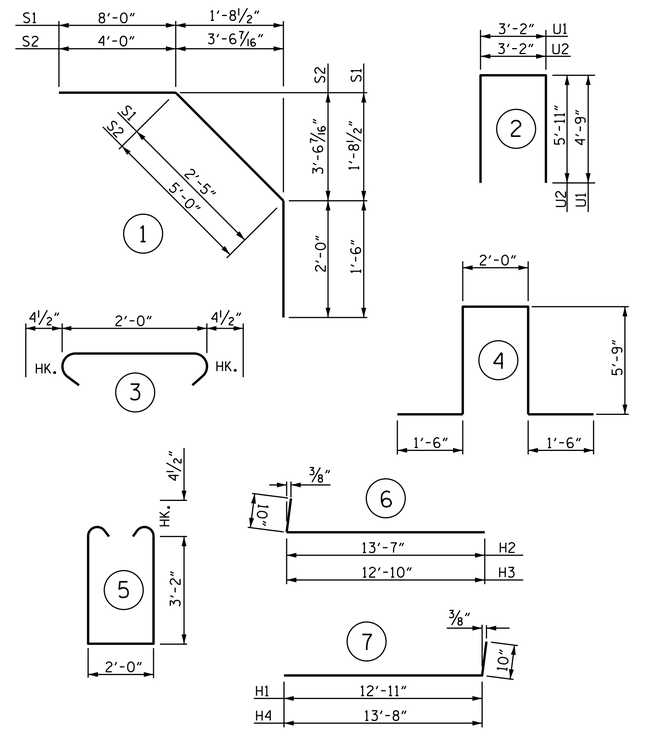
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	292	#5	STR.	26'-11"	8,198
✱A101	2	#5	STR.	12'-3"	26
A2	292	#5	STR.	26'-11"	8,198
A201	2	#5	STR.	12'-3"	26
✱B1	60	#4	STR.	21'-1"	845
✱B2	60	#4	STR.	22'-1"	885
✱B3	72	#6	STR.	19'-1"	2,064
✱B4	34	#6	STR.	27'-9"	1,417
✱B5	60	#6	STR.	24'-0"	2,163
B6	80	#5	STR.	47'-6"	3,963
H1	24	#5	7	13'-9"	344
H2	24	#5	6	14'-5"	361
H3	24	#5	6	13'-8"	342
H4	24	#5	7	14'-6"	363
K1	24	#4	STR.	17'-5"	279
K2	4	#4	STR.	5'-7"	15
K3	16	#4	STR.	8'-7"	92
K4	4	#4	STR.	7'-0"	19
K5	16	#4	STR.	2'-8"	29
K6	4	#4	STR.	5'-0"	13
K7	16	#4	STR.	6'-6"	69
K8	4	#4	STR.	5'-9"	15
K9	6	#4	STR.	19"-0"	76
K10	4	#4	STR.	5'-7"	15
K11	16	#4	STR.	8'-7"	92
K12	4	#4	STR.	5'-10"	16
✱S1	40	#4	1	11'-11"	318
✱S2	36	#4	1	11'-0"	265
S3	68	#4	3	2'-9"	125
S4	4	#4	5	9'-1"	24
U1	40	#4	2	12'-8"	338
U2	12	#4	2	15'-0"	120
✱U3	12	#4	4	16'-6"	132
V1	18	#4	STR.	5'-3"	63
V2	48	#5	STR.	6'-0"	300
V3	52	#5	STR.	6'-1"	330

REINFORCING STEEL 15,627 LBS.

✱EPOXY COATED REINFORCING STEEL 16,313 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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

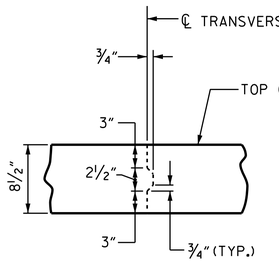
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	69.1	15,627	16,313
POUR #2	93.0		
◊ POUR #3	67.0		
TOTALS✱✱	229.1	15,627	16,313

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

◊ POUR #3 QUANTITY INCLUDES UPPER POUR OF WINGS AND INTEGRAL END BENT.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SUPERSTRUCTURE BILL OF MATERIAL

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-019
1			3			TOTAL SHEETS
2			4			30

STR. #15

STD. NO. BOM2

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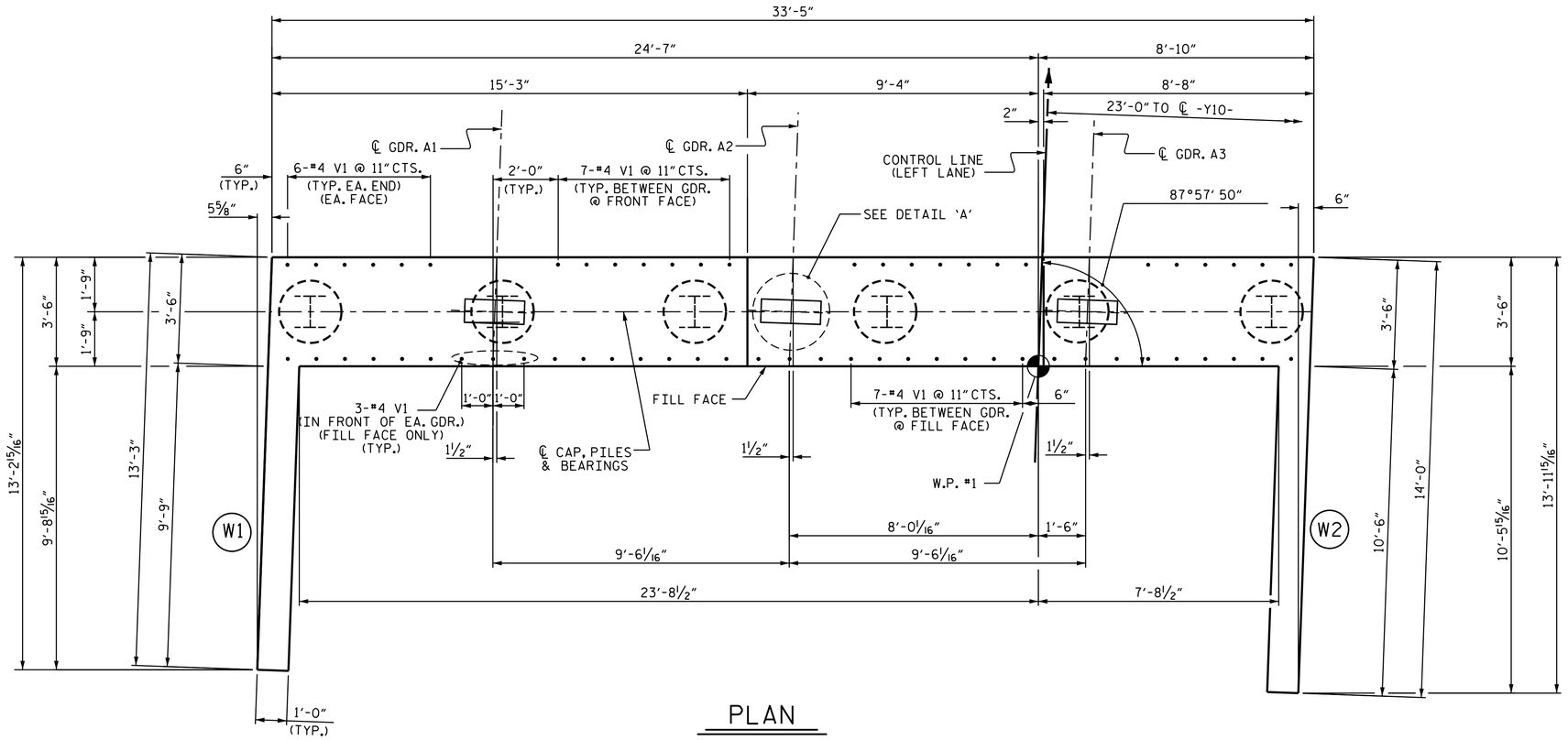
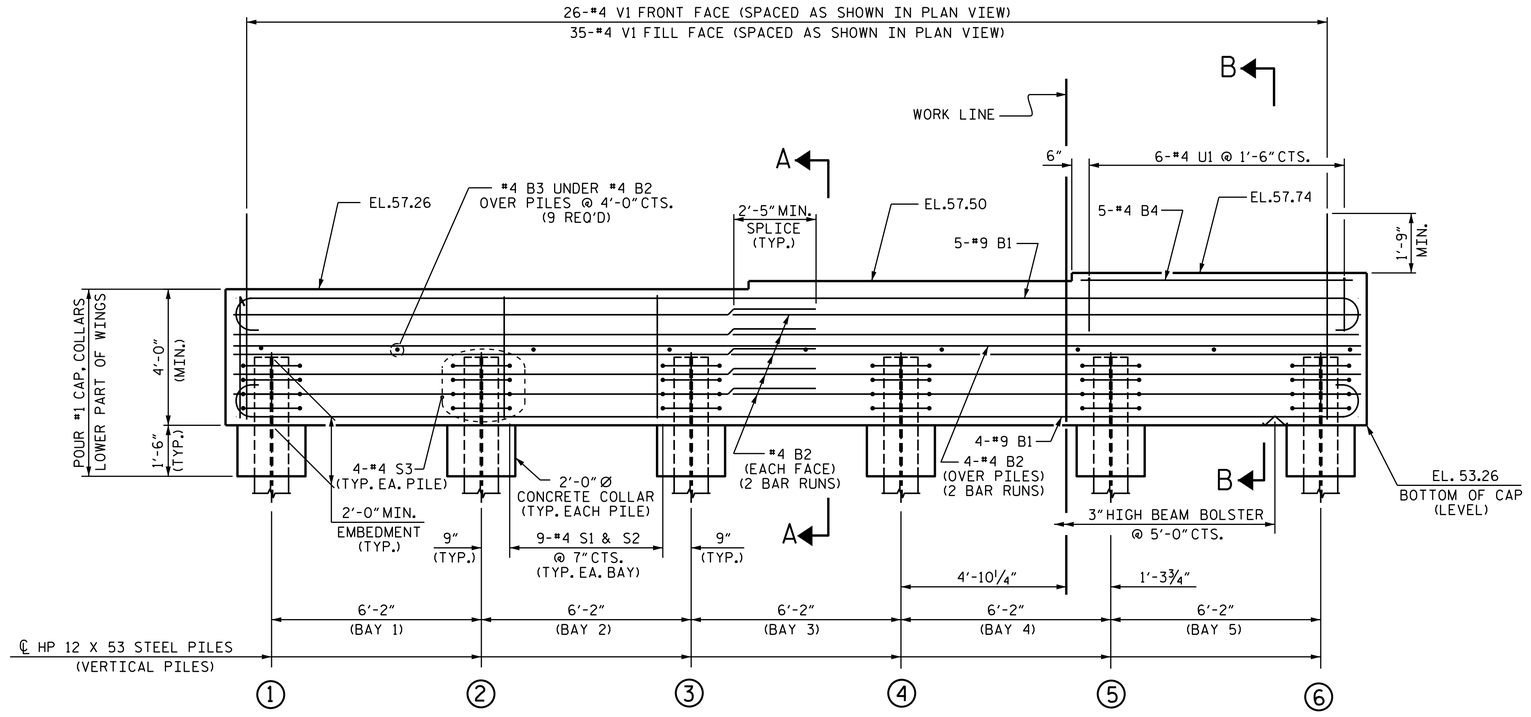
kpaschal



PLAN



ELEVATION

NOTES

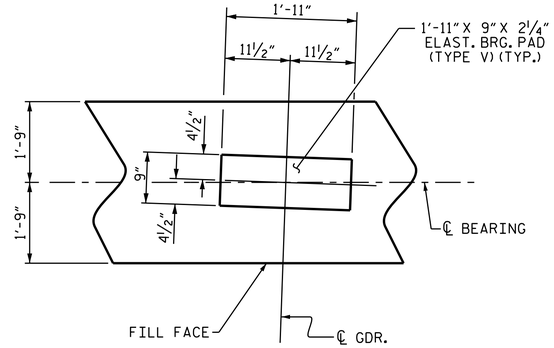
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAIL.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT UPPER PART OF WINGS ARE TO BE POURED WITH THE SUPERSTRUCTURE.

THE TOP SURFACE OF POUR #1 OF THE END BENT CAP AND WINGS, EXCLUDING THE OUTSIDE 4" AND THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".



DETAIL "A"

(TYP. EA. GDR.)

PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-020
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 4/25/14
CHECKED BY : K.P. SEDAI DATE : 5/15/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

23-MAR-2015 12:51
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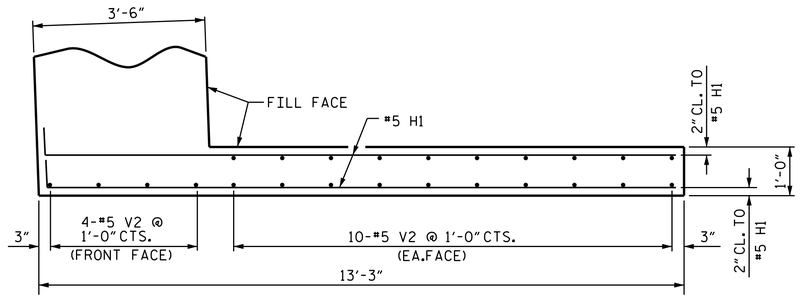
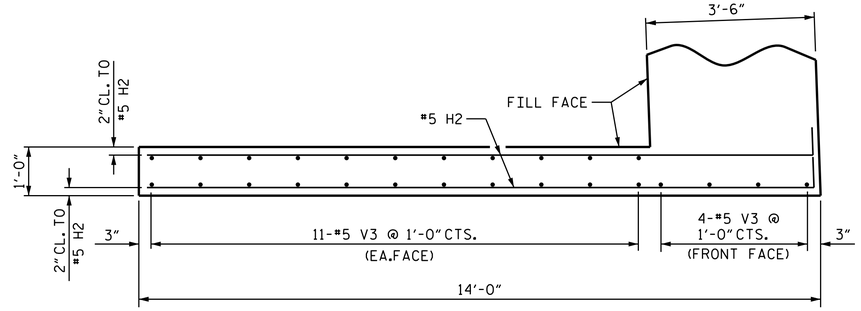
kpaschal

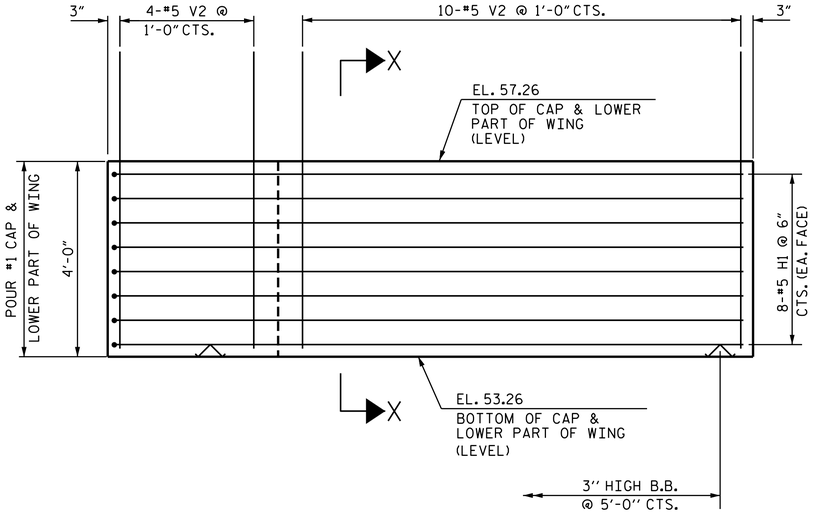
STR. #15



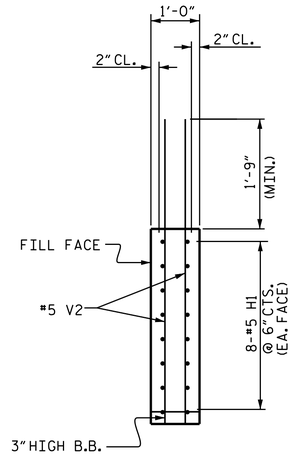
PLAN OF WING (W1)



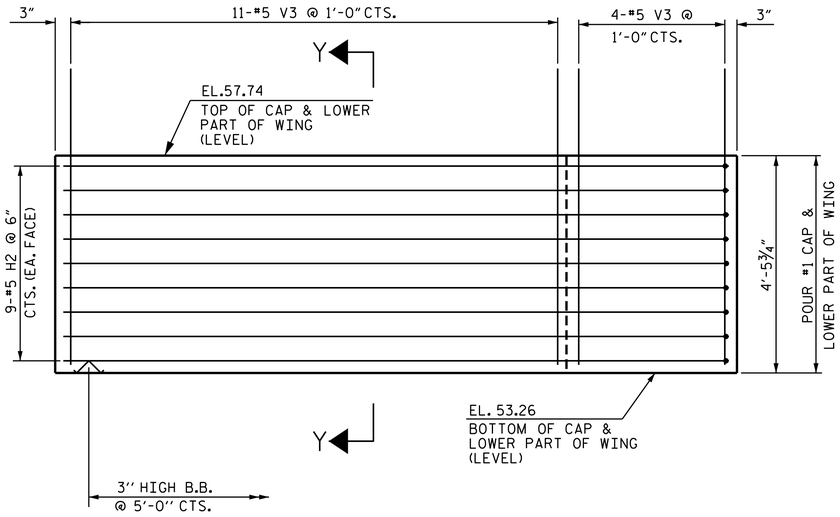
PLAN OF WING (W2)



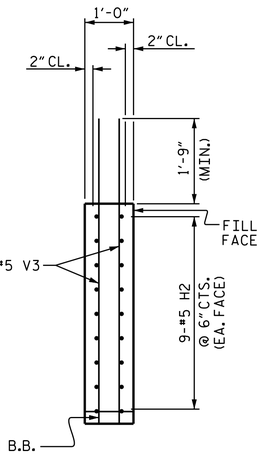
ELEVATION OF WING (W1)



SECTION X-X



ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. R-2514D
JONES-CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-021
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFDA8D48FA47B...
3/23/2015

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 4/25/14
CHECKED BY : K.P. SEDAI DATE : 5/19/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

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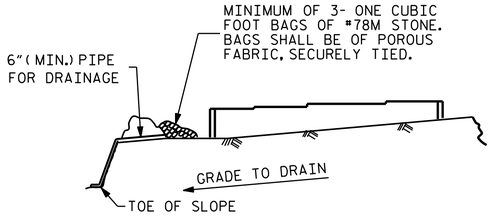
kpaschal

STR. #15



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

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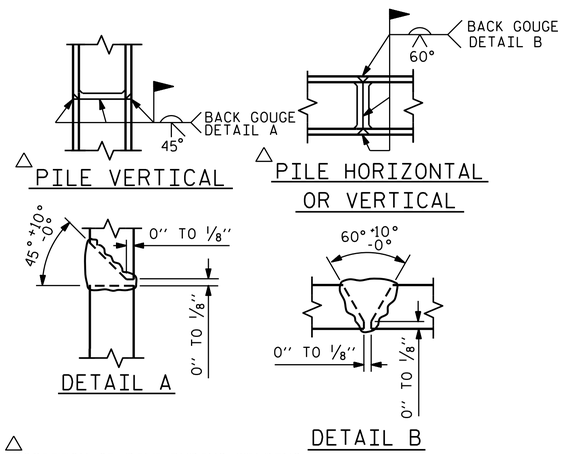
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

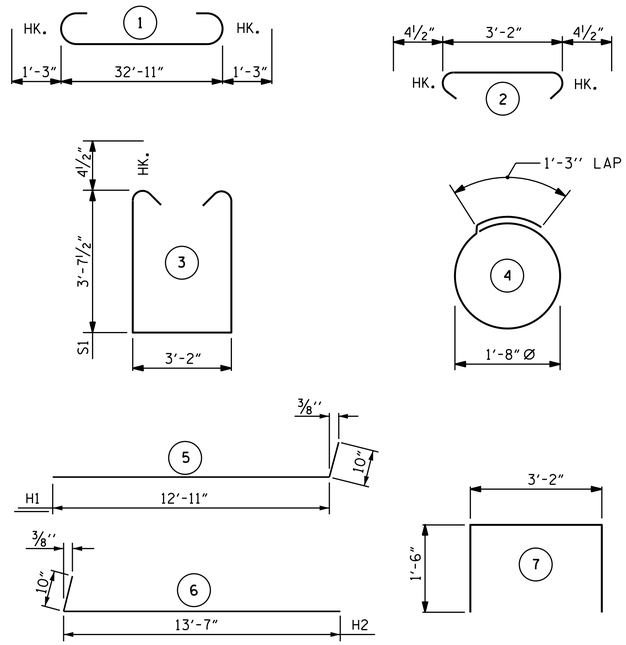
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

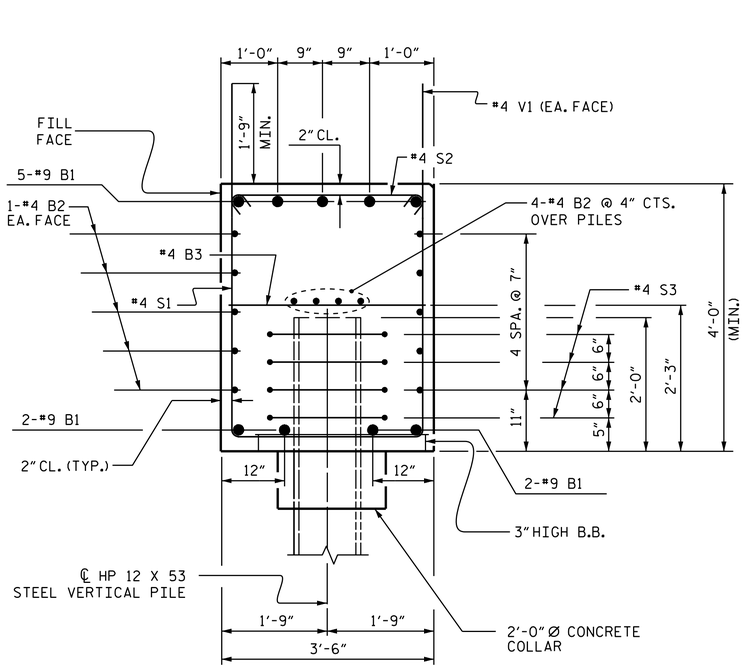
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#9	1	35'-5"	1,084
B2	28	#4	STR	17'-9"	332
B3	9	#4	STR	3'-2"	19
B4	5	#4	STR	8'-2"	27
H1	16	#5	5	13'-9"	229
H2	18	#5	6	14'-5"	271
S1	45	#4	3	11'-2"	336
S2	45	#4	2	3'-11"	118
S3	24	#4	4	6'-6"	104
U1	6	#4	7	6'-2"	25
V1	61	#4	STR	6'-2"	252
V2	24	#5	STR	5'-6"	138
V3	26	#5	STR	6'-0"	163

REINFORCING STEEL = 3,098 LBS

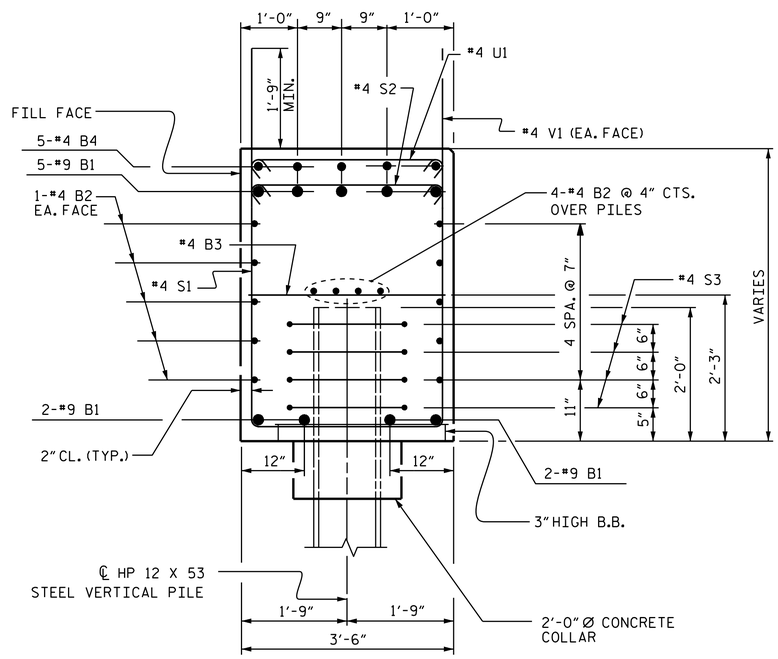
CLASS A CONCRETE

POUR #1 (CAP & LOWER PART OF WINGS)	21.3 C.Y.
CONCRETE COLLARS	1.0 C.Y.
TOTAL	22.3 C.Y.

HP 12 x 53 STEEL PILES No. 6	420 LIN FT.
STEEL PILE POINTS NO. 6	EA.
PILE REDRIVES	3 EA.



SECTION A-A



SECTION B-B

PROJECT NO. R-2514D
JONES-CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-022
1			3			TOTAL SHEETS
2			4			30

STR. #15

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48F447B...
3/23/2015

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 4/25/14
CHECKED BY : K.P. SEDAI DATE : 5/19/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

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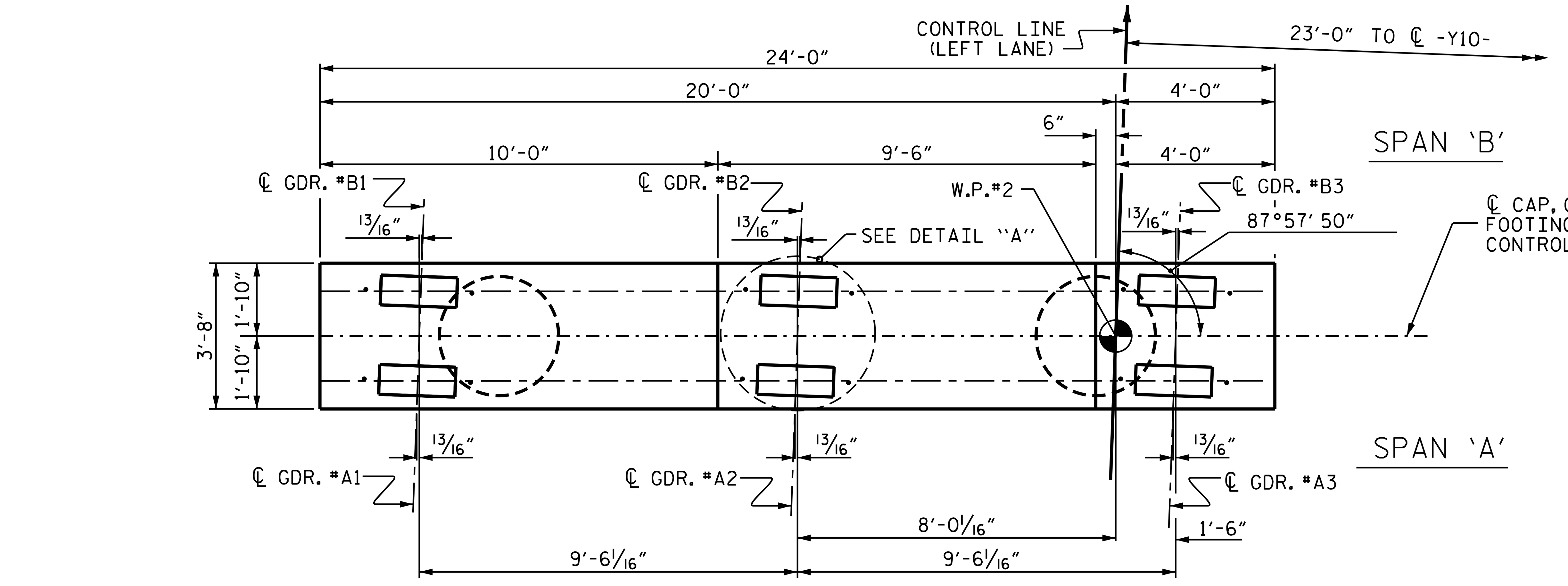
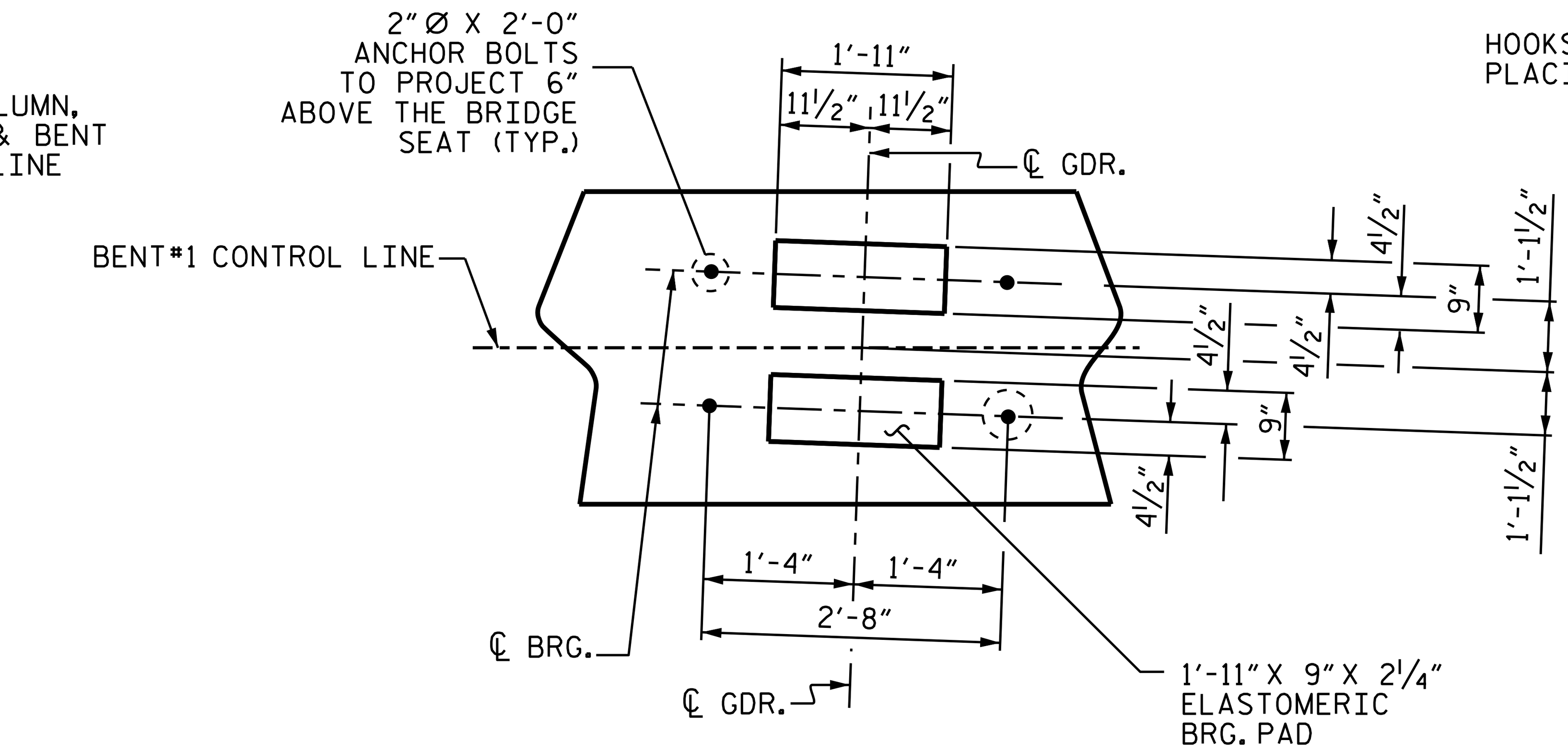


PLAN



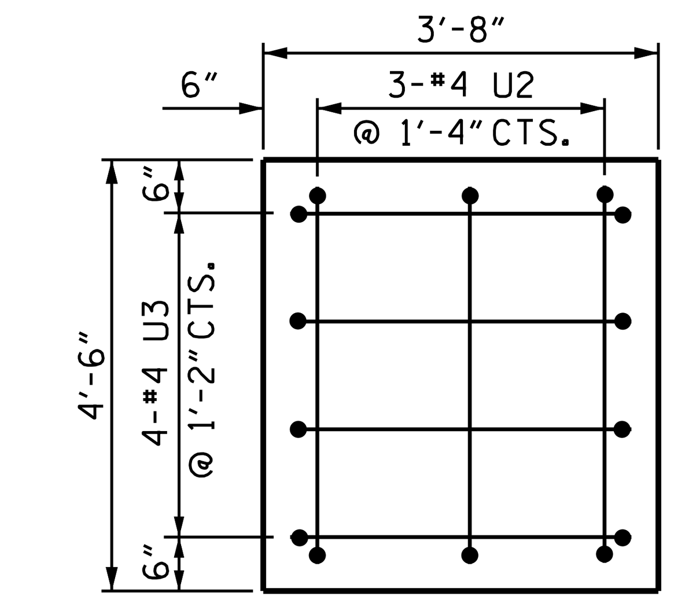
DETAIL "A"

(TYP. EA. GDR.)

NOTES

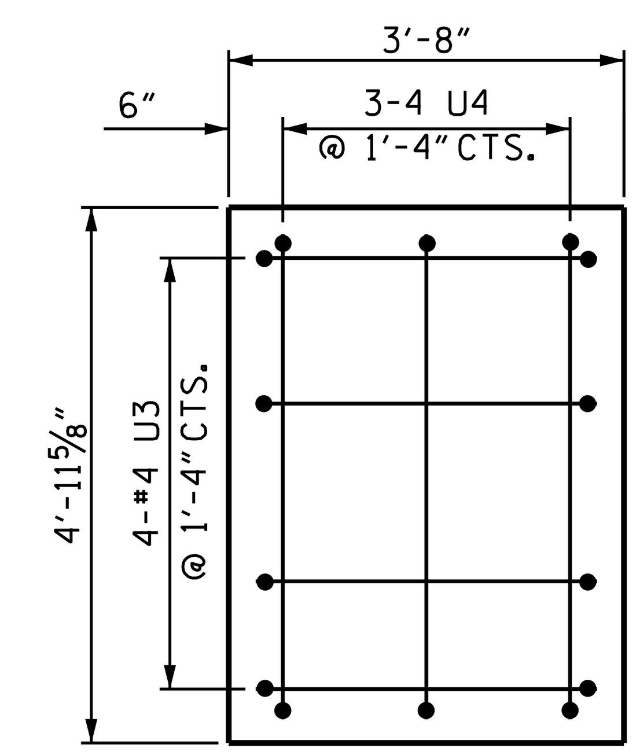
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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



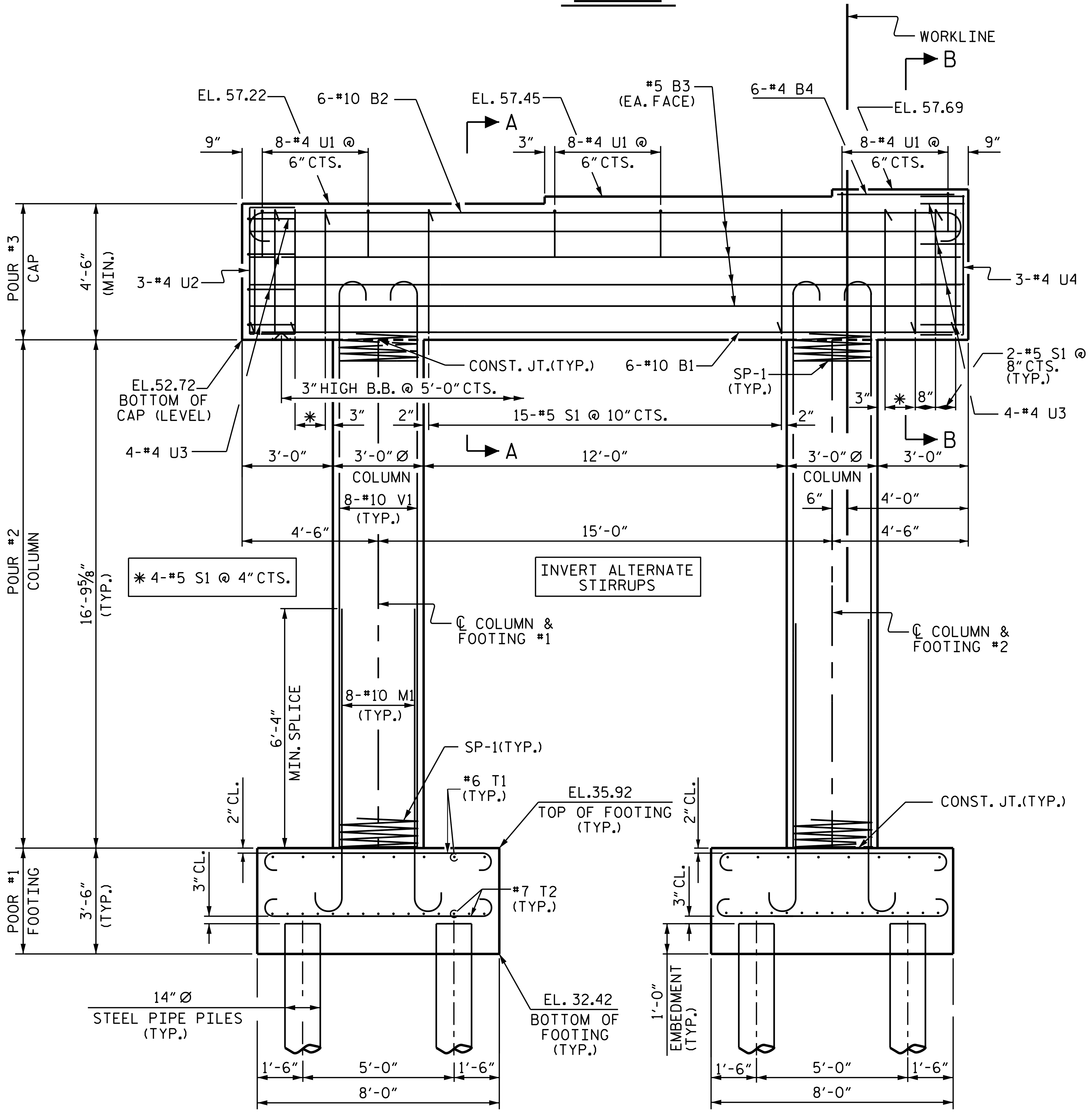
END VIEW

(LEFT SIDE)

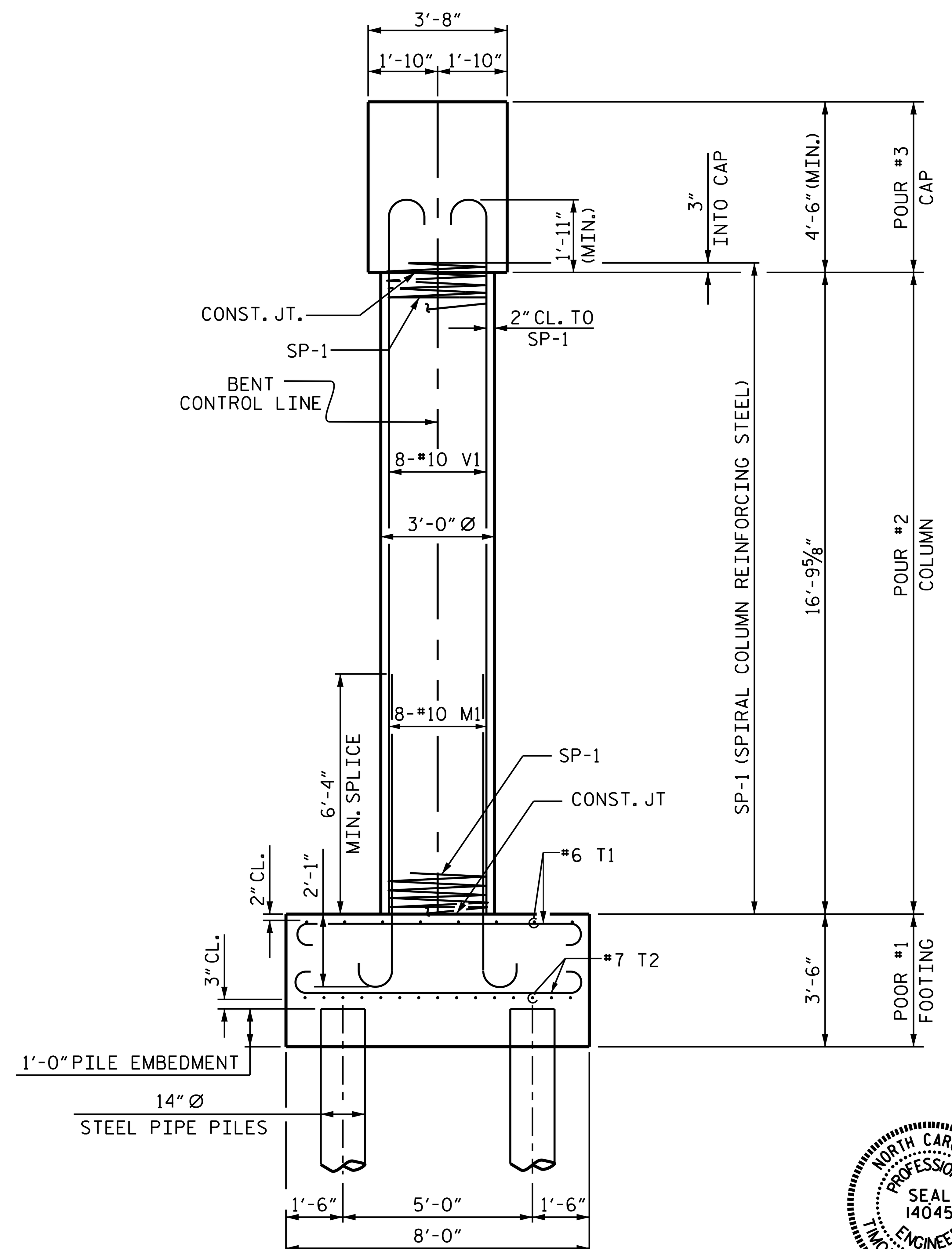


END VIEW

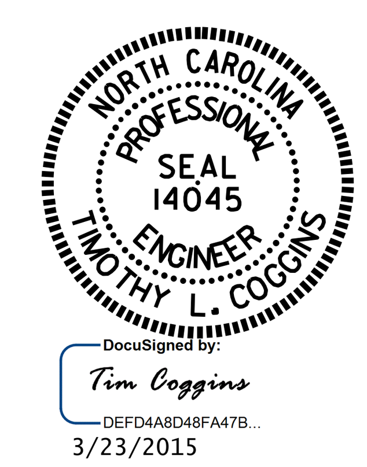
(RIGHT SIDE)



ELEVATION



END ELEVATION



PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-023
1			3			TOTAL SHEETS
2			4			30

STR. #15

DRAWN BY :	GHOLAMREZA KOUCHEKI	DATE :	5/30/14
CHECKED BY :	K.P.SEDAI	DATE :	5/30/14
DESIGN ENGINEER OF RECORD:	GHOLAMREZA KOUCHEKI	DATE :	02/2015

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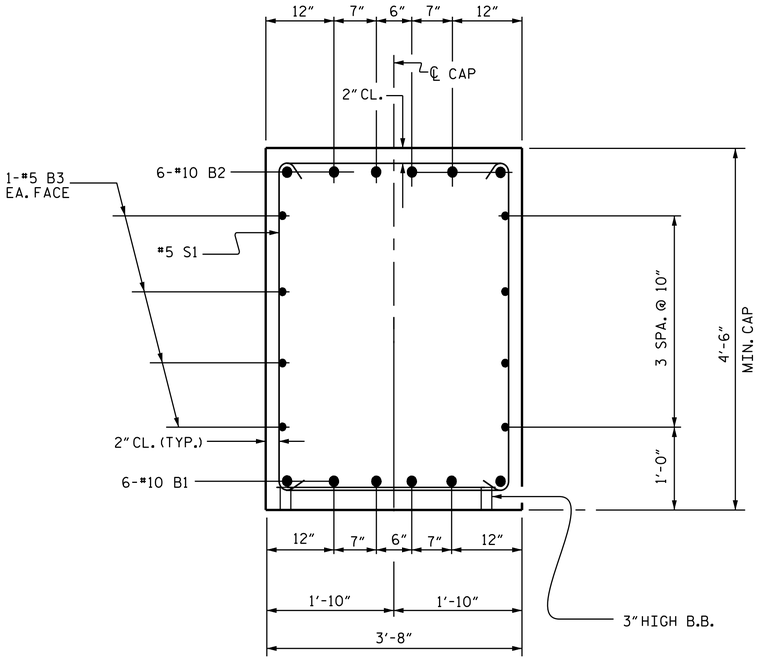
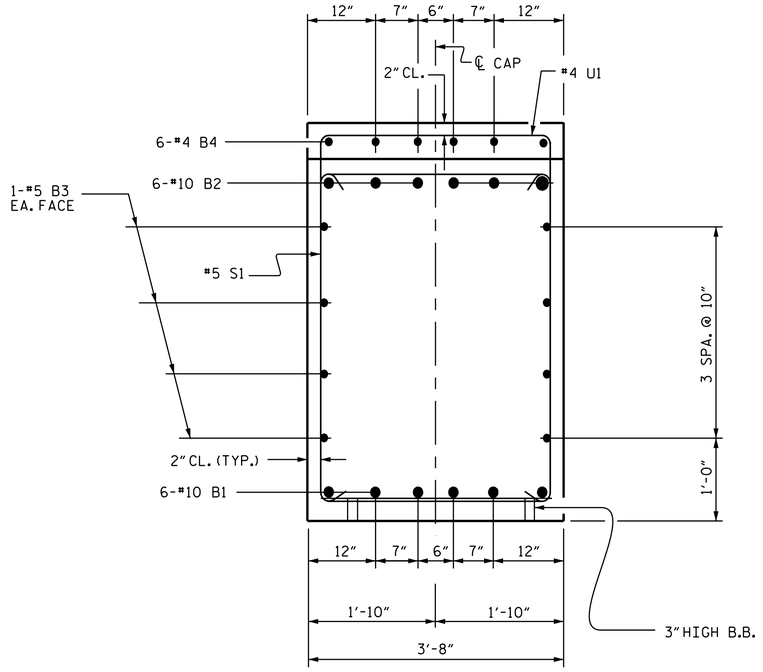
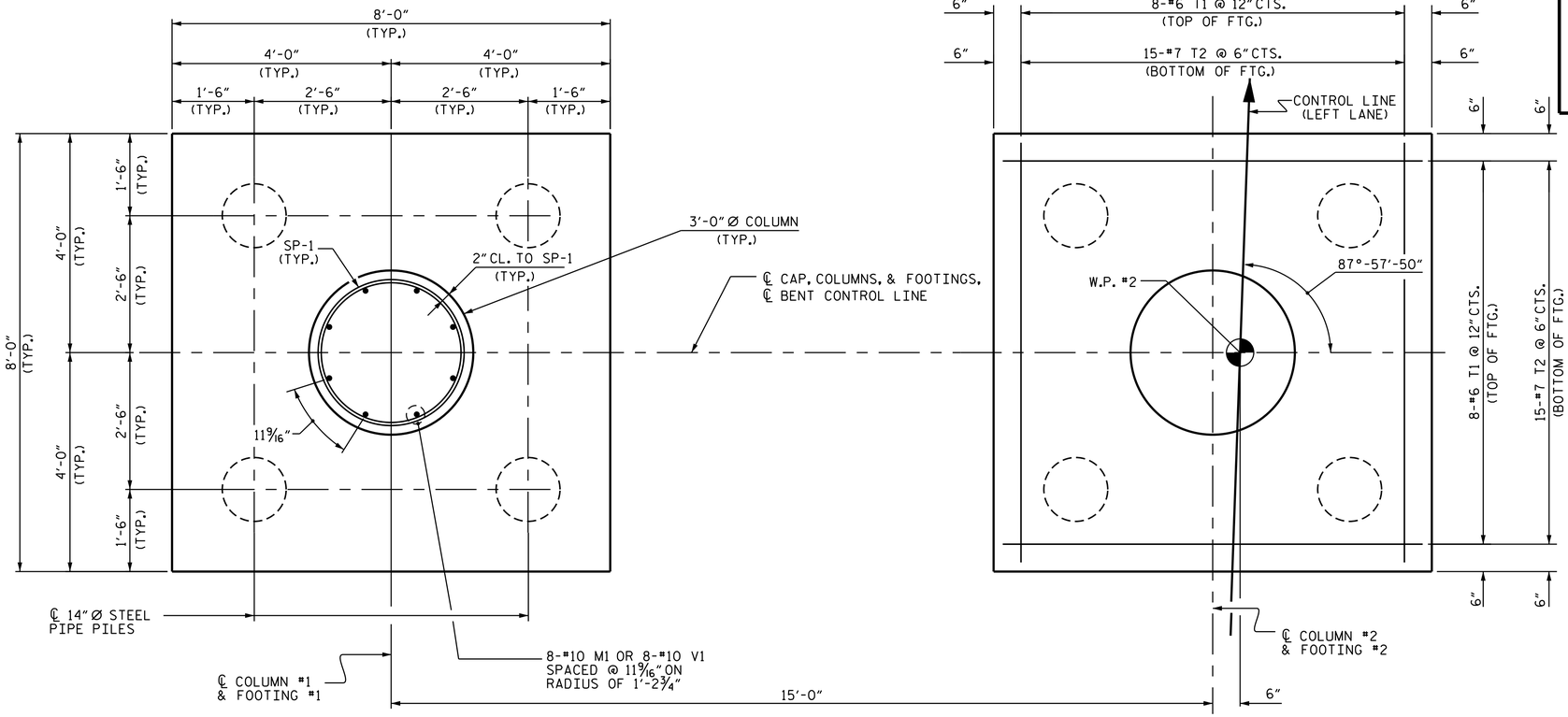


SECTION A-A



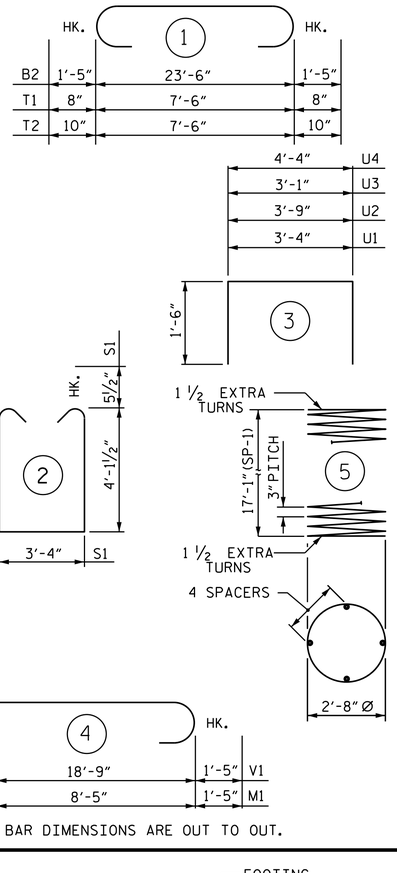
SECTION B-B



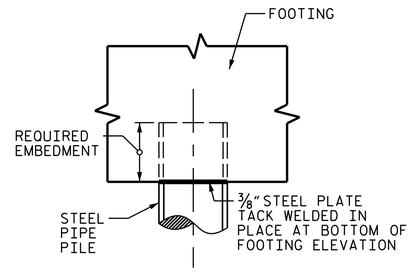
PLAN OF FOOTINGS

(ALL FOOTING, COLUMN DIMENSIONS AND REINFORCING STEEL ARE TYPICAL)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



PIPE PILE IN FOOTING DETAIL

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

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	10	STR	23'-6"	607
B2	6	10	1	26'-4"	680
B3	8	5	STR	23'-8"	197
B4	6	4	STR	4'-2"	17
S1	27	5	2	12'-6"	352
U1	24	4	3	6'-4"	102
U2	3	4	3	6'-9"	14
U3	8	4	3	6'-1"	33
U4	3	4	3	7'-4"	15
M1	16	10	4	9'-10"	677
V1	16	10	4	20'-2"	1388
T1	32	6	1	8'-10"	425
T2	60	7	1	9'-2"	1124
REINFORCING STEEL					5631 LBS.
SP-1	2	**	5	588'-7"	786 LBS.

SPIRAL COLUMN REINFORCING STEEL 786 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 FOOTINGS	CU. YD. 16.6
POUR #2 COLUMNS	CU. YD. 8.8
POUR #3 CAP	CU. YD. 15.3
TOTAL CLASS A CONCRETE	CU. YD. 40.7

14" Ø STEEL PIPE PILES
NO. 8 LIN. FT. 600

STEEL PILE POINTS
NO. 8 EA.

PILE REDRIVES EA. 4

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

PROJECT NO. R-2514D
JONES-CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1
(LEFT LANE)

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

SHEET NO. S15-024
SHEETS 30

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 5/30/14
CHECKED BY : K.P.SEDAI DATE : 5/30/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
Docusigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

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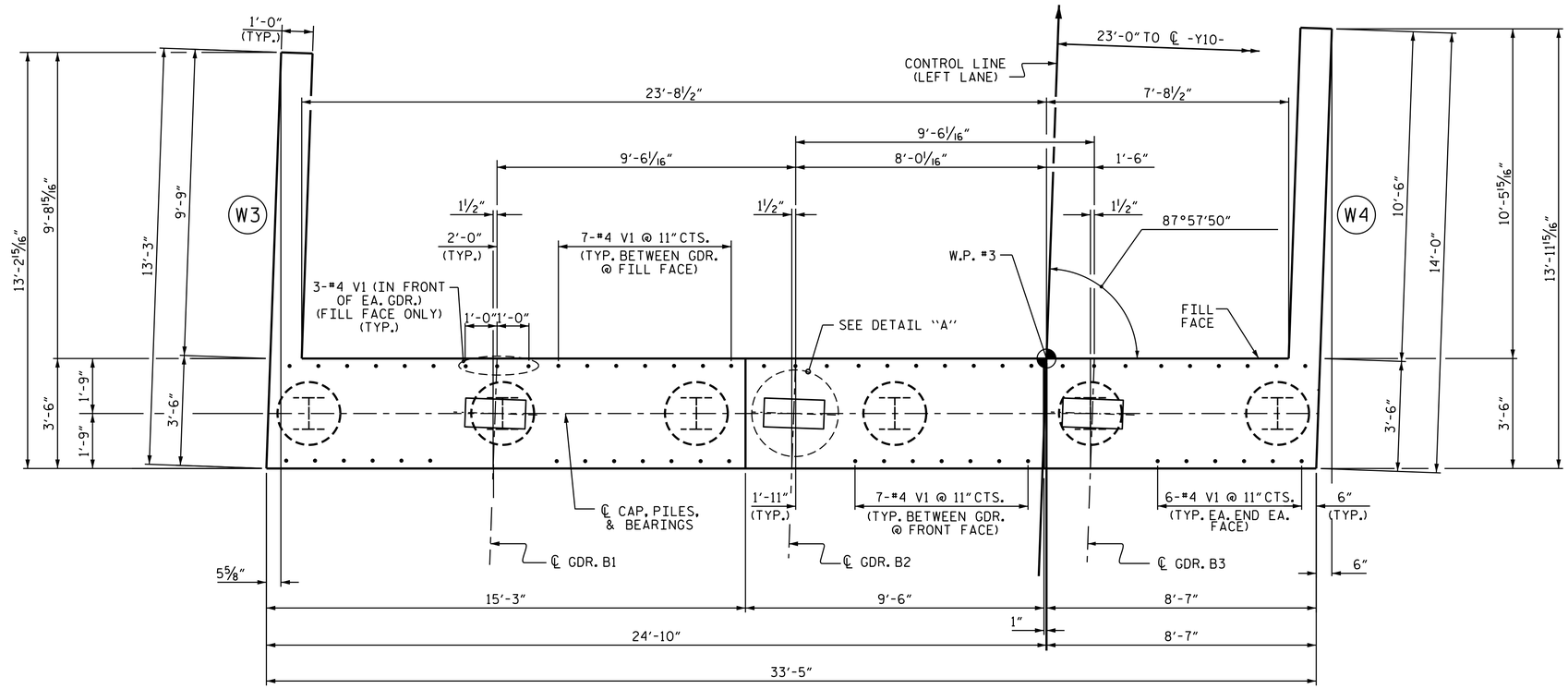
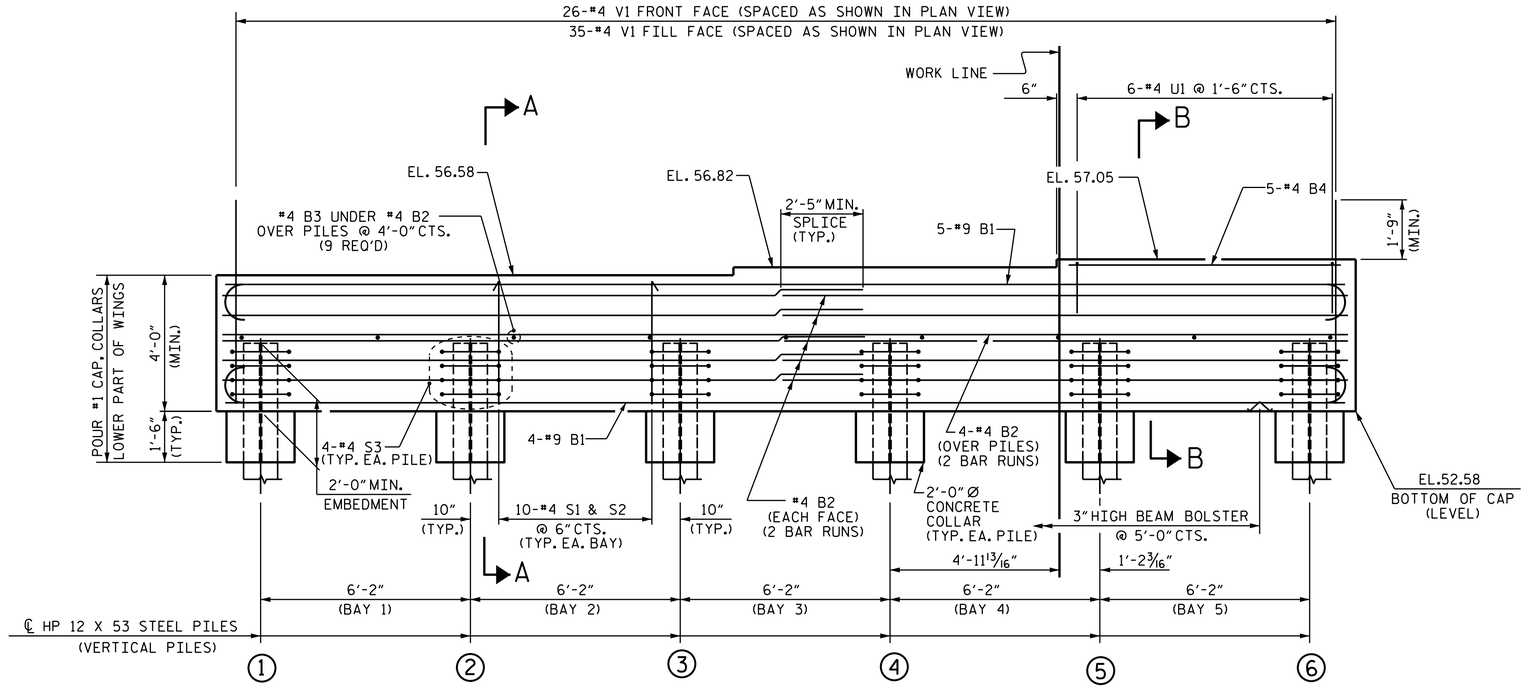
STR. #15



PLAN



ELEVATION

NOTES

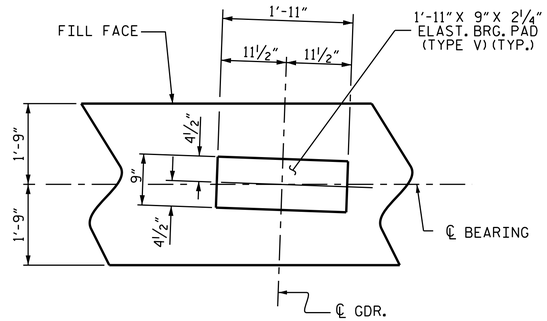
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAIL.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT UPPER PART OF WINGS ARE TO BE POURED WITH THE SUPERSTRUCTURE.

THE TOP SURFACE OF POUR #1 OF THE END BENT CAP AND WINGS, EXCLUDING THE OUTSIDE 4" AND THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".



DETAIL "A"

(TYP. EA. GDR.)

PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-025
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A80485FA47B...
3/23/2015

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 4/25/14
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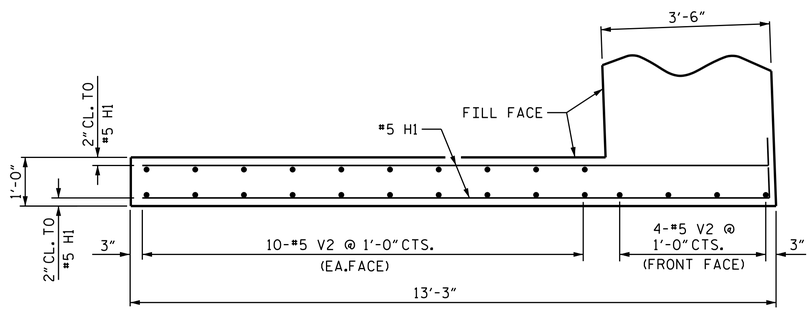
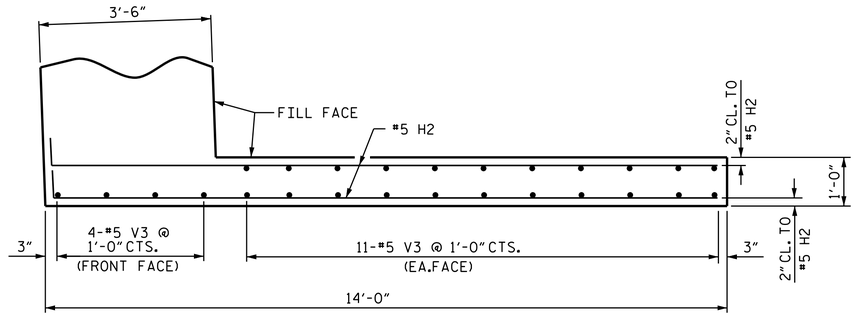
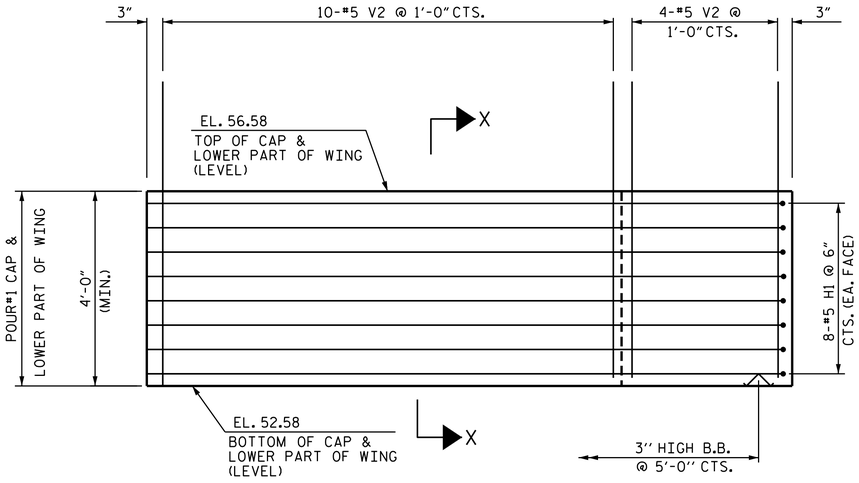
STR. #15



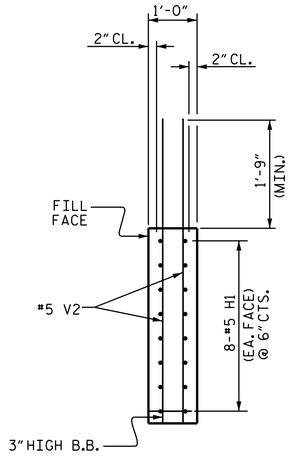
PLAN OF WING (W3)



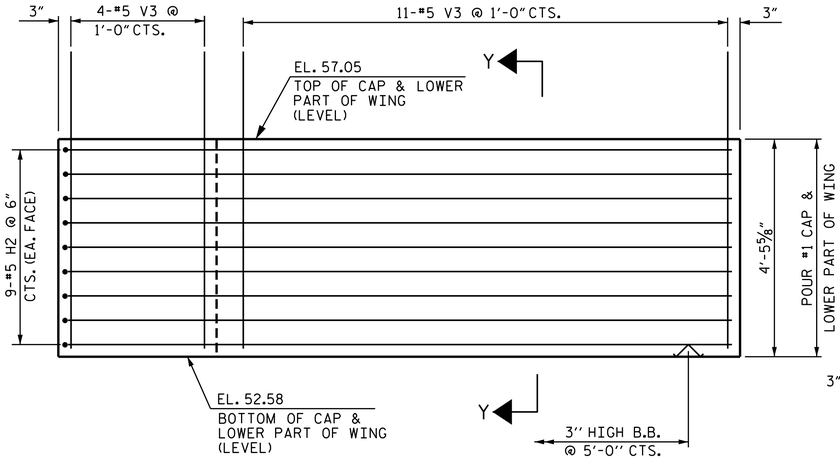
PLAN OF WING (W4)



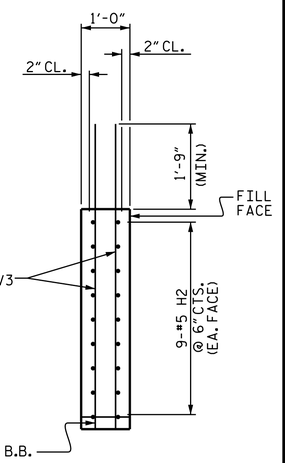
ELEVATION OF WING (W3)



SECTION X-X



ELEVATION OF WING (W4)



SECTION Y-Y

PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2

(LEFT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

Docusigned by: Tim Coggins DEFD4A8D48FA47B... 3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-026
1			3			TOTAL SHEETS
2			4			30

STR. #15

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 4/25/14
CHECKED BY : K.P.SEDAI DATE : 5/15/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

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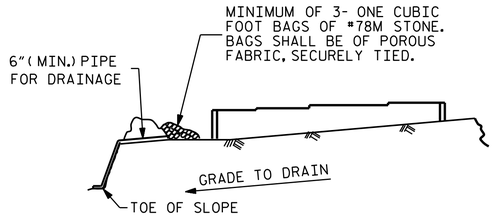

BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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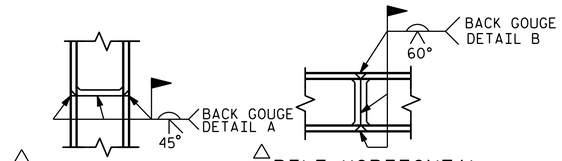
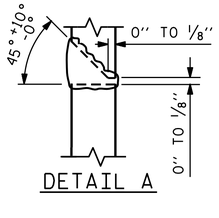
TEMPORARY DRAINAGE AT END BENT

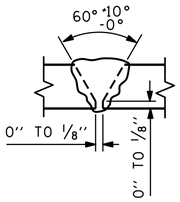


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



DETAIL A

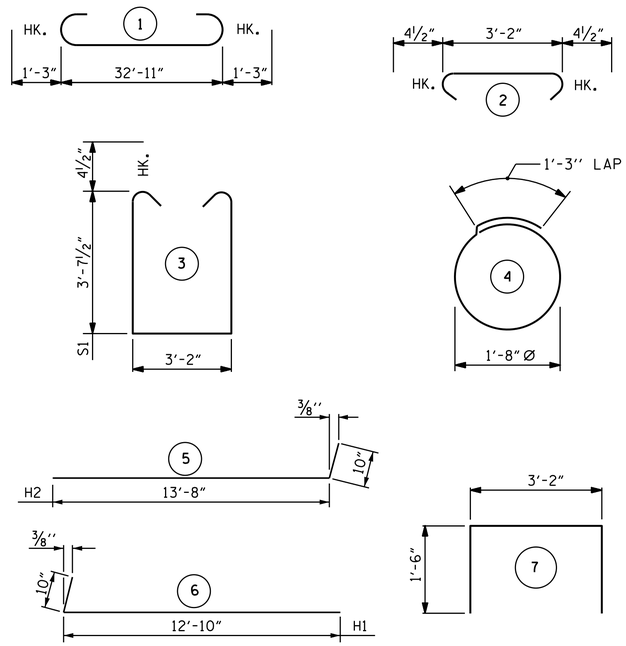


DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

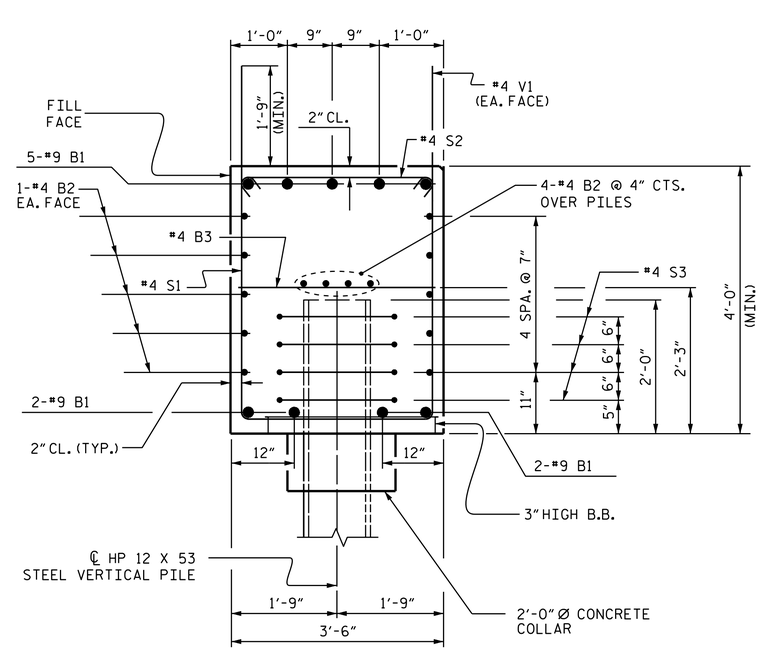
END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#9	1	35'-5"	1084
B2	28	#4	STR	17'-9"	332
B3	9	#4	STR	3'-2"	19
B4	5	#4	STR	8'-4"	28
H1	16	#5	6	13'-8"	228
H2	18	#5	5	14'-6"	272
S1	50	#4	3	11'-2"	373
S2	50	#4	2	3'-11"	131
S3	24	#4	4	6'-6"	104
U1	6	#4	7	6'-2"	25
V1	61	#4	STR	6'-2"	252
V2	24	#5	STR	5'-6"	138
V3	26	#5	STR	6'-0"	163

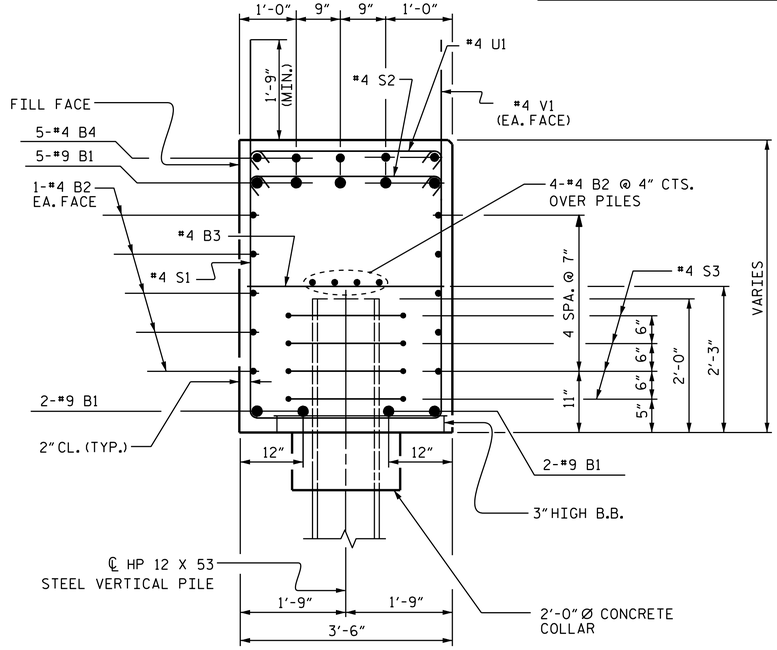
REINFORCING STEEL = 3149 LBS

CLASS A CONCRETE	
POUR #1 (CAP & LOWER PART OF WINGS)	21.3 C.Y.
CONCRETE COLLARS	1.0 C.Y.
TOTAL	22.3 C.Y.

HP 12 x 53 STEEL PILES No. 6	420 LIN FT.
STEEL PILE POINTS NO. 6	EA.
PILE REDRIVES	3 EA.



SECTION A-A



SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEF04A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES-CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 2
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-027
1			3			TOTAL SHEETS
2			4			30

STR. #15

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 4/25/14
CHECKED BY : K.P. SEDAI DATE : 5/15/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

23-MAR-2015 12:51
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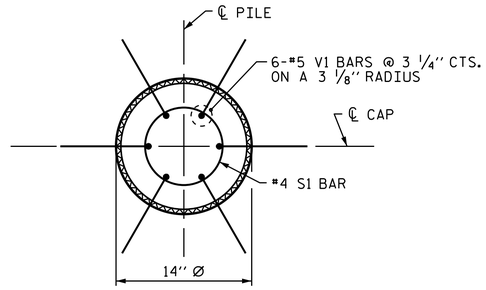
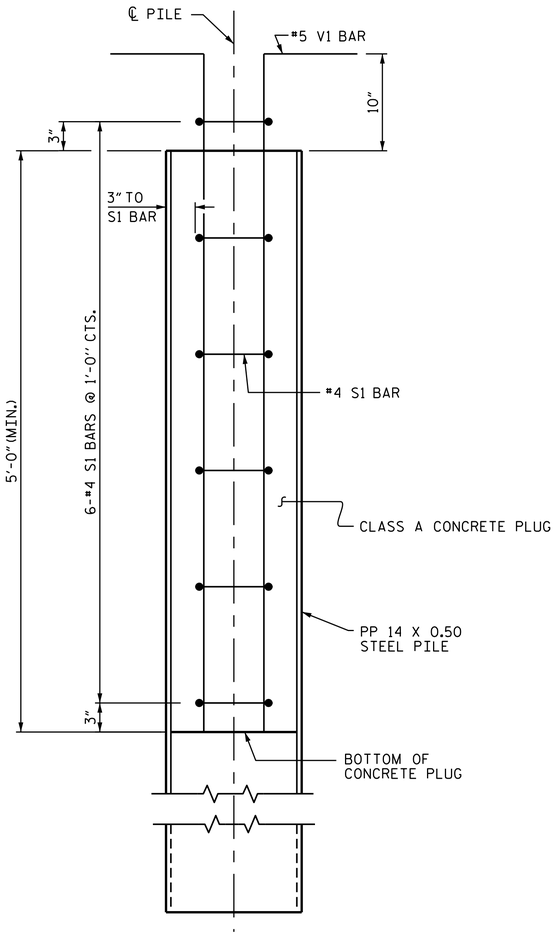
kpaschal



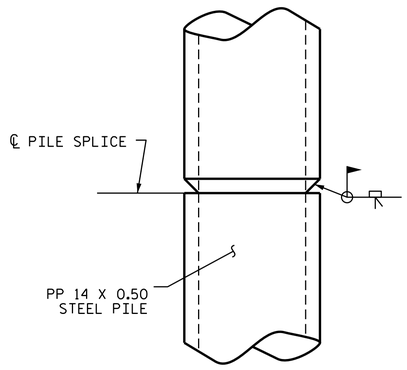
PLAN



ELEVATION

PP 14 X 0.50 STEEL PILE

(CLOSED END)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 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.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL AND CLASS A CONCRETE ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 14 X 0.50 STEEL PIPE PILES.

FOR STEEL PILE POINTS, SEE SPECIAL PROVISIONS.

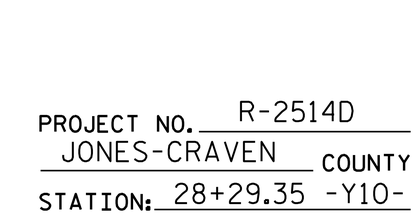
BILL OF MATERIAL FOR ONE PP 14 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	3'-5"	14
V1	6	#5	2	6'-8''	42
REINFORCING STEEL =				56	lbs

CLASS A CONCRETE

5'-0'' MINIMUM PLUG 0.2 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

ASSEMBLED BY : GHOLAMREZA KOUCHEKI DATE : 5/30/14
CHECKED BY : K.P.SEDAI DATE : 5/30/14

DRAWN BY : TLA 8/05
CHECKED BY : GM 9/05

ADDED 10/1/05
REV. 5/1/06R MAA/KMM
REV. 10/1/11 MAA/GM

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kpaschal

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD1A8C048FA47B... 3/23/2015

PROJECT NO. R-2514D
JONES-CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 3 OF 3

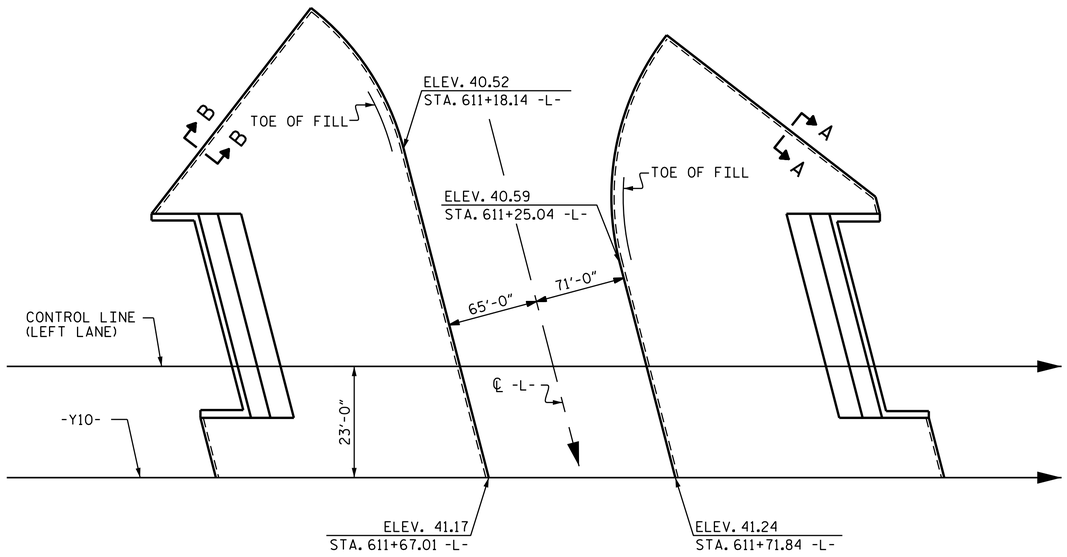
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

14'' STEEL PIPE PILE (LEFT LANE)

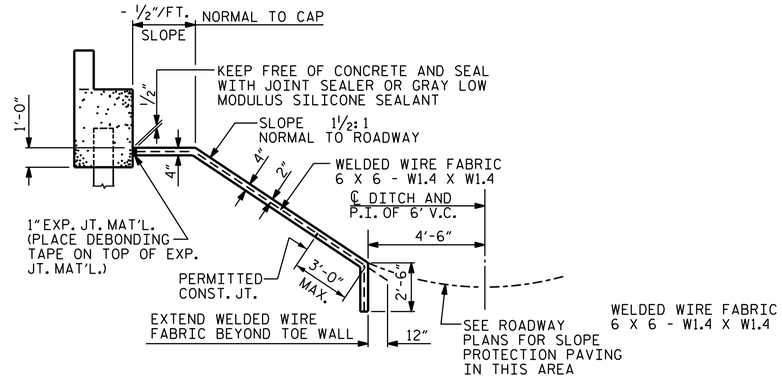
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-028
1			3			TOTAL SHEETS
2			4			30

STR. #15 STD. NO. SPP1

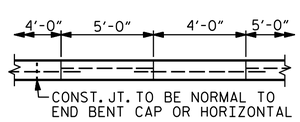


END BENT #1 END BENT #2

PLAN VIEW

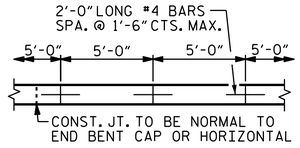


SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH



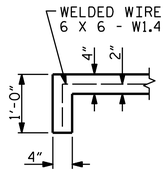
POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

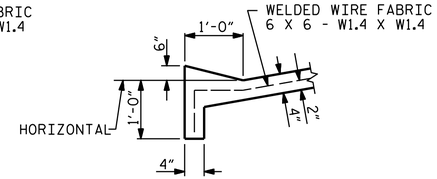


STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



SECTION A-A



SECTION B-B

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

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

BRIDGE @ STA. 28+29.35 -Y10- (LEFT LANE)	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	274	548
END BENT 2	263	526

* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS (LEFT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-029
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : B. L. GREEN DATE : 6/14/13
CHECKED BY : M. D. PISO DATE : 6/26/13

DRAWN BY : ELR 5/92
CHECKED BY : GRP 6/92

REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM

23-MAR-2015 12:51
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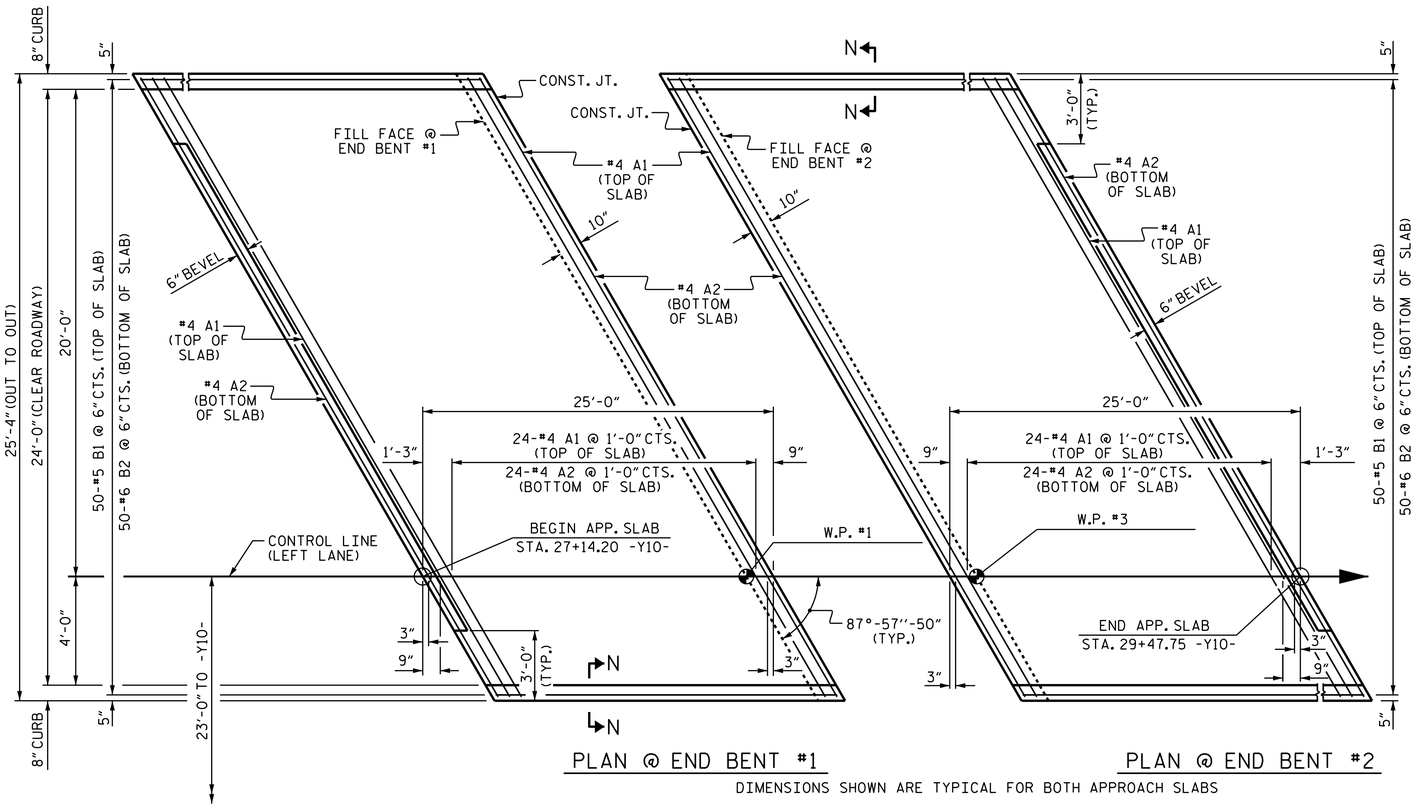
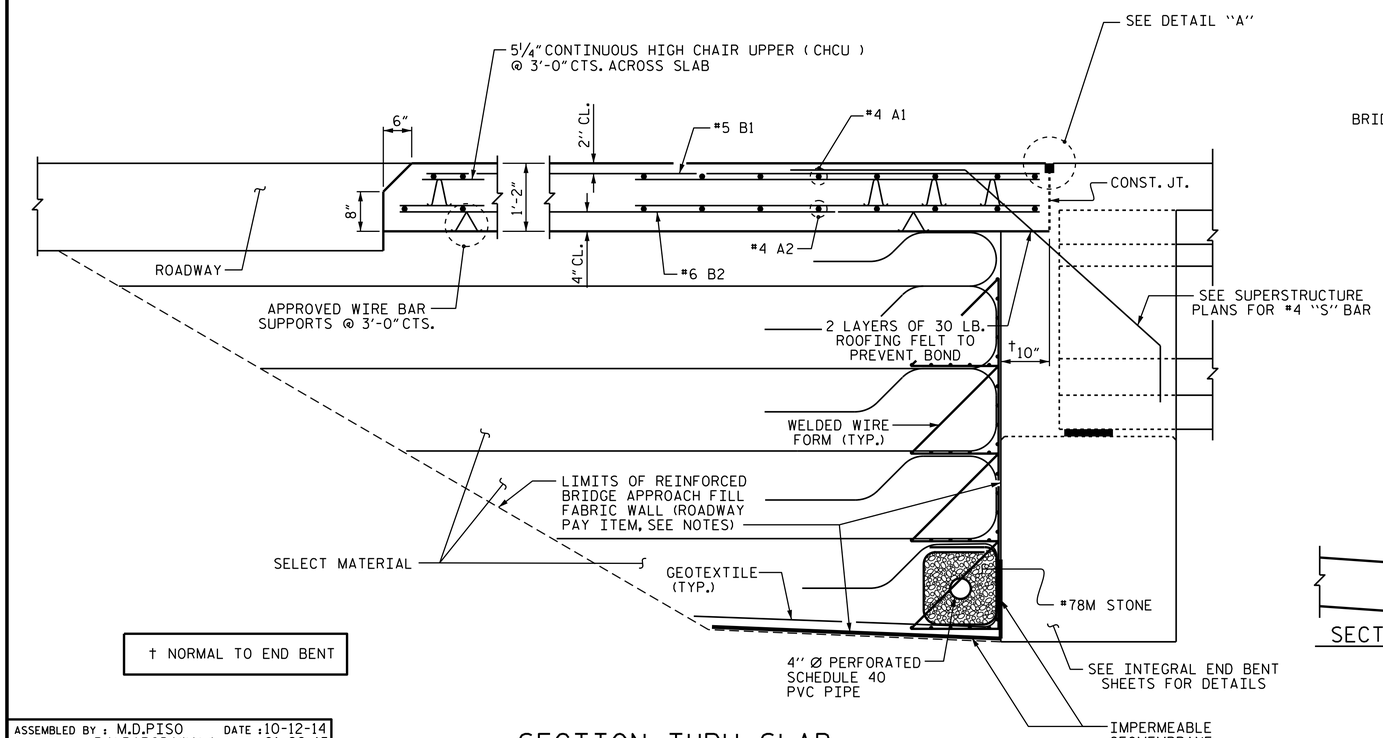
STR. #15

STD. NO. SP1 (SHT 5)





SECTION THRU SLAB

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

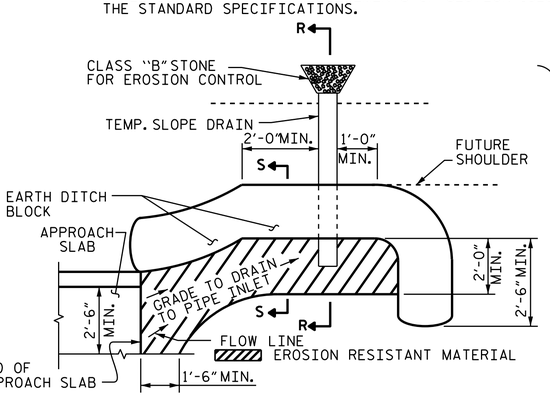
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

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

BILL OF MATERIAL

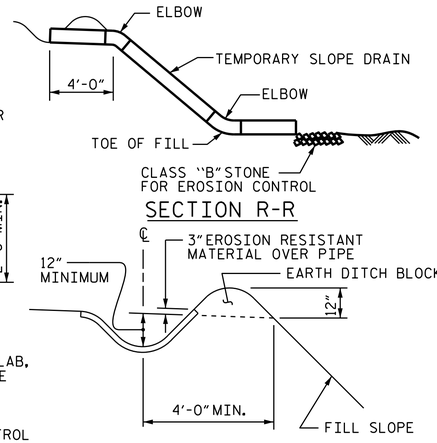
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	26	#4	STR	25'-0"	432
A2	26	#4	STR	25'-0"	432
✱ B1	50	#5	STR	24'-2"	1,260
B2	50	#6	STR	24'-8"	1,852
REINFORCING STEEL					2,284 LBS.
✱ EPOXY COATED REINFORCING STEEL					1,692 LBS.
CLASS AA CONCRETE					27.5 CU.YDS.



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

PLAN VIEW

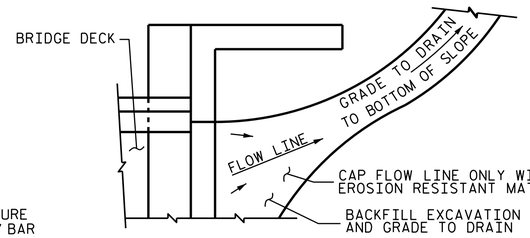


SECTION R-R

SECTION S-S

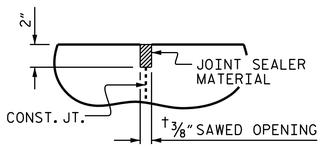
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

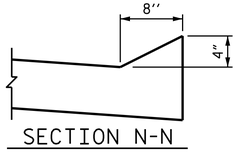


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

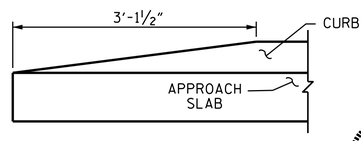
TEMPORARY DRAINAGE DETAIL



DETAIL "A"



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15-030
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : M.D.PISO	DATE : 10-12-14
CHECKED BY : B.N.BARODAWALA	DATE : 01-26-15
DRAWN BY : TLA 10/05	ADDED 5/1/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

23-MAR-2015 12:51
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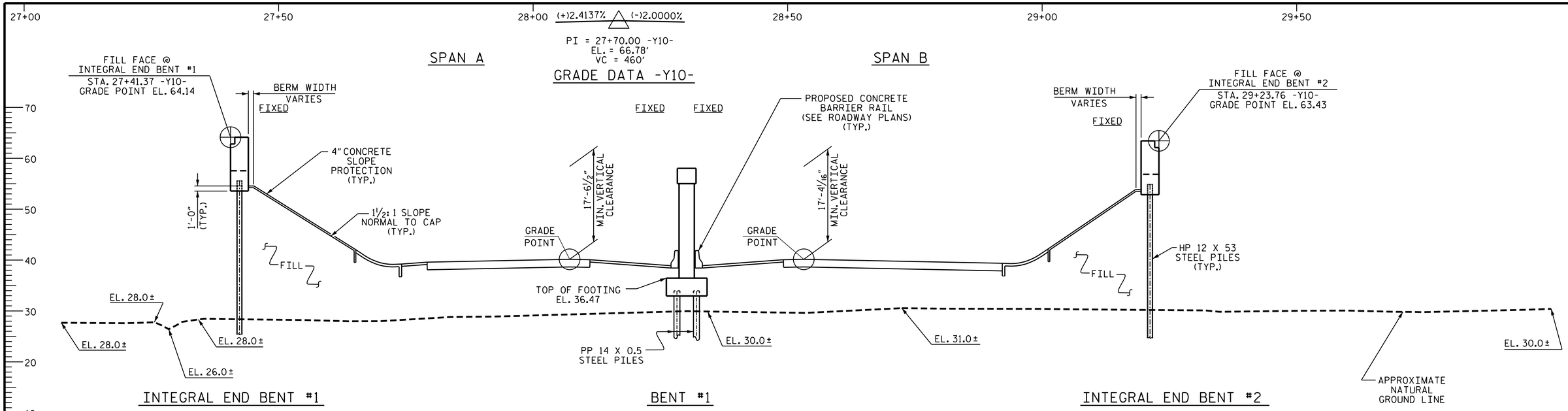
kpaschal

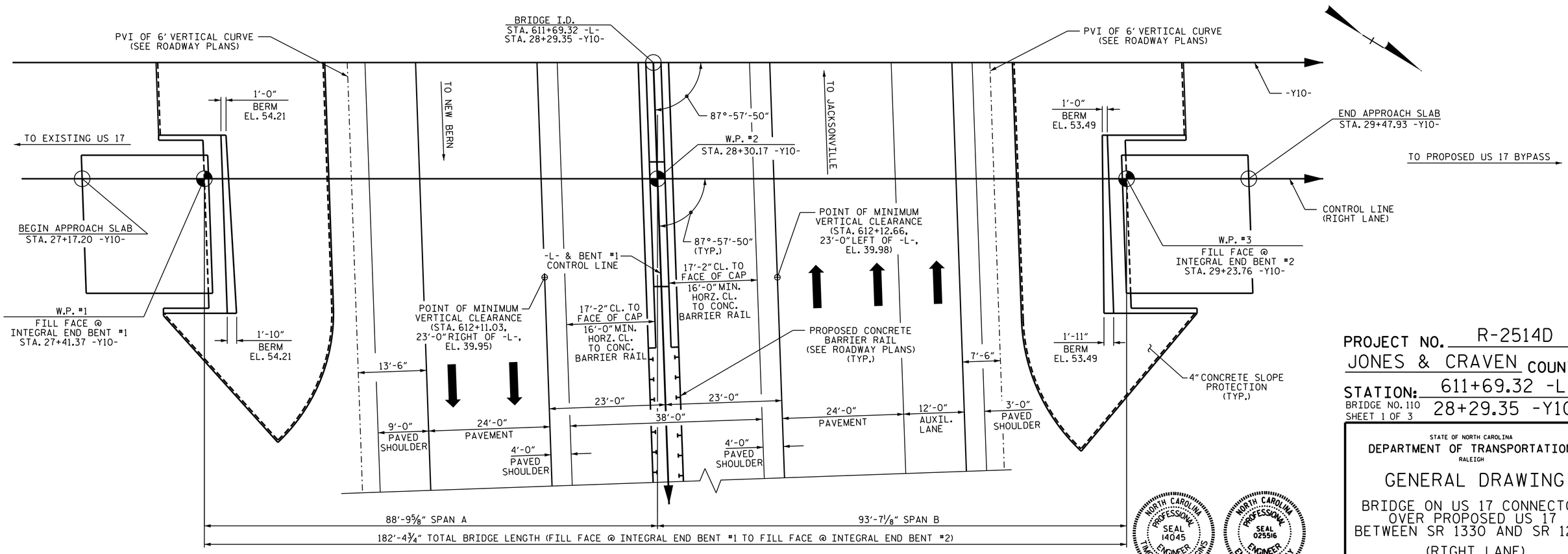
STR. #15

STD. NO. BAS5 (SHT 2a)



SECTION ALONG CONTROL LINE (RIGHT LANE)

SECTION AT INTEGRAL END BENTS AND BENT ARE AT RIGHT ANGLES.



PLAN

(FOUNDATION NOT SHOWN FOR CLARITY)

DRAWN BY : D. C. ELY DATE : 01/2015
CHECKED BY : N. RUFFIN DATE : 01/16/15
DESIGN ENGINEER OF RECORD: C. KOUCHEKI DATE : 02/2015

23-MAR-2015 13:09
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kpaschal

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
DocuSigned by: Emily Murray CAEB97AEDC5B4E0...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 611+69.32 -L-
BRIDGE NO. 110 28+29.35 -Y10-
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

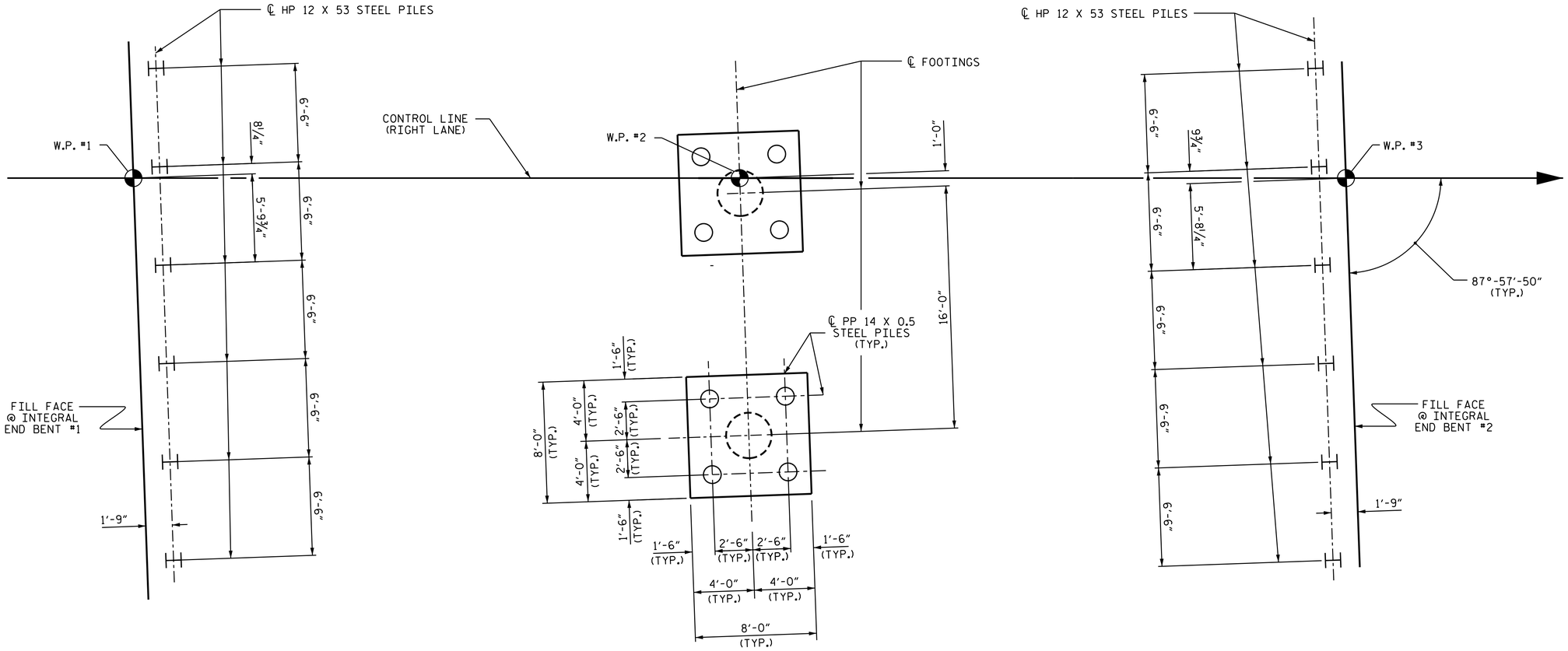
GENERAL DRAWING

BRIDGE ON US 17 CONNECTOR OVER PROPOSED US 17 BETWEEN SR 1330 AND SR 1224

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-001
1			3			TOTAL SHEETS
2			4			30

STR. #16



INTEGRAL END BENT #1 | BENT #1 | INTEGRAL END BENT #2

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT BOTTOM OF CAP AND FOOTING)
(FOOTING DIMENSIONS AND PILE LAYOUT ARE TYPICAL FOR EACH FOOTING)

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT INTEGRAL END BENT 1 AND INTEGRAL END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT INTEGRAL END BENT 1 AND INTEGRAL END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 155 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 210 TONS PER PILES.

INSTALL PILES AT BENT 1 TO A TIP ELEVATION NO HIGHER THAN -20 FEET.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT INTEGRAL END BENT 1 AND INTEGRAL END BENT 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

STEEL PIPE PILE INSIDE FIT CONICAL POINTS ARE REQUIRED FOR STEEL PIPE PILES AT BENT 1. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 59,500 FT-LBS TO 96,800 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

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

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED AT INTEGRAL END BENT 1 OR INTEGRAL END BENT 2. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8048FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 611+69.32 -L-
28+29.35 -Y10-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 17 CONNECTOR OVER PROPOSED US 17 BETWEEN SR 1330 AND SR 1224

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-002
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : D. G. ELY DATE : 01/2015
CHECKED BY : N. RUFFIN DATE : 01-16-15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02/2015

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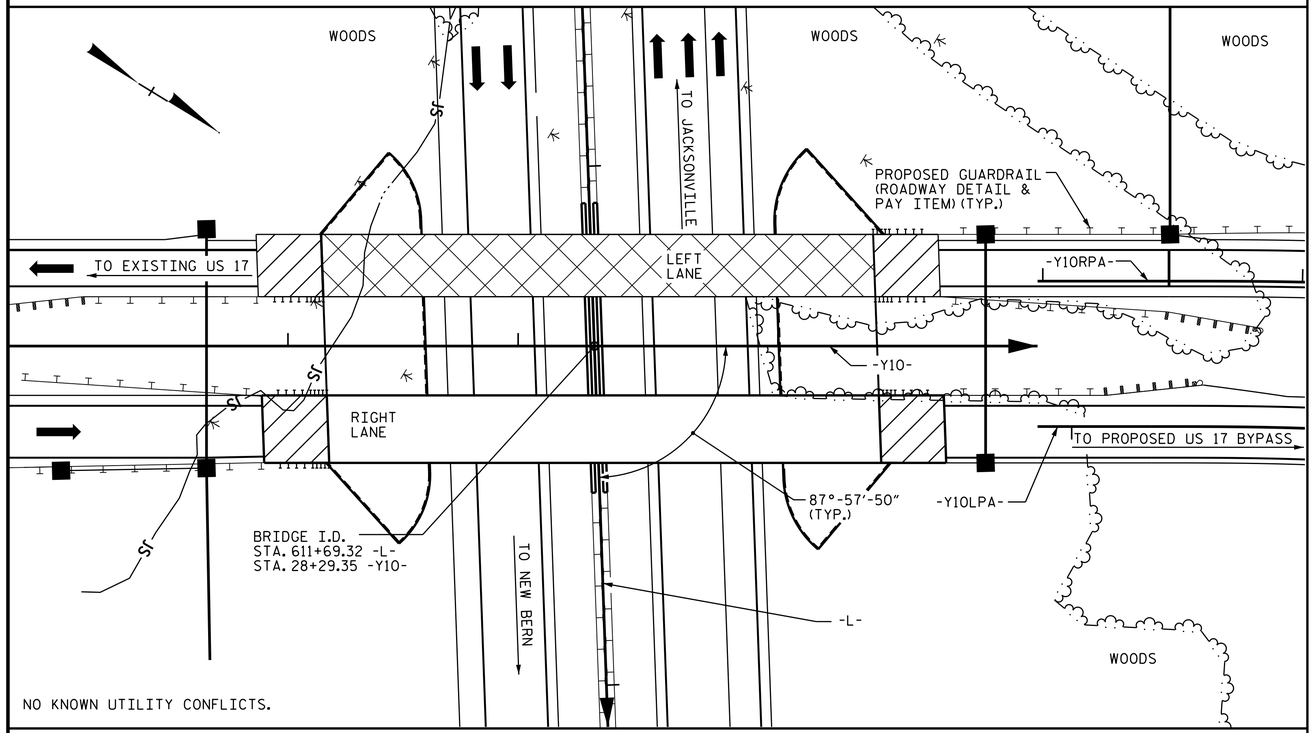
kpaschal

STR. #16

BM 32: RR SPIKE IN 7"PINE, STA. 608+78.00 -L-, 849' LEFT, ELEV. 36.79'.



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		HP 12 x 53 STEEL PILES		PP 14 X 0.5 STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	EA.	SQ. FT.	SQ. FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	No.	LIN.FT.	No.	LIN.FT.	EA.	EA.	LIN.FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE		5,335	5,284		LUMP SUM			6	538.44							361.46		LUMP SUM
INTEGRAL END BENT #1				23.6		3,250				6	450			6	3		239	
BENT #1				41.7		5,724	761					8	600	8	4			
INTEGRAL END BENT #2				23.6		3,248				6	450			6	3		250	
TOTAL	2	5,335	5,284	88.9	LUMP SUM	12,222	761	6	538.44	12	900	8	600	20	10	361.46	489	LUMP SUM

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 611+69.32 -L-
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SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 17 CONNECTOR OVER PROPOSED US 17 BETWEEN SR 1330 AND SR 1224

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-003
1			3			TOTAL SHEETS
2			4			30

STR. #16

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEF04A8D48F447B...
3/23/2015

DRAWN BY : D. G. ELY DATE : 01/2015
CHECKED BY : N. RUFFIN DATE : 01/16/15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02/2015

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS, γLL	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)	LIVELOAD FACTORS, γLL	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	⟨1⟩	1.07	--	1.75	0.914	1.39	A	EL	42.963	0.990	**1.07**	A	I	60.148	0.80	0.914	1.10	B	EL	45.359	
		HL-93(Opr)	N/A	--	1.38	--	1.35	0.914	1.80	A	EL	42.963	0.990	1.38	A	I	60.148	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	⟨2⟩	1.32	47.520	1.75	0.914	1.88	A	EL	42.963	0.990	**1.32**	A	I	60.148	0.80	0.914	1.50	B	EL	45.359	
		HS-20(Opr)	36.000	--	1.71	61.560	1.35	0.914	2.43	A	EL	42.963	0.990	1.71	A	I	60.148	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE SV	SNSH	13.500	--	3.51	47.385	1.40	0.914	5.45	A	EL	42.963	0.990	3.89	A	I	60.148	0.80	0.914	3.51	B	EL	45.359	
		SNGARBS2	20.000	--	2.56	51.200	1.40	0.914	4.00	A	EL	42.963	0.990	2.78	A	I	60.148	0.80	0.914	2.56	B	EL	45.359	
		SNAGRIS2	22.000	--	2.40	52.800	1.40	0.914	3.76	A	EL	42.963	0.990	2.58	A	I	60.148	0.80	0.914	2.40	B	EL	45.359	
		SNCOTTS3	27.250	--	1.75	47.688	1.40	0.914	2.71	A	EL	42.963	0.990	1.94	A	I	60.148	0.80	0.914	1.75	B	EL	45.359	
		SNAGGRS4	34.925	--	1.44	50.292	1.40	0.914	2.24	A	EL	42.963	0.990	1.62	A	I	60.148	0.80	0.914	1.44	B	EL	45.359	
		SNS5A	35.550	--	1.41	50.126	1.40	0.914	2.19	A	EL	42.963	0.990	1.65	A	I	60.148	0.80	0.914	1.41	B	EL	45.359	
		SNS6A	39.950	--	1.28	51.136	1.40	0.914	2.00	A	EL	42.963	0.990	1.51	A	I	60.148	0.80	0.914	1.28	B	EL	45.359	
		SNS7B	42.000	--	1.22	51.240	1.40	0.914	1.91	A	EL	42.963	0.990	1.48	A	I	60.148	0.80	0.914	1.22	B	EL	45.359	
	TRUCK TRACTOR SEMI-TRAILOR TTST	TNAGRIT3	33.000	--	1.56	51.480	1.40	0.914	2.44	A	EL	42.963	0.990	1.79	A	I	60.148	0.80	0.914	1.56	B	EL	45.359	
		TNT4A	33.075	--	1.57	51.928	1.40	0.914	2.44	A	EL	42.963	0.990	1.74	A	I	60.148	0.80	0.914	1.57	B	EL	45.359	
		TNT6A	41.600	--	1.27	52.832	1.40	0.914	1.99	A	EL	42.963	0.990	1.59	A	I	60.148	0.80	0.914	1.27	B	EL	45.359	
		TNT7A	42.000	--	1.27	53.340	1.40	0.914	1.99	A	EL	42.963	0.990	1.56	A	I	60.148	0.80	0.914	1.27	B	EL	45.359	
		TNT7B	42.000	--	1.31	55.020	1.40	0.914	2.05	A	EL	42.963	0.990	1.45	A	I	60.148	0.80	0.914	1.31	B	EL	45.359	
		TNAGRIT4	43.000	--	1.25	53.750	1.40	0.914	1.96	A	EL	42.963	0.990	1.40	A	I	60.148	0.80	0.914	1.25	B	EL	45.359	
		TNAGT5A	45.000	--	1.18	53.100	1.40	0.914	1.85	A	EL	42.963	0.990	1.40	A	I	60.148	0.80	0.914	1.18	B	EL	45.359	
		TNAGT5B	45.000	⟨3⟩	1.17	52.650	1.40	0.914	1.83	A	EL	42.963	0.990	1.33	A	I	60.148	0.80	0.914	**1.17**	B	EL	45.359	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

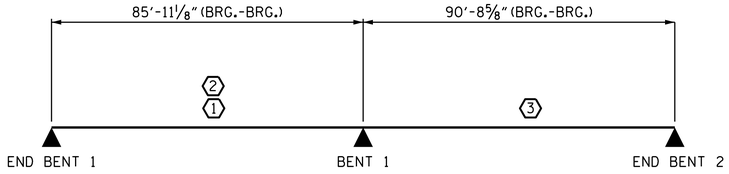
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

ASSEMBELED B Y :	M.D.PISO	DATE : 09-24-14
CHECKED BY :	K.P.SEDAI	DATE : 05-21-13
DESIGN ENGINEER OF RECORD :	G.KOUCHEKI	DATE : 02/2015
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFDA83D48FA47B...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-004
1			3			TOTAL SHEETS
2			4			30

STR. #16 STD. NO. LRFR1

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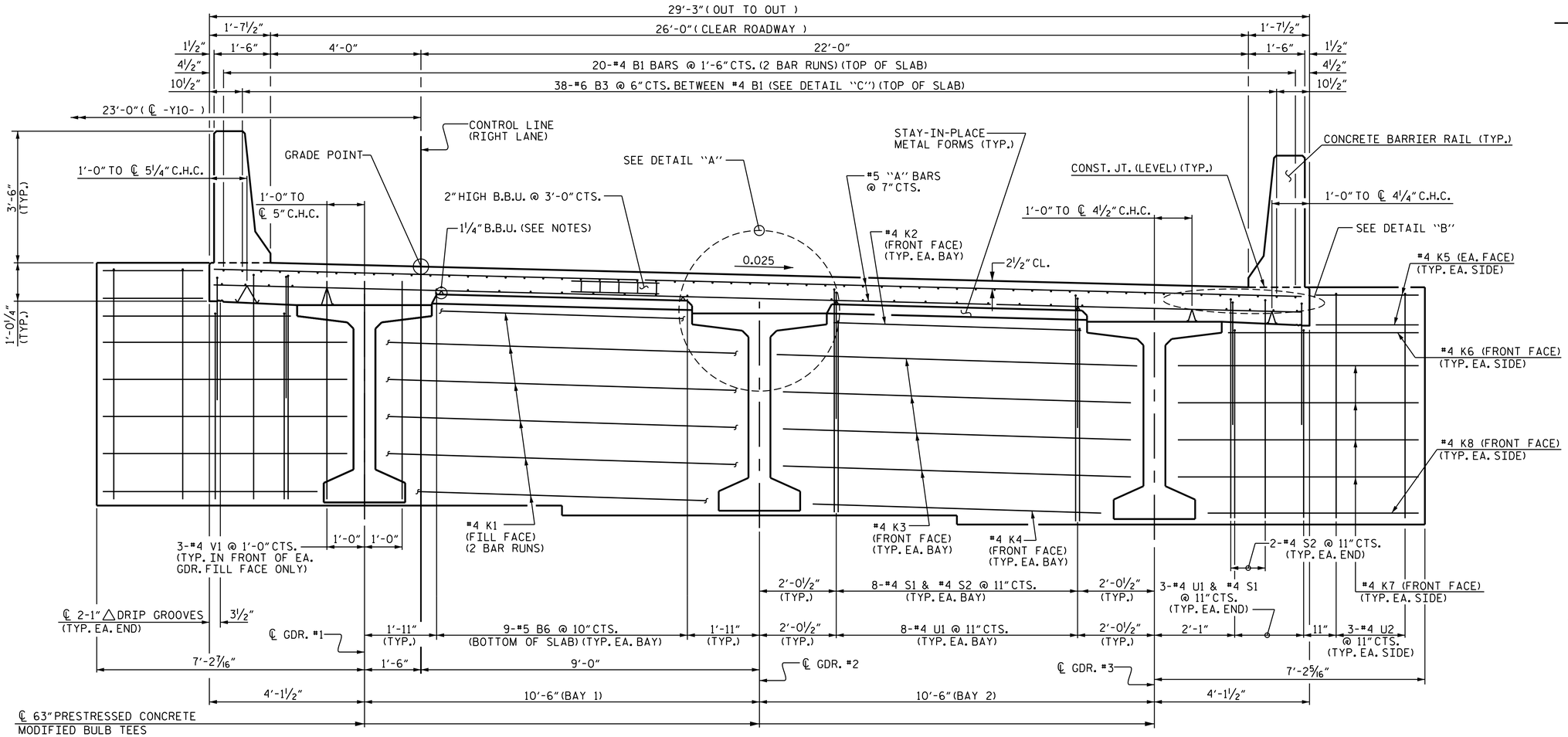


TYPICAL SECTION @ INTEGRAL END BENT

NOTE: #4 U1, #4 U2, #4 S1, #4 S2 BARS & #4 V1 TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP

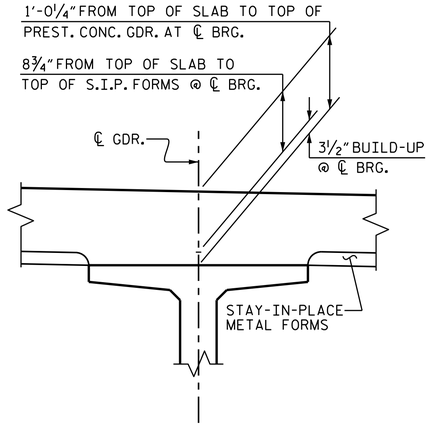
NOTES:

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.

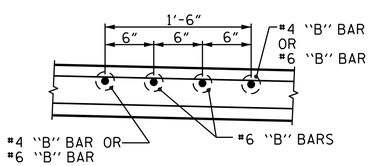
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

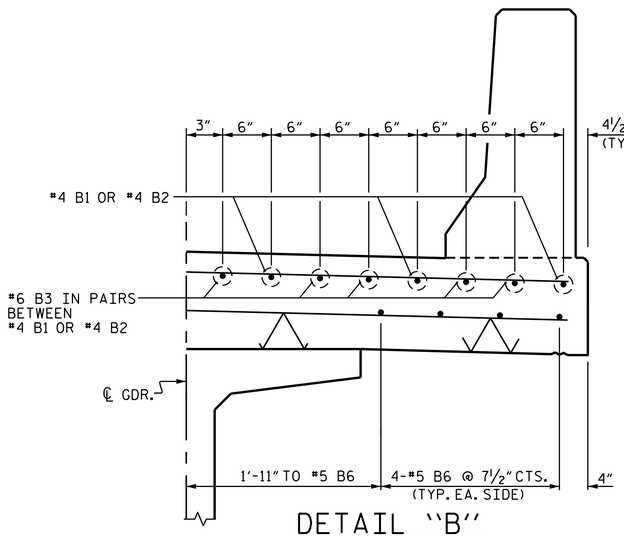


DETAIL "A"



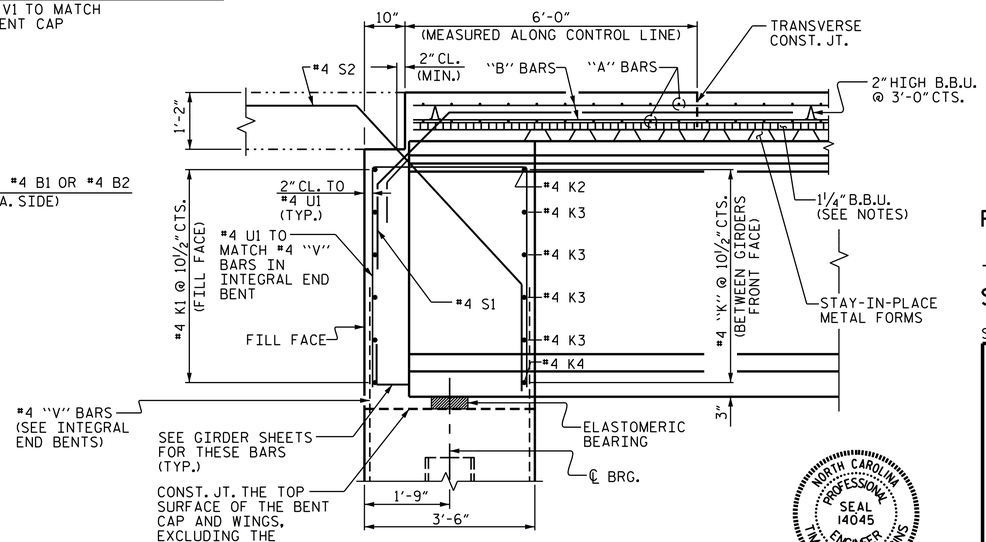
DETAIL "C"

SHOWING TOP OF SLAB "B" BAR SPACING @ INTEGRAL END BENT OR INTERIOR BENT



DETAIL "B"

SHOWING REINFORCING STEEL @ OVERHANG (TYP. EA. SIDE)



END OF GIRDER DETAIL @ INTEGRAL END BENT

(#4 "V" BARS IN FRONT OF GIRDER NOT SHOWN)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
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3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-005
1			3			TOTAL SHEETS
2			4			30

STR. #16

DRAWN BY :	M.D.PISO	DATE : 08-18-14
CHECKED BY :	K.P.SEDAI	DATE : 09-26-14
DESIGN ENGINEER OF RECORD:	G.KOUCHEKI	DATE : 02/2015

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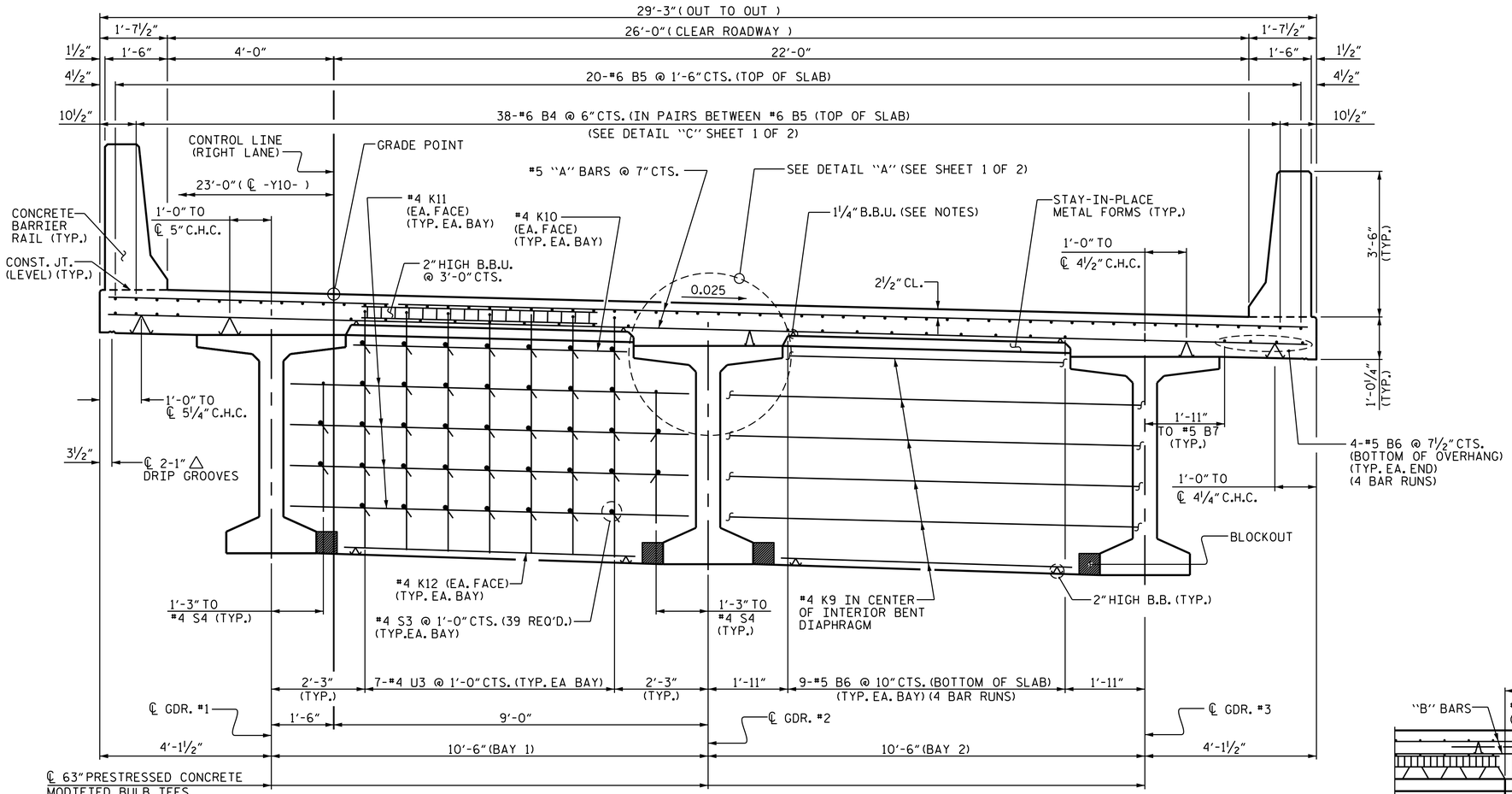
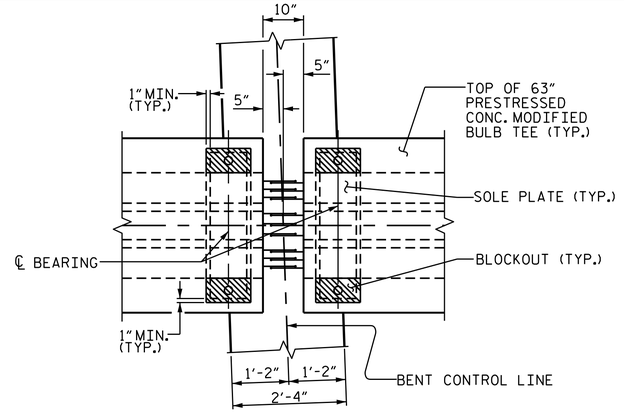
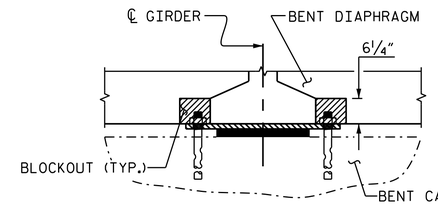


TYPICAL SECTION @ CONTINUOUS BENT DIAPHRAGM

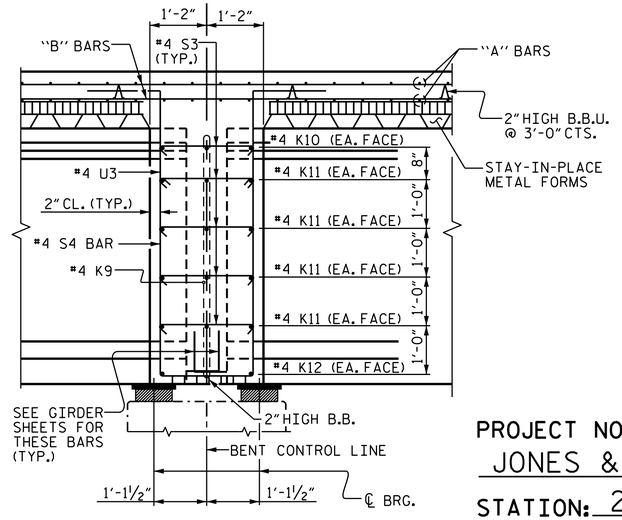


PLAN

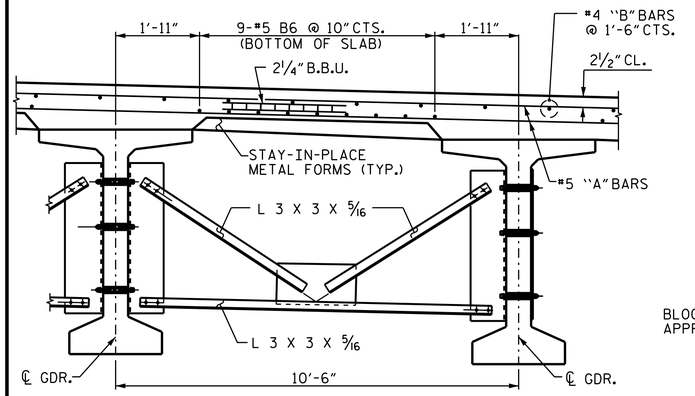


SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL

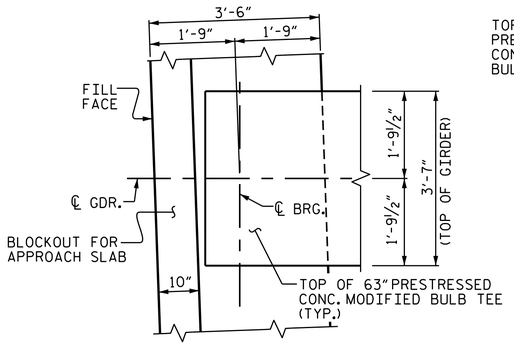


SECTION @ INTERIOR BENT DIAPHRAGM

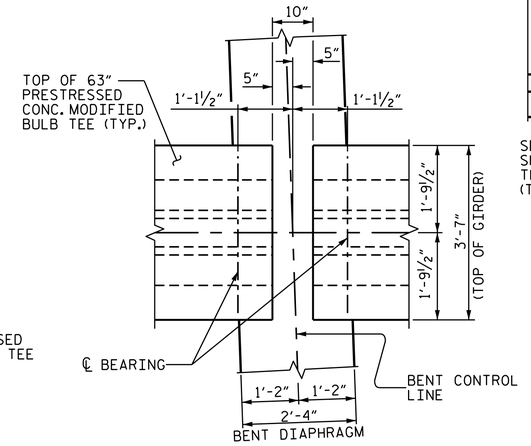


PARTIAL TYPICAL SECTION @ INTERMEDIATE DIAPHRAGMS

SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS" SHEET FOR DETAILS.



END BENT DIAPHRAGM



BENT DIAPHRAGM

PLAN

DRAWN BY : M.D.PISO DATE : 08-18-14
CHECKED BY : K.P.SEDAI DATE : 08-00-14
DESIGN ENGINEER OF RECORD: G.KOUCHEKI DATE : 02/2015

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NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

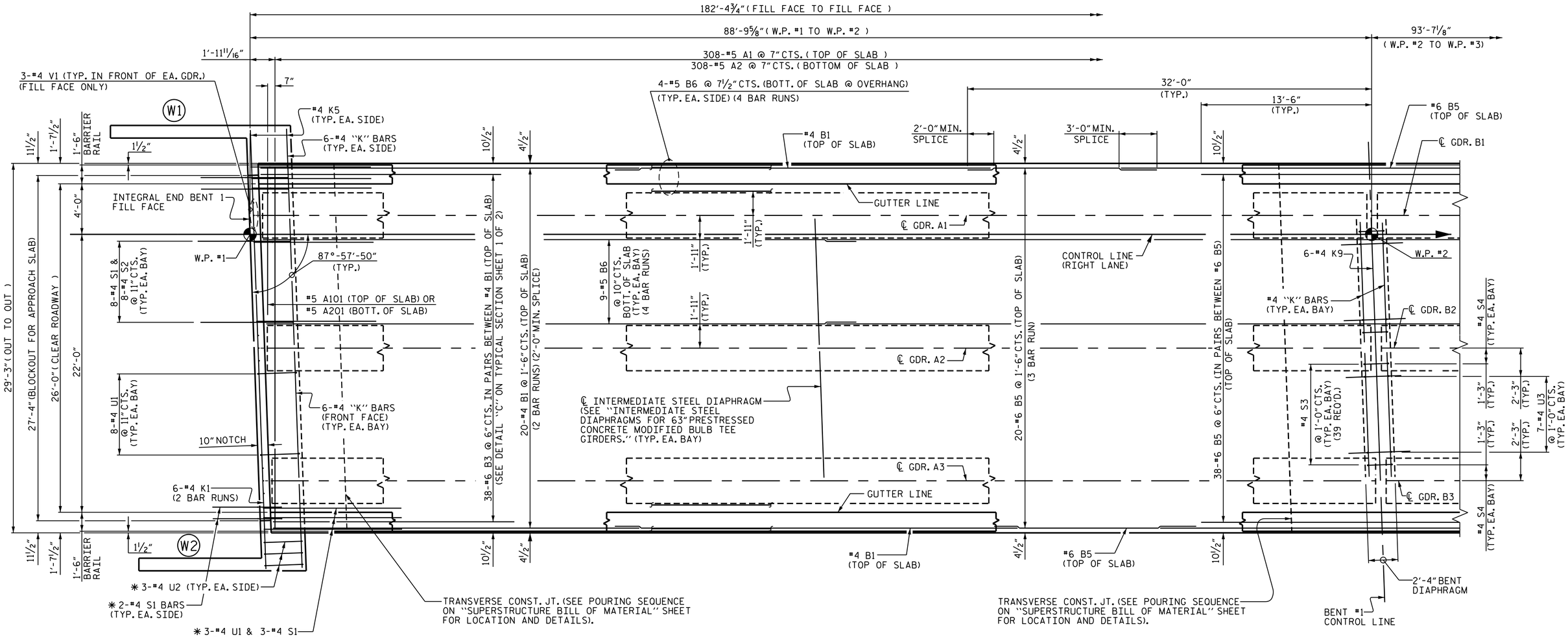
PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 2 OF 2

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

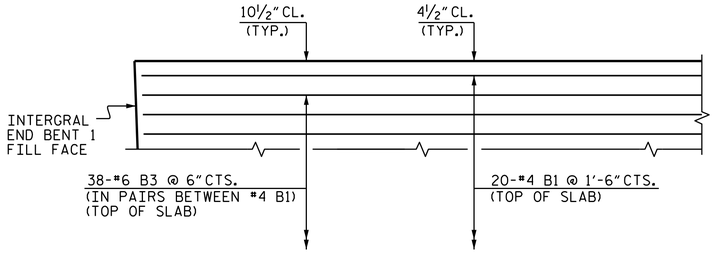
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-006
1			3			TOTAL SHEETS
2			4			30

STR. #16

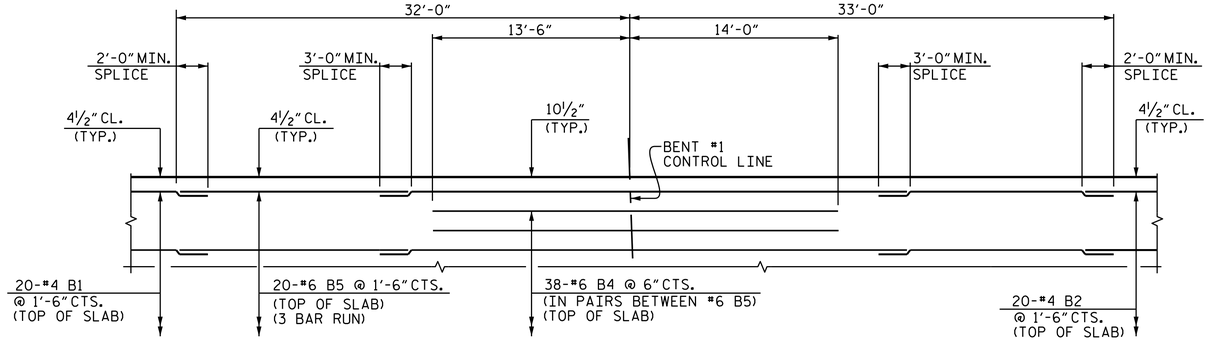


PLAN OF SPAN A

✱ #4 U1, #4 U2, #4 V1 #4 S1 & #4 S2 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP FOR TOP OF SLAB REINFORCING DETAILS, SEE "REINFORCING STEEL LAYOUT"



TOP REINFORCING STEEL @ END BENT



TOP REINFORCING STEEL @ BENT #1

REINFORCING STEEL LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

DRAWN BY : M.D.PISO DATE : 09-18-14
CHECKED BY : K.P.SEDAI DATE : 10-09-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

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kpaschal

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

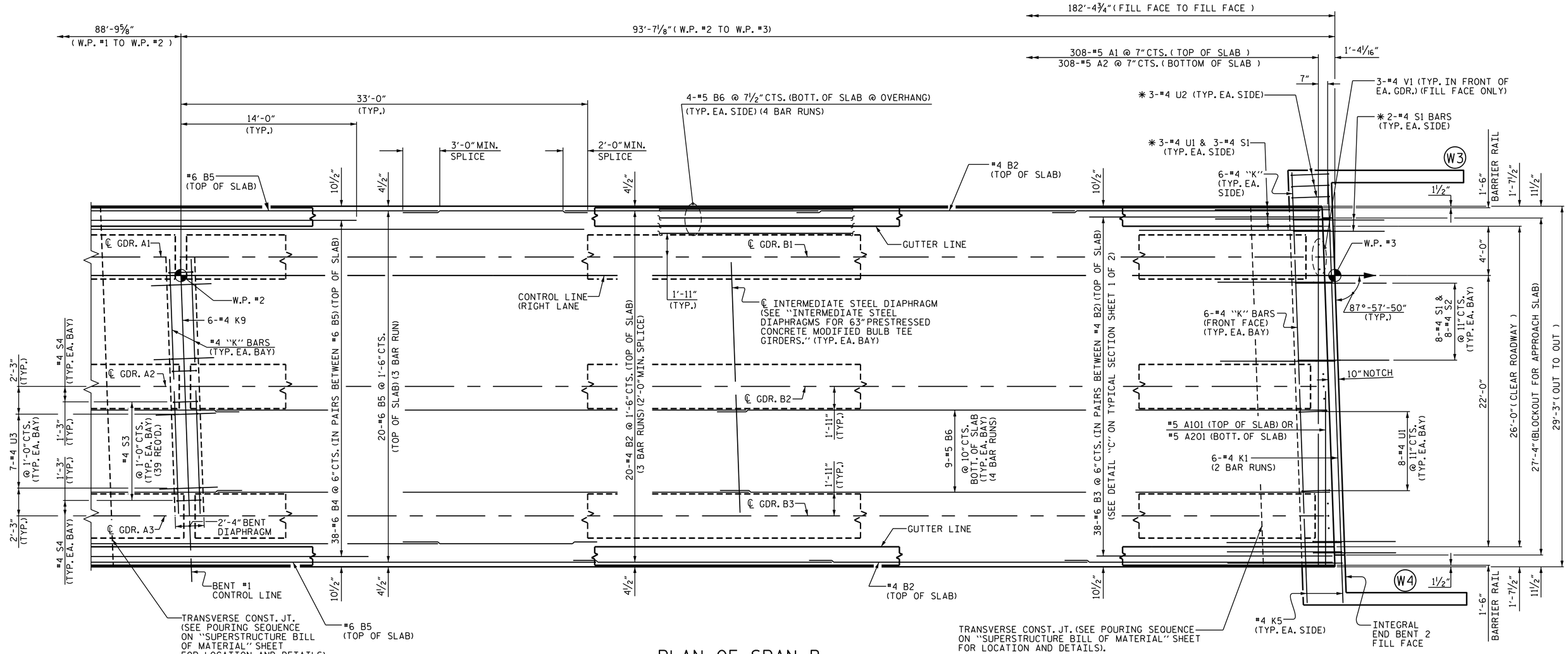
SUPERSTRUCTURE

PLAN OF SPAN A

(RIGHT LANE)

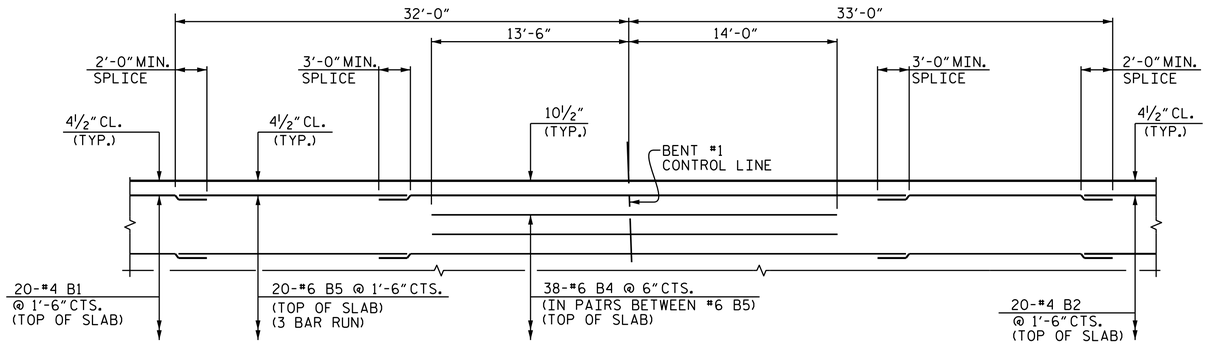
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-007
1			3			TOTAL SHEETS
2			4			30

STR. #16

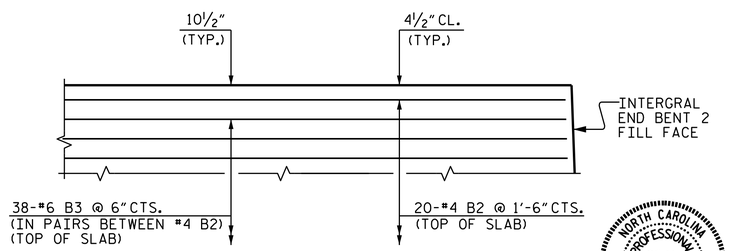


PLAN OF SPAN B

* #4 U1, #4 U2, #4 V1 #4 S1 & #4 S2 BARS TO MATCH WITH #4 "V" BARS IN INTEGRAL END BENT CAP FOR TOP OF SLAB REINFORCING DETAILS, SEE "REINFORCING STEEL LAYOUT"



TOP REINFORCING STEEL @ BENT #1



TOP REINFORCING STEEL @ END BENT #2

REINFORCING STEEL LAYOUT

DRAWN BY : M.D.PISO DATE : 10-01-14
CHECKED BY : K.P.SEDAI DATE : 10-09-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

23-MAR-2015 13:09
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kpaschal

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

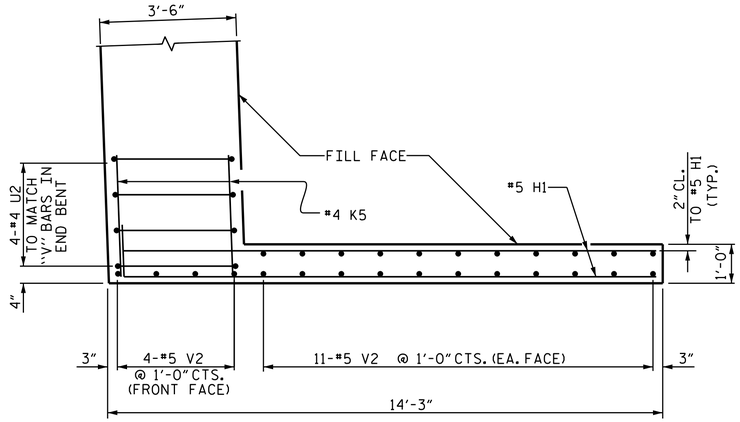
SUPERSTRUCTURE

PLAN OF SPAN B

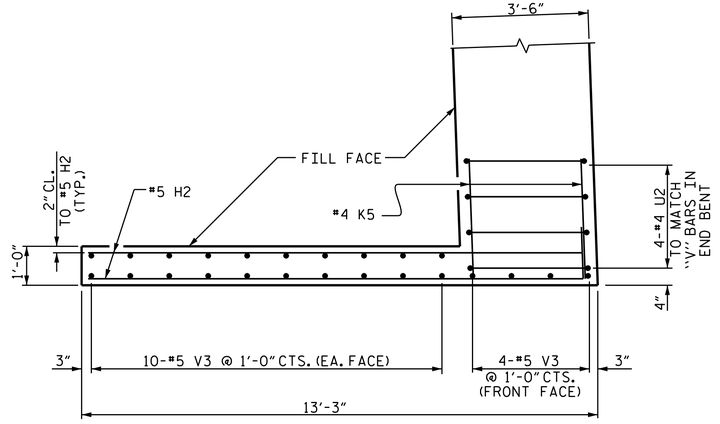
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-008
1			3			TOTAL SHEETS
2			4			30

STR. #16



PLAN (W1)



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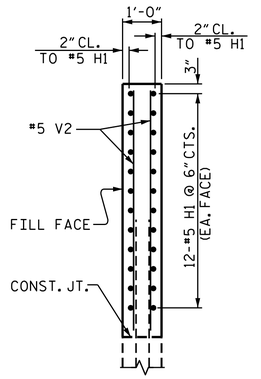
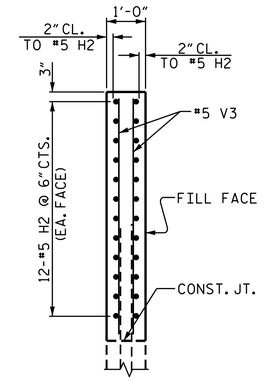
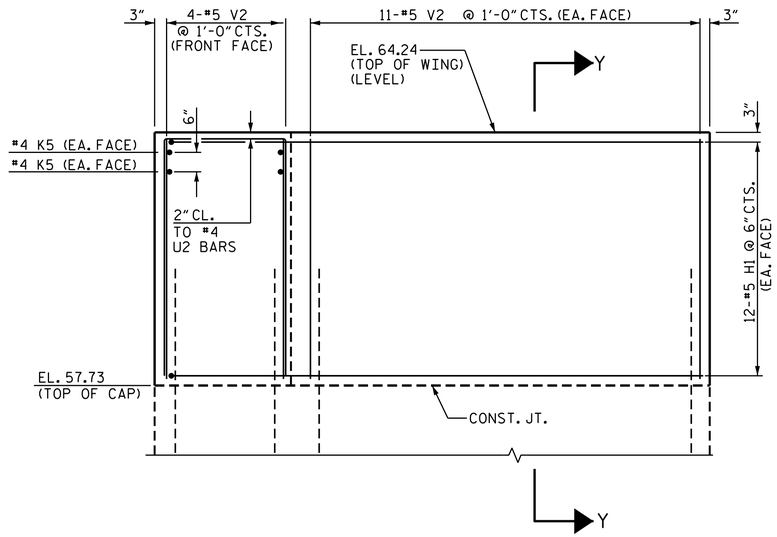


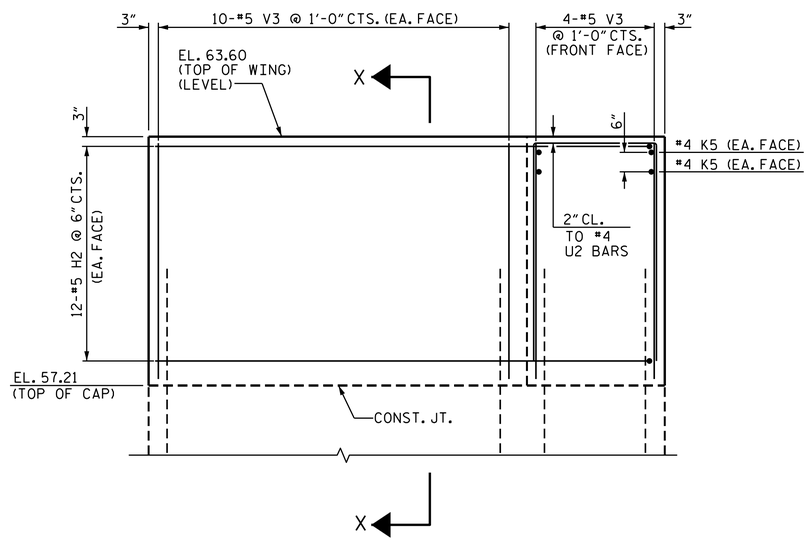
SECTION Y-Y



SECTION X-X



ELEVATION (W1)



ELEVATION (W2)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-009
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

DRAWN BY : M.D.PISO DATE : 09-09-14
CHECKED BY : K.P.SEDAI DATE : 09-15-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

23-MAR-2015 13:09
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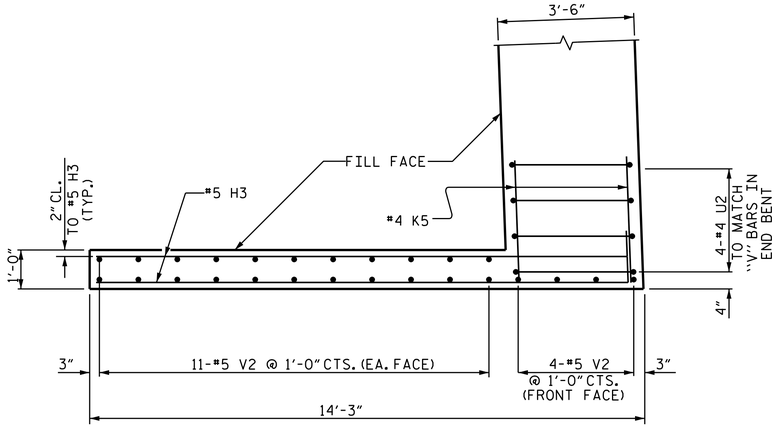
kpaschal

STR. #16



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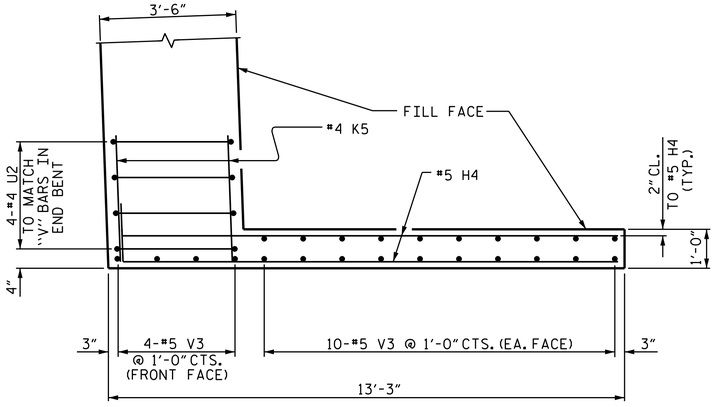

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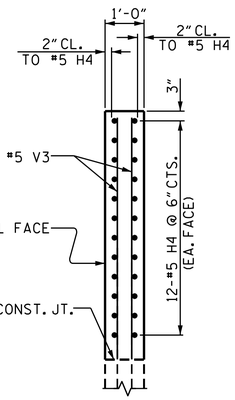

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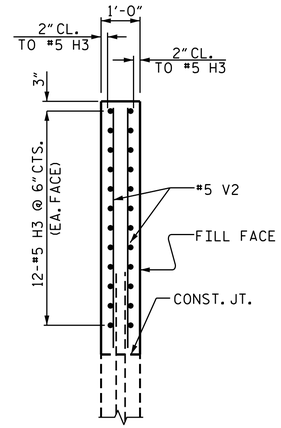
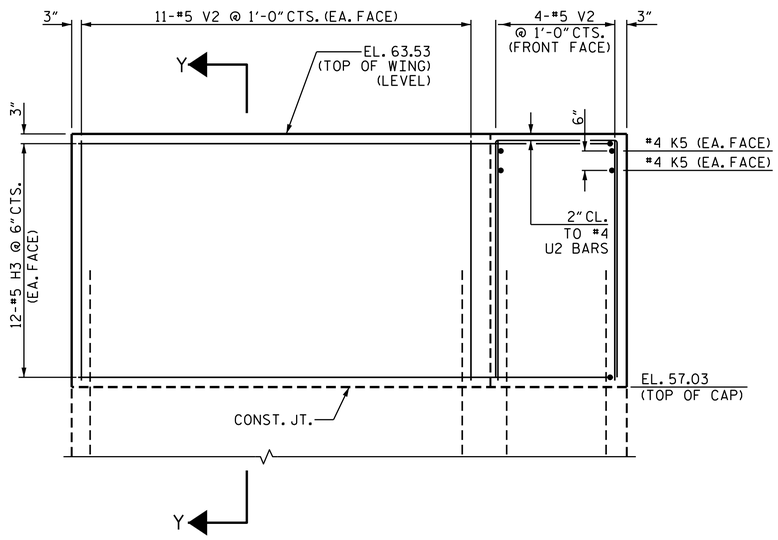
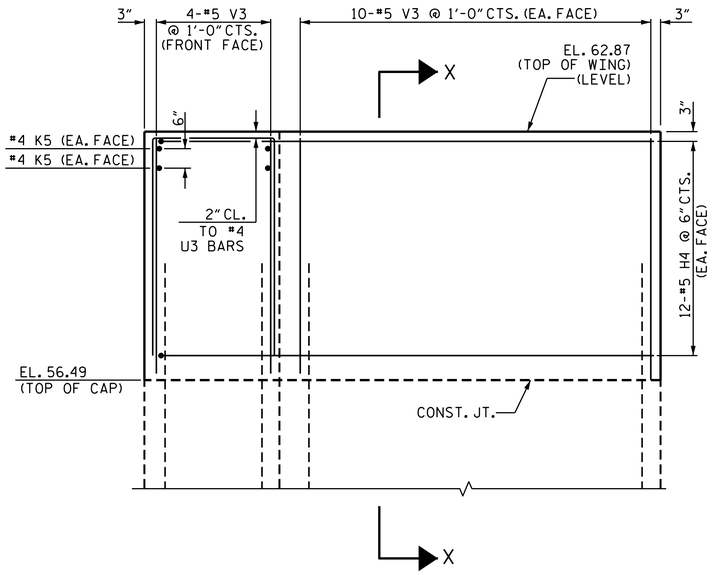


SECTION Y-Y



ELEVATION (W3)



ELEVATION (W4)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-010
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8348FA47B...
3/23/2015

DRAWN BY : M.D.PISO DATE : 09-09-14
CHECKED BY : K.P.SEDAI DATE : 09-15-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

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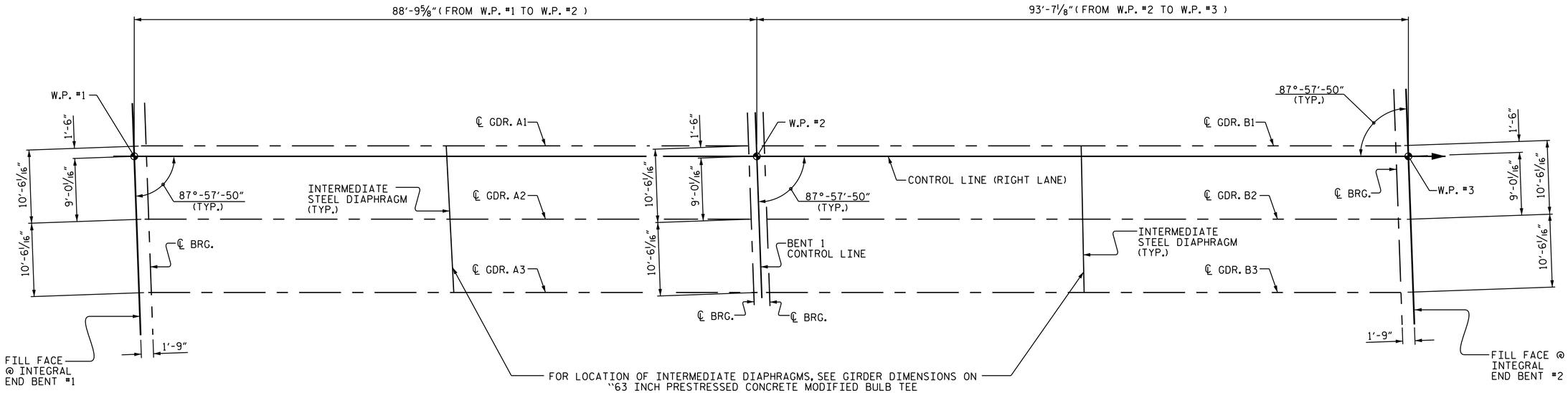
kpaschal

STR. #16



FRAMING PLAN

FOR INTERMEDIATE STEEL DIAPHRAGMS
SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR 63" PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS"

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-011
1			3			TOTAL SHEETS
2			4			30

STR. #16

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins 3/23/2015

DRAWN BY :	M.D.PISO	DATE : 07-18-13
CHECKED BY :	K.P.SEDAI	DATE : 09-10-14
DESIGN ENGINEER OF RECORD:	R.KOUCHEKI	DATE : 02/2015

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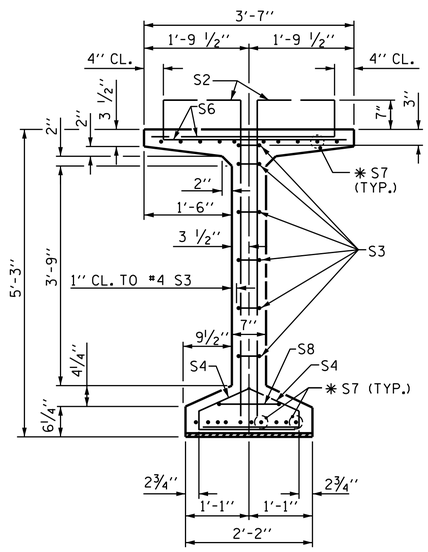
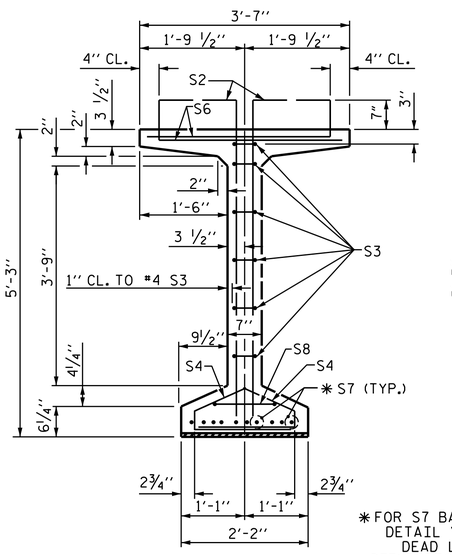
kpaschal

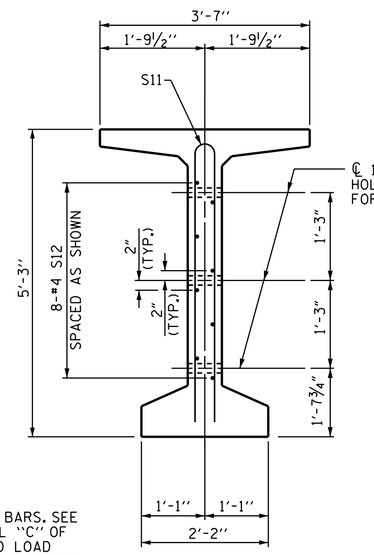


SECTION A-A



SECTION B-B

* FOR S7 BARS, SEE DETAIL "C" OF DEAD LOAD DEFLECTION SHEET

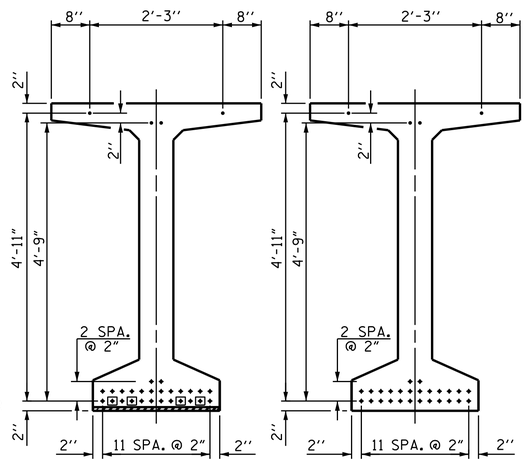


SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

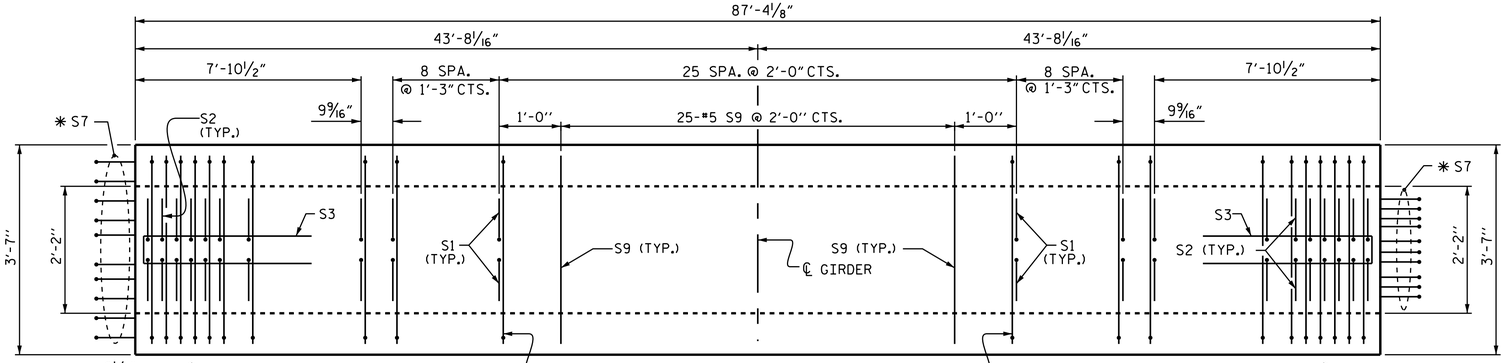
- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER



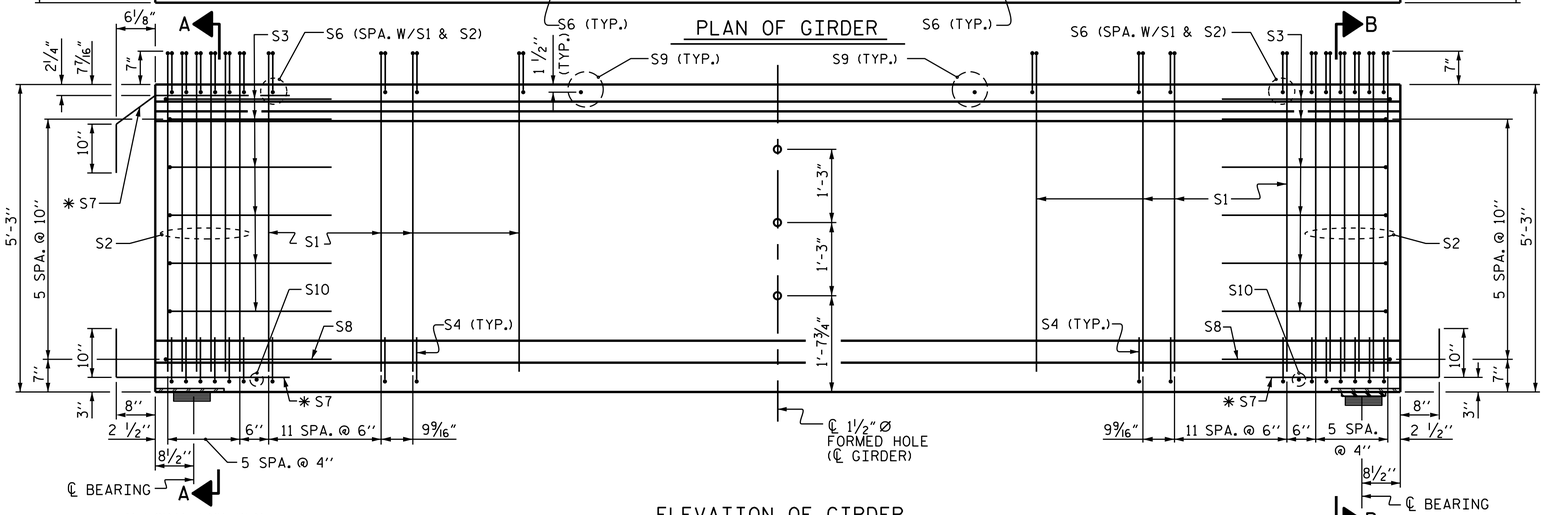
AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(30 STRAIGHT STRANDS)



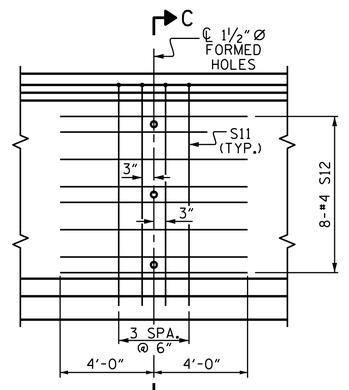
PLAN OF GIRDER



INTEGRAL END BENT

ELEVATION OF GIRDER

FIX



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 3.

0.6" Ø L. R. GRADE 270 STRANDS

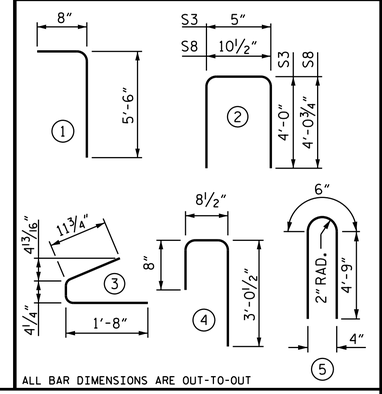
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	132	#4	1	6'-2"	544
S2	24	#5	1	6'-2"	154
S3	12	#4	2	8'-5"	67
S4	76	#4	3	3'-0"	152
S6	156	#5	4	4'-5"	719
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	25	#5	STR	3'-3"	85
S10	2	#3	STR	1'-10"	1
S11	4	#5	5	10'-0"	42
S12	8	#4	STR	8'-0"	43

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

BAR TYPES



QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER	1941	17.3	30

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
3	87'-4 1/8"	262'-0 3/8"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN A (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-012
1			3			TOTAL SHEETS
2			4			30

STR. #16

STD. NO. PCG7 (Sht. 2)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

ASSEMBLED BY : M.D.PISO		DATE : 09-10-14
CHECKED BY : K.P.SEDAI		DATE : 09-10-14
DESIGN ENGINEER OF RECORD : R.KOUCHEKI		DATE : 02/2015
DRAWN BY : EEM 2/6/97	REV. 5/1/06R	TLA/GM
CHECKED BY : VAP 2/6/97	REV. 10/1/11	MAA/GM
	REV. 6/13	MAA/GM

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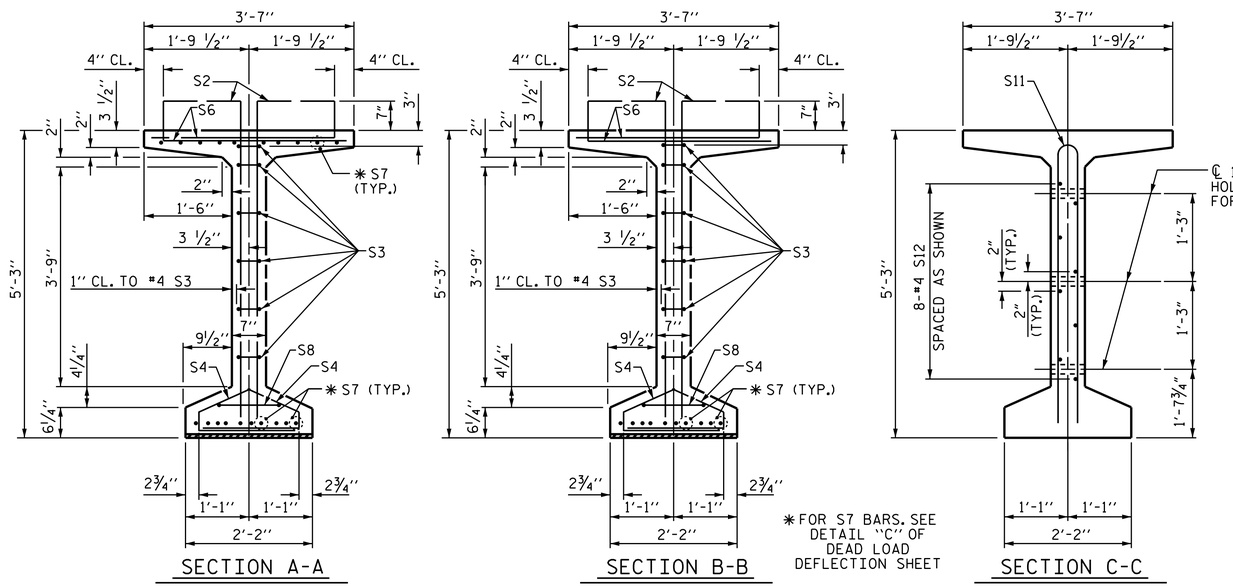
kpaschal



SECTION A-A

SECTION B-B

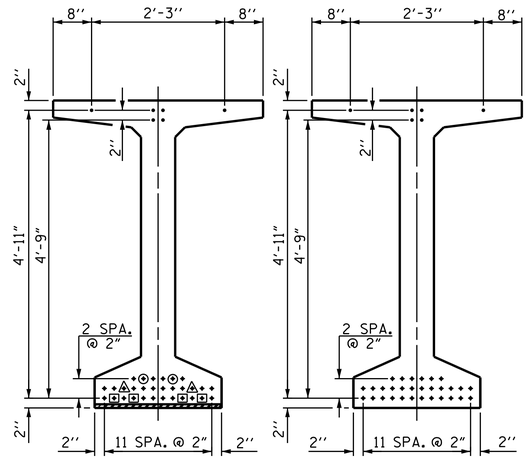
* FOR S7 BARS. SEE DETAIL "C" OF DEAD LOAD DEFLECTION SHEET

SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

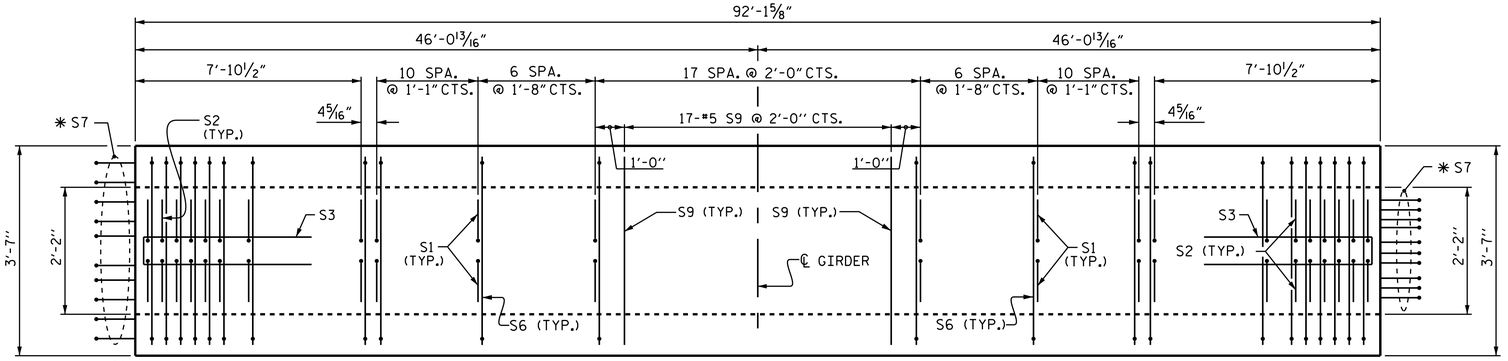
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER



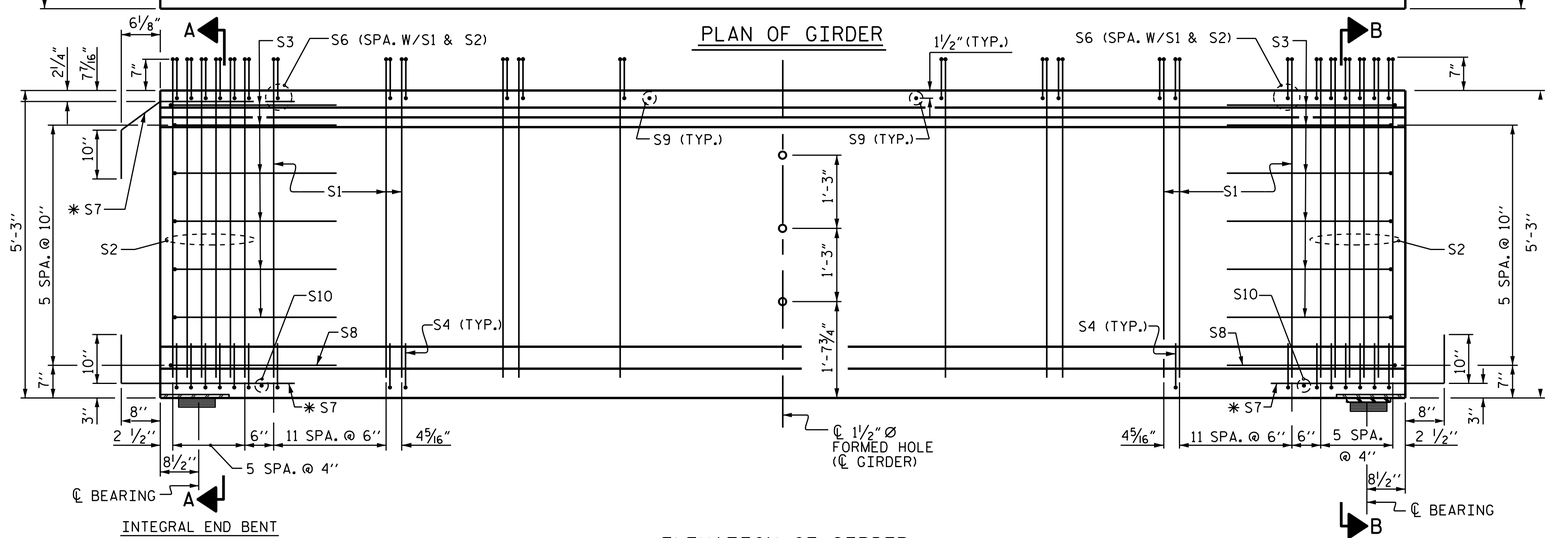
AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(36 STRAIGHT STRANDS)

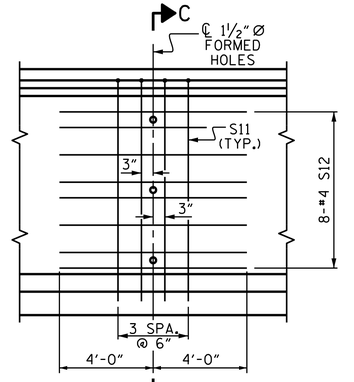


PLAN OF GIRDER



INTEGRAL END BENT

ELEVATION OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 THRU 3.

0.6" Ø L. R. GRADE 270 STRANDS

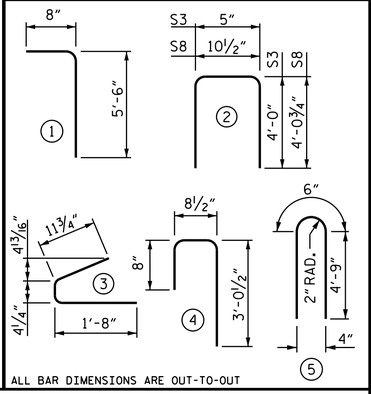
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	148	#4	1	6'-2"	610
S2	24	#5	1	6'-2"	154
S3	12	#4	2	8'-5"	67
S4	72	#4	3	3'-0"	144
S6	172	#5	4	4'-5"	792
* S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	17	#5	STR	3'-3"	58
S10	2	#3	STR	1'-10"	1
S11	4	#5	5	10'-0"	42
S12	8	#4	STR	8'-0"	43

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER	2045	18.3	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
3	92'-1 5/8"	276'-4 7/8"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
63" PRESTRESSED CONCRETE
MODIFIED BULB TEE
CONTINUOUS FOR LIVE LOAD
SPAN B
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-013
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

Docusigned by: Tim Coggins DEFD4A9D48FA47B...

3/23/2015

ASSEMBLED BY :	M.D.PISO	DATE : 09-10-14
CHECKED BY :	K.P.SEDAI	DATE : 09-10-14
DESIGN ENGINEER OF RECORD :	R.KOUCHEKI	DATE : 02/2015
DRAWN BY : EEM 2/6/97	REV. 5/1/06R	TLA/GM
CHECKED BY : VAP 2/6/97	REV. 10/1/11	MAA/GM
	REV. 6/13	MAA/GM

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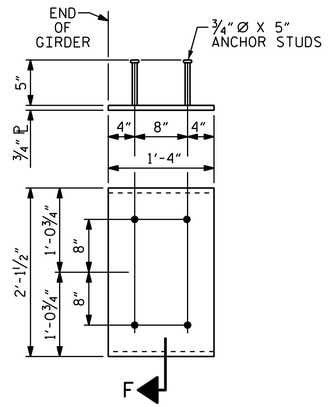
kpaschal

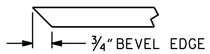
STR. #16

STD. NO. PCG7 (Sht. 2)



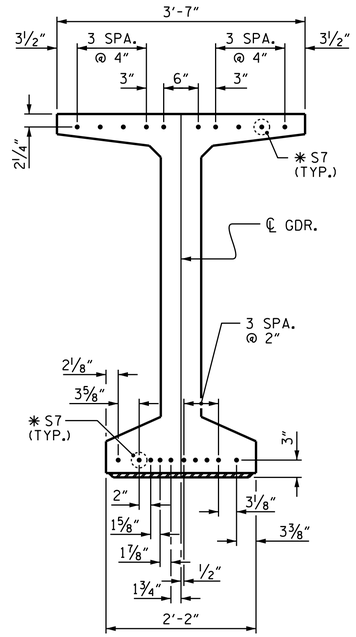
EMBEDDED PLATE "B-1" DETAILS FOR 63" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



SECTION "F"

(SEE NOTES)



DETAIL "C"

(FOR 63" MODIFIED BULB TEES)

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 6000 PSI (SPAN A) & 6200 PSI (SPAN B)

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

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

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN ½" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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

DEAD LOAD DEFLECTION TABLE FOR SPAN A

0.6" LOW RELAXATION	GIRDER 1											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.050	0.094	0.129	0.151	0.159	0.151	0.129	0.094	0.050	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	-0.024	-0.046	-0.063	-0.074	-0.077	-0.074	-0.063	-0.046	-0.024	0.0
FINAL CAMBER ↑	0.0	5/16"	9/16"	13/16"	15/16"	1"	15/16"	13/16"	9/16"	5/16"	0.0

* 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 SPAN B

0.6" LOW RELAXATION	GIRDER 1											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.054	0.102	0.140	0.164	0.172	0.164	0.140	0.102	0.054	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	-0.030	-0.057	-0.078	-0.091	-0.096	-0.091	-0.078	-0.057	-0.030	0.0
FINAL CAMBER ↑	0.0	5/16"	9/16"	3/4"	7/8"	15/16"	7/8"	3/4"	9/16"	5/16"	0.0

* 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 SPAN A

0.6" LOW RELAXATION	GIRDER 2										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.050	0.094	0.129	0.151	0.159	0.151	0.129	0.094	0.050	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	-0.025	-0.048	-0.066	-0.077	-0.081	-0.077	-0.066	-0.048	-0.025	0.0
FINAL CAMBER ↑	0.0	5/16"	9/16"	3/4"	7/8"	15/16"	7/8"	3/4"	9/16"	5/16"	0.0

* 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 SPAN B

0.6" LOW RELAXATION	GIRDER 2										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.054	0.102	0.140	0.164	0.172	0.164	0.140	0.102	0.054	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	-0.032	-0.060	-0.082	-0.096	-0.100	-0.096	-0.082	-0.060	-0.032	0.0
FINAL CAMBER ↑	0.0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0.0

* 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 SPAN A

0.6" LOW RELAXATION	GIRDER 3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.050	0.094	0.129	0.151	0.159	0.151	0.129	0.094	0.050	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	-0.024	-0.045	-0.062	-0.073	-0.076	-0.073	-0.062	-0.045	-0.024	0.0
FINAL CAMBER ↑	0.0	5/16"	9/16"	13/16"	15/16"	1"	15/16"	13/16"	9/16"	5/16"	0.0

* 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 SPAN B

0.6" LOW RELAXATION	GIRDER 3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.054	0.102	0.140	0.164	0.172	0.164	0.140	0.102	0.054	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	-0.030	-0.056	-0.077	-0.090	-0.095	-0.090	-0.077	-0.056	-0.030	0.0
FINAL CAMBER ↑	0.0	5/16"	9/16"	3/4"	7/8"	15/16"	7/8"	3/4"	9/16"	5/16"	0.0

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

DRAWN BY : M.D.PISO DATE : 08-07-13
CHECKED BY : K.P.SEDAI DATE : 09-15-14
DESIGN ENGINEER OF RECORD: R.KOUCHEKI DATE : 02/2015

23-MAR-2015 13:09
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kpaschal

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION

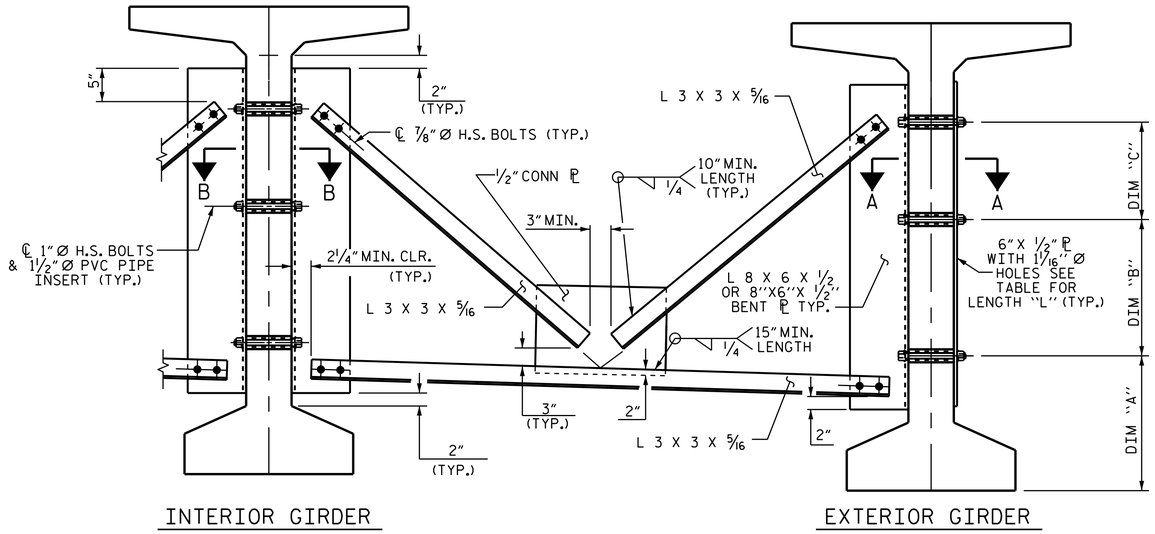
(SPANS A & B)

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-014
1			3			TOTAL SHEETS
2			4			30

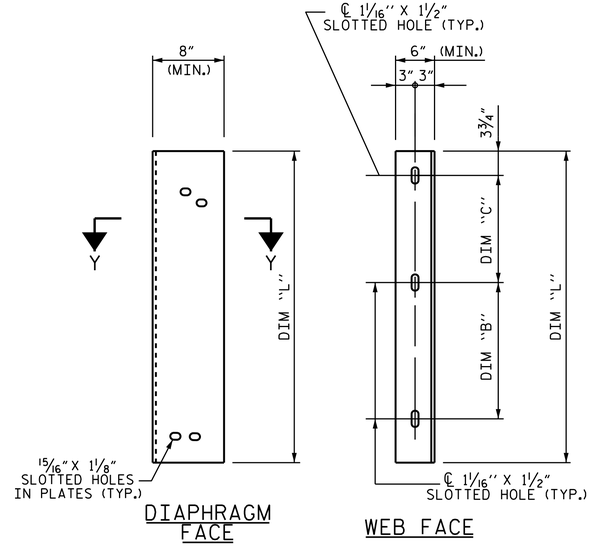
STR. #16

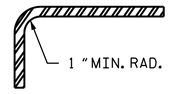
STD. NO. PCG9



PART SECTION AT INTERMEDIATE DIAPHRAGM

(63" BULB TEE GIRDER SHOWN)





SECTION Y-Y

CONNECTOR PLATE DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

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

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

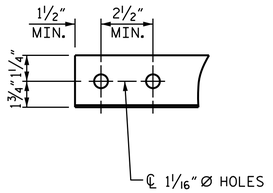
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-7 3/4"	1'-3"	1'-3"	3'-5"



ANGLE END

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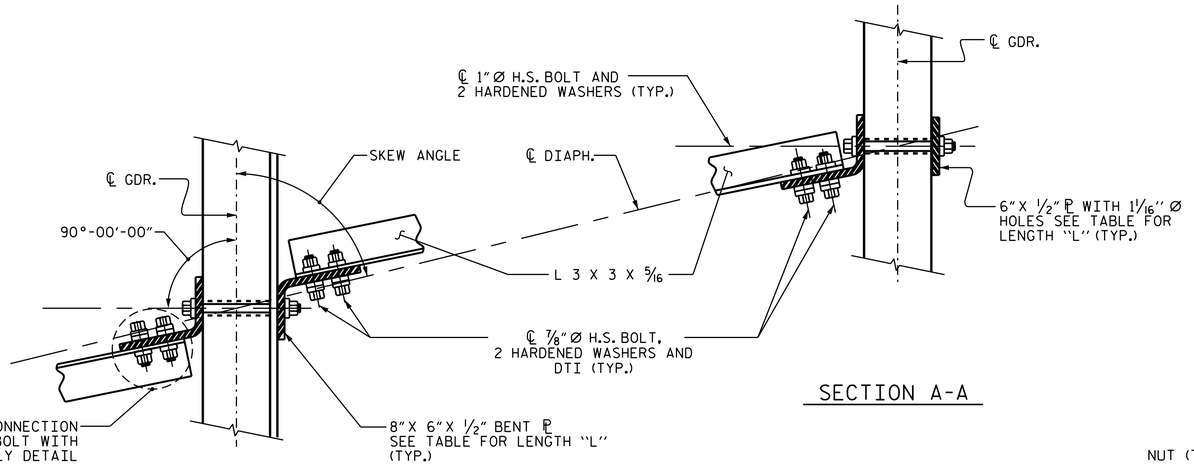
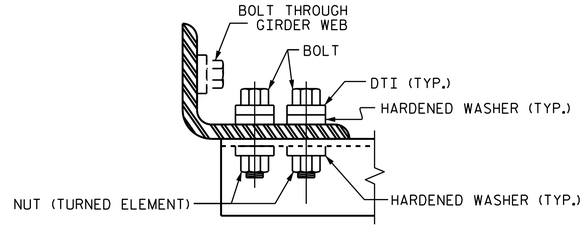


SECTION A-A

SECTION B-B



BOLT WITH DTI ASSEMBLY DETAIL

CONNECTION DETAILS

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-015
1			3			TOTAL SHEETS
2			4			30

STR. #16 STD. NO. PCG11 (SHT 2)

ASSEMBLED BY :	M.D.PISO	DATE :	09-19-14
CHECKED BY :	K.P.SEDAI	DATE :	09-25-14
DRAWN BY :	RWW 11/09	ADDED	11/23/09R
CHECKED BY :	GM 11/09	REV.	10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/24/2015

24-MAR-2015 07:37
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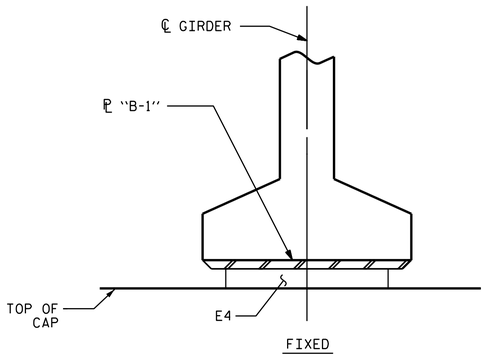
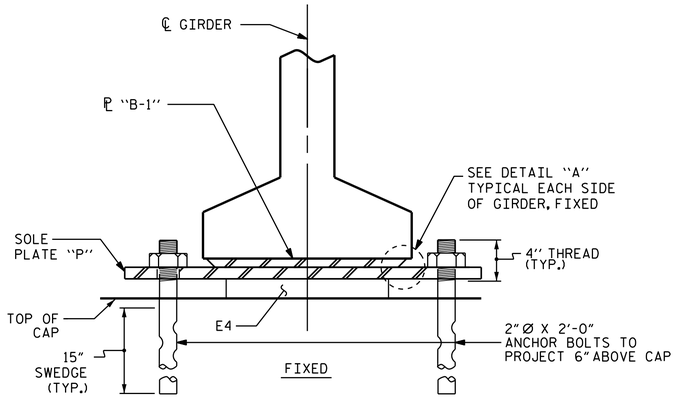


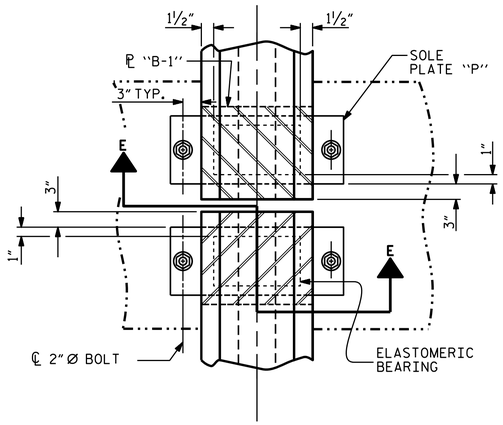
SECTION @ END BENT

SHOWING SECTION AT END BENT



SECTION E-E

SHOWING SECTION AT BENT



TYPICAL PLAN

(SHOWING CONTINUOUS BENT)

NOTES

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

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.

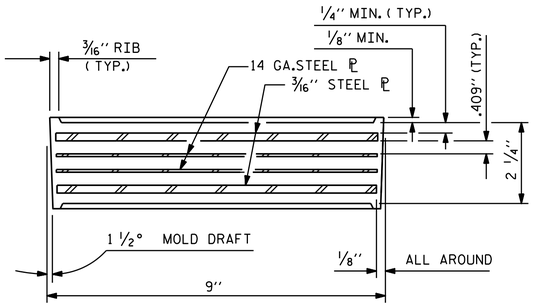
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

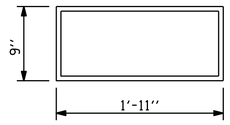
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



TYPICAL SECTION OF ELASTOMERIC BEARINGS

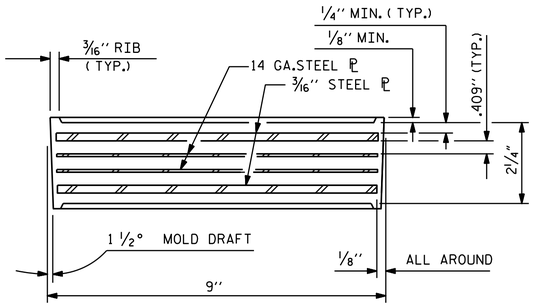


E4 (6 REQ'D.)

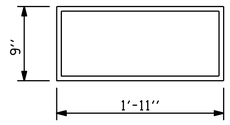
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

(AT END BENT)



TYPICAL SECTION OF ELASTOMERIC BEARINGS

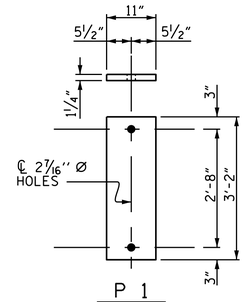


E4 (6 REQ'D.)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

(AT BENT)



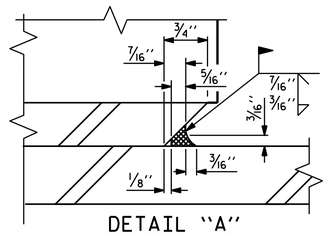
P 1

(FIXED)

P1 (6 REQ'D.)

(AT BENT)

SOLE PLATE DETAILS ("P")



DETAIL "A"

LOAD RATINGS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

ASSEMBLED BY : M.D.PISO		DATE : 07-18-13
CHECKED BY : K.P.SEDAI		DATE : 09-10-14
DESIGN ENGINEER OF RECORD :	R.KOUCHEKI	DATE : 02/2015
DRAWN BY : EEM 2/97	REV. 5/1/06 TLA/GM	
CHECKED BY : VAP 2/97	REV. 10/1/11 MAA/GM	
	REV. 6/13 AAC/MAA	

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-016
1			3			TOTAL SHEETS
2			4			30

STR. #16

STD. NO. EB4 (SHT 1)

23-MAR-2015 13:09

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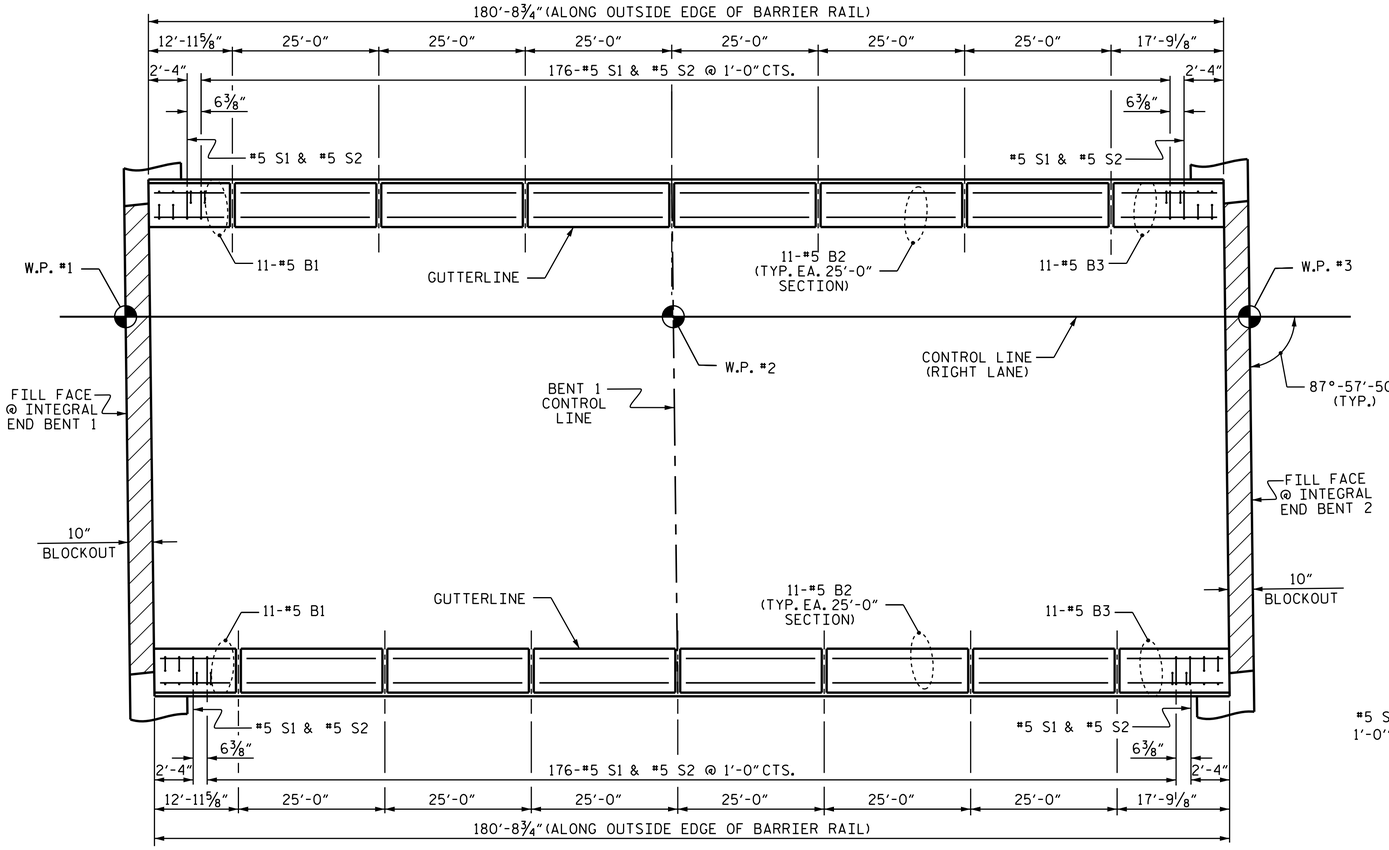
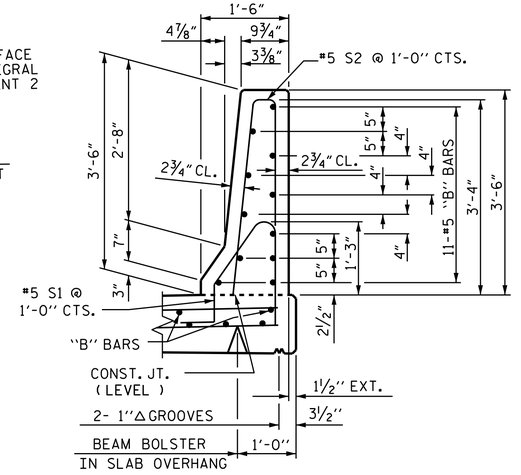
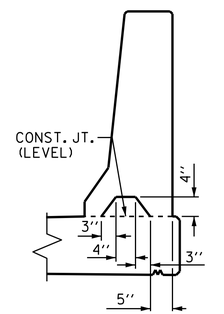
kpaschal



PLAN



SECTION THRU RAIL



SECTION S-S

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

NOTES

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

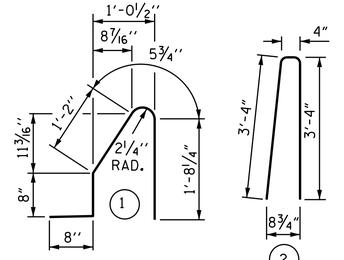
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

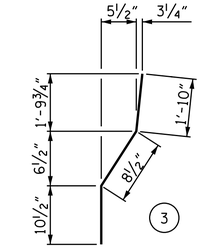
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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

#5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE ½" EXPANSION JOINT MATERIAL IN RAIL.

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

BAR TYPES





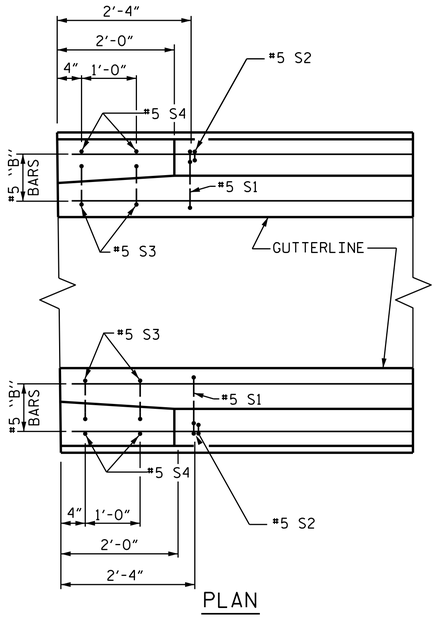
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

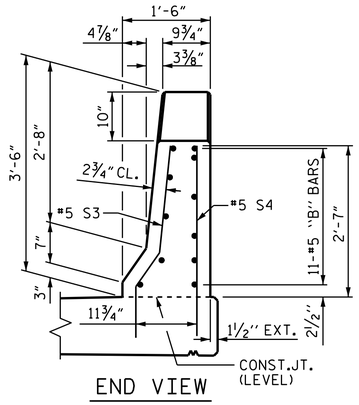
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	22	#5	STR	12'-6"	287
* B2	132	#5	STR	24'-7"	3385
* B3	22	#5	STR	17'-4"	398
* S1	356	#5	1	4'-8"	1733
* S2	356	#5	2	7'-0"	2599
* S3	8	#5	3	3'-5"	29
* S4	8	#5	STR	3'-3"	27

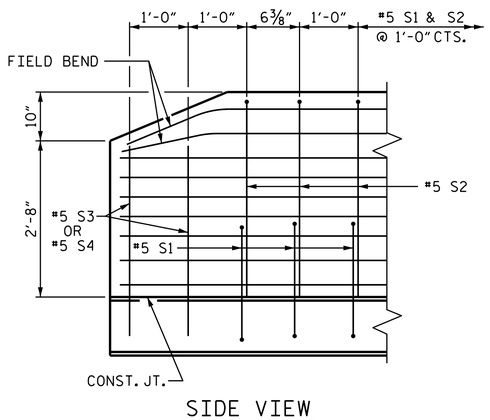
* EPOXY COATED REINFORCING STEEL	8458 LBS.
CLASS AA CONCRETE	49.5 CU. YDS.
CONCRETE BARRIER RAIL	361.46 LIN. FT.



PLAN



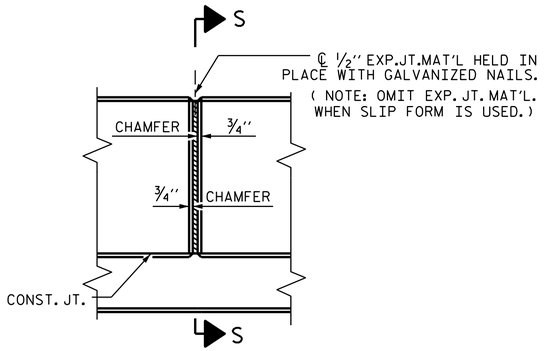
END VIEW



SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

DRAWN BY :	D. G. ELY	DATE :	2/3/15
CHECKED BY :	G. DICKEY	DATE :	2/4/15
DESIGN ENGINEER OF RECORD:	G. GOUCHEKI	DATE :	02/2015

DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4ABD48FA47B...

3/23/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-017
1			3			TOTAL SHEETS
2			4			30

STR. #16

STD. NO. CBR1 (SHT 1)

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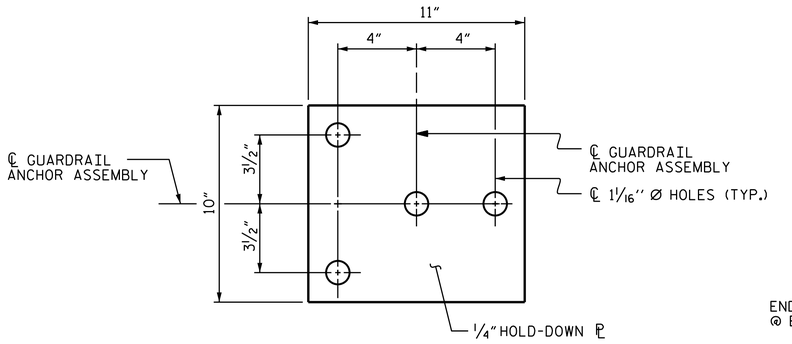
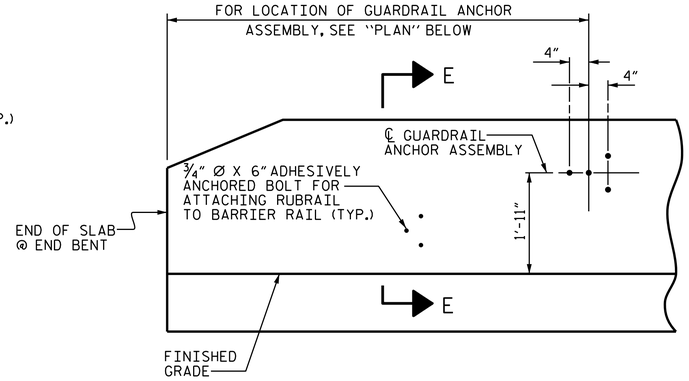
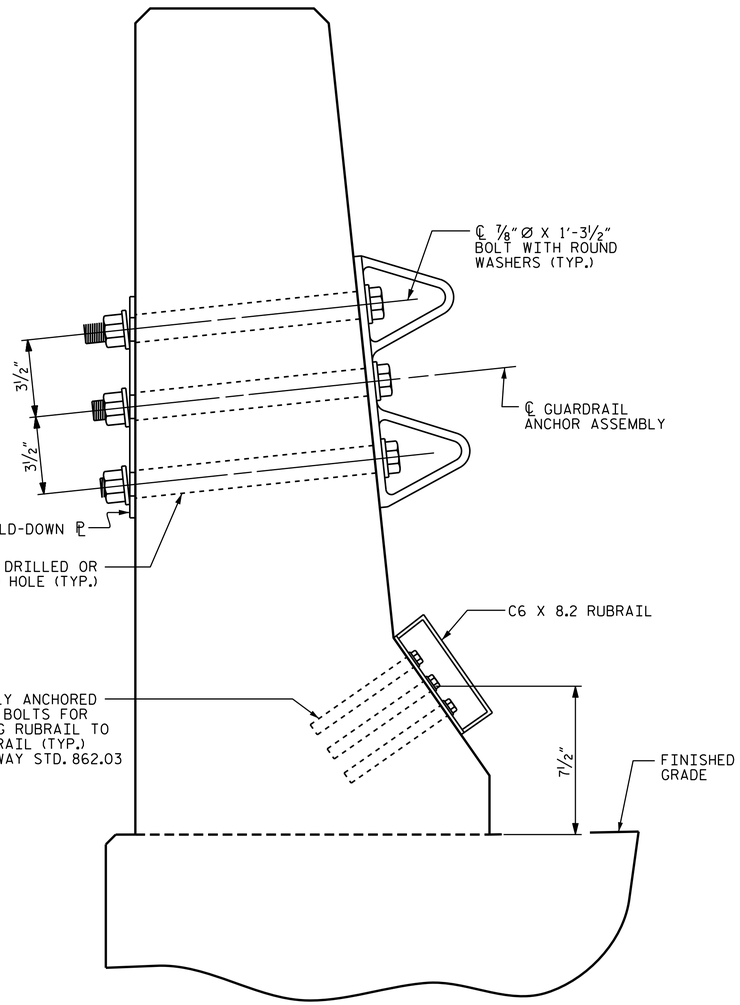


PLAN

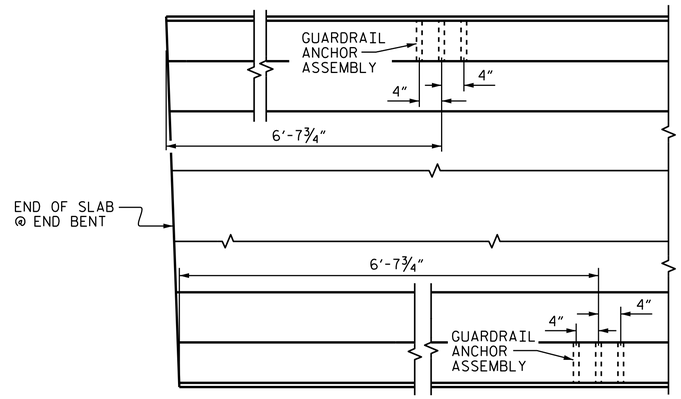


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

NOTES

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

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

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

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

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

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

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

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

SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

(RIGHT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD1A8D48FA47B...
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-018
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : M.D.PISO		DATE : 08-06-13	
CHECKED BY : K.P.SEDAI		DATE : 09-10-14	
DRAWN BY : TLA 5/06	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 5/06	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

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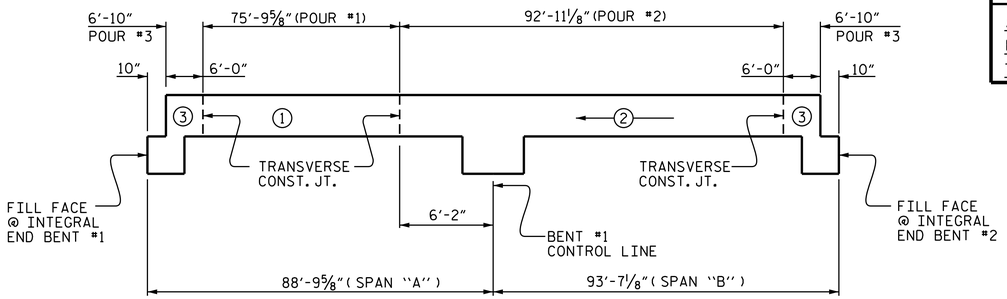
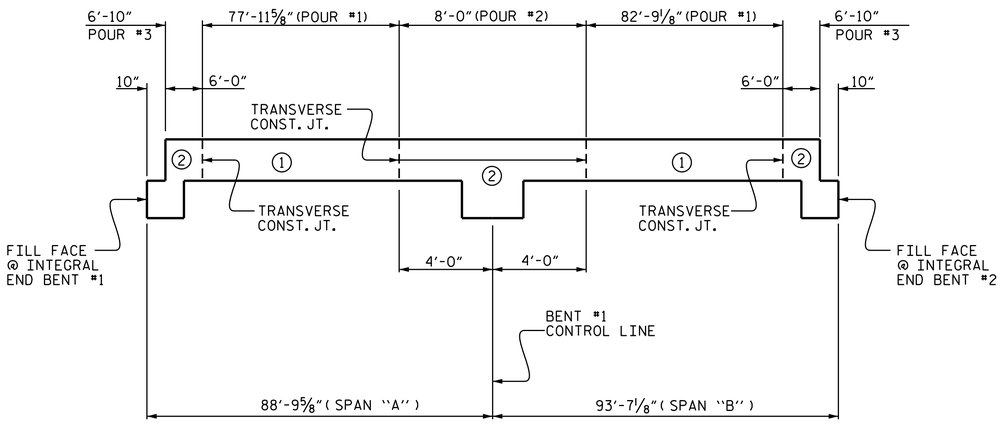
kpaschal

STR. #16 (SHT 1a) STD. NO. GRA2



POURING SEQUENCE

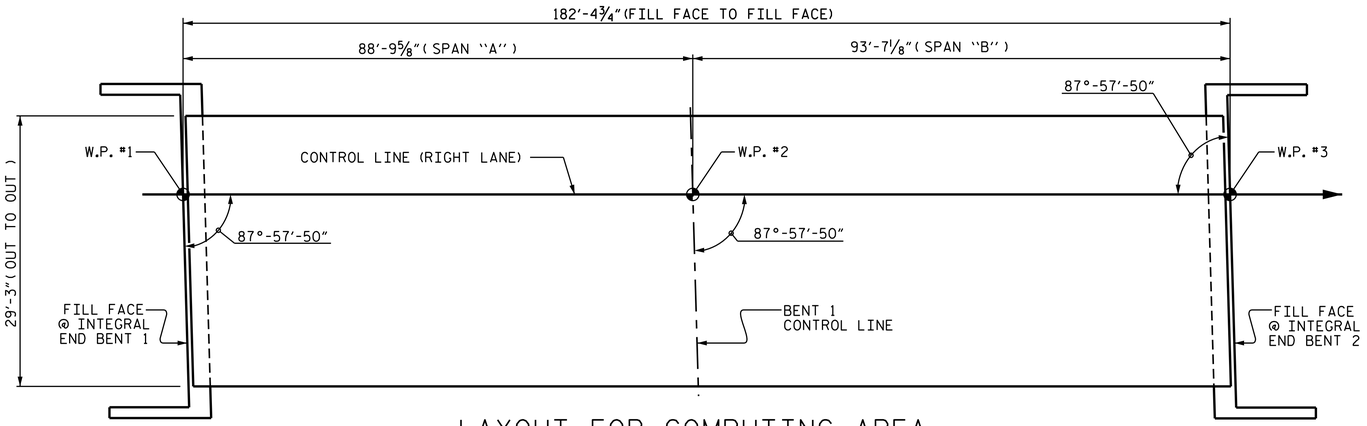
POUR (3) INCLUDES 6'-10" SECTION OF TH BRIDGE DECK AND UPPER PART OF INTEGRAL END BENTS AND WINGS.



OPTIONAL POURING SEQUENCE

POUR (2) CAN NOT BE POURED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUN STRENGTH OF 3000 PSI.

AT END BENTS POUR (2) INCLUDES 6'-10" SECTION OF THE BRIDGE DECK AND UPPER PART OF INTEGRAL END BENTS AND WINGS.



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5,335)

GROOVING BRIDGE FLOORS

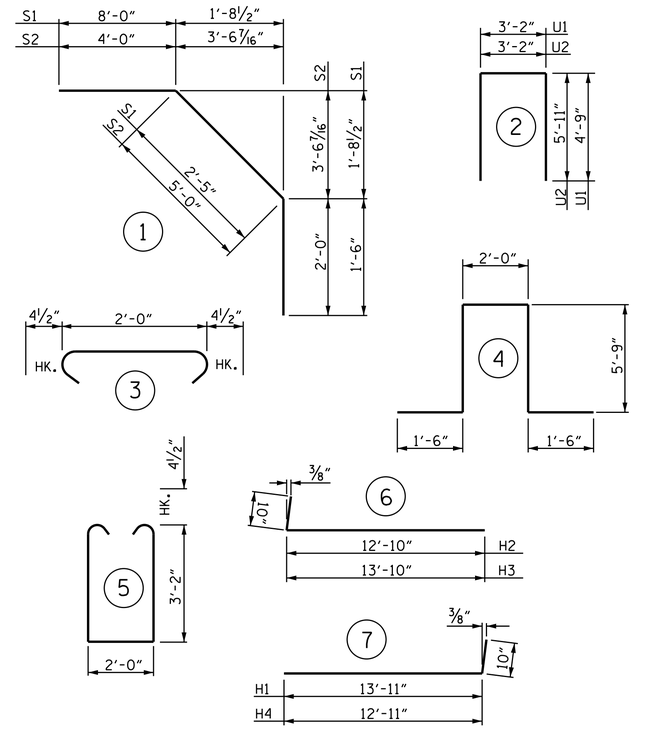
APPROACH SLABS	1,135 SQ.FT.
BRIDGE DECK	4,149 SQ.FT.
TOTAL	5,284 SQ.FT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	308	#5	STR.	28'-11"	9,289
✱A101	2	#5	STR.	14'-1"	29
A2	308	#5	STR.	28'-11"	9,289
A201	2	#5	STR.	14'-1"	29
✱B1	40	#4	STR.	29'-11"	799
✱B2	60	#4	STR.	21'-11"	878
✱B3	76	#6	STR.	18'-9"	2,140
✱B4	38	#6	STR.	27'-6"	1,570
✱B5	60	#6	STR.	23'-8"	2,133
B6	104	#5	STR.	46'-9"	5,071
H1	24	#5	7	14'-9"	369
H2	24	#5	6	13'-8"	342
H3	24	#5	6	14'-8"	367
H4	24	#5	7	13'-9"	344
K1	24	#4	STR.	18'-5"	295
K2	4	#4	STR.	6'-7"	18
K3	16	#4	STR.	9'-7"	102
K4	4	#4	STR.	8'-0"	21
K5	16	#4	STR.	2'-8"	29
K6	4	#4	STR.	5'-0"	13
K7	16	#4	STR.	6'-6"	69
K8	4	#4	STR.	5'-9"	15
K9	6	#4	STR.	21'-0"	84
K10	4	#4	STR.	6'-7"	18
K11	16	#4	STR.	9'-7"	102
K12	4	#4	STR.	6'-10"	18
✱S1	44	#4	1	11'-11"	350
✱S2	40	#4	1	11'-0"	294
S3	78	#4	3	2'-9"	143
S4	4	#4	5	9'-1"	24
U1	44	#4	2	12'-8"	372
U2	12	#4	2	15'-0"	120
✱U3	14	#4	4	16'-6"	154
V1	18	#4	STR.	5'-3"	63
V2	52	#5	STR.	6'-2"	334
V3	48	#5	STR.	6'-0"	300
REINFORCING STEEL					17,951 LBS.

✱ EPOXY COATED REINFORCING STEEL 17,636 LBS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

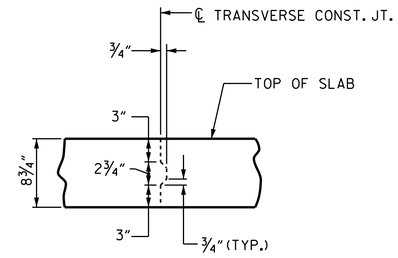
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	74.1	17,951	17,636
POUR #2	100.3		
◊ POUR #3	69.0		
TOTALS✱✱	243.4	17,951	17,636

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

◊ POUR #3 QUANTITY INCLUDES UPPER POUR OF WINGS AND INTEGRAL END BENT.

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"			



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4ABD48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-019
1			3			TOTAL SHEETS
2			4			30

STR. #16 STD. NO. BOM2

ASSEMBLED BY : M.D.PISO		DATE : 09-15-14
CHECKED BY : K.P.SEDAI		DATE : 09-25-14
DESIGN ENGINEER OF RECORD : G.KOUCHEKI		DATE : 02/2015
DRAWN BY : JMB 5/87	REV. 8/16/99	RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

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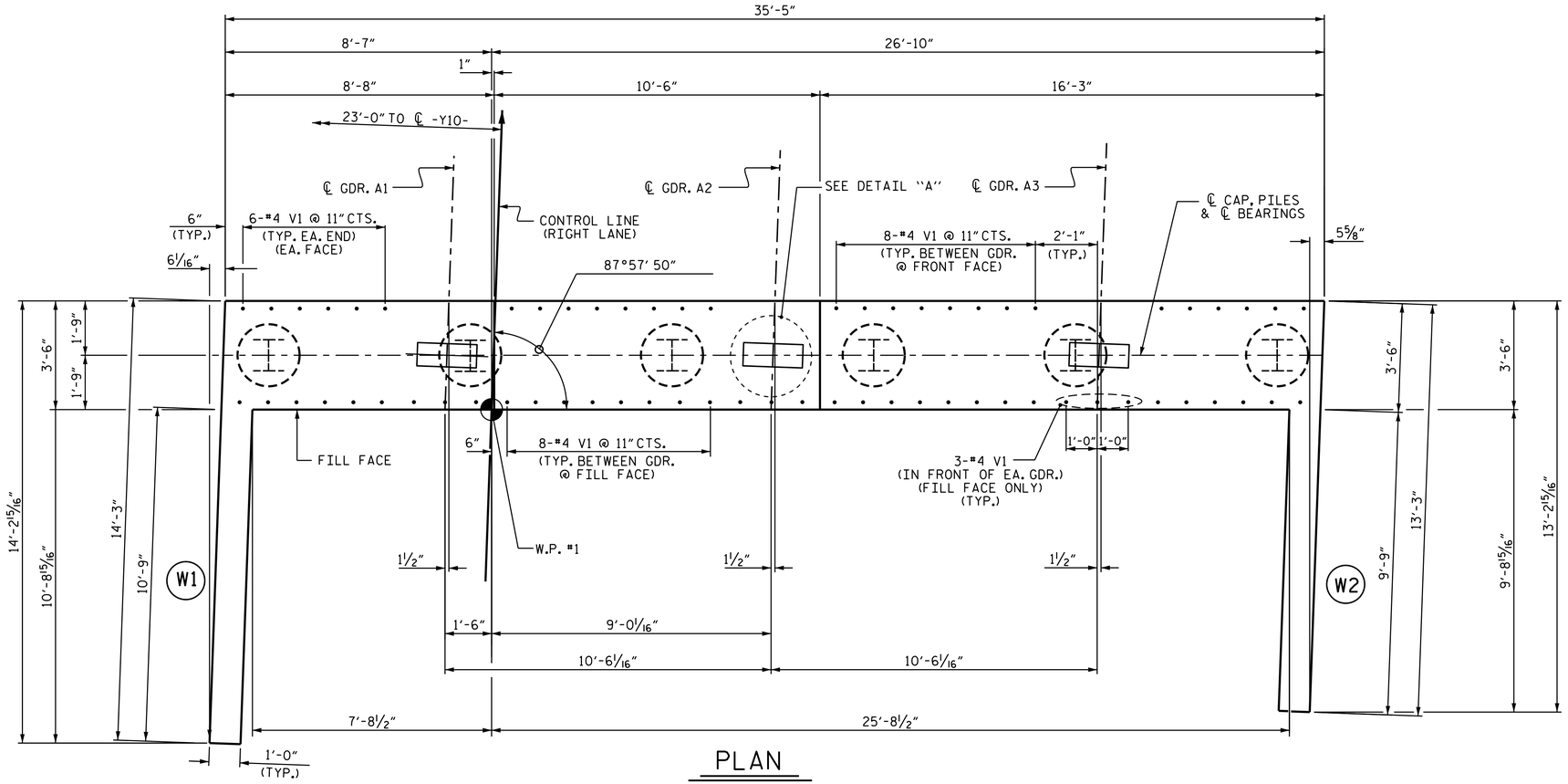
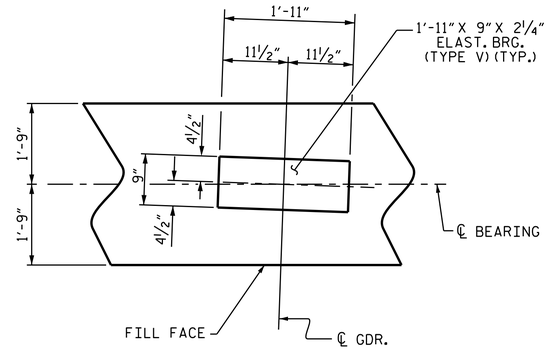
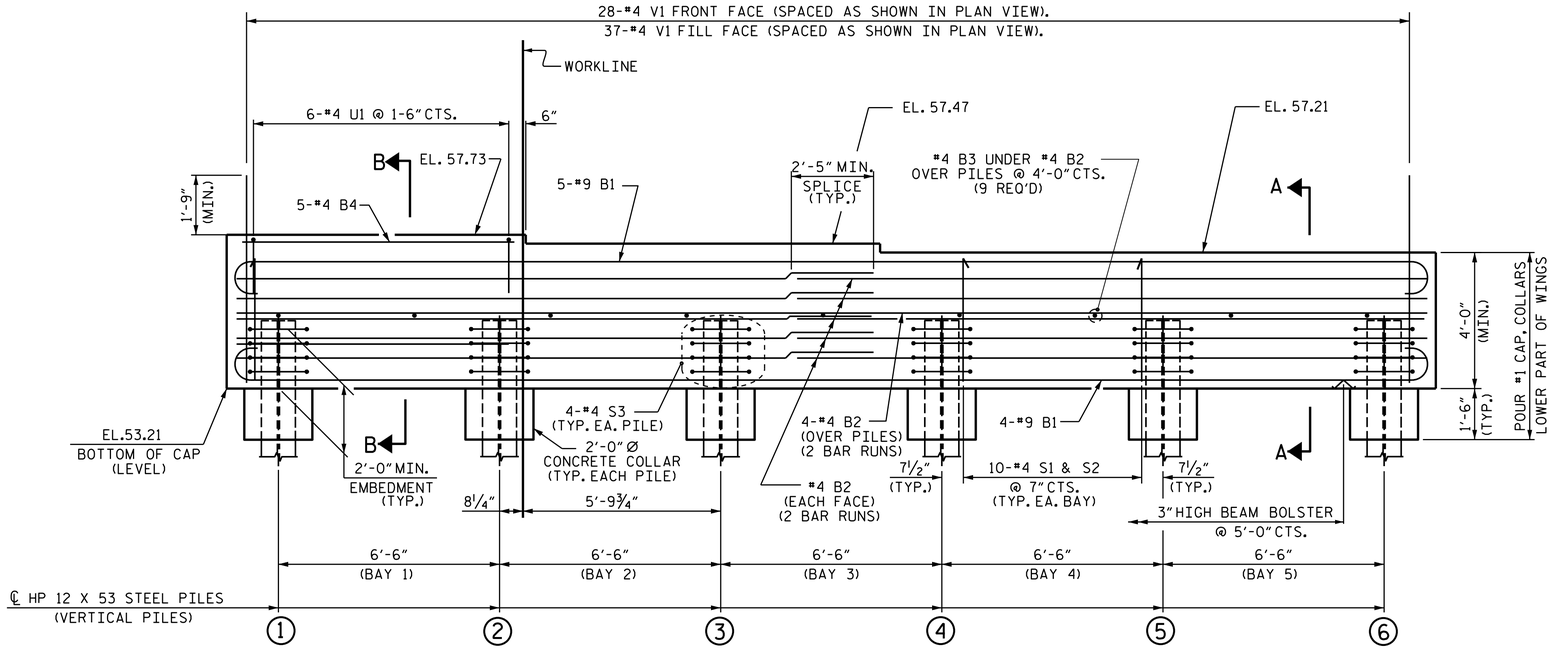
kpaschal



PLAN



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



ELEVATION

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAIL.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT UPPER PART OF WINGS ARE TO BE POURED WITH THE SUPERSTRUCTURE.

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

PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-020
1			3			TOTAL SHEETS
2			4			30

STR. #16

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 6/23/14
CHECKED BY : K.P.SEDAI DATE : 6/24/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

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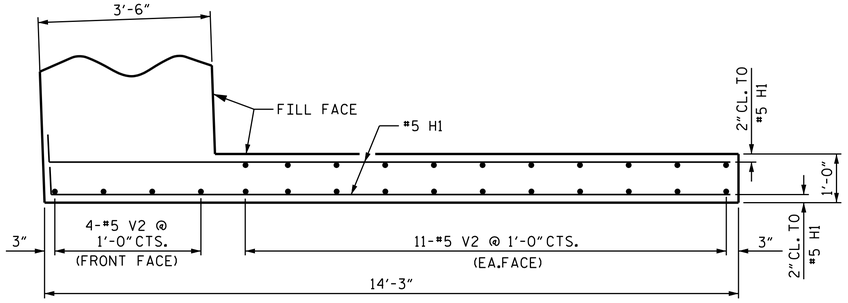
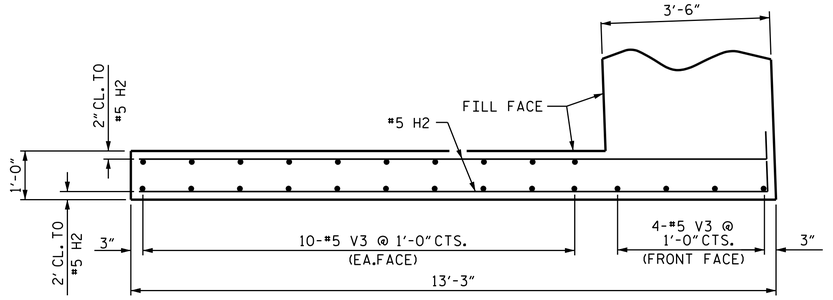
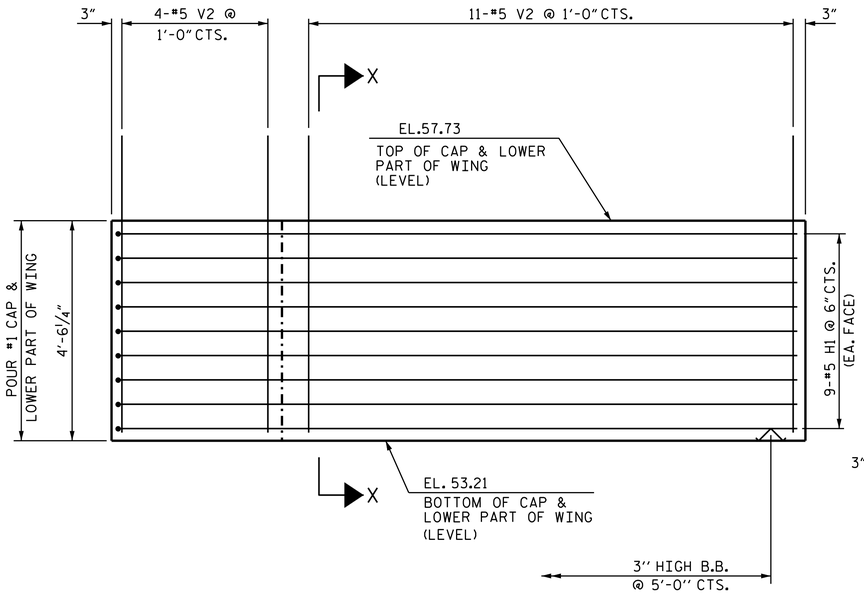


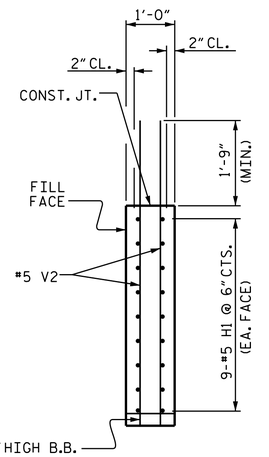
PLAN OF WING W1



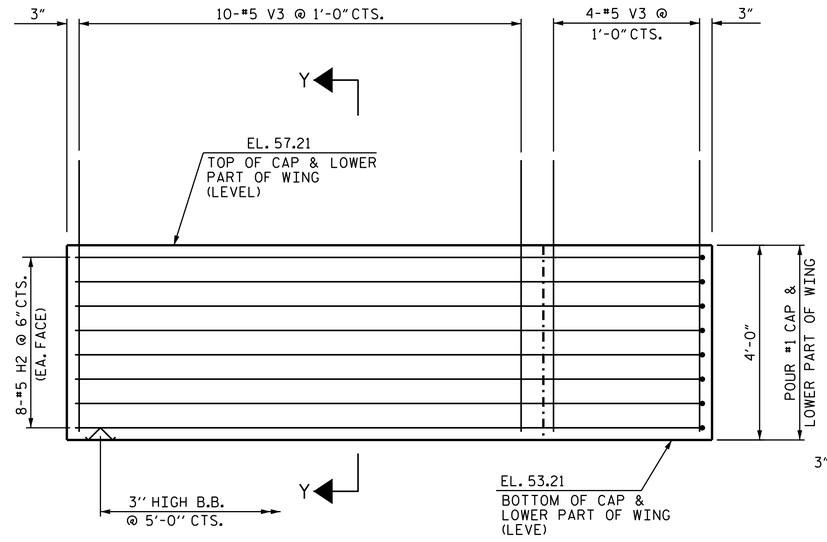
PLAN OF WING W2



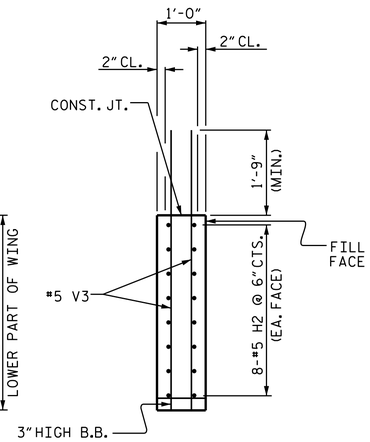
ELEVATION OF WING W1



SECTION X-X



ELEVATION OF WING W2



SECTION Y-Y

PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-021
1			3			TOTAL SHEETS
2			4			30

STR. #16

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 6/23/14
CHECKED BY : K.P.SEDAI DATE : 6/24/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

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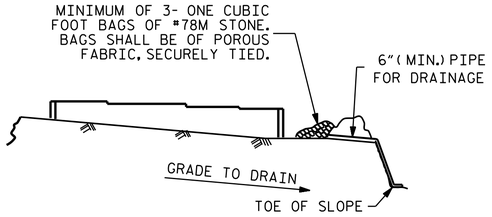
kpaschal

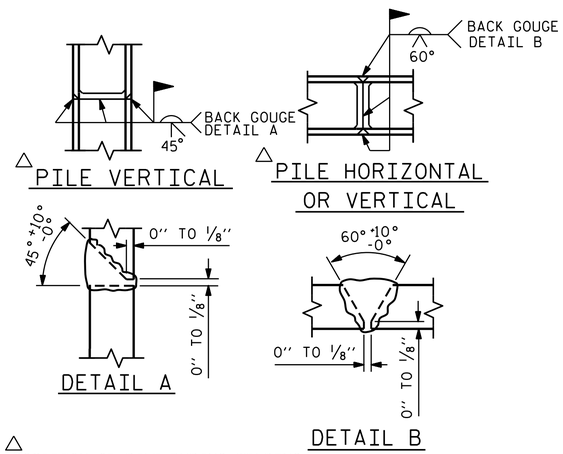


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

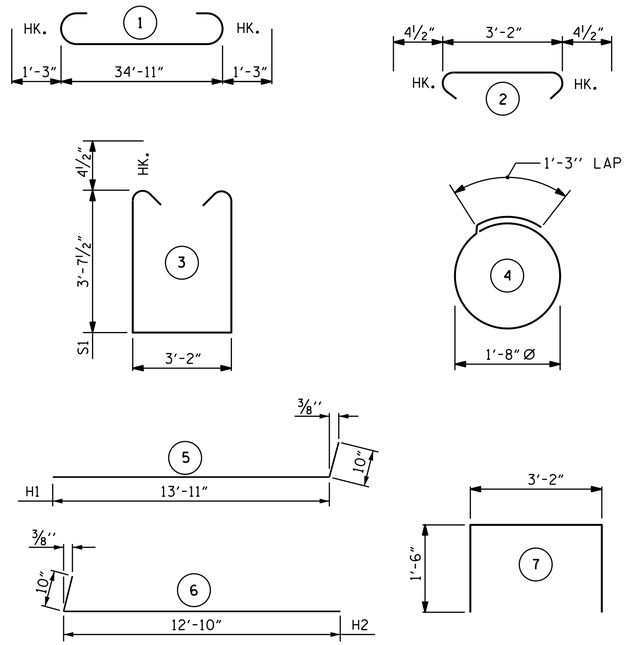
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

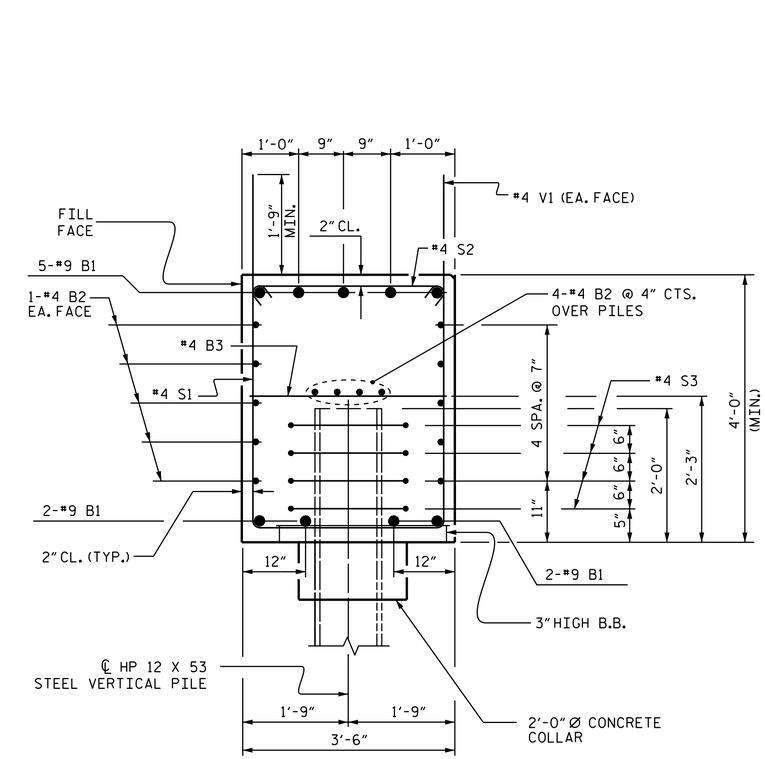
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#9	1	37'-5"	1145
B2	28	#4	STR	18'-9"	351
B3	9	#4	STR	3'-2"	19
B4	5	#4	STR	8'-4"	28
H1	18	#5	5	14'-9"	277
H2	16	#5	6	13'-8"	228
S1	50	#4	3	11'-2"	373
S2	50	#4	2	3'-11"	131
S3	24	#4	4	6'-6"	104
U1	6	#4	7	6'-2"	25
V1	65	#4	STR	6'-2"	268
V2	26	#5	STR	6'-0"	163
V3	24	#5	STR	5'-6"	138

REINFORCING STEEL = 3250 LBS

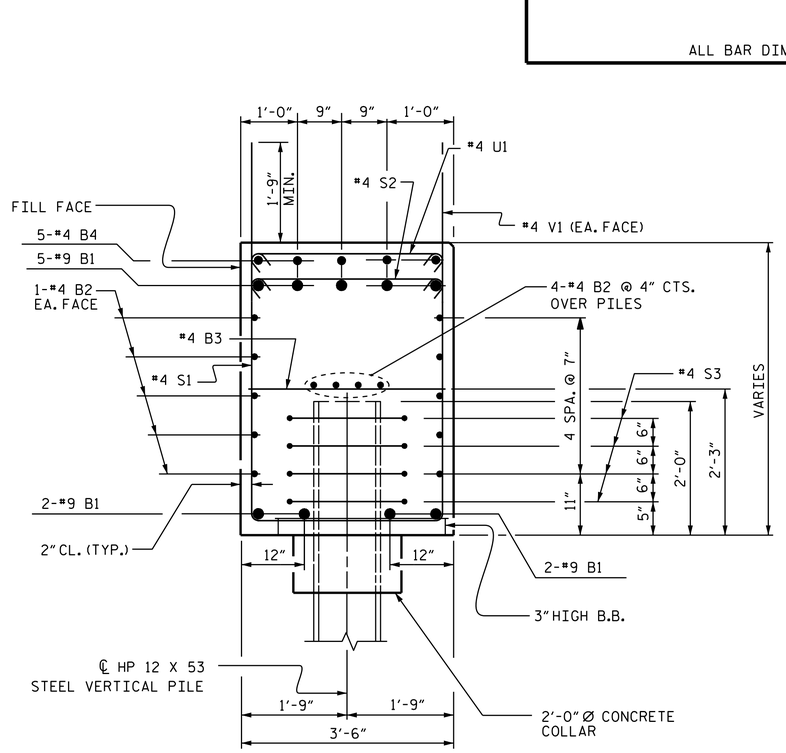
CLASS A CONCRETE

POUR #1 (CAP & LOWER PART OF WINGS)	22.6 C.Y.
CONCRETE COLLARS	1.0 C.Y.
TOTAL	23.6 C.Y.

HP 12 x 53 STEEL PILES No. 6	450 LIN FT.
STEEL PILE POINTS NO. 6	EA.
PILE REDRIVES	3 EA.



SECTION A-A



SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT 1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-022
1			3			TOTAL SHEETS
2			4			30

STR. #16

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 6/23/14
CHECKED BY : K.P. SEDAI DATE : 6/24/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

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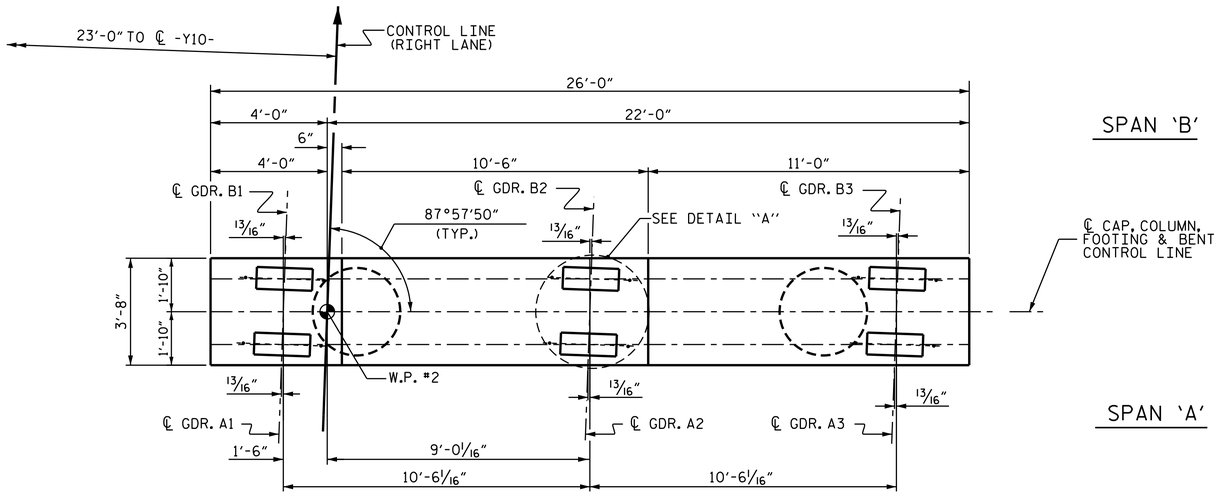
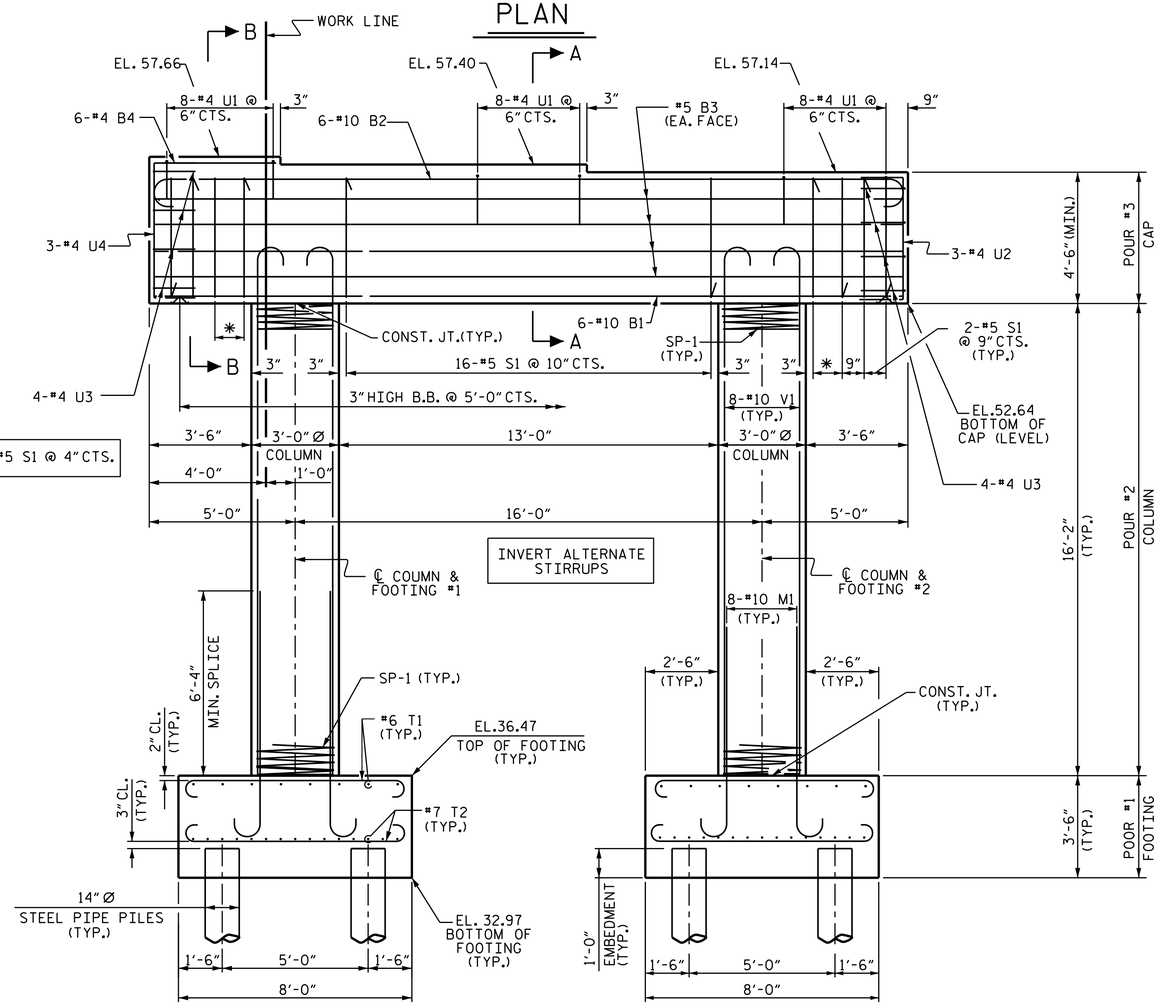
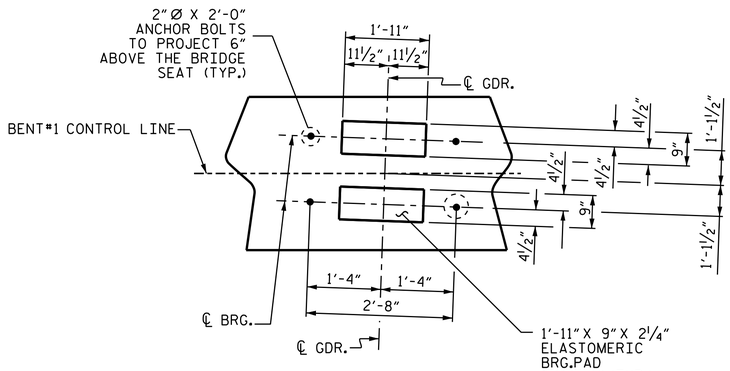
kpaschal



PLAN



ELEVATION

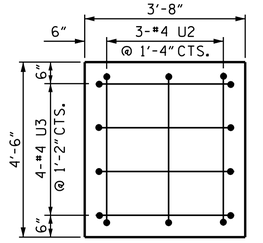


DETAIL "A"
(TYP. EA. GDR.)

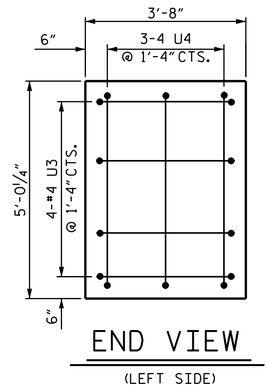
NOTES

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

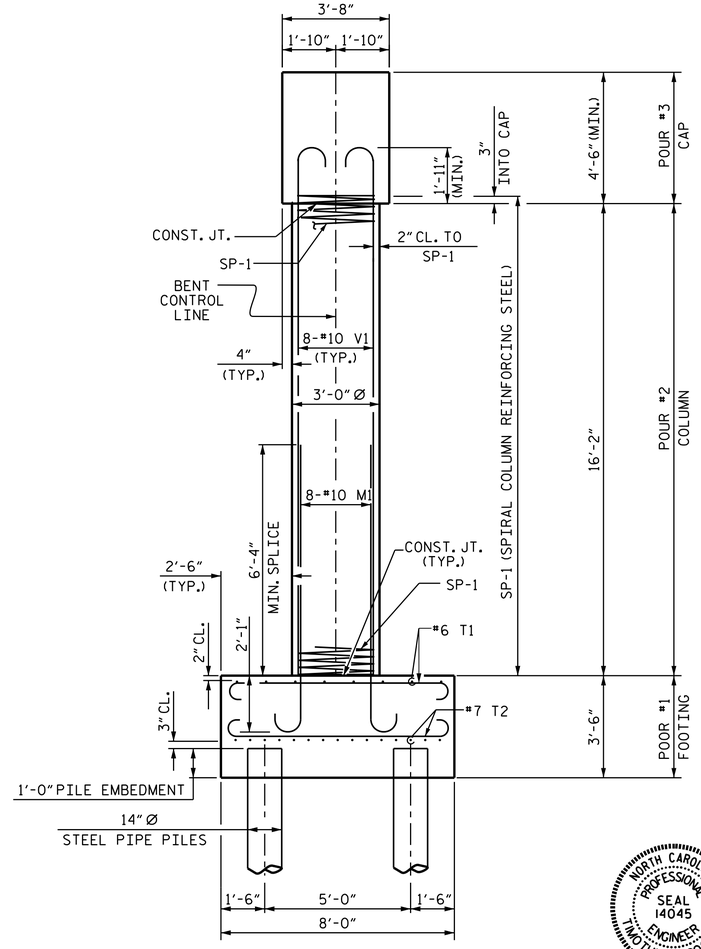
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.



END VIEW
(RIGHT SIDE)



END VIEW
(LEFT SIDE)



END ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4AMD48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES-CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-023
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 6/11/14
CHECKED BY : K.P.SEDAI DATE : 6/11/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

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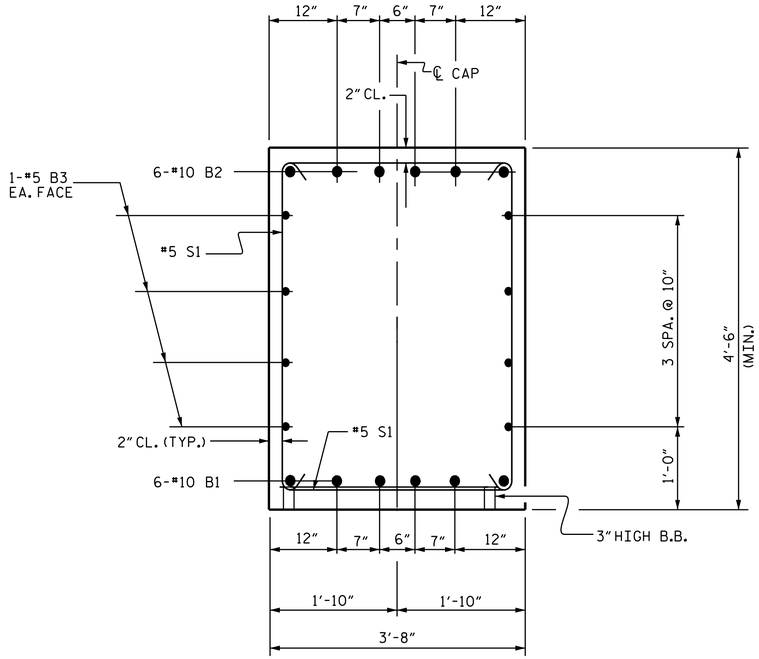
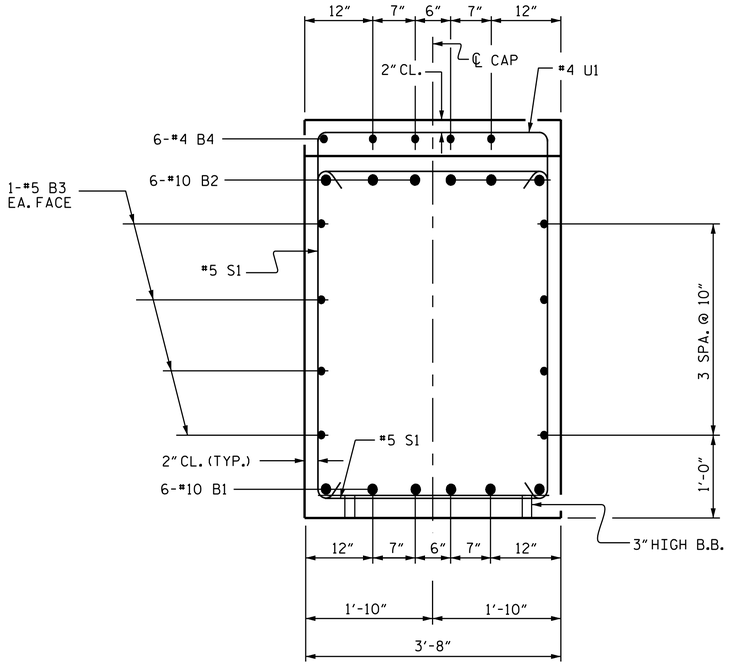
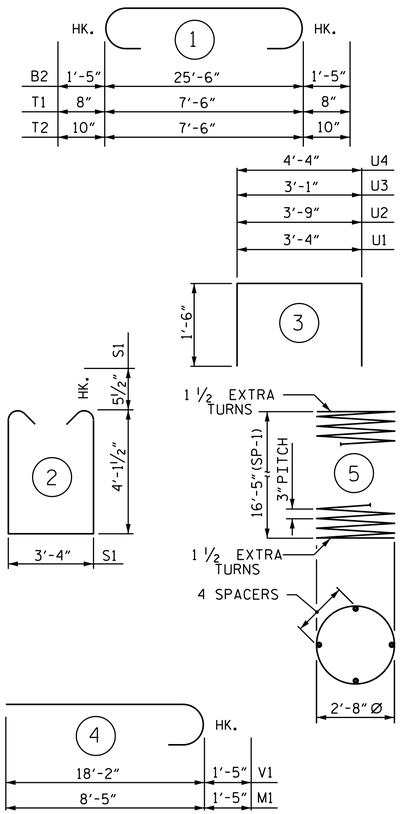
STR.#16



SECTION A-A



SECTION B-B



BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	10	STR	25'-6"	658
B2	6	10	1	28'-4"	732
B3	8	5	STR	25'-8"	214
B4	6	4	STR	4'-2"	17
S1	28	5	2	12'-6"	365
U1	24	4	3	6'-4"	102
U2	3	4	3	6'-9"	14
U3	8	4	3	6'-1"	33
U4	3	4	3	7'-4"	15
M1	16	10	4	9'-10"	677
V1	16	10	4	19'-7"	1348
T1	32	6	1	8'-10"	425
T2	60	7	1	9'-2"	1124
REINFORCING STEEL					5724 LBS.
SP-1	2	**	5	569'-4"	761 LBS.

SPIRAL COLUMN REINFORCING STEEL 761 LBS.

CLASS A CONCRETE BREAKDOWN

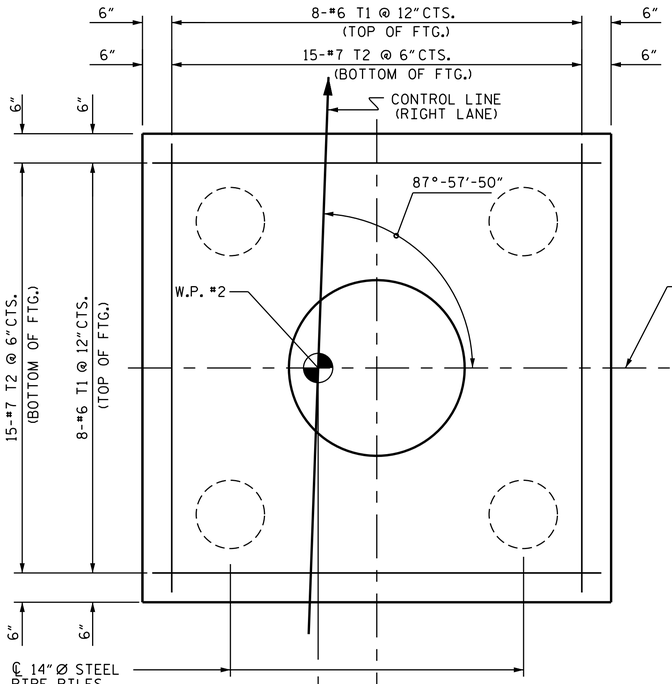
POUR #1 FOOTINGS	CU. YD. 16.6
POUR #2 COLUMNS	CU.YD. 8.5
POUR #3 CAP	CU. YD. 16.6
TOTAL CLASS A CONCRETE	CU. YD. 41.7

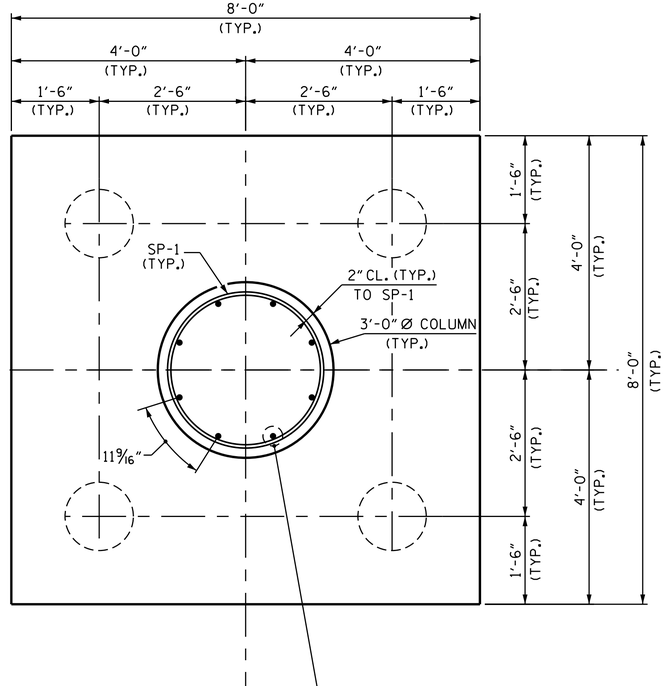
14" Ø PIPE PILES
NO. 8 LIN. FT. 600

STEEL PILE POINTS
NO. 8 EA.

PILE REDRIVES EA. 4

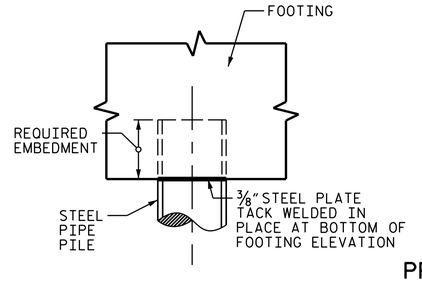
** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.





PLAN OF FOOTINGS

(ALL FOOTING, COLUMN DIMENSIONS AND REINFORCING STEEL ARE TYPICAL)



PIPE PILE IN FOOTING DETAIL

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

PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-024
1			3			TOTAL SHEETS
2			4			30

STR.#16

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48F447B...
3/23/2015

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 6/09/14
CHECKED BY : K.P. SEDAI DATE : 6/11/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

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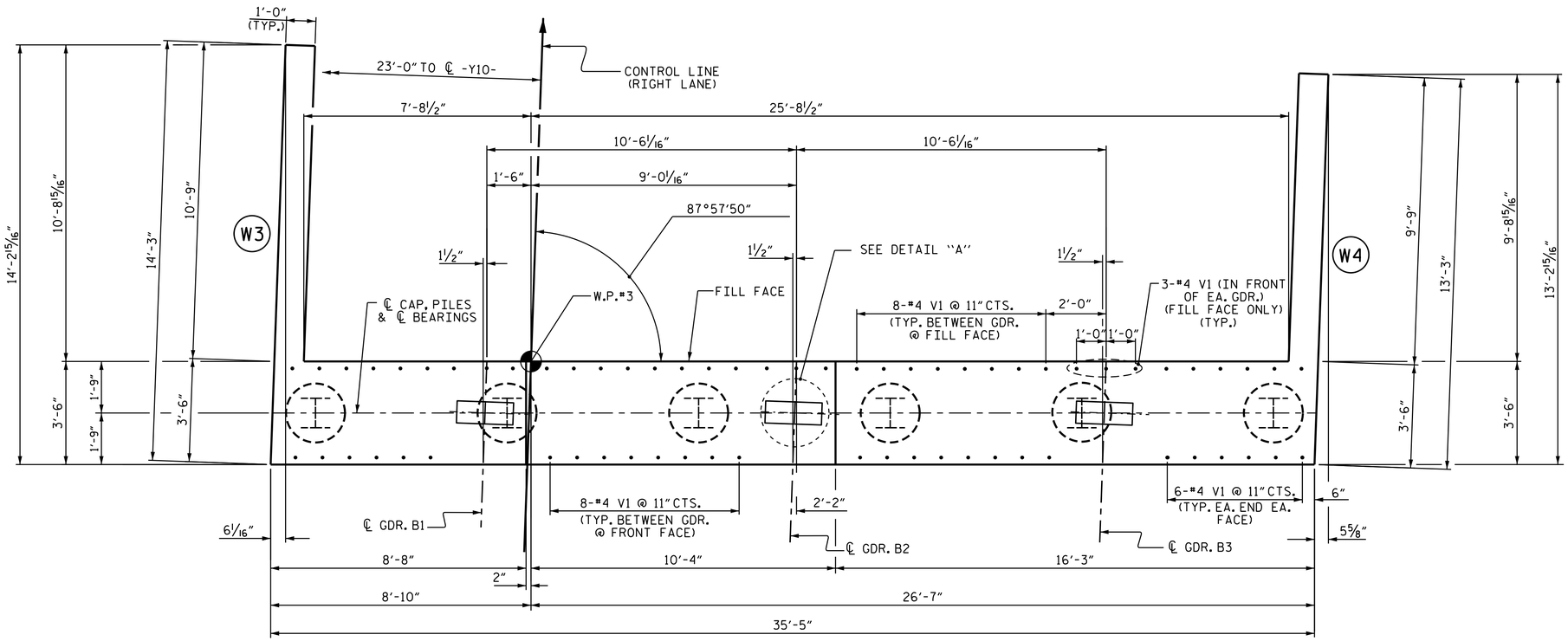
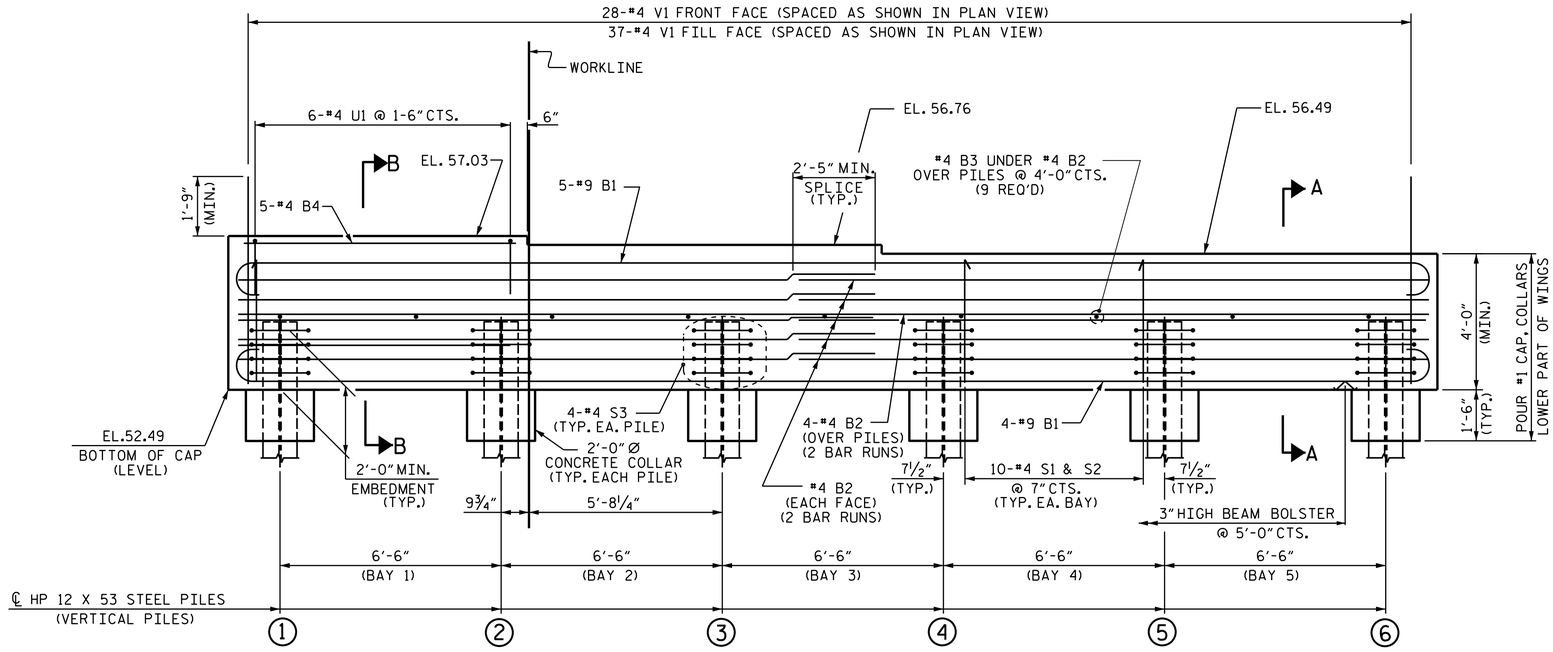


PLAN



ELEVATION

NOTES

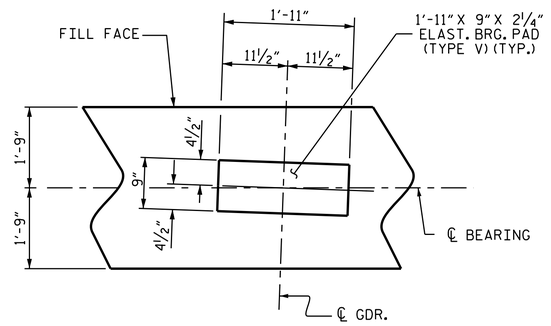
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #4 V1.

INSTALL THE 4"DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAIL.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT UPPER PART OF WINGS ARE TO BE POURED WITH THE SUPERSTRUCTURE.

THE TOP SURFACE OF POUR #1 OF THE END BENT CAP AND WINGS, EXCLUDING THE OUTSIDE 4" AND THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".



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

PROJECT NO. R-2514D
JONES-CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
INTEGRAL END BENT 2
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-025
1			3			TOTAL SHEETS
2			4			30

STR#16

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 6/24/14
CHECKED BY : K.P.SEDAI DATE : 6/25/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

23-MAR-2015 13:10
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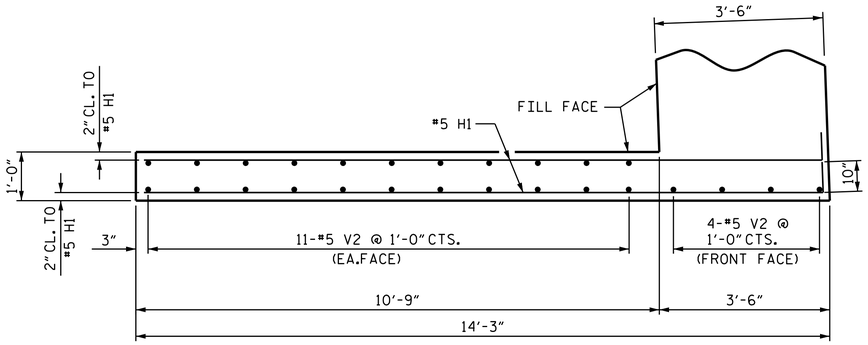
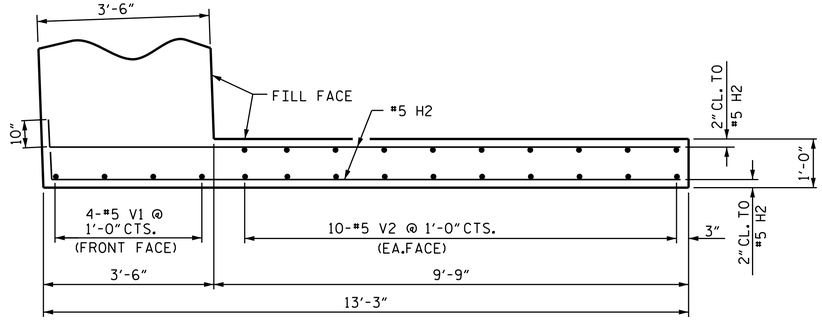
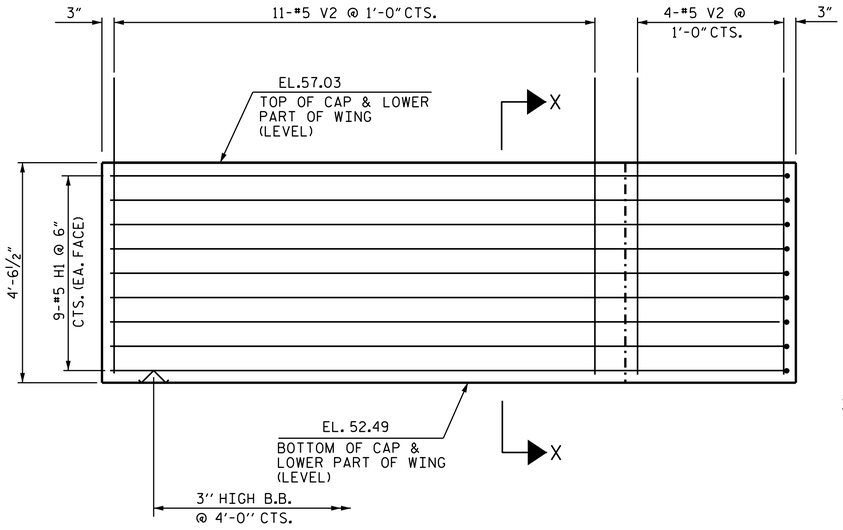


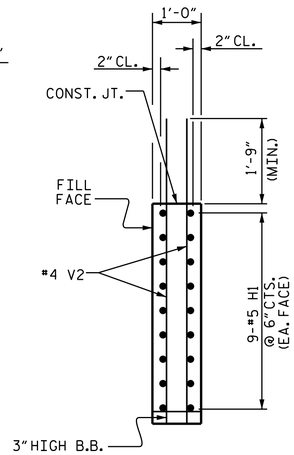
PLAN OF WING W3



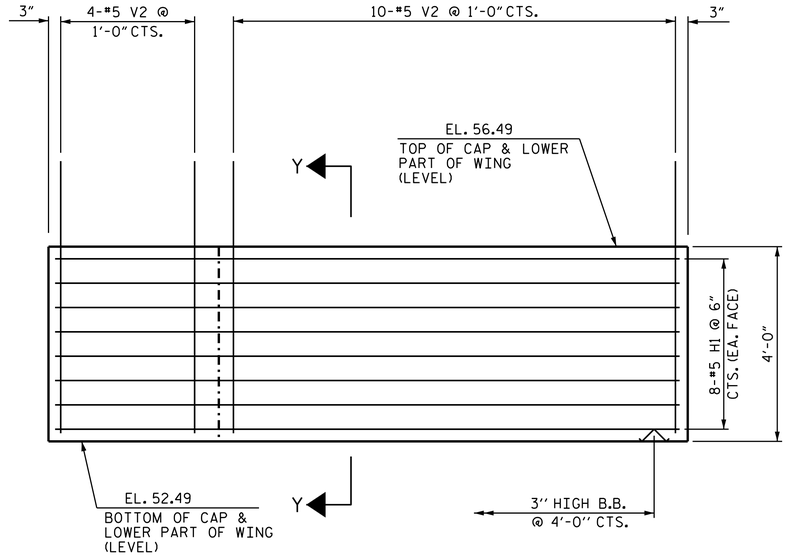
PLAN OF WING W4



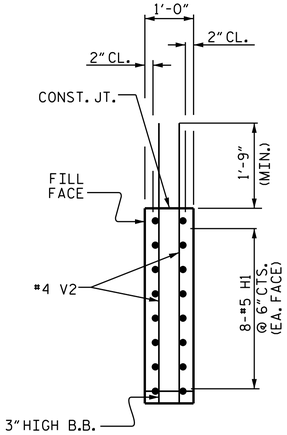
ELEVATION OF WING W3



SECTION X-X



ELEVATION OF WING W4



SECTION Y-Y

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

INTEGRAL END BENT #2

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-026
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A6D48FA47B...
3/23/2015

DRAWN BY :	GHOLAMREZA KOUCHEKI	DATE : 6/24/14
CHECKED BY :	K.P.SEDAI	DATE : 6/25/14
DESIGN ENGINEER OF RECORD:	GHOLAMREZA KOUCHEKI	DATE : 02/2015

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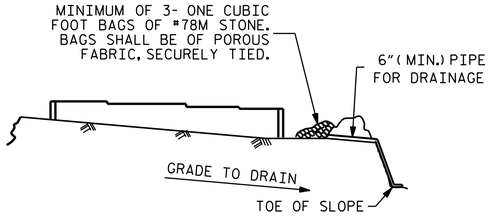
STR#16

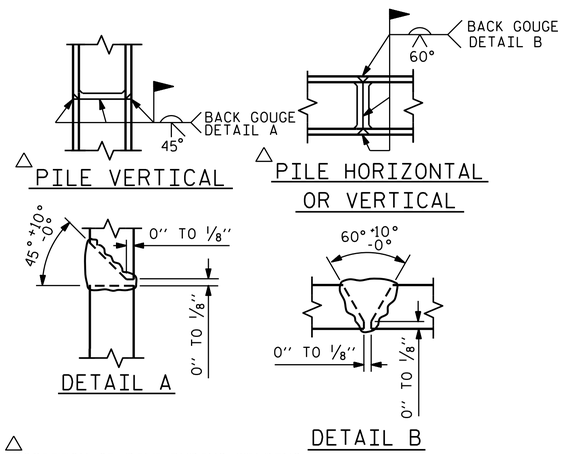


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

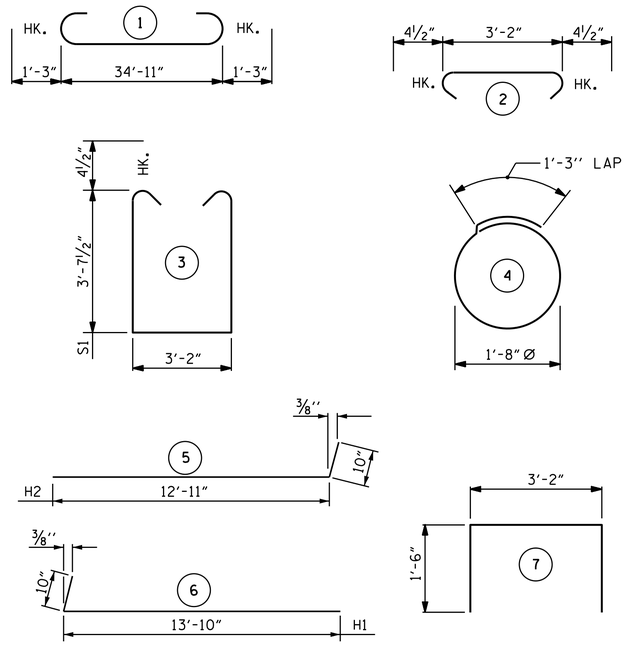
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2

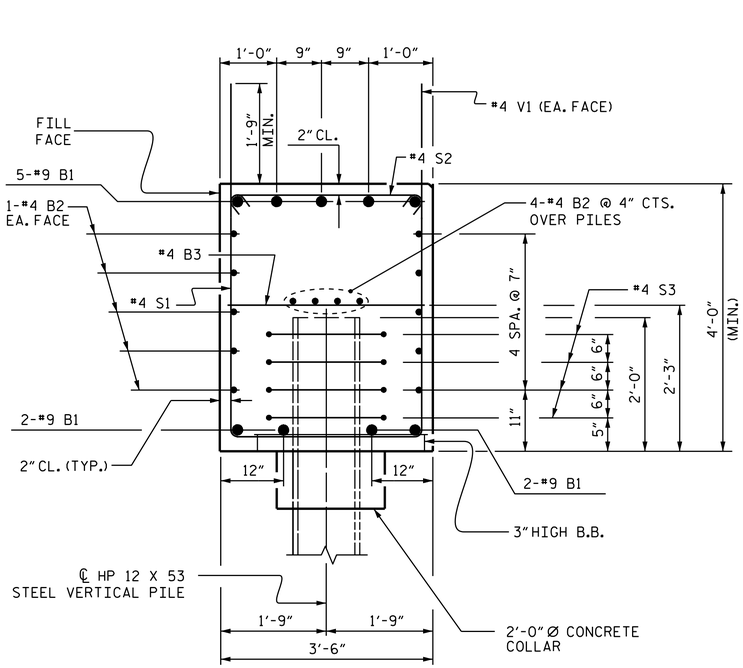
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	9	#9	1	37'-5"	1145
B2	28	#4	STR	18'-9"	351
B3	9	#4	STR	3'-2"	19
B4	5	#4	STR	8'-2"	27
H1	18	#5	6	14'-8"	275
H2	16	#5	5	13'-9"	229
S1	50	#4	3	11'-2"	373
S2	50	#4	2	3'-11"	131
S3	24	#4	4	6'-6"	104
U1	6	#4	7	6'-2"	25
V1	65	#4	STR	6'-2"	268
V2	26	#5	STR	6'-0"	163
V3	24	#5	STR	5'-6"	138

REINFORCING STEEL = 3248 LBS

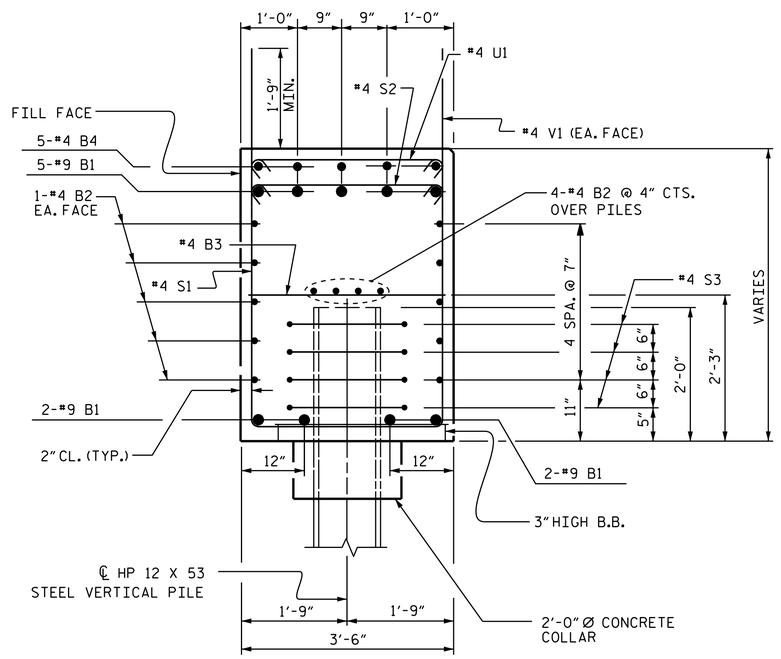
CLASS A CONCRETE

POUR #1 (CAP & LOWER PART OF WINGS)	22.6 C.Y.
CONCRETE COLLARS	1.0 C.Y.
TOTAL	23.6 C.Y.

HP 12 x 53 STEEL PILES No. 6	450 LIN FT.
STEEL PILE POINTS NO. 6	EA.
PILE REDRIVES	3 EA.



SECTION A-A



SECTION B-B

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 6/24/14
CHECKED BY : K.P. SEDAI DATE : 6/25/14
DESIGN ENGINEER OF RECORD: GHOLAMREZA KOUCHEKI DATE : 02/2015

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kpaschal

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES-CRAVEN COUNTY
STATION: 28+29.35 -Y10-

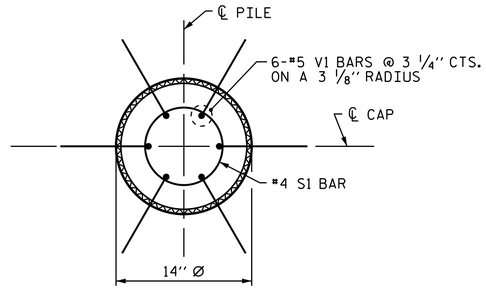
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

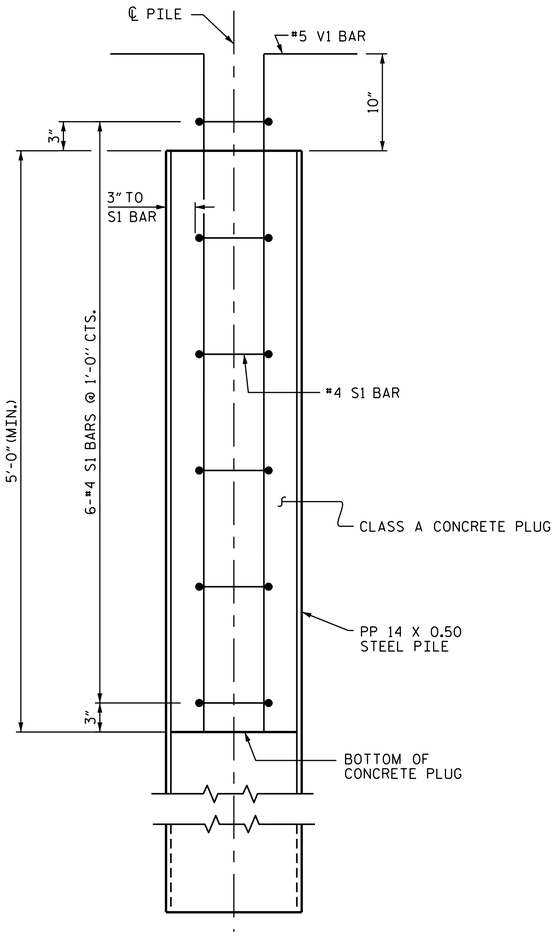
SUBSTRUCTURE
INTEGRAL END BENT 2
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-027
1			3			TOTAL SHEETS
2			4			30

STR. #16



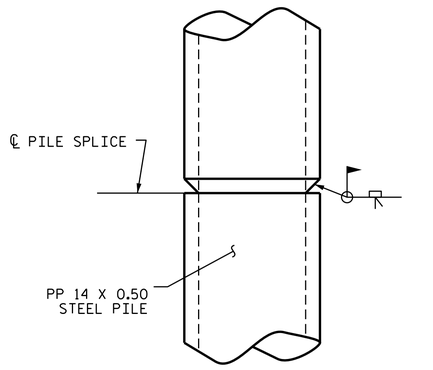
PLAN



ELEVATION

PP 14 X 0.50 STEEL PILE

(CLOSED END)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 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.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL AND CLASS A CONCRETE ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 14 X 0.50 STEEL PIPE PILES.

FOR STEEL PILE POINTS, SEE SPECIAL PROVISIONS.

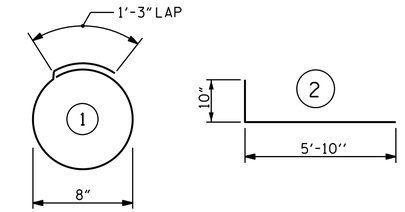
BILL OF MATERIAL FOR ONE PP 14 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	3'-5"	14
V1	6	#5	2	6'-8''	42
REINFORCING STEEL =				56	lbs

CLASS A CONCRETE

5'-0'' MINIMUM PLUG 0.2 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. R-2514D

JONES-CRAVEN COUNTY

STATION: 28+29.35 -Y10-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

14'' STEEL PIPE PILE (RIGHT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B... 3/24/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-028
1			3			TOTAL SHEETS
2			4			30

STR. #16 STD. NO. SPP1

ASSEMBLED BY : GHOLAMREZA KOUCHEKI	DATE : 5/30/14
CHECKED BY : K.P.SEDAI	DATE : 5/30/14
DRAWN BY : TLA 8/05	ADDED 10/1/05
CHECKED BY : GM 9/05	REV. 5/1/06R MAA/KMM
	REV. 10/1/11 MAA/GM

24-MAR-2015 07:41
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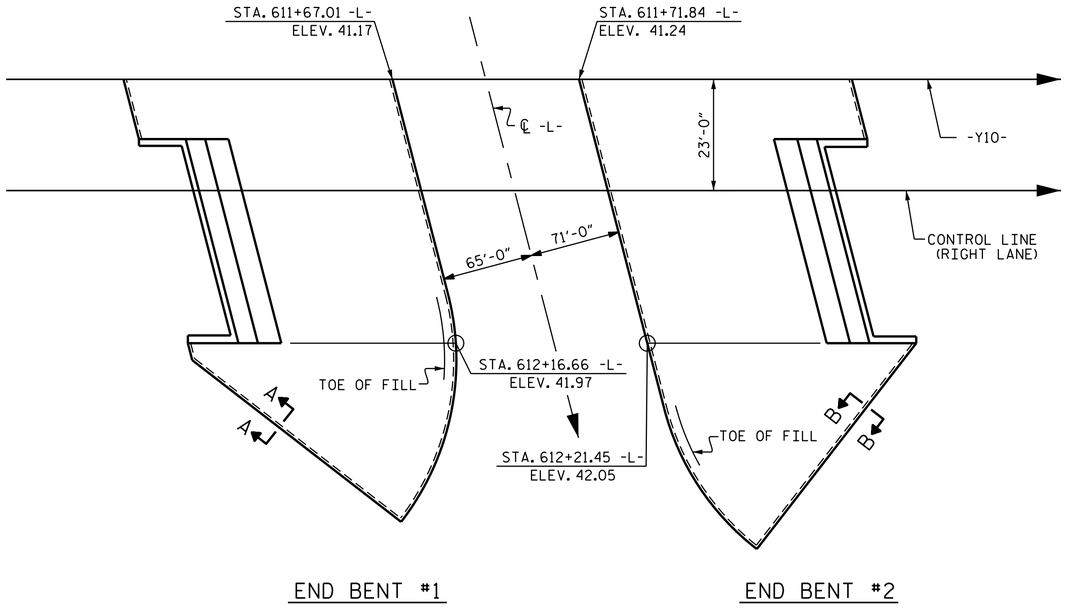
nruffin

GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

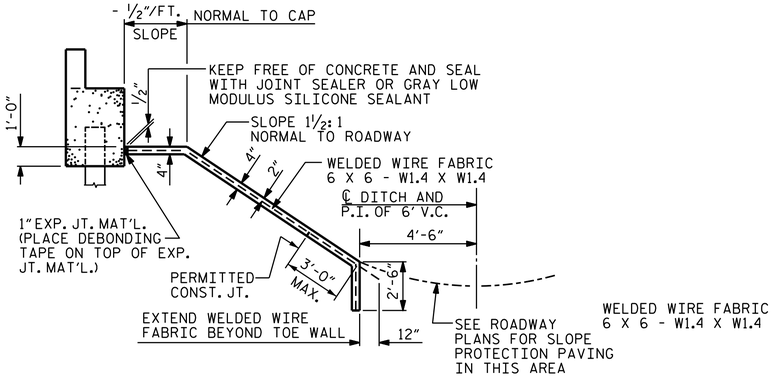
ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE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



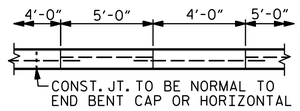
PLAN VIEW

BRIDGE @ STA. 28+29.35 -Y10- (RIGHT LANE)	4 INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	239	478
END BENT 2	250	500

✳ QUANTITY SHOWN IS BASED ON 5' POURS.

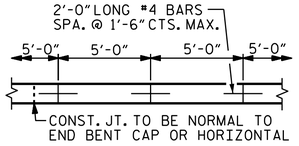


SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH



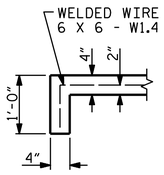
POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

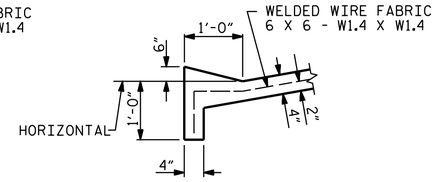


STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



SECTION A-A



SECTION B-B

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 28+29.35 -Y10-

SHEET 1 OF 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS
(RIGHT LANE)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/24/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-029
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : B. L. GREEN	DATE : 6/14/13		
CHECKED BY : M. D. PISO	DATE : 6/26/13		
DRAWN BY : ELR 5/92	REV. 5/1/06	TLA/GM	
CHECKED BY : GRP 6/92	REV. 10/1/11	MAA/GM	
	REV. 12/21/11	MAA/GM	

24-MAR-2015 07:37
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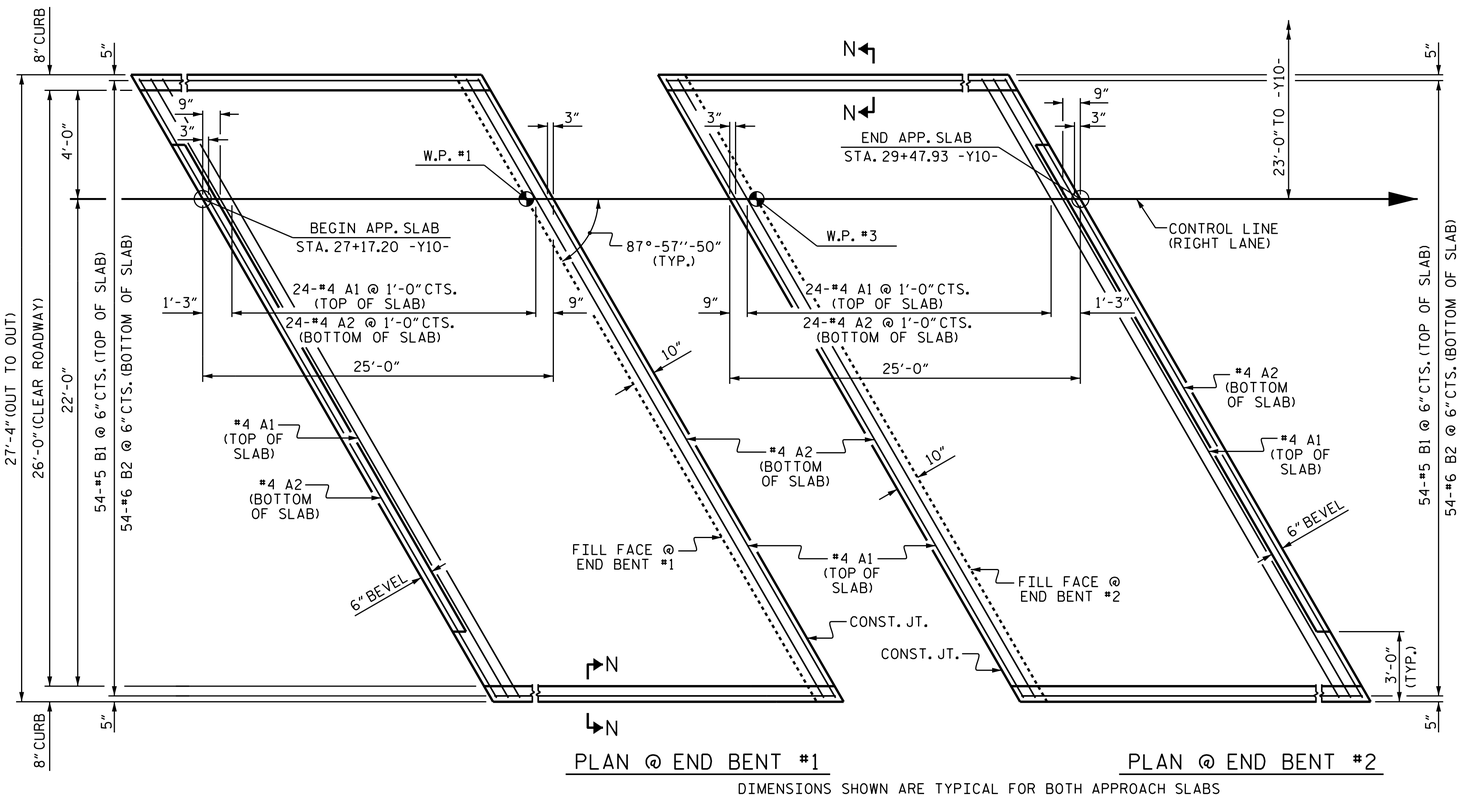
STR. #16

STD. NO. SP1 (SHT 5)



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4'' Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

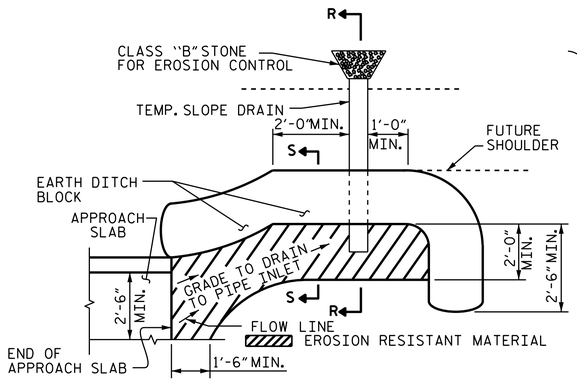
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

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

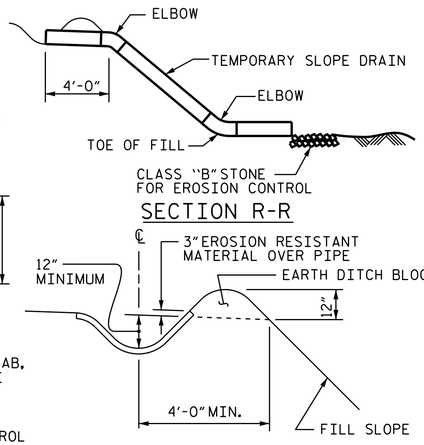
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	26	#4	STR	27'-0"	469
A2	26	#4	STR	27'-0"	469
✱ B1	54	#5	STR	24'-2"	1,361
B2	54	#6	STR	24'-8"	2,001
REINFORCING STEEL					2,470 LBS.
✱ EPOXY COATED REINFORCING STEEL					1,830 LBS.
CLASS AA CONCRETE					29.6 CU.YDS.



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.



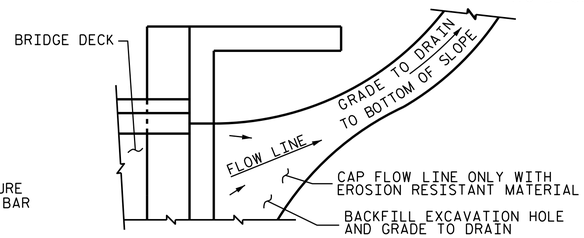
SECTION R-R

SECTION S-S

PLAN VIEW

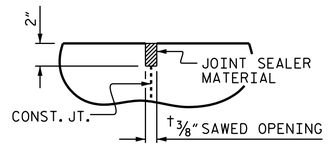
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

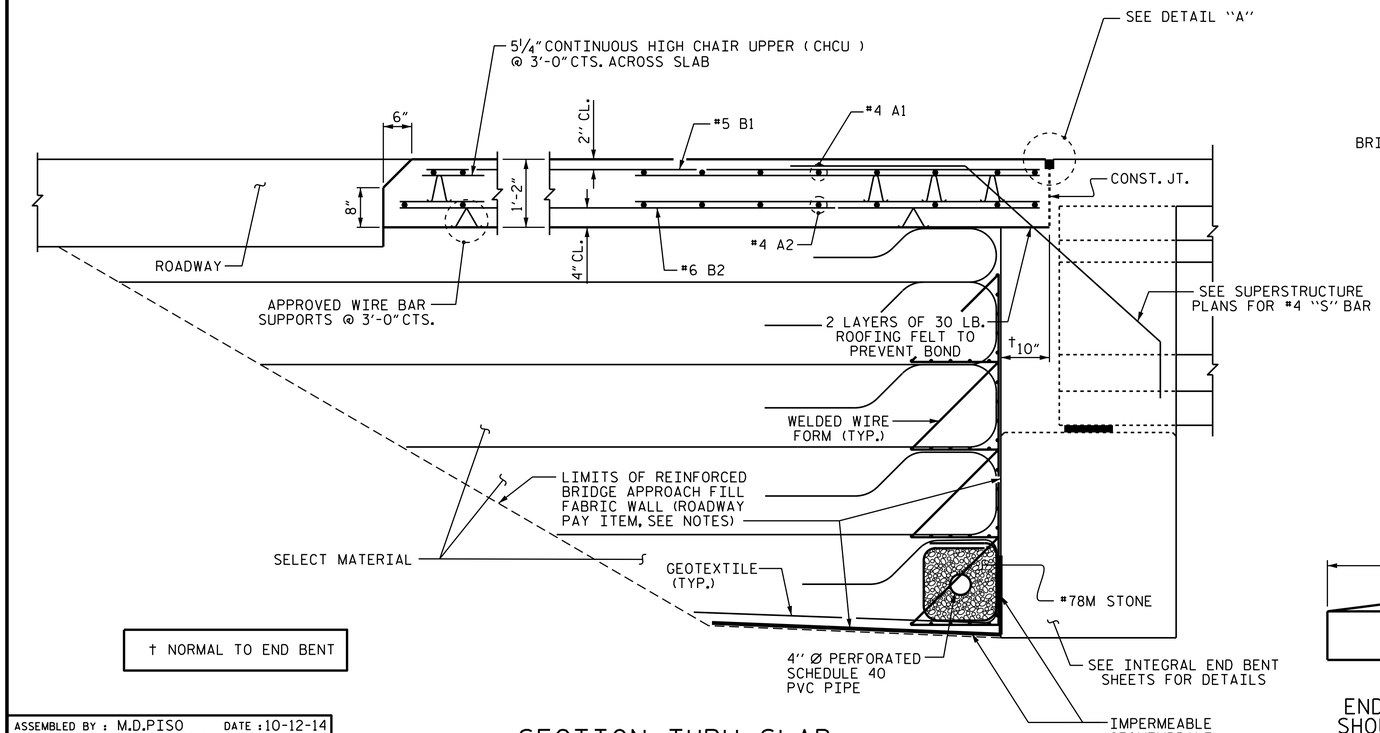


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

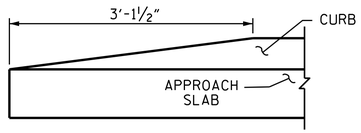


DETAIL "A"

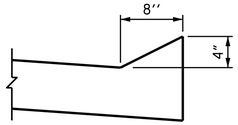


† NORMAL TO END BENT

SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 28+29.35 -Y10-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16-030
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : M.D.PISO	DATE : 10-12-14
CHECKED BY : B.N.BARODAWALA	DATE : 01-26-15
DRAWN BY : TLA 10/05	ADDED 5/1/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

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kpaschal

STR. #16

STD. NO. BAS5 (SHT 2a)

GRADE DATA

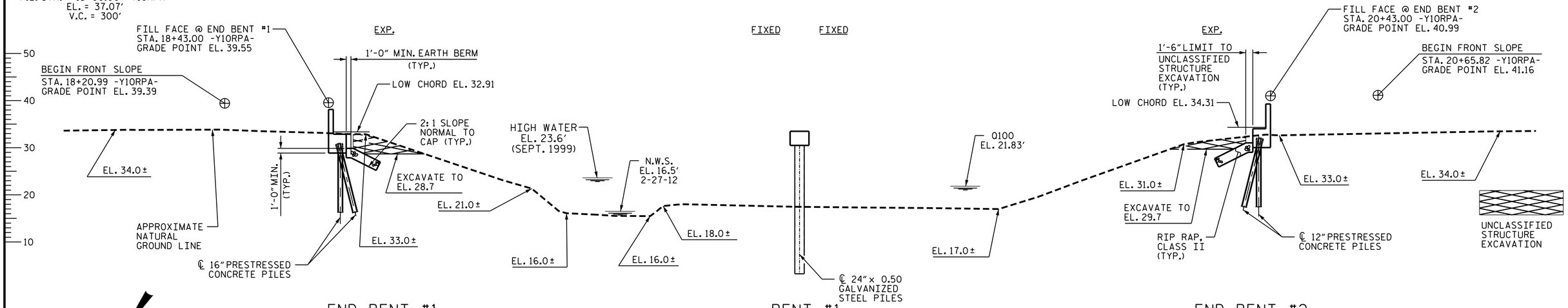
P.I. STA. = 15+00.00 -Y10RPA-
EL. = 37.07'
V.C. = 300'

(-)0.7480% (+)0.7219%

18+00 18+50 19+00 19+50 20+00 20+50

SPAN A

SPAN B



END BENT #1 BENT #1 END BENT #2

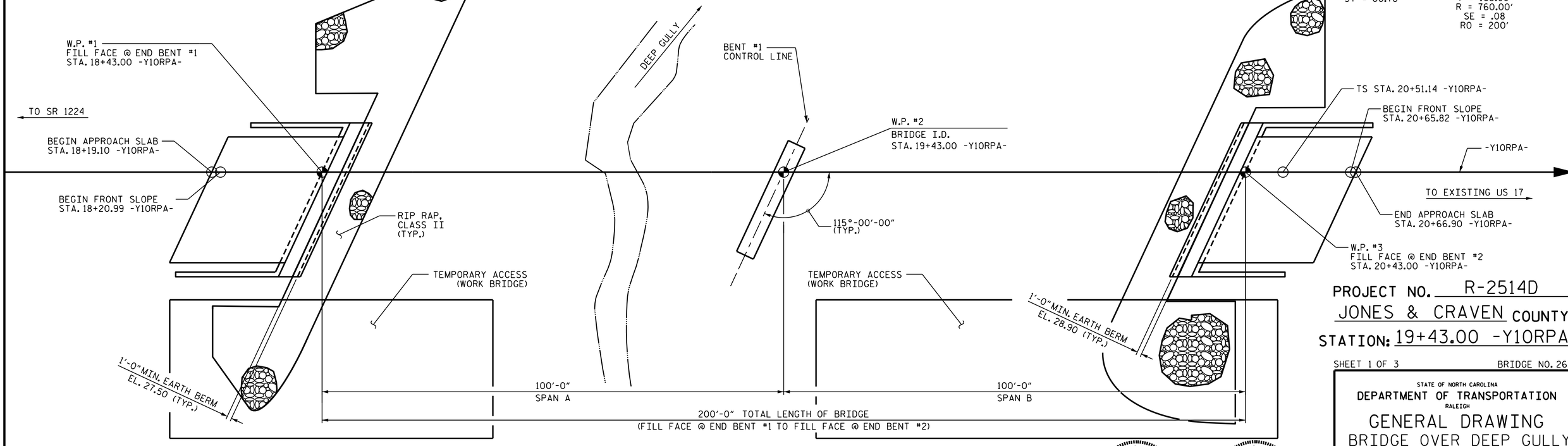
SECTION ALONG -Y10RPA-

(BENTS ON SECTION AT RIGHT ANGLE TO BENTS)

HORIZONTAL CURVE DATA -Y10RPA-

PIs STA = 21+84.59
Θs = 7°-32'-20.1"
Ls = 200.00'
LT = 133.45'
ST = 66.78"

PI STA = 24+15.04
$\triangle$ = 24°-20'-25.9"(RT.)
D = 7°-32'-20.1"
L = 322.86'
T = 163.90'
R = 760.00'
SE = .08
RO = 200'



PLAN

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 1 OF 3 BRIDGE NO. 269

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER DEEP GULLY ON RAMP FROM US 17 BYPASS TO EXISTING US 17 BETWEEN SR 1330 TO SR 1224

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-001
1			3			TOTAL SHEETS
2			4			32

STR 17

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
DocuSigned by: Emily Murray CAE997AEDC5B4E0...
3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DED7D4A854FF47B...
3/23/2015

DRAWN BY : N. Ruffin DATE : 1/5/15
CHECKED BY : D.G. ELY DATE : 1/9/15
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

23-MAR-2015 10:46
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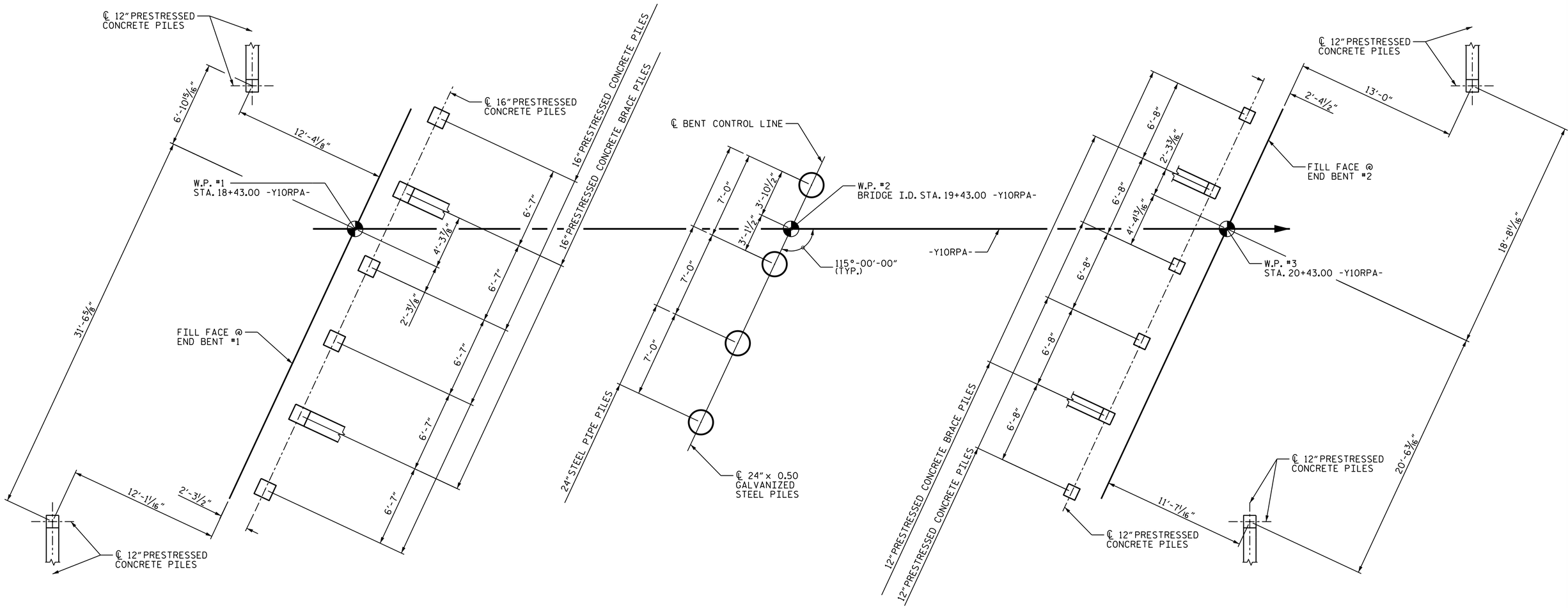
kpaschal



END BENT #1 BENT #1 END BENT #2

FOUNDATION LAYOUT

DIMENSION LOCATING PILES ARE SHOWN TO THE PILE CENTER LINE.
BRACE PILES AT END BENTS ARE TO BE BATTERED AT 3:12.
ALL WING BRACE PILES ARE 12"PRESTRESSED CONCRETE PILES.

--- NOTES ---

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 270 TONS PER PILE.

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

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 365 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

INSTALL PILES AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN -18.0 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 12.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

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

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 95-170 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT NO. 1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 1 AND END BENT NO. 2.

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

DRAWN BY : N. Ruffin DATE : 1/2/15
CHECKED BY : D.G. ELY DATE : 1/9/15
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

23-MAR-2015 10:11
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PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER DEEP GULLY ON RAMP FROM US 17 BYPASS TO EXISTING US 17 BETWEEN SR 1330 AND SR 1224

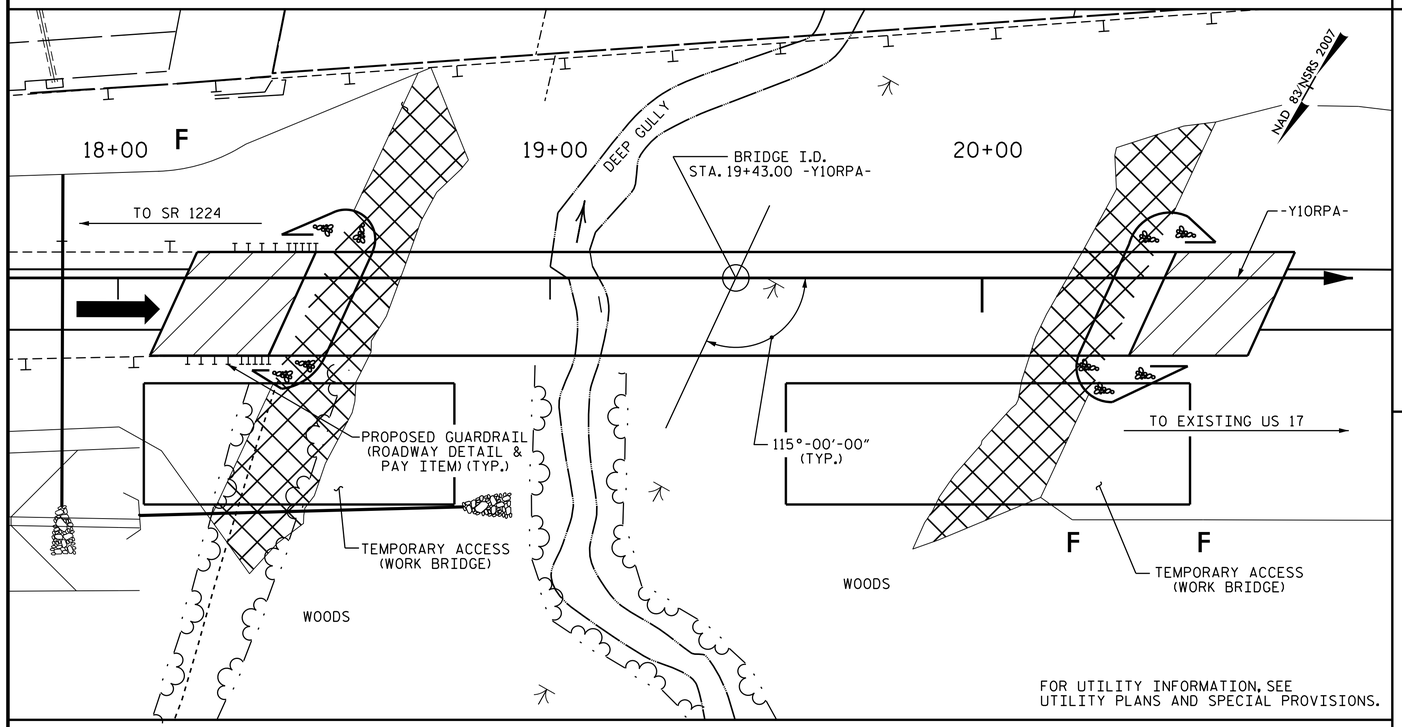
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-002
1			3			TOTAL SHEETS
2			4			32

STR #17

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		12" PRESTRESSED CONCRETE PILES		16" PRESTRESSED CONCRETE PILES		PP 24"X 0.50 GALVANIZED STEEL PILES		PIPE PILE PLATES	PILE REDRIVES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0") THICK	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	EA.	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	NO.	LIN.FT.	NO.	LIN.FT.	EA.	EA.	LIN. FT.	TONS	SY	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			LUMP SUM	5,386	5,118		LUMP SUM		6	584.13									436.70			LUMP SUM	LUMP SUM
END BENT NO.1						50.7		5,877			2	120	6	360				3		190	208		
BENT NO.1						15.9		2,147							4	260	4	2					
END BENT NO.2						47.4		5,868			8	280						3		155	168		
TOTAL	LUMP SUM	4	LUMP SUM	5,386	5,118	114.0	LUMP SUM	13,892	6	584.13	10	400	6	360	4	260	4	8	436.70	345	376	LUMP SUM	LUMP SUM

B.M. #32: RAILROAD SPIKE IN 7" PINE, STA. 608+78.00 -L-, 849' LT., ELEV. 36.79', NAVD 88.



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 390 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 50 YR.
DESIGN HIGH WATER ELEVATION	= 21.4'
DRAINAGE AREA	= 1.5 SQ. MI.
BASE DISCHARGE (Q100)	=480 C.F.S.
BASE HIGH WATER ELEVATION	= 21.83'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= N/A
FREQUENCY OF OVERTOPPING FLOOD	= 500 YR. +
OVERTOPPING FLOOD ELEVATION	= 33.0' ●

● OVERTOPPING ELEV. IS TOP OF HILL @ STA. 17+00 RT. -Y10RPA-

--- NOTES ---

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 47.5 FT LEFT AND 55.75 FT. RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

FOR INTERIOR BENT 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET(S) FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS AT STATION 19+43.00 -Y10RPA-, SEE SPECIAL PROVISIONS.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00-Y10RPA-

SHEET 3 OF 3

DRAWN BY : N. RUFFIN DATE : 1/5/15

CHECKED BY : D.G. ELY DATE : 1/12/15

DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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kpaschal

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tom Coggins DEFD4A8D48F447B...

3/26/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER DEEP GULLY ON RAMP FROM US 17 BYPASS TO EXISTING US 17 BETWEEN SR 1330 AND SR 1224

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-003
1			3			TOTAL SHEETS
2			4			32

STR. #17

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS $\gamma_{(LL)}$	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.02	--	1.75	0.884	1.52	A	EL	47.966	0.943	1.41	A	EL	28.78	0.80	0.884	**1.02**	A	EL	47.966	
		HL-93(Opr)	N/A	--	1.83	--	1.35	0.884	1.97	A	EL	47.966	0.943	1.83	A	EL	28.78	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.41	50.630	1.75	0.884	2.11	A	EL	47.966	0.943	1.74	A	EL	38.373	0.80	0.884	**1.41**	A	EL	47.966	
		HS-20(Opr)	36.000	--	2.26	81.380	1.35	0.884	2.73	A	EL	47.966	0.943	2.26	A	EL	38.373	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.32	44.844	1.40	0.884	6.22	A	EL	47.966	0.943	5.1	A	EL	38.373	0.80	0.884	3.32	A	EL	47.966	
		SNGARBS2	20.000	--	2.41	48.227	1.40	0.884	4.51	A	EL	47.966	0.943	3.65	A	EL	38.373	0.80	0.884	2.41	A	EL	47.966	
		SNAGRIS2	22.000	--	2.26	49.669	1.40	0.884	4.23	A	EL	47.966	0.943	3.4	A	EL	38.373	0.80	0.884	2.26	A	EL	47.966	
		SNCOTTS3	27.250	--	1.65	44.993	1.40	0.884	3.09	A	EL	47.966	0.943	2.55	A	EL	38.373	0.80	0.884	1.65	A	EL	47.966	
		SNAGGRS4	34.925	--	1.36	47.328	1.40	0.884	2.54	A	EL	47.966	0.943	2.13	A	EL	38.373	0.80	0.884	1.36	A	EL	47.966	
		SNS5A	35.550	--	1.33	47.168	1.40	0.884	2.48	A	EL	47.966	0.943	2.17	A	EL	38.373	0.80	0.884	1.33	A	EL	47.966	
		SNS6A	39.950	--	1.21	48.231	1.40	0.884	2.26	A	EL	47.966	0.943	1.99	A	EL	38.373	0.80	0.884	1.21	A	EL	47.966	
		SNS7B	42.000	--	1.15	48.272	1.40	0.884	2.15	A	EL	47.966	0.943	1.97	A	EL	38.373	0.80	0.884	1.15	A	EL	47.966	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.47	48.485	1.40	0.884	2.75	A	EL	47.966	0.943	2.36	A	EL	38.373	0.80	0.884	1.47	A	EL	47.966	
		TNT4A	33.075	--	1.47	48.720	1.40	0.884	2.76	A	EL	47.966	0.943	2.29	A	EL	38.373	0.80	0.884	1.47	A	EL	47.966	
		TNT6A	41.600	--	1.20	49.710	1.40	0.884	2.24	A	EL	47.966	0.943	2.10	A	EL	28.78	0.80	0.884	1.19	A	EL	47.966	
		TNT7A	42.000	--	1.20	50.229	1.40	0.884	2.24	A	EL	47.966	0.943	2.06	A	EL	28.78	0.80	0.884	1.20	A	EL	47.966	
		TNT7B	42.000	--	1.23	51.454	1.40	0.884	2.29	A	EL	47.966	0.943	1.91	A	EL	38.373	0.80	0.884	1.23	A	EL	47.966	
		TNAGRIT4	43.000	--	1.17	50.500	1.40	0.884	2.20	A	EL	47.966	0.943	1.85	A	EL	38.373	0.80	0.884	1.17	A	EL	47.966	
		TNAGT5A	45.000	--	1.11	50.022	1.40	0.884	2.08	A	EL	47.966	0.943	1.85	A	EL	38.373	0.80	0.884	1.11	A	EL	47.966	
		TNAGT5B	45.000	3	1.10	49.588	1.40	0.884	2.06	A	EL	47.966	0.943	1.76	A	EL	38.373	0.80	0.884	**1.10**	A	EL	47.966	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.

2.

3.

4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

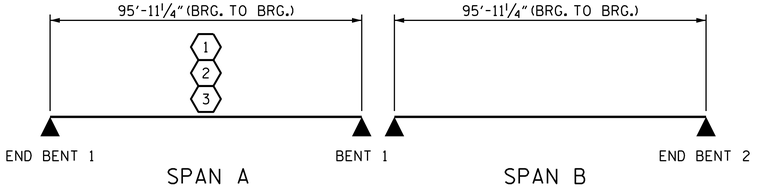
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tom Coggins DEFD4AMD48FA47B... 3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-004
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : N. Ruffin DATE : 7/5/13
CHECKED BY : M. D. PISO DATE : 3/14/14

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

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

ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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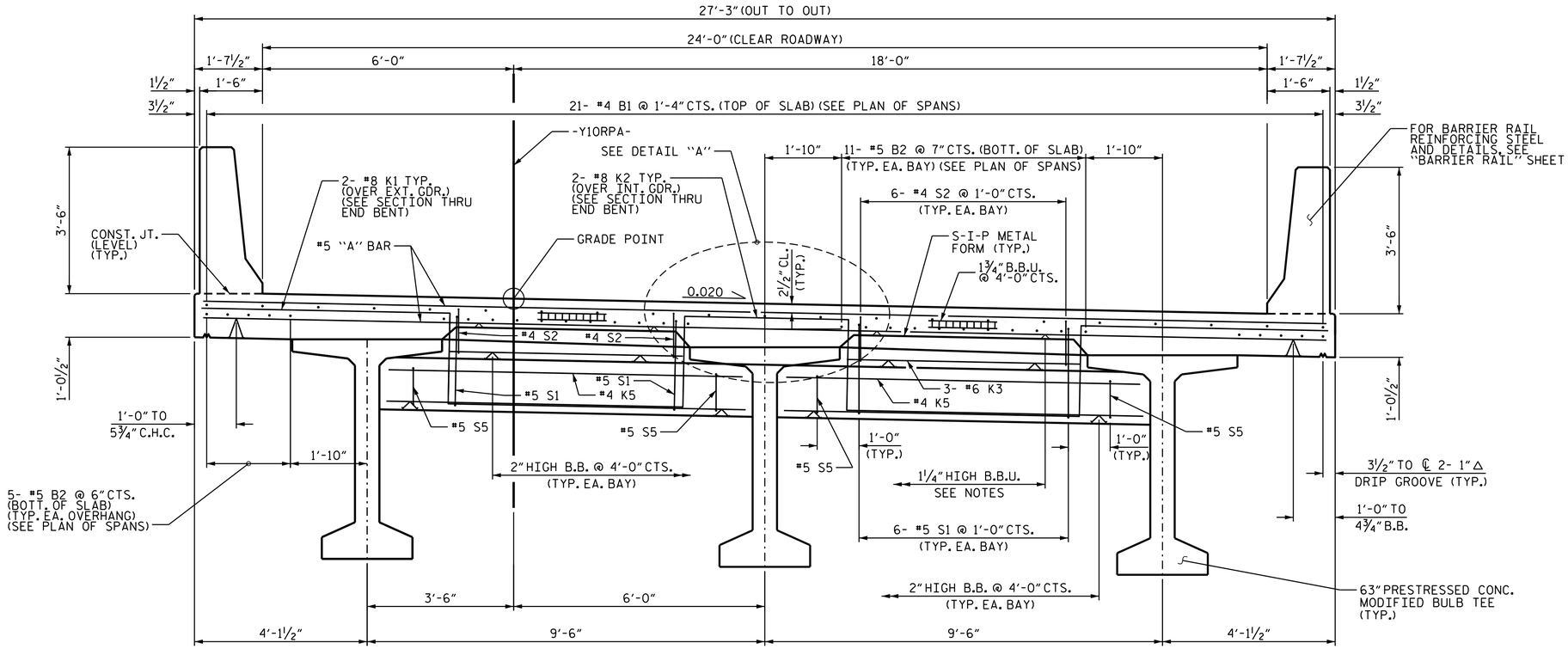
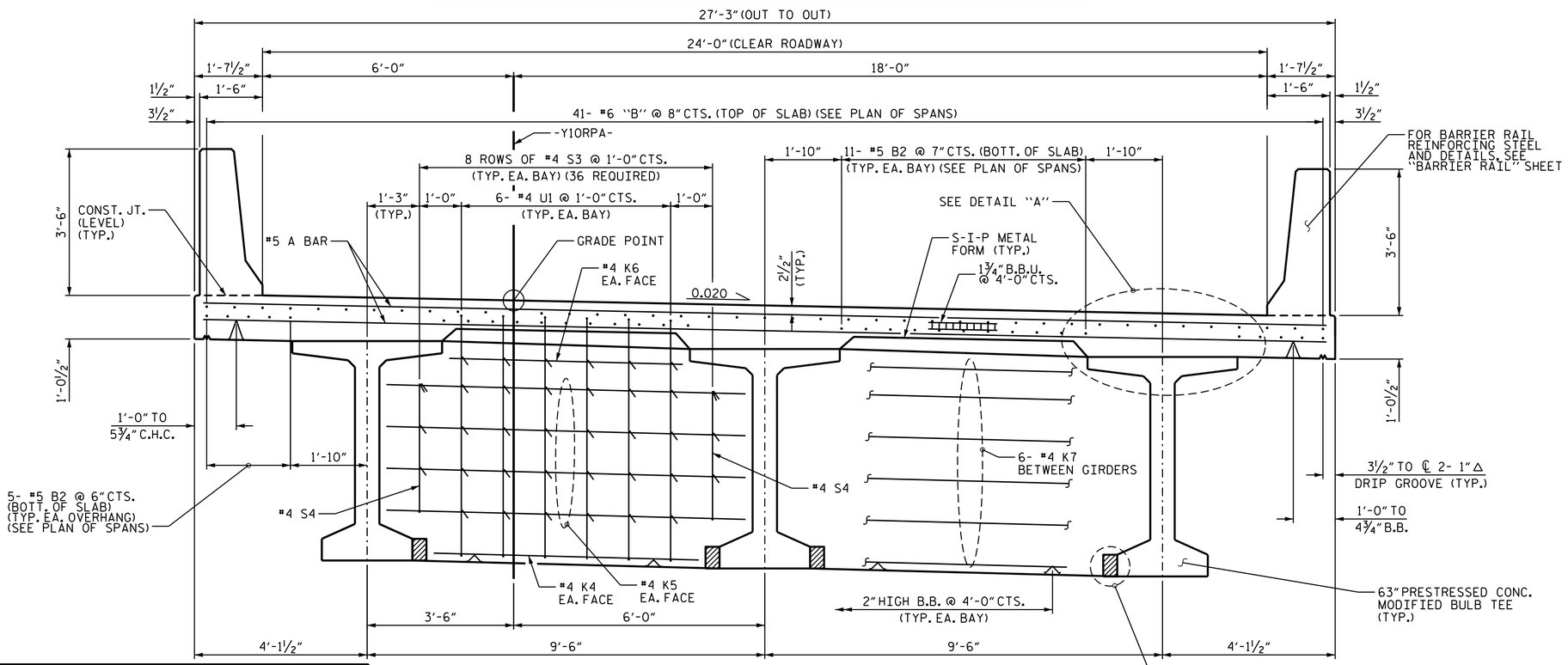
STR. 17

STD. NO. LRFR1



TYPICAL SECTION - END BENT DIAPHRAGM



TYPICAL SECTION - CONTINUOUS BENT DIAPHRAGM

BLOCKOUT (SEE "BENT DIAPHRAGM BLOCK-OUT DETAIL" SHEET 2 OF 2) (TYP.)

-- 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 2 1/2" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

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

#5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

DETAIL "A"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-005
1			3			TOTAL SHEETS
2			4			32

STR #17

DRAWN BY : N. Ruffin DATE : 7/10/13
CHECKED BY : M. PISO DATE : 3/14/14
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

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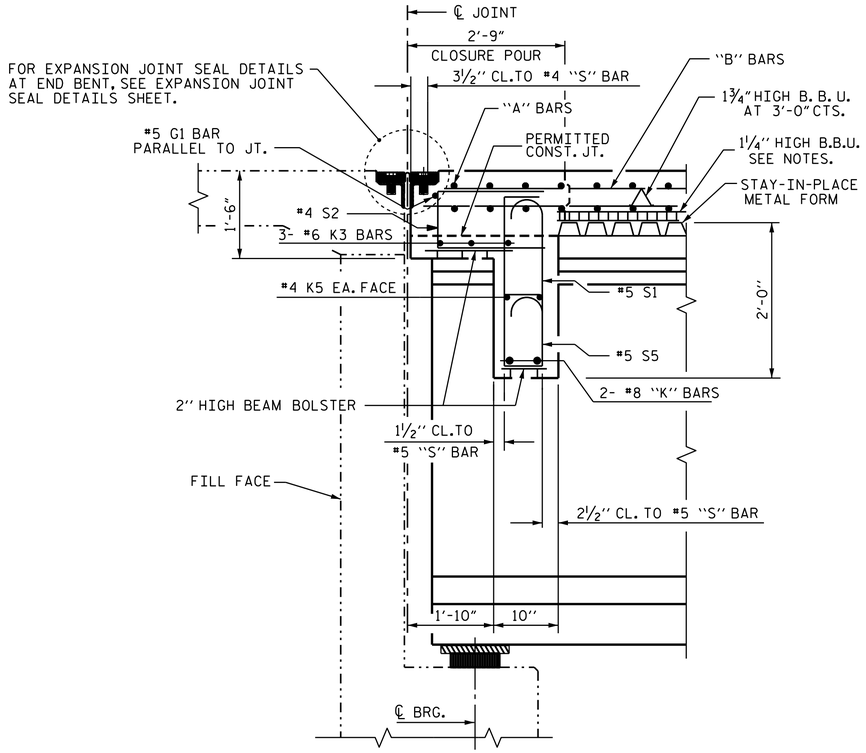
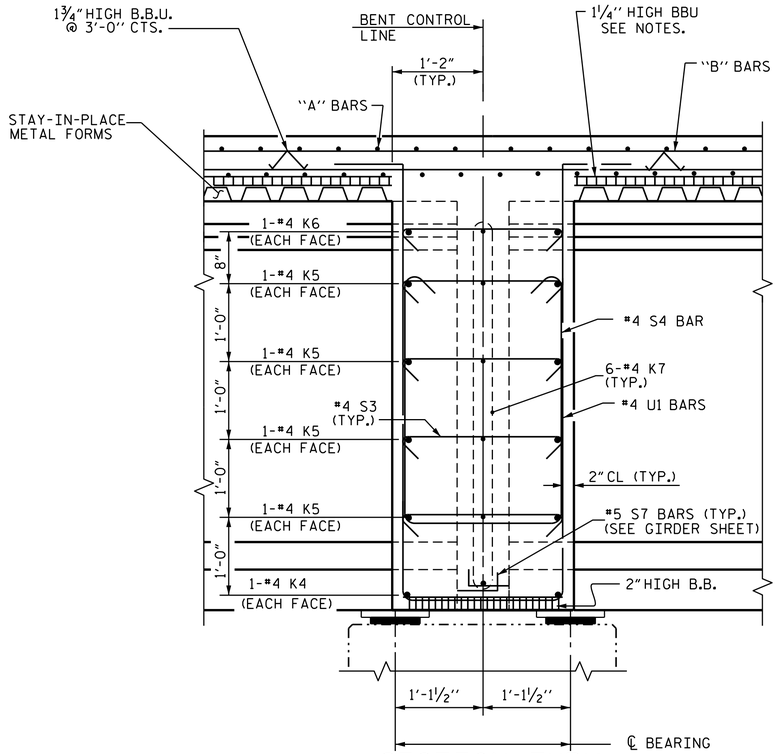
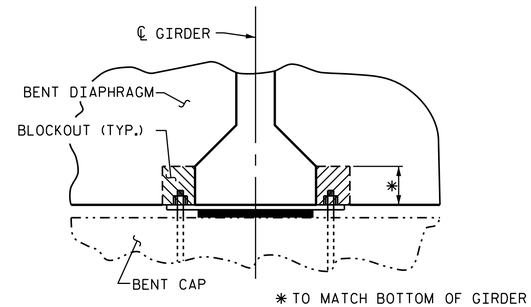


SECTION THRU END BENTS



SECTION THRU BENT DIAPHRAGM



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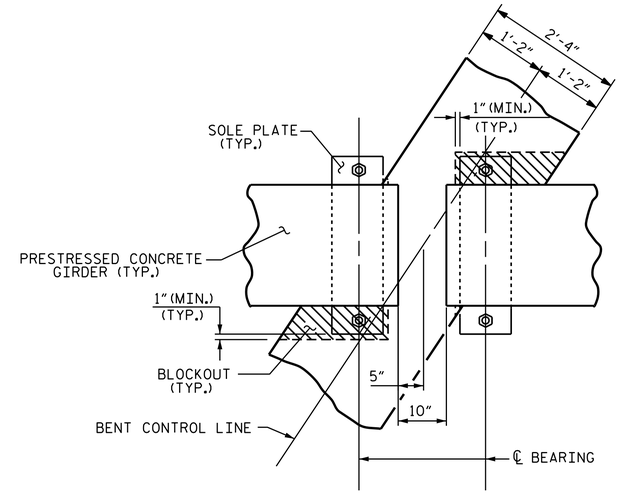
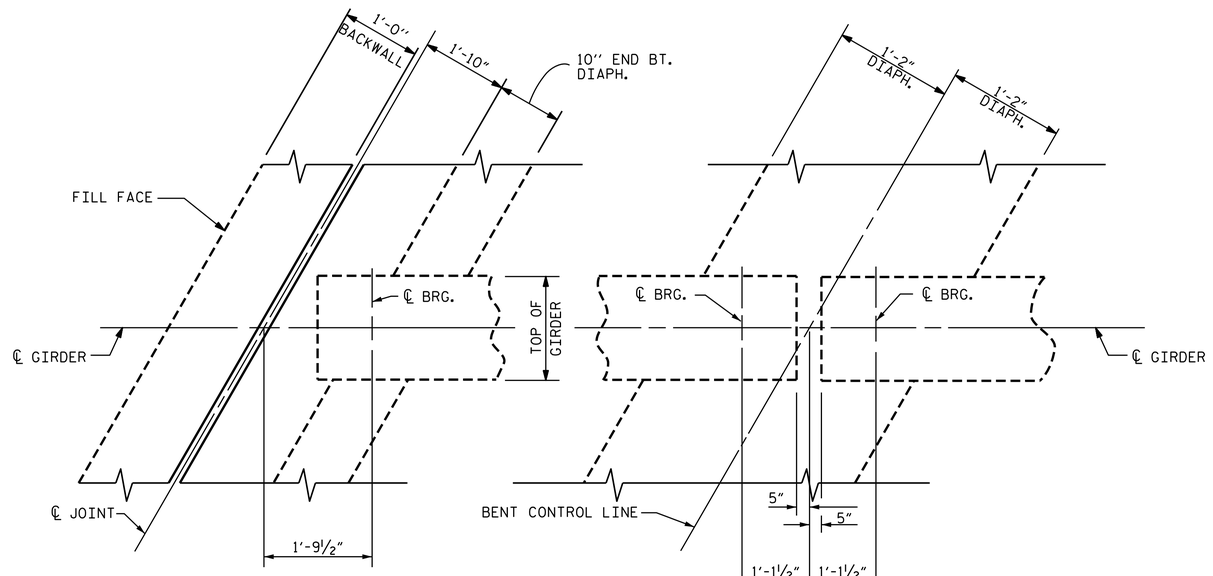


PLAN

BENT DIAPHRAGM BLOCK-OUT DETAIL



PLAN

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-006
1			3			TOTAL SHEETS
2			4			32

STR #17

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
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3/23/2015

DRAWN BY : N. Ruffin DATE : 7/12/13
CHECKED BY : M. PISO DATE : 3/14/14
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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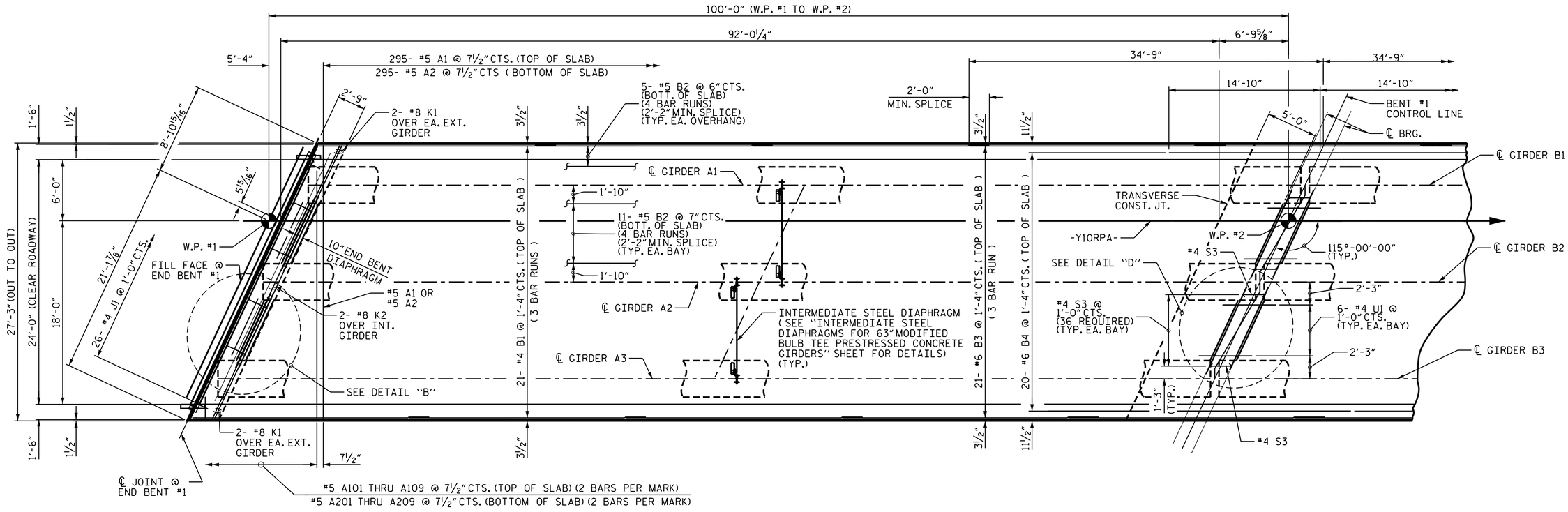
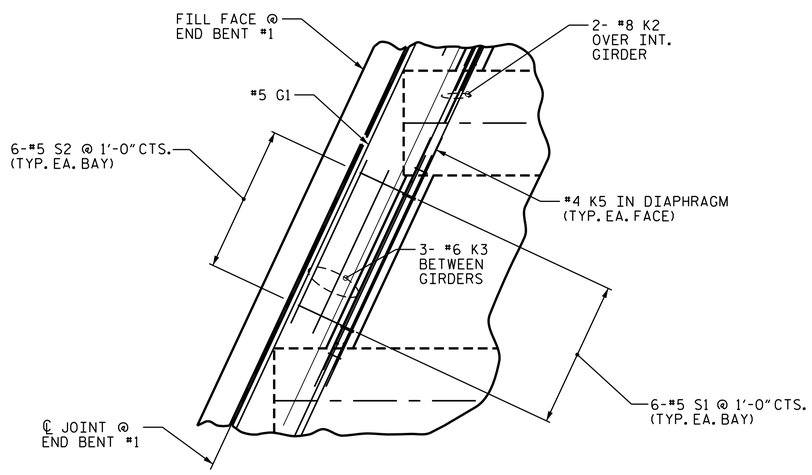
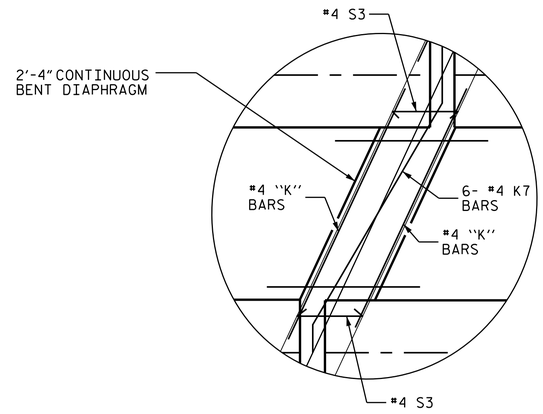


SPAN A



DETAIL "B"

SEE "SECTION THRU END BENTS" OF TYPICAL SECTION SHEET 2 OF 2



DETAIL "D"

SEE "SECTION THRU BENTS DIAPHRAGM" OF TYPICAL SECTION SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
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3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-007
1			3			TOTAL SHEETS
2			4			32

STR #17

DRAWN BY : N. RUFFIN DATE : 7/15/13
CHECKED BY : M. PISO DATE : 3/14/14
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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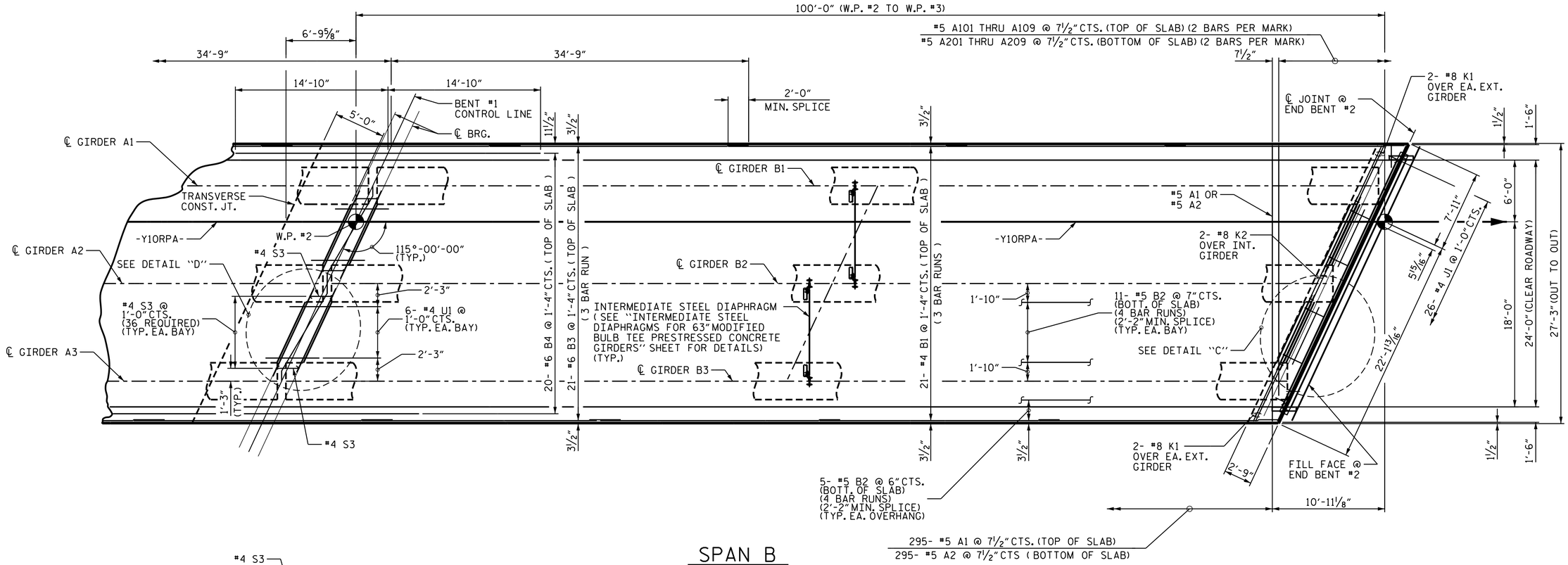
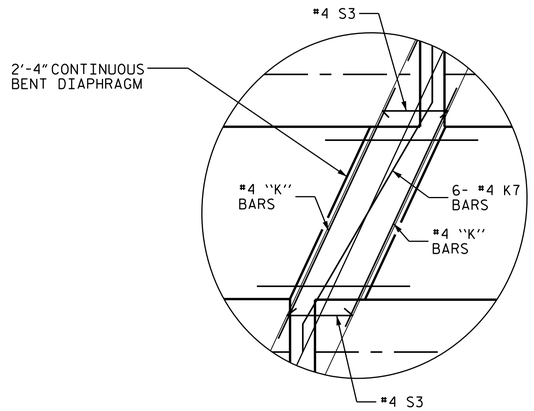
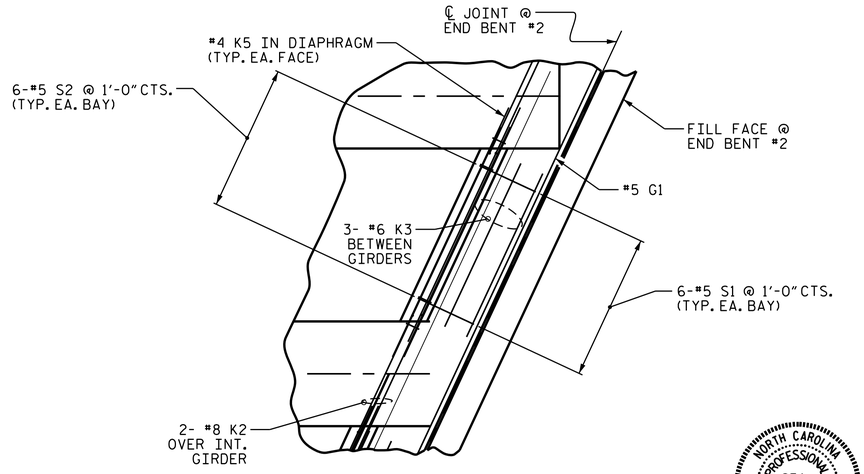


SPAN B



DETAIL "D"

SEE "SECTION THRU BENTS DIAPHRAGM" OF TYPICAL SECTION SHEET 2 OF 2



DETAIL "C"

SEE "SECTION THRU END BENTS" OF TYPICAL SECTION SHEET 2 OF 2

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-008
1			3			TOTAL SHEETS
2			4			32

STR #17

DRAWN BY : N. RUFFIN DATE : 7/15/13
CHECKED BY : M. PISO DATE : 3/14/14
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

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3/23/2015

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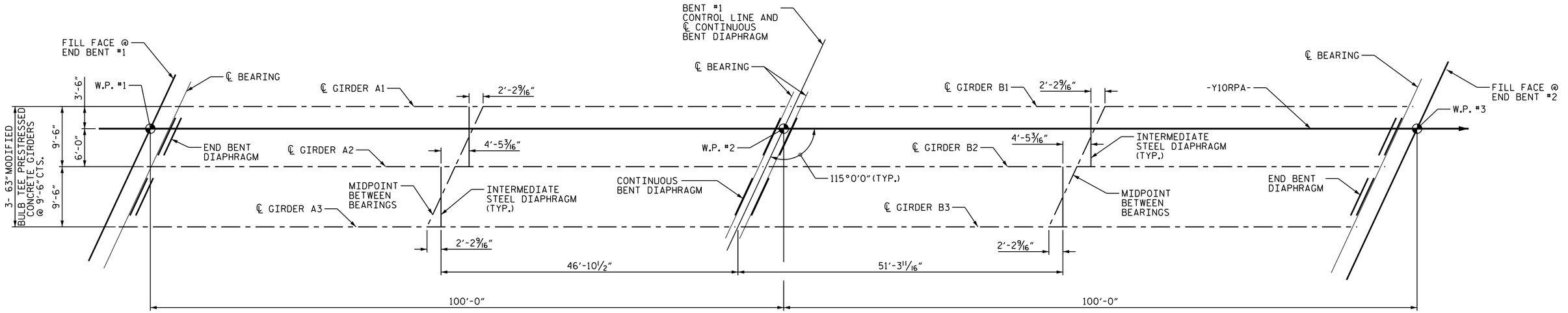

FRAMING PLAN

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D49FA47B...
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-009
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : N. Ruffin DATE : 7/9/13
CHECKED BY : M. PISO DATE : 3/14/14
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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kpaschal

STR #17

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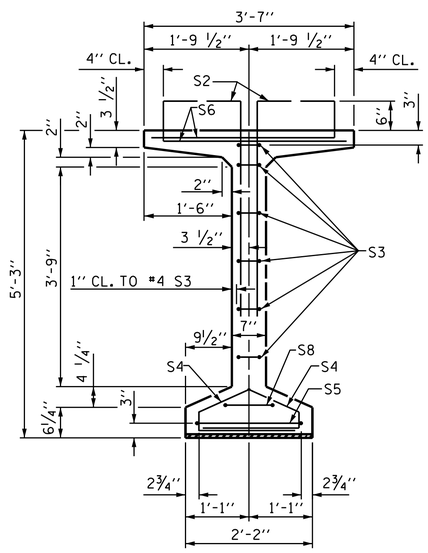
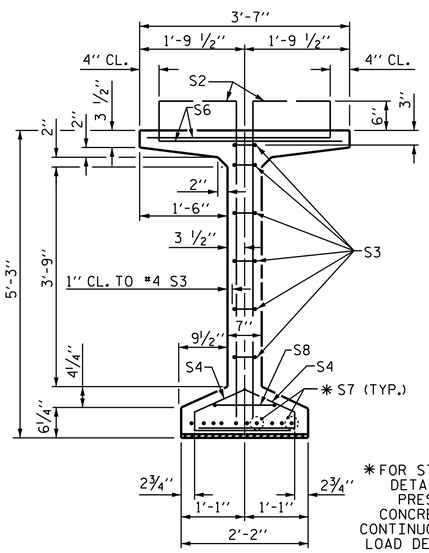
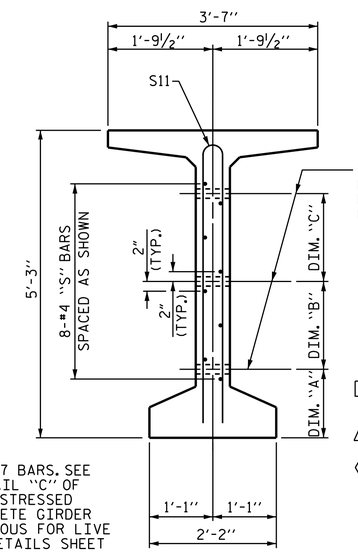


SECTION A-A



SECTION B-B



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

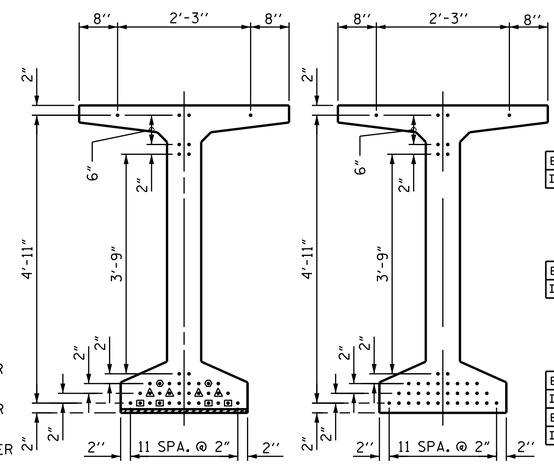
* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER



AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

0.6" Ø L. R. GRADE 270 STRANDS

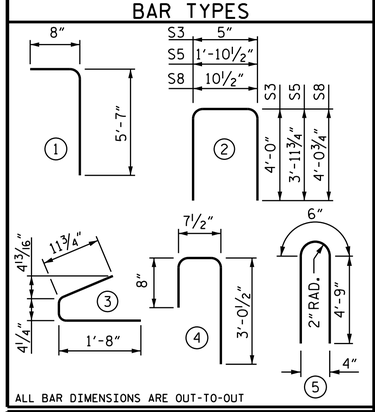
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
EXTERIOR GDR.	S1	176	#4	1	6'-3"	735
INTERIOR GDR.	S1	176	#4	1	6'-3"	735
	S2	24	#6	1	6'-3"	225
	S3	12	#4	2	8'-5"	67
	S4	72	#4	3	3'-0"	144
	S5	1	#5	2	9'-10"	10
EXTERIOR GDR.	S6	200	#5	4	4'-4"	904
INTERIOR GDR.	S6	200	#5	4	4'-4"	904
	* S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
	S9	19	#5	STR	3'-3"	64
	S10	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S11	4	#5	5	10'-0"	42
INTERIOR GDR.	S11	8	#5	5	10'-0"	83
EXTERIOR GDR.	S12	16	#4	STR	8'-0"	86
INTERIOR GDR.	S13	16	#4	STR	12'-8"	135

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

BAR TYPES



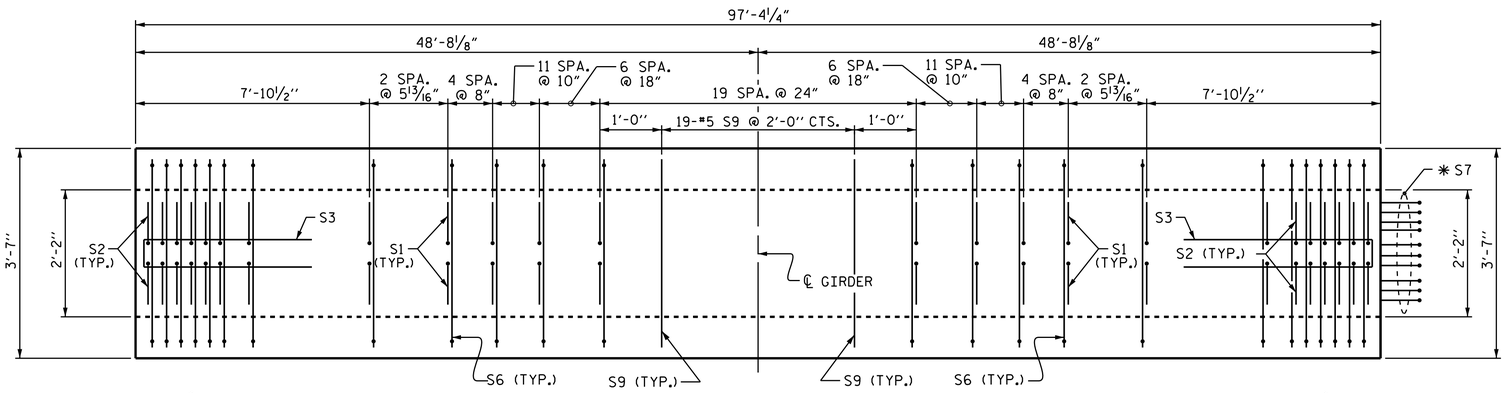
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

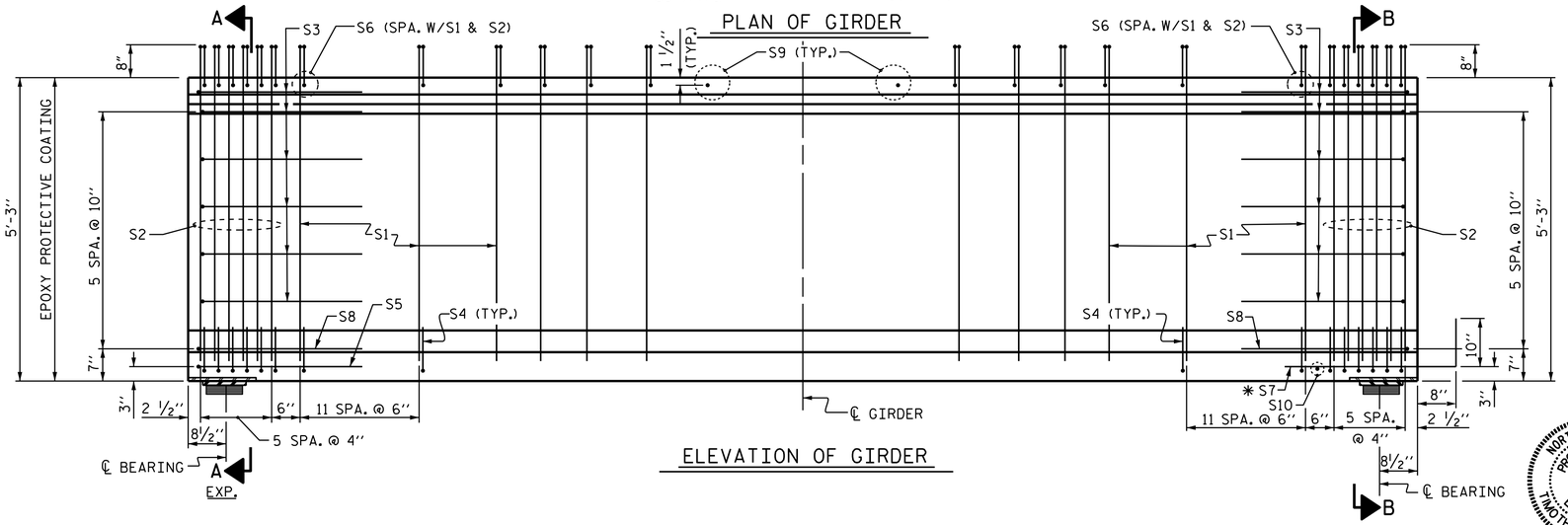
	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2292	19.3	40
INTERIOR GIRDER	2358	19.3	40

GIRDERS REQUIRED

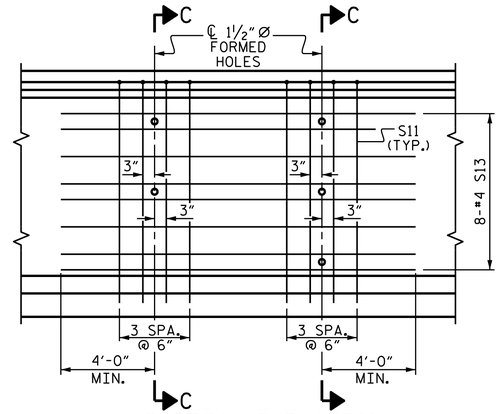
	NUMBER	LENGTH	TOTAL LENGTH
SPAN A	3	97'-4¼"	292'-0¾"
SPAN B	3	97'-4¼"	292'-0¾"



PLAN OF GIRDER

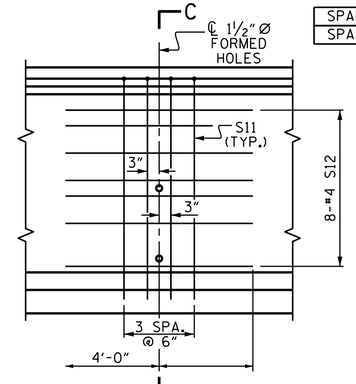


ELEVATION OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER No. 2



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 3

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD

SPAN A & B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-010
1			3			TOTAL SHEETS
2			4			32

STR #17

STD. NO. PCG7 (Sht. 1)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

ASSEMBLED BY : N. Ruffin	DATE : 7/9/13	
CHECKED BY : M. PISO	DATE : 3/14/14	
DRAWN BY : EEM 2/6/97	REV. 5/1/06R	TLA/GM
CHECKED BY : VAP 2/6/97	REV. 10/1/11	MAA/GM
	REV. 6/13	MAA/GM

ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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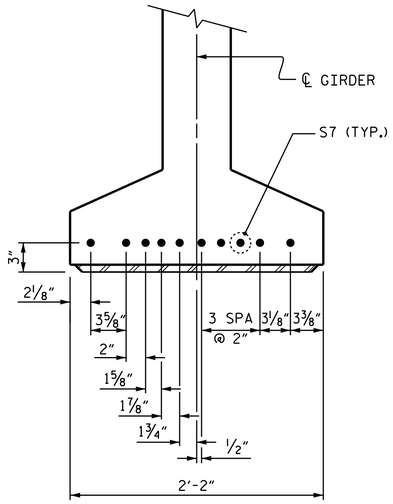
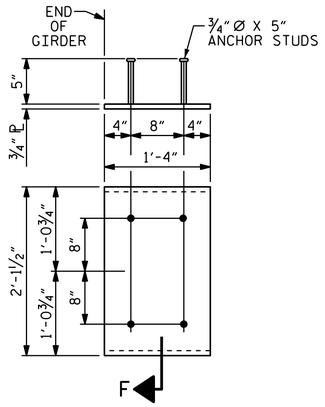
kpaschal



DETAIL "C"

(FOR 63" & 72" MODIFIED BULB TEES)



EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 63" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

EMBEDDED PLATE "B-1" SHALL BE 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 6200 PSI.

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

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

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

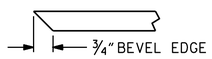
A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN A GIRDERS 1 THRU 3											SPAN B GIRDERS 1 THRU 3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.063	0.111	0.146	0.167	0.174	0.167	0.146	0.111	0.063	0	0	0.063	0.111	0.146	0.167	0.174	0.167	0.146	0.111	0.063	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.035	0.067	0.092	0.108	0.113	0.108	0.092	0.067	0.035	0	0	0.035	0.067	0.092	0.108	0.113	0.108	0.092	0.067	0.035	0
FINAL CAMBER ↑	0"	5/16"	1/2"	5/8"	11/16"	3/4"	11/16"	5/8"	1/2"	5/16"	0"	0"	5/16"	1/2"	5/8"	11/16"	3/4"	11/16"	5/8"	1/2"	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).



SECTION "F"

(SEE NOTES)

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

SPAN A & B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-011
1			3			TOTAL SHEETS
2			4			32

STR #17

STD. NO. PCG9 (Sht. 4)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48F447B...
3/23/2015

ASSEMBLED BY : M. Ruffin	DATE : 7/9/13		
CHECKED BY : M. PISO	DATE : 3/14/14		
DRAWN BY : ELR 11/91	REV. 10/1/11	MAA/GM	
CHECKED BY : GRP 11/91	REV. 1/15	MAA/TMG	
	REV. 2/15	MAA/TMG	

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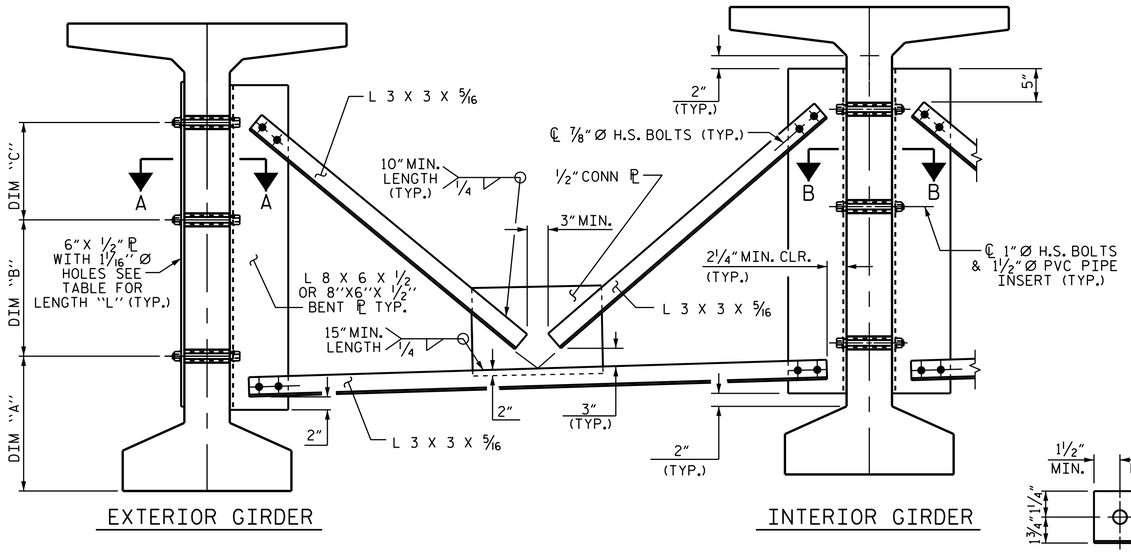
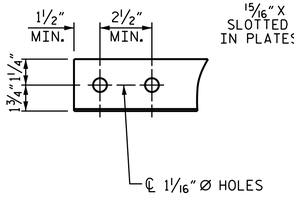


EXTERIOR GIRDER

INTERIOR GIRDER

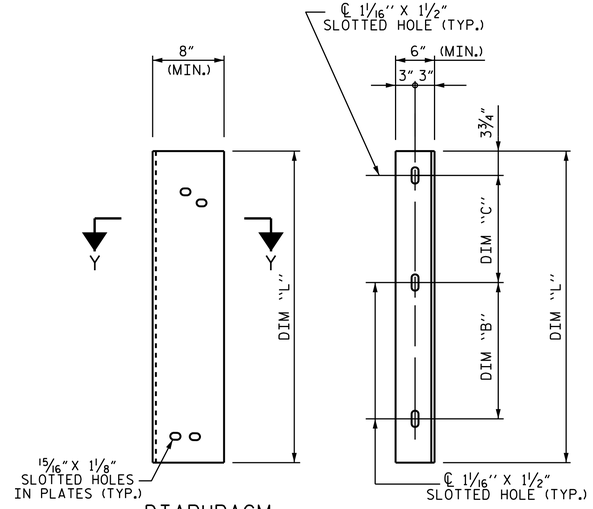
PART SECTION AT INTERMEDIATE DIAPHRAGM

(63" BULB TEE GIRDER SHOWN)



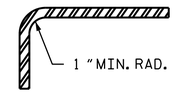
ANGLE END

(L 3 X 3 X 5/16)



DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTOR PLATE DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

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

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

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

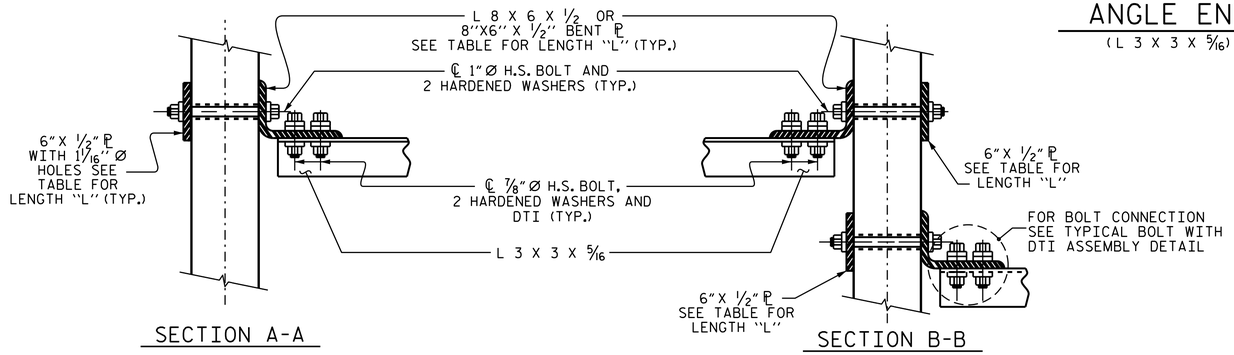
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

TABLE

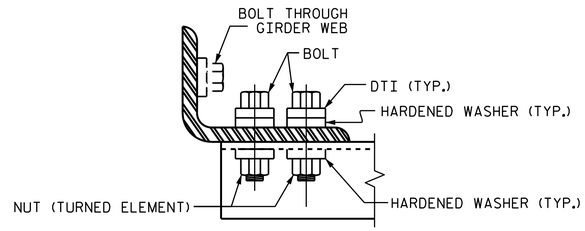
GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-5 3/4"	1'-4"	1'-4"	3'-5"



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 63" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-012
1			3			TOTAL SHEETS
2			4			32

STR #17

STD. NO. PCG11 (SHT 5)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEF0A8D48FA47B...
3/23/2015

ASSEMBLED BY : M. Ruffin	DATE : 7/8/13		
CHECKED BY : M. PISO	DATE : 3/14/14		
DRAWN BY : RWW 11/09	ADDED 11/23/09R	ENGINEER OF RECORD: N. RUFFIN	DATE : 1/28/15
CHECKED BY : GM 11/09	REV. 10/1/11 MAA/GM		

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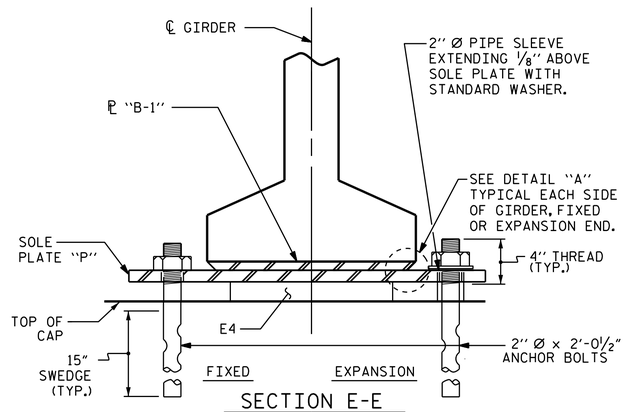
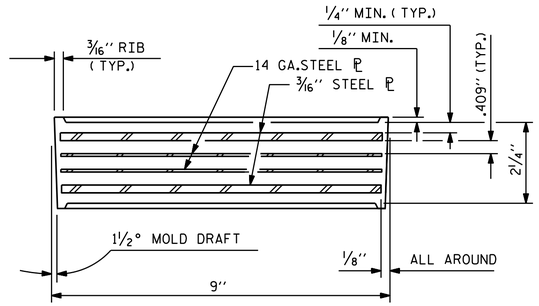
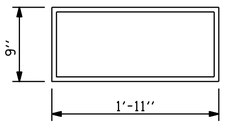


SECTION E-E



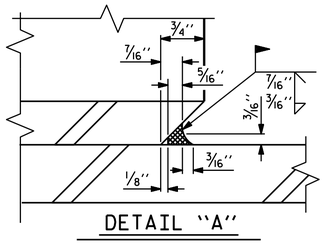
TYPICAL SECTION OF ELASTOMERIC BEARINGS



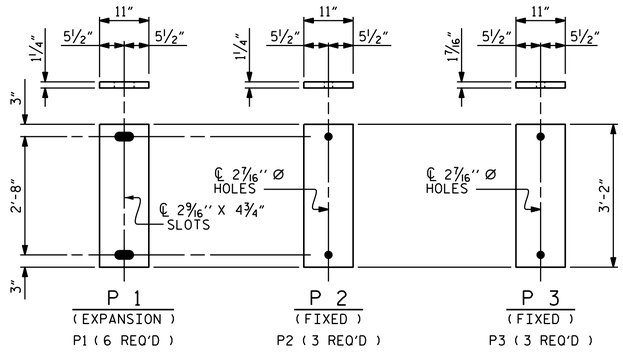
E4 (12 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



DETAIL ''A''



SOLE PLATE DETAILS (''P'')

NOTES

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

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

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

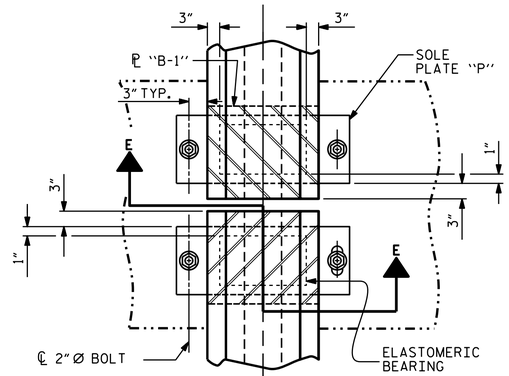
SOLE PLATE ''P'', BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

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

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D46FA47B...
3/23/2015

ASSEMBLED BY :	N. Ruffin	DATE : 7/7/13
CHECKED BY :	M. PISO	DATE : 3/14/14
DRAWN BY : EEM 2/97	REV. 5/1/06	TLA/GM
CHECKED BY : VAP 2/97	REV. 10/1/11	MAA/GM
	REV. 10/24/12	AAC/MAA

ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

23-MAR-2015 10:11
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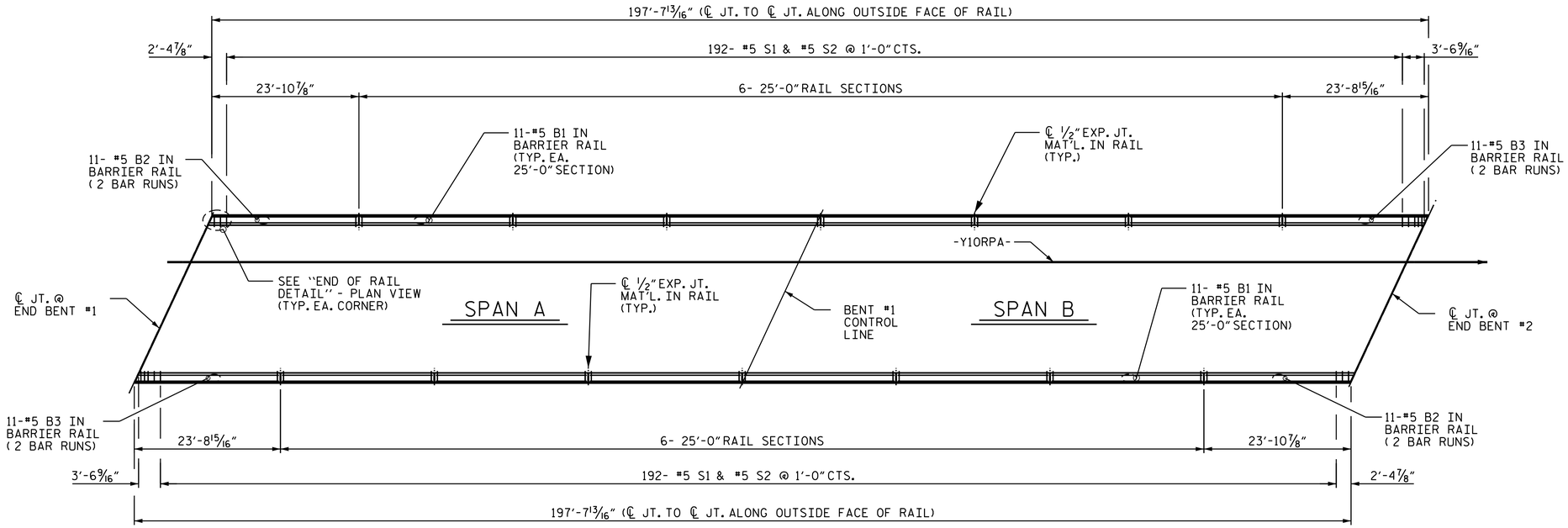
kpaschal

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-013
1			3			TOTAL SHEETS
2			4			32

STR #17

STD. NO. EB4 (SHT 1)



PLAN

NOTES

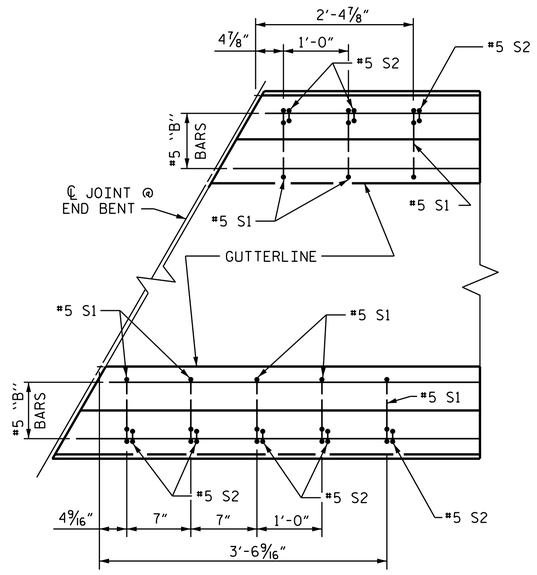
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

FOR EXPANSION JOINT SEAL, SEE "EXPANSION JOINT SEAL DETAILS" SHEET AND "EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL" SHEET.

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.

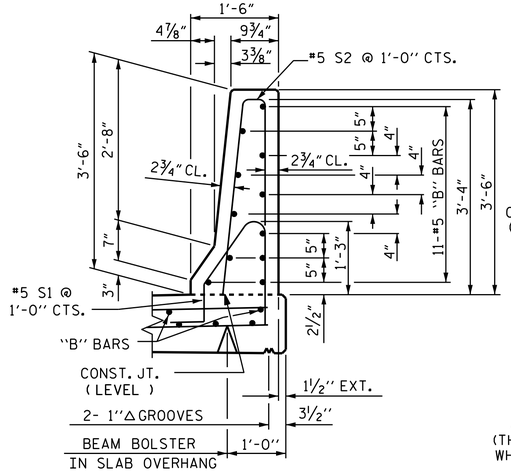
FOR BARRIER RAIL ON THE APPROACH SLAB, SEE "BRIDGE APPROACH SLAB DETAILS" SHEET.



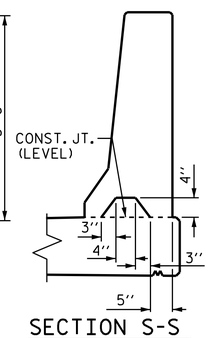
PLAN

END OF RAIL DETAILS

FOR FORMED OPENING AT JOINTS



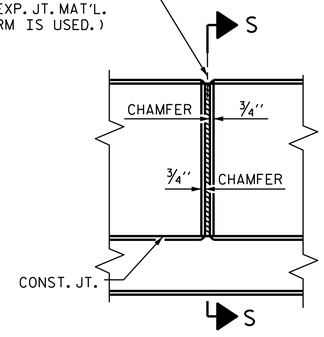
SECTION THRU RAIL



SECTION S-S

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

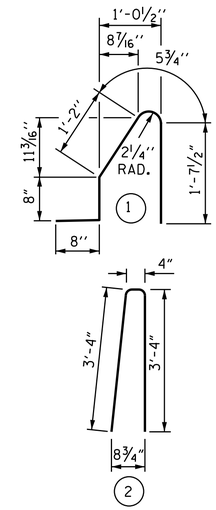
℄ 1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.
(NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	132	#5	STR	24'-7"	3385
* B2	44	#5	STR	13'-8"	627
* B3	44	#5	STR	13'-4"	612
* S1	396	#5	1	4'-7"	1893
* S2	396	#5	2	7'-0"	2891

* EPOXY COATED REINFORCING STEEL 9408

CLASS AA CONCRETE 53.8 C.Y.

CONCRETE BARRIER RAIL 395.30 LIN. FT.
CONCRETE BARRIER RAIL ON APPROACH SLABS 41.40 LIN. FT.
TOTAL 436.70

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins 3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-014
1			3			TOTAL SHEETS
2			4			32

STR #17

STD. NO. CBR1 (SHT 2)

ASSEMBLED BY : N. Ruffin		DATE : 7/19/13
CHECKED BY : M. PISO		DATE : 3/14/14
DRAWN BY : ARB 5/87	REV. 10/1/11	MAA/GM
CHECKED BY : SJD 9/87	REV. 7/12	MAA/GM
	REV. 6/13	MAA/GM

ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

23-MAR-2015 10:11
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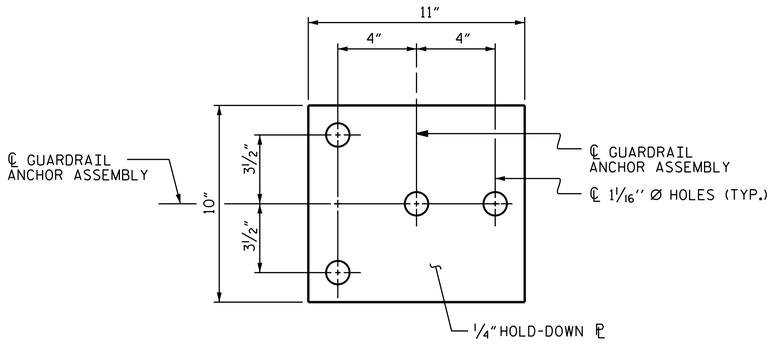
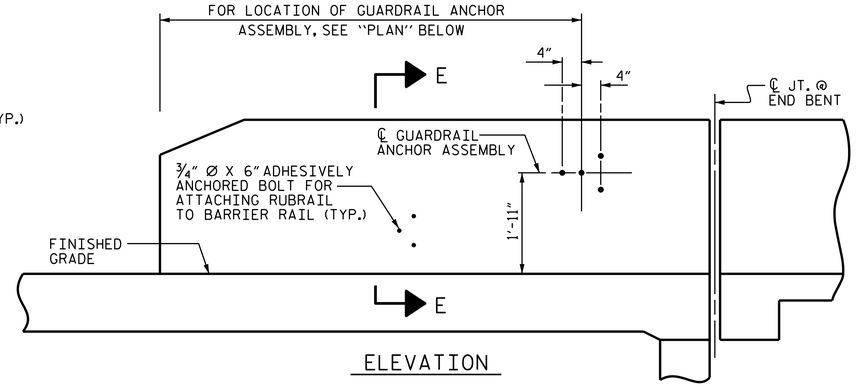
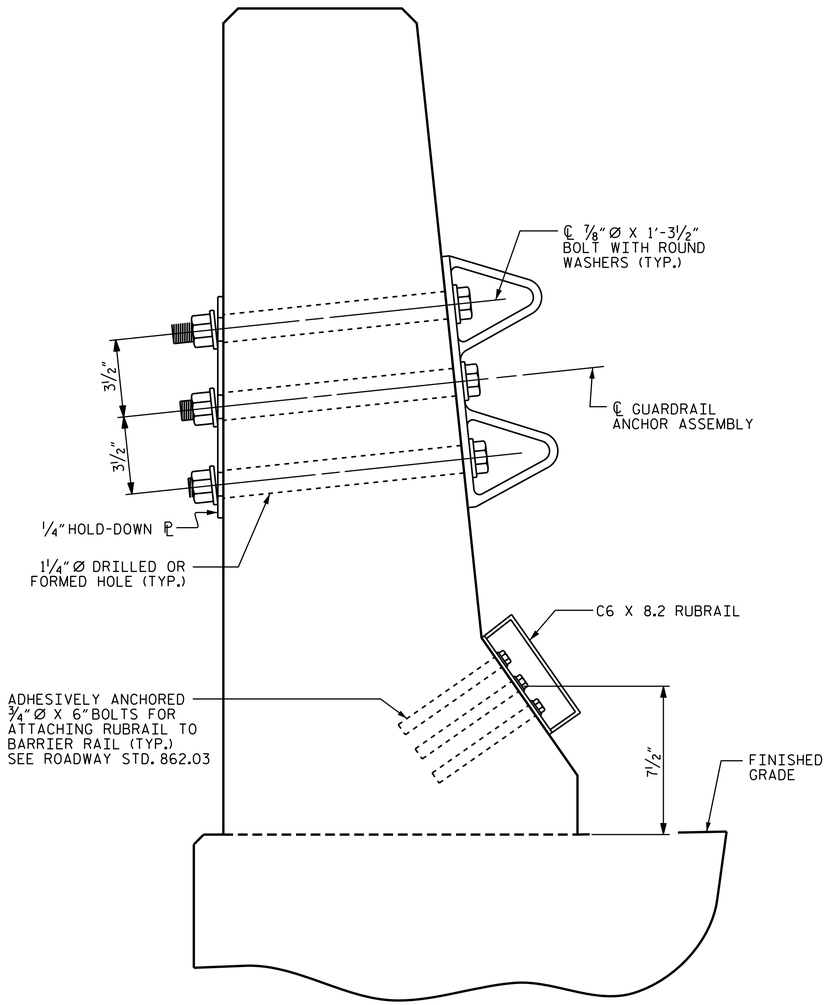
kpaschal



PLAN

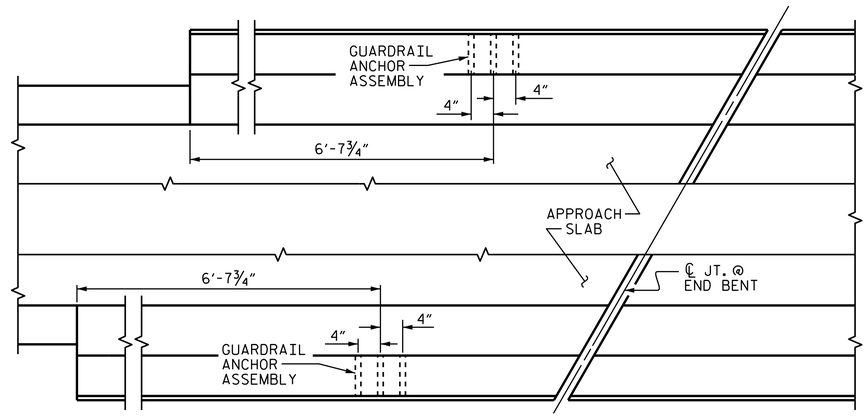


ELEVATION



SECTION E-E

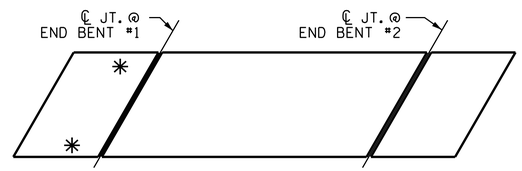
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

NOTES

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

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

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

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

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

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

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

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

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

ASSEMBLED BY : N. Ruffin		DATE : 6/27/13	
CHECKED BY : M. PISO		DATE : 3/14/14	
DRAWN BY : TLA 5/06	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 5/06	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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kpaschal

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

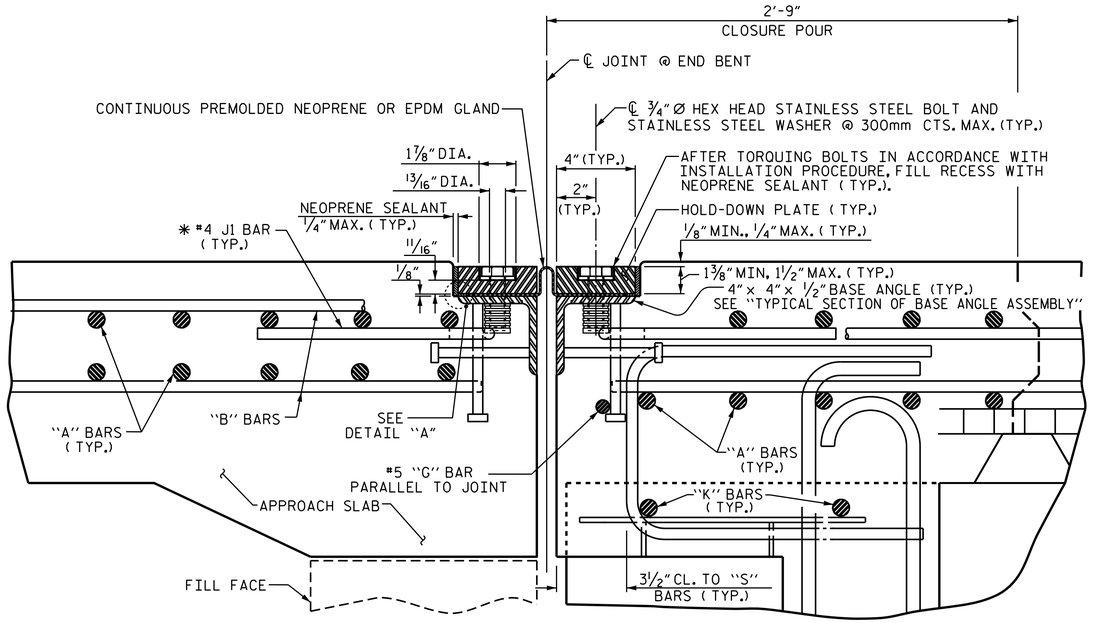
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-015
1			3			TOTAL SHEETS
2			4			32

STR #17 (SHT 3a) STD. NO. GRA2



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT 63" MODIFIED BULB TEE PRESTRESSED GIRDER SUPERSTRUCTURE

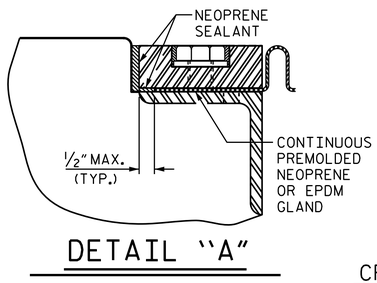
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

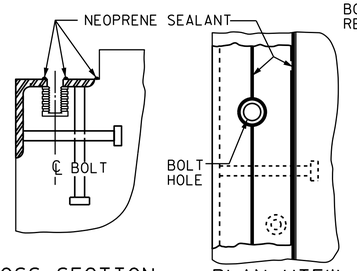
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾"Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1"Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4"X 4"X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
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 TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
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. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. 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 GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. 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.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. 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.

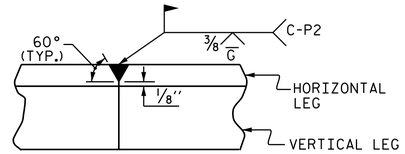


DETAIL "A"



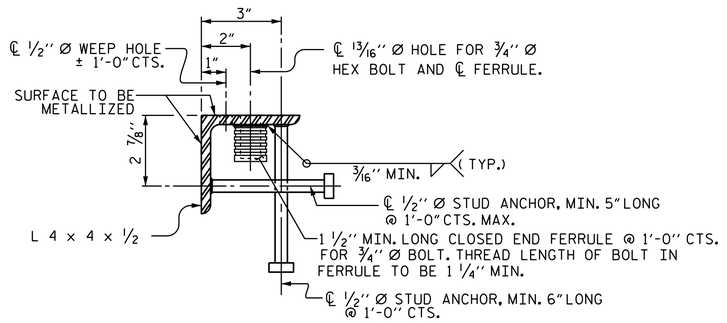
CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
EB #1	115°	9/16"	1 11/16"	1 9/16"	1⅜"
EB #2	115°	9/16"	1 11/16"	1 9/16"	1⅜"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

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:	S17-016
1			3			TOTAL SHEETS
2			4			32

STR #17 STD. NO. EJS1 (SHT 1)

ASSEMBLED BY :	M. Ruffin	DATE :	7/8/13
CHECKED BY :	M. PISO	DATE :	3/14/14
DRAWN BY : REK 9/87	REV. 5/7/03R		RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R		TLA/GM
	REV. 10/1/11		MAA/GM

ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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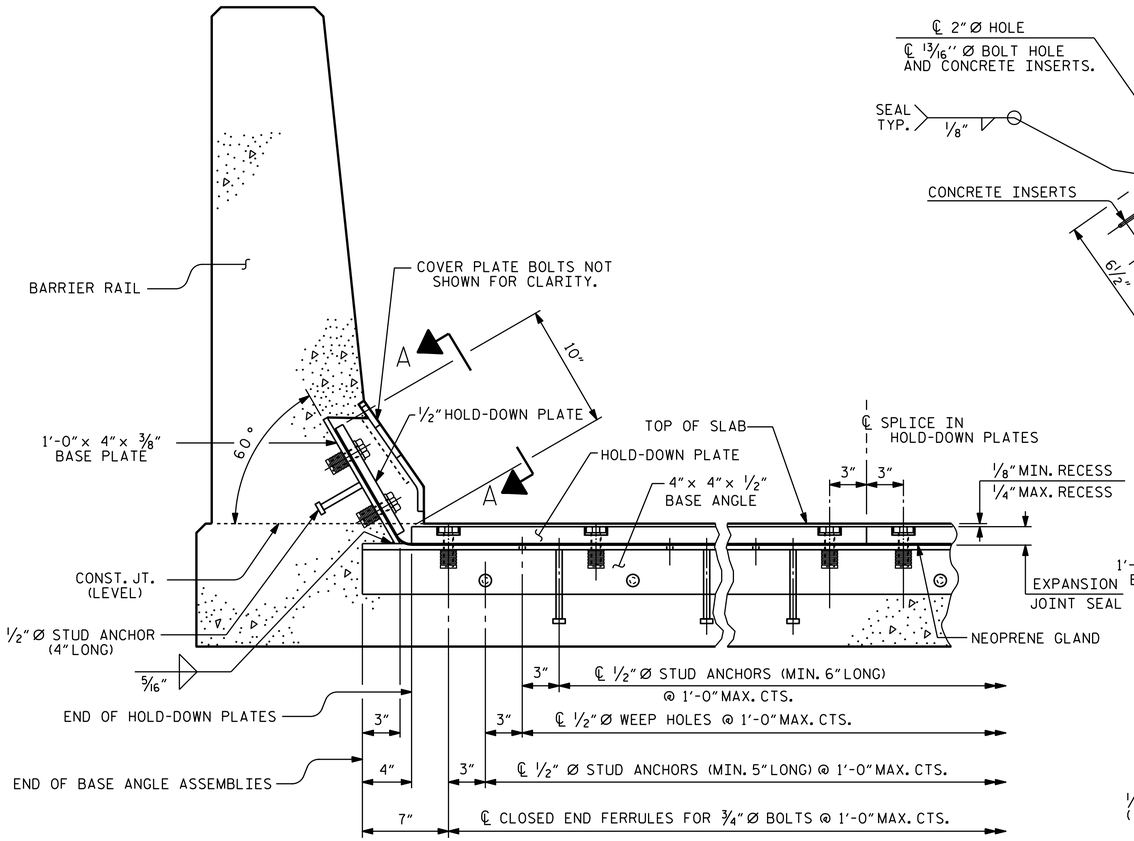
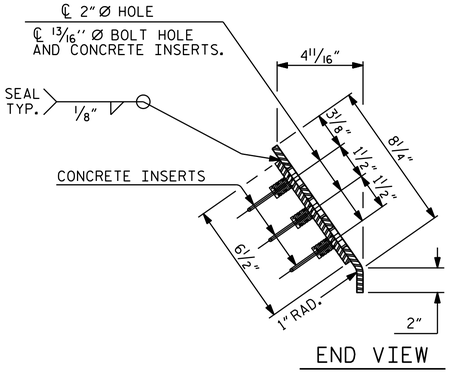
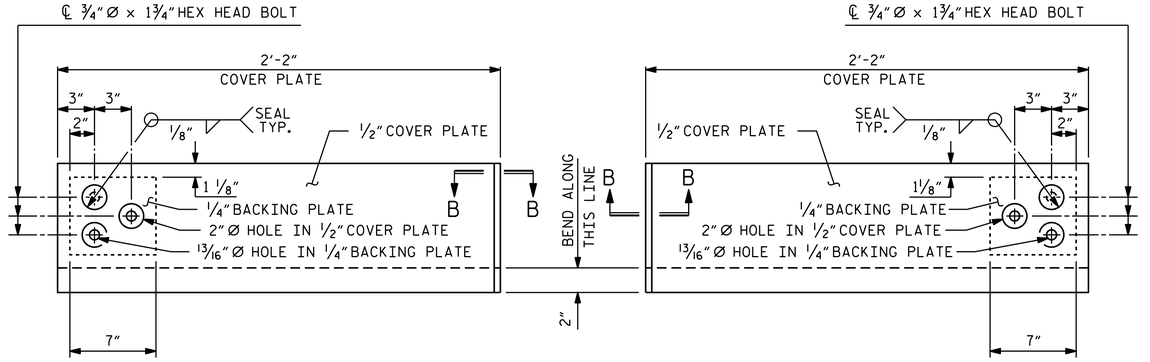


SECTION THRU RAIL NORMAL TO JOINT



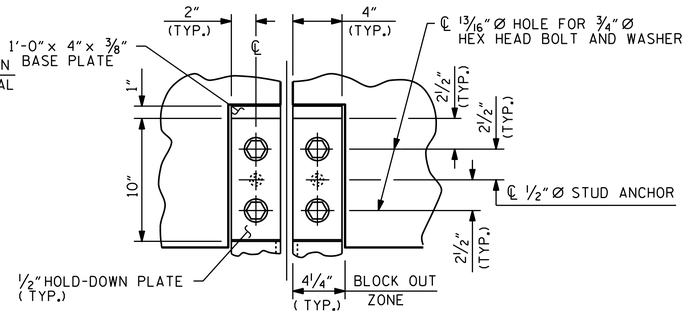
END VIEW



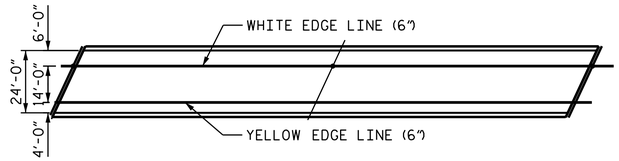
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

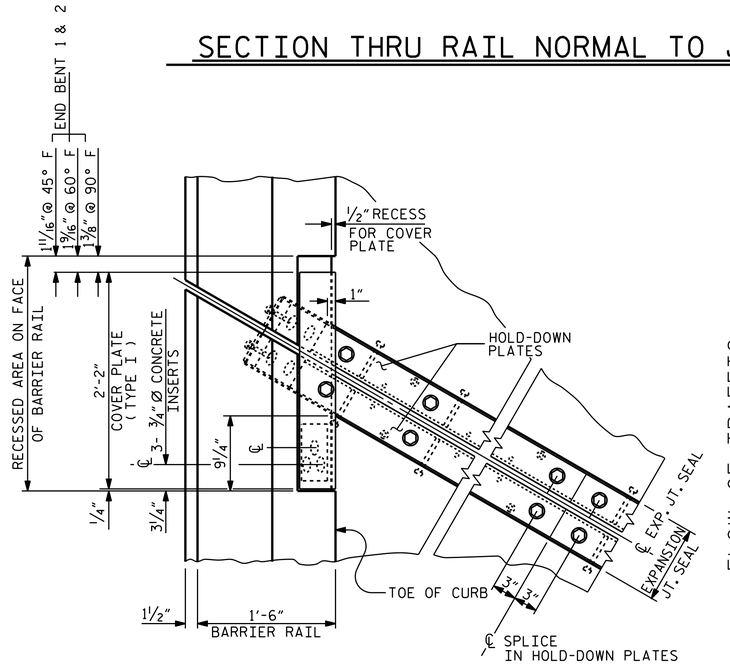
COVER PLATE DETAILS



SECTION A - A

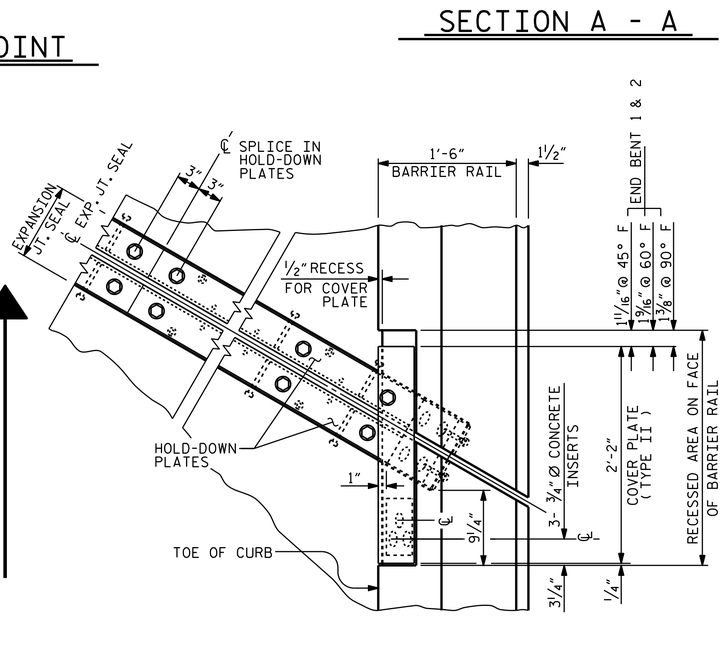


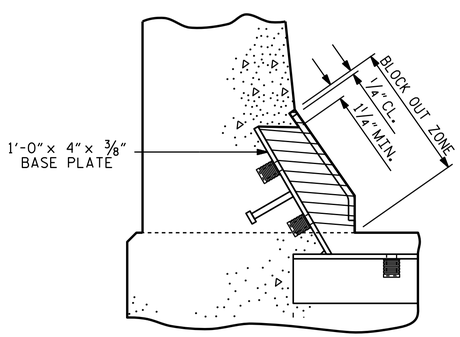
PAVEMENT MARKING ALIGNMENT



PLAN OF EXPANSION JOINT SEAL

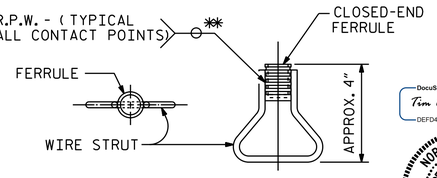
FLOW OF TRAFFIC





BLOCK OUT DETAIL

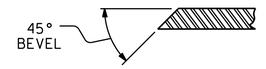
SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN ELEVATION

CONCRETE INSERT

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



SECTION B - B

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

ASSEMBLED BY :	N. Ruffin	DATE : 6/27/13			
CHECKED BY :	M. PISO	DATE : 3/14/14			
DRAWN BY : REK 9/87	REV. 10/1/11	MAA/GM			
CHECKED BY : CRK 10/87	REV. 7/12	MAA/GM			
	REV. 10/12	MAA/GM			

ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-017
1			3			TOTAL SHEETS
2			4			32

STR #17

STD. NO. EJS2 SHT 2b

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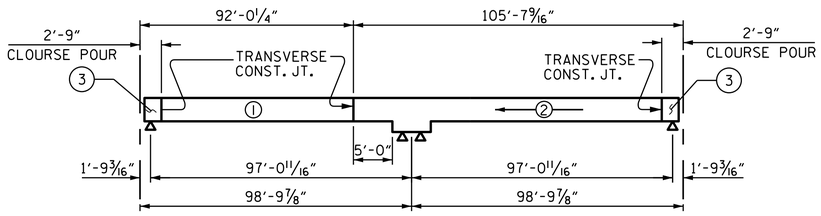
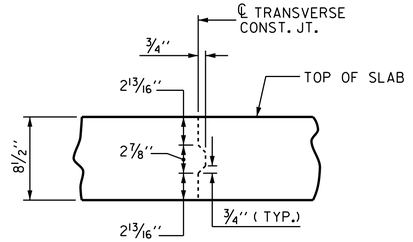
kpaschal



POUR SEQUENCE

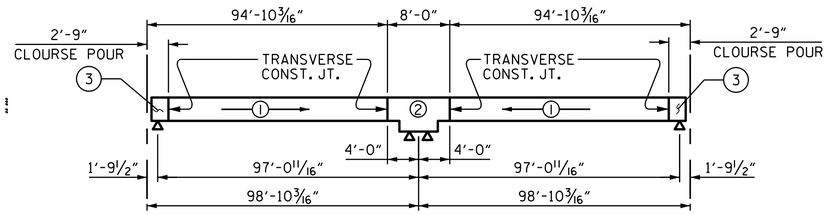
SEE TRANSVERSE CONSTRUCTION JOINT DETAIL

(#) = INDICATES POUR NUMBER AND DIRECTION OF POUR



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



OPTIONAL POUR SEQUENCE

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

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			

SUPERSTRUCTURE BILL OF MATERIAL

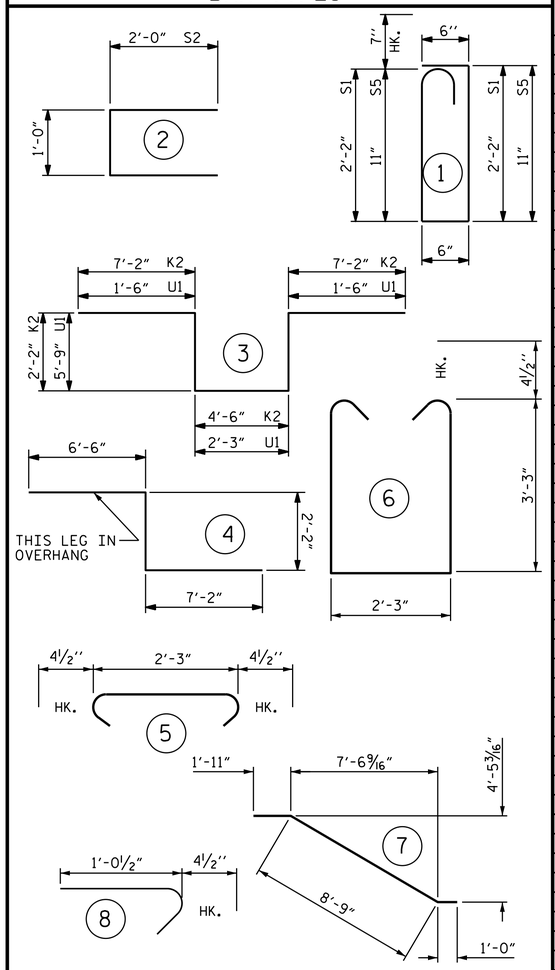
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPAN A & B	199.4	16,457	14,750
TOTALS **	199.4	16,457	14,750

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

CLASS AA CONCRETE BREAKDOWN

POUR #1	84.6	CU. YD.
POUR #2	106.4	CU. YD.
POUR #3	8.4	CU. YD.
CLASS AA CONCRETE	199.4	CU. YD.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

GROOVING BRIDGE FLOORS

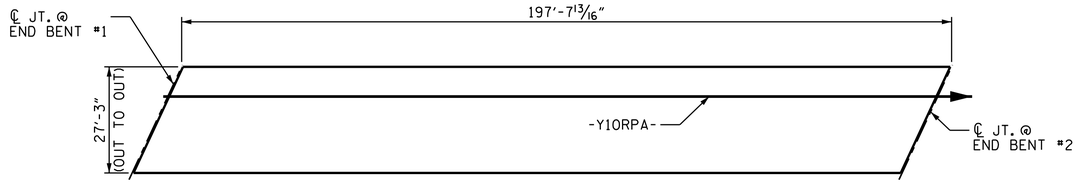
APPROACH SLABS	995	SQ.FT.
BRIDGE DECK	4123	SQ.FT.
TOTAL	5118	SQ.FT.

BILL OF MATERIAL

SPAN A & B

BAR	NO	SIZE	TYPE	LENGTH	WEIGHT
*A1	295	#5	STR	26'-10"	8256
A2	295	#5	STR	26'-10"	8256
*A101	4	#5	STR	24'-2"	101
*A102	4	#5	STR	21'-6"	90
*A103	4	#5	STR	18'-10"	79
*A104	4	#5	STR	16'-2"	67
*A105	4	#5	STR	13'-6"	56
*A106	4	#5	STR	10'-9"	45
*A107	4	#5	STR	8'-1"	34
*A108	4	#5	STR	5'-5"	23
*A109	4	#5	STR	2'-9"	11
A201	4	#5	STR	25'-0"	104
A202	4	#5	STR	22'-4"	93
A203	4	#5	STR	19'-8"	82
A204	4	#5	STR	17'-0"	71
A205	4	#5	STR	14'-4"	60
A206	4	#5	STR	11'-7"	48
A207	4	#5	STR	8'-11"	37
A208	4	#5	STR	6'-3"	26
A209	4	#5	STR	3'-7"	15
*B1	126	#4	STR	23'-3"	1957
B2	128	#5	STR	50'-11"	6798
*B3	63	#6	STR	25'-2"	2381
*B4	20	#6	STR	29'-8"	891
G1	2	#5	STR	29'-7"	62
*J1	52	#4	8	1'-5"	49
*K1	8	#8	4	15'-10"	338
*K2	4	#8	3	23'-2"	247
K3	12	#6	STR	6'-2"	111
K4	4	#4	STR	6'-5"	17
K5	24	#4	STR	9'-5"	151
K6	4	#4	STR	6'-2"	16
K7	12	#4	7	11'-8"	94
S1	24	#4	1	5'-11"	95
*S2	24	#5	2	5'-0"	125
S3	72	#4	5	3'-0"	144
S4	4	#4	6	9'-6"	25
S5	8	#4	1	3'-5"	18
U1	12	#4	3	16'-9"	134

REINFORCING STEEL	LBS.	16,457
*EPOXY COATED REINFORCING STEEL	LBS.	14,750



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 5,386)

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-018
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : N. Ruffin DATE : 7/19/13
CHECKED BY : M. PISO DATE : 3/14/14
DESIGN ENGINEER OF RECORD: N. RUFFIN DATE : 1/28/15

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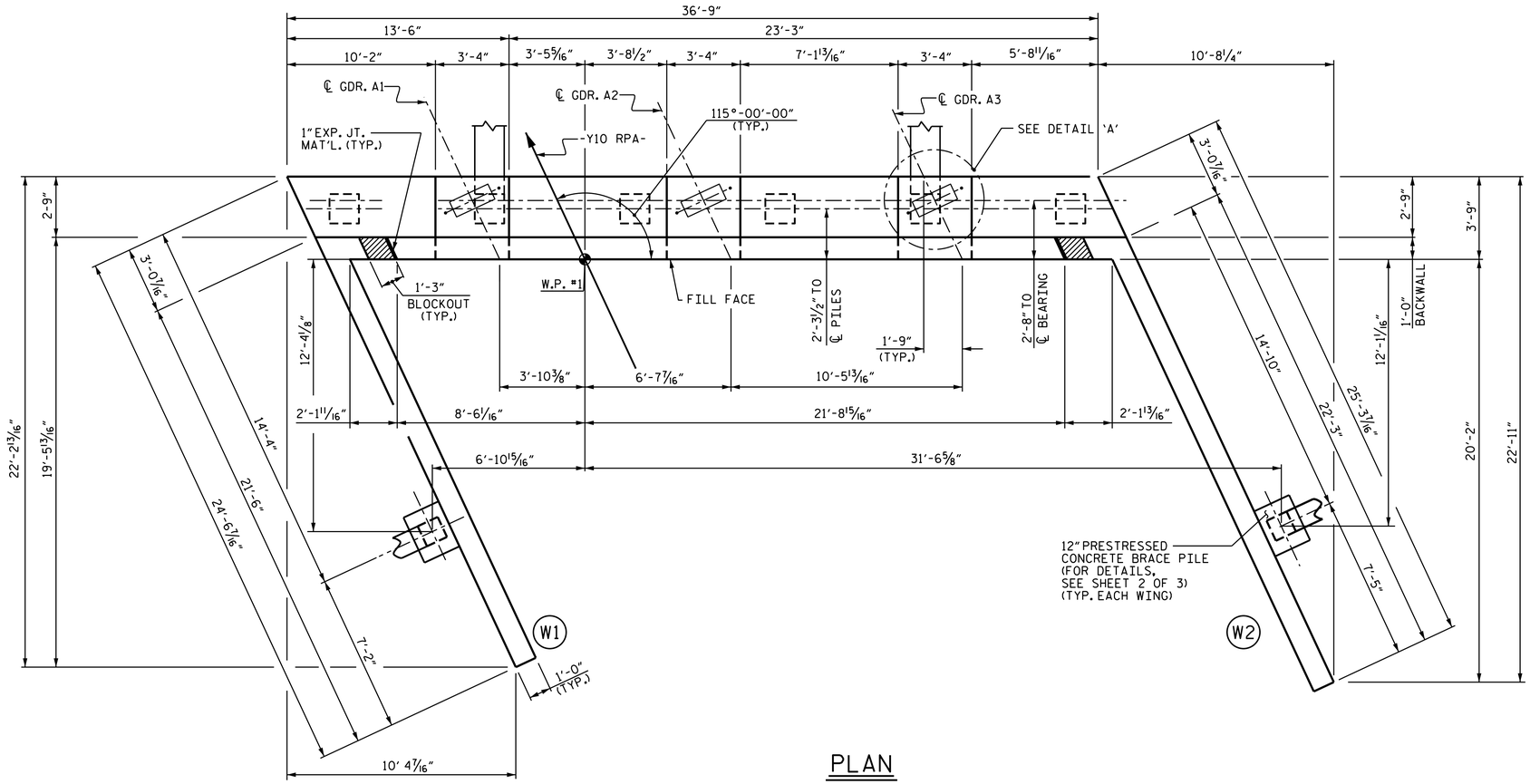
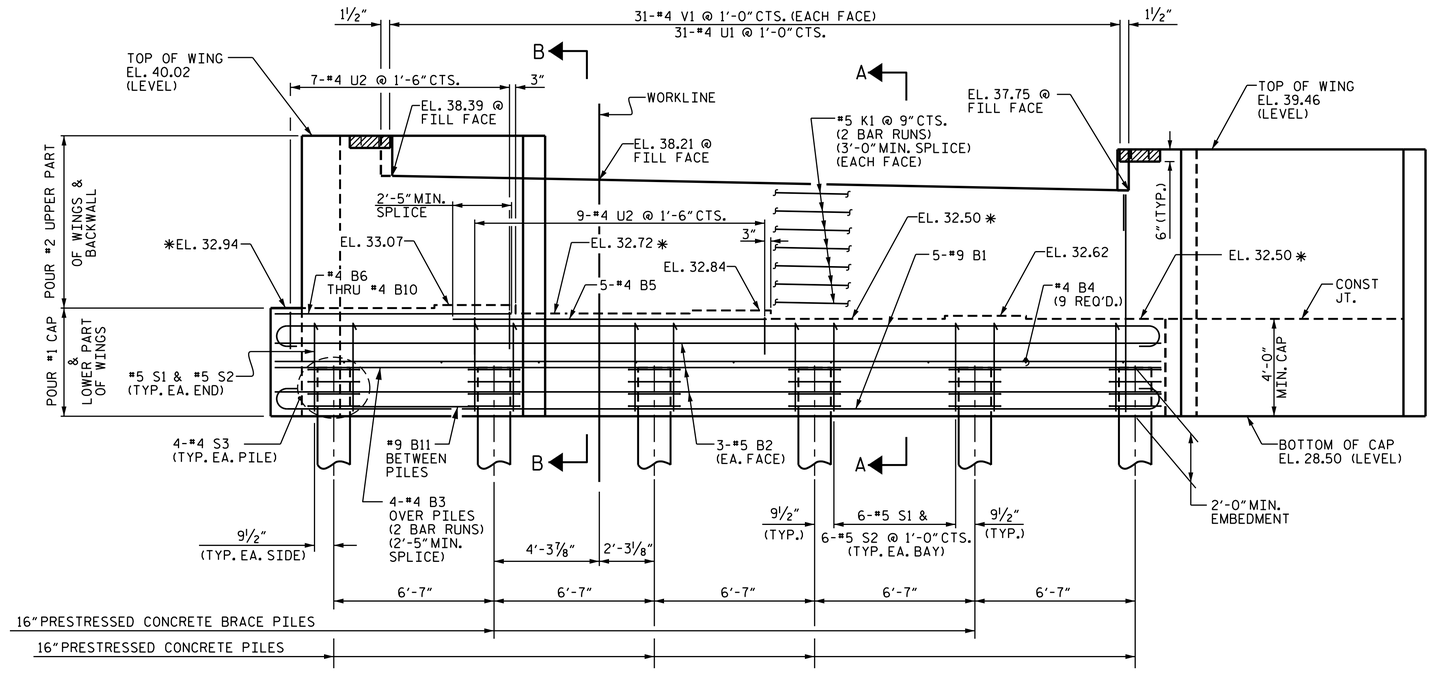
STR #17



PLAN



ELEVATION

WING BRACE PILES NOT SHOWN FOR CLARITY

NOTES:

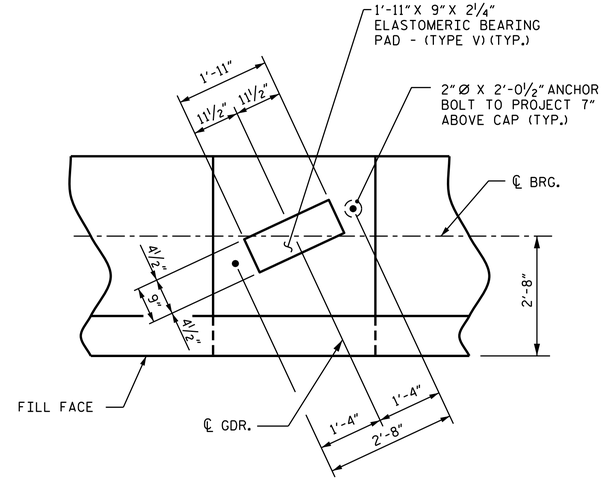
STIRRUPS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY 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 END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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



DETAIL A

(TYP. EACH GDR.)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-019
1			3			TOTAL SHEETS
2			4			32

STR. #17

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 9/23/14
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DESIGN ENGINEER OF RECORD: NEIL RUFFIN DATE : 1/29/15

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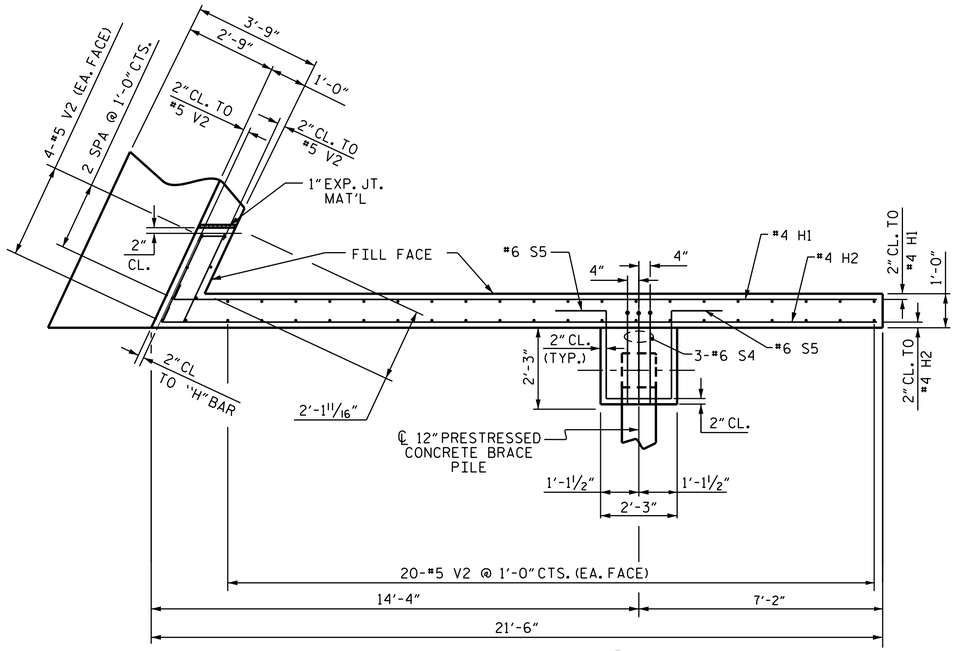
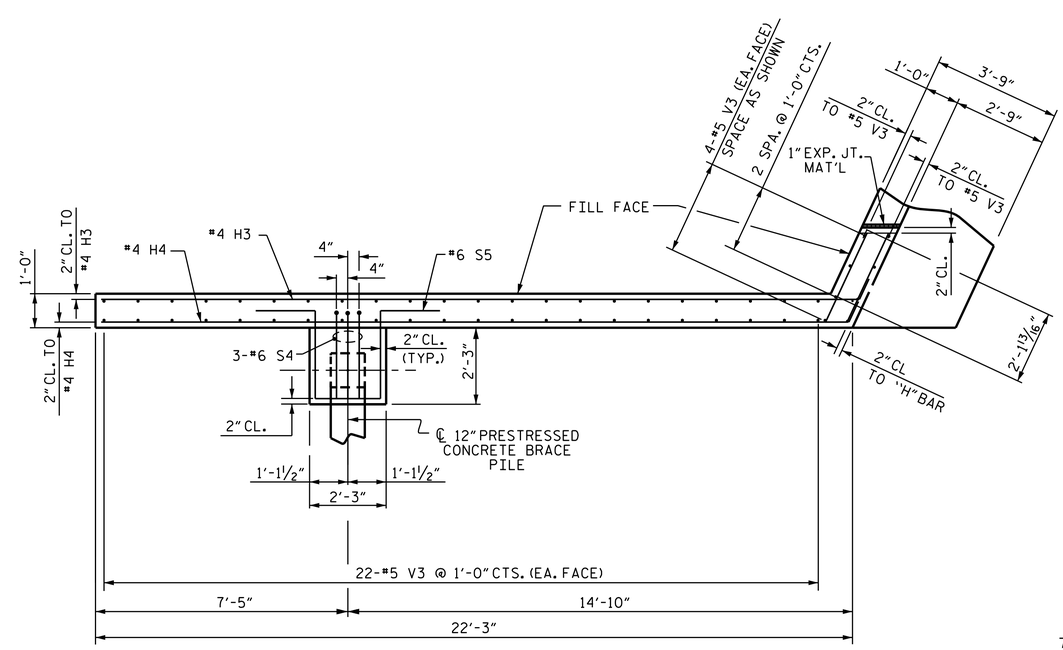
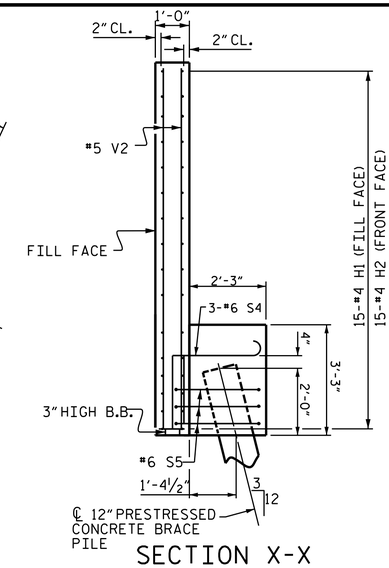


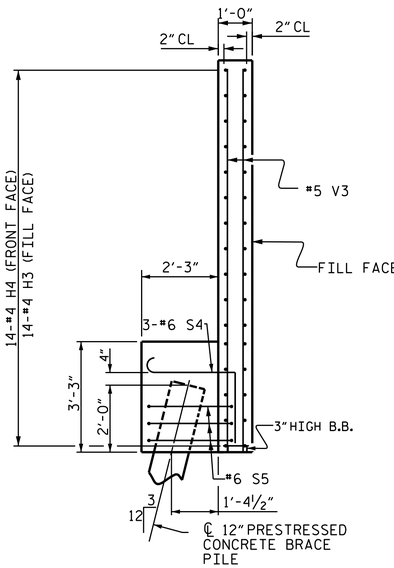
PLAN OF LEFT WING (W1)



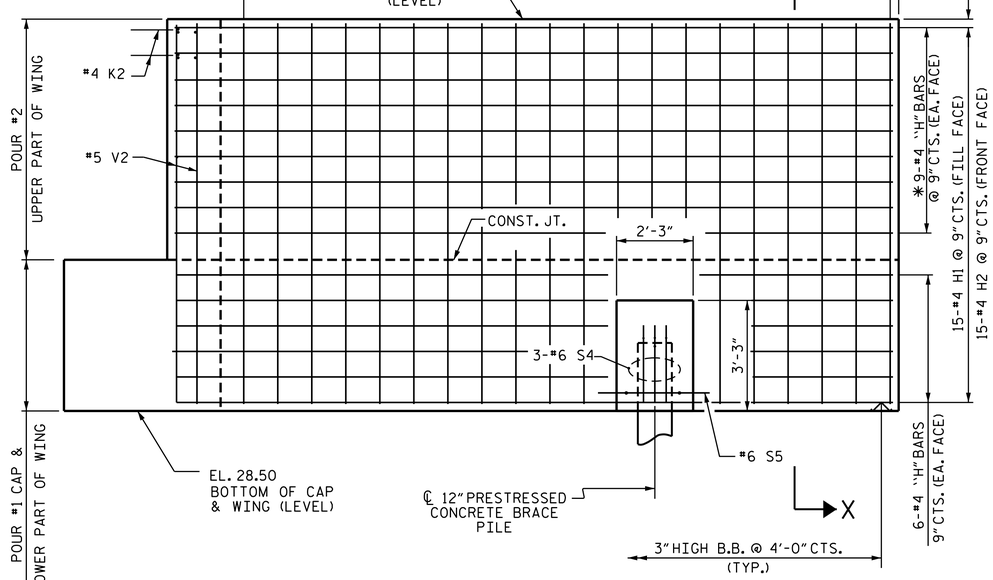
PLAN OF RIGHT WING (W2)



SECTION X-X

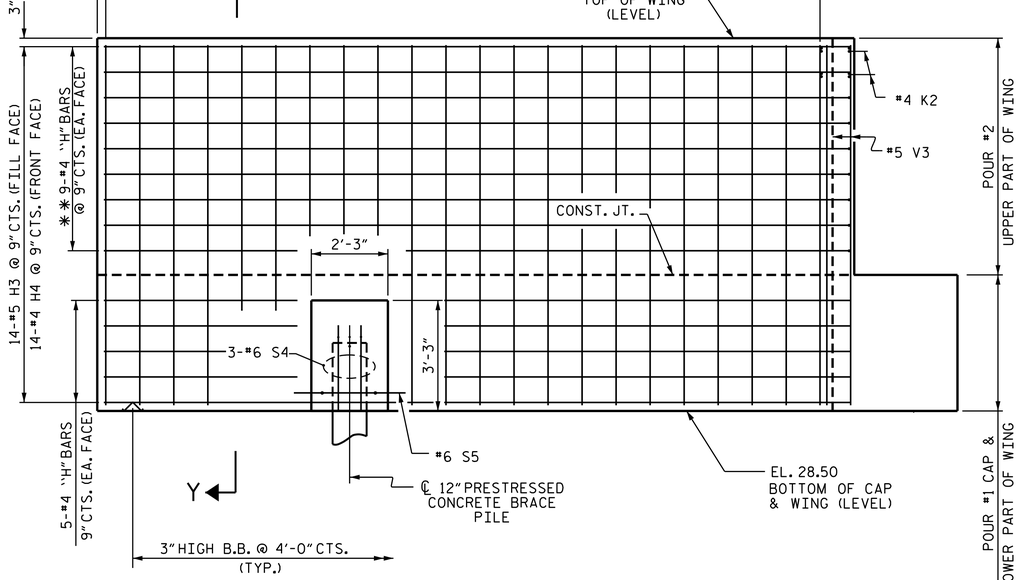


SECTION Y-Y



ELEVATION OF LEFT WING (W1)

* MATCH #4 H1 & #4 H2 TO "K" BARS IN BACKWALL



ELEVATION OF RIGHT WING (W2)

** MATCH #4 H3 & #4 H4 TO "K" BARS IN BACKWALL

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A834BFA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO.1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-020
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 10/16/14
CHECKED BY : M.D.PISO DATE : 10/22/14
DESIGN ENGINEER OF RECORD: NEIL RUFFIN DATE : 1/29/15

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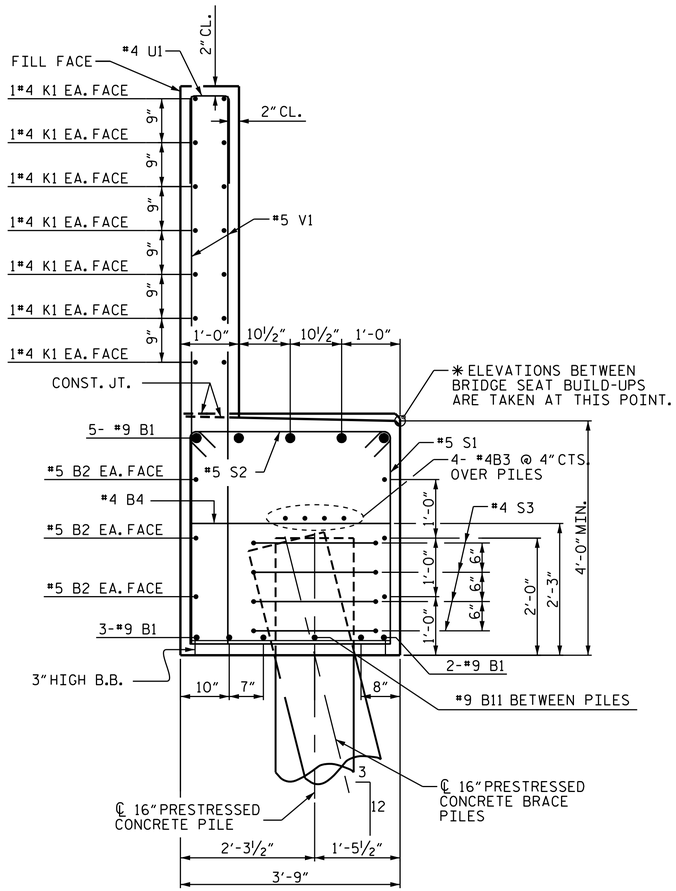
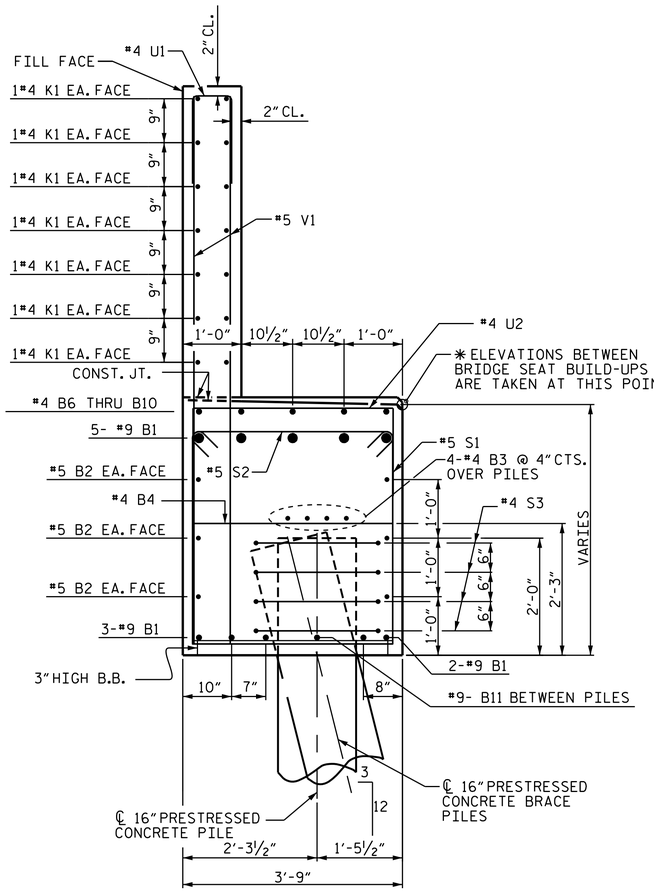
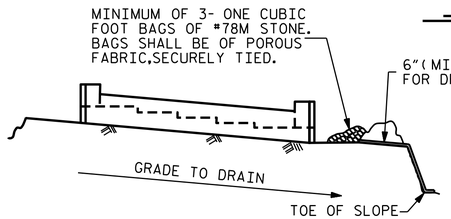
STR. #17



SECTION A-A



SECTION B-B



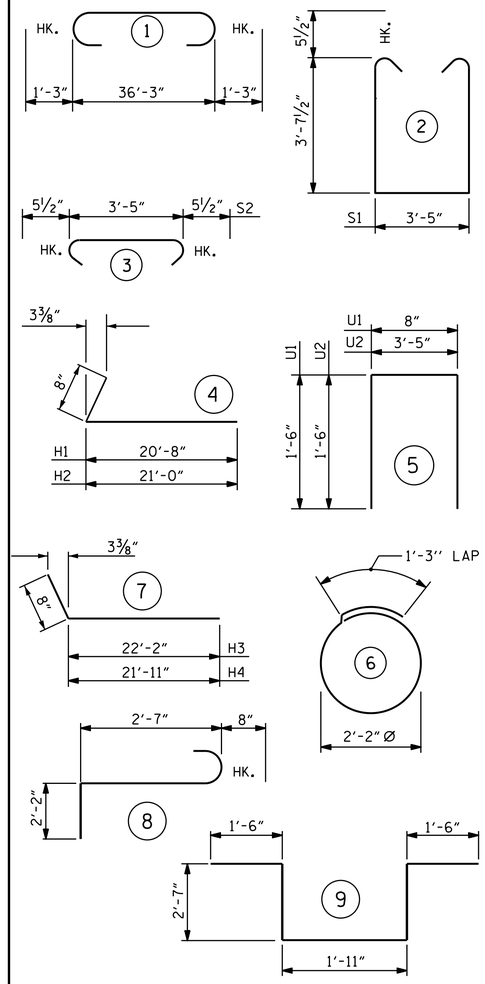
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	38'-9"	1318
B2	6	#5	STR	36'-4"	227
B3	8	#4	STR	19'-5"	104
B4	9	#4	STR	3'-5"	21
B5	5	#4	STR	12'-8"	42
B6	1	#4	STR	8'-1"	5
B7	1	#4	STR	8'-3"	6
B8	1	#4	STR	9'-0"	6
B9	1	#4	STR	9'-3"	6
B10	1	#4	STR	9'-7"	6
B11	5	#9	STR	4'-11"	84
H1	15	#4	4	21'-4"	214
H2	15	#4	4	21'-8"	217
H3	14	#4	7	22'-10"	214
H4	14	#4	7	22'-7"	211
K1	28	#5	STR	19'-5"	567
K2	8	#4	STR	2'-11"	16
S1	32	#5	2	11'-7"	387
S2	32	#5	3	4'-4"	145
S3	24	#4	6	8'-1"	130
S4	6	#6	8	5'-5"	49
S5	2	#6	9	10'-1"	30
U1	31	#4	5	3'-8"	76
U2	16	#4	5	6'-5"	69
V1	62	#5	STR	8'-11"	576
V2	48	#5	STR	11'-2"	559
V3	52	#5	STR	10'-11"	592

REINFORCING STEEL 5877 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, WING BRACE ▲ & LOWER PART OF WINGS 31.9 CU. YDS.

POUR #2 BACKWALL & UPPER PART OF WINGS 18.8 CU. YDS.

TOTAL CLASS A CONCRETE 50.7 CU. YDS.

16" PRESTRESSED CONCRETE PILES
NO. 6 360 LIN. FT.

12" PRESTRESSED CONCRETE PILES
NO. 2 120 LIN. FT.

PILE REDRIVES 3 EACH

▲-CONCRETE DISPLACED BY THE 16" P/S CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO.1

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-021
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 9/23/14
CHECKED BY : M.D.PISO DATE : 10/22/14
DESIGN ENGINEER OF RECORD: NEIL RUFFIN DATE : 1/29/15

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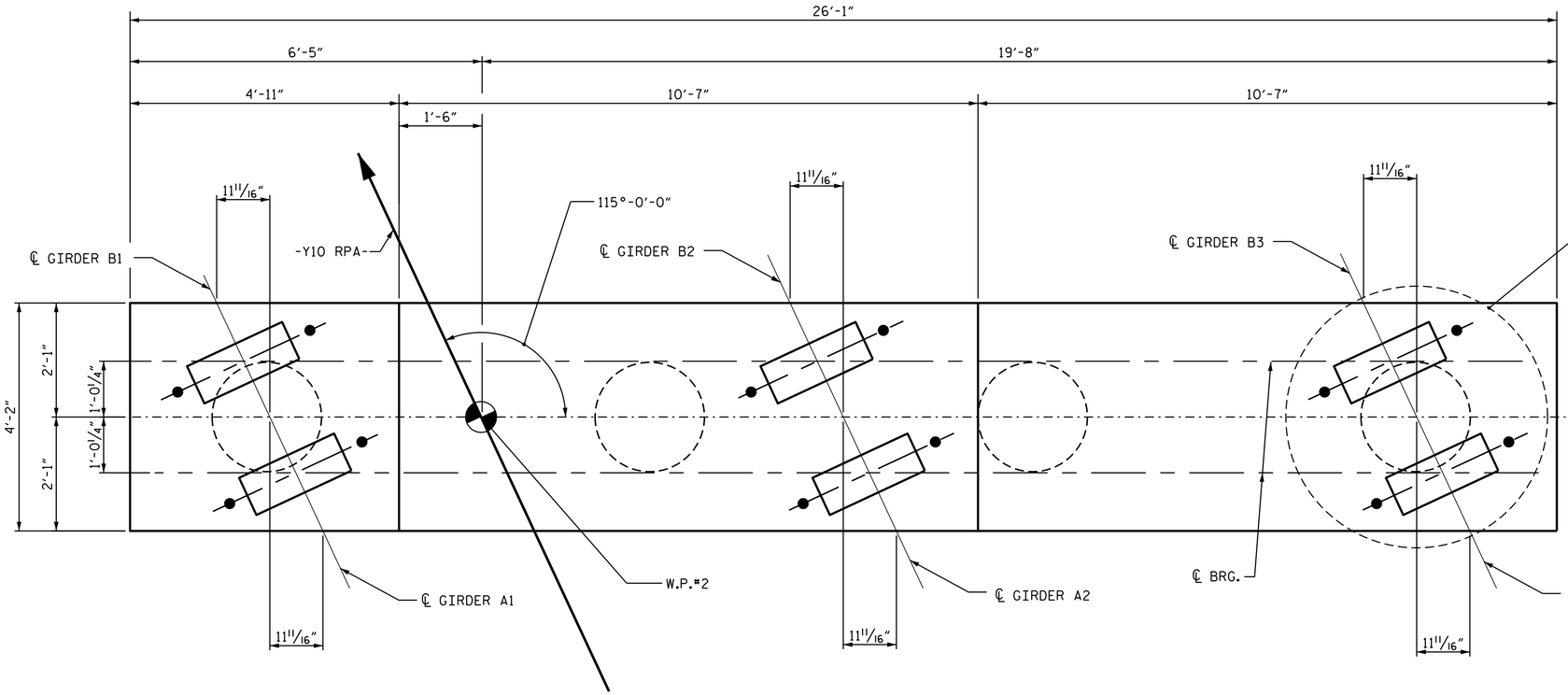
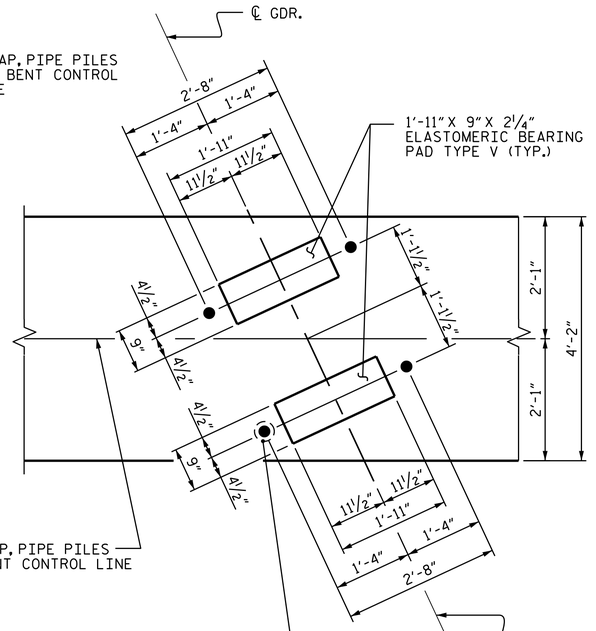
STR. #17



PLAN

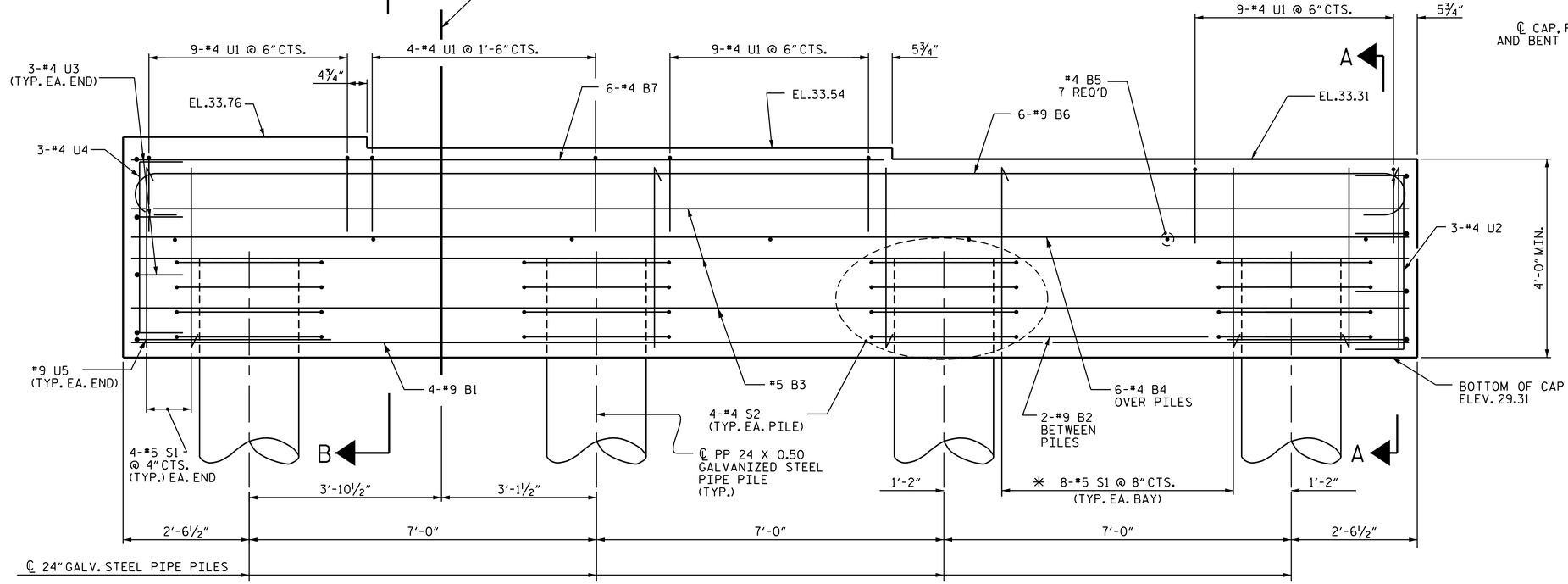


DETAIL "A"
(TYP. EA. GIRDER)

B

WORKLINE

A



ELEVATION
* INVERT ALTERNATE STIRRUPS

NOTES:

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

FOR REINFORCING STEEL IN PIPE PILES, SEE "24" STEEL PIPE PILE" SHEET.

GALVANIZE THE FULL LENGTH OF EACH INTERIOR BENT PILE A MINIMUM OF 33.0 FEET. GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO.1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-022
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 9/24/14
CHECKED BY : M.D.PISO DATE : 10/22/14
DESIGN ENGINEER OF RECORD: NEIL RUFFIN DATE : 1/29/15

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
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3/23/2015

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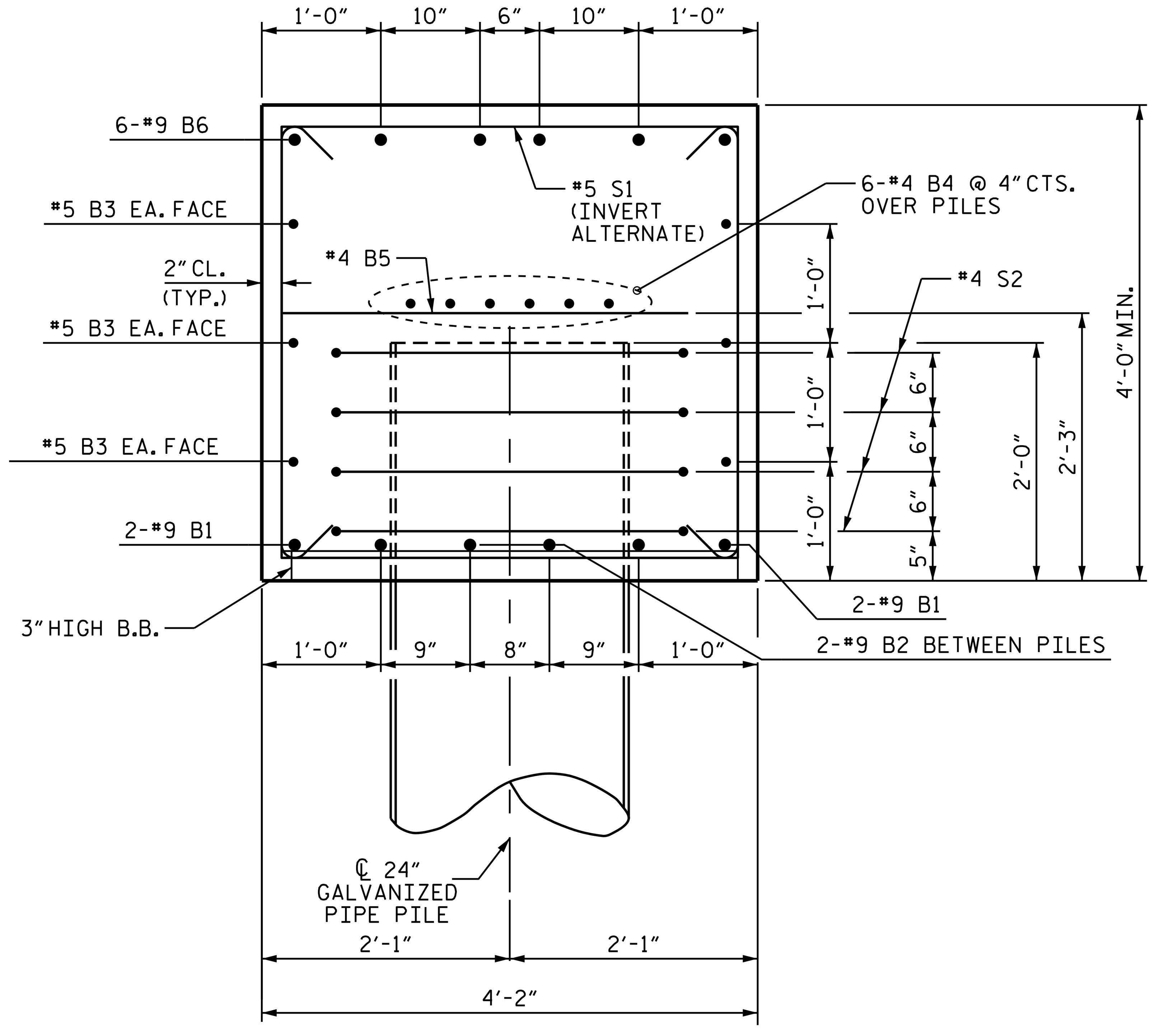
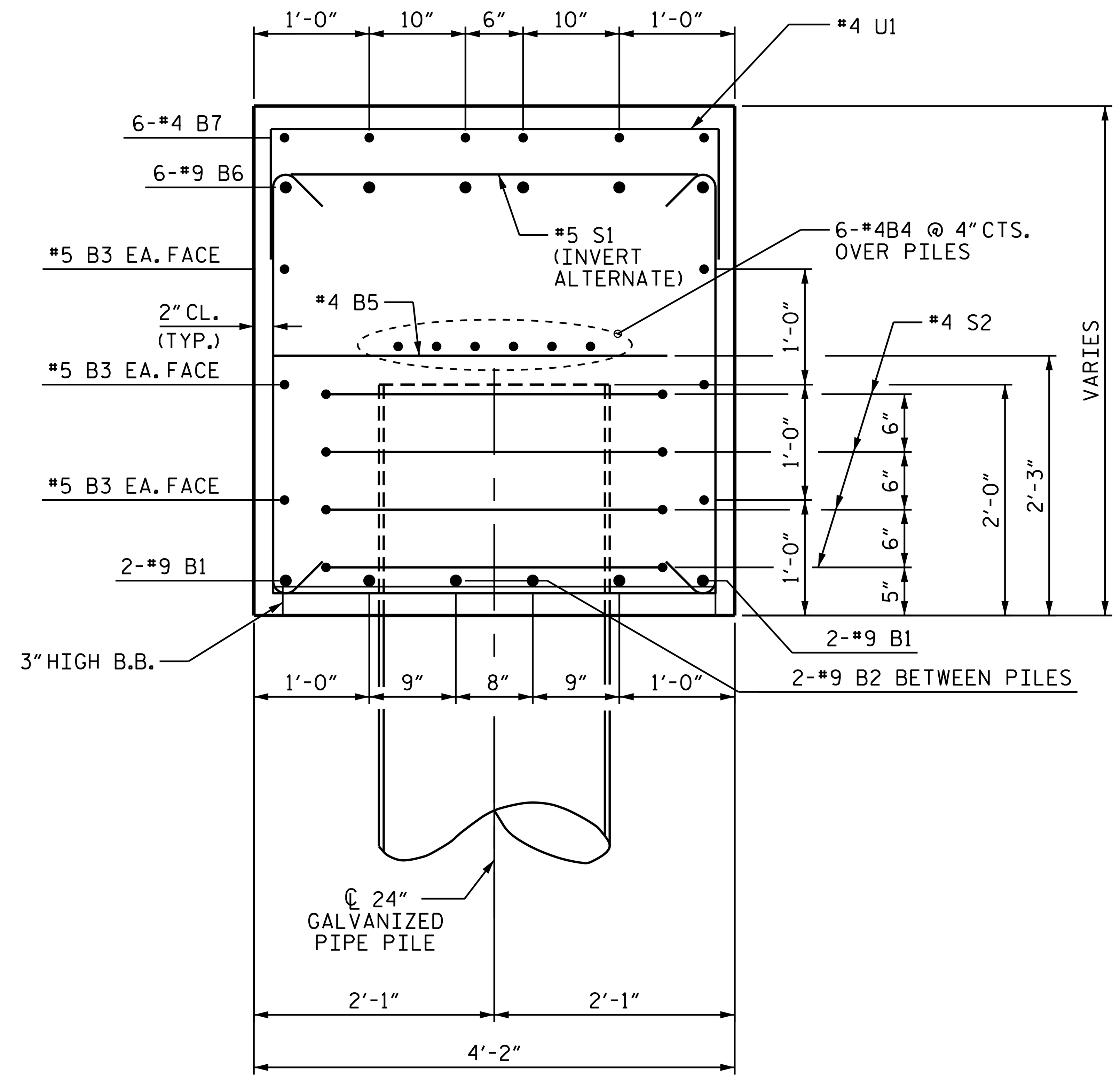
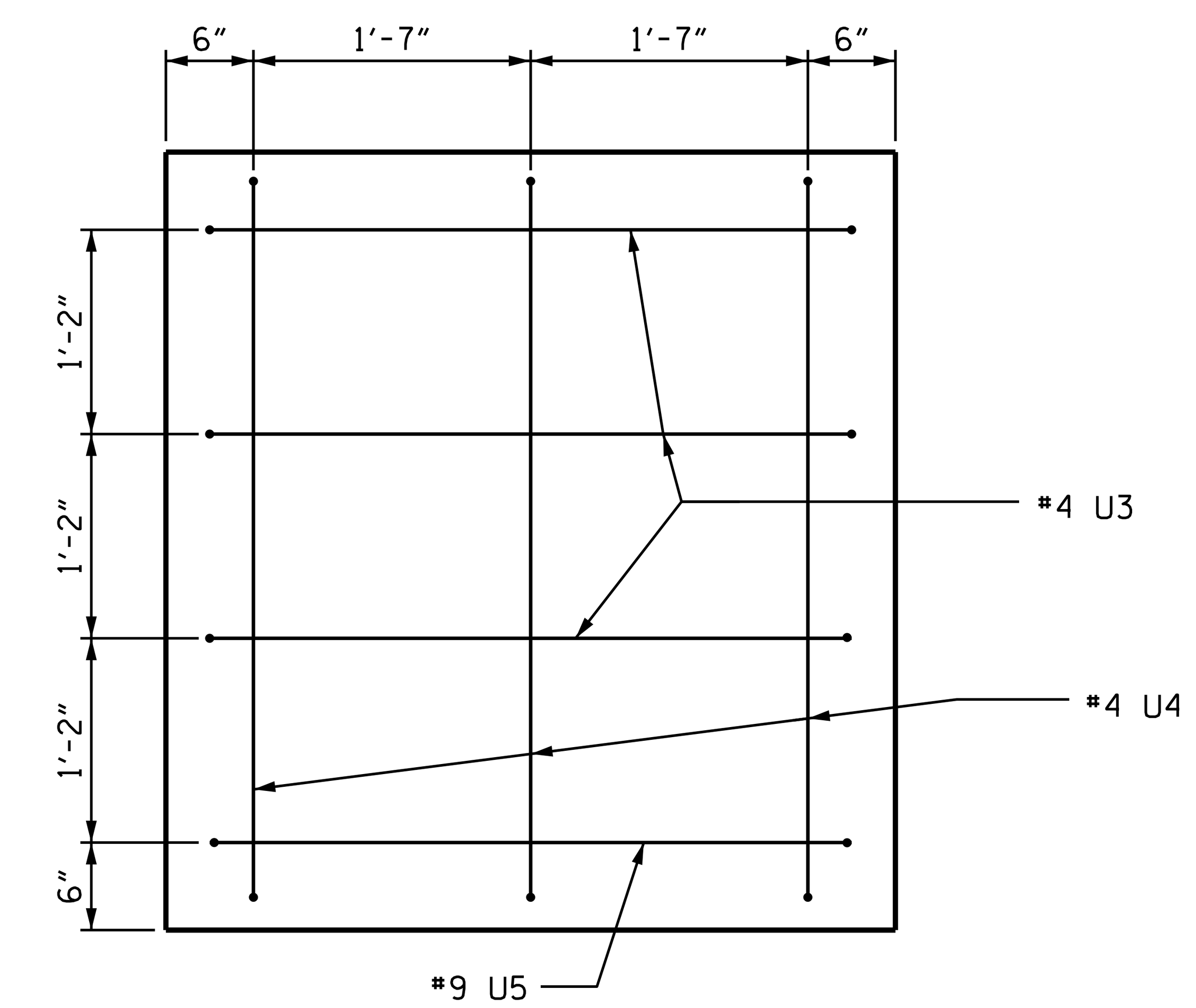
STR#17



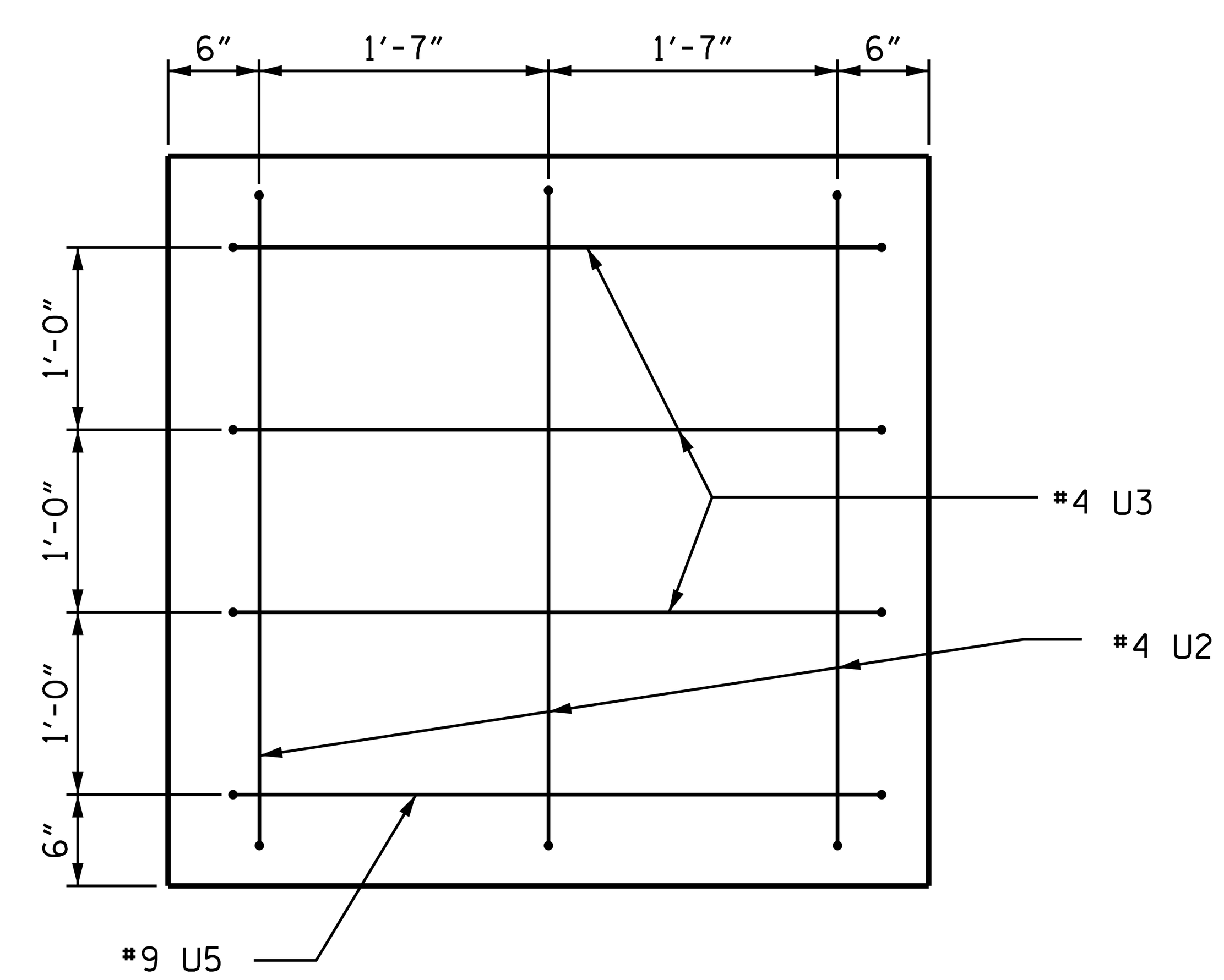
SECTION A-A



SECTION B-B

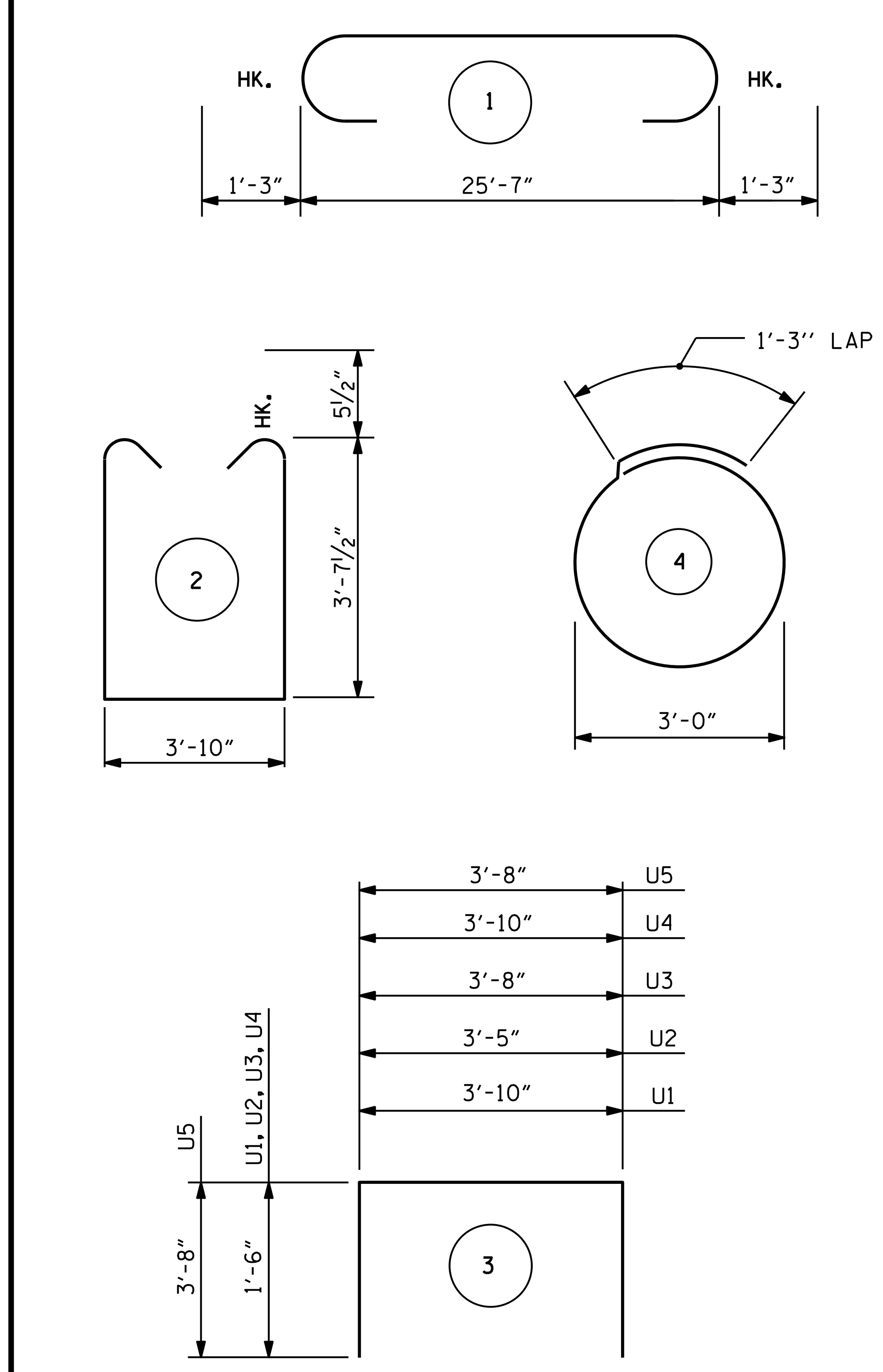


LEFT END VIEW



RIGHT END VIEW

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	STR	25'-9"	350
B2	6	#9	STR	4'-8"	95
B3	6	#5	STR	25'-9"	161
B4	6	#4	STR	25'-9"	103
B5	7	#4	STR	3'-10"	18
B6	6	#9	1	28'-1"	573
B7	6	#4	STR	15'-2"	61
S1	32	#5	2	12'-0"	401
S2	16	#4	4	10'-8"	114
U1	31	#4	3	6'-10"	142
U2	3	#4	3	6'-5"	13
U3	6	#4	3	6'-8"	27
U4	3	#4	3	6'-10"	14
U5	2	#9	3	11'-0"	75

REINFORCING STEEL 2147 LBS

TOTAL CLASS A CONCRETE ▲ 15.9 C.Y.

PP 24 X 0.50 GALVANIZED STEEL PILES
NO. 4 260 LIN. FT.

PILE REDRIVES EA. 2

PILE PLATES EA. 4

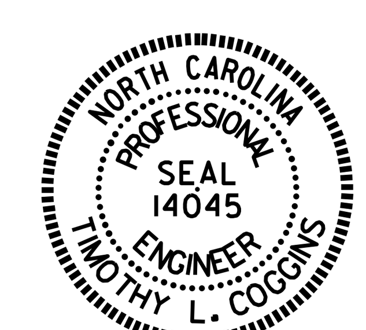
▲ CONCRETE DISPLACED BY THE PP 24 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT NO.1



DocuSigned by: Tim Coggins
3/23/2015

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S17-023
1			3					TOTAL SHEETS
2			4					32

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 9/25/14
CHECKED BY : M.D. PISO DATE : 10/21/14
DESIGN ENGINEER OF RECORD: NEIL RUFFIN DATE : 1/29/15

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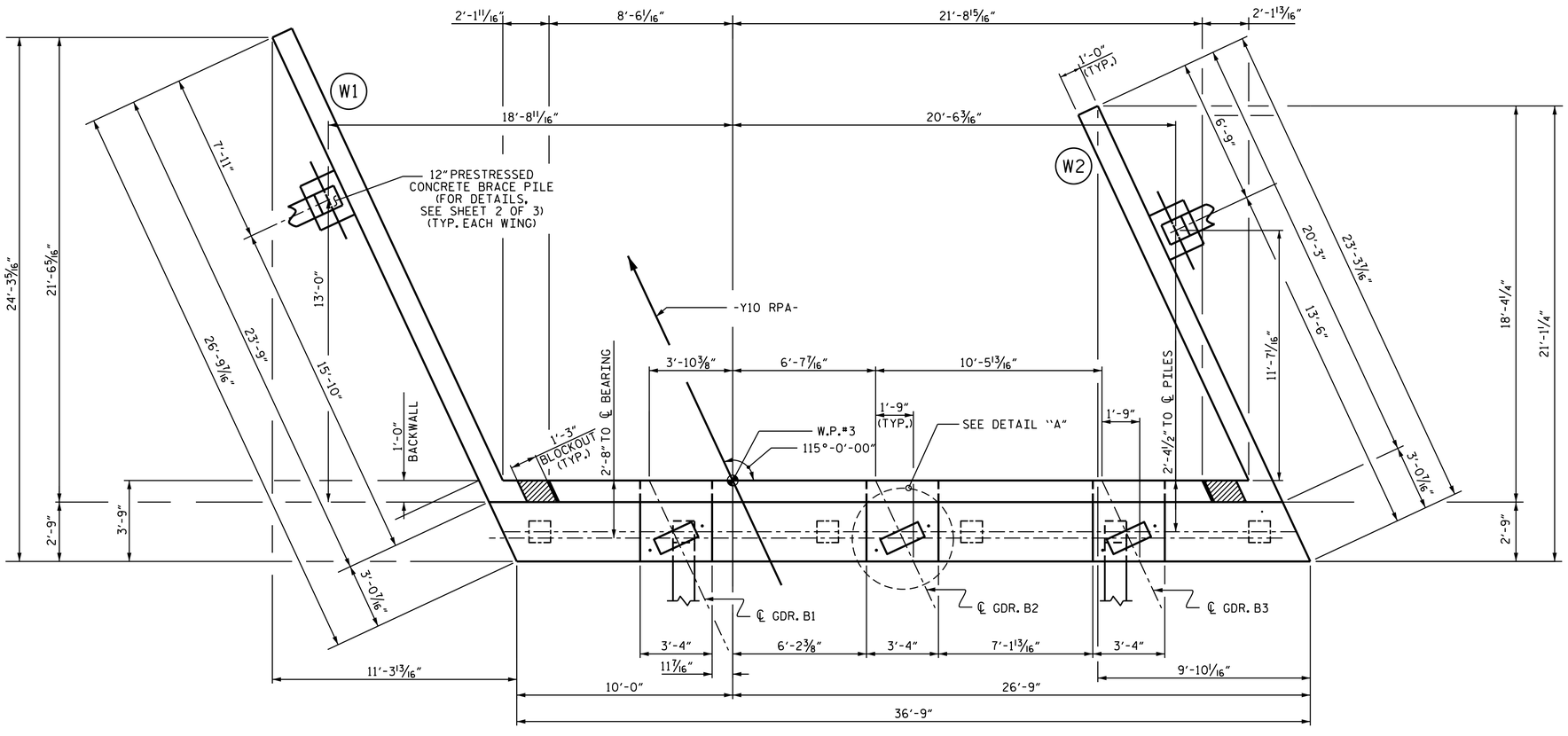
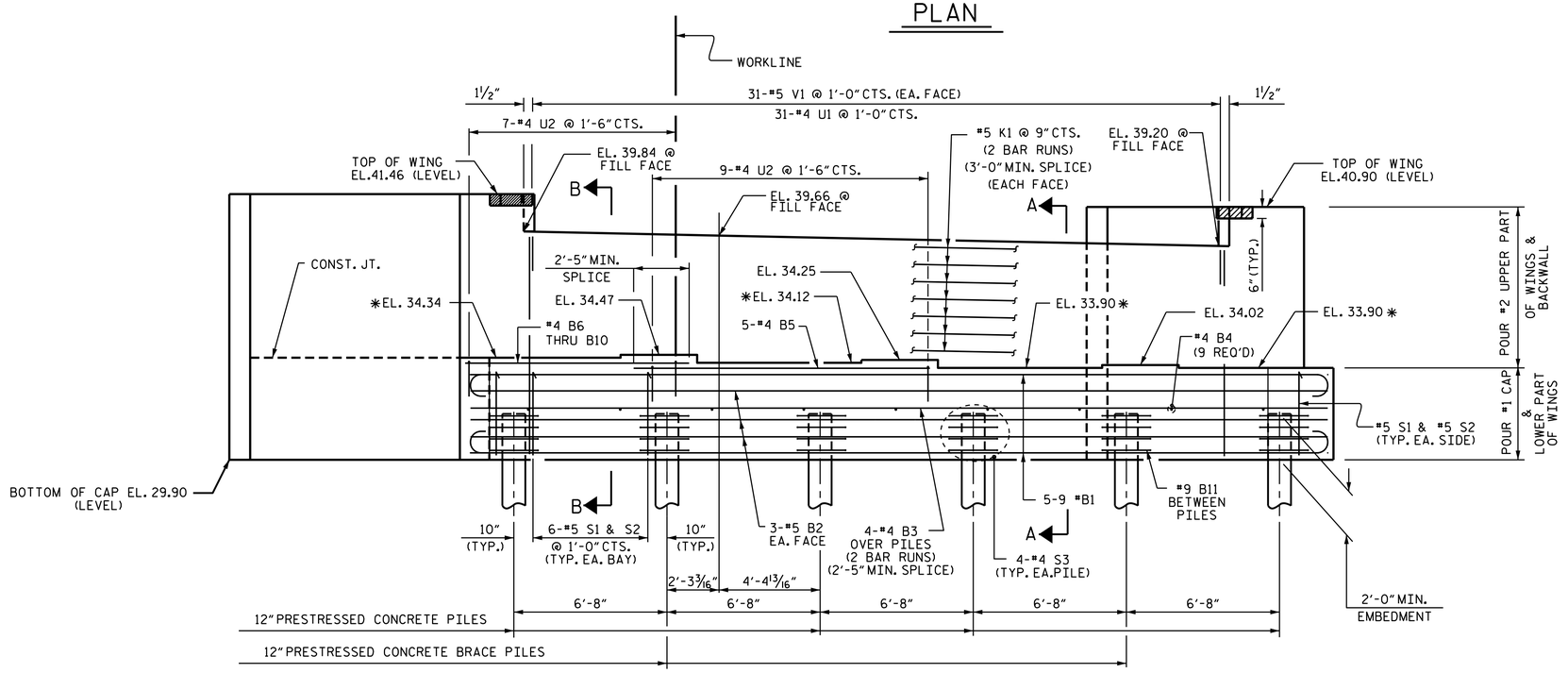
kpaschal

STR#17



PLAN



ELEVATION

NOTES:

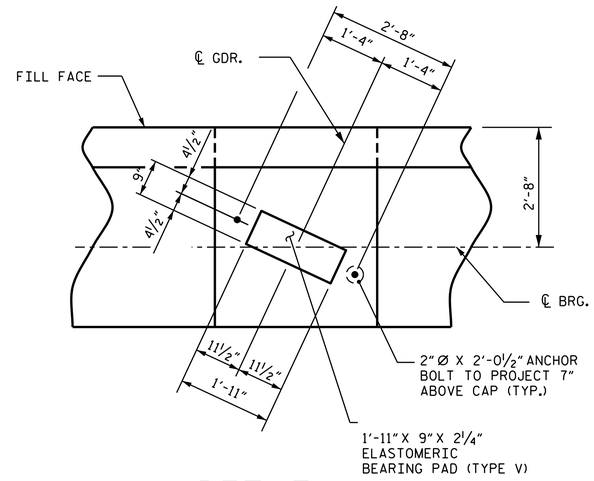
STIRRUPS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY 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 END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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



DETAIL A

(TYP. EACH GDR.)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT NO.2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-024
1			3			TOTAL SHEETS
2			4			32

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 10/17/14
CHECKED BY : M.D. PISO DATE : 10/22/14
DESIGN ENGINEER OF RECORD: NEIL RUFFIN DATE : 1/29/15

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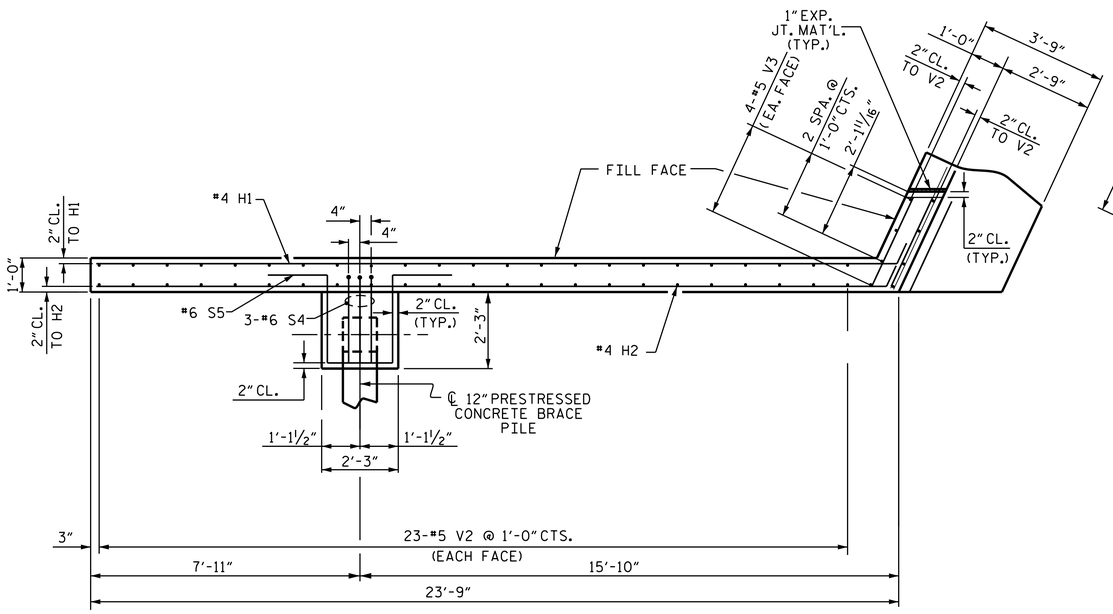
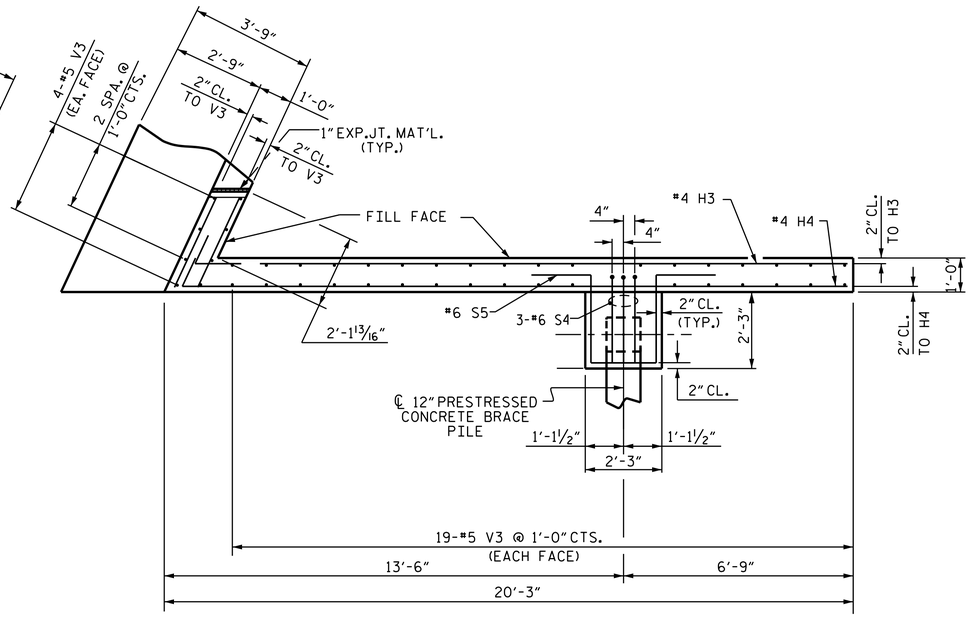
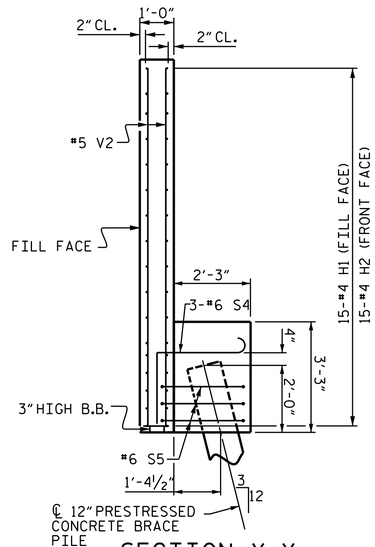


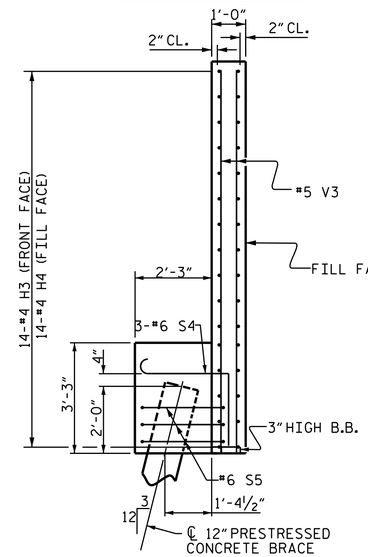
PLAN OF LEFT WING (W1)



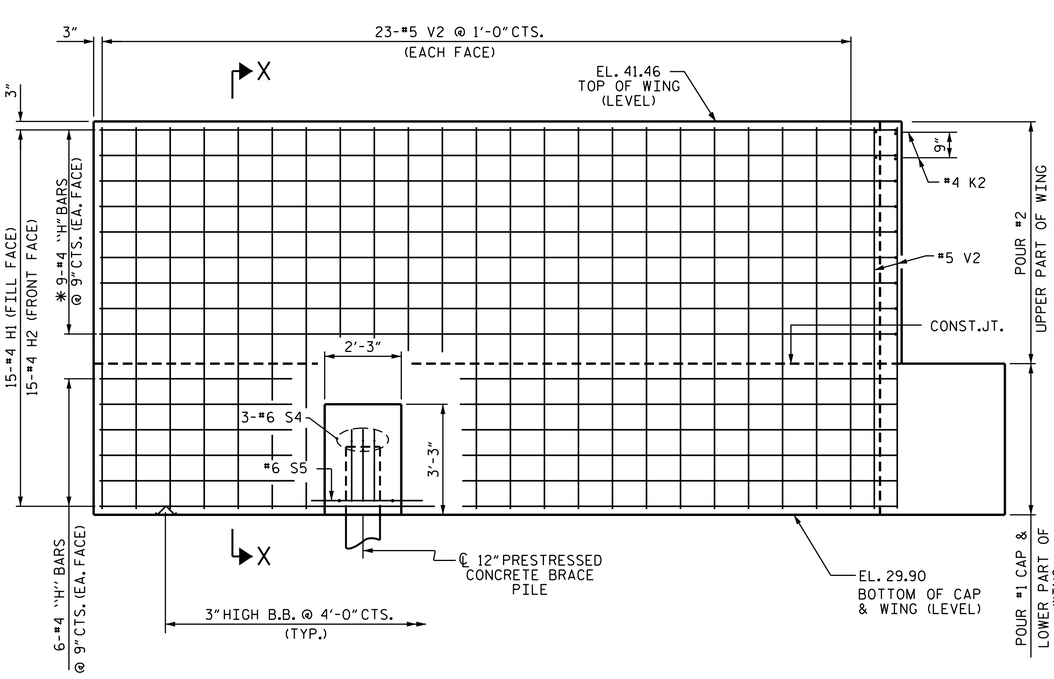
PLAN OF RIGHT WING (W2)



SECTION X-X

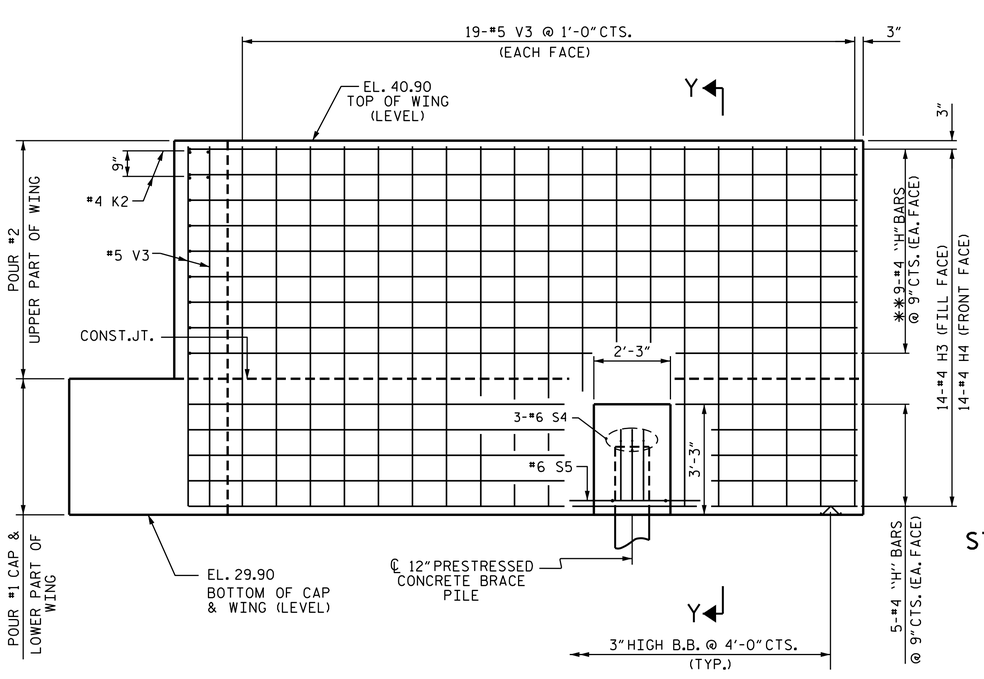


SECTION Y-Y



ELEVATION OF LEFT WING (W1)

* MATCH #4 H1 & #4 H2 TO "K" BARS IN BACKWALL



ELEVATION OF RIGHT WING (W2)

** MATCH #4 H3 & #4 H4 TO "K" BARS IN BACKWALL

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4AB08FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES/CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-025
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 10/23/14
CHECKED BY : M.D.PISO DATE : 10/22/14
DESIGN ENGINEER OF RECORD: NEIL RUFFIN DATE : 6/13/14

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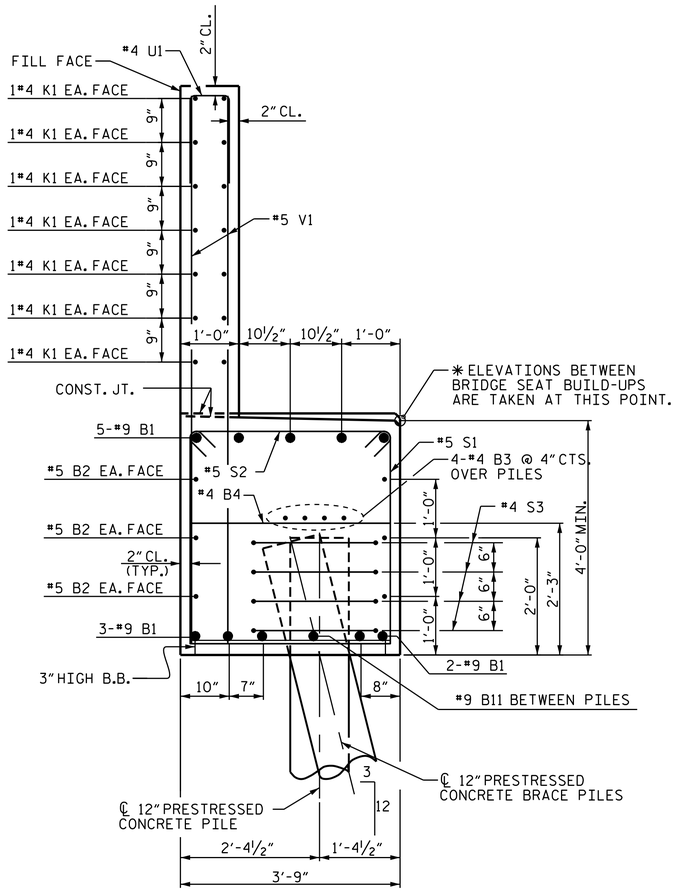
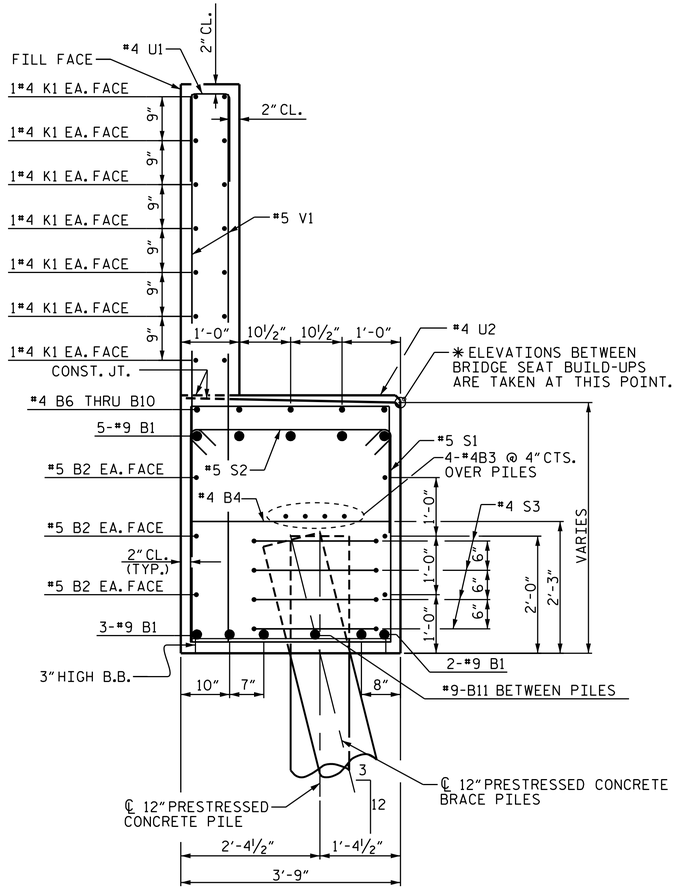
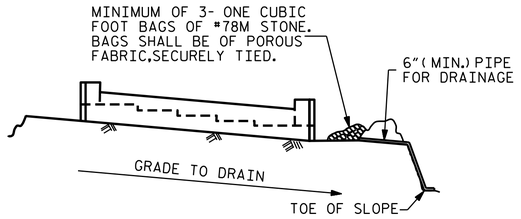


SECTION A-A



SECTION B-B



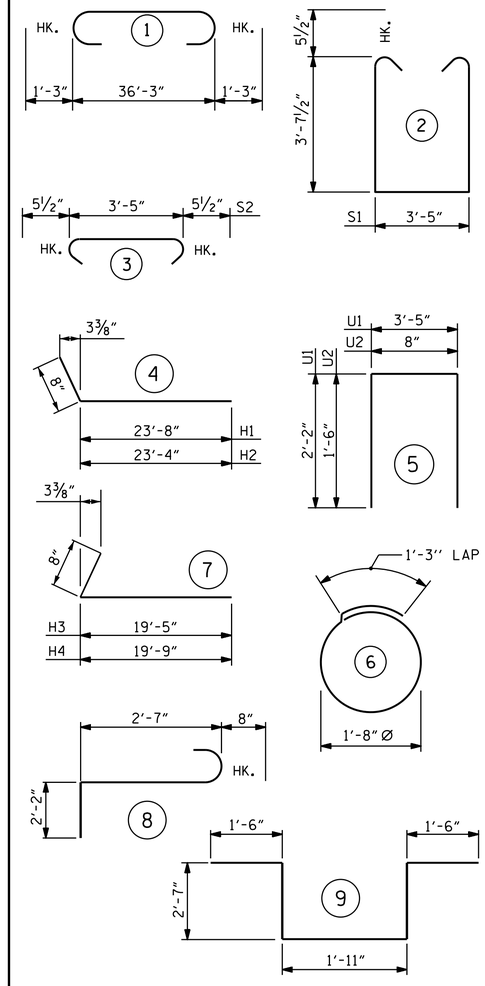
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	38'-9"	1318
B2	6	#5	STR	36'-5"	228
B3	8	#4	STR	19'-5"	104
B4	9	#4	STR	3'-5"	20
B5	5	#4	STR	12'-8"	42
B6	1	#4	STR	8'-1"	5
B7	1	#4	STR	8'-3"	6
B8	1	#4	STR	9'-0"	6
B9	1	#4	STR	9'-3"	6
B10	1	#4	STR	9'-7"	6
B11	5	#9	STR	5'-4"	91
H1	15	#4	4	24'-4"	244
H2	15	#4	4	24'-0"	240
H3	14	#4	7	20'-1"	188
H4	14	#4	7	20'-5"	191
K1	28	#5	STR	19'-5"	567
K2	8	#4	STR	2'-11"	16
S1	32	#5	2	11'-7"	387
S2	32	#5	3	4'-4"	145
S3	24	#4	6	6'-6"	104
S4	6	#6	8	5'-5"	49
S5	2	#6	9	10'-1"	30
U1	31	#4	5	3'-8"	76
U2	16	#4	5	6'-5"	69
V1	62	#5	STR	8'-11"	577
V2	54	#5	STR	11'-2"	629
V3	46	#5	STR	10'-11"	524

REINFORCING STEEL 5868 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, WING BRACE & LOWER PART OF WINGS ▲28.7 CU. YDS.

POUR #2 BACKWALL & UPPER PART OF WINGS 18.7 CU. YDS.

TOTAL CLASS A CONCRETE 47.4 CU. YDS.

12" PRESTRESSED CONCRETE PILES

NO. 8 280 LIN. FT.

PILE REDRIVES 3 EACH

▲-CONCRETE DISPLACED BY THE 12" P/S CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

PROJECT NO. R-2514D

JONES/CRAVEN COUNTY

STATION: 19+43.00 -Y10-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-026
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : GHOLAMREZA KOUCHEKI DATE : 10/21/14
CHECKED BY : M.D. PISO DATE : 10/22/14
DESIGN ENGINEER OF RECORD: NEIL RUFFIN DATE : 1/29/15

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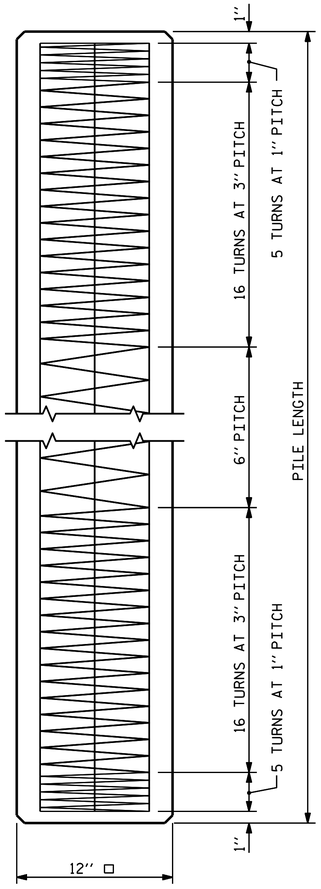
STR. #17



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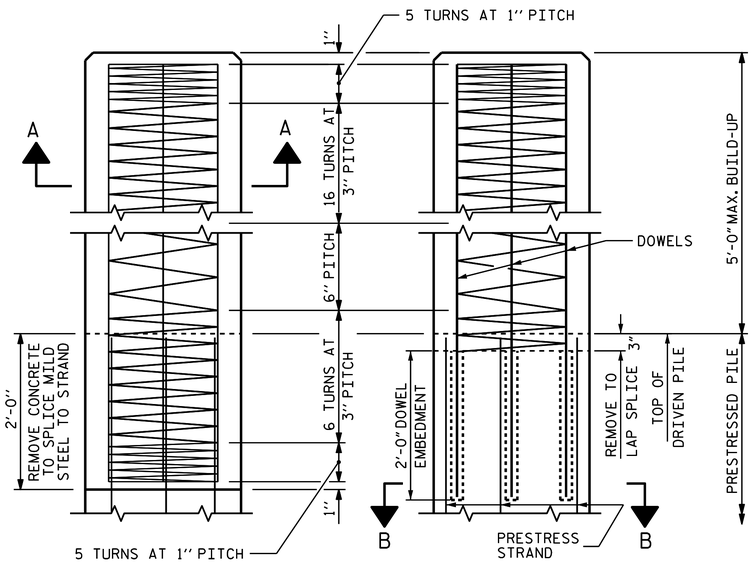
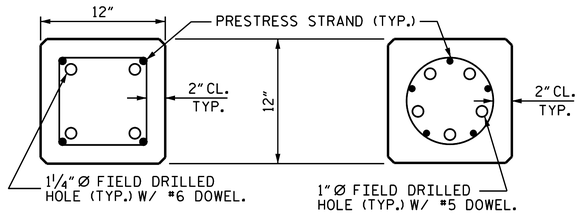


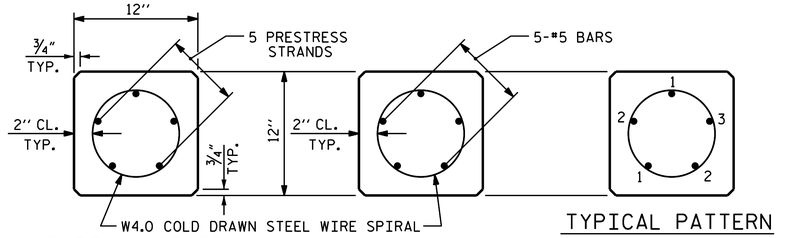
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



SECTION ''B-B''

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

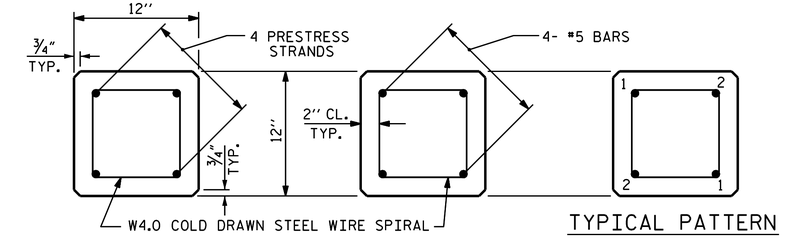


TYPICAL SECTION

SECTION ''A-A''

TYPICAL PATTERN FOR BURNING STRANDS

½'' OR 0.6'' Ø GRADE 270 L.R. PRESTRESS STRANDS



TYPICAL SECTION

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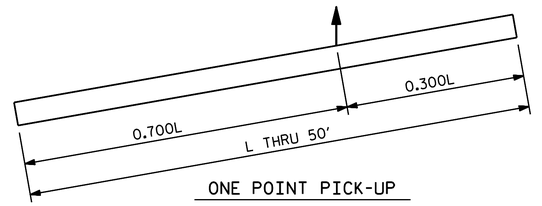
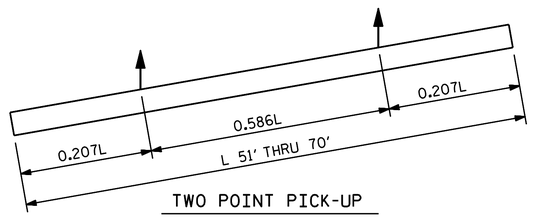


ONE POINT PICK-UP



TWO POINT PICK-UP

PICK-UP POINTS

QUANTITIES FOR ONE 12'' PRESTRESSED PILE						
	CONCRETE	PILE WT.	ONE POINT PICK-UP		TWO POINT PICK-UP	
LENGTH	CU. YDS.	TONS	0.300L	0.700L	0.207L	0.586L
25'-0''	0.91	1.85	7'-6''	17'-6''		
30'-0''	1.10	2.22	9'-0''	21'-0''		
35'-0''	1.28	2.59	10'-6''	24'-6''		
40'-0''	1.46	2.96	12'-0''	28'-0''		
45'-0''	1.64	3.33	13'-6''	31'-6''		
50'-0''	1.83	3.72	15'-0''	35'-0''		
55'-0''	2.01	4.09			11'-4½''	32'-3''
60'-0''	2.19	4.46			12'-5''	35'-2''
65'-0''	2.38	4.81			13'-5½''	38'-1''
70'-0''	2.57	5.18			14'-6''	41'-0''

NOTES

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

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

STRAND DATA:

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

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

AT THE CONTRACTOR'S OPTION, ½'' OR 0.6'' STRANDS MAY BE USED IN EITHER THE 4 OR 5 STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED.

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

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

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

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

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

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

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

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

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

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

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN ½'' CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

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

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

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

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00-Y10RPA-

ASSEMBLED BY : REZA KOUCHEKI DATE : 9/24/14
CHECKED BY : M.D.PISO DATE : 10/23/14

DRAWN BY : FCJ 7/88
CHECKED BY : CRK 3/89

REVISIONS		
REV. 5/1/06R	TLA/GM	
REV. 11/30/10	WMC/GM	
REV. 10/1/11	MAA/GM	

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B... 3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

12'' PRESTRESSED CONCRETE PILE

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

SHEET NO. S17-027

TOTAL SHEETS 32

STD. NO. PCP1

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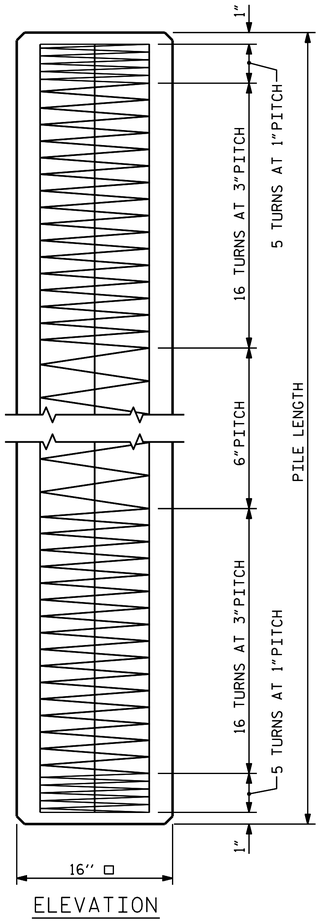

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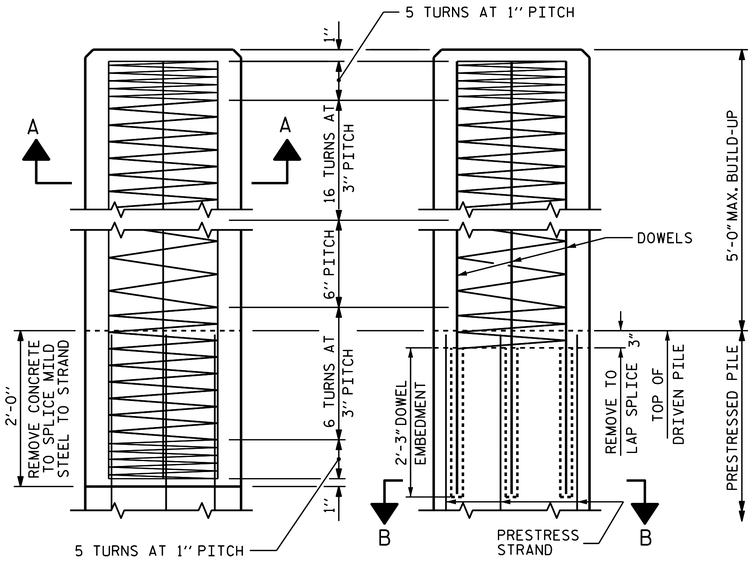
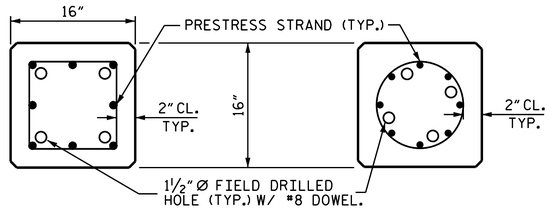


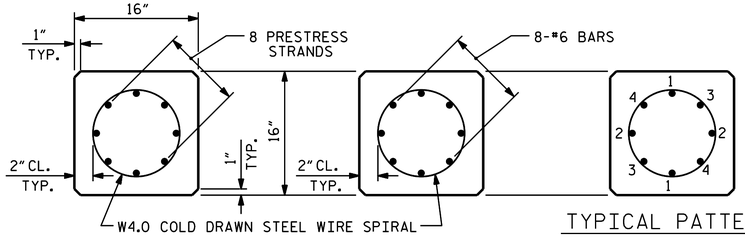
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



SECTION "B-B"

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

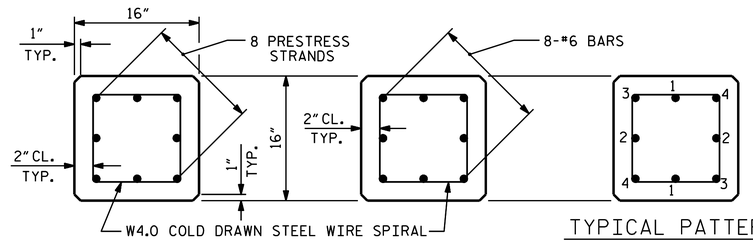


TYPICAL SECTION

SECTION "A-A"

TYPICAL PATTERN FOR BURNING STRANDS

½" OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



TYPICAL SECTION

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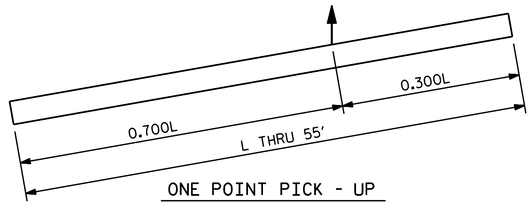
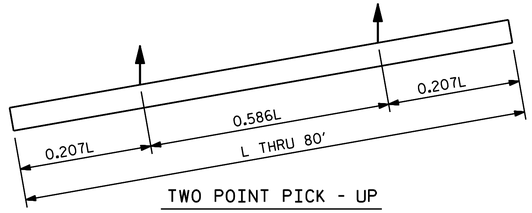


ONE POINT PICK - UP



TWO POINT PICK - UP

PICK - UP POINTS

QUANTITIES FOR ONE 16" PRESTRESSED PILE

LENGTH	CONCRETE CU. YDS.	PILE WT. TONS	ONE POINT PICK-UP 0.300L	ONE POINT PICK-UP 0.700L	TWO POINT PICK-UP 0.207L	TWO POINT PICK-UP 0.586L
25'-0"	1.63	3.31	7'-6"	17'-6"	5'-2"	14'-8"
30'-0"	1.96	3.97	9'-0"	21'-0"	6'-2½"	17'-7"
35'-0"	2.29	4.63	10'-6"	24'-6"	7'-3"	20'-6"
40'-0"	2.61	5.29	12'-0"	28'-0"	8'-3½"	23'-5"
45'-0"	2.94	5.95	13'-6"	31'-6"	9'-4"	26'-4"
50'-0"	3.27	6.61	15'-0"	35'-0"	10'-4"	29'-4"
55'-0"	3.59	7.28	16'-6"	38'-6"	11'-4½"	32'-3"
60'-0"	3.92	7.94			12'-5"	35'-2"
65'-0"	4.25	8.60			13'-5½"	38'-1"
70'-0"	4.57	9.26			14'-6"	41'-0"
75'-0"	4.90	9.92			15'-6½"	43'-11"
80'-0"	5.23	10.58			16'-7"	46'-10"

NOTES

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

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

STRAND DATA:

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

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

AT THE CONTRACTOR'S OPTION, ½" OR 0.6" STRANDS MAY BE USED IN EITHER STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED.

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

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

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN. FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES. STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 3-3 AND 4-4, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

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

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

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

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

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

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

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

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN ½" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

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

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

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

PROJECT NO. R-2514D

JONES & CRAVEN **COUNTY**

STATION: 19+43.00-Y10RPA-

ASSEMBLED BY : REZA KOUCHEKI DATE : 9/24/14
CHECKED BY : M.D.PISO DATE : 10/23/14

DRAWN BY : RH 9/98
CHECKED BY : LES 10/98

REVISIONS		
REV. 5/1/06R	TLA/GM	
REV. 11/30/10	WMC/GM	
REV. 10/1/11	MAA/GM	

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D49FA47B...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

16" PRESTRESSED CONCRETE PILE

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

SHEET NO. S17-028
TOTAL SHEETS 32

STD. NO. PCP2

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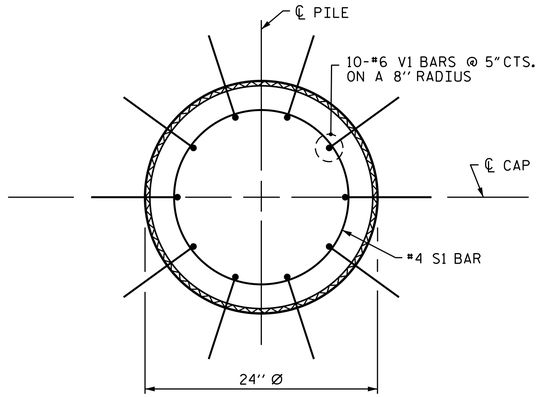
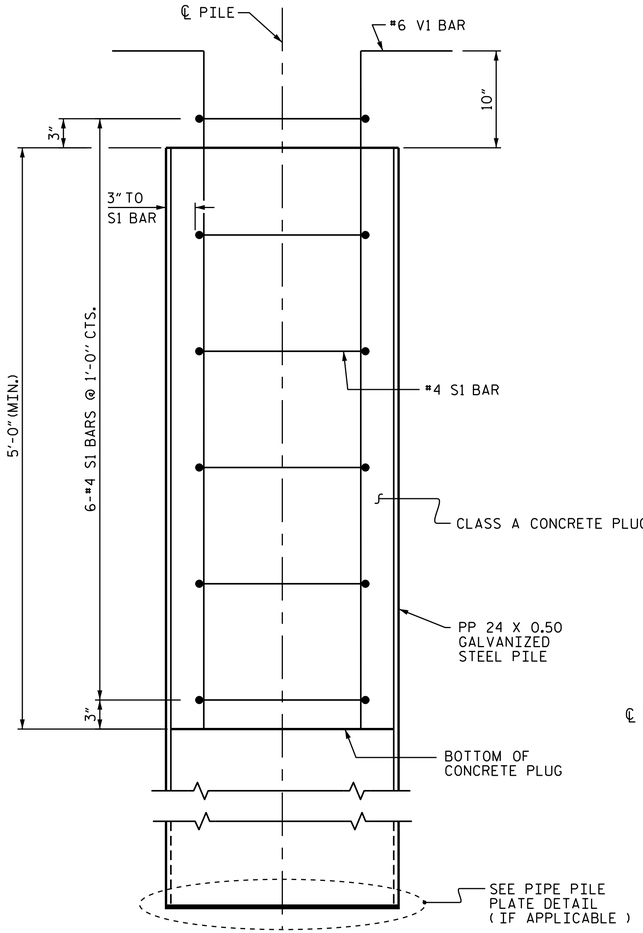


PLAN



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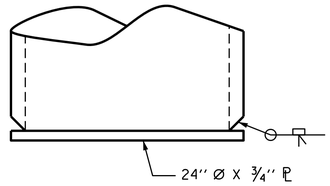
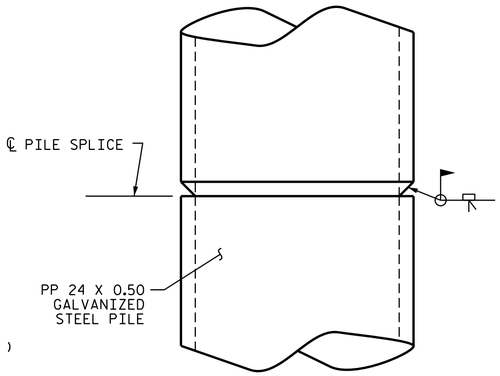


PIPE PILE PLATE DETAIL



PIPE PILE SPLICE DETAIL

PP 24 X 0.50 GALVANIZED STEEL PILE

(CLOSED END)

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.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.50 GALVANIZED STEEL PILES.

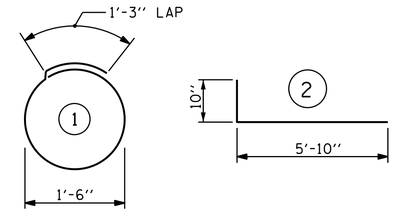
BILL OF MATERIAL FOR ONE PP 24 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	6'-0"	24
V1	10	#6	2	6'-8"	100
REINFORCING STEEL =				124	lbs

CLASS A CONCRETE

5'-0" MINIMUM PLUG 0.5 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

24" STEEL PIPE PILE

ASSEMBLED BY : REZA KOUCHEKI	DATE : 9/24/14
CHECKED BY : M.D. PISO	DATE : 10/22/14
DRAWN BY : TLA 8/05	ADDED 10/1/05 MAA/KMM
CHECKED BY : GM 9/05	REV. 5/1/06R MAA/GM
	REV. 10/1/11 MAA/GM

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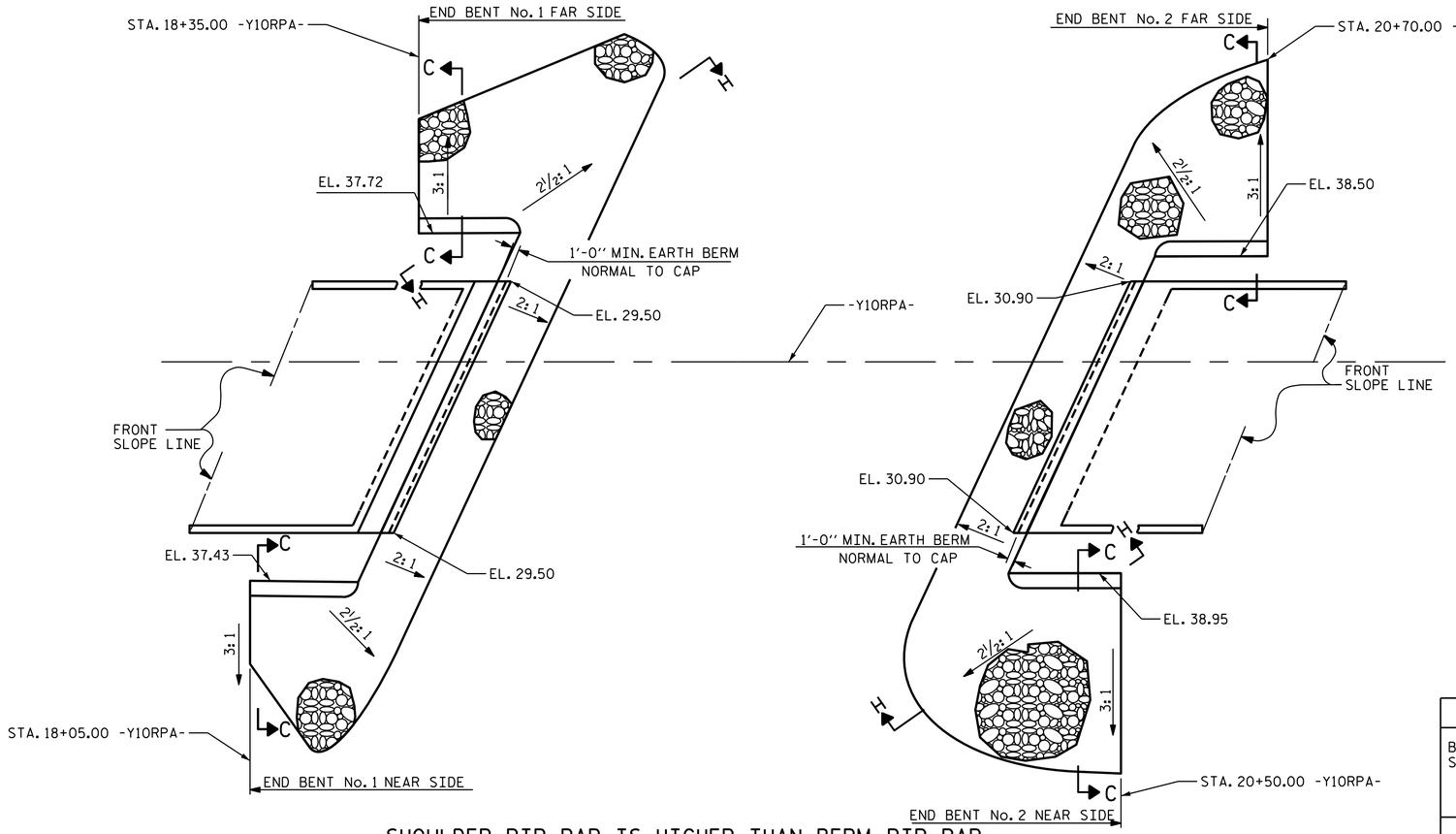
NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFDA8D48EFA47B...
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-029
1			3			TOTAL SHEETS
2			4			32

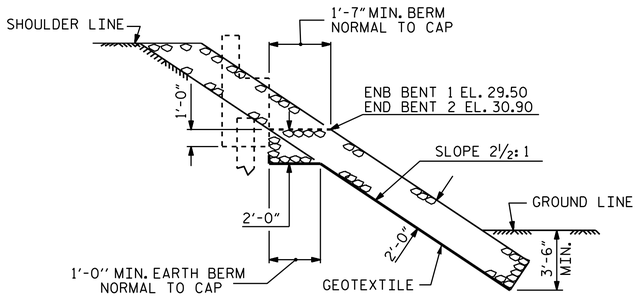
STR#17 STD. NO. SPP4



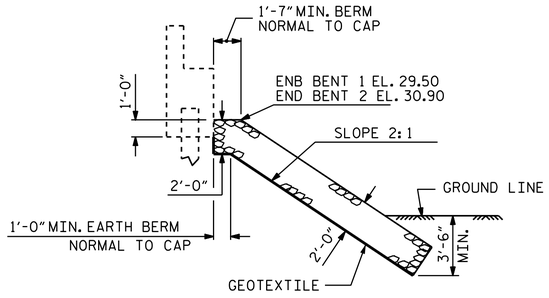
SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP

PLAN

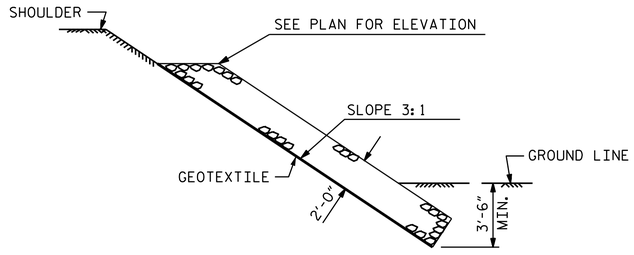
ESTIMATED QUANTITIES		
BRIDGE @ STA. 19+43.00 -Y10RPA-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	190	208
END BENT 2	155	168



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-030
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : N. Raffin DATE : 12/18/14
CHECKED BY : B.N. BARODAWALA DATE : 1/15/15
DRAWN BY : REK 1/84
CHECKED BY : RDU 1/84
REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM

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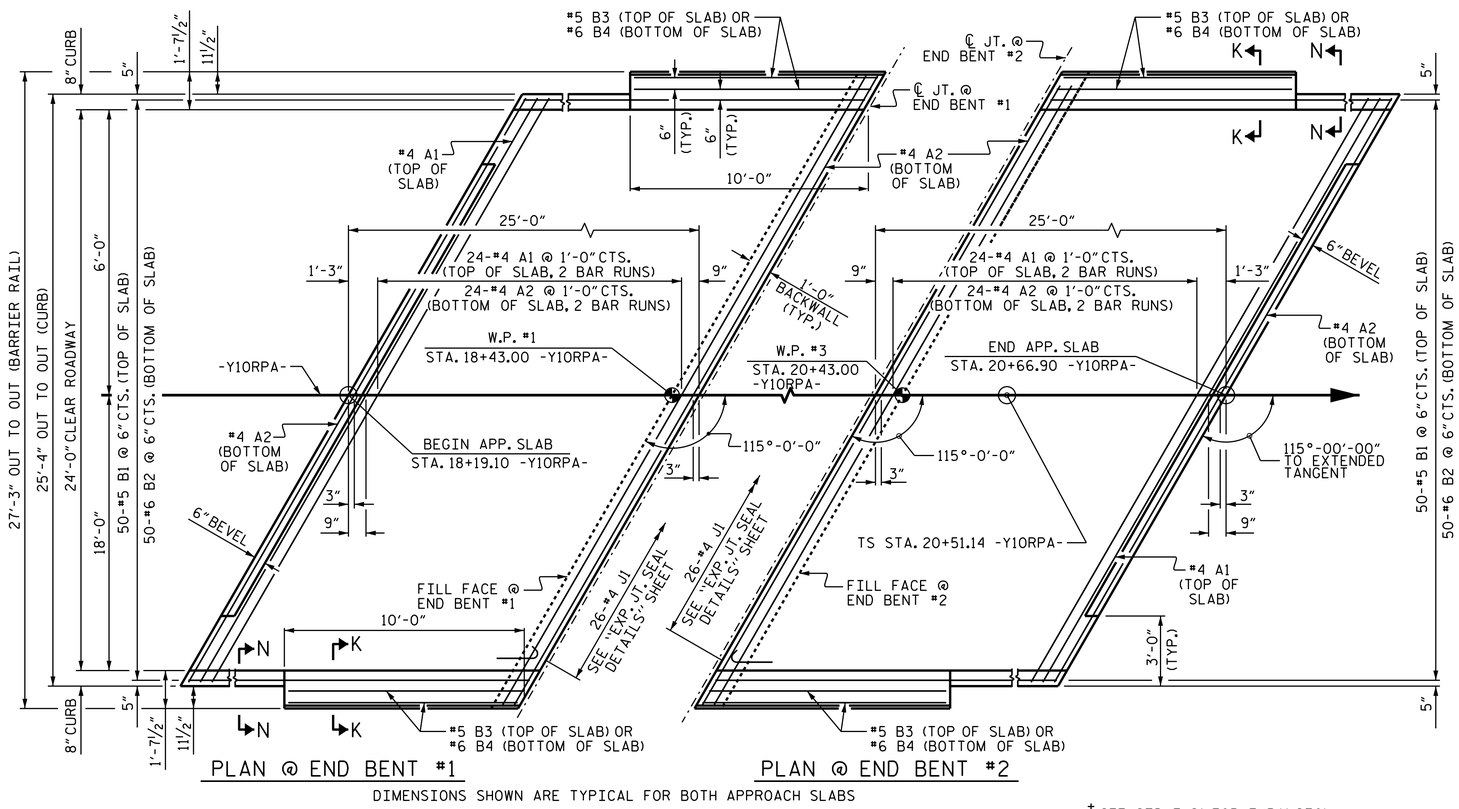
STR. 17

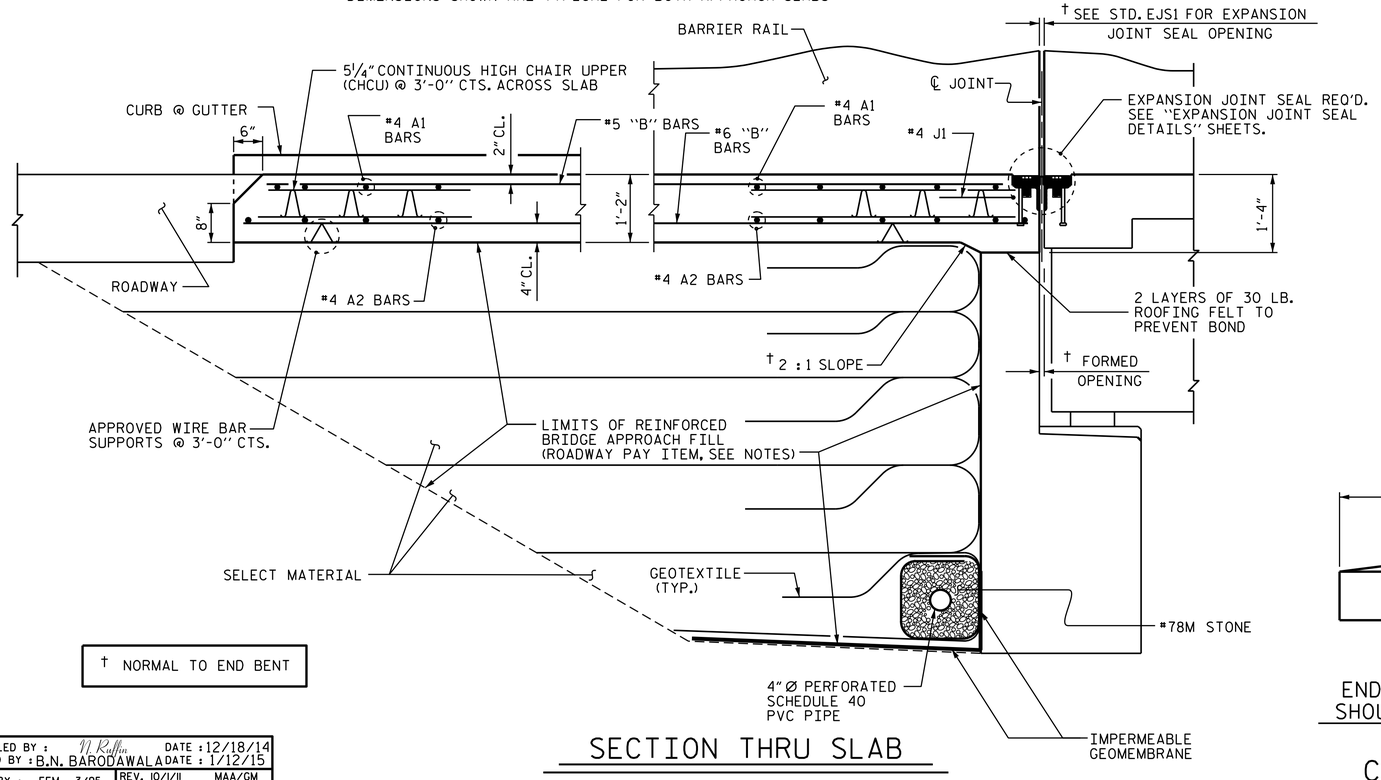
STD. NO. RR1 (Sht 3)



PLAN @ END BENT #1

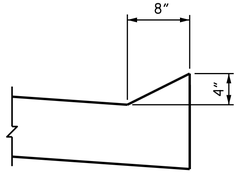
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB



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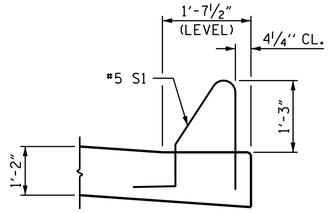
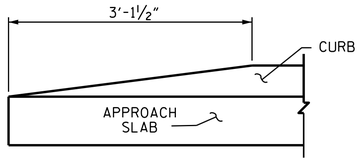


SECTION K-K



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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.

BILL OF MATERIAL

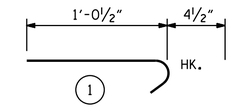
APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	50	#4	STR	15'-10"	529
A2	52	#4	STR	15'-8"	544
✱ B1	50	#5	STR	24'-2"	1260
B2	50	#6	STR	24'-5"	1834
✱ B3	4	#5	STR	9'-4"	39
B4	4	#6	STR	9'-8"	58
✱ J1	26	#4	1	1'-5"	25
REINFORCING STEEL ✱✱				LBS.	2,436
✱ EPOXY COATED REINFORCING STEEL				✱✱ LBS.	1,853
CLASS AA CONCRETE ✱✱				C.Y.	28.4

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	50	#4	STR	15'-10"	529
A2	52	#4	STR	15'-8"	544
✱ B1	50	#5	STR	24'-2"	1260
B2	50	#6	STR	24'-5"	1834
✱ B3	4	#5	STR	9'-4"	39
B4	4	#6	STR	9'-8"	58
✱ J1	26	#4	1	1'-5"	25
REINFORCING STEEL ✱✱				LBS.	2,436
✱ EPOXY COATED REINFORCING STEEL				✱✱ LBS.	1,853
CLASS AA CONCRETE ✱✱				C.Y.	28.4

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT.

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 2.

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

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 14045 ENGINEER TIMOTHY L. COGGINS
Docusigned by: Tim Coggins DEFDA8D48FA47B...
3/23/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 19+43.00 -Y10RPA-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-031
1			3			TOTAL SHEETS
2			4			32

STR. 17

STD. NO. BAS2 (SHT 4b)

ASSEMBLED BY : N Ruffin	DATE : 12/18/14		
CHECKED BY : B.N. BARODAWALA	DATE : 1/12/15		
DRAWN BY : EEM 3/95	REV. 10/1/11	MAA/GM	
CHECKED BY : VAP 3/95	REV. 12/21/11	MAA/GM	
	REV. 6/13	MAA/GM	

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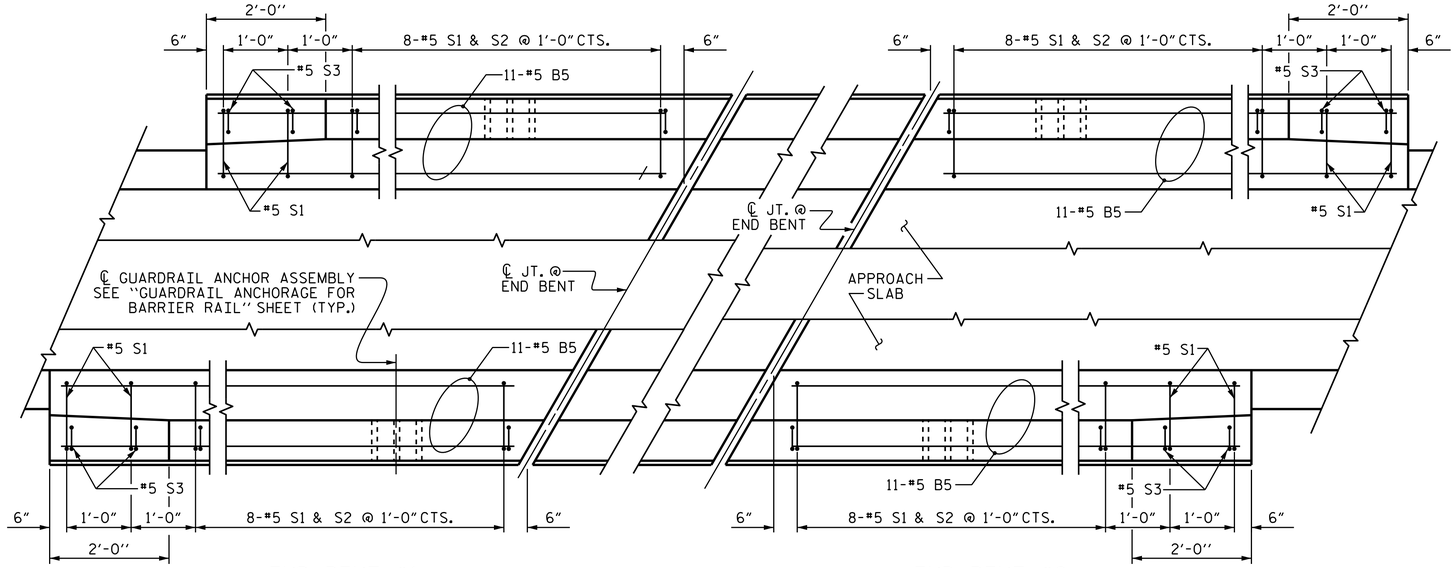


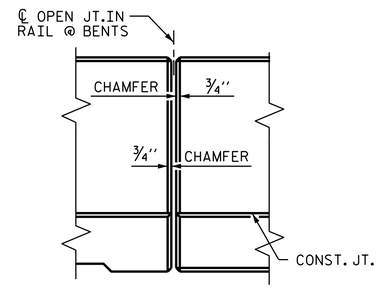
PLAN OF BARRIER RAIL

NOTES

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

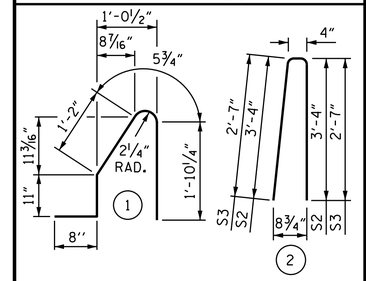
THE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.



ELEVATION AT EXPANSION JOINTS

BAR TYPES



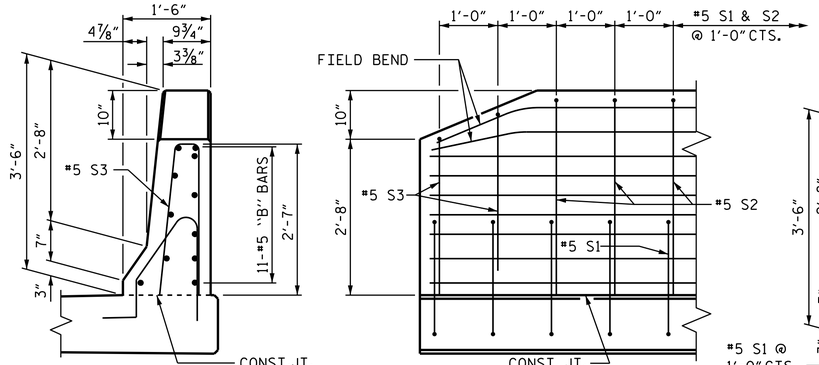
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

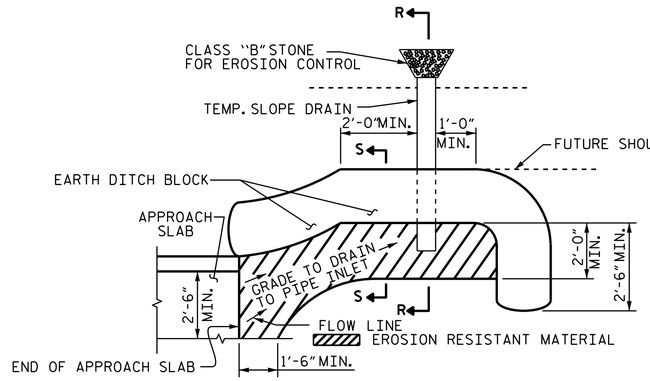
BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B5	44	#5	STR	9'-4"	428
* S1	40	#5	1	5'-1"	212
* S2	32	#5	2	7'-0"	234
* S3	8	#5	2	5'-6"	46
* EPOXY COATED REINFORCING STEEL				LBS.	920
CLASS AA CONCRETE				C.Y.	5.5
CONCRETE BARRIER RAIL				41.40	LIN.FT.

BARRIER RAIL DETAILS

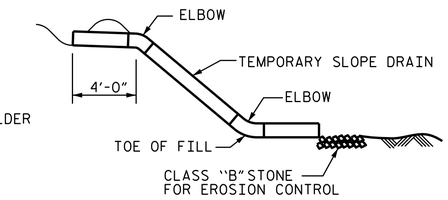


END OF RAIL DETAILS

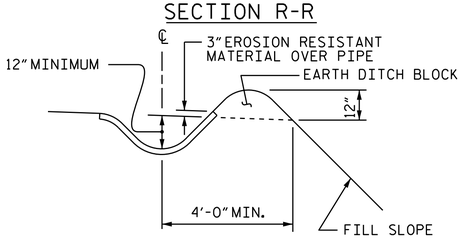


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

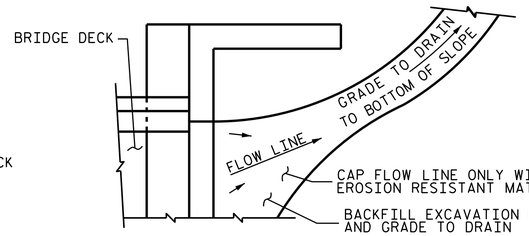
PLAN VIEW



SECTION R-R



SECTION S-S



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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ASSEMBLED BY : N. Raffin	DATE : 12/18/14		
CHECKED BY : B.N. BARODAWALA	DATE : 1/12/15		
DRAWN BY : FCJ 11/88	REV. 10/1/11	MAA/GM	
CHECKED BY : ARB 11/88	REV. 7/12	MAA/GM	
	REV. 6/13	MAA/GM	

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 19+43.00 -Y10RPA-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17-032
1			3			TOTAL SHEETS
2			4			32

STR. 17

STD. NO. BAS4 (SHT 3b)

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kpaschal

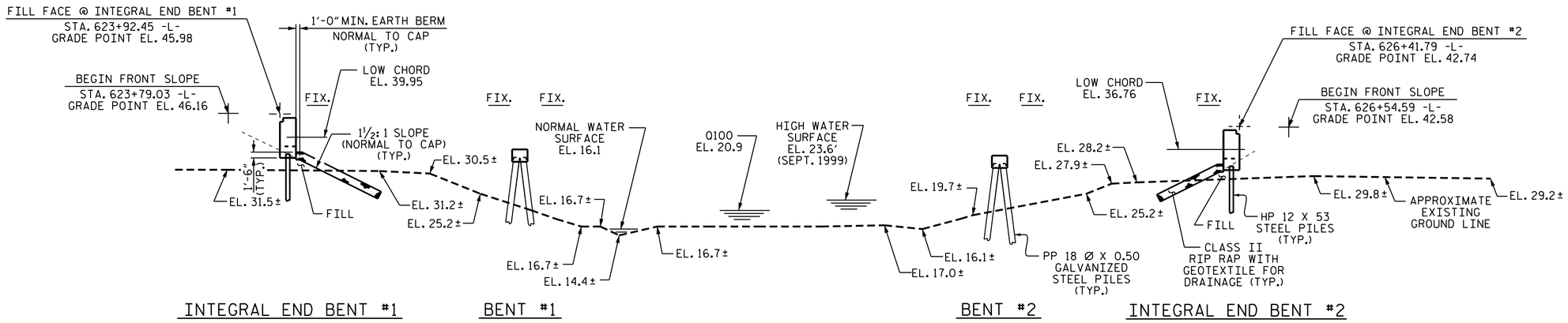
623+50 624+00 624+50 625+00 625+50 626+00 626+50 627+00

(+)2.2973% Δ(-)1.3000%

PI = 618+15.00 -L-
EL. = 53.49
VC = 910.00 FT.

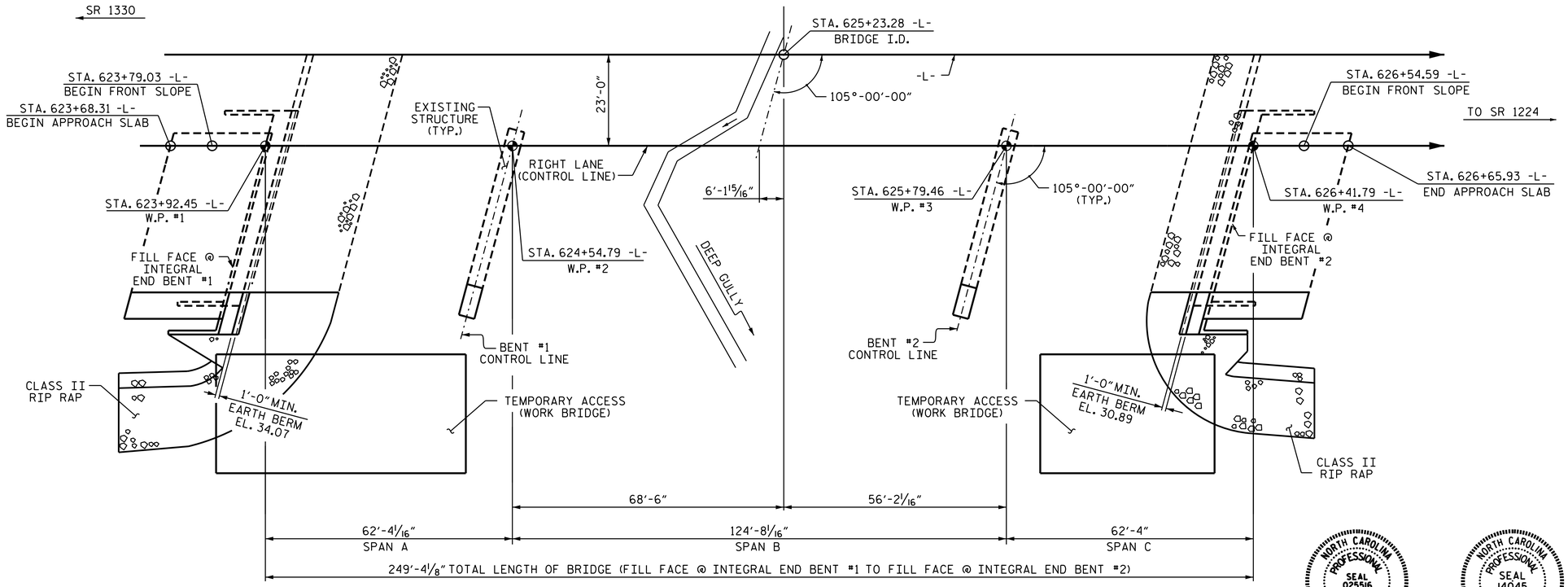
GRADE DATA

SPAN A SPAN B SPAN C



SECTION ALONG CONTROL LINE

BENTS ON SECTION AT RIGHT ANGLES TO BENTS



PLAN

PILES ARE NOT SHOWN IN PLAN VIEW FOR CLARITY.

DRAWN BY : D. G. ELY DATE : 1/26/15
CHECKED BY : B. N. BAROADWALA DATE : 1/27/15
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 02/2015

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NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
DocuSigned by: Emily Murray CAEB97AEDC5B4E0...
3/26/2015

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 1 OF 3 WIDENING OF BRIDGE #259

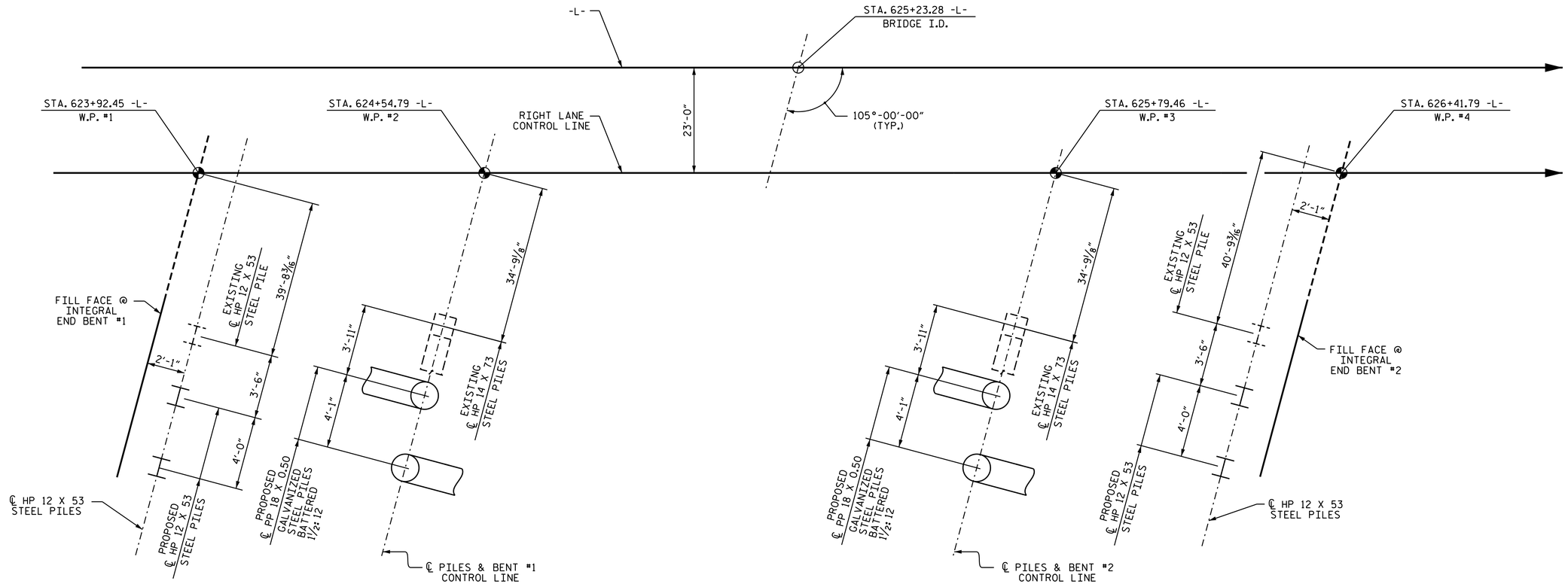
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR WIDENING OF BRIDGE OVER DEEP GULLY ON US 17 BETWEEN SR 1330 AND SR 1224

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-001
1			3			TOTAL
2			4			39

STR. #18



INTEGRAL END BENT #1 | BENT #1 | BENT #2 | INTEGRAL END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT INTEGRAL END BENT 1 AND INTEGRAL END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.

DRIVE PILES AT INTEGRAL END BENT 1 AND INTEGRAL END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 190 TONS PER PILE.

DRIVE PILES AT BENT 1 TO A REQUIRED DRIVING RESISTANCE OF 275 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

PILES AT BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 195 TONS PER PILE.

DRIVE PILES AT BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 260 TONS PER PILE.

INSTALL PILES AT BENT 1 AND BENT 2 TO A TIP ELEVATION NO HIGHER THAN -8.0 FEET AND -6.0 FEET, RESPECTIVELY.

THE SCOUR CRITICAL ELEVATION FOR BENT 1 IS ELEVATION 14.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 65-120 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT BENT 1 AND BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(DX2) OF THE STANDARD SPECIFICATIONS.

REMOVE EXISTING RIP RAP BEFORE DRIVING PILES AT INTEGRAL END BENT 1 AND INTEGRAL END BENT 2.

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/26/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR WIDENING OF
BRIDGE OVER DEEP GULLY
ON US 17
BETWEEN SR 1330 AND SR 1224

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-002
1			3			TOTAL SHEETS
2			4			39

STR. #18

DRAWN BY : D. G. ELY DATE : 1/27/15
CHECKED BY : B. N. BAROADAWALA DATE : 1/27/15
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 02/2015

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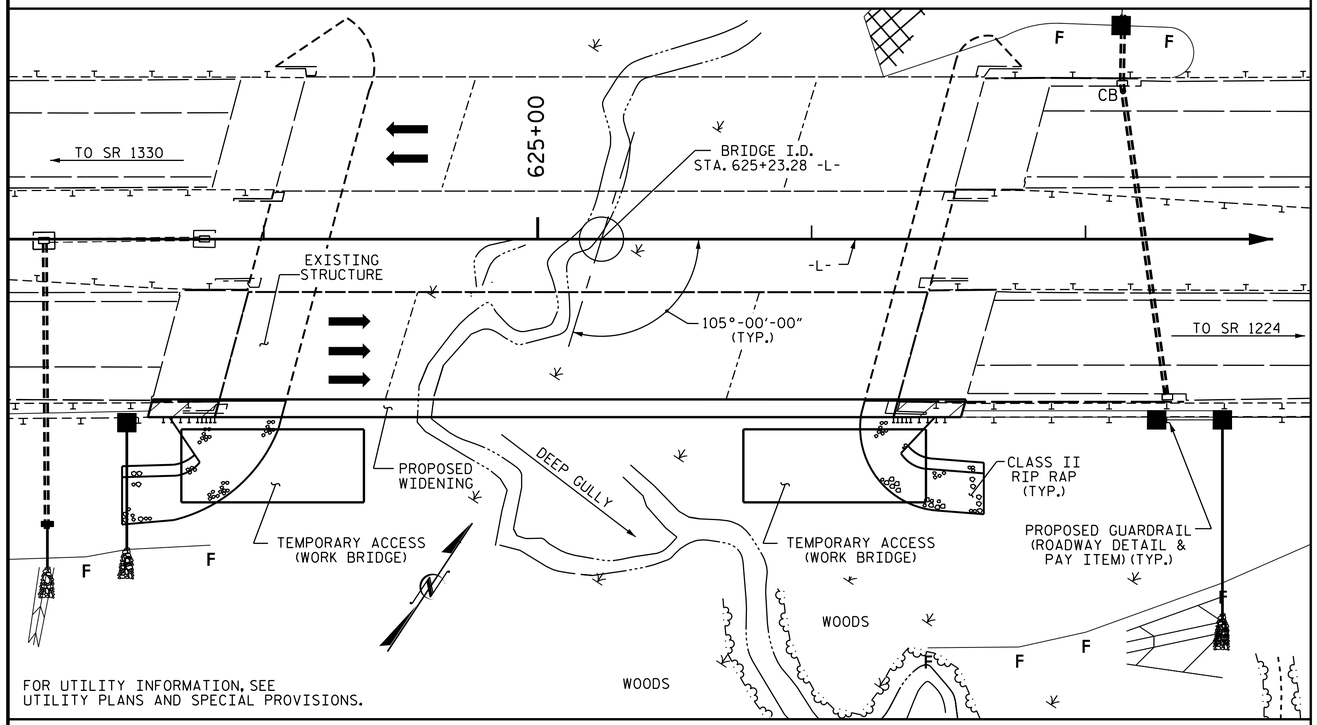
mruffin

B.M. #32: RAILROAD SPIKE IN 7"PINE, 608+78.00 -L-, 849' LT., ELEV. 36.79', NAVD 88.



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	=	445 C.F.S.
FREQUENCY OF DESIGN FLOOD	=	50 YRS.
DESIGN HIGH WATER ELEVATION	=	20.42'
DRAINAGE AREA	=	1.58 SQ. MI.
BASE DISCHARGE (Q100)	=	565 C.F.S.
BASE HIGH WATER ELEVATION	=	20.88'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	2825 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	=	500 YRS. +
OVERTOPPING FLOOD ELEVATION	=	39.09'

NOTES

ASSUMED LIVE LOAD = HS 25 OR ALTERNATE LOADING EXCEPT THE SUBSTRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THE SUPERSTRUCTURE OF THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN THE AASHTO STANDARD SPECIFICATIONS. THE SUBSTRUCTURE 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 CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

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

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR INTERIOR BENT 1 AND BENT 2, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS AT STATION 625+23.28 -L-, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		PP 18 X 0.50 GALVANIZED STEEL PILES		PIPE PILE PLATES	PILE REDRIVES	CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	ARMORED FOAM JOINT SEALS
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU.YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	EA.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			2,183	1,673		LUMP SUM		3	244.73							247.63			LUMP SUM	LUMP SUM
INTEGRAL END BENT #1					6.5		1,333			2	120				2		25	28		
BENT #1					3.6		824					2	120	2	2					
BENT #2					3.6		824					2	130	2	2					
INTEGRAL END BENT #2					6.4		1,319			2	130				2		20	22		
TOTAL	LUMP SUM	2	2,183	1,673	20.1	LUMP SUM	4,300	3	244.73	4	250	4	250	4	8	247.63	45	50	LUMP SUM	LUMP SUM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48F447B...
3/26/2015

DRAWN BY : D. G. ELY DATE : 1/27/15
CHECKED BY : B. N. BAROADAWALA DATE : 1/27/15
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 02/2015

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PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR WIDENING OF
BRIDGE OVER DEEP GULLY
ON US 17
BETWEEN SR 1330 AND SR 1224

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-003
1			3			TOTAL SHEETS
2			4			39

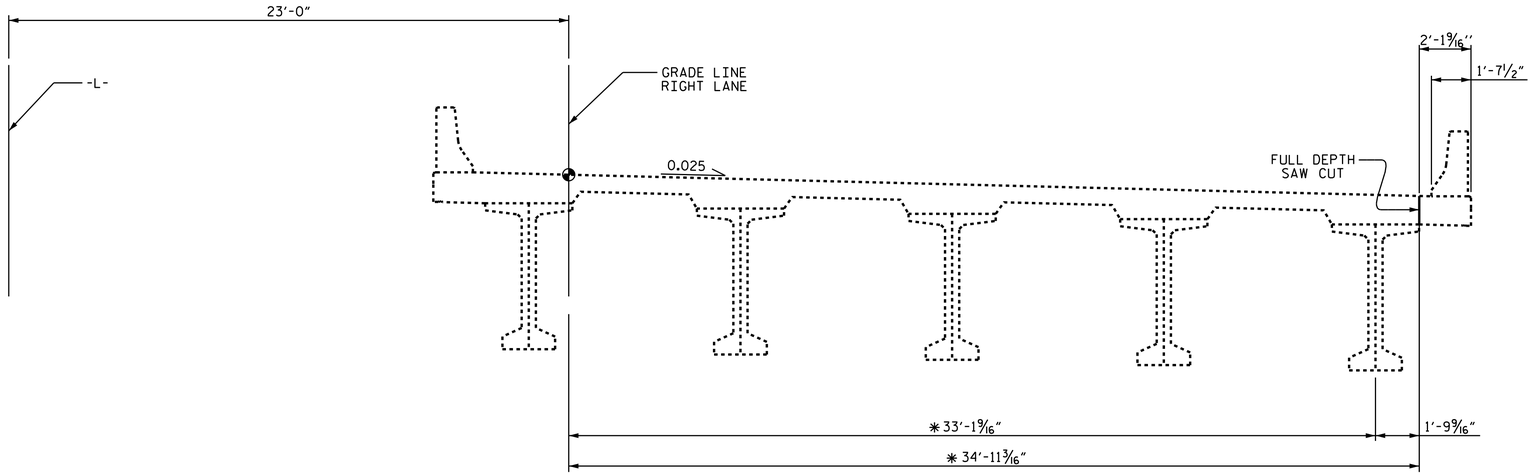
STR. #18

NOTE:

FOR TRAFFIC CONTROL, SEE TRAFFIC CONTROL PLANS.

FULL DEPTH SAW CUT OF EXISTING SLAB (ONLY). CHIP OUT THE INTEGRAL END BENT LEAVING REINFORCEMENT. TRIM & CLEAN REINFOREMENT AS NECESSARY FOR PLACEMENT OF NEW GIRDER AND REINFORCEMENT.

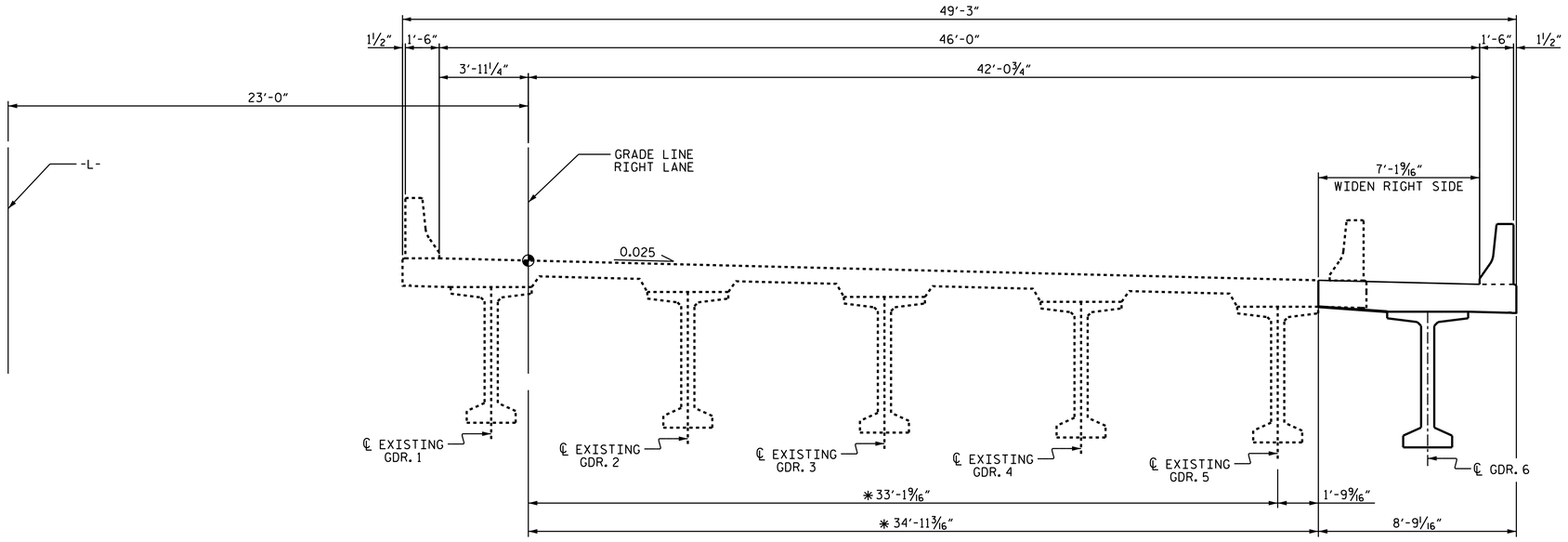
CONTRACTOR SHALL FIELD VERIFY CUT LOCATION AND OBTAIN APPROVAL OF ENGINEER PRIOR TO SAW CUTTING TO ENSURE THAT THE GIRDER FLANGE IS NOT DAMAGED IN REMOVAL OF DECK.



PHASE I

DIVERT TRAFFIC AS PER TRAFFIC CONTROL PLANS.
REMOVE EXISTING CONCRETE BARRIER RAIL, AND PARTIAL DECK OVERHANG TO SAW CUT LINE.

* THESE DIMENSIONS ARE ONLY ACCURATE AT THE I.D. STATION 625+23.28 -L-.



PHASE II

CONSTRUCT PROPOSED WIDENING OF DECK, INTEGRAL END BENTS, BENTS AND APPROACH SLABS AS SHOWN IN THE PLANS.

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8048FA47B...
3/26/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-004
1			3			TOTAL SHEETS
2			4			39

STR. #18

DRAWN BY : K. P. SEDAI DATE : 10/6/14
CHECKED BY : B.N.BARODAWALA DATE : 12/19/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 12/19/14

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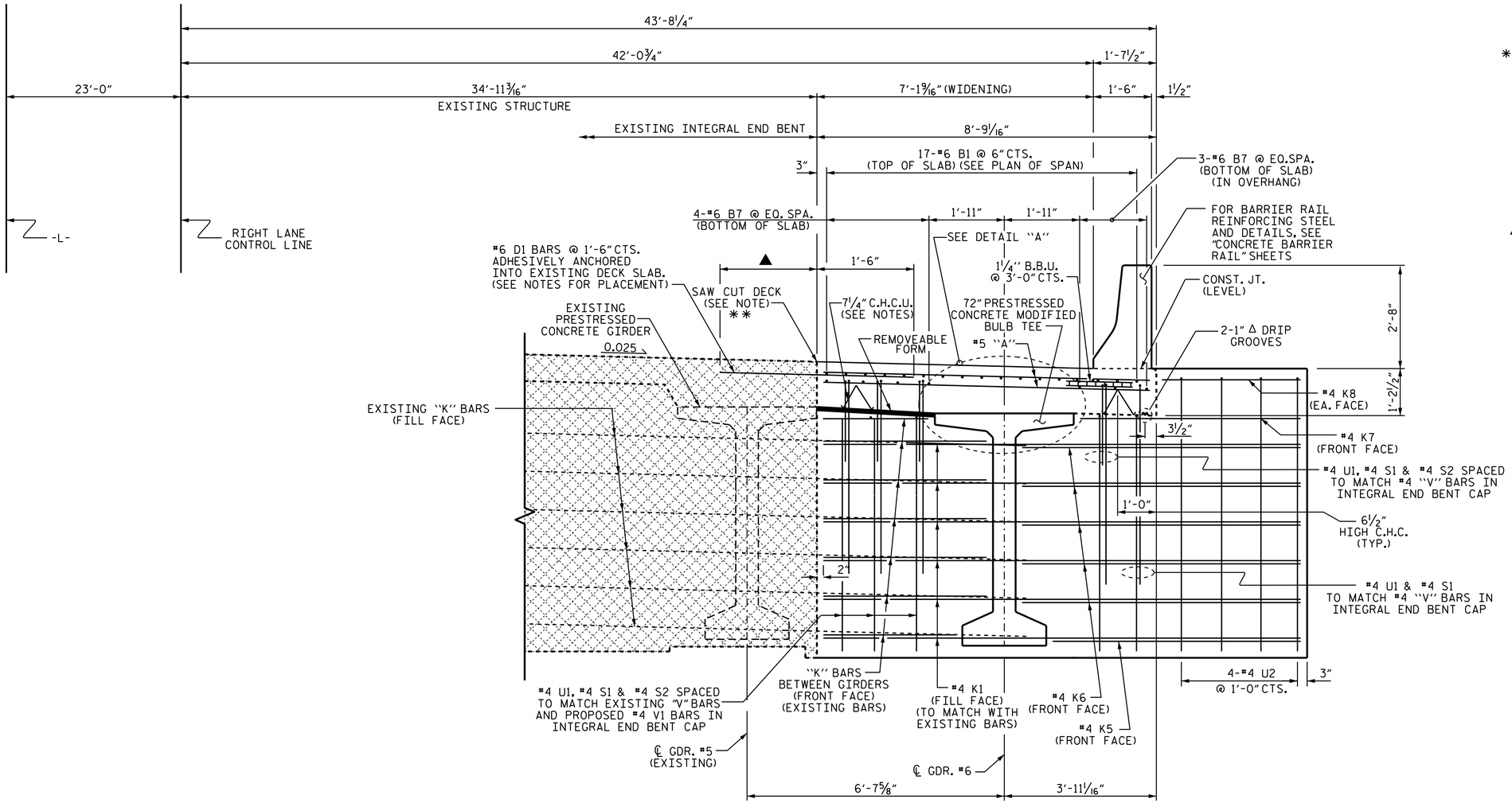
CONTRACTOR SHALL FIELD VERIFY CUT LOCATION AND OBTAIN APPROVAL OF ENGINEER PRIOR TO SAW CUTTING TO ENSURE THAT THE GIRDER FLANGE IS NOT DAMAGED IN REMOVAL OF DECK.



TYPICAL SECTION @ INTEGRAL END BENT

▲ EMBEDMENT LENGTH TO BE DETERMINED BY THE SELECTED MANUFACTURER

NOTES:

PROVIDE 7¼" CONTINUOUS HIGH CHAIRS (CHCM) AT 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 7¼" ABOVE THE TOP OF THE REMOVABLE FORM.

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

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

** FULL DEPTH SAW CUT OF EXISTING DECK SLAB (ONLY). CHIP OUT THE INTEGRAL END BENT RETAINING REINFORCEMENT. TRIM & CLEAN REINFORCEMENT AS NECESSARY FOR PLACEMENT OF NEW GIRDER AND REINFORCEMENT.

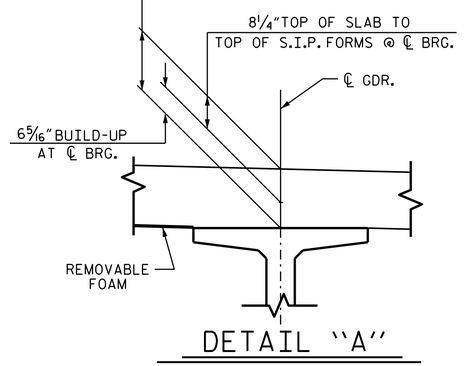
CARE SHOULD BE TAKEN NOT TO CUT EXISTING GIRDER FLANGE.

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE MAIN STEEL.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.

▲ #6 D1 DOWELS PLACED IN THE EXISTING DECK AND #4 K14 BARS IN CONTINUOUS BENT DIAPHRAGM SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM. LEVEL 1 FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE #6 D1 IS 26.4 KIPS AND THE #4 K14 IS 12.0 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

TEMPORARY STRUTS SHALL BE PLACED BETWEEN THE EXISTING PRESTRESSED GIRDER AND THE PROPOSED PRESTRESSED GIRDER AS SHOWN IN THE PLANS AND THE NUTS ON THE 1¼" DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACED 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RETIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.



DETAIL "A"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-005
1			3			TOTAL SHEETS
2			4			39

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEF04A8D48FA47B...
3/26/2015

DRAWN BY : B.N.BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-13-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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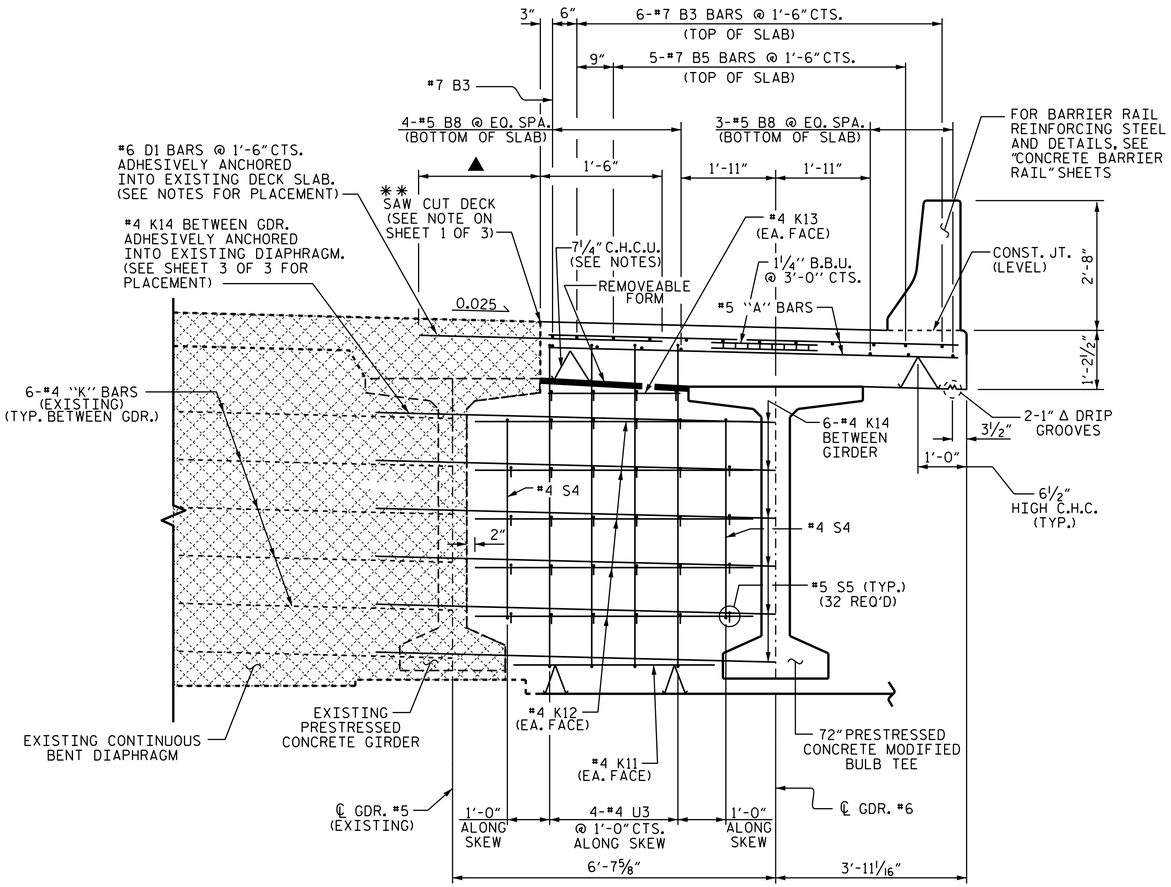
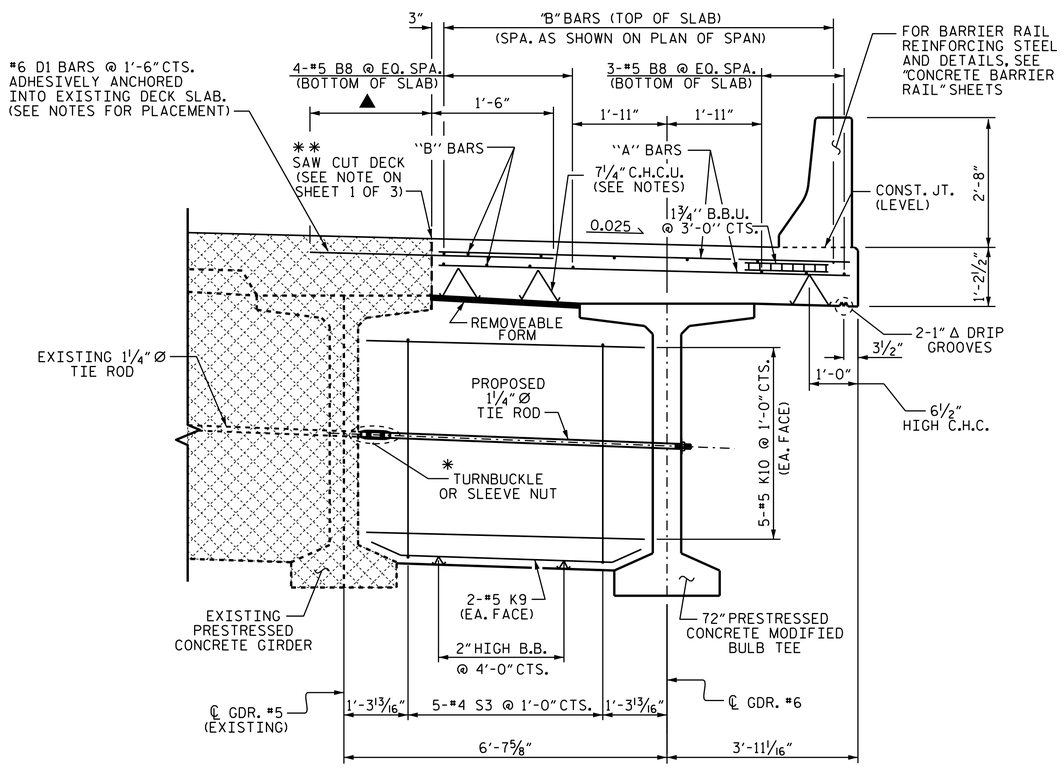


TYPICAL SECTION @ CONTINUOUS BENT DIAPHRAGM

▲ EMBEDMENT LENGTH TO BE DETERMINED BY THE SELECTED MANUFACTURER



TYPICAL SECTION @ INTERMEDIATE DIAPHRAGM

* SEE "PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS" SHEET 3 OF 3

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-006
1			3			TOTAL SHEETS
2			4			39

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

DRAWN BY : B.N.BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-14-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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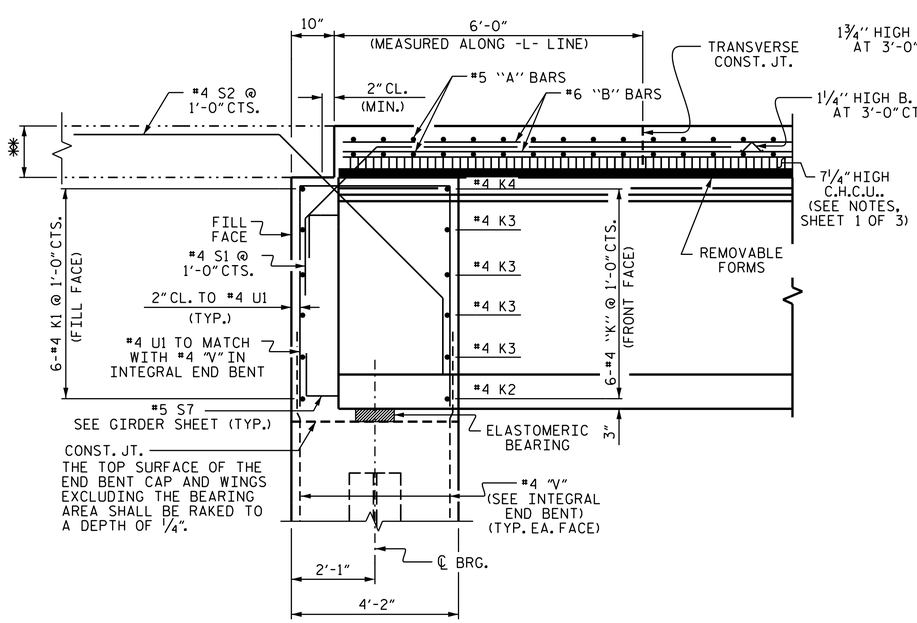
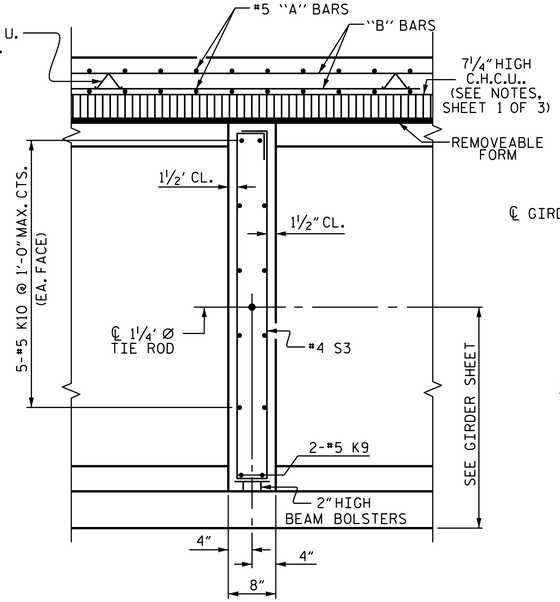
STR. #18

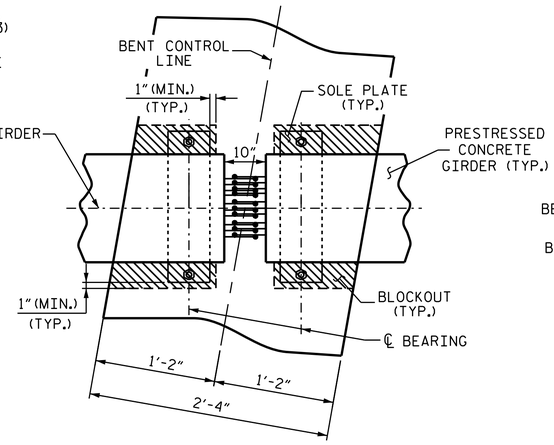


SECTION THROUGH INTEGRAL END BENT

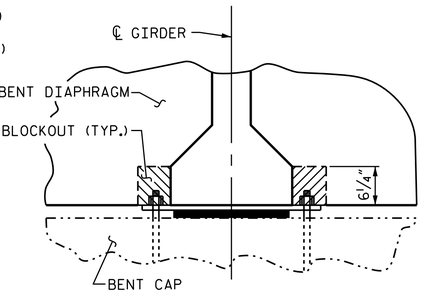
#4 V1 BARS IN FRONT OF GIRDER NOT SHOWN
✻✻ TO MATCH WITH EXISTING APPROACH SLAB



SECTION THROUGH INTERMEDIATE DIAPHRAGM

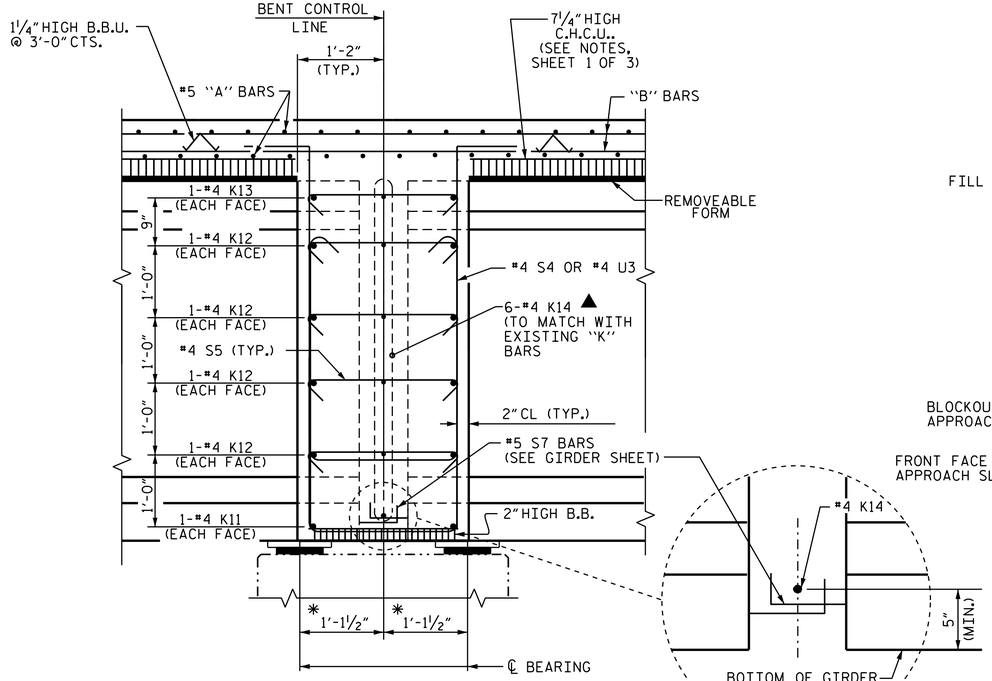


PLAN



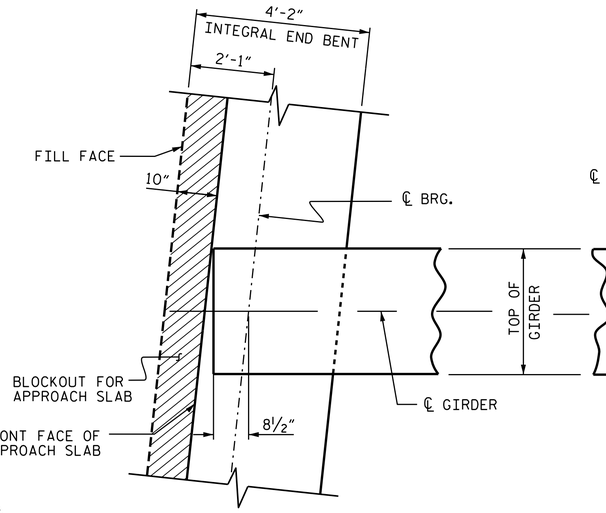
SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL

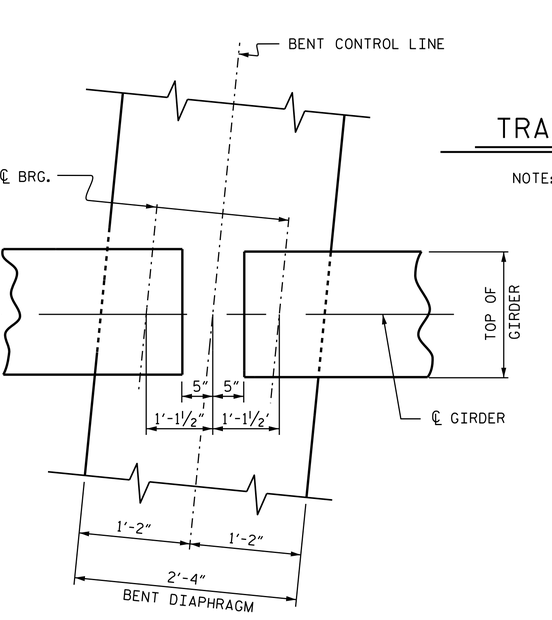


SECTION THROUGH CONTINUOUS BENT DIAPHRAGM

✻ MEASURED ALONG ℄ GIRDER

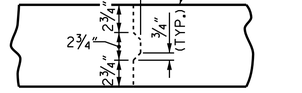


AT INTEGRAL END BENT



AT BENT DIAPHRAGM

PLAN OF GIRDER



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-007
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : B.N.BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-14-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

26-MAR-2015 09:23
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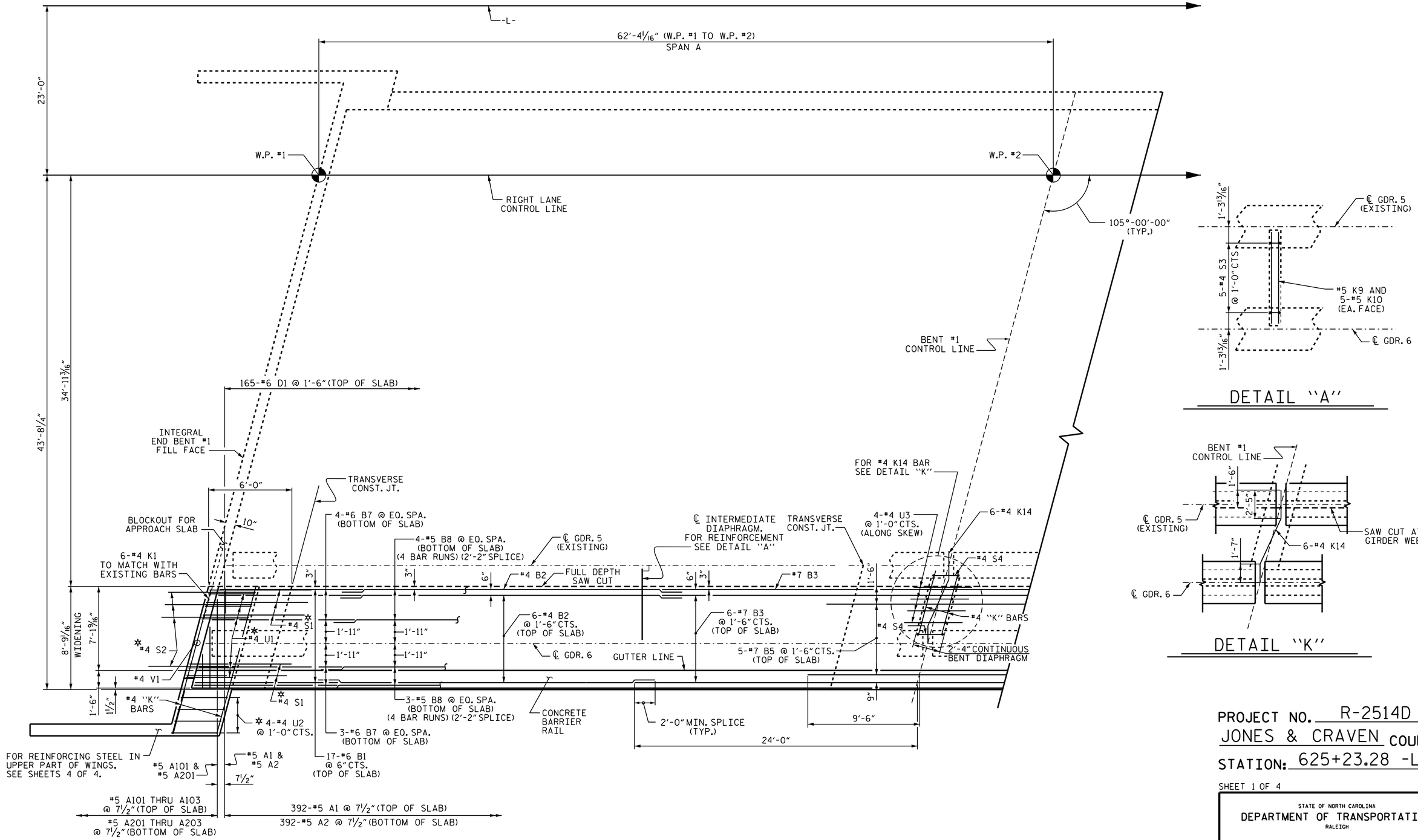
mruffin

STR. #18



PLAN OF SPAN A

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN."

✲ #4 U1, #4 U2, #4 V1, #4 S1 & #4 S2 BARS TO MATCH WITH #4 V1 BARS IN INTEGRAL END BENT CAP.

DETAIL "A"

DETAIL "K"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

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3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-008
1			3			TOTAL SHEETS
2			4			39

STR. #18

DRAWN BY : B. N. BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-15-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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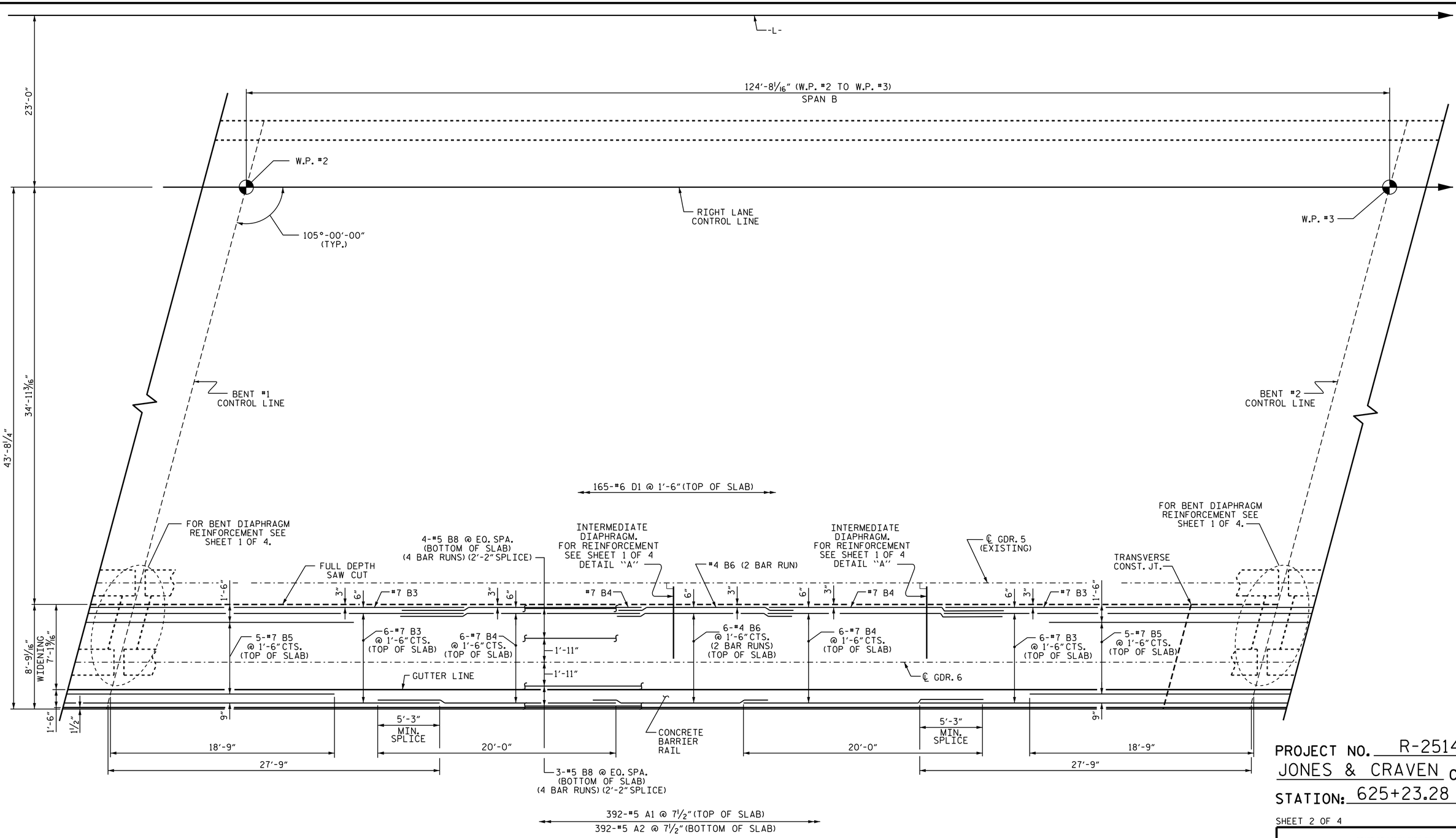

PLAN OF SPAN B

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN."

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-009
1			3			TOTAL SHEETS
2			4			39

STR. #18

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

DRAWN BY : B. N. BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-18-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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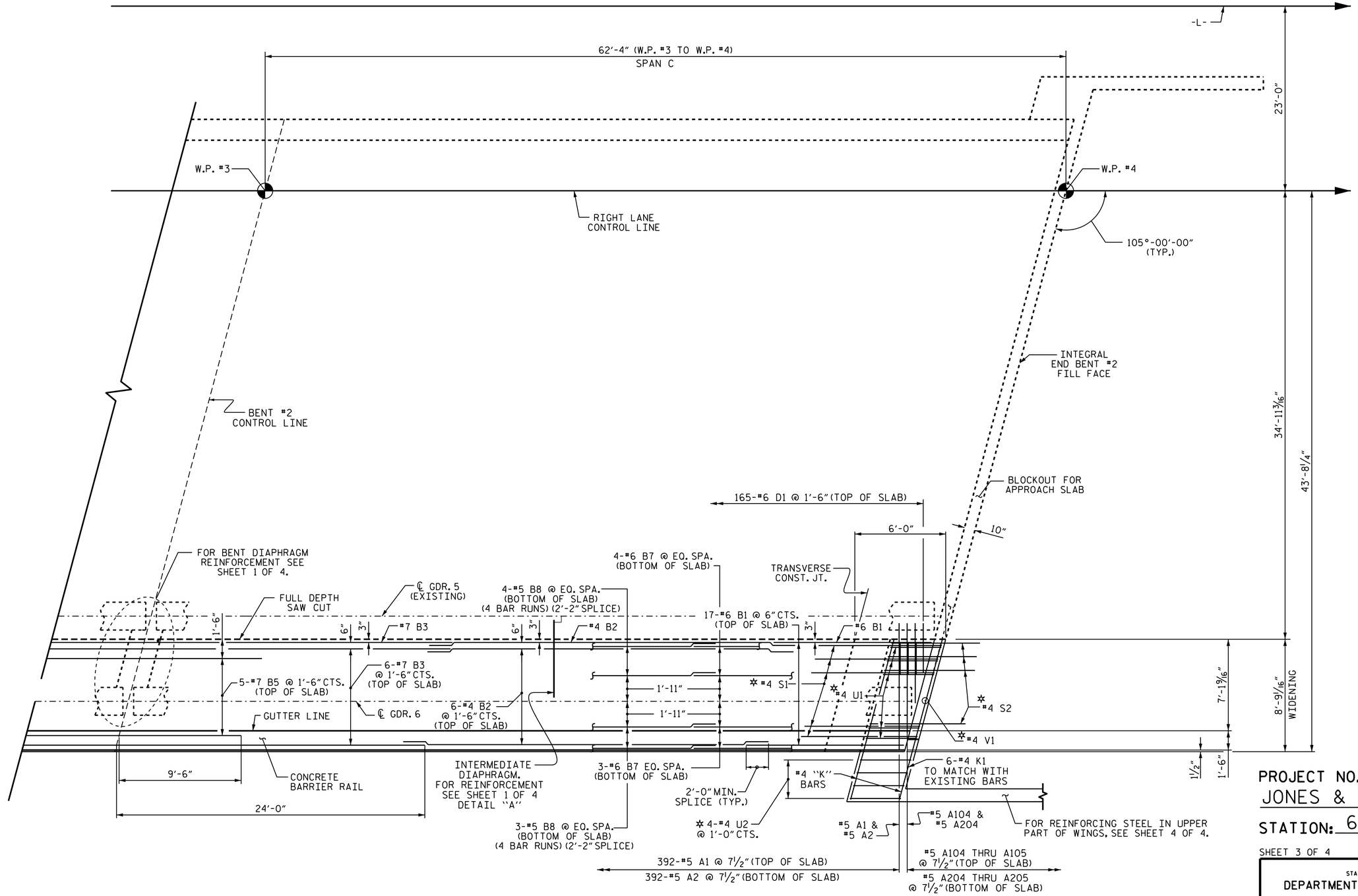

PLAN OF SPAN C

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN."

✲ #4 U1, #4 U2, #4 V1, #4 S1 & #4 S2 BARS TO MATCH WITH #4 V1 BARS IN INTEGRAL END BENT CAP.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

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3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-010
1			3			TOTAL SHEETS
2			4			39

STR. #18

DRAWN BY : B. N. BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-18-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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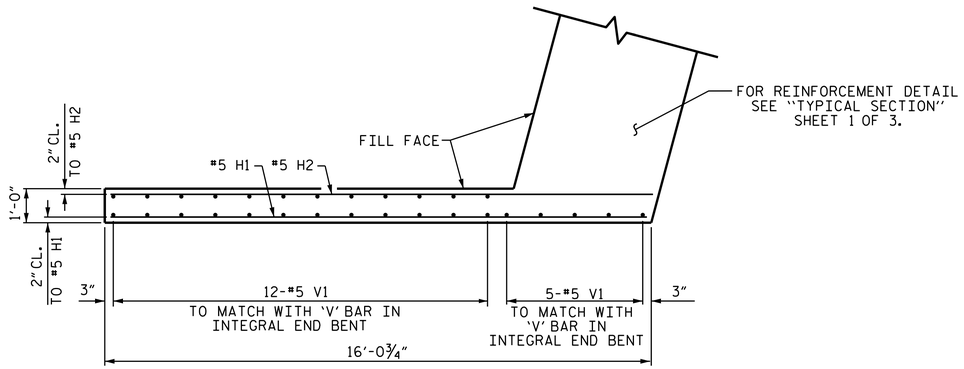
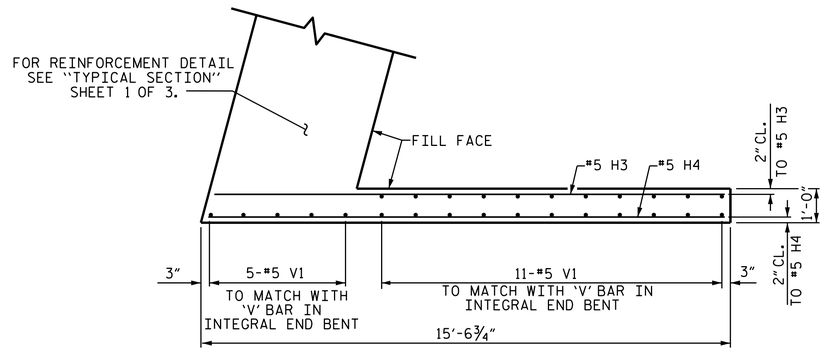


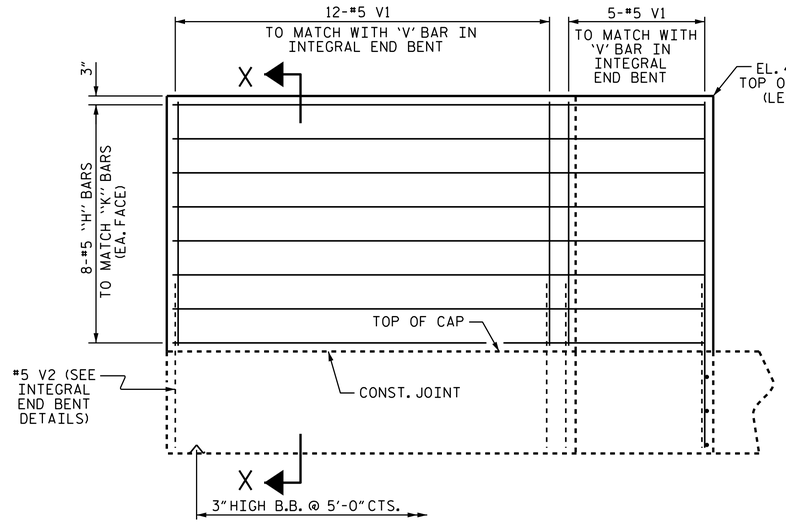
PLAN OF RIGHT WING (W2)

(AT END BENT #1)



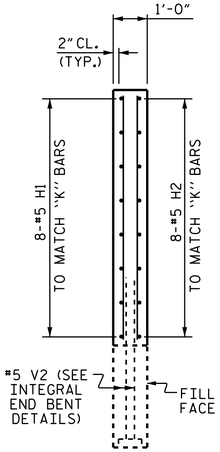
PLAN OF RIGHT WING (W2)

(AT END BENT #2)

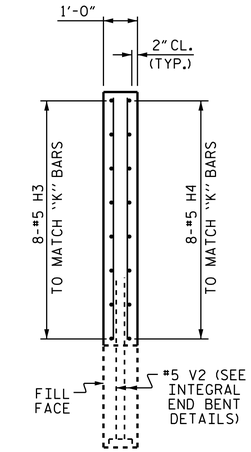


ELEVATION OF RIGHT WING (W2)

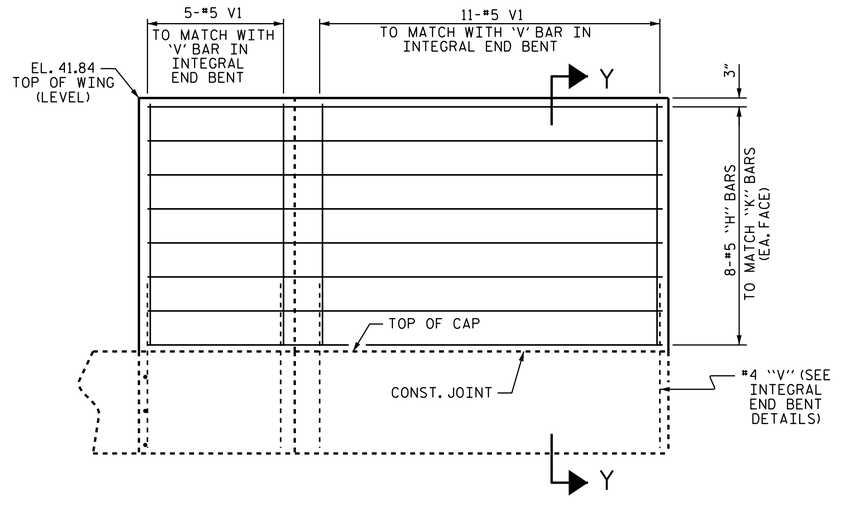
(AT END BENT #1)



SECTION X-X



SECTION Y-Y



ELEVATION OF RIGHT WING (W2)

(AT END BENT #2)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

Docusigned by: Tim Coggins DEFD4ABD48FA47B...
3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-011
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : B.N.BARODAWALA DATE : 10-31-14
CHECKED BY : NEIL RUFFIN DATE :
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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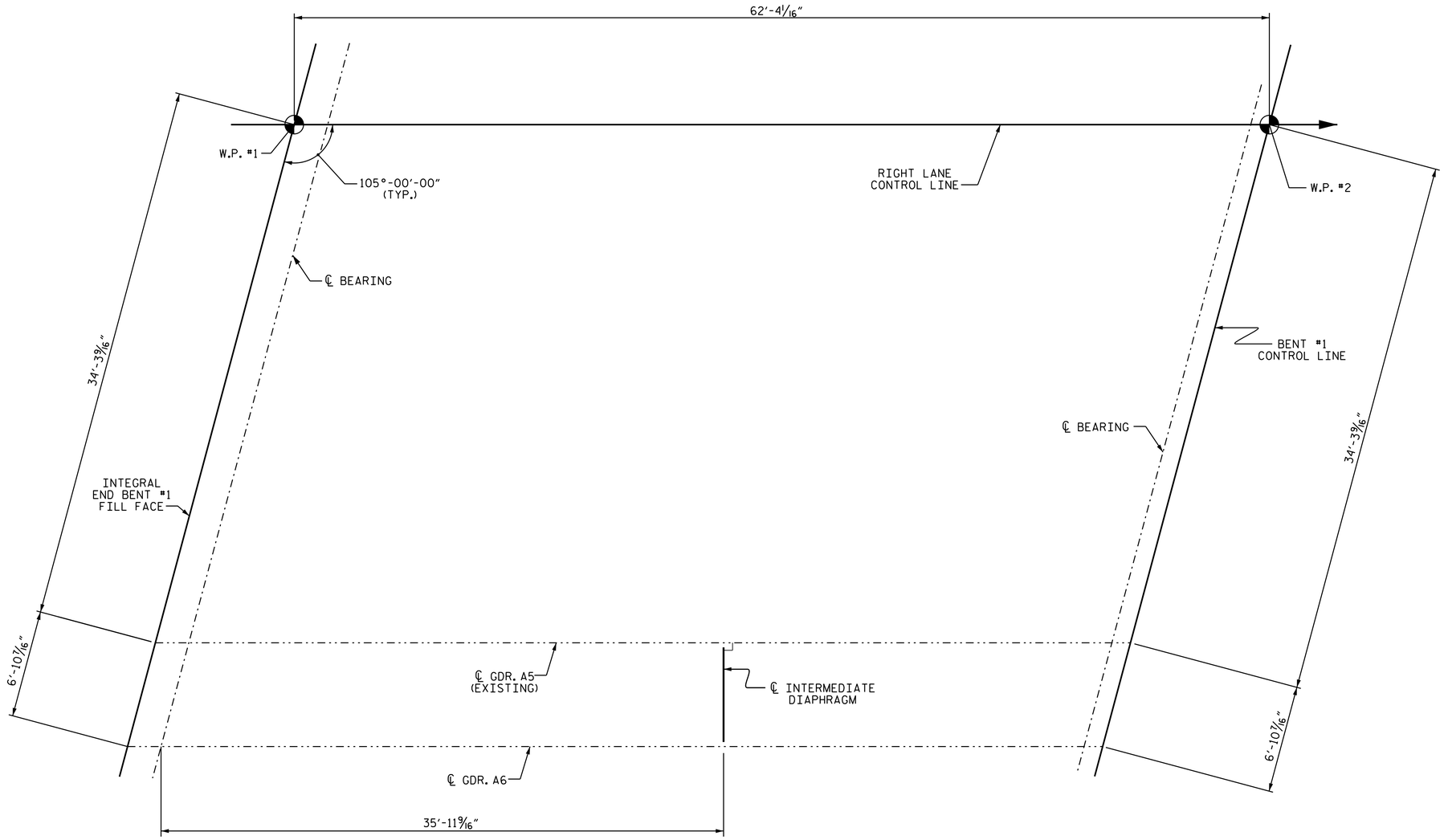
STR. #18



FIXED
E4

FRAMING PLAN SPAN A

FIXED
(E4, P1)

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-012
1			3			TOTAL SHEETS
2			4			39

STR. #18

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4ARD48F4478...
3/26/2015

DRAWN BY : B. N. BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-18-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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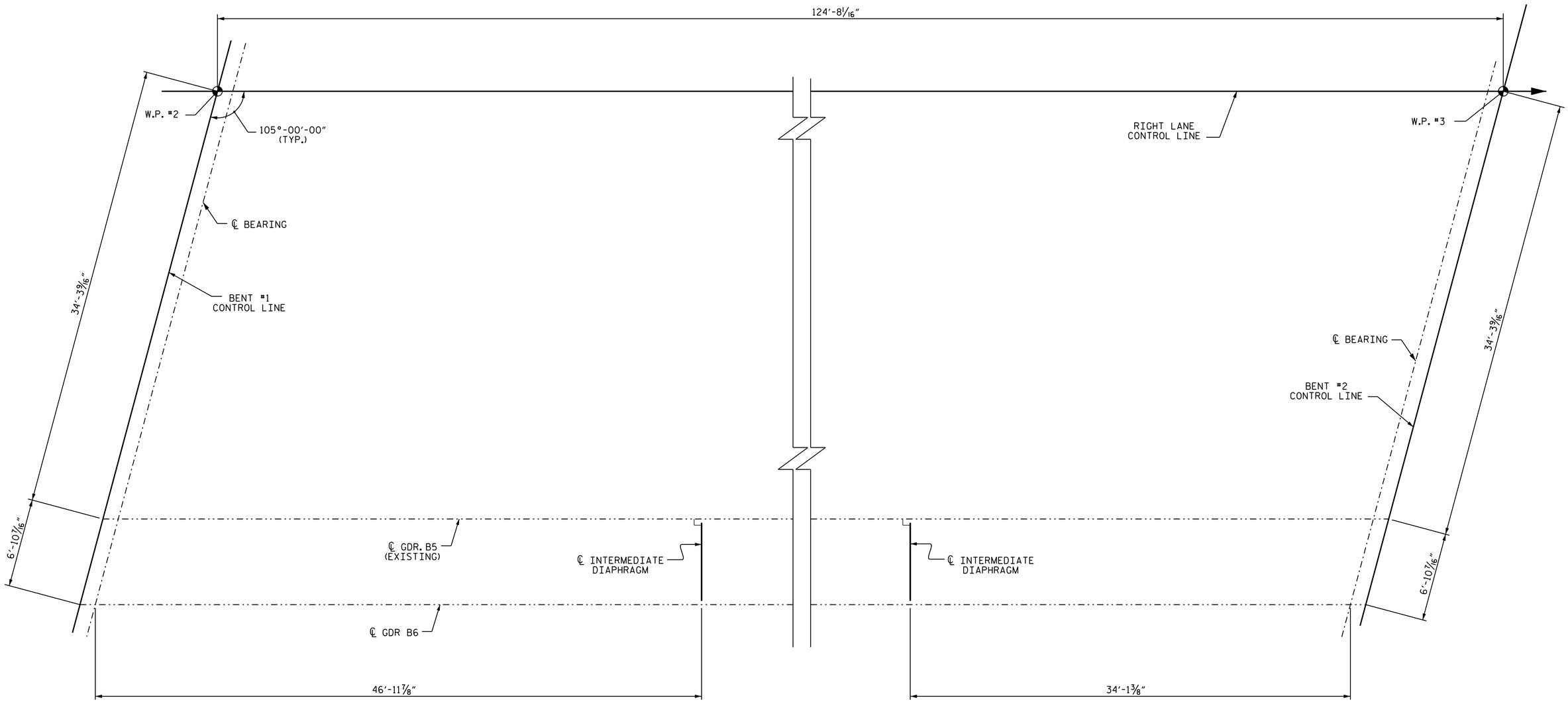

FIXED
(E5, P2)

FIXED
(E5, P3)

FRAMING PLAN SPAN B

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-013
1			3			TOTAL SHEETS
2			4			39

STR. #18

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

DRAWN BY : B. N. BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-18-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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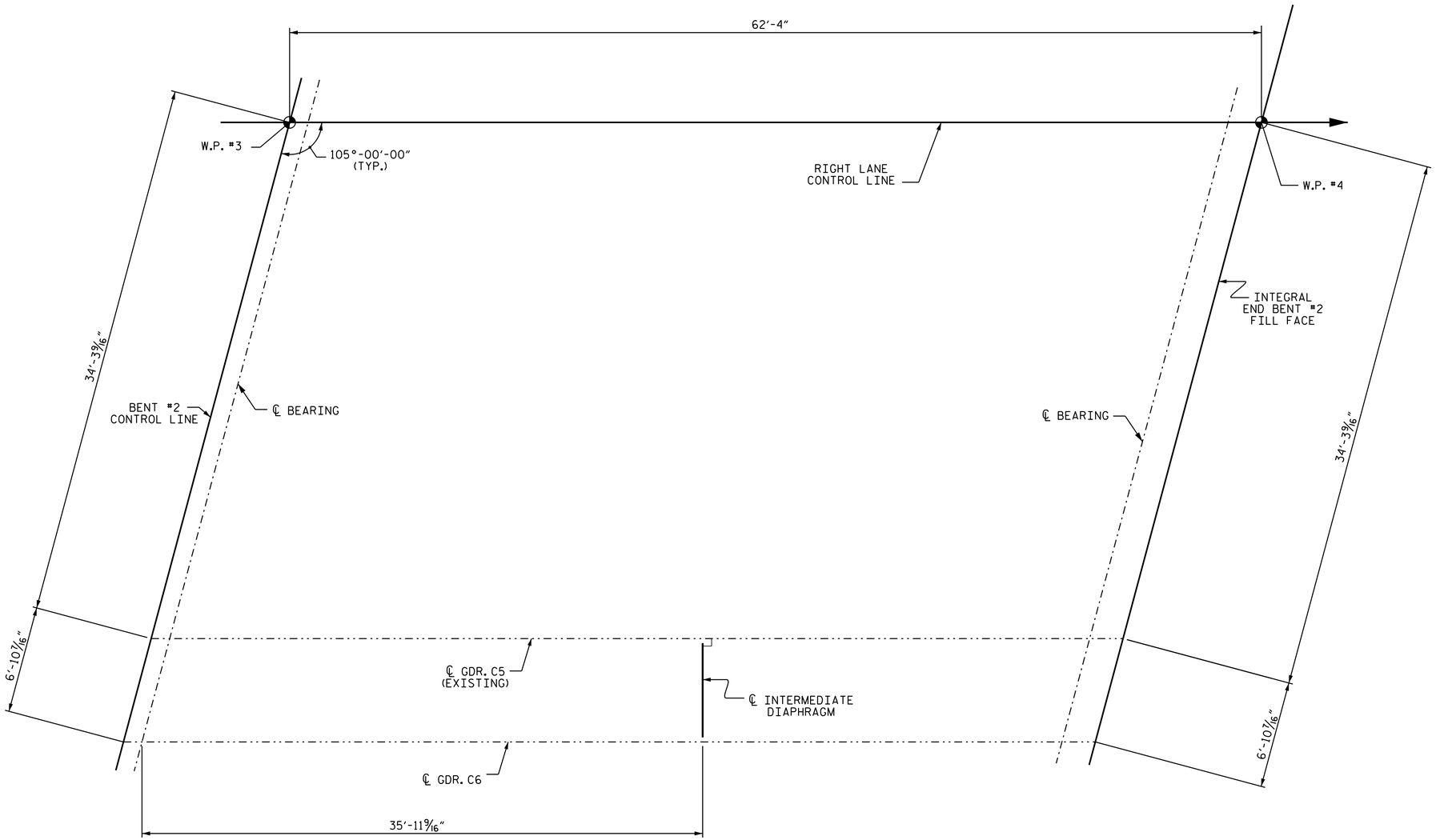

FIXED
(E4, P4)

FRAMING PLAN SPAN C

FIXED
E4

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-014
1			3			TOTAL SHEETS
2			4			39

STR. #18

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

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3/26/2015

DRAWN BY : B. N. BARODAWALA DATE : 2-18-14
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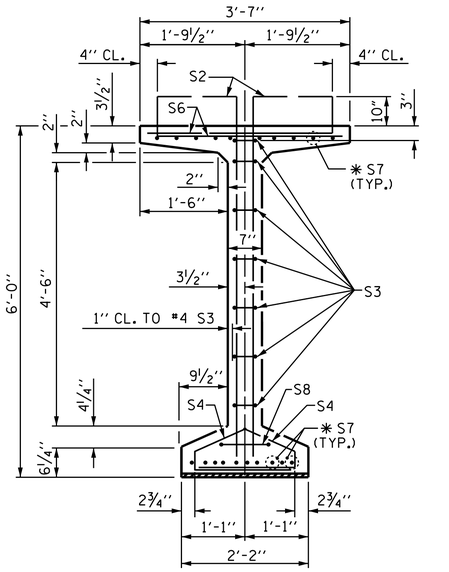
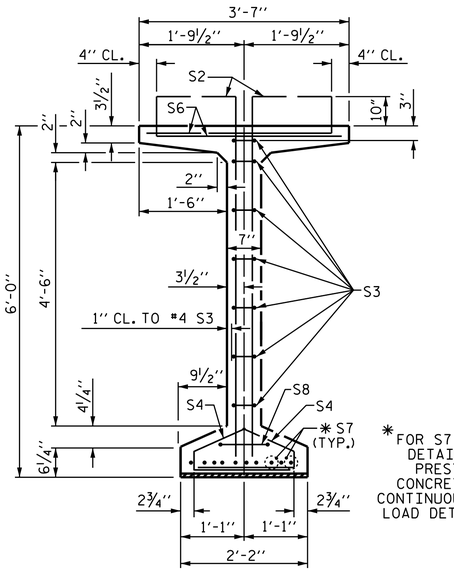
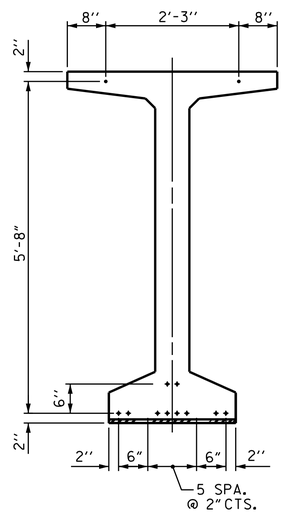


SECTION A-A

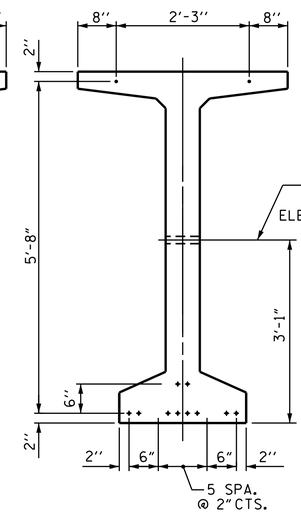


SECTION B-B

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



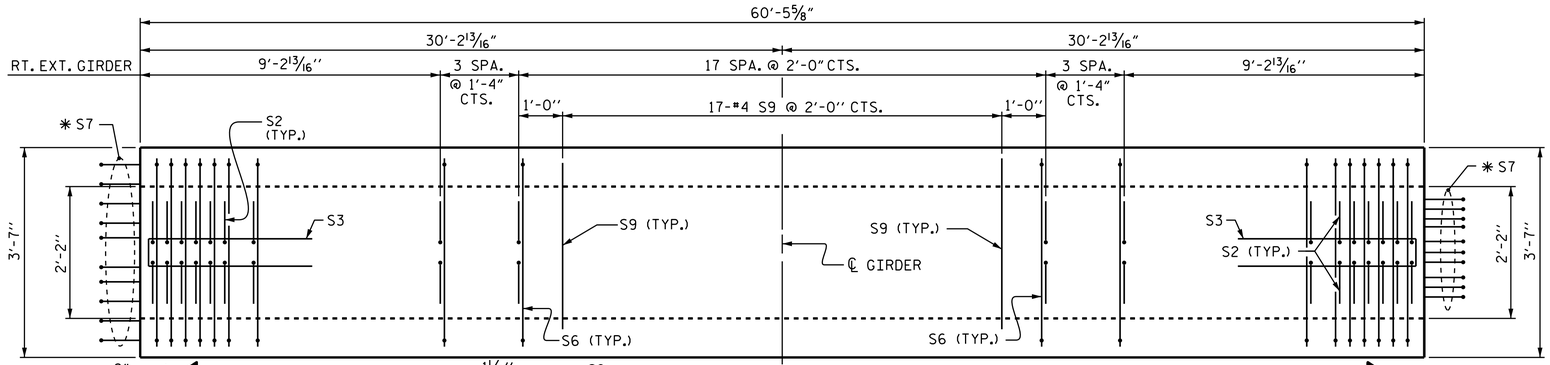
AT END OF GIRDER



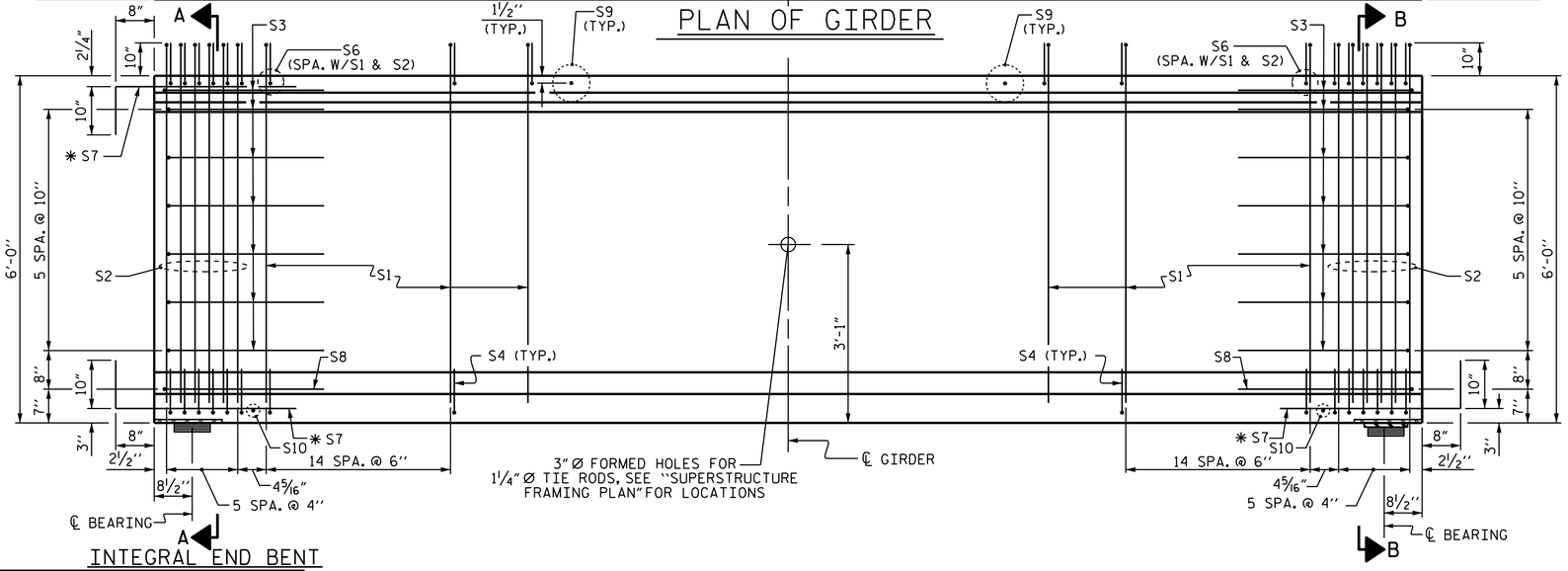
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND
• FULLY BONDED STRANDS



PLAN OF GIRDER



INTEGRAL END BENT

CONTINUOUS BENT

ELEVATION OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

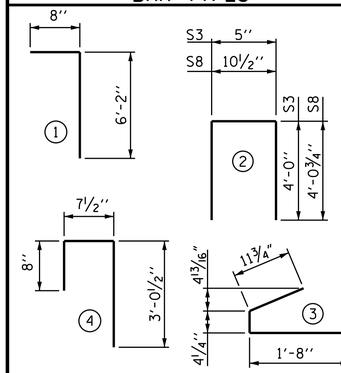
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	104	#4	1	6'-10"	457
S2	24	#5	1	6'-10"	171
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S6	128	#5	4	4'-4"	579
✱ S7	30	#5	STR	3'-8"	115
S8	2	#5	2	9'-0"	19
S9	17	#5	STR	3'-3"	58
S10	2	#3	STR	1'-10"	1

✱ 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	5000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	1,665	13.0	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
2	60'-5⅝"	120'-11¼"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD 72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPANS A & C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-015
1			3			TOTAL SHEETS
2			4			39

STR. #18

STD. NO. PCG8 (Sht. 2)

ASSEMBLED BY : B.N.BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-19-14

DRAWN BY : EEM 2/6/97
CHECKED BY : VAP 2/6/97

REV. 10/17/00 RWW/LES
REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/26/2015

26-MAR-2015 09:23
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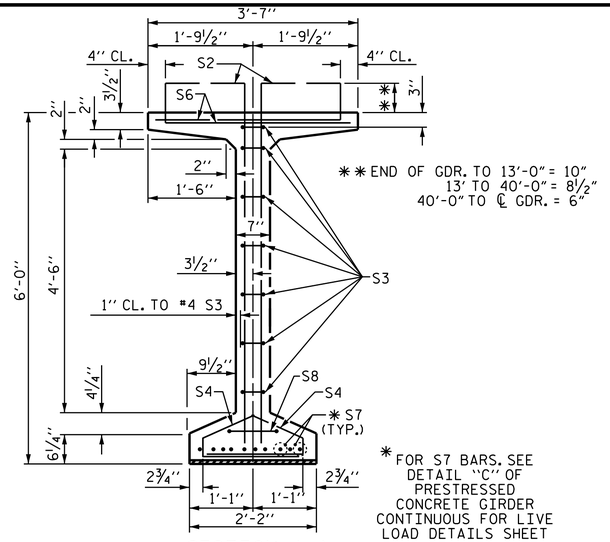
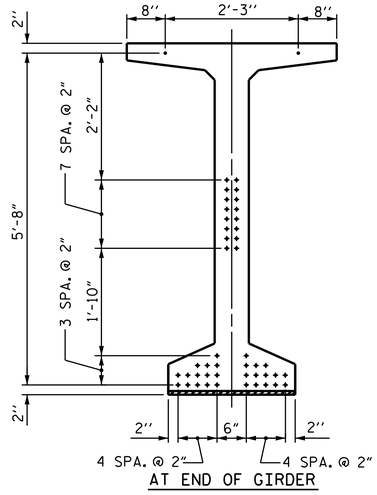


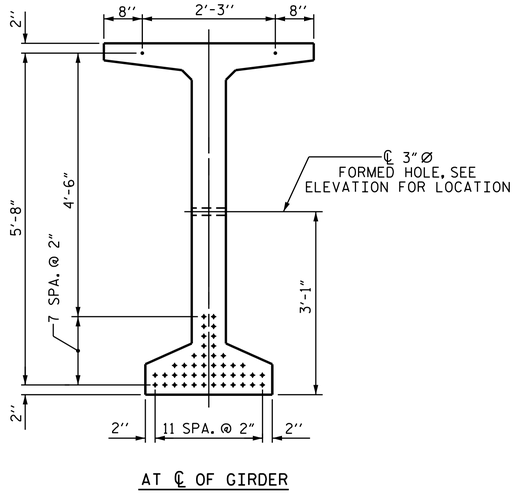
SECTION A-A

** END OF GDR. TO 13'-0" = 10"
13' TO 40'-0" = 8½"
40'-0" TO ℄ GDR. = 6"

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

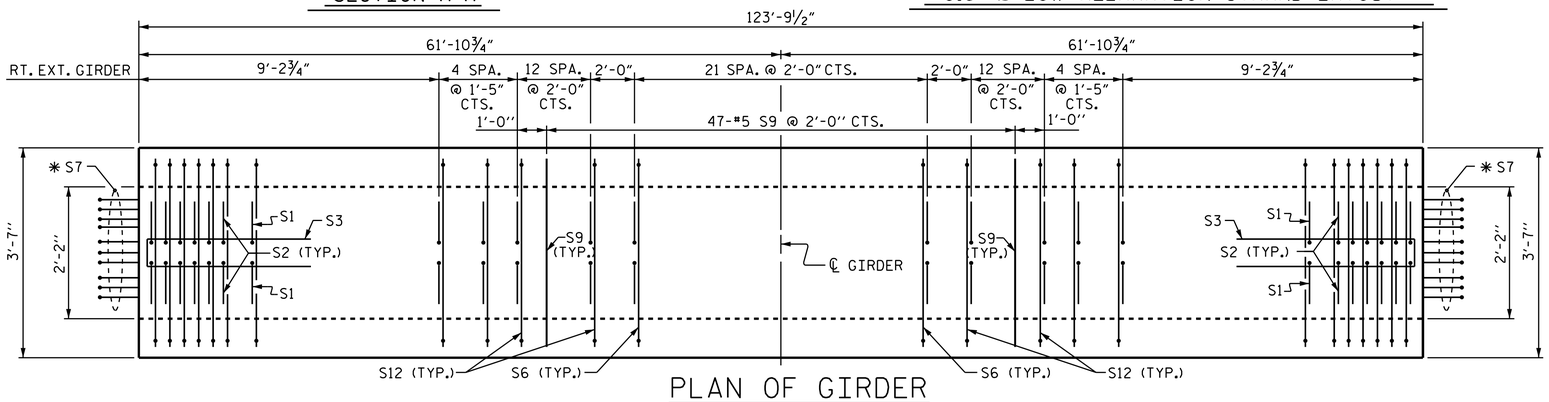


AT END OF GIRDER

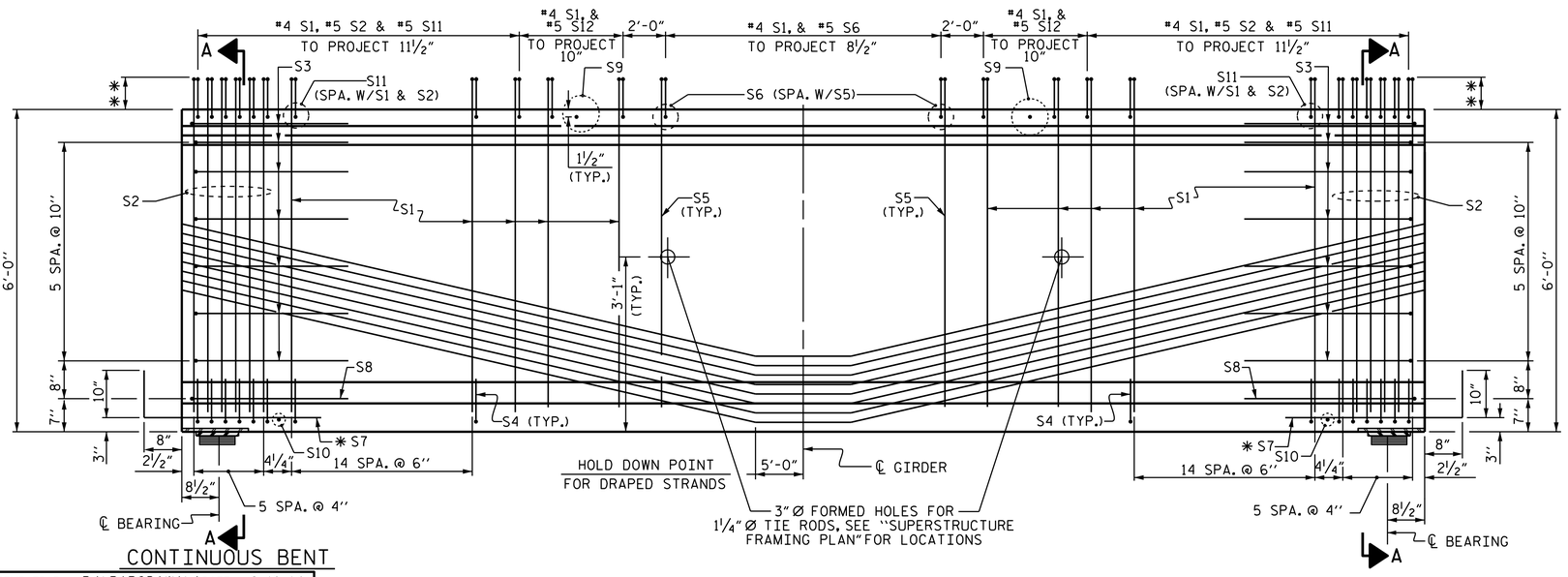


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



CONTINUOUS BENT

ELEVATION OF GIRDER

CONTINUOUS BENT

0.6" Ø L. R. GRADE 270 STRANDS

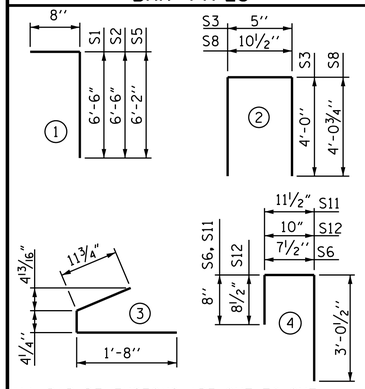
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR.

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	60	#4	1	7'-2"	287
S2	24	#5	1	7'-2"	179
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	24	#5	1	6'-10"	171
S6	44	#5	4	4'-4"	199
* S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	2	#5	STR	3'-3"	7
S10	2	#3	STR	1'-10"	1
S11	96	#5	4	4'-8"	467
S12	56	#5	4	4'-7"	268

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9500 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	1,921	26.5	46

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
1	123'-9½"	123'-9½"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-016
1			3			TOTAL SHEETS
2			4			39

STR. #18

STD. NO. PCG8 (Sht. 1)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

ASSEMBLED BY : B.N.BARODAWALA	DATE : 2-18-14		
CHECKED BY : NEIL RUFFIN	DATE : 8-20-14		
DRAWN BY : EEM 2/6/97	REV. 10/17/00	RWW/LES	
CHECKED BY : VAP 2/6/97	REV. 5/1/06R	TLA/GM	
	REV. 10/1/11	MAA/GM	

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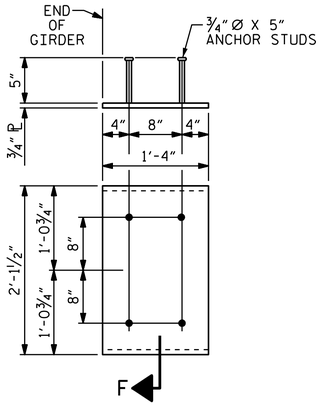
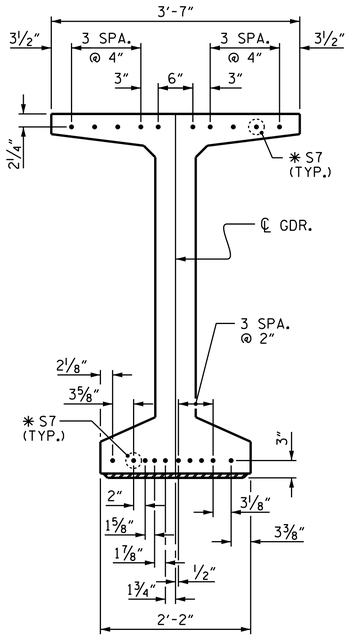


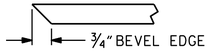
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



DETAIL "C"

(FOR 63" & 72" MODIFIED BULB TEES)



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.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL.

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 4000 PSI FOR SPANS A & C AND 7200 PSI FOR SPAN B.

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

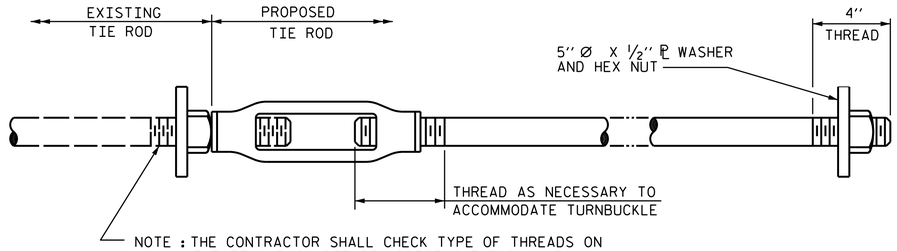
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN ½" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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

THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 28.8 KIPS IN SPAN B.



TIE ROD ASSEMBLY WITH TURNBUCKLE OR SLEEVE NUT

(4 COMPLETE ASSEMBLIES REQUIRED)

LOCATION OF THE PROPOSED 1¼" Ø TIE RODS FOR THE INTERIOR DIAPHRAGMS IS TO LINE UP, AS NEAR AS POSSIBLE, WITH EXISTING 1¼" Ø TIE RODS. THESE DIMENSIONS SHOWN ON THE PLANS SHALL BE CHECKED BY THE RESIDENT ENGINEER AND SUBMITTED, ALONG WITH SPAN LENGTHS, TO THE STRUCTURE MANAGEMENT UNIT.

NUTS ON EXISTING TIE RODS SHALL NOT BE REMOVED UNLESS TIE ROD PROJECTION BEYOND THE NUT IS LESS THAN 1⅛". TURNBUCKLES SHALL BE TIGHTENED AGAINST THE EXISTING NUTS EXCEPT AS NOTED ABOVE.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION		SPAN A & C GIRDERS #6										
TENTH POINTS			.1	.2	.3	.4	.5	.6	.7	.8	.9	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.014	0.026	0.036	0.042	0.044	0.042	0.036	0.026	0.014	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.005	0.010	0.014	0.017	0.017	0.017	0.014	0.010	0.005	0
FINAL CAMBER	↑	0	⅛"	3/16"	¼"	5/16"	5/16"	5/16"	¼"	3/16"	⅛"	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		SPAN B GIRDERS #6										
TENTH POINTS			.1	.2	.3	.4	.5	.6	.7	.8	.9	
CAMBER (GIRDER ALONE IN PLACE)	↑	0	0.173	0.326	0.447	0.523	0.550	0.523	0.447	0.326	0.173	0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	↓	0	0.073	0.139	0.190	0.222	0.233	0.222	0.190	0.139	0.073	0
FINAL CAMBER	↑	0	13/16"	2¼"	3/16"	3⅝"	3 13/16"	3⅝"	3/16"	2¼"	13/16"	0

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

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48F447B...
3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-017
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY : B.N.BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-20-14

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

REV. 10/1/11 MAA/GM
REV. 1/15 MAA/TMG
REV. 2/15 MAA/TMG

26-MAR-2015 09:23
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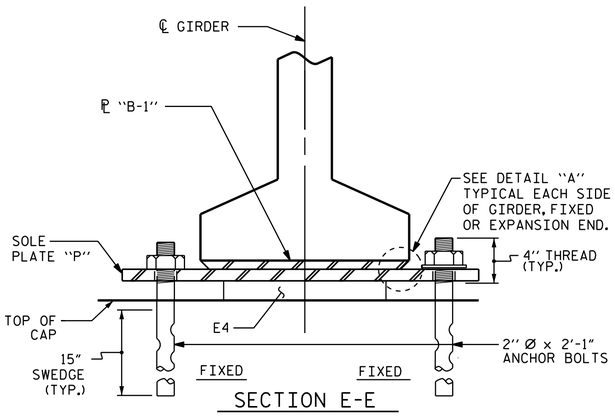
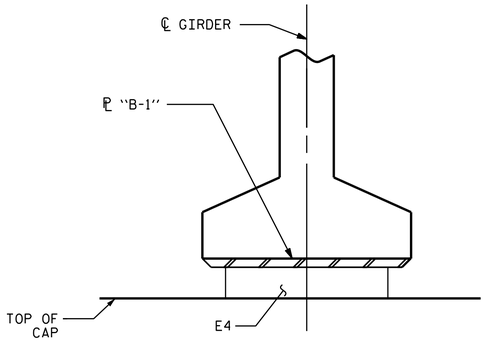
STD. NO. PCG9



SECTION E-E



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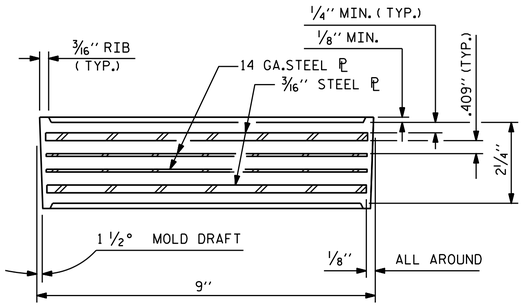
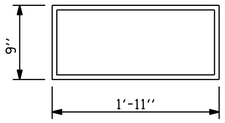


TYPICAL SECTION OF ELASTOMERIC BEARINGS

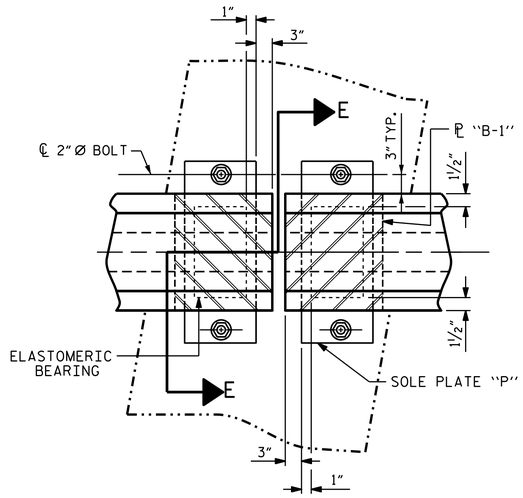


E4 (4 REQ'D.)

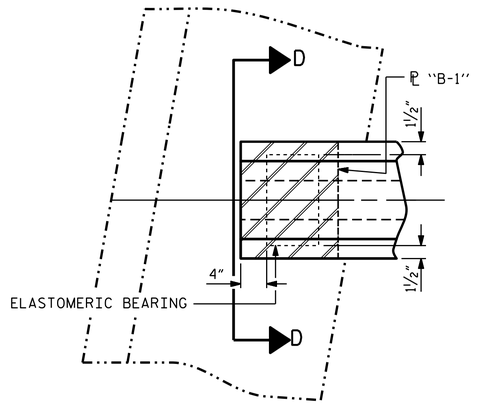
PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

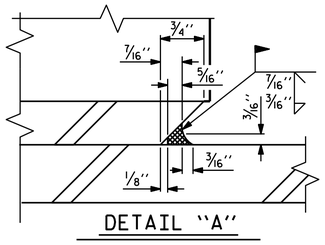
SPAN A - NEAR/FAR
SPAN C - NEAR/FAR



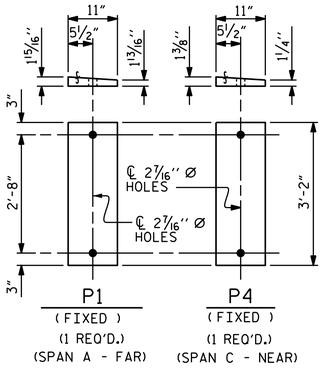
TYPICAL BENT PLAN



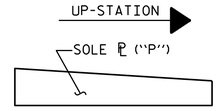
TYPICAL END BENT PLAN



DETAIL "A"



SOLE PLATE DETAILS ("P")



SOLE ℄ PLACEMENT DETAIL

NOTES

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

STEEL SOLE PLATES, ANCHOR BOLTS, 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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

-LOAD RATING-	
MAX, D.L.+L.L.	
TYPE V	180 Kips

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-018
1			3			TOTAL SHEETS
2			4			39

STR. #18

STD. NO. EB4 (SHT 1)

ASSEMBLED BY : B.N.BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-20-14

DRAWN BY : EEM 2/97
CHECKED BY : VAP 2/97

REV. 5/1/06	TLA/GM
REV. 10/1/11	MAA/GM
REV. 6/13	AAC/MAA

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

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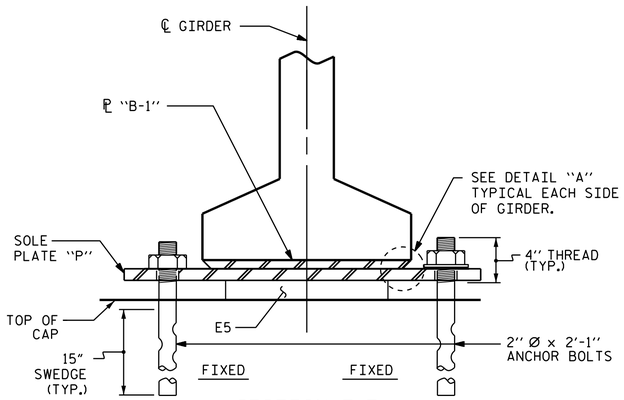
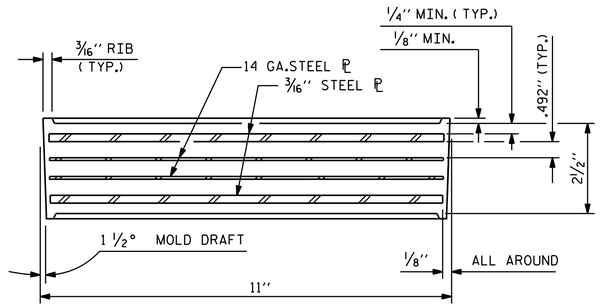
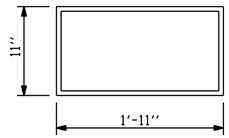


SECTION E-E



TYPICAL SECTION OF ELASTOMERIC BEARINGS

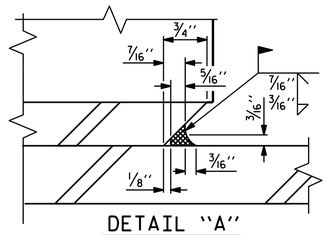


E5 (2 REQ'D.)

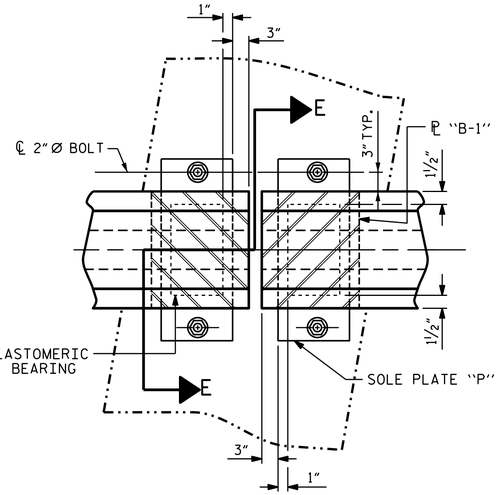
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI

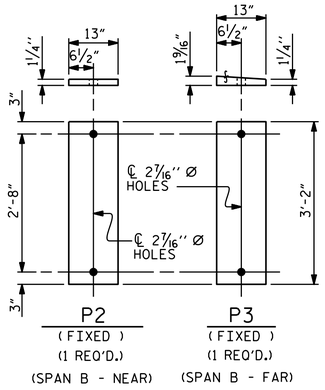
SPAN B - NEAR/FAR



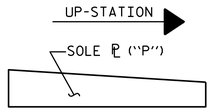
DETAIL "A"



TYPICAL BENT PLAN



SOLE PLATE DETAILS ("P")



SOLE ℄ PLACEMENT DETAIL

NOTES

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FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

-LOAD RATING-	
MAX. D.L.+L.L.	
TYPE VI	253 Kips

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

ASSEMBLED BY : B.N.BARODAWALA	DATE : 2-18-14
CHECKED BY : NEIL RUFFIN	DATE : 8-21-14

DRAWN BY : EEM 2/97	REV. 5/1/06	TLA/GM
CHECKED BY : VAP 2/97	REV. 10/1/11	MAA/GM
	REV. 6/13	AAC/MAA

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-019
1			3			TOTAL SHEETS
2			4			39

STR. #18

STD. NO. EB4 (SHT 2)

26-MAR-2015 09:23
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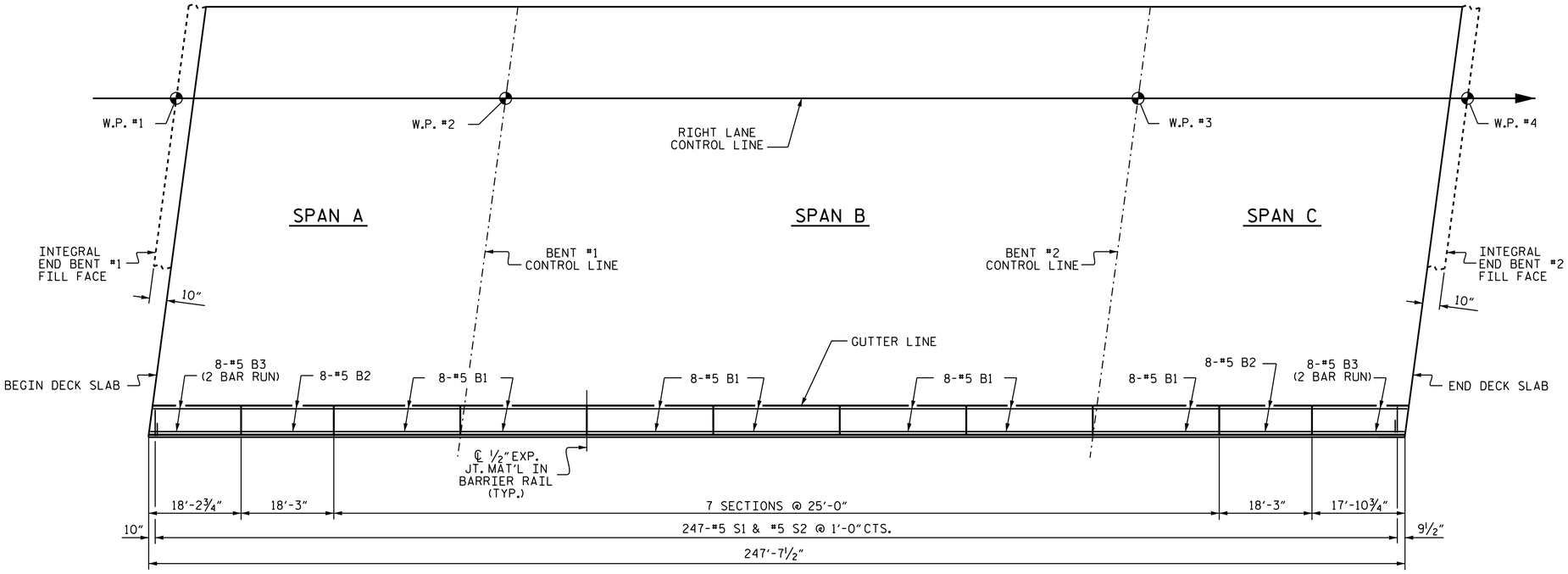
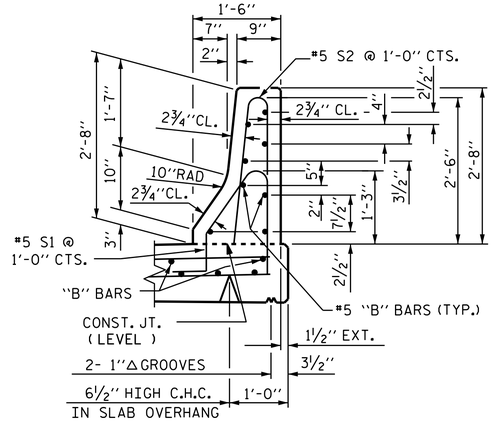
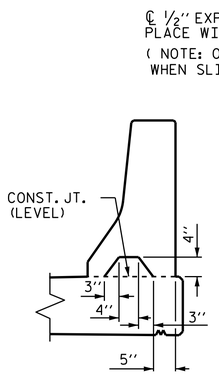


PLAN

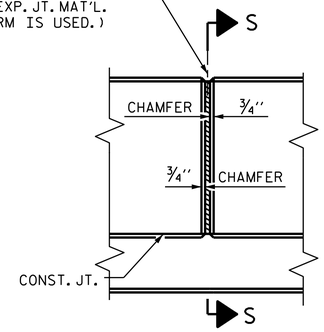


SECTION THRU RAIL



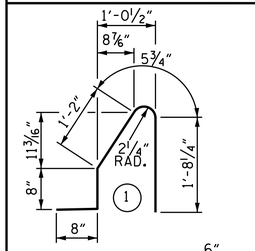
SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	56	#5	STR	24'-6"	1,431
* B2	16	#5	STR	17'-9"	296
* B3	32	#5	STR	10'-7"	353
* S1	247	#5	1	4'-8"	1,202
* S2	247	#5	2	5'-2"	1,331

* EPOXY COATED REINFORCING STEEL	LBS.	4,613
CLASS AA CONCRETE	CU. YDS.	24.8
CONCRETE BARRIER RAIL	LIN. FT.	247.63

NOTES

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

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.

THE #5 S1 AND #5 S2 BARS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, IN ORDER TO MAINTAIN 2" MIN. CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-020
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : B. N. BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-22-14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : 10-31-14

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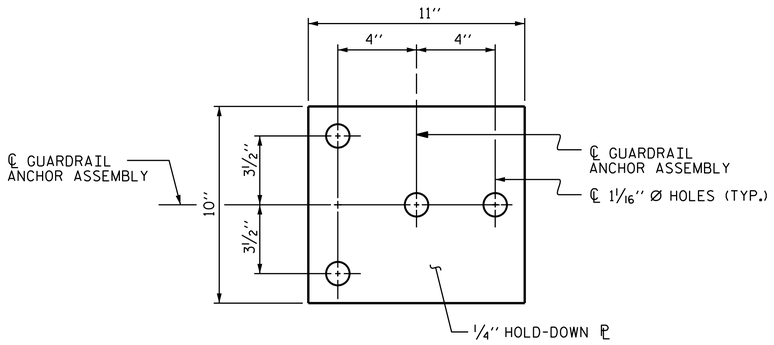
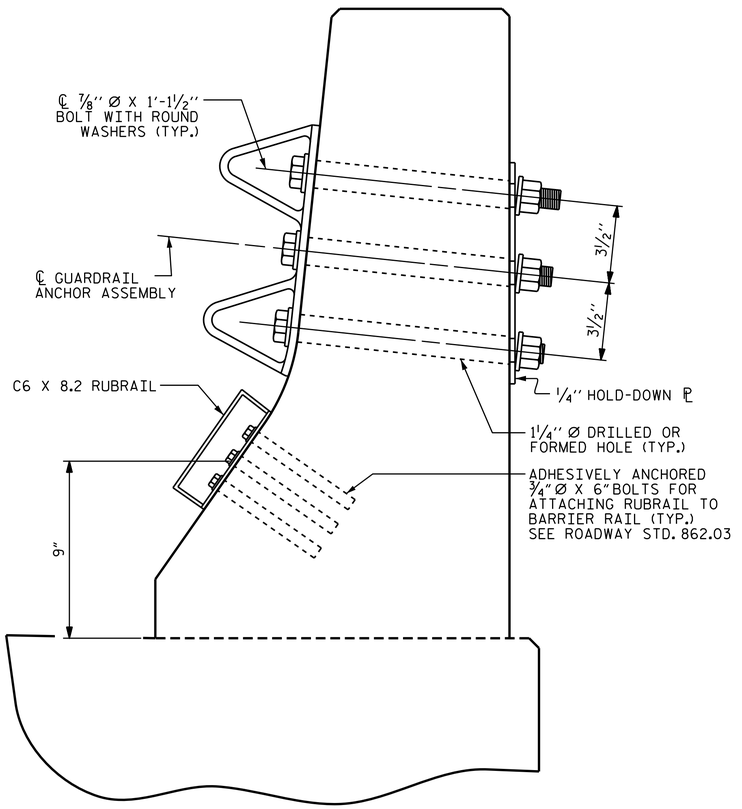
STR. #18

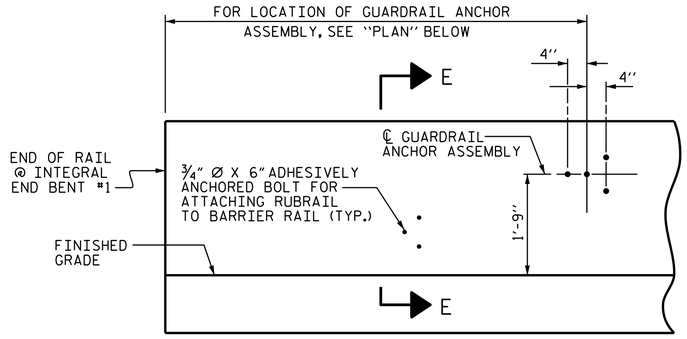


PLAN



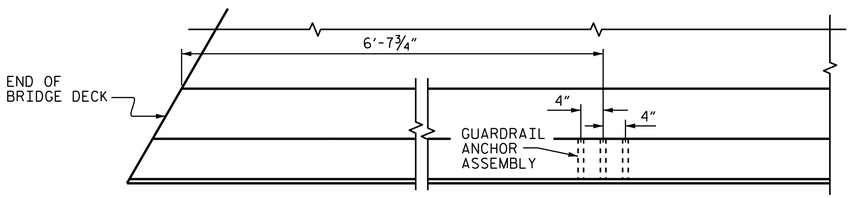
SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

NOTES

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

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

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

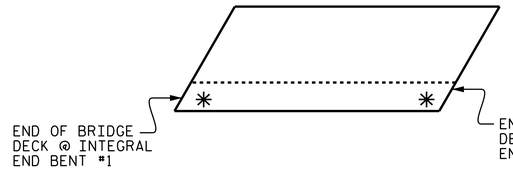
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

ASSEMBLED BY : B.N.BARODAWALA	DATE : 2-18-14
CHECKED BY : NEIL RUFFIN	DATE : 9-23-14
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

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NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFDAAB34BFA47B...

3/26/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

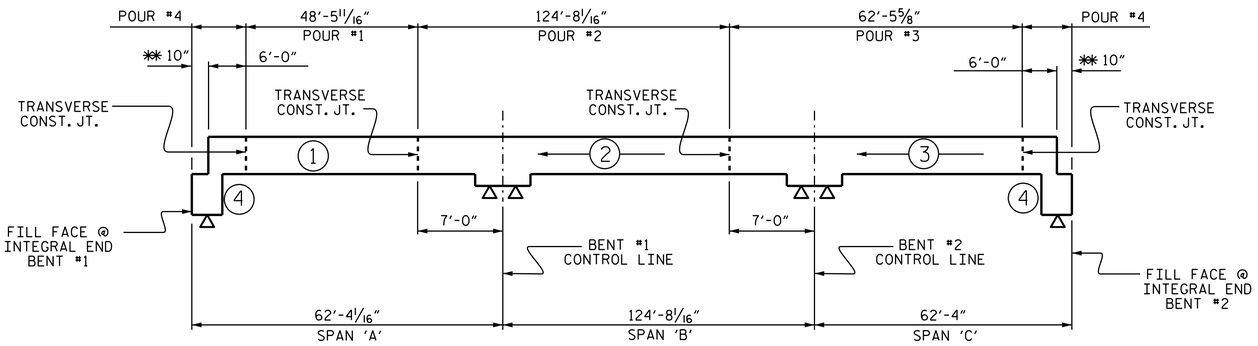
STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-021
1			3			TOTAL SHEETS
2			4			39

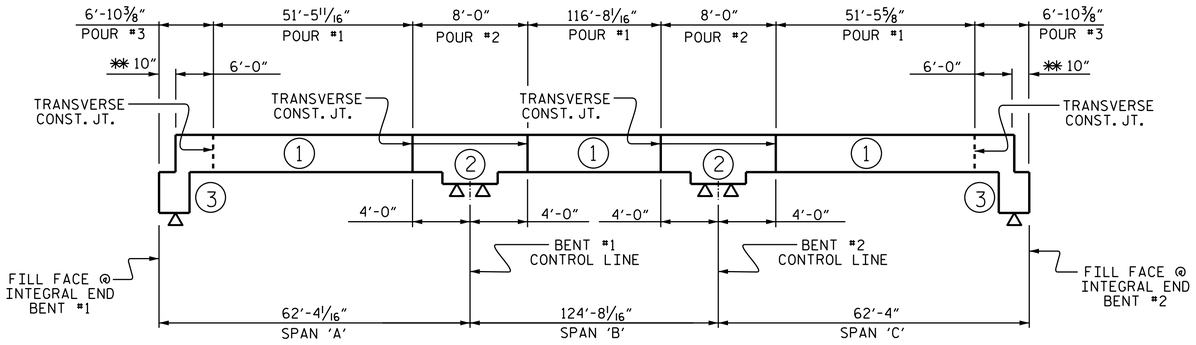
STR. #18

STD. NO. GRA2



POURING SEQUENCE

** THESE DIMENSIONS ARE NORMAL TO CAP.



OPTIONAL POURING SEQUENCE

POUR #2 CANNOT BE STARTED UNTIL BOTH ADJACENT POUR #1 REACH A MINIMUM OF 3000 P.S.I.

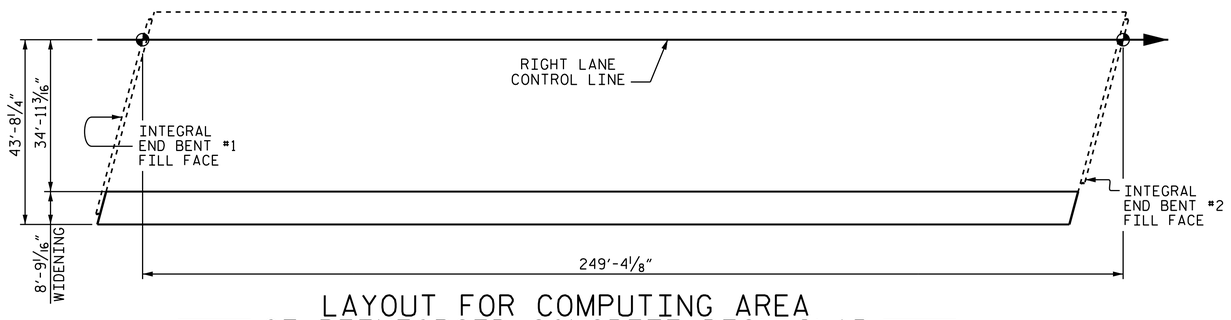
** THESE DIMENSIONS ARE NORMAL TO JOINT.

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

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	280	SQ.FT.
BRIDGE DECK	1,393	SQ.FT.
TOTAL	1,673	SQ.FT.

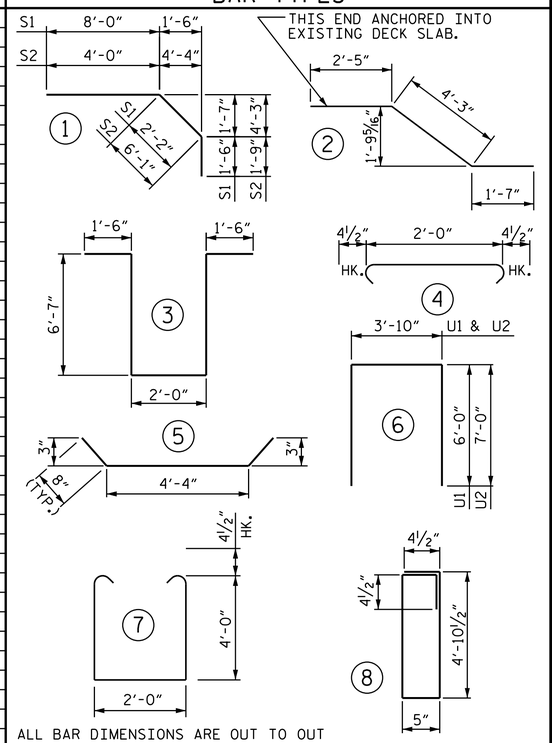


LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 2183)

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	392	#5	STR	8'-5"	3,441
A2	392	#5	STR	8'-5"	3,441
* A101	1	#5	STR	7'-5"	8
* A102	1	#5	STR	5'-1"	5
* A103	1	#5	STR	2'-9"	3
* A104	1	#5	STR	7'-1"	7
* A105	1	#5	STR	4'-9"	5
A201	1	#5	STR	7'-5"	8
A202	1	#5	STR	5'-1"	5
A203	1	#5	STR	2'-9"	3
A204	1	#5	STR	7'-1"	7
A205	1	#5	STR	4'-9"	5
* B1	34	#6	STR	12'-4"	630
* B2	14	#4	STR	29'-0"	271
* B3	14	#7	STR	51'-9"	1,481
* B4	14	#7	STR	20'-0"	572
* B5	10	#7	STR	28'-3"	577
* B6	14	#4	STR	22'-11"	214
B7	14	#6	STR	14'-4"	301
B8	28	#5	STR	57'-4"	1,674
* D1	165	#6	STR	3'-0"	743
H1	8	#5	STR	15'-9"	131
H2	8	#5	STR	15'-11"	133
H3	8	#5	STR	15'-0"	125
H4	8	#5	STR	15'-2"	127
K1	12	#4	STR	12'-8"	102
K2	2	#4	STR	3'-6"	5
K3	8	#4	STR	4'-4"	23
K4	2	#4	STR	2'-9"	4
K5	2	#4	STR	6'-8"	9
K6	10	#4	STR	7'-5"	50
K7	2	#4	STR	5'-9"	8
K8	4	#4	STR	3'-8"	10
K9	8	#5	5	5'-8"	47
K10	40	#5	STR	5'-8"	236
K11	4	#4	STR	4'-3"	11
K12	20	#4	STR	5'-11"	79
K13	4	#4	STR	2'-10"	8
K14	12	#4	2	8'-3"	66
* S1	10	#4	1	11'-8"	78
* S2	8	#4	1	11'-10"	63
S3	20	#4	8	11'-4"	151
S4	4	#4	7	10'-9"	29
S5	64	#5	4	2'-9"	184
U1	10	#4	6	15'-10"	106
U2	8	#4	6	17'-10"	95
U3	8	#4	3	18'-2"	97
V1	56	#5	STR	7'-1"	414
REINFORCING STEEL				LBS.	7,694
* EPOXY COATED REINFORCING STEEL				LBS.	8,098

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
POUR 1	19.0		
POUR 2	52.1		
POUR 3	27.8		
POUR 4 ✲	36.4		
TOTALS**	135.3	7,694	8,098

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

✲ POUR 4 QUANTITY INCLUDES UPPER POUR OF WINGS & INTEGRAL END BENT

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-022
1			3			TOTAL SHEETS
2			4			39

STR. #18

STD. NO. BOM2

ASSEMBLED BY : B. N. BARODAWALA DATE : 2-18-14
CHECKED BY : NEIL RUFFIN DATE : 8-22-14

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

REV. 8/16/99 RWW/LES
REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
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3/26/2015

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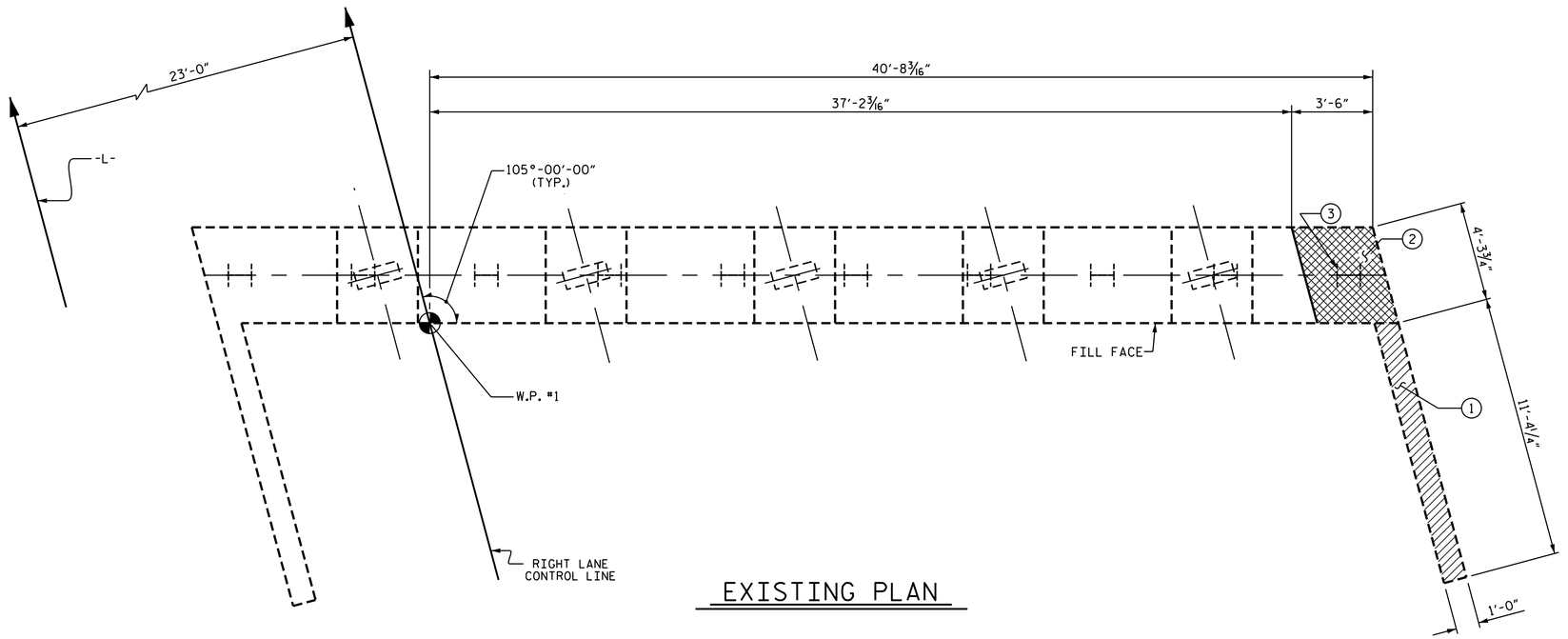
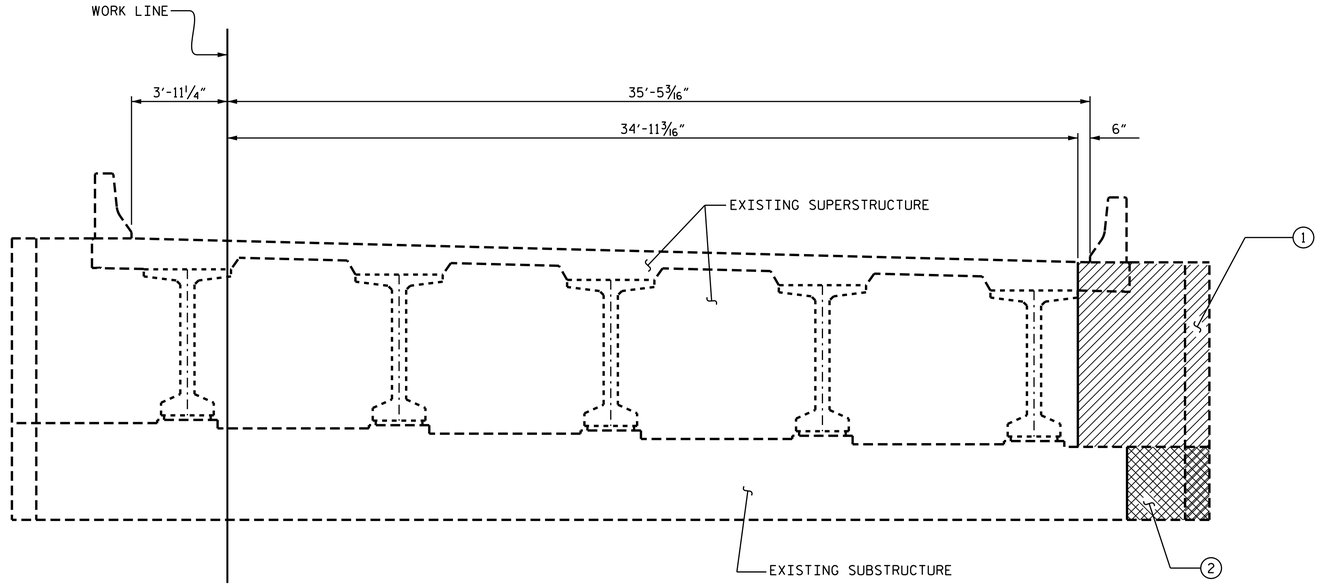
NOTES:

1. FOR REMOVING INTEGRAL PART OF SUPERSTRUCTURE, SEE NOTES ON "SUPERSTRUCTURE TYPICAL SECTION" SHEET.
2. CHIP OUT EXISTING CAP RETAINING REINFORCEMENT. TRIM & CLEAN REINFORCEMENT AS NECESSARY FOR PLACEMENT OF NEW REINFORCEMENT. REMOVE EXISTING RIGHT WING WALL UP TO FILL FACE.
3. CARE SHOULD BE TAKEN NOT TO CUT EXISTING STEEL PILE.



EXISTING PLAN



EXISTING ELEVATION
(NORMAL TO SURVEY LINE)

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1
EXISTING CAP

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-023
1			3			TOTAL SHEETS
2			4			39

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48F4A7B...
3/26/2015

DRAWN BY :	K. P. SEDAI	DATE :	9/19/14
CHECKED BY :	B. N. BARODAWALA	DATE :	12/19/14
DESIGN ENGINEER OF RECORD:	K. P. SEDAI	DATE :	

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STR. #18

NOTES

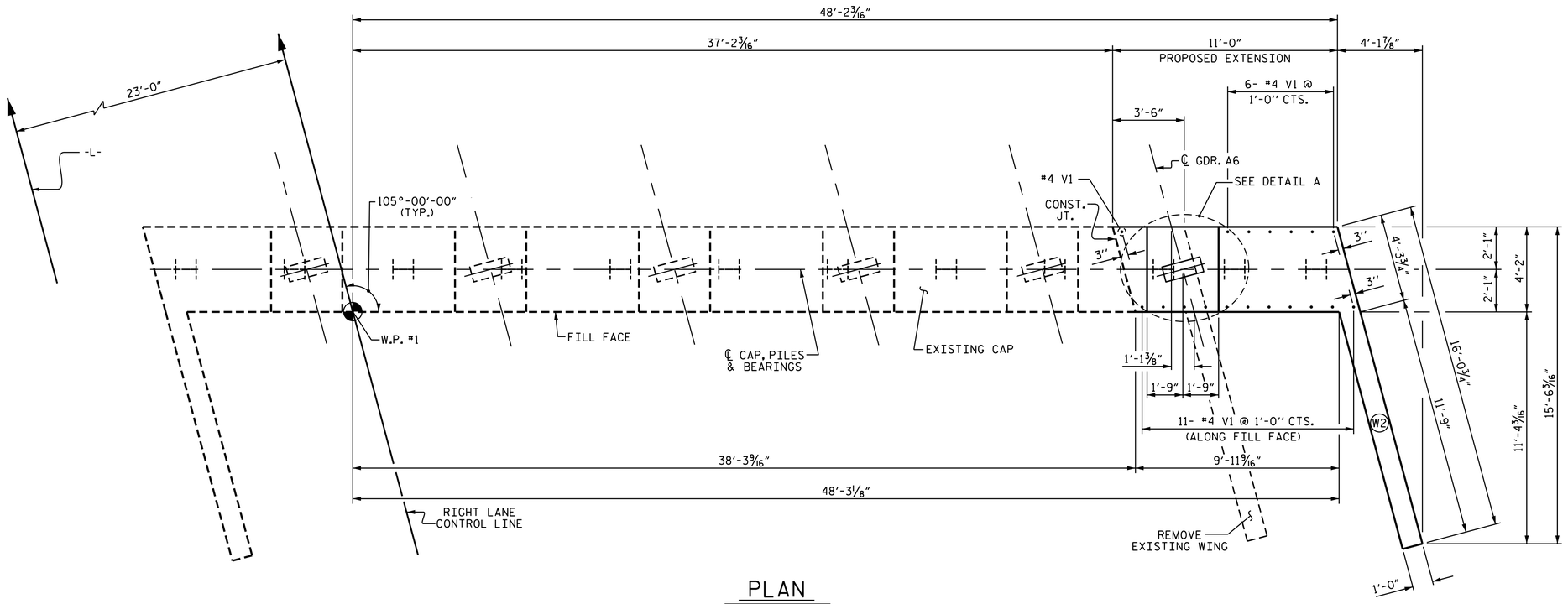
SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

THE CONTRACTORE SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

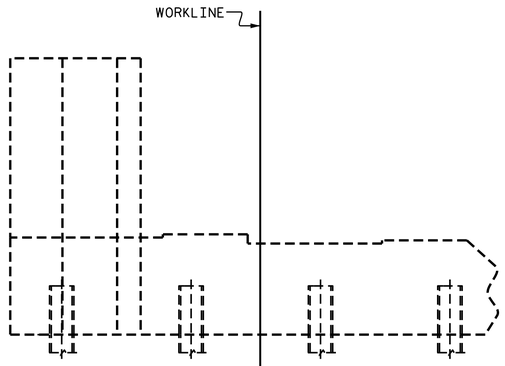
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE END BENT WINGS ARE TO BE POURED WITH POUR #4 OF THE SUPERSTRUCTURE.

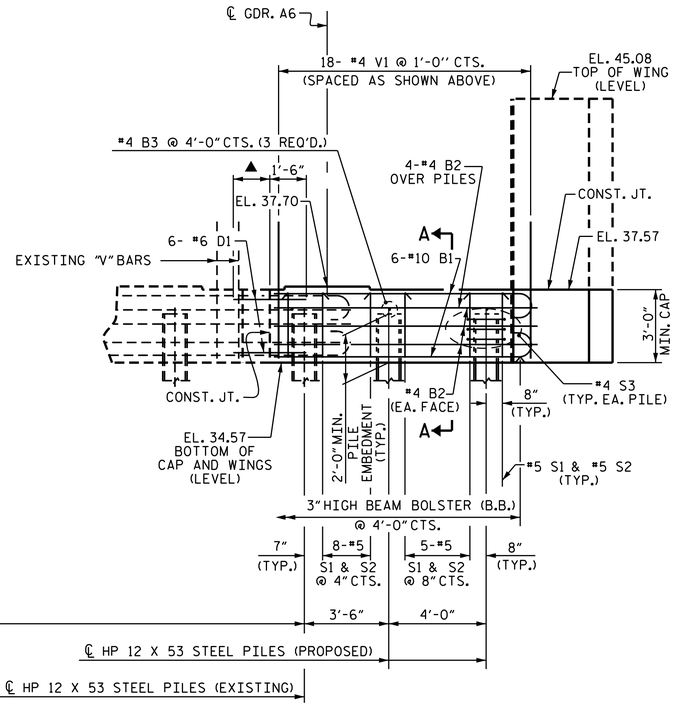
DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE MAIN STEEL.

▲ DOWELS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM. EMBEDMENT LENGTH SHALL BE DETERMINED BY THE SELECTED MANUFACTURER. LEVEL 1 FIELD TESTING IS REQUIRED AND THE YIELD LOAD IS 26.4 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

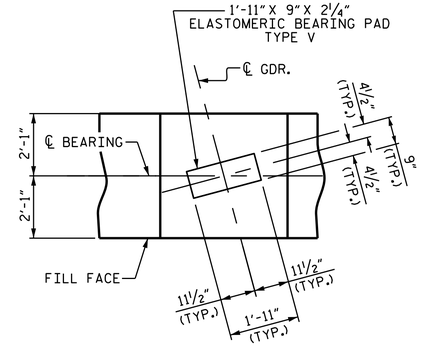


PLAN





ELEVATION



DETAIL A

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-024
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : K. P. SEDAI DATE : 9/19/14
CHECKED BY : B. N. BARODAWALA DATE : 12/19/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

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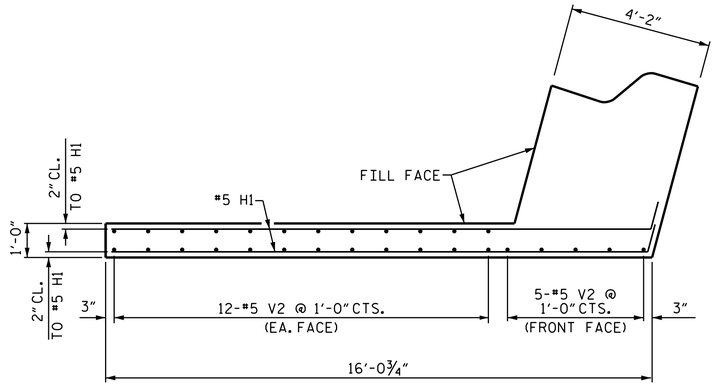
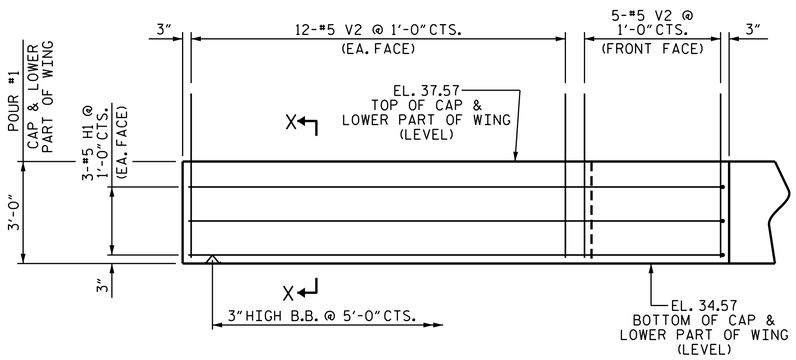
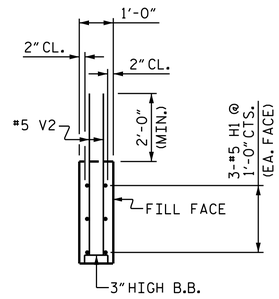


PLAN OF RIGHT WING (W2)



ELEVATION OF RIGHT WING (W2)



SECTION X-X

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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SUBSTRUCTURE

INTEGRAL END BENT 1

REVISIONS						SHEET NO.
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3/26/2015

DRAWN BY : K. P. SEDAI DATE : 9/19/14
CHECKED BY : B. N. BARODAWALA DATE : 12/19/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

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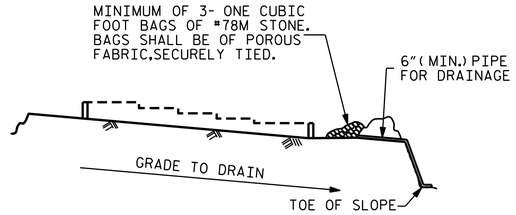
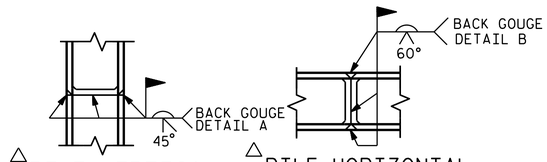


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

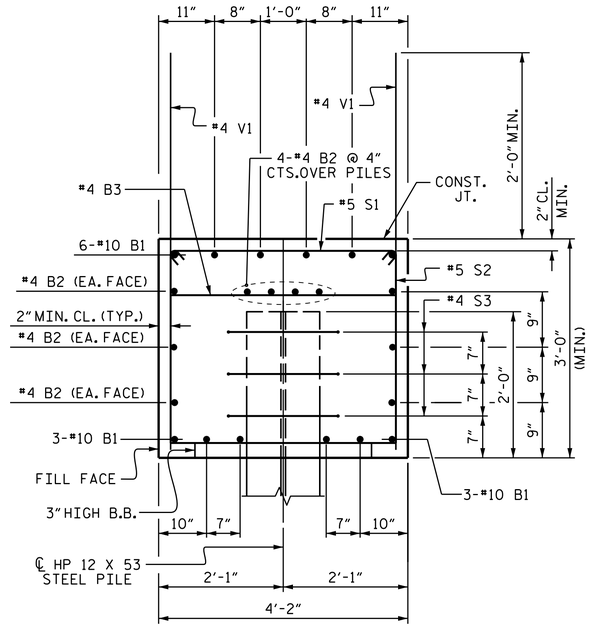
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



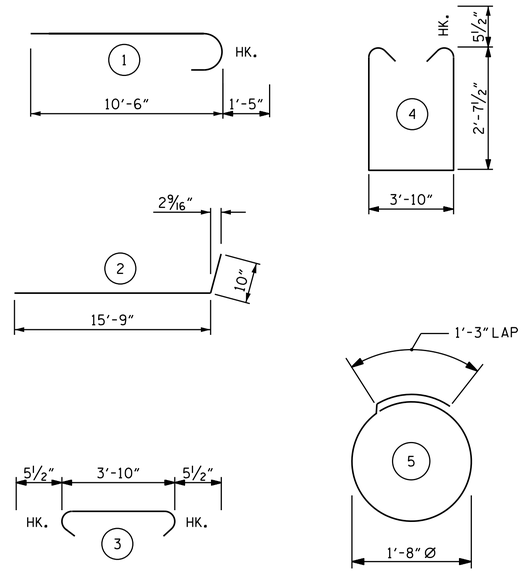
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	11'-11"	615
B2	10	#4	STR.	10'-9"	72
B3	3	#4	STR.	3'-10"	8
D1	12	#6	STR.	3'-0"	54
H1	6	#5	2	16'-7"	104
S1	15	#5	3	4'-9"	74
S2	15	#5	4	10'-0"	156
S3	9	#4	5	6'-6"	39
V1	18	#4	STR.	5'-0"	60
V2	29	#5	STR.	5'-0"	151

REINFORCING STEEL LBS. 1,333

CLASS A CONCRETE
POUR #1
(CAP & LOWER PART OF WING)
CU. YDS. 6.5
TOTAL CU. YDS. 6.5

HP 12 X 53 STEEL PILES
NO. 2 LIN. FT. 120

PILE REDRIVES
EACH 2

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-026
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : K. P. SEDAI DATE : 9/24/14
CHECKED BY : B. N. BARODAWALA DATE : 12/19/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

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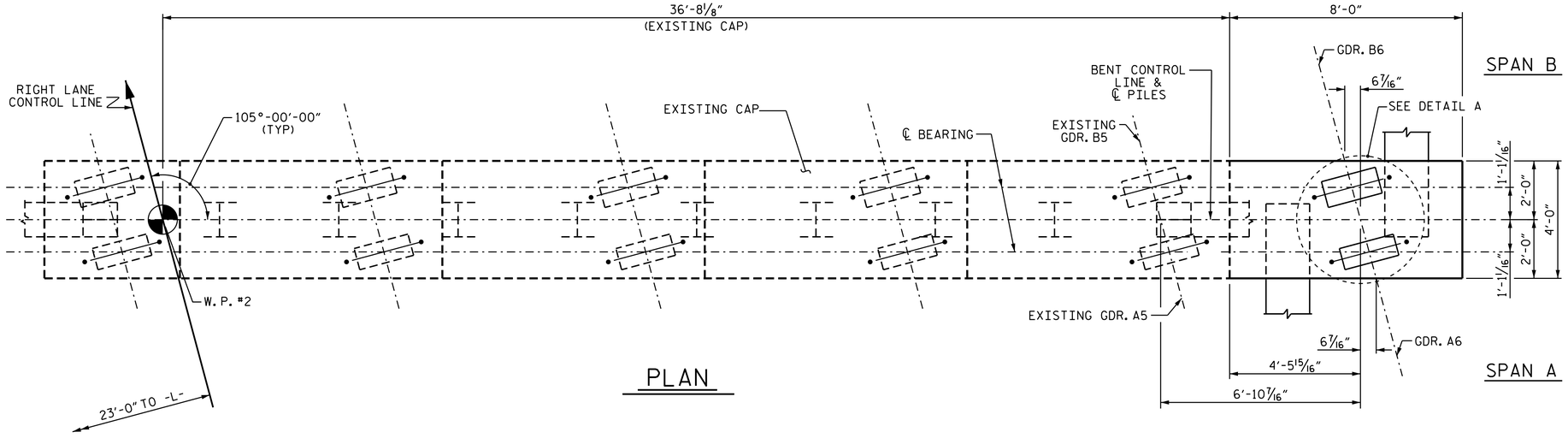
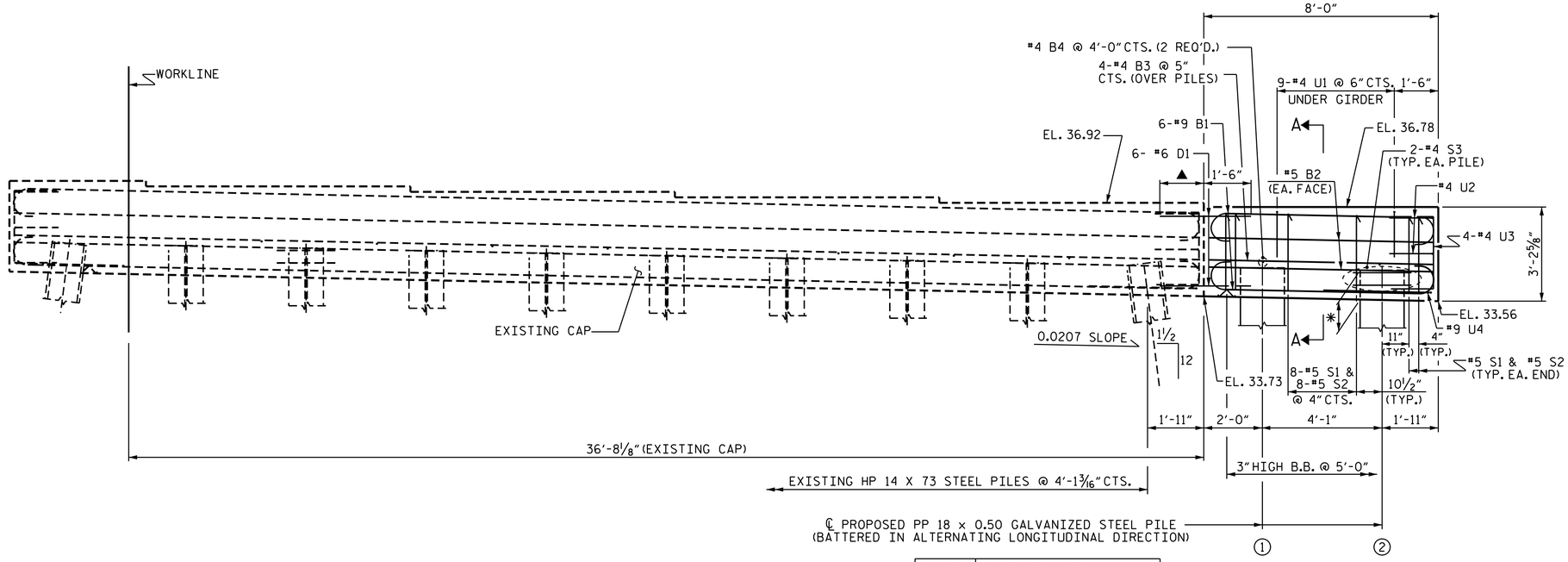
STR. #18



PLAN



ELEVATION

PILE #	TOP OF PILE ELEVATION
1	EL. 34.70
2	EL. 34.62

✱ 1'-0" MIN. PILE EMBEDMENT (TYP.)

NOTES

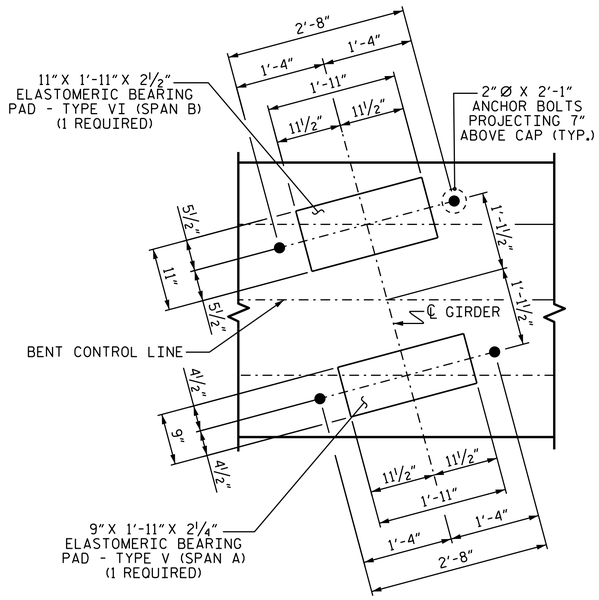
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR ADDITIONAL REINFORCING STEEL IN PP 18 x 0.50 GALVANIZED STEEL PILES, SEE "18 IN. STEEL PIPE PILE" SHEET.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 37.5 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE MAIN STEEL.

▲ DOWELS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM. EMBEDMENT LENGTH SHALL BE DETERMINED BY THE SELECTED MANUFACTURER. LEVEL 1 FIELD TESTING IS REQUIRED AND THE YIELD LOAD IS 26.4 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.



DETAIL A

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1

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

SHEET NO. S18-027
TOTAL SHEETS 39

STR. #18

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFDAA8D48FA47B...
3/26/2015

DRAWN BY : K. P. SEDAI DATE : 10/1/14
CHECKED BY : B. N. BARODAWALA DATE : 12/18/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

26-MAR-2015 09:23
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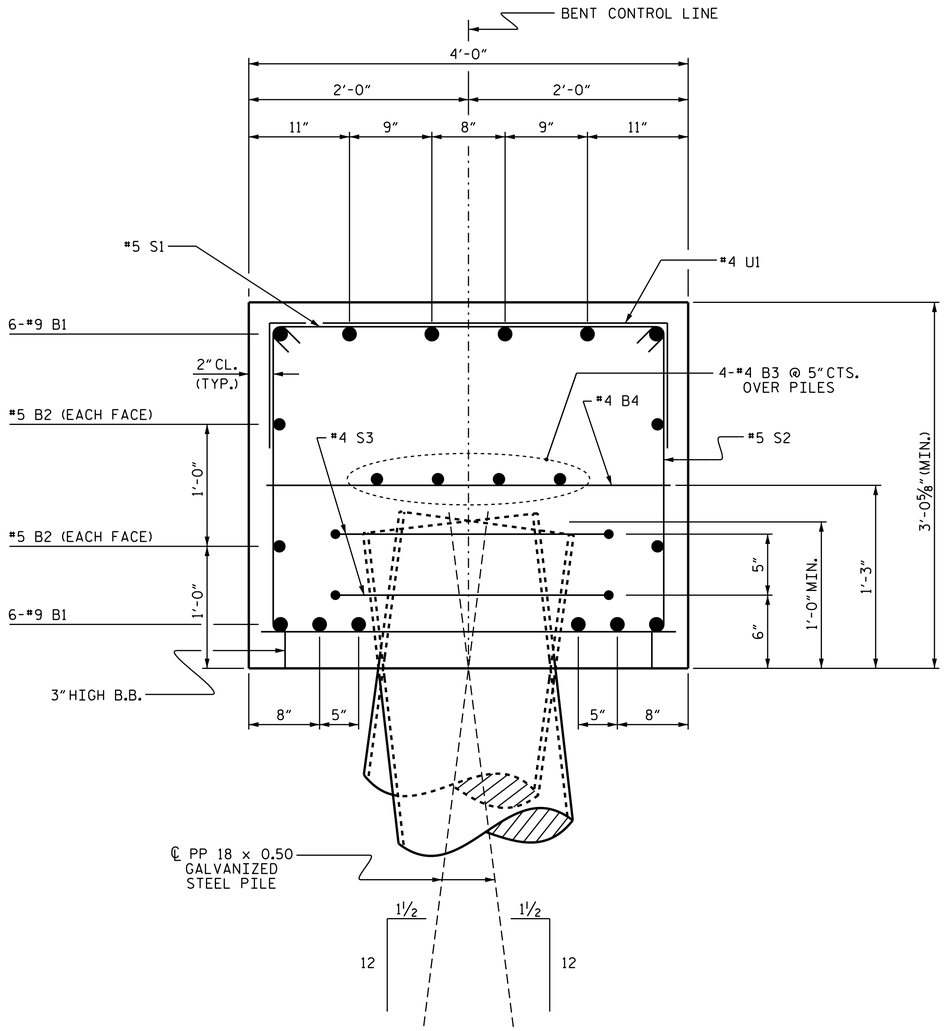
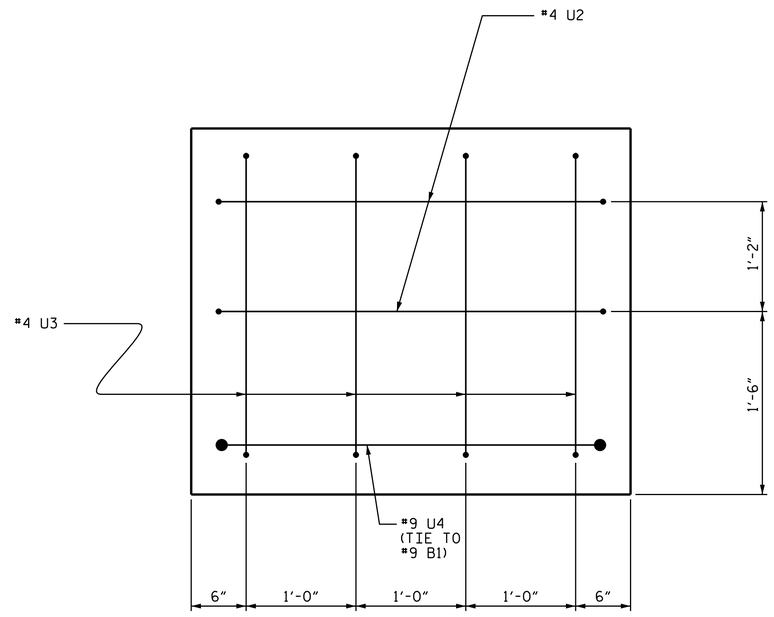
mruffin

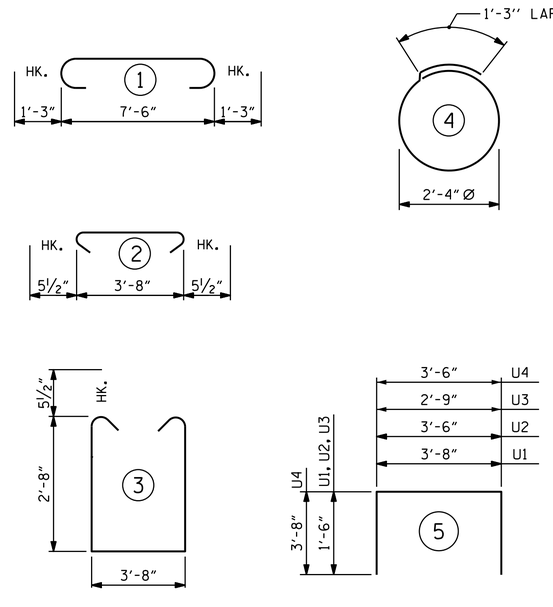


SECTION A-A



END OF CAP VIEW
(RIGHT END)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	10'-0"	408
B2	4	#5	STR	7'-8"	32
B3	4	#4	STR	7'-8"	20
B4	2	#4	STR	3'-8"	5
D1	12	#6	STR	3'-0"	54
S1	12	#5	2	4'-7"	57
S2	12	#5	3	9'-11"	124
S3	4	#4	4	8'-7"	23
U1	9	#4	5	6'-8"	40
U2	2	#4	5	6'-6"	9
U3	4	#4	5	5'-9"	15
U4	1	#9	5	10'-10"	37

REINFORCING STEEL 824 LBS

CLASS A CONCRETE BREAKDOWN

POUR #1 (CAP) ▲ 3.6 C.Y.

TOTAL CLASS A CONCRETE 3.6 C.Y.

PP 18 x 0.50 GALVANIZED STEEL PILES

No. 2 LIN. FT. 120

PIPE PILE PLATES No. = 2

PILE REDRIVES
EACH 2

▲ CONCRETE DISPLACED BY THE PP 18 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

DRAWN BY : K. P. SEDAI DATE : 10/2/14
CHECKED BY : B. N. BARODAWALA DATE : 12/18/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : _____

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NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48F447B...
3/26/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

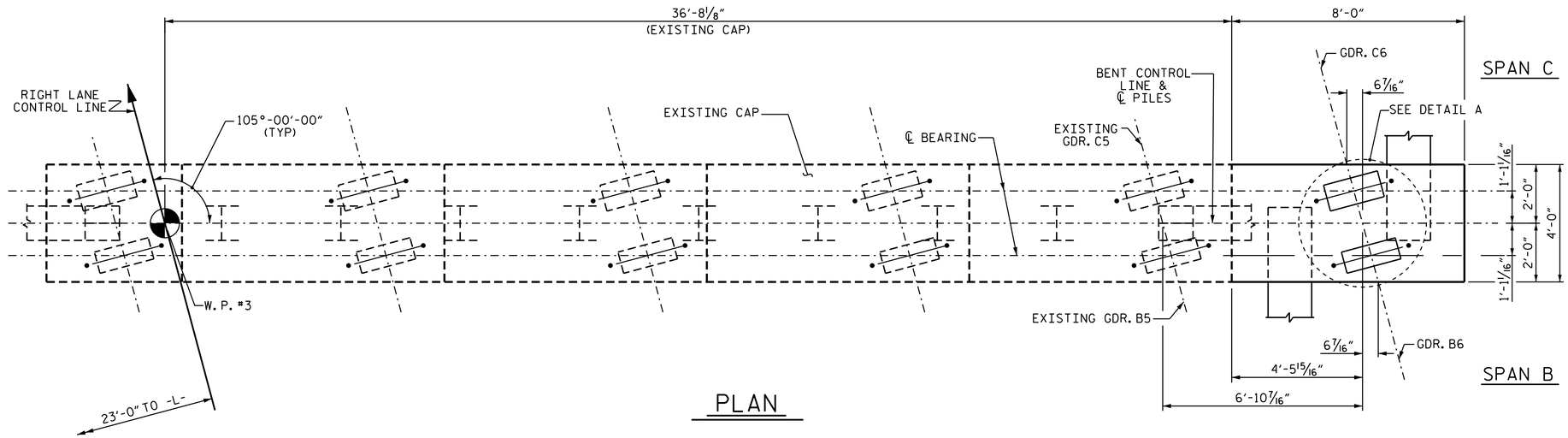
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

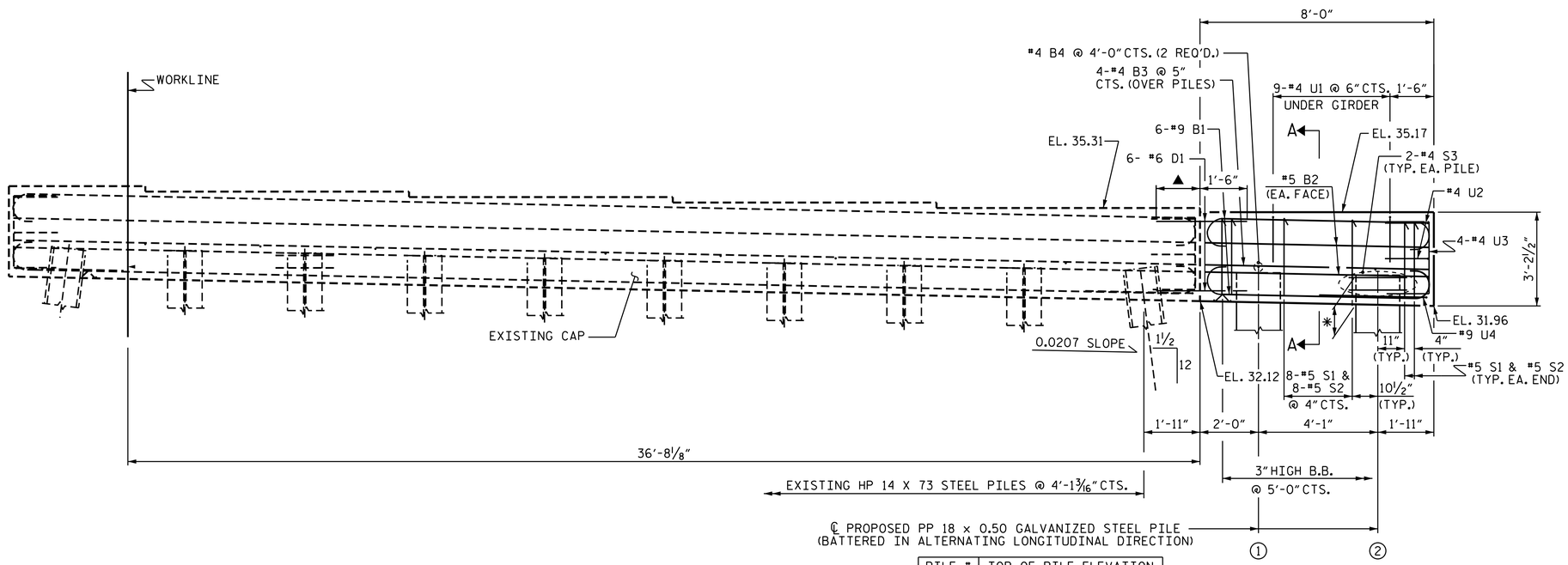
SUBSTRUCTURE
BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-028
1			3			TOTAL SHEETS
2			4			39

STR. #18



PLAN



PILE #	TOP OF PILE ELEVATION
1	EL. 33.09
2	EL. 33.01

✱ 1'-0" MIN. PILE EMBEDMENT (TYP.)

ELEVATION

NOTES

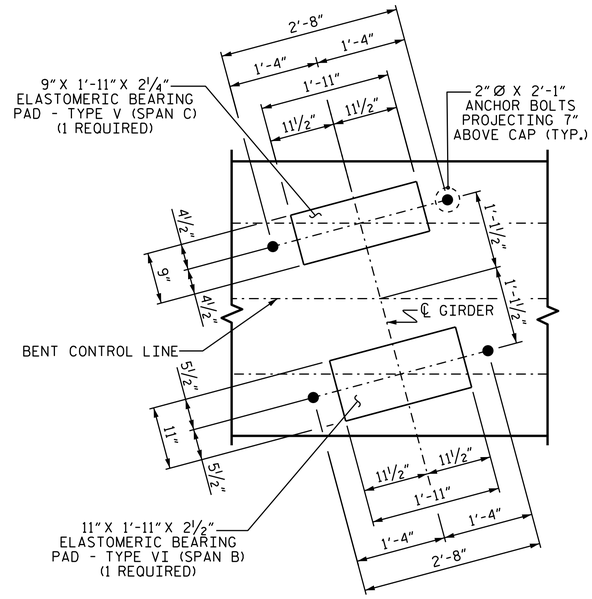
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

FOR ADDITIONAL REINFORCING STEEL IN PP 18 x 0.50 GALVANIZED STEEL PILES, SEE "18 IN. STEEL PIPE PILE" SHEET.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 32.0 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE MAIN STEEL.

▲ DOWELS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM. EMBEDMENT LENGTH SHALL BE DETERMINED BY THE SELECTED MANUFACTURER. LEVEL 1 FIELD TESTING IS REQUIRED AND THE YIELD LOAD IS 26.4 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.



DETAIL A

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-029
1			3			TOTAL SHEETS
2			4			39

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

DRAWN BY : K. P. SEDAI DATE : 10/1/14
CHECKED BY : B. N. BARODAWALA DATE : 12/18/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

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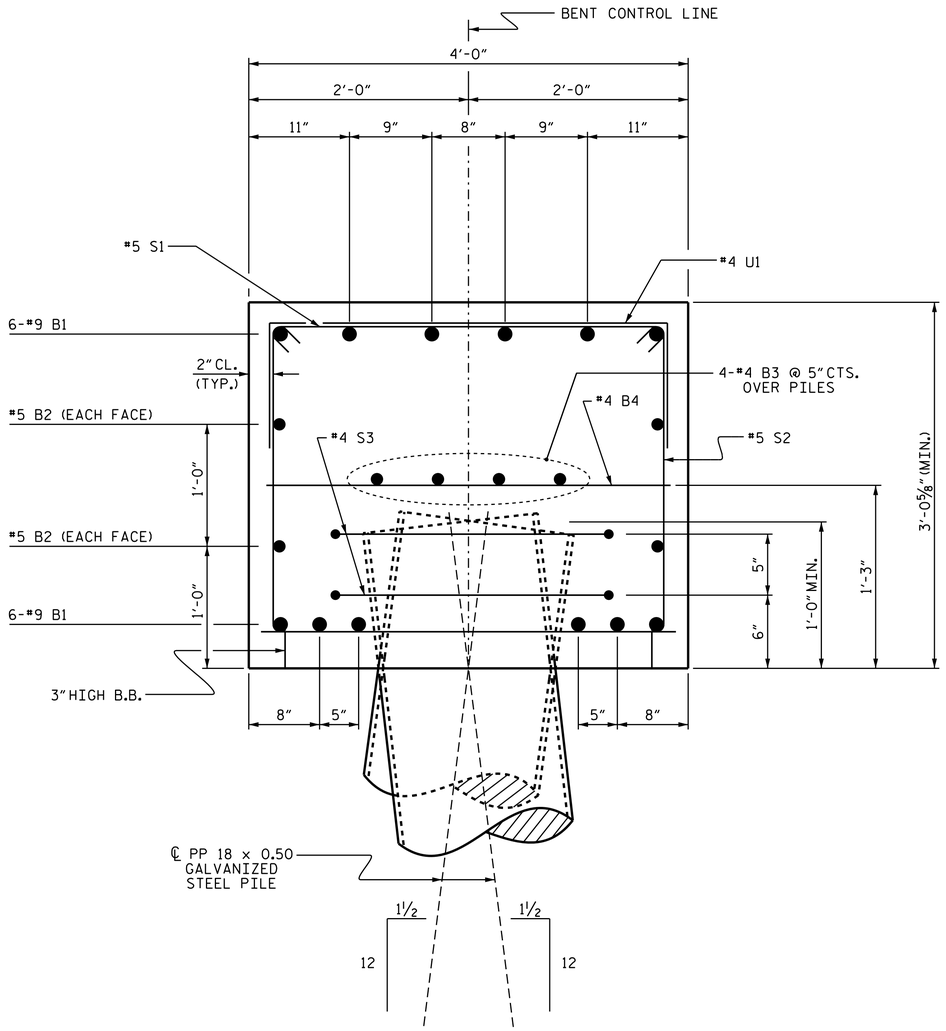
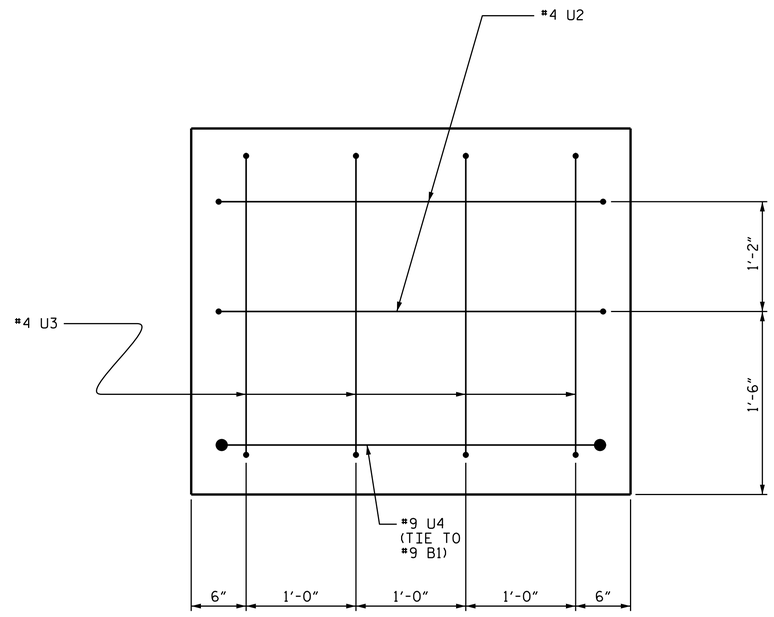
STR. #18

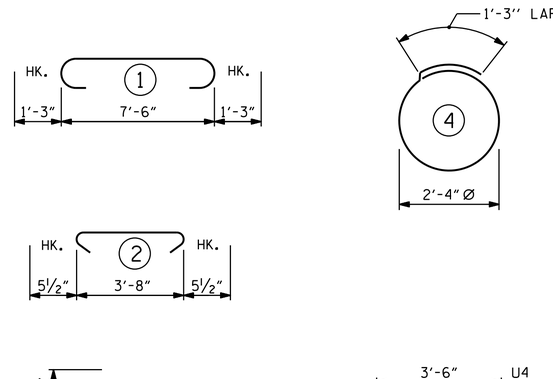


SECTION A-A



END OF CAP VIEW
(RIGHT END)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	10'-0"	408
B2	4	#5	STR	7'-8"	32
B3	4	#4	STR	7'-8"	20
B4	2	#4	STR	3'-8"	5
D1	12	#6	STR	3'-0"	54
S1	12	#5	2	4'-7"	57
S2	12	#5	3	9'-11"	124
S3	4	#4	4	8'-7"	23
U1	9	#4	5	6'-8"	40
U2	2	#4	5	6'-6"	9
U3	4	#4	5	5'-9"	15
U4	1	#9	5	10'-10"	37

REINFORCING STEEL 824 LBS

CLASS A CONCRETE BREAKDOWN

POUR #1 (CAP) ▲ 3.6 C.Y.

TOTAL CLASS A CONCRETE 3.6 C.Y.

PP 18 x 0.50 GALVANIZED STEEL PILES

No. 2 LIN. FT. 130

PIPE PILE PLATES No. = 2

PILE REDRIVES
EACH 2

▲ CONCRETE DISPLACED BY THE PP 18 x 0.50 GALVANIZED STEEL PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.

DRAWN BY : K. P. SEDAI DATE : 10/2/14
CHECKED BY : B. N. BARODAWALA DATE : 12/18/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE : _____

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NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48F47B...
3/26/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

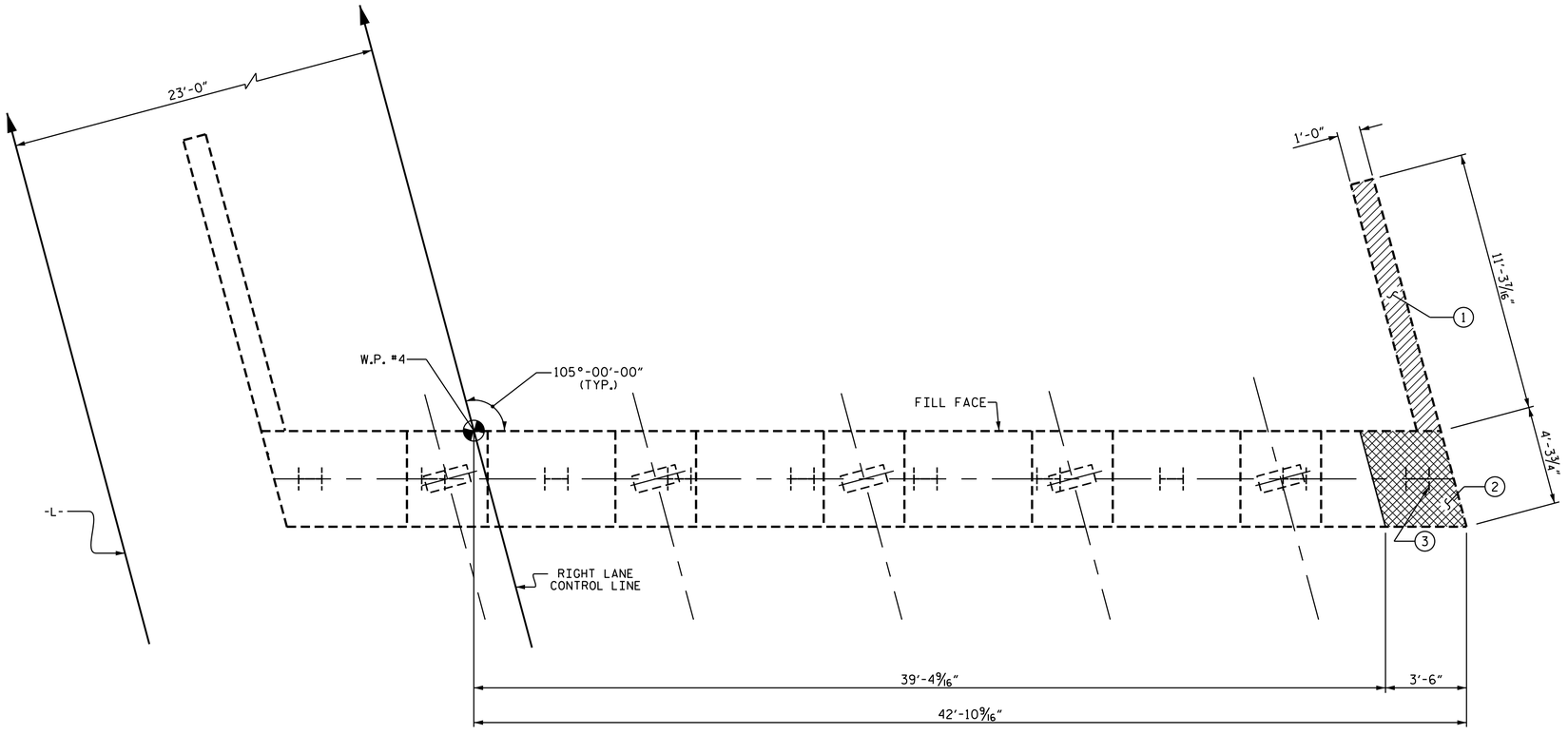
SUBSTRUCTURE
BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-030
1			3			TOTAL SHEETS
2			4			39

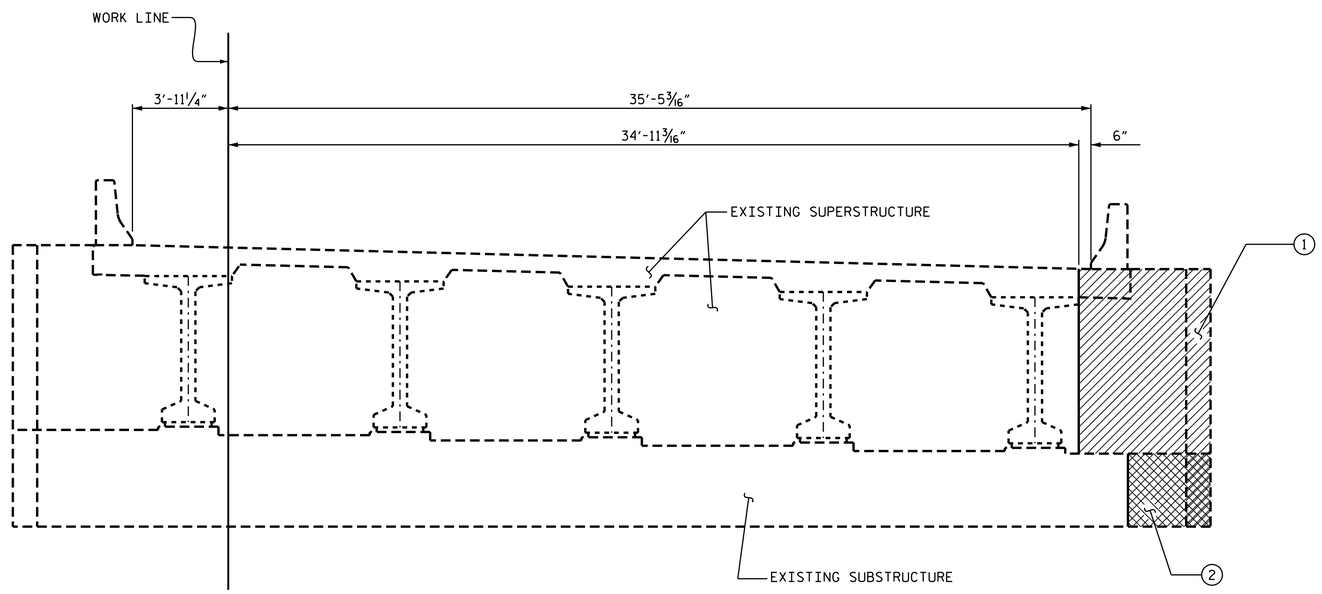
STR. #18

NOTES:

1. FOR REMOVING INTEGRAL PART OF SUPERSTRUCTURE, SEE NOTES ON "SUPERSTRUCTURE TYPICAL SECTION" SHEET.
2. CHIP OUT EXISTING CAP RETAINING REINFORCEMENT. TRIM & CLEAN REINFORCEMENT AS NECESSARY FOR PLACEMENT OF NEW REINFORCEMENT. REMOVE EXISTING RIGHT WING WALL UP TO FILL FACE.
3. CARE SHOULD BE TAKEN NOT TO CUT EXISTING STEEL PILE.



EXISTING PLAN



EXISTING ELEVATION

(NORMAL TO SURVEY LINE)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
EXISTING CAP

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48F447B...

3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-031
1			3			TOTAL SHEETS
2			4			39

DRAWN BY : K. P. SEDAI DATE : 9/19/14
CHECKED BY : B. N. BARODAWALA DATE : 12/19/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

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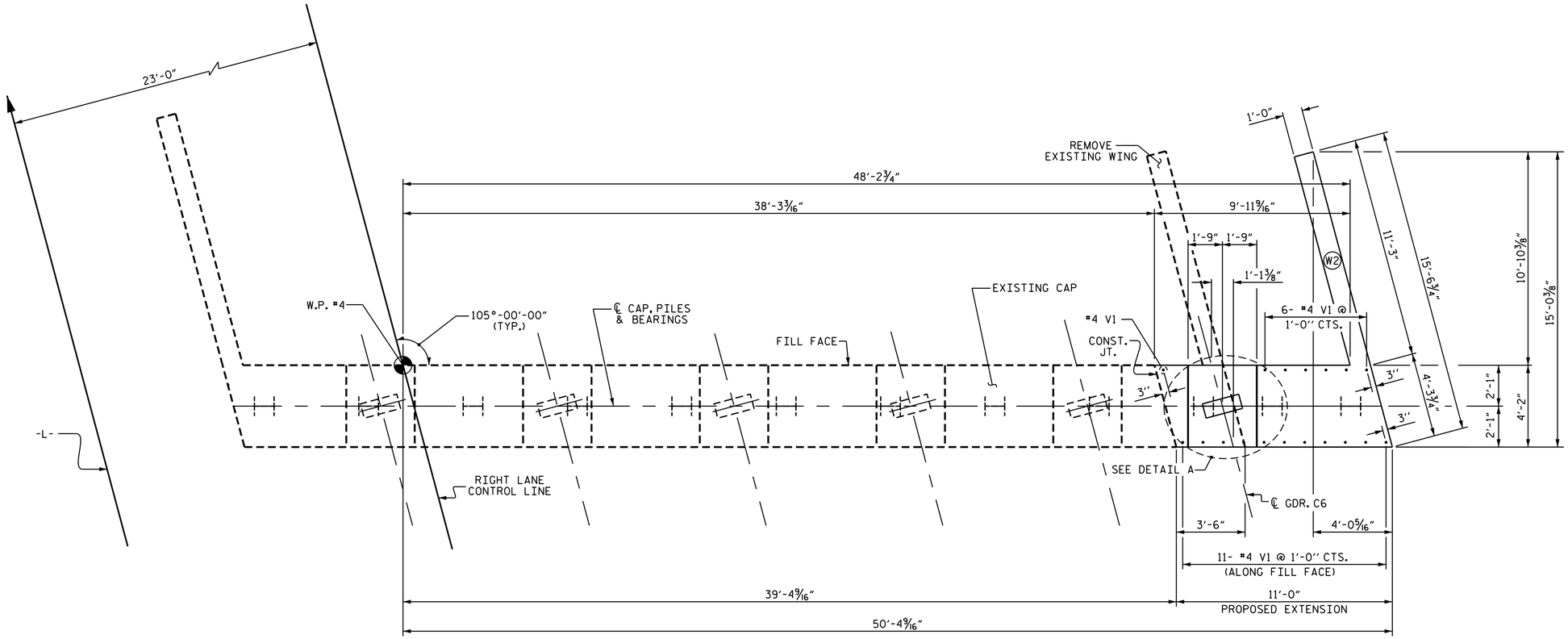
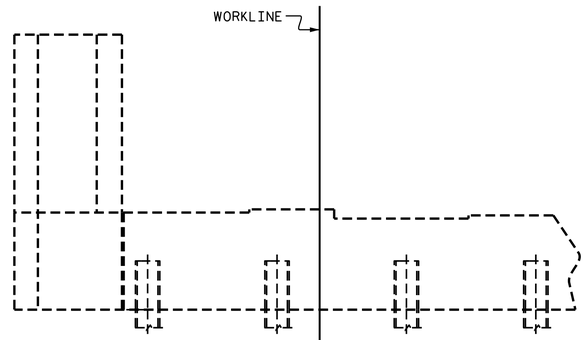
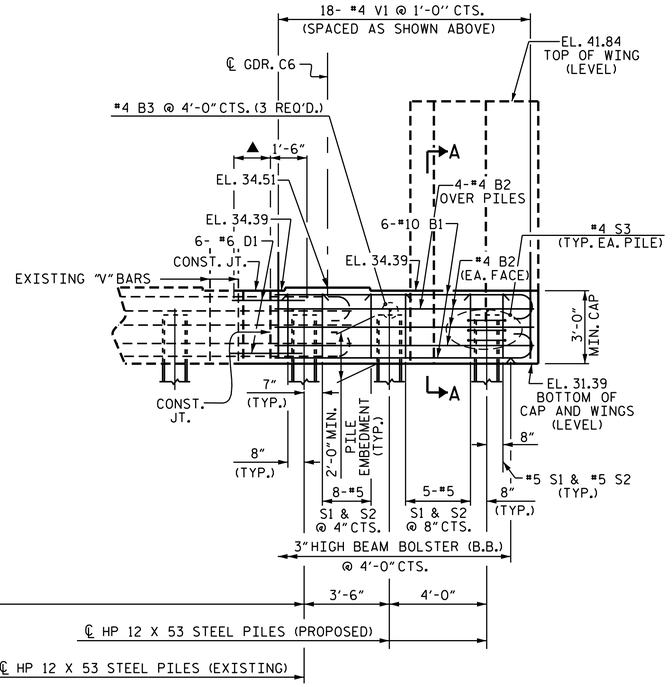
STR. #18

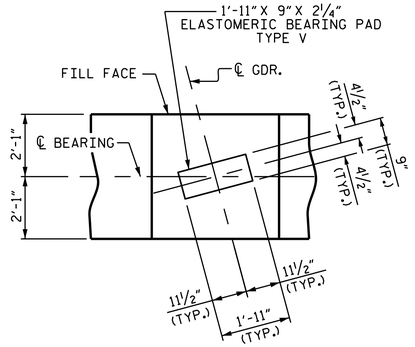


PLAN





ELEVATION



DETAIL A

NOTES

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

THE CONTRACTORE SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE END BENT WINGS ARE TO BE POURED WITH POUR #4 OF THE SUPERSTRUCTURE.

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE MAIN STEEL.

▲ DOWELS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM. EMBEDMENT LENGTH SHALL BE DETERMINED BY THE SELECTED MANUFACTURER. LEVEL 1 FIELD TESTING IS REQUIRED AND THE YIELD LOAD IS 26.4 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-032
1			3			TOTAL SHEETS
2			4			39

STR. #18

DRAWN BY : K. P. SEDAI DATE : 9/19/14
CHECKED BY : B. N. BARODAWALA DATE : 12/19/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
Tim Coggins
DocuSigned by: DEFD48D48FA47B...
3/26/2015

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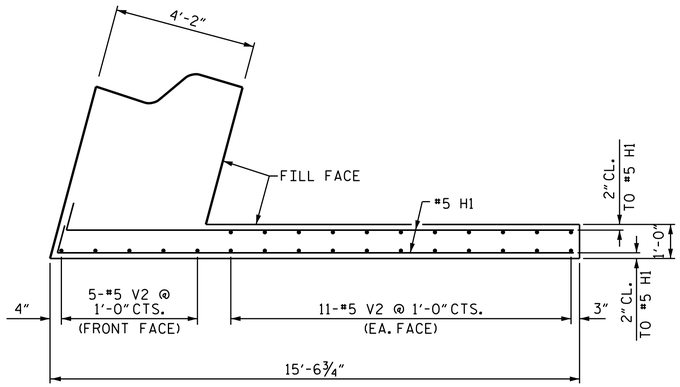
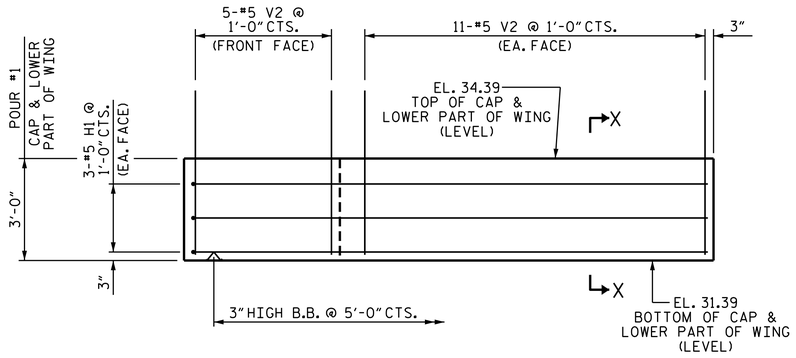
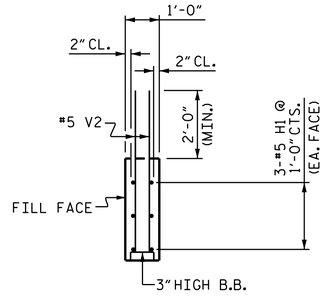


PLAN OF RIGHT WING (W2)



ELEVATION OF RIGHT WING (W2)



SECTION X-X

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-033
1			3			TOTAL SHEETS
2			4			39

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

DRAWN BY : K. P. SEDAI DATE : 9/23/14
CHECKED BY : B. N. BARODAWALA DATE : 12/19/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

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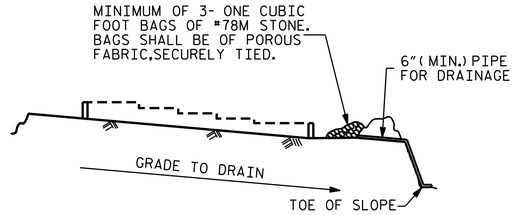
STR. #18

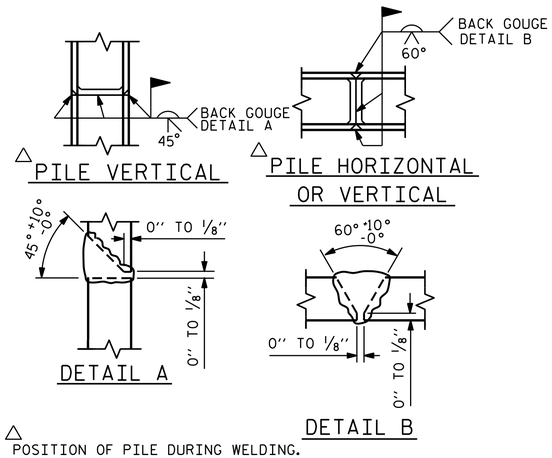


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

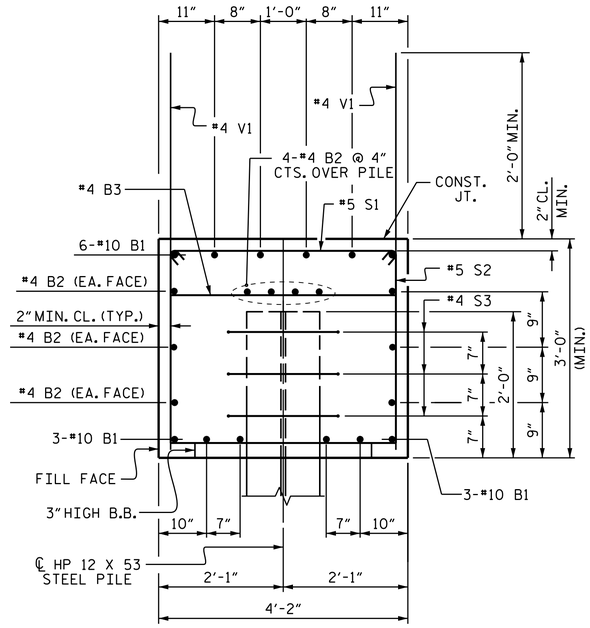
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



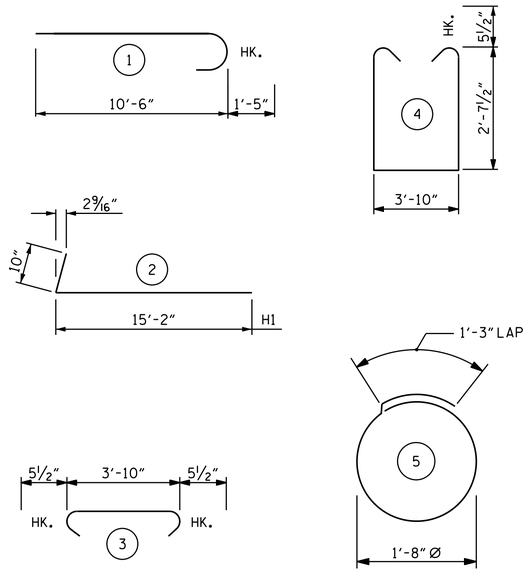
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	11'-11"	615
B2	10	#4	STR.	10'-9"	72
B3	3	#4	STR.	3'-10"	8
D1	12	#6	STR.	3'-0"	54
H1	6	#5	2	16'-0"	100
S1	15	#5	3	4'-9"	74
S2	15	#5	4	10'-0"	156
S3	9	#4	5	6'-6"	39
V1	18	#4	STR.	5'-0"	60
V2	27	#5	STR.	5'-0"	141
REINFORCING STEEL				LBS.	1,319

CLASS A CONCRETE
POUR #1
(CAP & LOWER PART OF WING)
CU. YDS. 6.4
TOTAL CU. YDS. 6.4

HP 12 X 53 STEEL PILES
NO. 2 LIN. FT. 130

PILE REDRIVES
EACH 2

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-034
1			3			TOTAL SHEETS
2			4			39

STR. #18

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

DRAWN BY : K. P. SEDAI DATE : 9/24/14
CHECKED BY : B. N. BARODAWALA DATE : 12/19/14
DESIGN ENGINEER OF RECORD: K. P. SEDAI DATE :

26-MAR-2015 09:23
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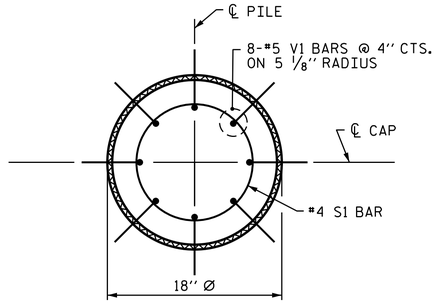

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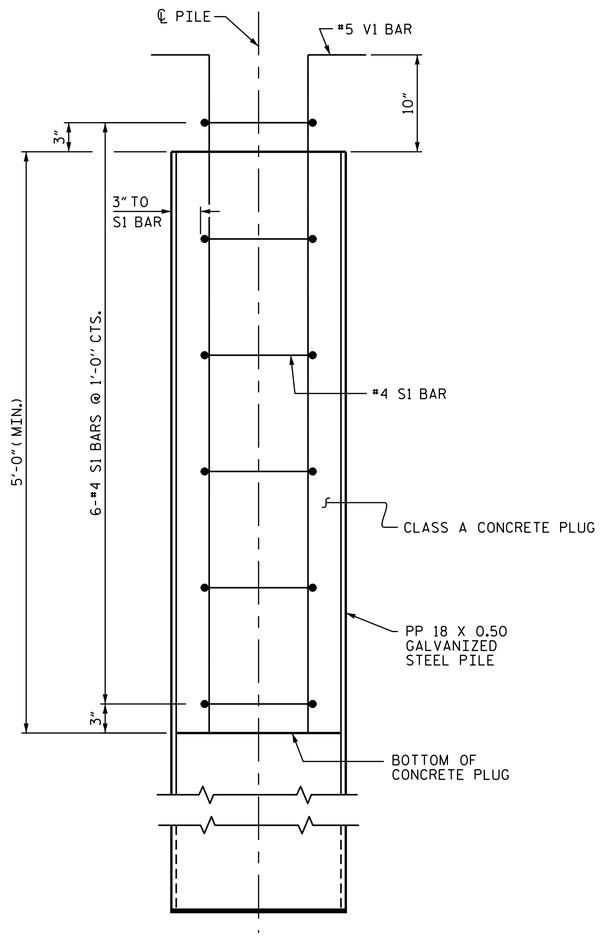
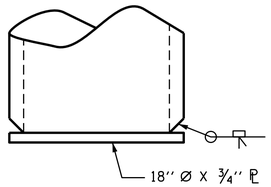


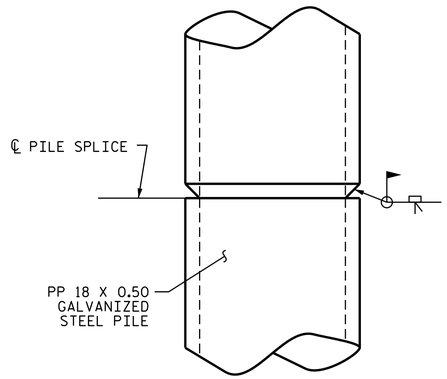
ELEVATION

PP 18 X 0.50 GALVANIZED STEEL PILE

(CLOSED END)



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.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE, AND GALVANIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 18 X 0.50 GALVANIZED STEEL PILES.

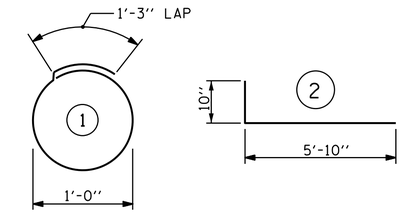
BILL OF MATERIAL FOR ONE PP 18 X 0.50 GALVANIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	4'-5"	18
V1	8	#5	2	6'-8"	56
REINFORCING STEEL =					74 lbs

CLASS A CONCRETE

5'-0" MINIMUM PLUG 0.3 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

18" STEEL PIPE PILE

ASSEMBLED BY : K. P. SEDAI	DATE : 10/1/14
CHECKED BY : B. N. BARODAWALA	DATE : 12/18/14
DRAWN BY : RWW 1/01	REV. 10/1/05 LBG/TLA
CHECKED BY : LES 1/01	REV. 5/1/06R MAA/KMM
	REV. 10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8048FA47B...

3/26/2015

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

SHEET NO. S18-035

TOTAL SHEETS 39

STR. #18

STD. NO. SPP3

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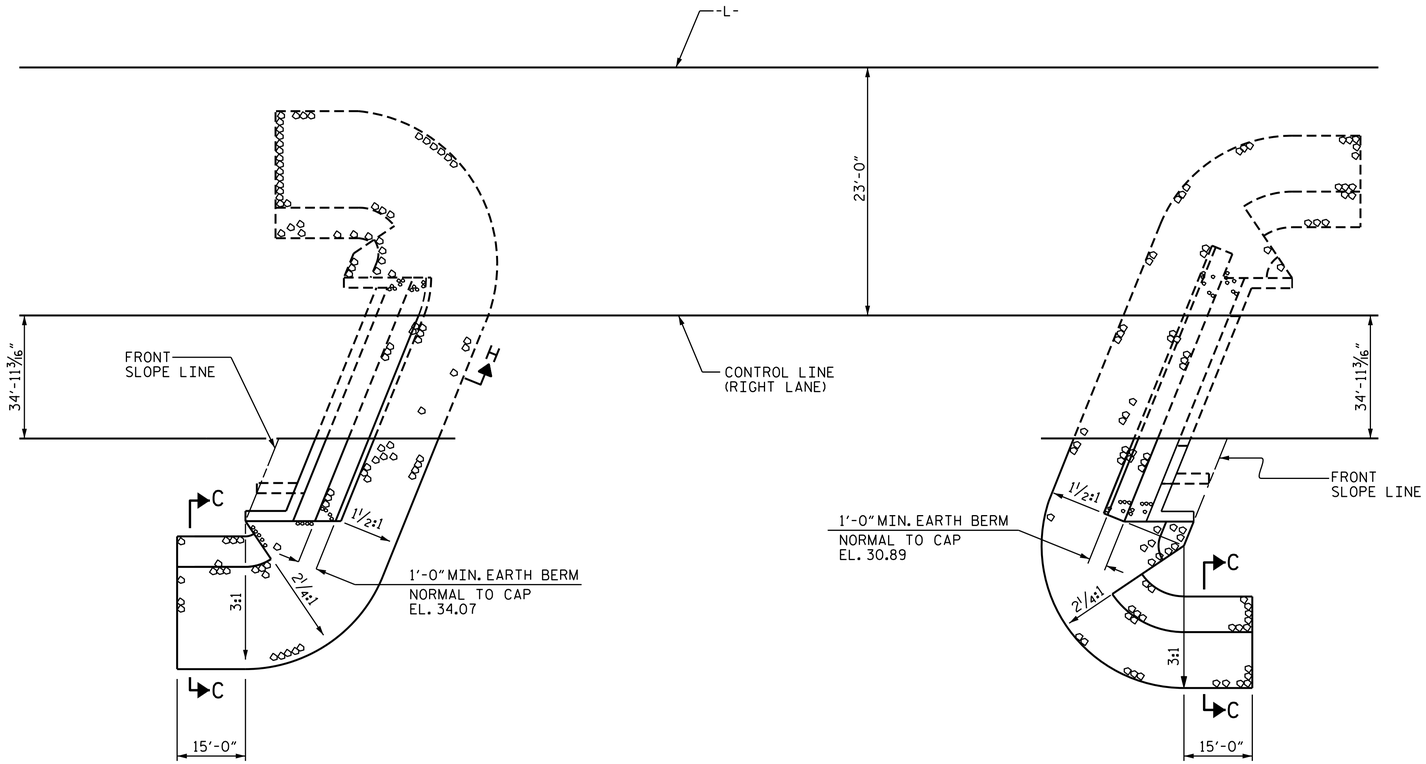
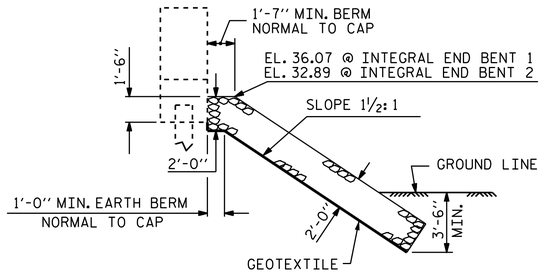


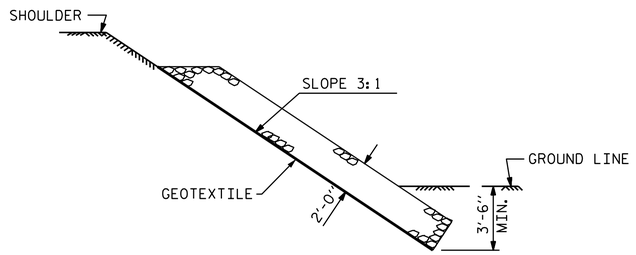
INTEGRAL END BENT 1

INTEGRAL END BENT 2

BERM RIP RAPPED



℄ SECTION
BERM RIP RAPPED



SECTION C-C

NOTES

REMOVE AND STOCKPILE EXISTING RIP RAP BEFORE DRIVING PILES AT INTEGRAL END BENT 1 AND INTEGRAL END BENT 2.

ESTIMATED QUANTITIES

BRIDGE @ STA. 625+23.28 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
INTEGRAL END BENT 1	25	28
INTEGRAL END BENT 2	20	22

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 623+23.28 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

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NO.	BY:	DATE:	NO.	BY:	DATE:	S18-036
1			3			TOTAL SHEETS
2			4			39

ASSEMBLED BY : M.D.PISO DATE : 01-22-15
CHECKED BY : D. G. ELY DATE : 02-10-15
DESIGN ENGINEER OF RECORD : T. L. COGGINS DATE : 02-10-15

DRAWN BY : REK 1/84
CHECKED BY : RDU 1/84

REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM

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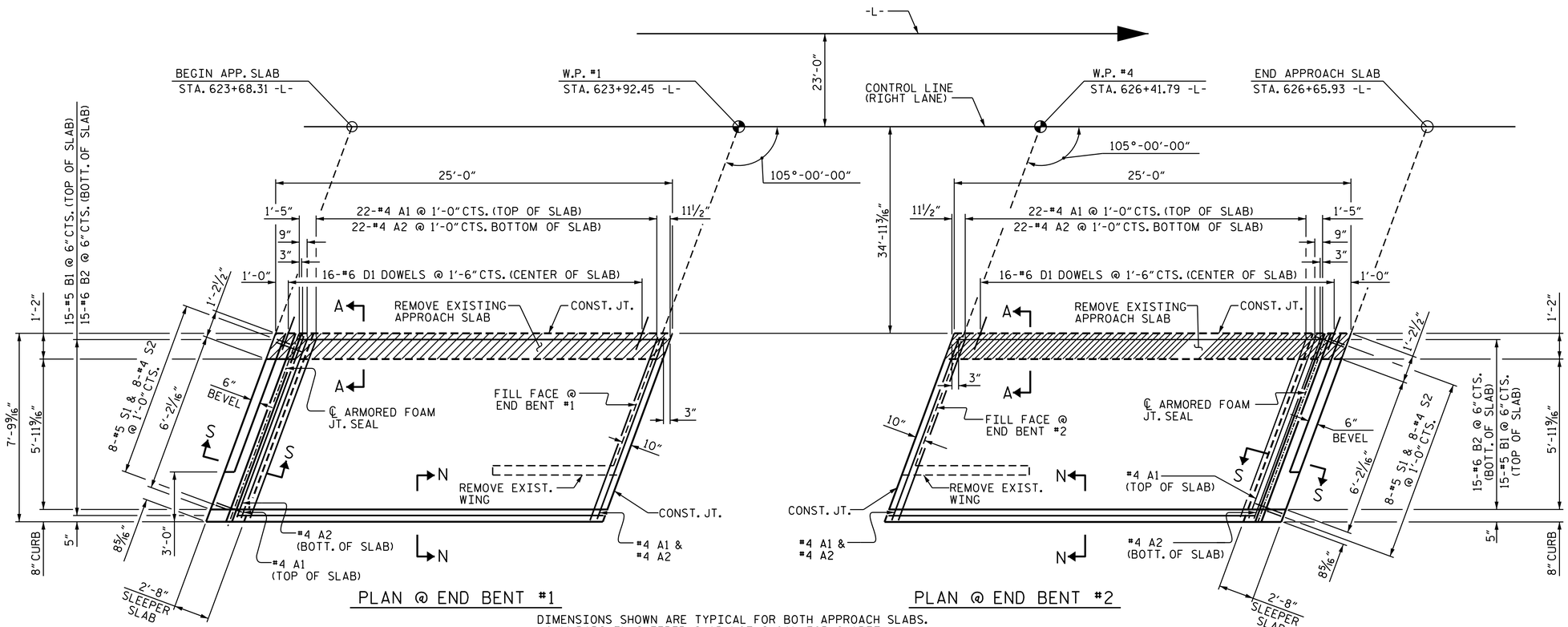
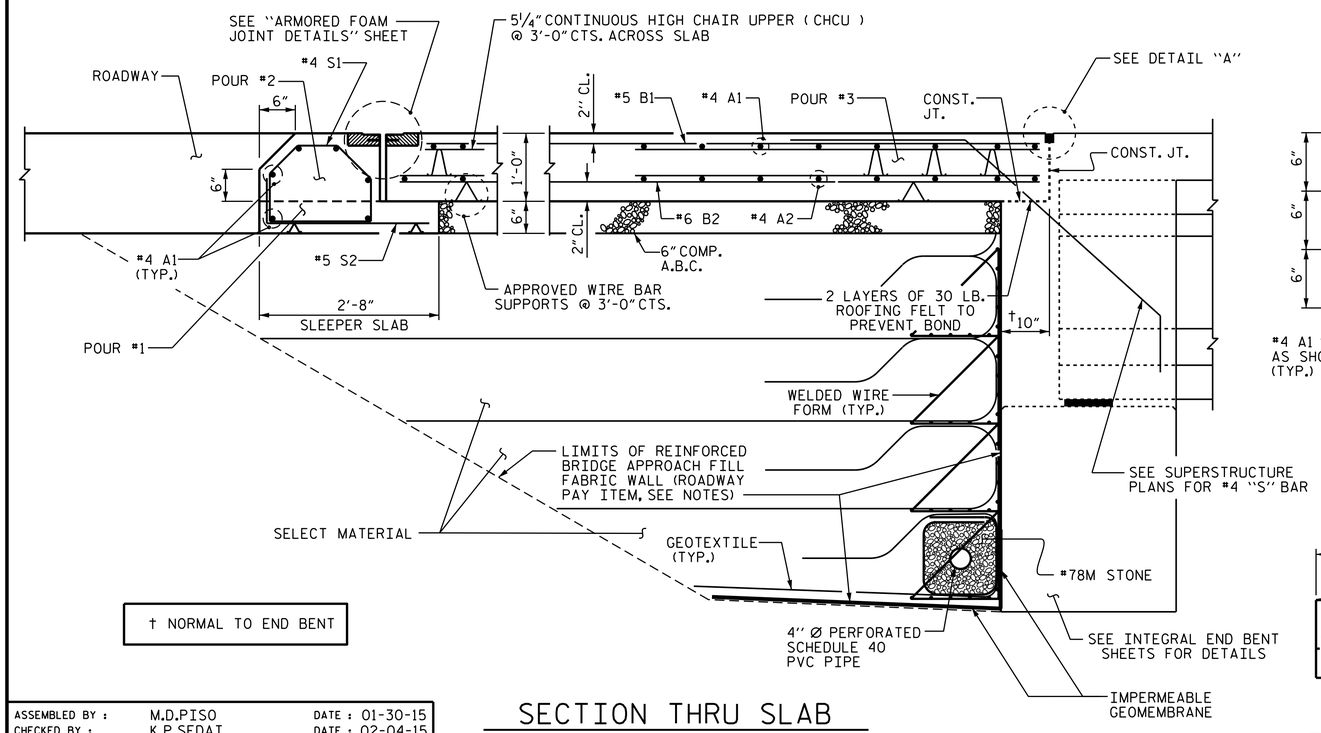
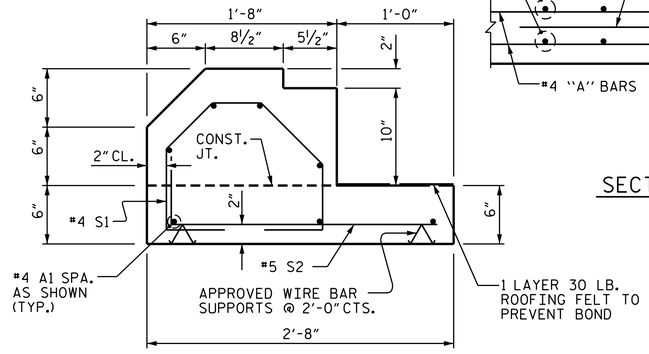
STD. NO. RR1 (Sht 3)

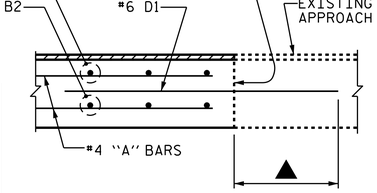




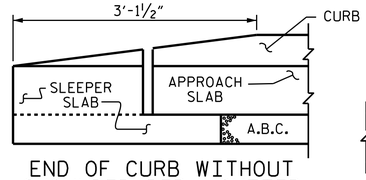
SECTION THRU SLAB



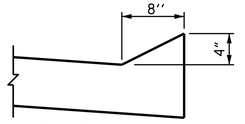
SECTION S-S
SHOWING SLEEPER SLAB



SECTION A-A

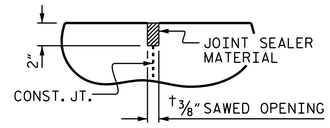


END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

▲ EMBEDMENT LENGTH TO BE DETERMINED BY SELECTED MANUFACTURER



DETAIL "A"

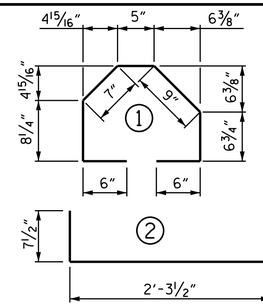
BILL OF MATERIAL
FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	31	#4	STR	7'-8"	159
A2	24	#4	STR	7'-8"	123
✳ B1	15	#5	STR	22'-4"	349
B2	15	#6	STR	22'-10"	514
✳ D1	16	#6	STR	3'-0"	72
✳ S1	8	#4	1	4'-0"	21
S2	8	#5	2	2"-11"	24

REINFORCING STEEL	661 LBS.
✳ EPOXY COATED REINFORCING STEEL	601 LBS.

CLASS AA CONCRETE		
POUR #1	- BOTTOM OF SLEEPER SLAB	0.4 CU.YDS.
POUR #2	- TOP OF SLEEPER SLAB	0.4 CU.YDS.
POUR #3	- SLAB & CURB	6.7 CU.YDS.
TOTAL		7.5 CU.YDS.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28-L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-037
1			3			TOTAL SHEETS
2			4			39

STR. #18

ASSEMBLED BY :	M.D.PISO	DATE : 01-30-15
CHECKED BY :	K.P.SEDAI	DATE : 02-04-15
DESIGN ENGINEER OF RECORD :	K.P.SEDAI	DATE : 02-10-15

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

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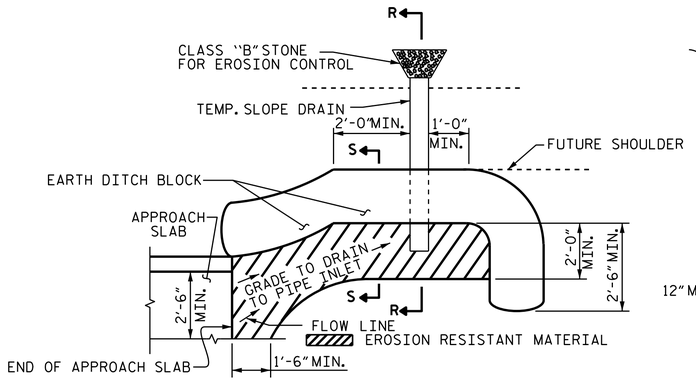
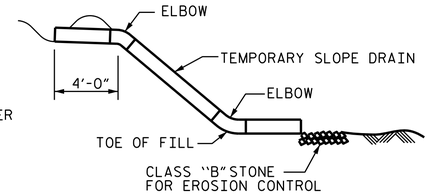
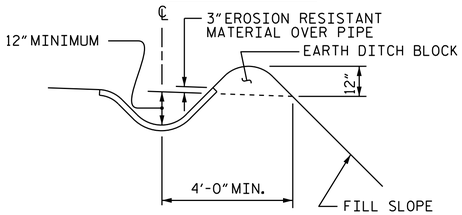


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



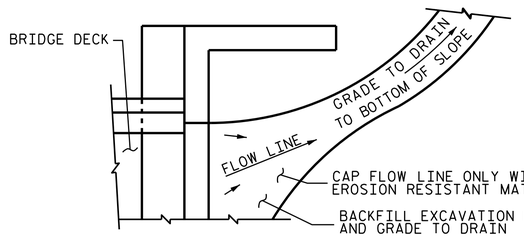
SECTION R-R



SECTION S-S

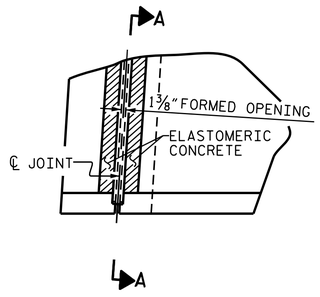
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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



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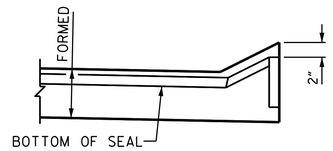

SECTION A-A

NOTES:

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE SLEEPER SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE SLEEPER SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE SLEEPER SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LBS. ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE VERTICAL JOINT ON THE RIGHT AND LEFT SIDE OF THE APPROACH SLAB AT THE ENDS OF THE FOAM JOINT SHALL BE FILLED WITH SILICONE OR OTHER APPROVED MATERIAL IN ORDER TO PREVENT BACKFILL FROM ENTERING THE JOINT OPENING.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT.

FOR ARMORED FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE $2\frac{13}{16}$".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

#6 DI DOWELS SHALL BE ADHESIVELY ANCHORED INTO EXISTING APPROACH SLAB. NO FIELD TESTING IS REQUIRED FOR ADHESIVELY ANCHORED DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 625+23.28 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/26/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-038
1			3			TOTAL SHEETS
2			4			39

STR. #18

DRAWN BY :	M.D.PISO	DATE : 02-04-15
CHECKED BY :	K.P.SEDAI	DATE : 02-04-15
DESIGN ENGINEER OF RECORD:	K.P.SEDAI	DATE : 02-10-15

26-MAR-2015 09:23
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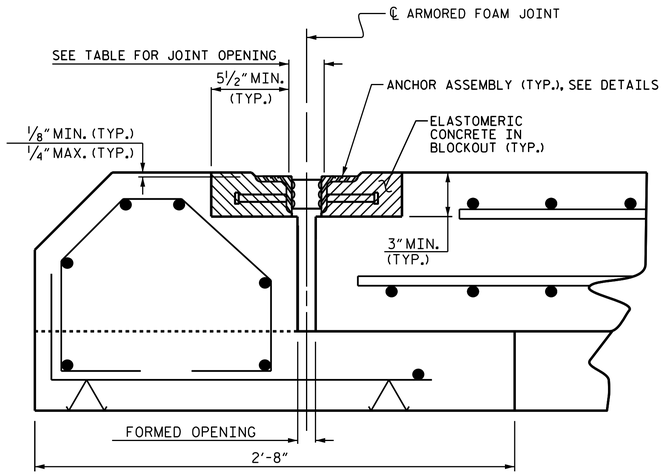
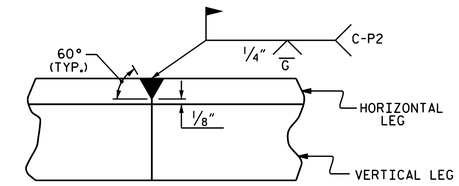
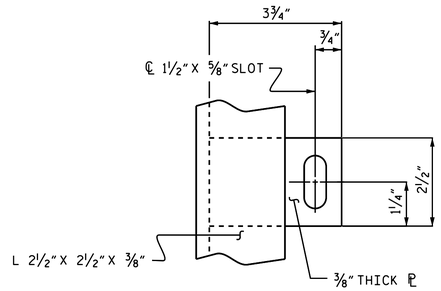


ARMORED JOINT DETAILS

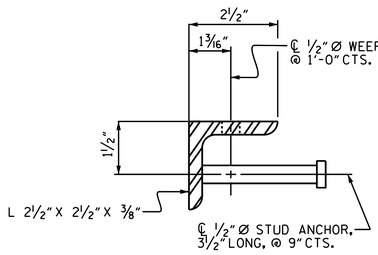
SECTION NORMAL TO JOINT AT END BENT



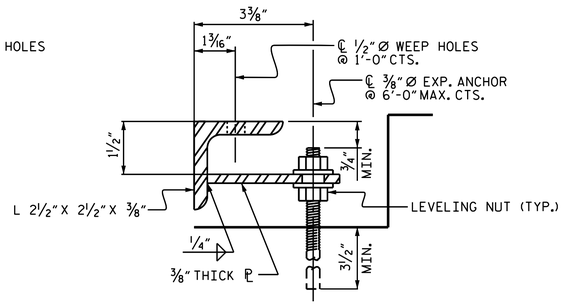
DETAIL- FIELD WELD SPLICE OF ANGLE



PLAN VIEW OF TAB



SECTION VIEW OF STUD



SECTION VIEW OF TAB

ARMORED JOINT ANCHOR ASSEMBLY DETAILS

NOTES

ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169 GRADES 1010 THRU 1020 OR APPROVED EQUAL.

STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON THE PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.

UPON COMPLETION OF SHOP FABRICATION, THE ENTIRE ANCHOR ASSEMBLY SHALL BE METALLIZED TO A MINIMUM THICKNESS OF 6 MILS. THE ½" Ø STUD ANCHORS AND ANCHOR TABS NEED NOT BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

ANCHOR ASSEMBLY SHALL BE MADE CONTINUOUS THE LENGTH OF THE JOINT FROM GUTTER TO GUTTER. FOR FIELD SPLICES AT ALL CROWN BREAK POINTS, THE ENDS OF THE STEEL ANGLES SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE. FINISHED FIELD WELDS SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR ASSEMBLY SEGMENTS SHALL NOT BE LESS 12 FEET NOR MORE THAN 20 FEET IN LENGTH. SHORTER SEGMENTS MAY BE USED AT THE EDGE OF ROADWAY OR AT POINTS OF STAGED CONSTRUCTION.

THE ANCHOR ASSEMBLY SHALL BE SECURED AND LEVELED AS SHOWN IN THE "ARMORED JOINT ANCHOR ASSEMBLY DETAILS". NO SUBMITTALS ARE REQUIRED FOR ⅜" Ø EXPANSION ANCHORS, NUTS OR WASHERS. THE CONTRACTOR MAY SUBMIT FOR APPROVAL AN ALTERNATE METHOD OF ALIGNING AND LEVELING THE ANGLES. THE ALTERNATE METHOD SHALL NOT INCLUDE ANY WELDING TO THE OUTSIDE FACE OF THE ANGLES.

AFTER THE ELASTOMERIC CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE ANY EXCESS CONCRETE THAT COMES THROUGH THE WEEP HOLES AND THOROUGHLY CLEAN THE ANGLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM OF 4 MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

SEE SPECIAL PROVISIONS FOR ARMORED FOAM JOINT SEALS.

SEE SPECIAL PROVISIONS FOR ELASTOMERIC CONCRETE.

MOVEMENT AND SETTING OF EVAZOTE JOINT

END BENT NO.	SKEW ANGLE	NOMINAL UNCOMPRESSED SEAL WIDTH	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60°F	PERPENDICULAR JOINT OPENING AT 90° F
1	105°-00'-00"	2 13/16"	1¼"	2½"	2¼"	1⅞"
2	105°-00'-00"	2 13/16"	1¼"	2½"	2¼"	1⅞"

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

BILL OF MATERIAL

END BENT NO.	ELASTOMERIC CONCRETE * (CU.FT.)	TOTAL LENGTH OF ANGLE (FT.)
1	1.8	14'-9"
2	1.8	14'-9"

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 625+23.28 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ARMORED FOAM JOINT DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A9D48FA47B...
3/26/2015

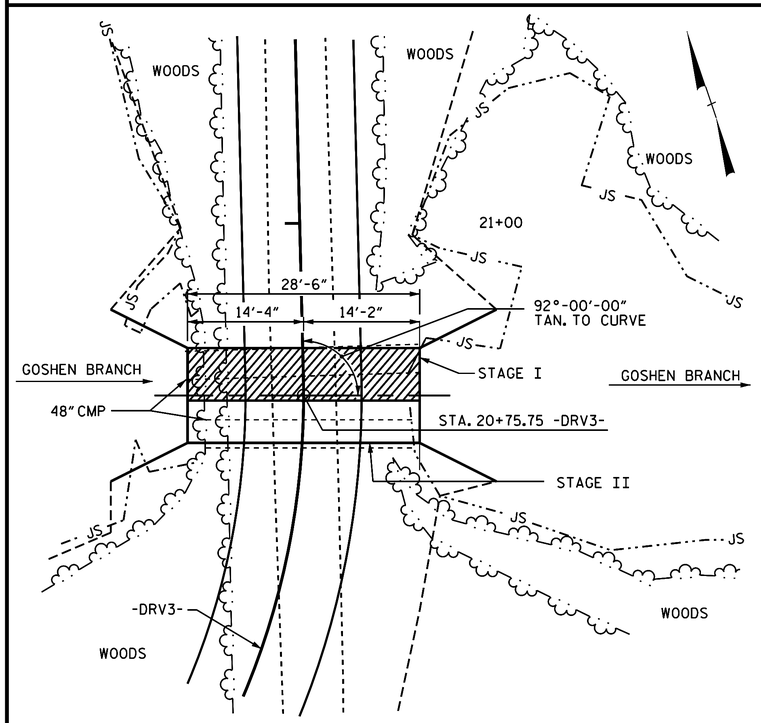
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18-039
1			3			TOTAL SHEETS
2			4			39

STR. #18 STD. NO. AEJ1

ASSEMBLED BY : M.D.PISO	DATE : 02-04-15	
CHECKED BY : K.P.SEDAI	DATE : 02-04-15	
DRAWN BY : EEM 1/96	REV. 7/10/11	LES/RDR
CHECKED BY : RGW 1/96	REV. 5/7/03RR	RWW/JTE
	REV. 5/1/06	TLA/GM

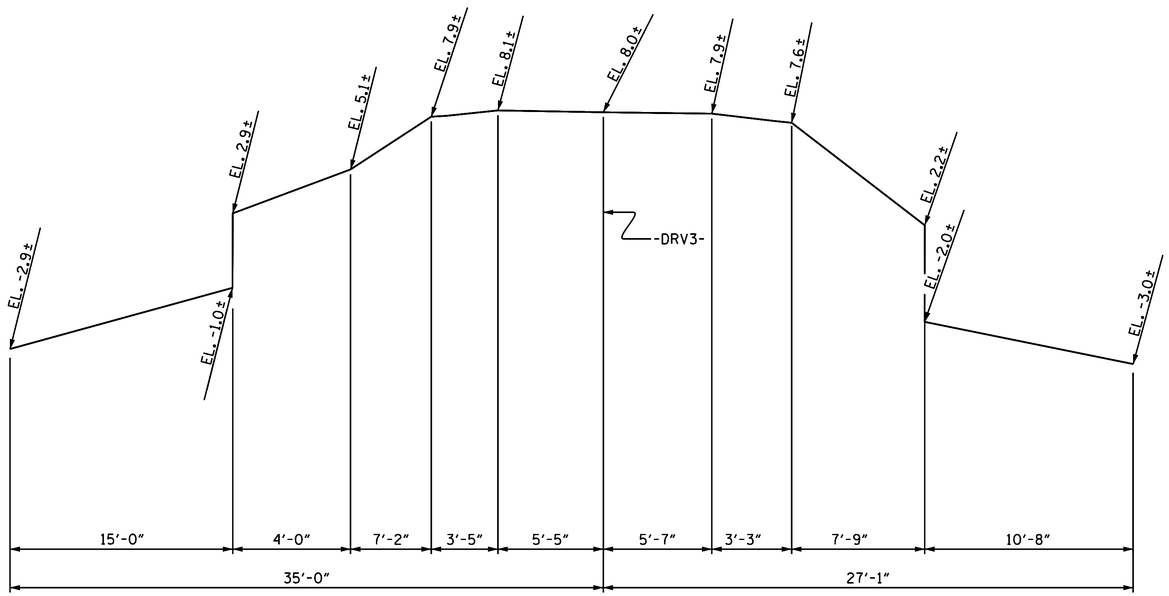
26-MAR-2015 09:23
R:\Structures\Final Plans\DocuSign Setup\418_000_R-2514D_SMU_S18-00.dgn
gruffin

BM #18; RR SPIKE IN GUY POLE (RSQ61), STA. 372+45.00 -L-, 127 FT. RIGHT, EL. 9.42'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

HYDRAULIC DATA

DESIGN DISCHARGE	= 280 C.F.S.
FREQUENCY OF DESIGN FLOOD	= 10 YEARS
DESIGN HIGH WATER ELEVATION	= 2.8
DRAINAGE AREA	= 2.1 SQ. MI.
BASE DISCHARGE (Q100)	= 600 C.F.S.
BASE HIGH WATER ELEVATION	= 4.87

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 1100 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500 YRS.+
OVERTOPPING FLOOD ELEVATION	= 7.8

OVERTOPPING -DRV3- @ STA. 19+91

GRADE DATA

GRADE PT. ELEV. @ STA. 20+75.75-DRV3-	= 7.98
BED ELEV. @ STA. 20+75.75 -DRV3-	= -2.40
ROADWAY FILL SLOPES	= 3:1

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

DESIGN FILL------- 2.41 FT.

FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTE SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN STAGE I & STAGE II TO BE POURED IN THE FOLLOWING ORDER:

1. STAGE I WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS AS INDICATED IN THE CONSTRUCTION SEQUENCE.
2. THE REMAINING PORTIONS OF THE STAGE I WALLS AND WINGS FULL HEIGHT.
3. STAGE II WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF VERTICAL WALL AS INDICATED IN THE CONSTRUCTION SEQUENCE.
4. THE REMAINING PORTION OF THE STAGE II WALLS AND WINGS FULL HEIGHT. FOLLOWED BY ROOF SLAB, HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR THE WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN IN THE WING SHEET.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE THE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

NO PRECAST REINFORCED BOX CULVERT OPTION WILL BE ALLOWED.

SILLS ARE TO BE PLACED ONE FOOT INSIDE EACH END OF THE CULVERT. THE CULVERT SHOULD BE BACKFILLED WITH NATIVE BED MATERIAL. BED MATERIALS SUBJECT TO APPROVAL OF THE ENGINEER.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION SEQUENCE, SEE SHEET 7 OF 8.

STAGE I STRUCTURE QUANTITIES

CLASS A CONCRETE	
1 BARREL	19.0 C.Y.
2 WINGS & CURTAIN WALLS	17.6 C.Y.
2 SILLS	1.2 C.Y.
STAGE I CONCRETE	37.8 C.Y.
REINFORCING STEEL	
1 BARREL	2,594 LBS.
2 WINGS	1,153 LBS.
STAGE I REINFORCING STEEL	3,747 LBS.
FOUNDATION CONDITIONING MAT'L.	29.0 TONS
CULVERT EXCAVATION	LUMP SUM

STAGE II STRUCTURE QUANTITIES

CLASS A CONCRETE	
1 BARREL & ROOF	33.0 C.Y.
2 WINGS & CURTAIN WALLS	17.4 C.Y.
2 HEADWALLS	1.7 C.Y.
2 SILLS	0.6 C.Y.
STAGE II CONCRETE	52.7 C.Y.
REINFORCING STEEL	
1 BARREL, ROOF, 2 HEADWALLS & 2 SILLS	3,757 LBS.
2 WINGS	1,153 LBS.
STAGE II REINFORCING STEEL	4,910 LBS.
FOUNDATION CONDITIONING MAT'L.	19.0 TONS
CULVERT EXCAVATION	LUMP SUM

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE	
STAGE I	37.8 C.Y.
STAGE II	52.7 C.Y.
TOTAL	90.5 C.Y.
REINFORCING STEEL	
STAGE I	3,747 LBS.
STAGE II	4,910 LBS.
TOTAL	8,657 LBS.
FOUNDATION CONDITIONING MATERIAL	
STAGE I	29 TONS
STAGE II	19 TONS
TOTAL	48 TONS
CULVERT EXCAVATION	LUMP SUM

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 20+75.75 -DRV3-

SHEET 1 OF 8

ASSEMBLED BY : M.D. PISO DATE : 01-09-15
CHECKED BY : N. RUFFIN DATE : 01-12-15
DRAWN BY : R.W. WRIGHT DATE : JULY, 1990
CHECKED BY : D.A. GLADDEN DATE : JULY, 1990

SPECIAL
STANDARD

ADDED NOV. 1, 1990

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
DocuSigned by: Emily Murray CAEB97AEDC5B4E0...
3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFDAA8CA8F447B...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT

92° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C19-001
1			3			TOTAL SHEETS
2			4			8

STR. #19 STD. NO. CB12A

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVE-LOAD FACTORS (γ_{LL})	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.03	--	1.75	1.36	1	BOTTOM SLAB	8.02	1.03	1	BOTTOM SLAB	7.79	
		HL-93 (OPERATING)	N/A		1.34	--	1.35	1.77	1	BOTTOM SLAB	8.02	1.34	1	BOTTOM SLAB	7.79	
		HS-20 (INVENTORY)	36.000	2	1.03	37.12	1.75	1.36	1	BOTTOM SLAB	8.02	1.03	1	BOTTOM SLAB	7.79	
		HS-20 (OPERATING)	36.000		1.34	48.11	1.35	1.77	1	BOTTOM SLAB	8.02	1.34	1	BOTTOM SLAB	7.79	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.16	29.15	1.40	2.88	1	TOP SLAB	3.68	2.16	1	TOP SLAB	7.53	
		SNGARBS2	20.000		2.02	40.48	1.40	2.68	1	BOTTOM SLAB	8.02	2.02	1	TOP SLAB	7.53	
		SNAGRIS2	22.000		1.88	41.28	1.40	2.47	1	BOTTOM SLAB	8.02	1.88	1	BOTTOM SLAB	7.79	
		SNCOTTS3	27.250		1.36	37.12	1.40	1.89	1	BOTTOM SLAB	8.02	1.36	1	TOP SLAB	7.53	
		SNAGGRS4	34.925		1.50	52.54	1.40	1.92	1	BOTTOM SLAB	8.02	1.50	1	BOTTOM SLAB	7.79	
		SNS5A	35.550		1.32	47.06	1.40	1.82	1	BOTTOM SLAB	8.02	1.32	1	BOTTOM SLAB	7.79	
		SNS6A	39.950		1.27	50.72	1.40	1.69	1	BOTTOM SLAB	8.02	1.27	1	BOTTOM SLAB	7.79	
		SNS7B	42.000		1.29	54.33	1.40	1.69	1	BOTTOM SLAB	8.02	1.29	1	BOTTOM SLAB	7.79	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.87	61.59	1.40	2.48	1	BOTTOM SLAB	8.02	1.87	1	BOTTOM SLAB	7.79	
		TNT4A	33.075		1.52	50.20	1.40	1.93	1	BOTTOM SLAB	8.02	1.52	1	BOTTOM SLAB	7.79	
		TNT6A	41.600		1.57	65.17	1.40	1.98	1	BOTTOM SLAB	8.02	1.57	1	BOTTOM SLAB	7.79	
		TNT7A	42.000		1.55	64.90	1.40	2.09	1	BOTTOM SLAB	8.02	1.55	1	BOTTOM SLAB	7.79	
		TNT7B	42.000		1.40	58.79	1.40	1.80	1	BOTTOM SLAB	8.02	1.40	1	BOTTOM SLAB	7.79	
		TNAGRIT4	43.000		1.26	54.39	1.40	1.64	1	BOTTOM SLAB	8.02	1.26	1	BOTTOM SLAB	7.79	
		TNAGT5A	45.000		1.28	57.78	1.40	1.66	1	BOTTOM SLAB	8.02	1.28	1	BOTTOM SLAB	7.79	
		TNAGT5B	45.000	3	1.25	56.29	1.40	1.67	1	BOTTOM SLAB	8.02	1.25	1	BOTTOM SLAB	7.79	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1.
2.
3.
4.

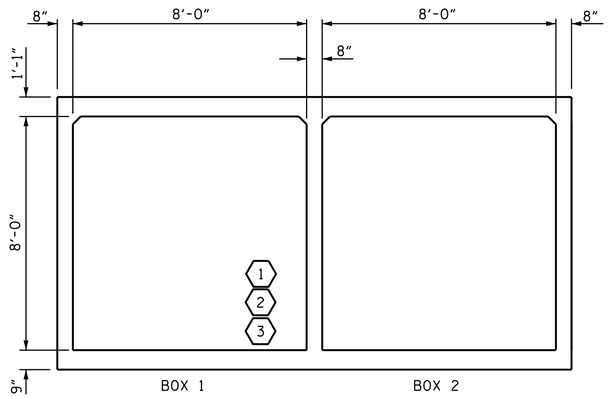
(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

(LOOKING DOWNSTREAM)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 20+75.75 -DRV3-

SHEET 2 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C19-002
1			3			TOTAL SHEETS
2			4			8

ASSEMBLED BY : M.D. PISO	DATE : 01-22-15	
CHECKED BY : N. RUFFIN	DATE : 01-22-15	
DRAWN BY : WMC 7/11	REV. 10/1/11	MAA/GM
CHECKED BY : GM 7/11		

23-MAR-2015 11:22
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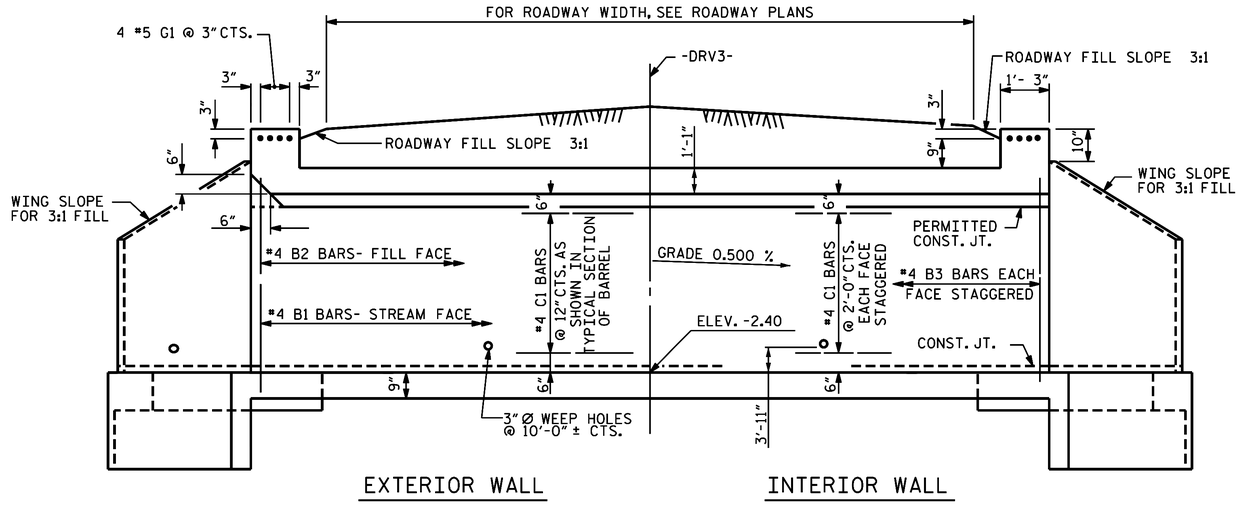
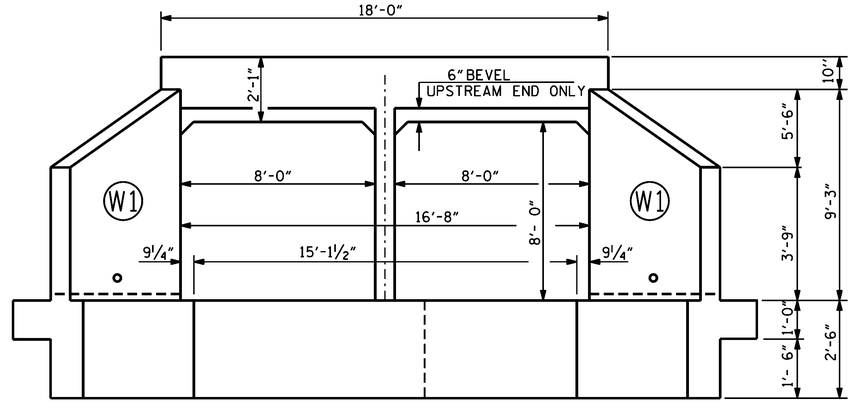
kpaschal

STR. #19

STD. NO. LRFR5

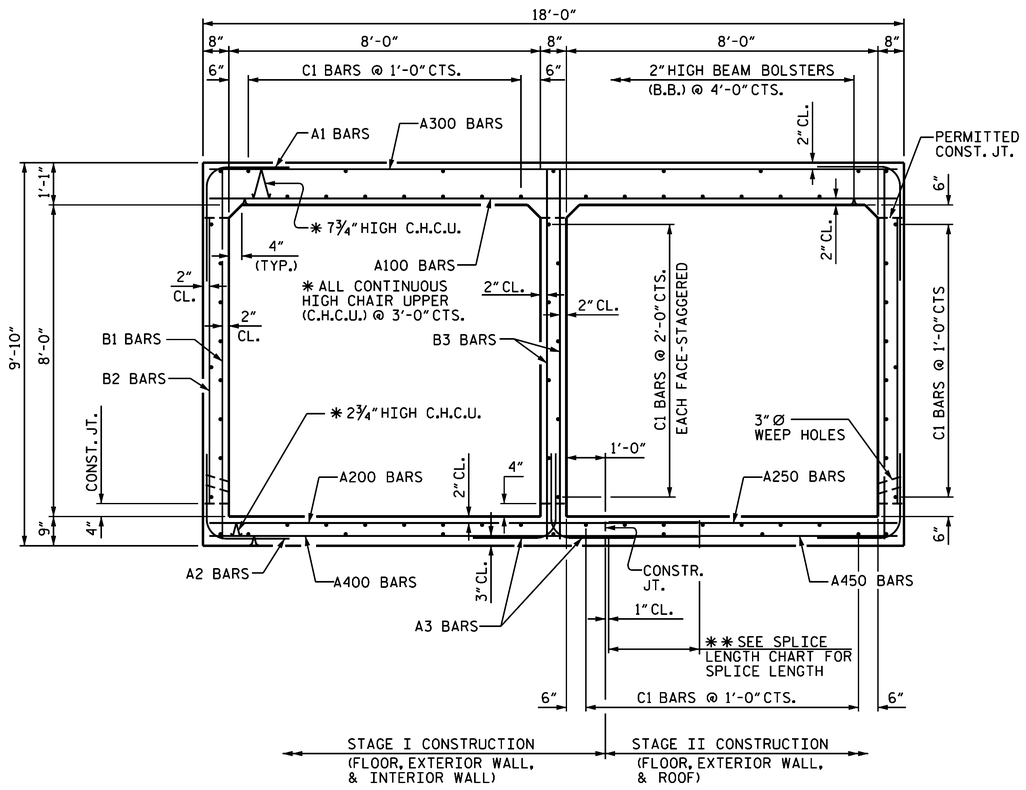


CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION

SILL DETAILS NOT SHOWN FOR CLARITY.
SEE "CULVERT SILL DETAILS", SHEET 7 OF 8.



RIGHT ANGLE SECTION OF BARREL

LOOKING DOWNSTEAM
THERE ARE 72 "C" BARS IN SECTION OF BARREL.

ASSEMBLED BY : M.D. PISO DATE : 01-12-15
CHECKED BY : N. RUFFIN DATE : 01-12-15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02-10-15

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 20+75.75 -DRV3-

SHEET 3 OF 8

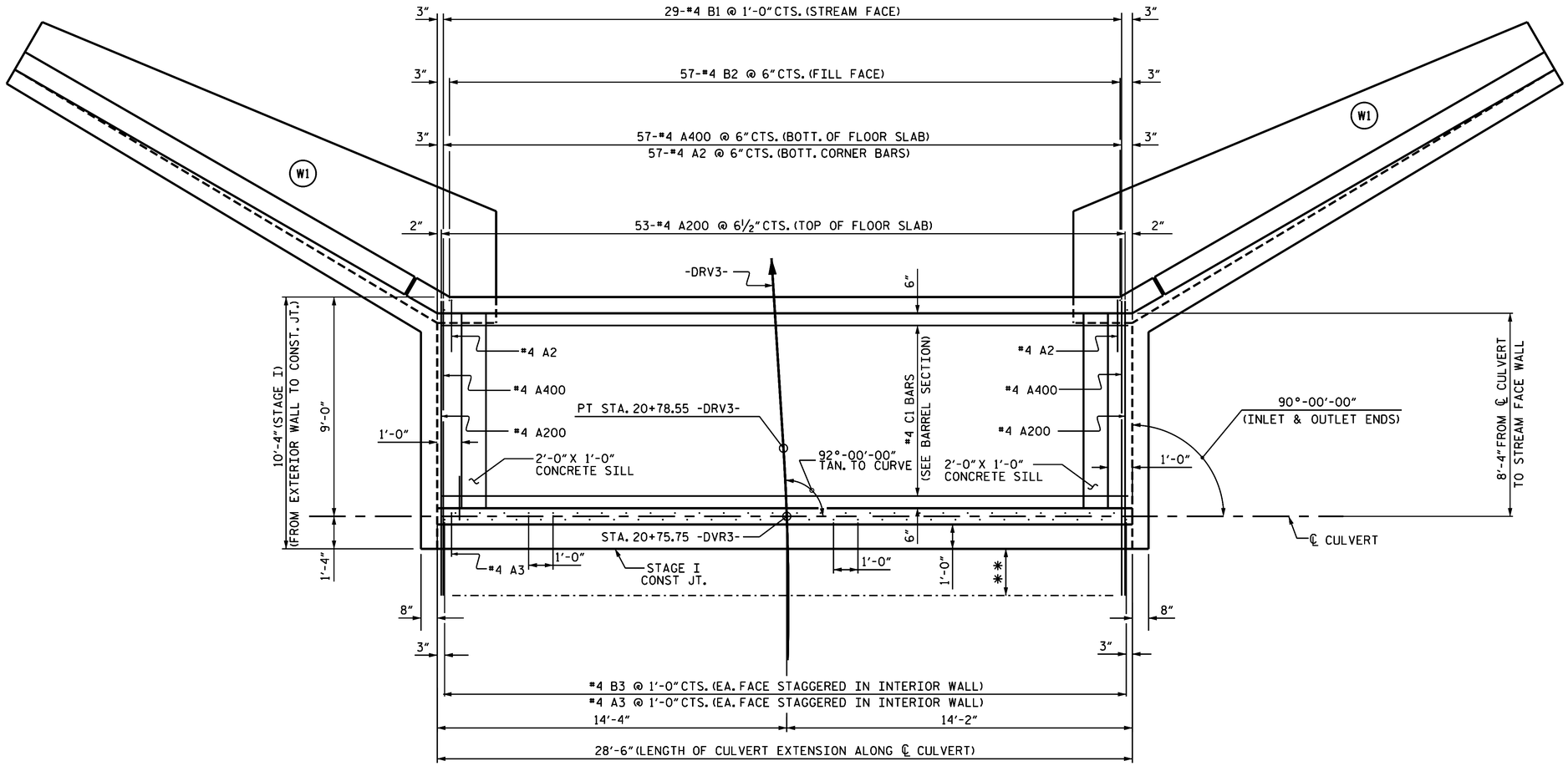
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT

92° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C19-003
1			3			TOTAL SHEETS
2			4			8

STR. #19



PARTIAL PLAN - FLOOR SLAB (STAGE I)

** FOR SPLICE LENGTH, SEE "SPLICE LENGTH CHART" SHEET 7 OF 8.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 20+75.75 -DRV3-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT

92° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins
3/23/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C19-004
1			3			TOTAL SHEETS
2			4			8

DRAWN BY : M.D. PISO DATE : 01-12-15
CHECKED BY : N. RUFFIN DATE : 01-22-15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02-10-15

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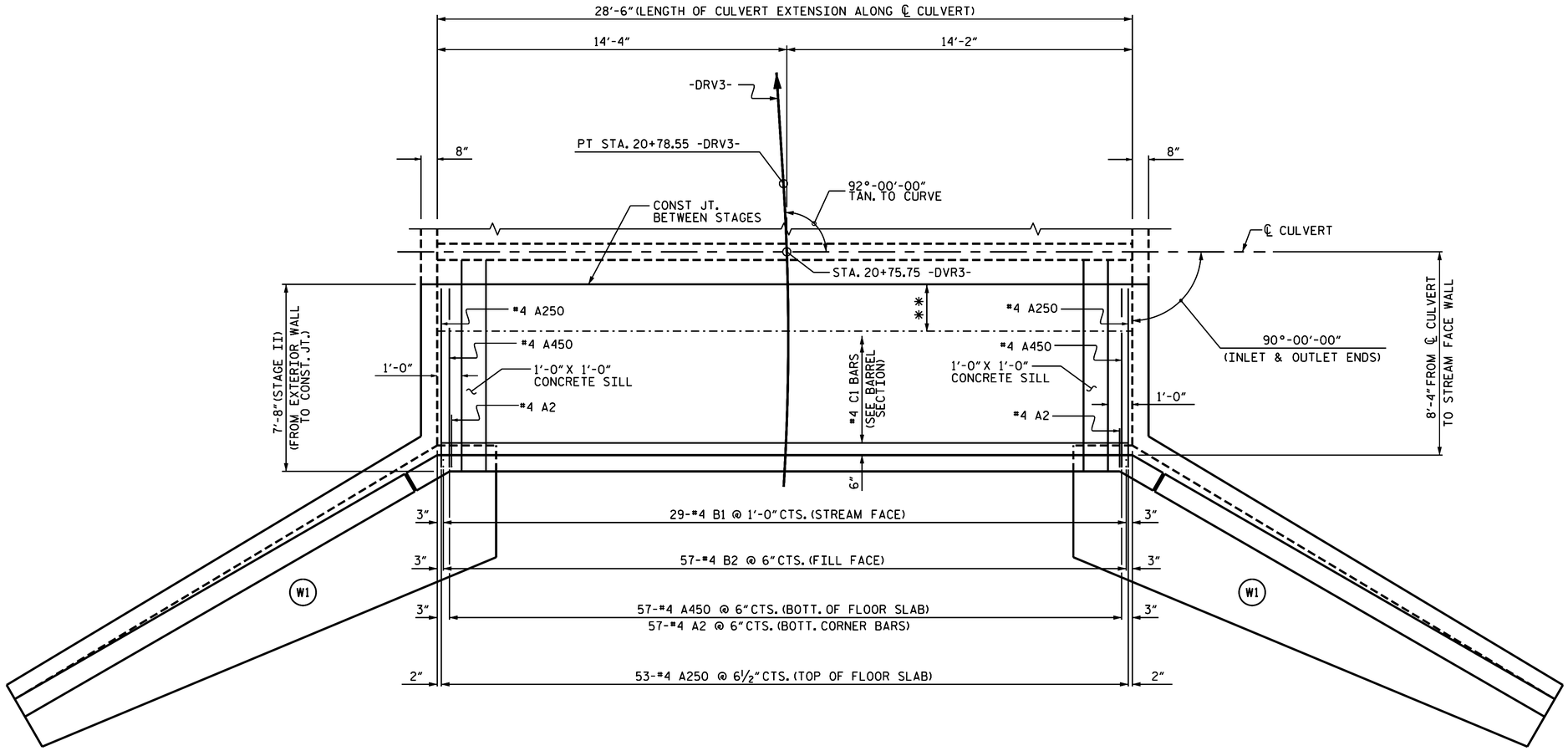
kpaschal

STR. #19



PARTIAL PLAN - FLOOR SLAB (STAGE II)

** FOR SPLICE LENGTH, SEE "SPLICE LENGTH CHART" SHEET 7 OF 8.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 20+75.75 -DRV3-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT

92° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C19-005
1			3			TOTAL SHEETS
2			4			8

STR. #19

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

DocuSigned by: Tim Coggins DEFD4A8D48FA47B...

3/23/2015

DRAWN BY : M.D. PISO DATE : 01-15-15
CHECKED BY : N. RUFFIN DATE : 01-22-15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02-10-15

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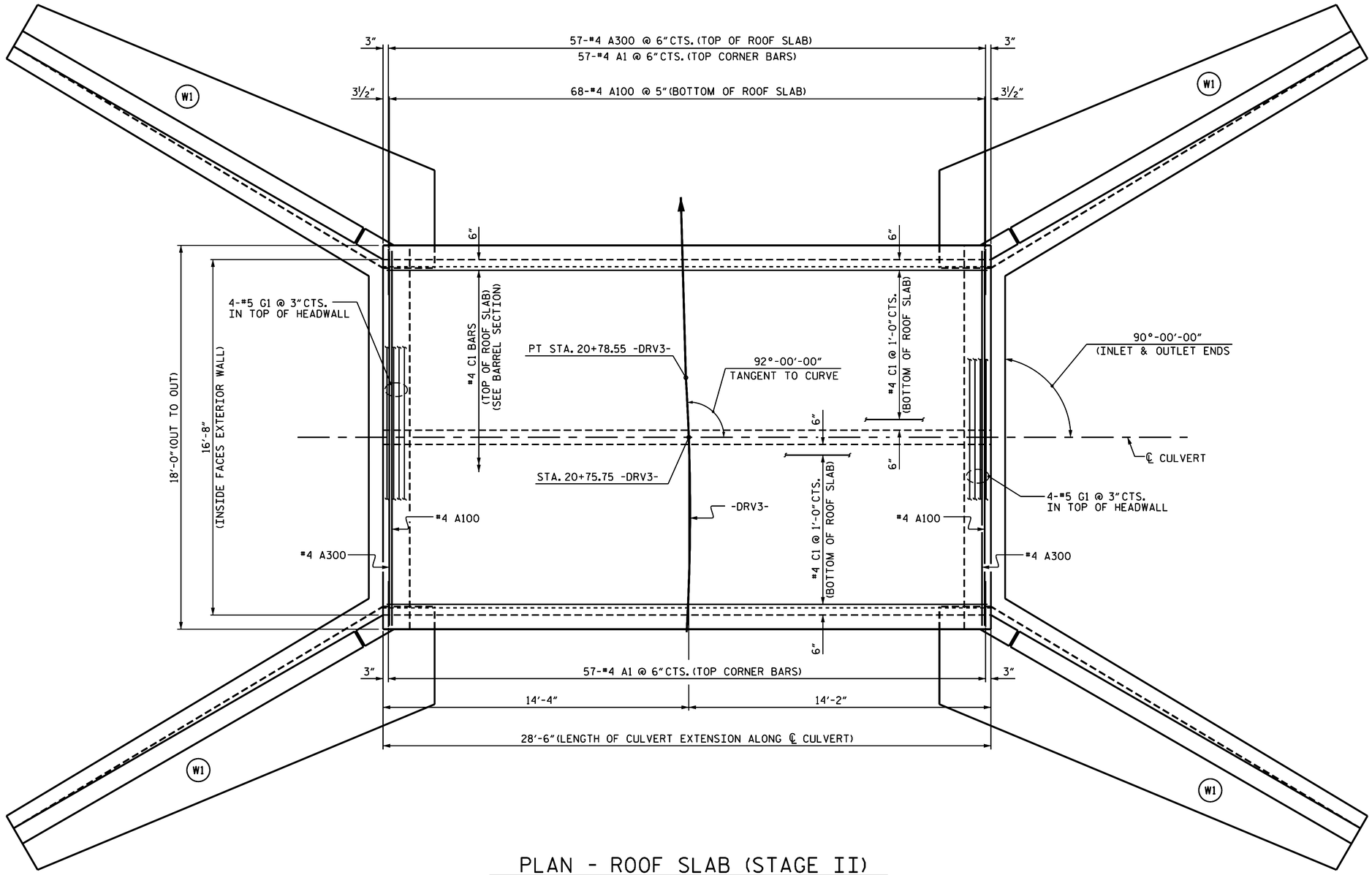
kpaschal



PLAN - ROOF SLAB (STAGE II)

**FOR SPLICE LENGTH, SEE "SPLICE LENGTH CHART" SHEET 7 OF 8.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 20+75.75 -DRV3-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT

92° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C19-006
1			3			TOTAL SHEETS
2			4			8

STR. #19

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFD4A8D48FA47B...
3/23/2015

DRAWN BY : M.D. PISO DATE : 01-15-15
CHECKED BY : N. RUFFIN DATE : 01-22-15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02-10-15

23-MAR-2015 11:22
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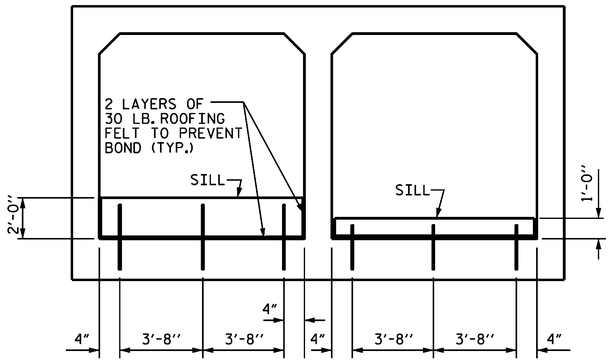
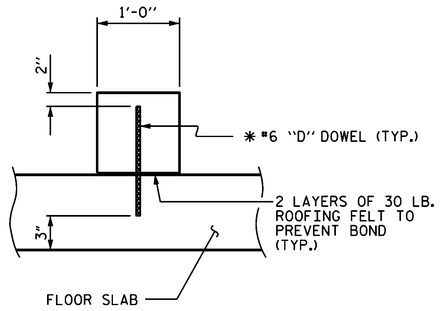
kpaschal



ELEVATION

SILLS REQUIRED AT INLET AND OUTLET ENDS
(LOOKING DOWNSTREAM)

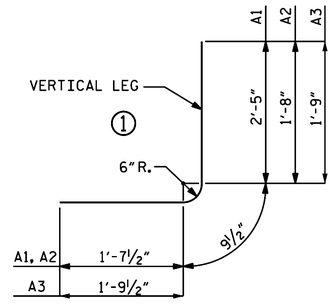


SECTION THROUGH SILL

* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

CULVERT SILL DETAILS

BAR TYPE



DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH CHART

BAR	SIZE	SPLICE LENGTH
A200	#4	1'-11"
A400	#4	1'-5"
B1	#4	1'-5"
C1	#4	1'-11"

BILL OF MATERIAL STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A200	53	#4	STR	12'-1"	428
A400	57	#4	STR	11'-7"	441
A2	57	#4	1	4'-1"	155
A3	57	#4	1	4'-4"	165
B1	29	#4	STR	9'-5"	182
B2	57	#4	STR	7'-4"	279
B3	57	#4	STR	9'-5"	359
C1	30	#4	STR	28'-2"	564
D1	6	#6	STR	2'-4"	21

TOTAL REINFORCING STEEL 2,594 LBS.

CLASS A CONCRETE

1 BARREL	19.0 C.Y.
2 SILLS	1.2 C.Y.
2 WINGS & CURTAIN WALLS	17.6 C.Y.
TOTAL CLASS A CONCRETE	37.8 C.Y.

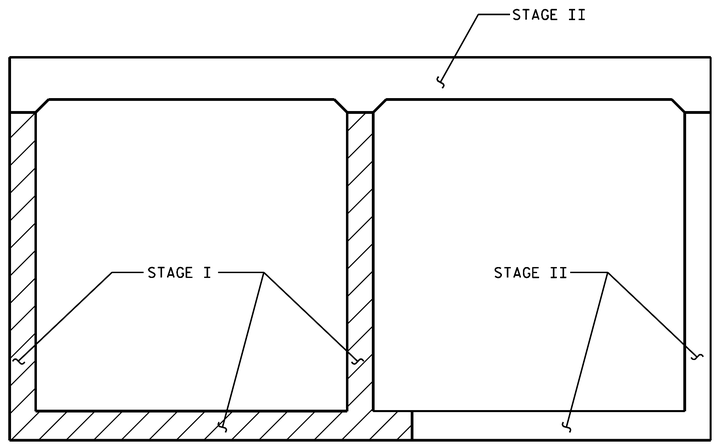
BILL OF MATERIAL STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A100	68	#4	STR.	17'-7"	799
A250	53	#4	STR.	7'-4"	260
A300	57	#4	STR.	17'-7"	670
A450	57	#4	STR.	7'-4"	279
A1	57	#4	1	4'-10"	184
A2	57	#4	1	4'-1"	155
B1	29	#4	STR.	9'-5"	182
B2	57	#4	STR.	7'-4"	279
C1	42	#4	STR.	28'-2"	790
D2	6	#6	STR.	1'-4"	12
G1	8	#5	STR.	17'-8"	147

TOTAL REINFORCING STEEL 3,757 LBS.

CLASS A CONCRETE

1 BARREL & ROOF	33.0 C.Y.
2 SILLS	0.6 C.Y.
2 HEADWALLS	1.7 C.Y.
2 WINGS & CURTAIN WALLS	17.4 C.Y.
TOTAL CLASS A CONCRETE	52.7 C.Y.



STAGE I AND II

CONSTRUCTION SEQUENCE

LOOKING DOWNSTREAM

ASSEMBLED BY : M.D. PISO DATE : 01-12-15
CHECKED BY : N. RUFFIN DATE : 01-22-15
DESIGN ENGINEER OF RECORD: G. KOUCHEKI DATE : 02-10-15

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS

Docusigned by: Tim Coggins DEFDAA8048FA47B...
3/23/2015

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 20+75.75 -DRV3-

SHEET 7 OF 8

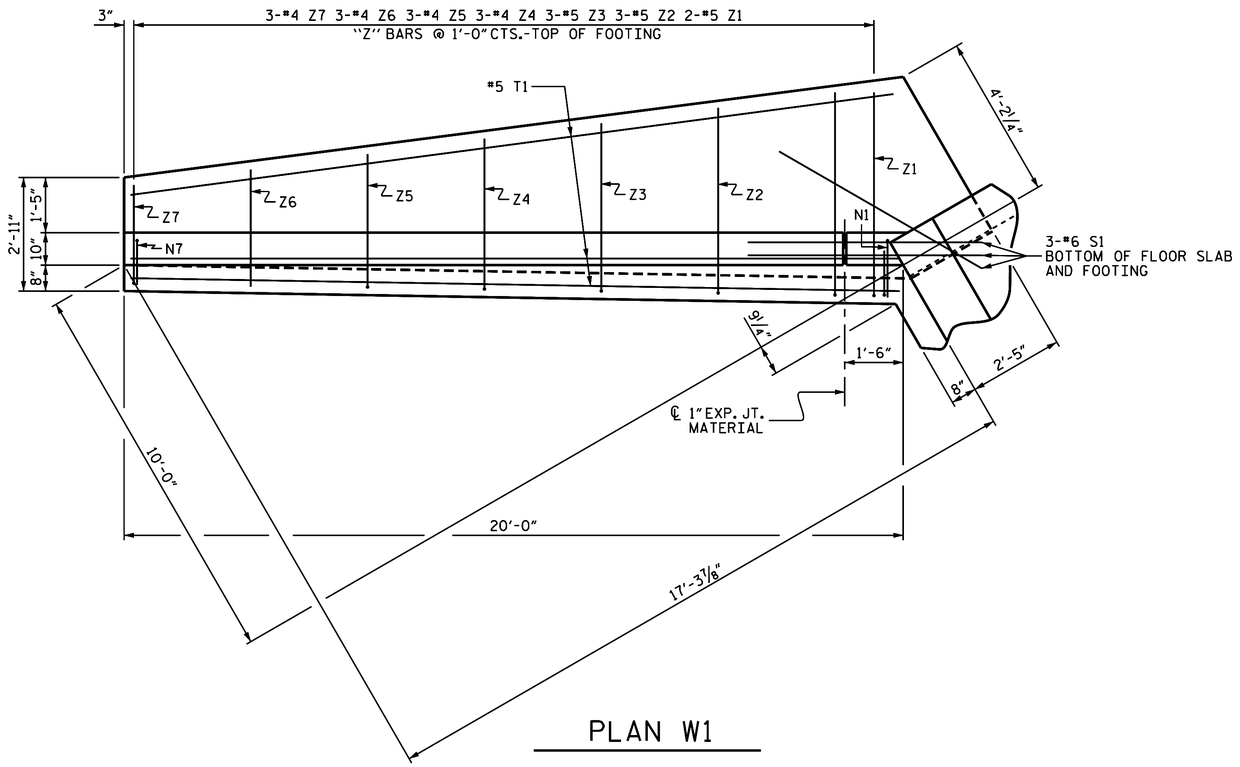
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT

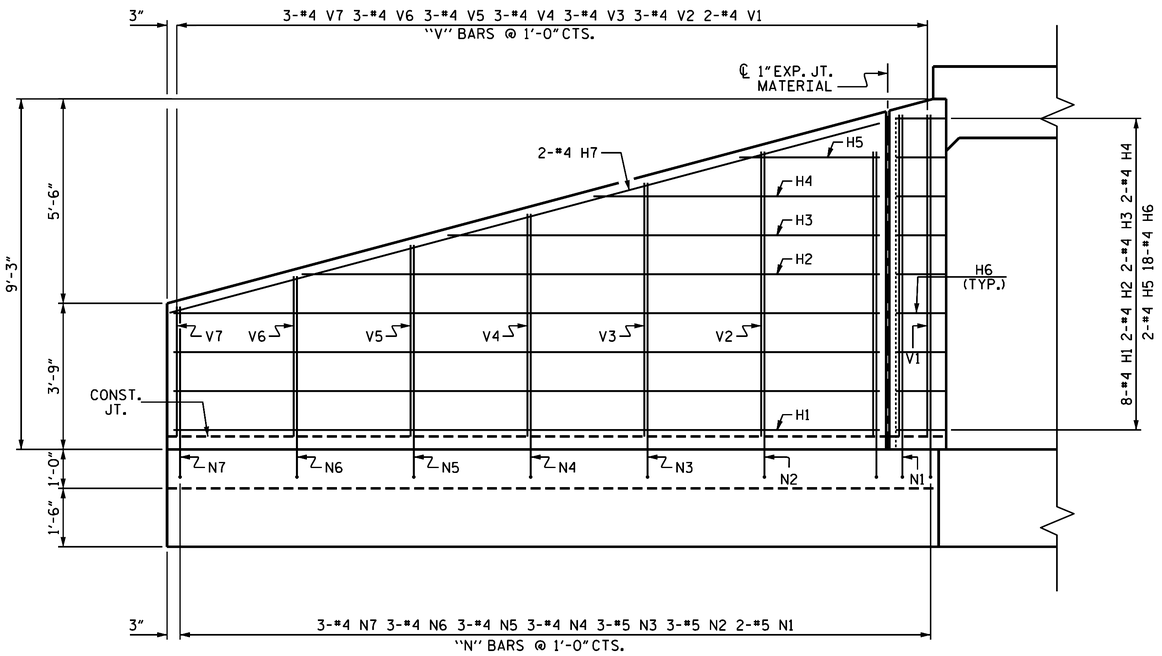
92° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C19-007
1			3			TOTAL SHEETS
2			4			8

STR. #19



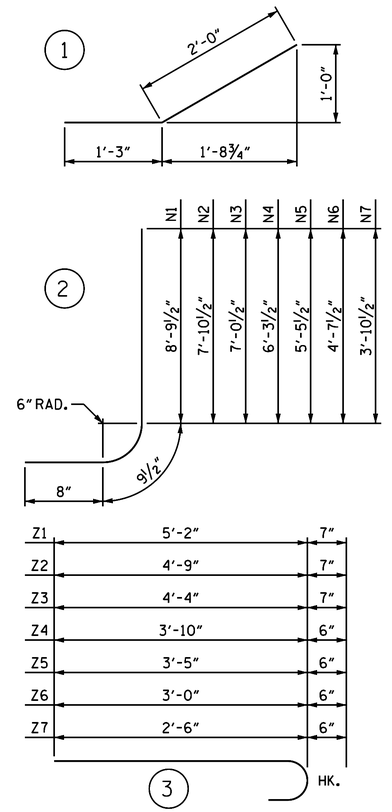
PLAN W1



ELEVATION W1

ASSEMBLED BY :	M.D. PISO	DATE :	01-09-15
CHECKED BY :	N.M. RUFFIN	DATE :	01-09-15
DRAWN BY :	BLG 04/12		
CHECKED BY :	NMR 05/12		

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

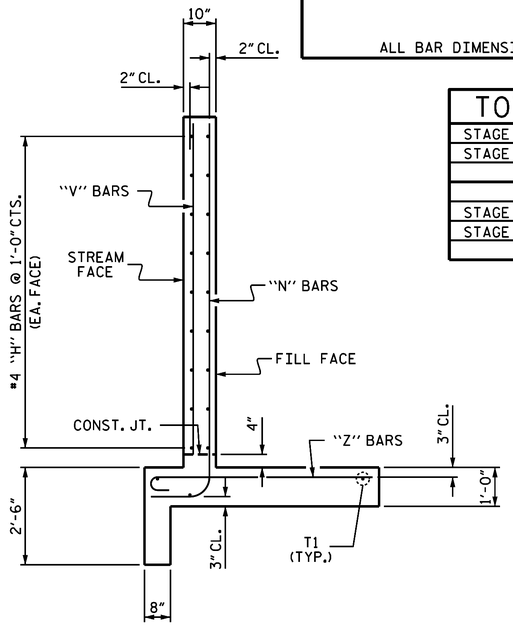
BILL OF MATERIAL FOR TWO WINGS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	16	#4	STR	18'-1"	193
H2	4	#4	STR	14'-10"	40
H3	4	#4	STR	11'-1"	30
H4	4	#4	STR	7'-4"	20
H5	4	#4	STR	3'-7"	10
H6	36	#4	1	3'-3"	78
H7	4	#4	STR	18'-10"	50
N1	4	#5	2	10'-3"	43
N2	6	#5	2	9'-4"	58
N3	6	#5	2	8'-6"	53
N4	6	#4	2	7'-9"	31
N5	6	#4	2	6-11"	28
N6	6	#4	2	6'-1"	24
N7	6	#4	2	5'-4"	21
S1	6	#6	STR	6'-0"	54
T1	6	#5	STR	19'-9"	124
V1	4	#4	STR	8'-3"	22
V2	6	#4	STR	7'-3"	29
V3	6	#4	STR	6'-6"	26
V4	6	#4	STR	5'-8"	23
V5	6	#4	STR	4'-11"	20
V6	6	#4	STR	4'-1"	16
V7	6	#4	STR	3'-4"	13
Z1	4	#5	3	5'-9"	24
Z2	6	#5	3	5'-4"	33
Z3	6	#5	3	4'-11"	31
Z4	6	#4	3	4'-4"	17
Z5	6	#4	3	3'-11"	16
Z6	6	#4	3	3'-6"	14
Z7	6	#4	3	3'-0"	12

REINFORCING STEEL FOR 2 WINGS	1153 LBS
CLASS A CONCRETE 2 WINGS	16.8 CY
TOTAL	16.8 CY

TOTAL QUANTITIES

STAGE I REINFORCING STEEL	1153 LBS.
STAGE II REINFORCING STEEL	1153 LBS.
TOTAL	2306 LBS.
STAGE I CLASS A CONCRETE	16.8 CY
STAGE II CLASS A CONCRETE	16.8 CY
TOTAL	33.6 CY



TYPICAL WING SECTION

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
DocuSigned by: Tim Coggins DEFDAA8C45EFA47B...
3/23/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 20+75.75 -DRV3-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT

H = 8'-0" SLOPE = 3:1
90° HEADWALL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C19-008
1			3			TOTAL SHEETS
2			4			8

STR. #19

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 2012 "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 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" 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 1/4" 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 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" 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