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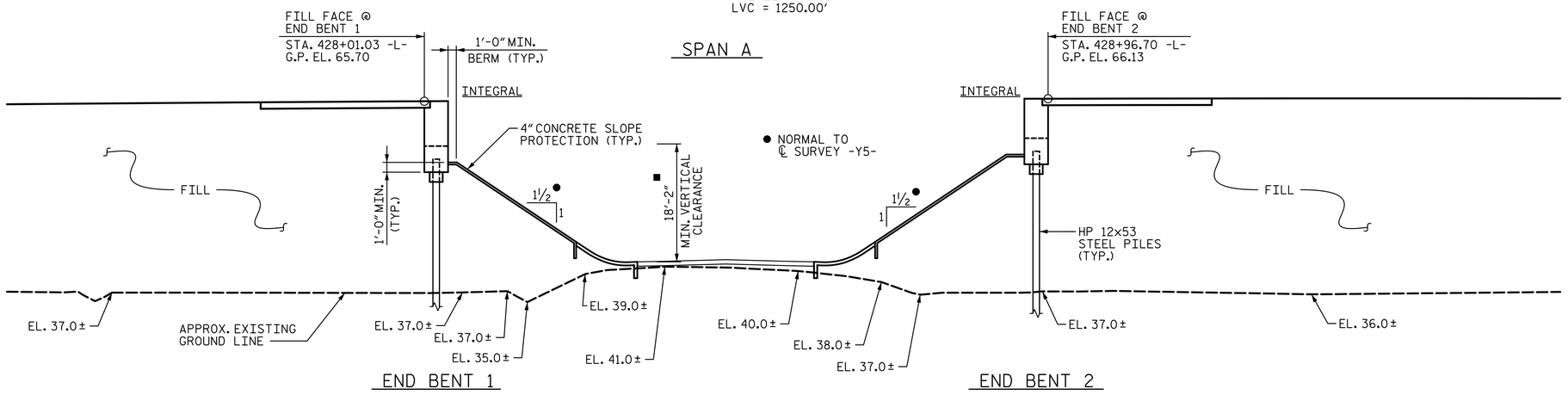
428+00 429+00

+ 2.9405% - 2.1154%

GRADE DATA

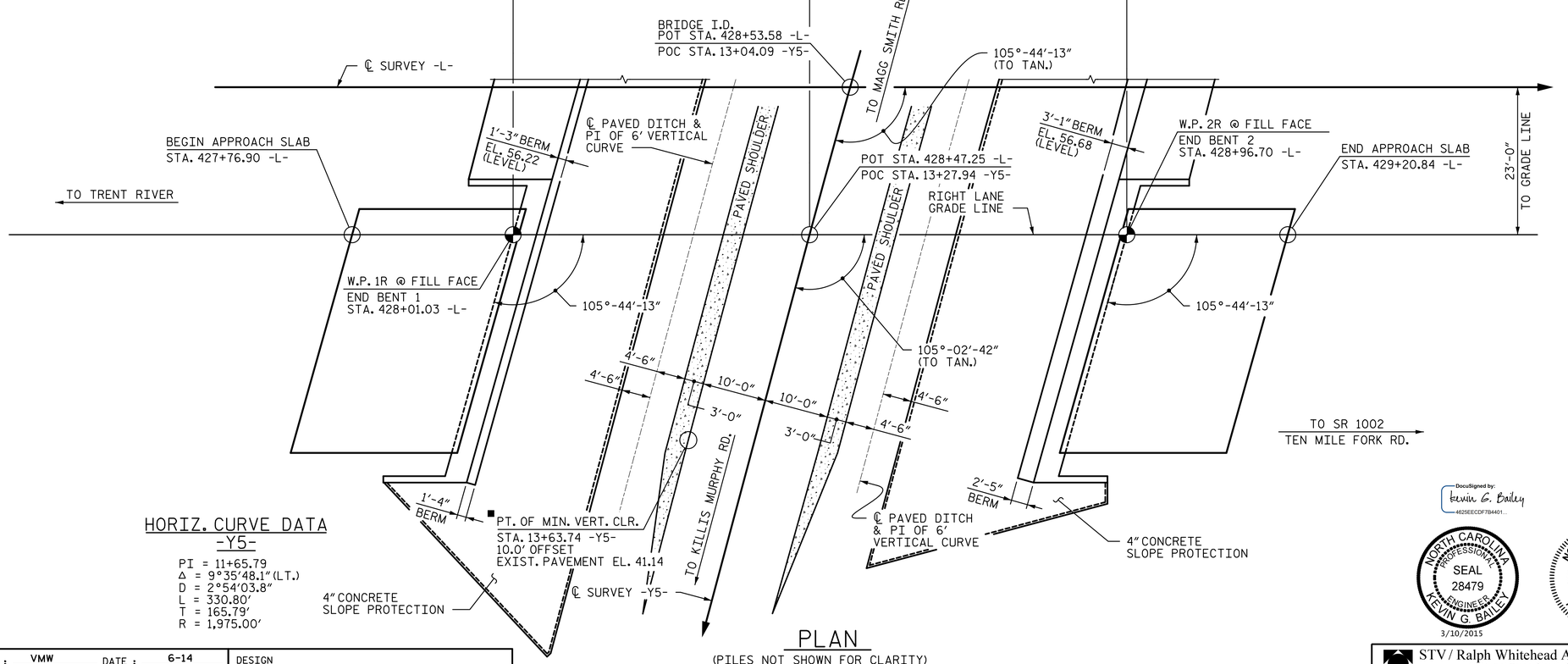
PVI STA. = 428+60.00 -L-
PVI EL. = 73.91
LVC = 1250.00'



SECTION ALONG RIGHT LANE GRADE LINE

(SECTIONS AT RIGHT ANGLES TO END BENTS)

■ VERTICAL CLEARANCE IS CALCULATED BASED ON EXISITNG PAVEMENT ELEVATIONS AND 1½" OVERLAY



PLAN

(PILES NOT SHOWN FOR CLARITY)

HORIZ. CURVE DATA -Y5-

PI = 11+65.79
Δ = 9°35'48.1" (LT.)
D = 2°54'03.8"
L = 330.80'
T = 165.79'
R = 1,975.00'

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : MLO	DATE : 6-14		

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

SHEET 1 OF 3 BRIDGE NO. 104

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 17 OVER OAK GROVE RD. (SR 1121) BETWEEN TRENT RIVER AND SR 1002
-RIGHT LANE-

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...
NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
3/10/2015

DocuSigned by: Adam J. Peter E3F8AF8D9B4742A...
NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

STV/ Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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1			3			TOTAL SHEETS
2			4			24

STR. #10

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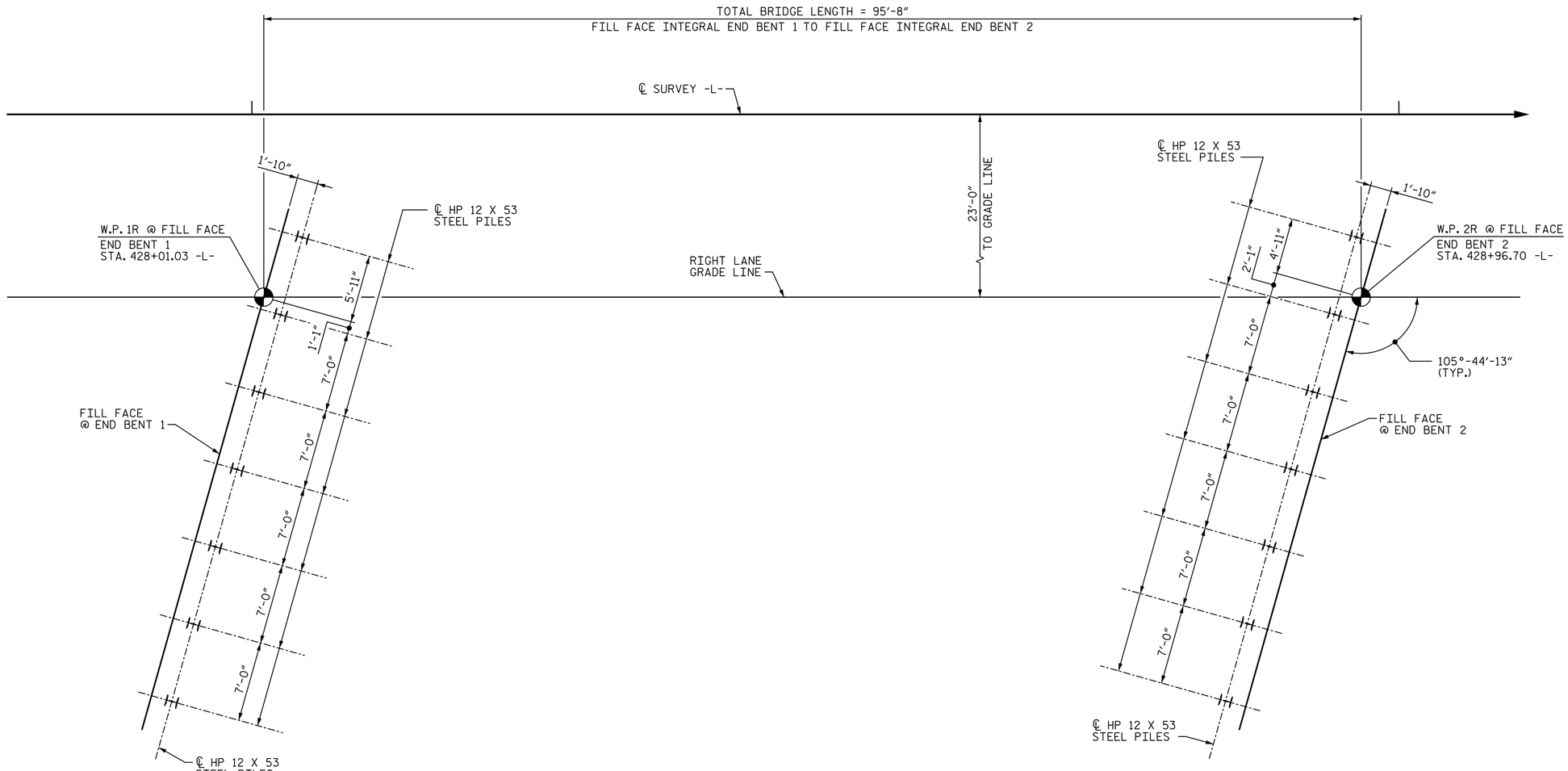

END BENT 1

END BENT 2

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.)

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT 1 AND END BENT 2. 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 48,500 FT-LBS PER BLOW TO 83,000 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

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

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

SHEET 2 OF 3

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
3/10/2015

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

-RIGHT LANE-

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : MLO	DATE : 6-14		

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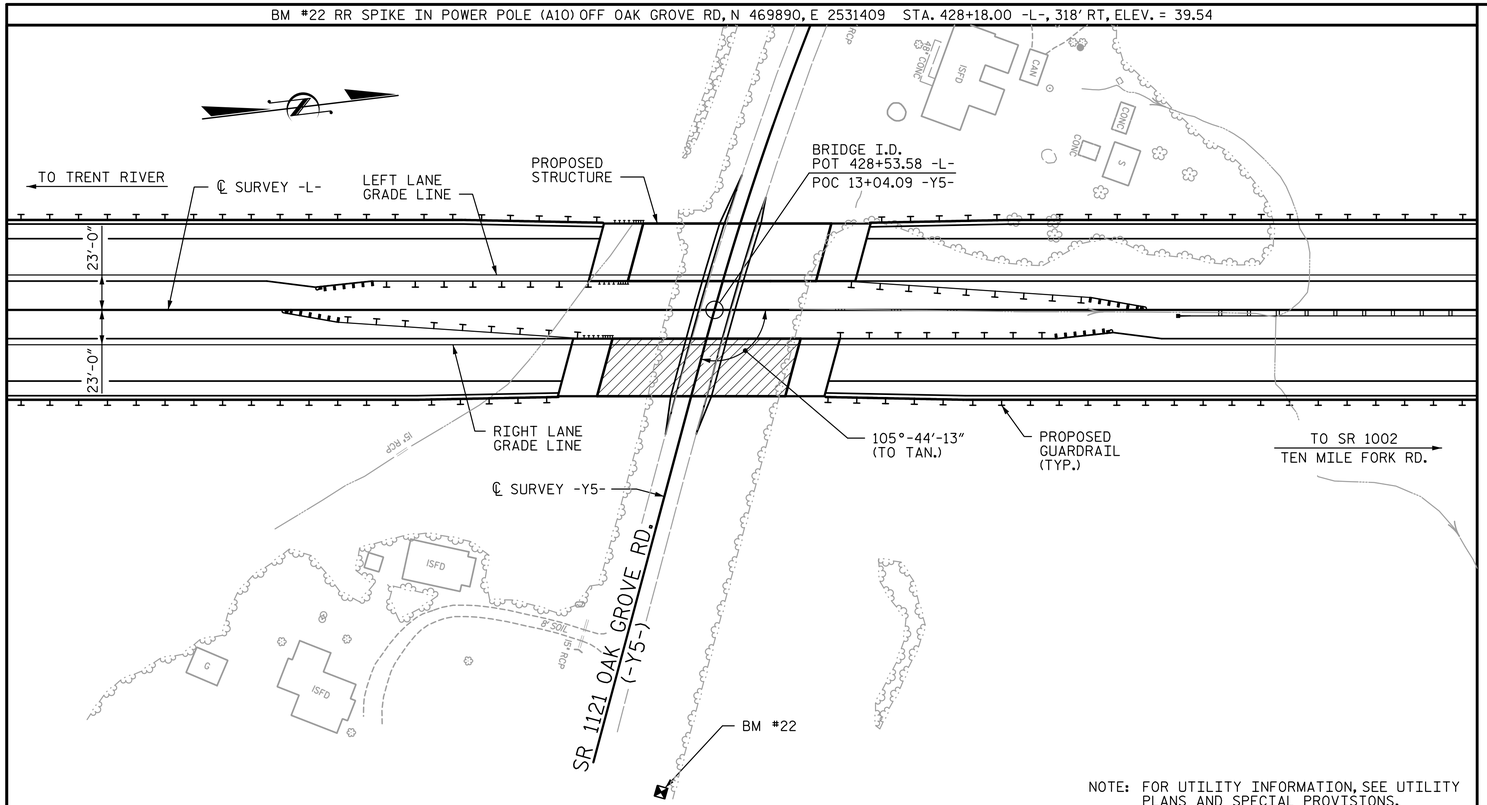

LOCATION SKETCH

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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 FOUNDATION NOTES, SEE "FOUNDATION LAYOUT" SHEET.

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

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

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.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION(S) ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12x53 STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	EA.	SQ. FT.	SQ. FT.	CU. YD.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	EA.	LIN. FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE		3,946	4,966		LUMP SUM		5	466.35					187.88		LUMP SUM
END BENT 1				30.7		4,697			7	490	7	4		275	
END BENT 2				30.0		4,591			7	455	7	4		275	
TOTAL	1	3,946	4,966	60.7	LUMP SUM	9,288	5	466.35	14	945	14	8	187.88	550	LUMP SUM

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...
3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY

DocuSigned by: Adam J. Peter E3F6AF8D99A742A...
3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 428+53.58 -L-
= 13+04.09 -Y5-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LOCATION SKETCH, GENERAL NOTES AND TOTAL BILL OF MATERIAL
-RIGHT LANE-

DRAWN BY : VMW DATE : 6-14
CHECKED BY : MLO DATE : 6-14
DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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2			4			24

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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					
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.15	--	1.75	0.78	1.56	A	EL	45.9	0.90	1.15	A	I	8.6	0.80	0.78	1.30	A	EL	45.9	
		HL-93 (OPERATING)	N/A		1.52	--	1.35	0.78	2.02	A	EL	45.9	0.90	1.52	A	I	8.6	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.54	55.44	1.75	0.78	2.14	A	EL	45.9	0.90	1.54	A	I	8.6	0.80	0.78	1.78	A	EL	45.9	
		HS-20 (OPERATING)	36.000		2.04	73.44	1.35	0.78	2.77	A	EL	45.9	0.90	2.04	A	I	8.6	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		4.19	56.57	1.40	0.78	6.27	A	EL	45.9	0.90	5.00	A	I	8.6	0.80	0.78	4.19	A	EL	45.9	
		SNGARBS2	20.000		3.05	61.00	1.40	0.78	4.57	A	EL	45.9	0.90	3.47	A	I	8.6	0.80	0.78	3.05	A	EL	45.9	
		SNAGRIS2	22.000		2.86	62.92	1.40	0.78	4.29	A	EL	45.9	0.90	3.20	A	I	8.6	0.80	0.78	2.86	A	EL	45.9	
		SNCOTTS3	27.250		2.08	56.68	1.40	0.78	3.12	A	EL	45.9	0.90	2.43	A	I	8.6	0.80	0.78	2.08	A	EL	45.9	
		SNAGGRS4	34.925		1.71	59.72	1.40	0.78	2.57	A	EL	45.9	0.90	1.96	A	I	8.6	0.80	0.78	1.71	A	EL	45.9	
		SNS5A	35.550		1.68	59.72	1.40	0.78	2.51	A	EL	45.9	0.90	1.97	A	I	8.6	0.80	0.78	1.68	A	EL	45.9	
		SNS6A	39.950		1.53	61.12	1.40	0.78	2.29	A	EL	45.9	0.90	1.78	A	I	8.6	0.80	0.78	1.53	A	EL	45.9	
		SNS7B	42.000		1.45	60.90	1.40	0.78	2.18	A	EL	45.9	0.90	1.73	A	I	8.6	0.80	0.78	1.45	A	EL	45.9	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.86	61.38	1.40	0.78	2.79	A	EL	45.9	0.90	2.15	A	I	8.6	0.80	0.78	1.86	A	EL	45.9	
		TNT4A	33.075		1.86	61.52	1.40	0.78	2.79	A	EL	45.9	0.90	2.10	A	I	8.6	0.80	0.78	1.86	A	EL	45.9	
		TNT6A	41.600		1.51	62.82	1.40	0.78	2.27	A	EL	45.9	0.90	1.83	A	I	8.6	0.80	0.78	1.51	A	EL	45.9	
		TNT7A	42.000		1.52	63.84	1.40	0.78	2.27	A	EL	45.9	0.90	1.79	A	I	8.6	0.80	0.78	1.52	A	EL	45.9	
		TNT7B	42.000		1.56	65.52	1.40	0.78	2.33	A	EL	45.9	0.90	1.70	A	I	8.6	0.80	0.78	1.56	A	EL	45.9	
		TNAGRIT4	43.000		1.49	64.07	1.40	0.78	2.23	A	EL	45.9	0.90	1.64	A	I	8.6	0.80	0.78	1.49	A	EL	45.9	
		TNAGT5A	45.000		1.41	63.45	1.40	0.78	2.11	A	EL	45.9	0.90	1.62	A	I	8.6	0.80	0.78	1.41	A	EL	45.9	
		TNAGT5B	45.000	⟨3⟩	1.40	63.00	1.40	0.78	2.09	A	EL	45.9	0.90	1.56	A	I	8.6	0.80	0.78	1.40	A	EL	45.9	

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.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

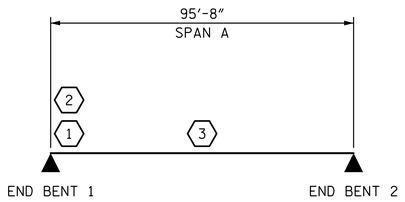
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨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: 428+53.58 -L-
= 13+04.09 -Y5-

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

4/17/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
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1	STV	4-15	3			TOTAL SHEETS
2			4			24

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CHECKED BY : AJP DATE : 6-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

⚠ REVISED PER NCDOT COMMENTS

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Charlotte, NC 28202
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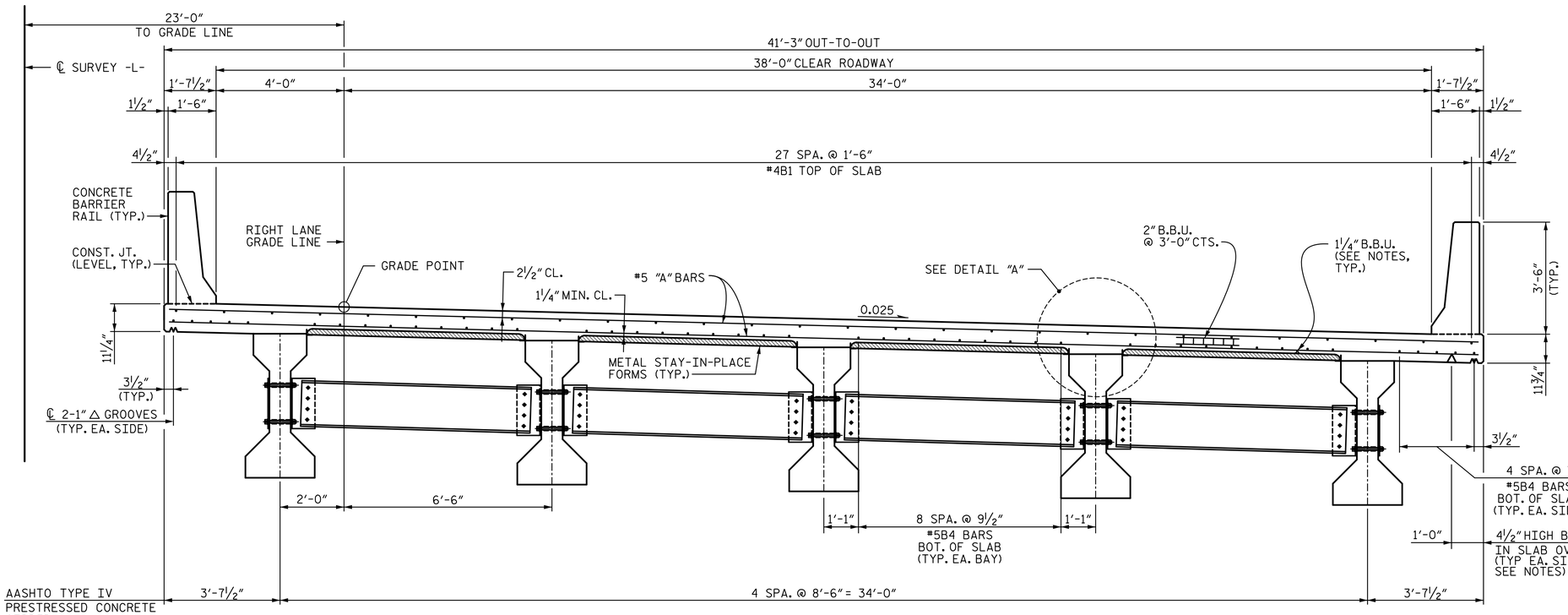
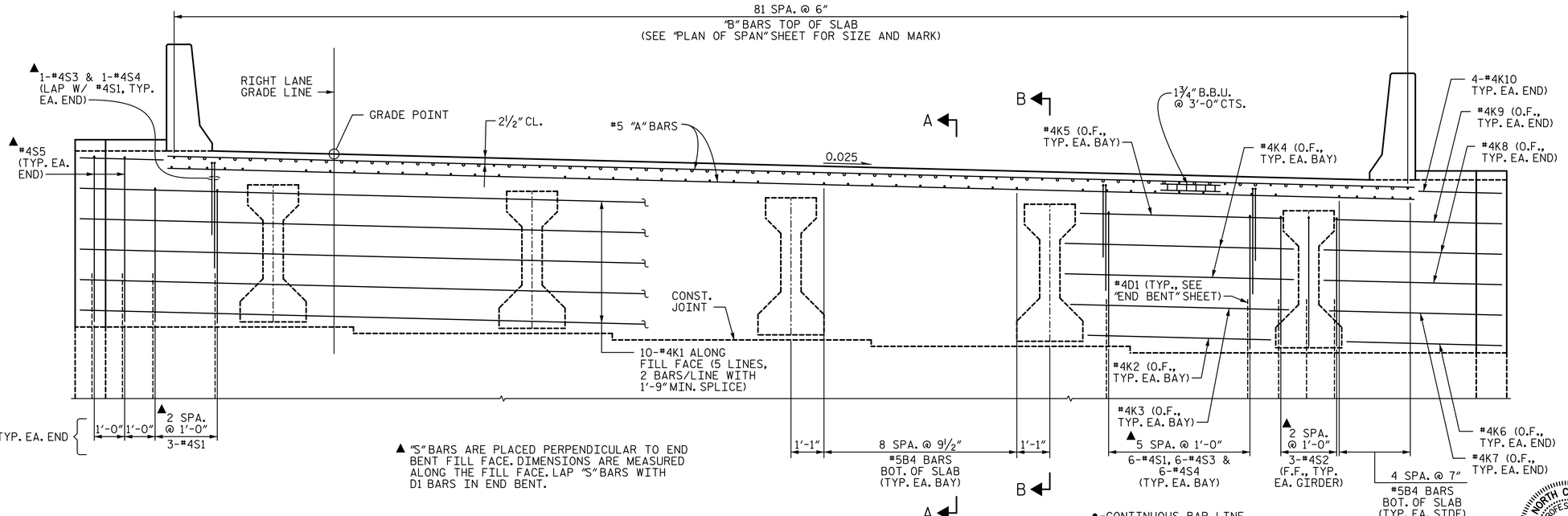


TYPICAL SECTION AT INTERMEDIATE DIAPHRAGMS



▲ "S" BARS ARE PLACED PERPENDICULAR TO END BENT FILL FACE. DIMENSIONS ARE MEASURED ALONG THE FILL FACE. LAP "S" BARS WITH D1 BARS IN END BENT.

● -CONTINUOUS BAR LINE
○ -NON-CONTINUOUS BAR LINE

ELEVATION OF INTEGRAL BACKWALL

(END BENT 1 SHOWN, END BENT 2 SIMILAR)
(LOOKING IN DIRECTION OF STATIONING, WING REINFORCEMENT NOT SHOWN FOR CLARITY.)

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.

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

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

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

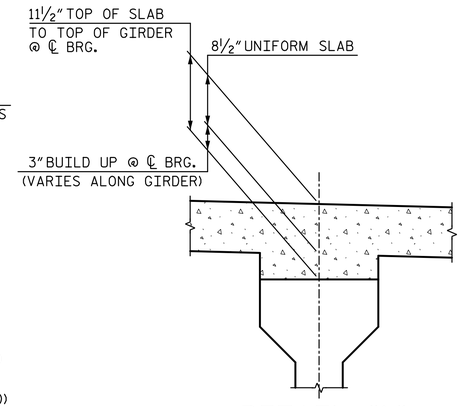
FOR BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEET.

F.F. DENOTES FILL FACE
O.F. DENOTES OUTSIDE FACE

FOR INTEGRAL BACKWALL DIMENSIONS, DETAILS AND ELEVATIONS, SEE "PLAN OF SPANS DETAILS" SHEETS.

FOR SECTIONS A-A AND B-B, SEE "SUPERSTRUCTURE DETAILS" SHEET.

HEIGHT OF BEAM BOLSTER IS CALCULATED @ ℄ BENT. CONTRACTOR SHALL ADJUST HEIGHTS, AS NECESSARY TO MAINTAIN PROPER CLEARANCE, DUE TO GIRDER CAMBER



DETAIL "A"
(TYP. EA. GIRDER)

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 428+53.58 -L-
= 13+04.09 -Y5-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION & INTEGRAL BACKWALL

-RIGHT LANE-

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...
3/10/2015

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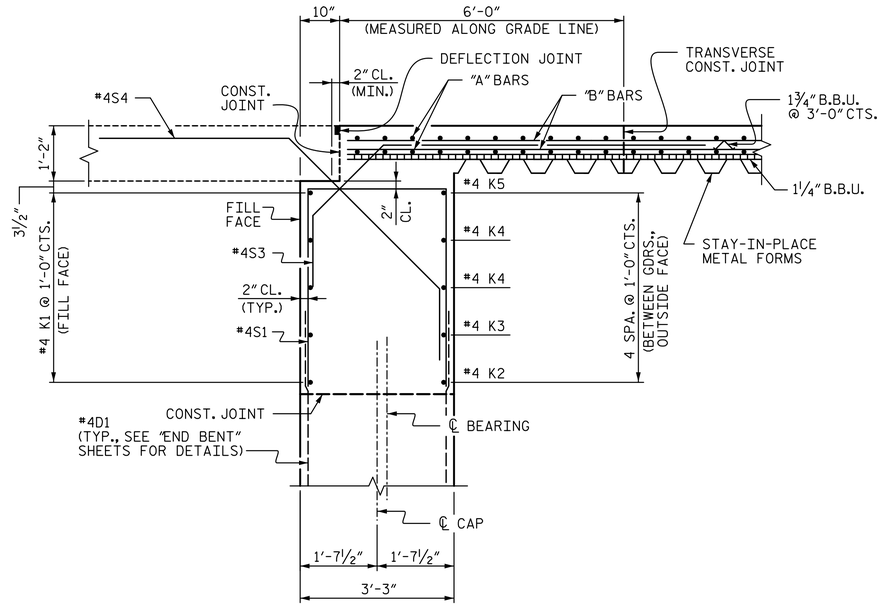
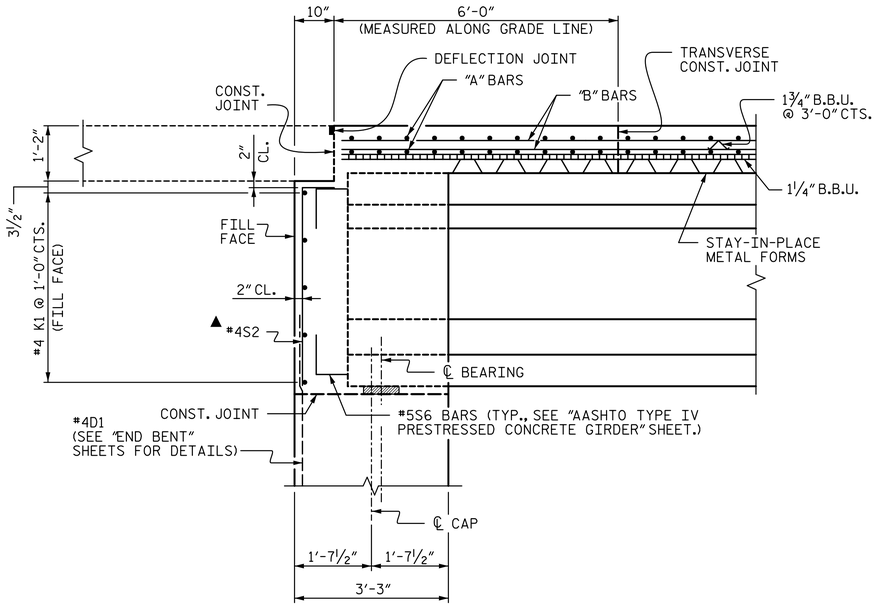
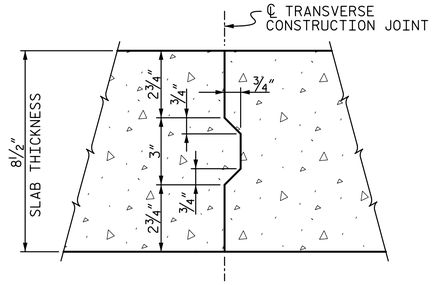


SECTION A-A



SECTION B-B

▲ HOOKS ON S2 BARS MAY BE TURNED AS NECESSARY TO CLEAR GIRDER.



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

TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SUPERSTRUCTURE DETAILS

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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SHEET NO. S10-6

TOTAL SHEETS 24

DRAWN BY : VMW DATE : 6-14
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DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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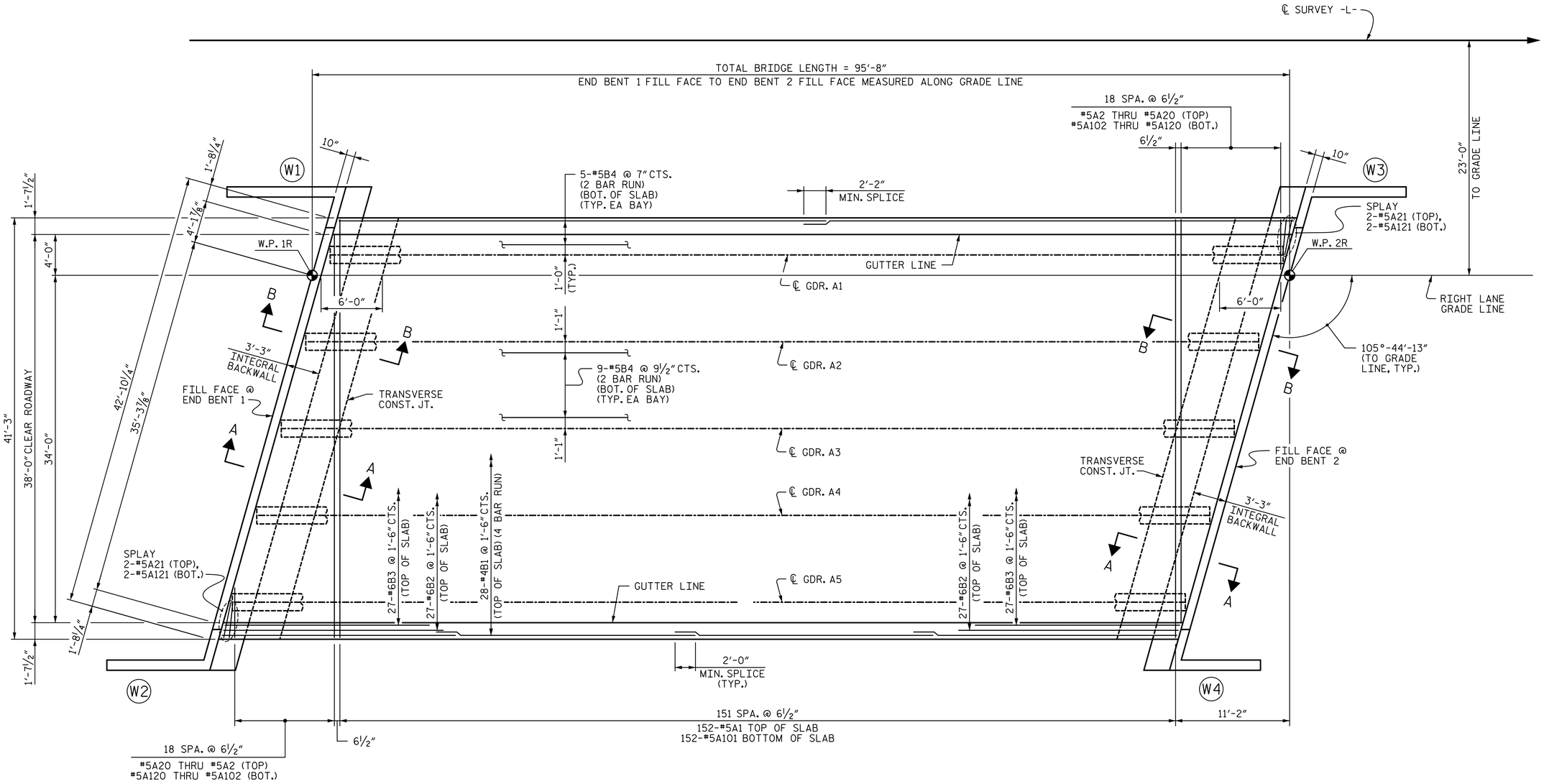

SPAN A

NOTES:

1. FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEET.
2. FOR POURING SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
3. FOR SECTION A-A, B-B, & TRANSVERSE CONST. JOINT IN DECK SLAB, SEE "SUPERSTRUCTURE DETAILS" SHEET.
4. FOR SPACING OF TOP AND BOTTOM "B" BARS, SEE "TYPICAL SECTION AND INTEGRAL BACKWALL" SHEET.
5. DIMENSIONS TO CONSTRUCTION JOINTS ARE MEASURED ALONG THE GRADE LINE.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

4/10/2015

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
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NC License Number F-0991

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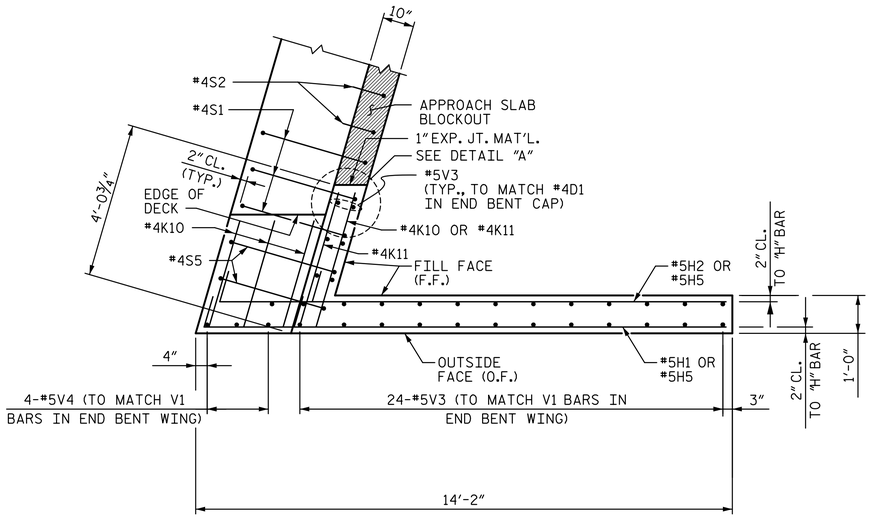
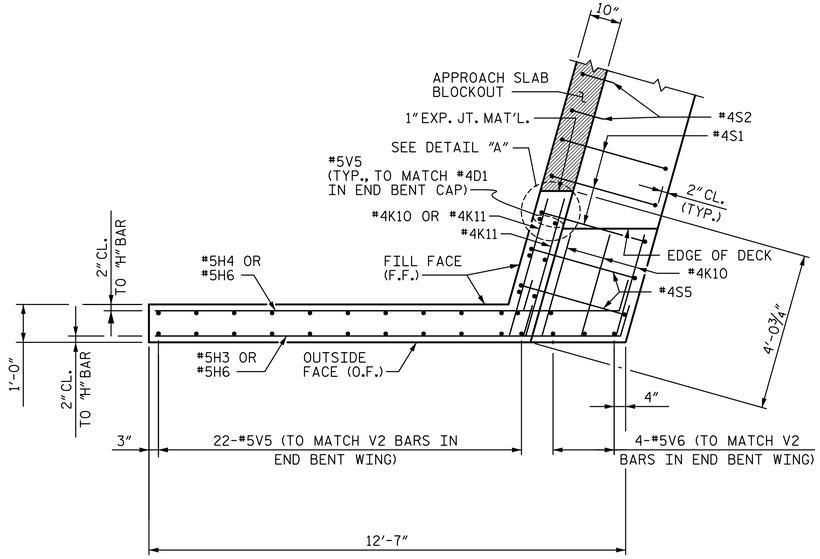


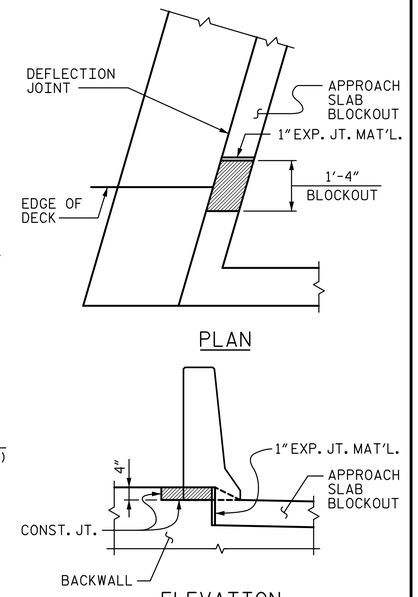
WING WALL PLAN (W1)

A



WING WALL PLAN (W2)

B



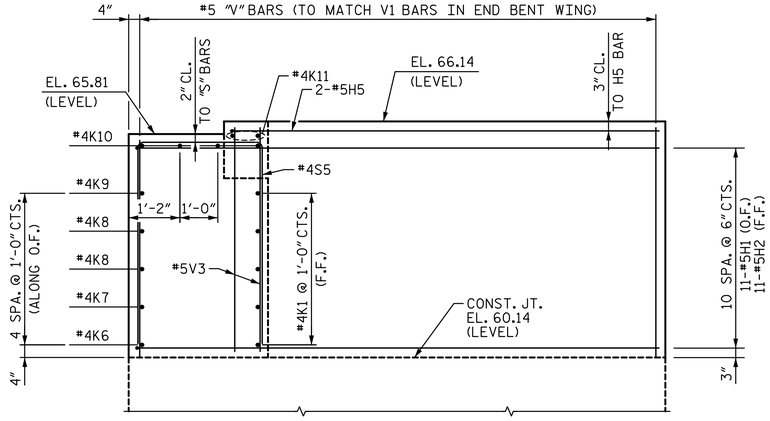
PLAN

ELEVATION

DETAIL "A"

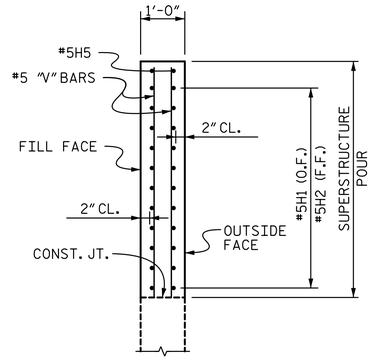
(WINGWALL (W1) SHOWN, WINGWALL (W2) SIMILAR.)

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE DEFLECTION JOINT HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

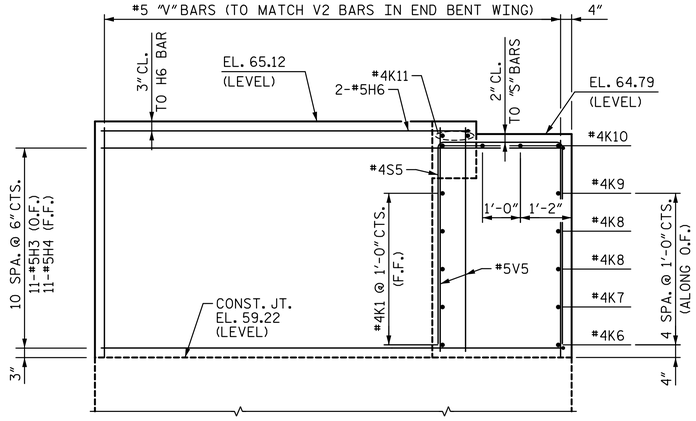


WING WALL ELEVATION (W1)

A

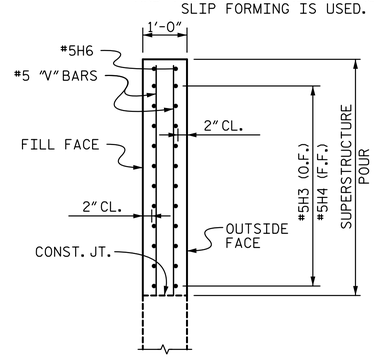


SECTION A-A



WING WALL ELEVATION (W2)

B



SECTION B-B

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS DETAILS

-RIGHT LANE-

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

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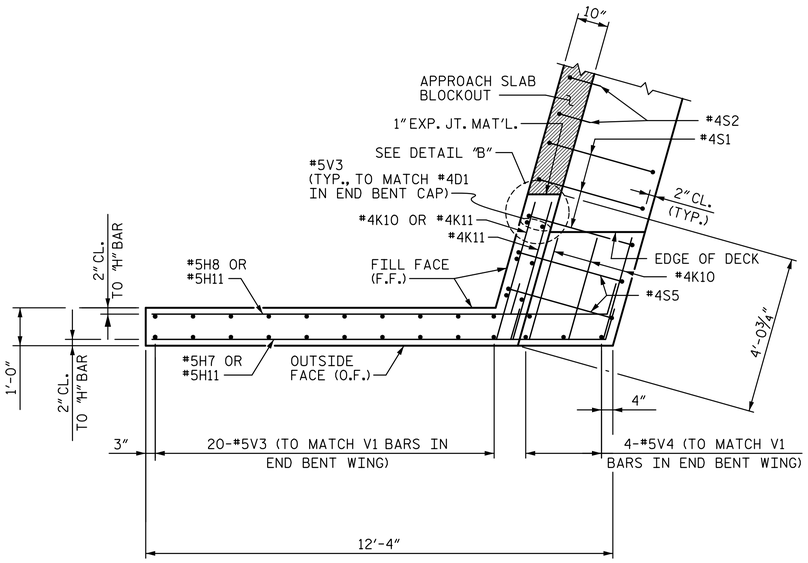
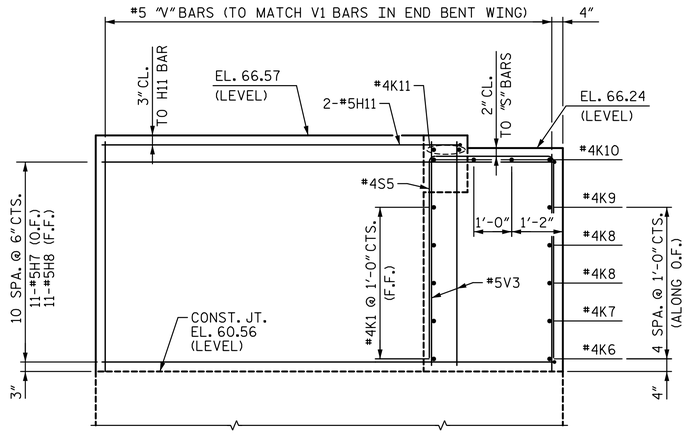
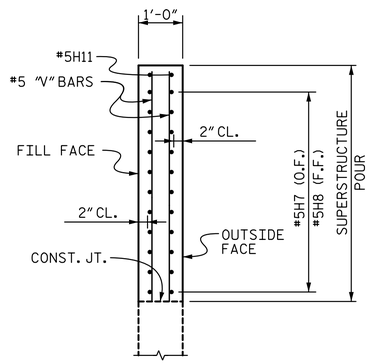


WING WALL PLAN (W3)

C

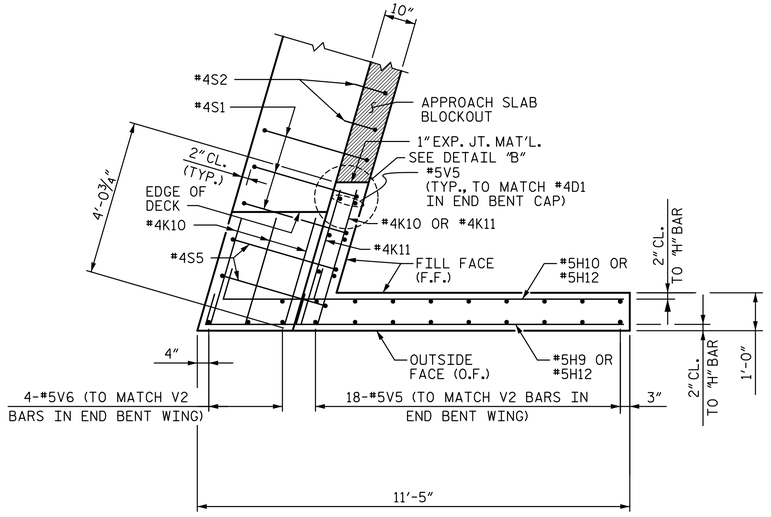


WING WALL ELEVATION (W3)



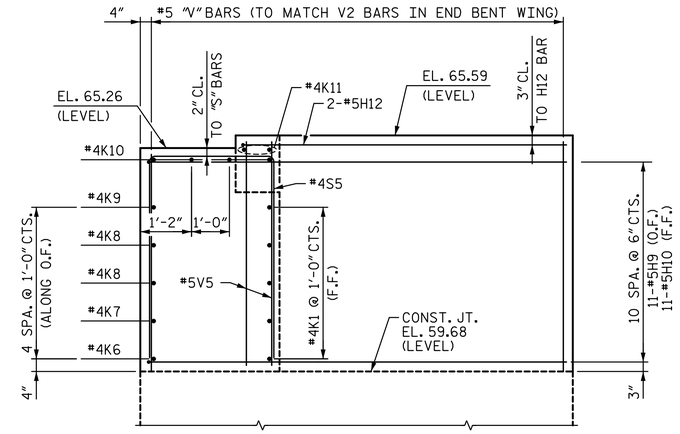
SECTION C-C

C



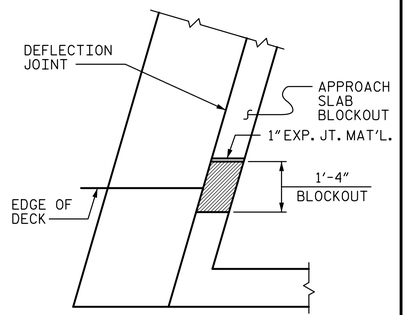
WING WALL PLAN (W4)

D

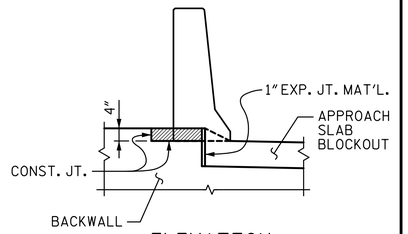


WING WALL ELEVATION (W4)

D



PLAN

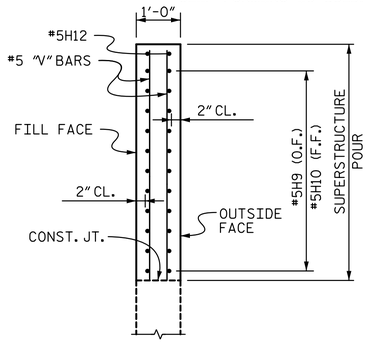


ELEVATION

DETAIL "B"

(WINGWALL (W4) SHOWN, WINGWALL (W3) SIMILAR.)

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE DEFLECTION JOINT HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



SECTION D-D

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS DETAILS

-RIGHT LANE-

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

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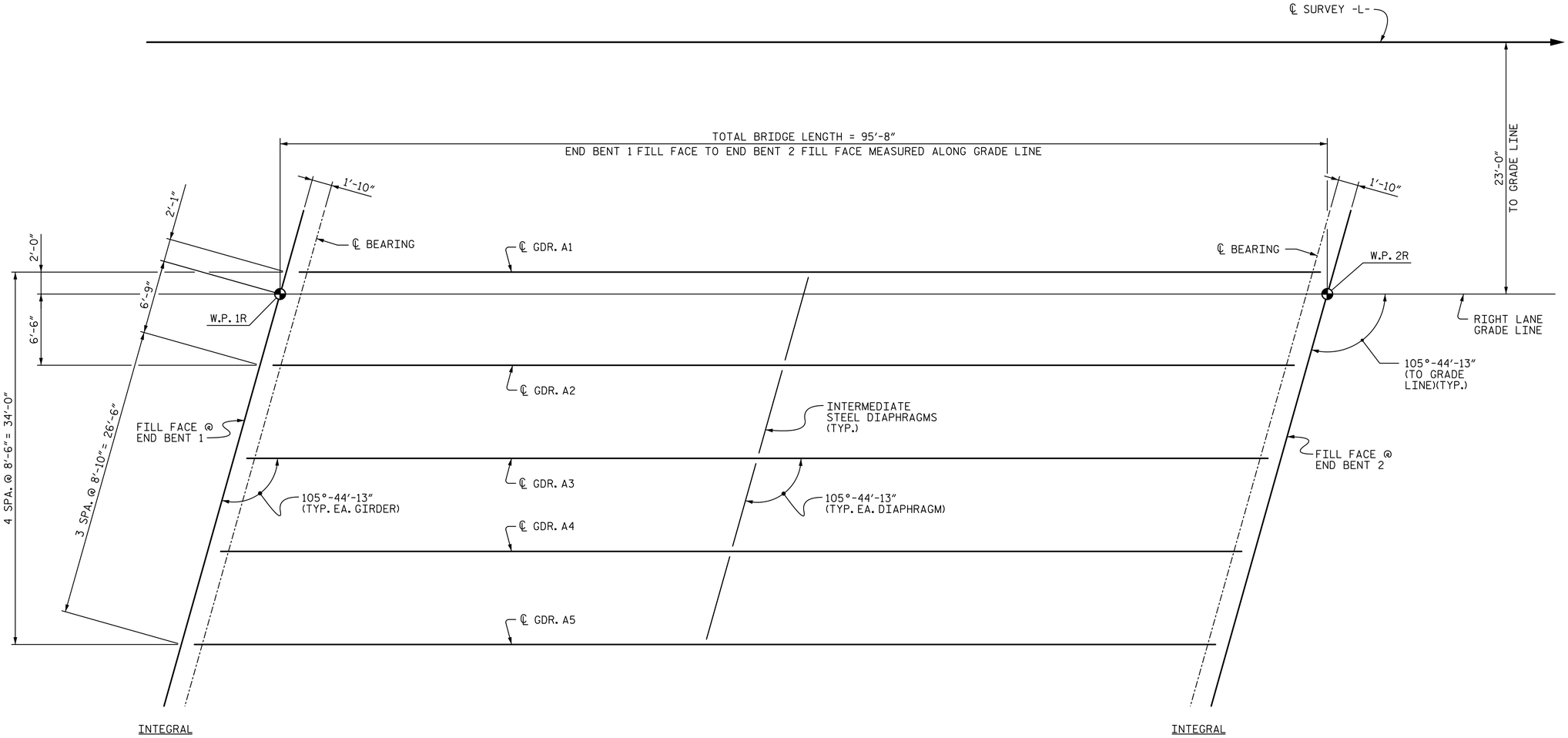


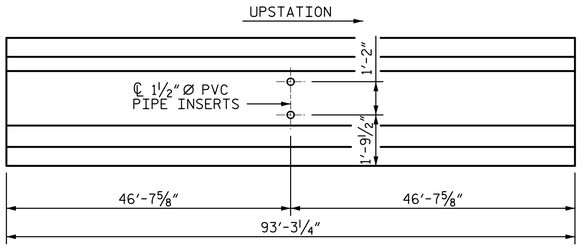
FRAMING PLAN - SPAN A

⚠ DEAD LOAD DEFLECTION TABLE

	SPAN A GIRDERS 1 & 5										
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.4	0.3	0.2	0.1	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.096	0.166	0.212	0.238	0.247	0.238	0.212	0.166	0.096	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.033	0.064	0.089	0.105	0.110	0.105	0.089	0.064	0.033	0.000
FINAL CAMBER ↑	0"	¾"	1 3/16"	1½"	1 5/8"	1 5/8"	1 5/8"	1½"	1 3/16"	¾"	0"

⚠ DEAD LOAD DEFLECTION TABLE

	SPAN A GIRDERS 2-4										
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.4	0.3	0.2	0.1	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.096	0.166	0.212	0.238	0.247	0.238	0.212	0.166	0.096	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.034	0.068	0.094	0.111	0.117	0.111	0.094	0.068	0.034	0.000
FINAL CAMBER ↑	0"	¾"	1 3/16"	1 7/16"	1½"	1 9/16"	1½"	1 7/16"	1 3/16"	¾"	0"



GIRDER INSERTS

NOTES:

ALL GIRDER ALONE IN PLACE CAMBERS AND DEFLECTIONS ARE SHOWN IN DECIMAL FEET.

▲ DOES NOT INCLUDE FUTURE WEARING SURFACE.

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

4/17/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN & DEAD LOAD DEFLECTIONS

-RIGHT LANE-

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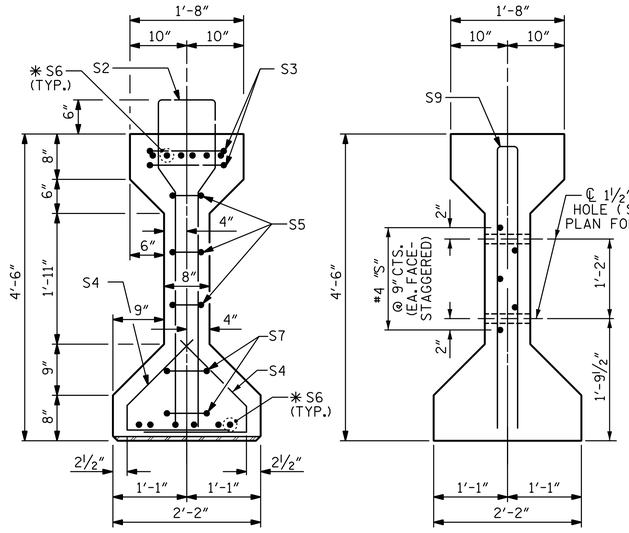
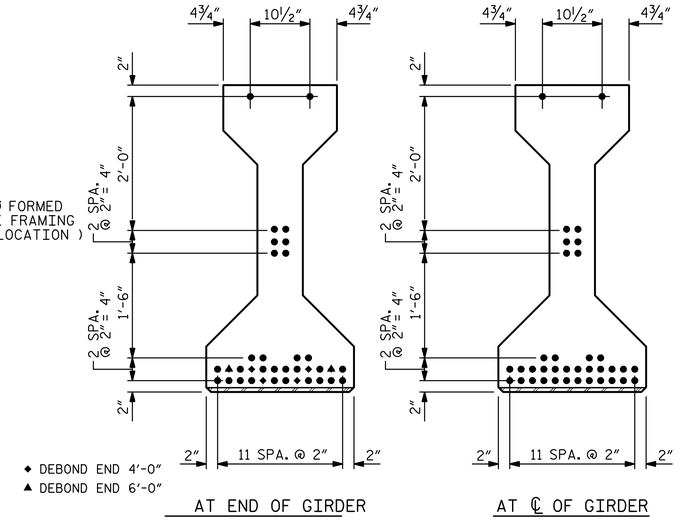


SECTION A-A

✳ FOR S6 BARS, SEE DETAIL "A"

SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE 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 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 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 TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6,000 PSI.

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

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE 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

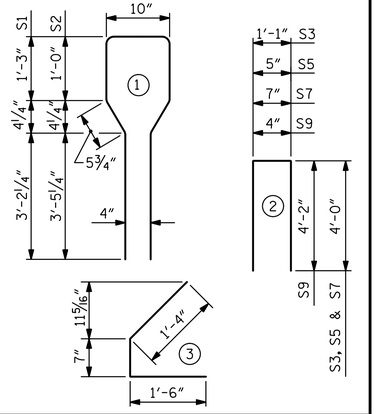
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	81	#4	1	10'-8"	577
S2	18	#6	1	10'-8"	288
S3	4	#4	2	9'-1"	24
S4	76	#4	3	3'-5"	173
S5	6	#4	2	8'-5"	34
✳ S6	24	#5	STR	3'-8"	92
S7	4	#4	2	8'-7"	23
S8	2	#3	STR	1'-10"	1
S9	2	#5	2	8'-8"	18
S10	5	#4	STR	7'-0"	23
S11	2	#3	STR	1'-4"	1

✳ NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT

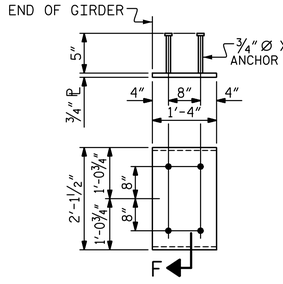


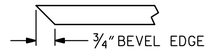
QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8,000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
	1,254	18.9	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	93'-3¼"	466'-4¼"



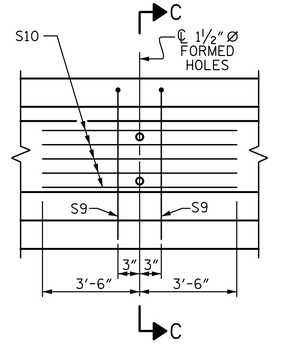


SECTION "F"

(SEE NOTES)

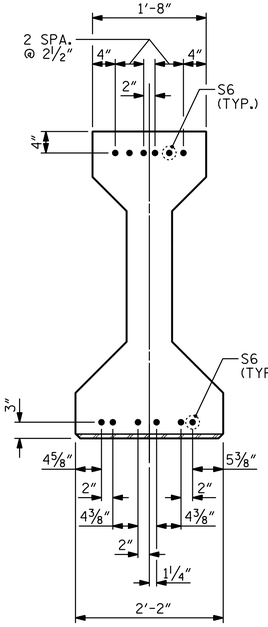
EMBEDDED PLATE "B-1" DETAILS

TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.

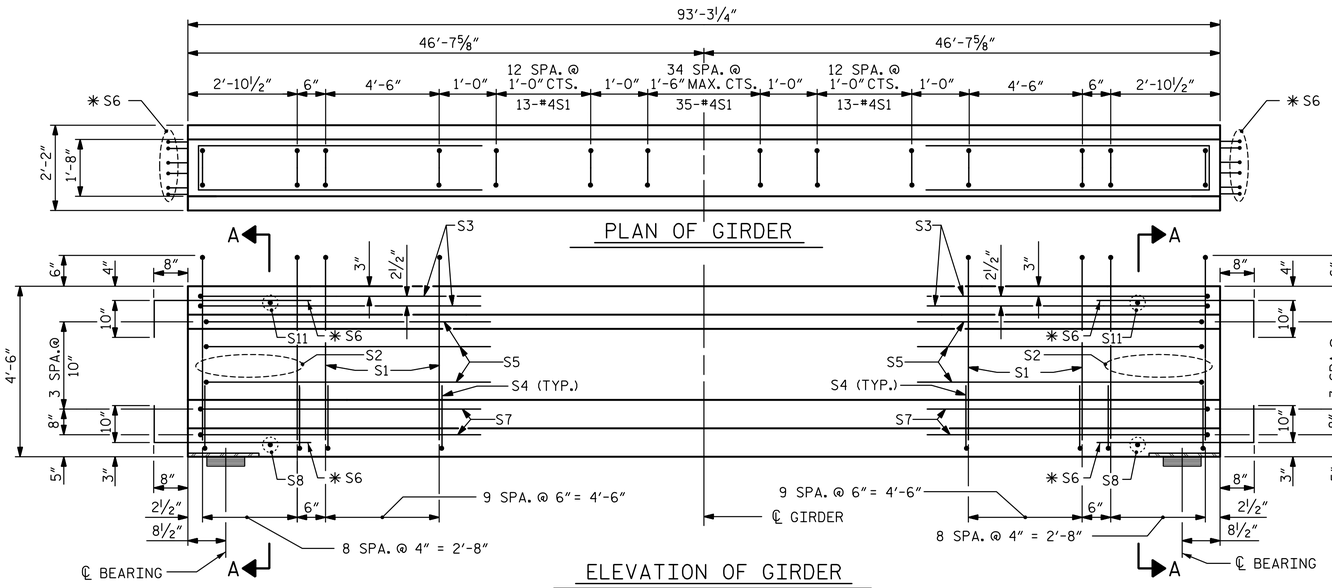


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS



DETAIL "A"



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

4/10/2015

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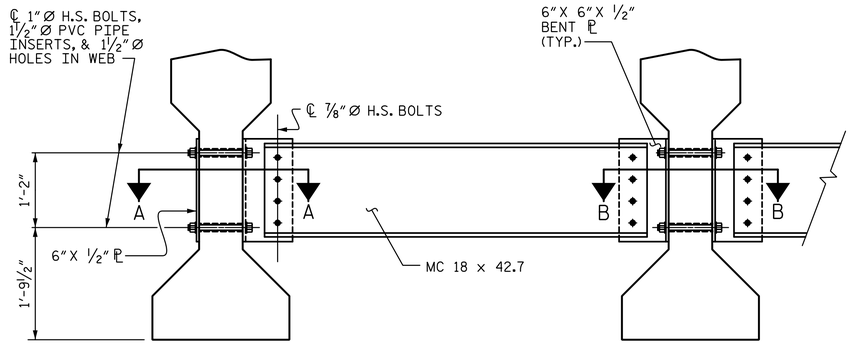
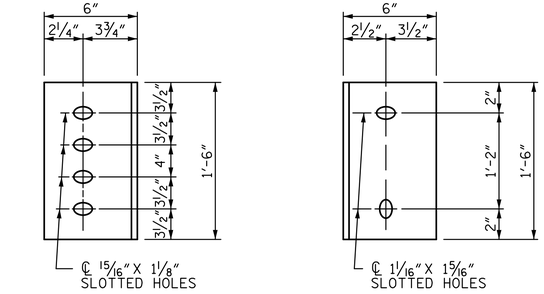


EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE

CONNECTOR PLATE DETAILS

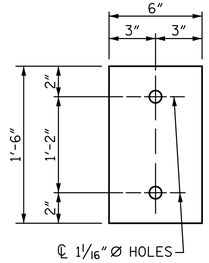
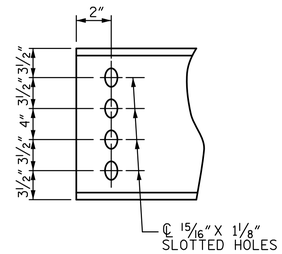
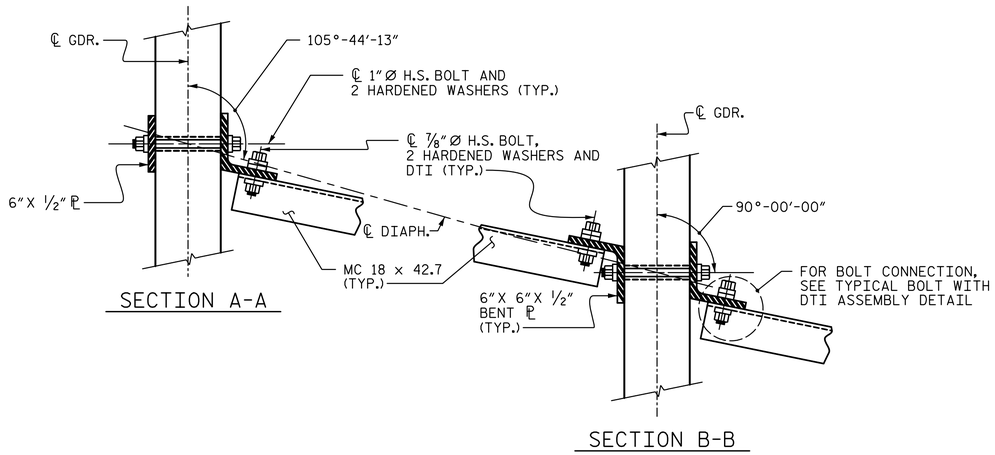


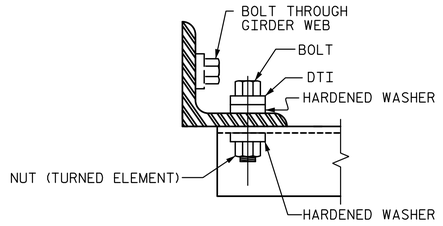
PLATE DETAILS



CHANNEL END



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

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

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

THE PLATES, BENT PLATES, AND CHANNELS 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 ¼"PROJECTION BEYOND THE NUT.

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

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

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

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

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS -RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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1			3			TOTAL SHEETS
2			4			24

DRAWN BY : VMW DATE : 6-14
CHECKED BY : MLO DATE : 6-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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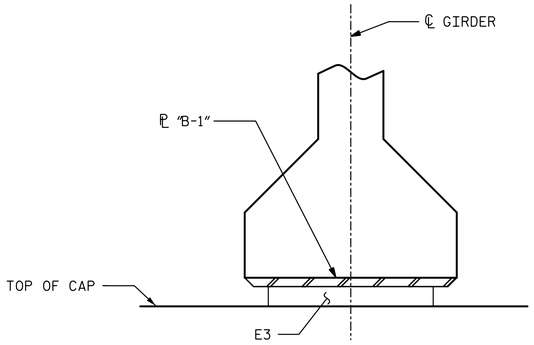
NOTES

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

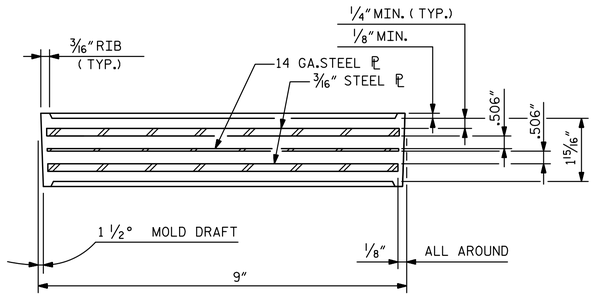
FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.



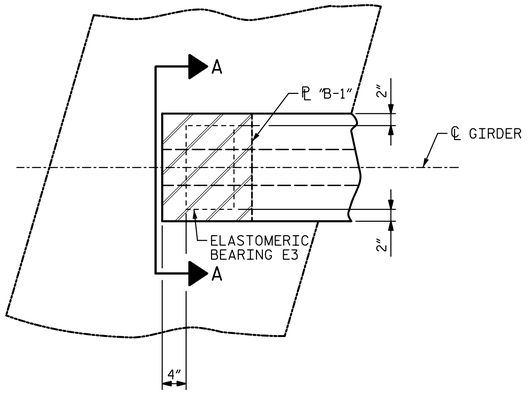
FIXED

— LOAD RATINGS —	
	MAX. D.L.+L.L.
E3	225 k

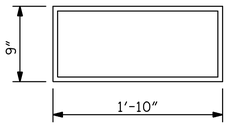
SECTION A-A



TYPICAL SECTION OF ELASTOMERIC BEARINGS



PLAN VIEW
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



E3 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ELASTOMERIC BEARING DETAILS

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

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2			4			24

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NC License Number F-0991

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CHECKED BY : AJP	DATE : 6-14		

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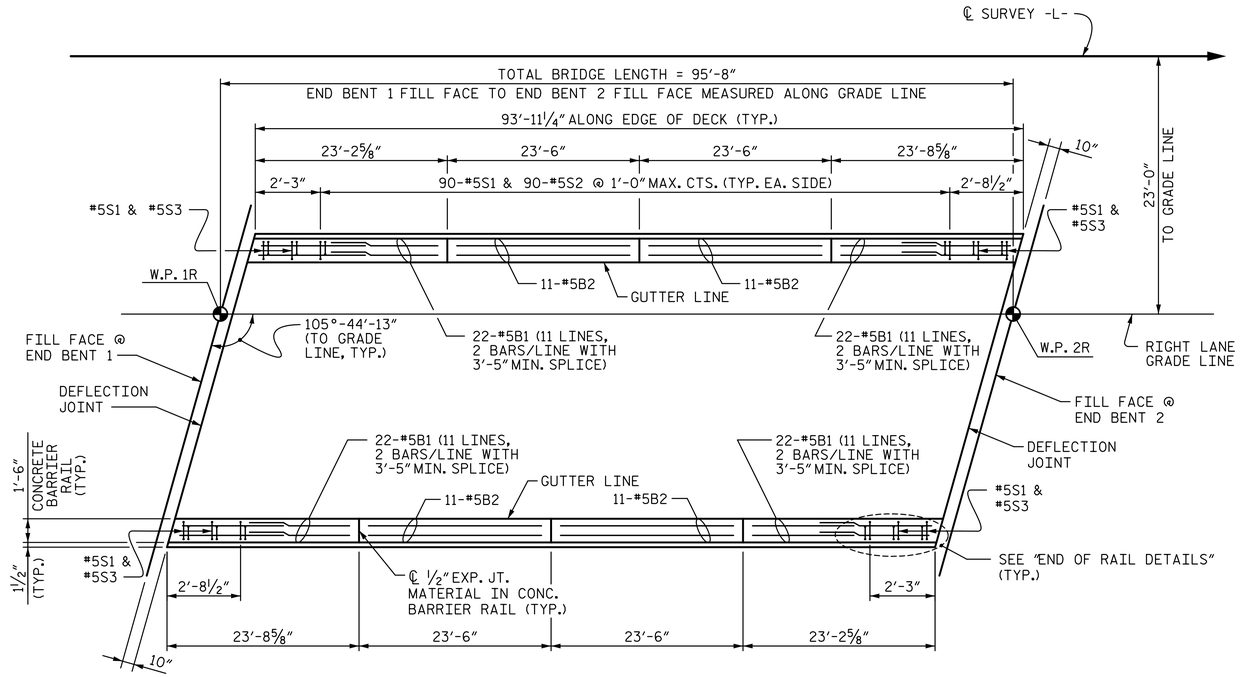


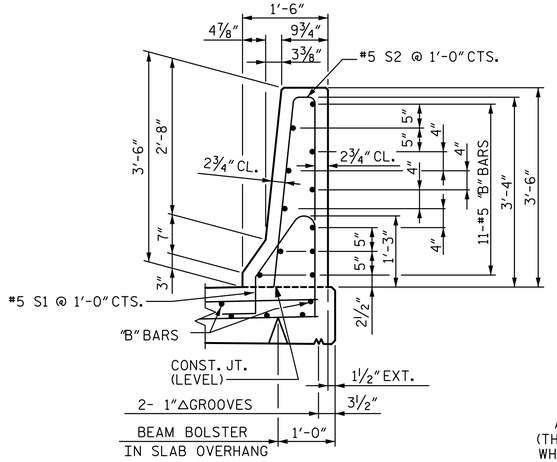
PLAN OF BARRIER RAIL

NOTES

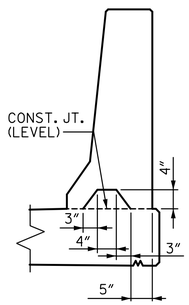
THE BARRIER RAIL IN THE SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

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.



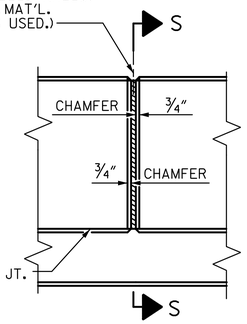
SECTION THRU RAIL



SECTION S-S

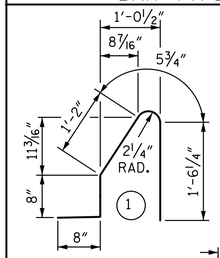
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

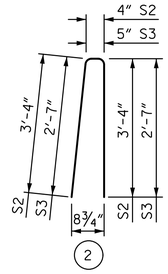
℄ ½" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS. (NOTE: OMIT EXP. JT. MAT'L. WHEN SLIP FORM IS USED.)



ELEVATION AT EXPANSION JOINTS

BAR TYPES



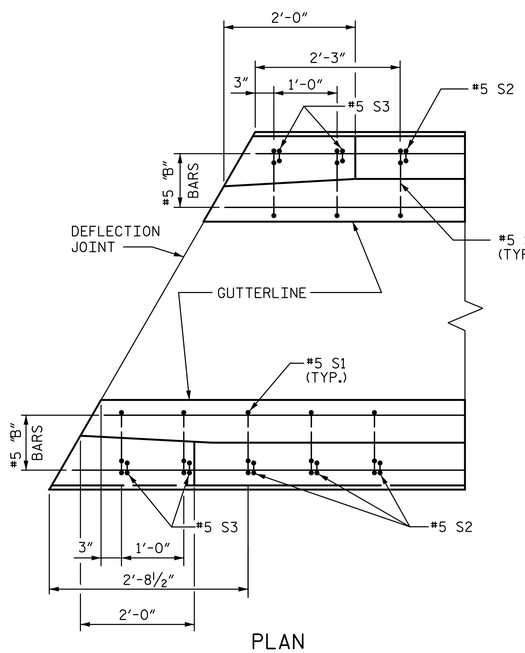


ALL BAR DIMENSIONS ARE OUT TO OUT

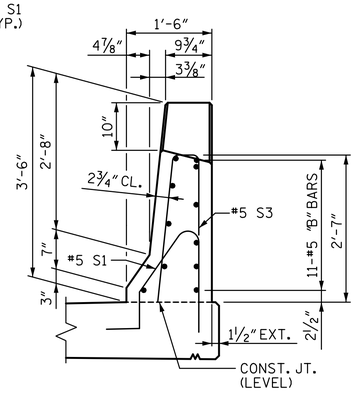
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

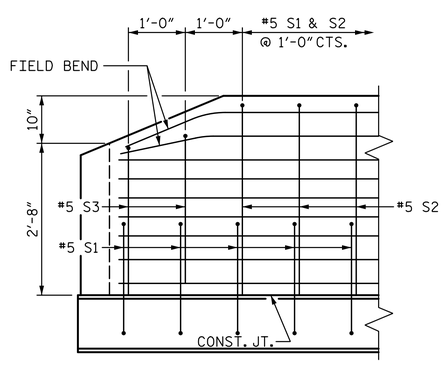
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	188	#5	1	4'-6"	882
* S2	180	#5	2	7'-0"	1,314
* S3	8	#5	2	5'-7"	47
* B1	88	#5	STR	13'-5"	1,231
* B2	44	#5	STR	23'-1"	1,059
* EPOXY COATED REINFORCING STEEL					4,533 LBS.
CLASS AA CONCRETE					25.6 CU. YDS.
CONCRETE BARRIER RAIL					187.88 LIN. FT.



PLAN



END VIEW



SIDE VIEW

END OF RAIL DETAILS

BARRIER RAIL DETAILS

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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SHEET NO. S10-14

TOTAL SHEETS 24

DRAWN BY : VMW DATE : 6-14
CHECKED BY : MLO DATE : 6-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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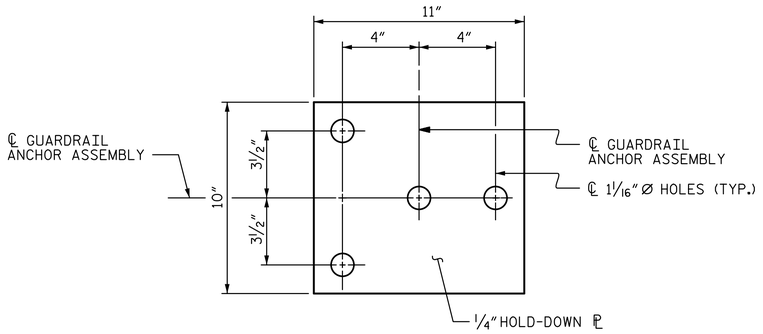
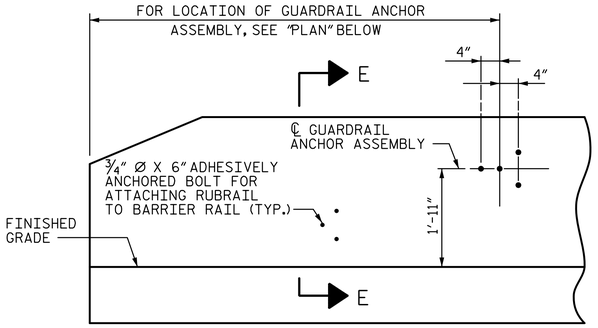
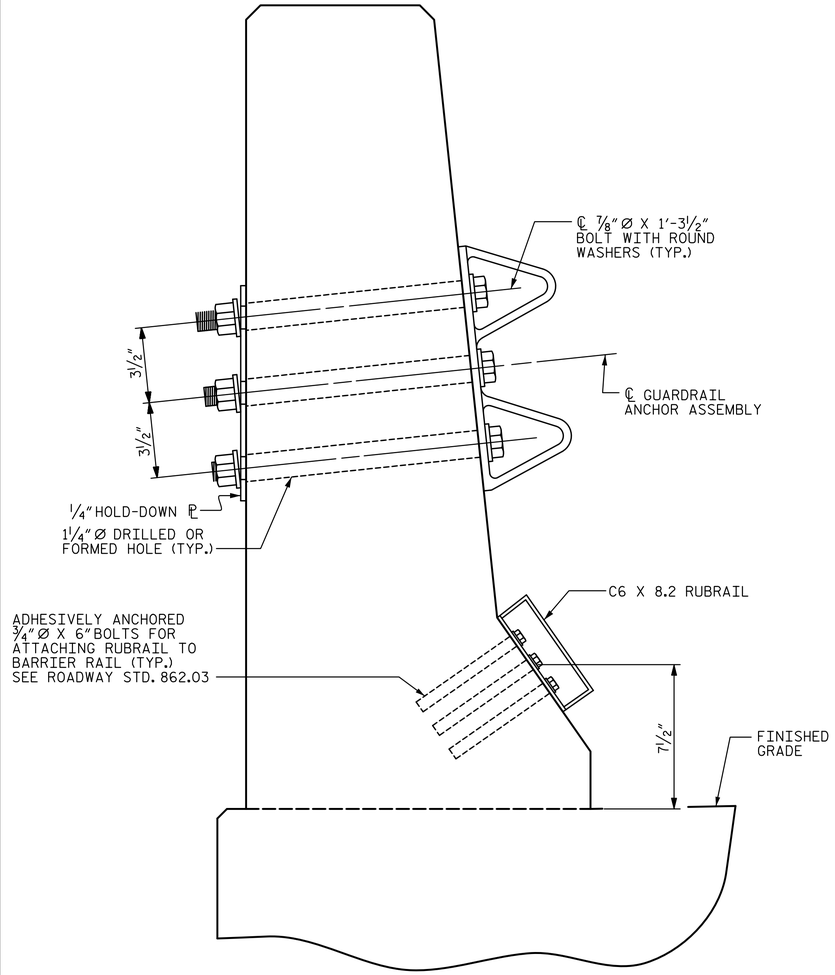


PLAN

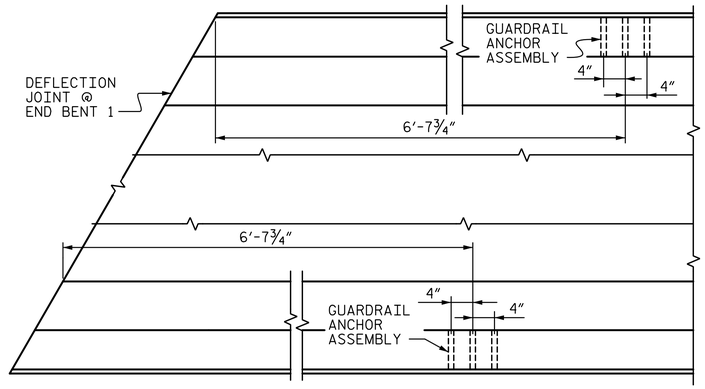


ELEVATION



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.)

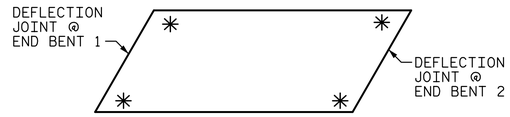
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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: 428+53.58 -L-
= 13+04.09 -Y5-

DocuSigned by: Adam J. Peter
E3F8AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

-RIGHT LANE-

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : MLO	DATE : 6-14		

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REINFORCING BAR SCHEDULE

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	152	#5	STR	40′-10″	6,474	✳B1	112	#4	STR	24′-11″	1,864
✳A2	2	#5	STR	39′-3″	82	✳B2	54	#6	STR	23′-0″	1,865
✳A3	2	#5	STR	37′-4″	78	✳B3	54	#6	STR	20′-0″	1,622
✳A4	2	#5	STR	35′-5″	74	B4	92	#5	STR	47′-10″	4,590
✳A5	2	#5	STR	33′-6″	70						
✳A6	2	#5	STR	31′-7″	66	K1	20	#4	STR	25′-3″	337
✳A7	2	#5	STR	29′-8″	62	K2	8	#4	STR	6′-1″	33
✳A8	2	#5	STR	27′-8″	58	K3	8	#4	STR	7′-1″	38
✳A9	2	#5	STR	25′-9″	54	K4	16	#4	STR	7′-8″	82
✳A10	2	#5	STR	23′-11″	50	K5	8	#4	STR	6′-8″	36
✳A11	2	#5	STR	21′-11″	46	K6	4	#4	STR	5′-4″	14
✳A12	2	#5	STR	20′-0″	42	K7	4	#4	STR	5′-9″	15
✳A13	2	#5	STR	18′-1″	38	K8	8	#4	STR	6′-1″	33
✳A14	2	#5	STR	16′-2″	34	K9	4	#4	STR	5′-7″	15
✳A15	2	#5	STR	14′-3″	30	K10	16	#4	STR	2′-9″	29
✳A16	2	#5	STR	12′-4″	26	K11	8	#4	STR	3′-9″	20
✳A17	2	#5	STR	10′-5″	22						
✳A18	2	#5	STR	8′-6″	18	H1	11	#5	①	14′-7″	167
✳A19	2	#5	STR	6′-7″	14	H2	11	#5	①	14′-3″	163
✳A20	2	#5	STR	4′-8″	10	H3	11	#5	②	13′-1″	150
✳A21	4	#5	STR	3′-4″	14	H4	11	#5	②	13′-2″	151
						H5	2	#5	①	11′-11″	25
A101	152	#5	STR	40′-10″	6,474	H6	2	#5	②	10′-7″	22
A102	2	#5	STR	39′-3″	82	H7	11	#5	②	12′-10″	147
A103	2	#5	STR	37′-4″	78	H8	11	#5	②	12′-11″	148
A104	2	#5	STR	35′-5″	74	H9	11	#5	①	11′-10″	136
A105	2	#5	STR	33′-6″	70	H10	11	#5	①	11′-6″	132
A106	2	#5	STR	31′-7″	66	H11	2	#5	②	10′-4″	22
A107	2	#5	STR	29′-8″	62	H12	2	#5	①	9′-1″	19
A108	2	#5	STR	27′-8″	58						
A109	2	#5	STR	25′-9″	54	S1	60	#4	③	11′-3″	451
A110	2	#5	STR	23′-11″	50	S2	30	#4	④	5′-0″	100
A111	2	#5	STR	21′-11″	46	✳S3	52	#4	⑤	11′-11″	414
A112	2	#5	STR	20′-0″	42	✳S4	52	#4	⑤	10′-0″	347
A113	2	#5	STR	18′-1″	38	✳S5	8	#4	③	13′-5″	72
A114	2	#5	STR	16′-2″	34						
A115	2	#5	STR	14′-3″	30	V3	44	#5	STR	5′-9″	264
A116	2	#5	STR	12′-4″	26	V4	8	#5	STR	5′-5″	45
A117	2	#5	STR	10′-5″	22	V5	40	#5	STR	5′-8″	236
A118	2	#5	STR	8′-6″	18	V6	8	#5	STR	5′-4″	45
A119	2	#5	STR	6′-7″	14						
A120	2	#5	STR	4′-8″	10						
A121	4	#5	STR	3′-4″	14						
						✳EPOXY COATED REINF. STEEL (LBS.)					13,546
						REINF. STEEL (LBS.)					15,027

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

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

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	✳EPOXY COATED STEEL REINFORCING	STEEL REINFORCING
SPAN A	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	104.7	--	--
POUR 2●	71.1	--	--
TOTAL✳✳	175.8	13,546	14,965

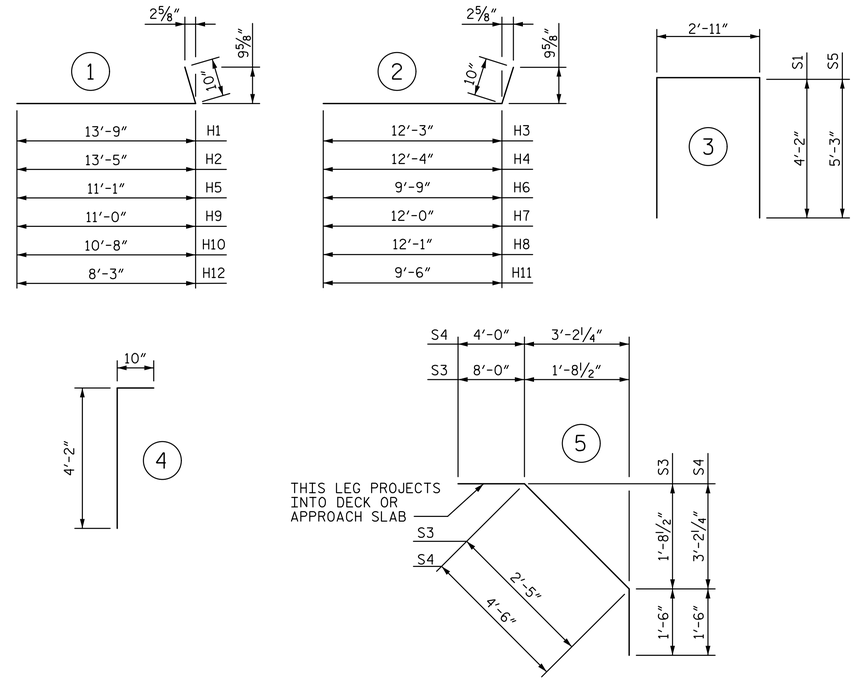
✳✳ QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED

● POUR 2 INCLUDES CONCRETE FOR SUPERSTRUCTURE PORTION OF INTEGRAL END BENT AND WING WALL. ALL COSTS ASSOCIATED WITH THE SUPERSTRUCTURE PORTION OF THE INTEGRAL END BENT AND WING WALL, INCLUDING BUT NOT LIMITED TO, MATERIALS, LABOR AND ALL INCIDENTALS SHALL BE INCLUDED IN THE CONTRACT BID PRICE FOR REINFORCED CONCRETE DECK SLAB. NO ADDITIONAL PAYMENT WILL BE MADE.

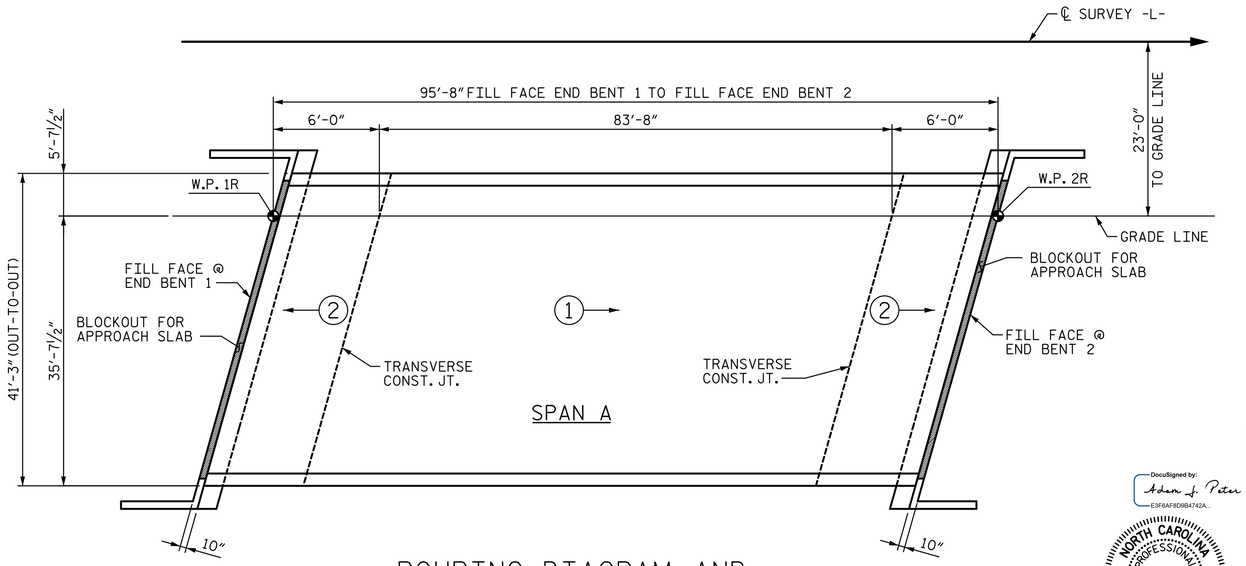
GROOVING BRIDGE FLOORS

APPROACH SLABS	1,690 SQ.FT.
BRIDGE DECK	3,276 SQ.FT.
TOTAL	4,966 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



POURING DIAGRAM AND LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 3,946)

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

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

4/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

-RIGHT LANE-

DRAWN BY : VMW DATE : 6-14
CHECKED BY : MLO DATE : 6-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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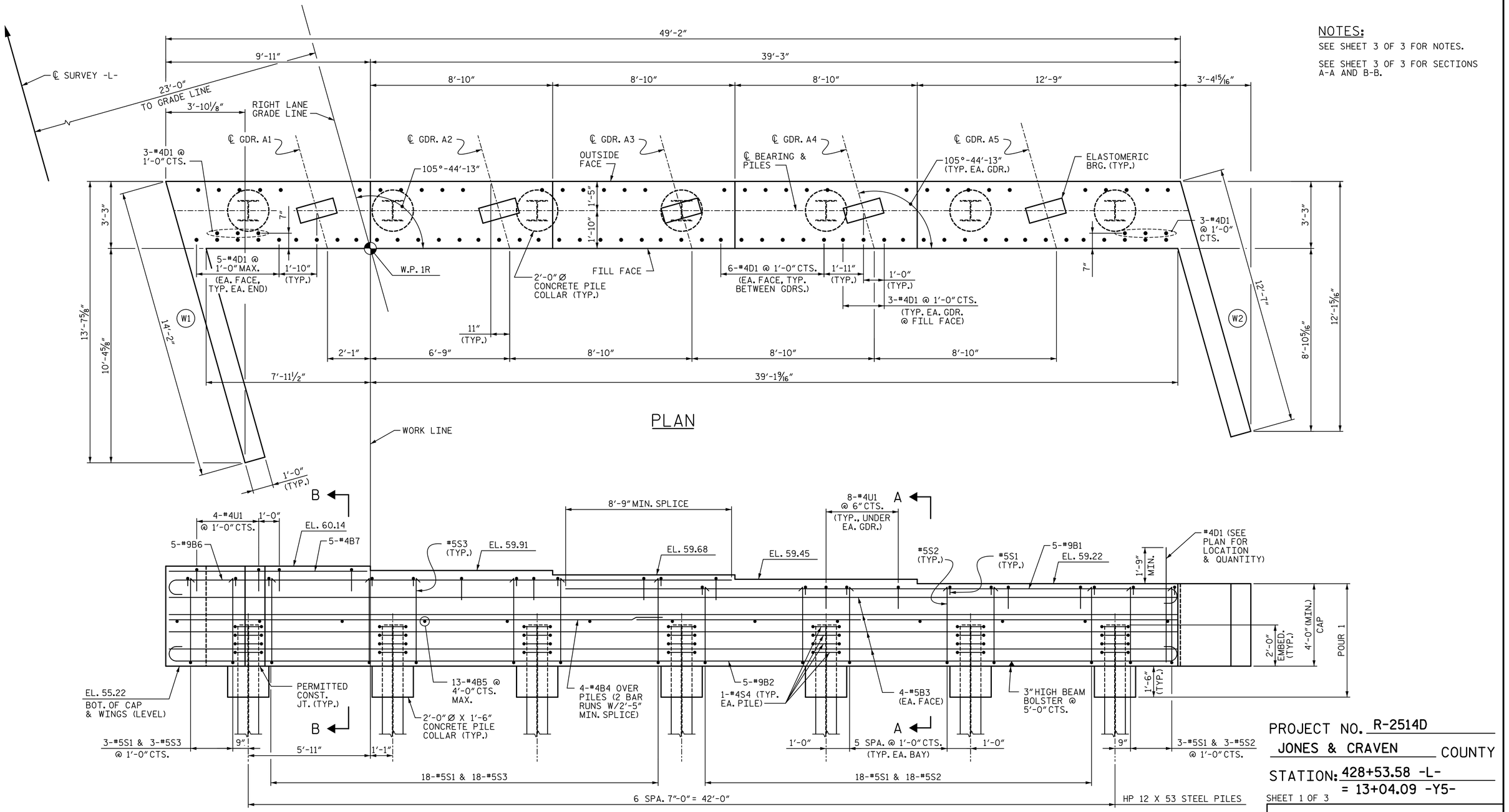
Charlotte, NC 28202
NC License Number F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-16
1			3			TOTAL SHEETS
2			4			24



PLAN

ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)
(WING DETAILS NOT SHOWN FOR CLARITY)

NOTES:

SEE SHEET 3 OF 3 FOR NOTES.

SEE SHEET 3 OF 3 FOR SECTIONS A-A AND B-B.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
CHECKED BY : MLO	DATE : 6-14		

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Charlotte, NC 28202
NC License Number F-0991

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

SHEET NO. S10-17
TOTAL SHEETS 24

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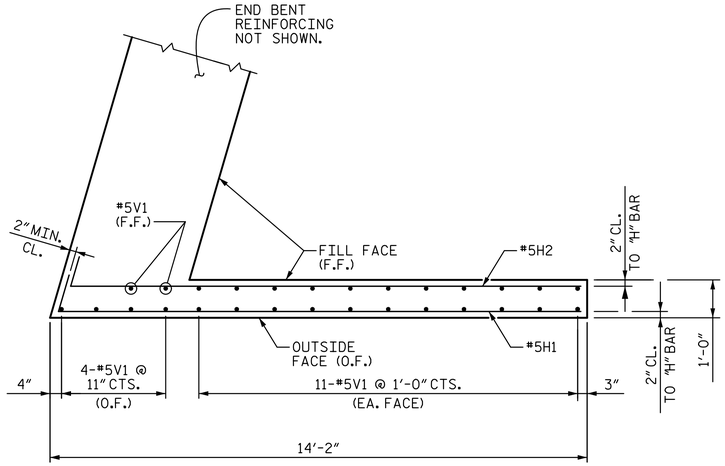
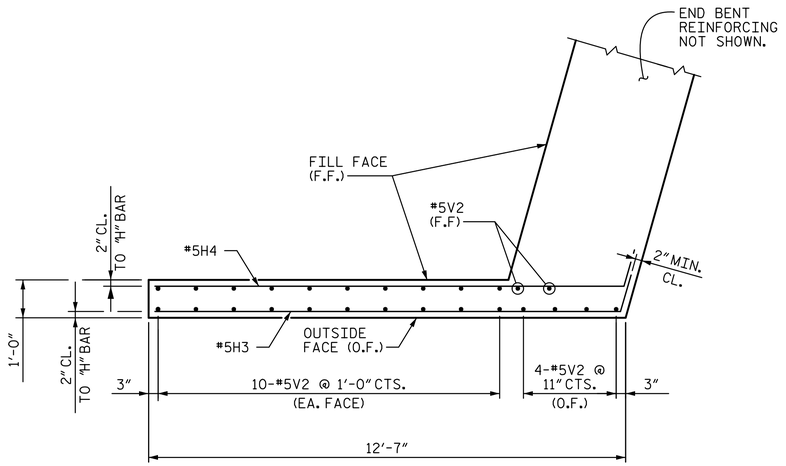
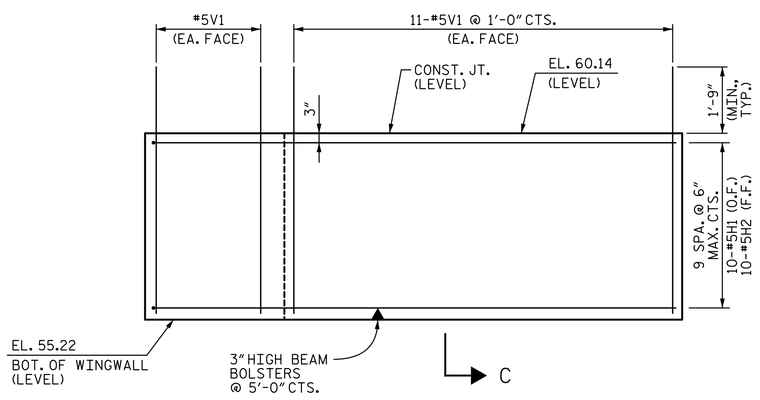


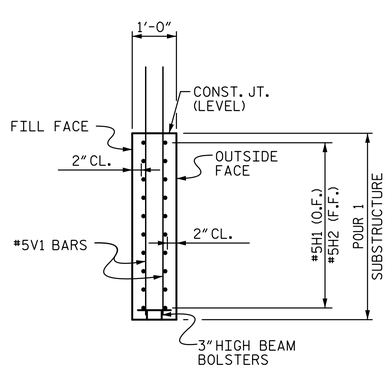
WING WALL PLAN (W1)



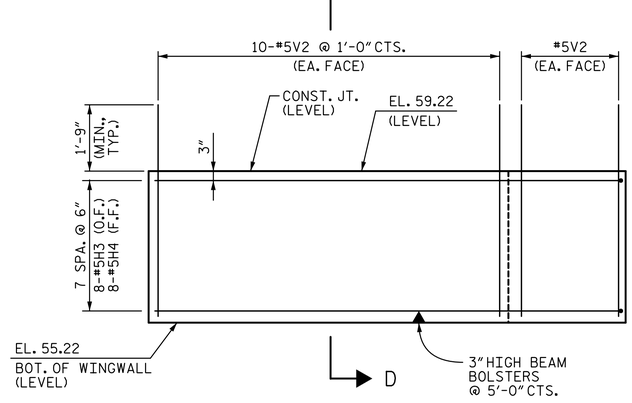
WING WALL PLAN (W2)



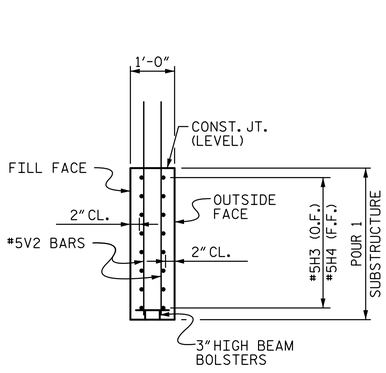
WING WALL ELEVATION (W1)



SECTION C-C



WING WALL ELEVATION (W2)



SECTION D-D

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-

= 13+04.09 -Y5-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

REVISIONS						SHEET NO.
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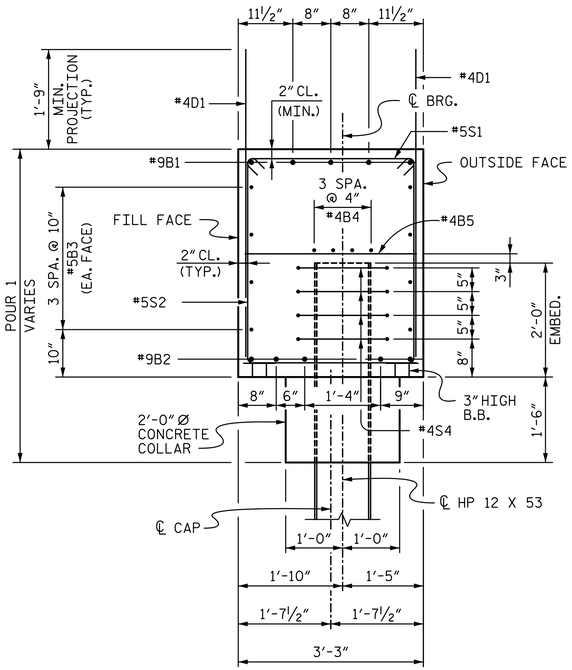
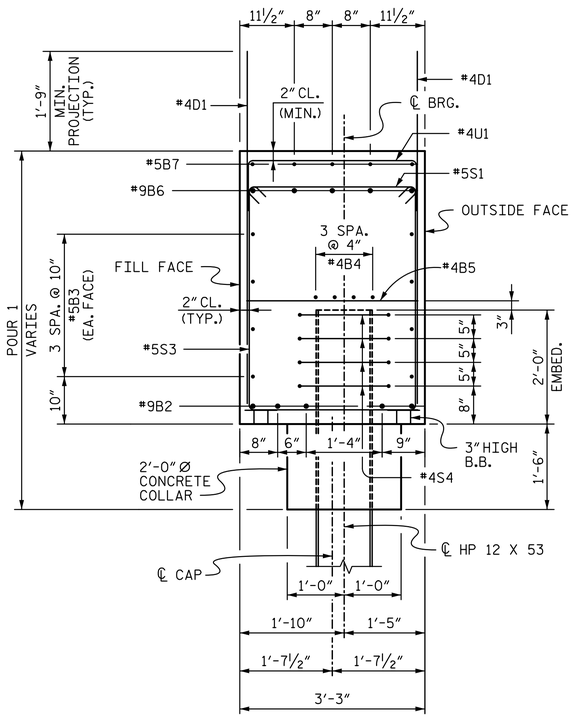
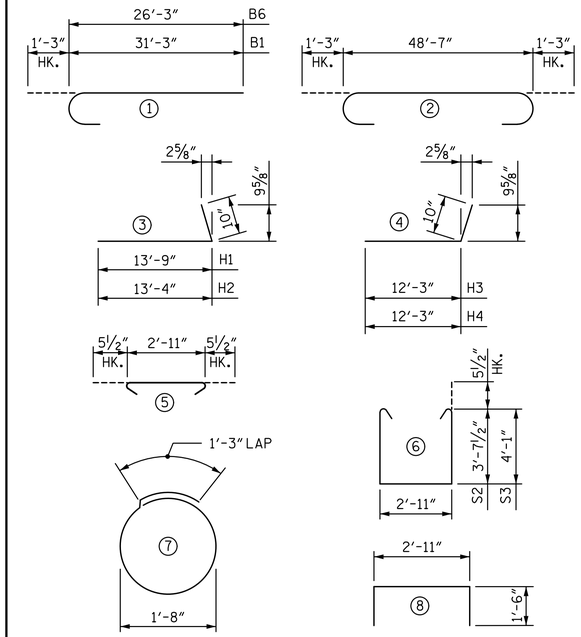


SECTION A-A



SECTION B-B



BILL OF REINFORCING

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	①	32′-6″	553
B2	5	#9	②	51′-1″	868
B3	8	#5	STR	48′-10″	407
B4	8	#4	STR	25′-8″	137
B5	13	#4	STR	2′-11″	25
B6	5	#9	①	27′-6″	468
B7	5	#4	STR	8′-8″	29
D1	89	#4	STR	6′-5″	381
H1	10	#5	③	14′-7″	152
H2	10	#5	③	14′-2″	148
H3	8	#5	④	13′-1″	109
H4	8	#5	④	13′-1″	109
S1	42	#5	⑤	3′-10″	168
S2	21	#5	⑥	11′-1″	243
S3	21	#5	⑥	12′-0″	263
S4	28	#4	⑦	6′-6″	122
U1	44	#4	⑧	5′-11″	174
V1	28	#5	STR	6′-6″	190
V2	26	#5	STR	5′-7″	151

NOTES:

FOR INTEGRAL BACKWALL REINFORCEMENT, SEE "TYPICAL SECTION AND INTEGRAL BACKWALL" AND "PLAN OF SPANS DETAILS" SHEETS.

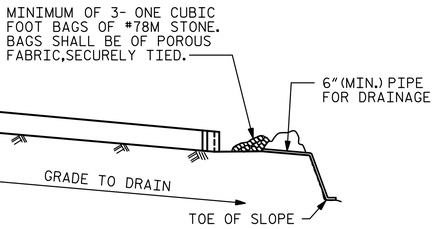
FOR FOUNDATION NOTES, SEE SHEET TITLED "FOUNDATION LAYOUT".

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

THE CONTRACTOR 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.

QUANTITIES

		END BENT 1
REINFORCING STEEL	LBS.	4,697
CLASS A CONCRETE		
POUR 1 (CAP, COLLARS & LOWER WING):	CU. YARDS	30.7
TOTAL :	CU. YARDS	30.7
HP 12 X 53 STEEL PILES	(NO.)	7
	LIN. FEET	490
STEEL PILE POINTS	(EA.)	7
PILE REDRIVES	(EA.)	4

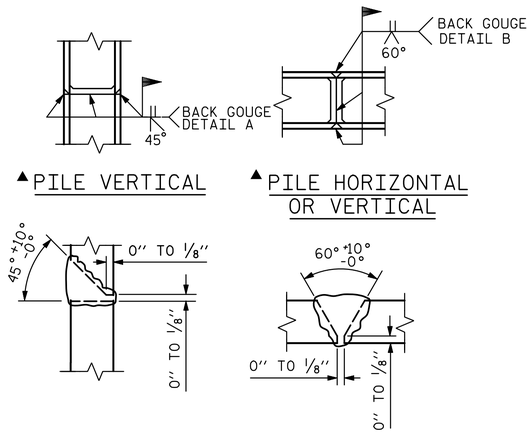


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D984742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-19
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2			4			24

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NC License Number F-0991

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CHECKED BY : MLO	DATE : 6-14		

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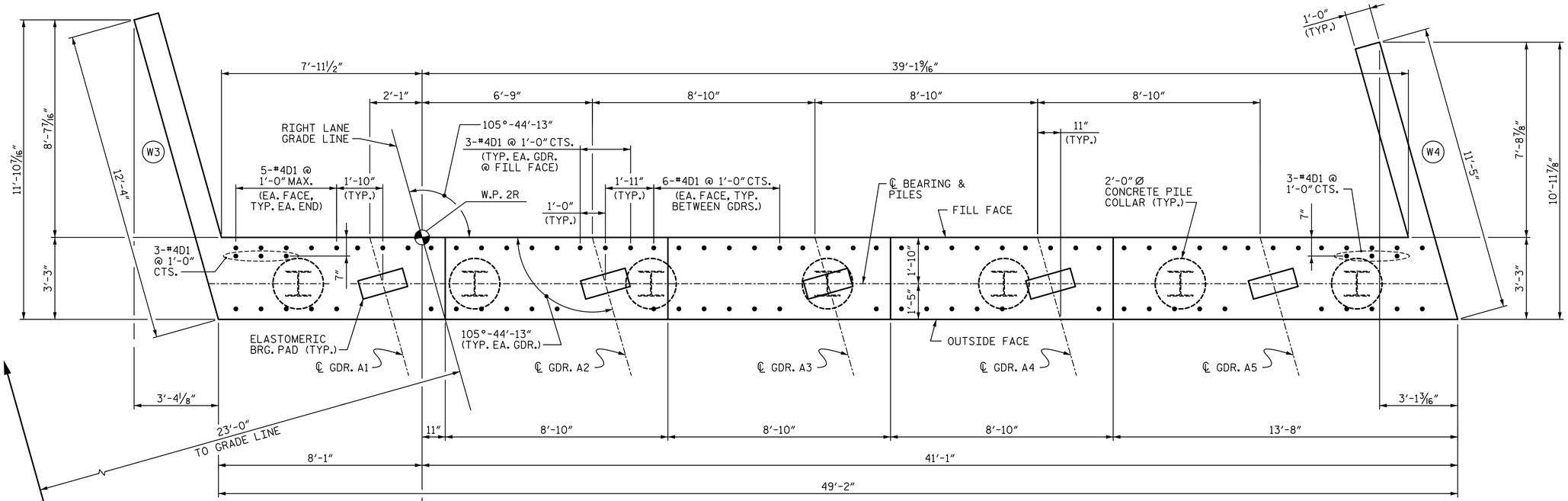
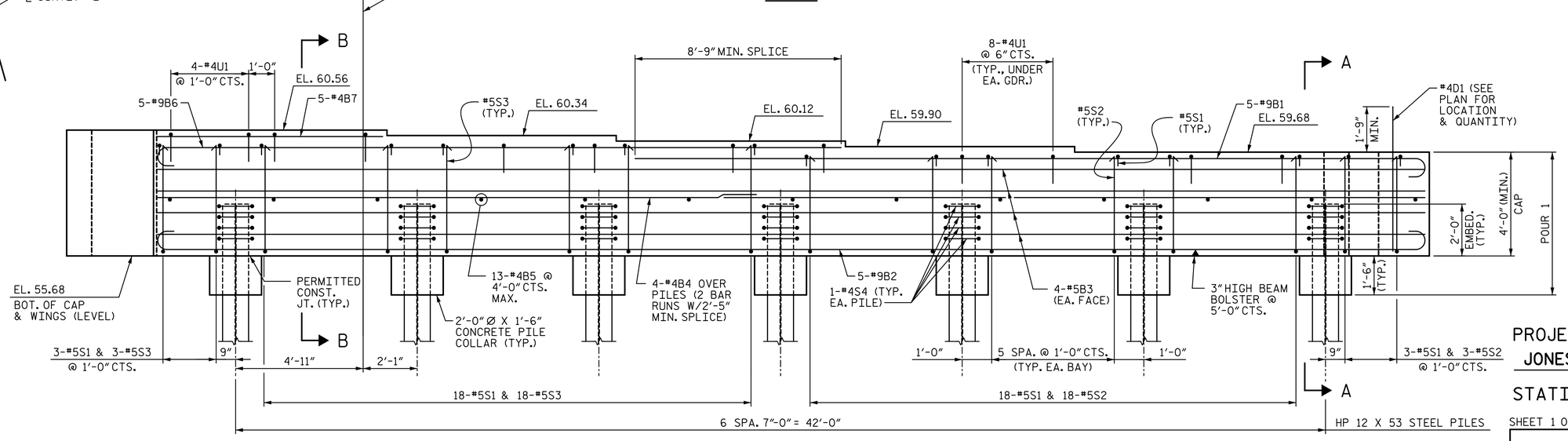
NOTES:

SEE SHEET 3 OF 3 FOR NOTES.

SEE SHEET 3 OF 3 FOR SECTIONS A-A AND B-B.



PLAN



ELEVATION

(LOOKING IN THE DIRECTION OF STATIONING)
(WING DETAILS NOT SHOWN FOR CLARITY)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

-RIGHT LANE-

DocuSigned by: Adam J. Peter
E9F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
CHECKED BY : MLO	DATE : 6-14		

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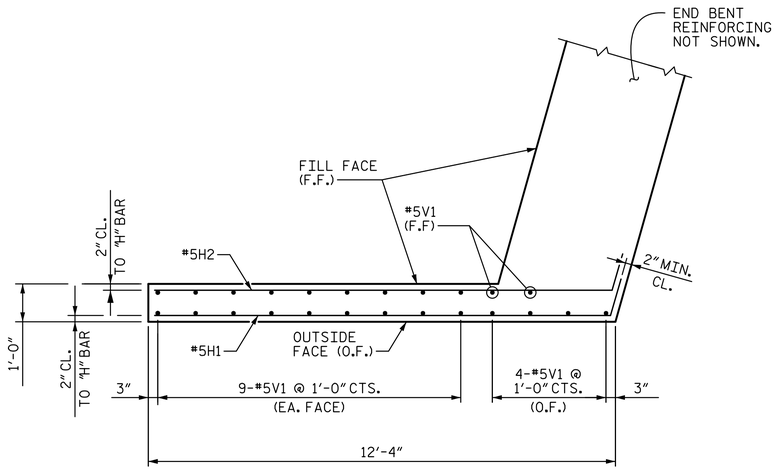
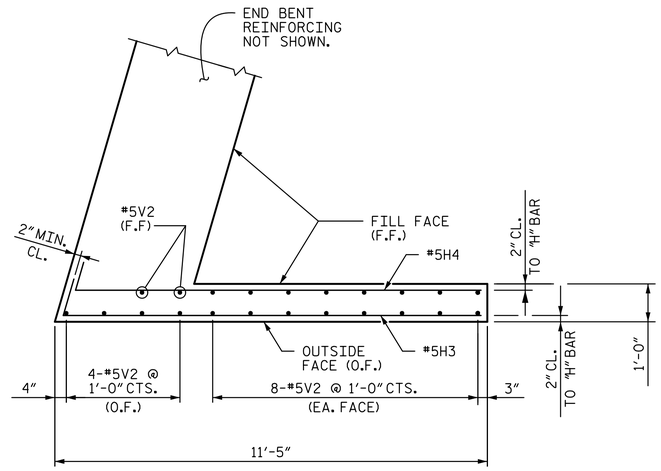
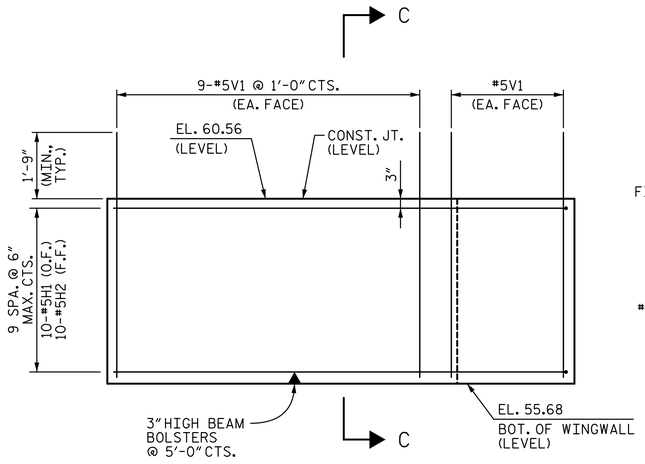


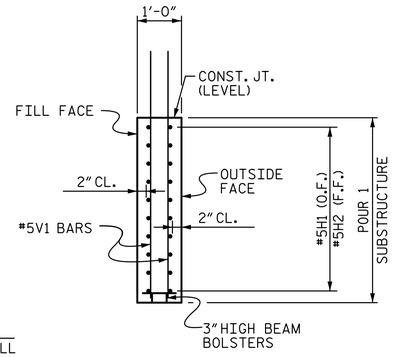
WING WALL PLAN W3



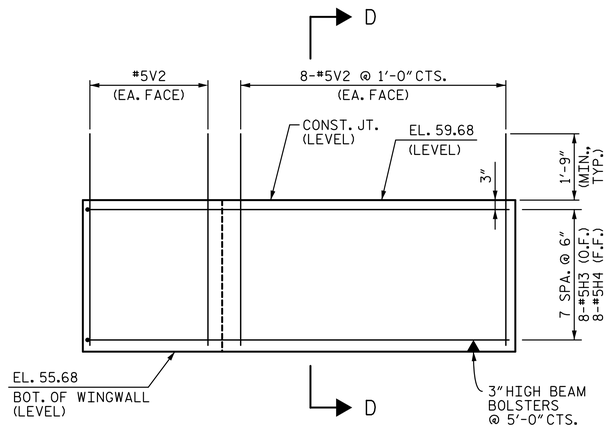
WING WALL PLAN W4



WING WALL ELEVATION W3



SECTION C-C



WING WALL ELEVATION W4

SECTION D-D

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

SHEET 2 OF 3

DocuSigned by:
Adam J. Peter
E3F6AF8D99A742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

-RIGHT LANE-

REVISIONS						SHEET NO.
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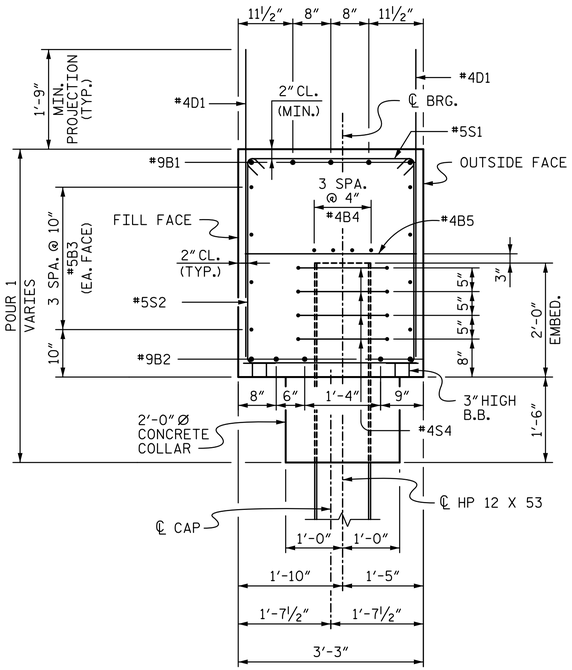
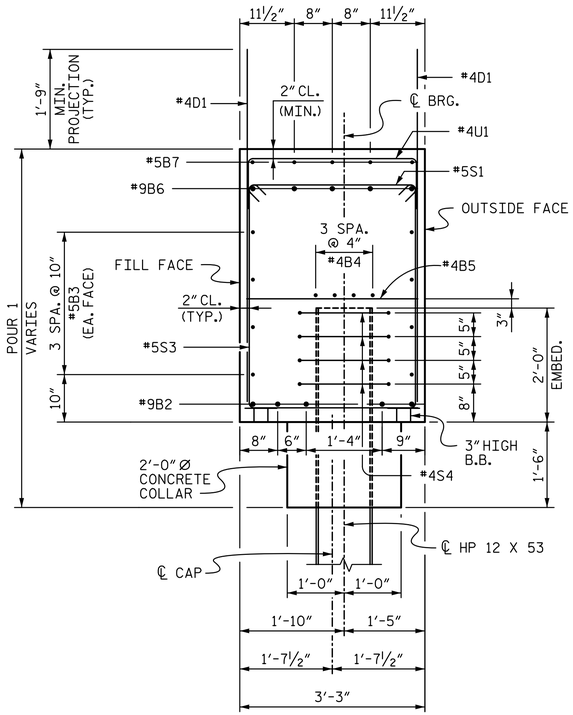
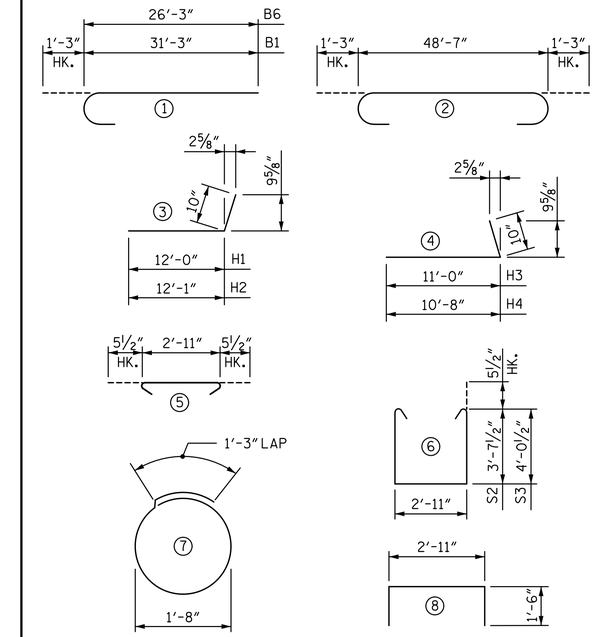


SECTION A-A



SECTION B-B



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF REINFORCING

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#9	①	32′-6″	553
B2	5	#9	②	51′-1″	868
B3	8	#5	STR	48′-10″	407
B4	8	#4	STR	25′-8″	137
B5	13	#4	STR	2′-11″	25
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B7	5	#4	STR	8′-8″	29
D1	89	#4	STR	6′-5″	381
H1	10	#5	③	12′-10″	134
H2	10	#5	③	12′-11″	135
H3	8	#5	④	11′-10″	99
H4	8	#5	④	11′-6″	96
S1	42	#5	⑤	3′-10″	168
S2	21	#5	⑥	11′-1″	243
S3	21	#5	⑥	11′-11″	261
S4	28	#4	⑦	6′-6″	122
U1	44	#4	⑧	5′-11″	174
V1	24	#5	STR	6′-6″	163
V2	22	#5	STR	5′-7″	128

NOTES:

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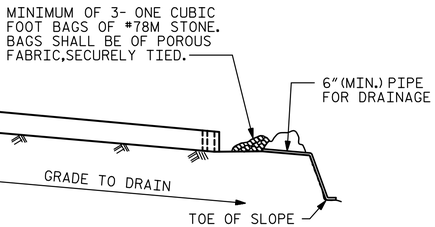
QUANTITIES

		END BENT 2
REINFORCING STEEL	LBS.	4,591
CLASS A CONCRETE		
POUR 1 (CAP, COLLARS & LOWER WING): CU. YARDS		30.0
TOTAL : CU. YARDS		30.0
HP 12 X 53 STEEL PILES	(NO.)	7
	LIN. FEET	455
STEEL PILE POINTS	(EA.)	7
PILE REDRIVES	(EA.)	4



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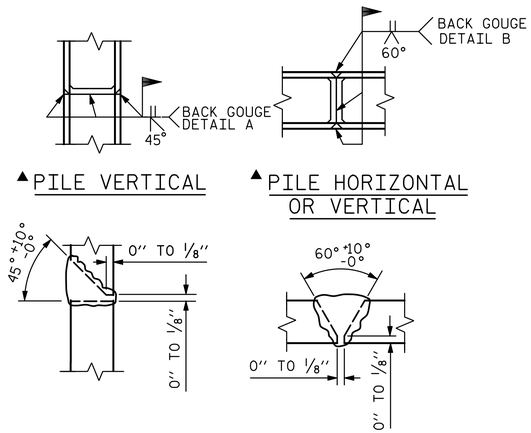
TEMPORARY DRAINAGE AT END BENT



▲ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D984742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10-22
1			3			TOTAL SHEETS
2			4			24

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NC License Number F-0991

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CHECKED BY : MLO	DATE : 6-14		

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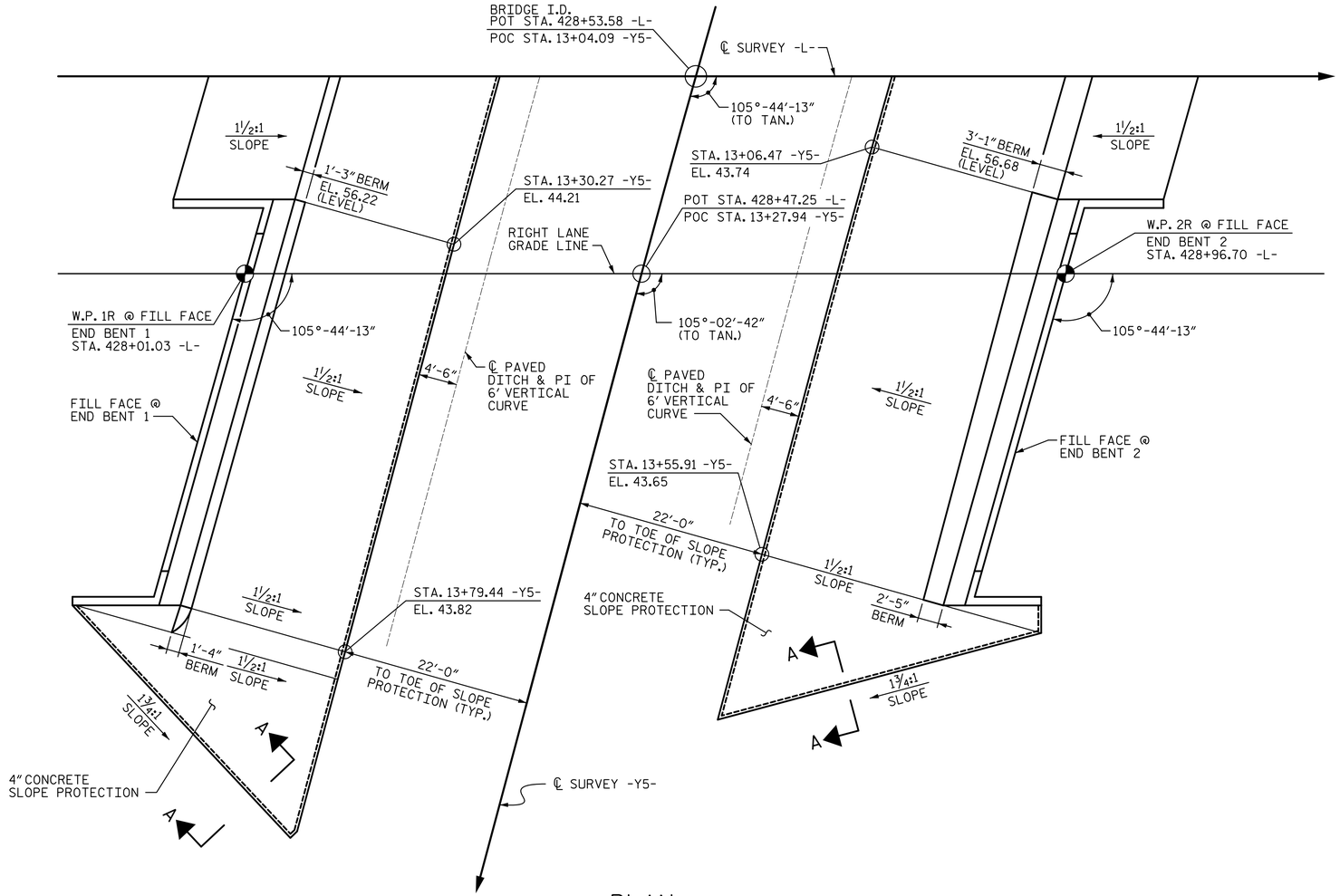


PLAN

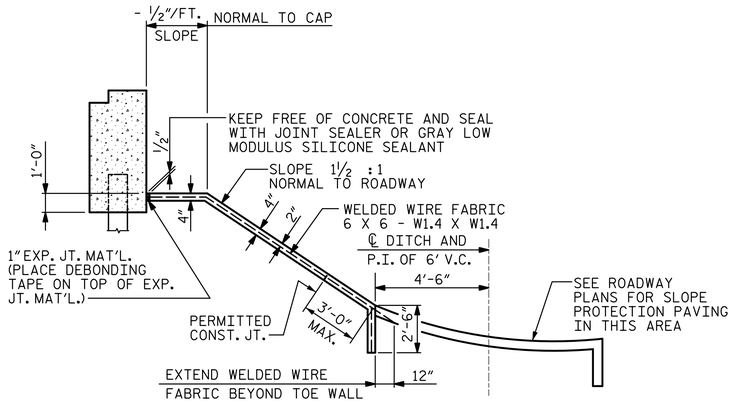
NOTES:

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.

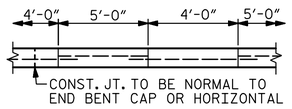
SLOPE PROTECTION SHALL CONSIST OF 4″ POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60″ WIDE. SLOPE PROTECTION SHALL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

BRIDGE @ STA. 428+53.58 -L-	4 INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	275	520
END BENT 2	275	515

✳ QUANTITY SHOWN IS BASED ON 5′ POURS.

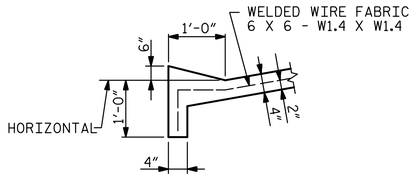


SECTION ALONG ℄ ROADWAY

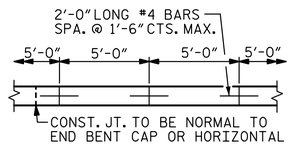


POUR A 4′-0″ STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



SECTION A-A



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

-RIGHT LANE-

DocuSigned by: Adam J. Peter ESF6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : MLO	DATE : 6-14		

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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

SHEET NO. S10-23
TOTAL SHEETS 24

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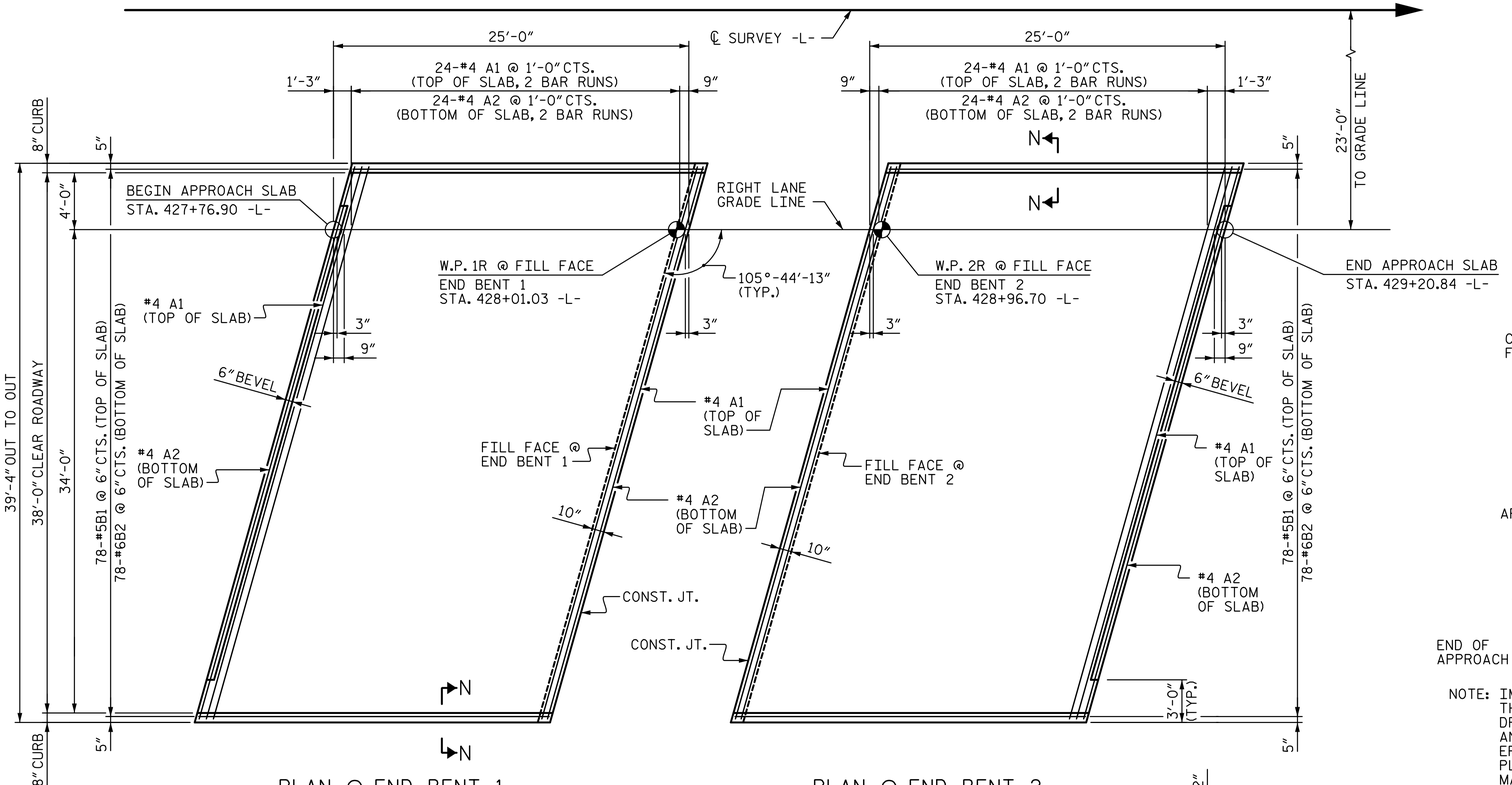
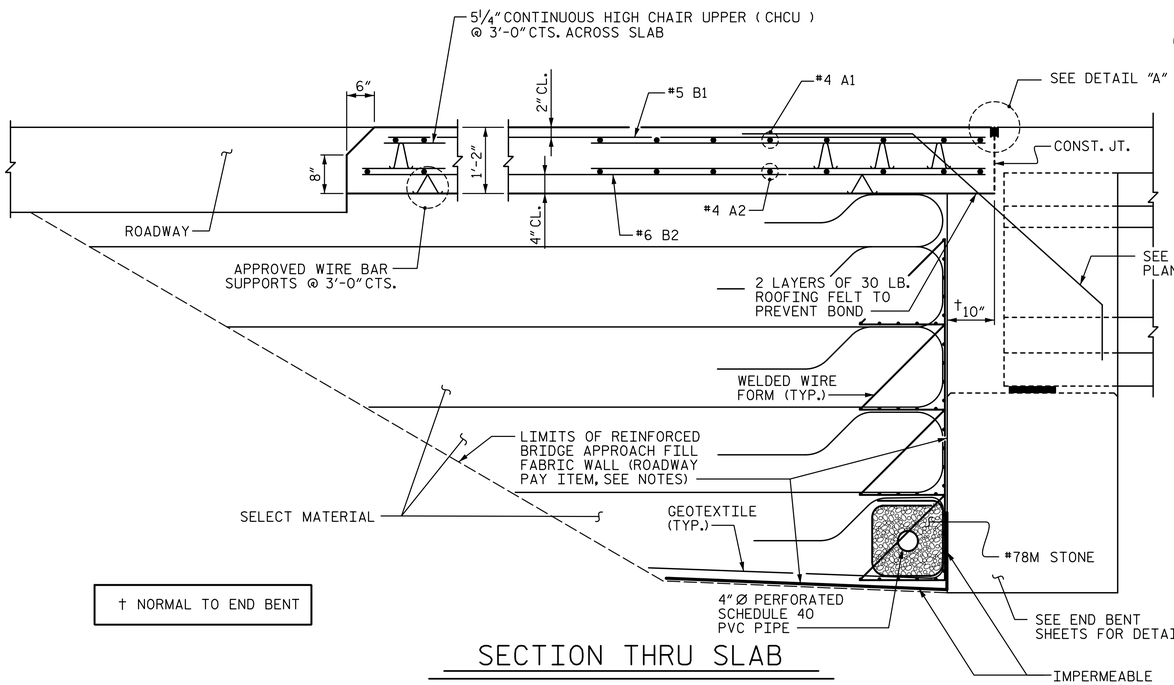


PLAN @ END BENT 1

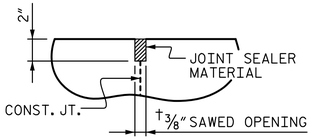
PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

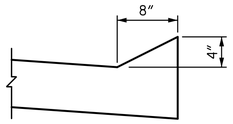


† NORMAL TO END BENT

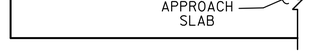
SECTION THRU SLAB



DETAIL "A"



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

NOTES

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

FOR 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.

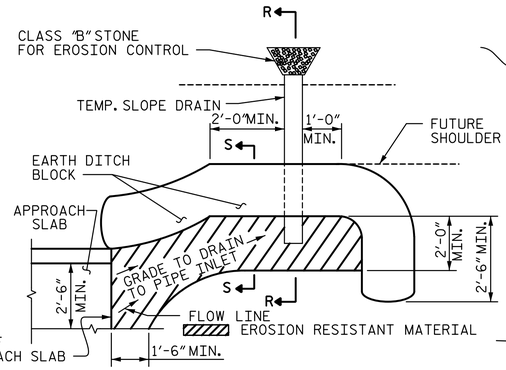
BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	52	#4	STR	21′-3″	738
A2	52	#4	STR	21′-2″	735
✱ B1	78	#5	STR	24′-1″	1,959
B2	78	#6	STR	24′-7″	2,880
REINFORCING STEEL				LBS.	3,615
✱ EPOXY COATED REINFORCING STEEL				LBS.	2,697
CLASS AA CONCRETE				C.Y.	42.5

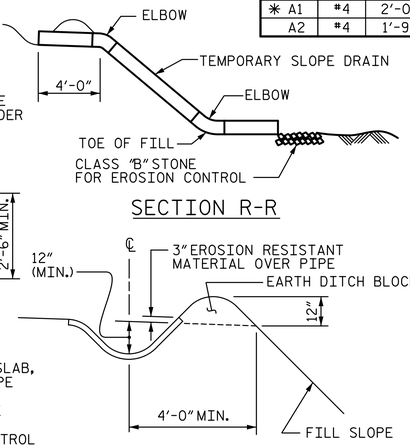
SPLICE CHART

BAR	SIZE	SPLICE
✱ A1	#4	2′-0″
A2	#4	1′-9″



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

PLAN VIEW

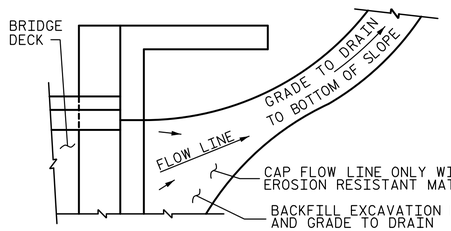


SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 428+53.58 -L-
= 13+04.09 -Y5-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APROACH SLAB
FOR INTEGRAL ABUTMENT

-RIGHT LANE-

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : MLO	DATE : 6-14		

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			24

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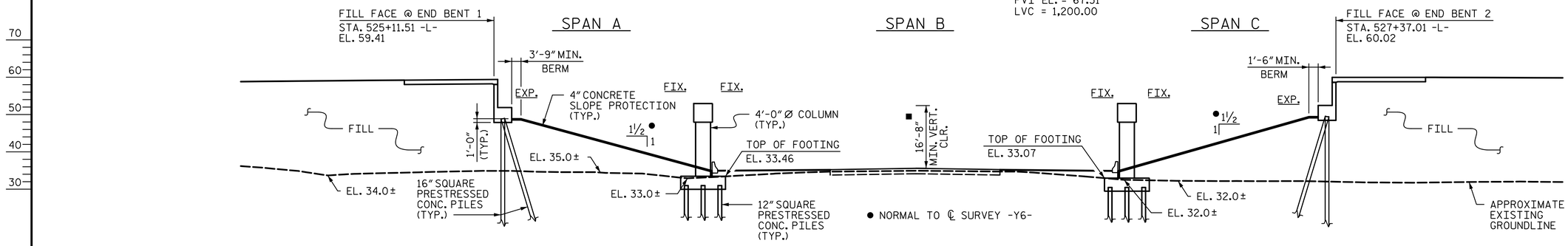
525+00 526+00 527+00 528+00

+ 2.5056% − 2.3304%

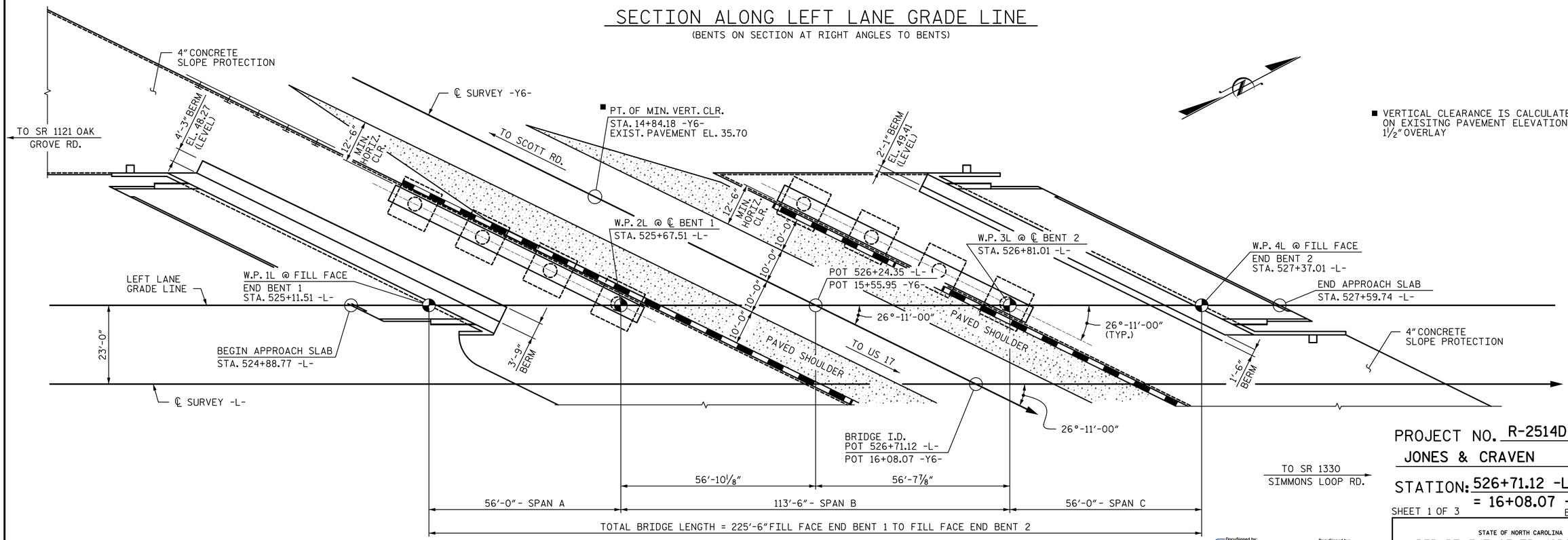
GRADE DATA

PVI STA. = 526+70.00 -L-
PVI EL. = 67.31
LVC = 1,200.00



SECTION ALONG LEFT LANE GRADE LINE

(BENTS ON SECTION AT RIGHT ANGLES TO BENTS)



PLAN

(PILES NOT SHOWN FOR CLARITY)

■ VERTICAL CLEARANCE IS CALCULATED BASED ON EXISITNG PAVEMENT ELEVATIONS AND 1½" OVERLAY

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 3 BRIDGE NO. 105

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...

DocuSigned by: Adam J. Peter E3F6AF8D09B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 17 OVER TEN MILE FORK RD. (SR 1002) BETWEEN SR 1121 AND SR 1330
-LEFT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
CHECKED BY : TJT	DATE : 6-14		

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Charlotte, NC 28202
NC License Number F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-1
1			3			TOTAL SHEETS
2			4			38

STR. #11

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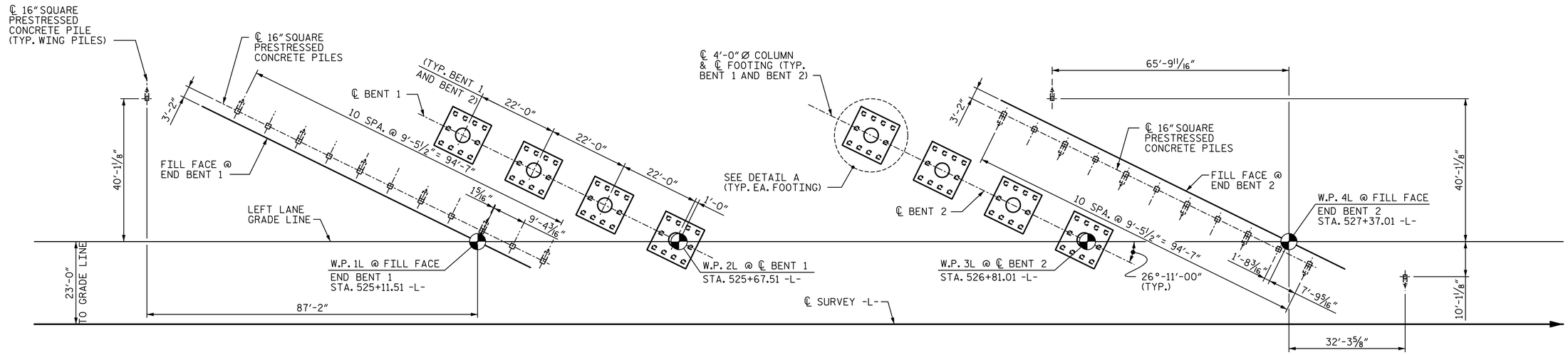


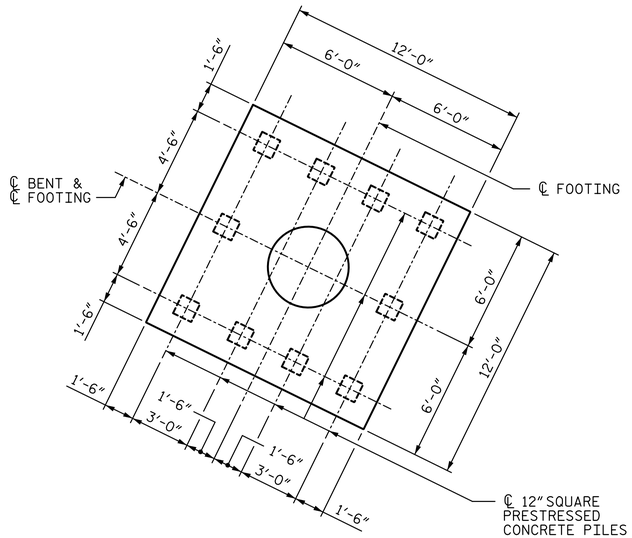
FOUNDATION LAYOUT

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

H DENOTES DIRECTION OF 3:12 PILE BATTER

NOTES:

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 160 TONS PER PILE.
3. PILES AT BENT 1 AND BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.
4. DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 215 TONS PER PILE.
5. DRIVE PILES AT BENT 1 AND BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.
6. IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 50-110 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. 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.
7. TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT 1 OR END BENT 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
8. 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.
9. OBSERVE A TWO MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 1 AND END BENT NO. 2 (STAGE 2 WAITING PERIOD). SEE ROADWAY PLAN TITLED "DETAILS FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION AND STAGE CONSTRUCTION AT -Y6- BRIDGE APPROACHES".
10. DO NOT BEGIN WORK AT BENT NO. 1 AND BENT NO. 2 UNTIL BRIDGE WAITING PERIODS END. SEE SUMMARY OF BRIDGE WAITING PERIODS IN THE ROADWAY PLANS.



DETAIL A

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

-LEFT LANE-

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY

3/10/2015

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

DRAWN BY : ATH	DATE : 6-14	DESIGN ENGINEER OF RECORD: P. KELLY	DATE : 6-14
CHECKED BY : TJT	DATE : 6-14		

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900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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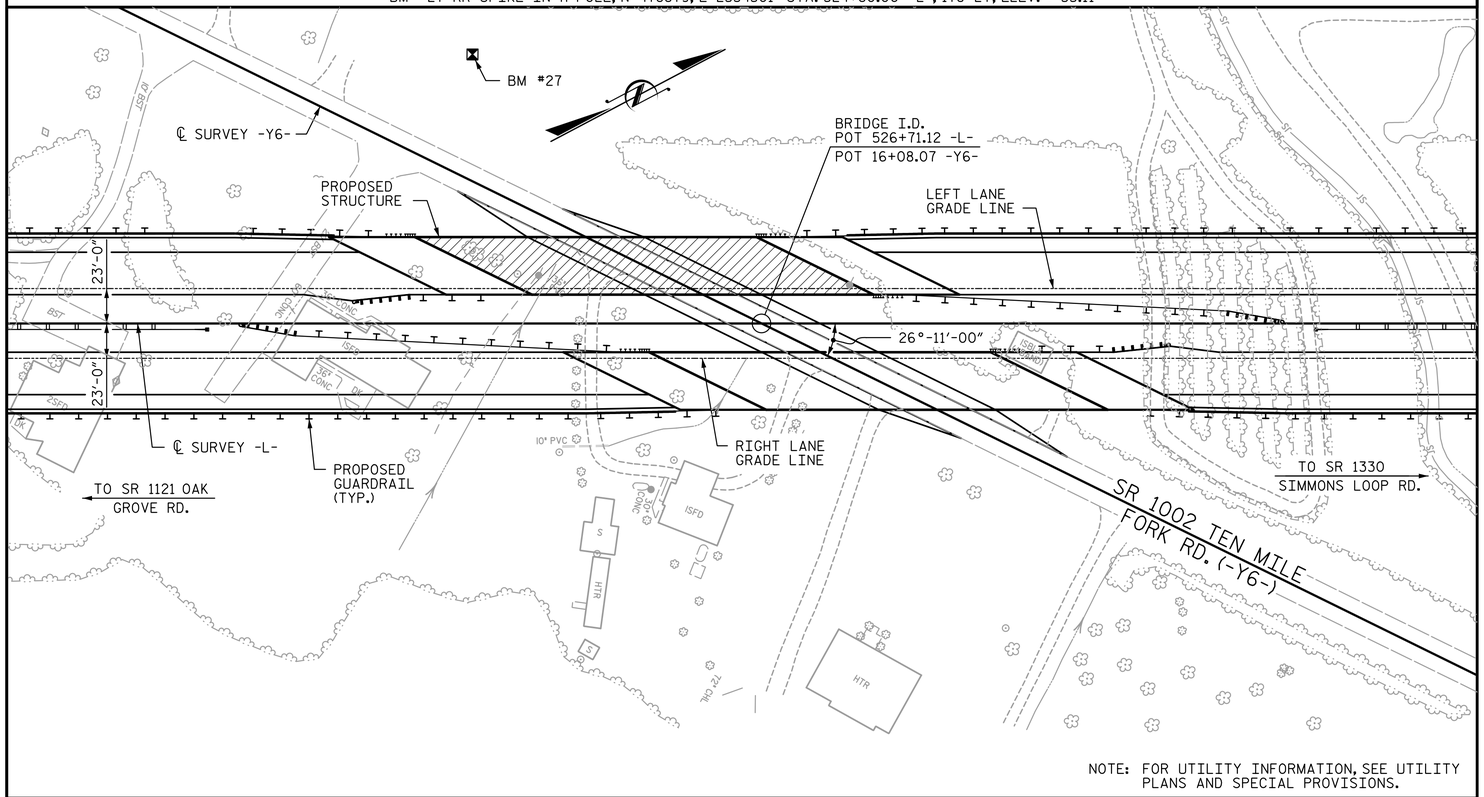
1			3			TOTAL SHEETS
2			4			38



NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		12" PRESTRESSED CONCRETE PILES		16" PRESTRESSED CONCRETE PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YD.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			9,107	9,233		LUMP SUM			15	1,064.9						487.8		LUMP SUM	LUMP SUM
END BENT 1					114.4		14,814						12	720	6		950		
BENT 1	LUMP SUM				180.3		29,548	1,887			40	1,400			10				
BENT 2	LUMP SUM				180.3		29,743	2,009			40	1,600			10				
END BENT 2					109.0		15,525						13	975	6		520		
TOTAL	LUMP SUM	2	9,107	9,233	584.0	LUMP SUM	89,630	3,896	15	1,064.9	80	3,000	25	1,695	32	487.8	1,470	LUMP SUM	LUMP SUM

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH, GENERAL NOTES, AND TOTAL BILL OF MATERIAL

-LEFT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-3
1			3			TOTAL SHEETS
2			4			38

DRAWN BY : CLG DATE : 6-14
CHECKED BY : TJT DATE : 6-14

DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 6-14

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NC License Number F-0991

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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					
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.12	--	1.75	0.63	1.39	B	EL	55.6	0.99	1.22	B	EL	89.4	0.80	0.63	1.12	B	EL	55.6	
		HL-93 (OPERATING)	N/A		1.80	--	1.35	0.63	1.80	B	EL	55.6	1.07	1.85	B	I	89.4	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.61	57.96	1.75	0.63	2.00	B	EL	55.6	1.07	1.93	B	I	89.4	0.80	0.63	1.61	B	EL	55.6	
		HS-20 (OPERATING)	36.000		2.55	91.80	1.35	0.63	2.59	B	EL	55.6	1.07	2.55	B	I	89.4	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.89	52.52	1.40	0.63	6.03	B	EL	55.6	1.04	5.97	A & C	I	89.4	0.80	0.63	3.89	B	EL	55.6	
		SNGARBS2	20.000		2.79	55.80	1.40	0.63	4.33	B	EL	55.6	1.04	4.45	A & C	I	89.4	0.80	0.63	2.79	B	EL	55.6	
		SNAGRIS2	22.000		2.60	57.20	1.40	0.63	4.03	B	EL	55.6	1.04	4.22	A & C	I	89.4	0.80	0.63	2.60	B	EL	55.6	
		SNCOTTS3	27.250		1.93	52.59	1.40	0.63	3.00	B	EL	55.6	1.04	2.95	A & C	I	89.4	0.80	0.63	1.93	B	EL	55.6	
		SNAGGRS4	34.925		1.57	54.83	1.40	0.63	2.44	B	EL	55.6	1.07	2.42	B	I	89.4	0.80	0.63	1.57	B	EL	55.6	
		SNS5A	35.550		1.54	54.75	1.40	0.63	2.39	B	EL	55.6	1.07	2.38	B	I	89.4	0.80	0.63	1.54	B	EL	55.6	
		SNS6A	39.950		1.39	55.53	1.40	0.63	2.17	B	EL	55.6	1.07	2.19	B	I	89.4	0.80	0.63	1.39	B	EL	55.6	
		SNS7B	42.000		1.33	55.86	1.40	0.63	2.06	B	EL	55.6	1.07	2.11	B	I	89.4	0.80	0.63	1.33	B	EL	55.6	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.70	56.10	1.40	0.63	2.63	B	EL	55.6	1.07	2.61	B	I	89.4	0.80	0.63	1.70	B	EL	55.6	
		TNT4A	33.075		1.70	56.23	1.40	0.63	2.64	B	EL	55.6	1.07	2.50	B	I	89.4	0.80	0.63	1.70	B	EL	55.6	
		TNT6A	41.600		1.37	56.99	1.40	0.63	2.13	B	EL	55.6	1.07	2.18	B	I	89.4	0.80	0.63	1.37	B	EL	55.6	
		TNT7A	42.000		1.37	57.54	1.40	0.63	2.13	B	EL	55.6	1.07	2.14	B	I	89.4	0.80	0.63	1.37	B	EL	55.6	
		TNT7B	42.000		1.40	58.80	1.40	0.63	2.17	B	EL	55.6	1.07	2.04	B	I	89.4	0.80	0.63	1.40	B	EL	55.6	
		TNAGRIT4	43.000		1.35	58.05	1.40	0.63	2.09	B	EL	55.6	1.07	1.95	B	I	89.4	0.80	0.63	1.35	B	EL	55.6	
		TNAGT5A	45.000		1.28	57.60	1.40	0.63	1.98	B	EL	55.6	1.07	1.91	B	I	89.4	0.80	0.63	1.28	B	EL	55.6	
		TNAGT5B	45.000	3	1.27	57.15	1.40	0.63	1.97	B	EL	55.6	1.07	1.98	B	I	89.4	0.80	0.63	1.27	B	EL	55.6	

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.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

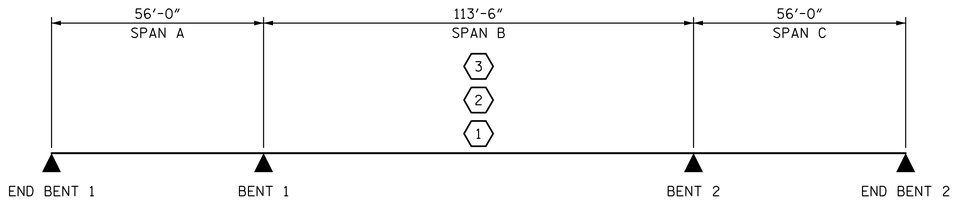
(2) DESIGN LOAD RATING (HS-20)

(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: 526+71.12 -L-
= 16+08.07 -Y6-

DocuSigned by: Adam J. Peter E3F6AFBD9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

DRAWN BY : CLG	DATE : 5-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
CHECKED BY : AJP	DATE : 5-14		

STV / Ralph Whitehead Associates, Inc.
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Charlotte, NC 28202
NC License Number F-0991

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1			3			TOTAL SHEETS
2			4			38

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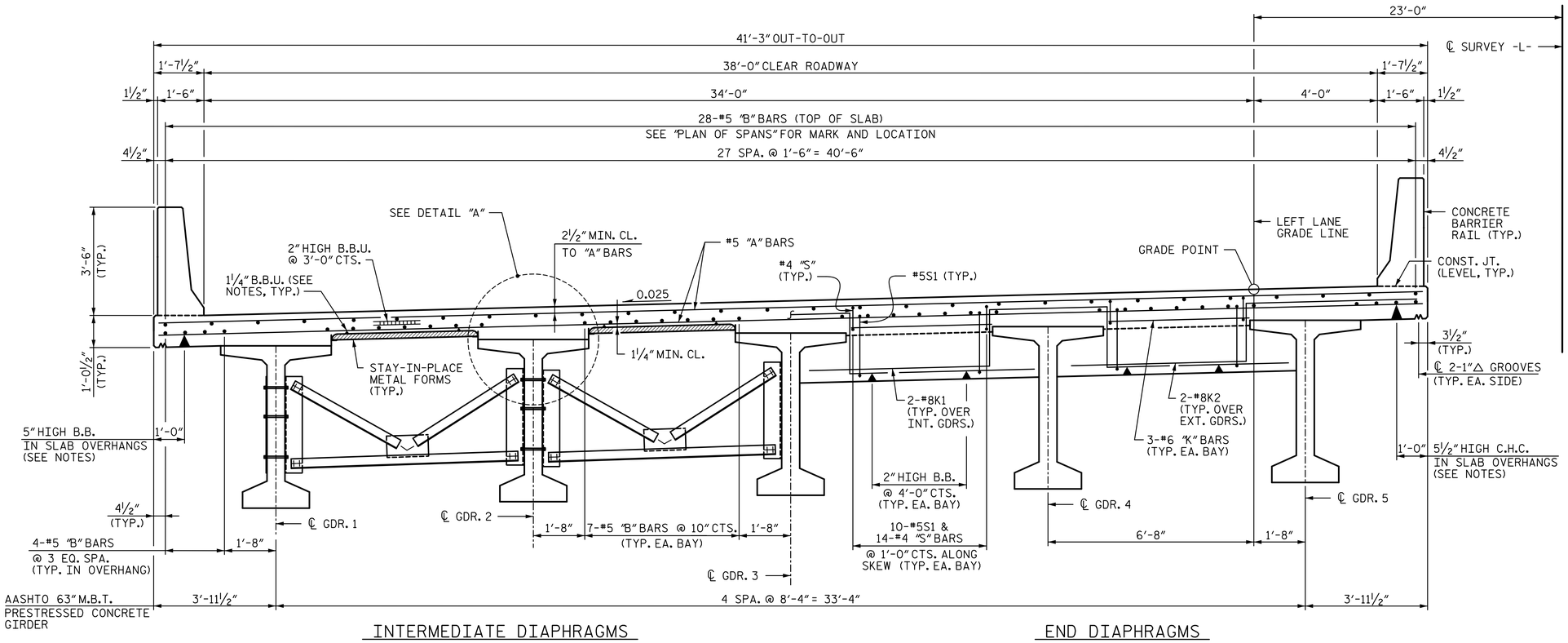


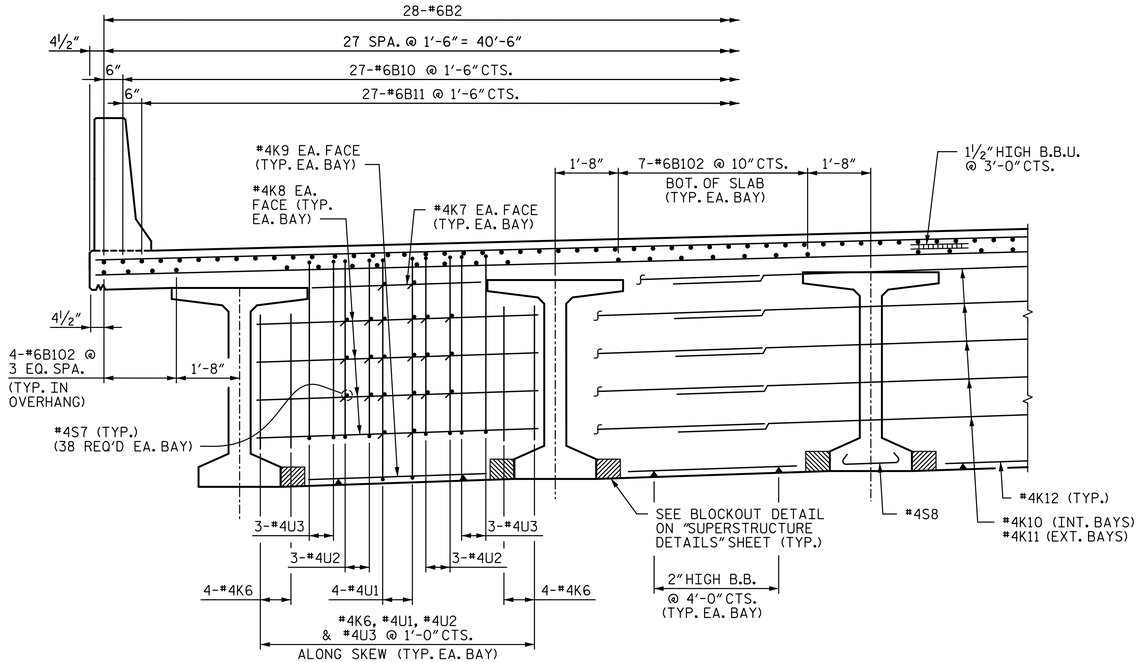
INTERMEDIATE DIAPHRAGMS

END DIAPHRAGMS

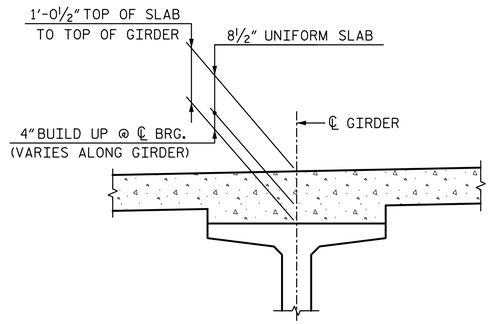
NOTES:

1. PROVIDE A 1¼" HIGH BEAM BOLSTER 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.
2. LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
3. BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
4. PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
5. FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM DETAILS FOR PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS" SHEET.
6. FOR END DIAPHRAGM AND CONTINUOUS DIAPHRAGM SECTIONS, SEE CORRESPONDING "SUPERSTRUCTURE DETAILS" SHEET.
7. FOR BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.
8. FOR "B" BAR MARKS AND LOCATIONS, SEE CORRESPONDING "PLAN OF SPANS" SHEET.
9. HEIGHT OF BEAM BOLSTER & CONTINUOUS HIGH CHAIR IS CALCULATED @ ℄ BENT. CONTRACTOR SHALL ADJUST HEIGHTS, AS NECESSARY TO MAINTAIN PROPER CLEARANCE, DUE TO GIRDER CAMBER.

TYPICAL SECTION



CONTINUOUS DIAPHRAGM



DETAIL "A"
(TYP. EA. GIRDER)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
SPANS A - C

-LEFT LANE-

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1			3			TOTAL SHEETS
2			4			38

DRAWN BY :	CLG	DATE :	5-14
CHECKED BY :	AJP	DATE :	5-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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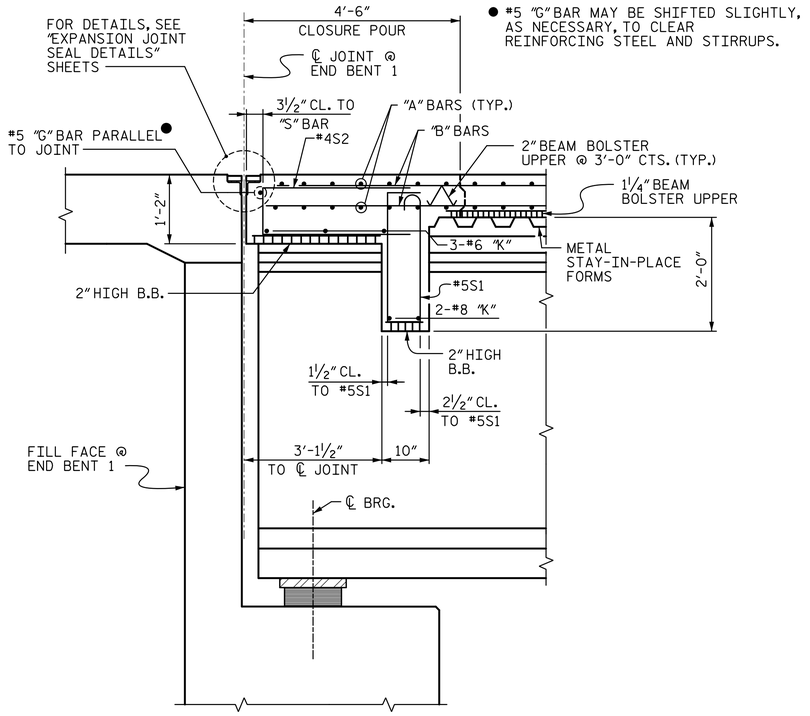
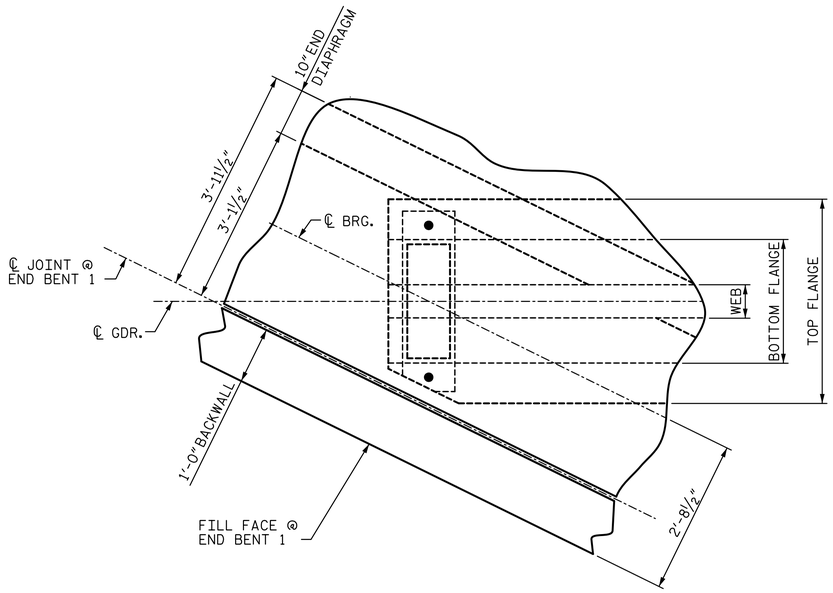


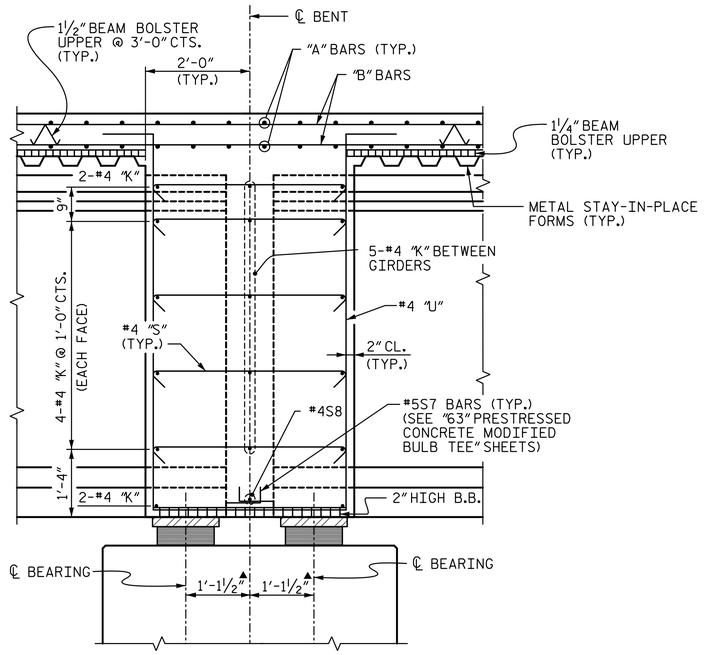
SECTION A-A

END DIAPHRAGM AT END BENT 1 SHOWN, END BENT 2 MIRRORED
("J" BAR USED WITH STANDARD EXP. JT. NOT SHOWN)



PLAN

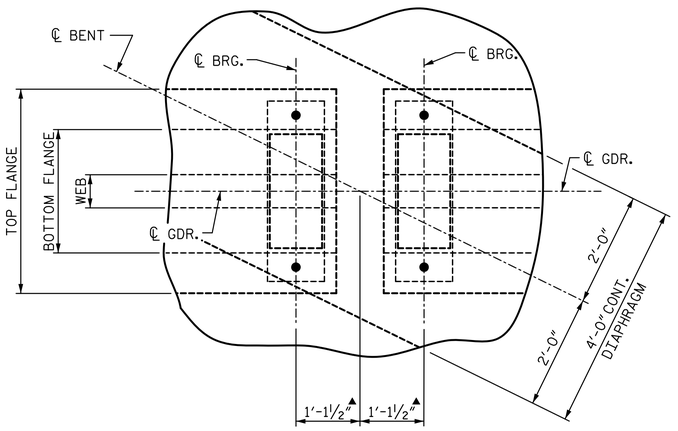
(BENT CAP NOT SHOWN FOR CLARITY)



SECTION B-B

CONTINUOUS DIAPHRAGM AT BENT 1 & 2

▲ DIMENSIONS ARE MEASURED ALONG ℄ GIRDER.



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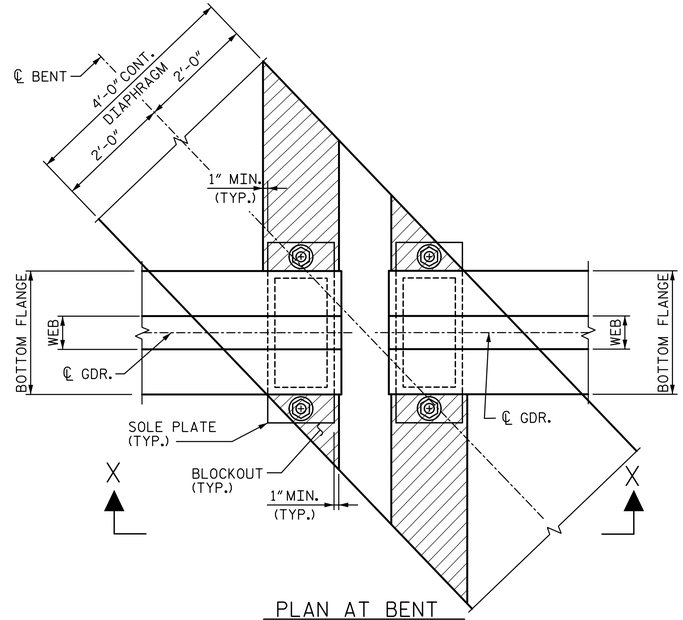
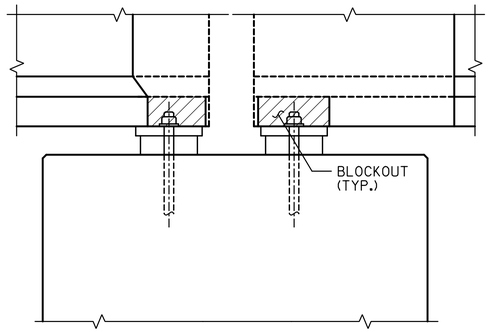


PLAN AT BENT

(SKEW EXAGGERATED FOR CLARITY)



SECTION X-X

CONTINUOUS DIAPHRAGM BLOCKOUT DETAILS

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SUPERSTRUCTURE DETAILS

-LEFT LANE-

DRAWN BY : CLG	DATE : 5-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : AJP	DATE : 5-14		

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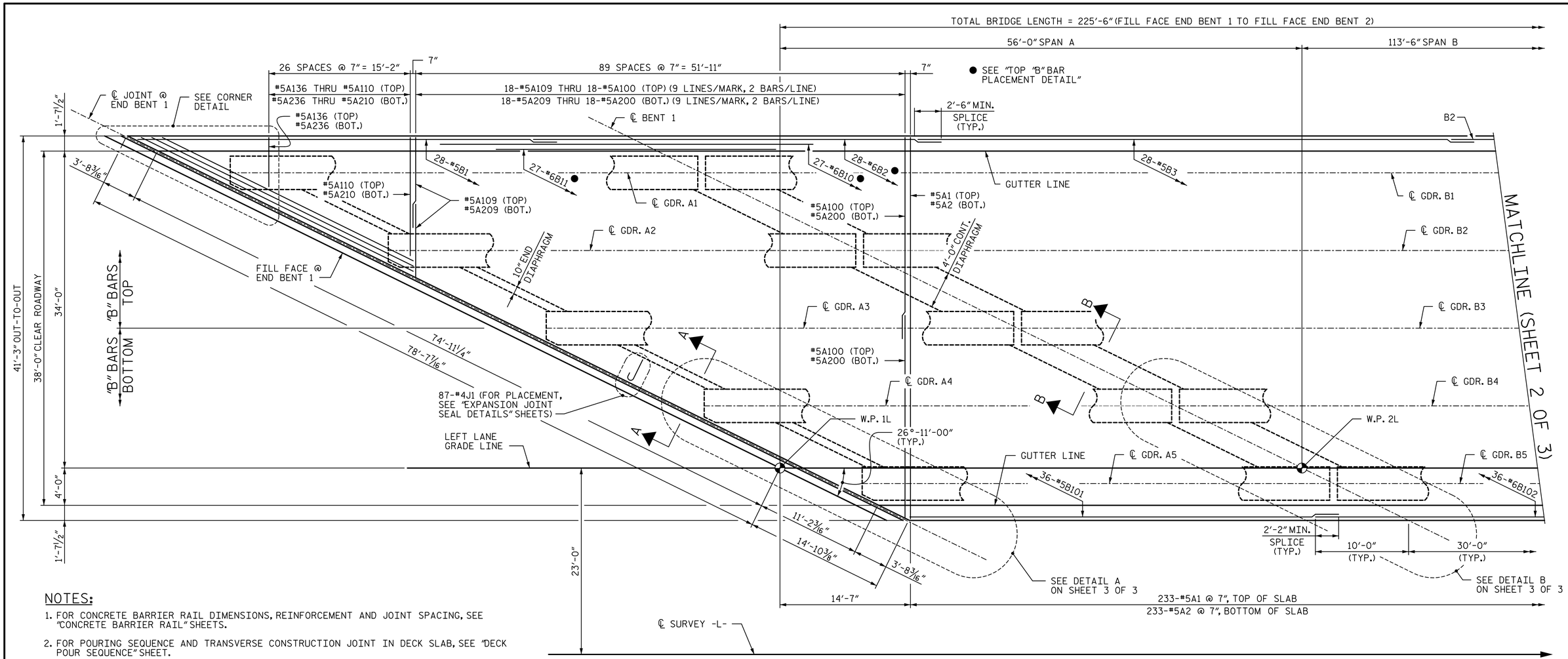
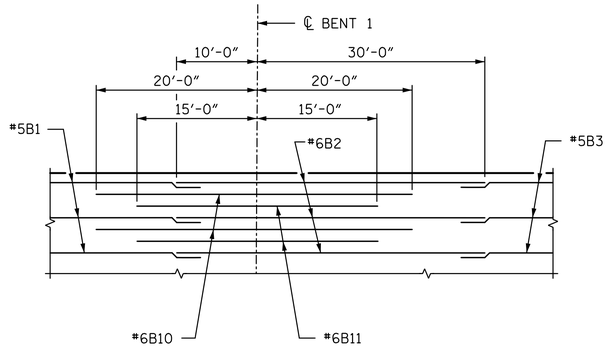


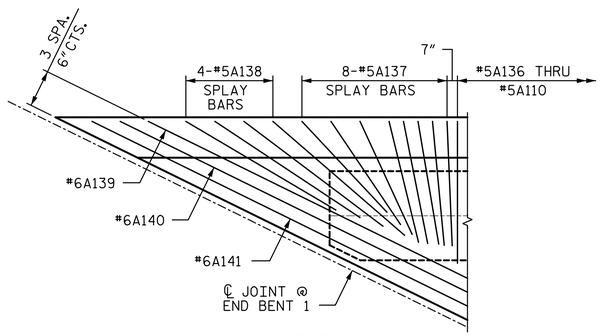
PLAN

NOTES:

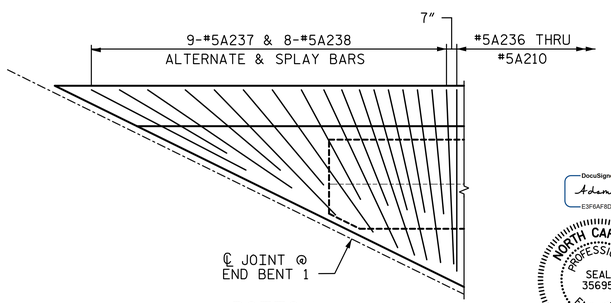
1. FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEETS.
2. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR SEQUENCE" SHEET.
3. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
4. FOR "B" BAR SPACING AND LOCATION, SEE "TYPICAL SECTION" SHEET.
5. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
6. FOR ADDITIONAL DETAILS, SEE SHEET 3 OF 3.



TOP "B" BAR PLACEMENT DETAIL



TOP



BOTTOM

CORNER DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR)
("B" BARS NOT SHOWN FOR CLARITY)

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPANS A - C

-LEFT LANE-

DRAWN BY : CLG	DATE : 5-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
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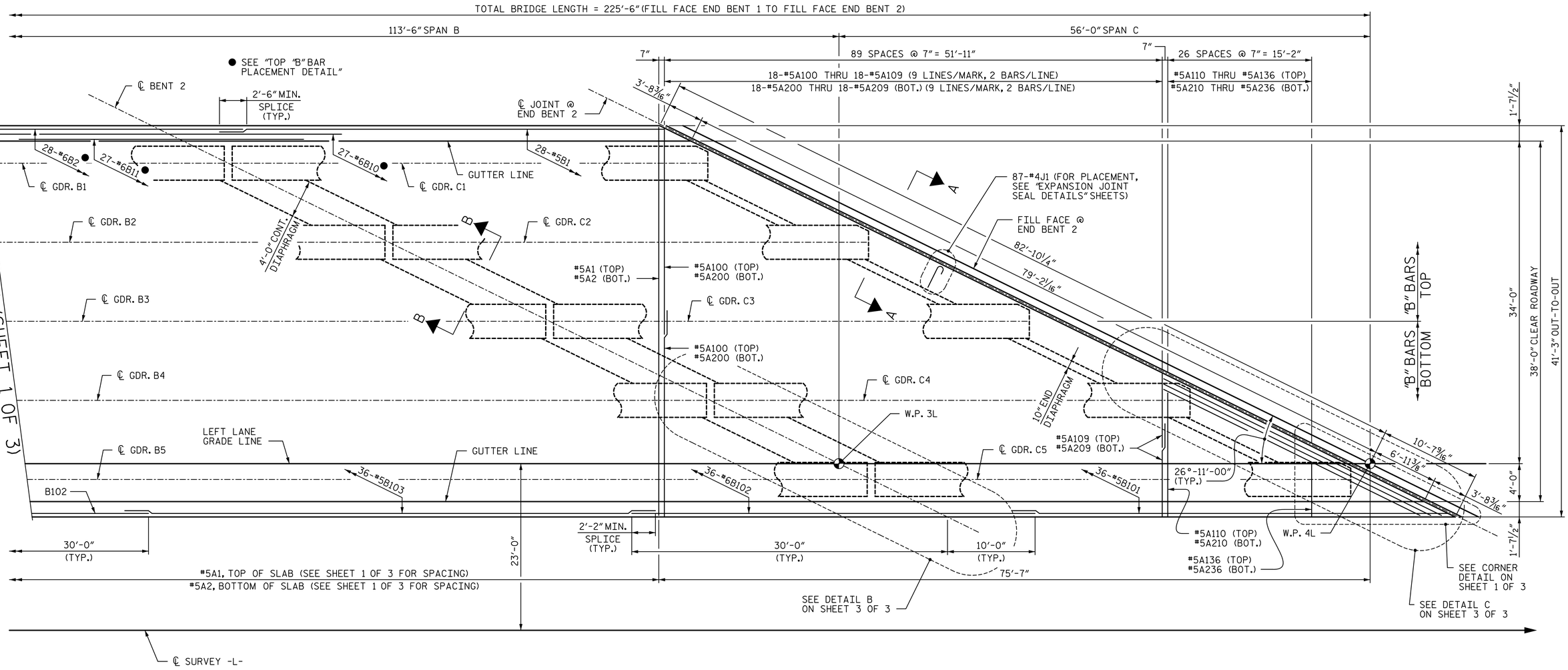
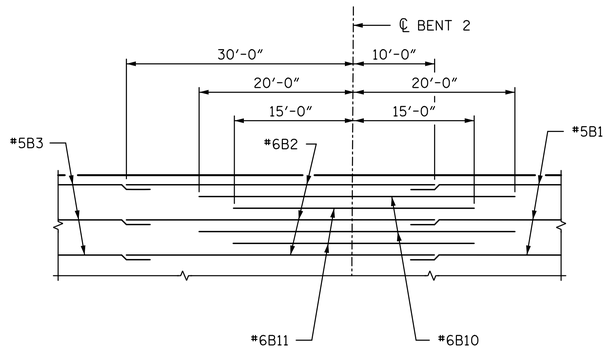


PLAN

NOTES:

1. FOR NOTES, SEE SHEET 1 OF 3.



TOP "B" BAR PLACEMENT DETAIL

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-

= 16+08.07 -Y6-

SHEET 2 OF 3

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3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPANS A - C

-LEFT LANE-

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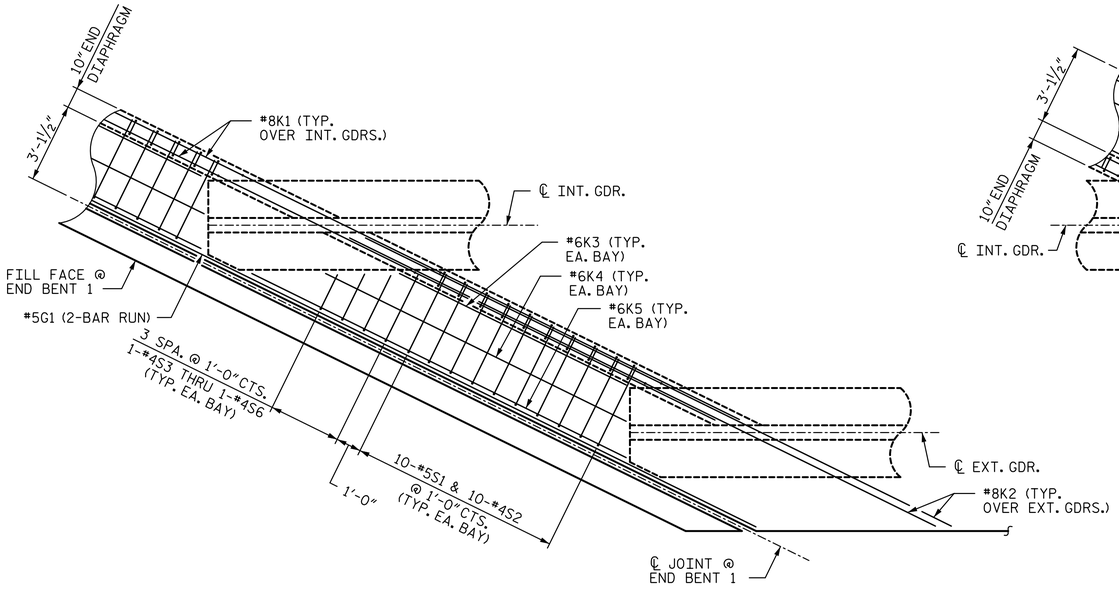
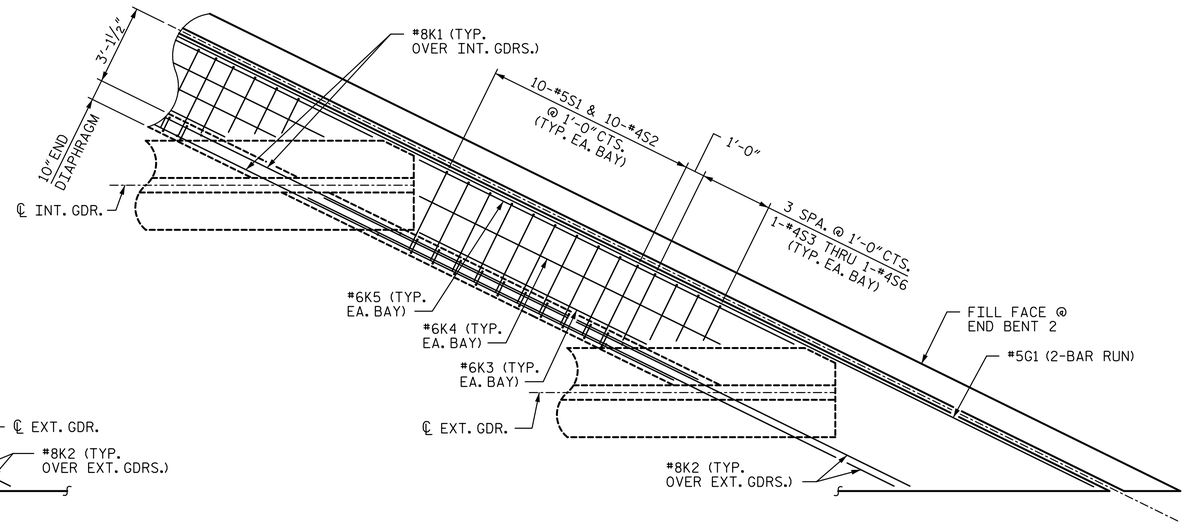
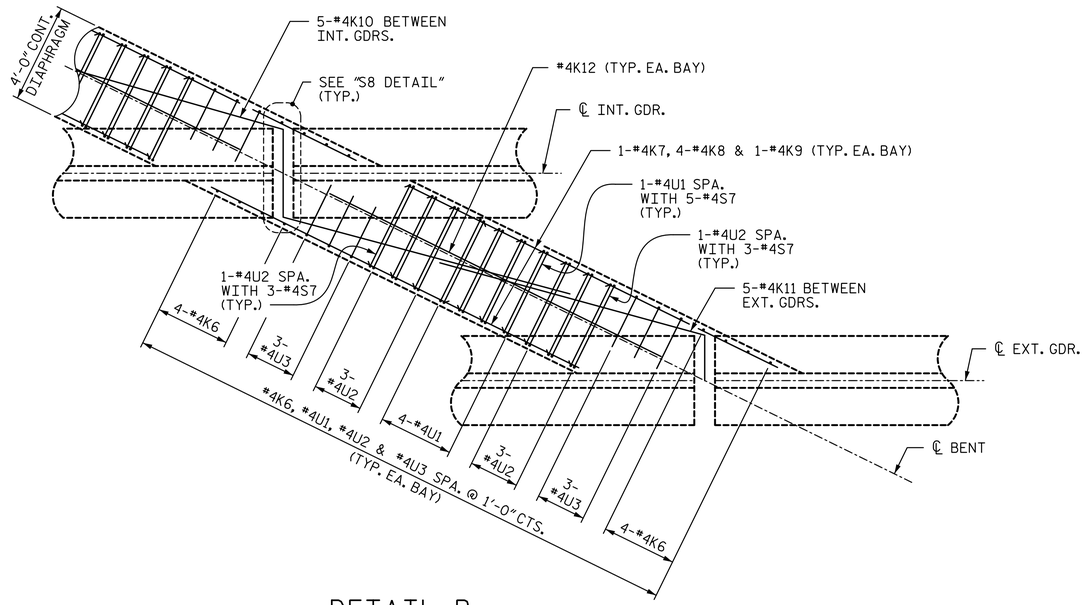


DETAIL A

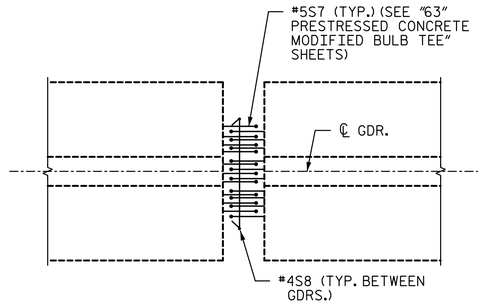


DETAIL C



DETAIL B

(#4S8 BAR NOT SHOWN FOR CLARITY)



S8 DETAIL

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-

= 16+08.07 -Y6-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPANS A - C

-LEFT LANE-

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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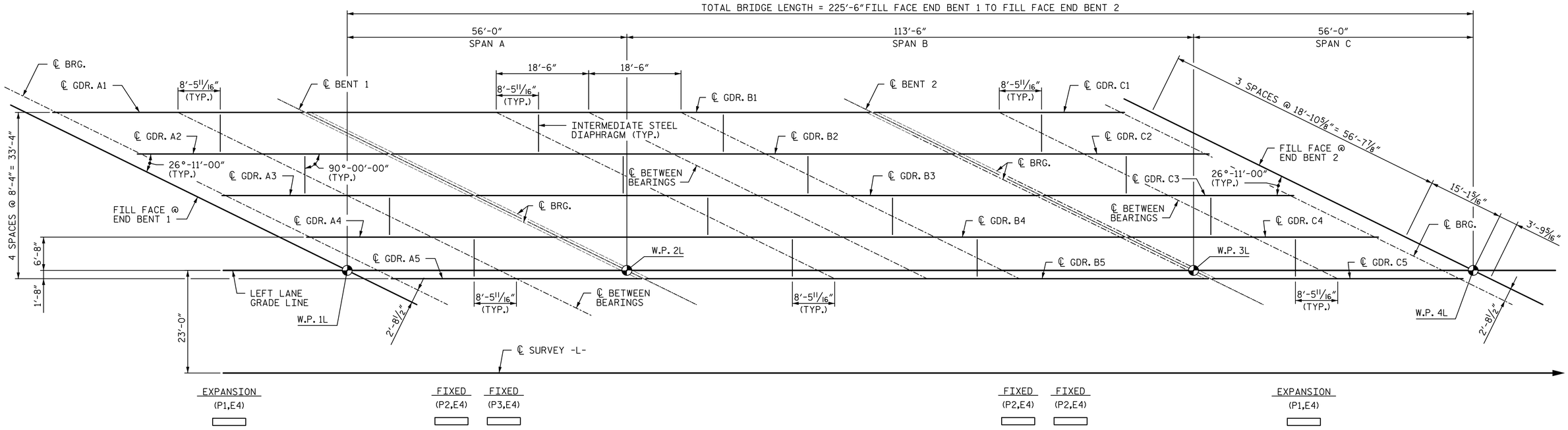
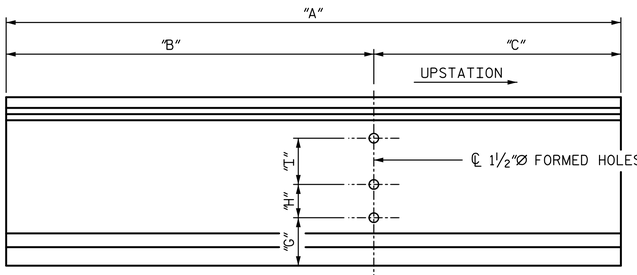
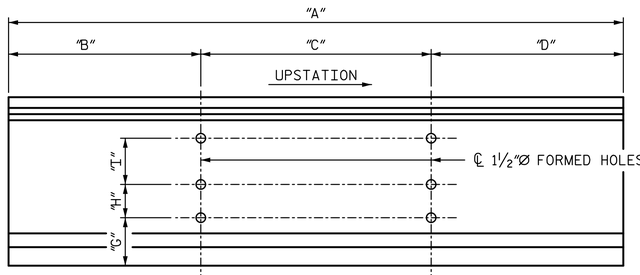


FRAMING PLAN

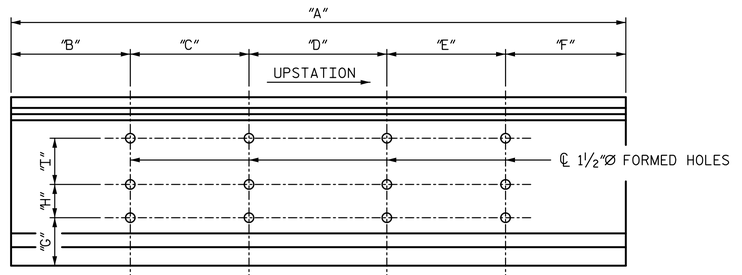
FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS DETAILS FOR PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS" SHEET



ONE INTERMEDIATE DIAPHRAGM CONNECTION



TWO INTERMEDIATE DIAPHRAGM CONNECTIONS



FOUR INTERMEDIATE DIAPHRAGM CONNECTIONS

GIRDER ELEVATIONS

GIRDER DIMENSIONS

GIRDER	"A" (FT)	"B" (FT)	"C" (FT)	"D" (FT)	"E" (FT)	"F" (FT)	"G" (FT)	"H" (FT)	"I" (FT)
A1 & C1	50'-1 7/8"	33'-6 5/8"	16'-7 1/4"	--	--	--	1'-4 1/4"	1'-3"	1'-6 1/2"
A2-A4 & C2-C4	50'-1 7/8"	16'-7 1/4"	16'-11 3/8"	16'-7 1/4"	--	--	1'-4 1/4"	1'-3"	1'-6 1/2"
A5 & C5	50'-1 7/8"	16'-7 1/4"	33'-6 5/8"	--	--	--	1'-4 1/4"	1'-3"	1'-6 1/2"
B1	112'-8"	46'-3 11/16"	37'-0"	29'-4 5/16"	--	--	1'-4 1/4"	1'-3"	1'-6 1/2"
B2-B4	112'-8"	29'-4 5/16"	16'-11 3/8"	20'-0 5/8"	16'-11 3/8"	29'-4 5/16"	1'-4 1/4"	1'-3"	1'-6 1/2"
B5	112'-8"	29'-4 5/16"	37'-0"	46'-3 11/16"	--	--	1'-4 1/4"	1'-3"	1'-6 1/2"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

DocuSigned by: Adam J. Peter ESF6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

-LEFT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-10
1			3			TOTAL SHEETS
2			4			38

DRAWN BY : CLG DATE : 5-14
CHECKED BY : AJP DATE : 6-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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NC License Number F-0991

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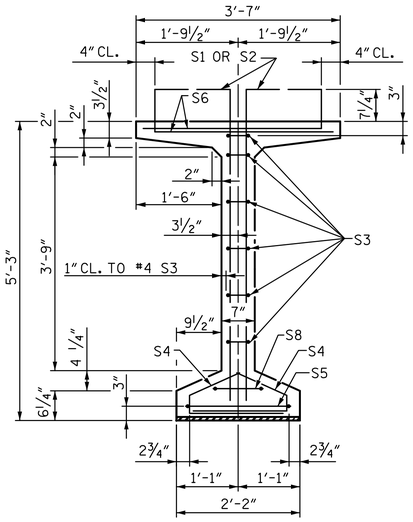
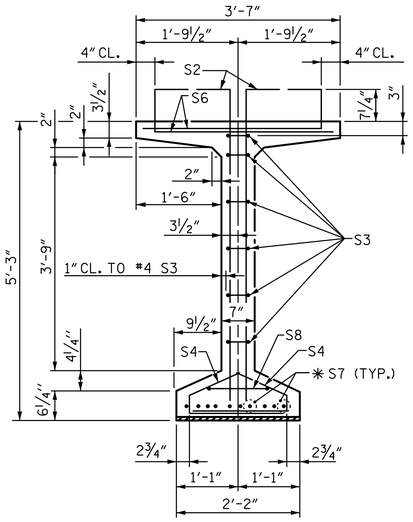
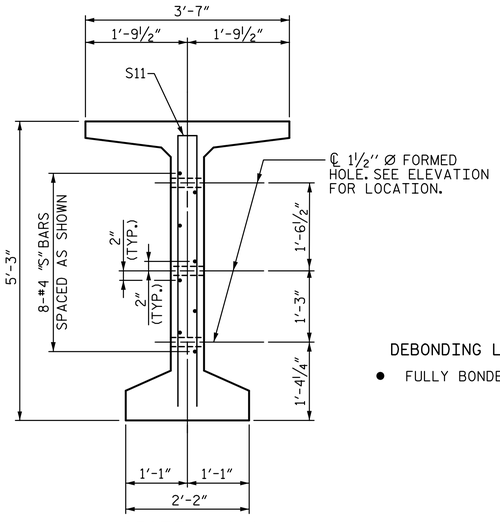


SECTION A-A



SECTION B-B

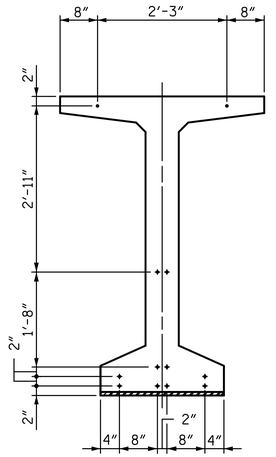


SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

● FULLY BONDED STRANDS



0.6'' Ø LOW RELAXATION STRAND LAYOUT

NOTES:

1. FOR DIAPHRAGM HOLE LOCATIONS, SEE "FRAMING PLAN" SHEET.
2. FOR GIRDER DETAILS, SEE SHEET 3 OF 3.
3. FOR NOTES, SEE SHEET 3 OF 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

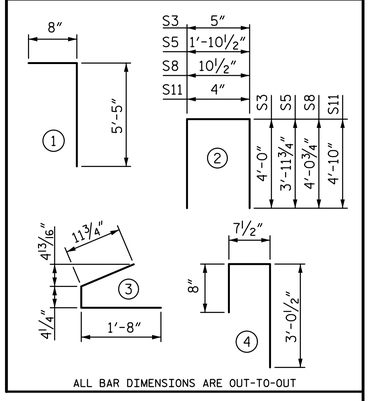
REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	92	#4	1	6'-1''	374
	S2	24	#5	1	6'-1''	152
	S3	12	#4	2	8'-5''	67
	S4	72	#4	3	3'-0''	144
	S5	1	#5	2	9'-10''	10
	S6	116	#5	4	4'-4''	524
	✳S7	10	#5	STR	3'-8''	38
	S8	2	#5	2	9'-0''	19
	S9	13	#5	STR	3'-3''	44
	S10	1	#3	STR	1'-10''	1
EXTERIOR GDR.	S11	4	#5	2	10'-0''	42
INTERIOR GDR.	S11	8	#5	2	10'-0''	83
EXTERIOR GDR.	S12	8	#4	STR	8'-0''	43
INTERIOR GDR.	S12	16	#4	STR	8'-0''	86

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

✳FOR S7 BARS, SEE SECTION D-D ON SHEET 3 OF 3.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

PLAN OF GIRDER

ELEVATION OF GIRDER

PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER 1 - 5

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8,000 PSI CONCRETE	0.6'' Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	1,458	10.0	12
INTERIOR GIRDER	1,542	10.0	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
10	50'-1⅞"	501'-6¾"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPANS A & C
-LEFT LANE-

DocuSigned by: Adam J. Peter E3F6AFBD9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

4/10/2015

DRAWN BY : CLG	DATE : 5-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
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2			4			38

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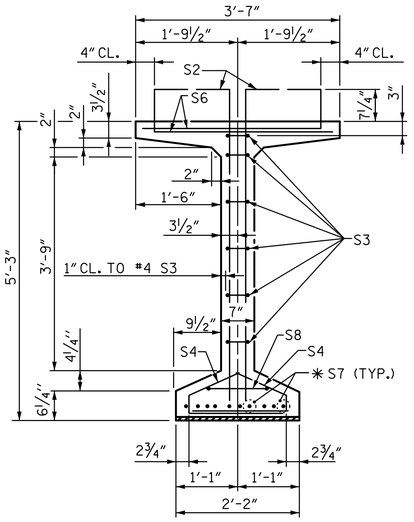
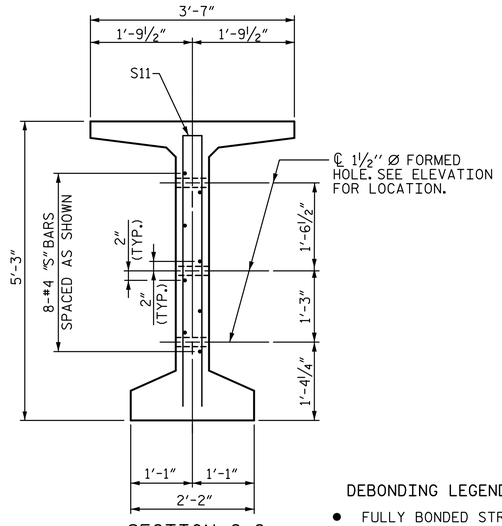
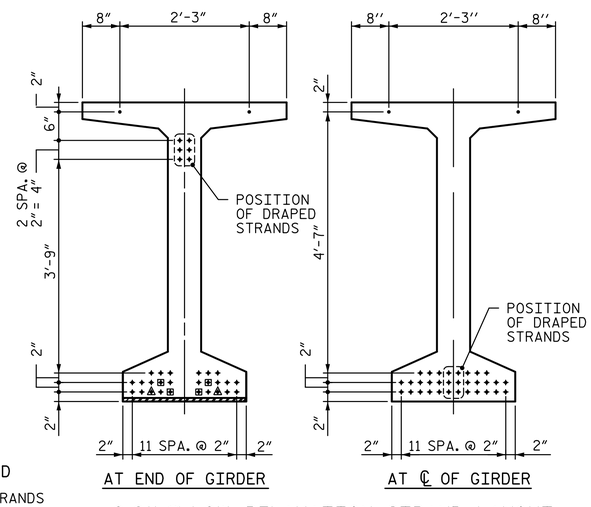


SECTION B-B



SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

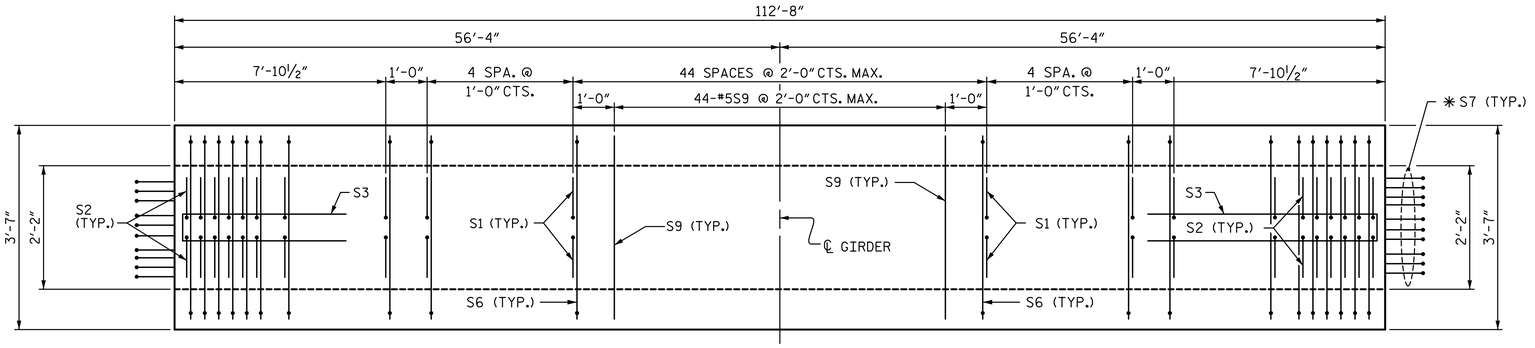


0.6″ Ø LOW RELAXATION STRAND LAYOUT

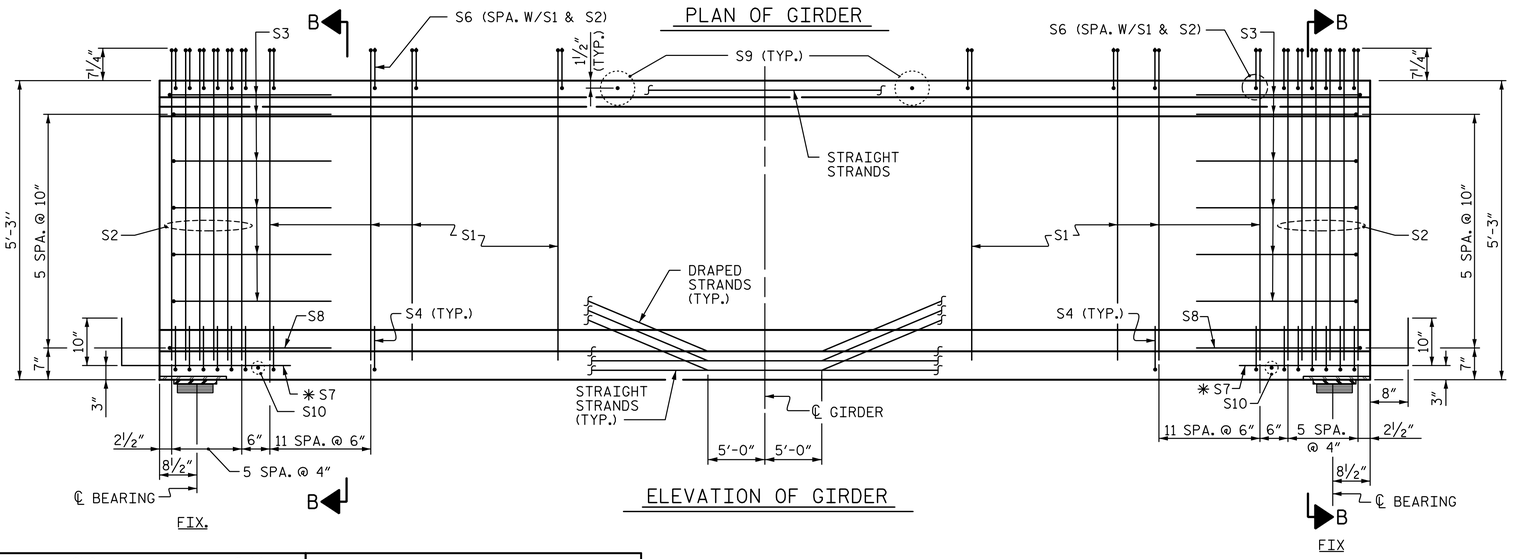
✱FOR S7 BARS, SEE SECTION D-D ON SHEET 3 OF 3.

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4′-0″ FROM END OF GIRDER
- ⊿ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER



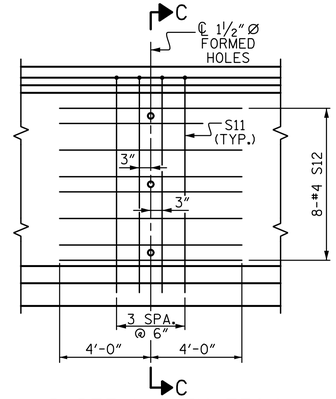
PLAN OF GIRDER



ELEVATION OF GIRDER

NOTES:

1. FOR DIAPHRAGM HOLE LOCATIONS, SEE "FRAMING PLAN" SHEET.
2. FOR GIRDER DETAILS, SEE SHEET 3 OF 3.
3. FOR NOTES, SEE SHEET 3 OF 3.
4. THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 23 KIPS.



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDERS 1 - 5

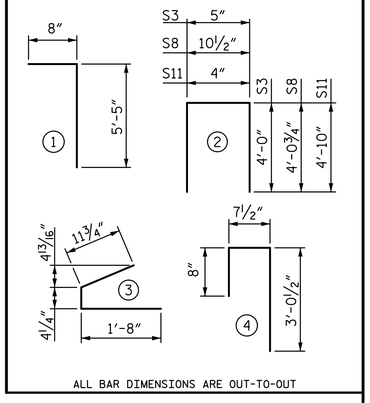
0.6″ Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	154	#5	1	6′-1″	977
	S2	24	#6	1	6′-1″	219
	S3	12	#4	2	8′-5″	67
	S4	72	#4	3	3′-0″	144
	S6	178	#5	4	4′-4″	805
	✱S7	20	#5	STR	3′-8″	76
	S8	2	#5	2	9′-0″	19
	S9	44	#5	STR	3′-3″	149
	S10	2	#3	STR	1′-10″	1
EXTERIOR GDR.	S11	8	#5	2	10′-0″	83
INTERIOR GDR.	S11	16	#5	2	10′-0″	167
EXTERIOR GDR.	S12	16	#4	STR	8′-0″	86
INTERIOR GDR.	S12	32	#4	STR	8′-0″	171

✱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.
EXTERIOR GIRDER	2,626	22.3	34
INTERIOR GIRDER	2,795	22.3	34

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	112′-8″	563′-4″

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 3

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4/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN B -LEFT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-12
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2			4			38

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CHECKED BY : PEK	DATE : 6-14		

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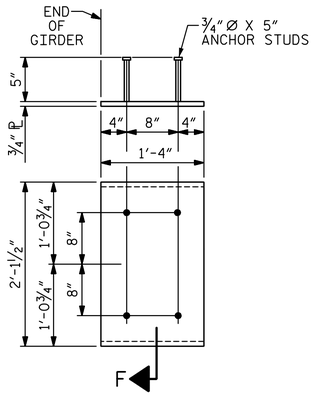
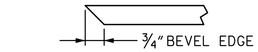


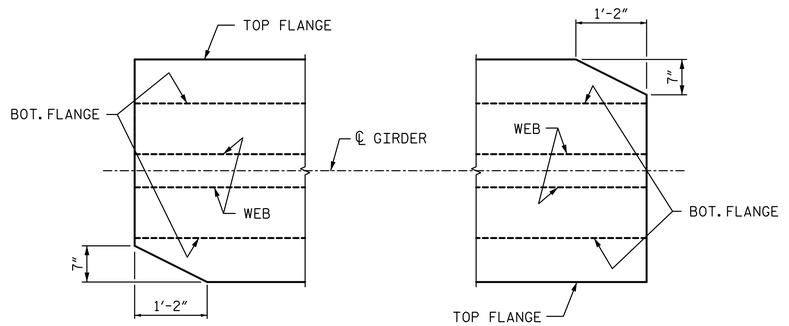


SECTION "F"

(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D. PER GIRDER)



AT END BENT 1 AT END BENT 2

TOP FLANGE CLIP DETAIL

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 ENDWALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI FOR SPANS A & C AND 6,400 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.

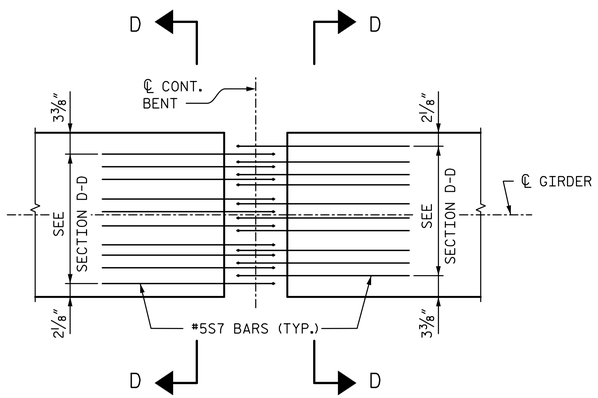
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

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.

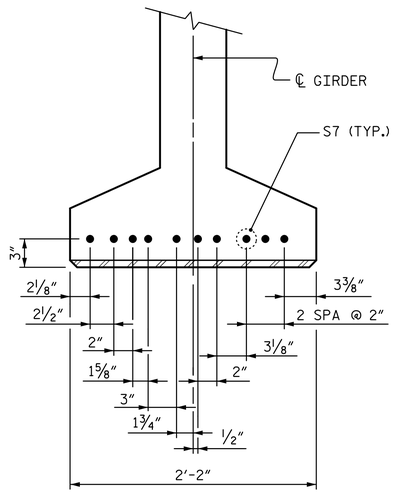
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4,500 lbs.

S6 BARS IN THE TOP FLANGE CLIP REGION SHALL BE SHIFTED SUCH THAT 4" CLEAR TO EDGE OF FLANGE IS MAINTAINED. THE HORIZONTAL LEG SHALL BE CUT SUCH THAT 2½" MIN. CLEAR IS MAINTAINED OPPOSITE THE TOP FLANGE CLIP.



PLAN- BOTTOM FLANGE

EXTERIOR S7 BARS SHOWN, OTHERS OMITTED FOR CLARITY.



SECTION D-D

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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SHEET 3 OF 3

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

RALEIGH

SUPERSTRUCTURE

63" PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDER DETAILS

-LEFT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
CHECKED BY : PEK	DATE : 6-14		

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REVISIONS						SHEET NO.
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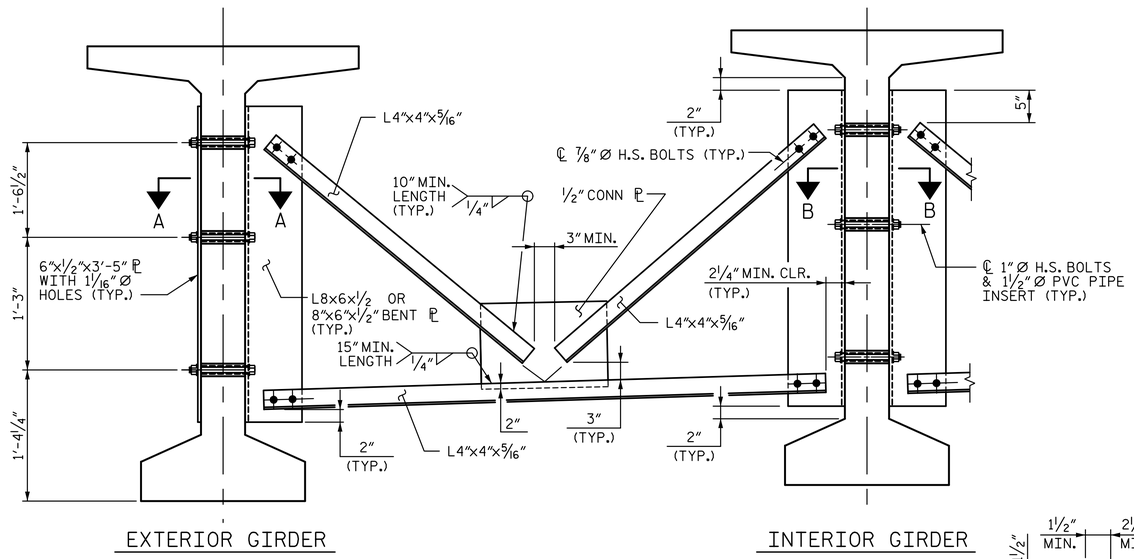
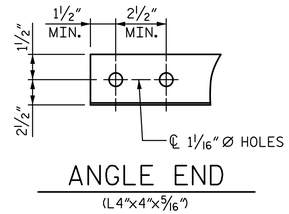


EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



ANGLE END
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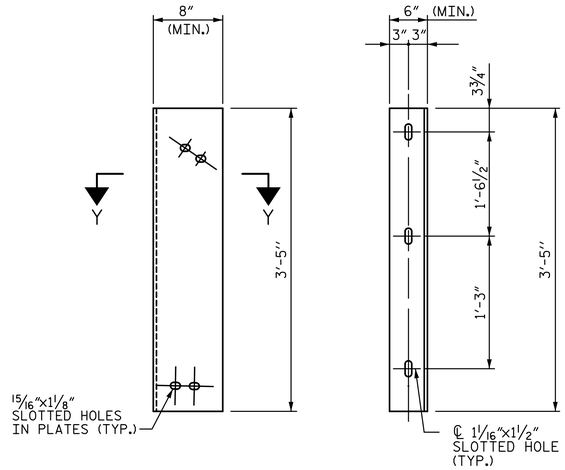
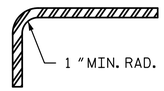


DIAPHRAGM FACE WEB FACE



SECTION Y-Y

CONNECTION 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.

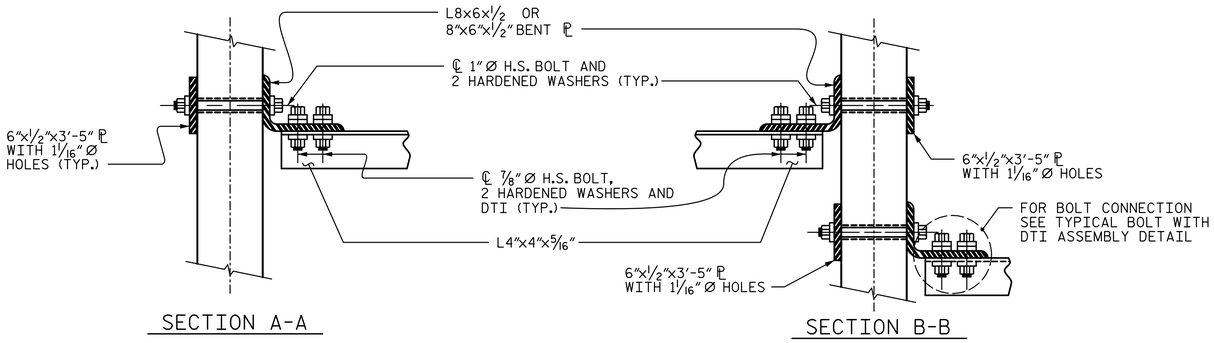
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.

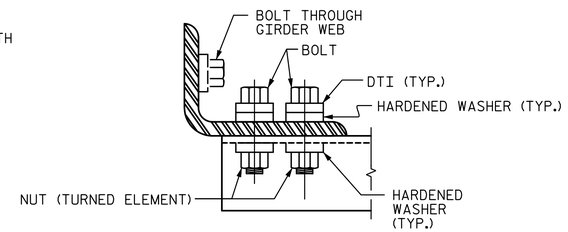
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



SECTION A-A SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

INTERMEDIATE STEEL DIAPHRAGM DETAILS FOR PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS -LEFT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : AJP	DATE : 6-14		

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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1			3			TOTAL SHEETS
2			4			38

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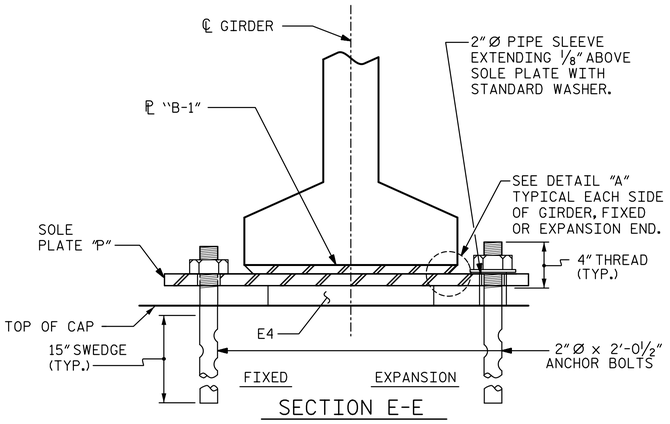
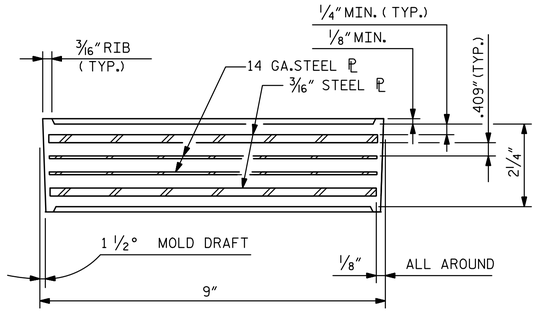
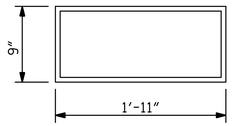


SECTION E-E



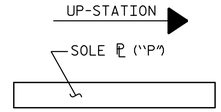
TYPICAL SECTION OF ELASTOMERIC BEARINGS



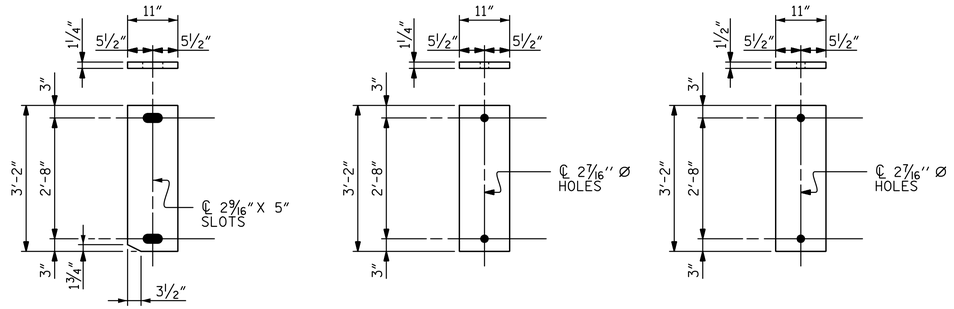
E4 (30 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

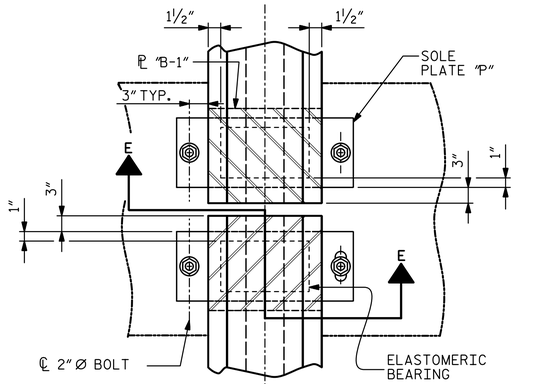
TYPE V



SOLE ℄ PLACEMENT DETAIL

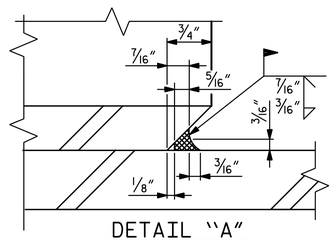


SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN
(SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN
(SHOWING SIMPLE SPAN BENT)



DETAIL "A"

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.

— LOAD RATINGS —	
	MAX. D.L.+L.L.
TYPE V	365 k

PROJECT NO. R-2514D

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DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ELASTOMERIC BEARING DETAILS

-LEFT LANE-

DRAWN BY : VMW	DATE : 5-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : AJP	DATE : 5-14		

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NC License Number F-0991

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DEAD LOAD DEFLECTION TABLE

	SPAN A & C					GIRDERS 1 - 5					
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.008	0.014	0.018	0.020	0.021	0.020	0.018	0.014	0.008	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲	0.000	0.002	0.005	0.007	0.008	0.008	0.008	0.007	0.005	0.002	0.000
FINAL CAMBER	0″	1/16″	1/8″	1/8″	1/8″	1/8″	1/8″	1/8″	1/8″	1/16″	0″

DEAD LOAD DEFLECTION TABLE

	SPAN B										GIRDERS 1 & 5										
TWENTIETH POINTS	0.0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.060	0.113	0.161	0.202	0.236	0.265	0.287	0.303	0.312	0.315	0.312	0.303	0.287	0.265	0.236	0.202	0.161	0.113	0.060	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲	0.000	0.026	0.053	0.078	0.101	0.122	0.140	0.155	0.165	0.172	0.174	0.172	0.165	0.155	0.140	0.122	0.101	0.078	0.053	0.026	0.000
FINAL CAMBER	0″	3/8″	3/4″	1″	1 3/16″	1 3/8″	1 1/2″	1 9/16″	1 5/8″	1 11/16″	1 11/16″	1 11/16″	1 5/8″	1 9/16″	1 1/2″	1 3/8″	1 3/16″	1″	3/4″	3/8″	0″

DEAD LOAD DEFLECTION TABLE

	SPAN B										GIRDERS 2-4										
TWENTIETH POINTS	0.0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE)	0.000	0.060	0.113	0.161	0.202	0.236	0.265	0.287	0.303	0.312	0.315	0.312	0.303	0.287	0.265	0.236	0.202	0.161	0.113	0.060	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲	0.000	0.025	0.050	0.075	0.097	0.117	0.134	0.148	0.158	0.164	0.166	0.164	0.158	0.148	0.134	0.117	0.097	0.075	0.050	0.025	0.000
FINAL CAMBER	0″	7/16″	3/4″	1 1/16″	1 1/4″	1 7/16″	1 9/16″	1 11/16″	1 3/4″	1 3/4″	1 13/16″	1 3/4″	1 3/4″	1 11/16″	1 9/16″	1 7/16″	1 1/4″	1 1/16″	3/4″	7/16″	0″

NOTES:

▲ DOES NOT INCLUDE FUTURE WEARING SURFACE.

ALL VALUES ARE SHOWN IN DECIMAL FEET, EXCEPT FOR "FINAL CAMBER" WHICH IS SHOWN IN INCHES.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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DocuSigned by: Adam J. Peter ESF6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63" MBT PRESTRESSED CONCRETE GIRDER DEAD LOAD DEFLECTION TABLES

-LEFT LANE-

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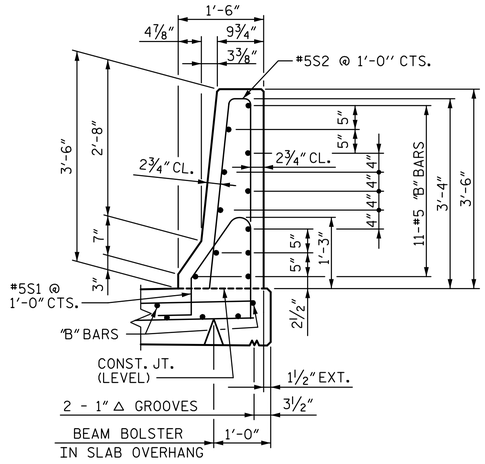
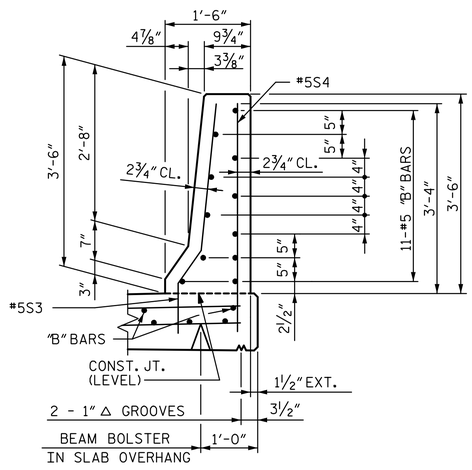
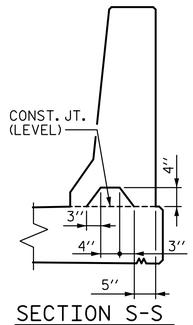


TYPICAL SECTION THRU RAIL



TYPICAL SECTION AT JOINT



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

NOTES

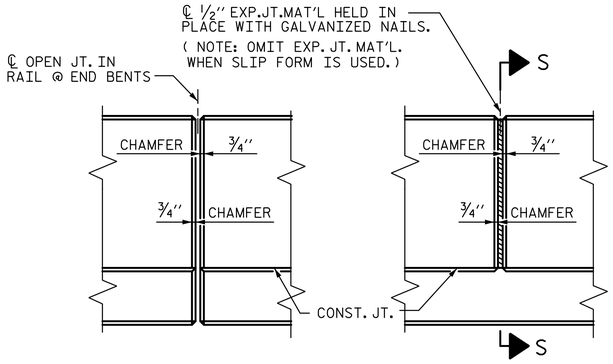
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

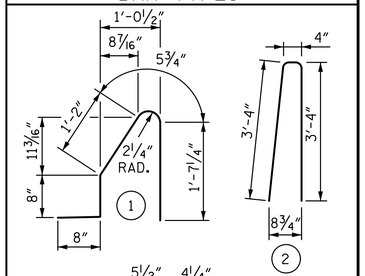
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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

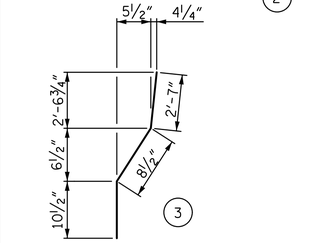
CONCRETE BARRIER RAIL ON APPROACH SLAB, LENGTH AND QUANTITIES, NOT INCLUDED. SEE "BRIDGE APPROACH SLAB DETAILS" SHEETS.



ELEVATION AT EXPANSION JOINTS

BAR TYPES





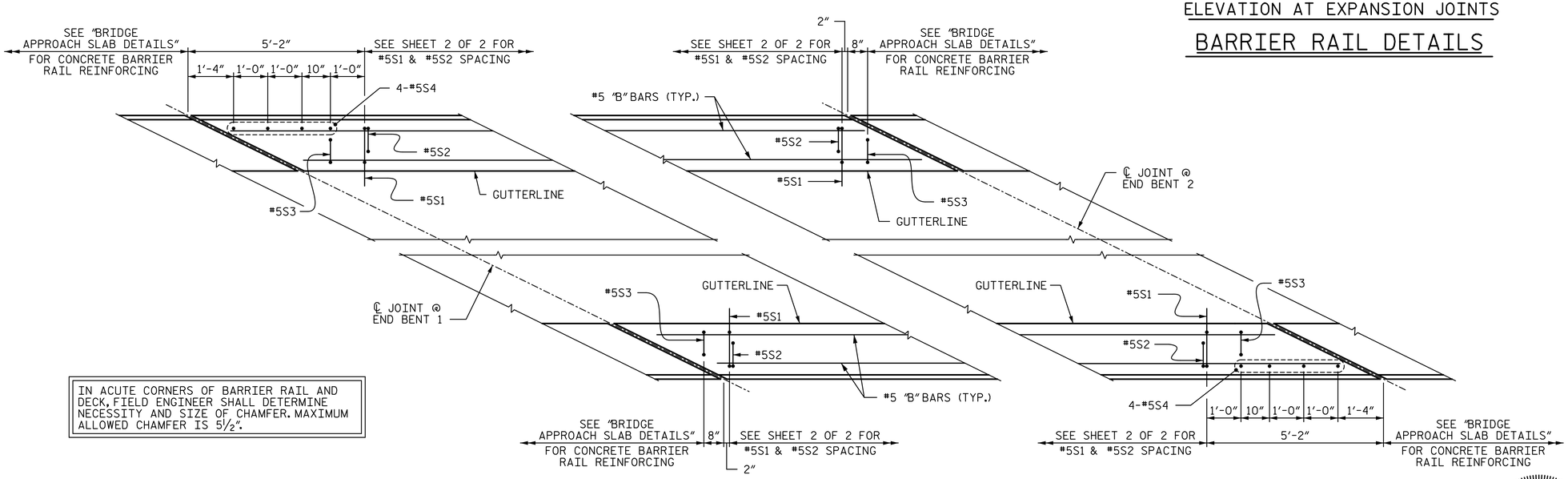
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	44	#5	STR.	12'-10"	589
* B2	88	#5	STR.	27'-11"	2,562
* B3	44	#5	STR.	29'-7"	1,358
* B4	44	#5	STR.	14'-7"	669
* S1	434	#5	①	4'-7"	2,075
* S2	434	#5	②	7'-0"	3,169
* S3	4	#5	③	4'-2"	17
* S4	8	#5	STR.	4'-0"	33

* EPOXY COATED REINFORCING STEEL	10,472 LBS.
CLASS AA CONCRETE	60.0 CU. YDS.
CONCRETE BARRIER RAIL	441.2 LIN. FT.



IN ACUTE CORNERS OF BARRIER RAIL AND DECK, FIELD ENGINEER SHALL DETERMINE NECESSITY AND SIZE OF CHAMFER. MAXIMUM ALLOWED CHAMFER IS 5½".

END BENT 1

END BENT 2

PLAN AT JOINTS

BARRIER RAIL DETAILS

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

-LEFT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9847424...
4/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

DRAWN BY : CLG DATE : 6-14
CHECKED BY : AJP DATE : 6-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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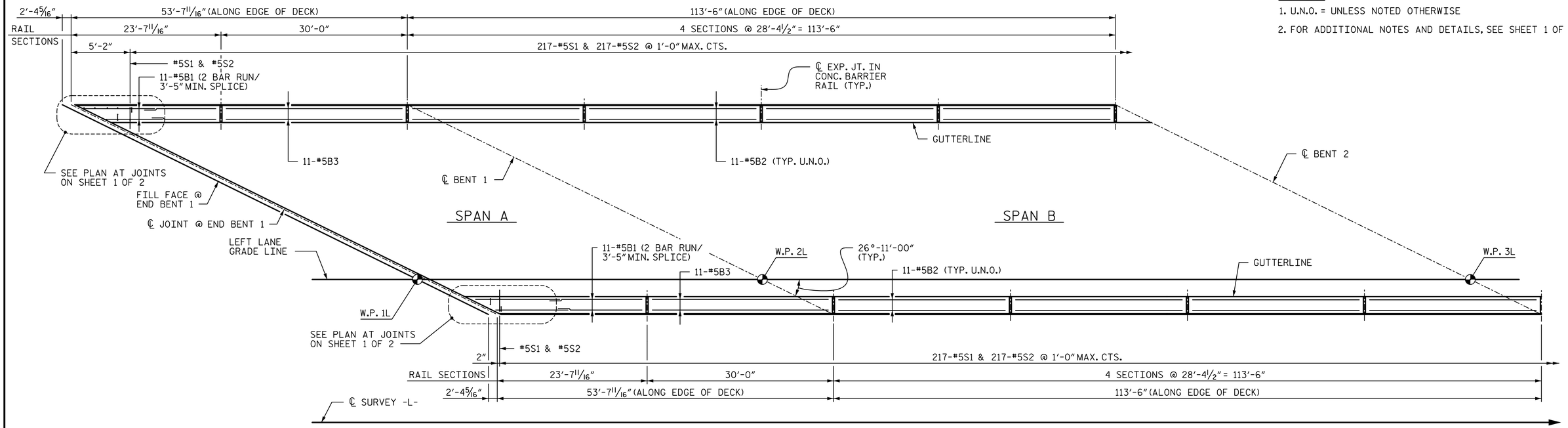
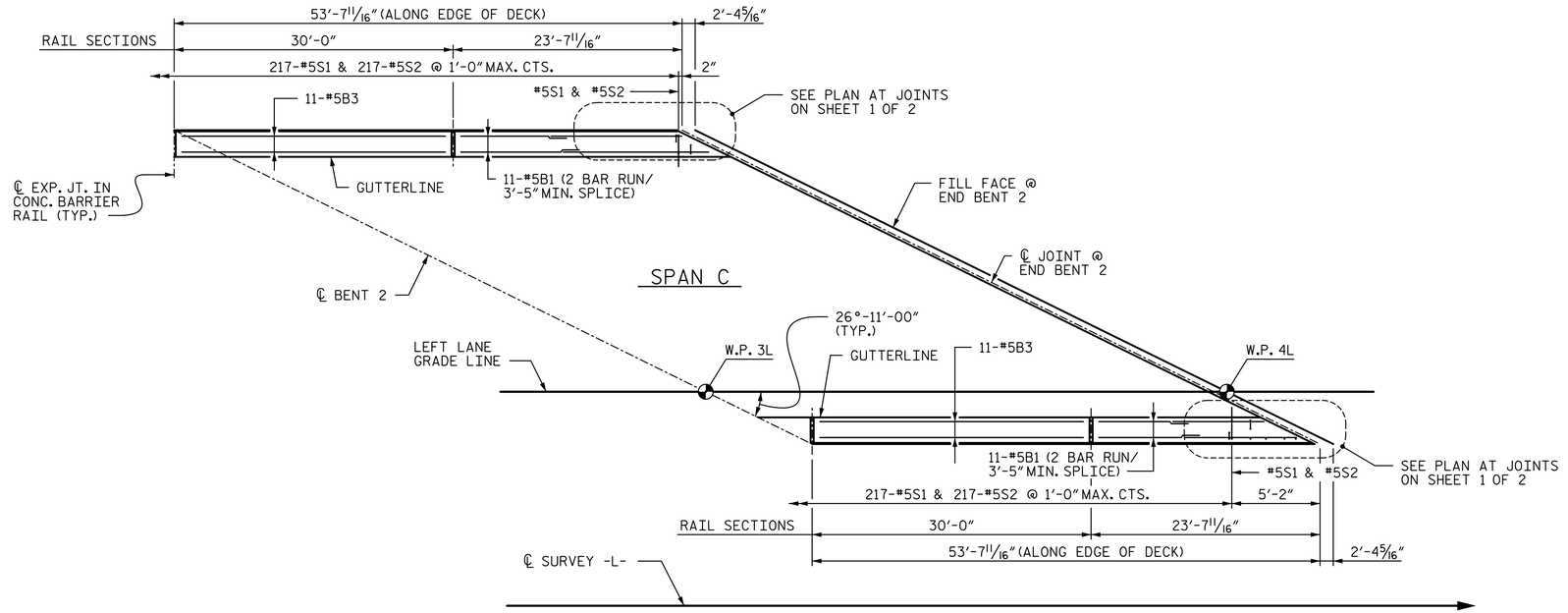
2			4			38

NOTES:

1. U.N.O. = UNLESS NOTED OTHERWISE
2. FOR ADDITIONAL NOTES AND DETAILS, SEE SHEET 1 OF 2.



PLAN - SPAN A & B



PLAN - SPAN C

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 2 OF 2

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

-LEFT LANE-

DocuSigned by: Adam J. Peter
E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : TJT	DATE : 6-14		

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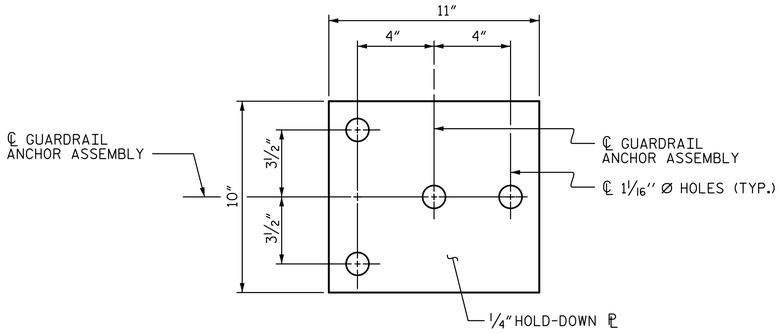
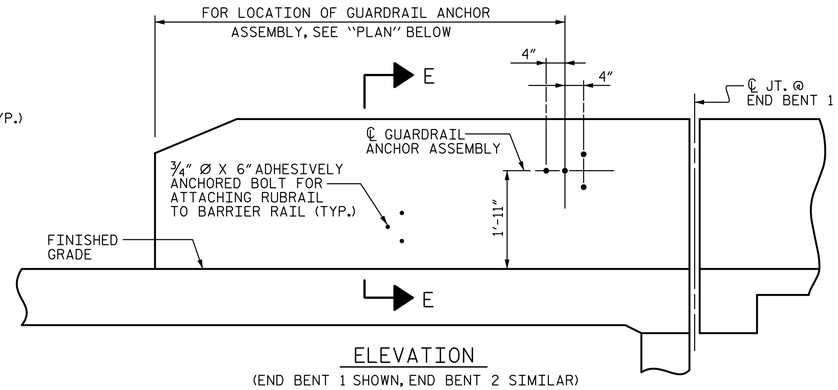
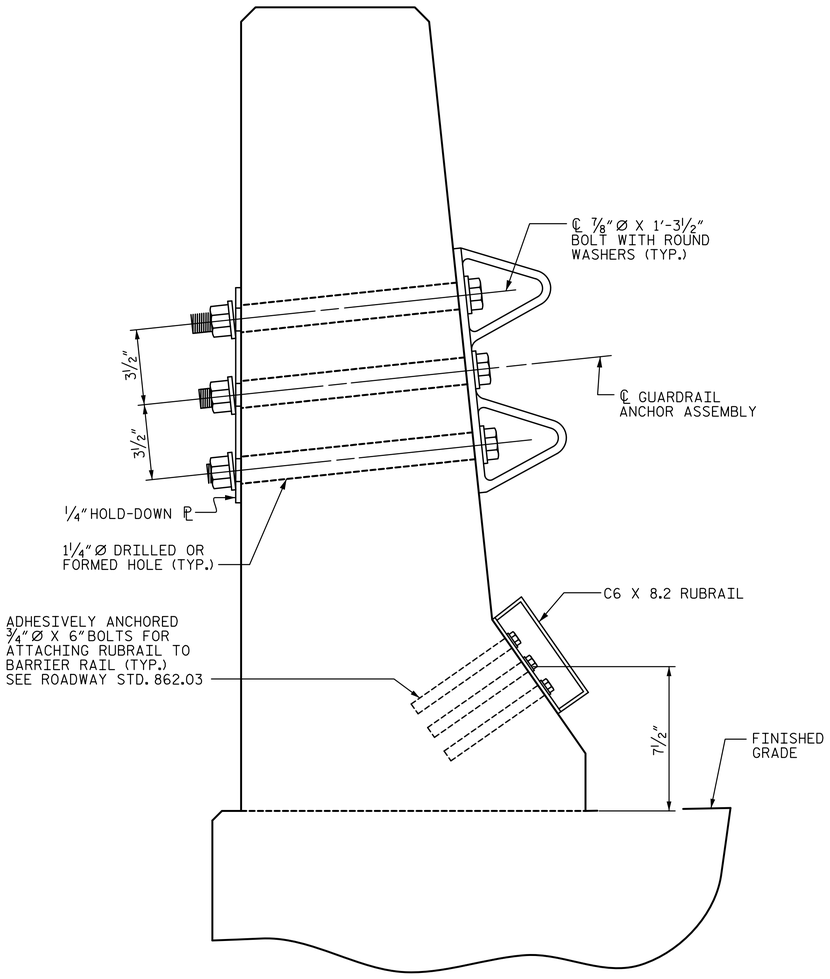


PLAN



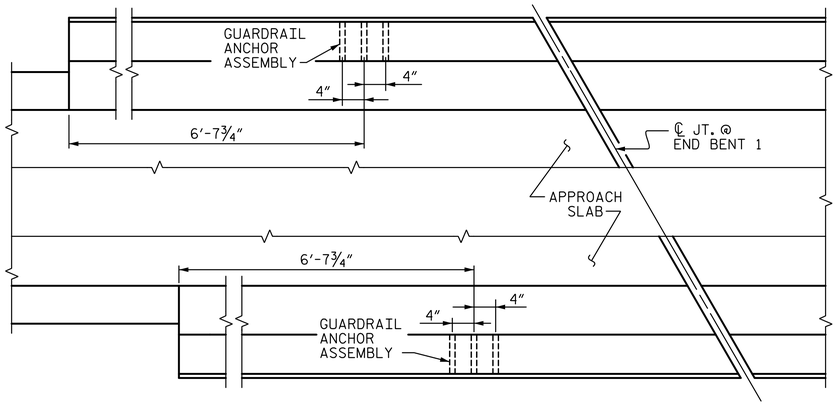
ELEVATION

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION E-E

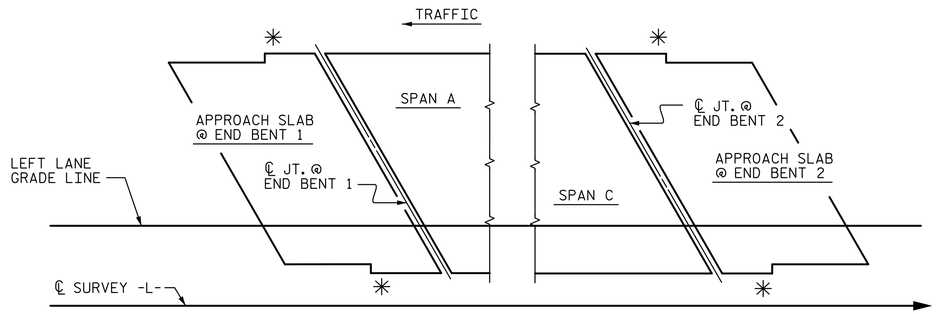
GUARDRAIL ANCHOR ASSEMBLY DETAILS



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 ¼″ HOLD-DOWN PLATE AND 4 - ⅞″ Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

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

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

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

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

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

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

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

-LEFT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : AJP	DATE : 6-14		

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SHEET NO. S11-19

TOTAL SHEETS 38

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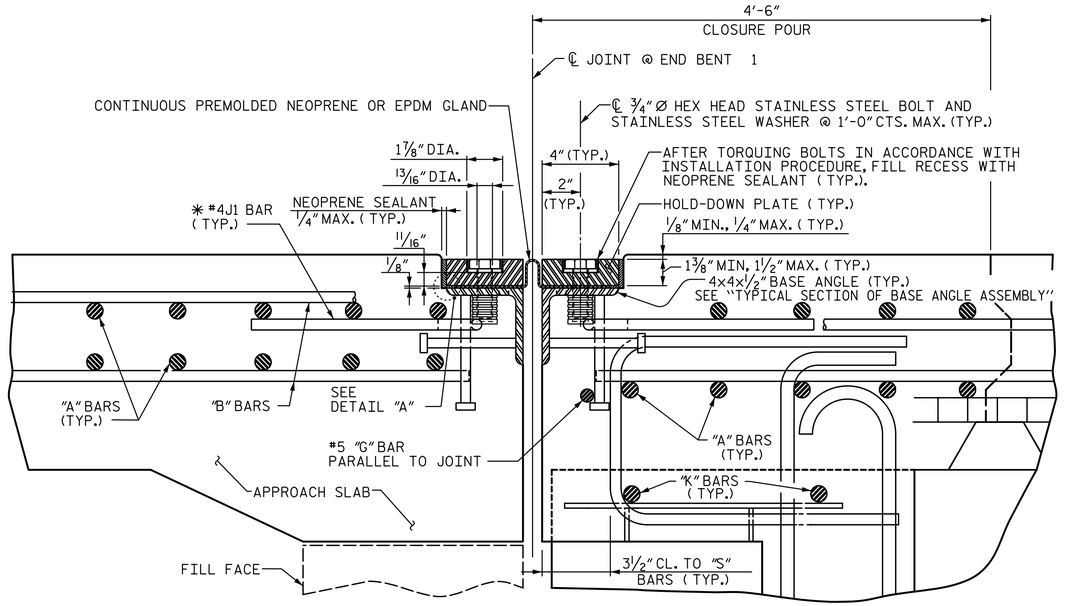


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

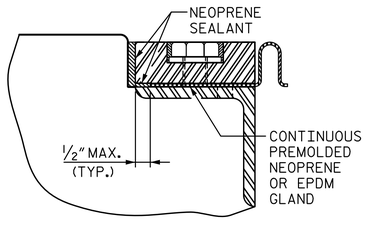
⁎ THE QUANTITY OF #4J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

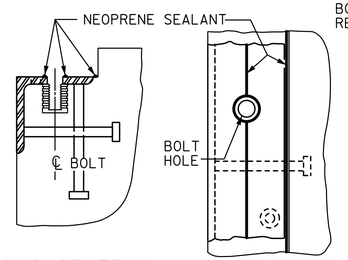
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO 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.

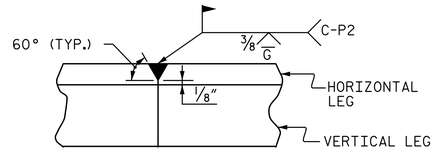


DETAIL "A"

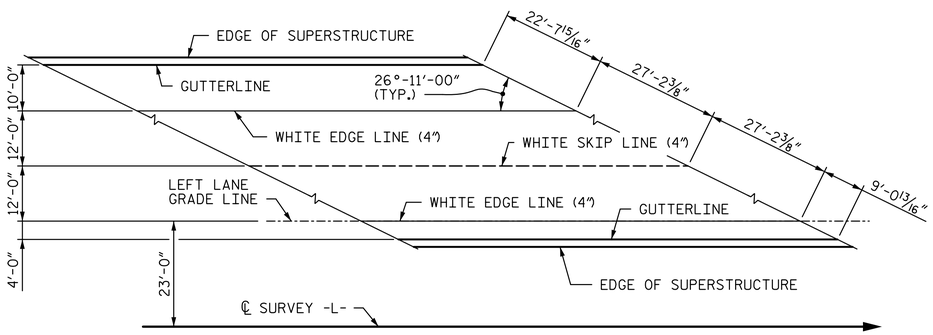


CROSS SECTION PLAN VIEW

INSTALLATION SKETCH

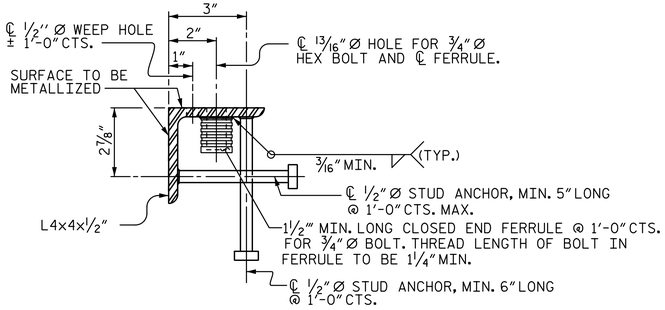


DETAIL- FIELD WELD SPLICE OF BASE ANGLE



PAVEMENT MARKING ALIGNMENT

MOVEMENT AND SETTING AT JOINT					
END 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
1	26°-11'-00"	11/16"	1⅛"	1 1/16"	1"
2	26°-11'-00"	11/16"	1⅛"	1 1/16"	1"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 2

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS

-LEFT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-20
1			3			TOTAL SHEETS
2			4			38

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : AJP	DATE : 6-14		

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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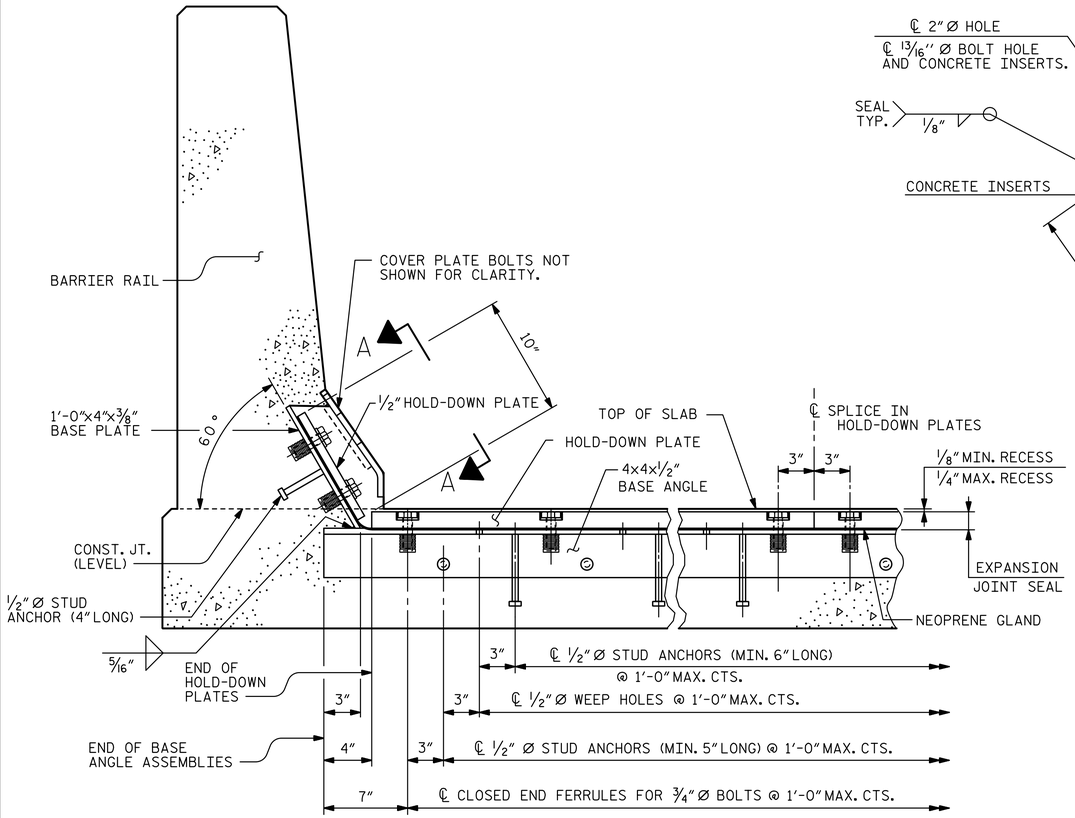
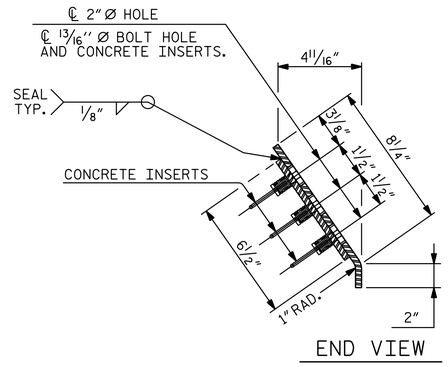
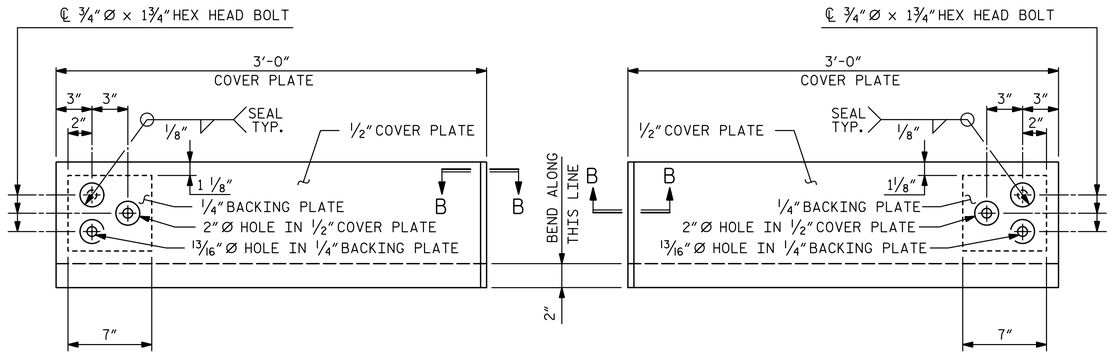




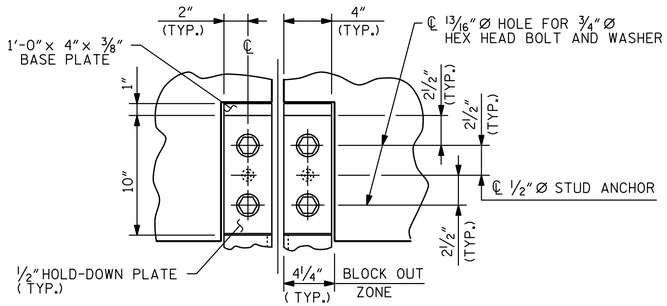
END VIEW



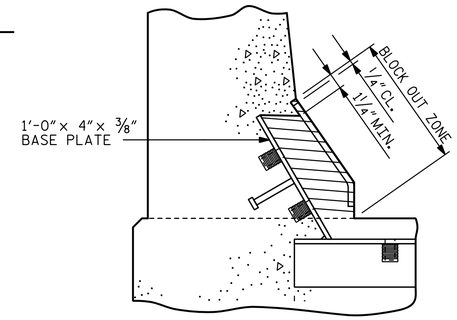
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

COVER PLATE DETAILS



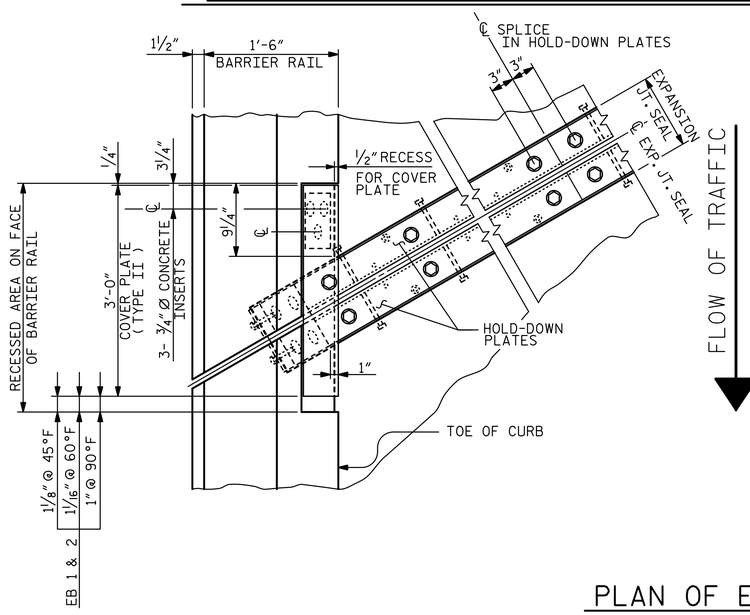
SECTION A - A



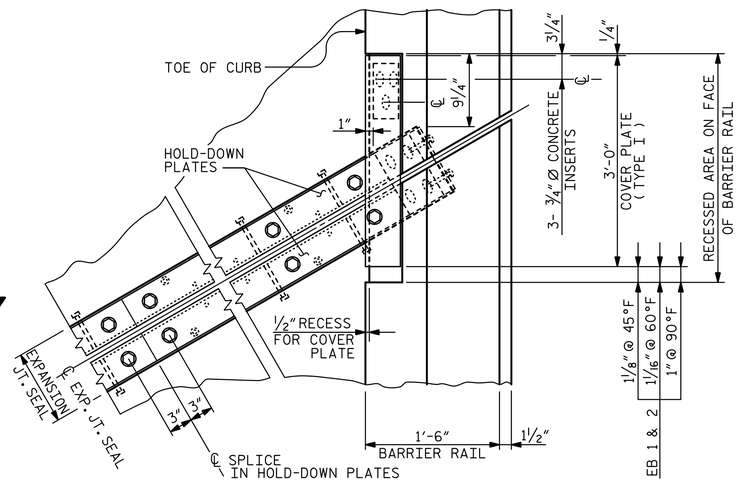
BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.

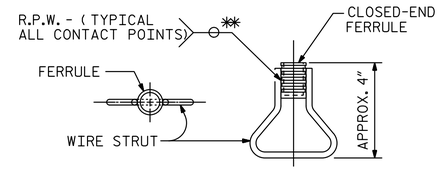
SECTION THRU RAIL NORMAL TO JOINT



FLOW OF TRAFFIC



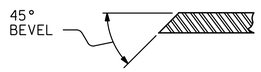
PLAN OF EXPANSION JOINT SEAL



PLAN ELEVATION

CONCRETE INSERT

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



SECTION B - B

DocuSigned by: Adam J. Peter ESF8AF8D9B4742A...

3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

-LEFT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : AJP	DATE : 6-14		

STV/ Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-21
1			3			TOTAL SHEETS
2			4			38

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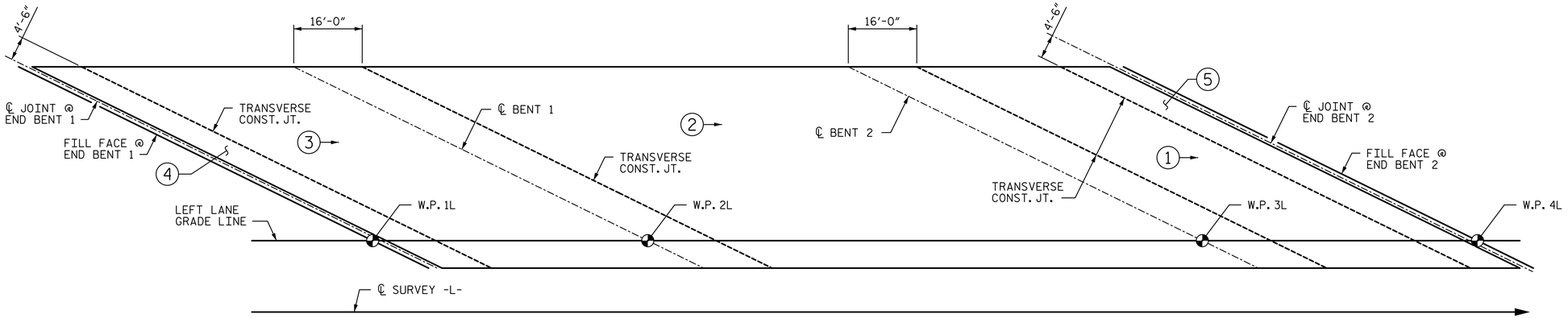
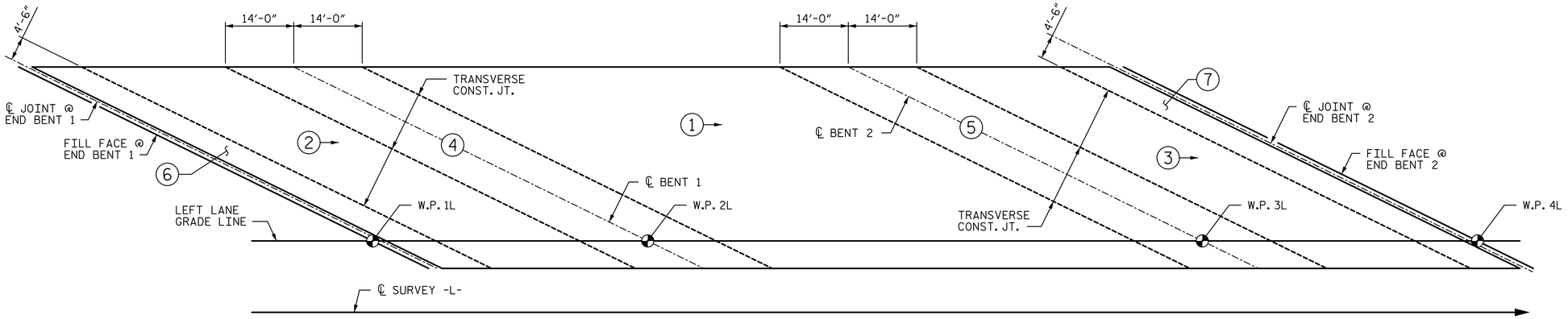


POUR SEQUENCE

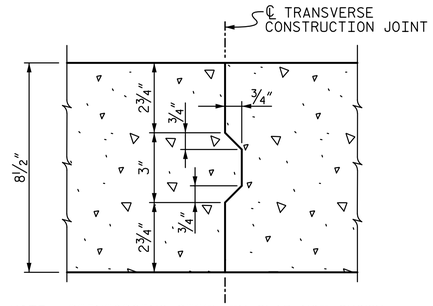
(#) → = INDICATES POUR NUMBER AND DIRECTION OF POUR

NOTE: CONTRACTOR HAS THE OPTION TO COMBINE POURS 4 AND 5.



OPTIONAL POUR SEQUENCE

NOTE: CONTRACTOR HAS THE OPTION TO COMBINE POURS 6 AND 7.



NOTE : REINFORCING STEEL IN SLAB NOT SHOWN. TRANSVERSE & LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

CONSTRUCTION JOINT IN DECK SLAB

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK POUR SEQUENCE

-LEFT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
CHECKED BY : AJP	DATE : 6-14		

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Charlotte, NC 28202
NC License Number F-0991

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

SHEET NO. S11-22

TOTAL SHEETS 38

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REINFORCING BAR SCHEDULE

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	233	#5	STR.	40′-11″	9,944	A216	2	#5	STR.	13′-4″	28
A2	233	#5	STR.	40′-11″	9,944	A217	2	#5	STR.	13′-1″	27
						A218	2	#5	STR.	12′-9″	27
✳A100	36	#5	STR.	21′-9″	817	A219	2	#5	STR.	12′-6″	26
✳A101	36	#5	STR.	20′-6″	770	A220	2	#5	STR.	12′-2″	25
✳A102	36	#5	STR.	19′-2″	720	A221	2	#5	STR.	11′-11″	25
✳A103	36	#5	STR.	17′-11″	673	A222	2	#5	STR.	11′-7″	24
✳A104	36	#5	STR.	16′-7″	623	A223	2	#5	STR.	11′-4″	24
✳A105	36	#5	STR.	15′-4″	576	A224	2	#5	STR.	11′-0″	23
✳A106	36	#5	STR.	14′-0″	526	A225	2	#5	STR.	10′-9″	22
✳A107	36	#5	STR.	12′-9″	479	A226	2	#5	STR.	10′-5″	22
✳A108	36	#5	STR.	11′-5″	429	A227	2	#5	STR.	10′-2″	21
✳A109	36	#5	STR.	10′-2″	382	A228	2	#5	STR.	9′-11″	21
✳A110	2	#5	STR.	13′-5″	28	A229	2	#5	STR.	9′-7″	20
✳A111	2	#5	STR.	13′-2″	27	A230	2	#5	STR.	9′-4″	19
✳A112	2	#5	STR.	12′-10″	27	A231	2	#5	STR.	9′-0″	19
✳A113	2	#5	STR.	12′-7″	26	A232	2	#5	STR.	8′-9″	18
✳A114	2	#5	STR.	12′-3″	26	A233	2	#5	STR.	8′-5″	18
✳A115	2	#5	STR.	12′-0″	25	A234	2	#5	STR.	8′-2″	17
✳A116	2	#5	STR.	11′-9″	25	A235	2	#5	STR.	7′-10″	16
✳A117	2	#5	STR.	11′-5″	24	A236	2	#5	STR.	7′-7″	16
✳A118	2	#5	STR.	11′-2″	23	A237	18	#5	STR.	5′-0″	94
✳A119	2	#5	STR.	10′-10″	23	A238	16	#5	STR.	7′-0″	117
✳A120	2	#5	STR.	10′-7″	22						
✳A121	2	#5	STR.	10′-3″	21	✳B1	56	#5	STR.	46′-0″	2,687
✳A122	2	#5	STR.	10′-0″	21	✳B2	56	#6	STR.	40′-0″	3,364
✳A123	2	#5	STR.	9′-9″	20	✳B3	28	#5	STR.	59′-0″	1,723
✳A124	2	#5	STR.	9′-5″	20	✳B10	54	#6	STR.	40′-0″	3,244
✳A125	2	#5	STR.	9′-2″	19	✳B11	54	#6	STR.	30′-0″	2,433
✳A126	2	#5	STR.	8′-10″	18	B101	72	#5	STR.	45′-9″	3,436
✳A127	2	#5	STR.	8′-7″	18	B102	72	#6	STR.	40′-0″	4,326
✳A128	2	#5	STR.	8′-3″	17	B103	36	#5	STR.	58′-0″	2,178
✳A129	2	#5	STR.	8′-0″	17						
✳A130	2	#5	STR.	7′-9″	16	✳G1	4	#5	STR.	48′-0″	200
✳A131	2	#5	STR.	7′-5″	15						
✳A132	2	#5	STR.	7′-2″	15	✳J1	174	#4	⑪	1′-5″	165
✳A133	2	#5	STR.	6′-10″	14						
✳A134	2	#5	STR.	6′-7″	14	✳K1	12	#8	①	39′-10″	1,276
✳A135	2	#5	STR.	6′-3″	13	✳K2	8	#8	②	28′-6″	609
✳A136	2	#5	STR.	6′-0″	13	✳K3	8	#6	STR.	10′-0″	120
✳A137	16	#5	STR.	5′-0″	83	✳K4	8	#6	STR.	13′-0″	156
✳A138	8	#5	STR.	7′-0″	58	✳K5	8	#6	STR.	16′-6″	198
✳A139	2	#6	STR.	31′-3″	94	K6	64	#4	STR.	3′-7″	153
✳A140	2	#6	STR.	32′-6″	98	K7	16	#4	STR.	10′-0″	107
✳A141	2	#6	STR.	33′-9″	101	K8	64	#4	STR.	16′-9″	716
						K9	16	#4	STR.	9′-2″	98
A200	36	#5	STR.	21′-6″	807	K10	30	#4	⑥	23′-6″	471
A201	36	#5	STR.	20′-3″	760	K11	20	#4	⑦	11′-9″	157
A202	36	#5	STR.	18′-11″	710	K12	8	#4	STR.	13′-1″	70
A203	36	#5	STR.	17′-8″	663						
A204	36	#5	STR.	16′-4″	613	✳S1	80	#5	③	6′-0″	501
A205	36	#5	STR.	15′-1″	566	✳S2	80	#4	④	7′-7″	405
A206	36	#5	STR.	13′-9″	516	✳S3	8	#4	④	3′-5″	18
A207	36	#5	STR.	12′-6″	469	✳S4	8	#4	④	4′-5″	24
A208	36	#5	STR.	11′-2″	419	✳S5	8	#4	④	5′-3″	28
A209	36	#5	STR.	9′-11″	372	✳S6	8	#4	④	6′-3″	33
A210	2	#5	STR.	15′-0″	31	S7	304	#4	⑤	4′-5″	897
A211	2	#5	STR.	14′-9″	31	S8	10	#4	⑤	2′-11″	19
A212	2	#5	STR.	14′-6″	30						
A213	2	#5	STR.	14′-3″	30	U1	32	#4	⑧	16′-6″	353
A214	2	#5	STR.	13′-11″	29	U2	48	#4	⑨	12′-2″	390
A215	2	#5	STR.	13′-8″	29	U3	48	#4	⑩	7′-6″	240
						✳EPOXY COATED REINF. STEEL (LBS.)					34,104
						REINF. STEEL (LBS.)					30,299

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

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

SUPERSTRUCTURE BILL OF MATERIAL

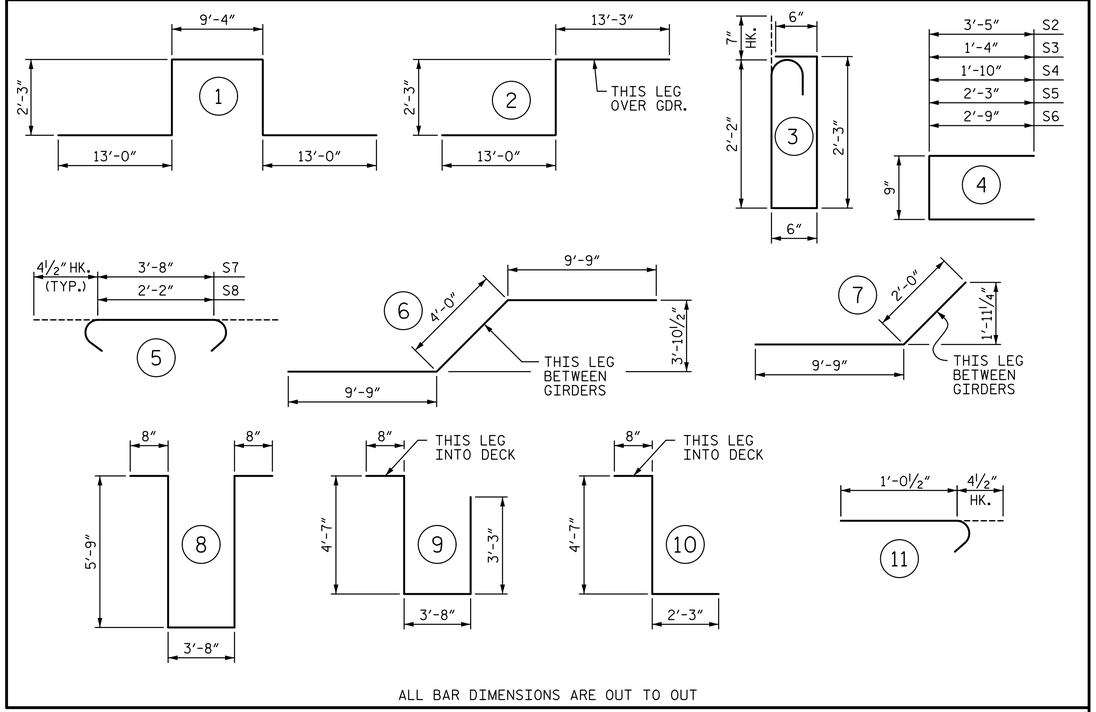
	CLASS AA CONCRETE	EPOXY COATED STEEL REINFORCING	STEEL REINFORCING
	(CU. YDS.)	(LBS.)	(LBS.)
SPAN A, B & C	--	34,104	30,299
POUR 1	39.3	--	--
POUR 2	209.9	--	--
POUR 3	142.4	--	--
POUR 4	21.2	--	--
POUR 5	21.2	--	--
TOTAL✳	434.0	34,104	30,299

✳QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED

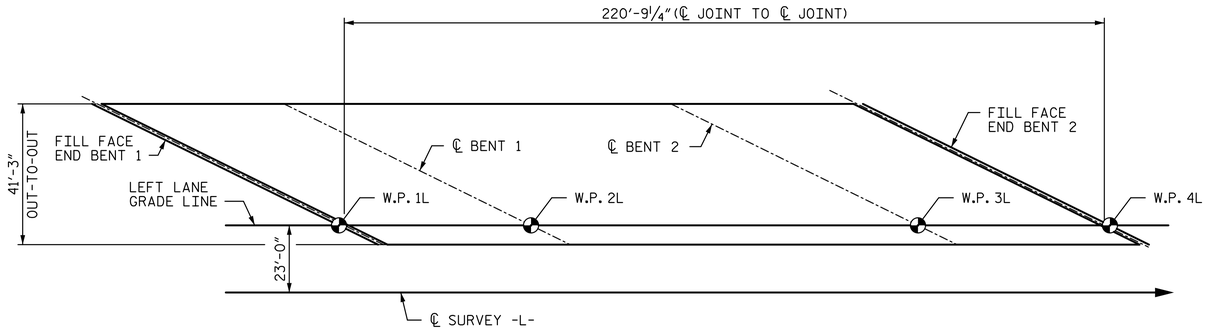
GROOVING BRIDGE FLOORS

APPROACH SLABS	1,591 SQ.FT.
BRIDGE DECK	7,642 SQ.FT.
TOTAL	9,233 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 9,107)

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SUPERSTRUCTURE BILL OF MATERIAL

-LEFT LANE-

DRAWN BY : CLG DATE : 6-14
CHECKED BY : AJP DATE : 6-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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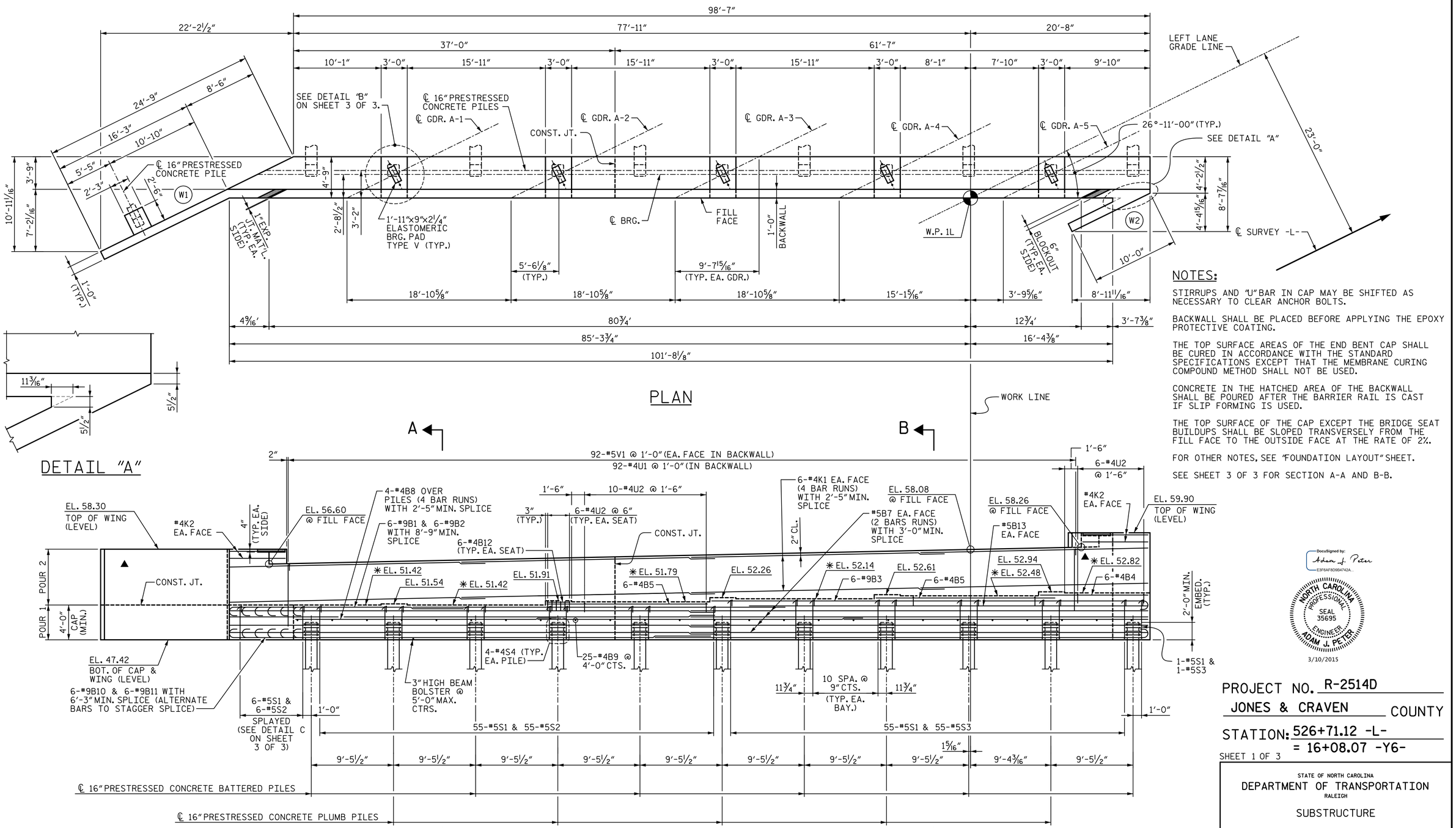
1			3		
2			4		

SHEET NO. S11-23

TOTAL SHEETS 38



PLAN

DETAIL "A"

ELEVATION

(WING WALL PILE NOT SHOWN FOR CLARITY)

▲ REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 2 OF 3.

✳ SEE SECTION A-A ON SHEET 3 OF 3 FOR LOCATION OF ELAVATIONS BETWEEN BRIDGE SEATS.

WORK LINE

NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

CONCRETE IN THE HATCHED AREA OF THE BACKWALL SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

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

FOR OTHER NOTES, SEE "FOUNDATION LAYOUT" SHEET.

SEE SHEET 3 OF 3 FOR SECTION A-A AND B-B.

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

-LEFT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-24
1			3			TOTAL SHEETS
2			4			38

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: P. KELLY	DATE : 6-14
CHECKED BY : PEK	DATE : 6-14		

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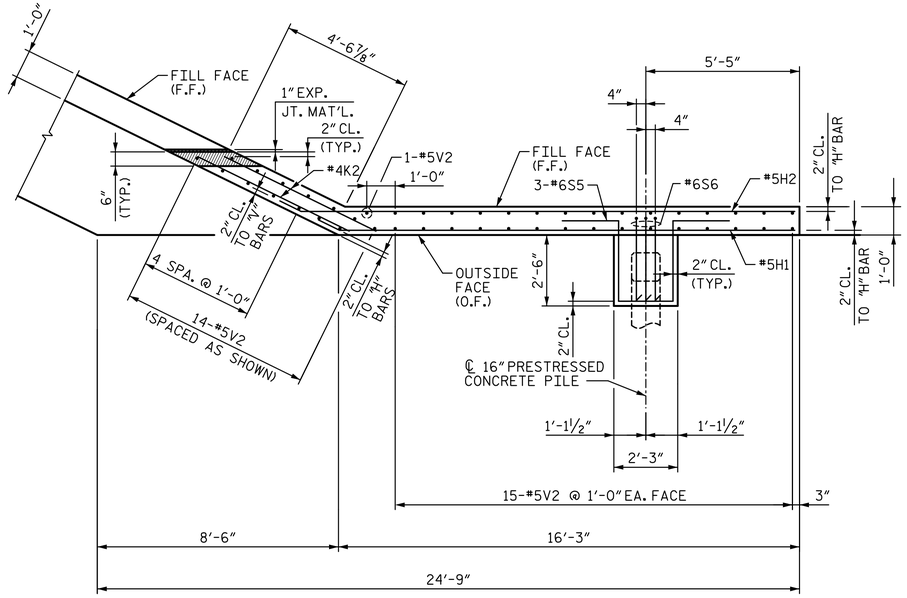
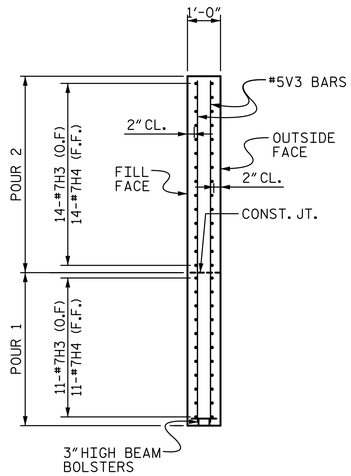
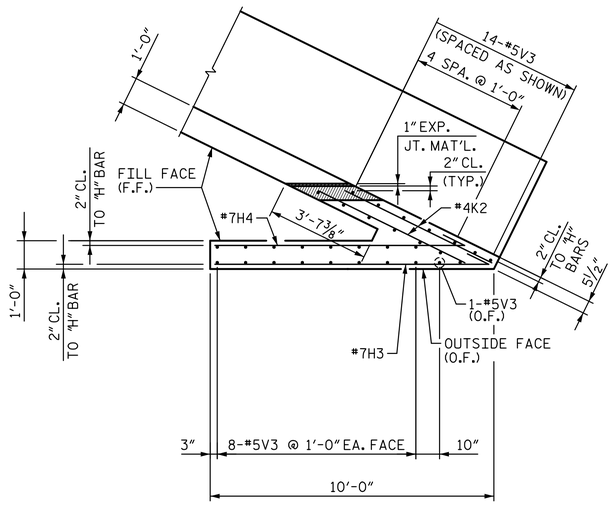


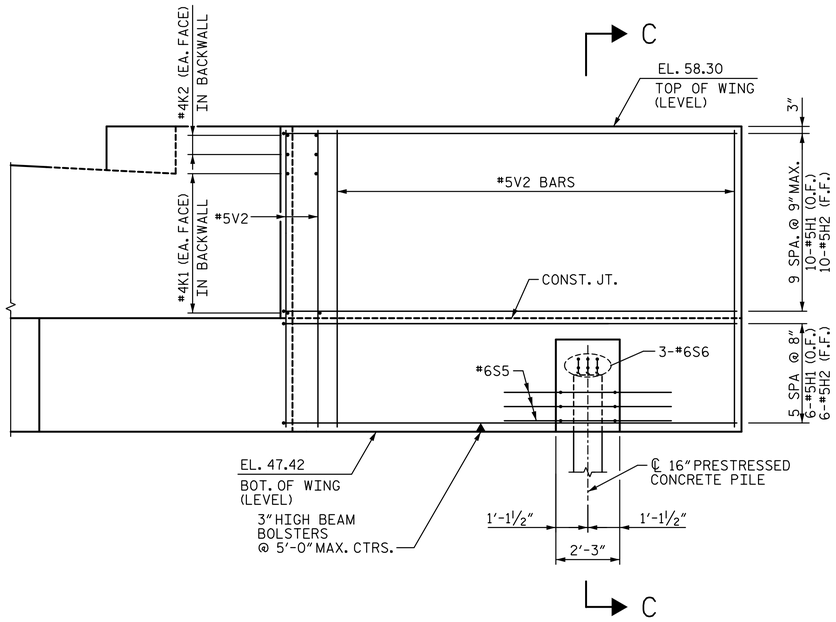
PLAN (W1)



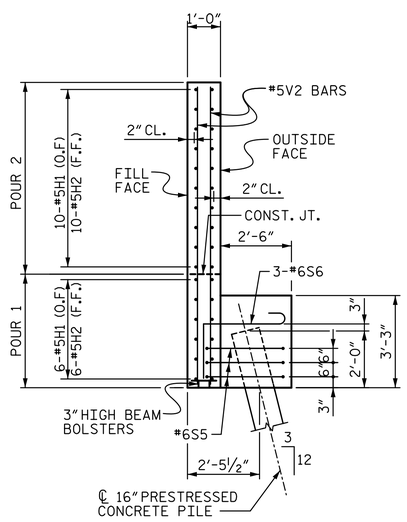
SECTION D-D



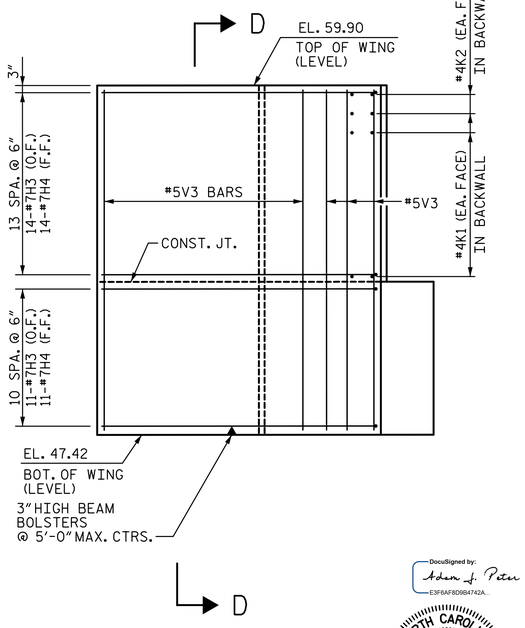
PLAN (W2)



ELEVATION (W1)



SECTION C-C



ELEVATION (W2)

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3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

-LEFT LANE-

DRAWN BY : VMW	DATE : 6/14	DESIGN ENGINEER OF RECORD: P. KELLY	DATE : 6-14
CHECKED BY : PEK	DATE : 6/14		

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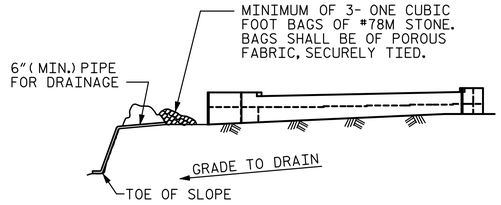
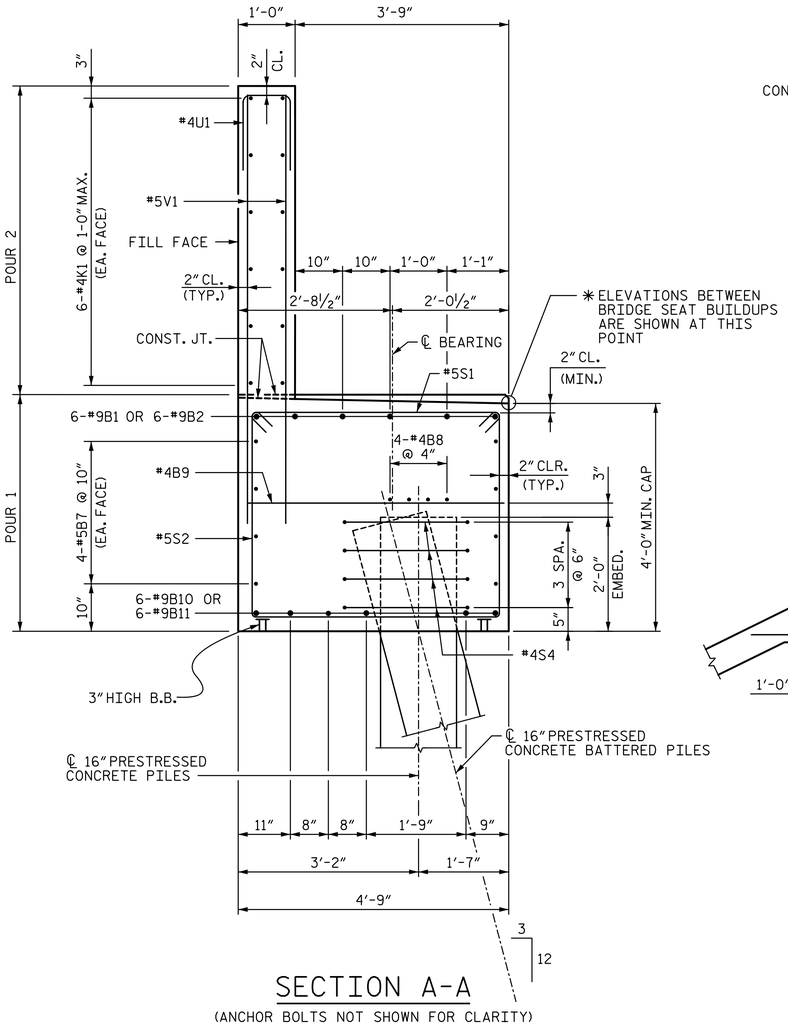


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

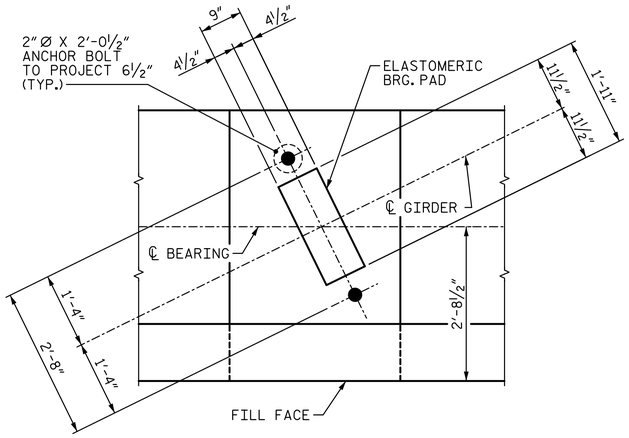
TEMPORARY DRAINAGE AT END BENT



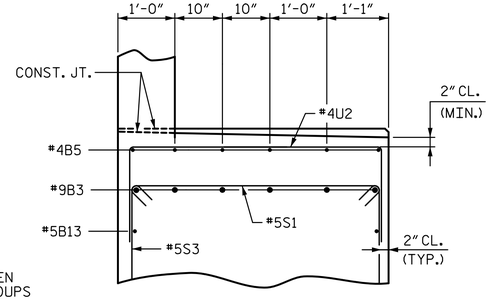
✱ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS ARE SHOWN AT THIS POINT

SECTION A-A

(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

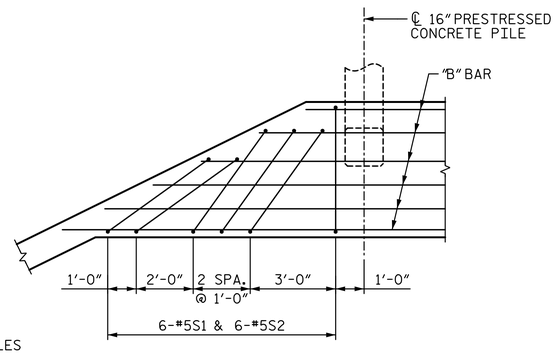


DETAIL "B"



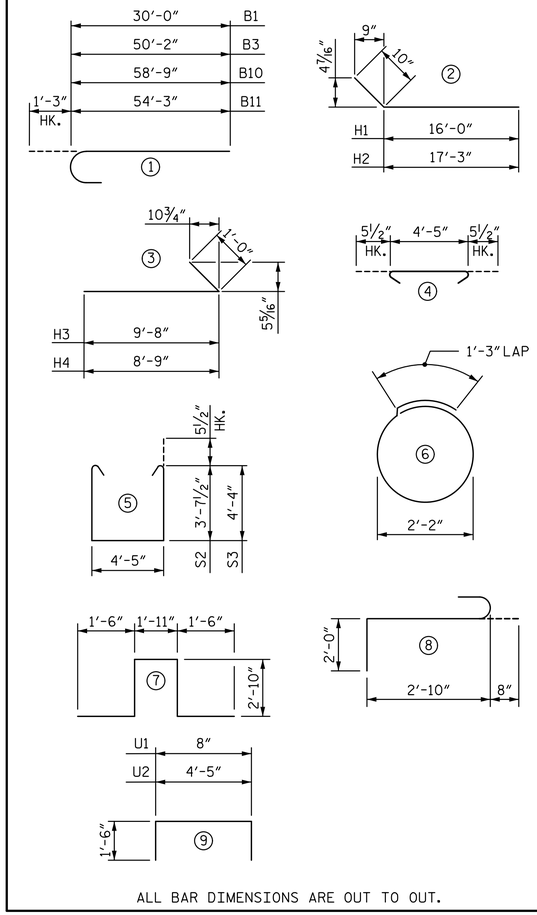
PARTIAL SECTION B-B

(ANCHOR BOLTS NOT SHOWN FOR CLARITY)



DETAIL "C"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF REINFORCING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	①	31'-3"	638
B2	6	#9	STR	44'-5"	906
B3	6	#9	①	51'-5"	1,049
B4	6	#4	STR	12'-4"	49
B5	12	#4	STR	21'-6"	172
B7	16	#5	STR	54'-9"	914
B8	16	#4	STR	27'-2"	290
B9	25	#4	STR	4'-5"	74
B10	6	#9	①	60'-0"	1,224
B11	6	#9	①	55'-6"	1,132
B12	30	#4	STR	2'-8"	53
B13	2	#5	STR	45'-0"	94
H1	16	#5	②	16'-10"	281
H2	16	#5	②	18'-1"	302
H3	25	#7	③	10'-8"	545
H4	25	#7	③	9'-9"	498
K1	48	#4	STR	28'-9"	922
K2	8	#4	STR	5'-10"	31
S1	117	#5	④	5'-4"	651
S2	61	#5	⑤	12'-7"	801
S3	56	#5	⑤	14'-0"	818
S4	44	#4	⑥	8'-1"	238
S5	3	#6	⑦	10'-7"	48
S6	3	#6	⑧	5'-6"	25
U1	92	#4	⑨	3'-8"	225
U2	56	#4	⑨	7'-5"	277
V1	184	#5	STR	8'-9"	1,679
V2	45	#5	STR	10'-5"	489
V3	31	#5	STR	12'-0"	388

QUANTITIES

		END BENT 1
REINFORCING STEEL	LBS.	14,814
CLASS A CONCRETE		
POUR 1 (CAP & LOWER WING)	: CU. YARDS	86.3
POUR 2 (BACKWALL & UPPER WING)	: CU. YARDS	28.1
TOTAL	: CU. YARDS	114.4
16" PRESTRESSED CONCRETE PILES	(NO.)	12
	LIN. FEET	720.0
PILE REDRIVES	EA.	6

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 3 OF 3

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

-LEFT LANE-

DRAWN BY : VMW DATE : 6-14
CHECKED BY : PEK DATE : 6-14

DESIGN ENGINEER OF RECORD: P. KELLY DATE : 6-14

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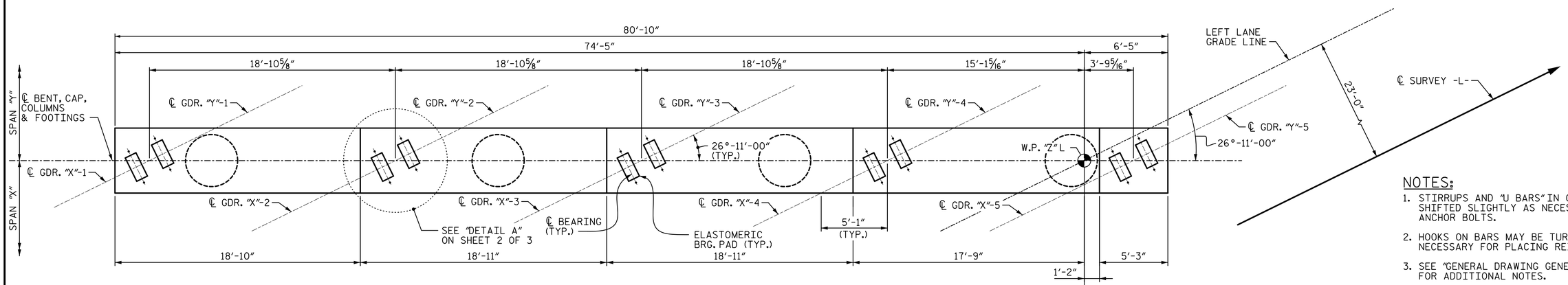
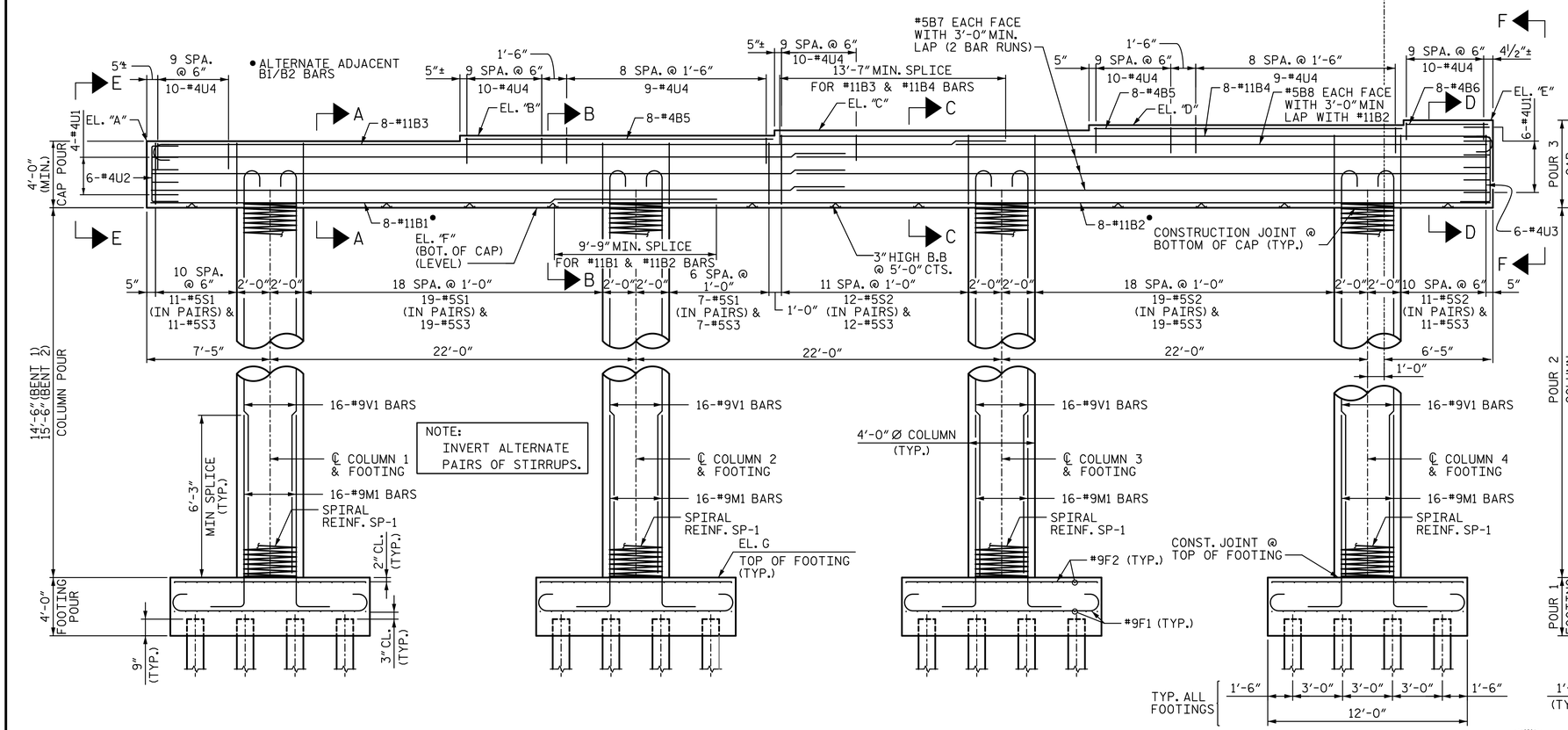


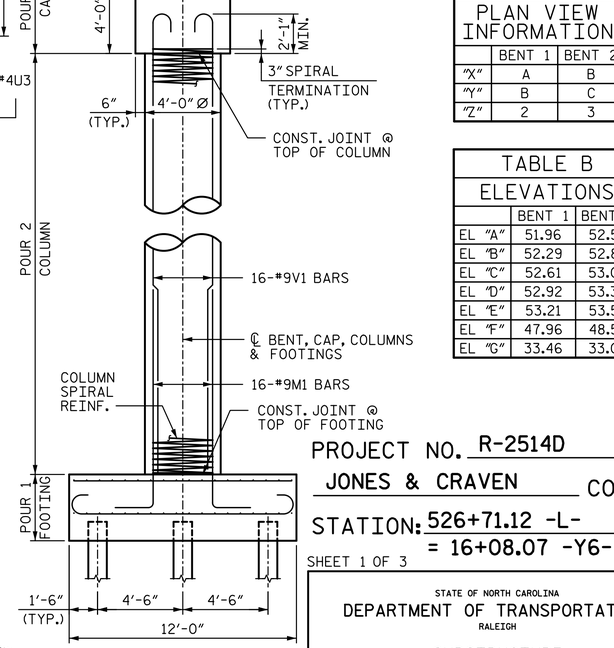
PLAN

NOTES:

1. STIRRUPS AND "U BARS" IN CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
2. HOOKS ON BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
3. SEE "GENERAL DRAWING GENERAL NOTES" SHEET FOR ADDITIONAL NOTES.
4. SEE SHEET 2 OF 3 FOR SECTIONS CALLED OUT ON ELEVATION VIEW AND DETAIL A.



ELEVATION



END VIEW

TABLE A

PLAN VIEW INFORMATION

	BENT 1	BENT 2
"X"	A	B
"Y"	B	C
"Z"	2	3

TABLE B

ELEVATIONS

	BENT 1	BENT 2
EL "A"	51.96	52.57
EL "B"	52.29	52.83
EL "C"	52.61	53.07
EL "D"	52.92	53.30
EL "E"	53.21	53.52
EL "F"	47.96	48.57
EL "G"	33.46	33.07

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SHEET 1 OF 3

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3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 & 2
PLAN & ELEVATION

-LEFT LANE-

DRAWN BY : ACA DATE : 5-14
CHECKED BY : TJT DATE : 6-14

DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 6-14

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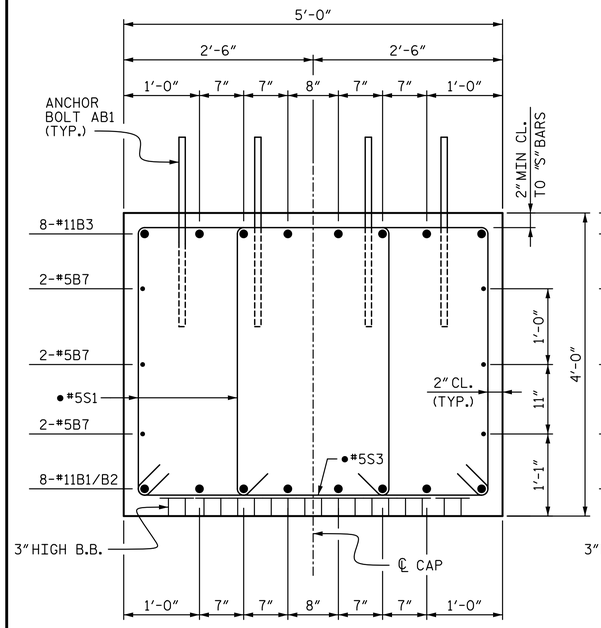
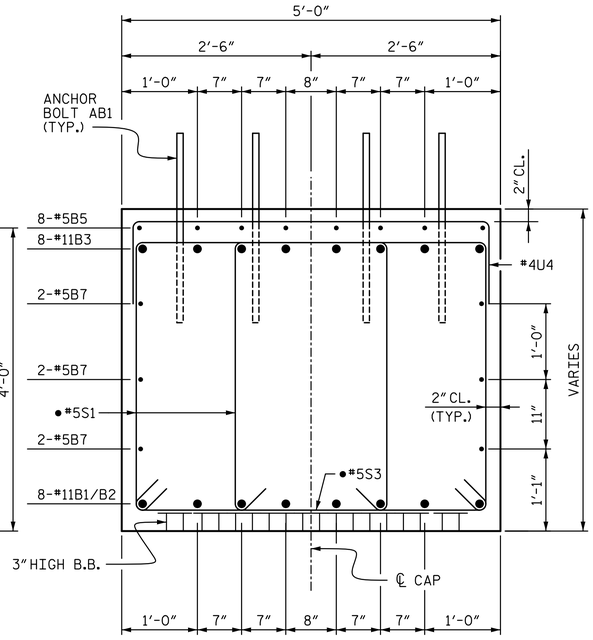
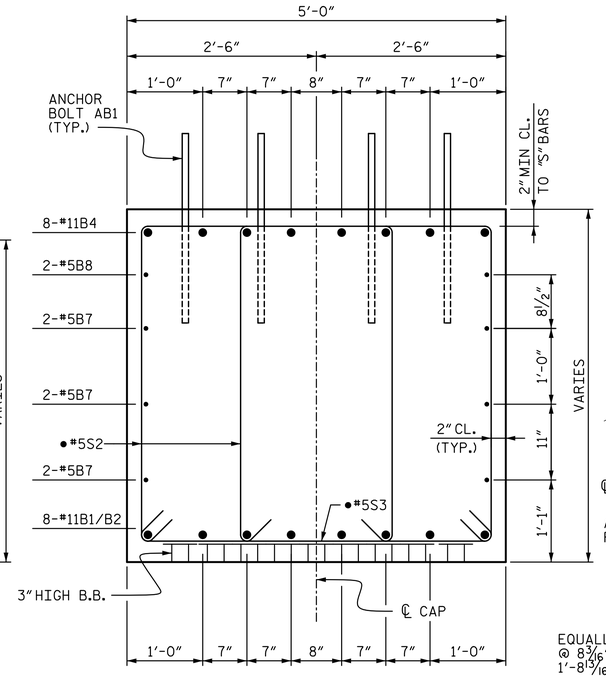


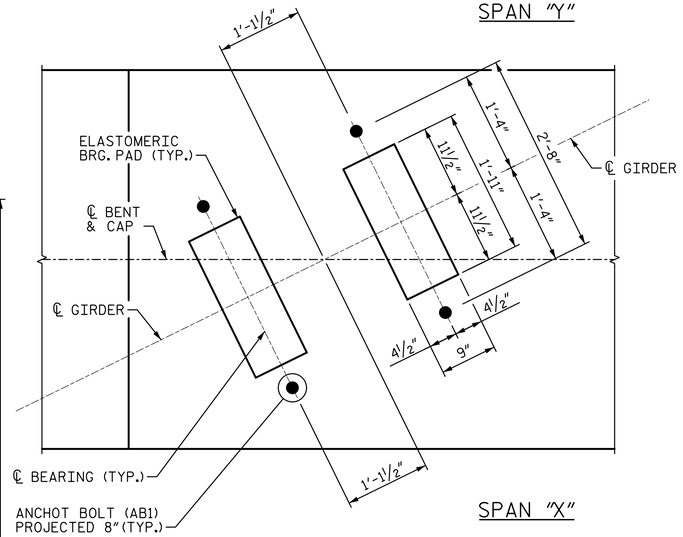
SECTION A-A



SECTION B-B



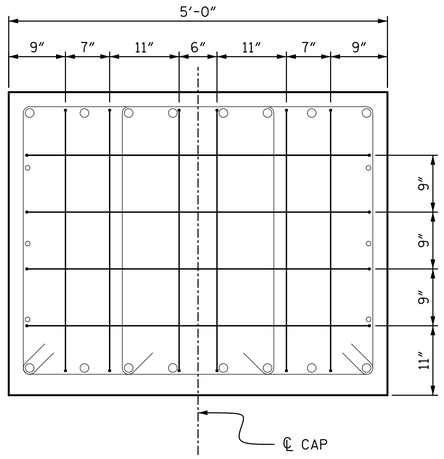
SECTION C-C



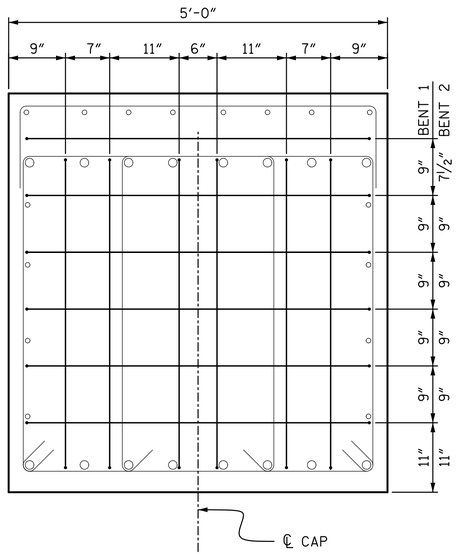
DETAIL "A"

SECTION D-D

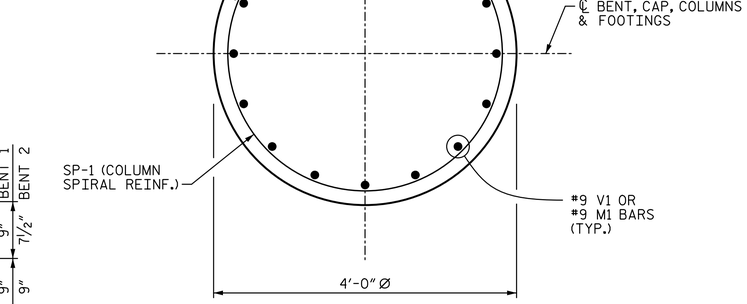
● INVERT ALTERNATE PAIRS OF STIRRUPS AND CAP WITH S3 BAR



VIEW E-E



VIEW F-F



TYPICAL SECTION THROUGH COLUMN

NOTE:

1. FOR "AB1" ANCHOR BOLTS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 & 2 DETAILS

-LEFT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J PETER

3/10/2015

DRAWN BY : ACA	DATE : 5-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
CHECKED BY : TJT	DATE : 6-14		

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2			4			38

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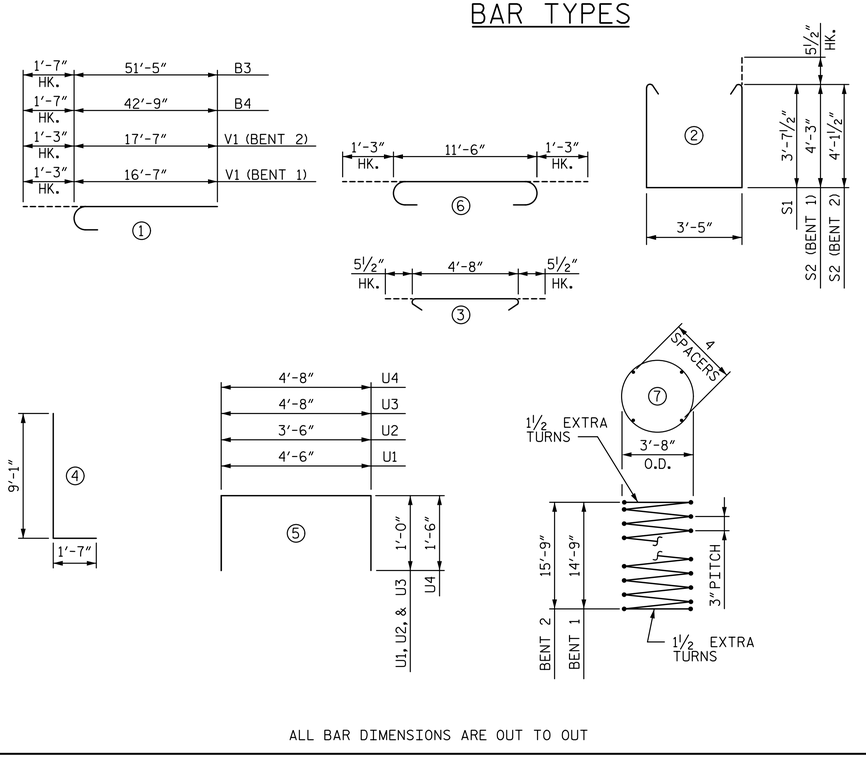
QUANTITIES

			BENT 1	BENT 2
REINFORCING STEEL		LBS.	29,548	29,743
SPIRAL REINFORCING STEEL		LBS.	1,887	2,009
CLASS A CONCRETE :	POUR 1 - FOOTINGS	CU. YDS.	85.4	85.4
	POUR 2 - COLUMNS	CU. YDS.	27.0	28.9
	POUR 3 - CAP	CU. YDS.	67.9	66.0
	TOTAL	CU. YDS.	180.3	180.3
12" SQUARE PRESTRESSED CONCRETE PILES				
	NUMBER	NO.	40	40
	LENGTH	FT.	1,400	1,600
PILE REDRIVES		EA.	10	10

BAR TYPES



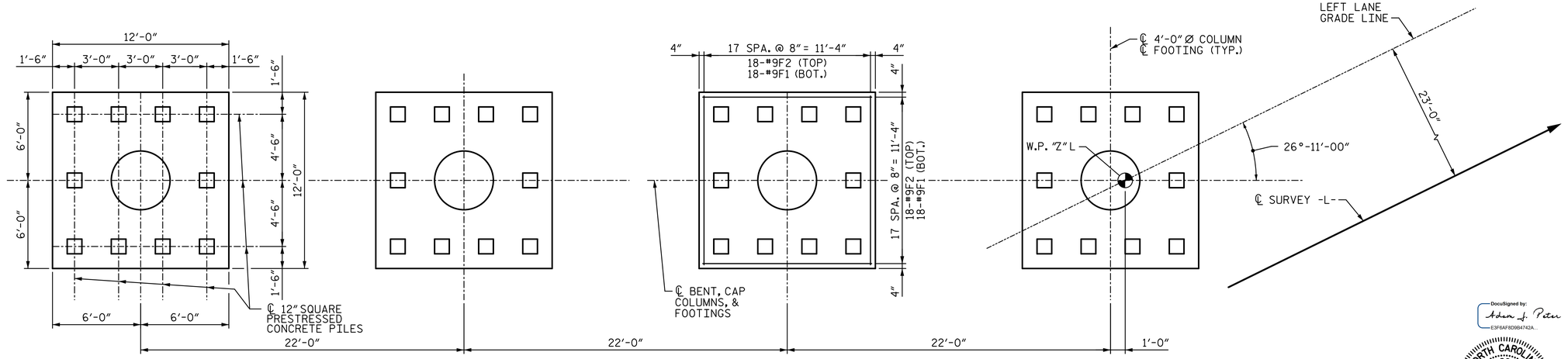
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE BENT (2 REQUIRED)

	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
	B1	8	#11	STR.	34'-2"	1,452
	B2	8	#11	STR.	56'-2"	1,537
	B3	8	#11	①	53'-0"	2,253
	B4	8	#11	①	44'-4"	1,884
	B5	16	#4	STR.	18'-11"	202
	B6	8	#4	STR.	4'-11"	26
	B7	12	#5	STR.	41'-9"	523
	B8	2	#5	STR.	32'-2"	67
	S1	74	#5	②	11'-7"	894
	S3	79	#5	③	5'-7"	460
	F1	144	#9	⑥	14'-2"	6,854
	F2	144	#9	STR.	11'-6"	5,630
	U1	10	#4	⑤	6'-6"	43
	U2	6	#4	⑤	5'-6"	22
	U3	6	#4	⑤	6'-8"	27
	U4	68	#4	⑤	7'-8"	348
	M1	64	#9	④	10'-8"	2,321
BENT 1	V1	64	#9	①	17'-10"	3,881
BENT 1	S2	84	#5	②	12'-10"	1,124
BENT 1	SP-1	4	✳	⑦	706'-3"	1,887
BENT 2	V1	64	#9	①	18'-10"	4,098
BENT 2	S2	84	#5	②	12'-7"	1,102
BENT 2	SP-1	4	✳	⑦	751'-10"	2,009

✳ THE SP-1 SPIRAL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR WITH A 3" PITCH.



PLAN OF PILE FOOTINGS

PILE LAYOUT, REINFORCING STEEL, AND FOOTING DIMENSIONS TYPICAL AT EACH FOOTING

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-

= 16+08.07 -Y6-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 & 2 DETAILS & QUANTITIES

-LEFT LANE-

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 6-14

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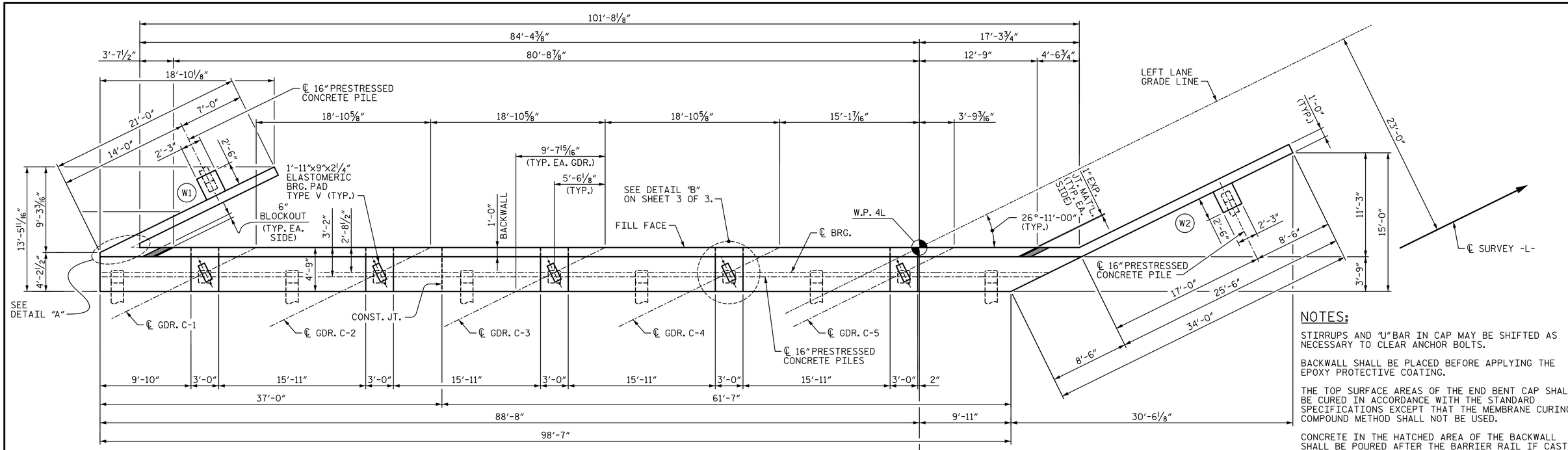
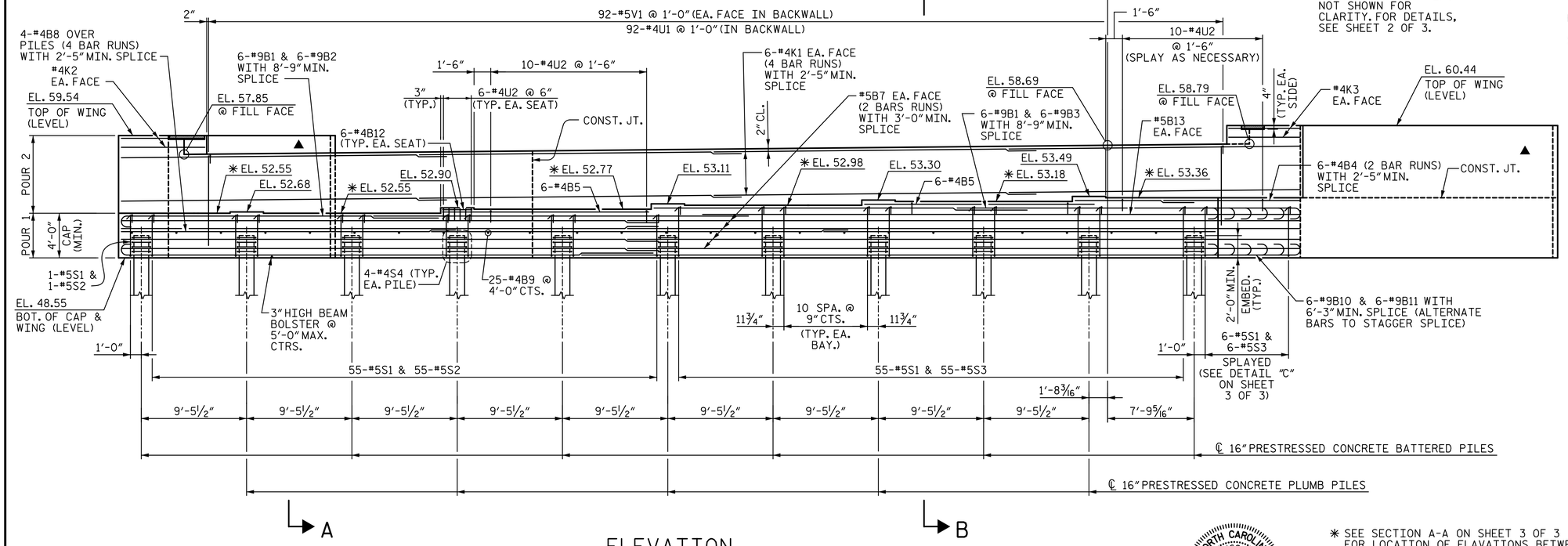


PLAN



ELEVATION

(WING WALL PILES NOT SHOWN FOR CLARITY)

▲ REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 2 OF 3.

✳ SEE SECTION A-A ON SHEET 3 OF 3 FOR LOCATION OF ELAVATIONS BETWEEN BRIDGE SEATS.

NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

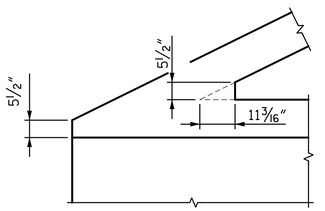
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

CONCRETE IN THE HATCHED AREA OF THE BACKWALL SHALL BE POURED AFTER THE BARRIER RAIL IF CAST IF SLIP FORMING IS USED.

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

FOR OTHER NOTES, SEE "FOUNDATION LAYOUT" SHEET.

SEE SHEET 3 OF 3 FOR SECTION A-A AND B-B.



DETAIL "A"

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

-LEFT LANE-

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3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

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DESIGN ENGINEER OF RECORD: P. KELLY DATE : 6-14

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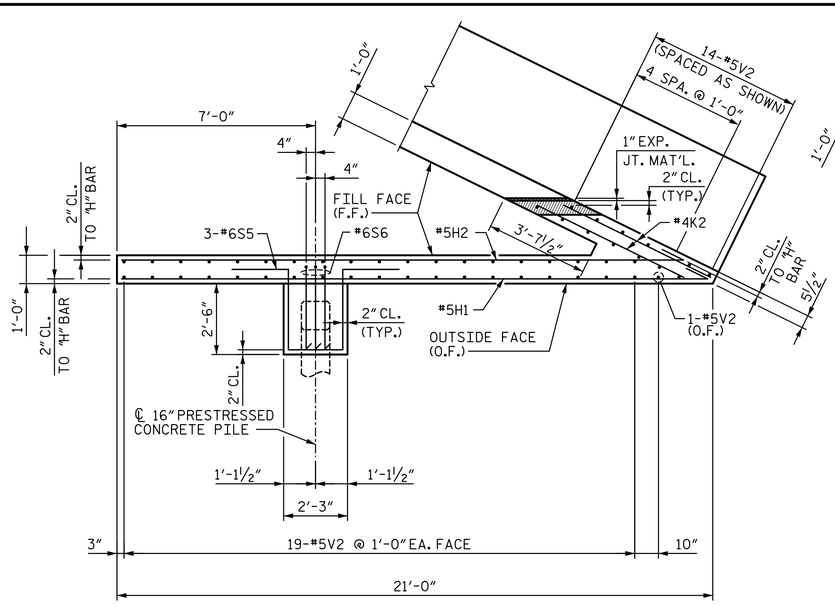
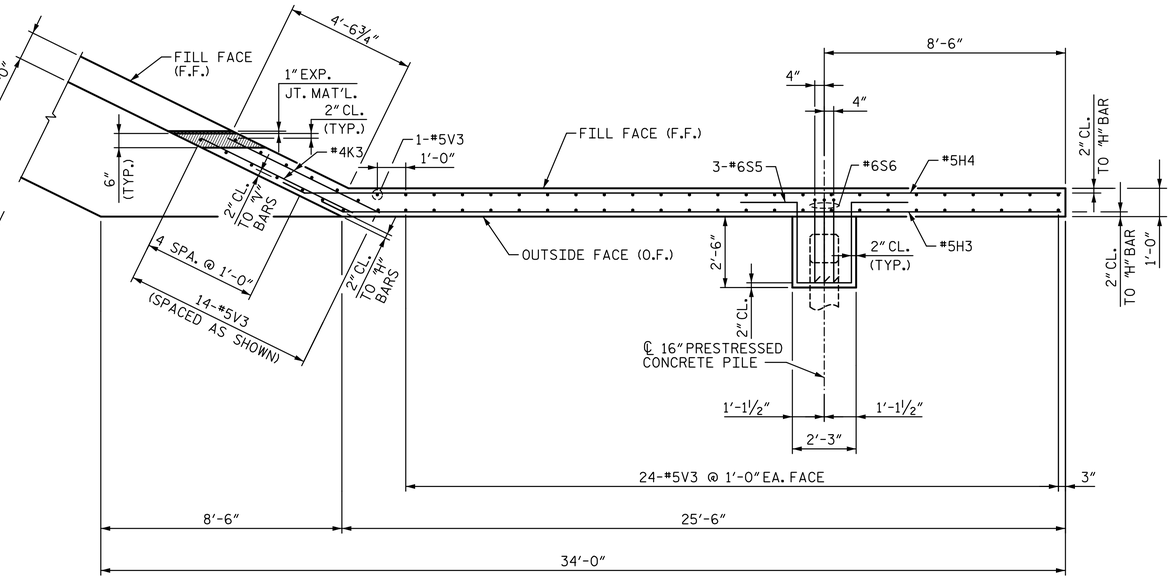
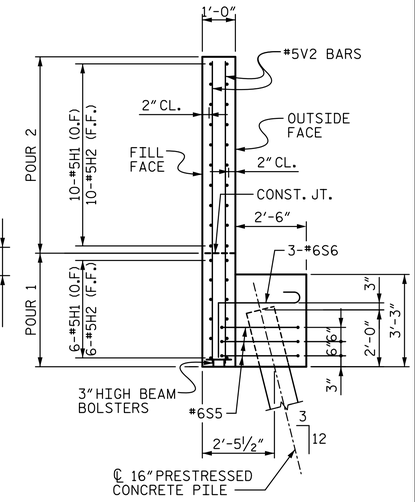


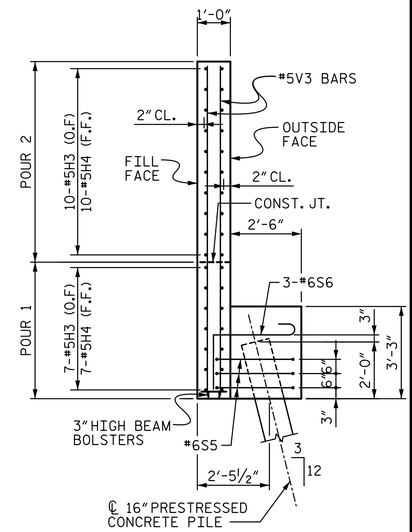
PLAN (W1)



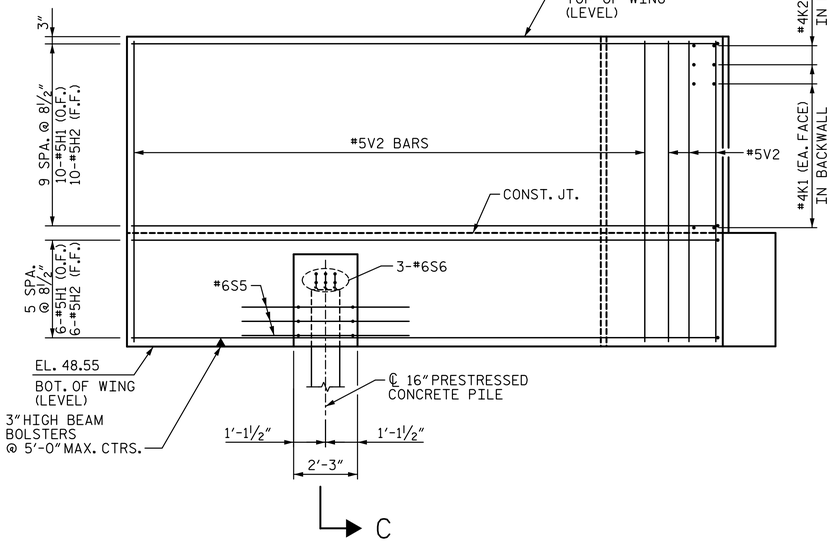
PLAN (W2)



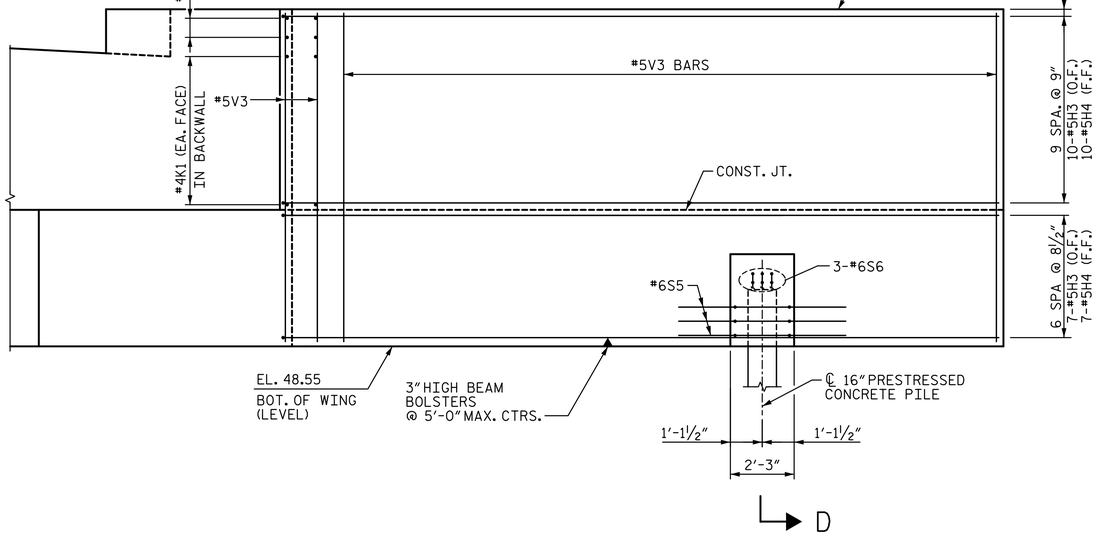
SECTION C-C



SECTION D-D



ELEVATION (W1)



ELEVATION (W2)

DocuSigned by:
Adam J. Peter
E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

-LEFT LANE-

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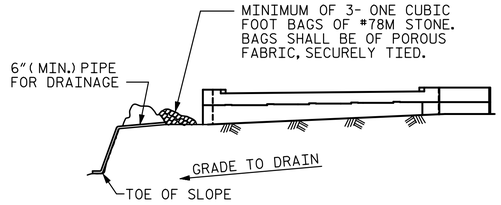
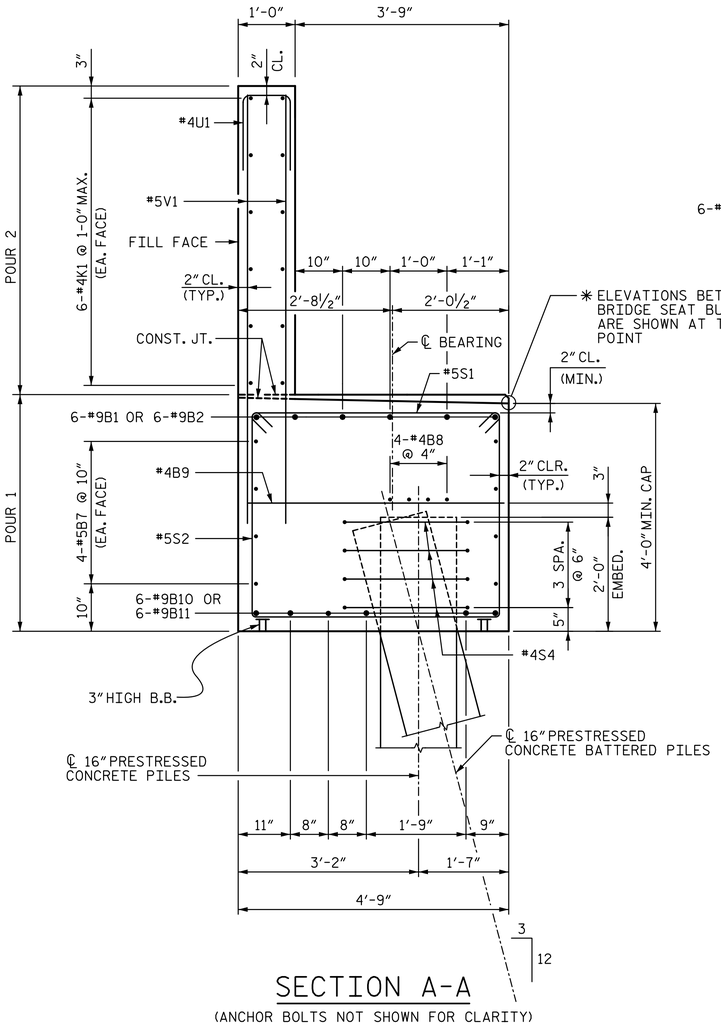


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

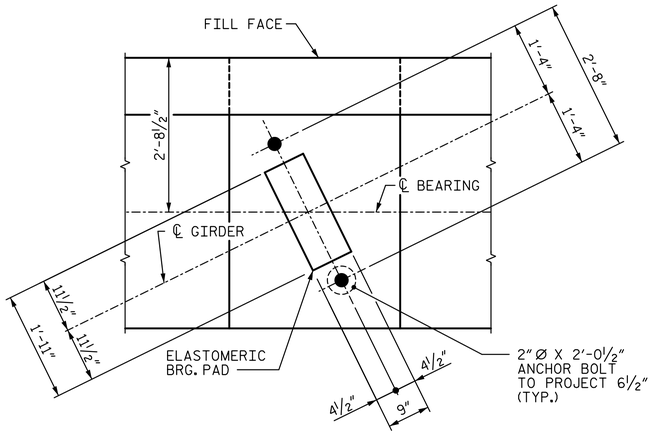
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

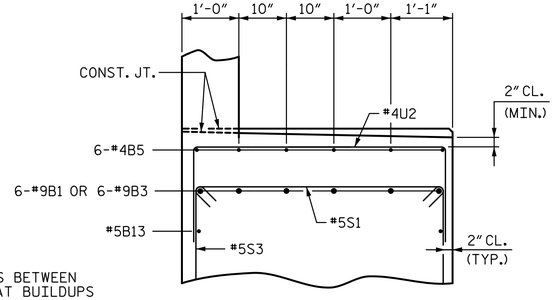


SECTION A-A

(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

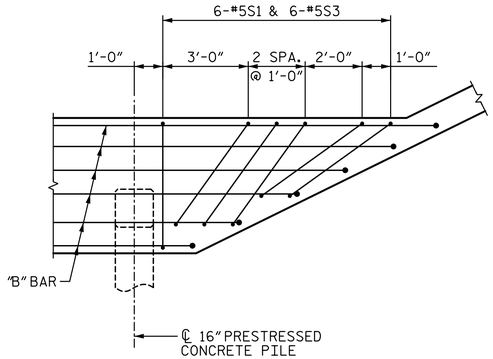


DETAIL "B"



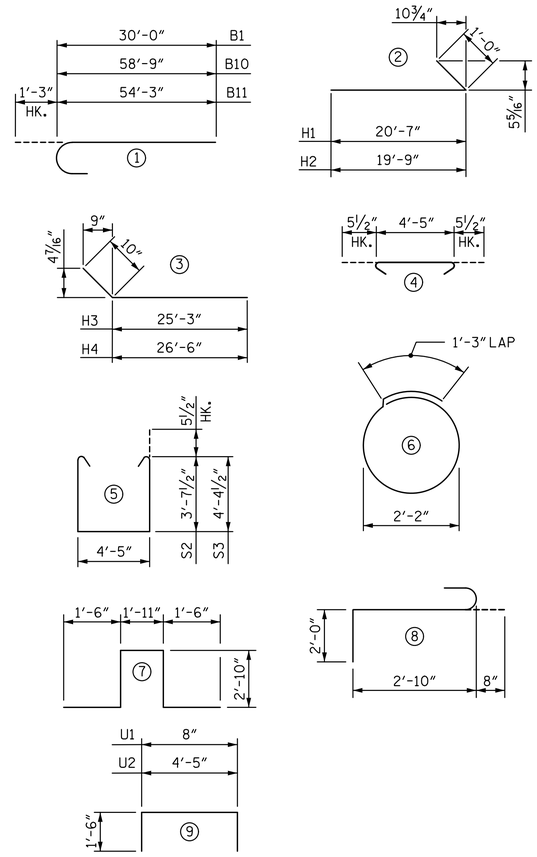
PARTIAL SECTION B-B

(ANCHOR BOLTS NOT SHOWN FOR CLARITY)



DETAIL "C"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF REINFORCING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	①	31'-3"	1,275
B2	6	#9	STR	28'-6"	581
B3	6	#9	STR	38'-9"	791
B4	12	#4	STR	12'-4"	99
B5	12	#4	STR	21'-6"	172
B7	16	#5	STR	54'-9"	914
B8	16	#4	STR	27'-2"	290
B9	25	#4	STR	4'-5"	74
B10	6	#9	①	60'-0"	1,224
B11	6	#9	①	55'-6"	1,132
B12	30	#4	STR	2'-8"	53
B13	2	#5	STR	60'-0"	125
H1	16	#5	②	21'-7"	360
H2	16	#5	②	20'-9"	346
H3	17	#5	③	26'-1"	462
H4	17	#5	③	27'-4"	485
K1	48	#4	STR	28'-6"	914
K2	4	#4	STR	5'-10"	16
K3	4	#4	STR	6'-0"	16
S1	117	#5	④	5'-4"	651
S2	56	#5	⑤	12'-7"	735
S3	61	#5	⑤	14'-1"	896
S4	44	#4	⑥	8'-1"	238
S5	6	#6	⑦	10'-7"	95
S6	6	#6	⑧	5'-6"	50
U1	92	#4	⑨	3'-8"	225
U2	60	#4	⑨	7'-5"	297
V1	184	#5	STR	8'-9"	1,679
V2	53	#5	STR	10'-6"	580
V3	63	#5	STR	11'-5"	750

QUANTITIES

	END BENT 2
REINFORCING STEEL LBS.	15,525
CLASS A CONCRETE	
POUR 1 (CAP & LOWER WING) : CU. YARDS	87.4
POUR 2 (BACKWALL & UPPER WING) : CU. YARDS	21.6
TOTAL : CU. YARDS	109.0
16" PRESTRESSED CONCRETE PILES (NO.)	13
LIN. FEET	975.0
PILE REDRIVES EA.	6

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 3 OF 3

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

-LEFT LANE-

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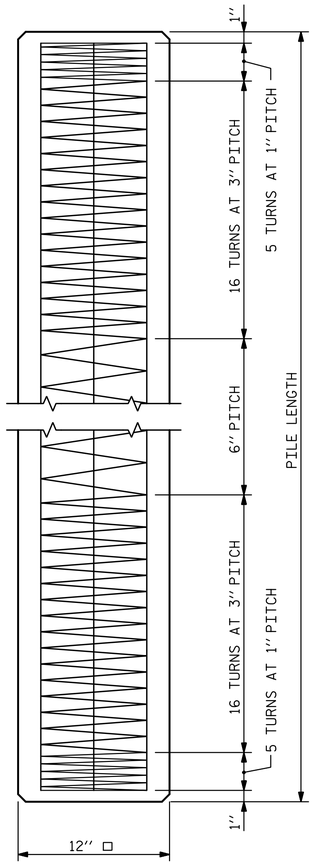

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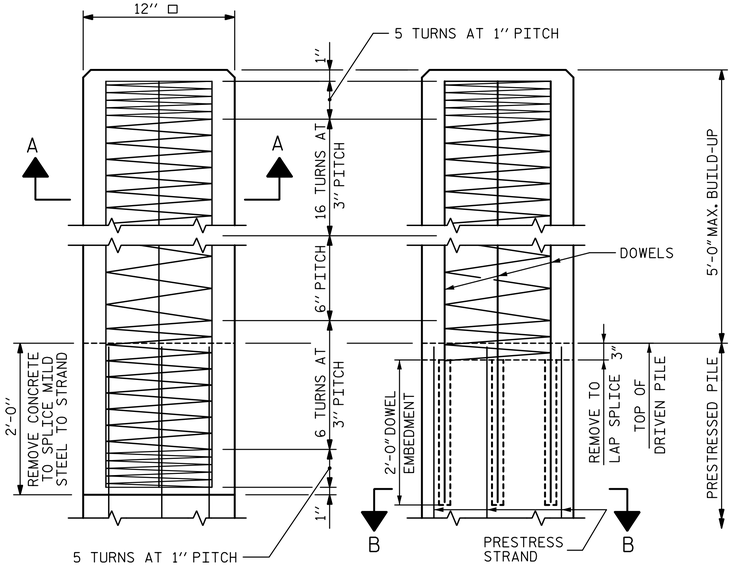
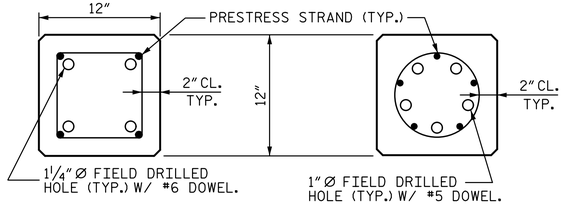


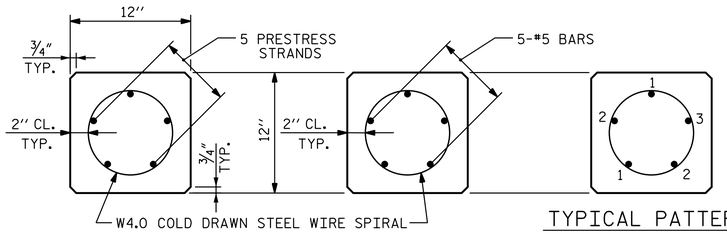
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



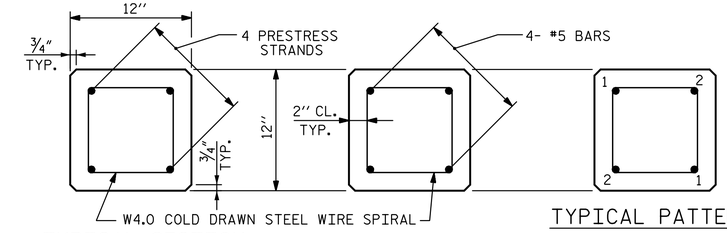
SECTION ''B-B''

(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



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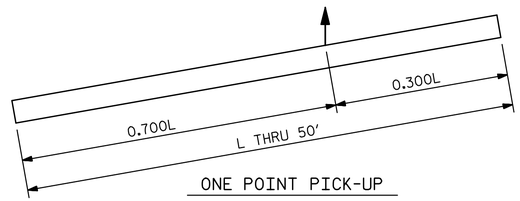
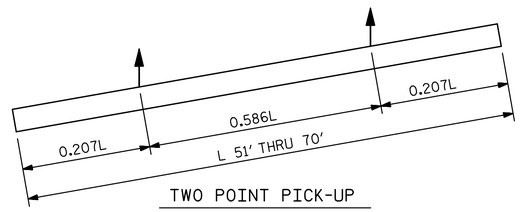


ONE POINT PICK-UP



TWO POINT PICK-UP

PICK-UP POINTS

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.

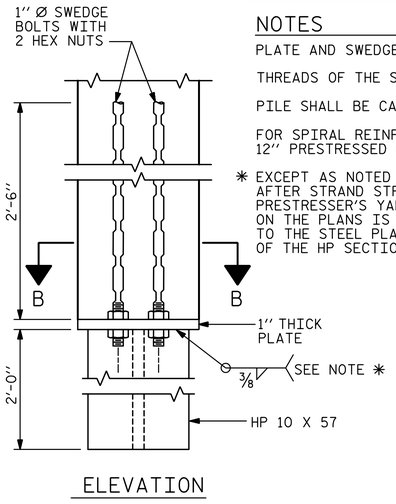
DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN ½'' CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

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.

STEEL PILE TIP DETAILS



ELEVATION

NOTES

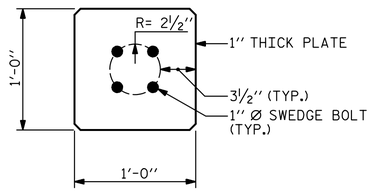
PLATE AND SWEDGE BOLTS SHALL MEET THE REQUIREMENTS OF AASHTO M270 GRADE 36.

THREADS OF THE SWEDGE BOLTS SHALL BE BURRED AT THE FACE OF THE NUT.

PILE SHALL BE CAST WITH SWEDGE BOLTS AND PLATE IN PLACE.

FOR SPIRAL REINFORCING AND PRESTRESSING STRAND DETAILS, SEE STANDARD 12'' PRESTRESSED CONCRETE PILE ELEVATION AND TYPICAL SECTION.

✱ EXCEPT AS NOTED BELOW, THE HP 10 X 57 SECTION SHALL BE WELDED TO THE STEEL PLATE AFTER STRAND STRESS IS RELIEVED. THE HP 10 X 57 SECTION MAY BE WELDED IN THE PRESTRESSER'S YARD OR IN THE FIELD. WHEN A CIRCULAR STRAND PATTERN AS SHOWN ON THE PLANS IS USED, THE CONTRACTOR, AT HIS OPTION, MAY WELD THE HP 10 X 57 SECTION TO THE STEEL PLATE AT THE FABRICATION PLANT PRIOR TO PLACING THE CONCRETE. THE FLANGES OF THE HP SECTION SHALL BE PARALLEL TO THE EDGES OF THE STEEL PLATE AND CONCRETE PILE.



SECTION B-B

(HOLES FOR STRANDS NOT SHOWN)

QUANTITIES FOR ONE 12'' 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''	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''

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

DocuSigned by: Adam J. Peter
E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

12'' PRESTRESSED CONCRETE PILE

-LEFT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-33
1			3			TOTAL SHEETS
2			4			38

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NC License Number F-0991

DRAWN BY : TJT	DATE : 6-14	DESIGN ENGINEER OF RECORD: K. BAILEY	DATE : 6-14
CHECKED BY : KGB	DATE : 6-14		

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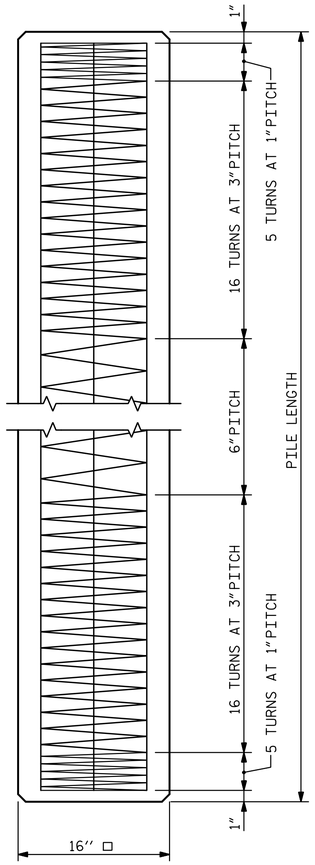
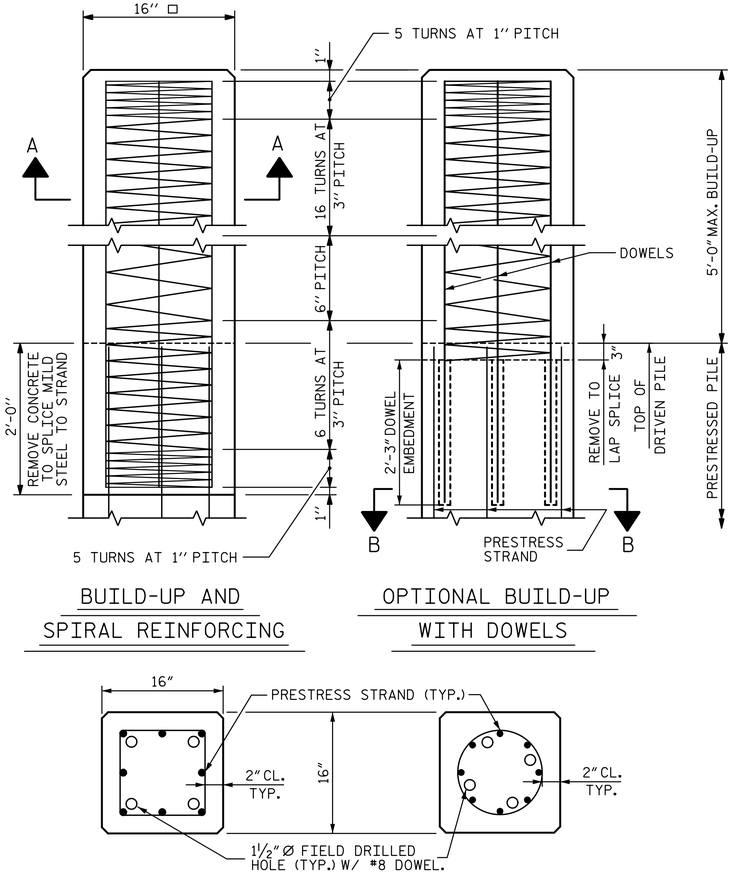


ELEVATION

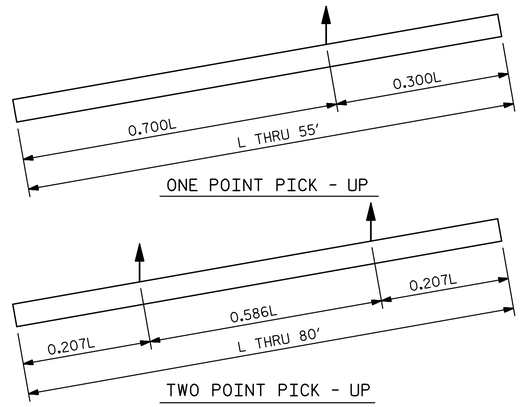


BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS

SECTION "B-B"

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



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

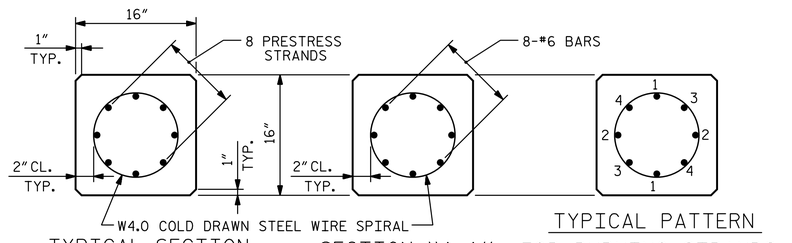
BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

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.

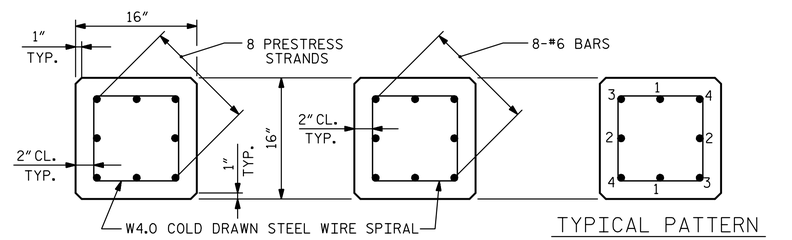


TYPICAL SECTION

SECTION "A-A"

TYPICAL PATTERN FOR BURNING STRANDS

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



TYPICAL SECTION

SECTION "A-A"

TYPICAL PATTERN FOR BURNING STRANDS

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

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

16" PRESTRESSED CONCRETE PILE

-LEFT LANE-

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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CHECKED BY : KGB DATE : 6-14

DESIGN ENGINEER OF RECORD: K. BAILEY DATE : 6-14

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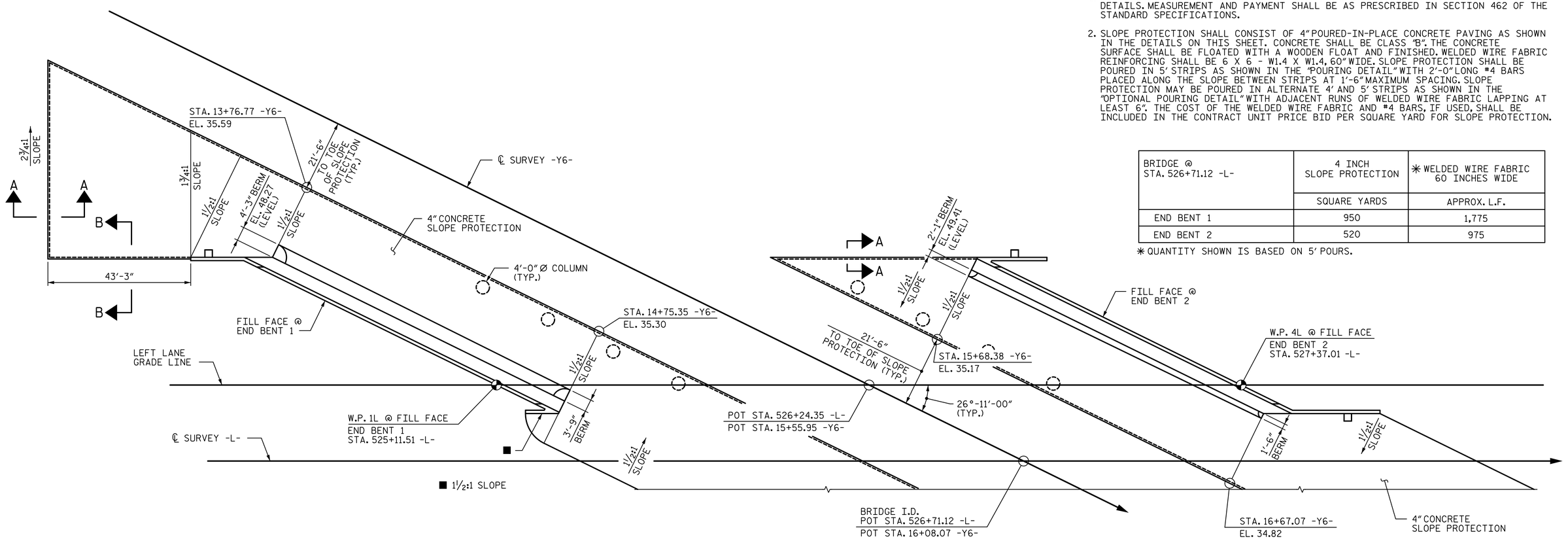
NOTES:

1. 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.

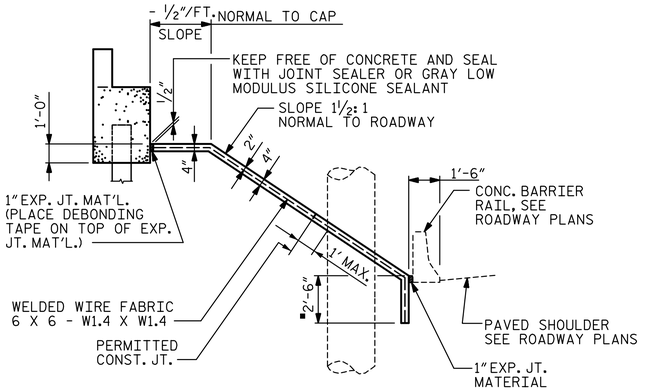
2. SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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

BRIDGE @ STA. 526+71.12 -L-	4 INCH SLOPE PROTECTION	✳ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	950	1,775
END BENT 2	520	975

✳ QUANTITY SHOWN IS BASED ON 5' POURS.

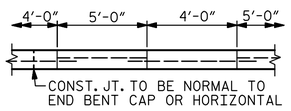


PLAN



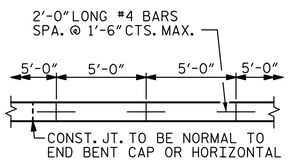
SECTION ALONG ℄ ROADWAY WITH SHOULDER PIER

■ OR TO THE TOP OF THE FOOTING



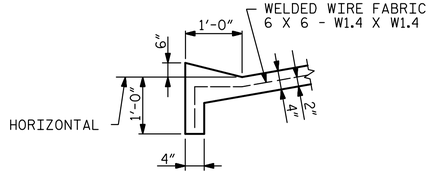
POUR A 4'-0'' STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

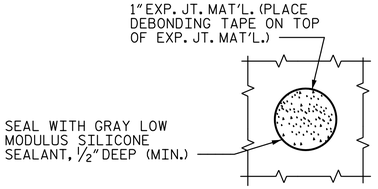


STRIP WIDTHS MAY VARY IN CURVED PORTION.

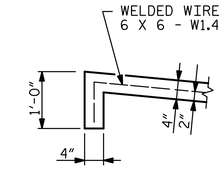
POURING DETAIL



SECTION A-A



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN



SECTION B-B

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

-LEFT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
CHECKED BY : TJT	DATE : 6-14		

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1			3			TOTAL SHEETS
2			4			38

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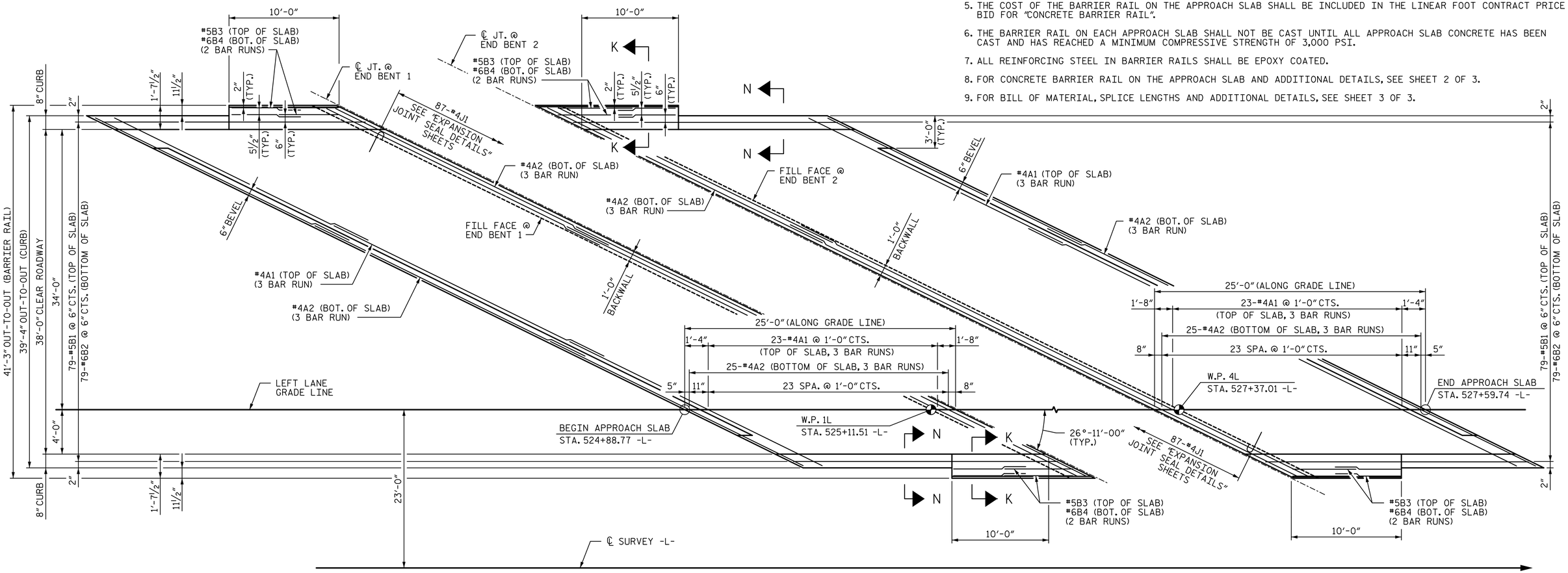
NOTES:

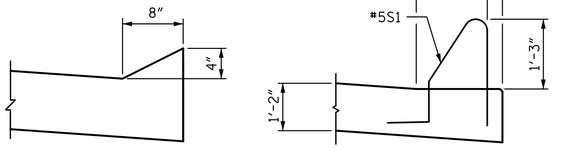
1. APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
2. FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
3. AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
4. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
5. THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".
6. 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.
7. ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
8. FOR CONCRETE BARRIER RAIL ON THE APPROACH SLAB AND ADDITIONAL DETAILS, SEE SHEET 2 OF 3.
9. FOR BILL OF MATERIAL, SPLICE LENGTHS AND ADDITIONAL DETAILS, SEE SHEET 3 OF 3.



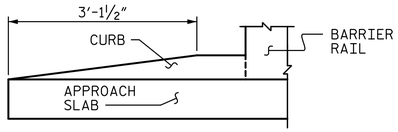
END BENT 1 END BENT 2

PLAN

(DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS)



SECTION N-N SECTION K-K



END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

-LEFT LANE-

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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1			3			TOTAL SHEETS
2			4			38

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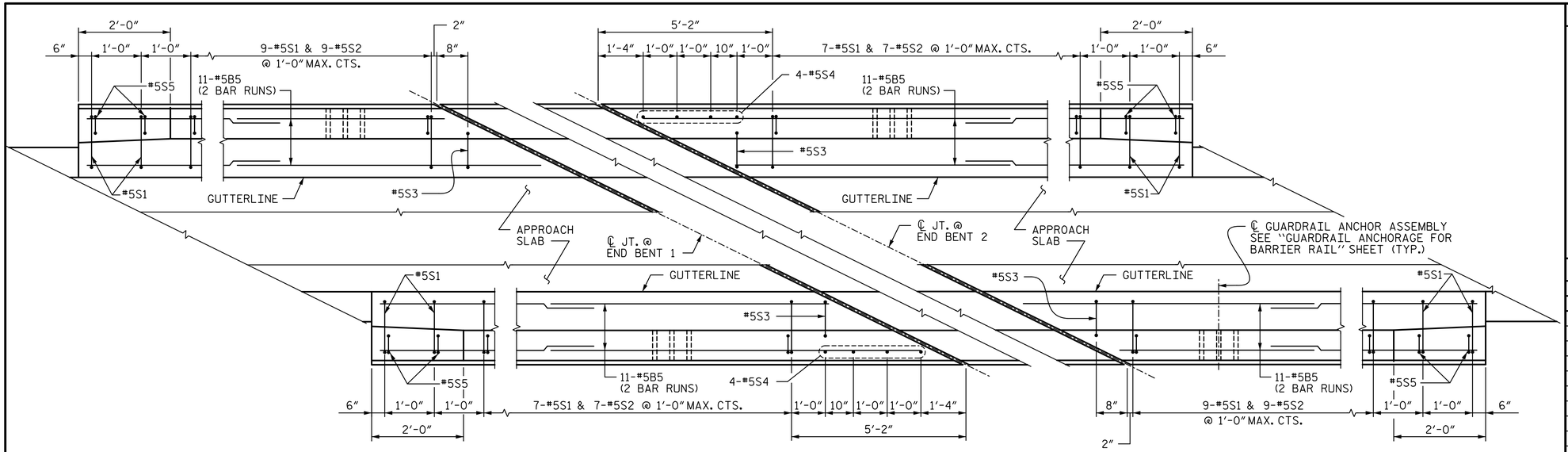
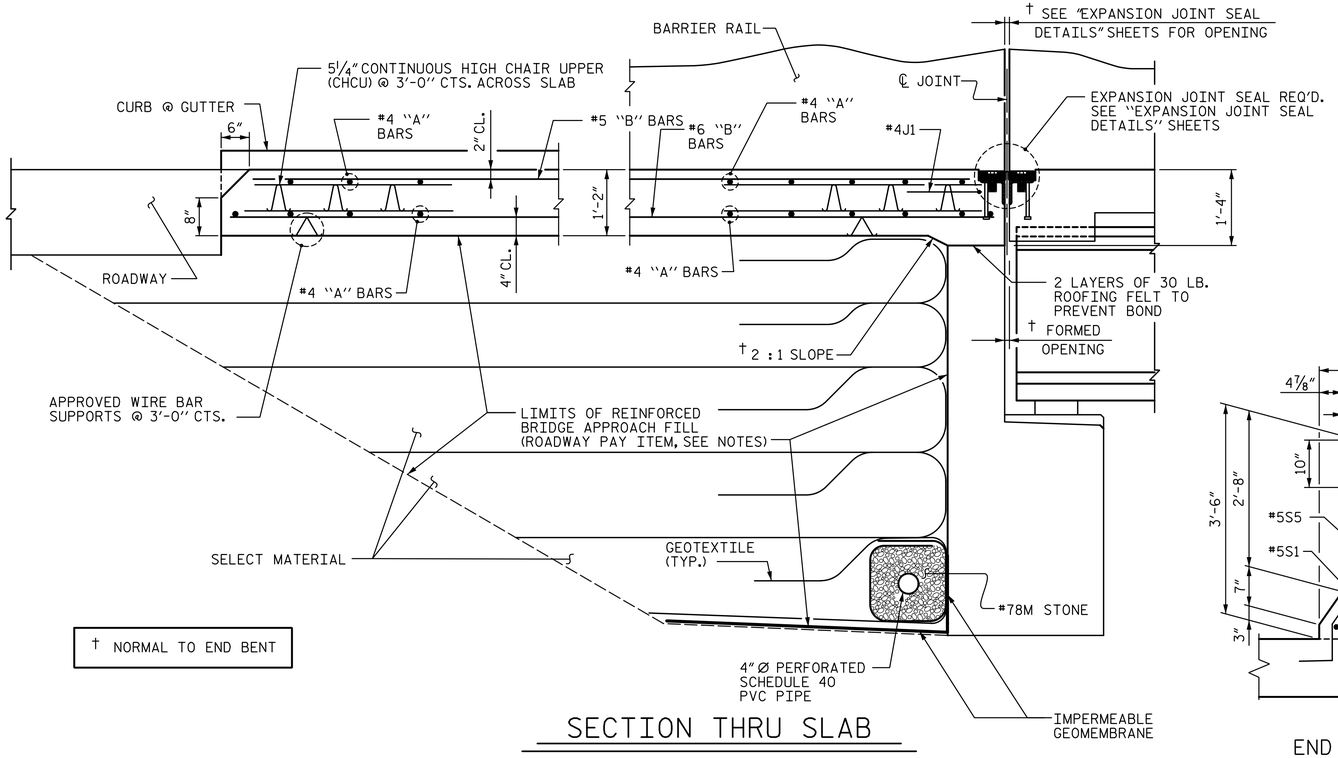


END BENT 1

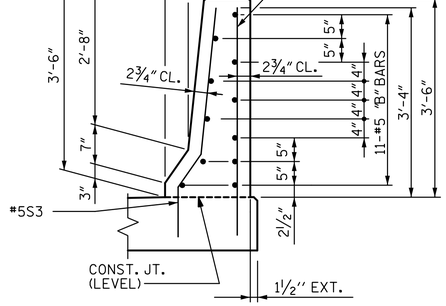
END BENT 2

PLAN OF BARRIER RAIL

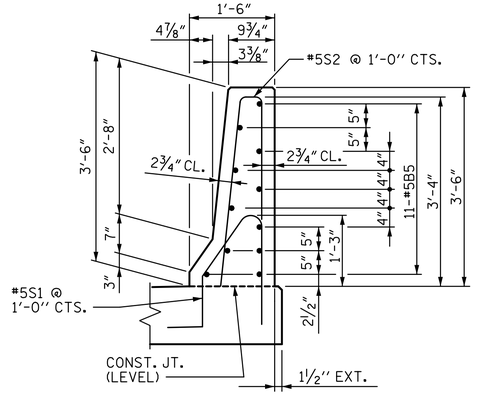


† NORMAL TO END BENT

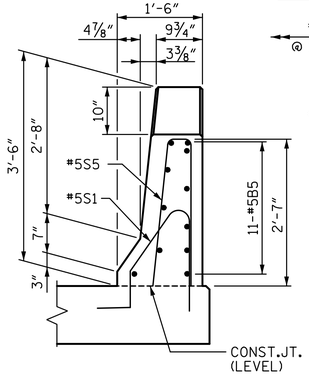
SECTION THRU SLAB



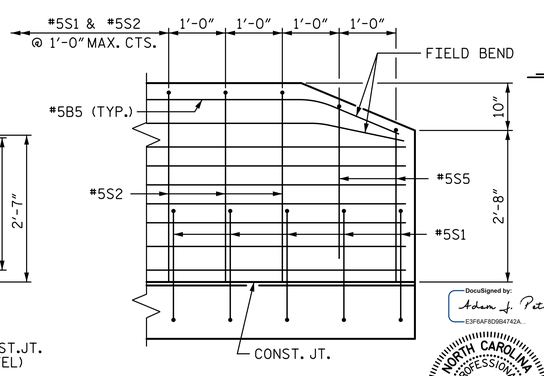
SECTION AT JOINT



SECTION THRU RAIL



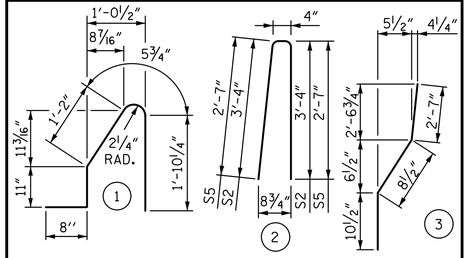
END VIEW



SIDE VIEW

END OF RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B5	88	#5	STR	7'-10"	719
✳S1	40	#5	①	5'-1"	212
✳S2	32	#5	②	7'-0"	234
✳S3	4	#5	③	4'-2"	17
✳S4	8	#5	STR	4'-0"	33
✳S5	8	#5	②	5'-6"	46

✳EPOXY COATED REINFORCING STEEL	LBS.	1,261
CLASS AA CONCRETE	C. Y.	6.2
CONCRETE BARRIER RAIL		46.6 LIN. FT.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

-LEFT LANE-

DocuSigned by: Adam J. Peter E3F6AFBD9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
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2			4		

SHEET NO. S11-37

TOTAL SHEETS 38

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BILL OF MATERIAL

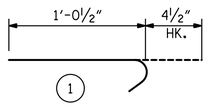
APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	69	#4	STR	32′-2″	1,483
A2	75	#4	STR	32′-0″	1,603
✳B1	79	#5	STR	23′-0″	1,895
B2	79	#6	STR	23′-11″	2,838
✳B3	8	#5	STR	7′-4″	61
B4	8	#6	STR	7′-4″	88
✳J1	87	#4	①	1′-5″	82
REINFORCING STEEL ✳✳ LBS.					4,529
✳EPOXY COATED REINFORCING STEEL ✳✳ LBS.					3,521
CLASS AA CONCRETE ✳✳ C.Y.					43.9

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	69	#4	STR	32′-2″	1,483
A2	75	#4	STR	32′-0″	1,603
✳B1	79	#5	STR	23′-0″	1,895
B2	79	#6	STR	23′-11″	2,838
✳B3	8	#5	STR	7′-4″	61
B4	8	#6	STR	7′-4″	88
✳J1	87	#4	①	1′-5″	82
REINFORCING STEEL ✳✳ LBS.					4,529
✳EPOXY COATED REINFORCING STEEL ✳✳ LBS.					3,521
CLASS AA CONCRETE ✳✳ C.Y.					43.9

BAR TYPE



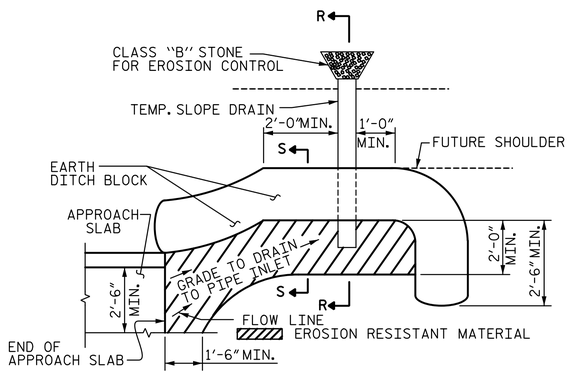
ALL BAR DIMENSIONS ARE OUT TO OUT

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 3.

THE QUANTITY OF #4J1 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.

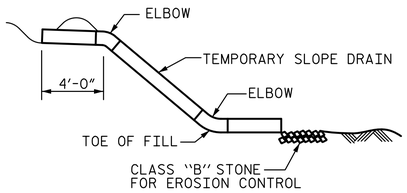
SPLICE LENGTHS

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

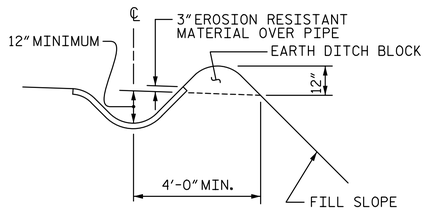


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

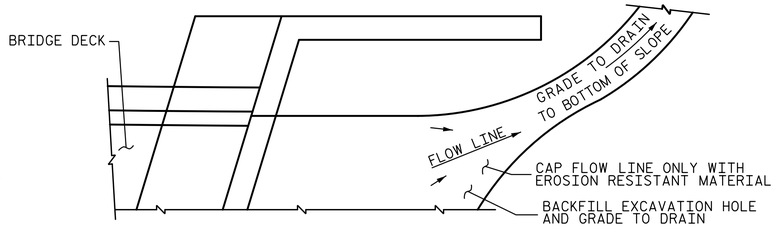
PLAN VIEW



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)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 3 OF 3

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

-LEFT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11-38
1			3			TOTAL SHEETS
2			4			38

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

DRAWN BY : CLG DATE : 6-14
CHECKED BY : AJP DATE : 6-14

DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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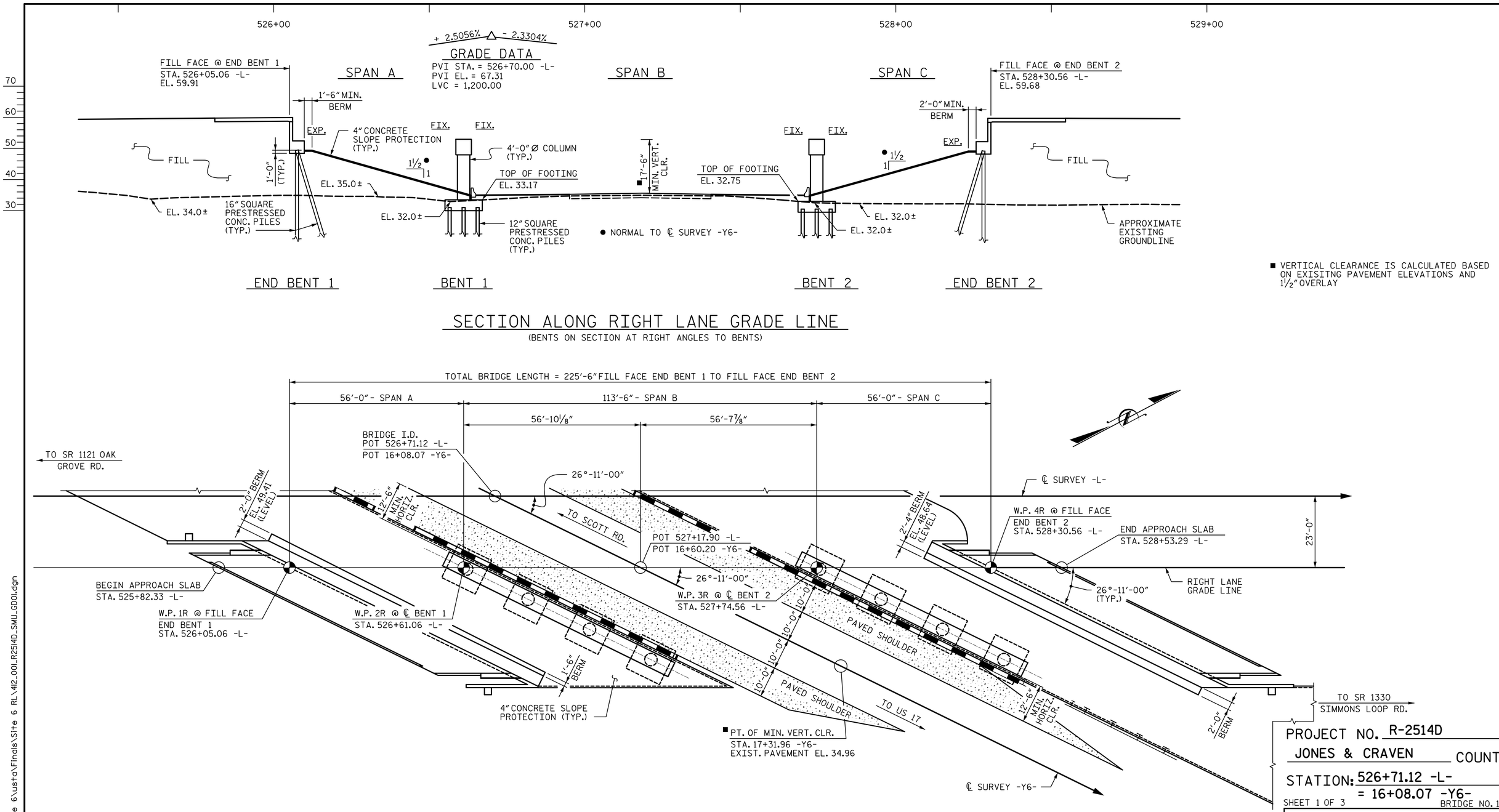

■ VERTICAL CLEARANCE IS CALCULATED BASED ON EXISITNG PAVEMENT ELEVATIONS AND 1½" OVERLAY

SECTION ALONG RIGHT LANE GRADE LINE

(BENTS ON SECTION AT RIGHT ANGLES TO BENTS)

PLAN

(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 3 BRIDGE NO. 106

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 17 OVER TEN MILE FORK RD. (SR 1002) BETWEEN SR 1121 AND SR 1330

-RIGHT LANE-

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY

3/10/2015

DocuSigned by: Adam J. Peter E3F6AF8D9B94742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 6-14
CHECKED BY : TJT	DATE : 6-14		

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Charlotte, NC 28202
NC License Number F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12-1
1			3			TOTAL SHEETS
2			4			38

STR. #12

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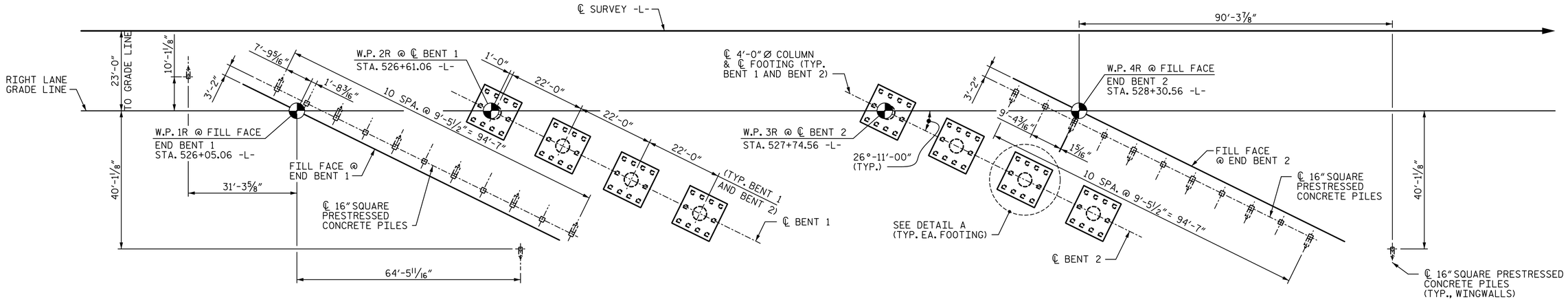


END BENT 1 BENT 1 BENT 2 END BENT 2

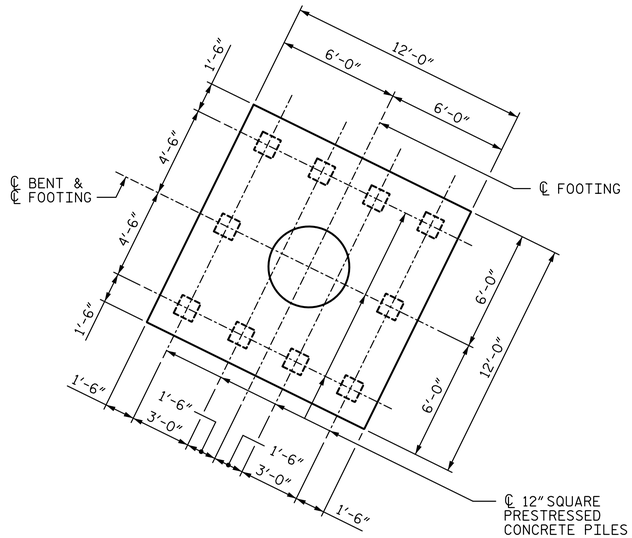
FOUNDATION LAYOUT

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

H DENOTES DIRECTION OF 3:12 PILE BATTER

NOTES:

1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
2. PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 160 TONS PER PILE.
3. PILES AT BENT 1 AND BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.
4. DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 215 TONS PER PILE.
5. DRIVE PILES AT BENT 1 AND BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 100 TONS PER PILE.
6. IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 50-110 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT 1 AND END BENT 2. 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.
7. TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT END BENT 1 OR END BENT 2. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
8. 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.
9. OBSERVE A TWO MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 1 AND END BENT NO. 2 (STAGE 2 WAITING PERIOD). SEE ROADWAY PLAN TITLED "DETAILS FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION AND STAGE CONSTRUCTION AT -Y6- BRIDGE APPROACHES".
10. DO NOT BEGIN WORK AT BENT NO. 1 AND BENT NO. 2 UNTIL BRIDGE WAITING PERIODS END. SEE SUMMARY OF BRIDGE WAITING PERIODS IN THE ROADWAY PLANS.



DETAIL A

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOUNDATION LAYOUT

-RIGHT LANE-

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY

3/10/2015

DocuSigned by: Adam J. Peter E3F6AFBD9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STV/ Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			38

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CHECKED BY : TJT	DATE : 6-14		

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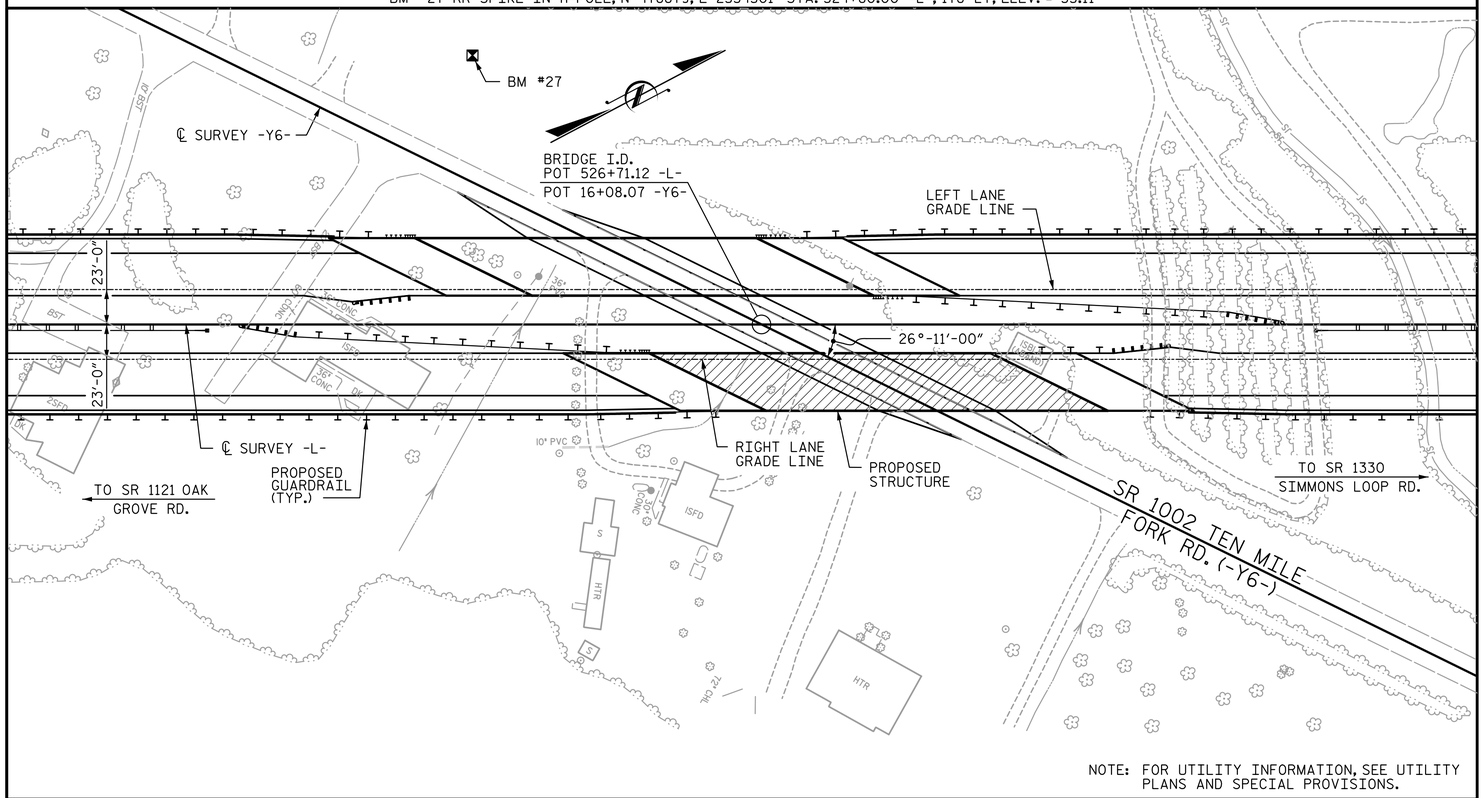

NOTE: FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION FOR BENT	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONCRETE GIRDERS		12" PRESTRESSED CONCRETE PILES		16" PRESTRESSED CONCRETE PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YD.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			9,107	9,233		LUMP SUM			15	1,064.9						487.8		LUMP SUM	LUMP SUM
END BENT 1					120.1		15,659						13	715	6		550		
BENT 1	LUMP SUM				179.5		29,730	2,009			40	1,600			10				
BENT 2	LUMP SUM				181.5		29,752	2,009			40	1,600			10				
END BENT 2					118.2		14,985						12	780	6		1,155		
TOTAL	LUMP SUM	2	9,107	9,233	599.3	LUMP SUM	90,126	4,018	15	1,064.9	80	3,200	25	1,495	32	487.8	1,705	LUMP SUM	LUMP SUM

DocuSigned by: Kevin G. Bailey 4625EECDF7B4401...

NORTH CAROLINA PROFESSIONAL SEAL 28479 ENGINEER KEVIN G. BAILEY
3/10/2015

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER
3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

LOCATION SKETCH, GENERAL NOTES AND TOTAL BILL OF MATERIAL
-RIGHT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12-3
1			3			TOTAL SHEETS
2			4			38

DRAWN BY : CLG DATE : 6-14
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DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 6-14

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.12	--	1.75	0.63	1.39	B	EL	55.6	0.99	1.22	B	EL	89.4	0.80	0.63	1.12	B	EL	55.6	
		HL-93 (OPERATING)	N/A		1.80	--	1.35	0.63	1.80	B	EL	55.6	1.07	1.85	B	I	89.4	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.61	57.96	1.75	0.63	2.00	B	EL	55.6	1.07	1.93	B	I	89.4	0.80	0.63	1.61	B	EL	55.6	
		HS-20 (OPERATING)	36.000		2.55	91.80	1.35	0.63	2.59	B	EL	55.6	1.07	2.55	B	I	89.4	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.89	52.52	1.40	0.63	6.03	B	EL	55.6	1.04	5.97	A & C	I	89.4	0.80	0.63	3.89	B	EL	55.6	
		SNGARBS2	20.000		2.79	55.80	1.40	0.63	4.33	B	EL	55.6	1.04	4.45	A & C	I	89.4	0.80	0.63	2.79	B	EL	55.6	
		SNAGRIS2	22.000		2.60	57.20	1.40	0.63	4.03	B	EL	55.6	1.04	4.22	A & C	I	89.4	0.80	0.63	2.60	B	EL	55.6	
		SNCOTTS3	27.250		1.93	52.59	1.40	0.63	3.00	B	EL	55.6	1.04	2.95	A & C	I	89.4	0.80	0.63	1.93	B	EL	55.6	
		SNAGGRS4	34.925		1.57	54.83	1.40	0.63	2.44	B	EL	55.6	1.07	2.42	B	I	89.4	0.80	0.63	1.57	B	EL	55.6	
		SNS5A	35.550		1.54	54.75	1.40	0.63	2.39	B	EL	55.6	1.07	2.38	B	I	89.4	0.80	0.63	1.54	B	EL	55.6	
		SNS6A	39.950		1.39	55.53	1.40	0.63	2.17	B	EL	55.6	1.07	2.19	B	I	89.4	0.80	0.63	1.39	B	EL	55.6	
		SNS7B	42.000		1.33	55.86	1.40	0.63	2.06	B	EL	55.6	1.07	2.11	B	I	89.4	0.80	0.63	1.33	B	EL	55.6	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.70	56.10	1.40	0.63	2.63	B	EL	55.6	1.07	2.61	B	I	89.4	0.80	0.63	1.70	B	EL	55.6	
		TNT4A	33.075		1.70	56.23	1.40	0.63	2.64	B	EL	55.6	1.07	2.50	B	I	89.4	0.80	0.63	1.70	B	EL	55.6	
		TNT6A	41.600		1.37	56.99	1.40	0.63	2.13	B	EL	55.6	1.07	2.18	B	I	89.4	0.80	0.63	1.37	B	EL	55.6	
		TNT7A	42.000		1.37	57.54	1.40	0.63	2.13	B	EL	55.6	1.07	2.14	B	I	89.4	0.80	0.63	1.37	B	EL	55.6	
		TNT7B	42.000		1.40	58.80	1.40	0.63	2.17	B	EL	55.6	1.07	2.04	B	I	89.4	0.80	0.63	1.40	B	EL	55.6	
		TNAGRIT4	43.000		1.35	58.05	1.40	0.63	2.09	B	EL	55.6	1.07	1.95	B	I	89.4	0.80	0.63	1.35	B	EL	55.6	
		TNAGT5A	45.000		1.28	57.60	1.40	0.63	1.98	B	EL	55.6	1.07	1.91	B	I	89.4	0.80	0.63	1.28	B	EL	55.6	
		TNAGT5B	45.000	3	1.27	57.15	1.40	0.63	1.97	B	EL	55.6	1.07	1.98	B	I	89.4	0.80	0.63	1.27	B	EL	55.6	

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.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

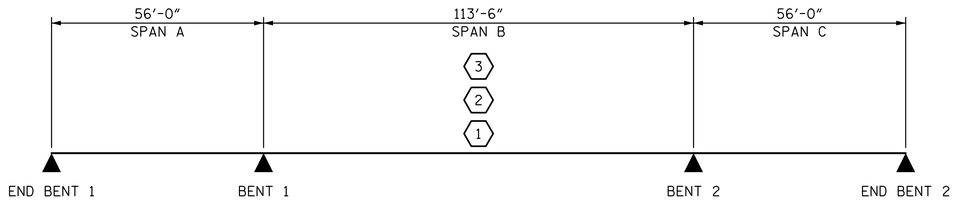
(2) DESIGN LOAD RATING (HS-20)

(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: 526+71.12 -L-
= 16+08.07 -Y6-

DocuSigned by: Adam J. Peter E3F6AFBD6947424...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

DRAWN BY : CLG DATE : 5-14
CHECKED BY : AJP DATE : 6-14

DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 6-14

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900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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2			4		

SHEET NO. S12-4

TOTAL SHEETS 38

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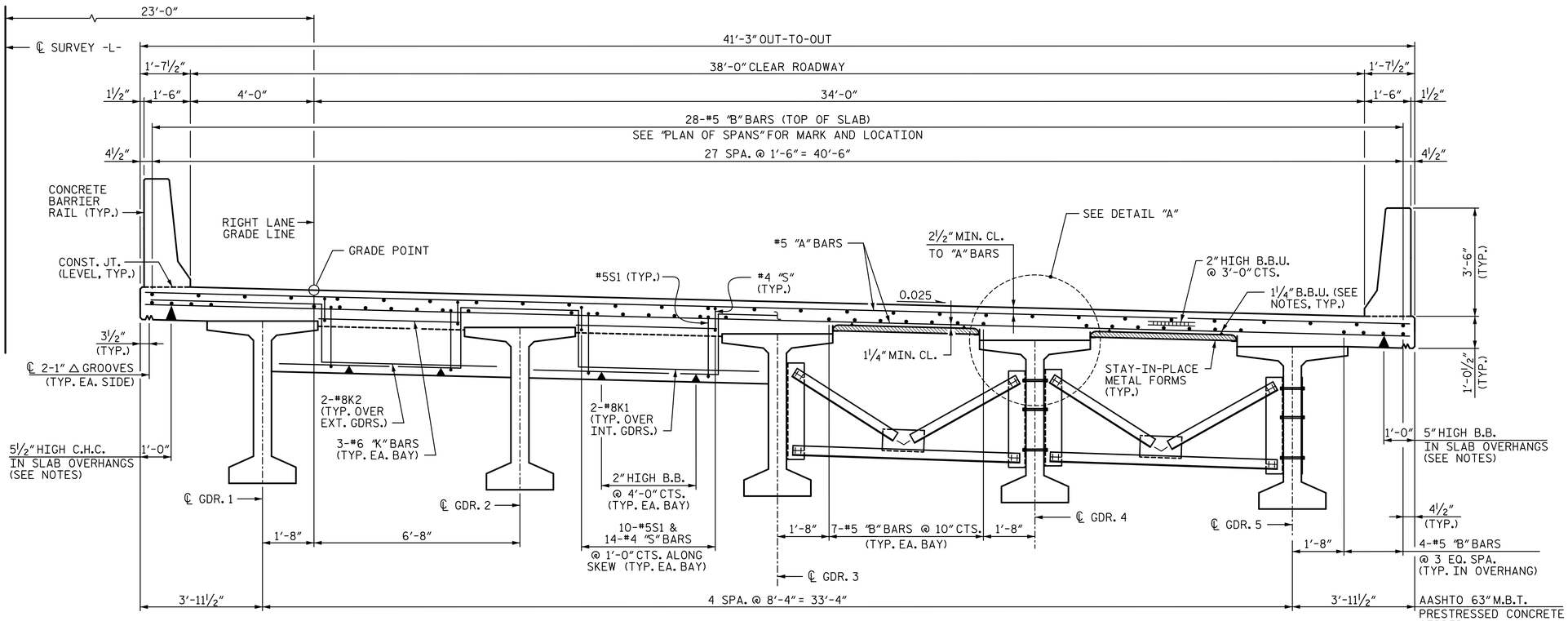


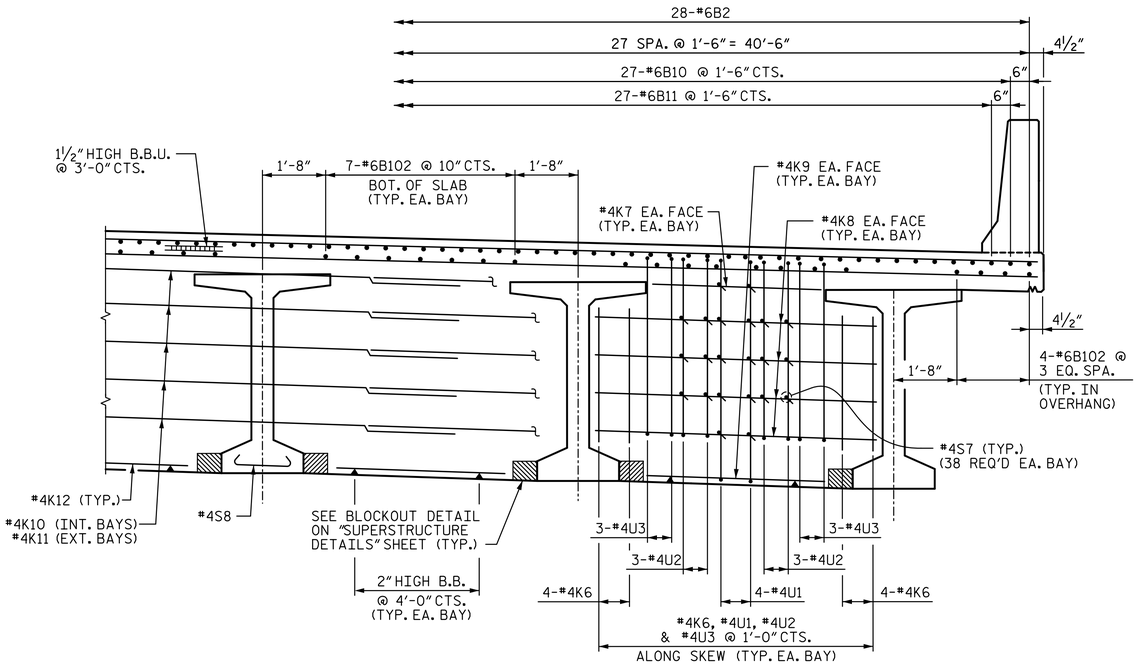
END DIAPHRAGMS

INTERMEDIATE DIAPHRAGMS

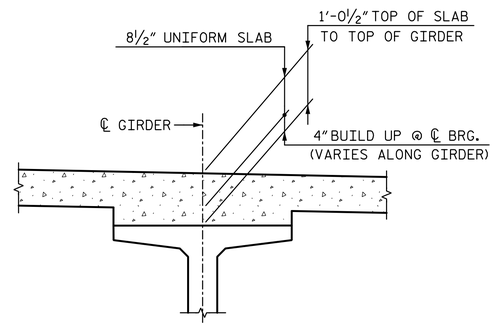
NOTES:

1. PROVIDE A 1¼" HIGH BEAM BOLSTER 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.
2. LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.
3. BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
4. PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.
5. FOR INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGM DETAILS FOR PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS" SHEET.
6. FOR END DIAPHRAGM AND CONTINUOUS DIAPHRAGM SECTIONS, SEE CORRESPONDING "SUPERSTRUCTURE DETAILS" SHEET.
7. FOR BARRIER RAIL DETAILS, SEE "CONCRETE BARRIER RAIL" SHEETS.
8. FOR "B" BAR MARKS AND LOCATIONS, SEE CORRESPONDING "PLAN OF SPANS" SHEET.
9. HEIGHT OF BEAM BOLSTER & CONTINUOUS HIGH CHAIR IS CALCULATED @ ℄ BENT. CONTRACTOR SHALL ADJUST HEIGHTS, AS NECESSARY TO MAINTAIN PROPER CLEARANCE, DUE TO GIRDER CAMBER.

TYPICAL SECTION



CONTINUOUS DIAPHRAGM



DETAIL "A"
(TYP. EA. GIRDER)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION
SPANS A - C

-RIGHT LANE-

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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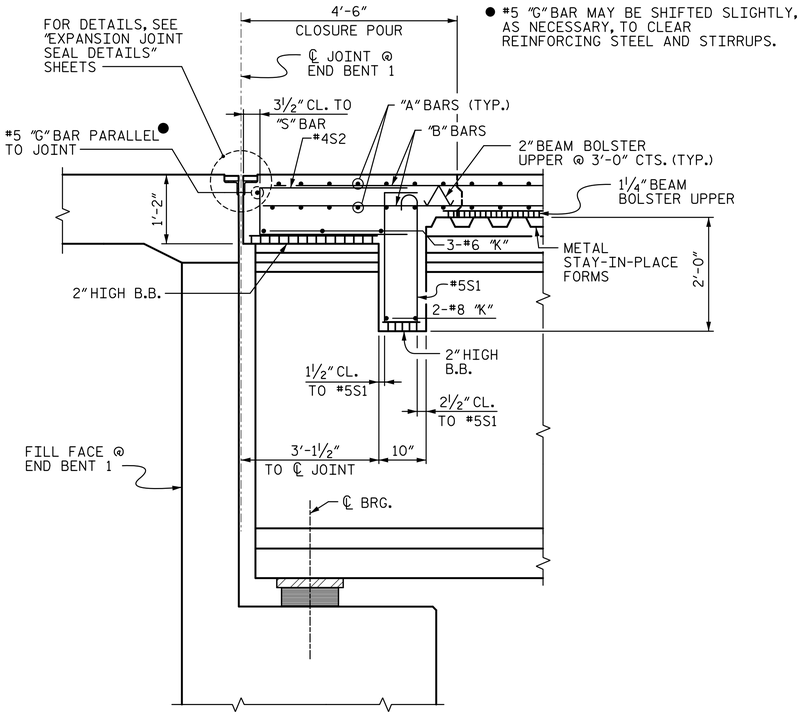
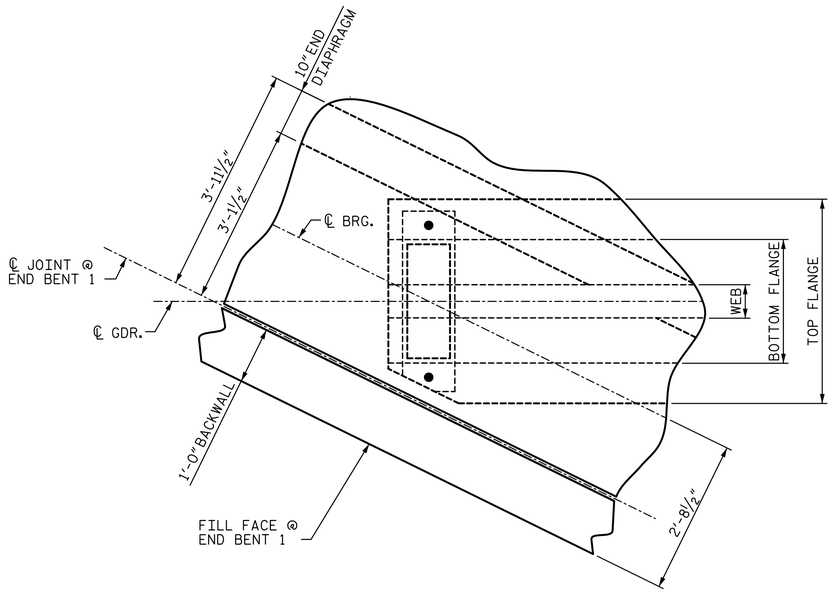


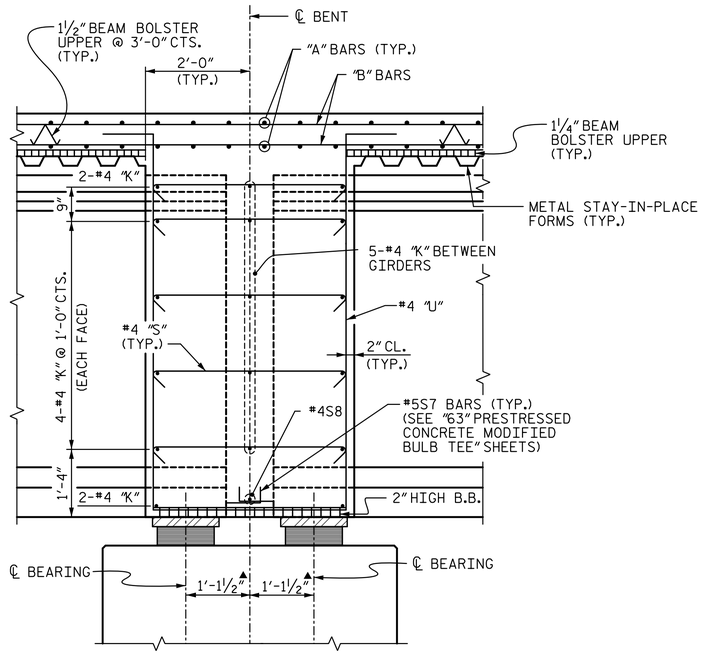
SECTION A-A

END DIAPHRAGM AT END BENT 1 SHOWN, END BENT 2 MIRRORED
("J" BAR USED WITH STANDARD EXP. JT. NOT SHOWN)



PLAN

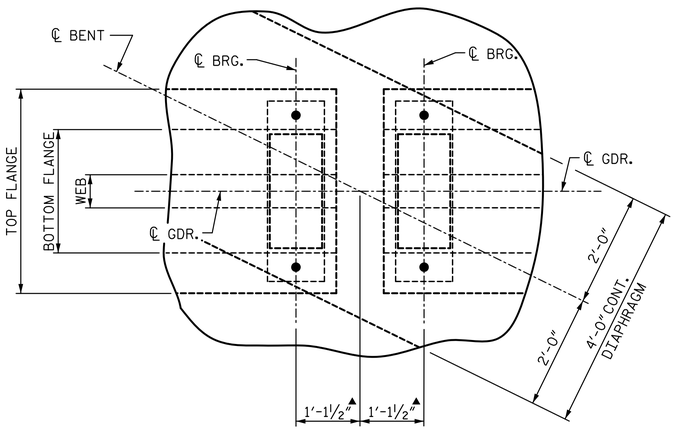
(BENT CAP NOT SHOWN FOR CLARITY)



SECTION B-B

CONTINUOUS DIAPHRAGM AT BENT 1 & 2

▲ DIMENSIONS ARE MEASURED ALONG ℄ GIRDER.



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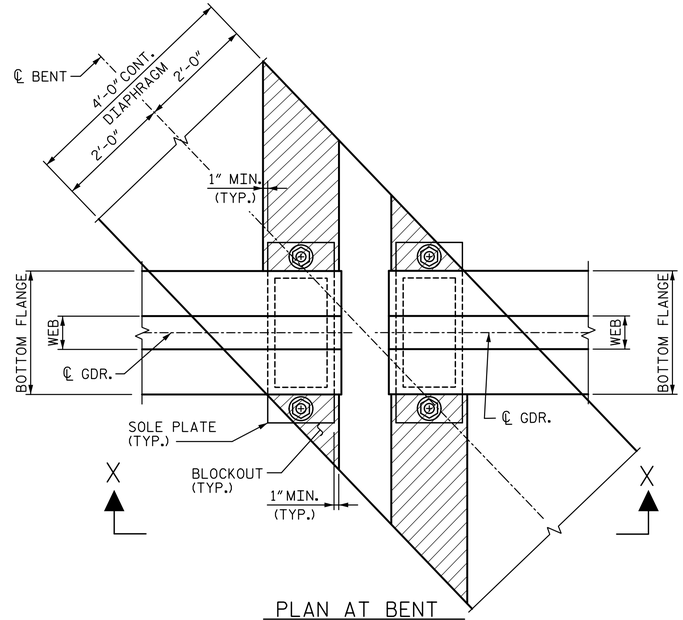
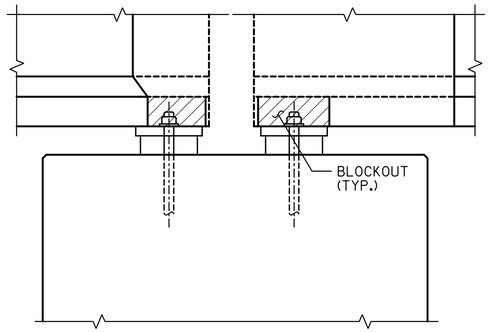


PLAN AT BENT

(SKEW EXAGGERATED FOR CLARITY)



SECTION X-X

CONTINUOUS DIAPHRAGM BLOCKOUT DETAILS

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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E3F6AF8D9B7424A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SUPERSTRUCTURE DETAILS

-RIGHT LANE-

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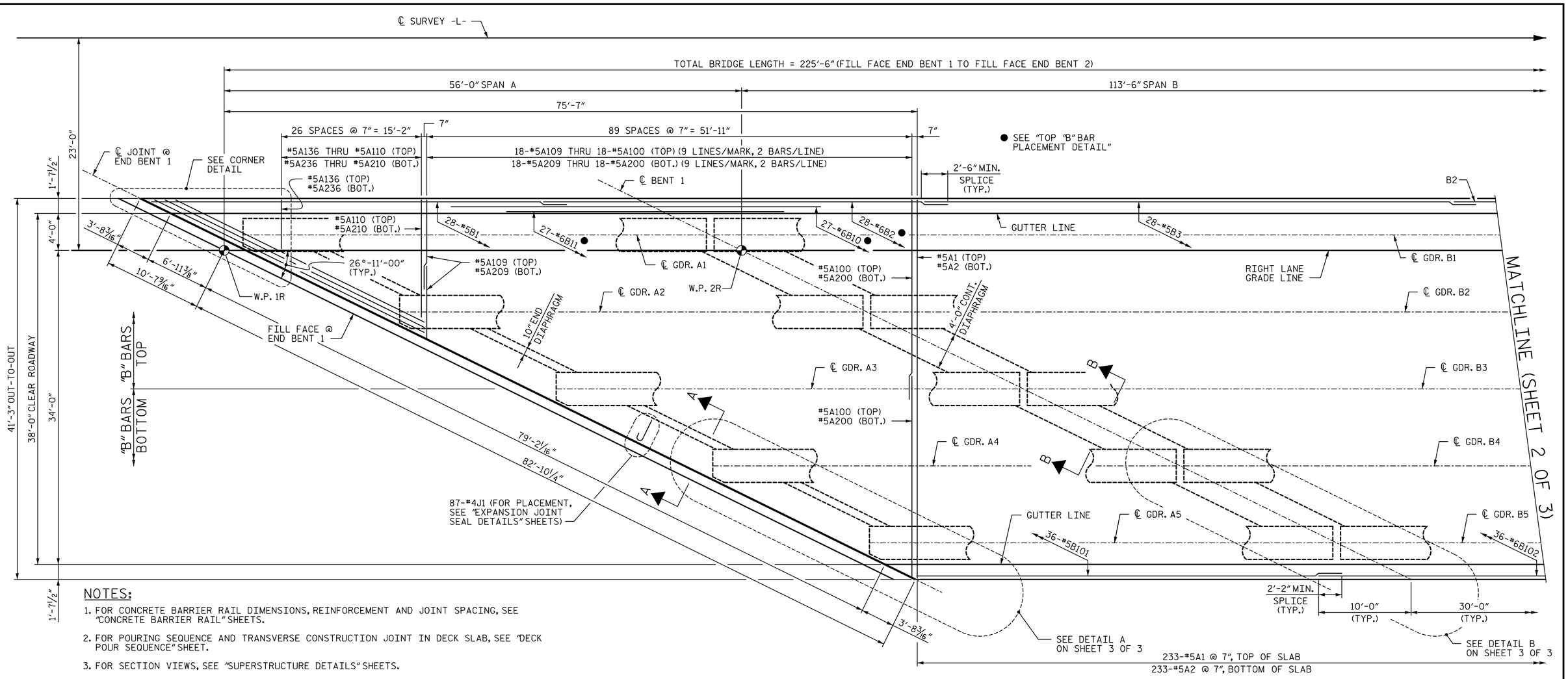
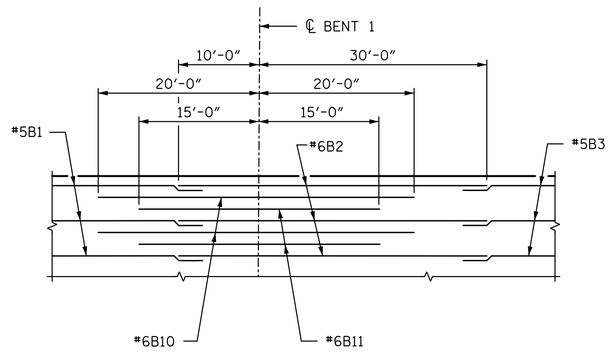


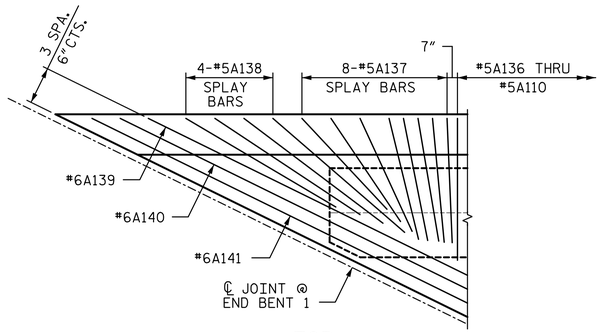
PLAN

NOTES:

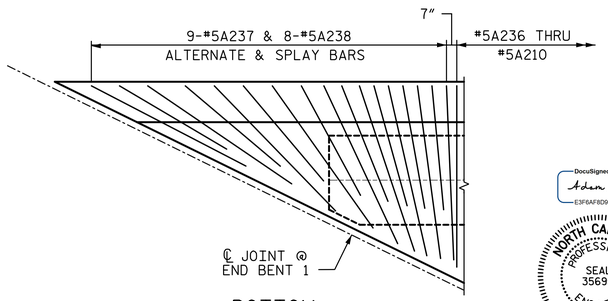
1. FOR CONCRETE BARRIER RAIL DIMENSIONS, REINFORCEMENT AND JOINT SPACING, SEE "CONCRETE BARRIER RAIL" SHEETS.
2. FOR POURING SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB, SEE "DECK POUR SEQUENCE" SHEET.
3. FOR SECTION VIEWS, SEE "SUPERSTRUCTURE DETAILS" SHEETS.
4. FOR "B" BAR SPACING AND LOCATION, SEE "TYPICAL SECTION" SHEET.
5. FOR MINIMUM SPLICE LENGTHS, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.
6. FOR ADDITIONAL DETAILS, SEE SHEET 3 OF 3.



TOP "B" BAR PLACEMENT DETAIL



TOP



BOTTOM

CORNER DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR)
("B" BARS NOT SHOWN FOR CLARITY)

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPANS A - C

-RIGHT LANE-

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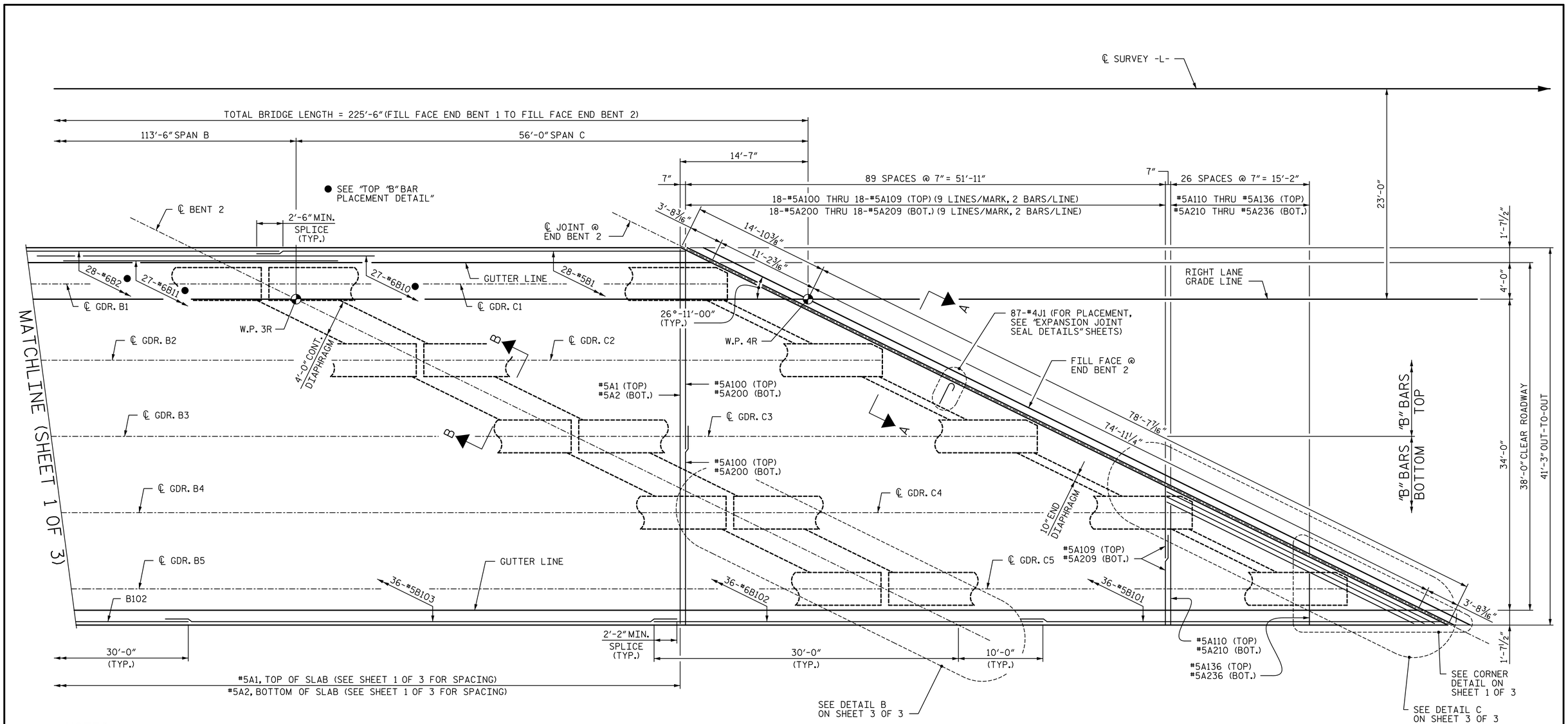
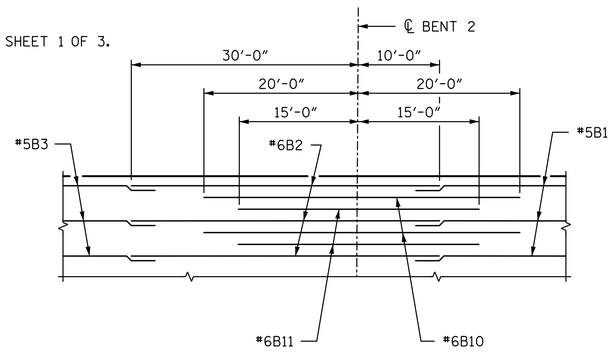


NOTES:

1. FOR NOTES, SEE SHEET 1 OF 3.



TOP "B" BAR PLACEMENT DETAIL

PLAN

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPANS A - C

-RIGHT LANE-

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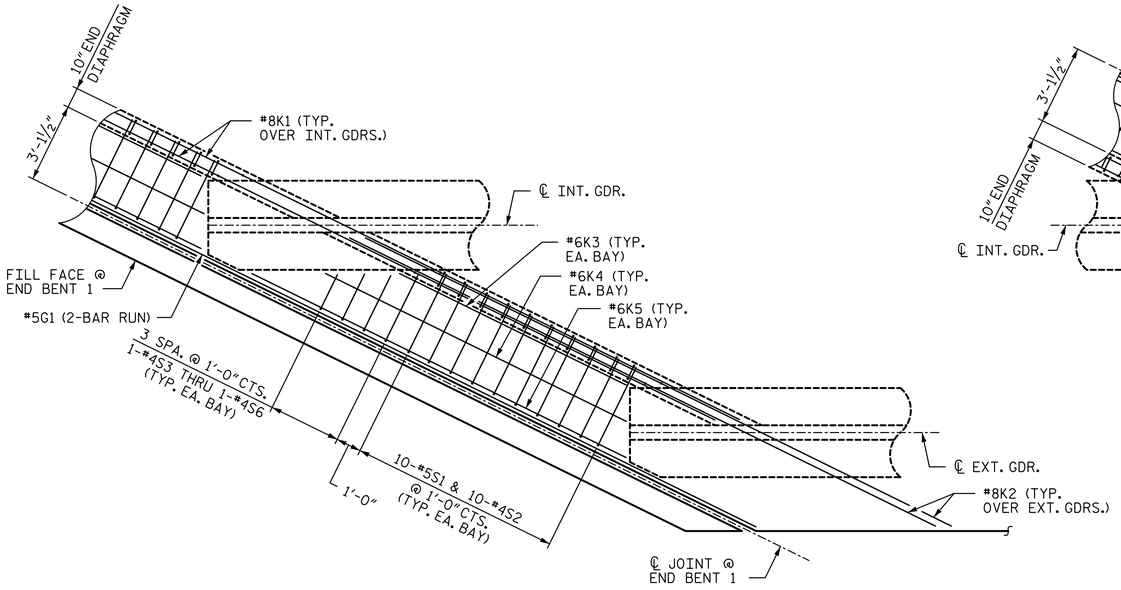
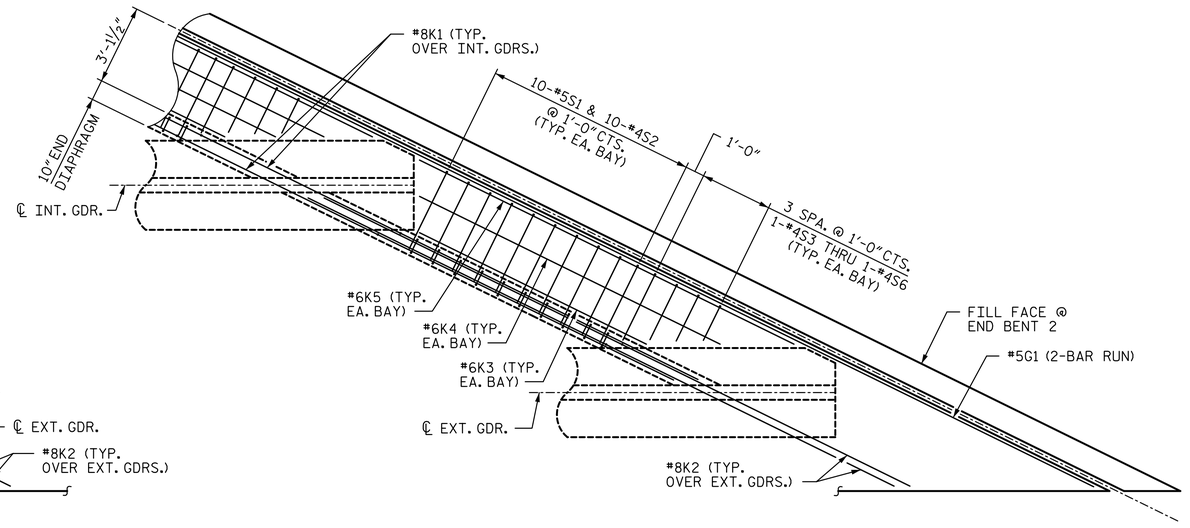
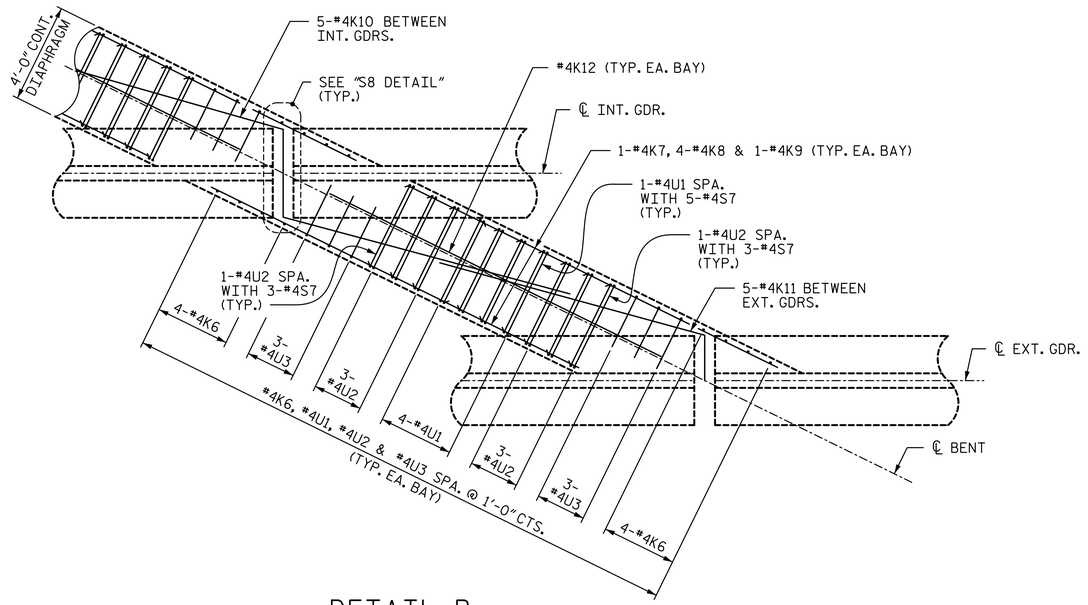


DETAIL A

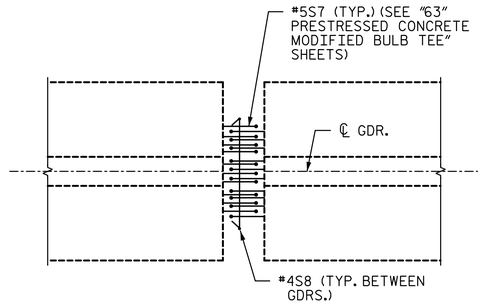


DETAIL C



DETAIL B

(#4S8 BAR NOT SHOWN FOR CLARITY)



S8 DETAIL

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-

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SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPANS A - C

-RIGHT LANE-

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3/10/2015

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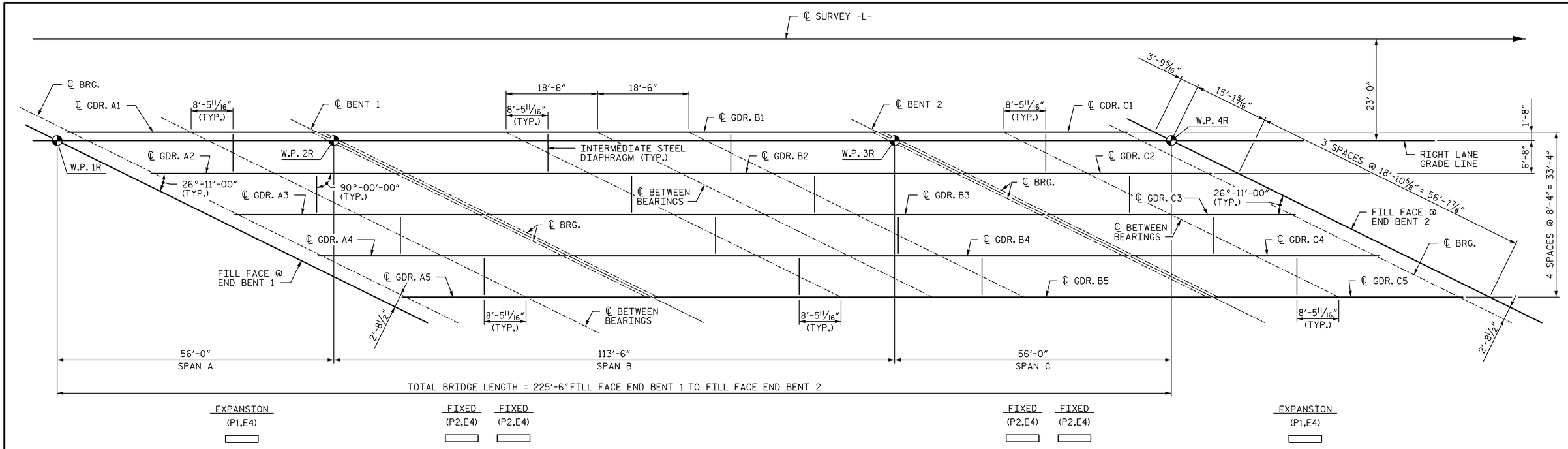
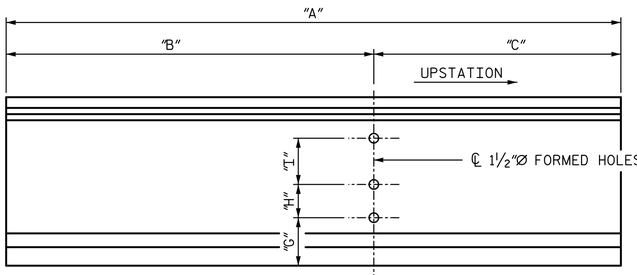
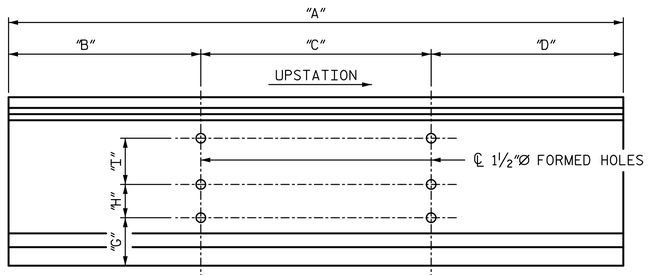


FRAMING PLAN

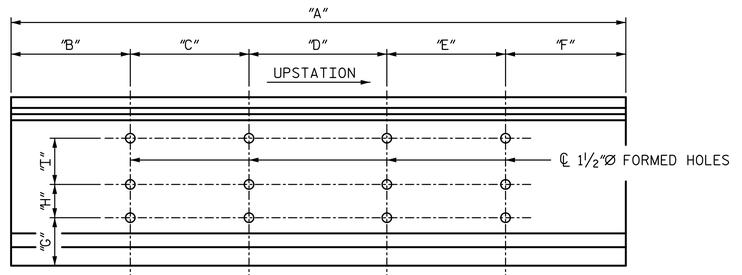
FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS DETAILS FOR PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS" SHEET



ONE INTERMEDIATE DIAPHRAGM CONNECTION



TWO INTERMEDIATE DIAPHRAGM CONNECTIONS



FOUR INTERMEDIATE DIAPHRAGM CONNECTIONS

GIRDER ELEVATIONS

GIRDER DIMENSIONS

GIRDER	"A" (FT)	"B" (FT)	"C" (FT)	"D" (FT)	"E" (FT)	"F" (FT)	"G" (FT)	"H" (FT)	"I" (FT)
A1 & C1	50′-1 7/8″	33′-6 5/8″	16′-7 1/4″	--	--	--	1′-4 1/4″	1′-3″	1′-6 1/2″
A2-A4 & C2-C4	50′-1 7/8″	16′-7 1/4″	16′-11 3/8″	16′-7 1/4″	--	--	1′-4 1/4″	1′-3″	1′-6 1/2″
A5 & C5	50′-1 7/8″	16′-7 1/4″	33′-6 5/8″	--	--	--	1′-4 1/4″	1′-3″	1′-6 1/2″
B1	112′-8″	46′-3 11/16″	37′-0″	29′-4 5/16″	--	--	1′-4 1/4″	1′-3″	1′-6 1/2″
B2-B4	112′-8″	29′-4 5/16″	16′-11 3/8″	20′-0 5/8″	16′-11 3/8″	29′-4 5/16″	1′-4 1/4″	1′-3″	1′-6 1/2″
B5	112′-8″	29′-4 5/16″	37′-0″	46′-3 11/16″	--	--	1′-4 1/4″	1′-3″	1′-6 1/2″

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

-RIGHT LANE-

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

SHEET NO. S12-10

TOTAL SHEETS 38

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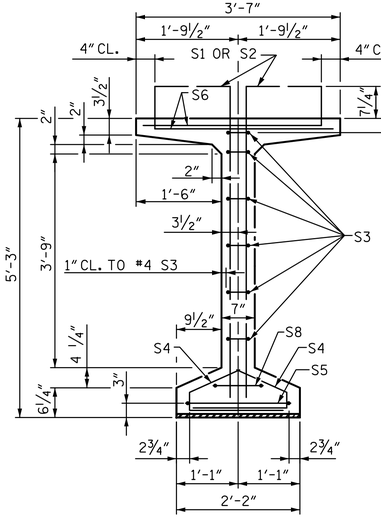
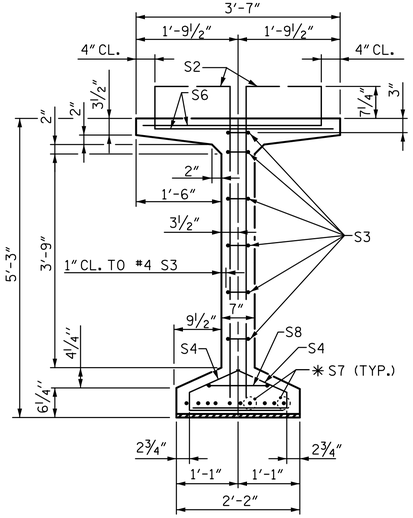
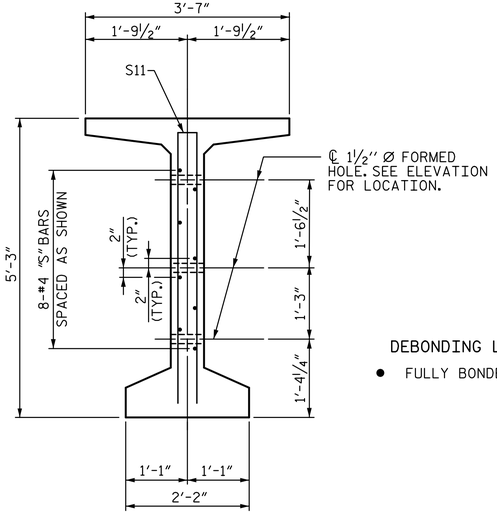


SECTION A-A



SECTION B-B

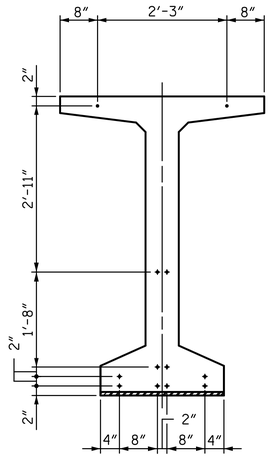


SECTION C-C

(S1 AND S9 BARS NOT SHOWN)

DEBONDING LEGEND

● FULLY BONDED STRANDS



0.6" Ø LOW RELAXATION STRAND LAYOUT

NOTES:

1. FOR DIAPHRAGM HOLE LOCATIONS, SEE "FRAMING PLAN" SHEET.
2. FOR GIRDER DETAILS, SEE SHEET 3 OF 3.
3. FOR NOTES, SEE SHEET 3 OF 3.

✳FOR S7 BARS, SEE SECTION D-D ON SHEET 3 OF 3.

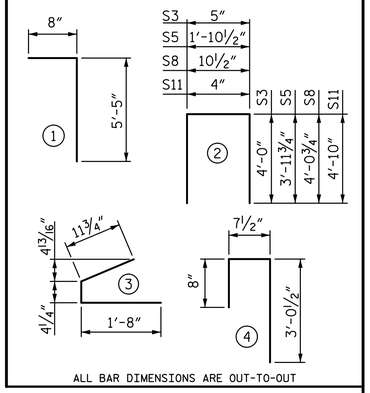
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	92	#4	1	6'-1"	374
	S2	24	#5	1	6'-1"	152
	S3	12	#4	2	8'-5"	67
	S4	72	#4	3	3'-0"	144
	S5	1	#5	2	9'-10"	10
	S6	116	#5	4	4'-4"	524
	✳S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
	S9	13	#5	STR	3'-3"	44
	S10	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S11	4	#5	2	10'-0"	42
INTERIOR GDR.	S11	8	#5	2	10'-0"	83
EXTERIOR GDR.	S12	8	#4	STR	8'-0"	43
INTERIOR GDR.	S12	16	#4	STR	8'-0"	86

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

BAR TYPES



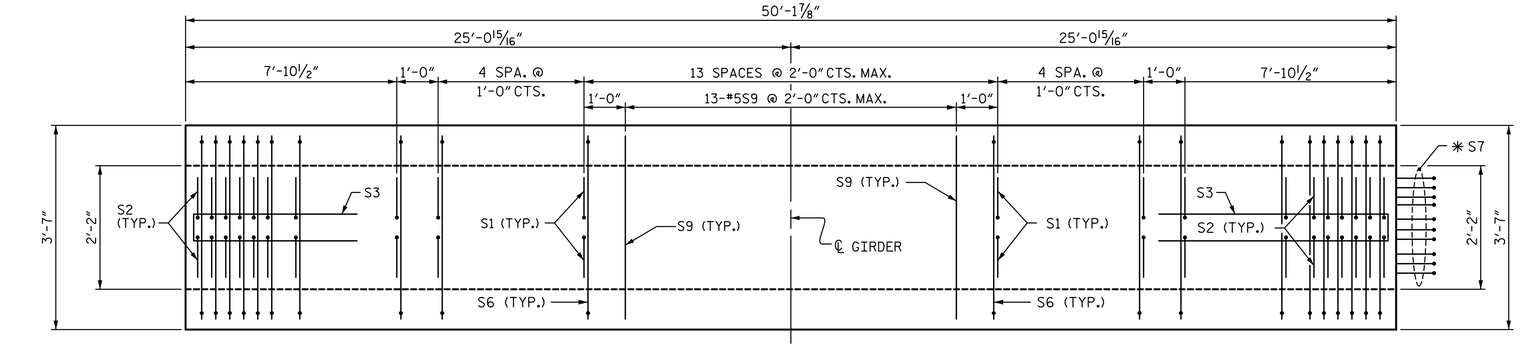
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

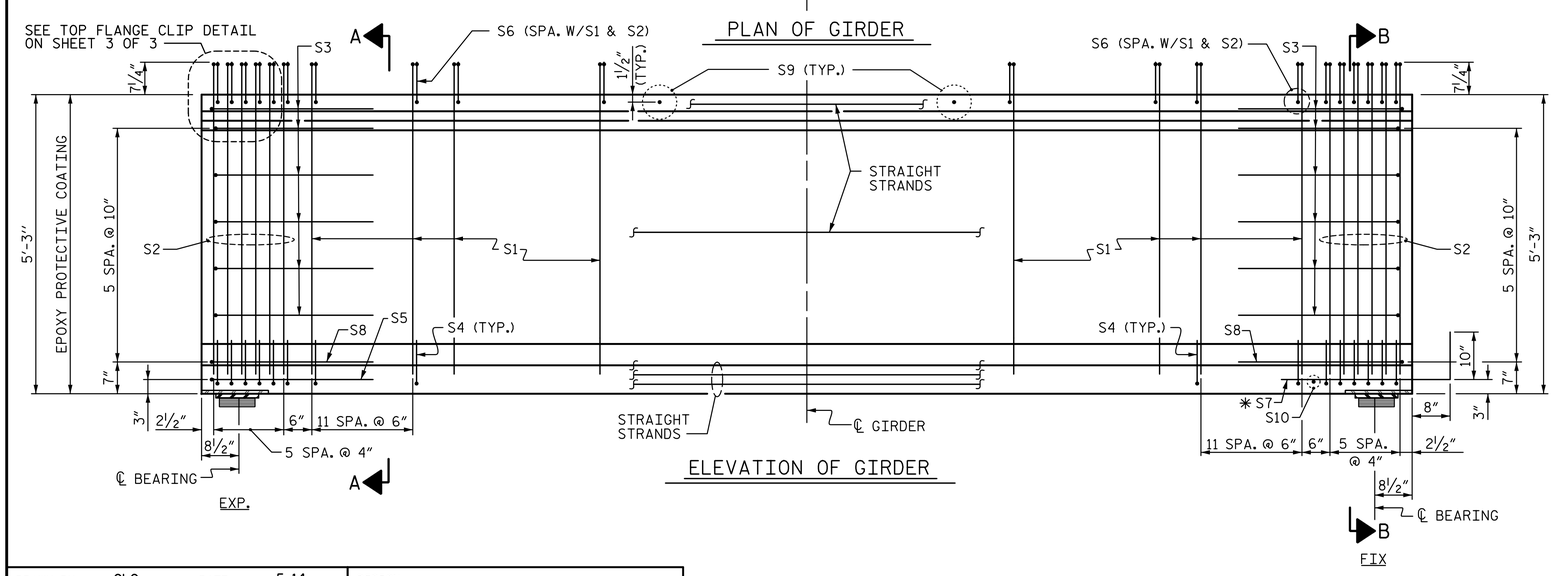
	REINFORCING STEEL	8,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	1,458	10.0	12
INTERIOR GIRDER	1,542	10.0	12

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
10	50'-1⅞"	501'-6¾"



PLAN OF GIRDER



ELEVATION OF GIRDER

PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER 1 - 5

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 3

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4/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPANS A & C
-RIGHT LANE-

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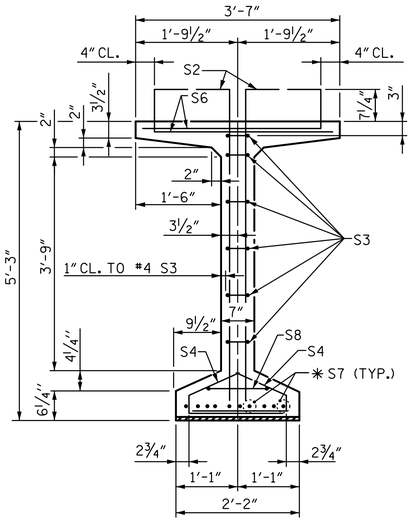
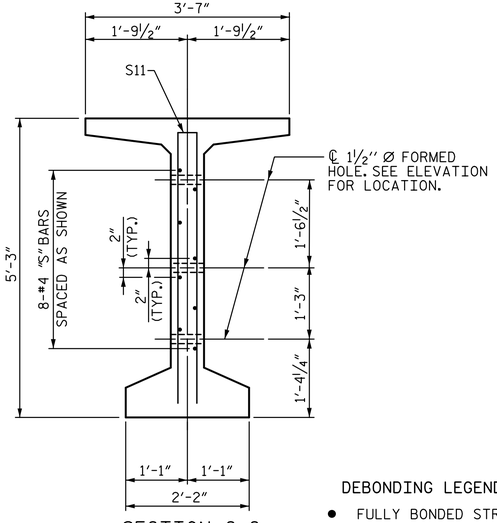
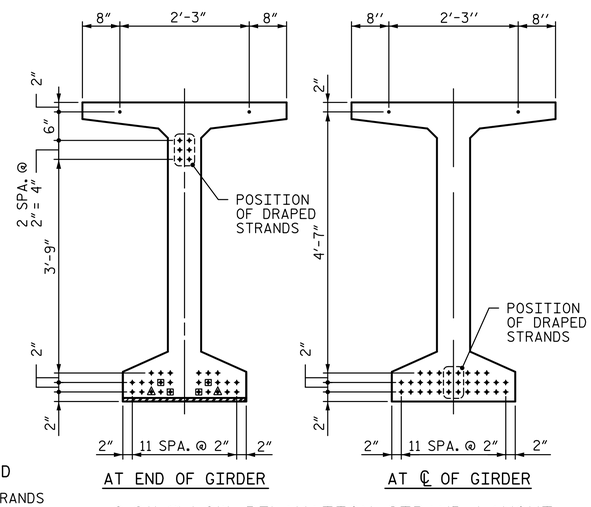


SECTION B-B



SECTION C-C

(S1 AND S9 BARS NOT SHOWN)



0.6″ Ø LOW RELAXATION STRAND LAYOUT

✱FOR S7 BARS, SEE SECTION D-D ON SHEET 3 OF 3.

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⊡ STRANDS DEBONDED FOR 4′-0″ FROM END OF GIRDER
- ⊿ STRANDS DEBONDED FOR 6′-0″ FROM END OF GIRDER

0.6″ Ø L. R. GRADE 270 STRANDS

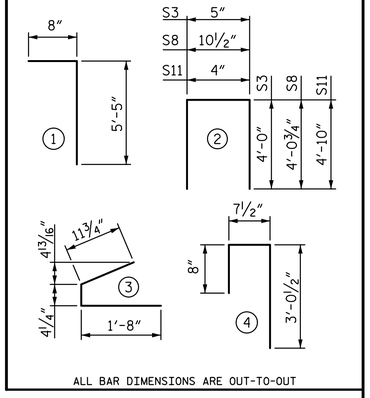
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	154	#5	1	6′-1″	977
	S2	24	#6	1	6′-1″	219
	S3	12	#4	2	8′-5″	67
	S4	72	#4	3	3′-0″	144
	S6	178	#5	4	4′-4″	805
	✱S7	20	#5	STR	3′-8″	76
	S8	2	#5	2	9′-0″	19
	S9	44	#5	STR	3′-3″	149
	S10	2	#3	STR	1′-10″	1
EXTERIOR GDR.	S11	8	#5	2	10′-0″	83
INTERIOR GDR.	S11	16	#5	2	10′-0″	167
EXTERIOR GDR.	S12	16	#4	STR	8′-0″	86
INTERIOR GDR.	S12	32	#4	STR	8′-0″	171

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

BAR TYPES



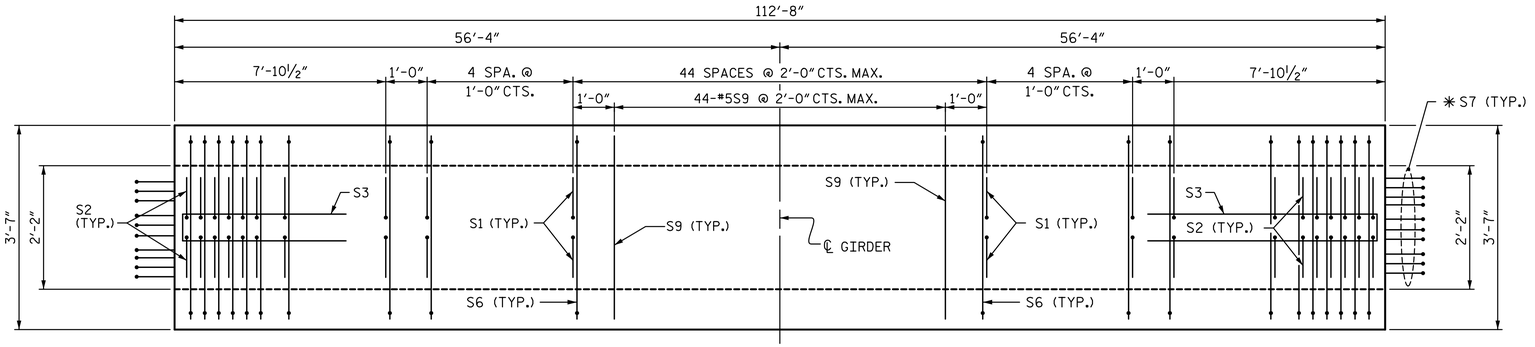
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

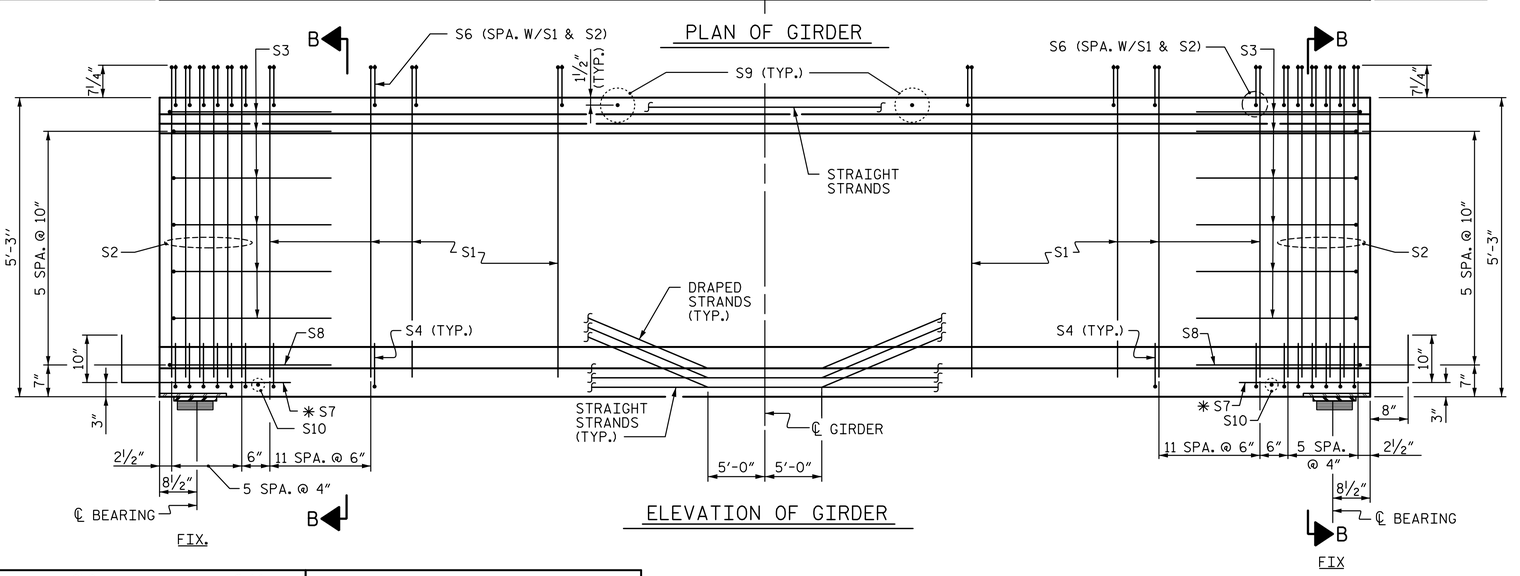
	REINFORCING STEEL	8,000 PSI CONCRETE	0.6″ Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	2,626	22.3	34
INTERIOR GIRDER	2,795	22.3	34

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5	112′-8″	563′-4″



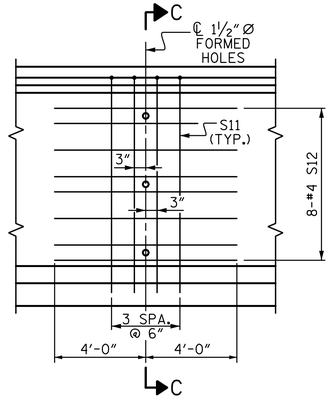
PLAN OF GIRDER



ELEVATION OF GIRDER

NOTES:

1. FOR DIAPHRAGM HOLE LOCATIONS, SEE "FRAMING PLAN" SHEET.
2. FOR GIRDER DETAILS, SEE SHEET 3 OF 3.
3. FOR NOTES, SEE SHEET 3 OF 3.
4. THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 23 KIPS.



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDERS 1 - 5

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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SHEET 2 OF 3

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4/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63″ PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPAN B -RIGHT LANE-

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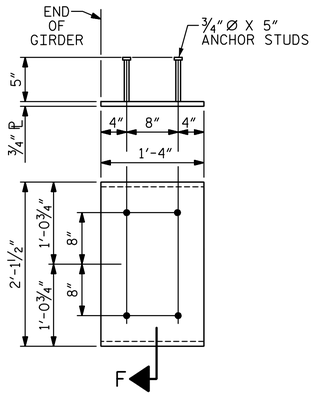
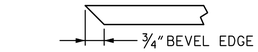


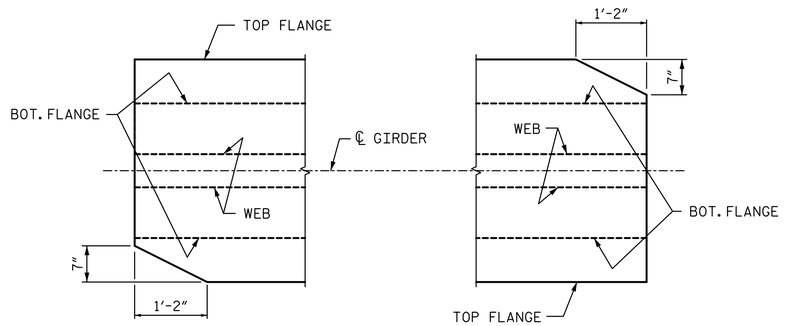


SECTION "F"

(SEE NOTES)

EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D. PER GIRDER)



AT END BENT 1 AT END BENT 2

TOP FLANGE CLIP DETAIL

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 ENDWALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE PRESTRESSED STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI FOR SPANS A & C AND 6,400 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.

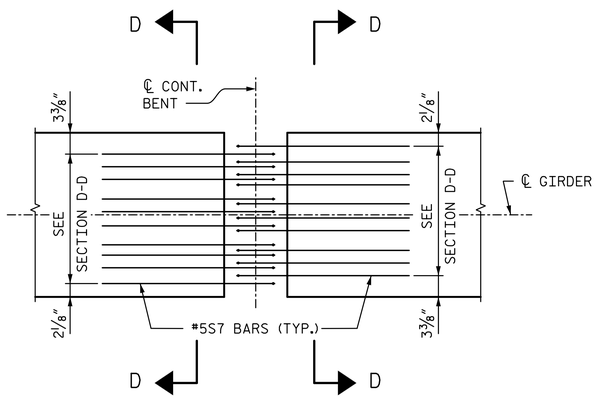
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

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.

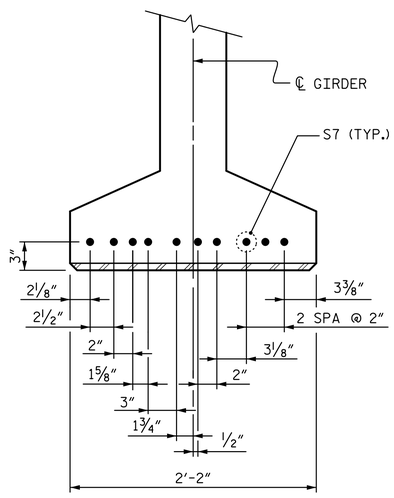
THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4,500 lbs.

S6 BARS IN THE TOP FLANGE CLIP REGION SHALL BE SHIFTED SUCH THAT 4" CLEAR TO EDGE OF FLANGE IS MAINTAINED. THE HORIZONTAL LEG SHALL BE CUT SUCH THAT 2½" MIN. CLEAR IS MAINTAINED OPPOSITE THE TOP FLANGE CLIP.



PLAN- BOTTOM FLANGE

EXTERIOR S7 BARS SHOWN, OTHERS OMITTED FOR CLARITY.



SECTION D-D

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63" PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDER DETAILS

-RIGHT LANE-

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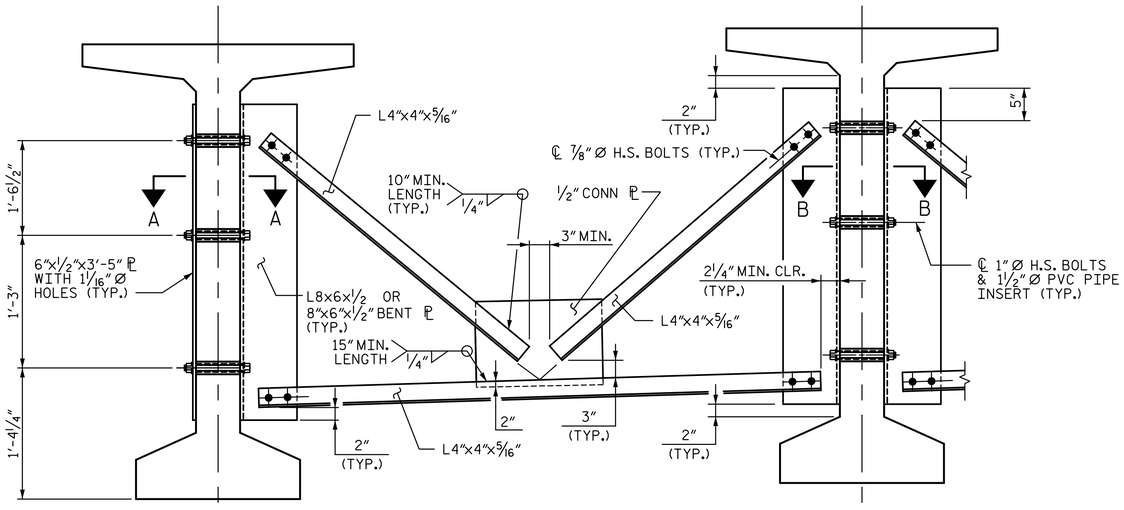
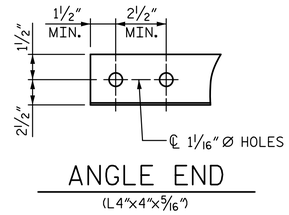
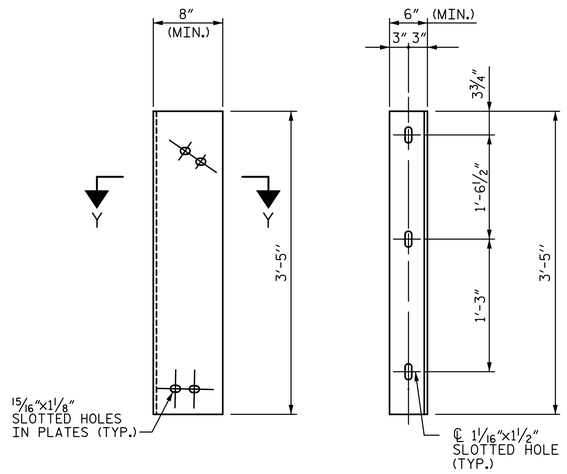


EXTERIOR GIRDER INTERIOR GIRDER

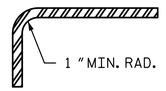
PART SECTION AT INTERMEDIATE DIAPHRAGM



ANGLE END
(L4"x4"x5/16")



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.

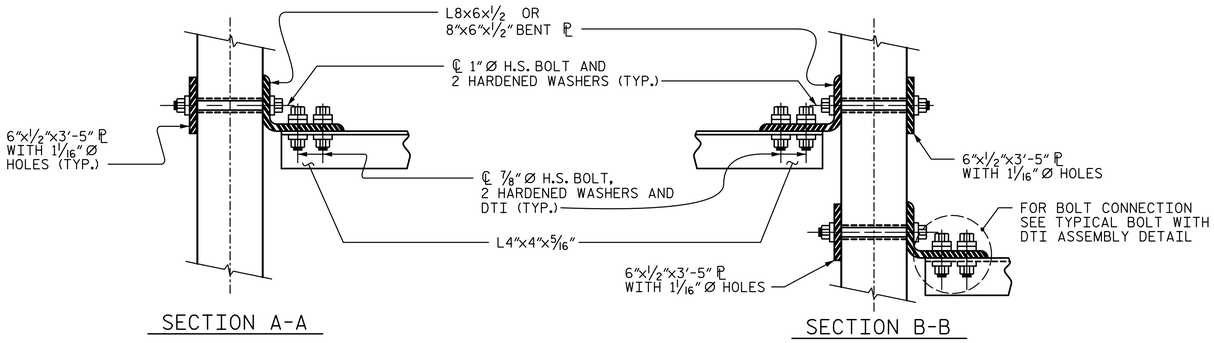
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.

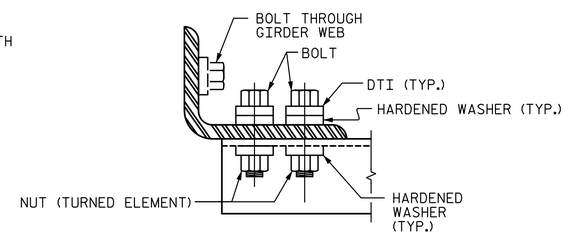
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



SECTION A-A SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

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3/10/2015

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RALEIGH

SUPERSTRUCTURE

INTERMEDIATE STEEL DIAPHRAGM DETAILS FOR PRESTRESSED CONCRETE MODIFIED BULB TEE GIRDERS -RIGHT LANE-

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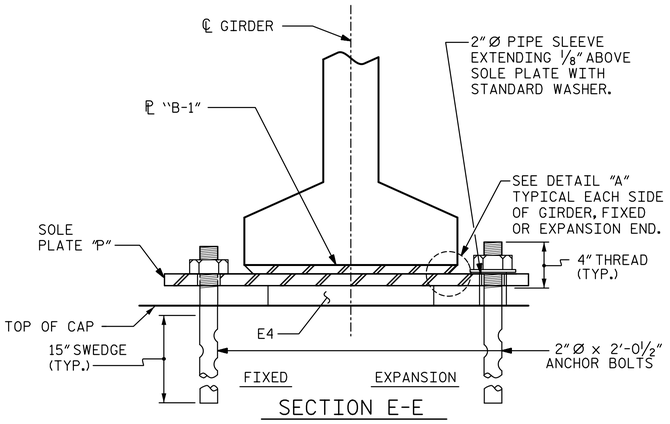
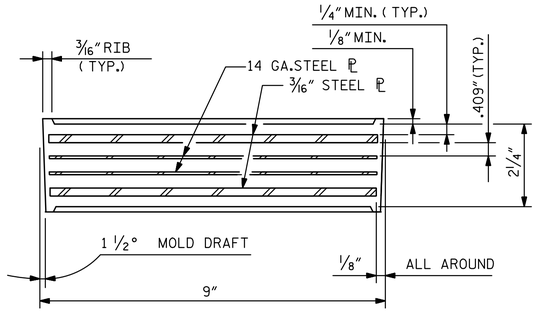
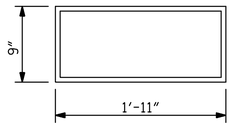


SECTION E-E



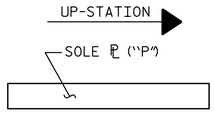
TYPICAL SECTION OF ELASTOMERIC BEARINGS



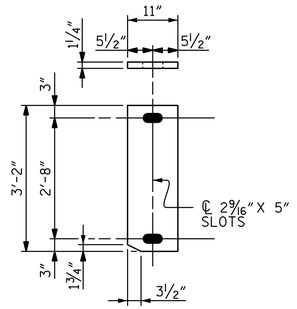
E4 (30 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



SOLE ℄ PLACEMENT DETAIL



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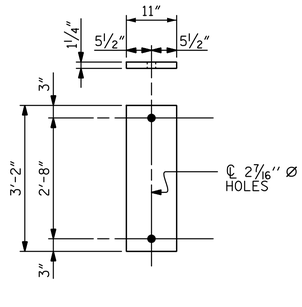
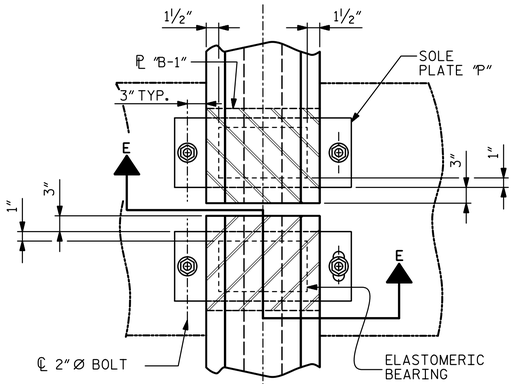
(EXPANSION)
P1 (10 REQ'D)



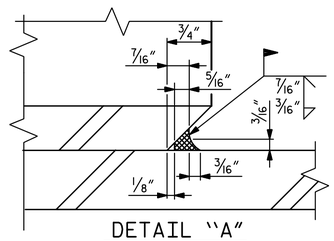
P2
(FIXED)
P2 (20 REQ'D)

SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN
(SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN
(SHOWING SIMPLE SPAN BENT)



DETAIL "A"

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.

— LOAD RATINGS —	
	MAX. D.L.+L.L.
TYPE V	365 k

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
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RALEIGH

SUPERSTRUCTURE

ELASTOMERIC BEARING DETAILS

-RIGHT LANE-

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NC License Number F-0991

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CHECKED BY : TJT	DATE : 6-14		

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DEAD LOAD DEFLECTION TABLE

	SPAN A & C					GIRDERS 1 - 5					
TENTH POINTS	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.008	0.014	0.018	0.020	0.021	0.020	0.018	0.014	0.008	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.002	0.005	0.007	0.008	0.008	0.008	0.007	0.005	0.002	0.000
FINAL CAMBER ↑	0″	1/16″	1/8″	1/8″	1/8″	1/8″	1/8″	1/8″	1/8″	1/16″	0″

DEAD LOAD DEFLECTION TABLE

	SPAN B										GIRDERS 1 & 5										
TWENTIETH POINTS	0.0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.060	0.113	0.161	0.202	0.236	0.265	0.287	0.303	0.312	0.315	0.312	0.303	0.287	0.265	0.236	0.202	0.161	0.113	0.060	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.026	0.053	0.078	0.101	0.122	0.140	0.155	0.165	0.172	0.174	0.172	0.165	0.155	0.140	0.122	0.101	0.078	0.053	0.026	0.000
FINAL CAMBER ↑	0″	3/8″	3/4″	1″	1 3/16″	1 3/8″	1 1/2″	1 9/16″	1 5/8″	1 11/16″	1 11/16″	1 11/16″	1 5/8″	1 9/16″	1 1/2″	1 3/8″	1 3/16″	1″	3/4″	3/8″	0″

DEAD LOAD DEFLECTION TABLE

	SPAN B										GIRDERS 2-4										
TWENTIETH POINTS	0.0	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.060	0.113	0.161	0.202	0.236	0.265	0.287	0.303	0.312	0.315	0.312	0.303	0.287	0.265	0.236	0.202	0.161	0.113	0.060	0.000
DEFLECTION DUE TO SUPERIMPOSED D.L. ▲ ↓	0.000	0.025	0.050	0.075	0.097	0.117	0.134	0.148	0.158	0.164	0.166	0.164	0.158	0.148	0.134	0.117	0.097	0.075	0.050	0.025	0.000
FINAL CAMBER ↑	0″	7/16″	3/4″	1 1/16″	1 1/4″	1 7/16″	1 9/16″	1 11/16″	1 3/4″	1 3/4″	1 13/16″	1 3/4″	1 3/4″	1 11/16″	1 9/16″	1 7/16″	1 1/4″	1 1/16″	3/4″	7/16″	0″

NOTES:

▲ DOES NOT INCLUDE FUTURE WEARING SURFACE.

ALL VALUES ARE SHOWN IN DECIMAL FEET, EXCEPT FOR "FINAL CAMBER" WHICH IS SHOWN IN INCHES.

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

DocuSigned by: Adam J. Peter E3F6AFBD9B7742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

63" MBT PRESTRESSED CONCRETE GIRDER DEAD LOAD DEFLECTION TABLES

-RIGHT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12-16
1			3			TOTAL SHEETS
2			4			38

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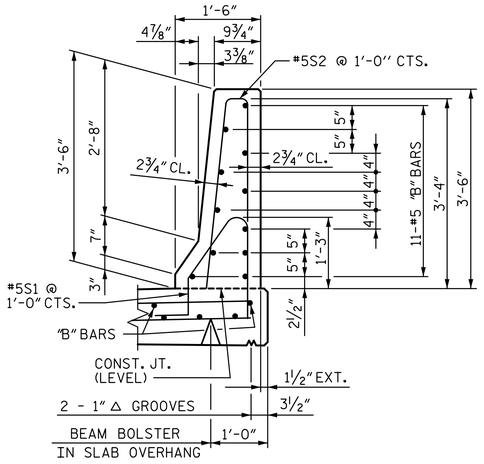
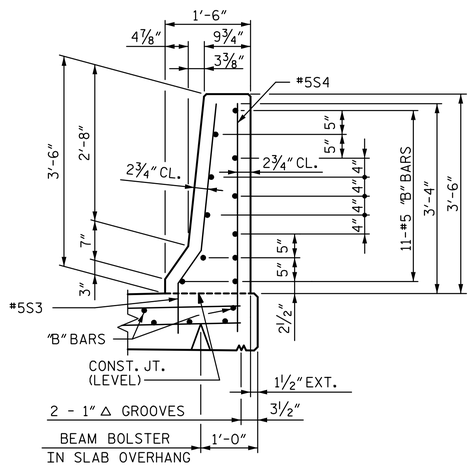
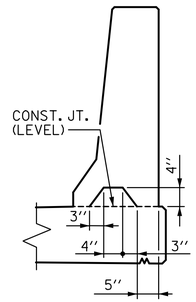


TYPICAL SECTION THRU RAIL



TYPICAL SECTION AT JOINT



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

NOTES

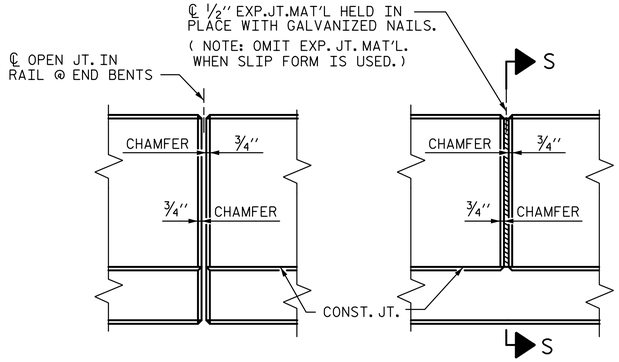
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

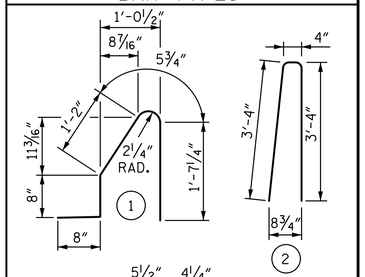
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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

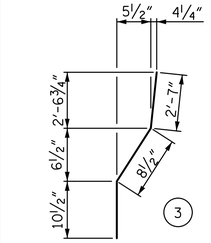
CONCRETE BARRIER RAIL ON APPROACH SLAB, LENGTH AND QUANTITIES, NOT INCLUDED. SEE "BRIDGE APPROACH SLAB DETAILS" SHEETS.



ELEVATION AT EXPANSION JOINTS

BAR TYPES





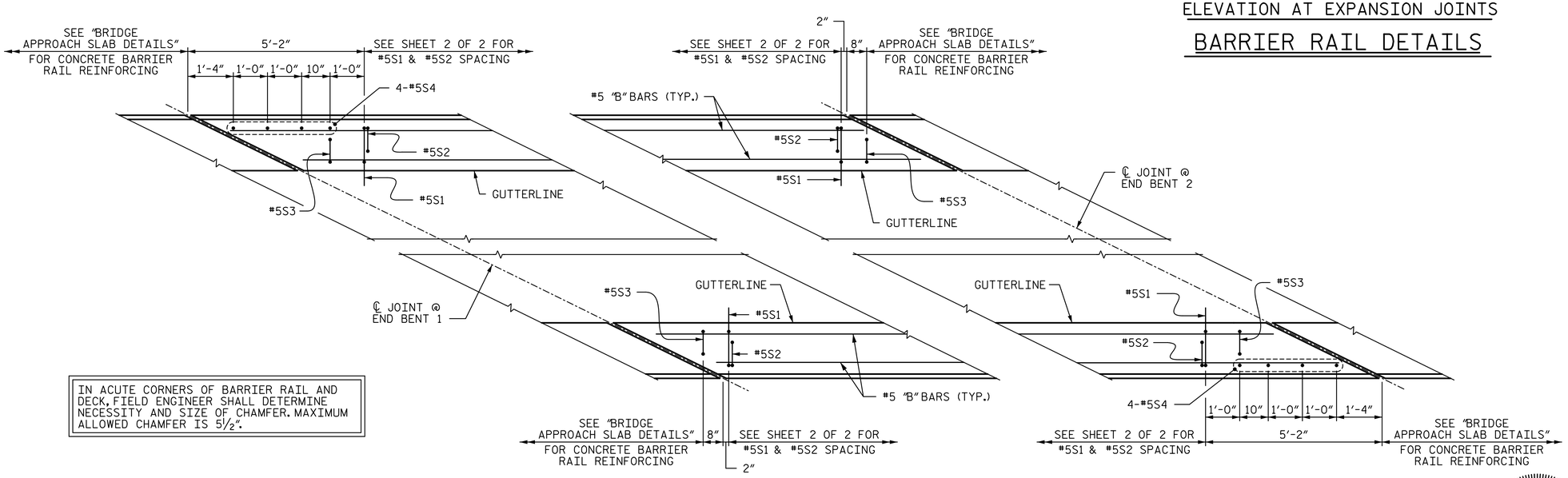
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	44	#5	STR.	12'-10"	589
* B2	88	#5	STR.	27'-11"	2,562
* B3	44	#5	STR.	29'-7"	1,358
* B4	44	#5	STR.	14'-7"	669
* S1	434	#5	①	4'-7"	2,075
* S2	434	#5	②	7'-0"	3,169
* S3	4	#5	③	4'-2"	17
* S4	8	#5	STR.	4'-0"	33

* EPOXY COATED REINFORCING STEEL	10,472 LBS.
CLASS AA CONCRETE	60.0 CU. YDS.
CONCRETE BARRIER RAIL	441.2 LIN. FT.



IN ACUTE CORNERS OF BARRIER RAIL AND DECK, FIELD ENGINEER SHALL DETERMINE NECESSITY AND SIZE OF CHAMFER. MAXIMUM ALLOWED CHAMFER IS 5½".

END BENT 1

END BENT 2

PLAN AT JOINTS

BARRIER RAIL DETAILS

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F8AF8D9B4742A...
4/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

DRAWN BY : CLG DATE : 6-14
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DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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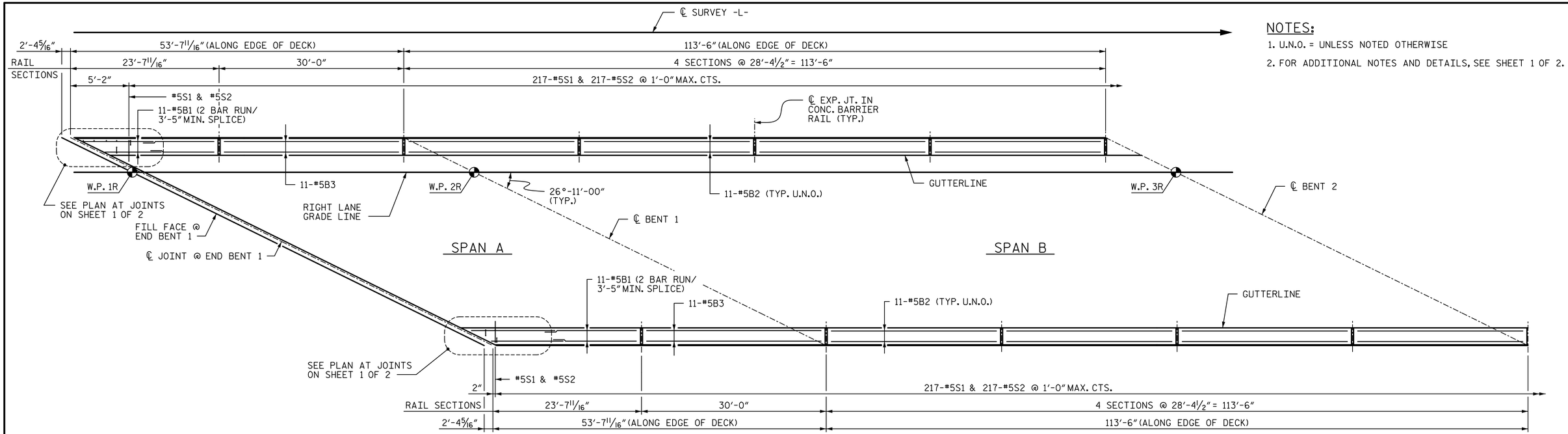
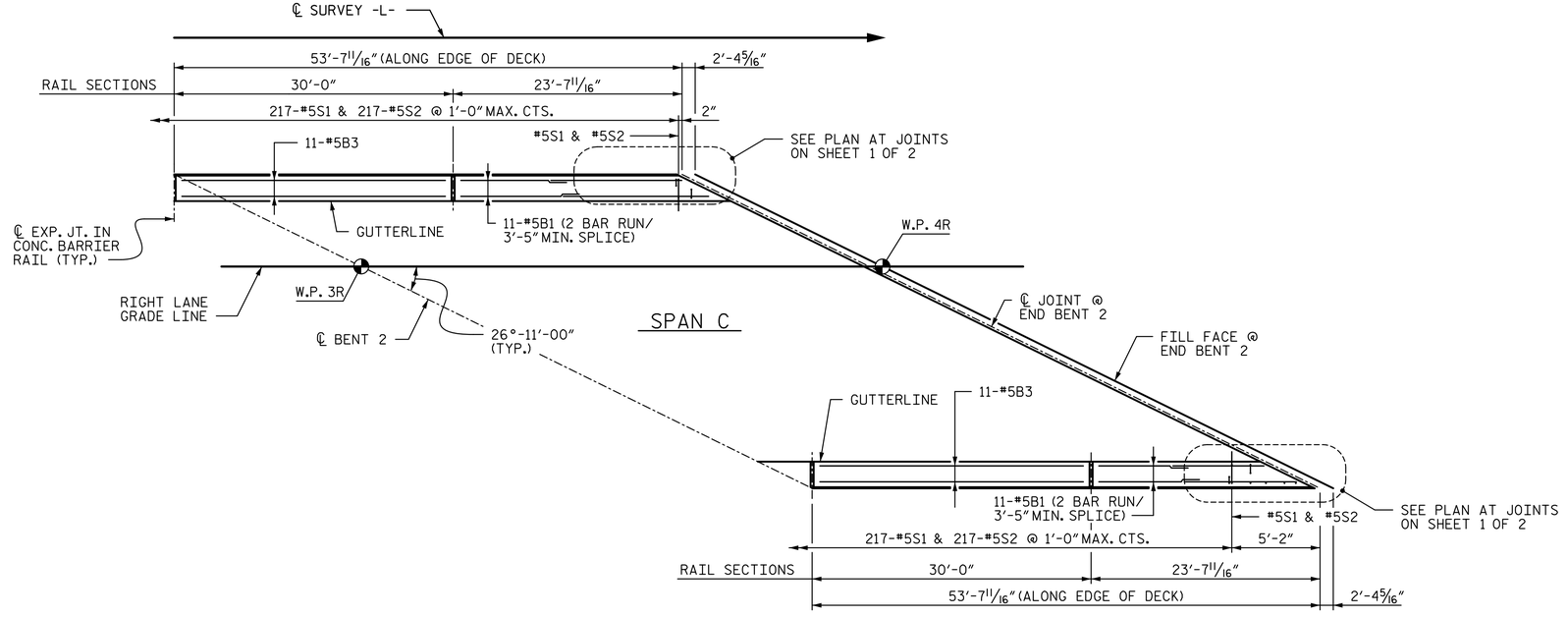


PLAN - SPAN A & B



PLAN - SPAN C

NOTES:

1. U.N.O. = UNLESS NOTED OTHERWISE
2. FOR ADDITIONAL NOTES AND DETAILS, SEE SHEET 1 OF 2.

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NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

-RIGHT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
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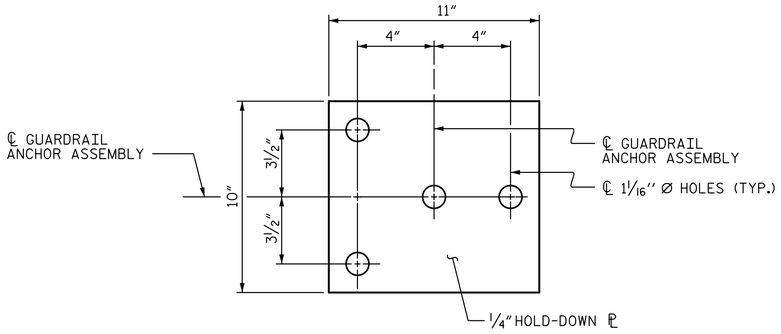
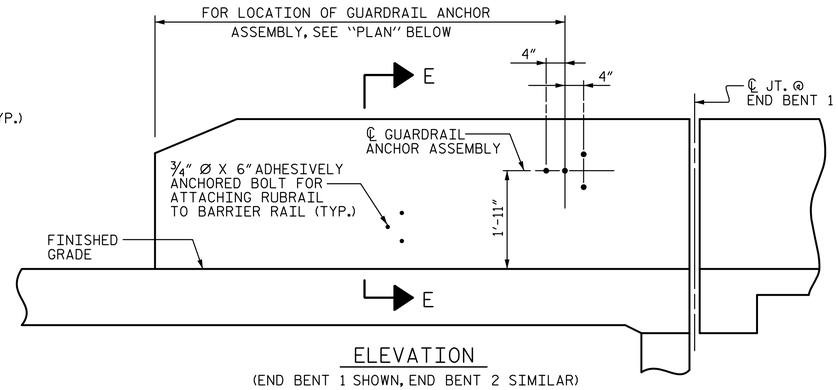
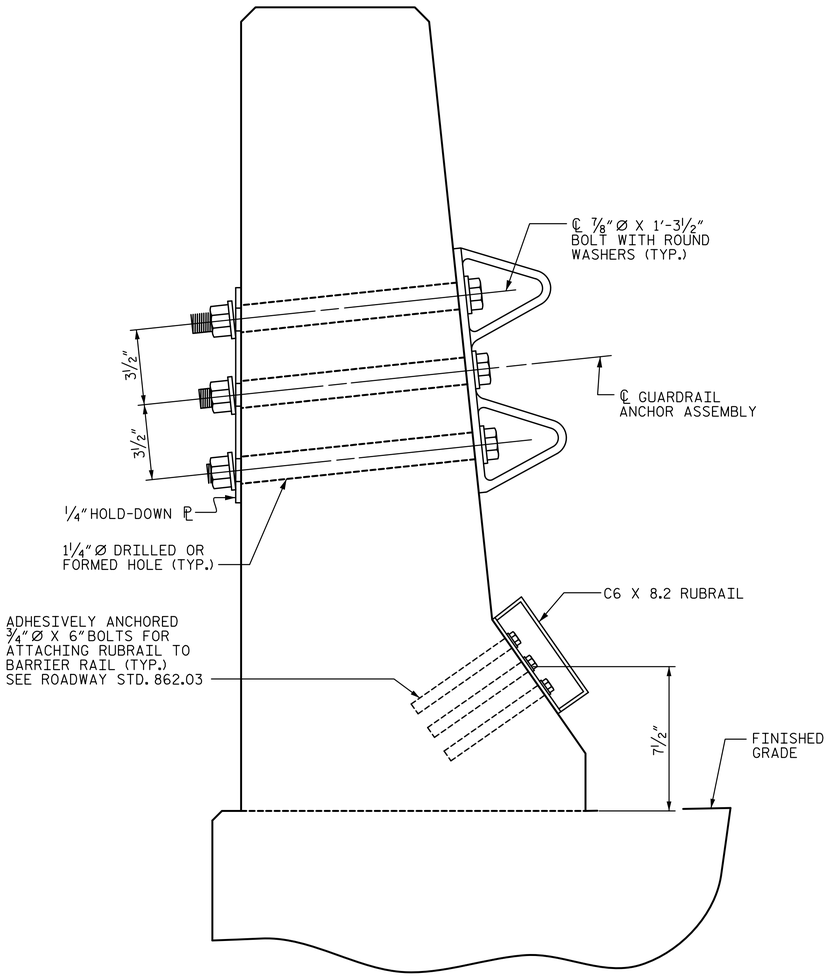


PLAN



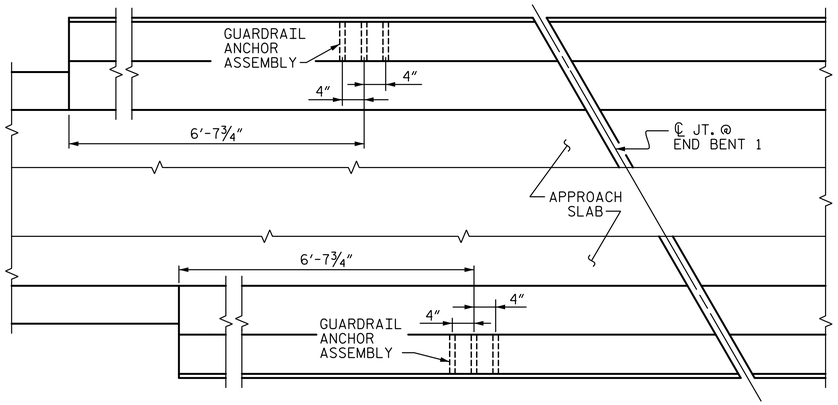
ELEVATION

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION E-E

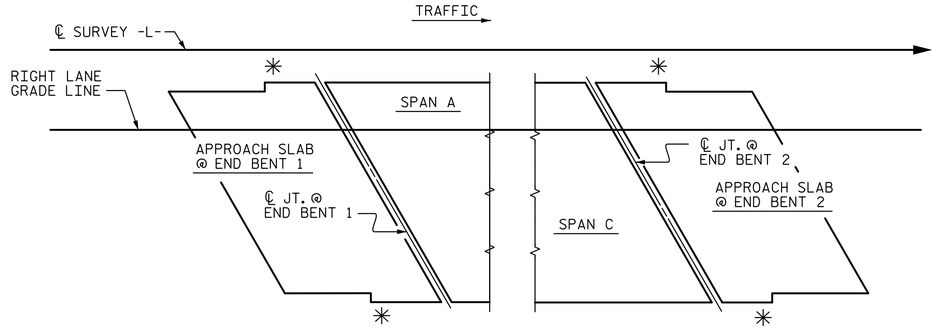
GUARDRAIL ANCHOR ASSEMBLY DETAILS



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.

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

-RIGHT LANE-

DRAWN BY : CLG	DATE : 6-14	DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14
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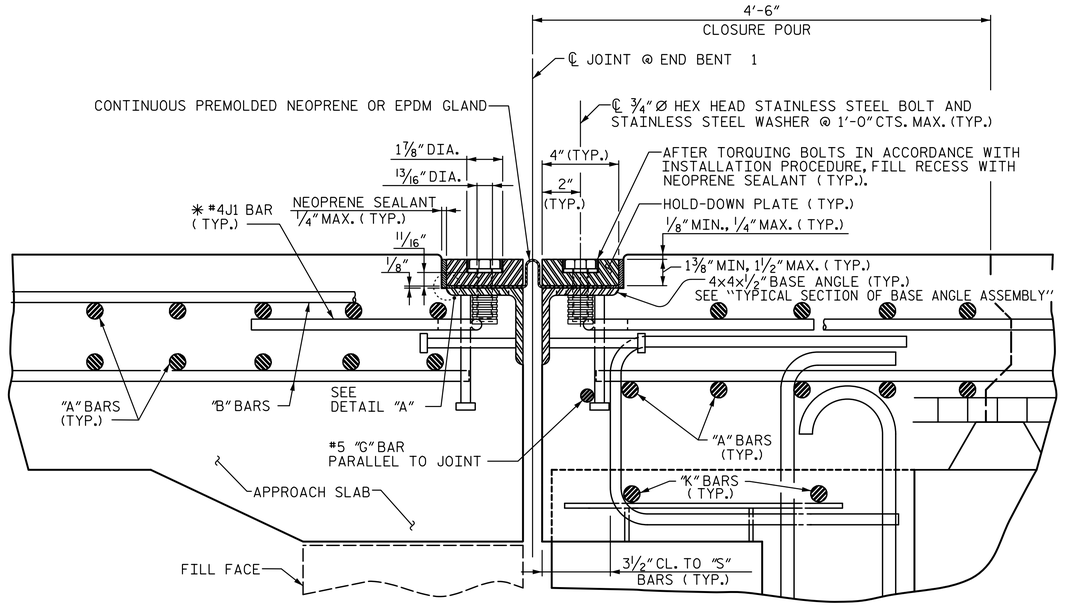


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

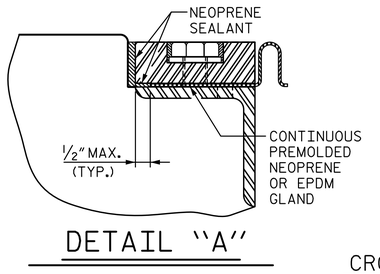
* THE QUANTITY OF #4J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

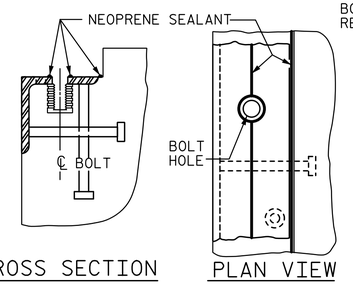
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO 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.

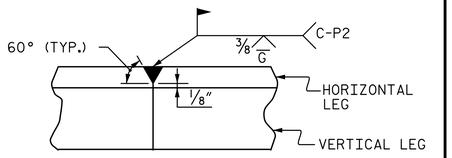


DETAIL "A"

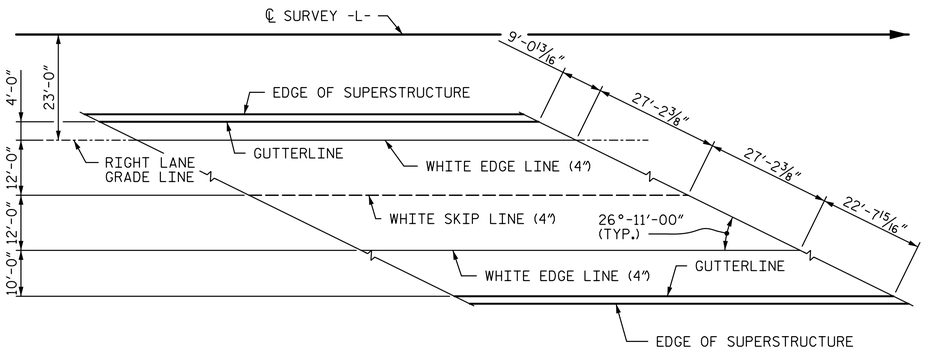


CROSS SECTION PLAN VIEW

INSTALLATION SKETCH

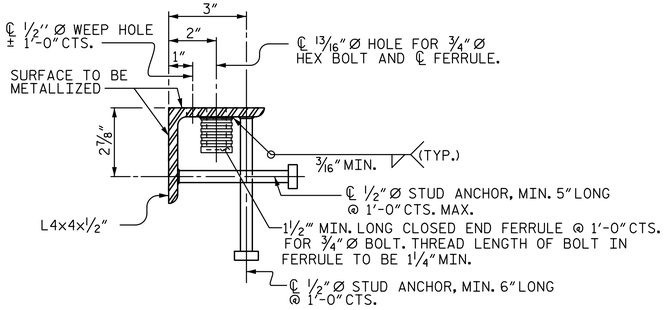


DETAIL- FIELD WELD SPLICE OF BASE ANGLE



PAVEMENT MARKING ALIGNMENT

MOVEMENT AND SETTING AT JOINT					
END 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
1	26°-11'-00"	11/16"	1⅛"	1 1/16"	1"
2	26°-11'-00"	11/16"	1⅛"	1 1/16"	1"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AFBD9B7472A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

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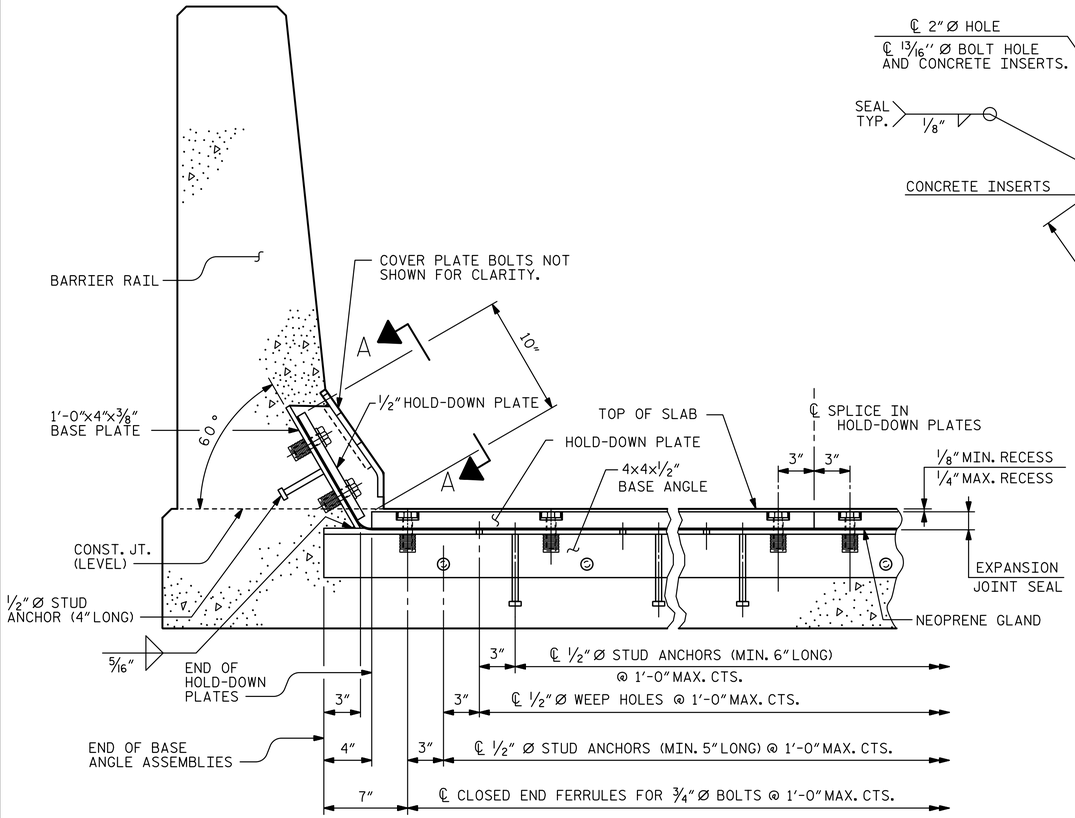
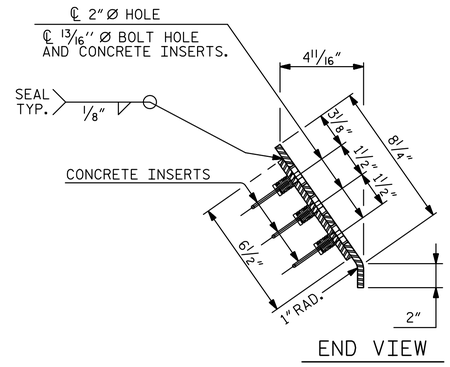
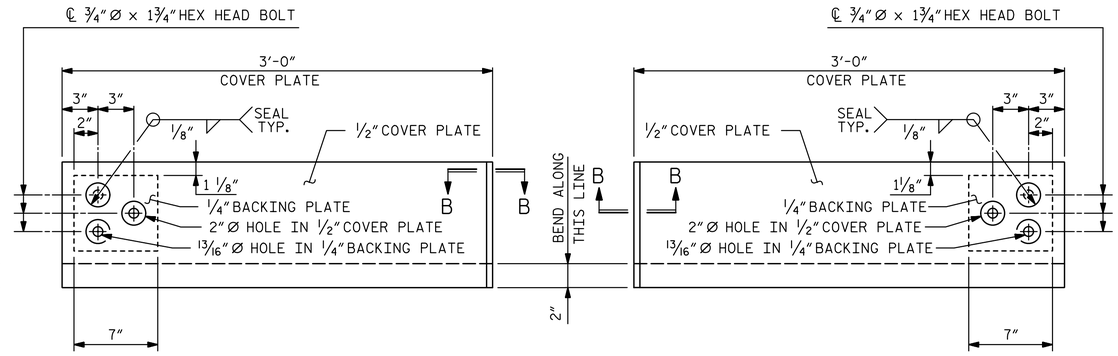


SECTION THRU RAIL NORMAL TO JOINT



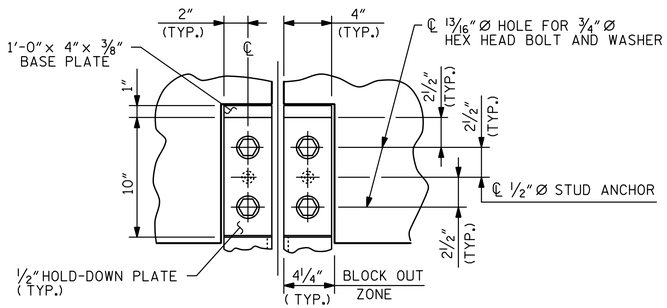
END VIEW



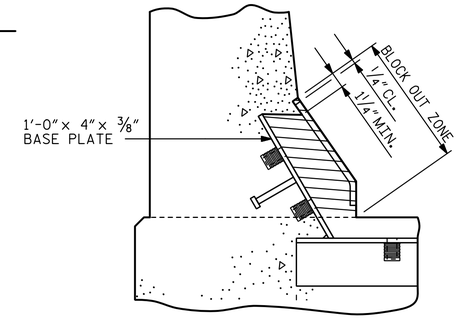
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

COVER PLATE DETAILS

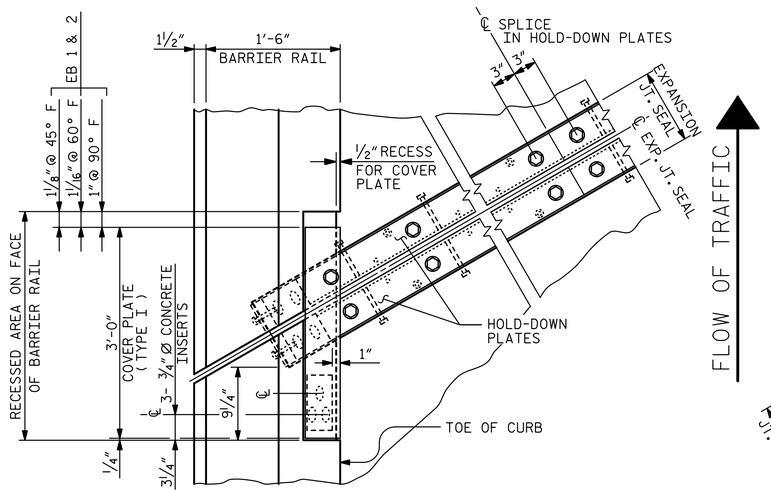


SECTION A - A

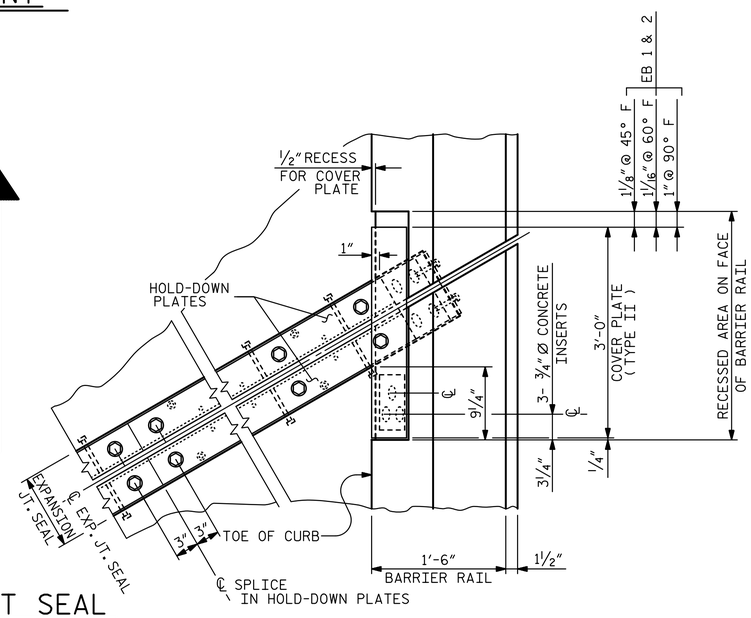


BLOCK OUT DETAIL

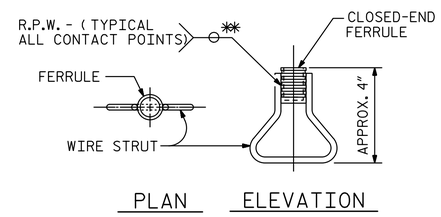
SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL

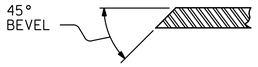


SECTION A - A



CONCRETE INSERT

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



SECTION B - B

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3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

PROJECT NO. R-2514D
JONES & CRAVEN COUNTY
STATION: 526+71.12 -L-
= 16+08.07 -Y6-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL -RIGHT LANE-

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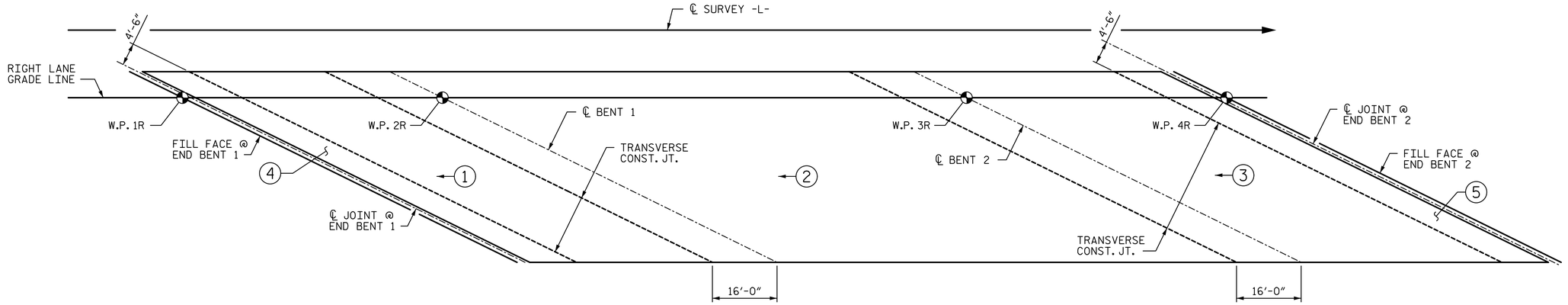
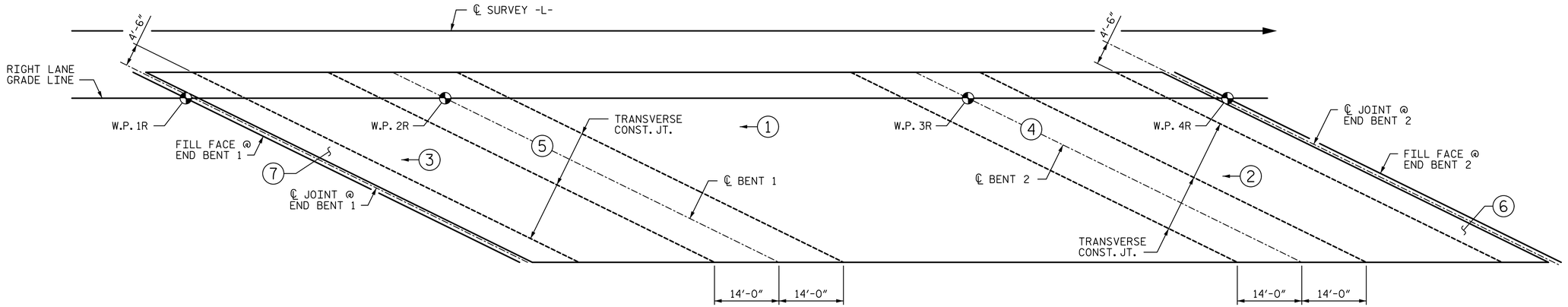


POUR SEQUENCE

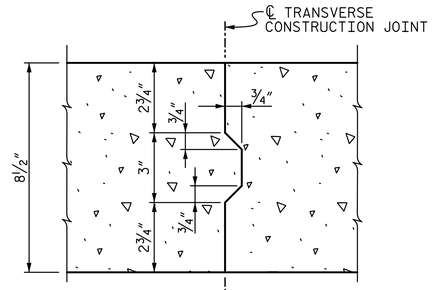
(#) = INDICATES POUR NUMBER AND DIRECTION OF POUR

NOTE: CONTRACTOR HAS THE OPTION TO COMBINE POURS 4 AND 5.



OPTIONAL POUR SEQUENCE

NOTE: CONTRACTOR HAS THE OPTION TO COMBINE POURS 6 AND 7.



NOTE : REINFORCING STEEL IN SLAB NOT SHOWN. TRANSVERSE & LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.

CONSTRUCTION JOINT IN DECK SLAB

DocuSigned by: Adam J. Peter E3F6AF8D994742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK POUR SEQUENCE

-RIGHT LANE-

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REINFORCING BAR SCHEDULE

MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT	MARK	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	233	#5	STR.	40′-11″	9,944	A216	2	#5	STR.	13′-4″	28
A2	233	#5	STR.	40′-11″	9,944	A217	2	#5	STR.	13′-1″	27
						A218	2	#5	STR.	12′-9″	27
✳A100	36	#5	STR.	21′-9″	817	A219	2	#5	STR.	12′-6″	26
✳A101	36	#5	STR.	20′-6″	770	A220	2	#5	STR.	12′-2″	25
✳A102	36	#5	STR.	19′-2″	720	A221	2	#5	STR.	11′-11″	25
✳A103	36	#5	STR.	17′-11″	673	A222	2	#5	STR.	11′-7″	24
✳A104	36	#5	STR.	16′-7″	623	A223	2	#5	STR.	11′-4″	24
✳A105	36	#5	STR.	15′-4″	576	A224	2	#5	STR.	11′-0″	23
✳A106	36	#5	STR.	14′-0″	526	A225	2	#5	STR.	10′-9″	22
✳A107	36	#5	STR.	12′-9″	479	A226	2	#5	STR.	10′-5″	22
✳A108	36	#5	STR.	11′-5″	429	A227	2	#5	STR.	10′-2″	21
✳A109	36	#5	STR.	10′-2″	382	A228	2	#5	STR.	9′-11″	21
✳A110	2	#5	STR.	13′-5″	28	A229	2	#5	STR.	9′-7″	20
✳A111	2	#5	STR.	13′-2″	27	A230	2	#5	STR.	9′-4″	19
✳A112	2	#5	STR.	12′-10″	27	A231	2	#5	STR.	9′-0″	19
✳A113	2	#5	STR.	12′-7″	26	A232	2	#5	STR.	8′-9″	18
✳A114	2	#5	STR.	12′-3″	26	A233	2	#5	STR.	8′-5″	18
✳A115	2	#5	STR.	12′-0″	25	A234	2	#5	STR.	8′-2″	17
✳A116	2	#5	STR.	11′-9″	25	A235	2	#5	STR.	7′-10″	16
✳A117	2	#5	STR.	11′-5″	24	A236	2	#5	STR.	7′-7″	16
✳A118	2	#5	STR.	11′-2″	23	A237	18	#5	STR.	5′-0″	94
✳A119	2	#5	STR.	10′-10″	23	A238	16	#5	STR.	7′-0″	117
✳A120	2	#5	STR.	10′-7″	22						
✳A121	2	#5	STR.	10′-3″	21	✳B1	56	#5	STR.	46′-0″	2,687
✳A122	2	#5	STR.	10′-0″	21	✳B2	56	#6	STR.	40′-0″	3,364
✳A123	2	#5	STR.	9′-9″	20	✳B3	28	#5	STR.	59′-0″	1,723
✳A124	2	#5	STR.	9′-5″	20	✳B10	54	#6	STR.	40′-0″	3,244
✳A125	2	#5	STR.	9′-2″	19	✳B11	54	#6	STR.	30′-0″	2,433
✳A126	2	#5	STR.	8′-10″	18	B101	72	#5	STR.	45′-9″	3,436
✳A127	2	#5	STR.	8′-7″	18	B102	72	#6	STR.	40′-0″	4,326
✳A128	2	#5	STR.	8′-3″	17	B103	36	#5	STR.	58′-0″	2,178
✳A129	2	#5	STR.	8′-0″	17						
✳A130	2	#5	STR.	7′-9″	16	✳G1	4	#5	STR.	48′-0″	200
✳A131	2	#5	STR.	7′-5″	15						
✳A132	2	#5	STR.	7′-2″	15	✳J1	174	#4	⑪	1′-5″	165
✳A133	2	#5	STR.	6′-10″	14						
✳A134	2	#5	STR.	6′-7″	14	✳K1	12	#8	①	39′-10″	1,276
✳A135	2	#5	STR.	6′-3″	13	✳K2	8	#8	②	28′-6″	609
✳A136	2	#5	STR.	6′-0″	13	✳K3	8	#6	STR.	10′-0″	120
✳A137	16	#5	STR.	5′-0″	83	✳K4	8	#6	STR.	13′-0″	156
✳A138	8	#5	STR.	7′-0″	58	✳K5	8	#6	STR.	16′-6″	198
✳A139	2	#6	STR.	31′-3″	94	K6	64	#4	STR.	3′-7″	153
✳A140	2	#6	STR.	32′-6″	98	K7	16	#4	STR.	10′-0″	107
✳A141	2	#6	STR.	33′-9″	101	K8	64	#4	STR.	16′-9″	716
						K9	16	#4	STR.	9′-2″	98
A200	36	#5	STR.	21′-6″	807	K10	30	#4	⑥	23′-6″	471
A201	36	#5	STR.	20′-3″	760	K11	20	#4	⑦	11′-9″	157
A202	36	#5	STR.	18′-11″	710	K12	8	#4	STR.	13′-1″	70
A203	36	#5	STR.	17′-8″	663						
A204	36	#5	STR.	16′-4″	613	✳S1	80	#5	③	6′-0″	501
A205	36	#5	STR.	15′-1″	566	✳S2	80	#4	④	7′-7″	405
A206	36	#5	STR.	13′-9″	516	✳S3	8	#4	④	3′-5″	18
A207	36	#5	STR.	12′-6″	469	✳S4	8	#4	④	4′-5″	24
A208	36	#5	STR.	11′-2″	419	✳S5	8	#4	④	5′-3″	28
A209	36	#5	STR.	9′-11″	372	✳S6	8	#4	④	6′-3″	33
A210	2	#5	STR.	15′-0″	31	S7	304	#4	⑤	4′-5″	897
A211	2	#5	STR.	14′-9″	31	S8	10	#4	⑤	2′-11″	19
A212	2	#5	STR.	14′-6″	30						
A213	2	#5	STR.	14′-3″	30	U1	32	#4	⑧	16′-6″	353
A214	2	#5	STR.	13′-11″	29	U2	48	#4	⑨	12′-2″	390
A215	2	#5	STR.	13′-8″	29	U3	48	#4	⑩	7′-6″	240
						✳EPOXY COATED REINF. STEEL (LBS.)					34,104
						REINF. STEEL (LBS.)					30,299

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

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

SUPERSTRUCTURE BILL OF MATERIAL

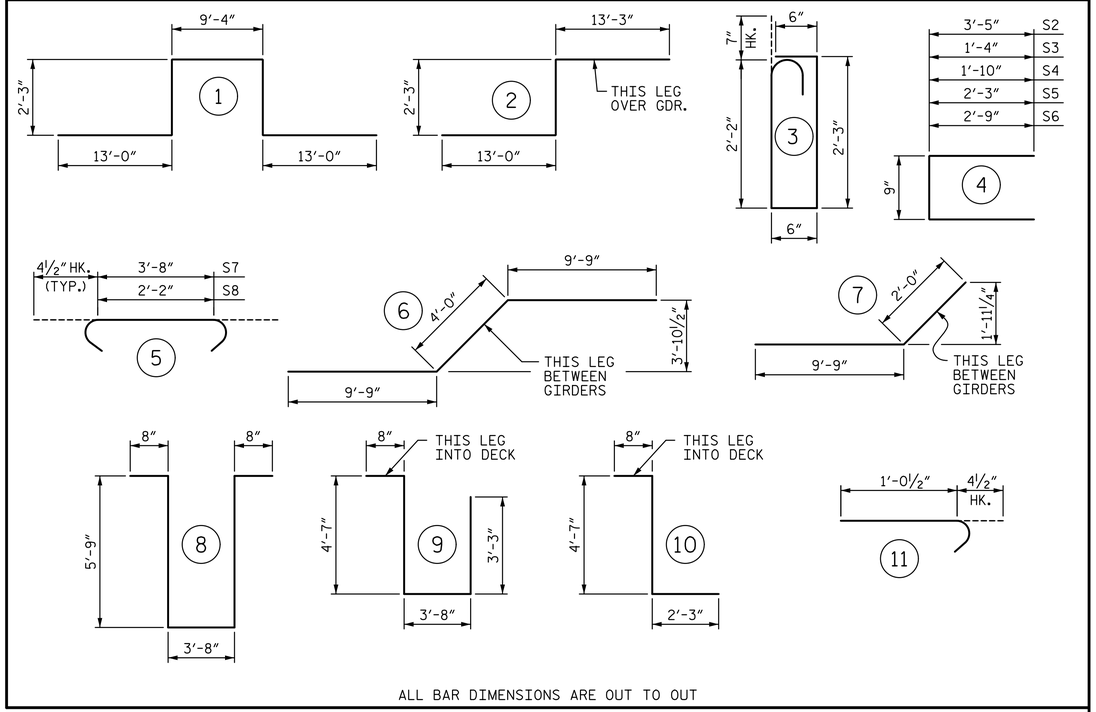
	CLASS AA CONCRETE	EPOXY COATED STEEL REINFORCING	STEEL REINFORCING
	(CU. YDS.)	(LBS.)	(LBS.)
SPAN A, B & C	--	34,104	30,299
POUR 1	39.3	--	--
POUR 2	209.9	--	--
POUR 3	142.4	--	--
POUR 4	21.2	--	--
POUR 5	21.2	--	--
TOTAL✳	434.0	34,104	30,299

✳QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED

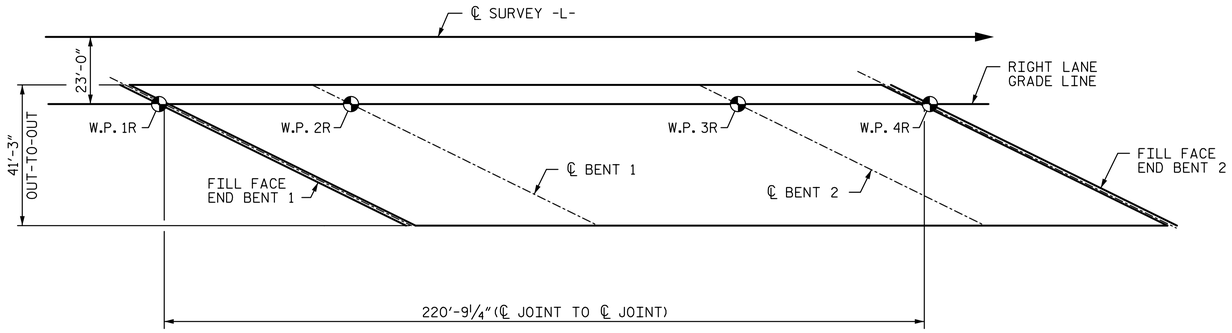
GROOVING BRIDGE FLOORS

APPROACH SLABS	1,591 SQ.FT.
BRIDGE DECK	7,642 SQ.FT.
TOTAL	9,233 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 9,107)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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DocuSigned by: Adam J. Peter
E3F6AFBD9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SUPERSTRUCTURE BILL OF MATERIAL

-RIGHT LANE-

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SHEET NO. S12-23

TOTAL SHEETS 38

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NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

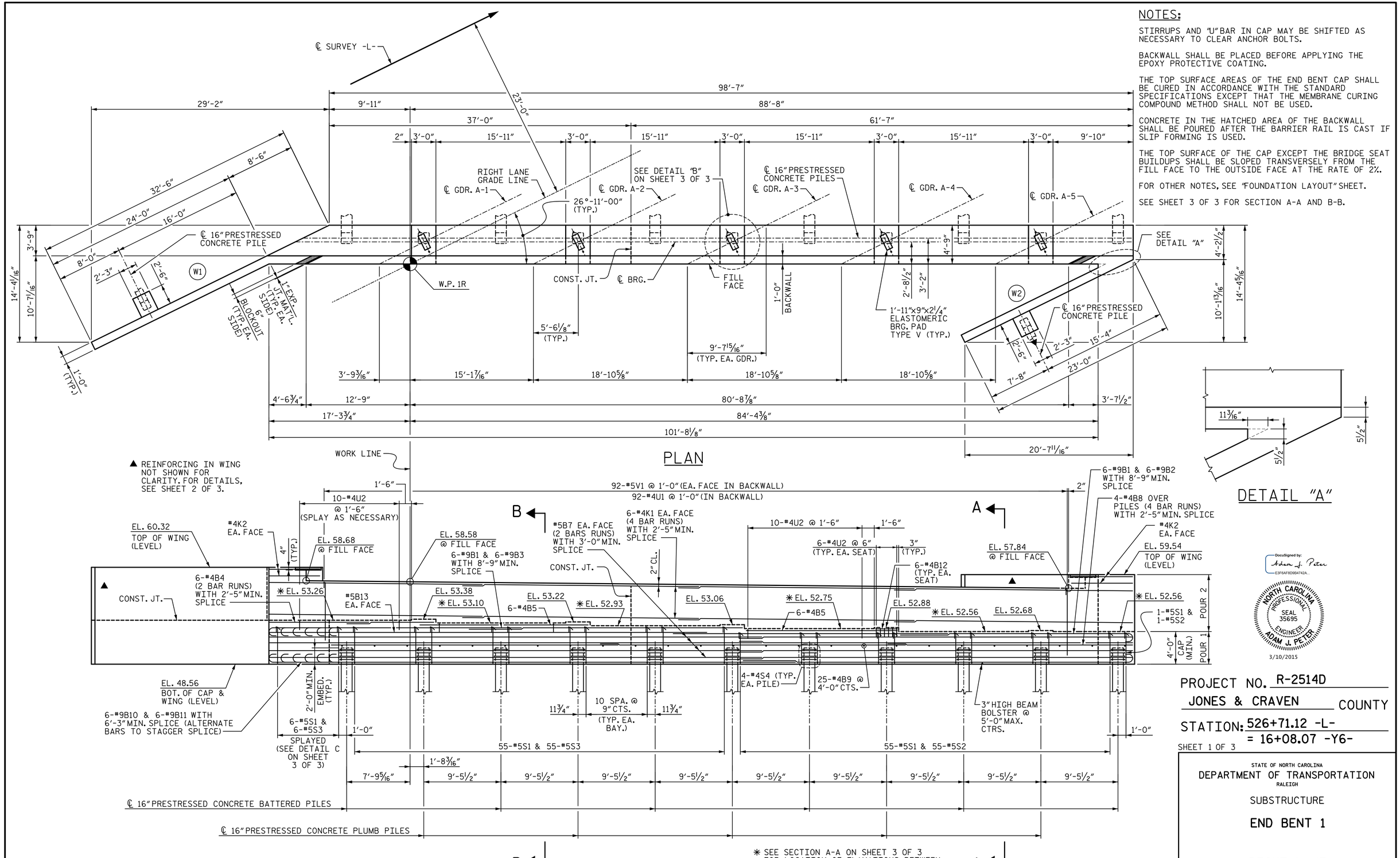
THE TOP SURFACE AREAS OF THE END BENT CAP SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

CONCRETE IN THE HATCHED AREA OF THE BACKWALL SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

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

FOR OTHER NOTES, SEE "FOUNDATION LAYOUT" SHEET.

SEE SHEET 3 OF 3 FOR SECTION A-A AND B-B.



PLAN

DETAIL "A"

ELEVATION

(WING WALL PILES NOT SHOWN FOR CLARITY)

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

-RIGHT LANE-

DRAWN BY : VMW	DATE : 6-14	DESIGN ENGINEER OF RECORD: P. KELLY	DATE : 6-14
CHECKED BY : PEK	DATE : 6-14		

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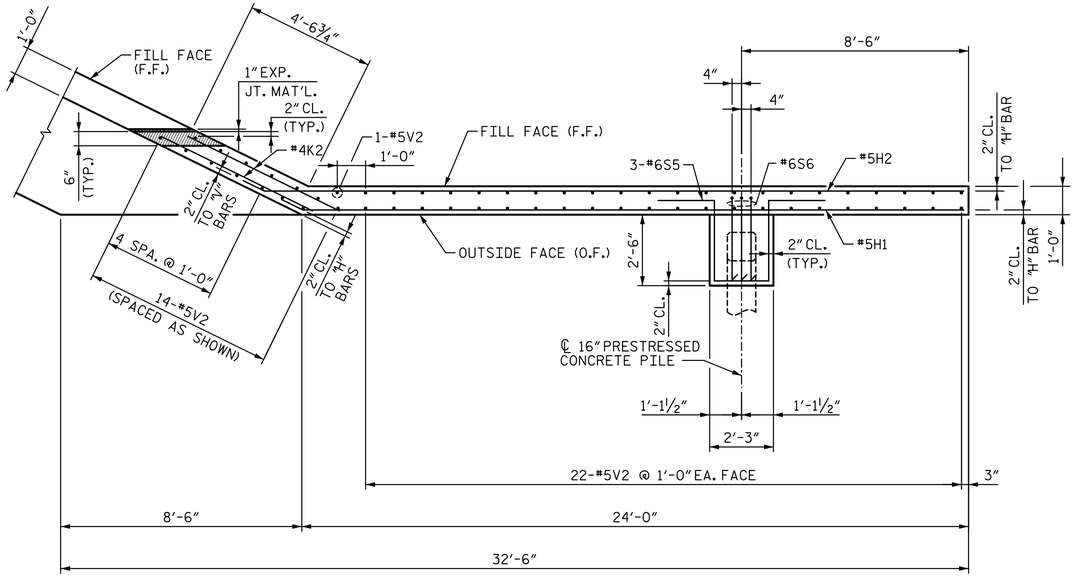
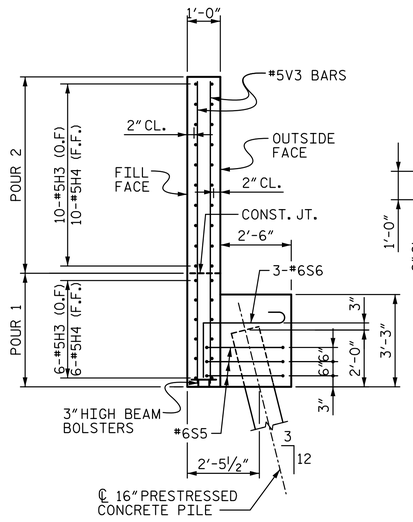
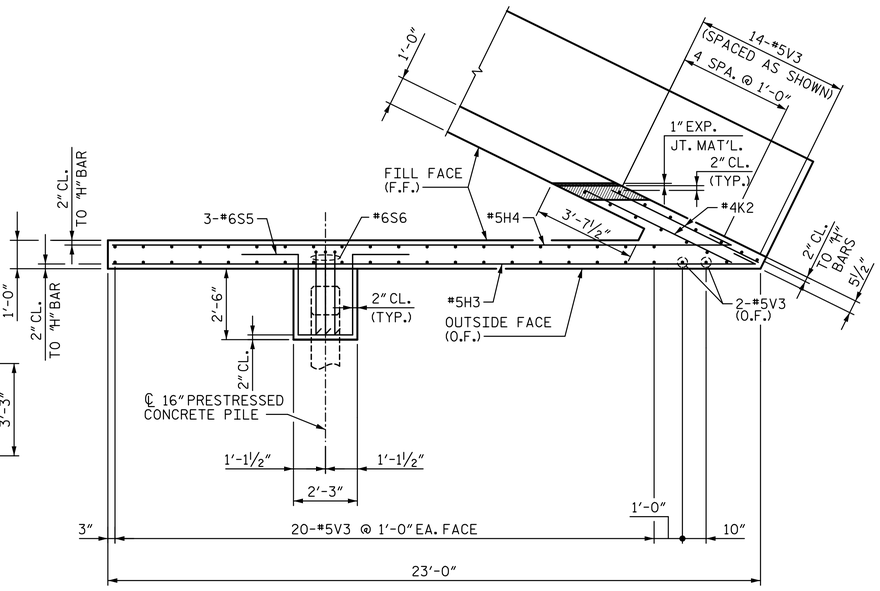


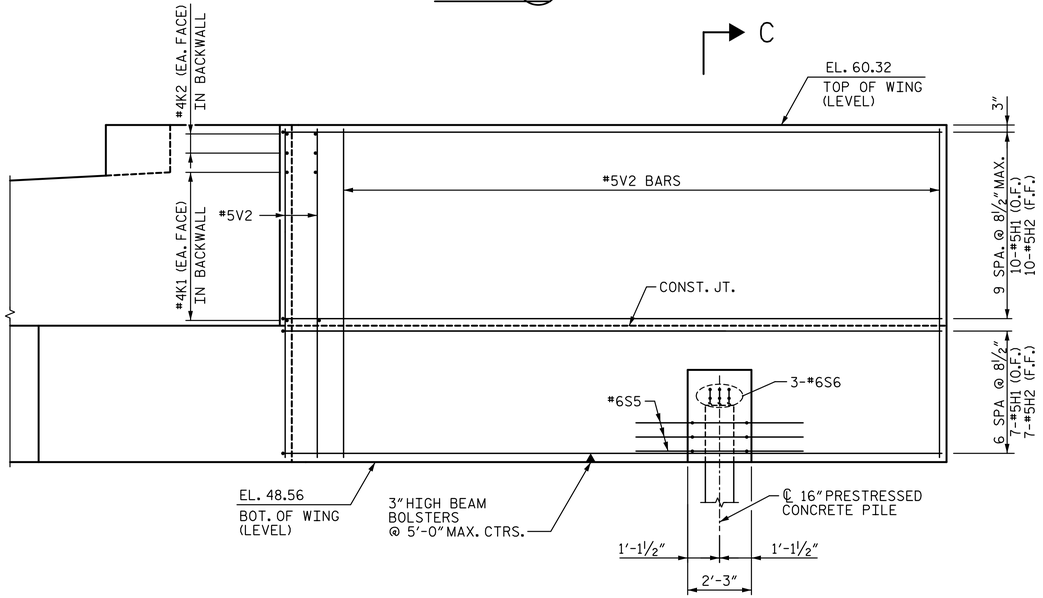
PLAN (W1)



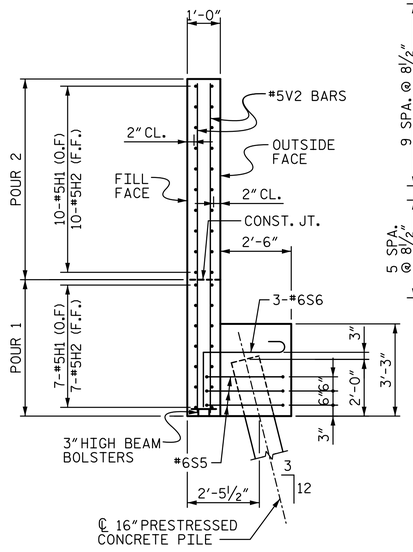
SECTION D-D



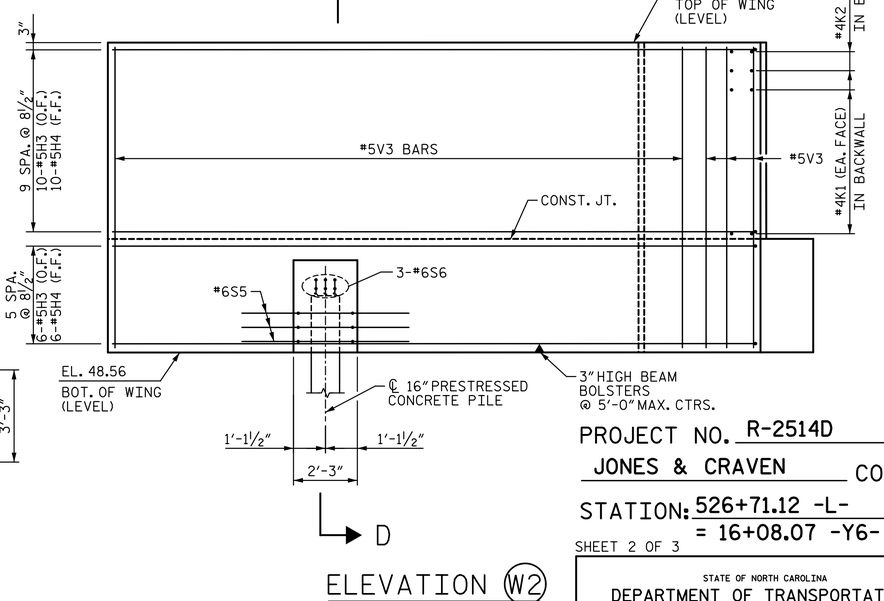
PLAN (W2)



ELEVATION (W1)



SECTION C-C



ELEVATION (W2)

DocuSigned by:
Adam J. Peter
E3F6AF8D9B4742A...
3/10/2015

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

-RIGHT LANE-

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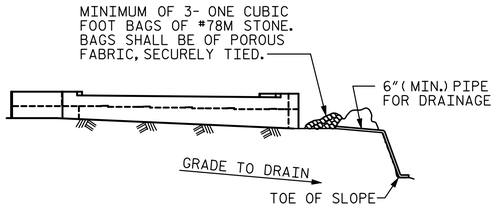
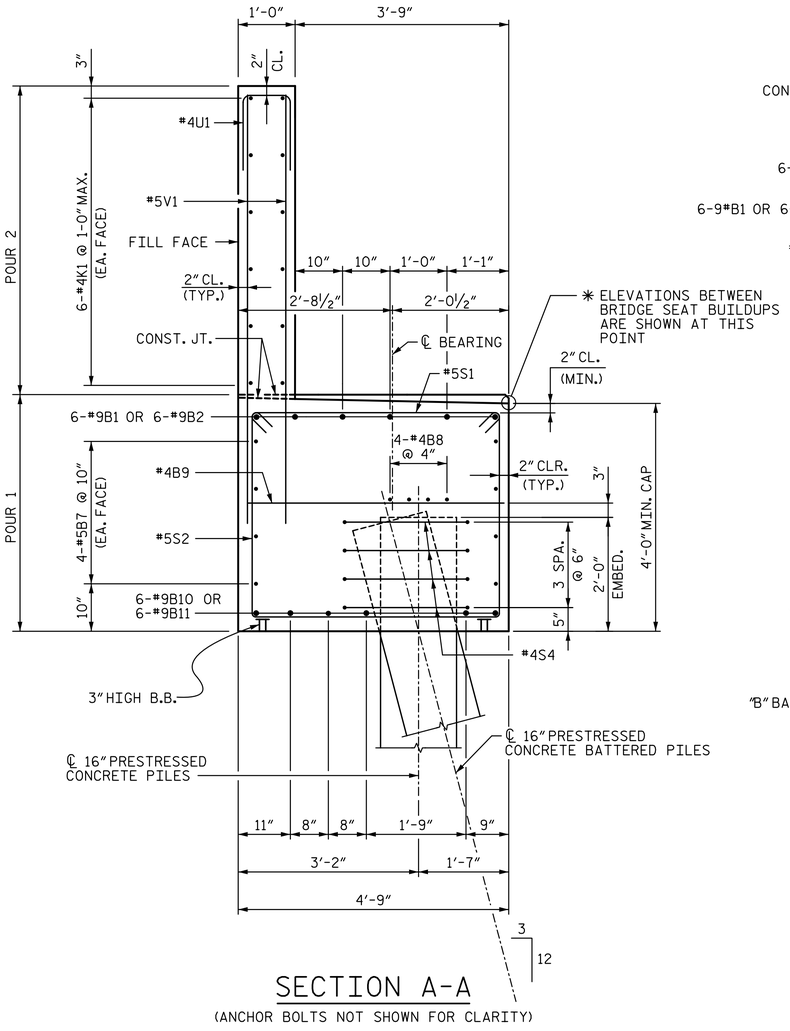


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

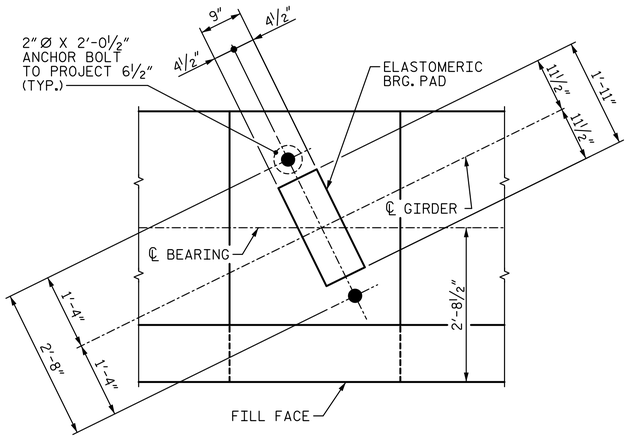
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

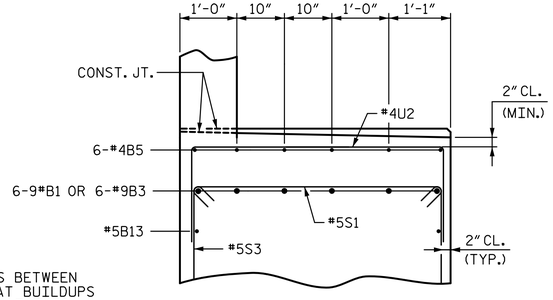


SECTION A-A

(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

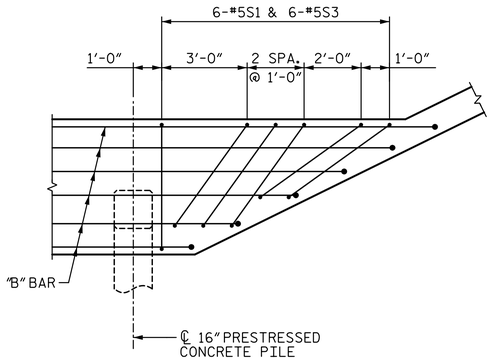


DETAIL "B"



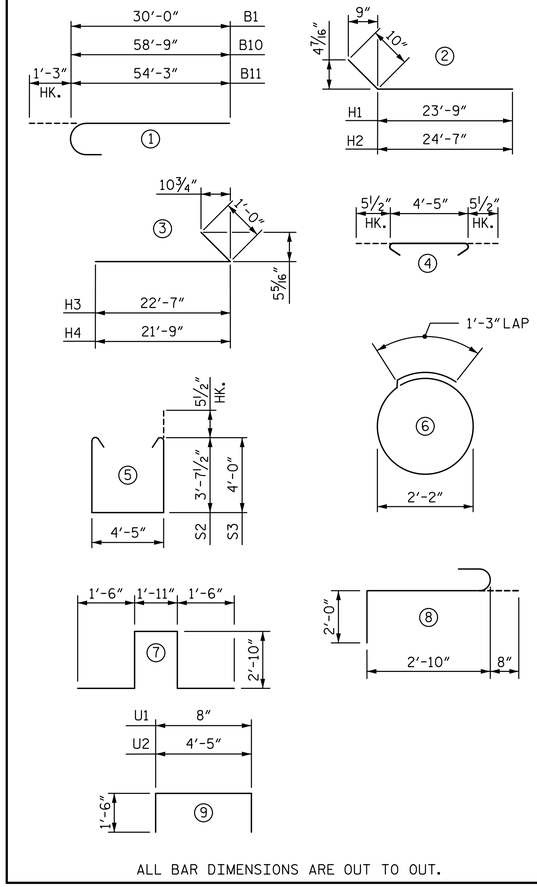
PARTIAL SECTION B-B

(ANCHOR BOLTS NOT SHOWN FOR CLARITY)



DETAIL "C"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF REINFORCING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	①	31'-3"	1,275
B2	6	#9	STR	29'-3"	597
B3	6	#9	STR	38'-9"	791
B4	12	#4	STR	12'-4"	99
B5	12	#4	STR	21'-6"	172
B7	16	#5	STR	54'-9"	914
B8	16	#4	STR	27'-2"	290
B9	25	#4	STR	4'-5"	74
B10	6	#9	①	60'-0"	1,224
B11	6	#9	①	55'-6"	1,132
B12	30	#4	STR	2'-8"	53
B13	2	#5	STR	60'-0"	125
H1	17	#5	②	24'-7"	436
H2	17	#5	②	25'-5"	451
H3	16	#5	③	23'-7"	394
H4	16	#5	③	22'-9"	380
K1	48	#4	STR	28'-9"	922
K2	8	#4	STR	5'-10"	31
S1	117	#5	④	5'-4"	651
S2	56	#5	⑤	12'-7"	735
S3	61	#5	⑤	13'-4"	848
S4	44	#4	⑥	8'-1"	238
S5	6	#6	⑦	10'-7"	95
S6	6	#6	⑧	5'-6"	50
U1	92	#4	⑨	3'-8"	225
U2	60	#4	⑨	7'-5"	297
V1	184	#5	STR	9'-8"	1,855
V2	59	#5	STR	11'-3"	692
V3	56	#5	STR	10'-6"	613

QUANTITIES

	END BENT 1
REINFORCING STEEL LBS.	15,659
CLASS A CONCRETE	
POUR 1 (CAP & LOWER WING) : CU. YARDS	86.6
POUR 2 (BACKWALL & UPPER WING) : CU. YARDS	33.5
TOTAL : CU. YARDS	120.1
16"PRESTRESSED CONCRETE PILES (NO.)	13
LIN. FEET	715.0
PILE REDRIVES EA.	6

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SHEET 3 OF 3

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3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

-RIGHT LANE-

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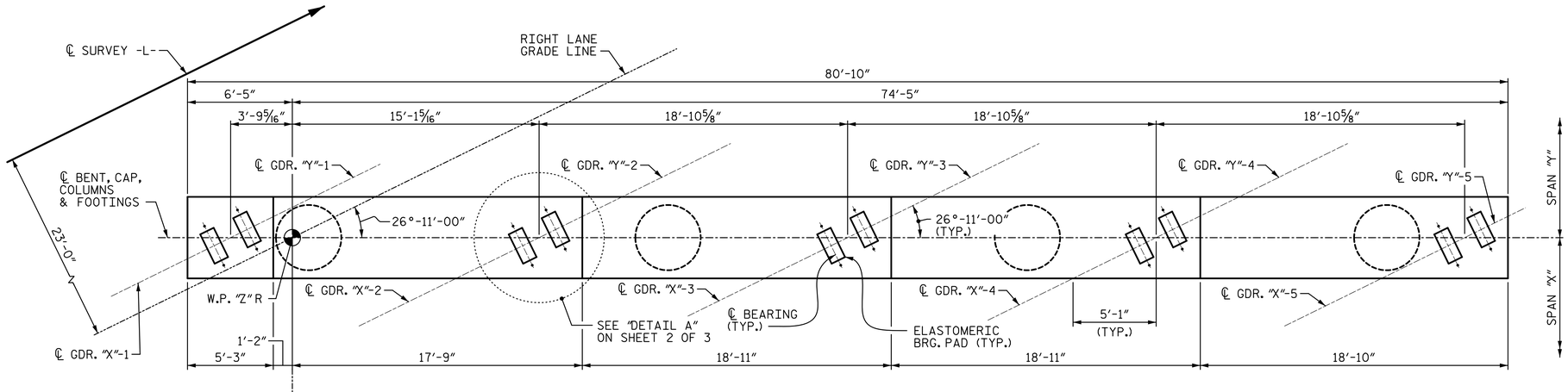
NOTES:

1. STIRRUPS AND "U BARS" IN CAP MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR ANCHOR BOLTS.
2. HOOKS ON BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
3. SEE "GENERAL DRAWING GENERAL NOTES" SHEET FOR ADDITIONAL NOTES.
4. SEE SHEET 2 OF 3 FOR SECTIONS CALLED OUT ON ELEVATION VIEW AND DETAIL A.



PLAN

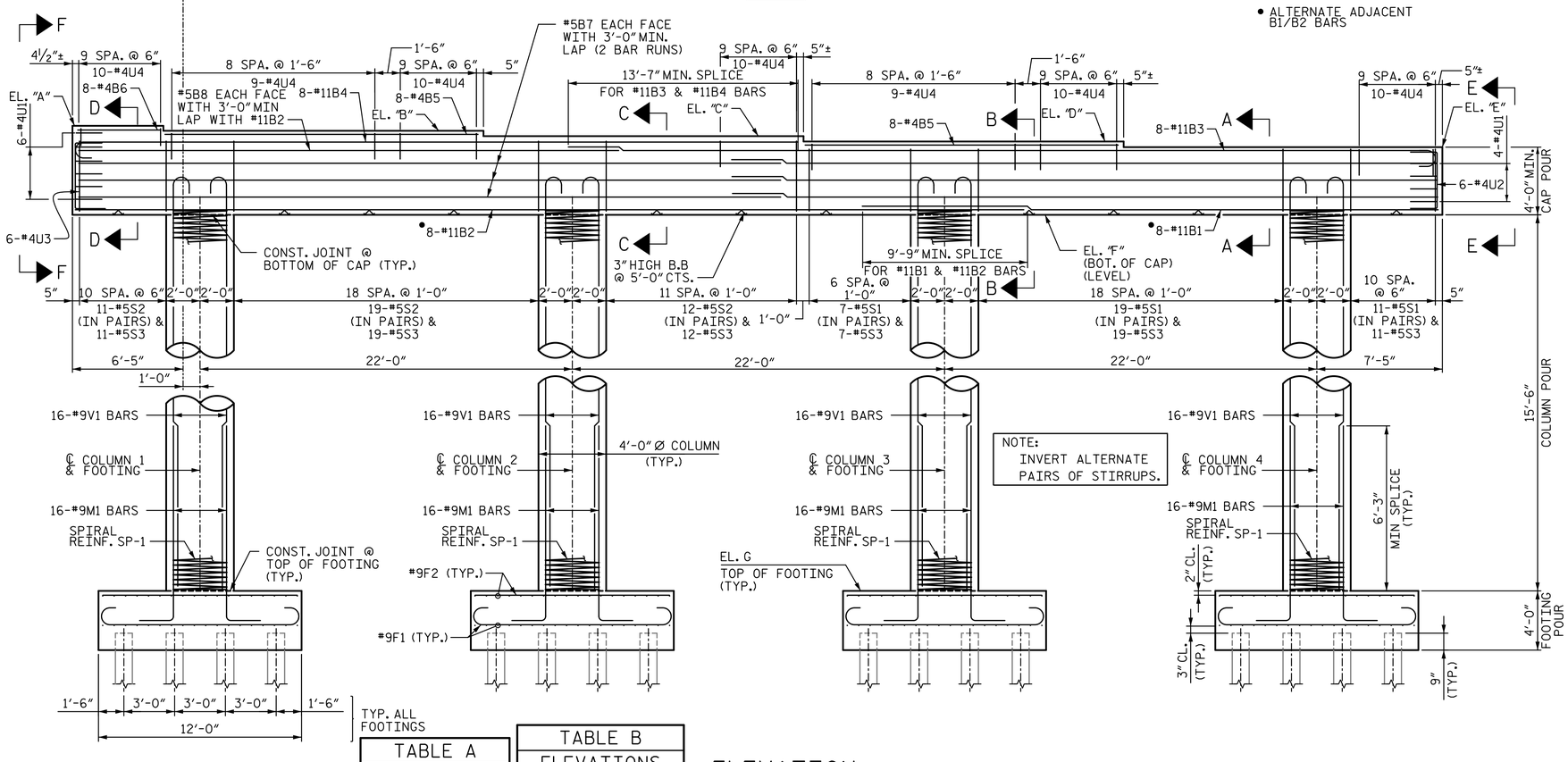
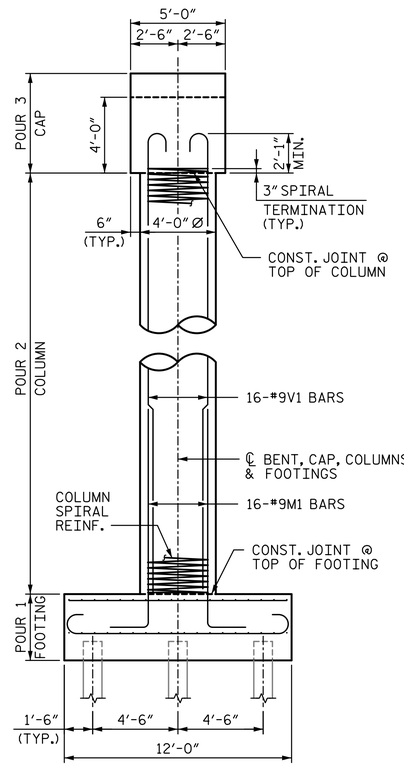


TABLE A PLAN VIEW INFORMATION		
	BENT 1	BENT 2
"X"	A	B
"Y"	B	C
"Z"	2	3

TABLE B ELEVATIONS		
	BENT 1	BENT 2
EL "A"	53.50	53.39
EL "B"	53.31	53.12
EL "C"	53.11	52.84
EL "D"	52.89	52.55
EL "E"	52.67	52.25
EL "F"	48.67	48.25
EL "G"	33.17	32.75

ELEVATION



END VIEW

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

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SHEET 1 OF 3

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RALEIGH

SUBSTRUCTURE

BENTS 1 & 2 PLAN & ELEVATION

-RIGHT LANE-

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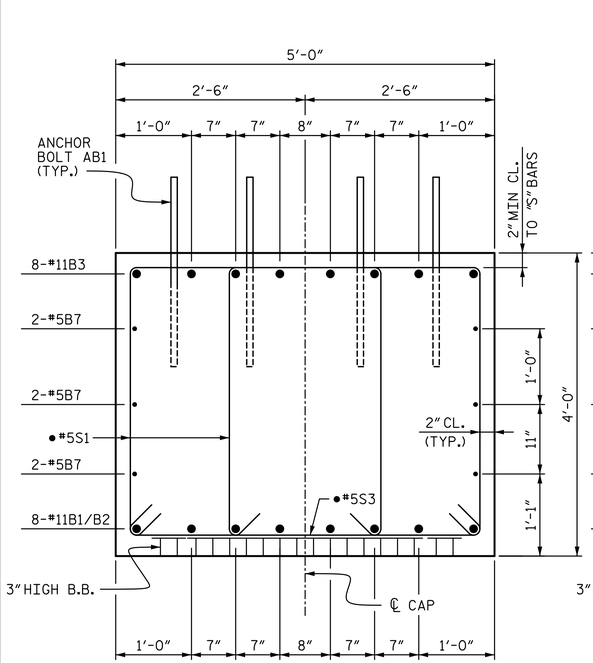
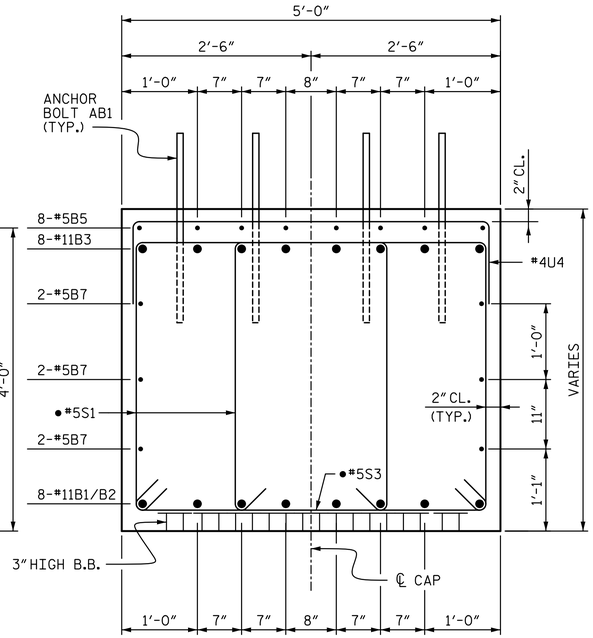
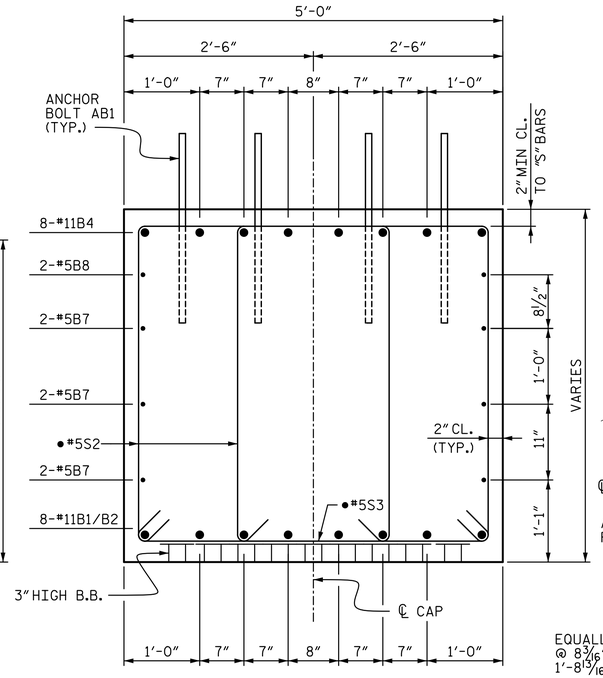


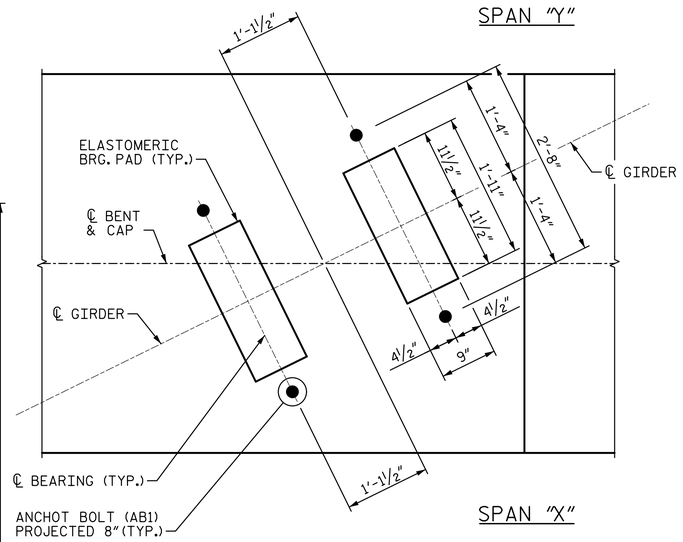
SECTION A-A



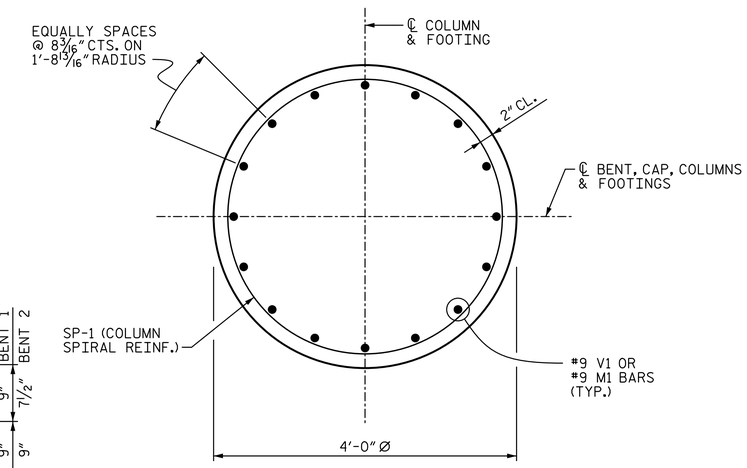
SECTION B-B



SECTION C-C

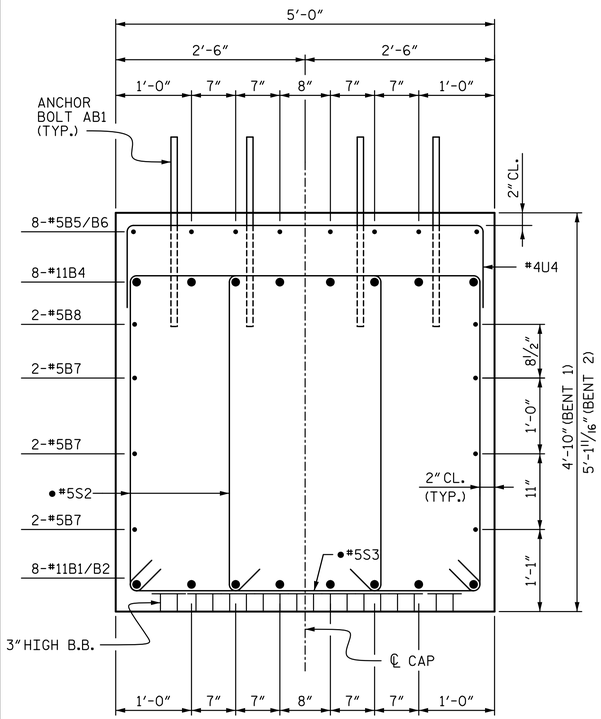


DETAIL "A"

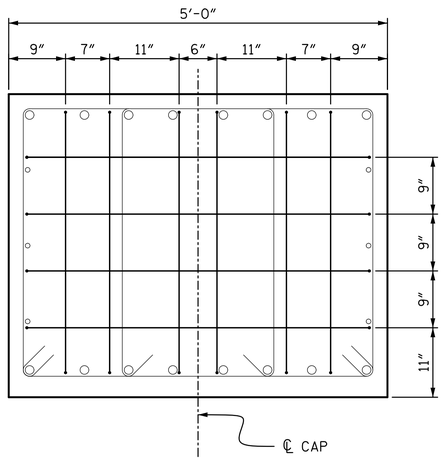


TYPICAL SECTION THROUGH COLUMN

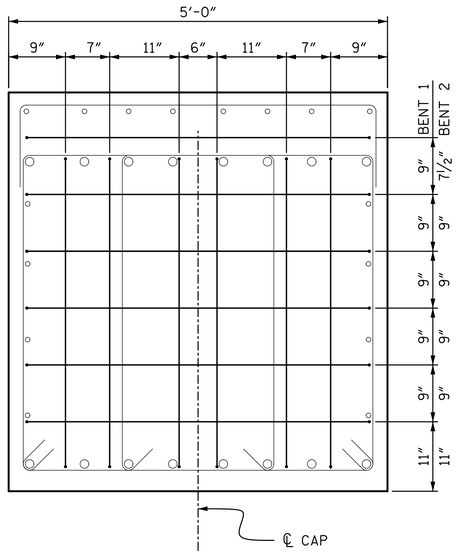
● INVERT ALTERNATE PAIRS OF STIRRUPS AND CAP WITH S3 BAR



SECTION D-D



VIEW E-E



VIEW F-F

NOTE:

1. FOR "AB1" ANCHOR BOLTS, SEE "ELASTOMERIC BEARING DETAILS" SHEET.

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SHEET 2 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

BENTS 1 & 2 DETAILS

-RIGHT LANE-

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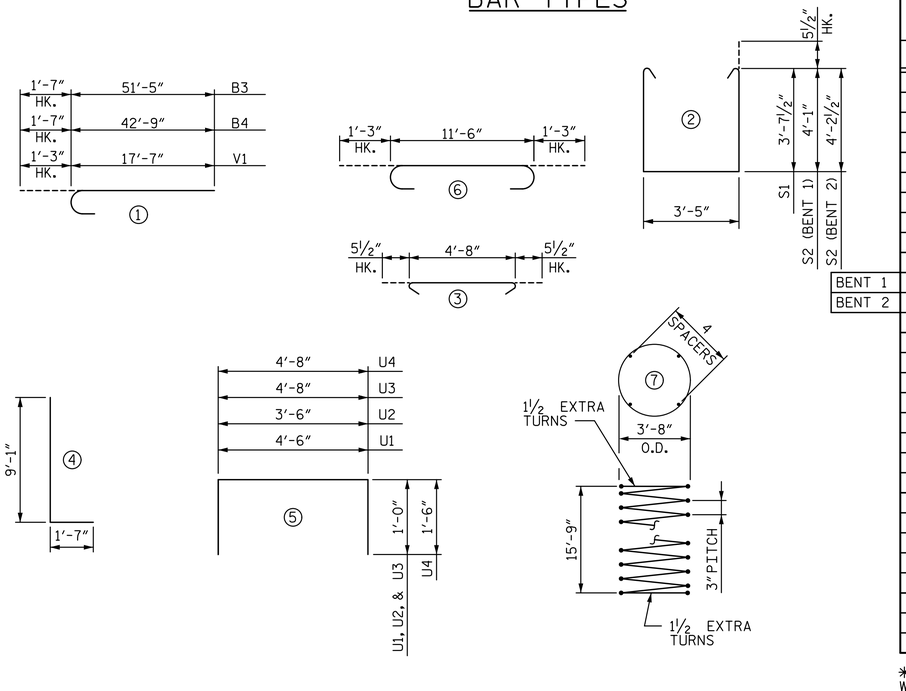
QUANTITIES

			BENT 1	BENT 2
REINFORCING STEEL		LBS.	29,730	29,752
SPIRAL REINFORCING STEEL		LBS.	2,009	2,009
CLASS A CONCRETE :	POUR 1 - FOOTINGS	CU. YDS.	85.4	85.4
	POUR 2 - COLUMNS	CU. YDS.	28.9	28.9
	POUR 3 - CAP	CU. YDS.	65.2	67.2
	TOTAL	CU. YDS.	179.5	181.5
12" SQUARE PRESTRESSED CONCRETE PILES				
	NUMBER	NO.	40	40
	LENGTH	FT.	1,600	1,600
PILE REDRIVES		EA.	10	10

BAR TYPES



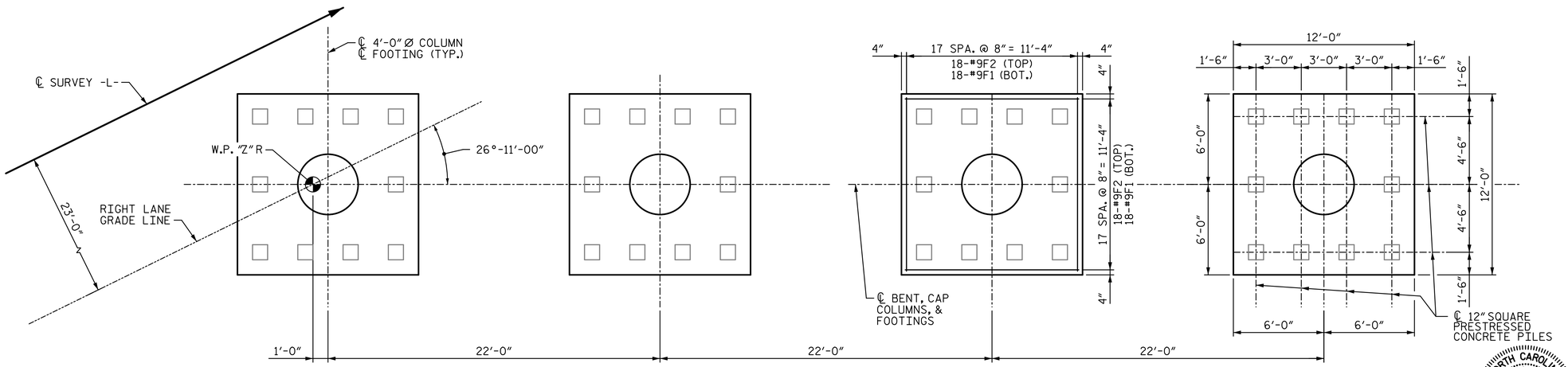
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR ONE BENT (2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#11	STR.	34'-2"	1,452
B2	8	#11	STR.	56'-2"	1,537
B3	8	#11	1	53'-0"	2,253
B4	8	#11	1	44'-4"	1,884
B5	16	#4	STR.	18'-11"	202
B6	8	#4	STR.	4'-11"	26
B7	12	#5	STR.	41'-9"	523
B8	2	#5	STR.	32'-2"	67
S1	74	#5	2	11'-7"	894
BENT 1 S2	84	#5	2	12'-6"	1,095
BENT 2 S2	84	#5	2	12'-9"	1,117
S3	79	#5	3	5'-7"	454
F1	144	#9	6	14'-0"	6,854
F2	144	#9	STR.	11'-6"	5,630
U1	10	#4	5	6'-6"	43
U2	6	#4	5	5'-6"	22
U3	6	#4	5	6'-8"	27
U4	68	#4	5	7'-8"	348
M1	64	#9	4	10'-8"	2,321
V1	64	#9	1	18'-10"	4,098
SP-1	4	*	7	751'-10"	2,009

* THE SP-1 SPIRAL REINFORCING SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR WITH A 3" PITCH.



PLAN OF PILE FOOTINGS

PILE LAYOUT, REINFORCING STEEL, AND FOOTING DIMENSIONS TYPICAL AT EACH FOOTING

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SHEET 3 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

BENTS 1 & 2 DETAILS & QUANTITIES
-RIGHT LANE-

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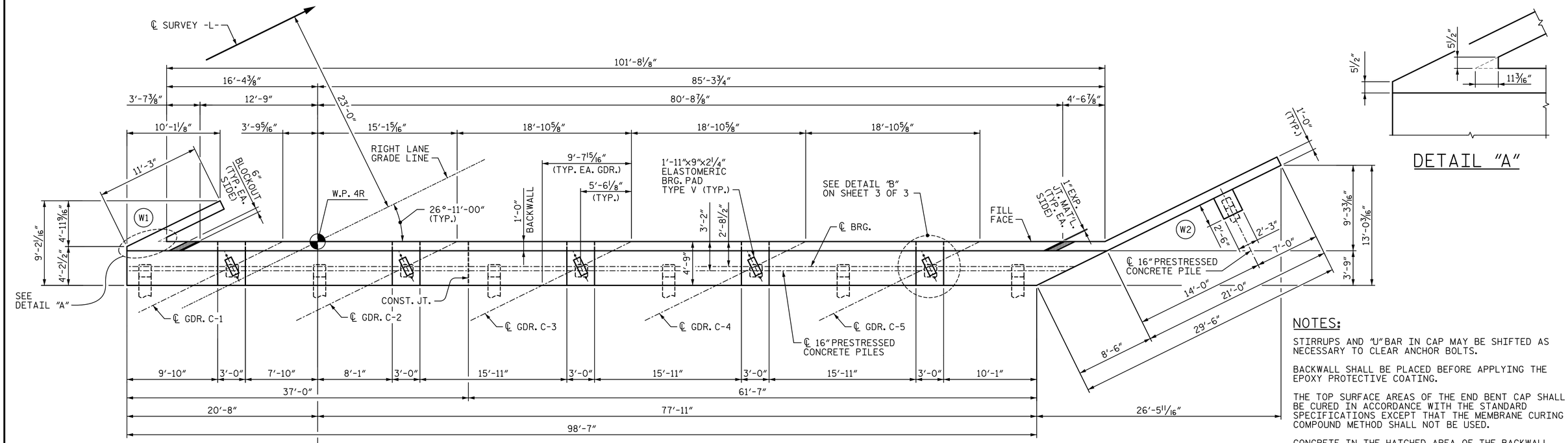
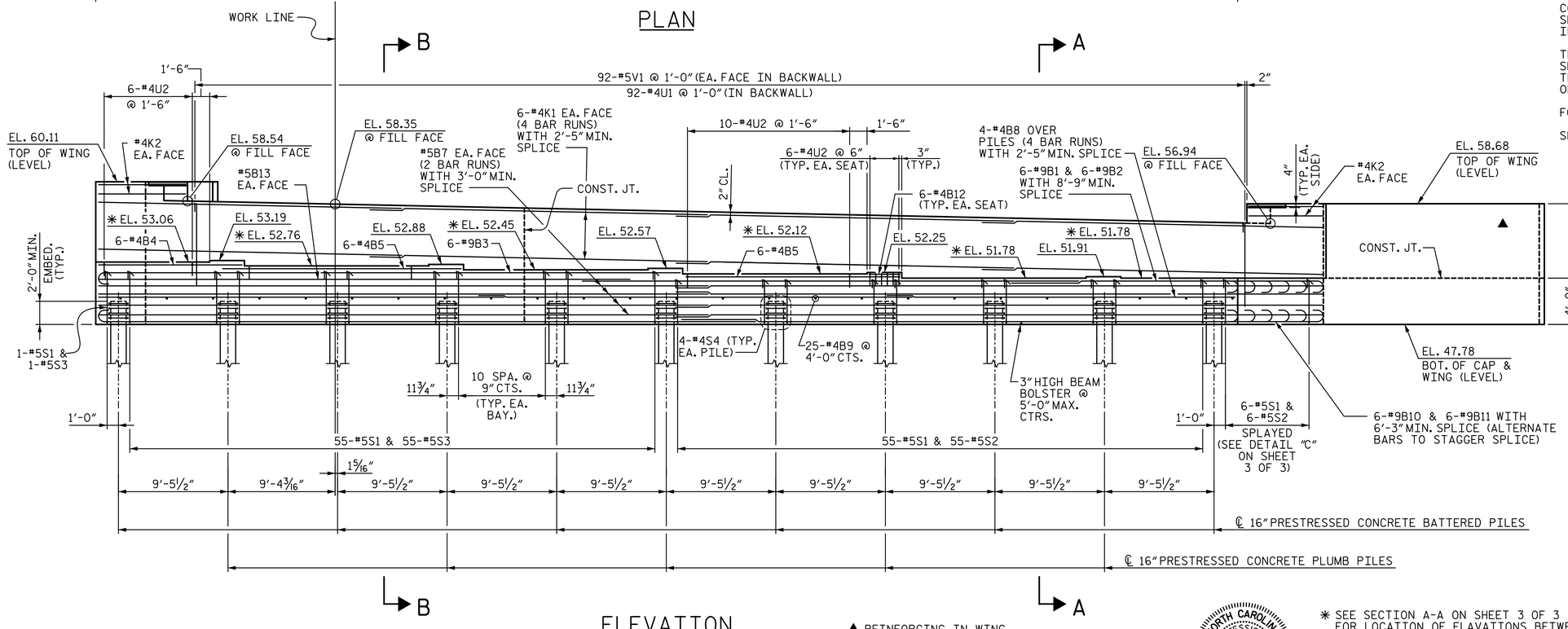


PLAN

DETAIL "A"



ELEVATION

(WING WALL PILES NOT SHOWN FOR CLARITY)

▲ REINFORCING IN WING NOT SHOWN FOR CLARITY. FOR DETAILS, SEE SHEET 2 OF 3.

✳ SEE SECTION A-A ON SHEET 3 OF 3 FOR LOCATION OF ELAVATIONS BETWEEN BRIDGE SEATS.

NOTES:

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

CONCRETE IN THE HATCHED AREA OF THE BACKWALL SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

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

FOR OTHER NOTES, SEE "FOUNDATION LAYOUT" SHEET.

SEE SHEET 3 OF 3 FOR SECTION A-A AND B-B.

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SHEET 1 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT 2

-RIGHT LANE-

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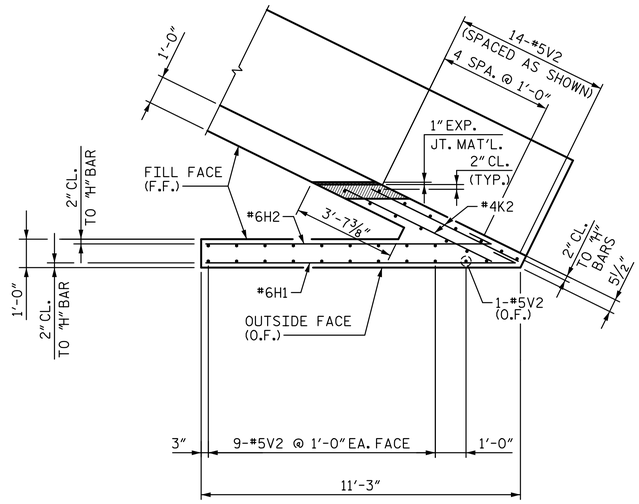
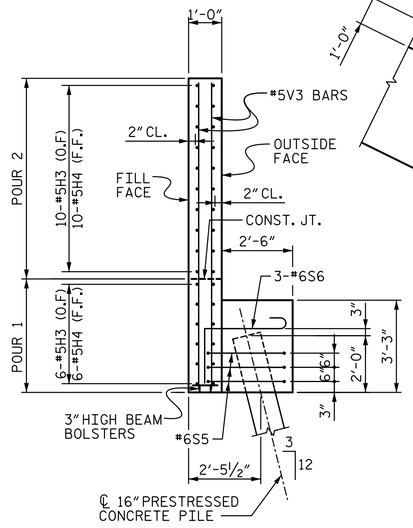
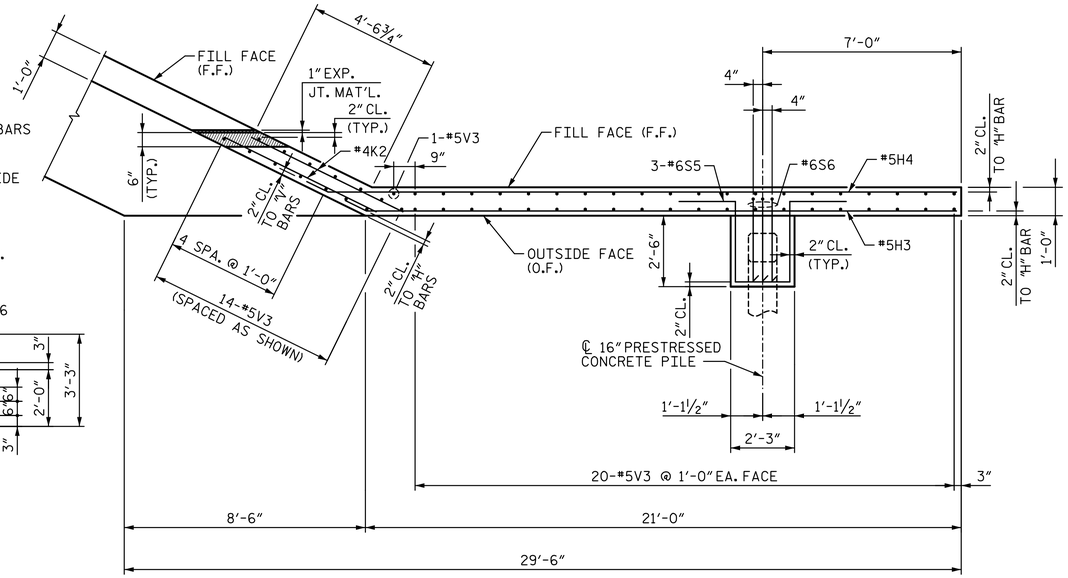


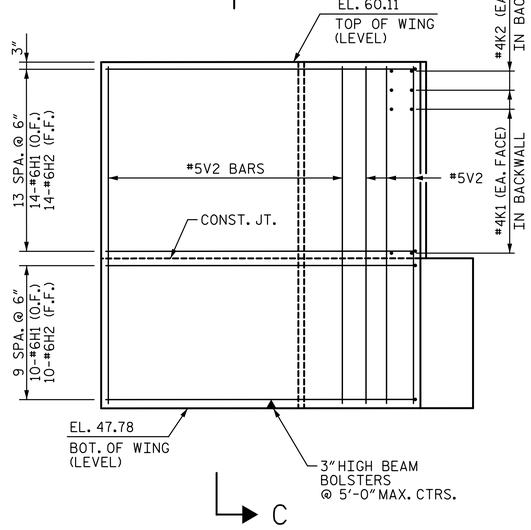
PLAN (W1)



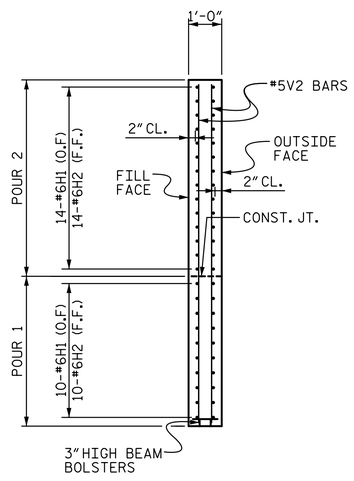
SECTION D-D



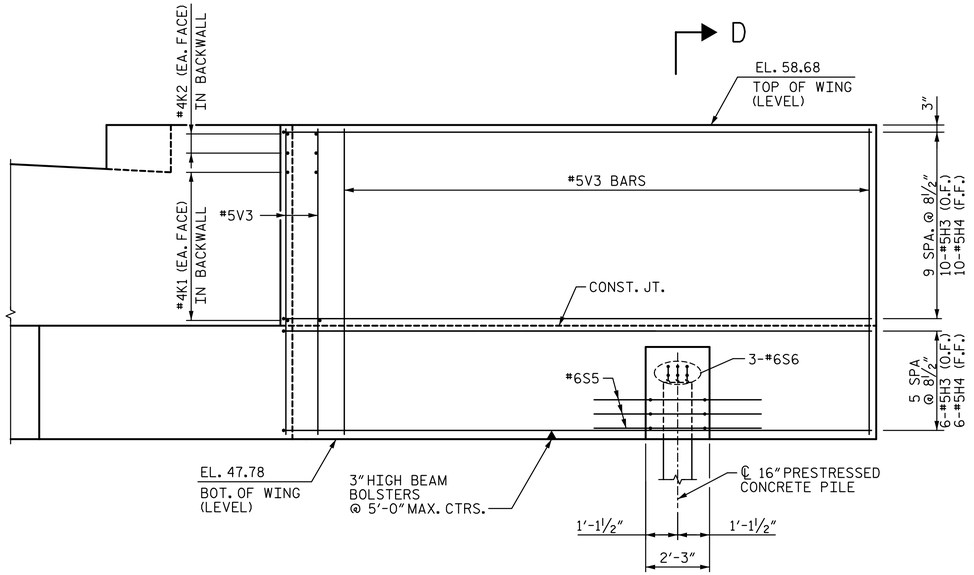
PLAN (W2)



ELEVATION (W1)



SECTION C-C



ELEVATION (W2)

DocuSigned by: Adam J. Peter E3F6AFBD6B1742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

-RIGHT LANE-

DRAWN BY : VMW	DATE : 6/14	DESIGN ENGINEER OF RECORD: P. KELLY	DATE : 6-14
CHECKED BY : PEK	DATE : 6/14		

STV / Ralph Whitehead Associates, Inc.
900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12-31
1			3			TOTAL SHEETS
2			4			38

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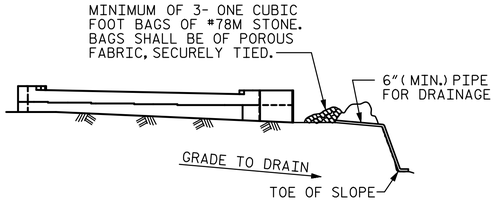
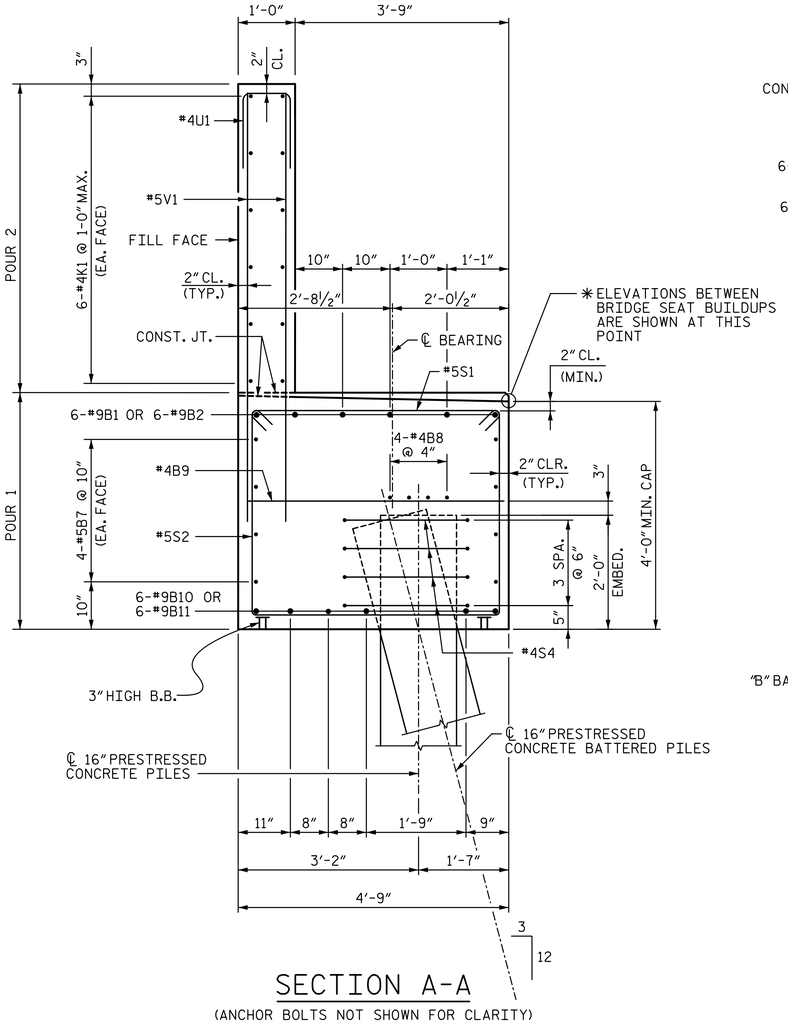


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

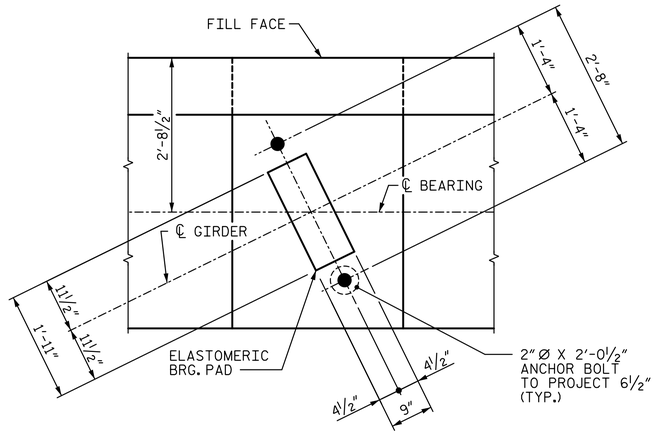
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

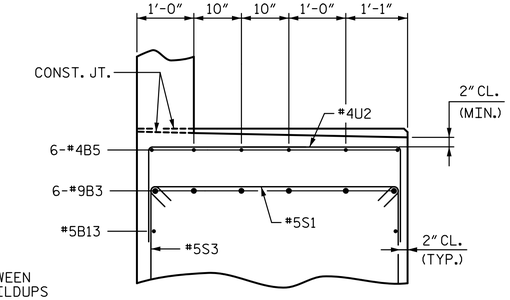


SECTION A-A

(ANCHOR BOLTS NOT SHOWN FOR CLARITY)

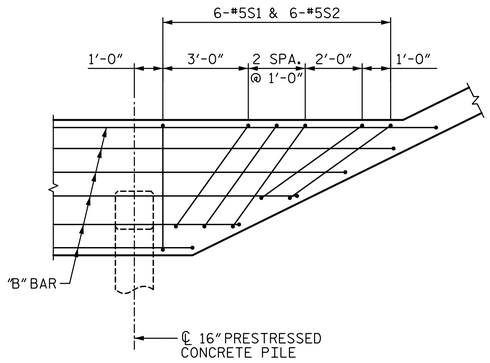


DETAIL "B"



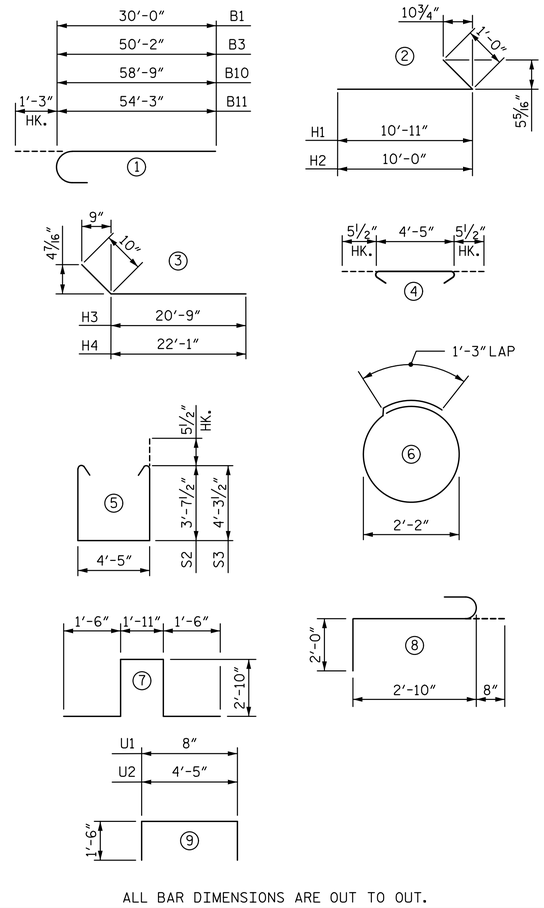
PARTIAL SECTION B-B

(ANCHOR BOLTS NOT SHOWN FOR CLARITY)



DETAIL "C"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF REINFORCING

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#9	①	31'-3"	638
B2	6	#9	STR	45'-3"	923
B3	6	#9	①	51'-5"	1,049
B4	6	#4	STR	12'-4"	49
B5	12	#4	STR	21'-6"	172
B7	16	#4	STR	54'-9"	914
B8	16	#5	STR	27'-2"	290
B9	25	#4	STR	4'-5"	74
B10	6	#9	①	60'-0"	1,224
B11	6	#9	①	55'-6"	1,132
B12	30	#4	STR	2'-8"	53
B13	2	#5	STR	45'-0"	94
H1	24	#6	②	11'-11"	430
H2	24	#6	②	11'-0"	397
H3	16	#5	③	21'-7"	360
H4	16	#5	③	22'-11"	382
K1	48	#4	STR	28'-6"	914
K2	8	#4	STR	6'-0"	32
S1	117	#5	④	5'-4"	651
S2	61	#5	⑤	12'-7"	801
S3	56	#5	⑤	13'-11"	813
S4	44	#4	⑥	8'-1"	238
S5	3	#6	⑦	10'-7"	48
S6	3	#6	⑧	5'-6"	25
U1	92	#4	⑨	3'-8"	225
U2	56	#4	⑨	7'-5"	277
V1	184	#5	STR	9'-3"	1,775
V2	33	#5	STR	11'-10"	407
V3	55	#5	STR	10'-5"	598

QUANTITIES

	END BENT 2
REINFORCING STEEL LBS.	14,985
CLASS A CONCRETE	
POUR 1 (CAP & LOWER WING) : CU. YARDS	87.3
POUR 2 (BACKWALL & UPPER WING) : CU. YARDS	30.9
TOTAL : CU. YARDS	118.2
16" PRESTRESSED CONCRETE PILES (NO.)	12
LIN. FEET	780.0
PILE REDRIVES EA.	6

DocuSigned by: Adam J. Peter E3F6AF8D9B7472A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

-RIGHT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12-32
1			3			TOTAL SHEETS
2			4			38

DRAWN BY : VMW DATE : 6-14
CHECKED BY : PEK DATE : 6-14

DESIGN ENGINEER OF RECORD: P. KELLY DATE : 6-14

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NC License Number F-0991

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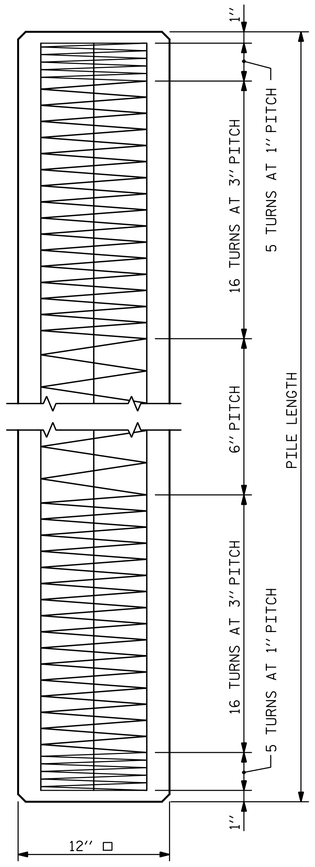
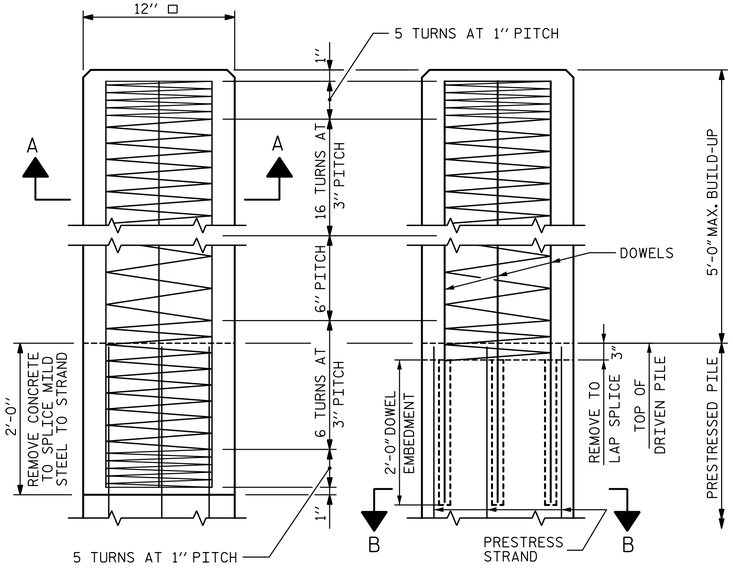
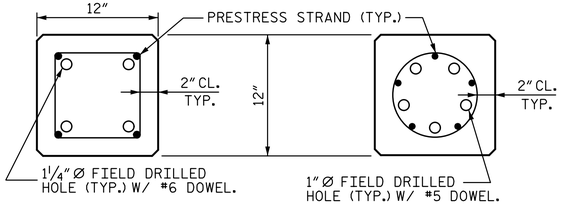


ELEVATION



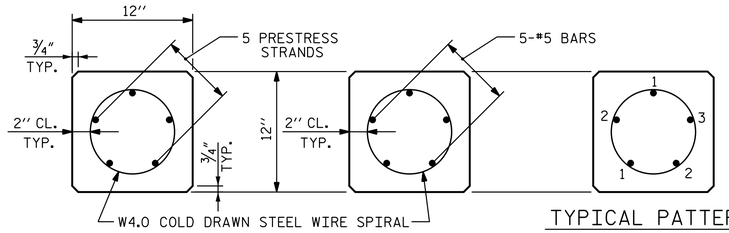
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



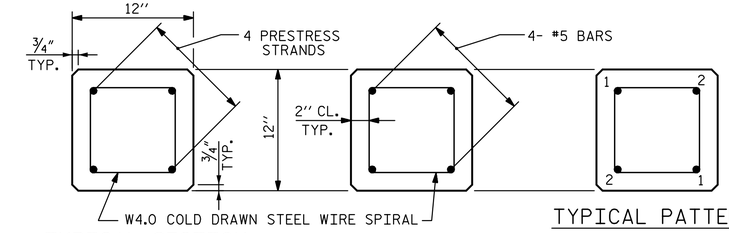
SECTION ''B-B''

(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 SECTION ''A-A'' TYPICAL PATTERN FOR BURNING STRANDS

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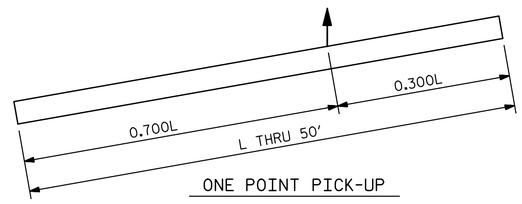
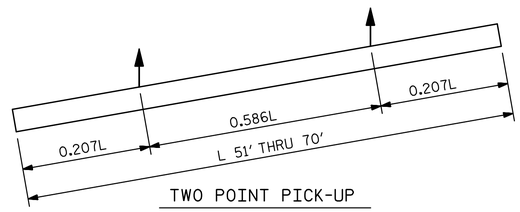


ONE POINT PICK-UP



TWO POINT PICK-UP

PICK-UP POINTS

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.

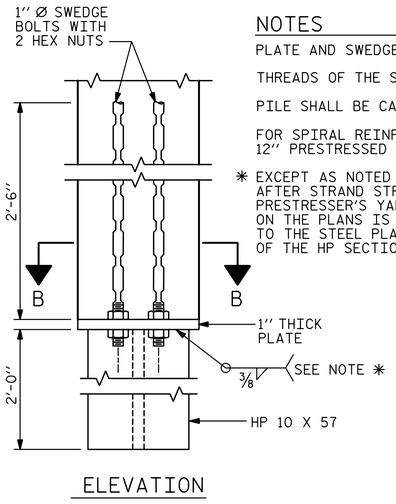
DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN ½'' CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

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.

STEEL PILE TIP DETAILS



ELEVATION

NOTES

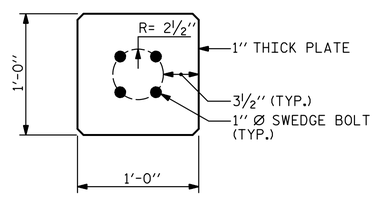
PLATE AND SWEDGE BOLTS SHALL MEET THE REQUIREMENTS OF AASHTO M270 GRADE 36.

THREADS OF THE SWEDGE BOLTS SHALL BE BURRED AT THE FACE OF THE NUT.

PILE SHALL BE CAST WITH SWEDGE BOLTS AND PLATE IN PLACE.

FOR SPIRAL REINFORCING AND PRESTRESSING STRAND DETAILS, SEE STANDARD 12'' PRESTRESSED CONCRETE PILE ELEVATION AND TYPICAL SECTION.

✳ EXCEPT AS NOTED BELOW, THE HP 10 X 57 SECTION SHALL BE WELDED TO THE STEEL PLATE AFTER STRAND STRESS IS RELIEVED. THE HP 10 X 57 SECTION MAY BE WELDED IN THE PRESTRESSER'S YARD OR IN THE FIELD. WHEN A CIRCULAR STRAND PATTERN AS SHOWN ON THE PLANS IS USED, THE CONTRACTOR, AT HIS OPTION, MAY WELD THE HP 10 X 57 SECTION TO THE STEEL PLATE AT THE FABRICATION PLANT PRIOR TO PLACING THE CONCRETE. THE FLANGES OF THE HP SECTION SHALL BE PARALLEL TO THE EDGES OF THE STEEL PLATE AND CONCRETE PILE.



SECTION B-B

(HOLES FOR STRANDS NOT SHOWN)

QUANTITIES FOR ONE 12'' 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''	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''

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
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DocuSigned by: Adam J. Peter E3F6AF8D9947424...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

12'' PRESTRESSED CONCRETE PILE

-RIGHT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12-33
1			3			TOTAL SHEETS
2			4			38

DRAWN BY : TJT DATE : 6-14
CHECKED BY : CLG DATE : 6-14

DESIGN ENGINEER OF RECORD: K. BAILEY DATE : 6-14

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Charlotte, NC 28202
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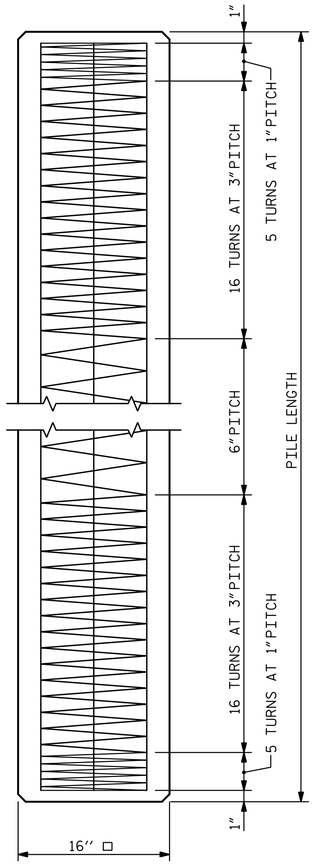

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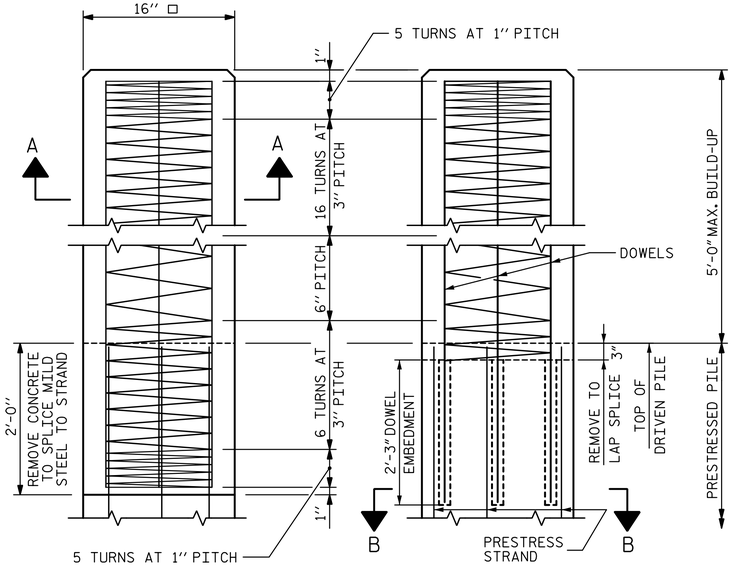
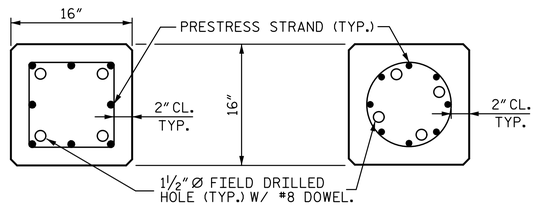


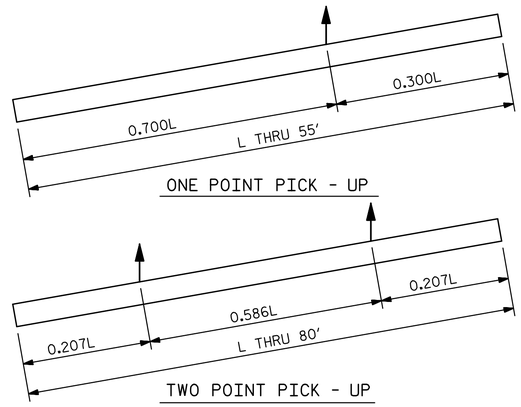
BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



SECTION ″B-B″

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



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

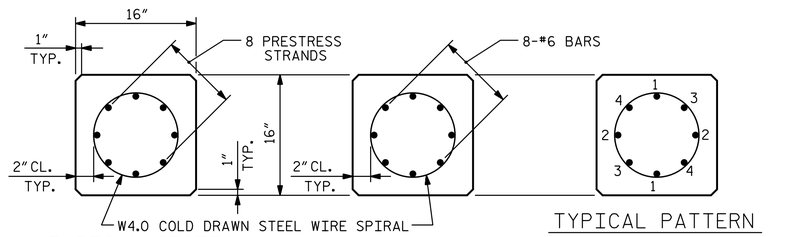
BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3″ OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

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.

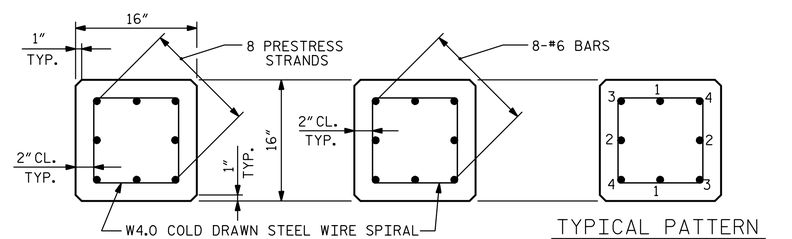
THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

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



TYPICAL SECTION SECTION ″A-A″ TYPICAL PATTERN FOR BURNING STRANDS

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



TYPICAL SECTION SECTION ″A-A″ TYPICAL PATTERN FOR BURNING STRANDS

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

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

16″ PRESTRESSED CONCRETE PILE

-RIGHT LANE-

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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NC License Number F-0991

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CHECKED BY : CLG	DATE : 6-14		

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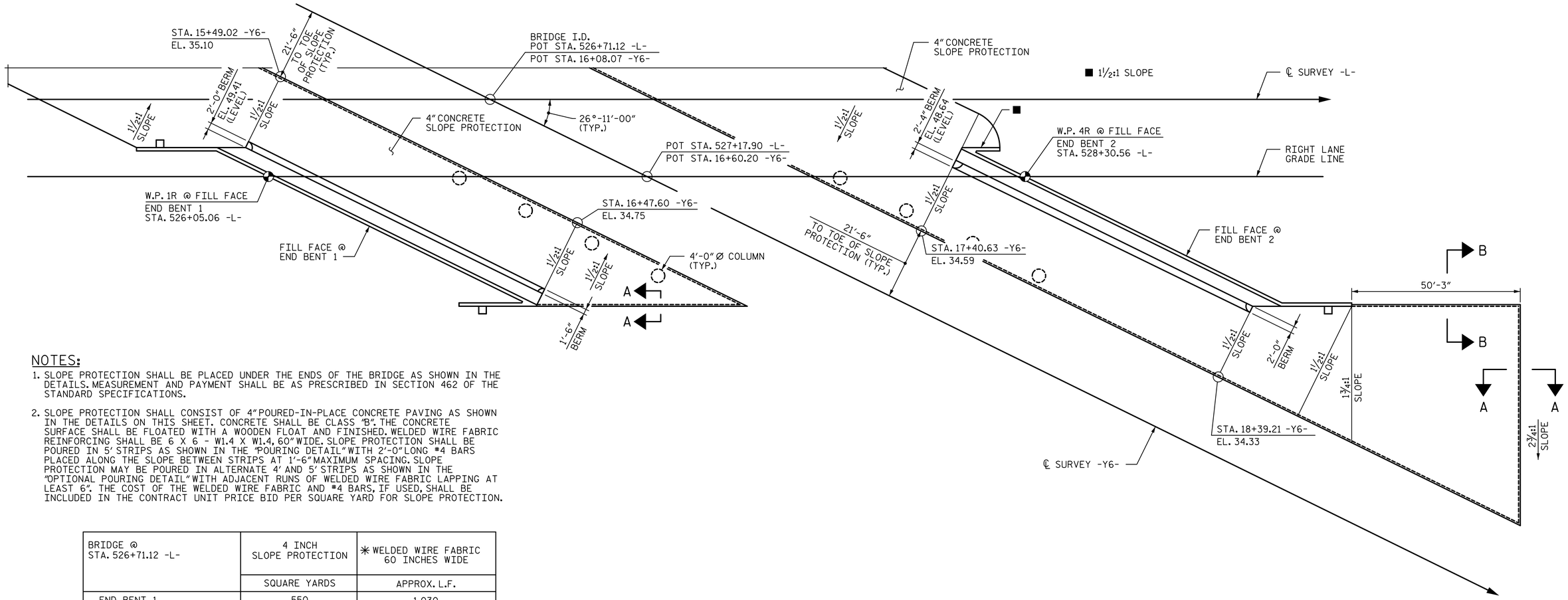


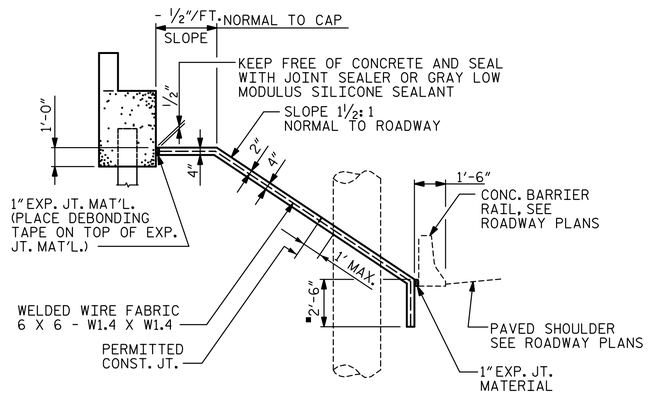
NOTES:

1. 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.

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

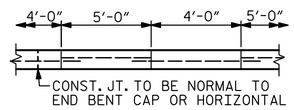
BRIDGE @ STA. 526+71.12 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	550	1,030
END BENT 2	1,155	2,100

* QUANTITY SHOWN IS BASED ON 5' POURS.



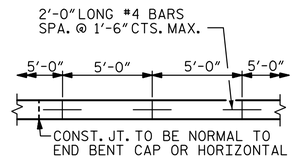
SECTION ALONG ℄ ROADWAY WITH SHOULDER PIER

■ OR TO THE TOP OF THE FOOTING



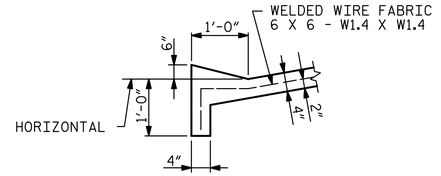
POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

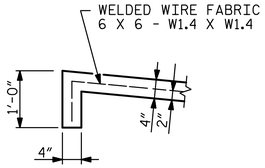


STRIP WIDTHS MAY VARY IN CURVED PORTION.

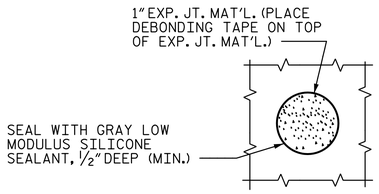
POURING DETAIL



SECTION A-A



SECTION B-B



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

-RIGHT LANE-

DocuSigned by: Adam J. Peter E3F6AF8D9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J PETER

3/10/2015

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900 West Trade Street, Suite 715
Charlotte, NC 28202
NC License Number F-0991

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NOTES:

1. APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.
2. FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4″ Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.
3. 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.
4. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
5. THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".
6. 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.
7. ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.
8. FOR CONCRETE BARRIER RAIL ON THE APPROACH SLAB AND ADDITIONAL DETAILS, SEE SHEET 2 OF 3.
9. FOR BILL OF MATERIAL, SPLICE LENGTHS AND ADDITIONAL DETAILS, SEE SHEET 3 OF 3.

PLAN

(DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS)

SECTION N-N

SECTION K-K

END OF CURB WITHOUT SHOULDER BERM GUTTER

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L- = 16+08.07 -Y6-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

-RIGHT LANE-

DocuSigned by: Adam J. Peter

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 35695 ADAM J. PETER

3/10/2015

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DESIGN ENGINEER OF RECORD: A. PETER DATE : 6-14

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1			3		
2			4		

SHEET NO. S12-36

TOTAL SHEETS 38

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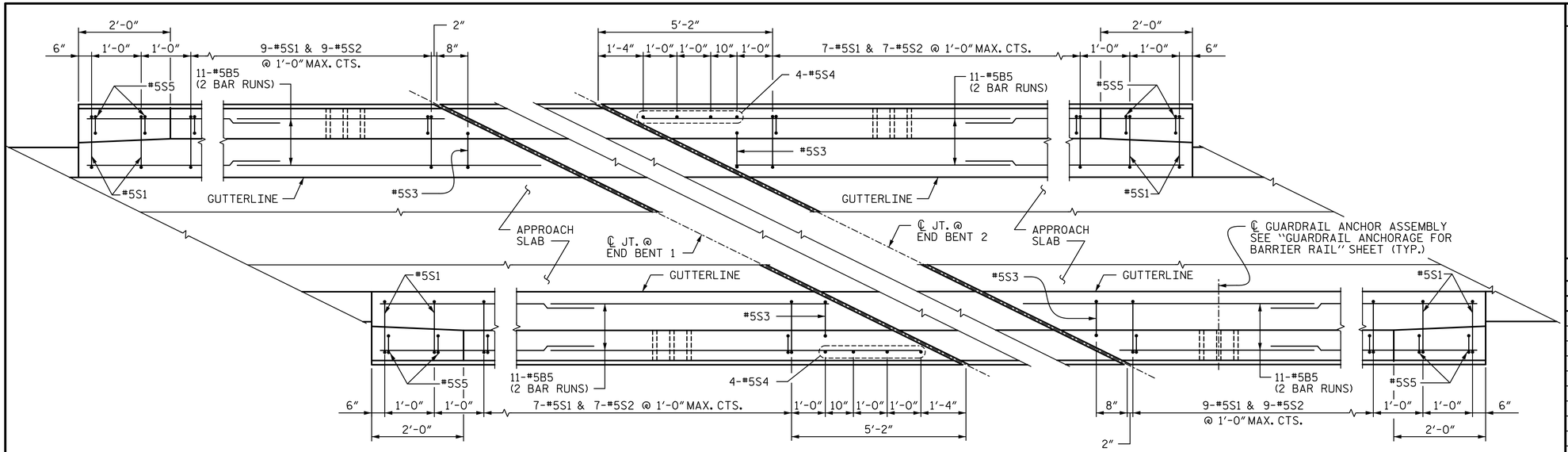
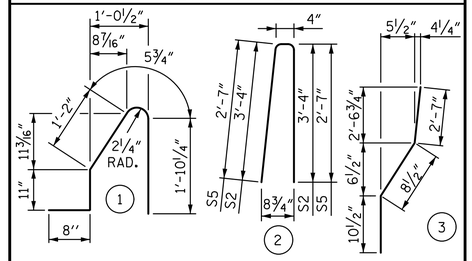


END BENT 1

END BENT 2

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

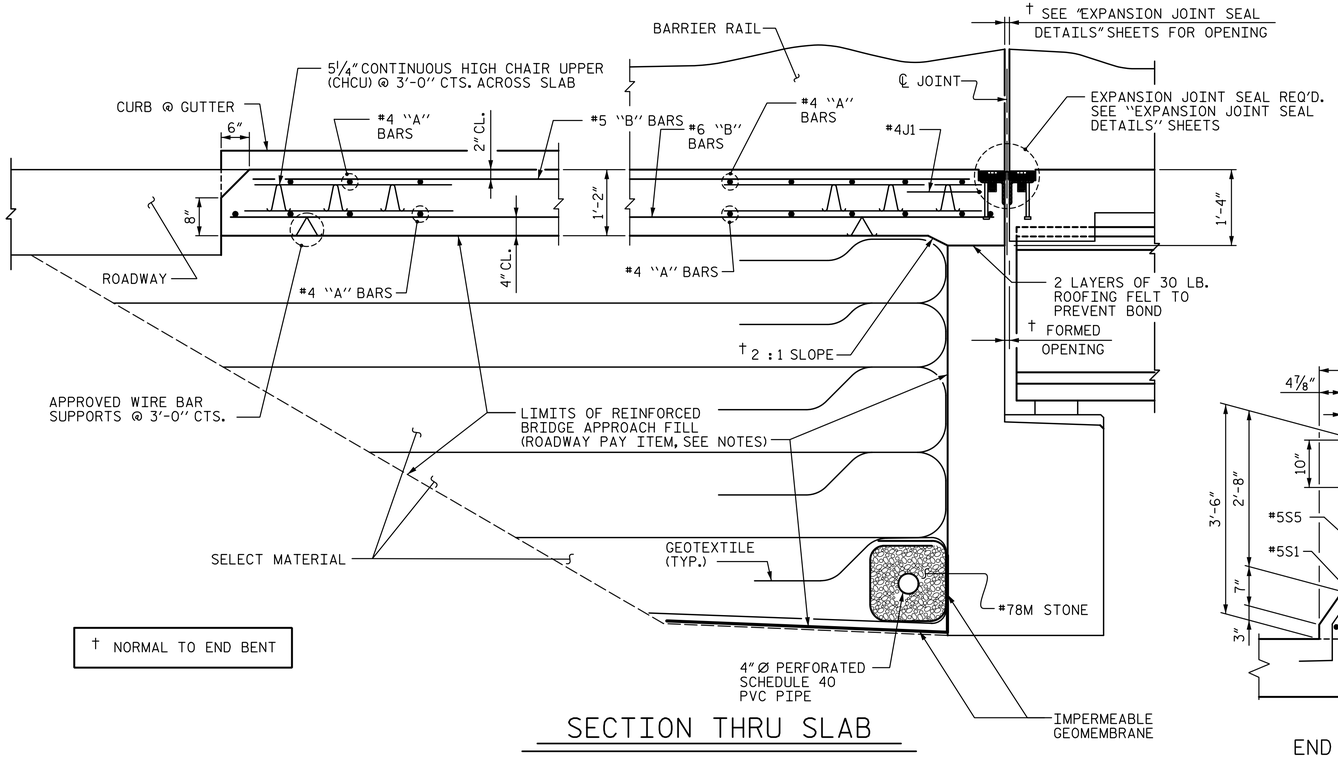
BILL OF MATERIAL

BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B5	88	#5	STR	7′-10″	719
✳S1	40	#5	①	5′-1″	212
✳S2	32	#5	②	7′-0″	234
✳S3	4	#5	③	4′-2″	17
✳S4	8	#5	STR	4′-0″	33
✳S5	8	#5	②	5′-6″	46

✳EPOXY COATED REINFORCING STEEL	LBS.	1,261
CLASS AA CONCRETE	C. Y.	6.2
CONCRETE BARRIER RAIL		46.6 LIN. FT.

PLAN OF BARRIER RAIL

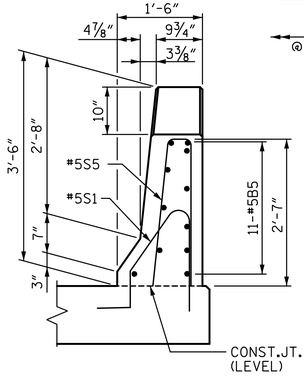


† NORMAL TO END BENT

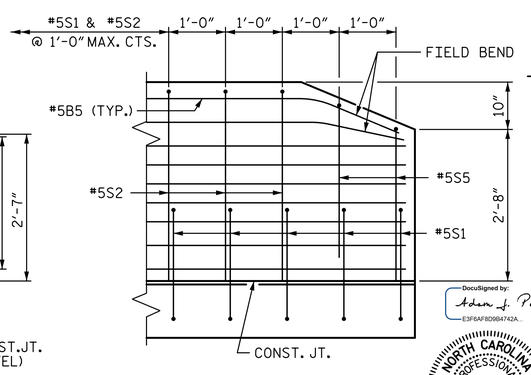
SECTION THRU SLAB

SECTION AT JOINT

SECTION THRU RAIL



END VIEW



SIDE VIEW

END OF RAIL DETAILS

DocuSigned by:
Adam J. Peter
E3F6AF8D9B7424A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

-RIGHT LANE-

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DESIGN ENGINEER OF RECORD: A. PETER	DATE : 6-14

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1			3			TOTAL SHEETS
2			4			38

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BILL OF MATERIAL

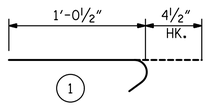
APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	69	#4	STR	32′-2″	1,483
A2	75	#4	STR	32′-0″	1,603
✳B1	79	#5	STR	23′-0″	1,895
B2	79	#6	STR	23′-11″	2,838
✳B3	8	#5	STR	7′-4″	61
B4	8	#6	STR	7′-4″	88
✳J1	87	#4	①	1′-5″	82
REINFORCING STEEL ✳✳ LBS.					4,529
✳EPOXY COATED REINFORCING STEEL ✳✳ LBS.					3,521
CLASS AA CONCRETE ✳✳ C.Y.					43.9

APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	69	#4	STR	32′-2″	1,483
A2	75	#4	STR	32′-0″	1,603
✳B1	79	#5	STR	23′-0″	1,895
B2	79	#6	STR	23′-11″	2,838
✳B3	8	#5	STR	7′-4″	61
B4	8	#6	STR	7′-4″	88
✳J1	87	#4	①	1′-5″	82
REINFORCING STEEL ✳✳ LBS.					4,529
✳EPOXY COATED REINFORCING STEEL ✳✳ LBS.					3,521
CLASS AA CONCRETE ✳✳ C.Y.					43.9

BAR TYPE



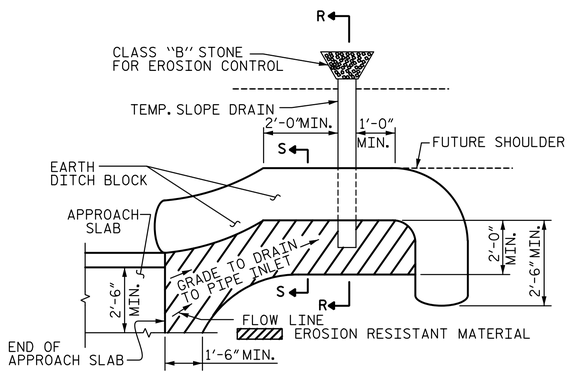
ALL BAR DIMENSIONS ARE OUT TO OUT

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 2 OF 3.

THE QUANTITY OF #4J1 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.

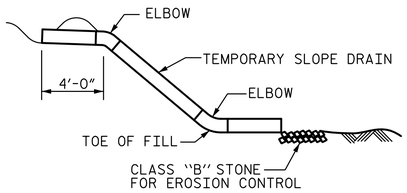
SPLICE LENGTHS

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

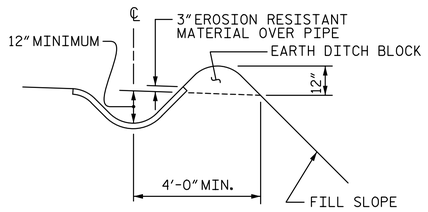


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

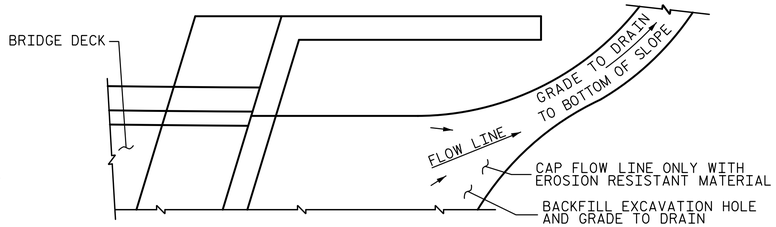
PLAN VIEW



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)

PROJECT NO. R-2514D

JONES & CRAVEN COUNTY

STATION: 526+71.12 -L-
= 16+08.07 -Y6-

SHEET 3 OF 3

DocuSigned by: Adam J. Peter E3F6AFBD9B4742A...

NORTH CAROLINA PROFESSIONAL SEAL 35695 ENGINEER ADAM J. PETER

3/10/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

-RIGHT LANE-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12-38
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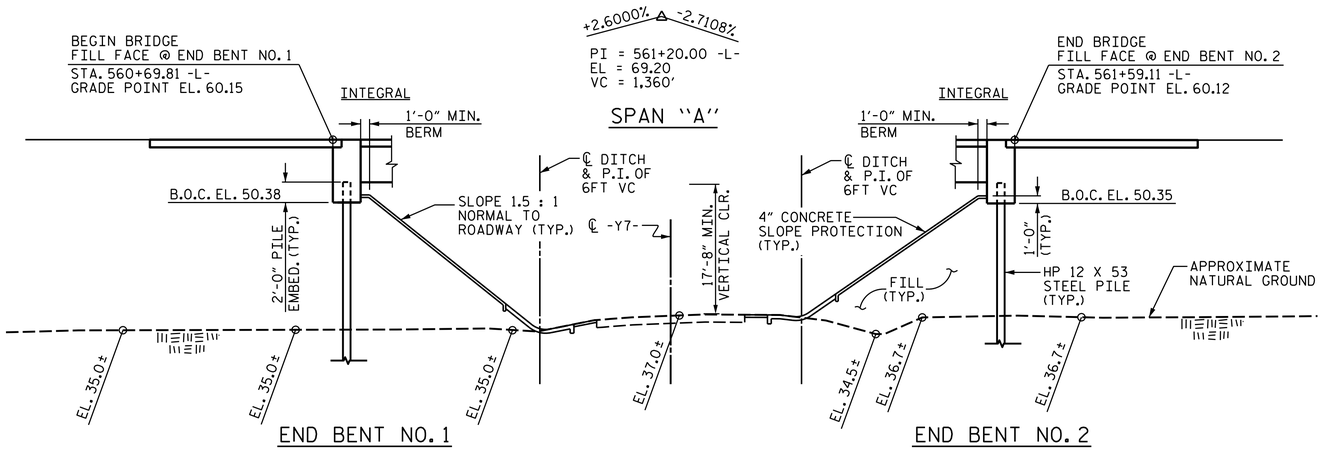
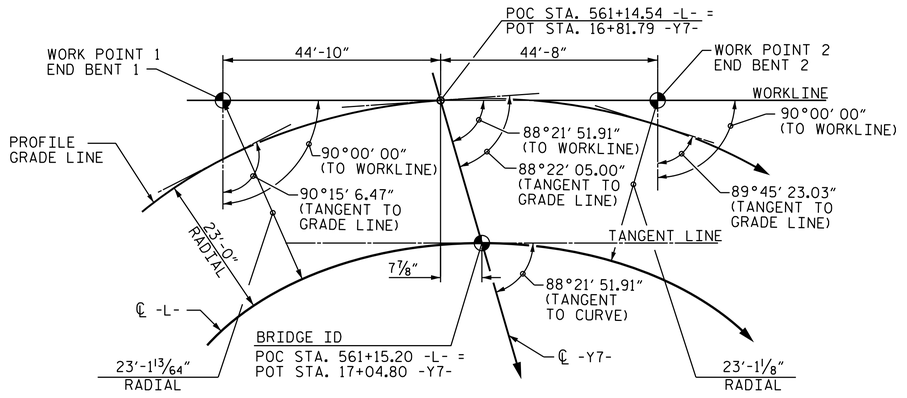
VERTICAL GRADE DATA

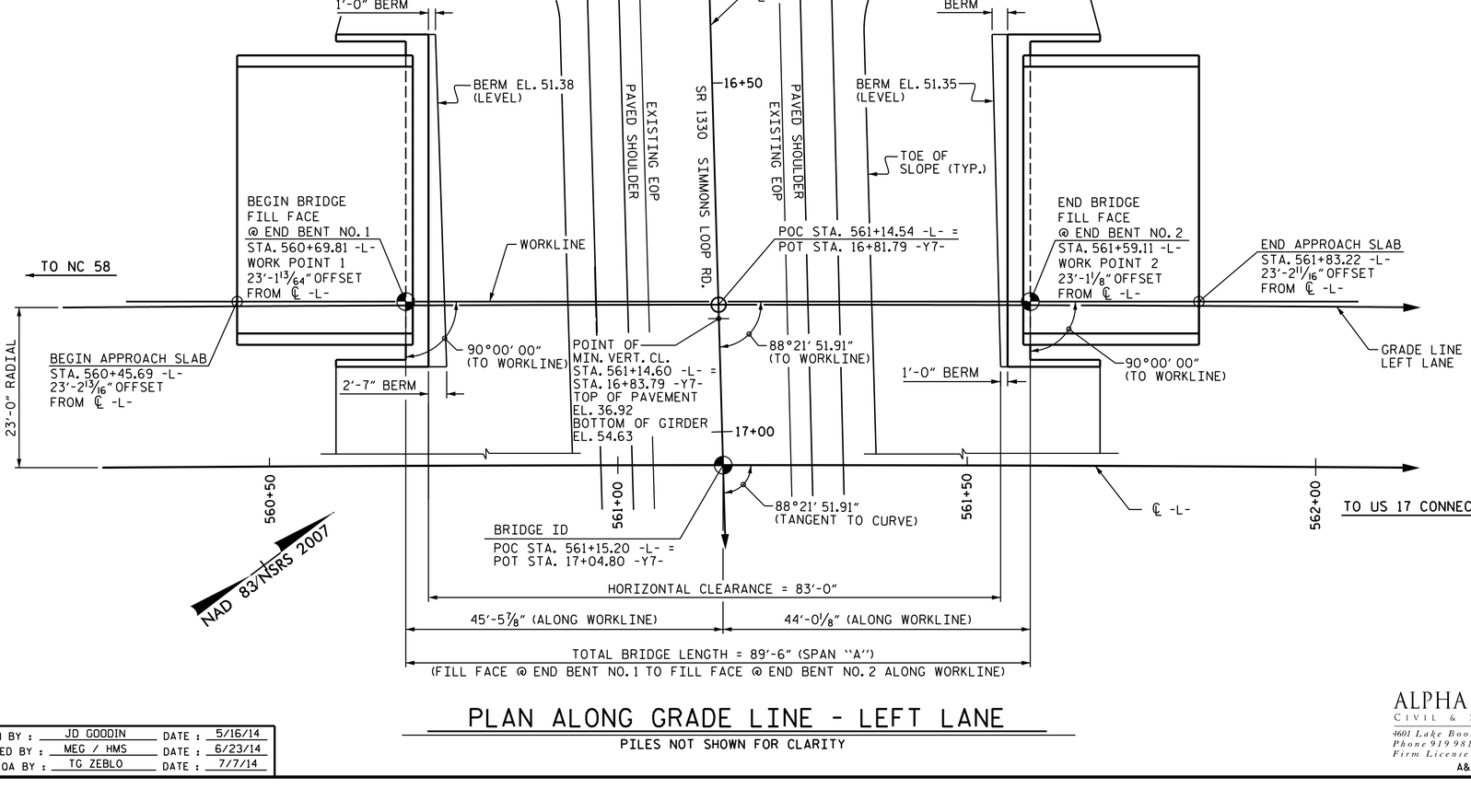


SECTION ALONG GRADE LINE - LEFT LANE

SECTIONS AT END BENTS ARE AT RIGHT ANGLES



WORKLINE SKETCH



PLAN ALONG GRADE LINE - LEFT LANE

PILES NOT SHOWN FOR CLARITY

HORIZONTAL CURVE DATA -L-

PI = 571+12.36
Δ = 28°45' 22.4" (RT)
D = 0°33' 17.1"
L = 5,183.63'
T = 2,647.63'
R = 10,328.19'
SE = .025
RO = 90'

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / HMS DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com
A&O PROJECT NO. 2013.044

DocuSigned by: Mark Gustafson 9E00EDB87408456...
3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 13-1

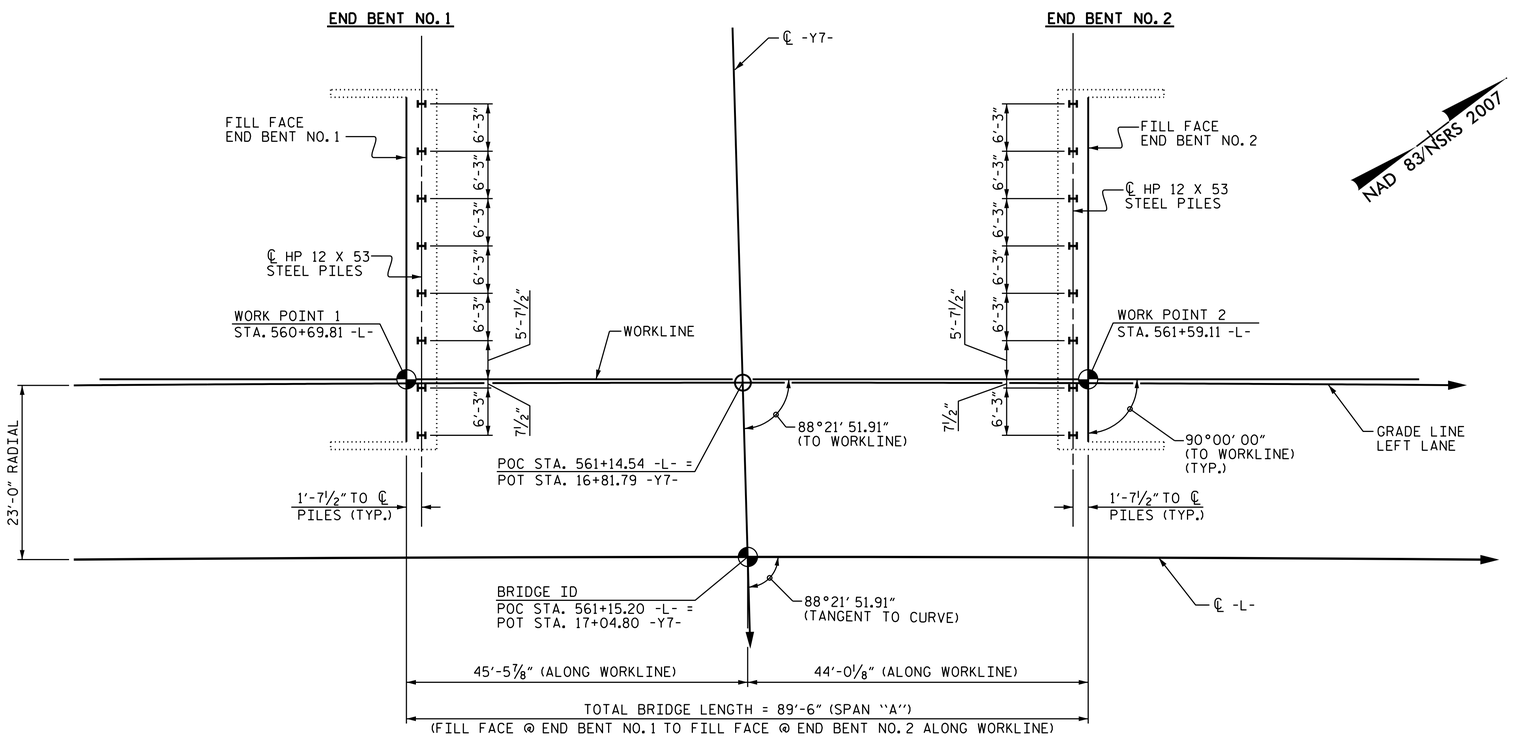
PROJECT NO. R-2514D
JONES COUNTY
STATION: 561+15.20 -L-
=17+04.80 -Y7-
SHEET 1 OF 3 BRIDGE NO. 107

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER SR 1330 ON US 17 BETWEEN NC 58 & US 17 CONNECTOR (LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-1
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13



FOUNDATION LAYOUT

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

NOTES

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / HMS DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com

A&O PROJECT NO. 2013.044

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

NORTH CAROLINA
SEAL
28601
ENGINEER
MARK E. GUSTAFSON
3-20-2015

REFERENCE NO. 13- 2

PROJECT NO. R-2514D
JONES COUNTY
STATION: 561+15.20 -L-
=17+04.80 -Y7-
SHEET 2 OF 3

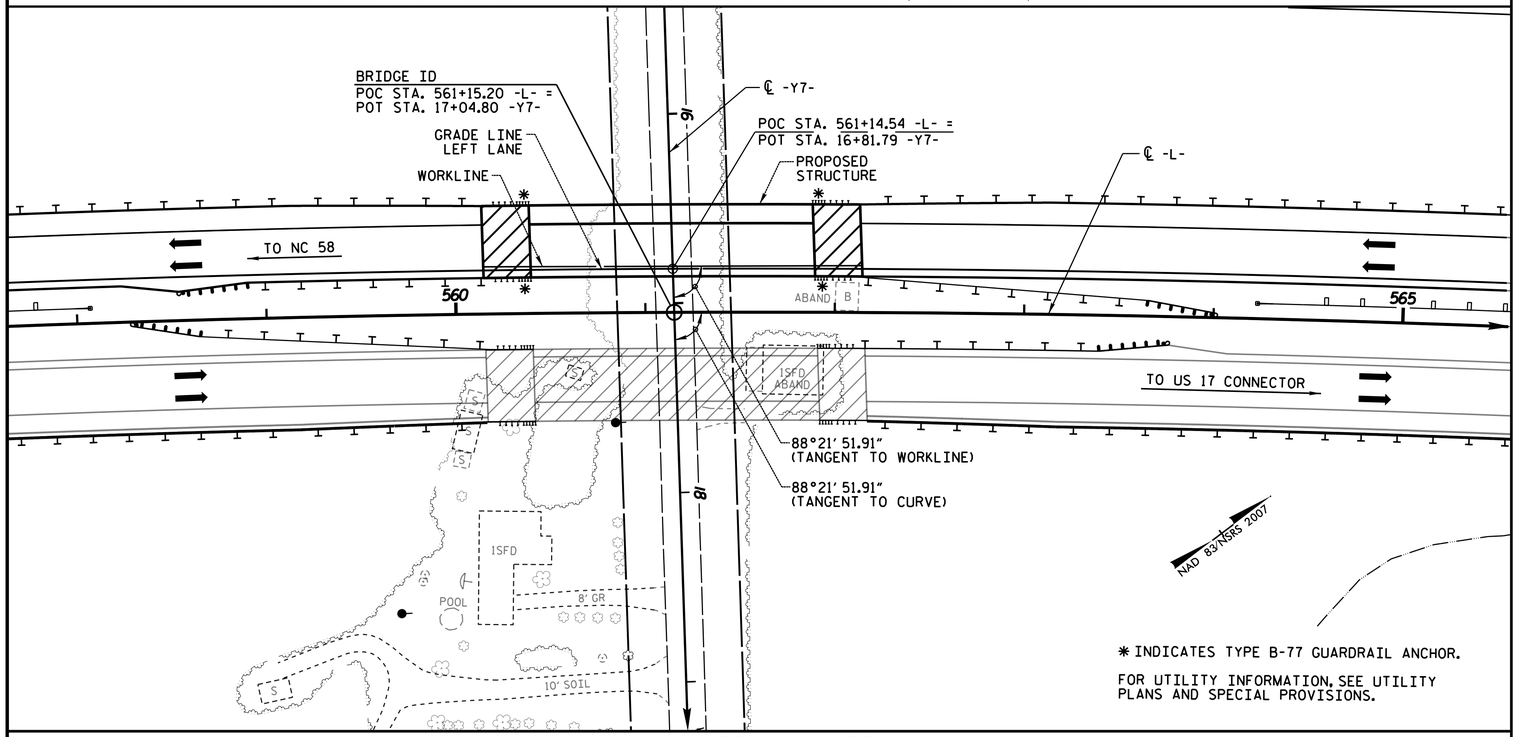
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER SR 1330 ON US 17 BETWEEN NC 58 & US 17 CONNECTOR
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-2
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

BM29 RR SPIKE IN 9" PINE AT STATION 559+85.00 -L-; 329' LT., ELEVATION = 37.70'



* INDICATES TYPE B-77 GUARDRAIL ANCHOR.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE IS FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISION NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, 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.

OBSERVE A TWO MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 1 AND END BENT NO. 2 (STAGE 2 WAITING PERIOD). SEE ROADWAY PLAN TITLED "DETAILS FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION AND STAGE CONSTRUCTION AT -Y7- BRIDGE APPROACHES".

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FEET	NO.	LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE	-	3714	4823	-	-	-	4	350.67	-			175.67		LUMP SUM
END BENT NO. 1	-	-	-	29.8	-	3958	-	-	8	600	4	-	264	
END BENT NO. 2	-	-	-	29.8	-	3958	-	-	8	600	4	-	260	
TOTAL	1	3714	4823	59.6	LUMP SUM	7916	4	350.67	16	1200	8	175.67	524	LUMP SUM

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / HMS DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:
ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com
A&O PROJECT NO. 2013.044

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 13- 3

PROJECT NO. R-2514D
JONES COUNTY
STATION: 561+15.20 -L-
=17+04.80 -Y7-
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER SR 1330 ON US 17 BETWEEN NC 58 & US 17 CONNECTOR
(LEFT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-3
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.03	--	1.75	0.930	1.75	A	E	43.125	1.055	1.03	A	I	8.625	0.80	0.863	1.50	A	I	43.125	
		HL-93 (OPERATING)	N/A		1.37	--	1.35	0.930	2.27	A	E	43.125	1.055	1.37	A	I	8.625	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.37	49.32	1.75	0.930	2.37	A	E	43.125	1.055	1.37	A	I	8.625	0.80	0.863	2.03	A	I	43.125	
		HS-20 (OPERATING)	36.000		1.80	64.80	1.35	0.930	3.07	A	E	43.125	1.055	1.80	A	I	8.625	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		4.71	58.88	1.40	0.930	7.48	A	E	43.125	1.055	4.71	A	I	8.625	0.80	0.863	5.13	A	I	43.125	
		S3C	21.500		2.72	58.48	1.40	0.930	4.38	A	E	43.125	1.055	2.72	A	I	8.625	0.80	0.863	3.00	A	I	43.125	
		S3A	22.750		2.58	58.69	1.40	0.930	4.15	A	E	43.125	1.055	2.58	A	I	8.625	0.80	0.863	2.84	A	I	43.125	
		S4A	26.750		2.24	59.92	1.40	0.930	3.65	A	E	43.125	1.055	2.24	A	I	8.625	0.80	0.863	2.50	A	I	43.125	
		S5A	30.500		2.04	62.22	1.40	0.930	3.22	A	E	43.125	1.055	2.04	A	I	8.625	0.80	0.863	2.21	A	I	43.125	
		S6A	34.500		1.83	63.13	1.40	0.930	2.92	A	E	43.125	1.055	1.83	A	I	8.625	0.80	0.863	2.00	A	I	43.125	
		S7B	38.500		1.70	65.45	1.40	0.930	2.66	A	E	43.125	1.055	1.70	A	I	8.625	0.80	0.863	1.82	A	I	43.125	
		S7A	40.000		1.73	69.20	1.40	0.930	2.63	A	E	43.125	1.055	1.73	A	I	8.625	0.80	0.863	1.80	A	I	43.125	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		2.17	61.30	1.40	0.930	3.60	A	E	43.125	1.055	2.17	A	I	8.625	0.80	0.863	2.47	A	I	43.125	
		T5B	32.000		2.05	65.60	1.40	0.930	3.16	A	E	43.125	1.055	2.05	A	I	8.625	0.80	0.863	2.17	A	I	43.125	
		T6A	36.000		1.87	67.32	1.40	0.930	2.90	A	E	43.125	1.055	1.87	A	I	8.625	0.80	0.863	1.99	A	I	43.125	
		T7A	40.000		1.74	69.60	1.40	0.930	2.69	A	E	43.125	1.055	1.74	A	I	8.625	0.80	0.863	1.84	A	I	43.125	
		T7B	40.000	3	1.63	65.20	1.40	0.930	2.87	A	E	43.125	1.055	1.63	A	I	8.625	0.80	0.863	1.97	A	I	43.125	

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)

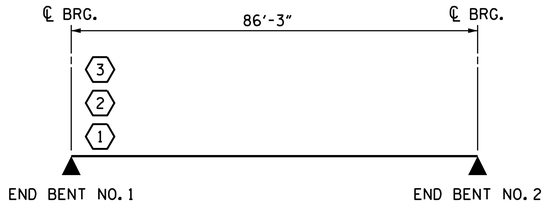
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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A&O PROJECT NO. 2013.044

NORTH CAROLINA SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 13-4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

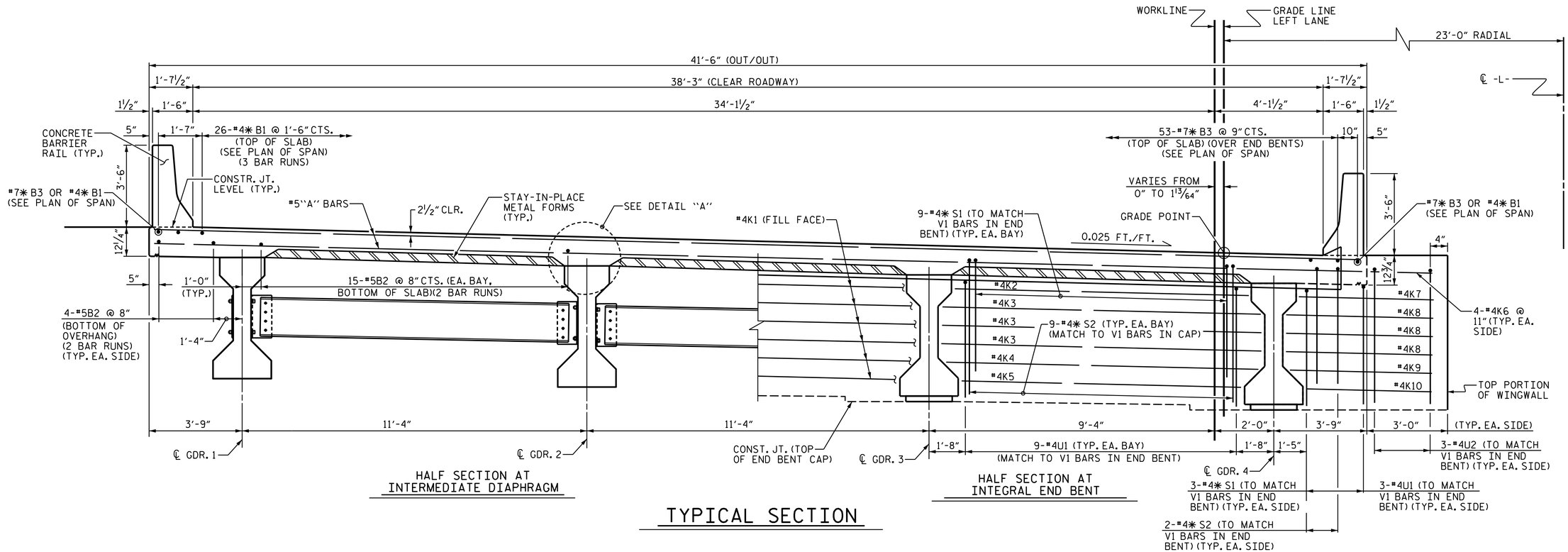
STANDARD
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(INTERSTATE TRAFFIC)
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-4
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

STD. NO. LRFR2

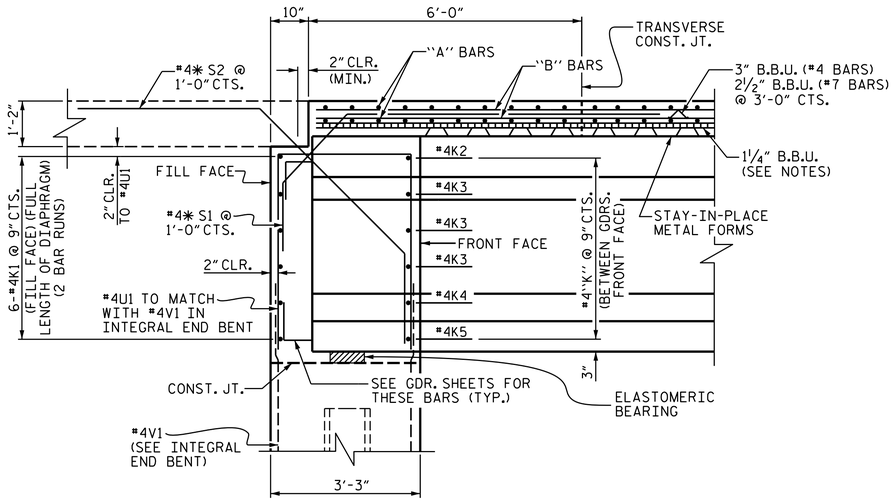
DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM		
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM		



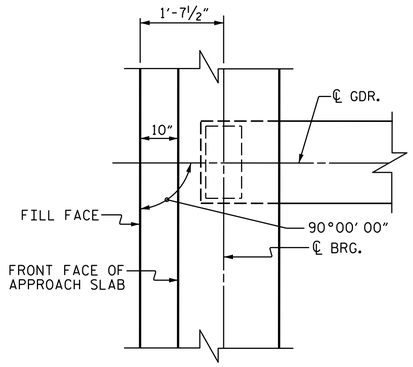
HALF SECTION AT INTERMEDIATE DIAPHRAGM

HALF SECTION AT INTEGRAL END BENT

TYPICAL SECTION



SECTION "A-A"



PLAN OF GIRDER AT INTEGRAL END BENT

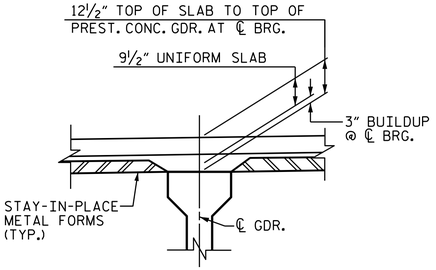
NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER @ 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.) AT 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.

SEE "SECTION THRU RAIL" ON SHEET 13-12 FOR DRIP GROOVES AND BEAM BOLSTERS IN OVERHANG.

FOR LOCATION OF SECTIONS, SEE "PLAN OF SPAN" SHEET.



DETAIL "A"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-5
1			3			TOTAL SHEETS
2			4			21

REFERENCE NO. 13-5

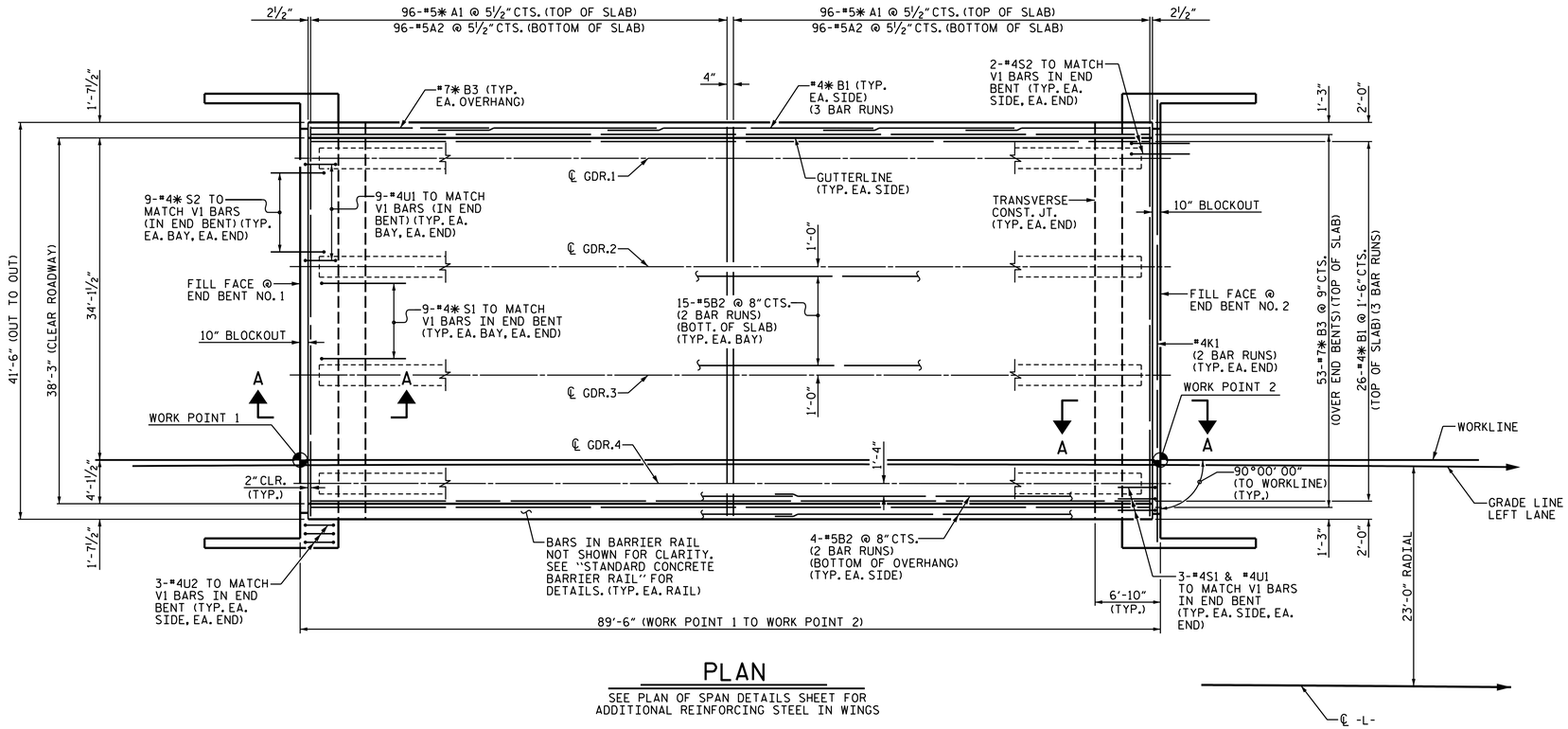
STRUCTURE NO. 13

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

PLAN PREPARED BY:

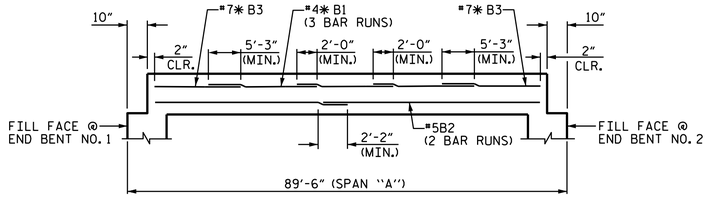
ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON 3-20-2015



PLAN

SEE PLAN OF SPAN DETAILS SHEET FOR ADDITIONAL REINFORCING STEEL IN WINGS



SCHEMATIC DIAGRAM OF SPAN "A"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN "A" LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-6
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / HMS DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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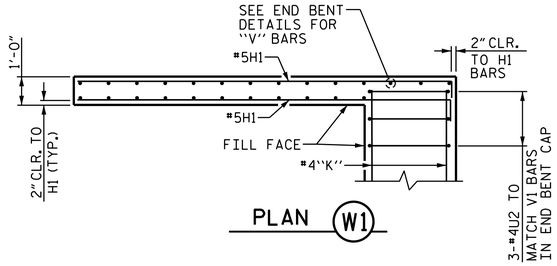
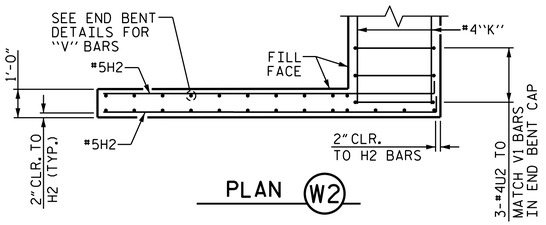
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON
3-20-2015

REFERENCE NO. 13-6



PLAN (W1)



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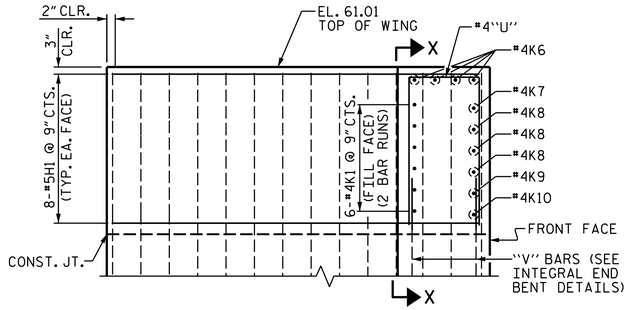

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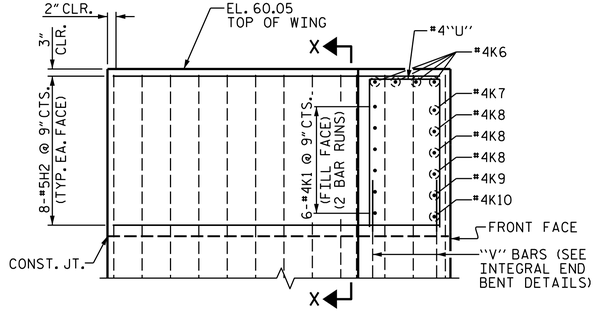

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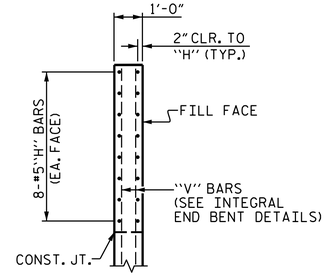
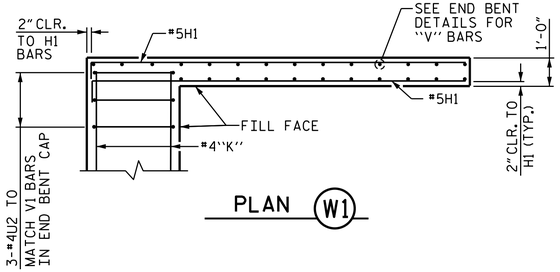


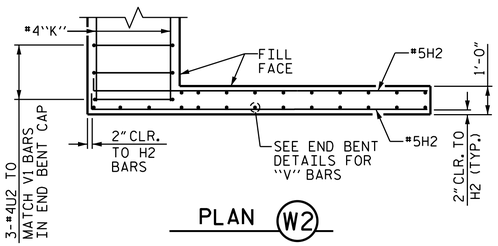
SECTION "X-X"

END BENT NO. 1

(FOR WING DIMENSIONS SEE SUBSTRUCTURE END BENT NO. 1)



PLAN (W1)



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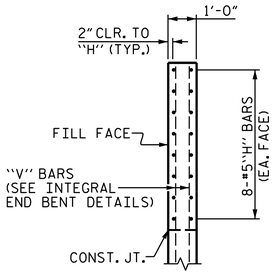
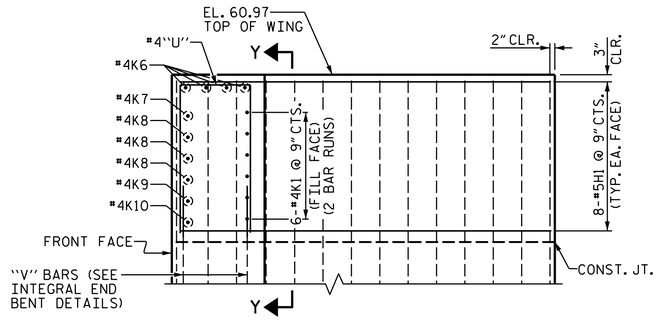
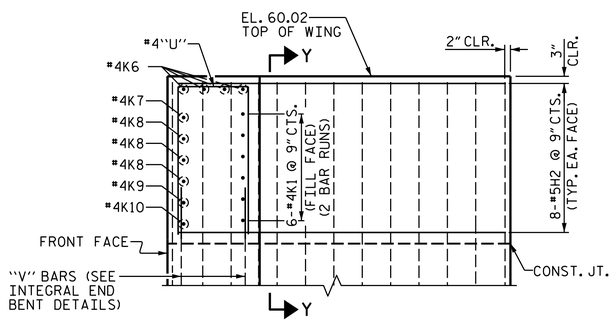


SECTION "Y-Y"



ELEVATION (W1)



ELEVATION (W2)

END BENT NO. 2

(FOR WING DIMENSIONS SEE SUBSTRUCTURE END BENT NO. 2)

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
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A&O PROJECT NO. 2013.044

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 3-20-2015 MARK E. GUSTAFSON

REFERENCE NO. 13-7

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

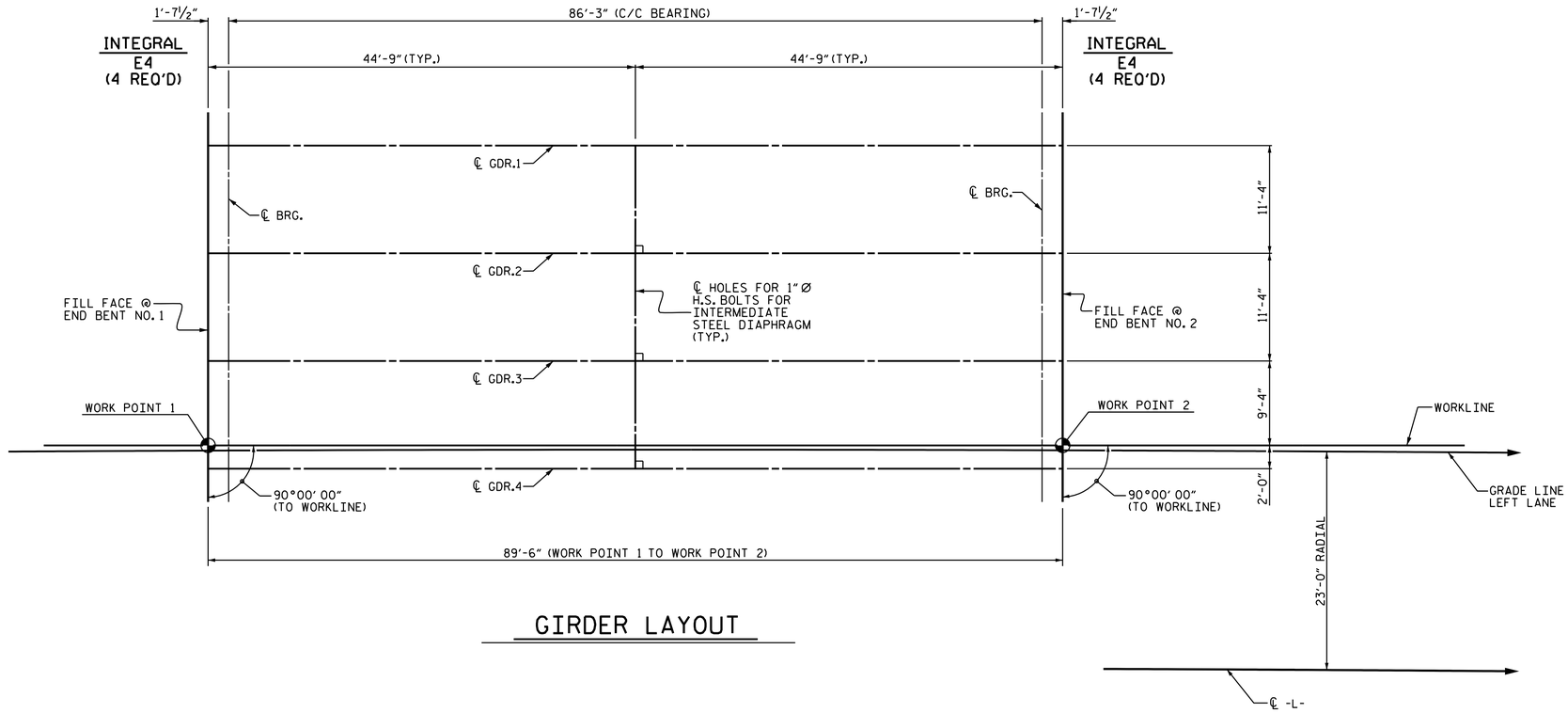
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS
TOP OF WINGS
END BENT NO. 1 &
END BENT NO. 2
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-7
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13



GIRDER LAYOUT

DEAD LOAD DEFLECTION TABLE FOR GIRDERS																						
0.6"Ø LOW RELAXATION STRANDS	SPAN "A"																					
	GIRDERS 1 & 4											GIRDERS 2 & 3										
TENTH POINTS	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0
CAMBER (GIRDER ALONE IN PLACE)	0.0	0.104	0.181	0.235	0.266	0.276	0.266	0.235	0.181	0.104	0.0	0.0	0.104	0.181	0.235	0.266	0.276	0.266	0.235	0.181	0.104	0.0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L.	0.0	-0.036	-0.070	-0.097	-0.115	-0.121	-0.115	-0.097	-0.070	-0.036	0.0	0.0	-0.040	-0.078	-0.109	-0.128	-0.135	-0.128	-0.109	-0.078	-0.040	0.0
FINAL CAMBER	0	3/16	5/16	5/8	13/16	7/8	13/16	5/8	5/16	3/16	0	0	3/4	1 1/4	1 1/2	1 5/8	1 11/16	1 5/8	1 1/2	1 1/4	3/4	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 COUNTY

STATION: 561+15.20 -L-
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3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GIRDER LAYOUT
LEFT LANE

PLAN PREPARED BY:

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A&O PROJECT NO. 2013.044

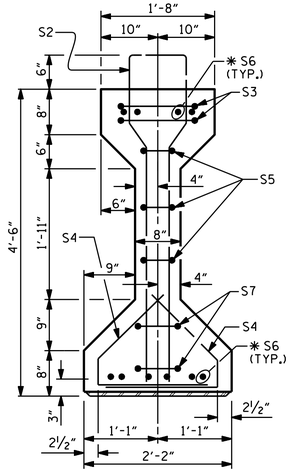
NORTH CAROLINA
SEAL
28601
3-20-2015
ENGINEER
MARK E. GUSTAFSON

REFERENCE NO. 13-8

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-8
1			3			TOTAL SHEETS
2			4			21

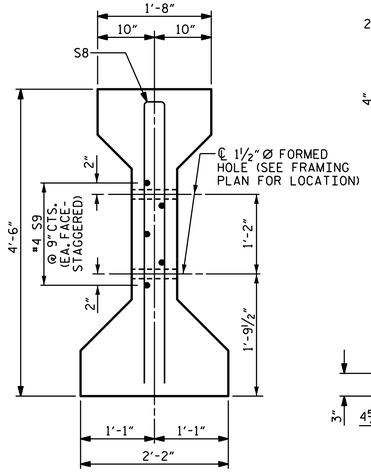
DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / HMS DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

STRUCTURE NO. 13



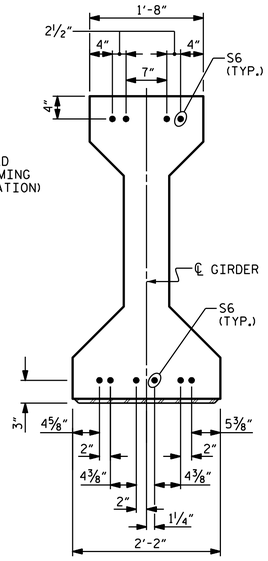
SECTION "A-A"

✱FOR S6 BARS, SEE DETAIL "A"

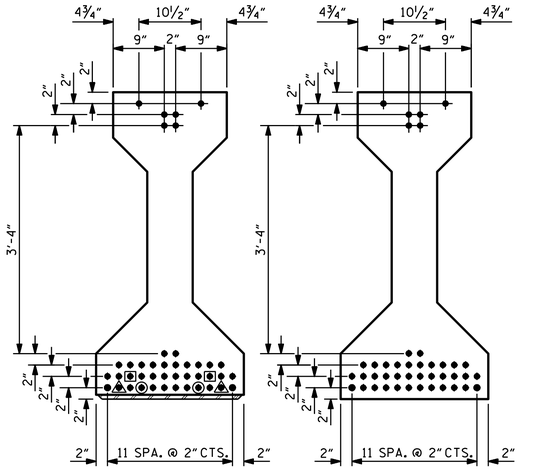


SECTION "C-C"

(S1 BARS NOT SHOWN)



DETAIL "A"



AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

▣ STRANDS DEBONDED 2'-0" FROM END OF GIRDER.
◈ STRANDS DEBONDED 8'-0" FROM END OF GIRDER.
◉ STRANDS DEBONDED 24'-0" FROM END OF 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.

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

BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

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.

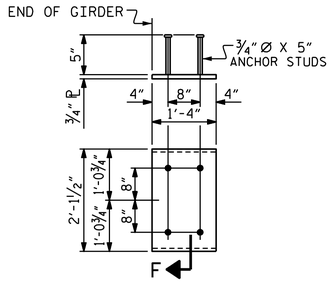
AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

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.

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

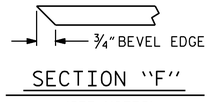
ALL REINFORCING STEEL SHALL BE GRADE 60.

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



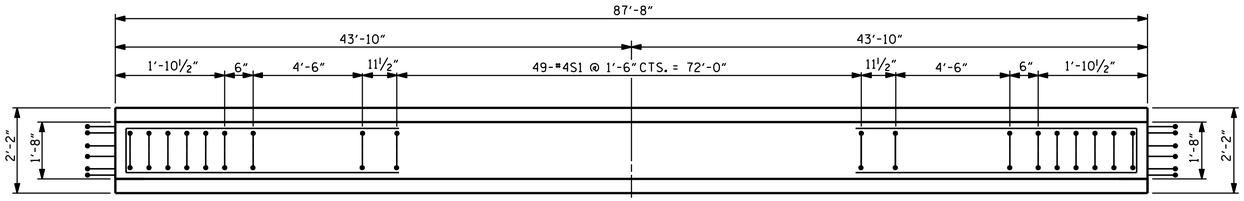
EMBEDDED PLATE "B-1" DETAILS

TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.

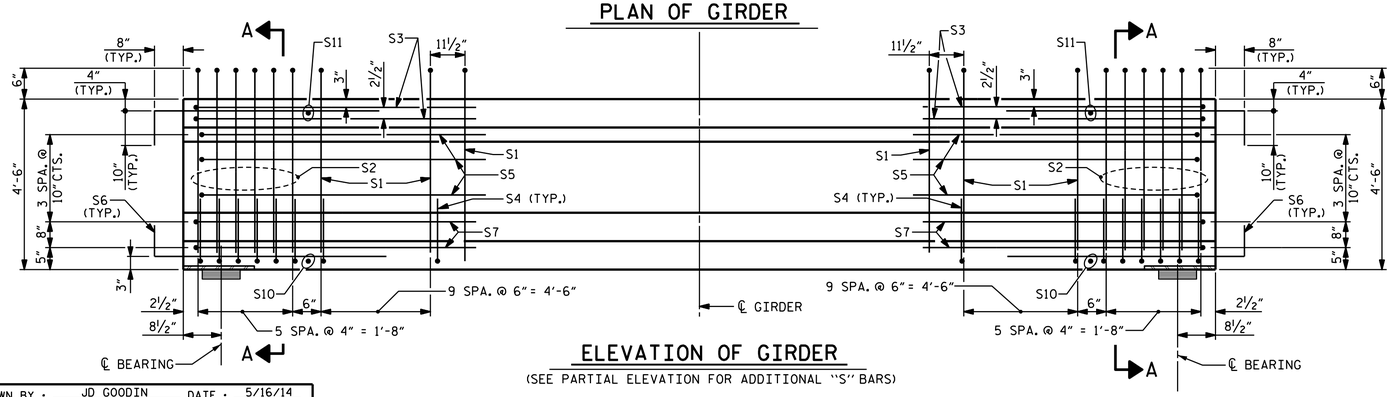


SECTION "F"

(SEE NOTES)

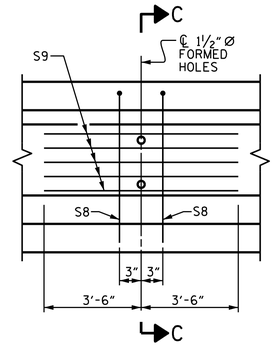


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER NOS. 1 THROUGH 4.

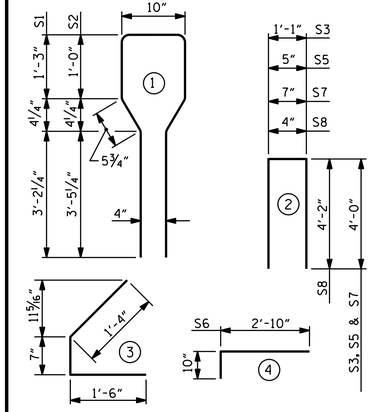
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	69	#4	1	10'-8"	492
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
✱S6	20	#5	4	3'-8"	76
S7	4	#4	2	8'-7"	23
S8	2	#5	2	8'-8"	18
S9	5	#4	STR	7'-0"	23
S10	2	#3	STR	1'-10"	1
S11	2	#3	STR	1'-4"	1

✱NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
EXTERIOR GIRDER	1030	17.8	42
INTERIOR GIRDER	1030	17.8	42

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	87'-8"	350'-8"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

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3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED
CONCRETE GIRDER
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-9
1			3			TOTAL SHEETS
2			4			21

DRAWN BY :	JD GOODIN	DATE : 5/16/14
CHECKED BY :	MEG / HMS	DATE : 6/23/14
QC / QA BY :	TG ZEBLO	DATE : 7/7/14
DRAWN BY :	JMB 12/87	REV. 8/16/99RR RWW/LES
CHECKED BY :	ARB 12/87	REV. 5/1/06R TLA/GM
		REV. 10/1/11 MAA/GM

PLAN PREPARED BY:

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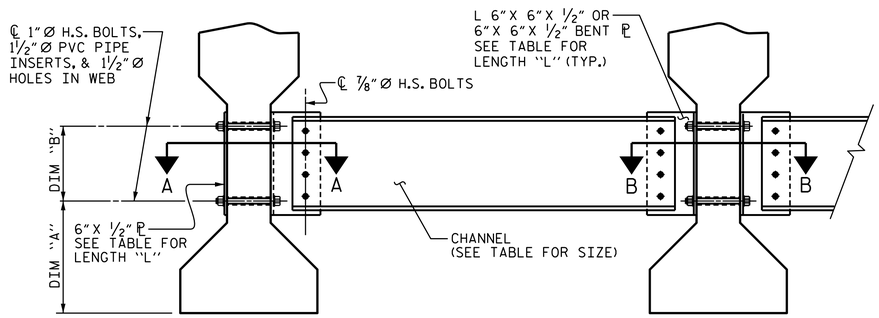
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E GUSTAFSON
3-20-2015

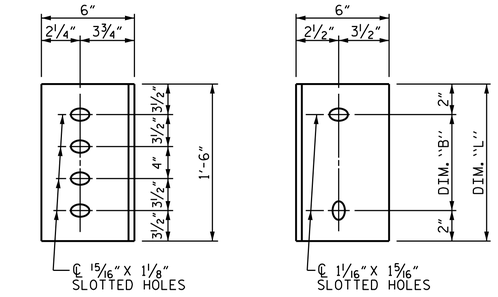
REFERENCE NO. 13- 9

STRUCTURE NO. 13

STD. NO. PCG3



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

STRUCTURAL STEEL NOTES

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

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

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

THE PLATES, BENT PLATES, CHANNELS AND ANGLES SHALL BE 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.

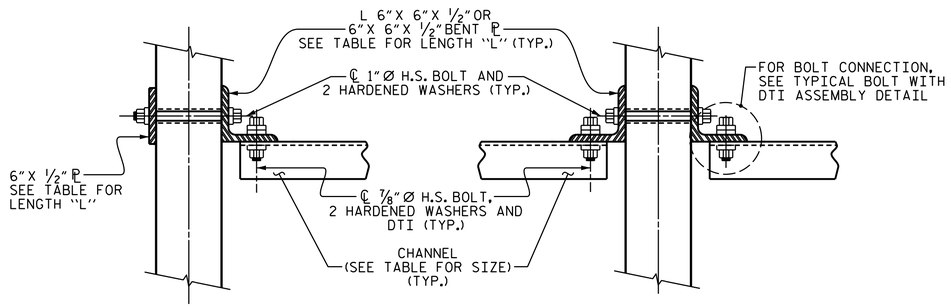
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

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

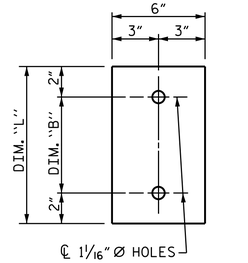
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

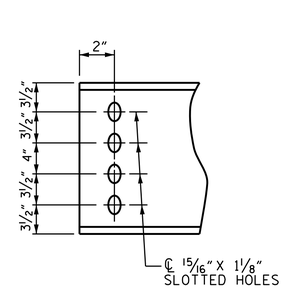
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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



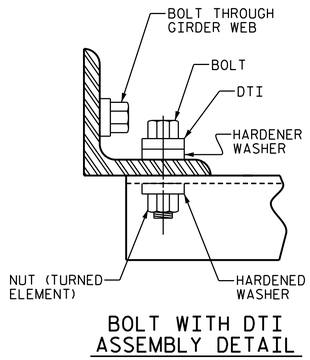
CONNECTION DETAILS





TABLE

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



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

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NOTE: THIS STANDARD DRAWING REVIEWED AND ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED.

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 13-10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-10
1			3			TOTAL SHEETS
2			4			21

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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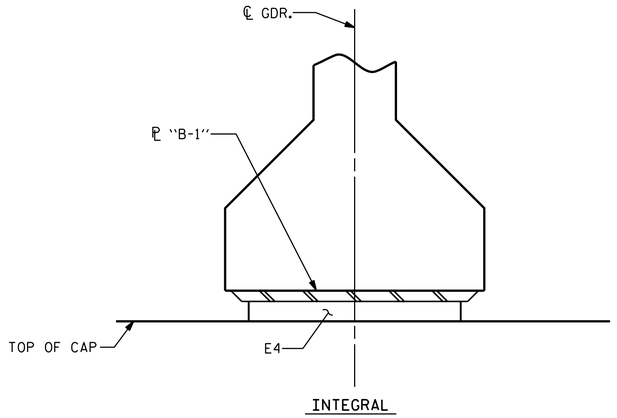
A&O PROJECT NO. 2013.044

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

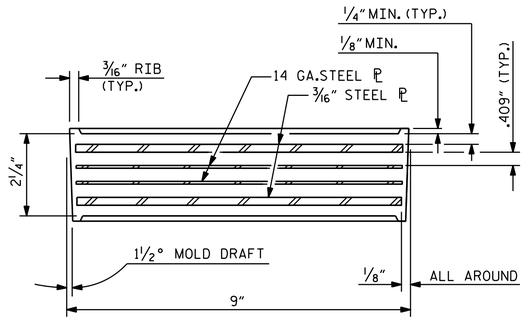
DRAWN BY :	TLA	6/05	ADDED 10/21/05
CHECKED BY :	VC	6/05	REV. 5/1/06RRR KMM/GM
			REV. 10/1/11 MAA/GM

STRUCTURE NO. 13

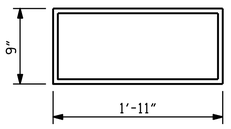
STD. NO. PCG10



SECTION "E-E"



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

NOTES

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.

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

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

NOTE: THIS STANDARD DRAWING REVIEWED AND ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED.

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON
3-20-2015

REFERENCE NO. 13- 11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD TYPE V ELASTOMERIC BEARING DETAILS

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-11
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

STD. NO. EB4

PLAN PREPARED BY:

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QC / QA BY :	TG ZEBLO	DATE :	7/7/14

DRAWN BY : EEM 2/97	REV. 5/1/06	TLA/GM
CHECKED BY : VAP 2/97	REV. 10/1/11	MAA/GM
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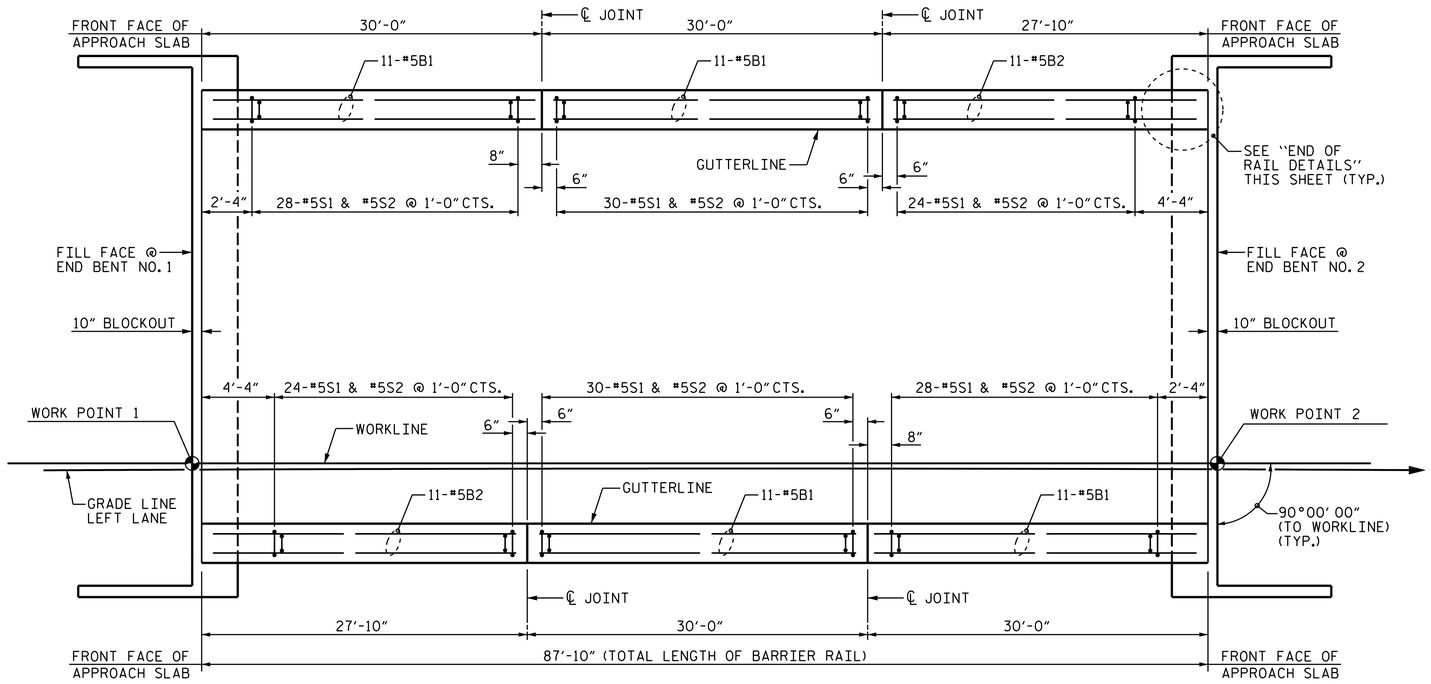


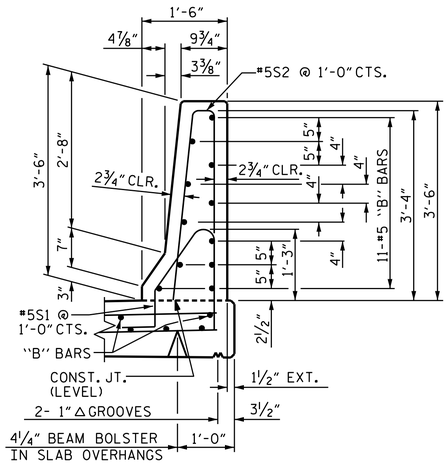
PLAN

NOTES

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

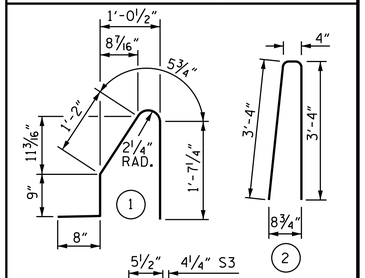
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

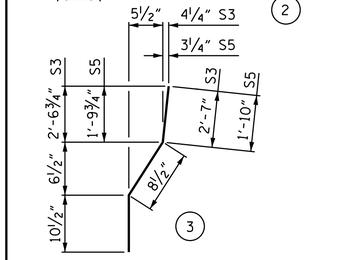
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED 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.



SECTION THRU RAIL

BAR TYPES





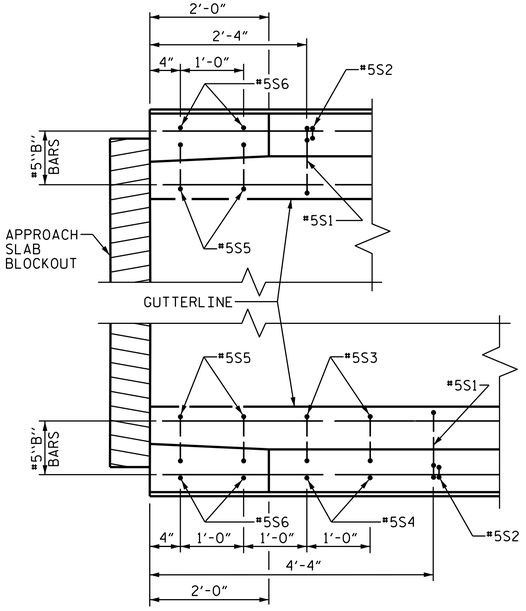
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

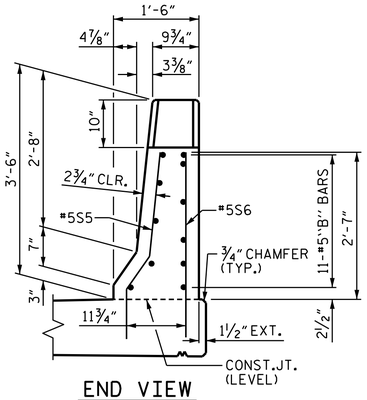
FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ S1	164	#5	1	4'-8"	798
✱ S2	164	#5	2	7'-0"	1197
✱ S3	4	#5	3	4'-2"	17
✱ S4	4	#5	STR	4'-0"	17
✱ S5	8	#5	3	3'-5"	29
✱ S6	8	#5	STR	3'-3"	27
✱ B1	44	#5	STR	29'-8"	1361
✱ B2	22	#5	STR	27'-6"	631

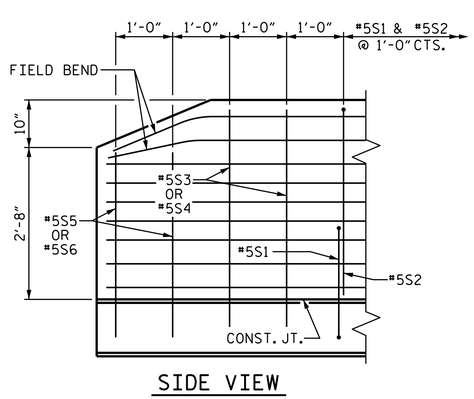
✱ EPOXY COATED REINFORCING STEEL	4077 LBS.
CLASS AA CONCRETE	23.9 CU. YDS.
CONCRETE BARRIER RAIL	175.67 L.F.



PLAN



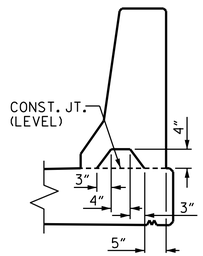
END VIEW



SIDE VIEW

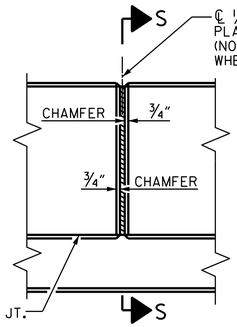
END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS



SECTION "S-S"

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DRAWN BY :	JD GOODIN	DATE :	5/16/14		
CHECKED BY :	MEG / HMS	DATE :	6/23/14		
QC / QA BY :	TG ZEBLO	DATE :	7/7/14		
DRAWN BY : ARB 5/87		REV. 10/1/11		MAA/GM	
CHECKED BY : SJD 9/87		REV. 7/12		MAA/GM	
		REV. 10/12		MAA/GM	

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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Phone 919 981 0310 Fax 919 981 0451
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A&O PROJECT NO. 2013.044

NOTE: THIS STANDARD DRAWING REVIEWED AND ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON
Mark E. Gustafson 3-20-2015

REFERENCE NO. 13-12

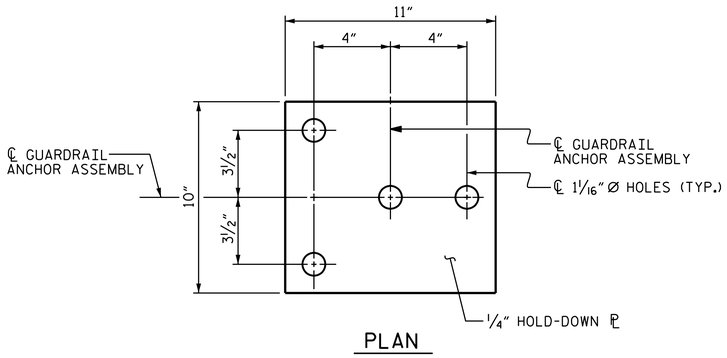
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL
LEFT LANE

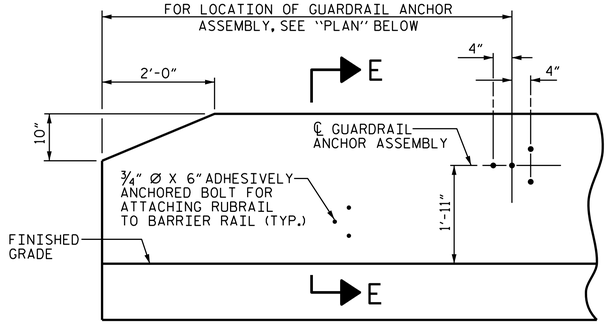
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-12
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

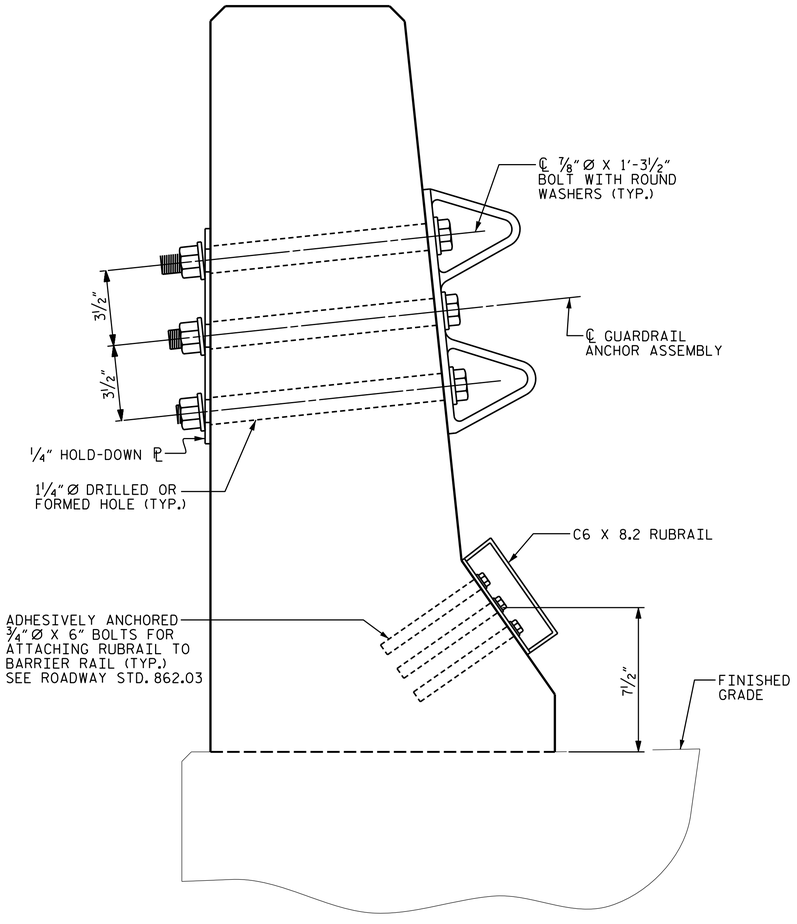
STD. NO. CBR1



PLAN

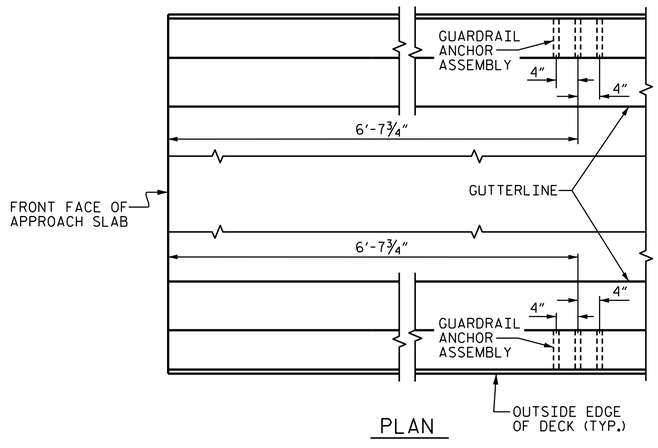


ELEVATION



SECTION "E-E"

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT NO. 1 SHOWN, END BENT NO. 2 SIMILAR

NOTES

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

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

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

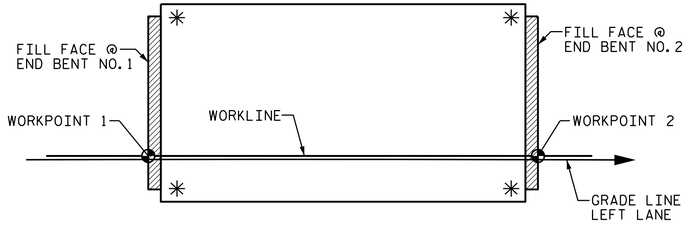
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

DENOTES GUARDRAIL ANCHOR ASSEMBLY TYPE B-77

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

DRAWN BY : TLA 5/06	ADDED 5/11/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM
	REV. 7/12 MAA/GM

PLAN PREPARED BY:

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A&O PROJECT NO. 2013.044

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 3-30-2015 MARK E. GUSTAFSON

REFERENCE NO. 13-13

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:	S13-13
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

STD. NO. GRA2

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	192	#5	STR.	41′-2″	8244
A2	192	#5	STR.	41′-2″	8244
✳ B1	84	#4	STR.	22′-1″	1239
B2	106	#5	STR.	44′-10″	4957
✳ B3	110	#7	STR.	17′-11″	4028
✳ S1	66	#4	1	11′-8″	514
✳ S2	62	#4	1	10′-8″	442
K1	24	#4	STR.	24′-6″	393
K2	6	#4	STR.	9′-4″	37
K3	18	#4	STR.	10′-4″	124
K4	6	#4	STR.	9′-4″	37
K5	6	#4	STR.	8′-10″	35
K6	16	#4	STR.	2′-8″	29
K7	4	#4	STR.	5′-7″	15
K8	12	#4	STR.	6′-1″	49
K9	4	#4	STR.	5′-7″	15
K10	4	#4	STR.	5′-4″	14
U1	66	#4	2	11′-3″	496
U2	12	#4	2	13′-5″	108
H1	32	#5	3	13′-10″	462
H2	32	#5	3	12′-5″	414

✳ EPOXY COATED REINFORCING STEEL.

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	92.3		
POUR 2	73.7		
TOTALS✳✳	166.0	15429	14467

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

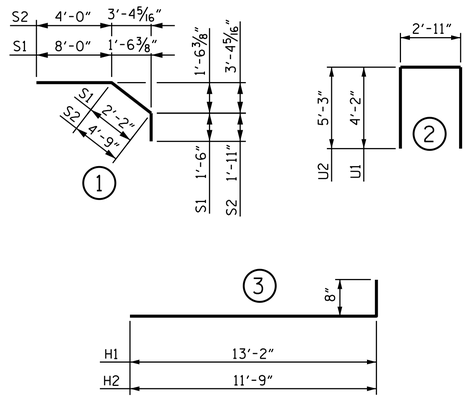
GROOVING BRIDGE FLOORS

APPROACH SLABS	1739	SQ.FT.
BRIDGE DECK	3084	SQ.FT.
TOTAL	4823	SQ.FT.

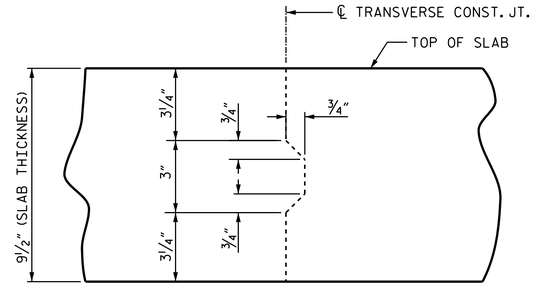
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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″			

BAR TYPES

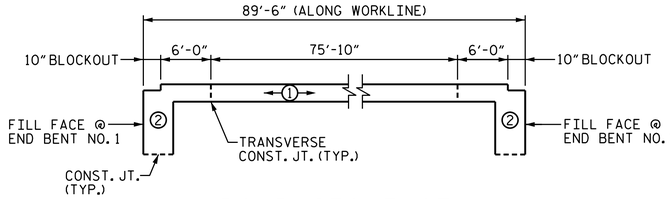


ALL BAR DIMENSIONS ARE OUT TO OUT.



TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

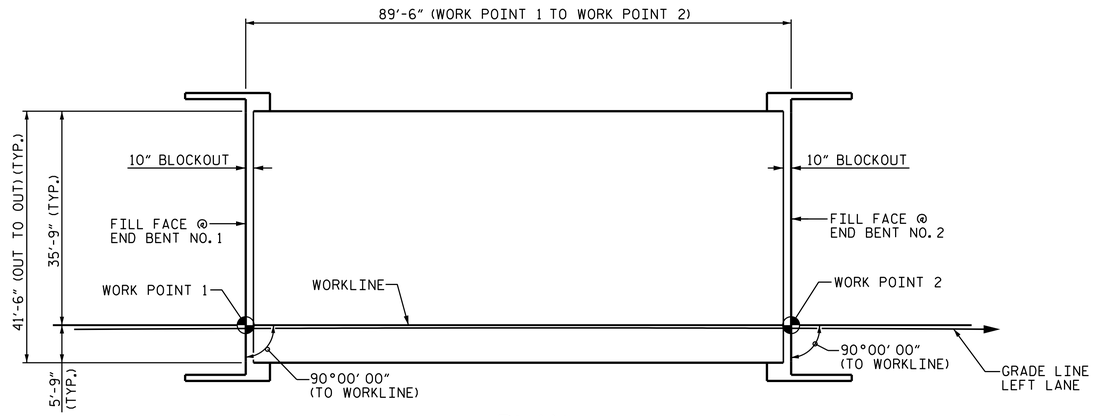
REINFORCING STEEL IN SLAB NOT SHOWN.
LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.



POUR SEQUENCE

①→ INDICATES POUR NUMBER AND DIRECTION OF POUR.

(POUR #2 CANNOT BE STARTED UNTIL POUR #1 HAS REACHED A MINIMUM OF 3,000 PSI.)



PLAN

LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB.
(SQ. FT. = 3714)

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

NOTE: THIS STANDARD DRAWING REVIEWED AND ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 13- 14

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-14
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

STD. NO. BOM1

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
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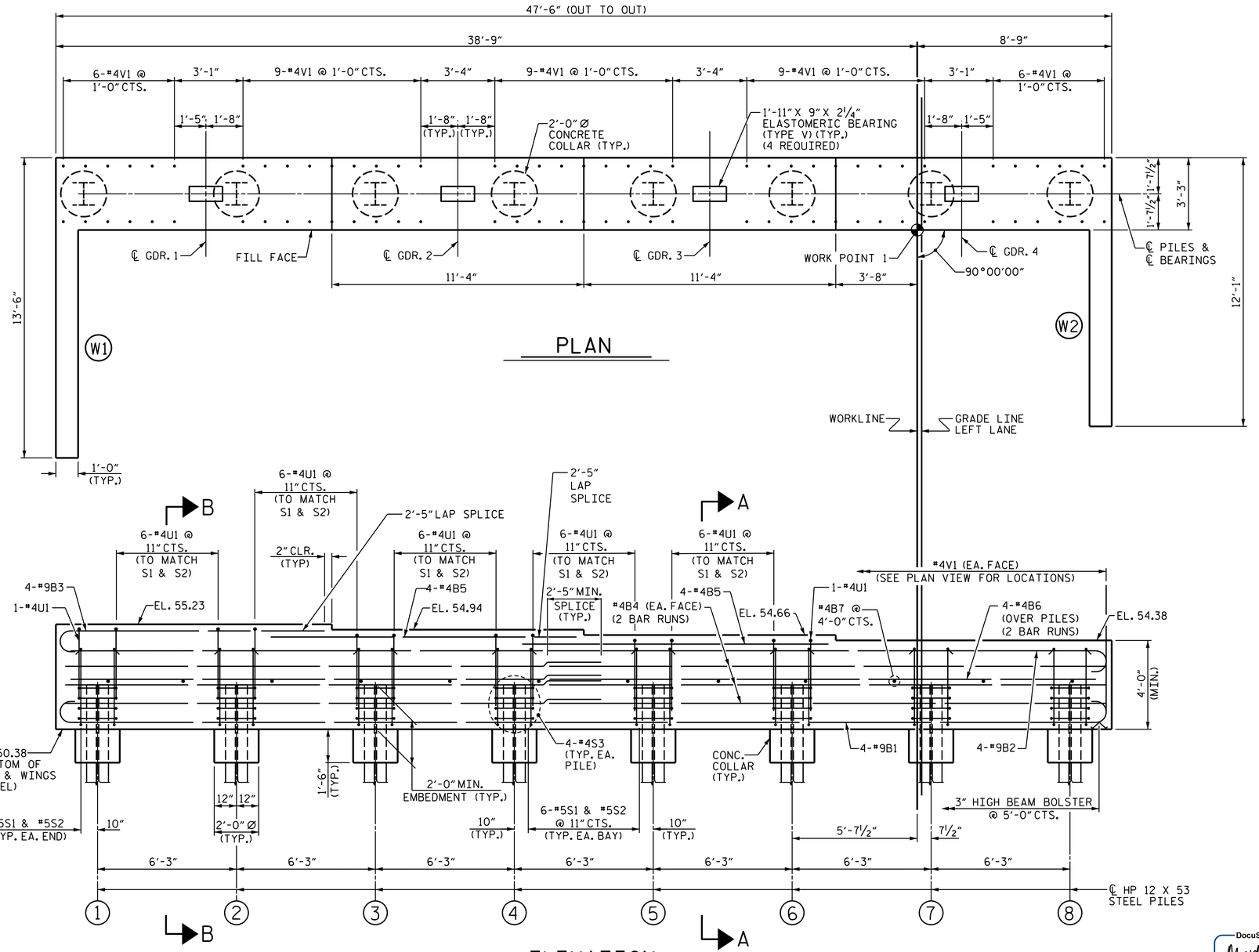
A&O PROJECT NO. 2013.044

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

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



ELEVATION

FOR SECTION "A-A" AND PARTIAL SECTION "B-B", SEE SHEET 2 OF 5.

NOTES

THE #4V1 BARS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 5.

FOR WING DETAILS, SEE SHEET 5 OF 5.

THE TOP SURFACE OF THE CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF THE INTEGRAL END BENT DETAILS.

INSTALL 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.

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 1 OF 5

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 1
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-15
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
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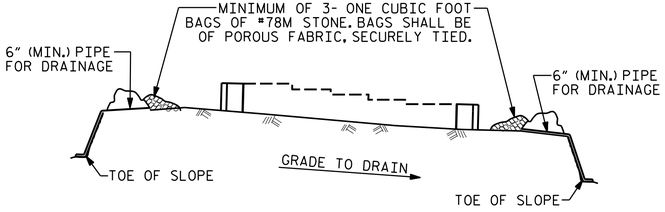
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON
3-20-2015

REFERENCE NO. 13-15

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

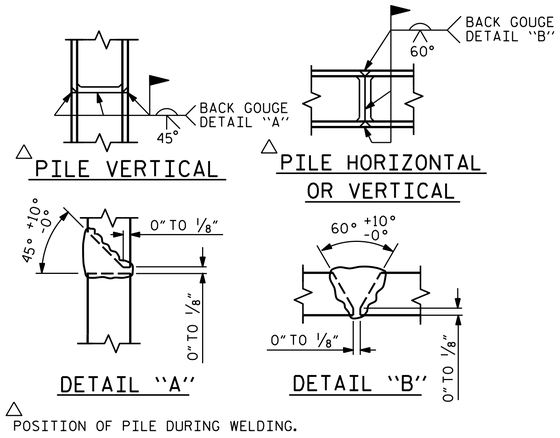


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

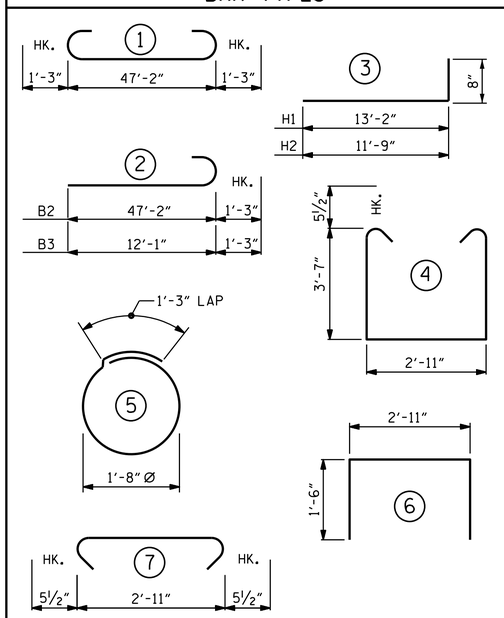
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	49'-8"	675
B2	4	#9	2	48'-5"	658
B3	4	#9	2	13'-4"	181
B4	12	#4	STR	24'-10"	199
B5	8	#4	STR	13'-9"	73
B6	8	#4	STR	24'-10"	133
B7	12	#4	STR	2'-11"	23
H1	14	#5	3	13'-10"	202
H2	10	#5	3	12'-5"	130
S1	44	#5	4	11'-0"	505
S2	44	#5	7	3'-10"	176
S3	32	#4	5	6'-6"	139
V1	78	#4	STR	6'-5"	334
V2	25	#5	STR	10'-1"	263
V3	23	#4	STR	9'-2"	141
U1	32	#4	6	5'-11"	126

REINFORCING STEEL 3958

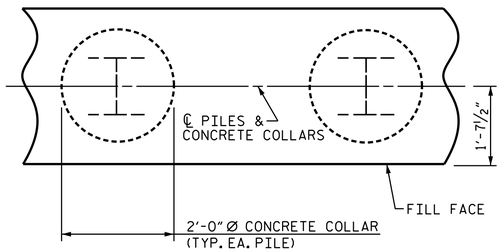
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 29.8 C.Y.

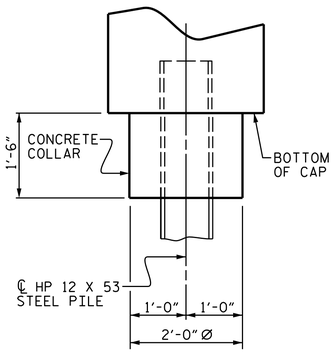
TOTAL CLASS A CONCRETE 29.8 C.Y.

HP 12 X 53 STEEL PILES NO. = 8 600 L.F.

PILE REDRIVES 4 EA.

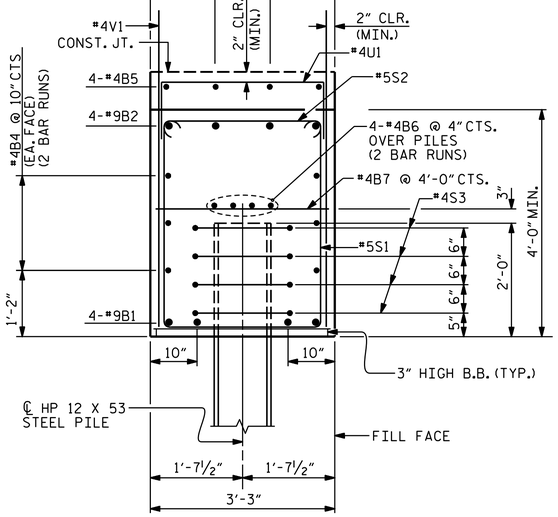


PLAN



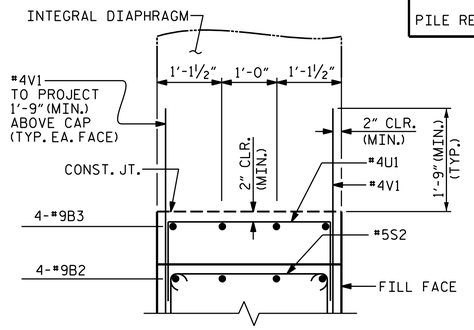
ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL



SECTION "A-A"

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PARTIAL SECTION "B-B"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 2 OF 5

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 1
DETAILS
LEFT LANE

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / HMS DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com

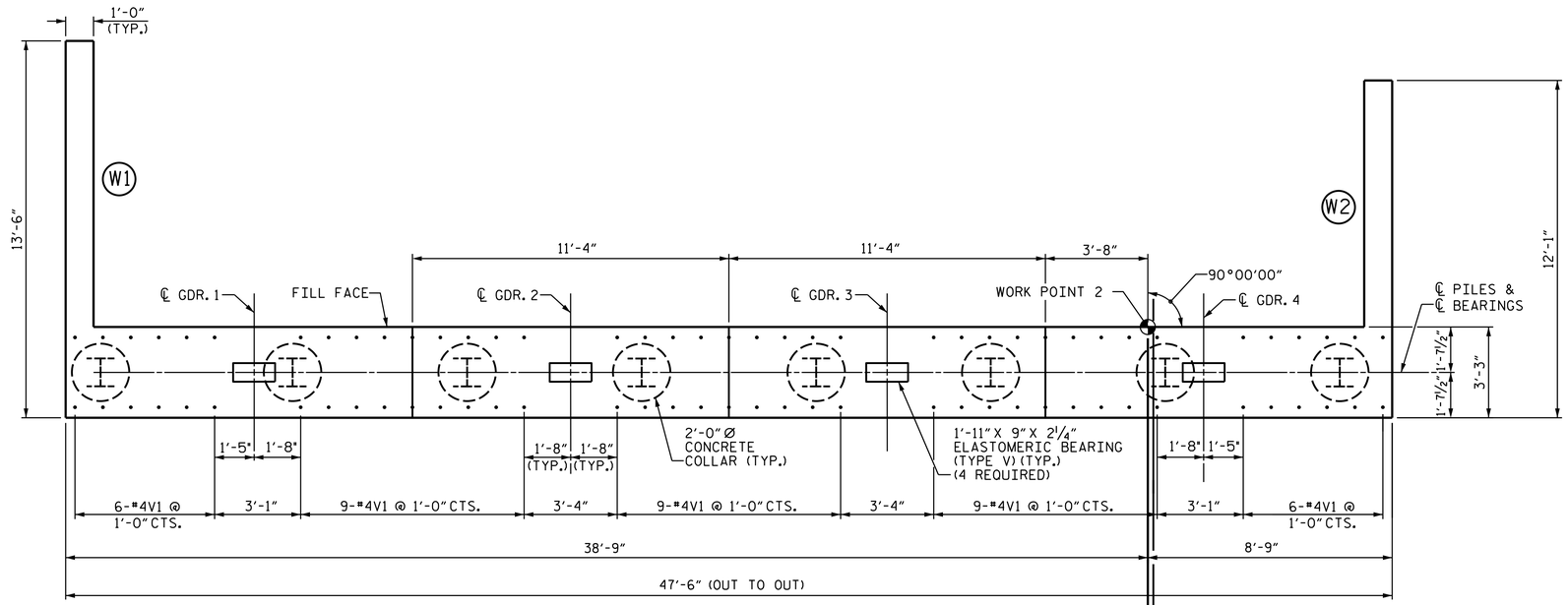
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

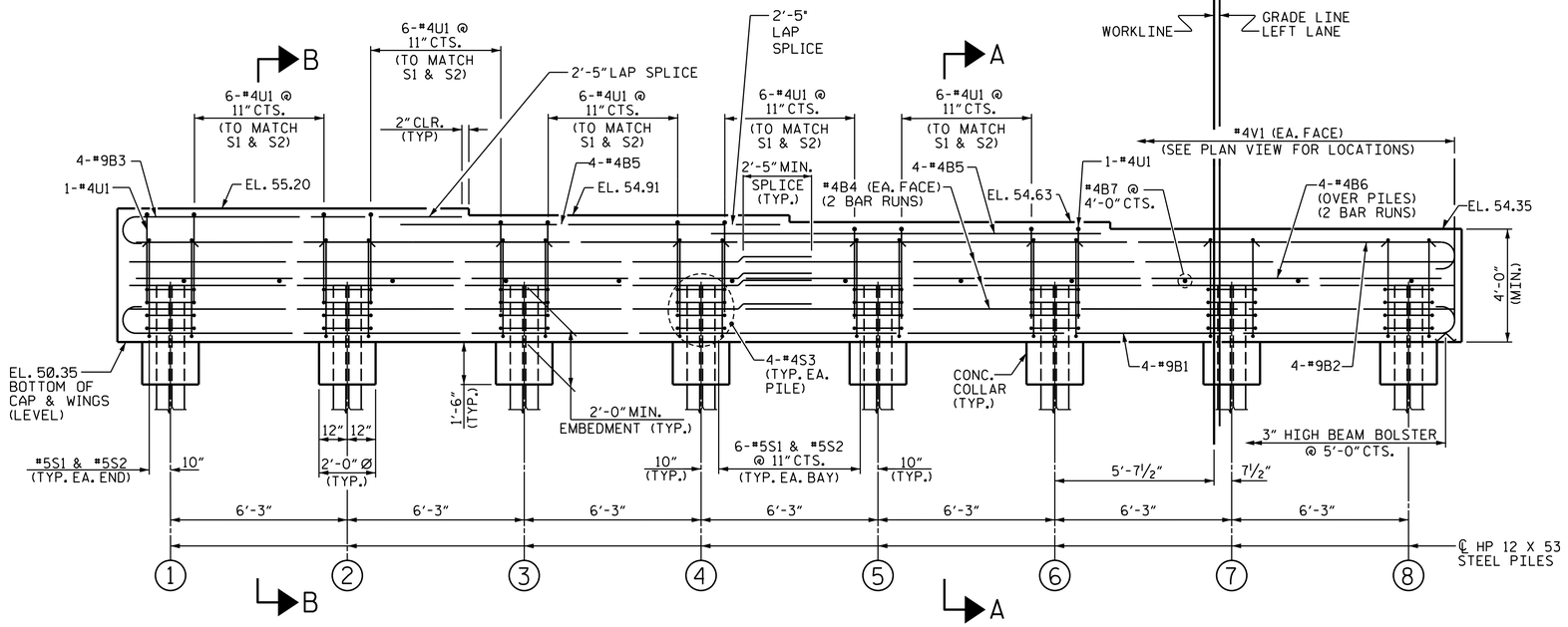
REFERENCE NO. 13-16

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-16
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13



PLAN



ELEVATION

FOR SECTION "A-A" AND PARTIAL SECTION "B-B", SEE SHEET 4 OF 5.

NOTES

THE #4V1 BARS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 5.

FOR WING DETAILS, SEE SHEET 5 OF 5.

THE TOP SURFACE OF THE CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF THE INTEGRAL END BENT DETAILS.

INSTALL 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.

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 3 OF 5

DocuSigned by: Mark Gustafson 9E00EDB87408456...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-17
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

PLAN PREPARED BY:

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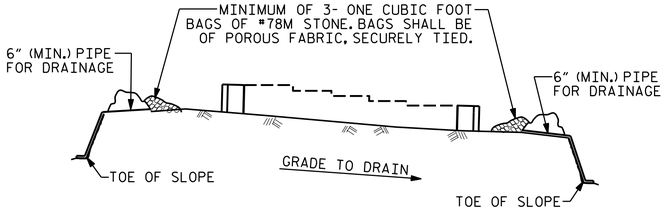
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E GUSTAFSON
3-20-2015

REFERENCE NO. 13-17

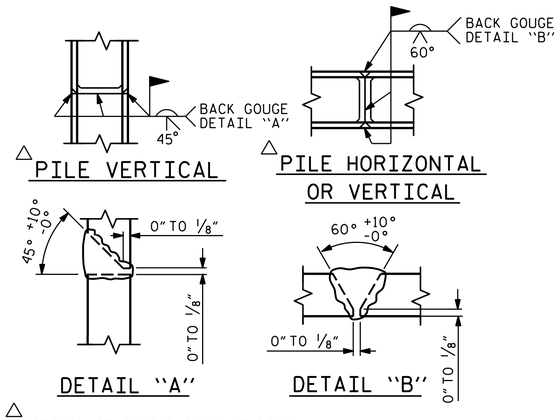


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

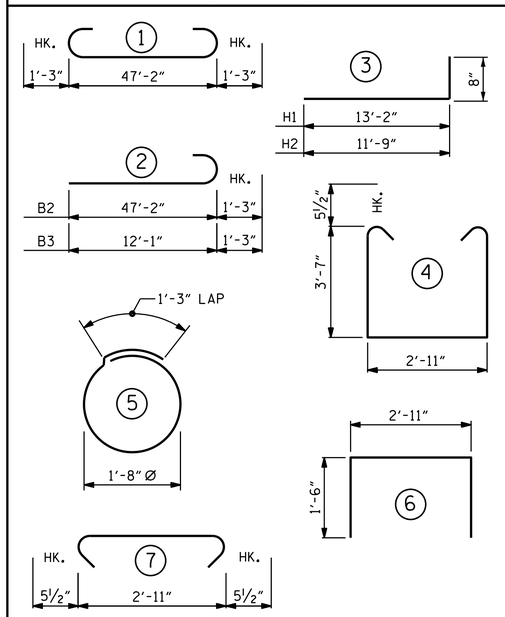
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	49'-8"	675
B2	4	#9	2	48'-5"	658
B3	4	#9	2	13'-4"	181
B4	12	#4	STR	24'-10"	199
B5	8	#4	STR	13'-9"	73
B6	8	#4	STR	24'-10"	133
B7	12	#4	STR	2'-11"	23
H1	14	#5	3	13'-10"	202
H2	10	#5	3	12'-5"	130
S1	44	#5	4	11'-0"	505
S2	44	#5	7	3'-10"	176
S3	32	#4	5	6'-6"	139
V1	78	#4	STR	6'-5"	334
V2	25	#5	STR	10'-1"	263
V3	23	#4	STR	9'-2"	141
U1	32	#4	6	5'-11"	126

REINFORCING STEEL 3958

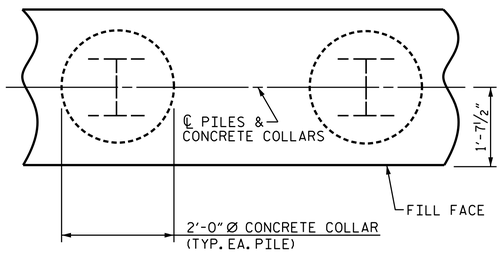
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 29.8 C.Y.

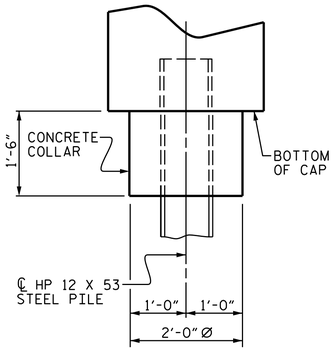
TOTAL CLASS A CONCRETE 29.8 C.Y.

HP 12 X 53 STEEL PILES NO. = 8 600 L.F.

PILE REDRIVES 4 EA.

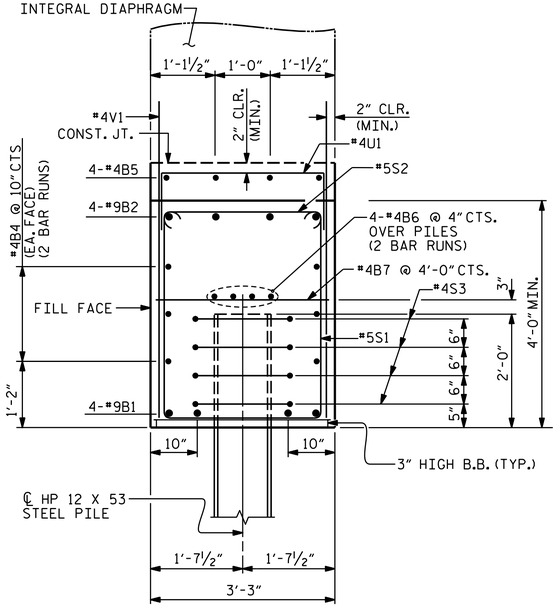


PLAN



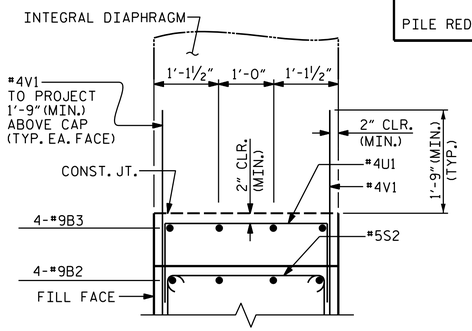
ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL



SECTION "A-A"

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PARTIAL SECTION "B-B"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

SHEET 4 OF 5

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2
DETAILS
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-18
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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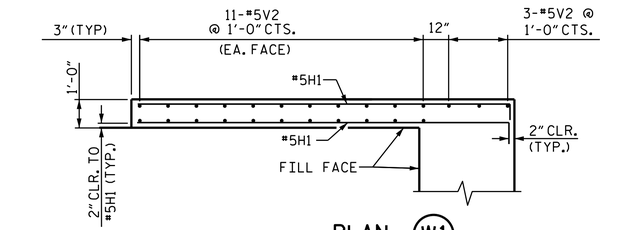
Firm License No. C-1684 www.aogroup.com

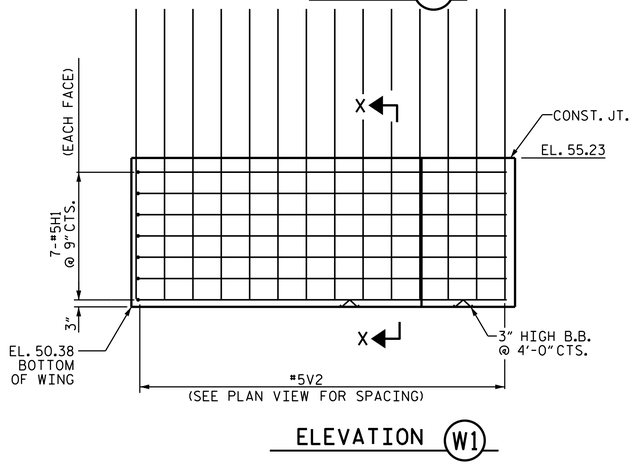
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

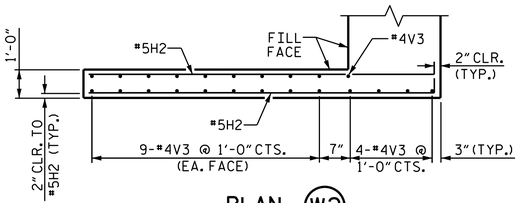
REFERENCE NO. 13-18



PLAN (W1)



ELEVATION (W1)



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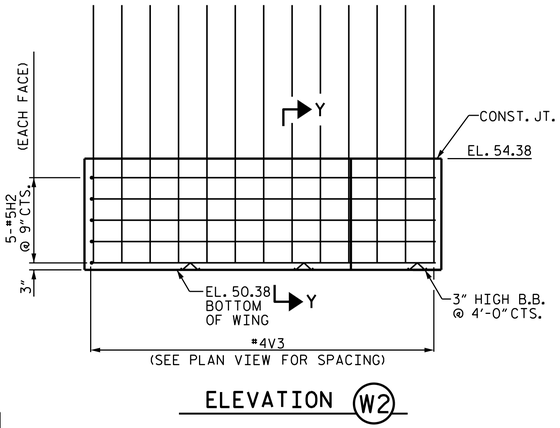

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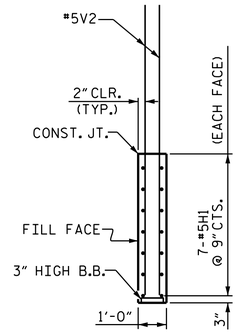
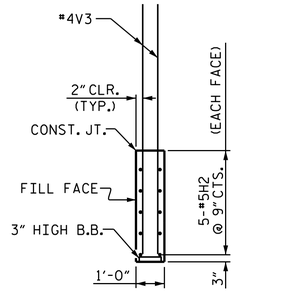
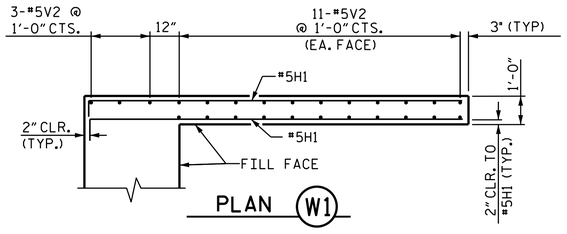


SECTION "X-X"

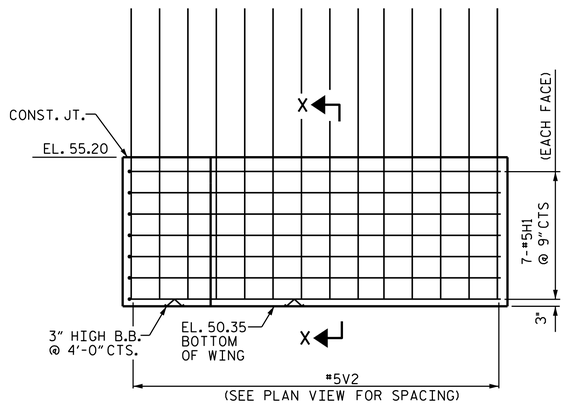


SECTION "Y-Y"

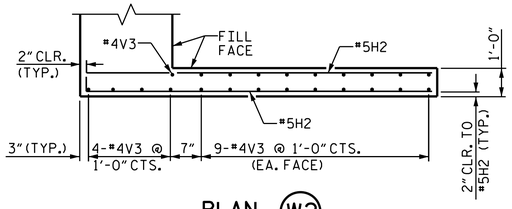
END BENT NO. 1



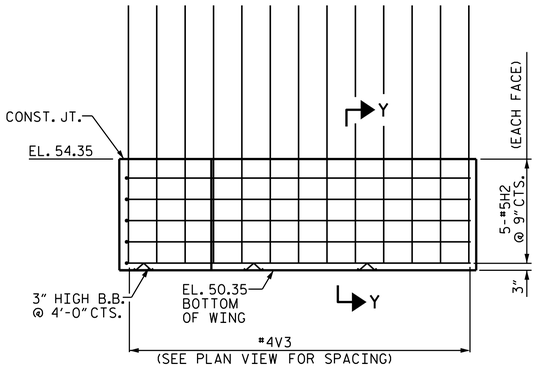
PLAN (W1)



ELEVATION (W1)



PLAN (W2)



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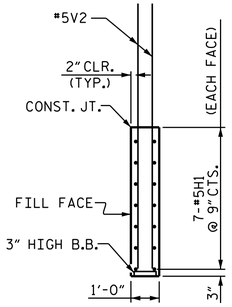
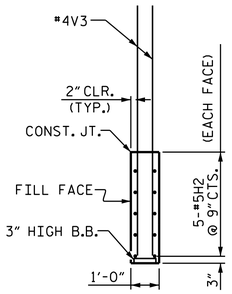


SECTION "X-X"



SECTION "Y-Y"

END BENT NO. 2

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

SHEET 5 OF 5

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BOTTOM OF WINGS
END BENT NO. 1
& END BENT NO. 2
LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-19
1			3			TOTAL SHEETS
2			4			21

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / HMS DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

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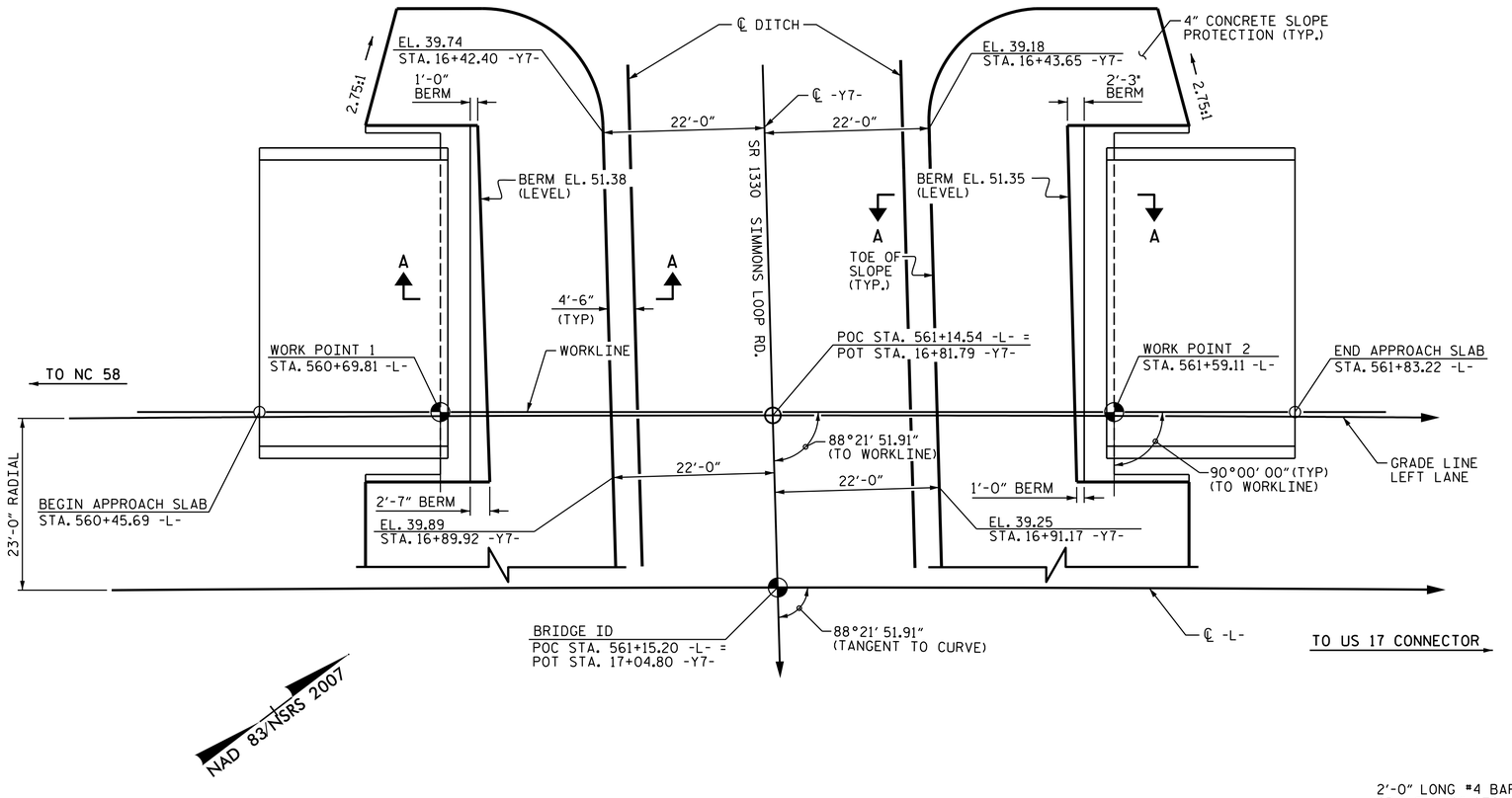
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

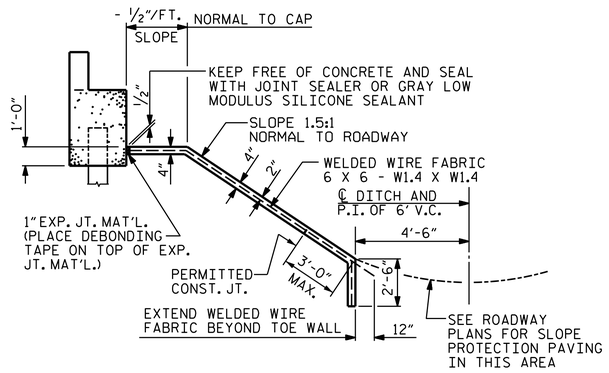
REFERENCE NO. 13-19

STRUCTURE NO. 13



PLAN ALONG WORKLINE - LEFT LANE

PILES ARE NOT SHOWN IN PLAN VIEW



SECTION A-A

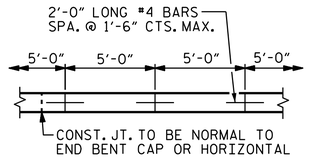
GENERAL NOTES

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

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

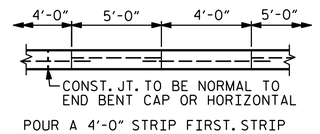
BRIDGE @ STA. 561+15.20 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT NO. 1	264	476
END BENT NO. 2	260	468

* QUANTITY SHOWN IS BASED ON 5' POURS.



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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Phone 919 981 0310 Fax 919 981 0451
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A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON
3-20-2015

REFERENCE NO. 13-20

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SLOPE PROTECTION DETAILS
LEFT LANE

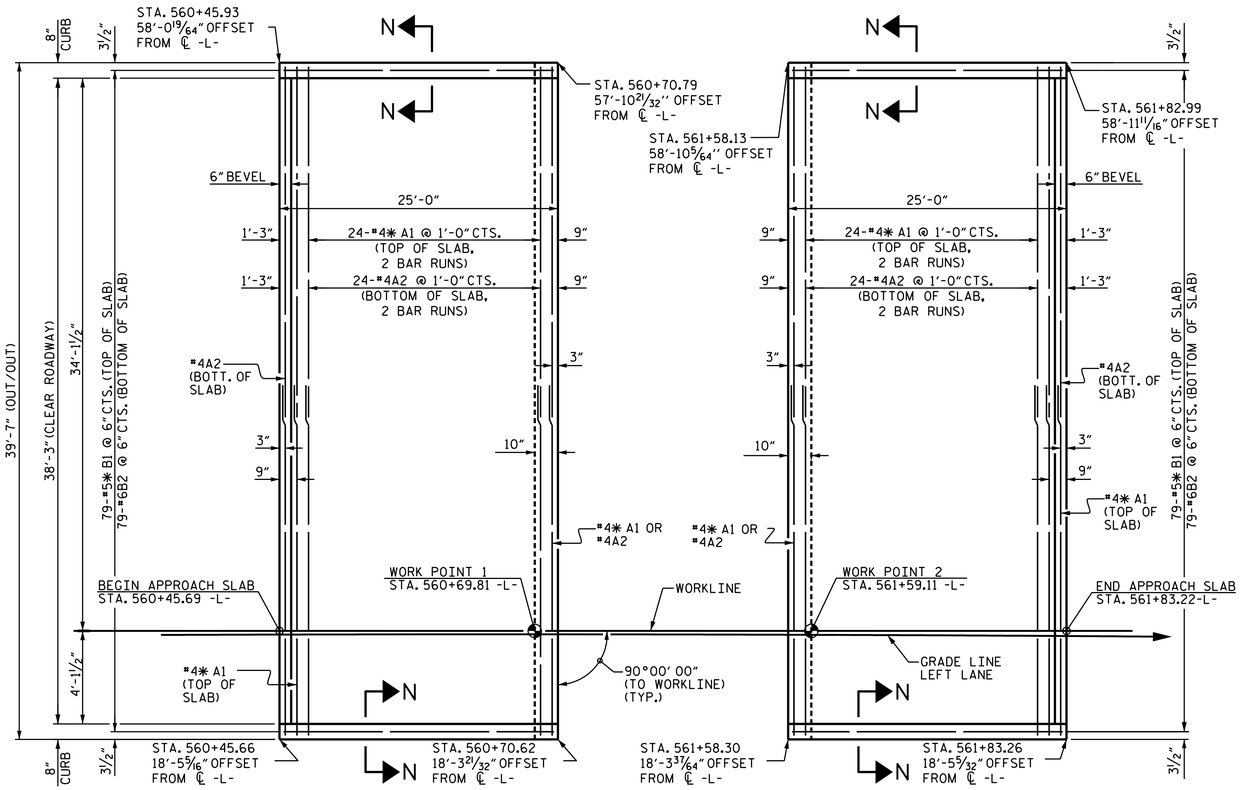
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-20
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 13

STD. NO. SP1

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

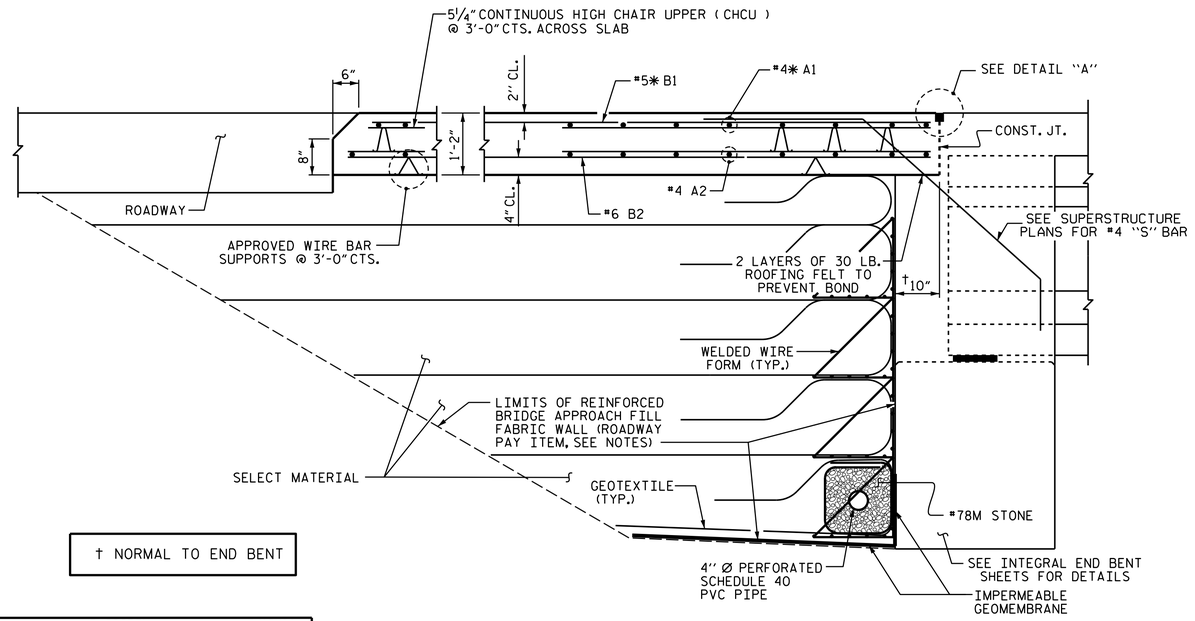
DRAWN BY : ELR 5/92	REV. 5/1/06	TLA/GM
CHECKED BY : GRP 6/92	REV. 10/1/11	MAA/GM
	REV. 12/21/11	MAA/GM



PLAN @ END BENT NO. 1

PLAN @ END BENT NO. 2

(DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS)



† NORMAL TO END BENT

SECTION THRU SLAB

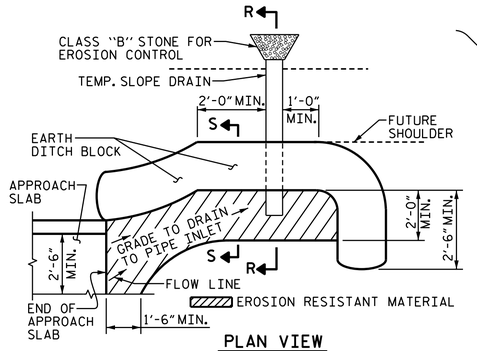
NOTES

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.

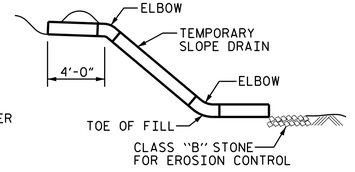
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

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.

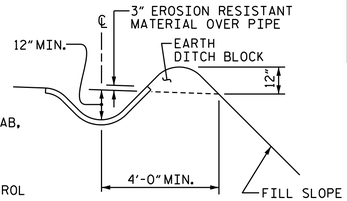


PLAN VIEW

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.



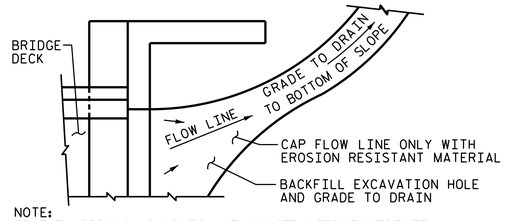
SECTION "R-R"



SECTION "S-S"

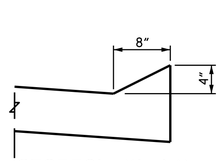
TEMPORARY BERM AND SLOPE DRAIN DETAILS

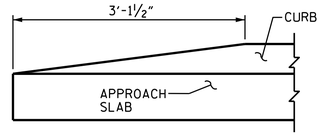
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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.

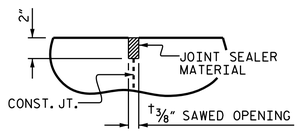
TEMPORARY DRAINAGE DETAIL





END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS



DETAIL "A"

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com
A&O PROJECT NO. 2013.044

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

NORTH CAROLINA EXPIRES 12/31/2015 SEAL 28601 ENGINEER MARK E. GUSTAFSON
Mark E. Gustafson
3-20-2015

REFERENCE NO. 13-21

BILL OF MATERIAL

APPROACH SLAB AT END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	20'-8"	718
A2	52	#4	STR	20'-6"	712
*B1	79	#5	STR	24'-2"	1991
B2	79	#6	STR	24'-8"	2927

REINFORCING STEEL	3639 LBS.
* EPOXY COATED REINFORCING STEEL	2709 LBS.
CLASS AA CONCRETE	42.6 C.Y.

BILL OF MATERIAL

APPROACH SLAB AT END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*A1	52	#4	STR	20'-8"	718
A2	52	#4	STR	20'-6"	712
*B1	79	#5	STR	24'-2"	1991
B2	79	#6	STR	24'-8"	2927

REINFORCING STEEL	3639 LBS.
* EPOXY COATED REINFORCING STEEL	2709 LBS.
CLASS AA CONCRETE	42.6 C.Y.

SPLICE CHART	
#4* A1	2'-0" MIN.
#4A2	1'-9" MIN.

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR INTEGRAL END BENT

LEFT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13-21
1			3			TOTAL SHEETS
2			4			21

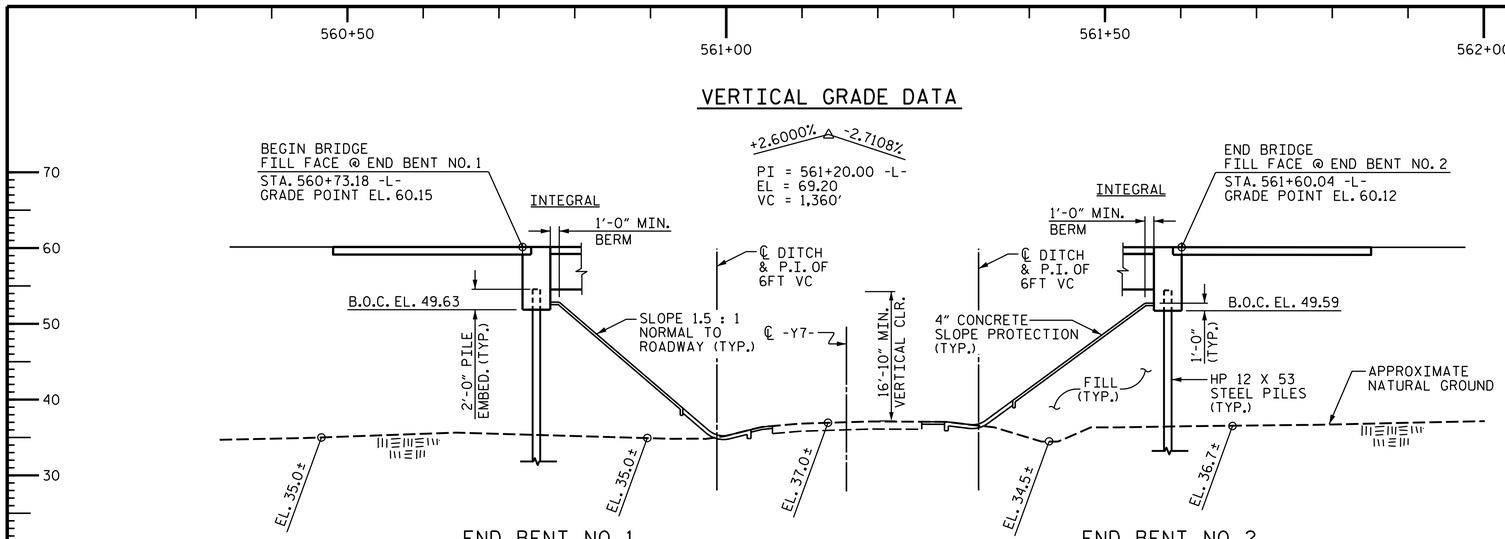
STRUCTURE NO. 13

STD. NO. BAS5

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / HMS	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

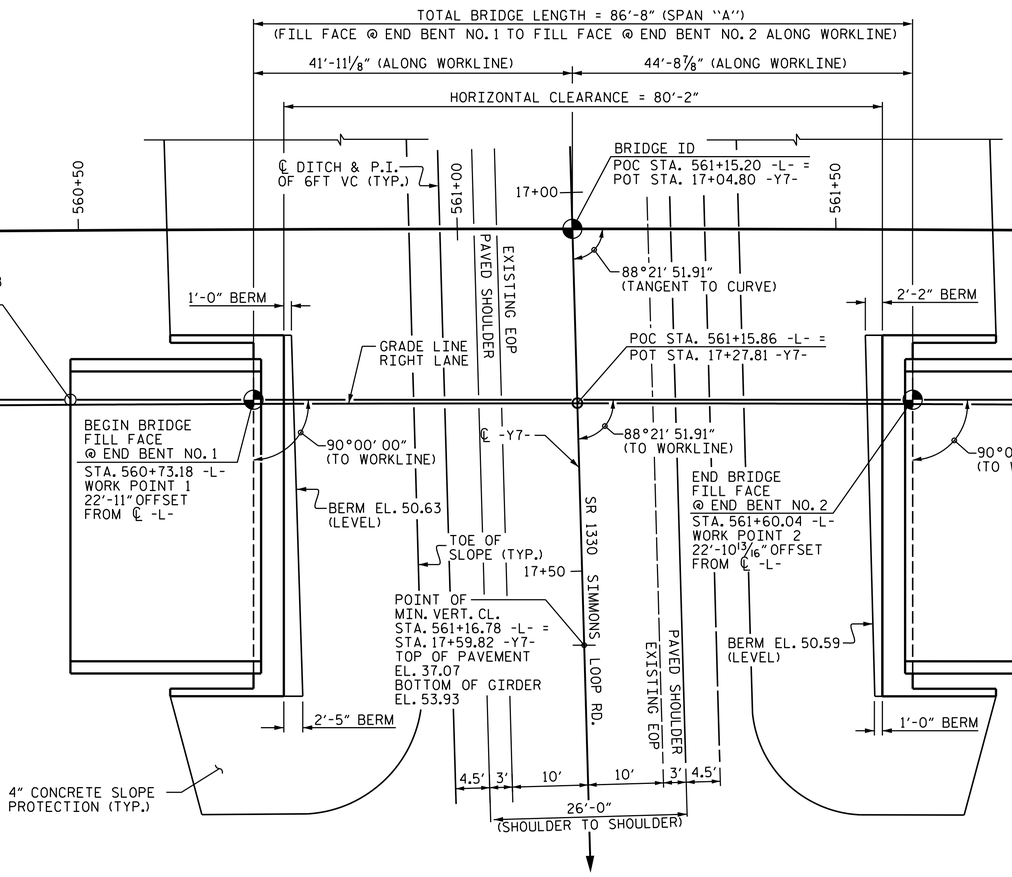
DRAWN BY : SHS/MAA 5-09
CHECKED BY : BCH 5-09

VERTICAL GRADE DATA



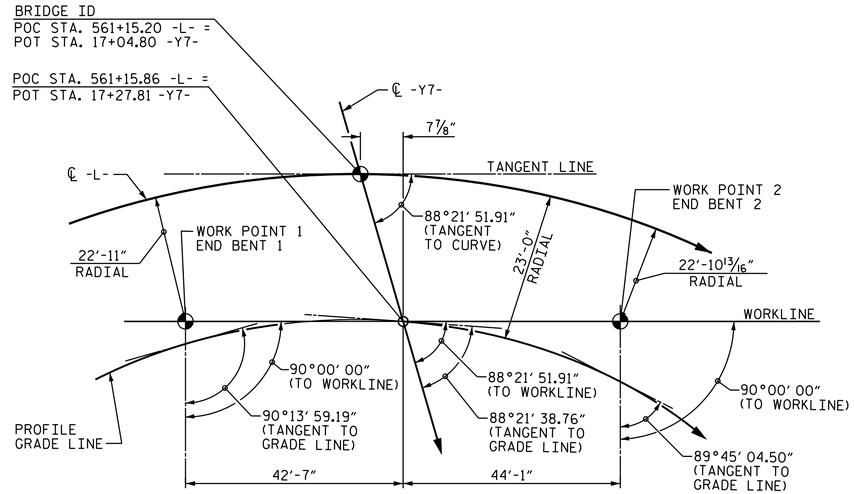
SECTION ALONG GRADE LINE - RIGHT LANE

SECTIONS AT END BENTS ARE AT RIGHT ANGLES



PLAN ALONG GRADE LINE - RIGHT LANE

PILES NOT SHOWN FOR CLARITY



WORKLINE SKETCH

HORIZONTAL CURVE DATA -L-

PI = 571+12.36
Δ = 28°45' 22.4"(RT)
D = 0°33' 17.1"
L = 5,183.63'
T = 2,647.63'
R = 10,328.19'
SE = .025
RO = 90'

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 1 OF 3 BRIDGE NO. 108

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / JWT DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
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A&O PROJECT NO. 2013.044

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

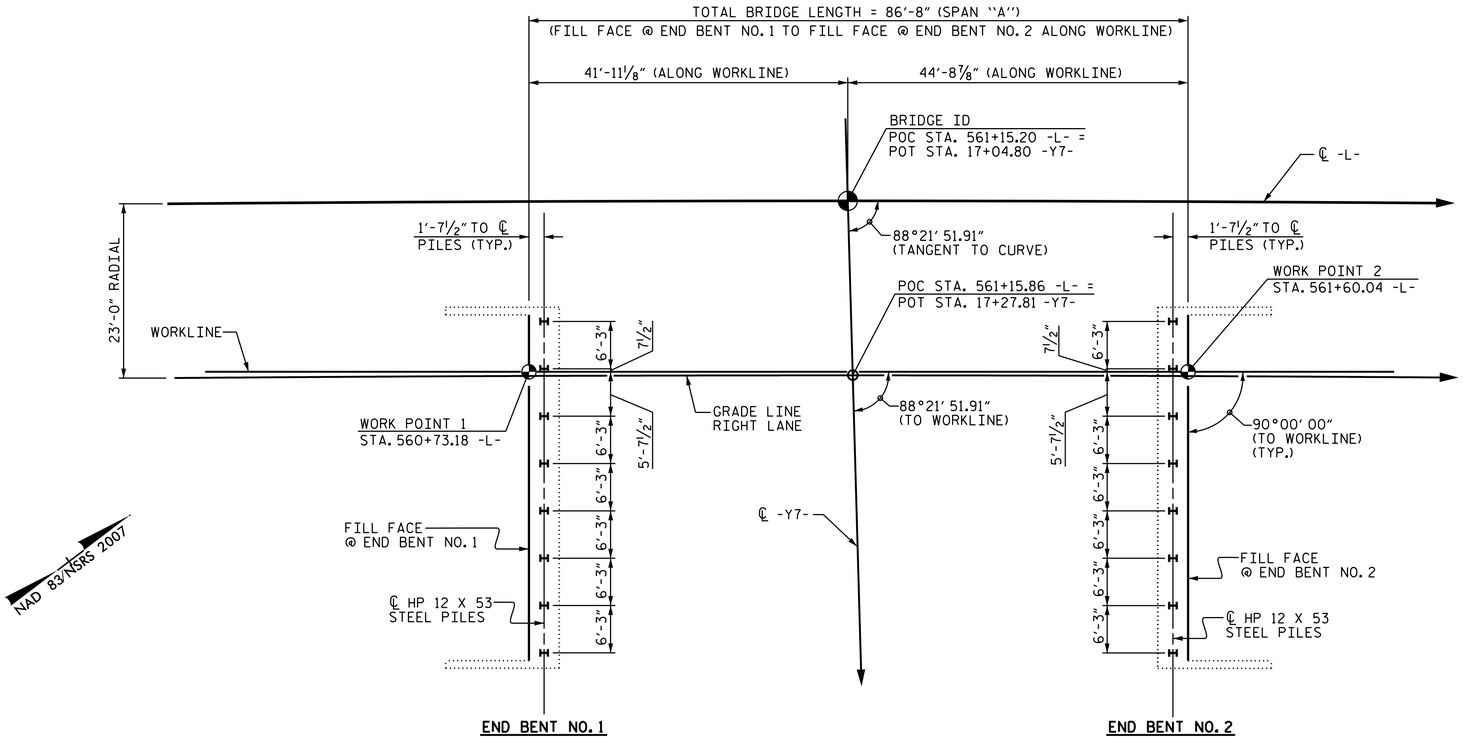
REFERENCE NO. 14- 1

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER SR 1330 ON US 17 BETWEEN NC 58 & US 17 CONNECTOR (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-1
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14



FOUNDATION LAYOUT

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

NOTES

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / JWT DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

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DocuSigned by: Mark Gustafson 9E00EDB87408456.. 3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 14- 2

PROJECT NO. R-2514D
JONES COUNTY
STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 2 OF 3

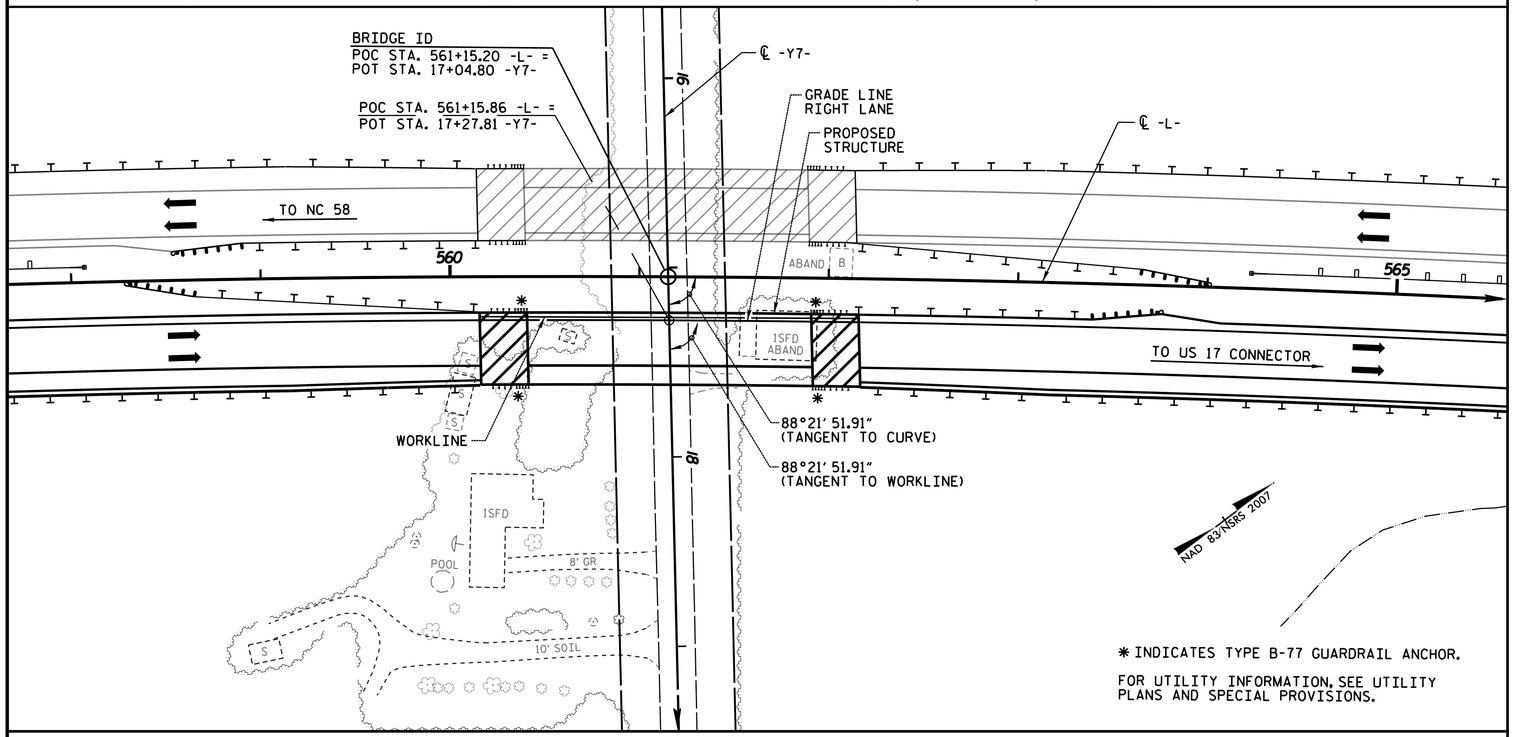
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER SR 1330 ON US 17 BETWEEN NC 58 & US 17 CONNECTOR (RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-2
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14

BM29 RR SPIKE IN 9" PINE AT STATION 559+85.00 -L-; 329' LT., ELEVATION = 37.70'



* INDICATES TYPE B-77 GUARDRAIL ANCHOR.

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE IS FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISION NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, 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.

OBSERVE A TWO MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 1 AND END BENT NO. 2 (STAGE 2 WAITING PERIOD). SEE ROADWAY PLAN TITLED "DETAILS FOR GEOTEXTILE FOR EMBANKMENT STABILIZATION AND STAGE CONSTRUCTION AT -Y7- BRIDGE APPROACHES".

TOTAL BILL OF MATERIAL

	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FEET	NO.	LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM
SUPERSTRUCTURE	-	3597	4782	-	-	-	4	339.33	-	-		170.00		LUMP SUM
END BENT NO. 1	-	-	-	29.8	-	3958	-	-	8	600	4	-	246	
END BENT NO. 2	-	-	-	29.8	-	3958	-	-	8	600	4	-	251	
TOTAL	1	3597	4782	59.6	LUMP SUM	7916	4	339.33	16	1200	8	170.00	497	LUMP SUM

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / JWT DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

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A&O PROJECT NO. 2013.044

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 14- 3

PROJECT NO. R-2514D
JONES COUNTY
STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER SR 1330
ON US 17
BETWEEN NC 58
& US 17 CONNECTOR
(RIGHT LANE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-3
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.17	--	1.75	0.930	2.14	A	E	41.7	1.055	1.17	A	I	7.8	0.80	0.888	1.84	A	I	41.7	
		HL-93 (OPERATING)	N/A		1.54	--	1.35	0.930	2.77	A	E	41.7	1.055	1.54	A	I	7.8	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.53	55.00	1.75	0.930	2.87	A	E	41.7	1.055	1.53	A	I	7.8	0.80	0.888	2.46	A	I	41.7	
		HS-20 (OPERATING)	36.000		2.01	72.00	1.35	0.930	3.72	A	E	41.7	1.055	2.01	A	I	7.8	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SH	12.500		5.23	65.38	1.40	0.930	9.01	A	E	41.7	1.055	5.23	A	I	7.8	0.80	0.888	6.19	A	I	41.7	
		S3C	21.500		3.03	65.15	1.40	0.930	5.27	A	E	41.7	1.055	3.03	A	I	7.8	0.80	0.888	3.62	A	I	41.7	
		S3A	22.750		2.87	65.29	1.40	0.930	5.00	A	E	41.7	1.055	2.87	A	I	7.8	0.80	0.888	3.43	A	I	41.7	
		S4A	26.750		2.48	66.34	1.40	0.930	4.41	A	E	41.7	1.055	2.48	A	I	7.8	0.80	0.888	3.03	A	I	41.7	
		S5A	30.500		2.28	69.54	1.40	0.930	3.89	A	E	41.7	1.055	2.28	A	I	7.8	0.80	0.888	2.67	A	I	41.7	
		S6A	34.500		2.04	70.38	1.40	0.930	3.53	A	E	41.7	1.055	2.04	A	I	7.8	0.80	0.888	2.43	A	I	41.7	
		S7B	38.500		1.91	73.54	1.40	0.930	3.22	A	E	41.7	1.055	1.91	A	I	7.8	0.80	0.888	2.21	A	I	41.7	
		S7A	40.000		1.94	77.60	1.40	0.930	3.18	A	E	41.7	1.055	1.94	A	I	7.8	0.80	0.888	2.19	A	I	41.7	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	T4A	28.250		2.42	68.37	1.40	0.930	4.35	A	E	41.7	1.055	2.42	A	I	7.8	0.80	0.888	2.99	A	I	41.7	
		T5B	32.000		2.28	72.96	1.40	0.930	3.82	A	E	41.7	1.055	2.28	A	I	7.8	0.80	0.888	2.62	A	I	41.7	
		T6A	36.000		2.09	75.24	1.40	0.930	3.51	A	E	41.7	1.055	2.09	A	I	7.8	0.80	0.888	2.41	A	I	41.7	
		T7A	40.000		1.94	77.60	1.40	0.930	3.26	A	E	41.7	1.055	1.94	A	I	7.8	0.80	0.888	2.24	A	I	41.7	
		T7B	40.000	3	1.83	73.20	1.40	0.930	3.49	A	E	41.7	1.055	1.83	A	I	7.8	0.80	0.888	2.40	A	I	41.7	

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)

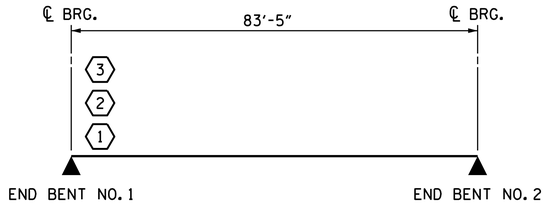
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-4
1			3			TOTAL SHEETS
2			4			21

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / JWT	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

DRAWN BY : MAA 1/08 REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08 REV. 10/1/11 MAA/GM

PLAN PREPARED BY:
ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
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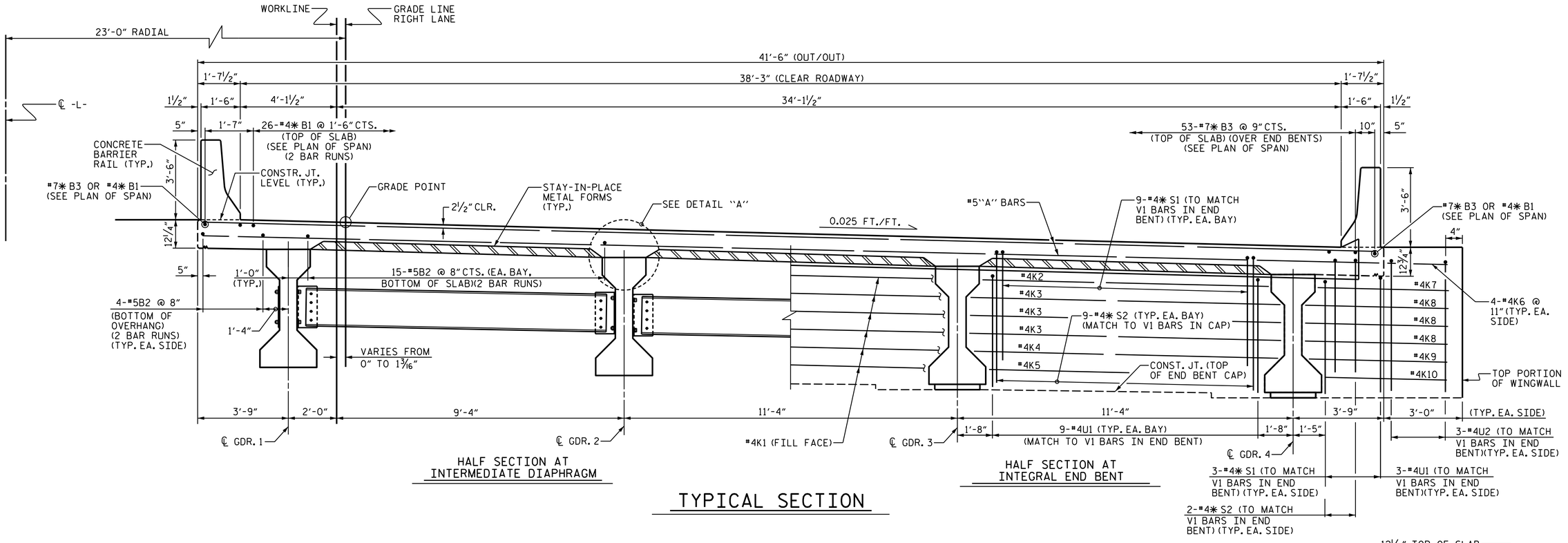
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 14- 4

STRUCTURE NO. 14

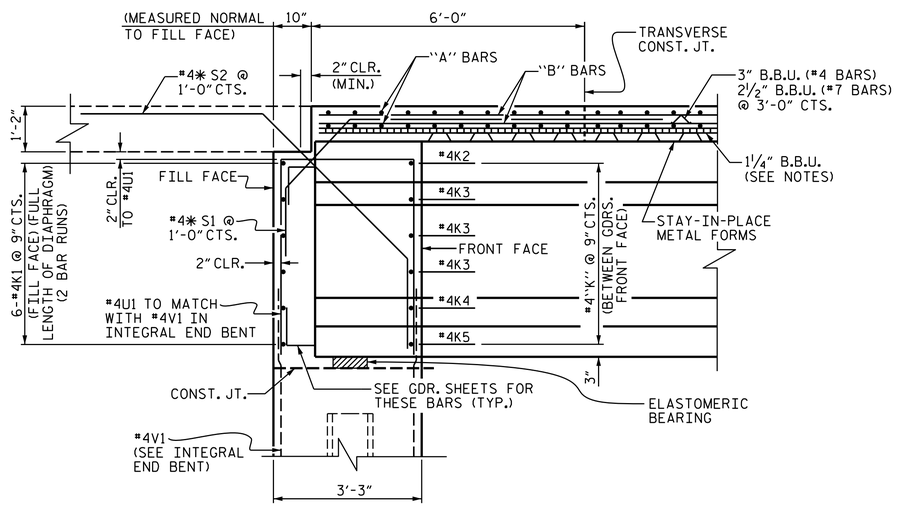
STD. NO. LRFR2



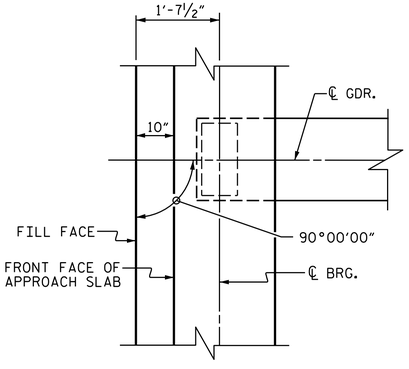
HALF SECTION AT INTERMEDIATE DIAPHRAGM

HALF SECTION AT INTEGRAL END BENT

TYPICAL SECTION



SECTION "A-A"



PLAN OF GIRDER AT INTEGRAL END BENT

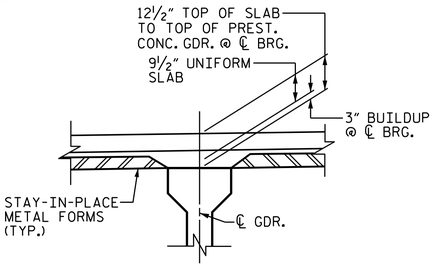
NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER @ 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.) AT 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.

SEE "SECTION THRU RAIL" ON SHEET 14-12 FOR DRIP GROOVES AND BEAM BOLSTERS IN OVERHANG.

FOR LOCATION OF SECTIONS, SEE "PLAN OF SPAN" SHEET.



DETAIL "A"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

DocuSigned by: Mark Gustafson 9E00EDB87408456...

3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION RIGHT LANE

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / JWT	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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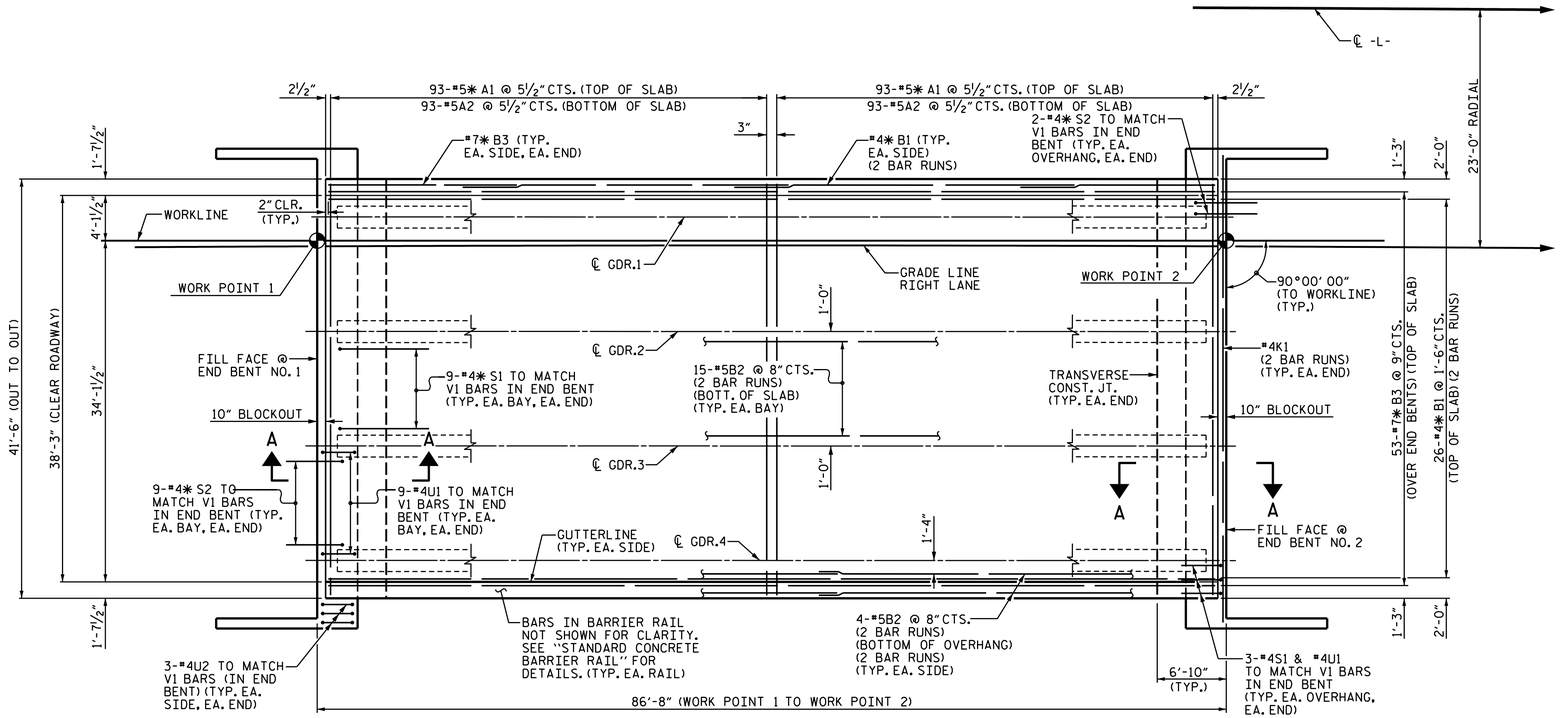
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 3-20-2015 MARK E. GUSTAFSON

REFERENCE NO. 14- 5

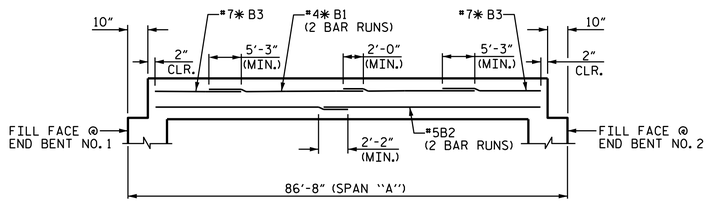
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-5
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14



PLAN

SEE PLAN OF SPAN DETAILS SHEET FOR ADDITIONAL REINFORCING STEEL IN WINGS



SCHEMATIC DIAGRAM OF SPAN "A"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 14- 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN "A"
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-6
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14

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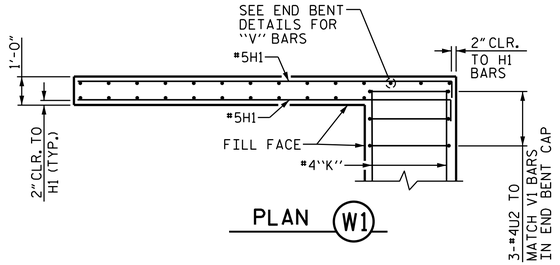
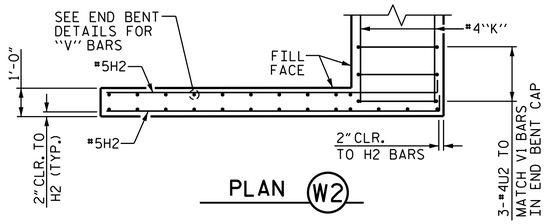


PLAN (W1)



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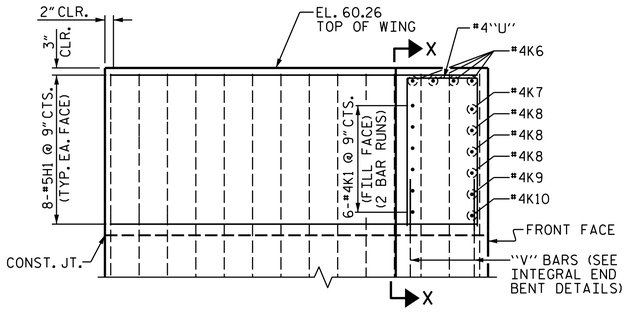

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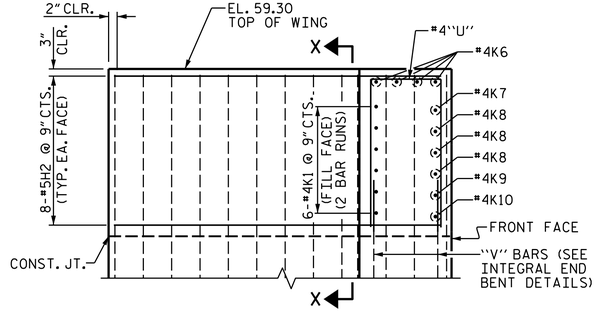

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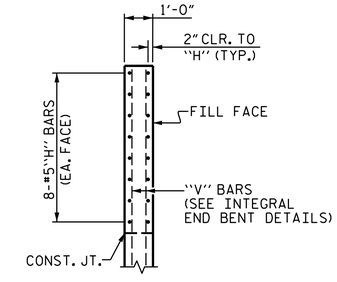
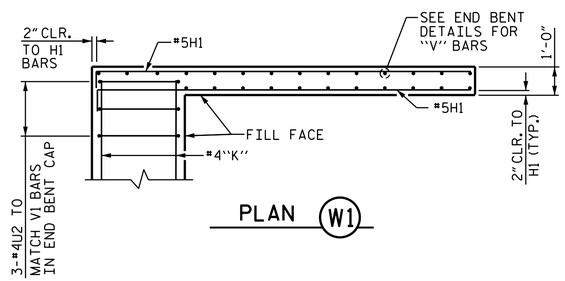


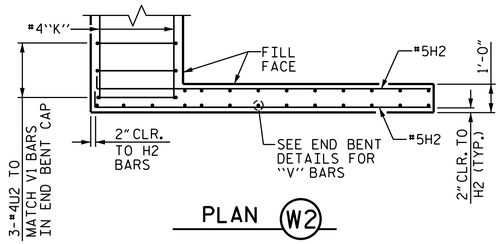
SECTION "X-X"

END BENT NO. 1

(FOR WING DIMENSIONS SEE SUBSTRUCTURE END BENT NO. 1)



PLAN (W1)



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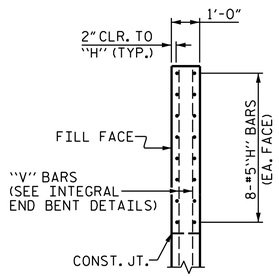

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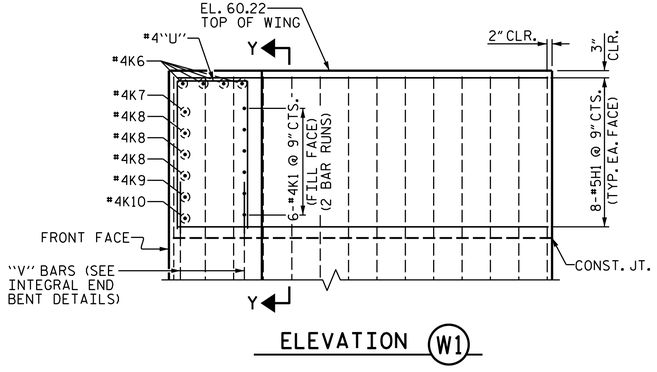
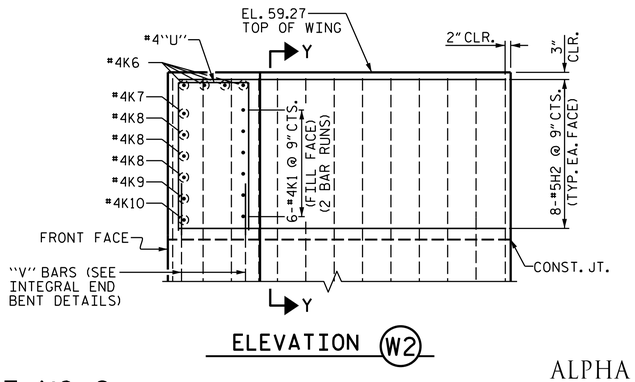


ELEVATION (W1)



ELEVATION (W2)

END BENT NO. 2

(FOR WING DIMENSIONS SEE SUBSTRUCTURE END BENT NO. 2)

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
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3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN DETAILS
TOP OF WINGS
END BENT NO. 1 &
END BENT NO. 2
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-7
1			3			TOTAL SHEETS
2			4			21

REFERENCE NO. 14- 7

STRUCTURE NO. 14

PLAN PREPARED BY:

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NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 3-20-2015

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CHECKED BY :	MEG / JWT	DATE :	6/23/14
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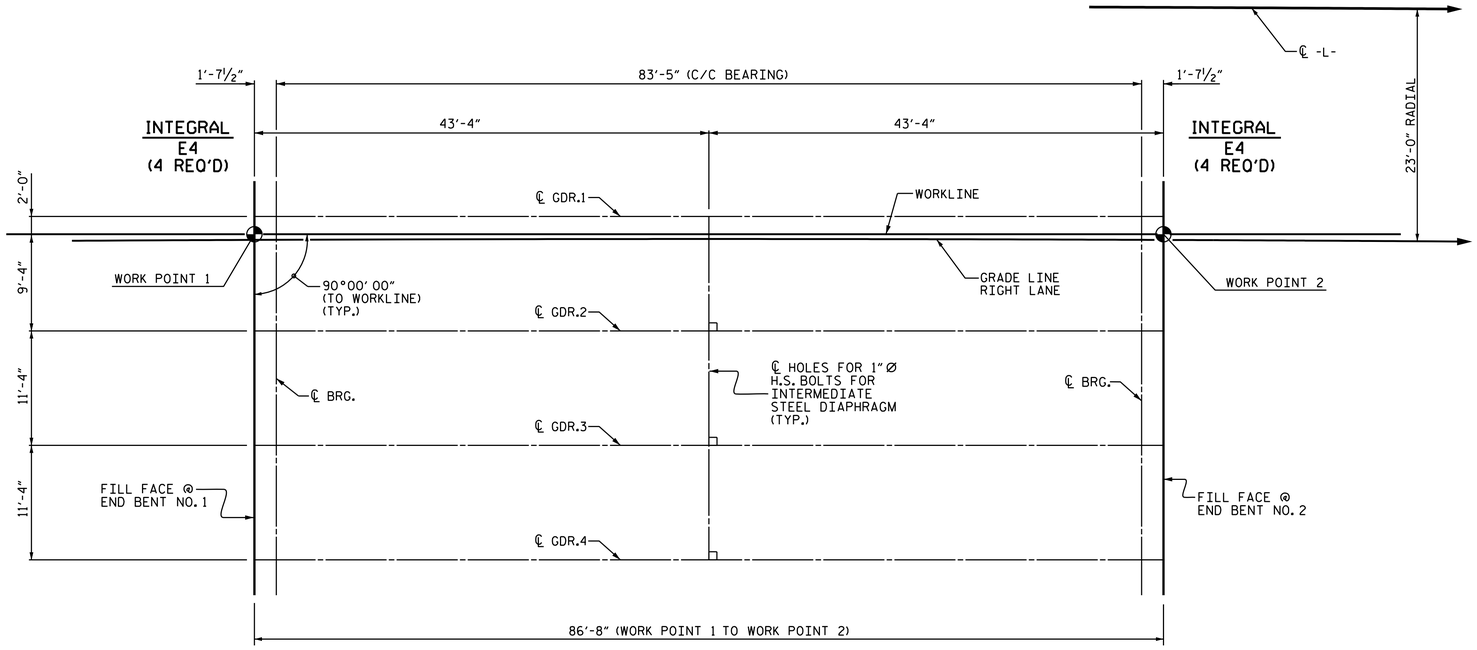

GIRDER LAYOUT

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION STRANDS	SPAN "A"																					
	GIRDERS 1 & 4											GIRDERS 2 & 3										
TENTH POINTS	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0.0	0	.10	.20	.30	.40	.50	.60	.70	.80	.90	0
CAMBER (GIRDER ALONE IN PLACE)	0.0	0.101	0.172	0.225	0.255	0.265	0.255	0.225	0.172	0.101	0.0	0.0	0.101	0.172	0.225	0.255	0.265	0.255	0.225	0.172	0.101	0.0
* DEFLECTION DUE TO SUPERIMPOSED D.L.	0.0	-0.031	-0.060	-0.084	-0.099	-0.104	-0.099	-0.084	-0.060	-0.031	0.0	0.0	-0.035	-0.068	-0.094	-0.111	-0.117	-0.111	-0.094	-0.068	-0.035	0.0
FINAL CAMBER	0	13/16	1 3/8	1 11/16	1 7/8	1 15/16	1 7/8	1 11/16	1 3/8	13/16	0	0	3/4	1 1/4	1 9/16	1 11/16	1 3/4	1 11/16	1 9/16	1 1/4	3/4	0

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

DRAWN BY : JD GOODIN DATE : 5/16/14
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NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON
3-20-2015

REFERENCE NO. 14- 8

PROJECT NO. R-2514D
JONES COUNTY
STATION: 561+15.20 -L-
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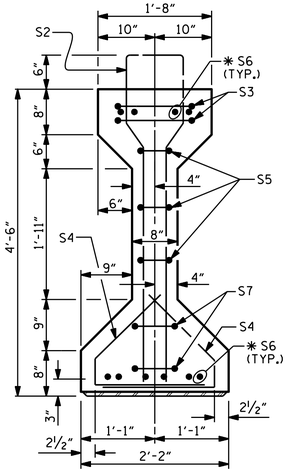
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
GIRDER LAYOUT
RIGHT LANE

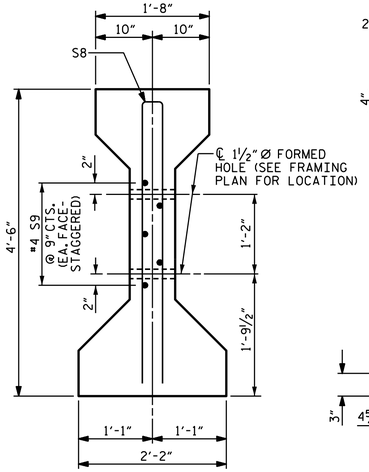
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-8
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14



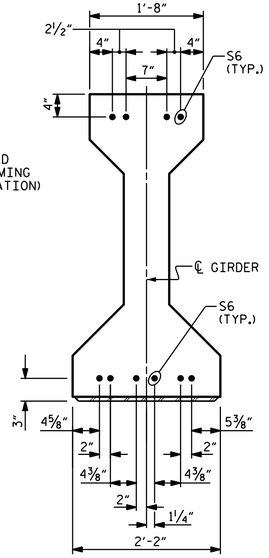
SECTION "A-A"

✱FOR S6 BARS, SEE DETAIL "A"

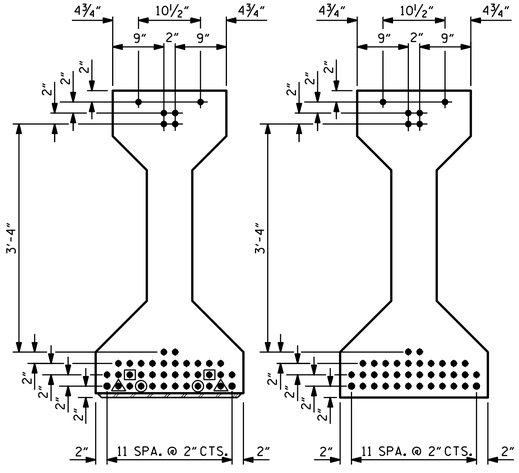


SECTION "C-C"

(S1 BARS NOT SHOWN)



DETAIL "A"



0.6"Ø LOW RELAXATION STRAND LAYOUT

▣ STRANDS DEBONDED 2'-0" FROM END OF GIRDER.
▲ STRANDS DEBONDED 8'-0" FROM END OF GIRDER.
◉ STRANDS DEBONDED 24'-0" FROM END OF 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.

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

BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

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.

THE TOP SURFACE OF THE GIRDER SHALL BE RAKED TO A DEPTH OF ¼" EXCEPT IN THE AREA BETWEEN THE STIRRUP AND THE EDGE OF THE GIRDER.

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

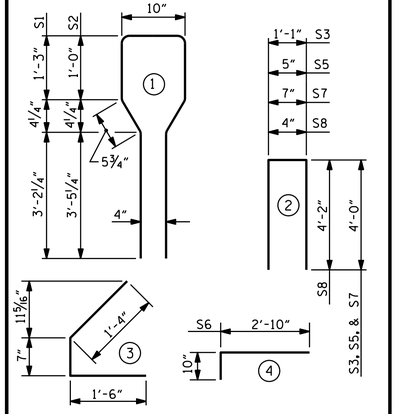
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	67	#4	1	10'-8"	477
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
✱S6	20	#5	4	3'-8"	76
S7	4	#4	2	8'-7"	23
S8	2	#5	2	8'-8"	18
S9	5	#4	STR	7'-0"	23
S10	2	#3	STR	1'-10"	1
S11	2	#3	STR	1'-4"	1

✱NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



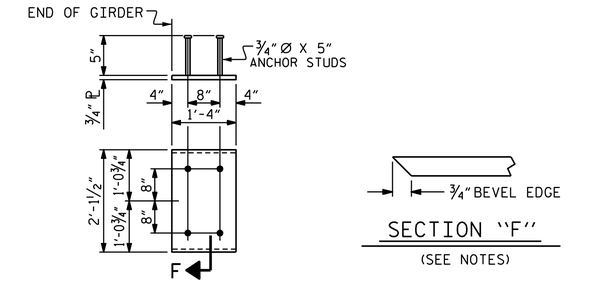
ALL BAR DIMENSIONS ARE OUT-TO-OUT.

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	8000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	1015	17.2	42
INTERIOR GIRDER	1015	17.2	42

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4	84'-10"	339'-4"

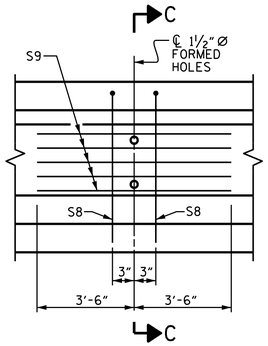


EMBEDDED PLATE "B-1" DETAILS

TWO EMBEDDED PLATES "B-1" ARE REQUIRED FOR EACH GIRDER.

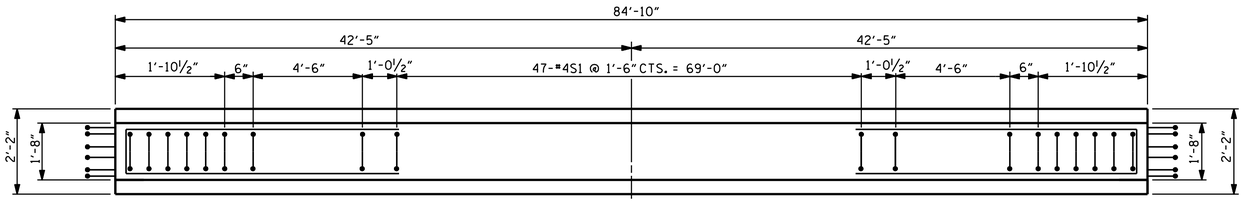
SECTION "F"

(SEE NOTES)

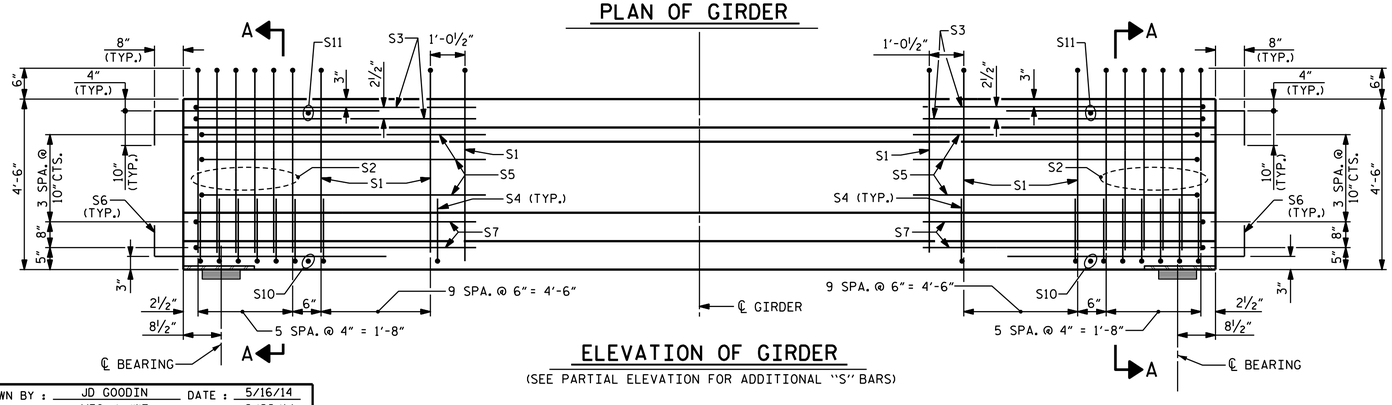


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER NOS. 1 THROUGH 4.



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
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3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER RIGHT LANE

REVISIONS							SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:		S14-9
1			3				TOTAL SHEETS
2			4				21

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DRAWN BY :	JMB 12/87	REV. 8/16/99RR	RWW/LES
CHECKED BY :	ARB 12/87	REV. 5/1/06R	TLA/GM
		REV. 10/1/11	MAA/GM

PLAN PREPARED BY:

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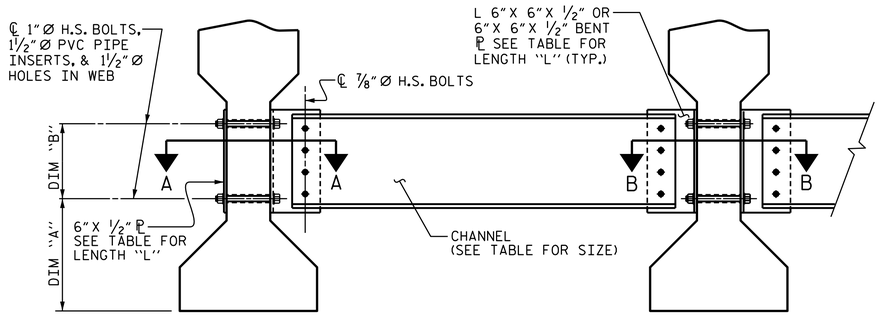
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON
3-20-2015

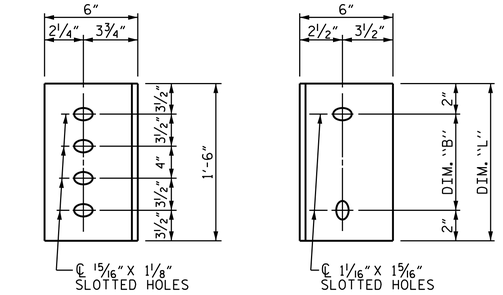
REFERENCE NO. 14- 9

STRUCTURE NO. 14

STD. NO. PCG3



PART SECTION AT INTERMEDIATE DIAPHRAGM



CONNECTOR PLATE DETAILS

STRUCTURAL STEEL NOTES

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

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

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

THE PLATES, BENT PLATES, CHANNELS AND ANGLES SHALL BE 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 ¼" PROJECTION BEYOND THE NUT.

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

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

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

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

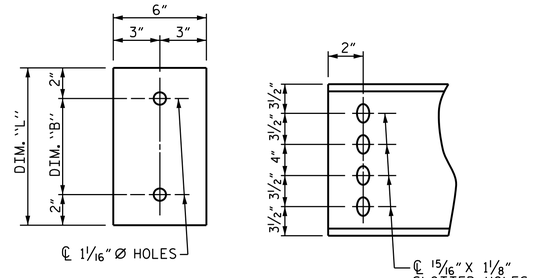
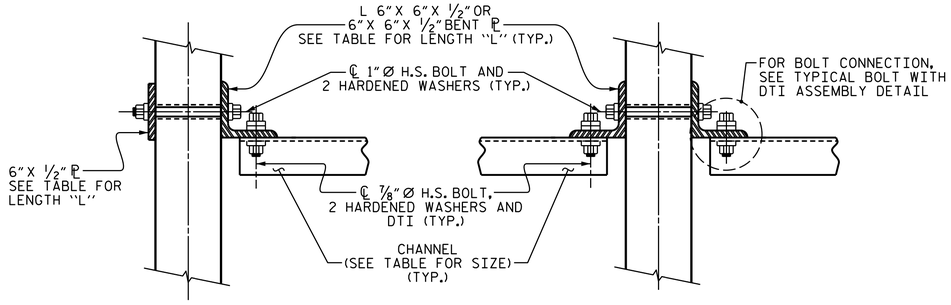


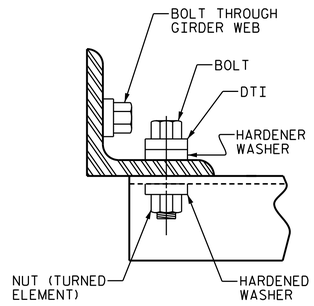
PLATE DETAILS CHANNEL END

TABLE

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



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

NOTE: THIS STANDARD DRAWING REVIEWED AND ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED.

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON

REFERENCE NO. 14- 10

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-10
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14

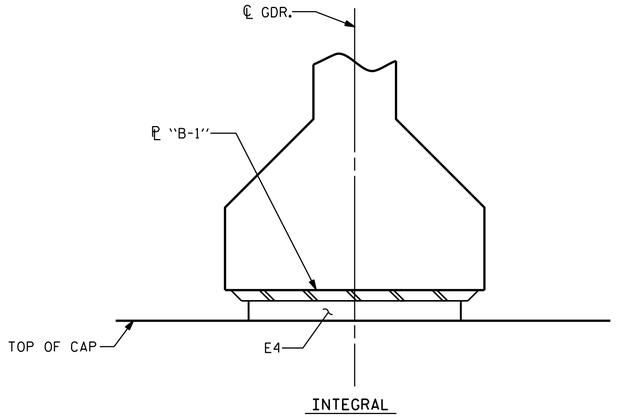
STD. NO. PCG10

PLAN PREPARED BY:

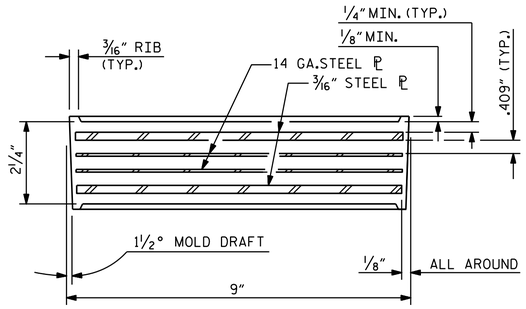
ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com
A&O PROJECT NO. 2013.044

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / JWT	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

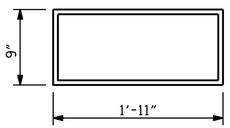
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RRR KMM/GM
	REV. 10/1/11 MAA/GM



SECTION "E-E"



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V

NOTES

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.

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

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / JWT	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

DRAWN BY :	EEM	2/97
CHECKED BY :	VAP	2/97

REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM
REV. 10/24/12 AAC/MAA

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Mark Gustafson
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3/23/2015

NOTE: THIS STANDARD DRAWING REVIEWED AND ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED.

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON
Mark E. Gustafson
3-20-2015

REFERENCE NO. 14- 11

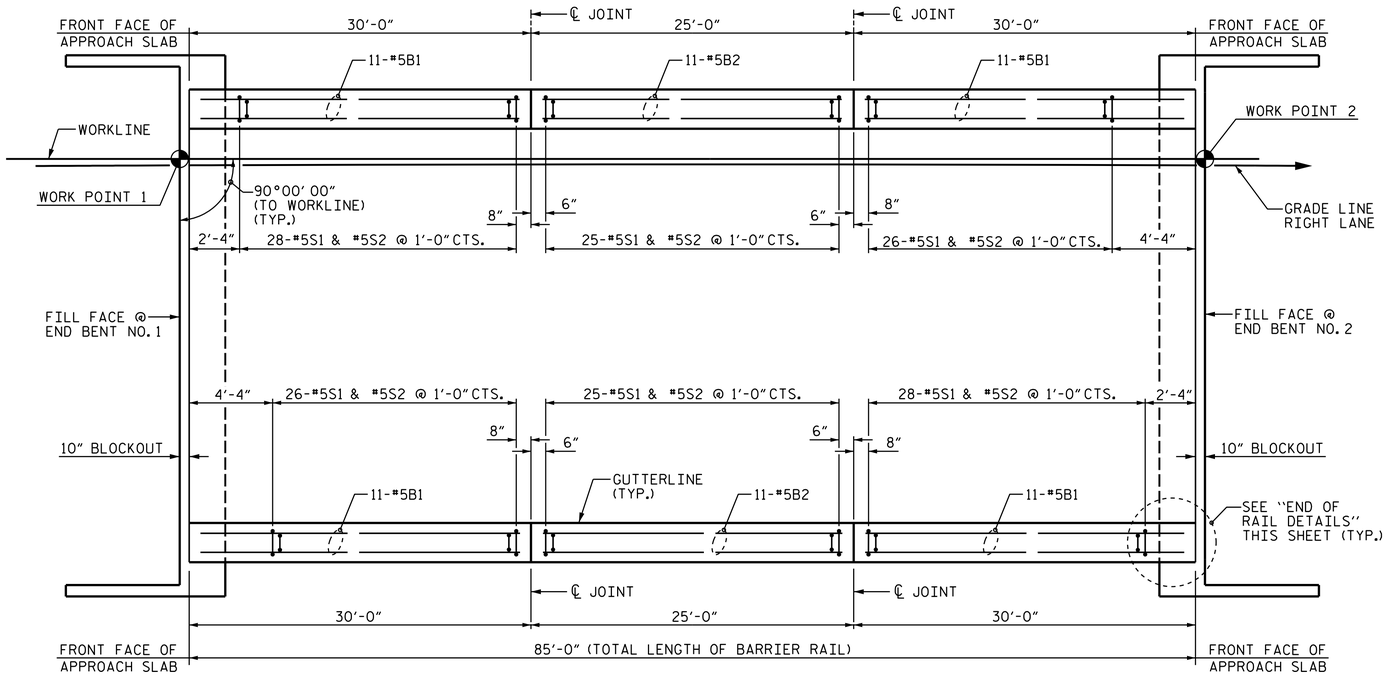
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
TYPE V
ELASTOMERIC BEARING
DETAILS
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-11
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14

STD. NO. EB4



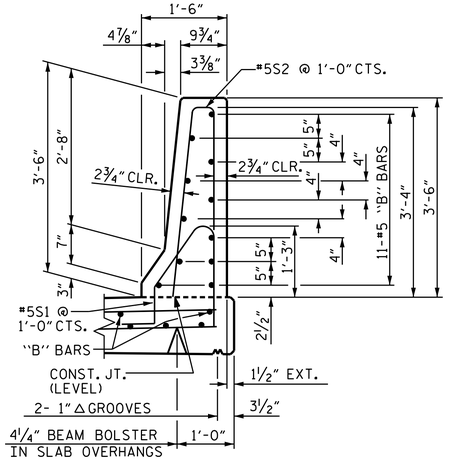
PLAN

NOTES

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

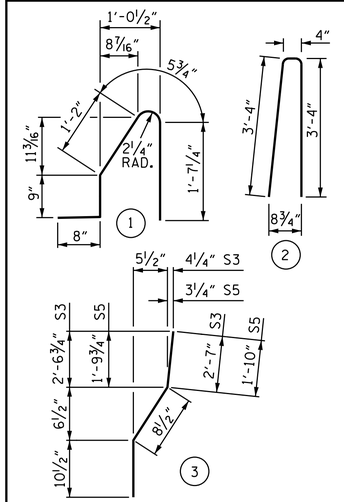
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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.



SECTION THRU RAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

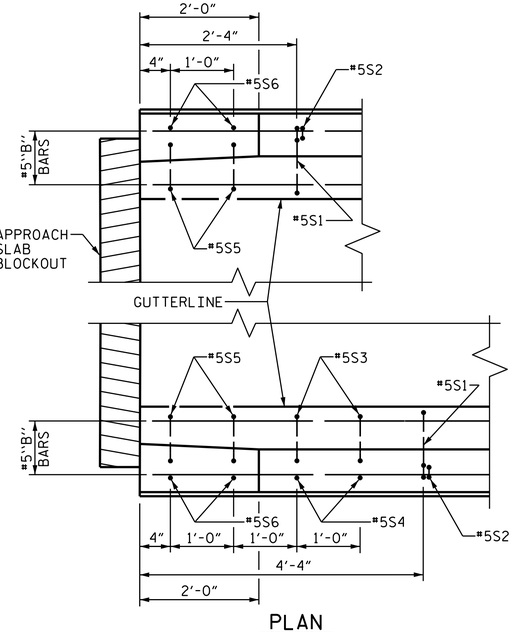
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

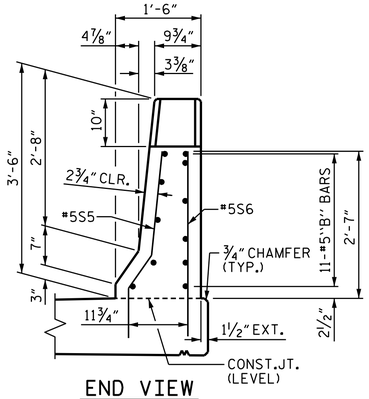
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ S1	158	#5	1	4'-8"	769
✱ S2	158	#5	2	7'-0"	1154
✱ S3	4	#5	3	4'-2"	17
✱ S4	4	#5	STR	4'-0"	17
✱ S5	8	#5	3	3'-5"	29
✱ S6	8	#5	STR	3'-3"	27
✱ B1	44	#5	STR	29'-8"	1361
✱ B2	22	#5	STR	24'-8"	566

✱ EPOXY COATED

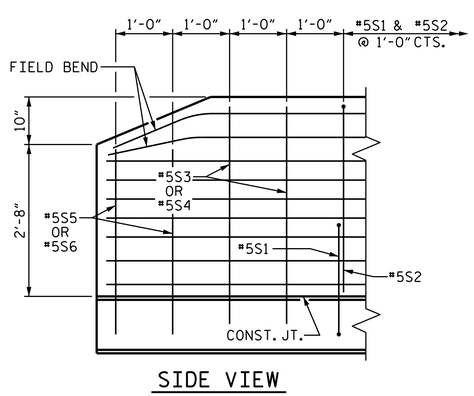
REINFORCING STEEL	3940 LBS.
CLASS AA CONCRETE	23.1 CU. YDS.
CONCRETE BARRIER RAIL	170.00 L.F.



PLAN



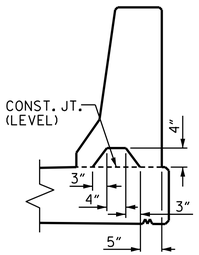
END VIEW



SIDE VIEW

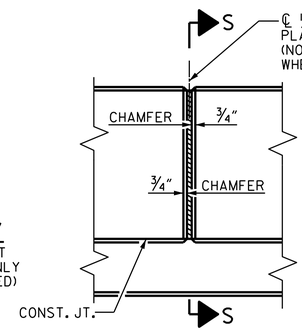
END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS.



SECTION "S-S"

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

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3/23/2015

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE
BARRIER RAIL
RIGHT LANE

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CHECKED BY :	MEG / JWT	DATE : 6/23/14
QC / QA BY :	TG ZEBLO	DATE : 7/7/14

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

PLAN PREPARED BY:
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A&O PROJECT NO. 2013.044

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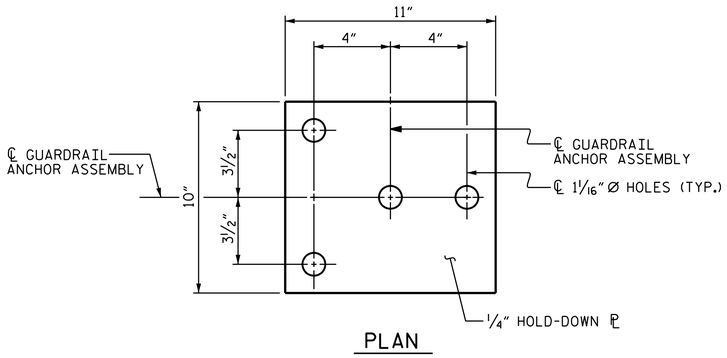
NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON
Mark E. Gustafson 3-20-2015

REFERENCE NO. 14- 12

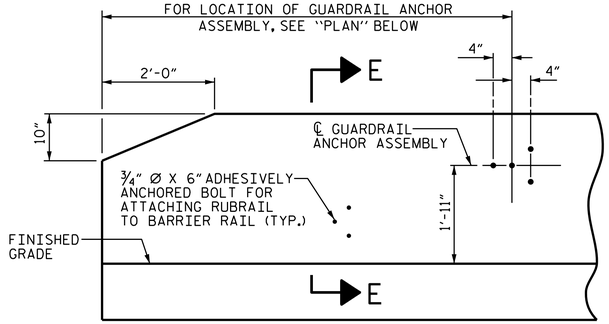
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-12
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14

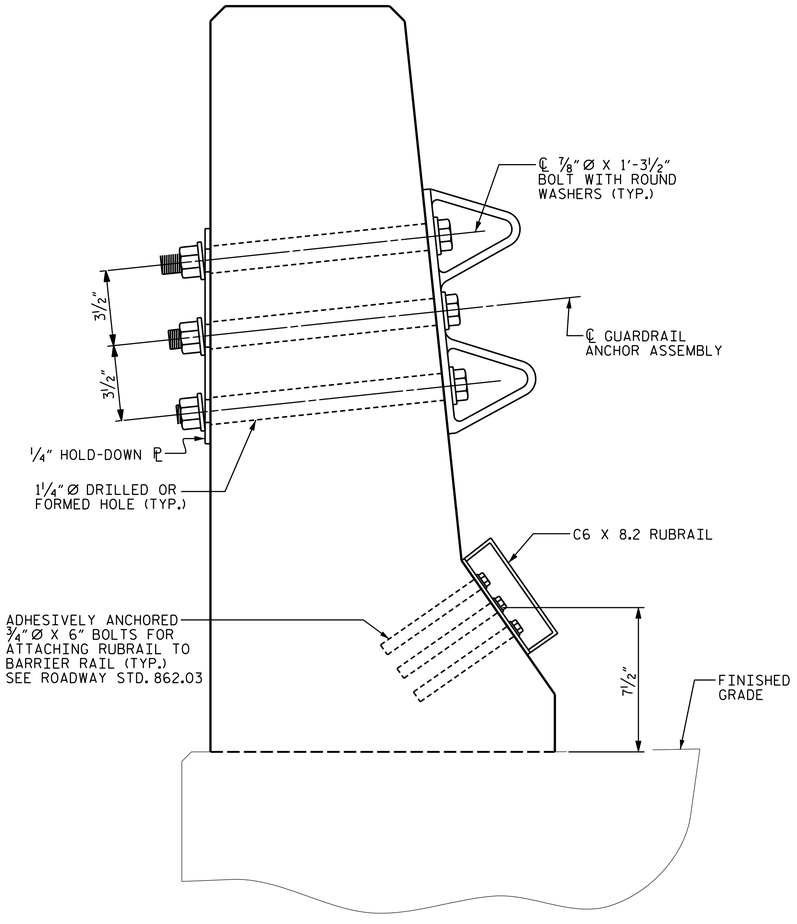
STD. NO. CBR1



PLAN

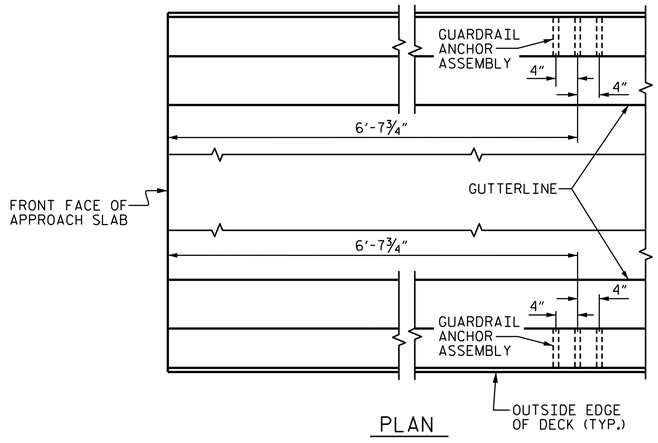


ELEVATION



SECTION "E-E"

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT NO. 1 SHOWN, END BENT NO. 2 SIMILAR.

NOTES

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

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

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

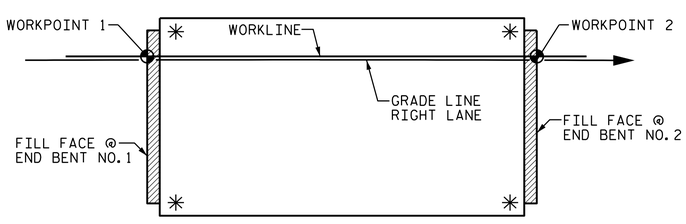
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-

=17+04.80 -Y7-

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QC / QA BY :	TG ZEBLO	DATE :	7/7/14

DRAWN BY : TLA 5/06	ADDED 5/1/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM
	REV. 7/12 MAA/GM

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3/23/2015

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NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E. GUSTAFSON 7-30-2015

REFERENCE NO. 14- 13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR BARRIER RAIL
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-13
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STRUCTURE NO. 14

STD. NO. GRA2

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	186	#5	STR.	41′-2″	7986
A2	186	#5	STR.	41′-2″	7986
✳ B1	56	#4	STR.	30′-0″	1122
B2	106	#5	STR.	43′-5″	4800
✳ B3	110	#7	STR.	18′-7″	4178
✳ S1	66	#4	1	11′-8″	514
✳ S2	62	#4	1	10′-8″	442
K1	24	#4	STR.	24′-6″	393
K2	6	#4	STR.	9′-4″	37
K3	18	#4	STR.	10′-4″	124
K4	6	#4	STR.	9′-4″	37
K5	6	#4	STR.	8′-10″	35
K6	16	#4	STR.	2′-8″	29
K7	4	#4	STR.	5′-7″	15
K8	12	#4	STR.	6′-1″	49
K9	4	#4	STR.	5′-7″	15
K10	4	#4	STR.	5′-4″	14
U1	66	#4	2	11′-3″	496
U2	12	#4	2	13′-5″	108
H1	32	#5	3	13′-10″	462
H2	32	#5	3	12′-5″	414

✳ EPOXY COATED REINFORCING STEEL.

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	88.8		
POUR 2	73.7		
TOTALS✳✳	162.5	15014	14242

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

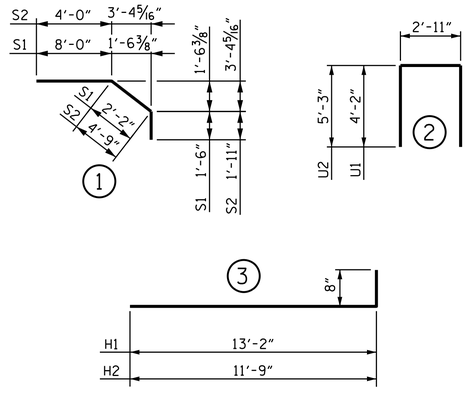
GROOVING BRIDGE FLOORS

APPROACH SLABS	1739	SQ.FT.
BRIDGE DECK	3043	SQ.FT.
TOTAL	4782	SQ.FT.

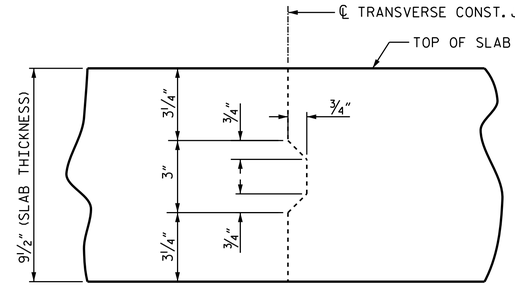
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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″			

BAR TYPES

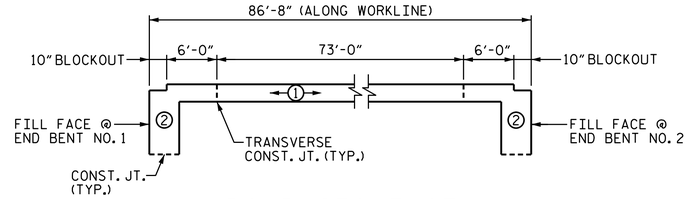


ALL BAR DIMENSIONS ARE OUT TO OUT.



TRANSVERSE CONSTRUCTION JOINT IN DECK SLAB

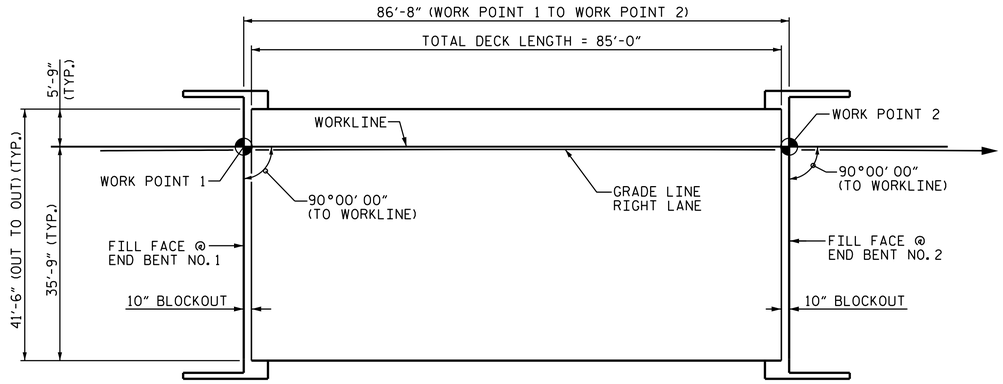
REINFORCING STEEL IN SLAB NOT SHOWN.
LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH JOINT.



POUR SEQUENCE

→① INDICATES POUR NUMBER AND DIRECTION OF POUR.

(POUR #2 CANNOT BE STARTED UNTIL POUR #1 HAS REACHED A MINIMUM OF 3,000 PSI.)



PLAN

LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB.
(SQ. FT. = 3597)

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

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Mark E. Gustafson
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL
RIGHT LANE

REVISIONS						SHEET NO.
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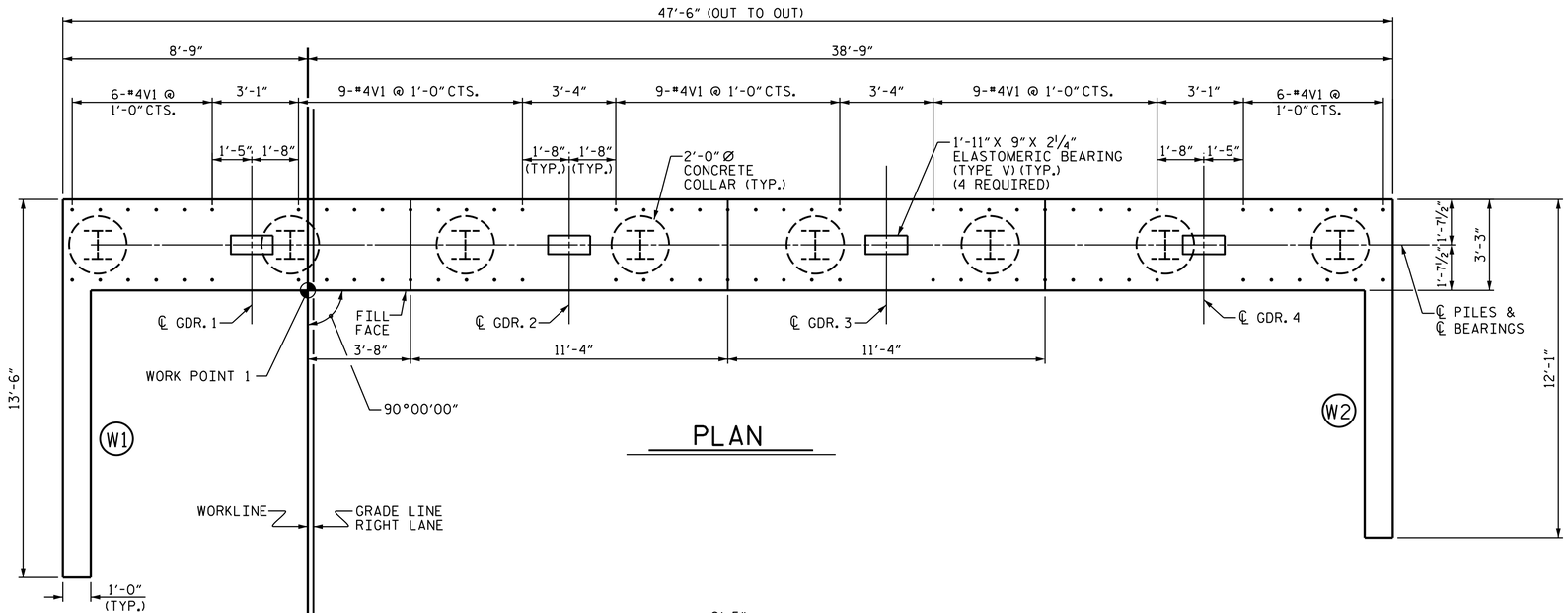
DRAWN BY : JMB 5/87	REV. 8/16/99	RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

STRUCTURE NO. 14

STD. NO. BOM1



PLAN

ELEVATION

FOR SECTION "A-A" AND PARTIAL SECTION "B-B", SEE SHEET 2 OF 5.

NOTES

THE #4V1 BARS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

FOR PILE SPLICE DETAILS, SEE SHEET 2 OF 5.

FOR WING DETAILS, SEE SHEET 5 OF 5.

THE TOP SURFACE OF THE CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF THE INTEGRAL END BENT DETAILS.

INSTALL 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.

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3/23/2015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON 3-20-2015

REFERENCE NO. 14- 15

PROJECT NO. R-2514D
JONES COUNTY
STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 1 OF 5

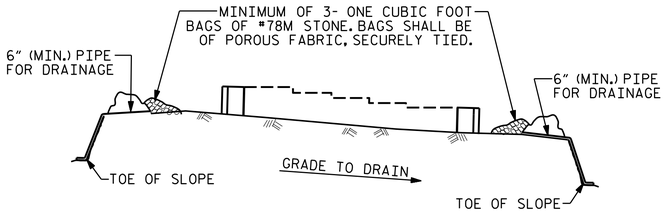
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 1
RIGHT LANE

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

SHEET NO. S14-15
TOTAL SHEETS 21

STRUCTURE NO. 14

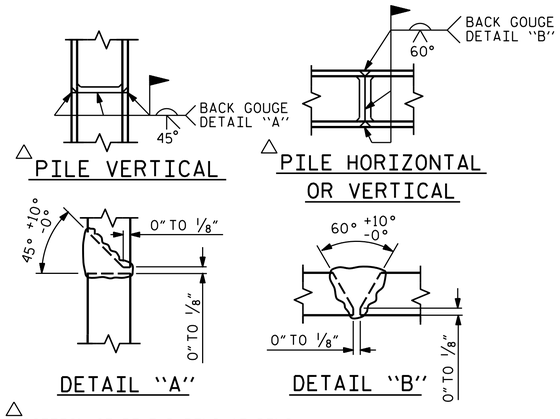


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

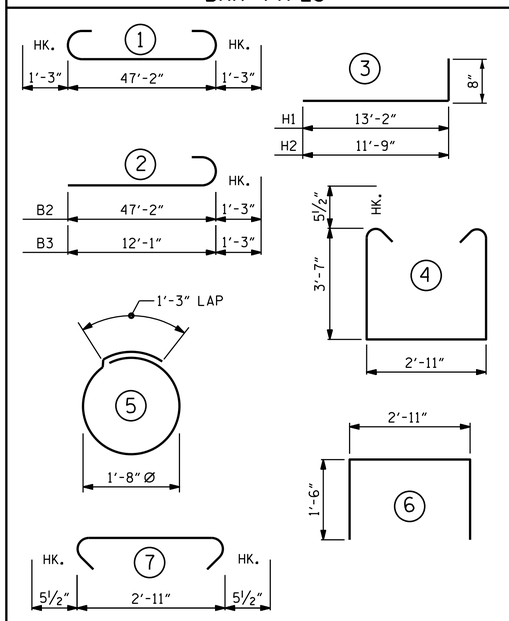
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	49'-8"	675
B2	4	#9	2	48'-5"	658
B3	4	#9	2	13'-4"	181
B4	12	#4	STR	24'-10"	199
B5	8	#4	STR	13'-9"	73
B6	8	#4	STR	24'-10"	133
B7	12	#4	STR	2'-11"	23
H1	14	#5	3	13'-10"	202
H2	10	#5	3	12'-5"	130
S1	44	#5	4	11'-0"	505
S2	44	#5	7	3'-10"	176
S3	32	#4	5	6'-6"	139
V1	78	#4	STR	6'-5"	334
V2	25	#5	STR	10'-1"	263
V3	23	#4	STR	9'-2"	141
U1	32	#4	6	5'-11"	126

REINFORCING STEEL 3958

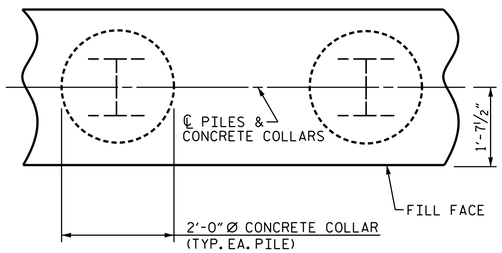
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 29.8 C.Y.

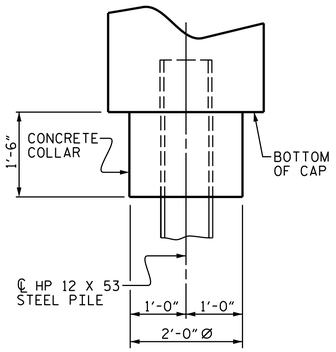
TOTAL CLASS A CONCRETE 29.8 C.Y.

HP 12 X 53 STEEL PILES NO. = 8 600 L.F.

PILE REDRIVES 4 EA.

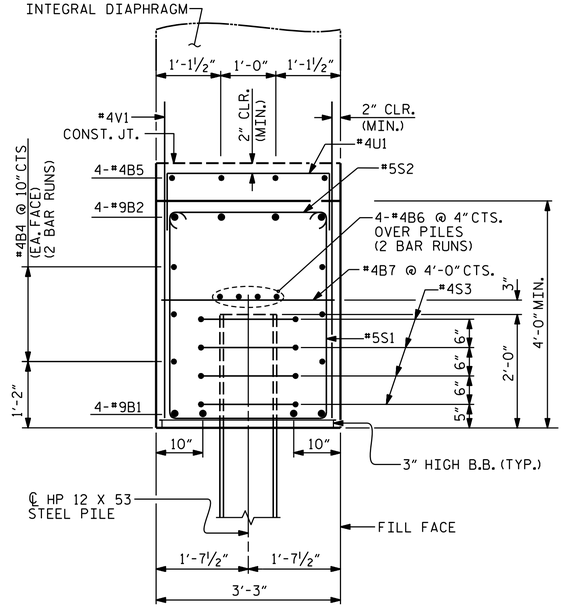


PLAN



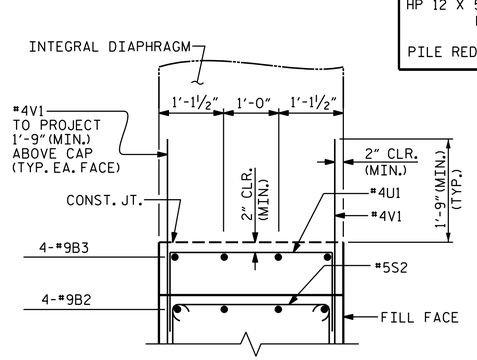
ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL



SECTION "A-A"

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PARTIAL SECTION "B-B"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 1
DETAILS
RIGHT LANE

DocuSigned by: Mark Gustafson 9E00EDB87408456...
3/23/2015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON 3-20-2015

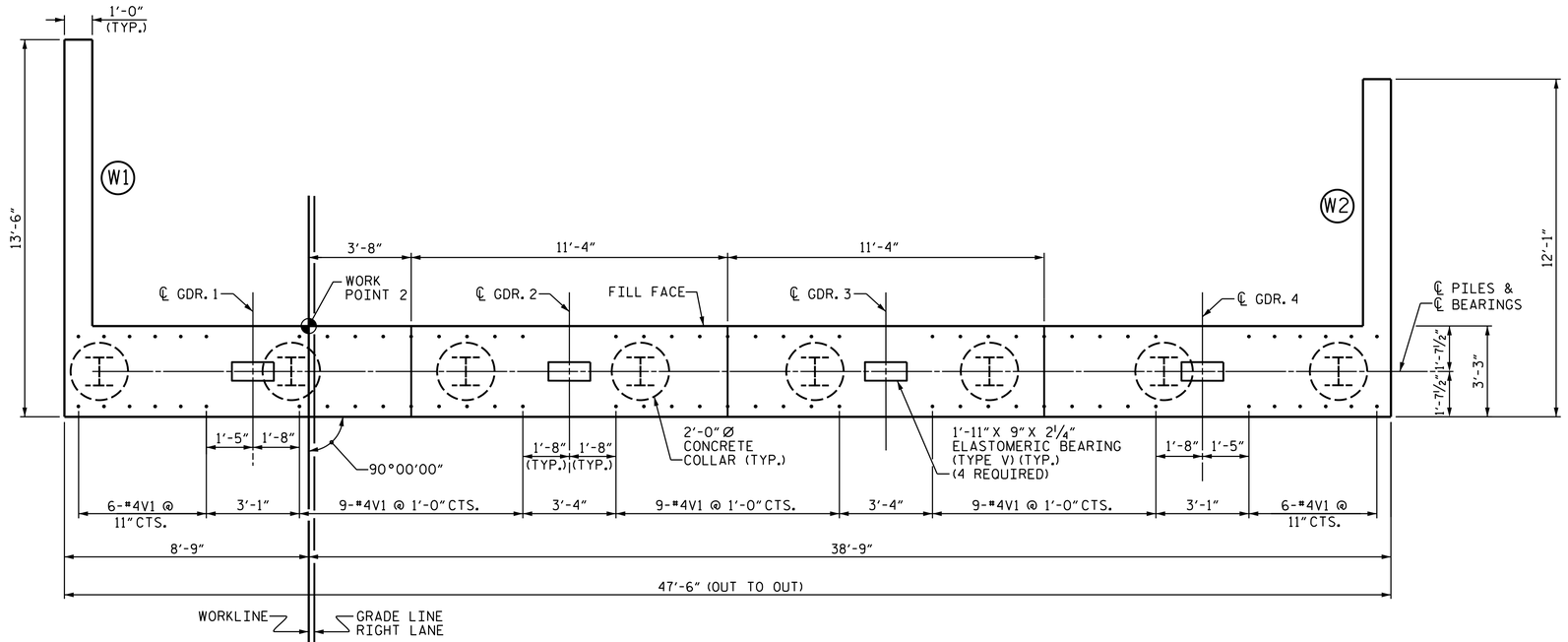
REFERENCE NO. 14- 16

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-16
1			3			TOTAL SHEETS
2			4			21

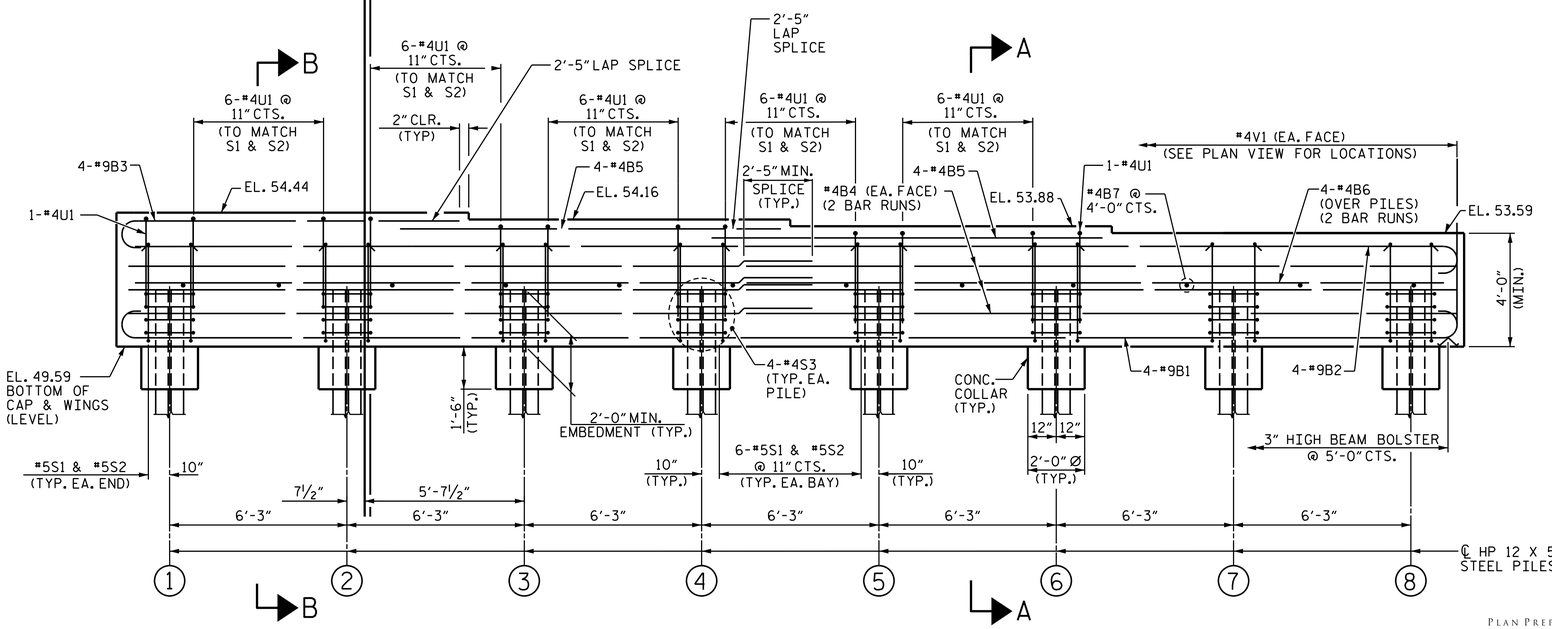
STRUCTURE NO. 14

PLAN PREPARED BY:
ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com
A&O PROJECT NO. 2013.044

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / JWT DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14



PLAN



ELEVATION

FOR SECTION "A-A" AND PARTIAL SECTION "B-B", SEE SHEET 4 OF 5.

NOTES

THE #4V1 BARS IN CAP MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 5.

FOR WING DETAILS, SEE SHEET 5 OF 5.

THE TOP SURFACE OF THE CAP AND WINGS, EXCLUDING THE BEARING AREA, SHALL BE RAKED TO A DEPTH OF ¼".

SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF THE INTEGRAL END BENT DETAILS.

INSTALL 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.

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / JWT DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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A&O PROJECT NO. 2013.044

DocuSigned by: Mark Gustafson 9E00EDB87408456... 3/23/2015

NORTH CAROLINA PROFESSIONAL SEAL 28601 ENGINEER MARK E GUSTAFSON 3-20-2015

REFERENCE NO. 14- 17

PROJECT NO. R-2514D
JONES COUNTY
STATION: 561+15.20 -L-
=17+04.80 -Y7-

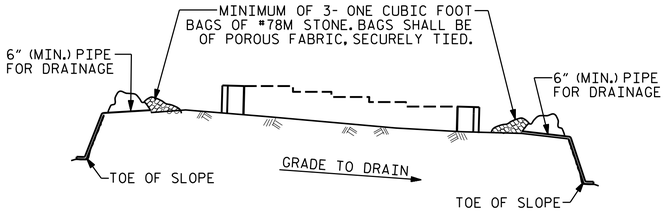
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-17
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14



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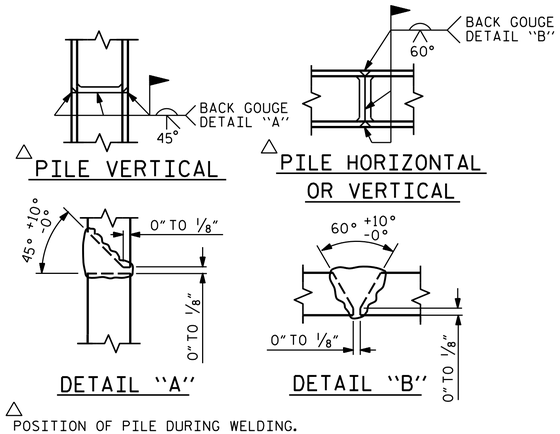
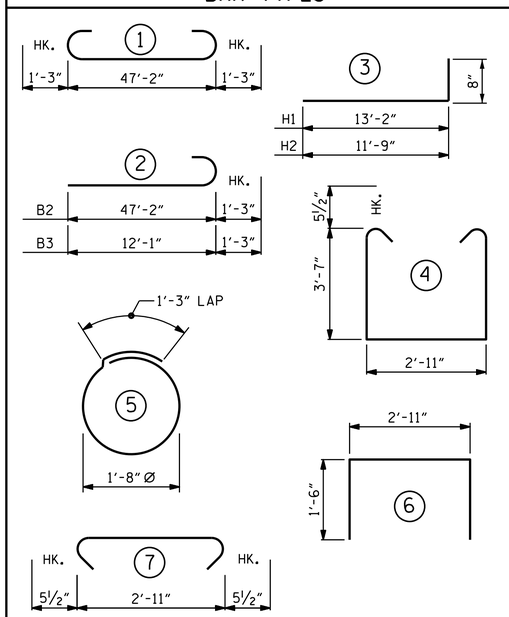
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

INTEGRAL END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#9	1	49'-8"	675
B2	4	#9	2	48'-5"	658
B3	4	#9	2	13'-4"	181
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REINFORCING STEEL 3958

CLASS A CONCRETE BREAKDOWN

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TOTAL CLASS A CONCRETE 29.8 C.Y.

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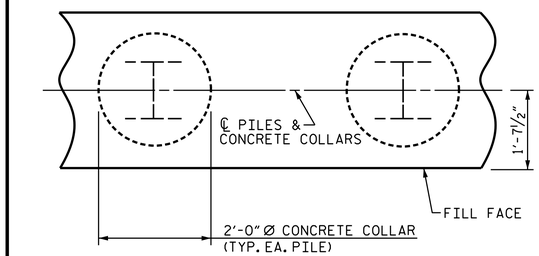
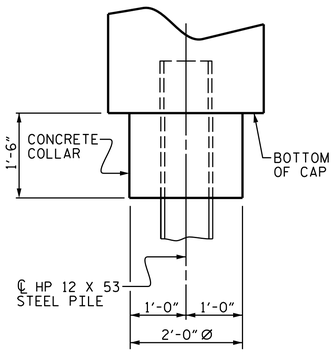
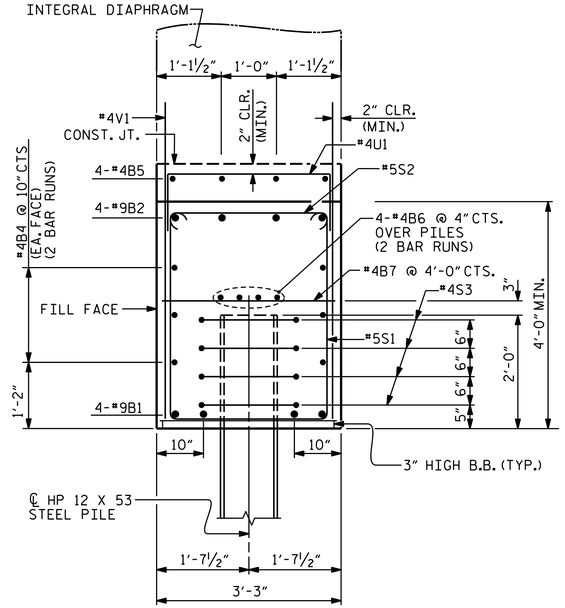


PLAN



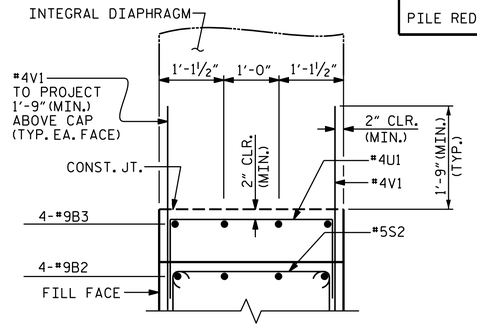
ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL



SECTION "A-A"

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



PARTIAL SECTION "B-B"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT NO. 2
DETAILS
RIGHT LANE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-18
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 3-20-2015 MARK E. GUSTAFSON

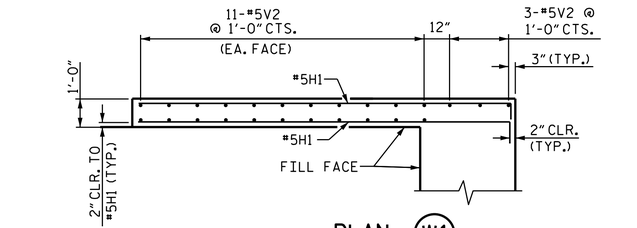
REFERENCE NO. 14- 18

DRAWN BY : JD GOODIN DATE : 5/16/14
CHECKED BY : MEG / JWT DATE : 6/23/14
QC / QA BY : TG ZEBLO DATE : 7/7/14

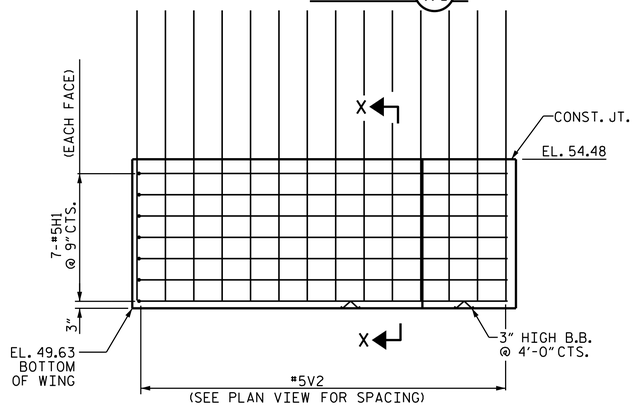
PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com

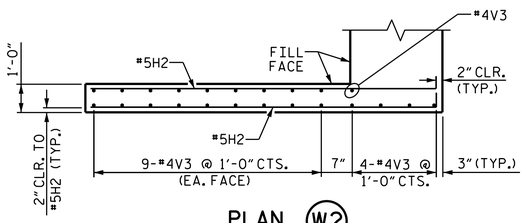
A&O PROJECT NO. 2013.044



PLAN (W1)



ELEVATION (W1)



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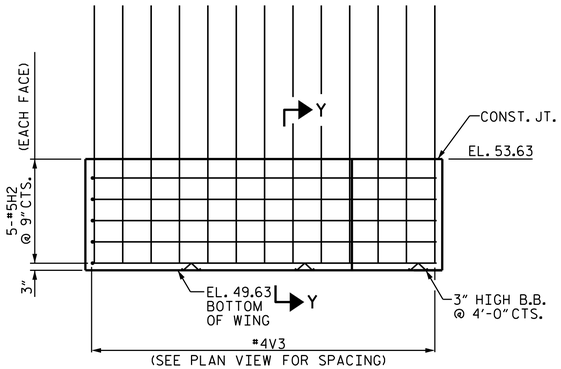
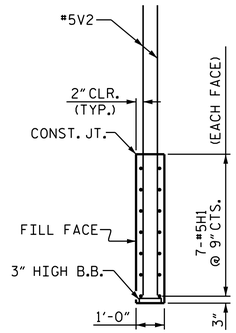
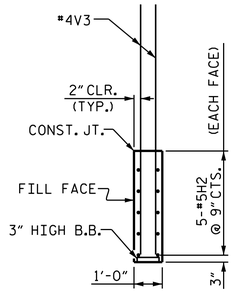


ELEVATION (W2)

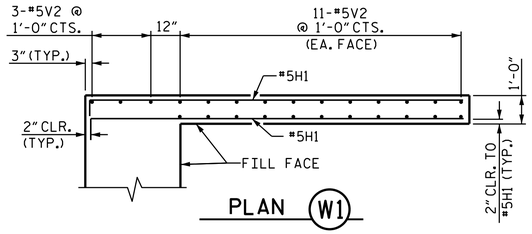


SECTION "X-X"



SECTION "Y-Y"

END BENT NO. 1



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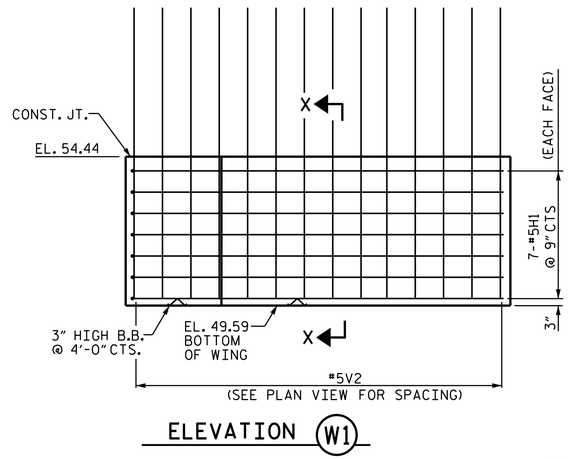
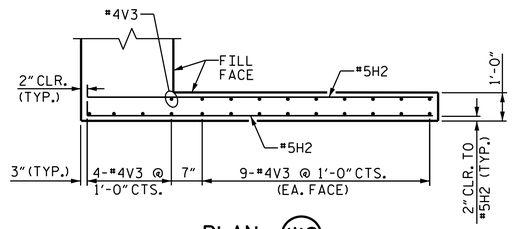


ELEVATION (W1)



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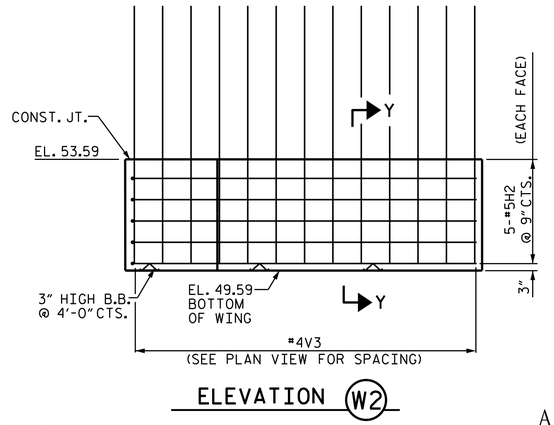
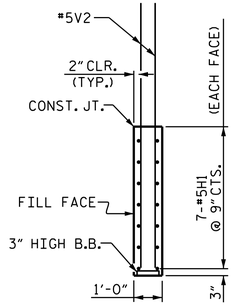
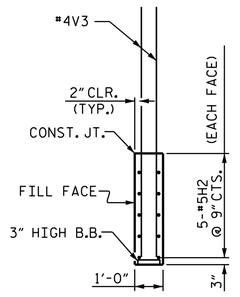


ELEVATION (W2)

END BENT NO. 2



SECTION "X-X"



SECTION "Y-Y"

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

SHEET 5 OF 5

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BOTTOM OF WINGS
END BENT NO. 1
& END BENT NO. 2
RIGHT LANE

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

SHEET NO. S14-19

TOTAL SHEETS 21

REFERENCE NO. 14-19

STRUCTURE NO. 14

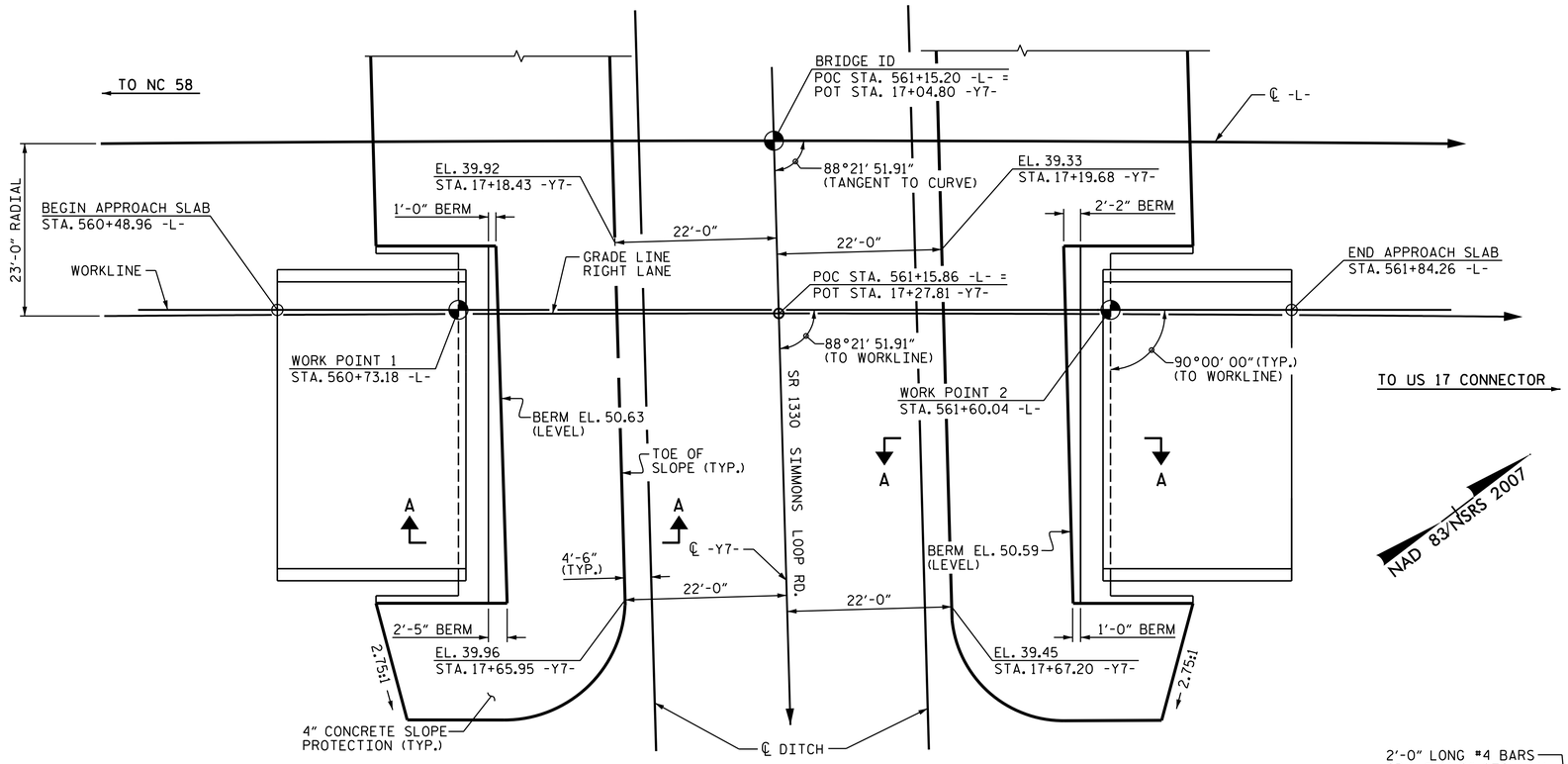
DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / JWT	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
CIVIL & STRUCTURAL ENGINEERS
4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
Phone 919 981 0310 Fax 919 981 0451
Firm License No. C-1684 www.aogroup.com

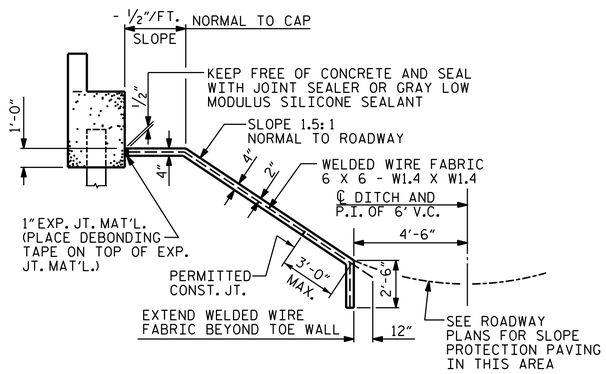
A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 3-20-2015 MARK E. GUSTAFSON



PLAN ALONG WORKLINE - RIGHT LANE

PILES ARE NOT SHOWN IN PLAN VIEW



SECTION A-A

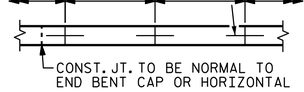
GENERAL NOTES

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

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

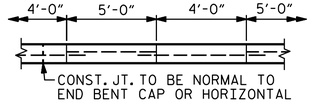
BRIDGE @ STA. 561+15.20 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT NO. 1	246	443
END BENT NO. 2	251	452

* QUANTITY SHOWN IS BASED ON 5' POURS.



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

PLAN PREPARED BY:

ALPHA & OMEGA GROUP
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4601 Lake Boone Trail, Ste. 3C Raleigh, NC 27607
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A&O PROJECT NO. 2013.044

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 3-20-2015 MARK E. GUSTAFSON

REFERENCE NO. 14- 20

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SLOPE PROTECTION DETAILS
RIGHT LANE

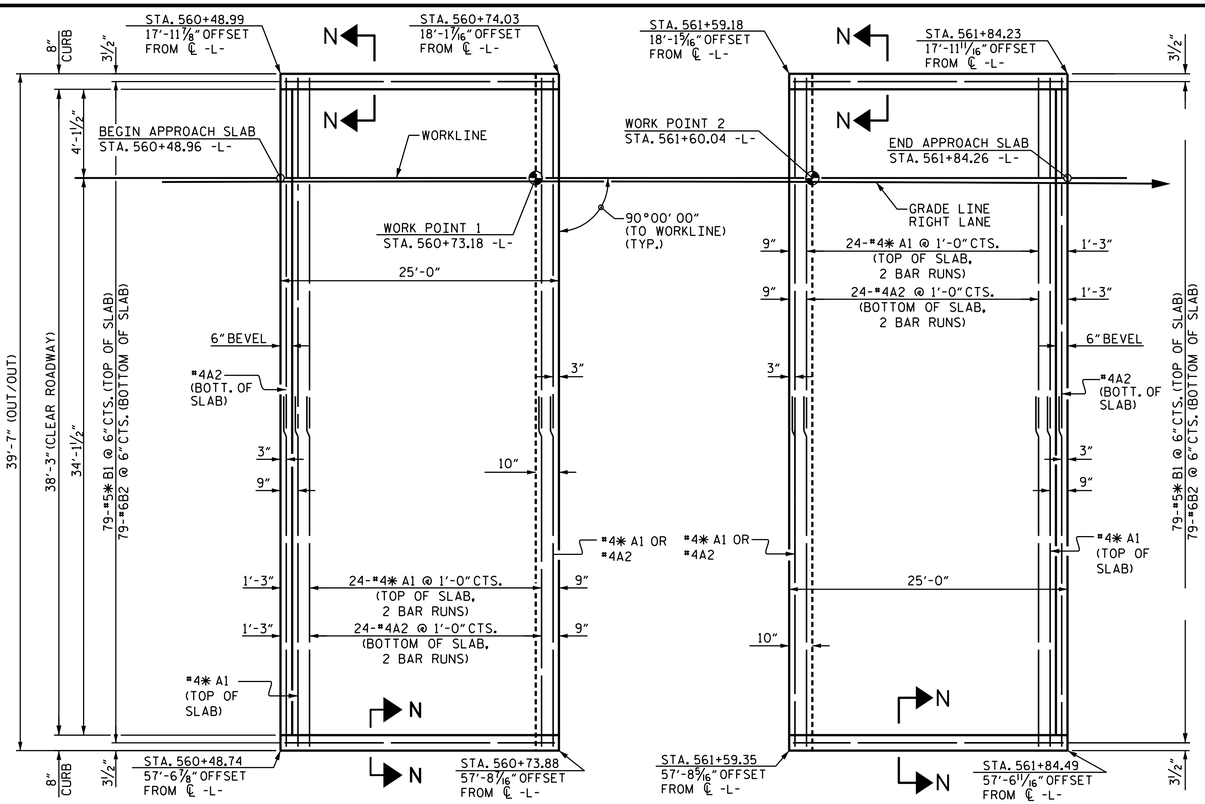
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14-20
1			3			TOTAL SHEETS
2			4			21

STRUCTURE NO. 14

STD. NO. SP1

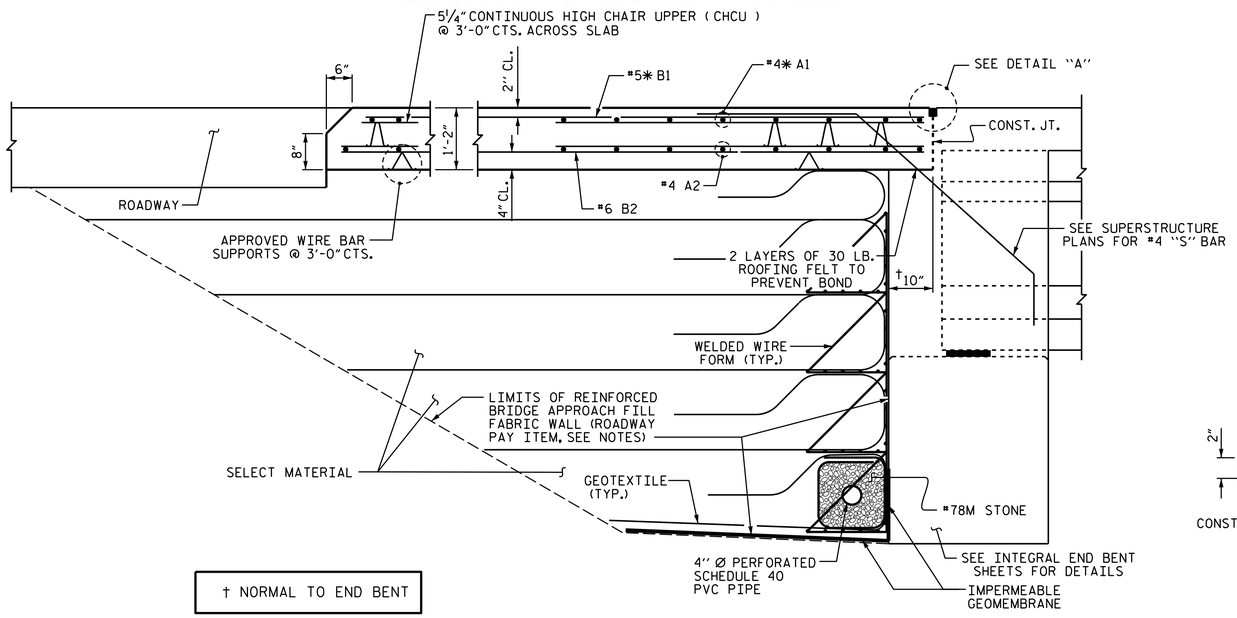
DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / JWT	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14

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



PLAN @ END BENT NO. 1 — PLAN @ END BENT NO. 2

(DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS)



† NORMAL TO END BENT

SECTION THRU SLAB

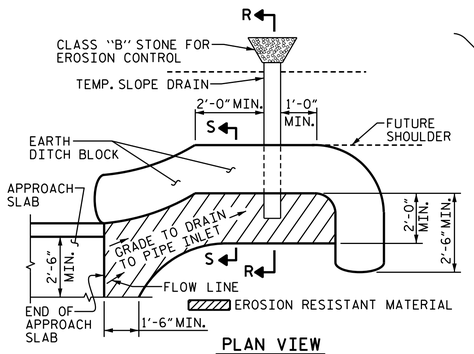
NOTES

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.

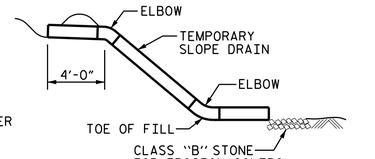
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

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.

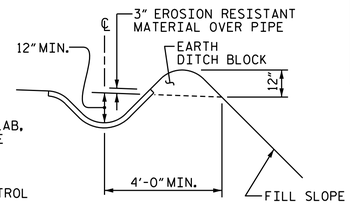


PLAN VIEW

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.



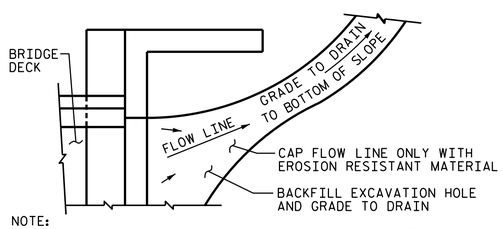
SECTION "R-R"



SECTION "S-S"

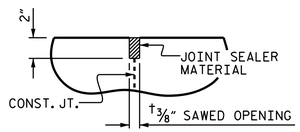
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

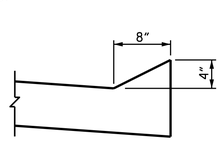


NOTE:
IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

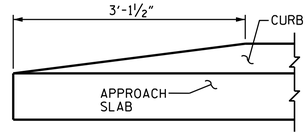
TEMPORARY DRAINAGE DETAIL



DETAIL "A"



SECTION "N-N"



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

BILL OF MATERIAL
APPROACH SLAB AT END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	52	#4	STR	20'-8"	718
A2	52	#4	STR	20'-6"	712
✱B1	79	#5	STR	24'-2"	1991
B2	79	#6	STR	24'-8"	2927

REINFORCING STEEL	3639 LBS.
✱ EPOXY COATED REINFORCING STEEL	2709 LBS.
CLASS AA CONCRETE	42.6 C.Y.

BILL OF MATERIAL
APPROACH SLAB AT END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	52	#4	STR	20'-8"	718
A2	52	#4	STR	20'-6"	712
✱B1	79	#5	STR	24'-2"	1991
B2	79	#6	STR	24'-8"	2927

REINFORCING STEEL	3639 LBS.
✱ EPOXY COATED REINFORCING STEEL	2709 LBS.
CLASS AA CONCRETE	42.6 C.Y.

SPLICE CHART	
#4✱ A1	2'-0" MIN.
#4A2	1'-9" MIN.

PROJECT NO. R-2514D

JONES COUNTY

STATION: 561+15.20 -L-
=17+04.80 -Y7-

DocuSigned by:
Mark Gustafson
9E00EDB87408456...
3/23/2015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28601 MARK E. GUSTAFSON
3-20-2015

PLAN PREPARED BY:

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR INTEGRAL END BENT RIGHT LANE

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO. S14-21
1			3			TOTAL SHEETS 21
2			4			

REFERENCE NO. 14- 21

STRUCTURE NO. 14 STD. NO. BAS5

DRAWN BY :	JD GOODIN	DATE :	5/16/14
CHECKED BY :	MEG / JWT	DATE :	6/23/14
QC / QA BY :	TG ZEBLO	DATE :	7/7/14
DRAWN BY : SHS/MAA 5-09			
CHECKED BY : BCH 5-09			