09/06/99

TIP R-2707AA

CONTRACT: C203026

STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707AA		

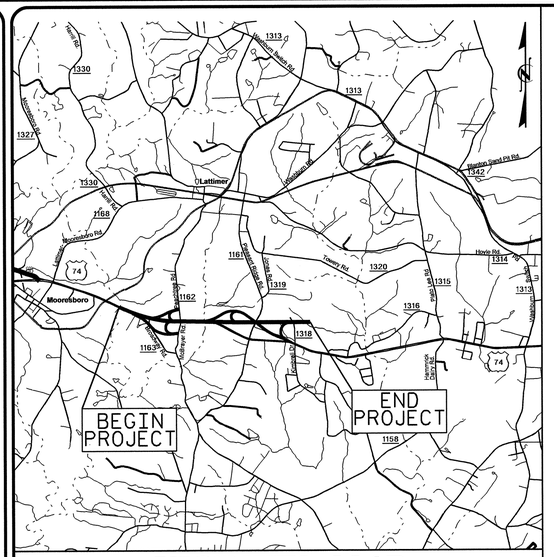
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34497.1.2	NHF-0074(14)	PE
34497.2.3	NHF-0074(76)	R/W, UTIL
34497.3.3	NHF-0074(141)	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

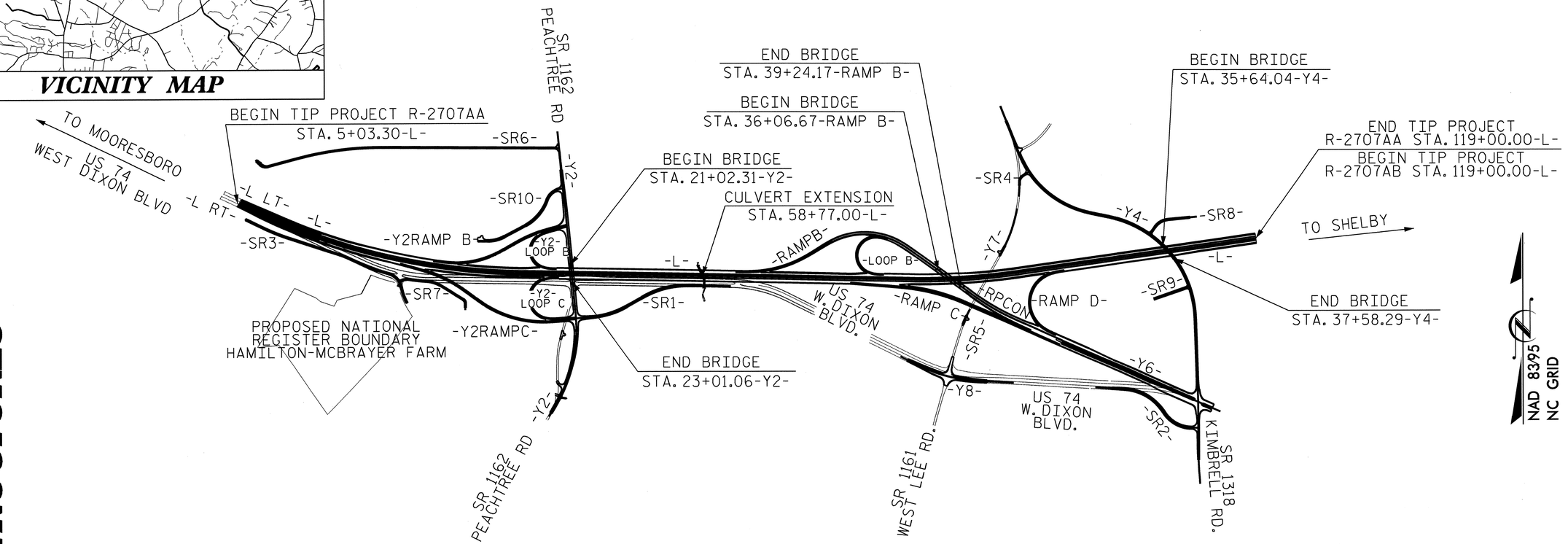
CLEVELAND COUNTY

LOCATION: US 74 (SHELBY BYPASS) FROM WEST OF SR 1162 (PEACHTREE ROAD) TO EAST OF SR 1318 (KIMBRELL ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURES



VICINITY MAP



DESIGN DATA	
ADT 2012	= 37,655
ADT 2035	= 54,360
DHV	= 12 %
D	= 60 %
T	= 14 % *
V	= 70 MPH
* TTST 8%	DUAL 6%
FUNC CLASS	= FREEWAY
STATEWIDE TIER DESIGN	

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT R-2707AA = 2.158 miles

TOTAL LENGTH TIP PROJECT R-2707AA = 2.158 miles

Prepared In the Office of:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
MAY 21, 2013

QUANG NGUYEN, P.E.
PROJECT ENGINEER

B. D. KLAPPENBACH, PE
PROJECT DESIGN ENGINEER

STRUCTURE MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

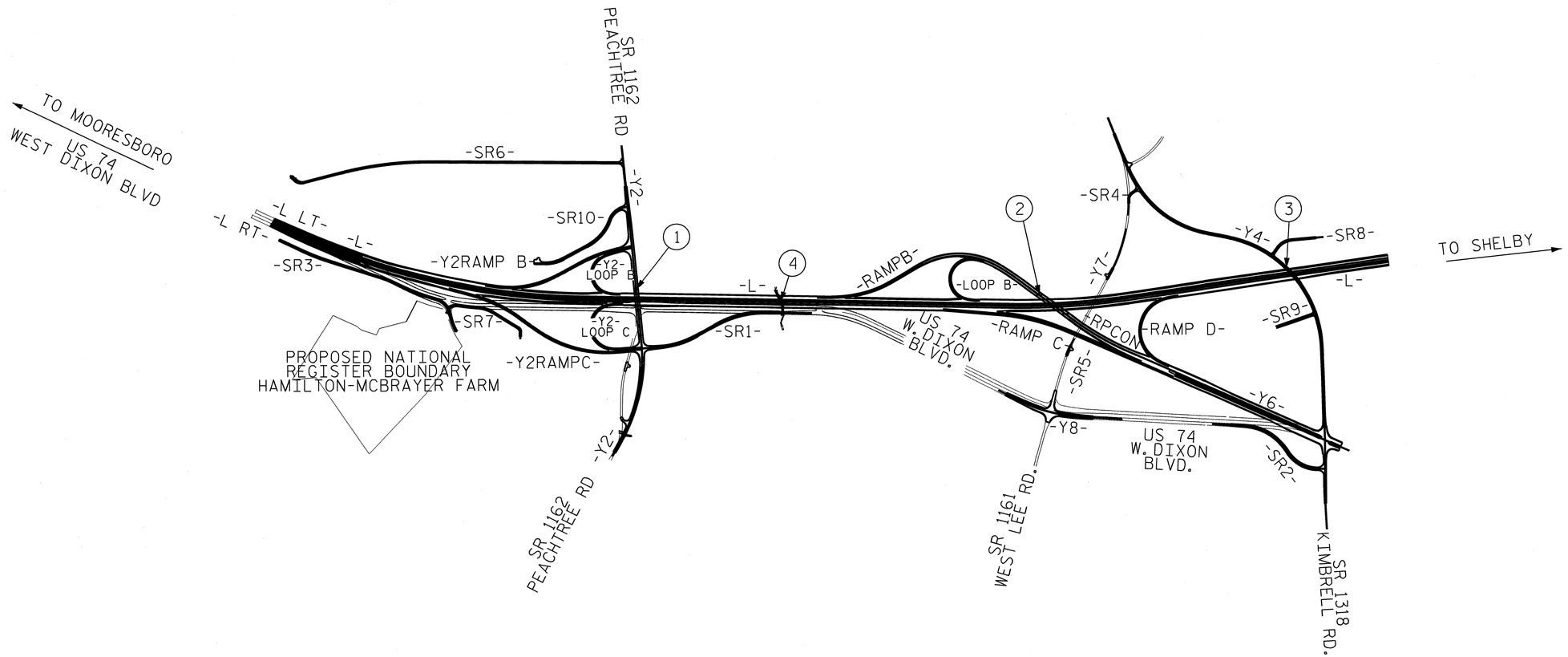
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
ENGINEER DIVISION ADMINISTRATION *DATE*

ARCADIS G&M
Date:=$DATE$ Time: $TIME$
Filenames:$FILE$



INDEX			
STR. No.	STATION	DESCRIPTION	SHEETS
1	43+66.99-L-	BRIDGE ON PEACHTREE ROAD (SR 1162) OVER US 74	S-1 THRU S-32
2	86+28.82-L-	BRIDGE ON RAMP B OVER US 74	S-33 THRU S-66
3	110+97.64-L-	BRIDGE ON KIMBRELL ROAD (SR 1318) OVER US 74	S-67 THRU S-96
4	58+77.00-L-	DOUBLE 8 FT. X 8 FT. RCBC EXTENSION	C-1 THRU C-7
N/A	VARIES	RETAINING WALL	W-1 THRU W-3

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

INDEX

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

DRAWN BY : H. T. BARBOUR DATE : 6-11-12
CHECKED BY : B. D. KLAPPENBACH DATE : 11-9-12

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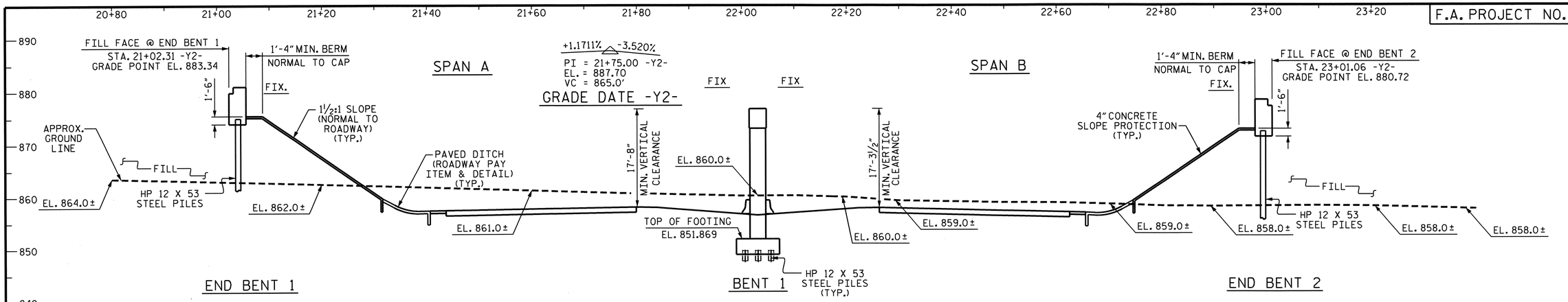
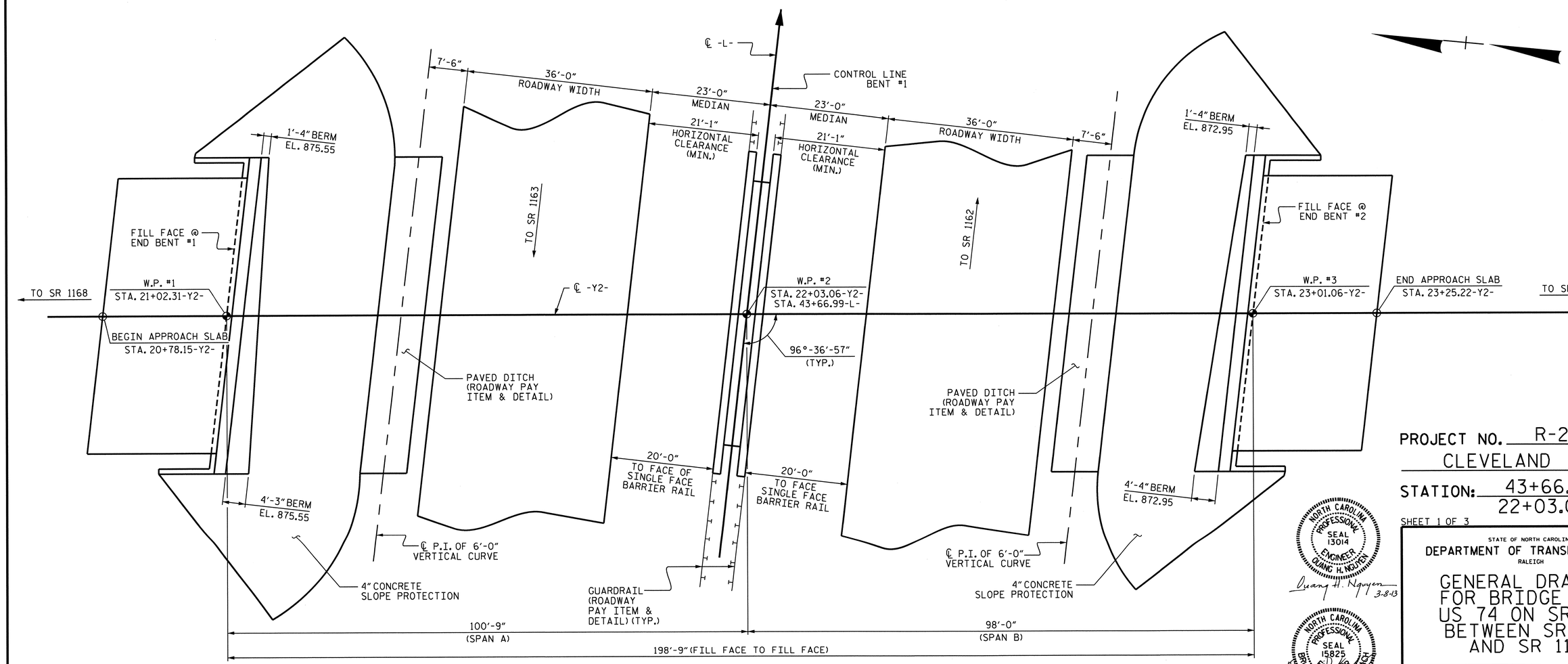


SECTION ALONG ℄ -Y2-

(BENTS AND END BENTS ARE SHOWN AT RIGHT ANGLES)



PLAN

(PILES AND FOOTINGS NOT SHOWN FOR CLARITY)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99-L-
22+03.06-Y2-

SHEET 1 OF 3 BRIDGE No. 451

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER US 74 ON SR 1162 BETWEEN SR 1318 AND SR 1168

NORTH CAROLINA PROFESSIONAL SEAL 13014 ENGINEER QUANG H. NGUYEN
Quang H. Nguyen 3-8-13

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-8-2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS 96
2			4			

DRAWN BY : H. T. BARBOUR DATE : 2-3-12
CHECKED BY : B. D. KLAPPENBACH DATE : 7-12

08-MAR-2013 09:46
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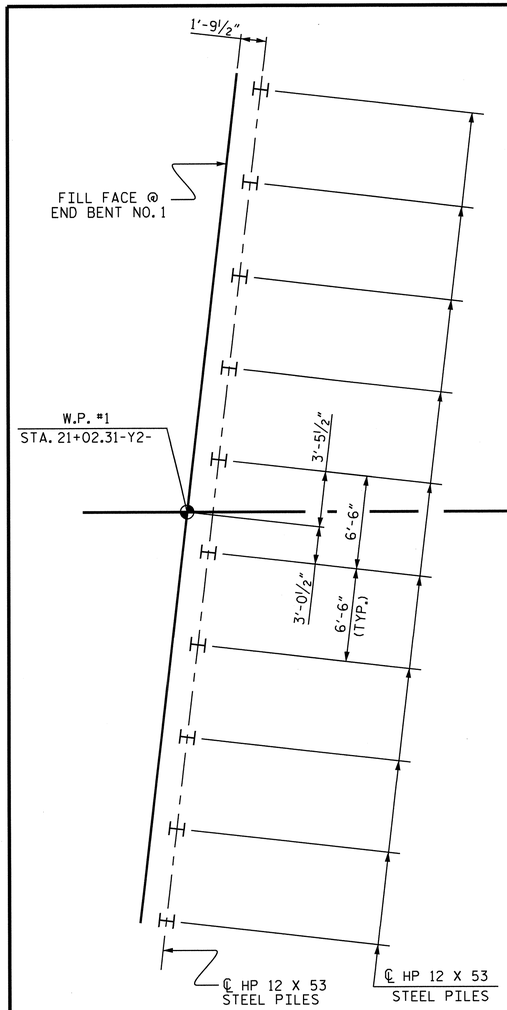
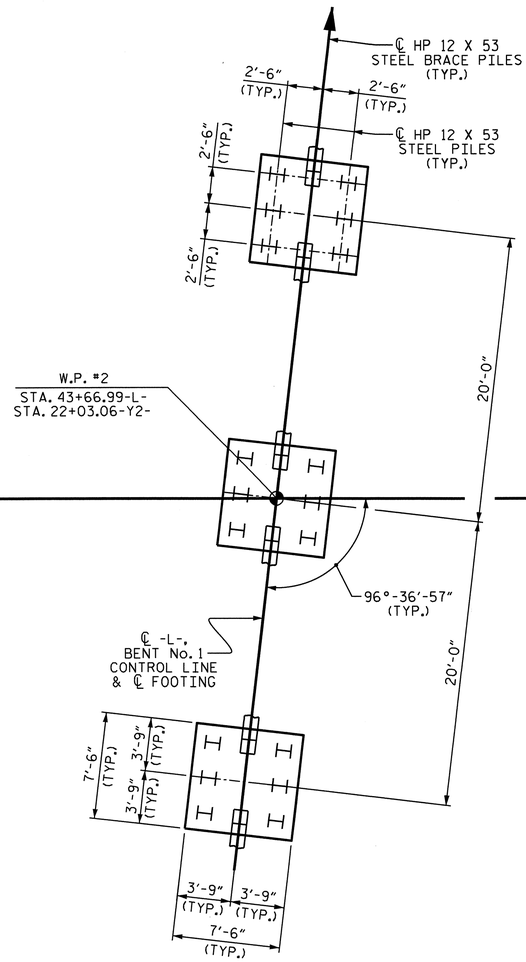
bklappenbach

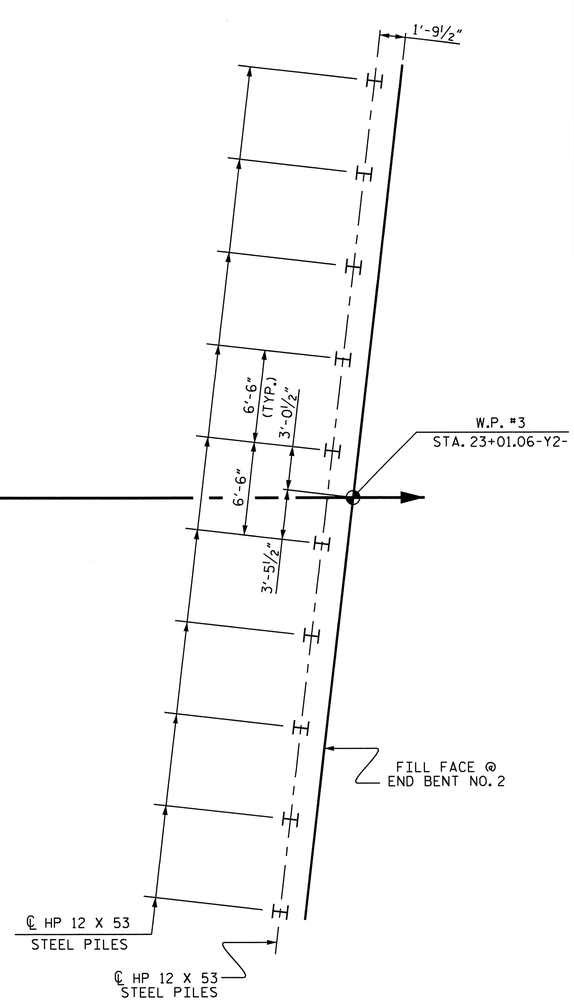
STR. #1



END BENT No. 1



BENT No. 1



END BENT No. 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES AND BENT FOOTINGS ARE SHOWN TO THE CENTERLINE OF PILES AND BENT FOOTING.

ALL BRACE PILES IN THE FOOTINGS SHALL BE BATTERED AT 1½: 12

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS

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

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

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

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

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

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

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99-L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER US 74 ON SR 1162 BETWEEN SR 1318 AND SR 1168

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRADLEY D. KLAPPENBACH
3-4-2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS 96
2			4			

DRAWN BY : H. T. BARBOUR DATE : 2-6-12
CHECKED BY : B. D. KLAPPENBACH DATE : 7-12

02-JAN-2013 11:41
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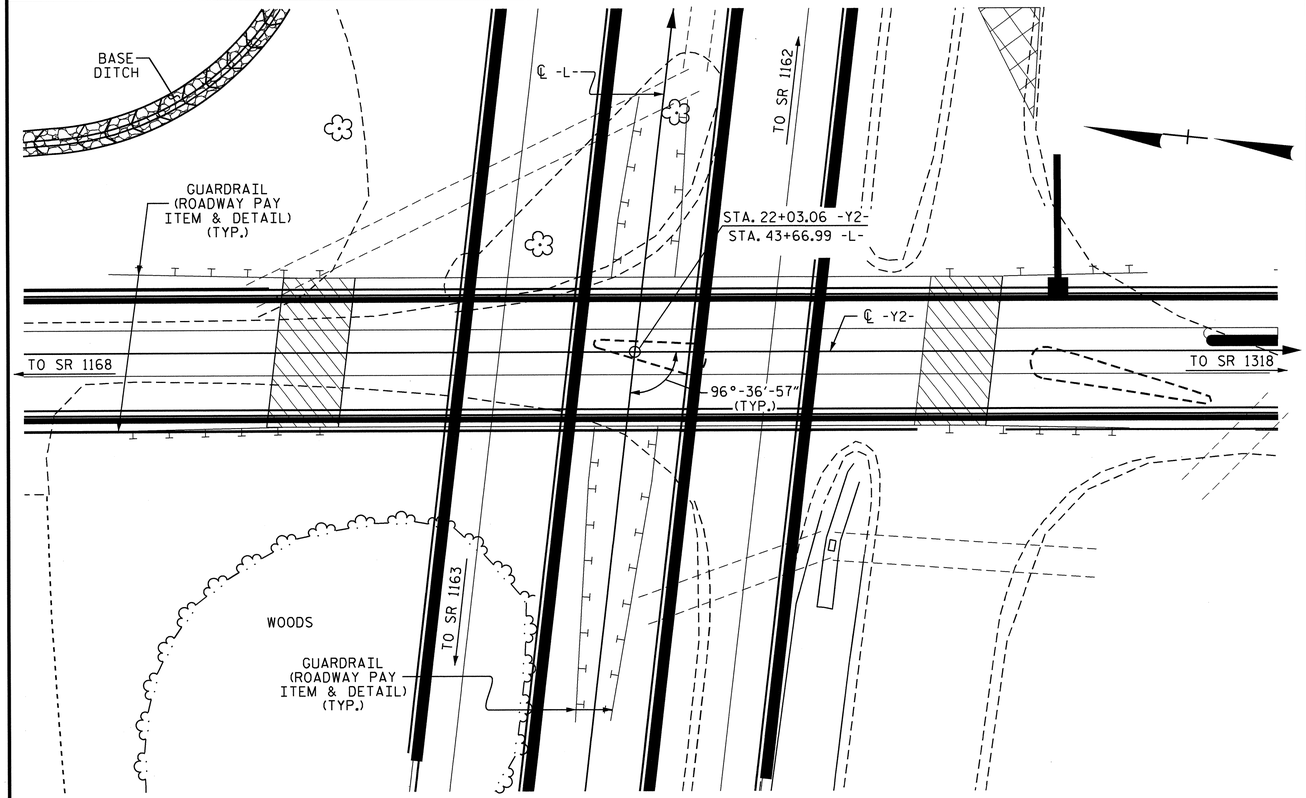
tbarbour

B.M. #3 RAILROAD SPIKE IN 18" Ø MAPLE TREE STA. 37+93.23 -Y2-, ELEV. 832.220



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

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.

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

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

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

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

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

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.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS
	LUMP SUM	EA.	SQ. FT.	SQ. FT.	CU. YARDS	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	EA.	LIN. FT.	SQ. YD.	LUMP SUM
SUPERSTRUCTURE			10888	12008		LUMP SUM			12	1174.38				394.15		LUMP SUM
END BENT NO. 1		1			29.0		5456				10	500	10		459	
BENT NO. 1	LUMP SUM				73.1		9786	1323			24	1080				
END BENT NO. 2		1			29.3		5469				10	550	10		390	
TOTAL	LUMP SUM	2	10888	12008	131.40	LUMP SUM	20711	1323	12	1174.38	44	2130	20	394.15	849	LUMP SUM

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE OVER US 74 ON SR 1162 BETWEEN SR 1318 AND SR 1168

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			96

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRENT D. KLAPPENBACH

3-8-2013

DRAWN BY : H. T. BARBOUR DATE : 2-7-12
CHECKED BY : B. D. KLAPPENBACH DATE : 7-12

27-DEC-2012 07:56
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tbarbour

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE							COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.04	--	1.75	0.83	1.74	A	ER	48.911	0.94	3.25	A	I	4.891	0.80	0.83	1.04	A	ER	48.911	
		HL-93(Opr)	N/A	--	2.26	--	1.35	0.83	2.25	A	ER	48.911	0.94	4.21	A	I	4.891	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.44	51.958	1.75	0.83	2.42	A	ER	48.911	0.94	4.22	B	I	57.043	0.80	0.83	1.44	A	ER	48.911	
		HS-20(Opr)	36.000	--	3.13	112.742	1.35	0.83	3.13	A	ER	48.911	0.94	5.48	B	I	57.043	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.42	46.141	1.4	0.83	7.15	A	ER	48.911	0.94	12.34	B	I	57.043	0.80	0.83	3.42	A	ER	48.911	
		SNGARBS2	20.000	--	2.48	49.545	1.4	0.83	5.18	A	ER	48.911	0.94	8.85	B	I	57.043	0.80	0.83	2.48	A	ER	48.911	
		SNAGRIS2	22.000	--	2.32	50.993	1.4	0.83	4.85	A	ER	48.911	0.94	8.24	B	I	57.043	0.80	0.83	2.32	A	ER	48.911	
		SNCOTTS3	27.250	--	1.7	46.291	1.4	0.83	3.55	A	ER	48.911	0.94	6.17	B	I	57.043	0.80	0.83	1.70	A	ER	48.911	
		SNAGGRS4	34.925	--	1.39	48.641	1.4	0.83	2.91	A	ER	48.911	0.94	5.17	B	I	57.043	0.80	0.83	1.39	A	ER	48.911	
		SNS5A	35.550	--	1.36	48.481	1.4	0.83	2.85	A	ER	48.911	0.94	5.26	B	I	57.043	0.80	0.83	1.36	A	ER	48.911	
		SNS6A	39.950	--	1.24	49.549	1.4	0.83	2.6	A	ER	48.911	0.94	4.82	B	I	57.043	0.80	0.83	1.24	A	ER	48.911	
		SNS7B	42.000	--	1.18	49.590	1.4	0.83	2.47	A	ER	48.911	0.94	4.77	B	I	57.043	0.80	0.83	1.18	A	ER	48.911	
	TTST	TNAGRIT3	33.000	--	1.51	49.805	1.4	0.83	3.16	A	ER	48.911	0.94	5.72	B	I	57.043	0.80	0.83	1.51	A	ER	48.911	
		TNT4A	33.075	--	1.51	50.040	1.4	0.83	3.17	A	ER	48.911	0.94	5.55	B	I	57.043	0.80	0.83	1.51	A	ER	48.911	
		TNT6A	41.600	--	1.23	51.034	1.4	0.83	2.57	A	ER	48.911	0.94	5.03	A	I	4.891	0.80	0.83	1.23	A	ER	48.911	
		TNT7A	42.000	--	1.23	51.556	1.4	0.83	2.57	A	ER	48.911	0.94	4.95	A	I	4.891	0.80	0.83	1.23	A	ER	48.911	
		TNT7B	42.000	--	1.26	52.783	1.4	0.83	2.63	A	ER	48.911	0.94	4.63	B	I	57.043	0.80	0.83	1.26	A	ER	48.911	
		TNAGRIT4	43.000	--	1.21	51.827	1.4	0.83	2.52	A	ER	48.911	0.94	4.48	B	I	57.043	0.80	0.83	1.21	A	ER	48.911	
		TNAGT5A	45.000	--	1.14	51.347	1.4	0.83	2.39	A	ER	48.911	0.94	4.48	B	I	57.043	0.80	0.83	1.14	A	ER	48.911	
		TNAGT5B	45.000	3	1.13	50.912	1.4	0.83	2.37	A	ER	48.911	0.94	4.25	B	I	57.043	0.80	0.83	1.13	A	ER	48.911	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

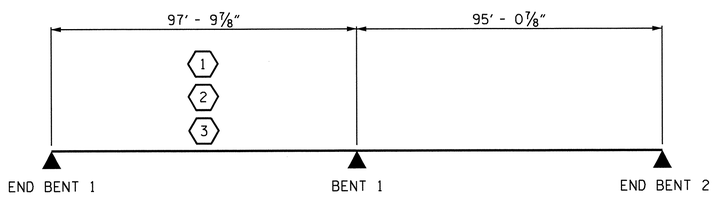
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRIAN O. KLAPPENBACH
3-15-2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			96

STD. NO. LRFR1

ASSEMBLED BY : S.T. CHAMPION DATE : JAN. 2013
CHECKED BY : H.P. KIM DATE : JAN. 2013
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08
REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

05-MAR-2013 10:23
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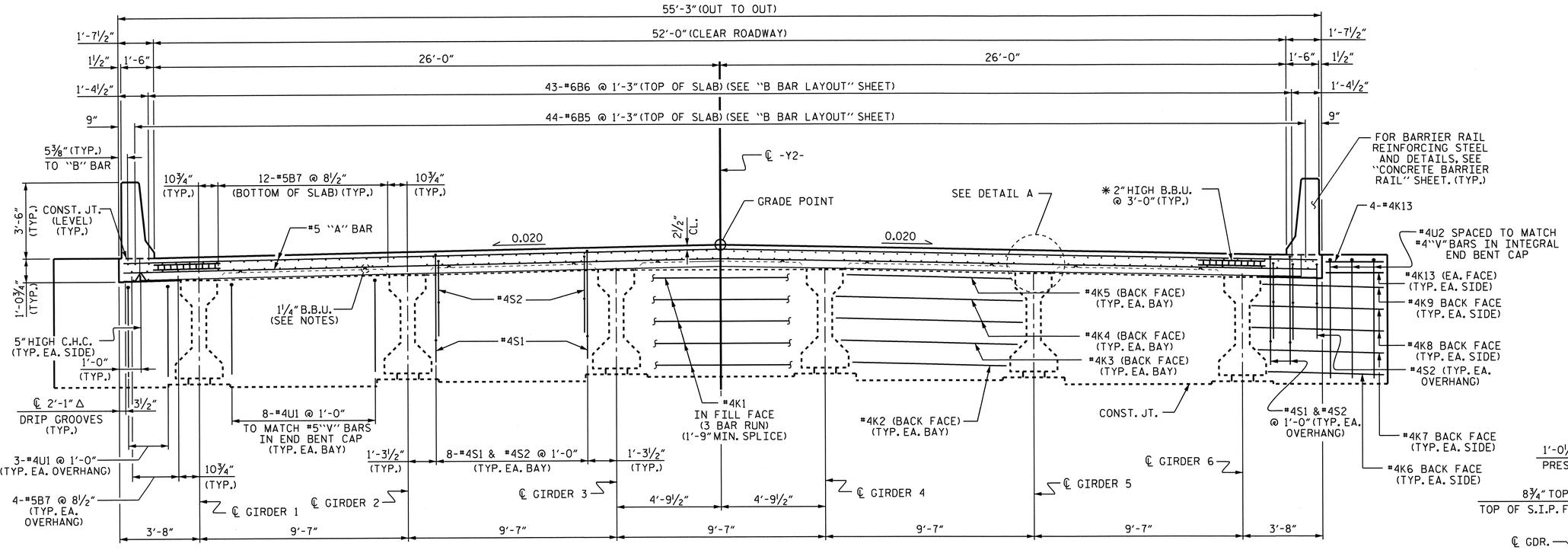
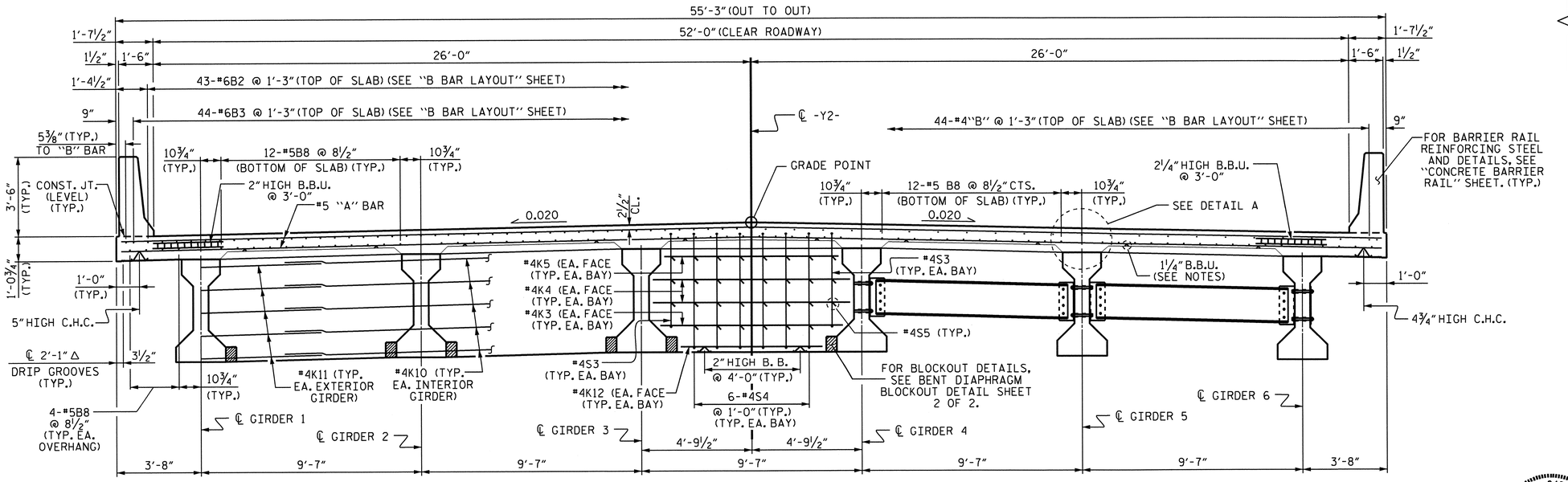
bklappenbach



TYPICAL SECTION @ INTEGRAL END BENT

(END BENT #1 SHOWN, END BENT #2 SIMILAR)



AT BENT DIAPHRAGM

AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

NOTES

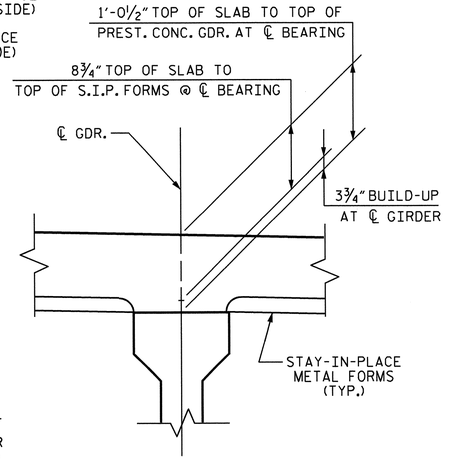
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE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

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

BARRIER RAIL IN 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.

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

✱USE THIS SIZE BAR SUPPORT IN THE AREAS WITH THE #6 "B" BARS. USE THE BAR SUPPORT AS SHOWN IN THE TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM.



DETAIL A

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			96

STR. #1

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE O. KLAPPENBACH
3-8-2013

DRAWN BY : M. G. SHAIKH DATE : 04-19-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

04-MAR-2013 15:53
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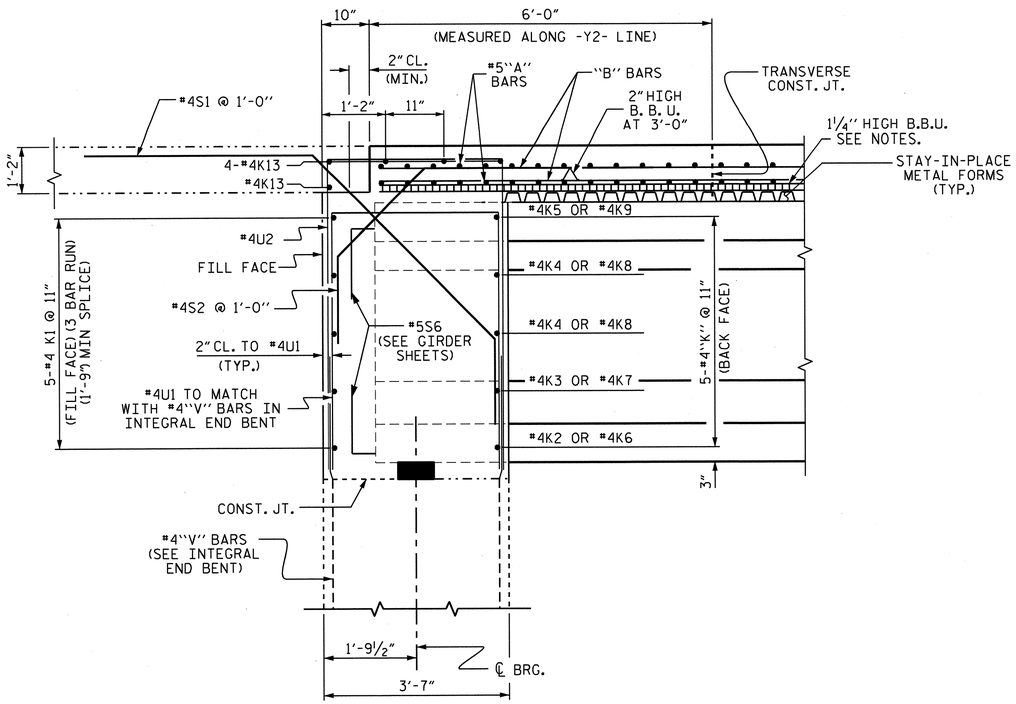
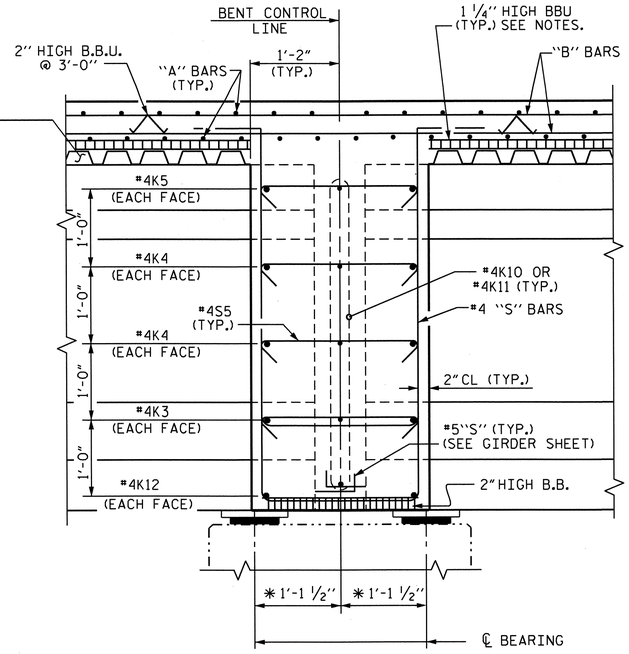
tbarbour

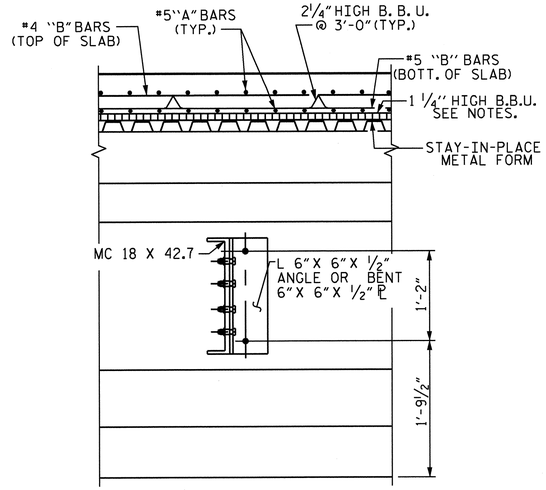


SECTION AT INTEGRAL END BENT

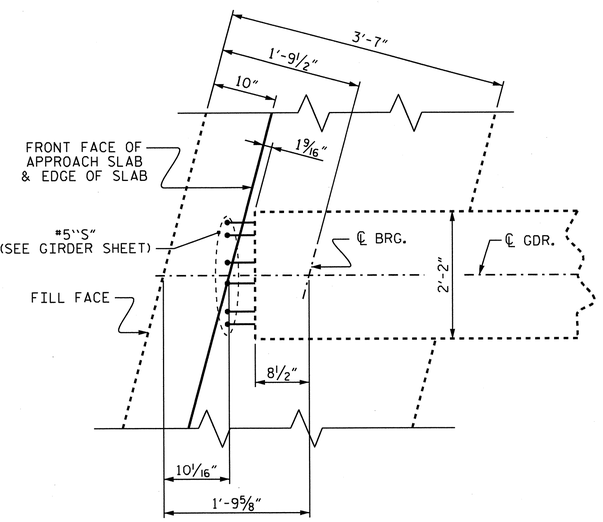


SECTION AT BENT DIAPHRAGM

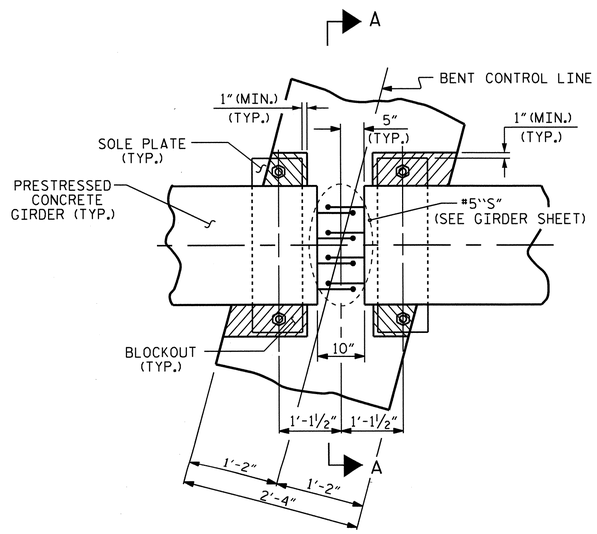
* MEASURED ALONG ℄ GIRDER



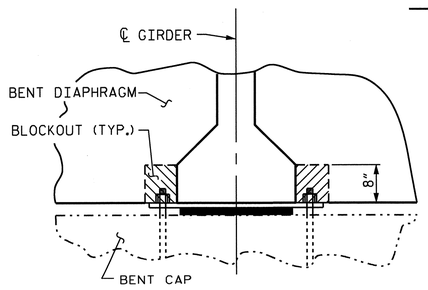
SECTION AT INTERMEDIATE STEEL DIAPHRAGM



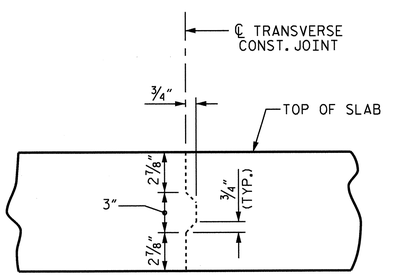
PLAN OF GIRDER AT INTEGRAL END BENT



PLAN



SECTION A-A



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

BENT DIAPHRAGM BLOCKOUT DETAIL

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH 3-6-2013

DRAWN BY : M. G. SHAIKH DATE : 04-27-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

13-NOV-2012 09:47
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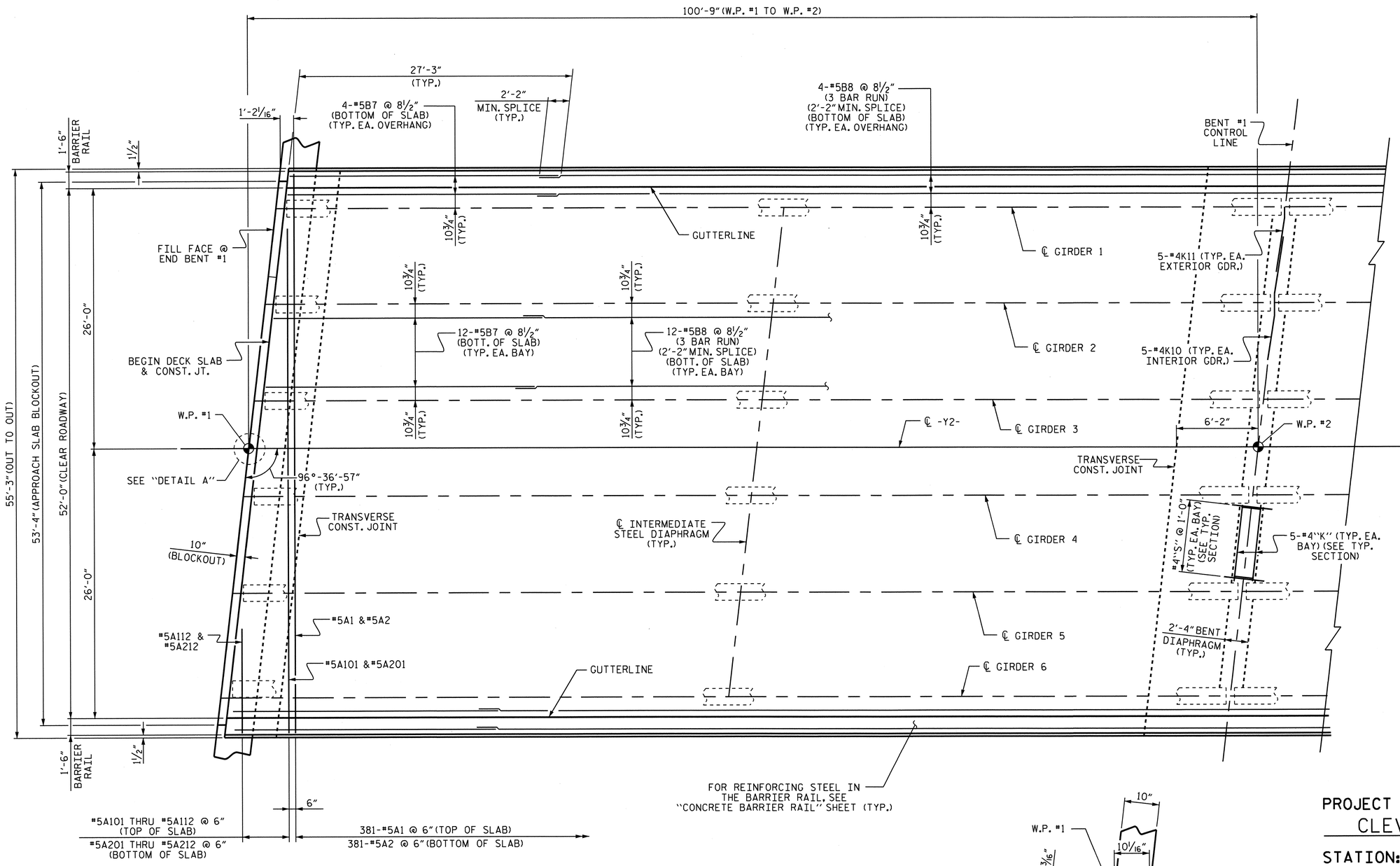
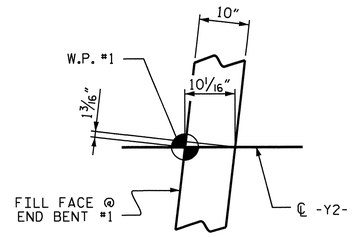
bklappenbach

STR. #1



PLAN OF SPAN "A"

FOR REINFORCING STEEL IN ABUTMENTS, SEE "PLAN OF SPAN DETAILS" SHEET.
FOR LONGITUDINAL BARS IN TOP OF SLAB, SEE "B BAR LAYOUT" SHEET.



DETAIL A

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 43+66.99 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN "A"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER TIMOTHY D. KLAPPENBERGER
3-5-2013

DRAWN BY : M. G. SHAIKH DATE : 04-14-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

27-DEC-2012 09:30
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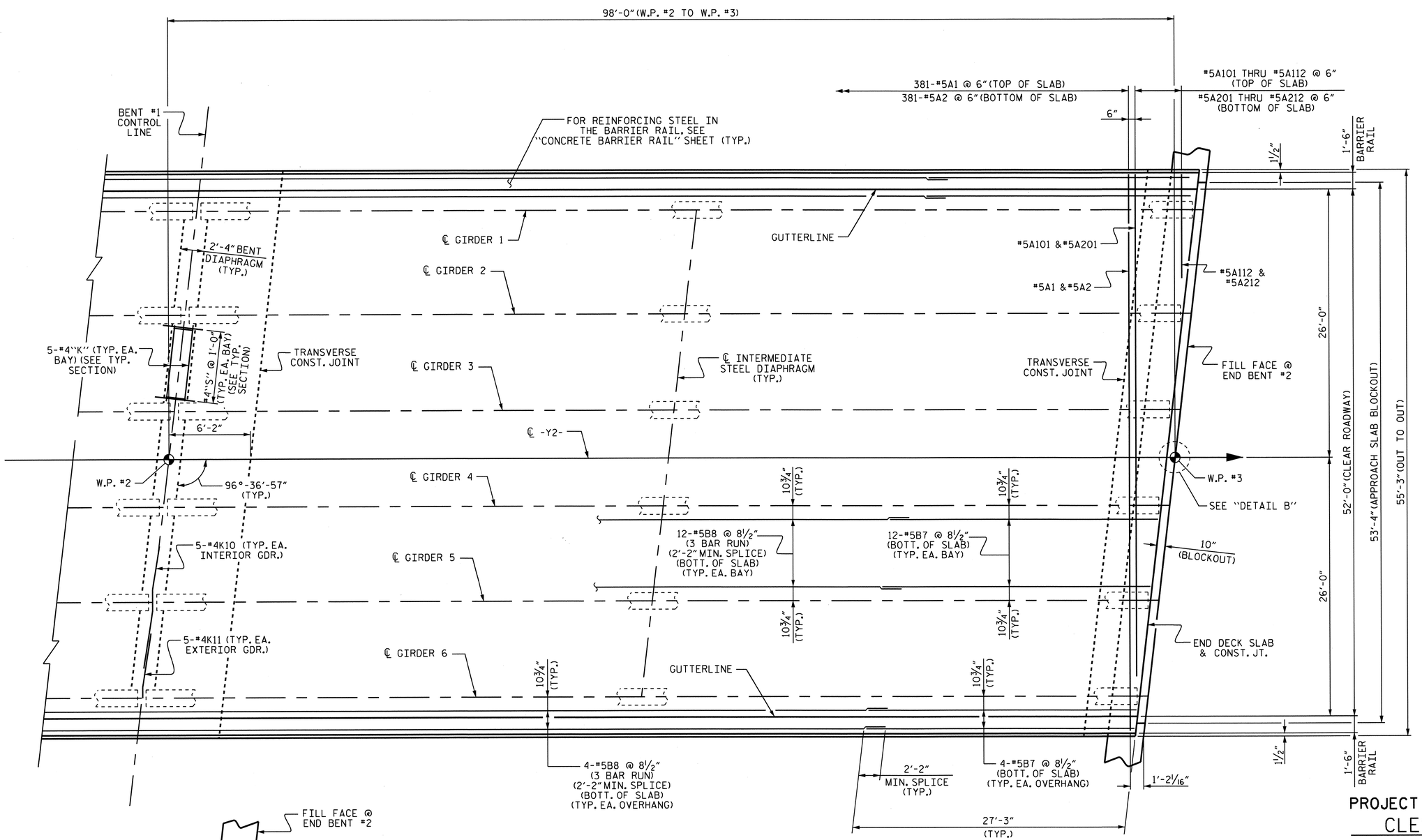
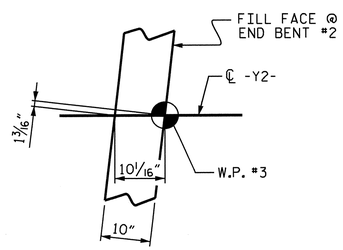
tbarbour

STR #1





DETAIL B

PLAN OF SPAN "B"

FOR REINFORCING STEEL IN ABUTMENTS, SEE "PLAN OF SPAN DETAILS" SHEET.
FOR LONGITUDINAL BARS IN TOP OF SLAB, SEE "B BAR LAYOUT" SHEET.

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN "B"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCHER O. KLAPPENBACH

3-8-2013

DRAWN BY : M. G. SHAIKH DATE : 04-14-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

27-DEC-2012 09:30
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tbarbour

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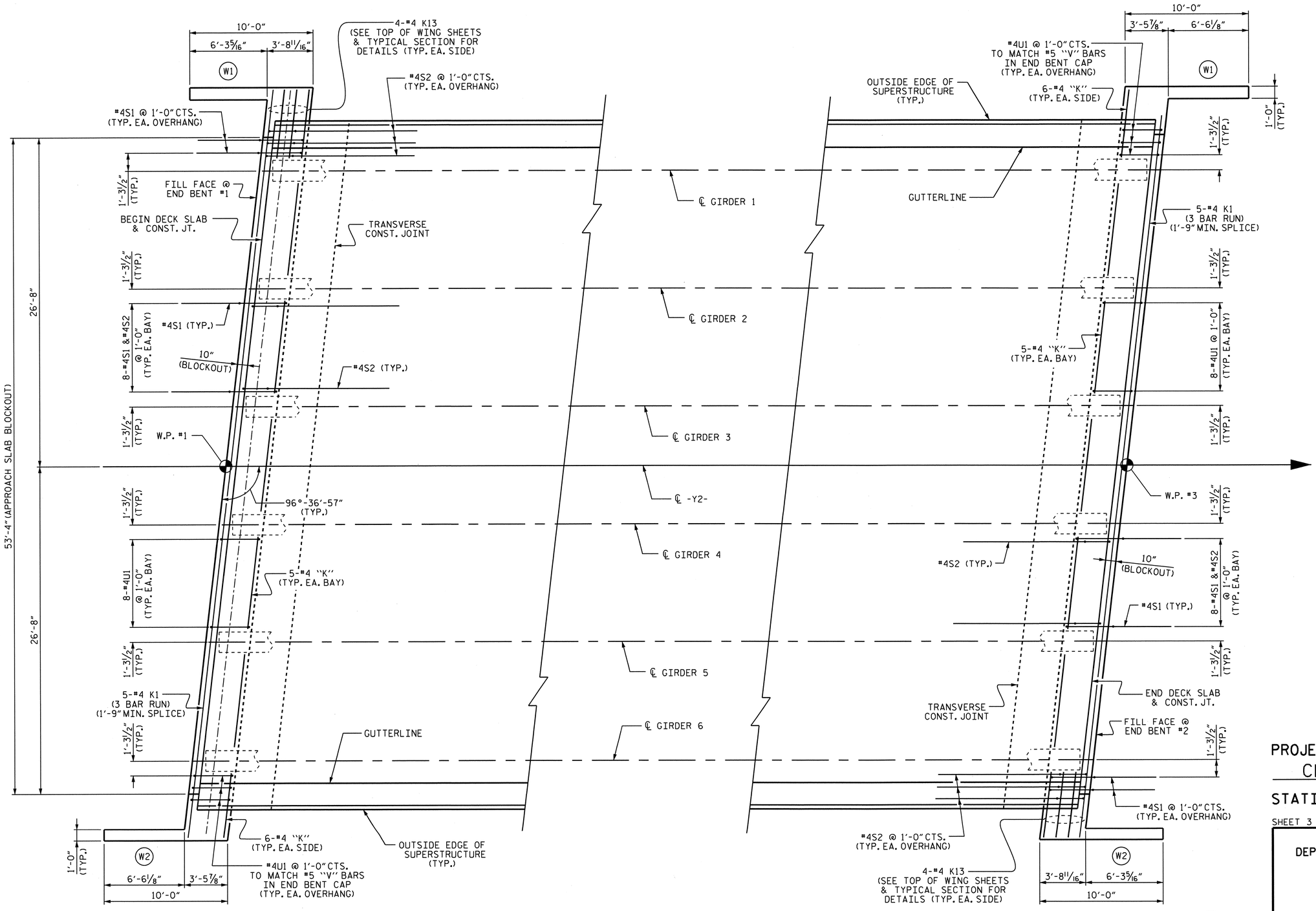

@ END BENT #1

PLAN OF ABUTMENT WALLS

@ END BENT #2

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF SPAN DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15829 ENGINEER BRUCE O. KLAPPENBERG 3-8-2013

DRAWN BY : M. G. SHAIKH DATE : 04-18-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

02-JAN-2013 11:42
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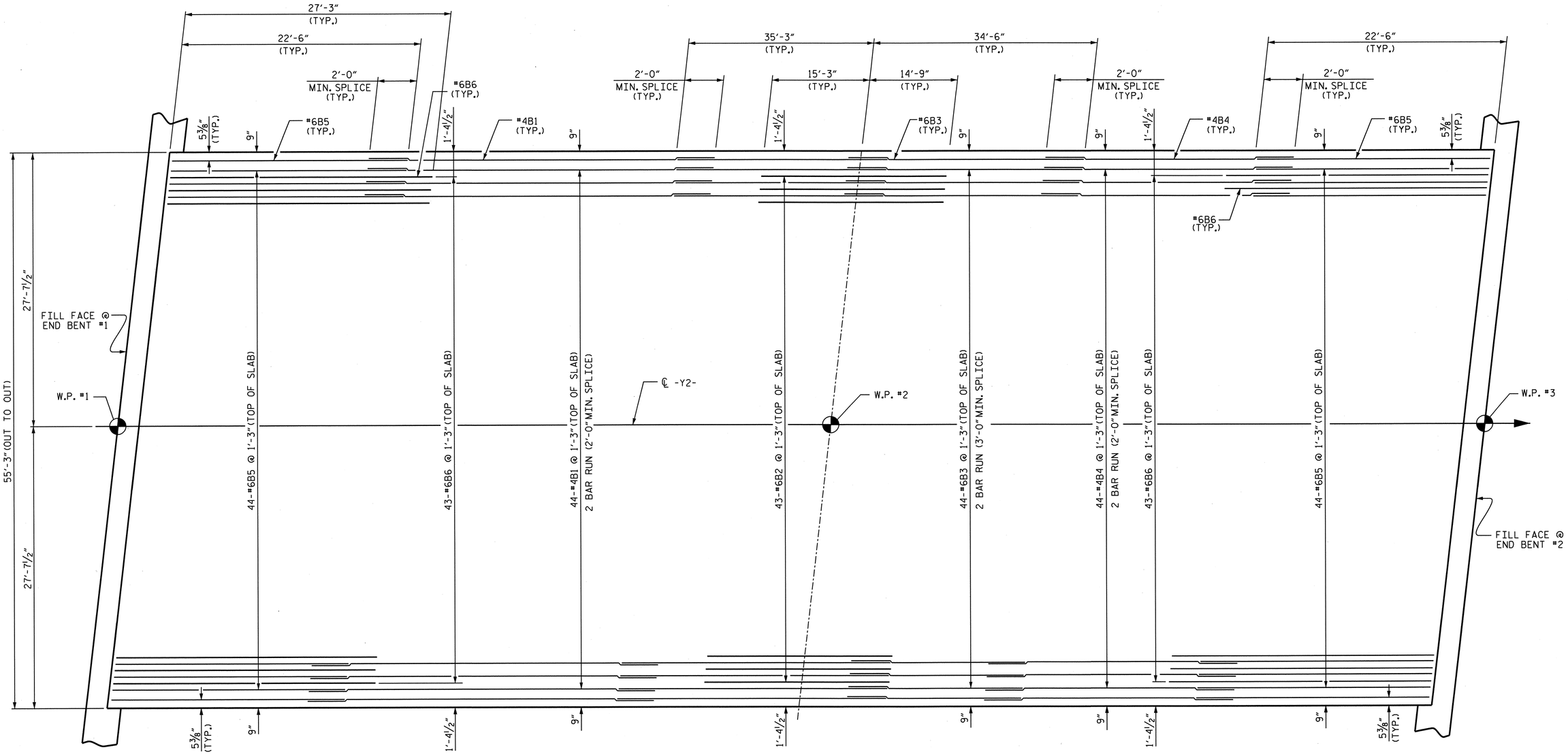

PLAN OF "B" BAR LAYOUT

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE "B" BAR LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE O. KLAPPENBACH
3-6-2013

DRAWN BY : M. G. SHAIKH DATE : 04-14-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

13-NOV-2012 09:47
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bklappenbach

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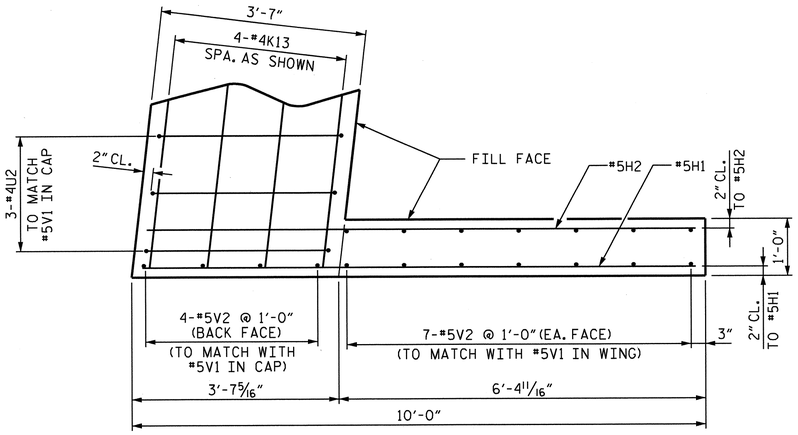
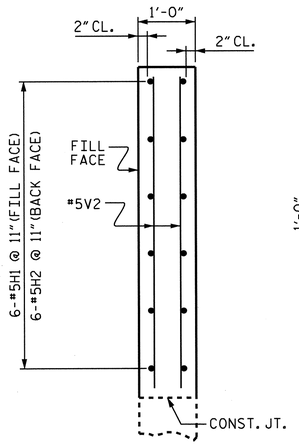
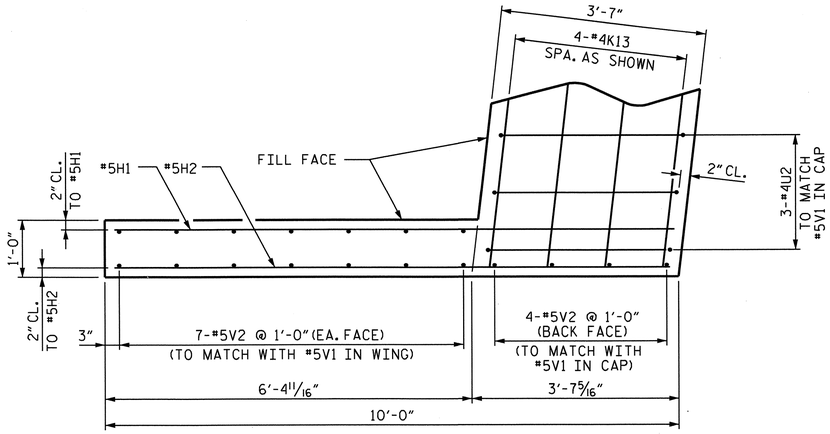


PLAN OF LEFT WING (W1)



SECTION Y-Y



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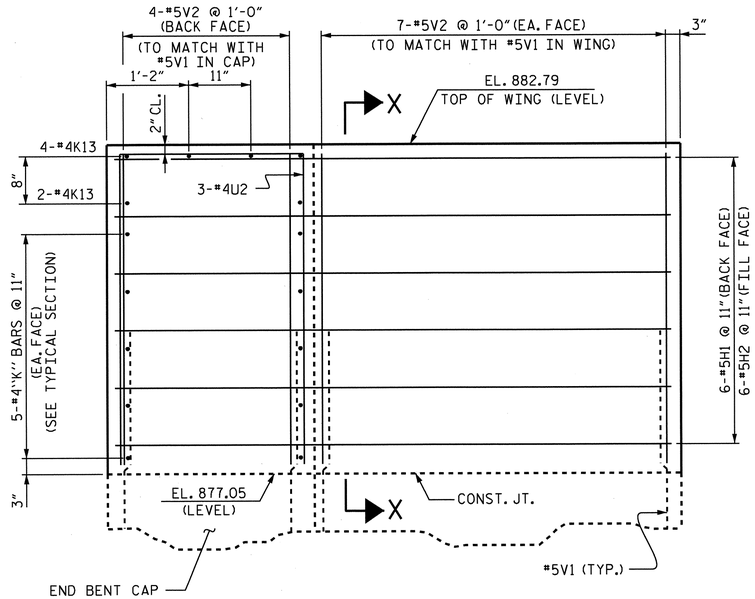
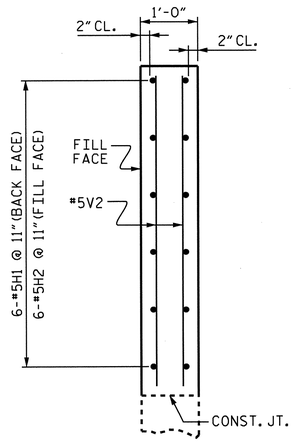


ELEVATION OF LEFT WING (W1)



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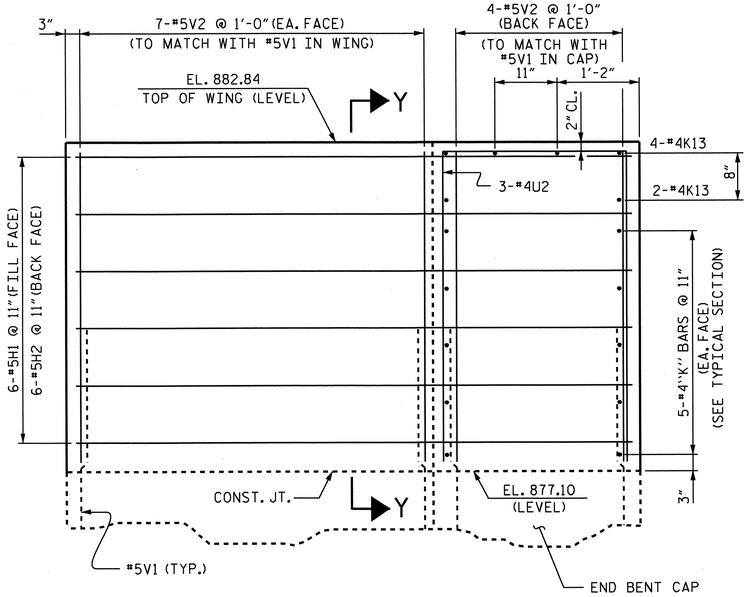

ELEVATION OF RIGHT WING (W2)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TOP OF WINGS END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH 3-5-2013

DRAWN BY : M. G. SHAIKH DATE : 04-27-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

13-NOV-2012 09:47
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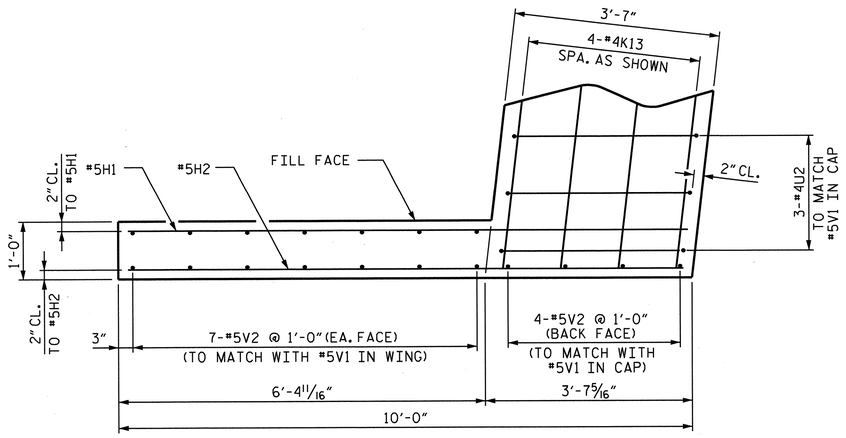
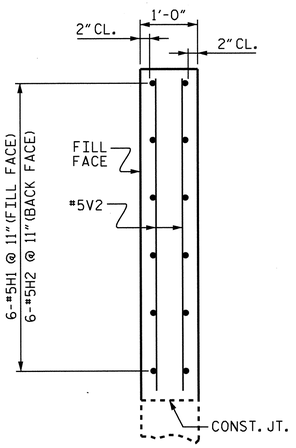
bklappenbach

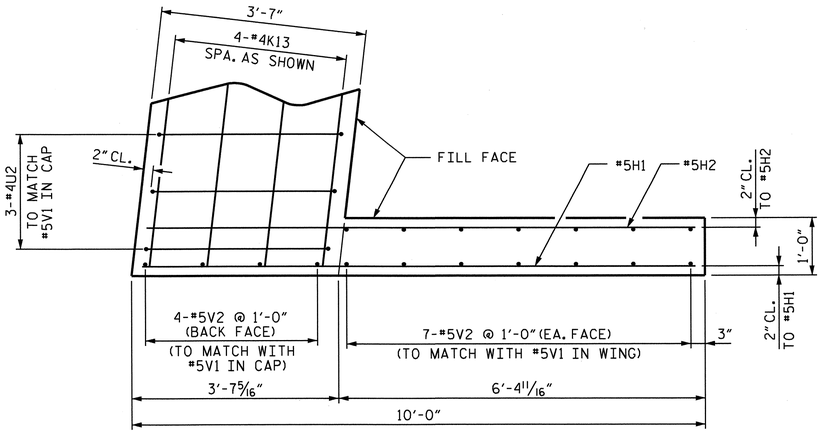
STR. #1



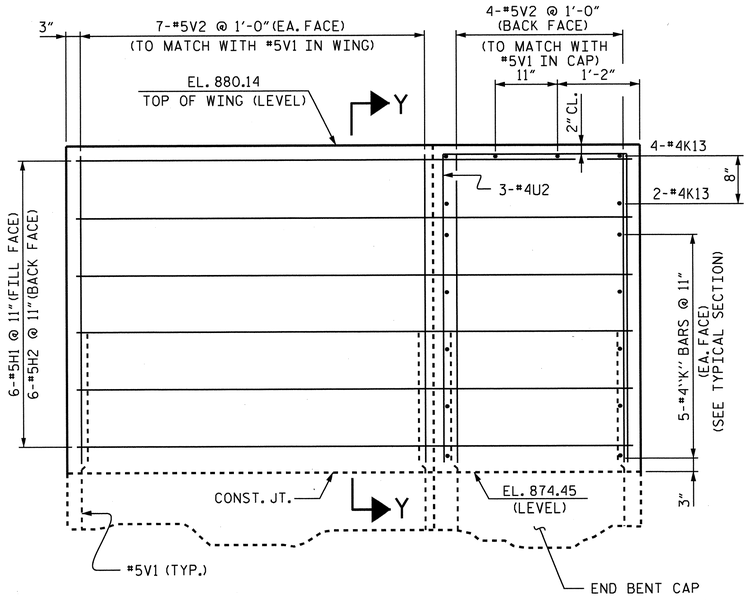
PLAN OF LEFT WING (W1)



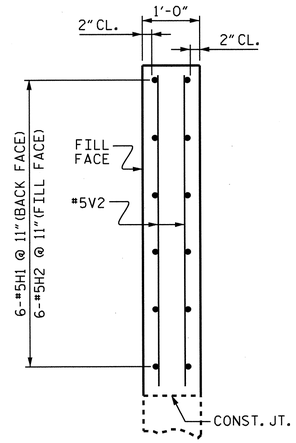
SECTION Y-Y



PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



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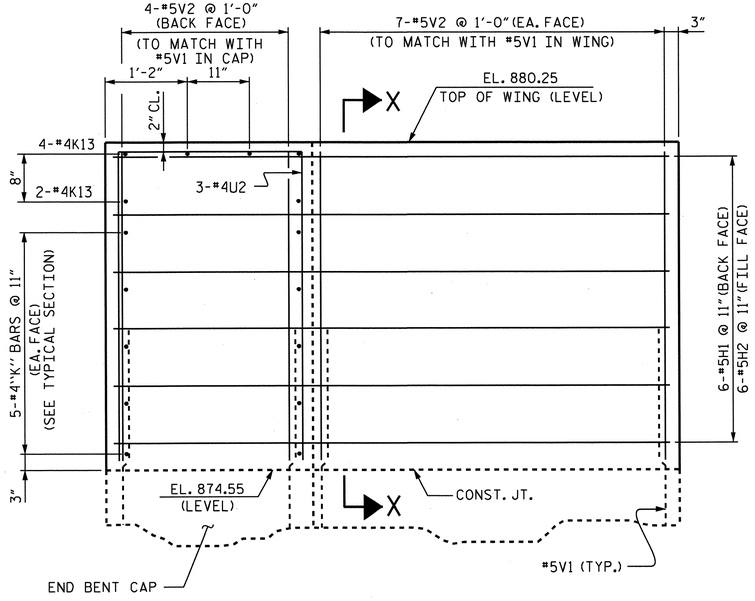

ELEVATION OF RIGHT WING (W2)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TOP OF WINGS END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-8-2013

DRAWN BY : M. G. SHAIKH DATE : 04-28-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

13-NOV-2012 09:47
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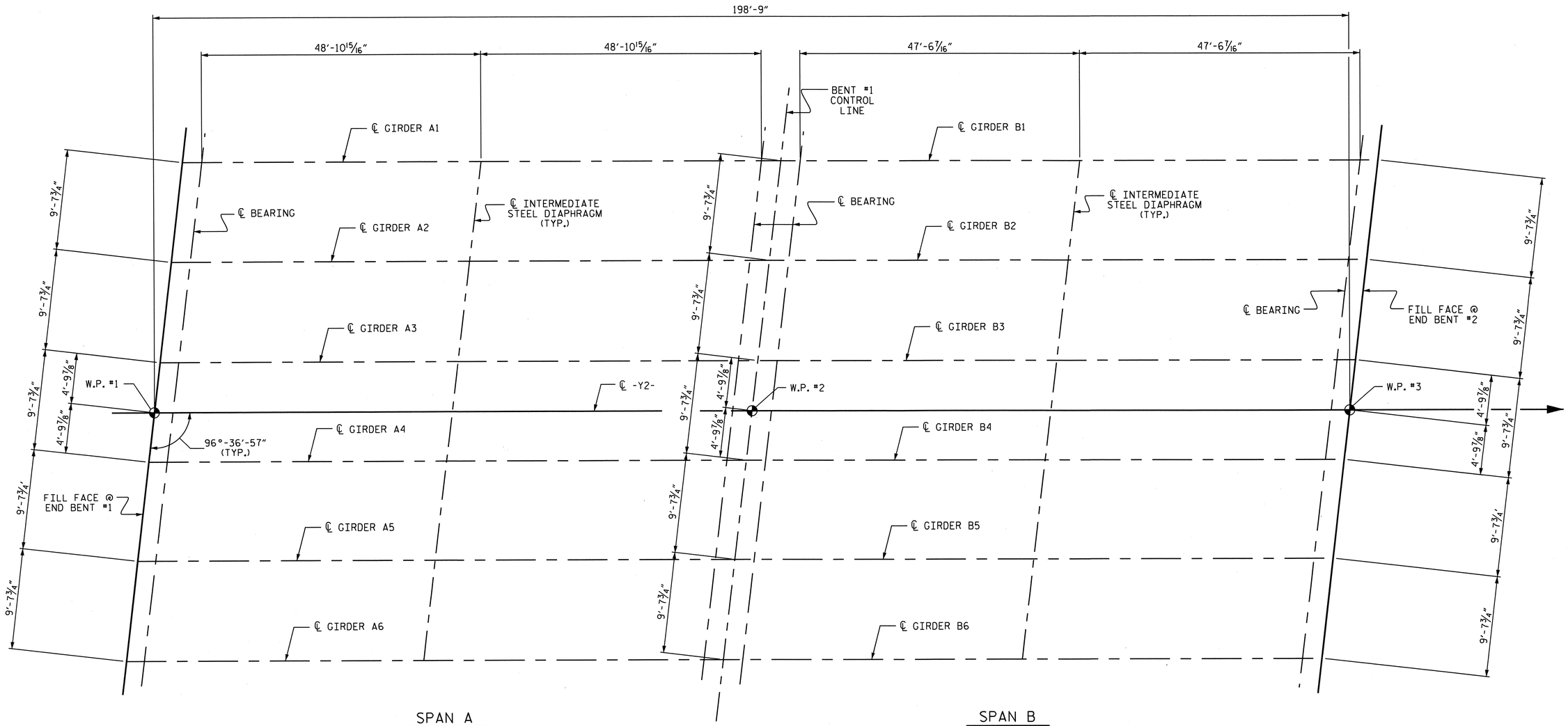
bklappenbach

STR. #1



FRAMING PLAN

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-8-2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			96

STR #1

DRAWN BY : M. G. SHAIKH DATE : 04-28-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

13-NOV-2012 09:47
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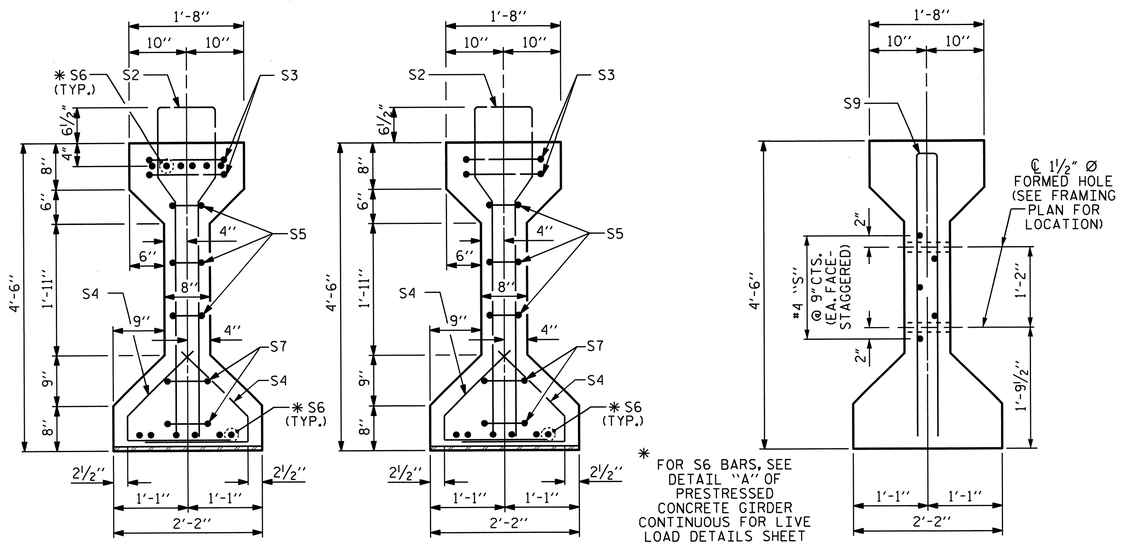
bklappenbach



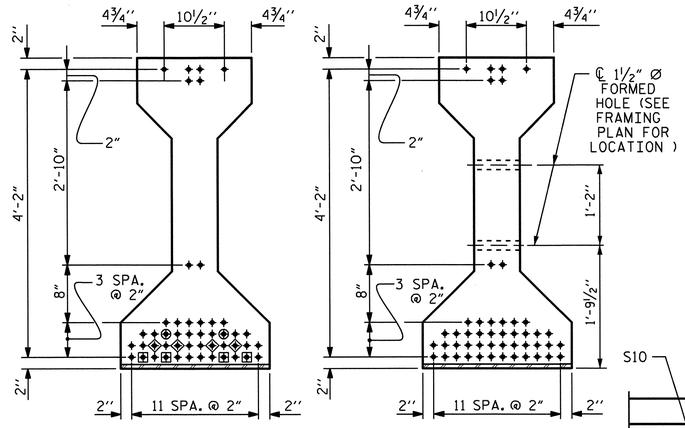
SECTION A-A

SECTION B-B

✱ FOR S6 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION C-C

(S1 BARS NOT SHOWN)



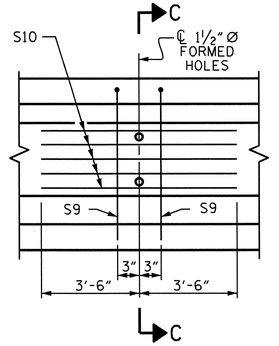
AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

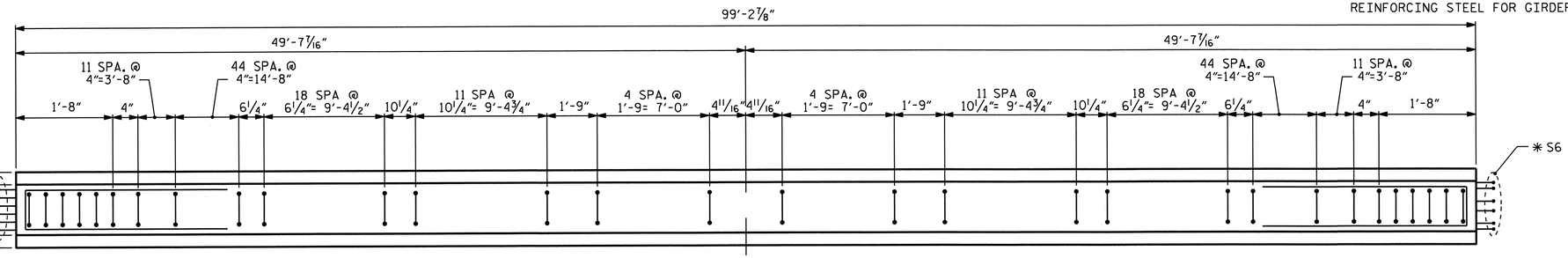
DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER

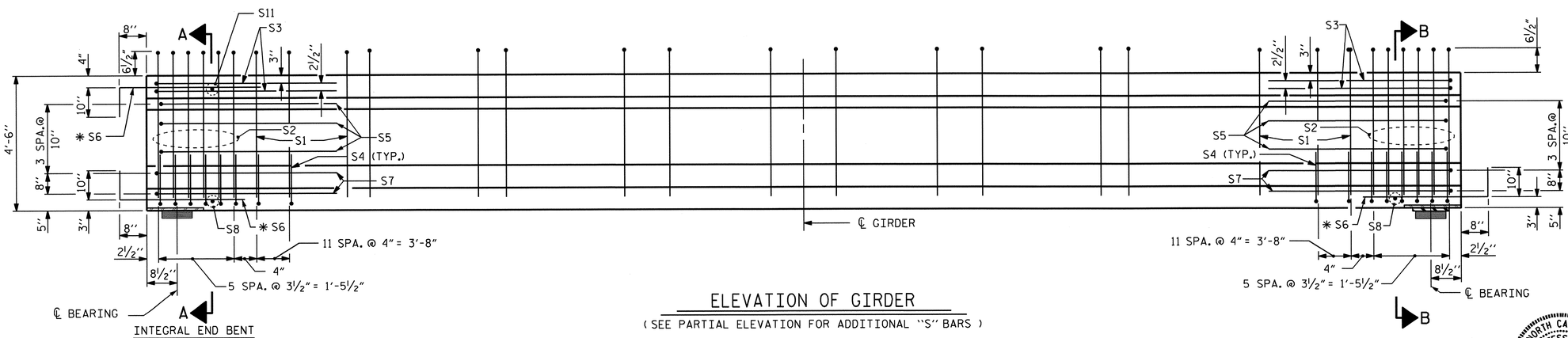


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-6.



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

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

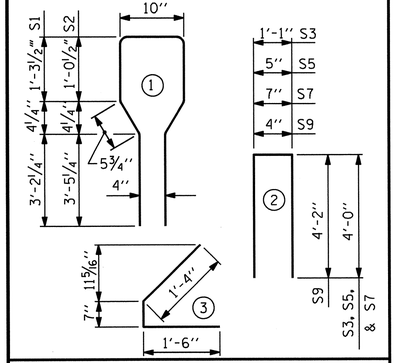
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	184	#4	1	10'-9"	1321
S2	12	#6	1	10'-9"	194
S3	4	#4	2	9'-1"	24
S4	72	#4	3	3'-5"	164
S5	6	#4	2	8'-5"	34
✱S6	18	#5	STR	3'-8"	69
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	1	#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.
GDRS. 1-6	1872	20.1	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	99'-2⅞"	595.44

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			96

ASSEMBLED BY : T.L.CLELLAND	DATE : 12/11		
CHECKED BY : H.T. BARBOUR	DATE : 12/11		
DRAWN BY : ELR 8/91	REV. 10/17/00R	RWW/LES	
CHECKED BY : GRP 8/91	REV. 5/1/06R	TLA/GM	
	REV. 10/1/11	MAA/GM	

05-MAR-2013 11:35
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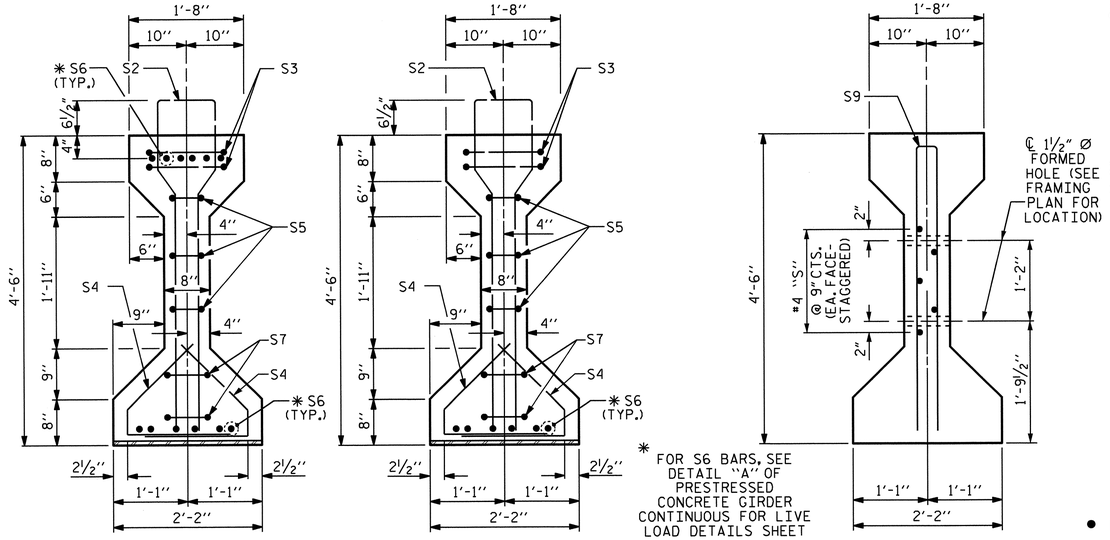
tbarbour

STR. #1

STD. NO. PCG6 (Sht. 2)



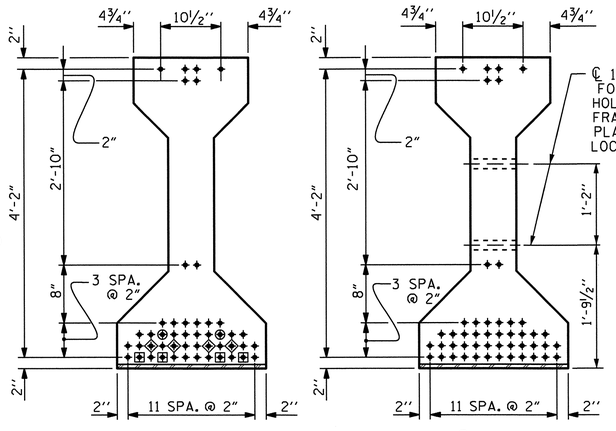
SECTION A-A

SECTION B-B

* FOR S6 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION C-C

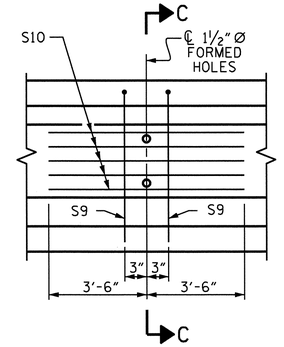
(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

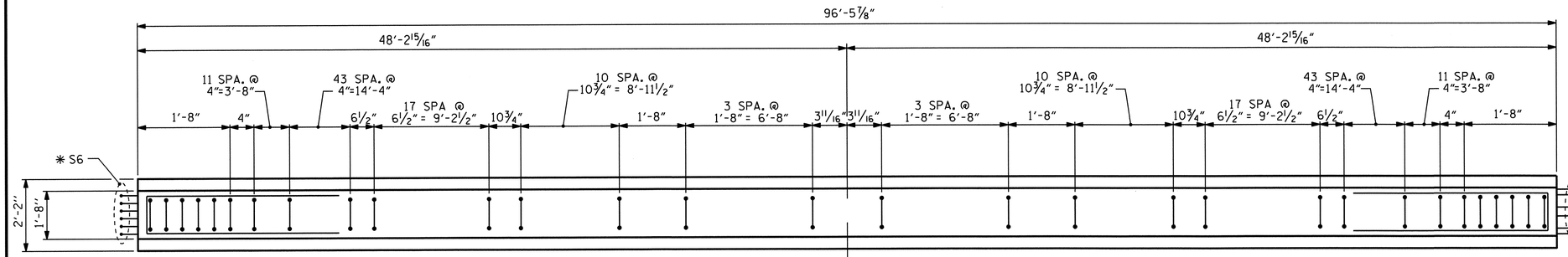
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 14'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER
- ▣ STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER

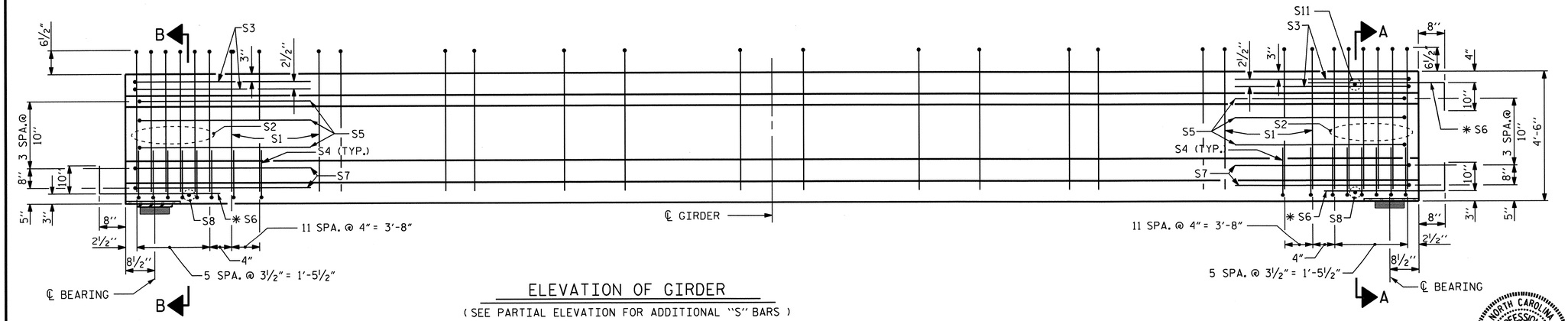


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1-6.



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

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

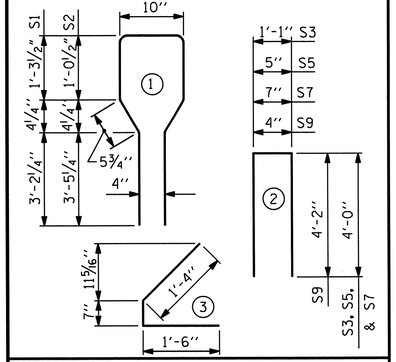
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	176	#4	1	10'-9"	1264
S2	12	#6	1	10'-9"	194
S3	4	#4	2	9'-1"	24
S4	72	#4	3	3'-5"	164
S5	6	#4	2	8'-5"	34
* S6	18	#5	STR	3'-8"	69
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	1	#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	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GDRS. 1-6	1815	19.6	48

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	96'-5⅞"	578.94

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 5825 ENGINEER BRADLEY D. KLAPPENBACH
3-8-2013

ASSEMBLED BY : T.L.CLELLAND	DATE : 12/11		
CHECKED BY : H.T. BARBOUR	DATE : 12/11		
DRAWN BY : ELR 8/91	REV. 10/17/00R	RWW/LES	
CHECKED BY : GRP 8/91	REV. 5/1/06R	TLA/GM	
	REV. 10/1/11	MAA/GM	

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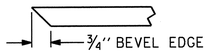
tbarbour

STR. #1

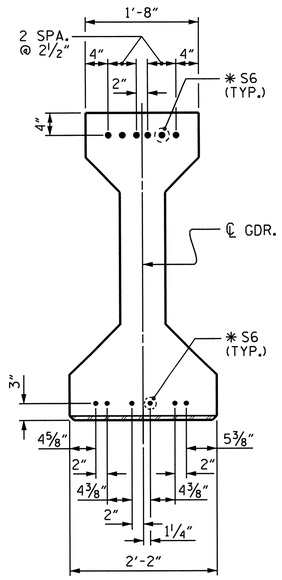
STD. NO. PCG6 (Sht. 2)

SECTION "G"



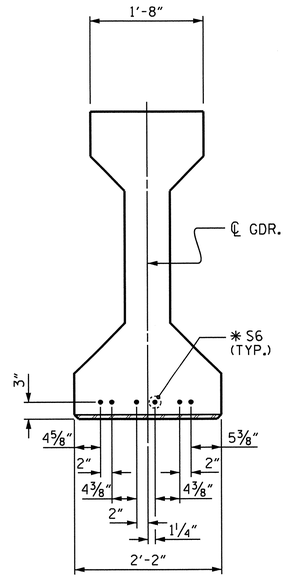
SECTION "F"

(SEE NOTES)



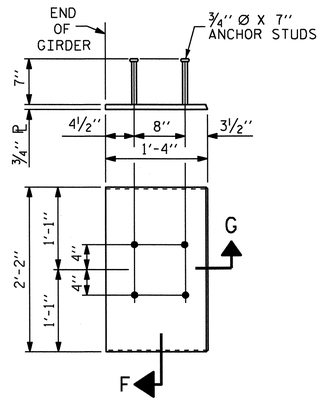
DETAIL "A"

(@ INTEGRAL END BENTS)



DETAIL "B"

(@ BENT)



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

(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD 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 7000 PSI FOR SPAN A AND SPAN B.

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

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

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPANS A, GIRDERS 1-6											SPANS B, GIRDERS 1-6										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	0.125	0.236	0.323	0.379	0.398	0.379	0.323	0.236	0.125	0.0	0.0	0.120	0.227	0.311	0.365	0.383	0.365	0.311	0.227	0.120	
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	0.055	0.104	0.143	0.167	0.176	0.167	0.143	0.104	0.055	0.0	0.0	0.049	0.093	0.128	0.149	0.157	0.149	0.128	0.093	0.049	0.0
FINAL CAMBER ↑	0.0	13/16"	1 9/16"	2 3/16"	2 9/16"	2 11/16"	2 9/16"	2 3/16"	1 9/16"	13/16"	0.0	0.0	7/8"	1 5/8"	2 3/16"	2 9/16"	2 11/16"	2 9/16"	2 3/16"	1 5/8"	7/8"	0.0

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

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER TIMOTHY L. CLELLAND
3/9/2013

ASSEMBLED BY : T.L.CLELLAND	DATE : 12/11	
CHECKED BY : H.T. BARBOUR	DATE : 12/11	
DRAWN BY : ELR 11/91	REV. 7/10/01RR	LES/RDR
CHECKED BY : GRP 11/91	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

05-MAR-2013 11:36
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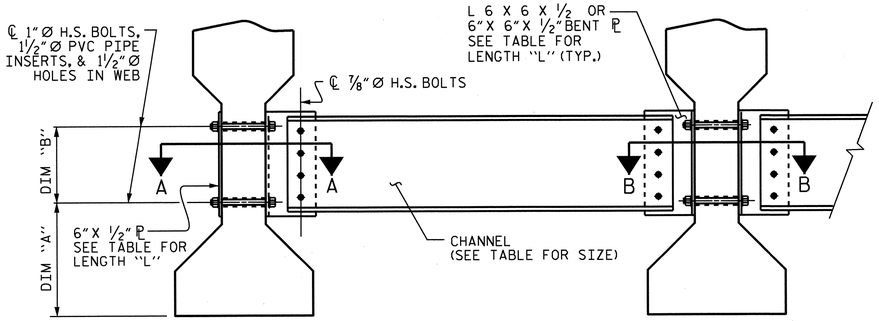
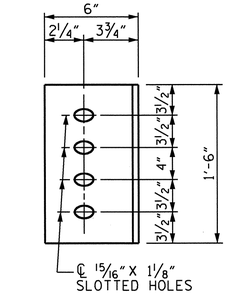
STR. #1

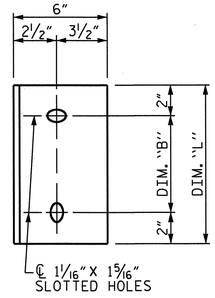
STD. NO. PCG9 (Sht. 3a)



PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

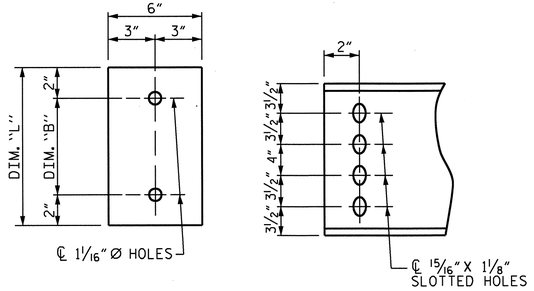


PLATE DETAILS CHANNEL END

STRUCTURAL STEEL NOTES

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

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

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

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

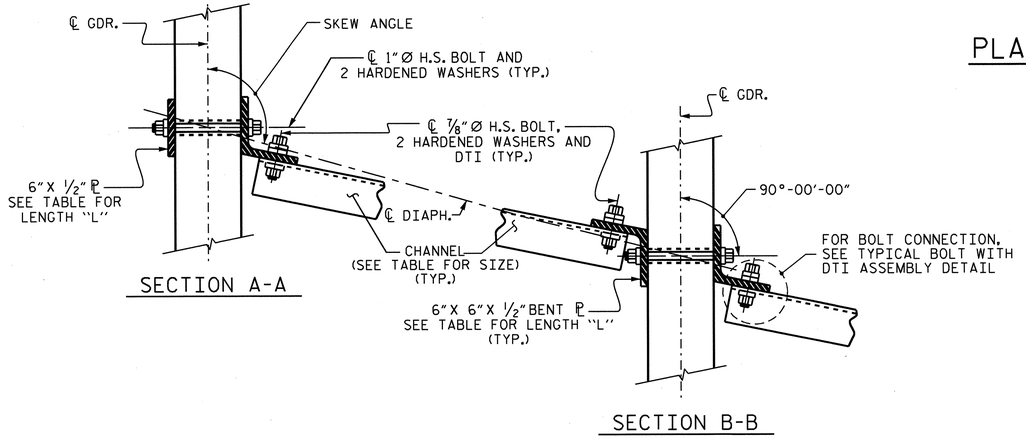
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

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.

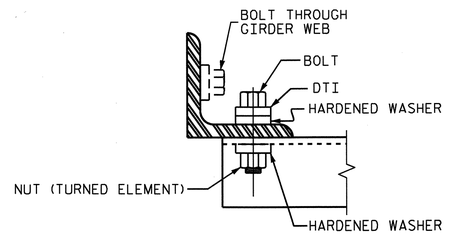
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



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-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE II, III, & IV PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			96

ASSEMBLED BY : T.L.CLELLAND	DATE : 12/11
CHECKED BY : H.T. BARBOUR	DATE : 12/11
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

13-NOV-2012 09:47
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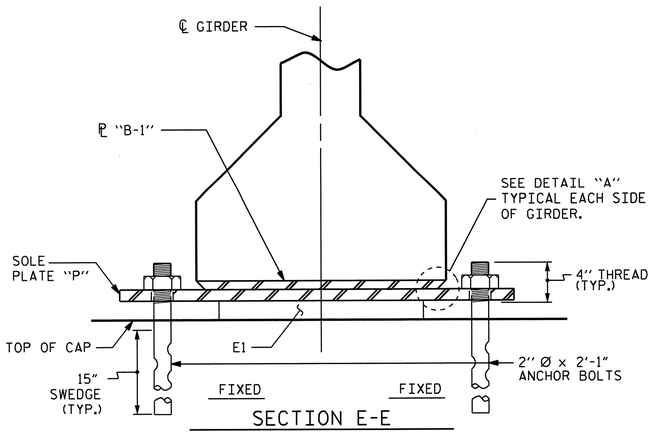
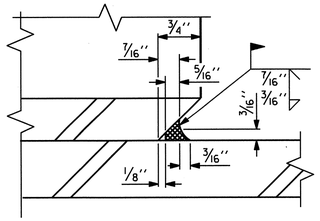
bklappenbach

STR #1

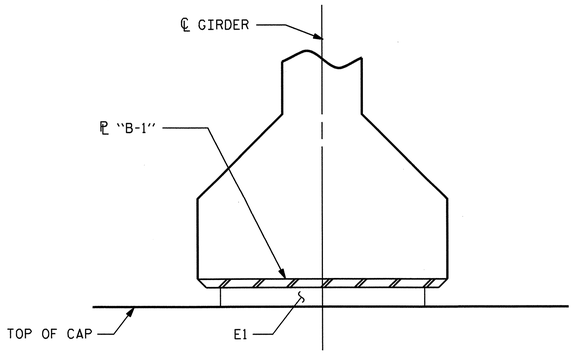
STD. NO. PCG10



SECTION E-E



DETAIL "A"



SECTION F-F

NOTES

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

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

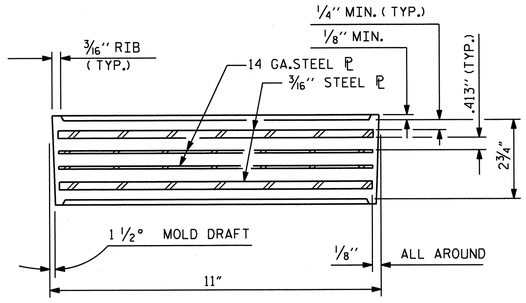
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

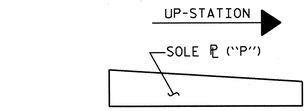
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

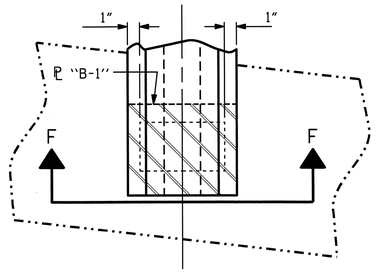
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



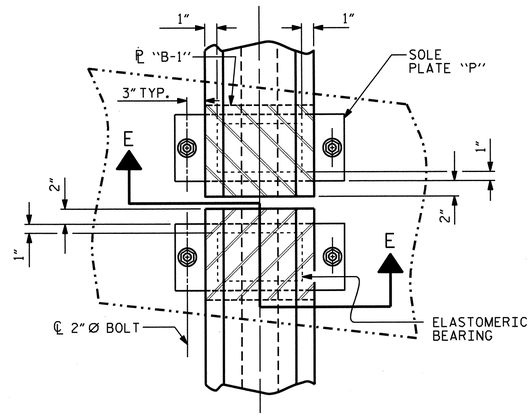
TYPICAL SECTION OF ELASTOMERIC BEARINGS



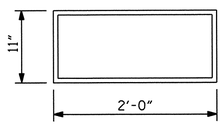
SOLE ℙ PLACEMENT DETAIL



TYPICAL PLAN
(SHOWING INTEGRAL END BENT)



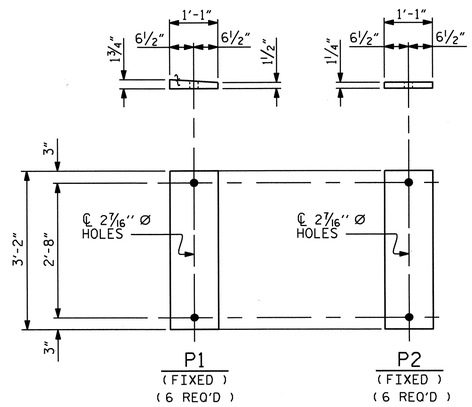
TYPICAL PLAN
(SHOWING CONTINUOUS BENT)



E1 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VII



SOLE PLATE DETAILS ("P")

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE VII	264 K

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-9-2012

ASSEMBLED BY : M. G. SHAIKH	DATE : 05-09-11	
CHECKED BY : H.T. BARBOUR	DATE : 12/11	
DRAWN BY : EEM 2/97	REV. 8/16/99	RWW/LES
CHECKED BY : VAP 2/97	REV. 10/17/00	RWW/LES
	REV. 5/1/06	TLA/GM

13-NOV-2012 09:47
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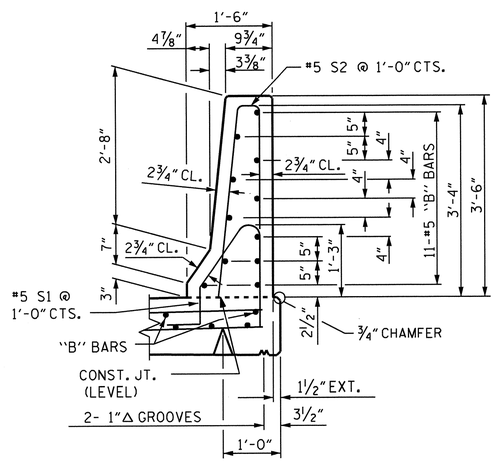
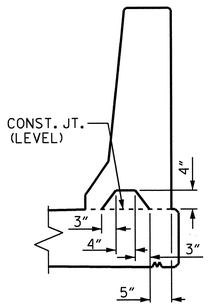
bklappenbach

STR. #1

STD. NO. EB4 (SHT 3)

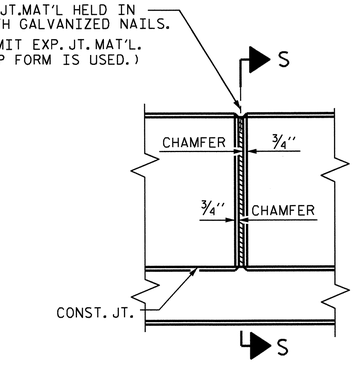


SECTION THRU RAIL

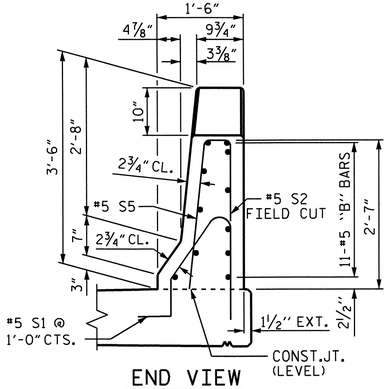


SECTION S-S

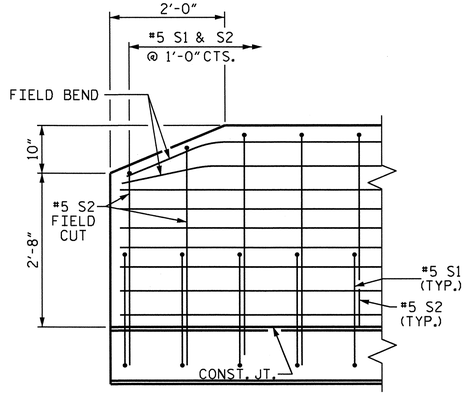
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY
WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



END VIEW

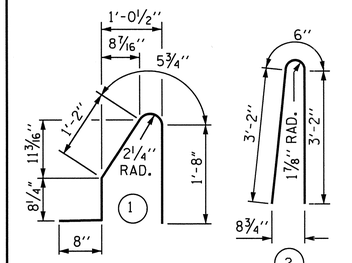


SIDE VIEW

END OF RAIL DETAILS

BARRIER RAIL DETAILS

BAR TYPES



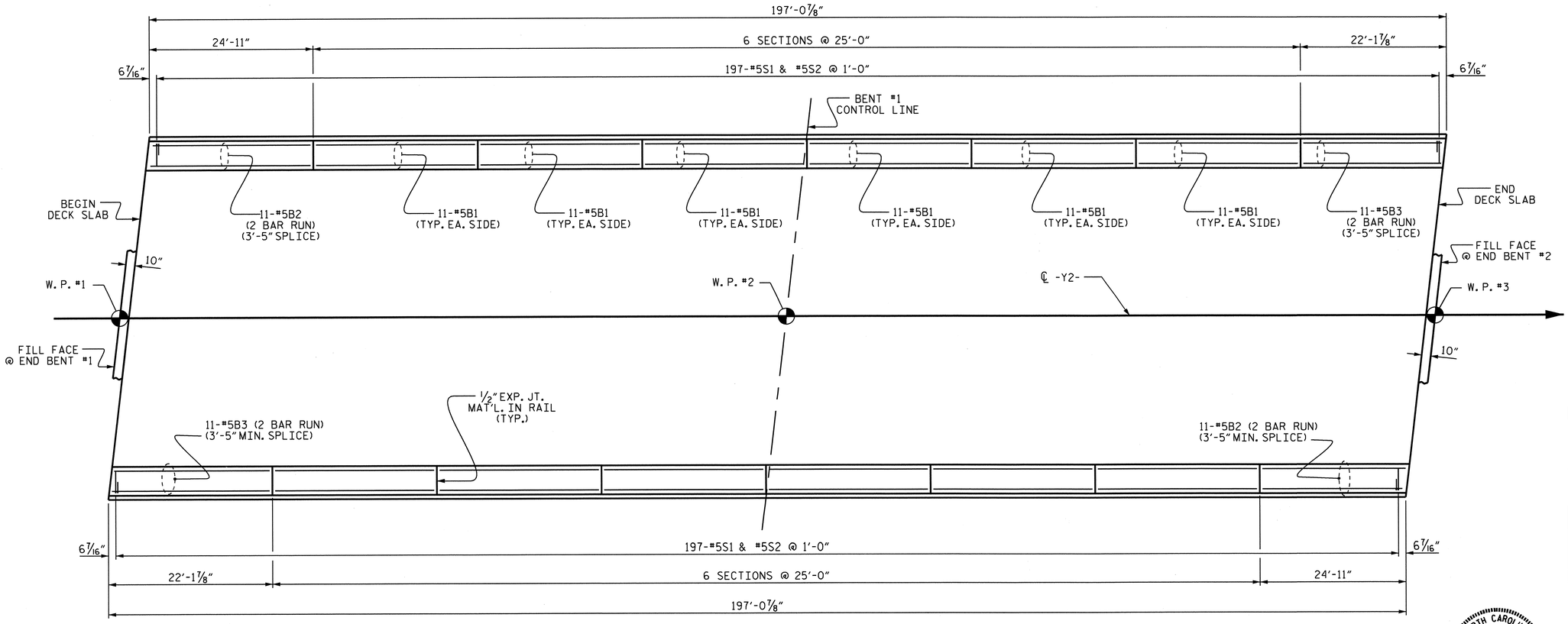
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	132	#5	STR	24'-7"	3385
✳ B2	44	#5	STR	14'-1"	646
✳ B3	44	#5	STR	12'-7"	577
✳ S1	394	#5	1	4'-8"	1918
✳ S2	394	#5	2	6'-10"	2808

✳ EPOXY COATED REINFORCING STEEL	9334 LBS.
CLASS AA CONCRETE	53.6 CU. YDS.
CONCRETE BARRIER RAIL	394.15 LIN. FT.



PLAN

NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

ASSEMBLED BY : M. G. SHAIKH	DATE : 05-05-11		
CHECKED BY : H.T. BARBOUR	DATE : 12/11		
DRAWN BY : ARB 5/87	REV. 10/17/00	RWW/LES	
CHECKED BY : SJD 9/87	REV. 5/7/03R	RWW/JTE	
	REV. 5/1/06	TLA/GM	

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER D. KLAPPENBACH
3-8-2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			96

STR #1

STD. NO. CBR1 (SHT 3)

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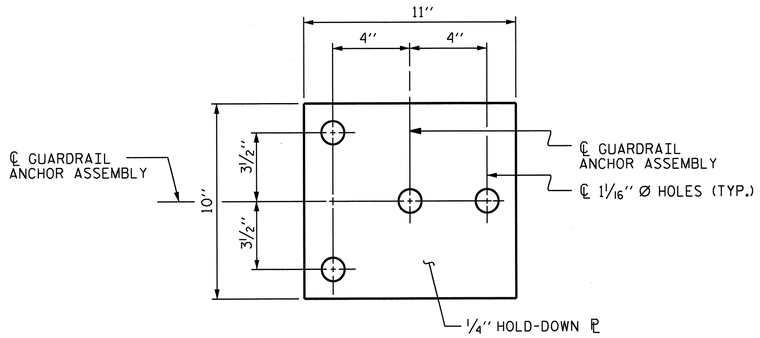
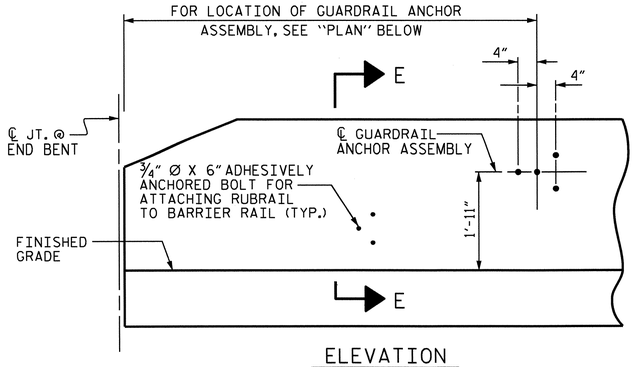
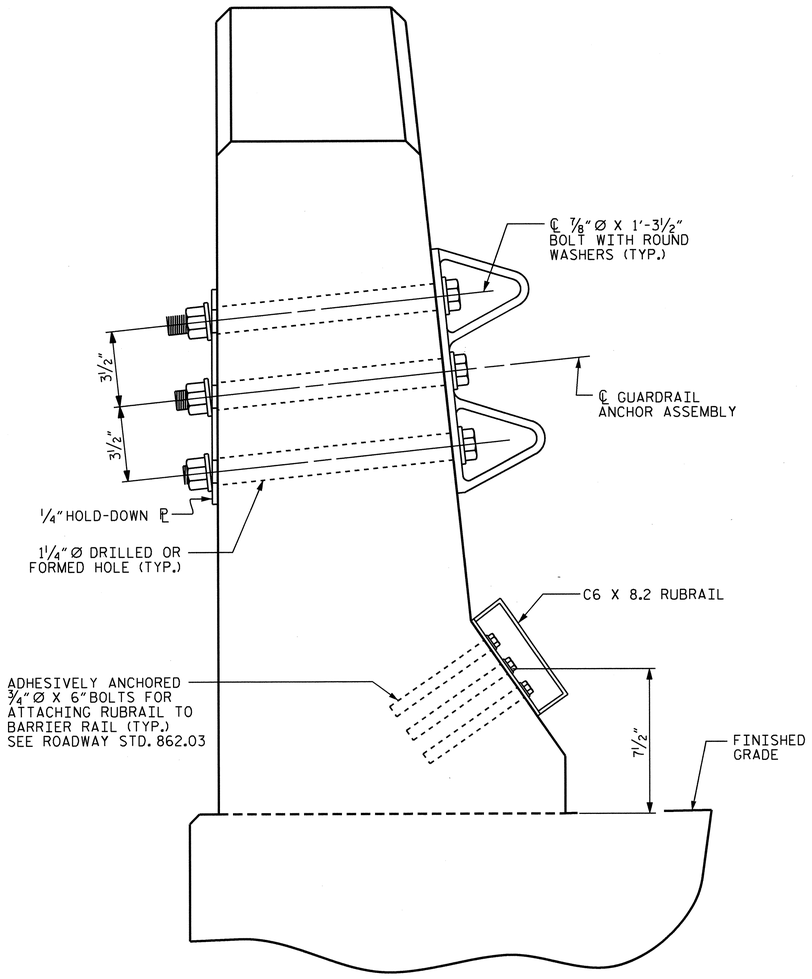
tbarbour



PLAN

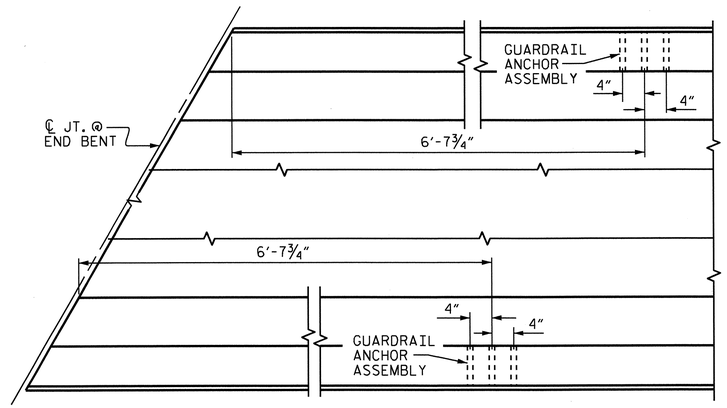


ELEVATION



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.)

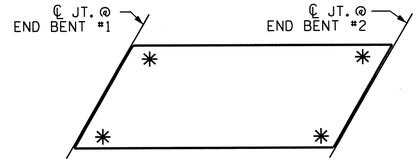
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPERICH 3-8-2013

ASSEMBLED BY : M. G. SHAIKH	DATE : 05-05-11	ADDED 5/1/06RR KMM/GM	
CHECKED BY : H.T. BARBOUR	DATE : 12/11	REV. 10/1/11 MAA/GM	
DRAWN BY : TLA 5/06			
CHECKED BY : GM 5/06			

27-DEC-2012 15:45
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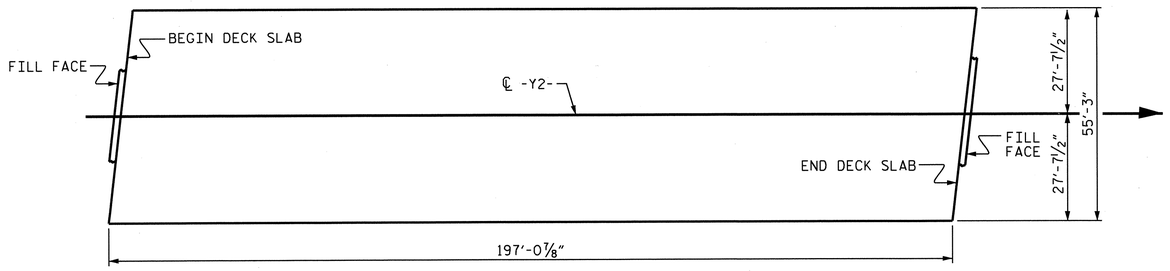
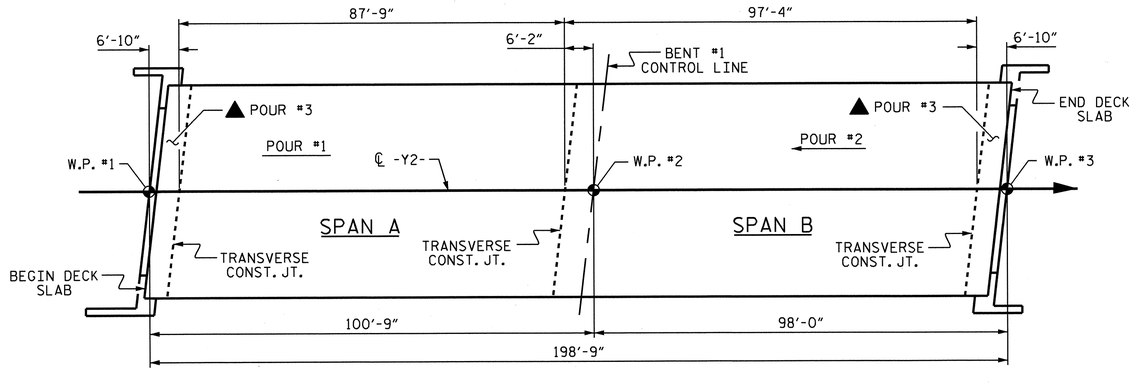
tbarbour

(SHT 1b) STD. NO. GRA2 STR. #1

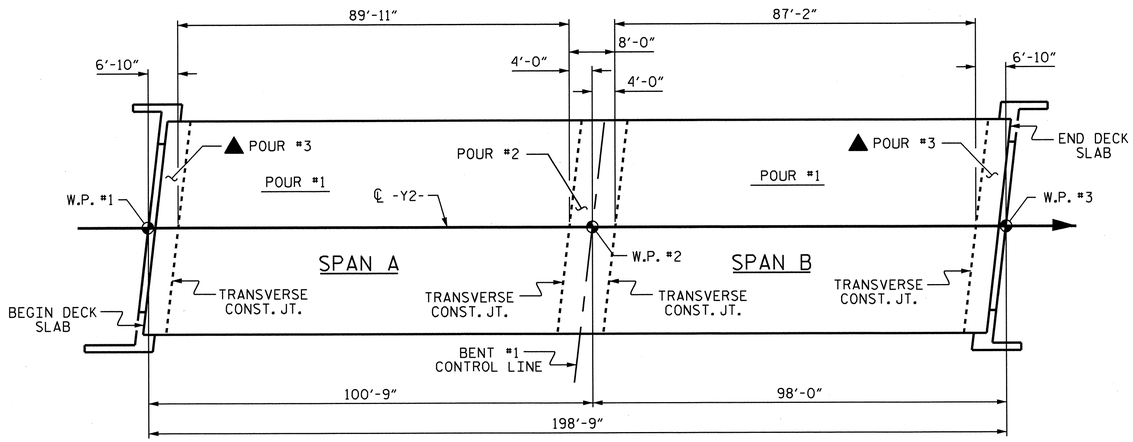


LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 10888)



POURING SEQUENCE

▲ POUR #3 INCLUDES THE UPPER PART OF THE END BENT WINGS, UPPER PART OF THE INTEGRAL END BENT, AND 6'-10" SECTION OF THE BRIDGE DECK.



OPTIONAL POURING SEQUENCE

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

▲ POUR #3 INCLUDES THE UPPER PART OF THE END BENT WINGS, UPPER PART OF THE INTEGRAL END BENT, AND 6'-10" SECTION OF THE BRIDGE DECK.

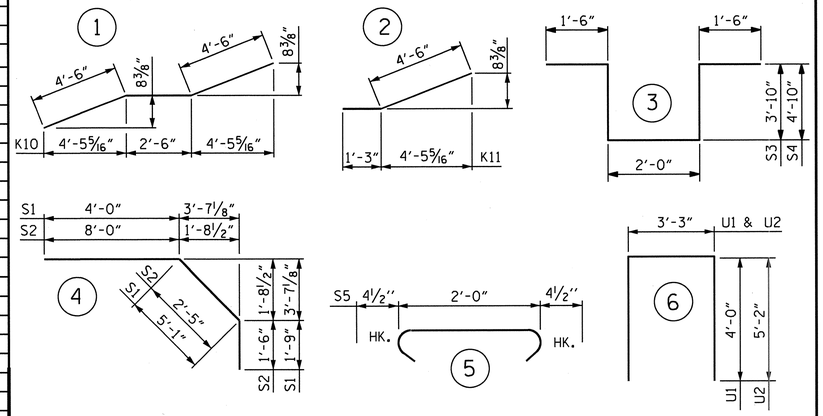
ASSEMBLED BY : M. C. SHAIKH	DATE : 05-09-11		
CHECKED BY : H.T. BARBOUR	DATE : 12/11		
DRAWN BY : JMB 5/87	REV. 6/1/94	EEM/GRP	
CHECKED BY : SJD 9/87	REV. 8/16/99	RWW/LES	

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	381	#5	STR	54'-11"	21823
A2	381	#5	STR	54'-11"	21823
✳ A101	2	#5	STR	52'-2"	109
✳ A102	2	#5	STR	47'-10"	100
✳ A103	2	#5	STR	43'-6"	91
✳ A104	2	#5	STR	39'-3"	82
✳ A105	2	#5	STR	34'-11"	73
✳ A106	2	#5	STR	30'-7"	64
✳ A107	2	#5	STR	26'-4"	55
✳ A108	2	#5	STR	22'-0"	46
✳ A109	2	#5	STR	17'-8"	37
✳ A110	2	#5	STR	13'-4"	28
✳ A111	2	#5	STR	9'-1"	19
✳ A112	2	#5	STR	4'-9"	10
A201	2	#5	STR	52'-2"	109
A202	2	#5	STR	47'-10"	100
A203	2	#5	STR	43'-6"	91
A204	2	#5	STR	39'-3"	82
A205	2	#5	STR	34'-11"	73
A206	2	#5	STR	30'-7"	64
A207	2	#5	STR	26'-4"	55
A208	2	#5	STR	22'-0"	46
A209	2	#5	STR	17'-8"	37
A210	2	#5	STR	13'-4"	28
A211	2	#5	STR	9'-1"	19
A212	2	#5	STR	4'-9"	10
✳ B1	92	#4	STR	24'-1"	1480
✳ B2	43	#6	STR	30'-0"	1938
✳ B3	92	#6	STR	36'-5"	5032
✳ B4	92	#4	STR	23'-1"	1419
✳ B5	92	#6	STR	22'-4"	3086
✳ B6	86	#6	STR	27'-1"	3498
B7	136	#5	STR	27'-1"	3842
B8	204	#5	STR	50'-5"	10727
H1	24	#5	STR	9'-6"	238
H2	24	#5	STR	9'-4"	234
K1	30	#4	STR	21'-8"	434
K2	10	#4	STR	7'-1"	47
K3	20	#4	STR	8'-0"	107
K4	40	#4	STR	8'-7"	229
K5	20	#4	STR	7'-7"	101
K6	4	#4	STR	5'-3"	14
K7	4	#4	STR	5'-9"	15
K8	8	#4	STR	6'-1"	33
K9	4	#4	STR	5'-7"	15
K10	20	#4	1	11'-6"	154
K11	10	#4	2	5'-9"	38
K12	10	#4	STR	5'-11"	40
K13	24	#4	STR	2'-8"	43
✳ S1	88	#4	4	12'-8"	745
✳ S2	92	#4	4	14'-8"	901
S3	10	#4	3	12'-8"	85
S4	30	#4	3	14'-8"	294
S5	150	#4	5	2'-9"	276
U1	92	#4	6	11'-3"	691
U2	12	#4	6	13'-7"	109
V2	72	#5	STR	5'-4"	401

REINFORCING STEEL = 40704 LBS
✳ EPOXY COATED REINF. STEEL = 40636 LBS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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

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

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	159.6		
POUR 2	195.6		
POUR 3	93.5		
TOTALS ✳✳	448.7	40704	40636

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	2368	SQ.FT.
BRIDGE DECK	9640	SQ.FT.
TOTAL	12008	SQ.FT.

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 43+66.99 -L-

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-8-2013

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			96

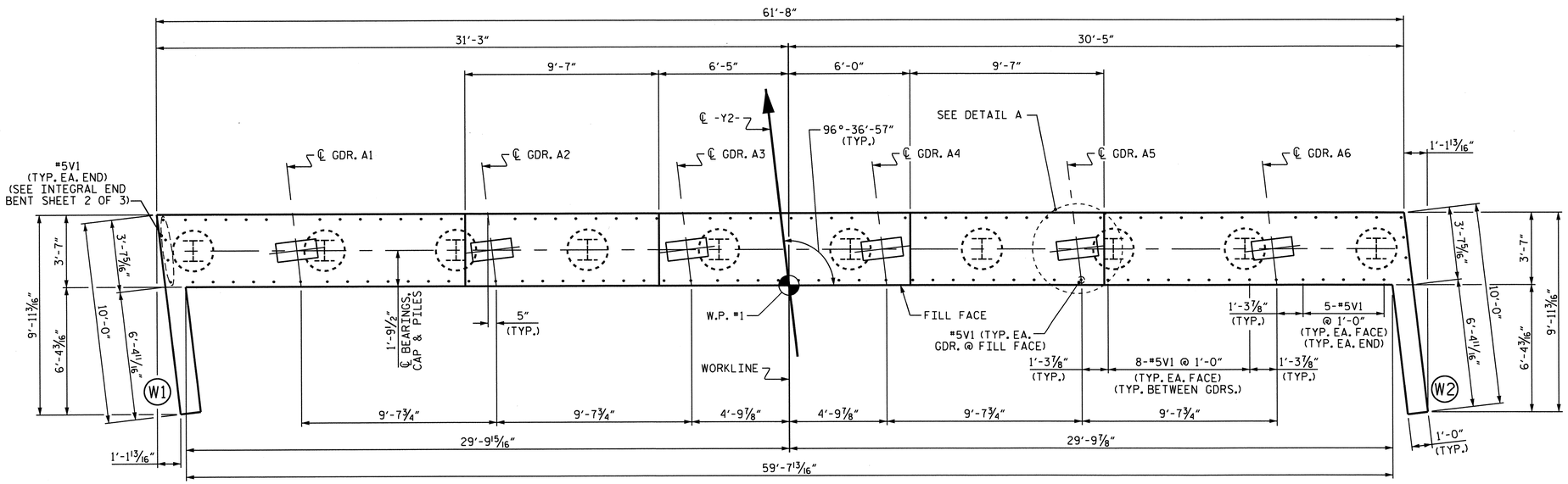
STR #1

NOTES

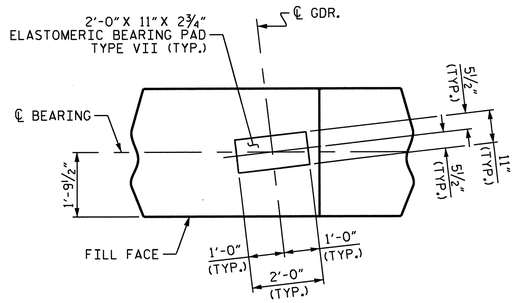
SEE SUPERSTRUCTURE SHEETS FOR UPPER PART OF INTEGRAL END BENT DETAILS.

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.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE END BENT WINGS ARE TO BE POURED WITH POUR #3 OF THE SUPERSTRUCTURE.

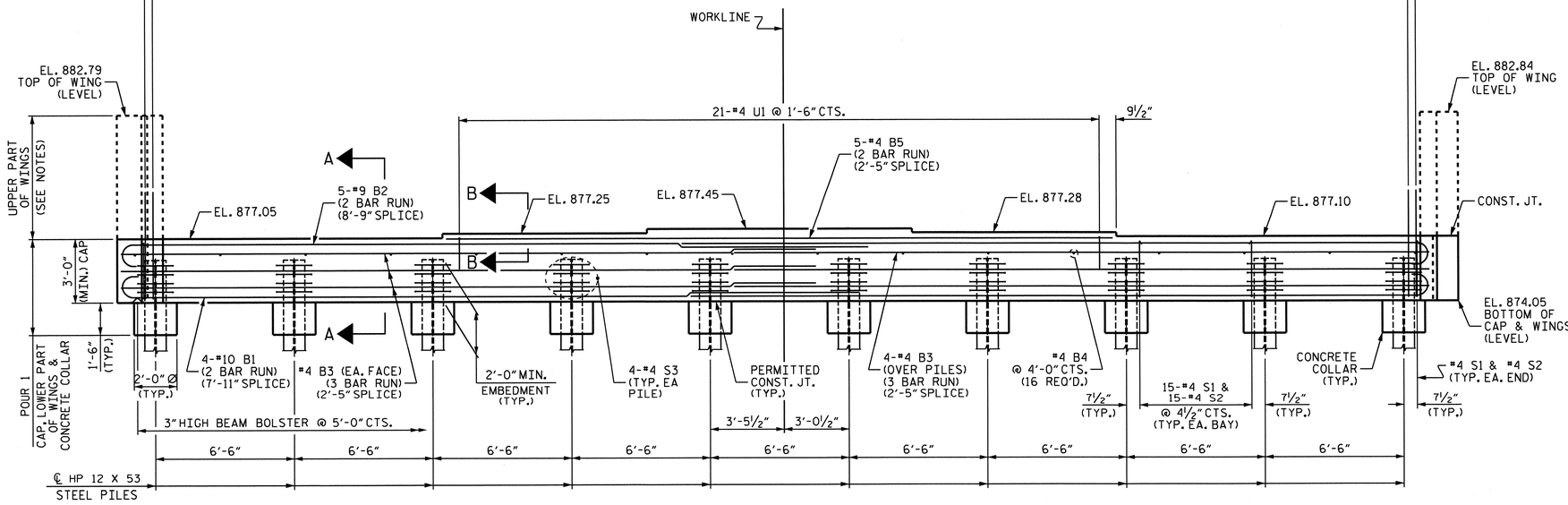


PLAN



DETAIL A

PILES NOT SHOWN FOR CLARITY



ELEVATION

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 4-11-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

02-JAN-2013 11:39
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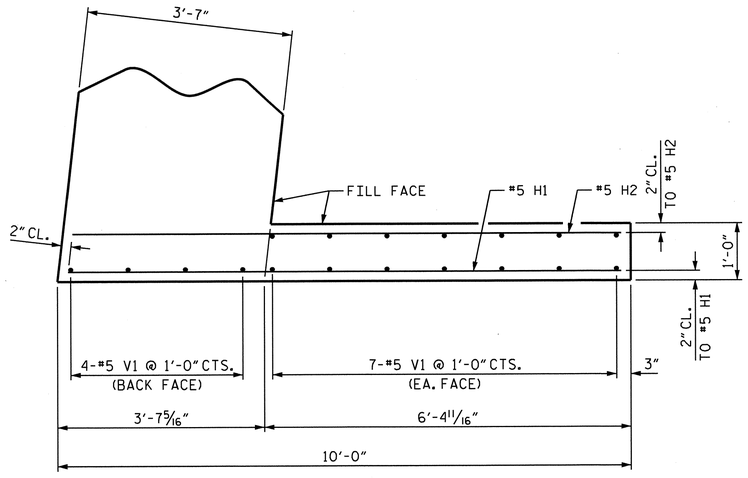
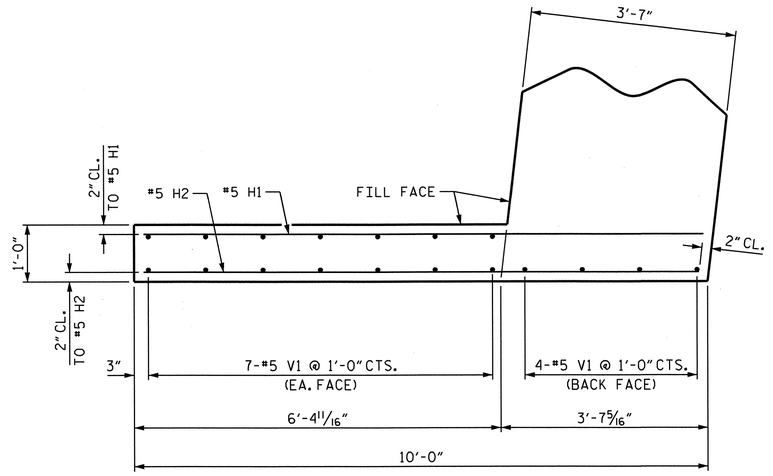
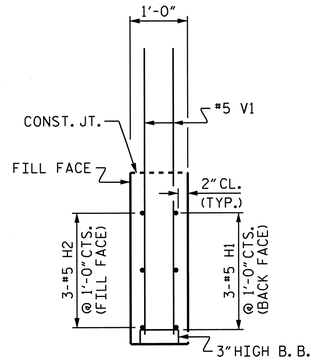


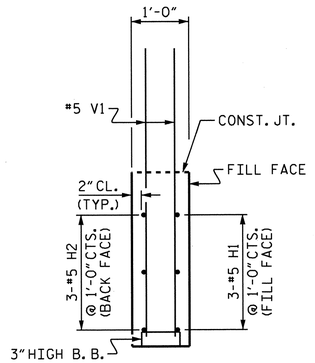
PLAN OF WING (W1)



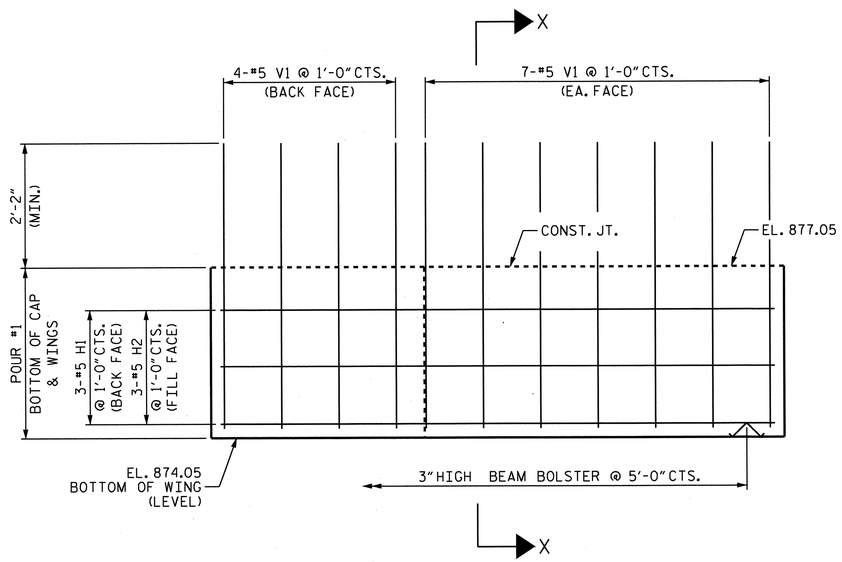
PLAN OF WING (W2)



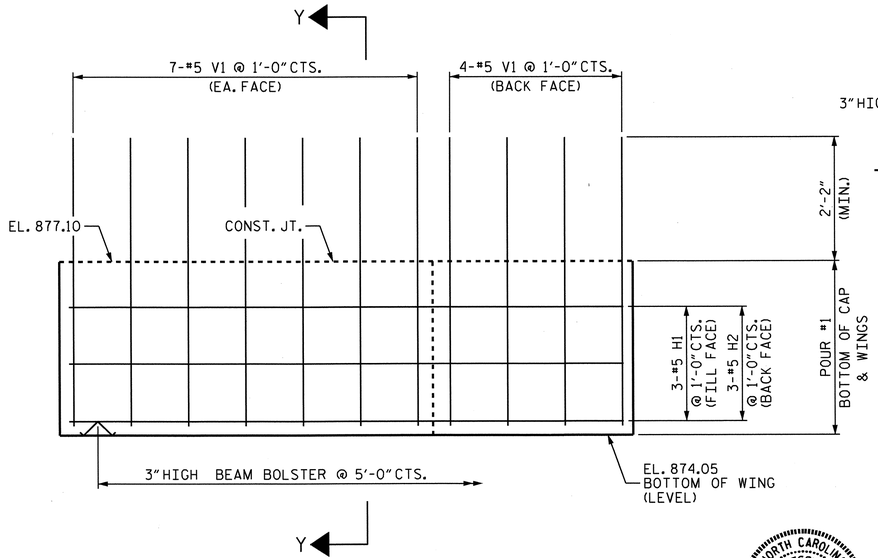
SECTION X-X



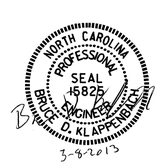
SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE INTEGRAL END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			96

STR. #1

DRAWN BY : E.C. LOCKLEAR DATE : 4-11-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

13-NOV-2012 10:05
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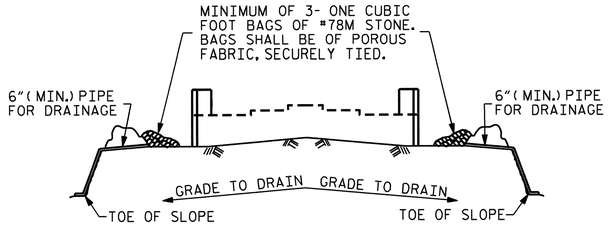
bklappenbach

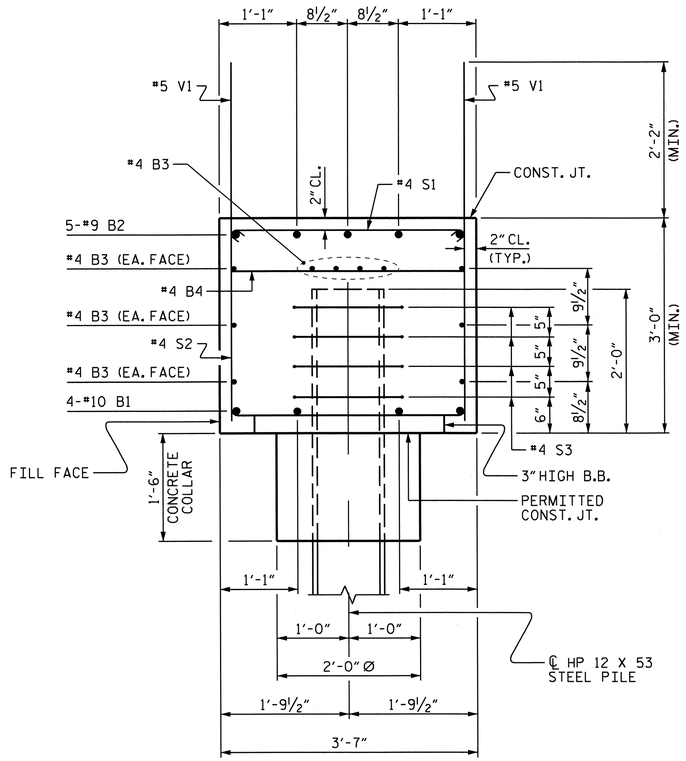


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

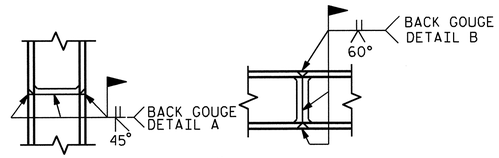
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

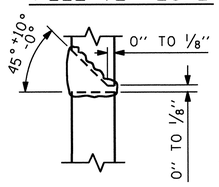
TEMPORARY DRAINAGE AT END BENT



SECTION A-A

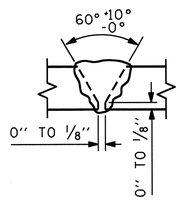


* PILE VERTICAL



DETAIL A

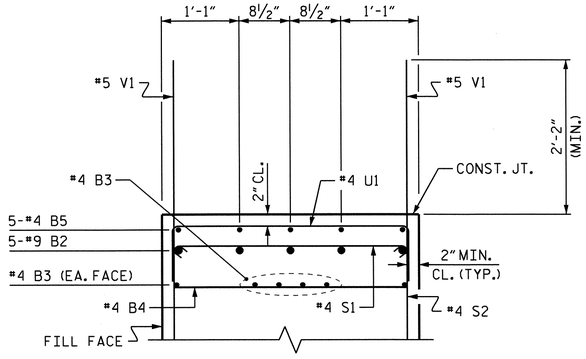
* PILE HORIZONTAL OR VERTICAL



DETAIL B

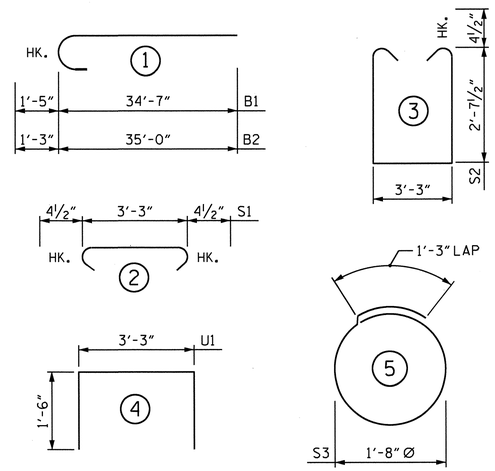
* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



PARTIAL SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

* CONCRETE QUANTITY FOR UPPER PART OF WINGS IN POUR #3 ON SUPERSTRUCTURE.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	36'-0"	1239
B2	10	#9	1	36'-3"	1233
B3	30	#4	STR	22'-1"	443
B4	16	#4	STR	3'-3"	35
B5	10	#4	STR	16'-10"	112
H1	6	#5	STR	9'-6"	59
H2	6	#5	STR	9'-4"	58
S1	137	#4	2	4'-0"	366
S2	137	#4	3	9'-3"	847
S3	40	#4	5	6'-6"	174
U1	21	#4	4	6'-3"	88
V1	142	#5	STR	5'-5"	802

REINFORCING STEEL = 5456 LBS.

CLASS A CONCRETE
* POUR #1 (CAP, LOWER PART OF WINGS & CONCRETE COLLAR)
CU. YDS. 29.0
TOTAL CU. YDS. 29.0

HP 12 X 53 STEEL PILES
NO. 10 LIN. FT. 500

PILE REDRIVES NO. 10

PDA TESTING NO. 1

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 43+66.99 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-9-2013

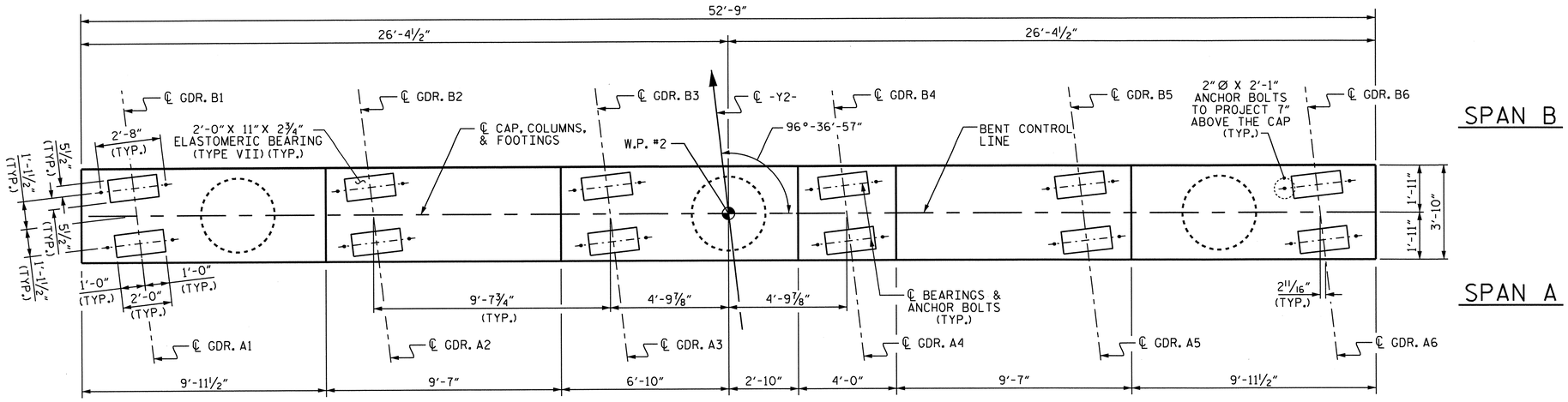
DRAWN BY : E.C. LOCKLEAR DATE : 4-11-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

27-DEC-2012 12:53
R:\Structures\Plans\FINAL PLANS\Str1\R-2707AA_SD_E*.dgn
tbarbour

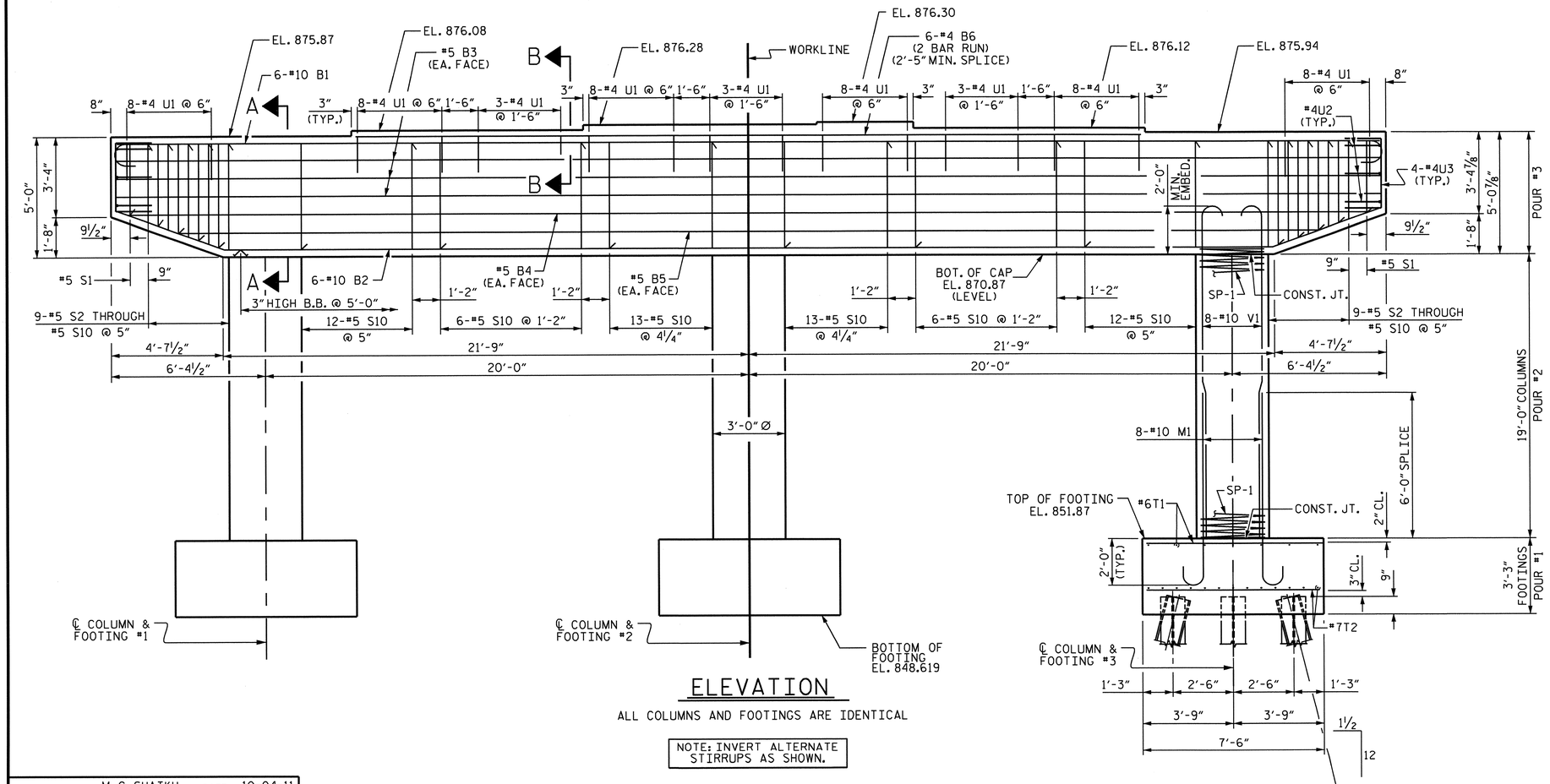
NOTES

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

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



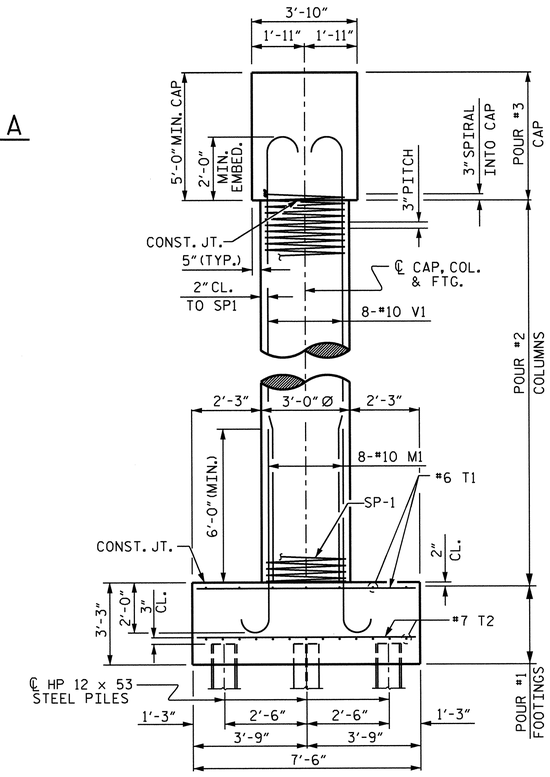
PLAN



ELEVATION

ALL COLUMNS AND FOOTINGS ARE IDENTICAL

NOTE: INVERT ALTERNATE STIRRUPS AS SHOWN.



END ELEVATION

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRADLEY D. KLAPPENBACH
3-8-2013

DRAWN BY : M. C. SHAIKH DATE : 10-04-11
CHECKED BY : H.T. BARBOUR DATE : 12-11

04-MAR-2013 15:55
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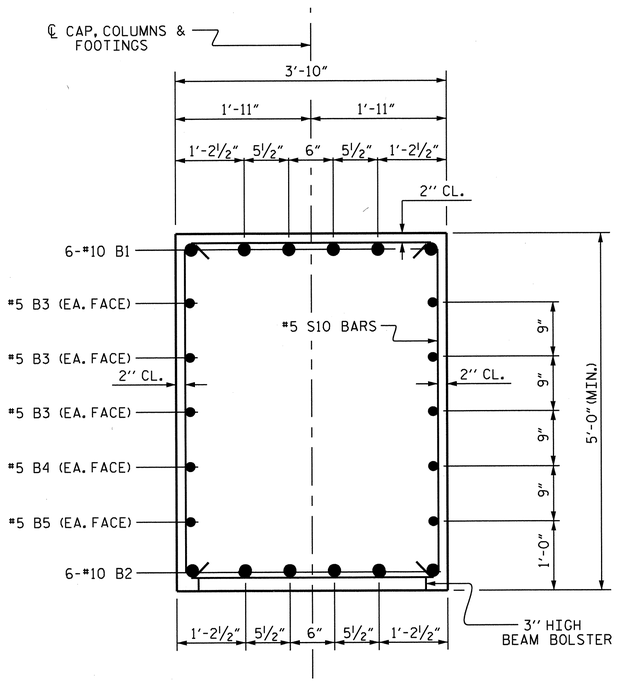
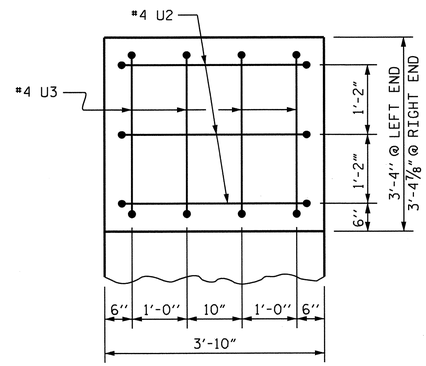
tbarbour

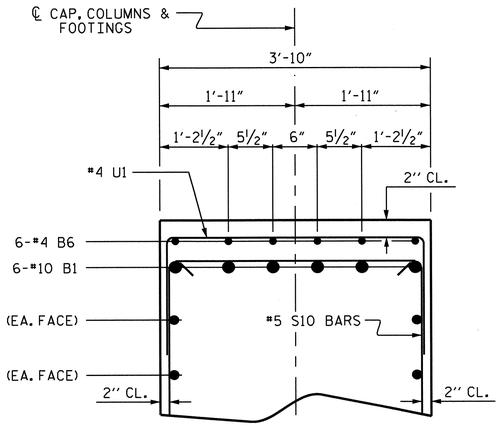
STR #1



SECTION A-A

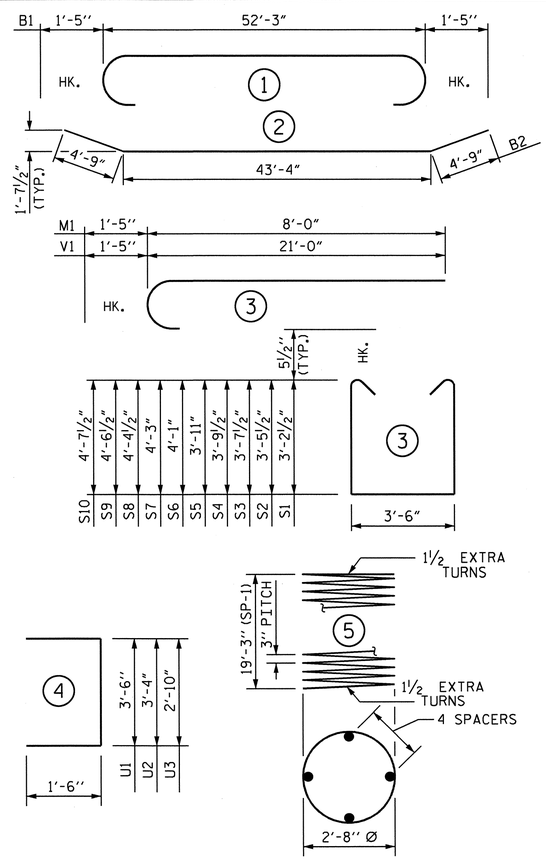


END OF CAP DETAIL



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	1	55'-1"	1422
B2	6	#10	2	52'-10"	1364
B3	6	#5	STR	52'-5"	328
B4	2	#5	STR	51'-4"	107
B5	2	#5	STR	47'-2"	98
B6	12	#4	STR	17'-6"	140
M1	24	#10	3	9'-5"	972
S1	2	#5	3	10'-10"	23
S2	2	#5	3	11'-4"	24
S3	2	#5	3	11'-8"	24
S4	2	#5	3	12'-0"	25
S5	2	#5	3	12'-3"	26
S6	2	#5	3	12'-7"	26
S7	2	#5	3	12'-11"	27
S8	2	#5	3	13'-2"	27
S9	2	#5	3	13'-6"	28
S10	64	#5	3	13'-8"	912
T1	42	#6	STR	7'-2"	452
T2	78	#7	STR	7'-2"	1143
U1	57	#4	4	6'-6"	247
U2	6	#4	4	6'-4"	25
U3	8	#4	4	5'-10"	31
V1	24	#10	3	22'-5"	2315
REINFORCING STEEL				=	9786 LBS

SP-1	3	*	5	660'-1"	1323

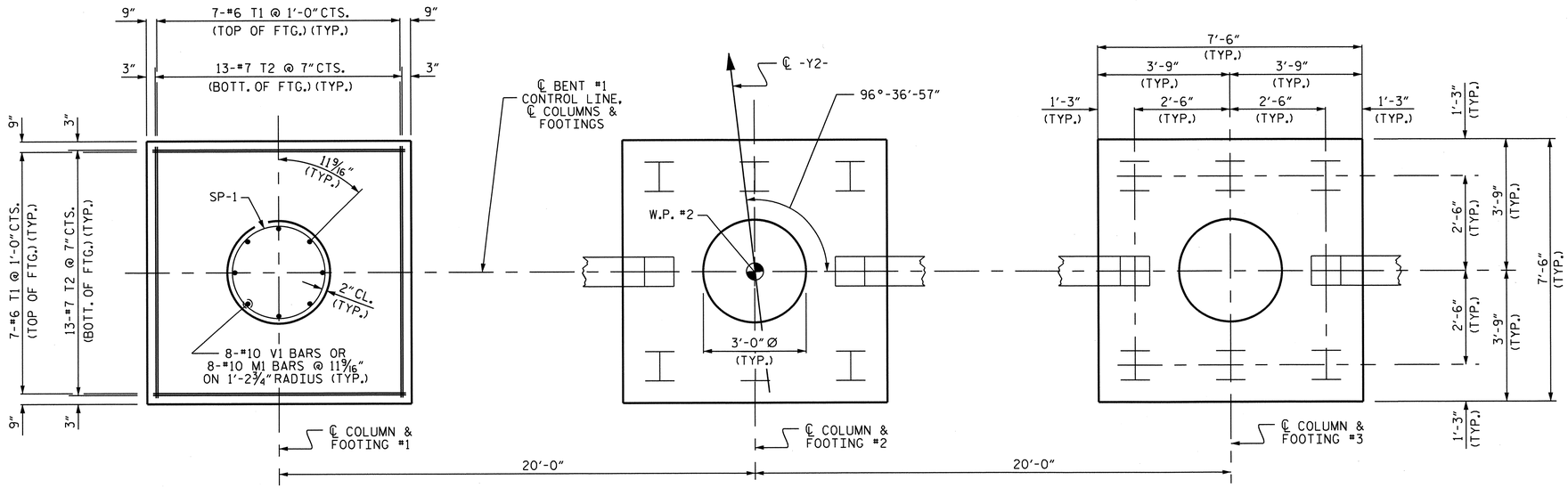
SPIRAL COLUMN REINFORCING STEEL = 1323 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 (FOOTINGS)	=	20.3 C.Y.
POUR #2 (COLUMN)	=	14.9 C.Y.
POUR #3 (CAP)	=	37.9 C.Y.
TOTAL	=	73.1 C.Y.

HP 12 x 53 STEEL PILES NO. 24 = LIN. FT. 1080.0

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



PLAN OF COLUMNS AND FOOTINGS

FOOTING DETAILS ARE TYPICAL

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBERGER 3-6-2013

DRAWN BY : M. G. SHAIKH DATE : 10-06-11
CHECKED BY : H.T. BARBOUR DATE : 12-11

27-DEC-2012 15:09
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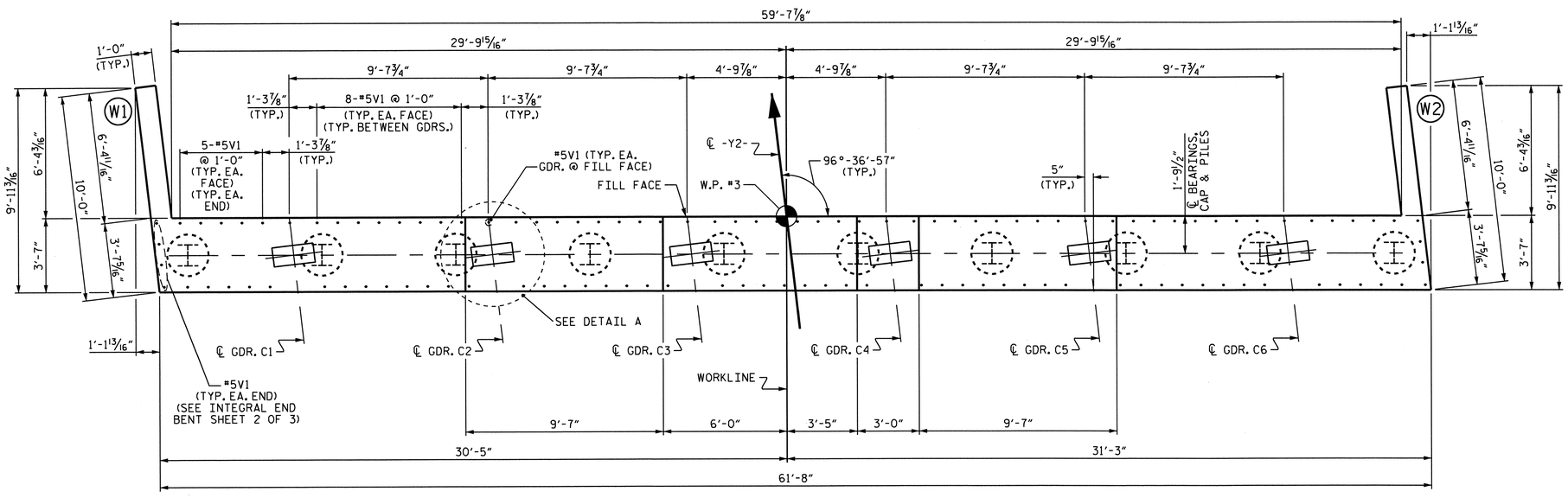
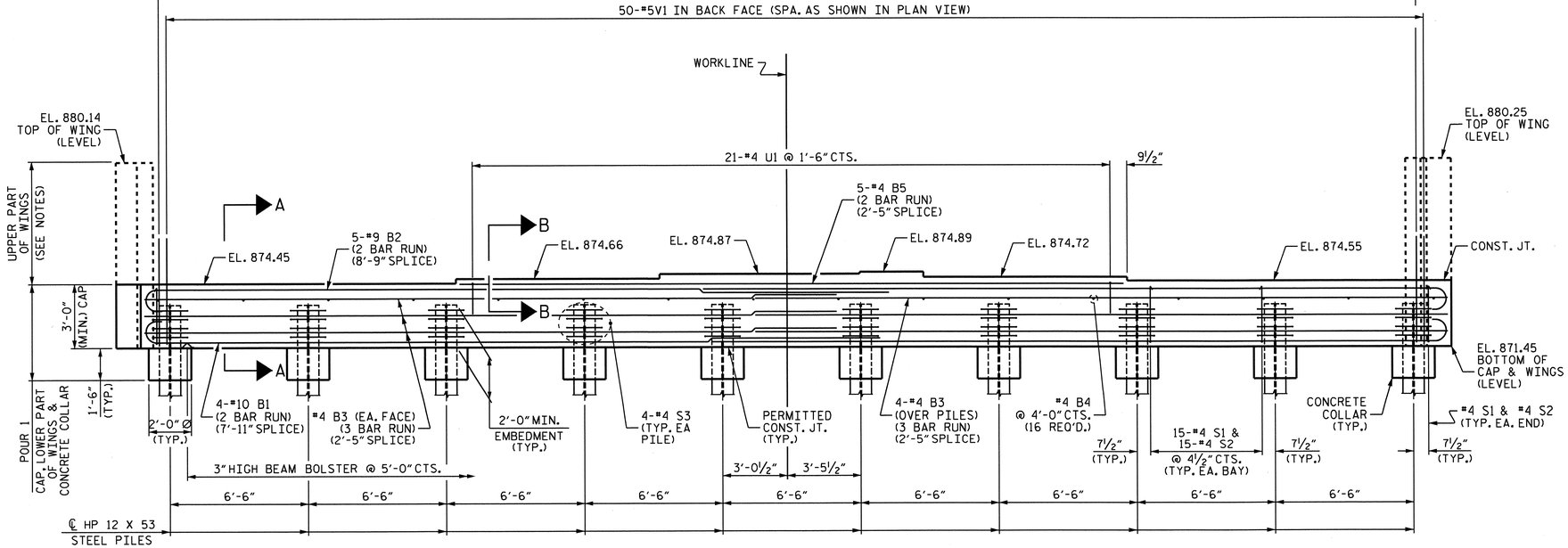
tbarbour

STR #1



PLAN



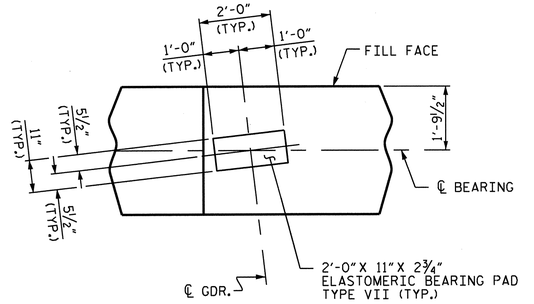
ELEVATION

NOTES

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

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.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE UPPER PART OF THE END BENT WINGS ARE TO BE POURED WITH POUR #3 OF THE SUPERSTRUCTURE.



DETAIL A

PILES NOT SHOWN FOR CLARITY

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRADLEY D. KLAPPENBERGER
3-4-2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 4-13-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

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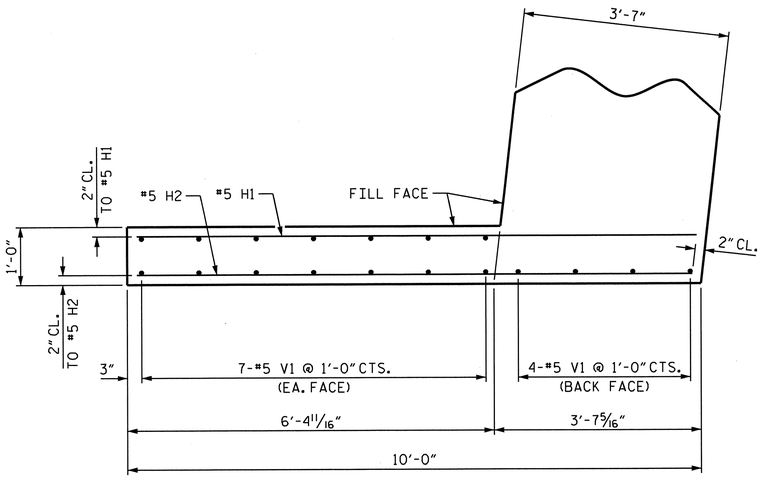
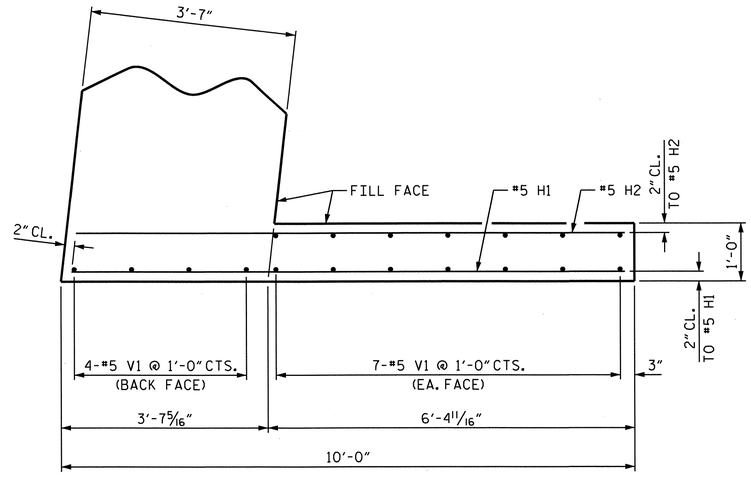
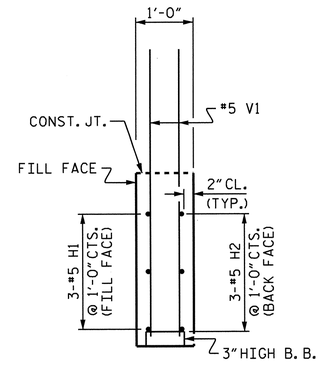


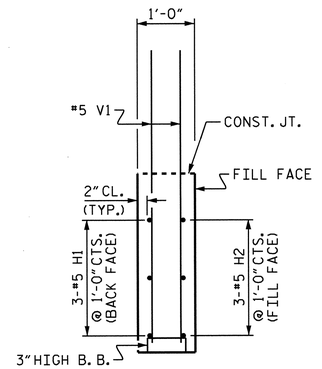
PLAN OF WING (W1)



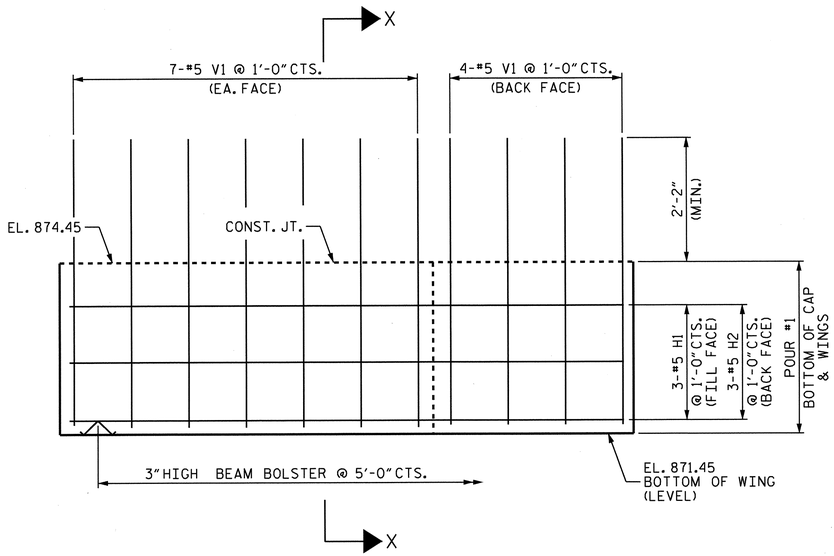
PLAN OF WING (W2)



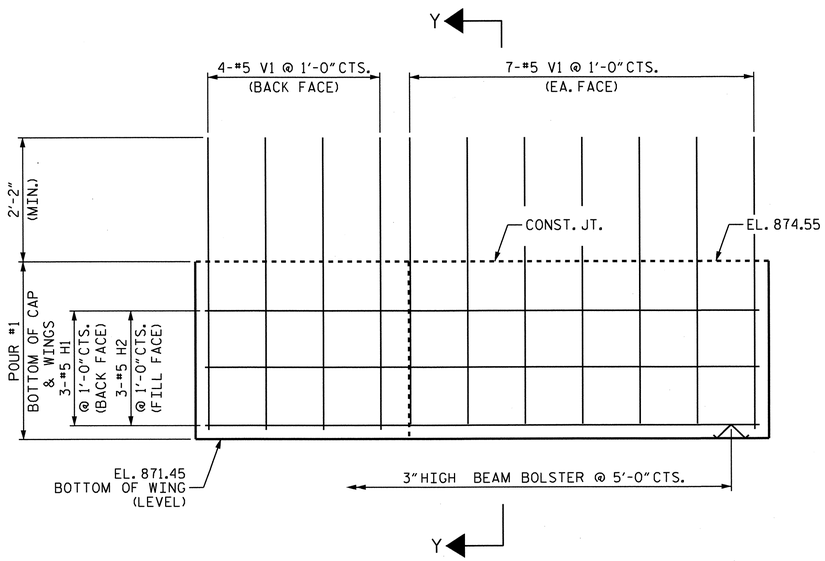
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER D. MCIMER BRIDGE D. KLAPPENBACH
3-9-2013

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 43+66.99 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 4-13-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

13-NOV-2012 10:05
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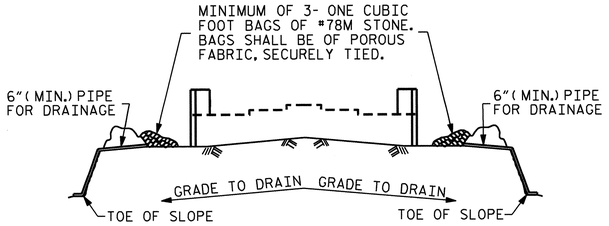
bklappenbach

STR. #1

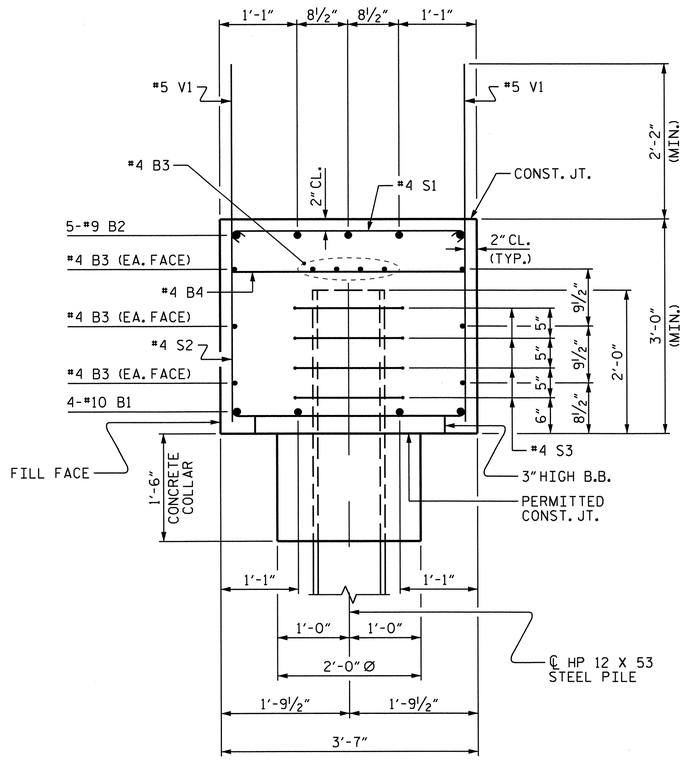


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

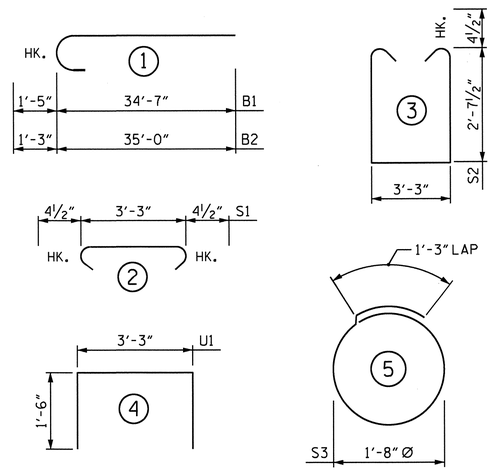
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	36'-0"	1239
B2	10	#9	1	36'-3"	1233
B3	30	#4	STR	22'-1"	443
B4	16	#4	STR	3'-3"	35
B5	10	#4	STR	16'-10"	112
H1	6	#5	STR	9'-6"	59
H2	6	#5	STR	9'-4"	58
S1	137	#4	2	4'-0"	366
S2	137	#4	3	9'-3"	847
S3	40	#4	5	6'-6"	174
U1	21	#4	4	6'-3"	88
V1	142	#5	STR	5'-6"	815

REINFORCING STEEL = 5469 LBS.

CLASS A CONCRETE

* POUR #1 (CAP, LOWER PART OF WINGS & CONCRETE COLLAR)

CU. YDS. 29.3

TOTAL CU. YDS. 29.3

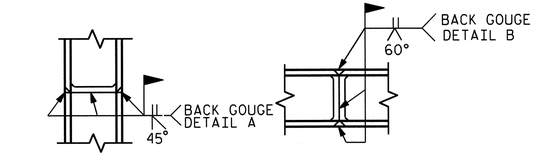
* CONCRETE QUANTITY FOR UPPER PART OF WINGS IN POUR #3 ON SUPERSTRUCTURE.

HP 12 X 53 STEEL PILES

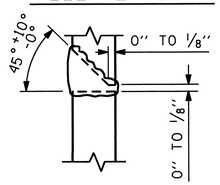
NO. 10 LIN. FT. 550

PILE REDRIVES NO. 10

PDA TESTING NO. 1

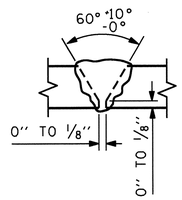


* PILE VERTICAL



DETAIL A

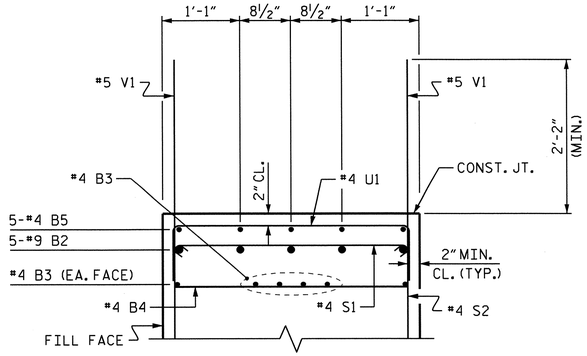
* PILE HORIZONTAL OR VERTICAL



DETAIL B

* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



PARTIAL SECTION B-B

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
INTEGRAL
END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-5-2017

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 4-13-11
CHECKED BY : H.T. BARBOUR DATE : 12/11

27-DEC-2012 12:53
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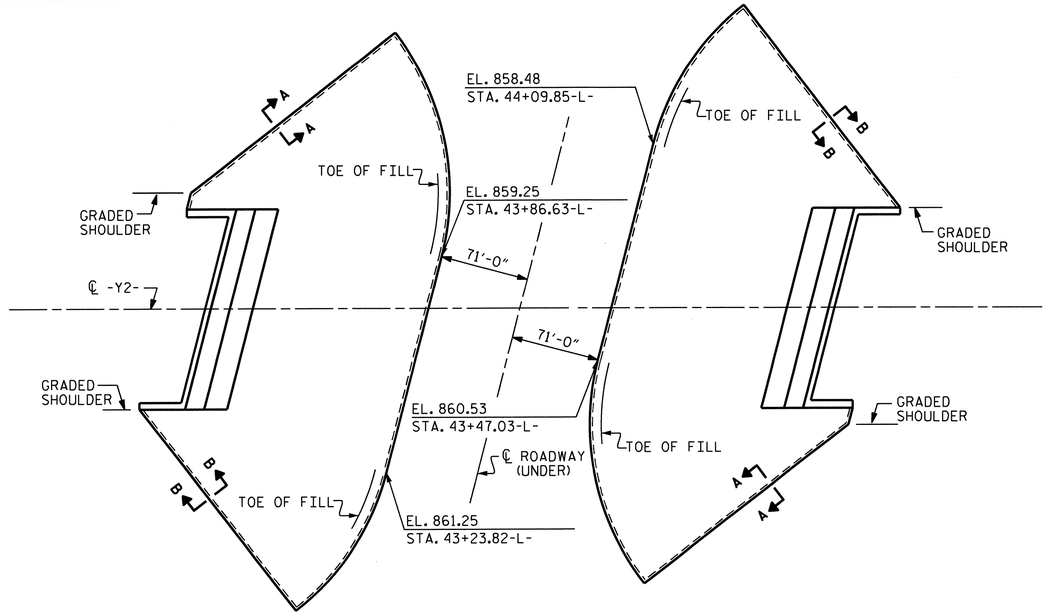
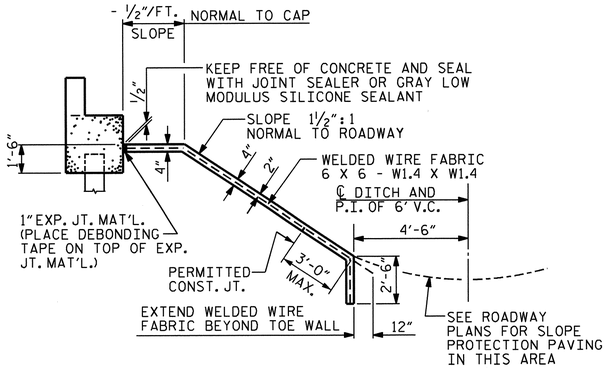
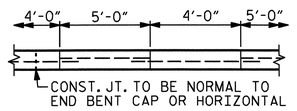
tbarbour



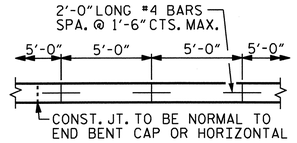


SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH



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

OPTIONAL POURING DETAIL



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

GENERAL NOTES

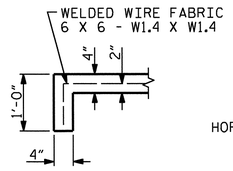
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. THE CONTRACTOR, AT HIS OPTION, MAY USE ALTERNATE "B" ONLY FOR HIGHWAY OVER HIGHWAY GRADE SEPARATIONS WITH 2:1 END BENT SLOPE IN RURAL, UNPOPULATED AREAS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

ALTERNATE "A"

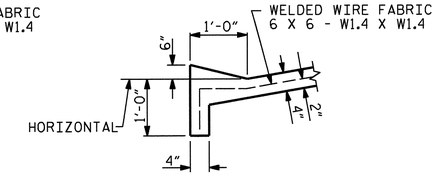
ALTERNATE "A" SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE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

BRIDGE @ STA. 43+66.99-L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	459	918
END BENT 2	390	780
TOTAL	849	1698

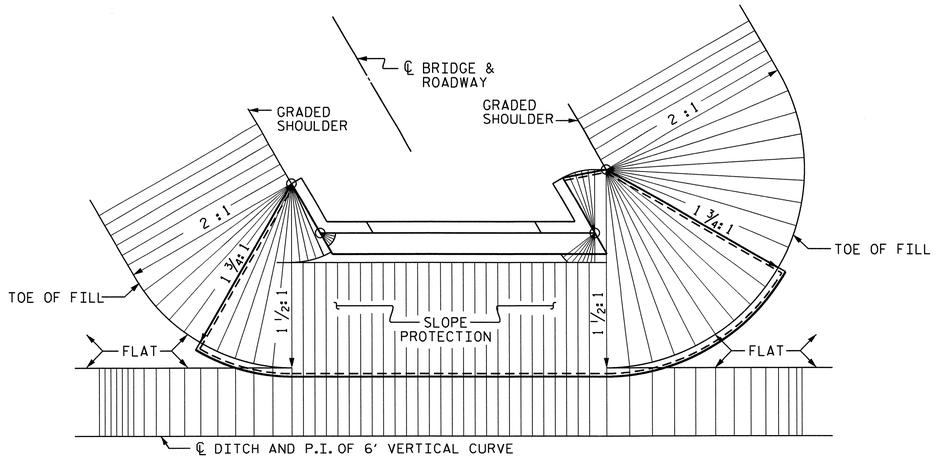
* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION A-A



SECTION B-B



PLAN - END BENT WITH SWEPT BACK WINGS - SKEWED

(1 ½: 1 SLOPE)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99-L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

ASSEMBLED BY : H. T. BARBOUR	DATE : 10-04-11
CHECKED BY : D. A. GLADDEN	DATE : 2-12
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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
5-9-2013

STD. NO. SP1 (SHT 6)

08-MAR-2013 10:11
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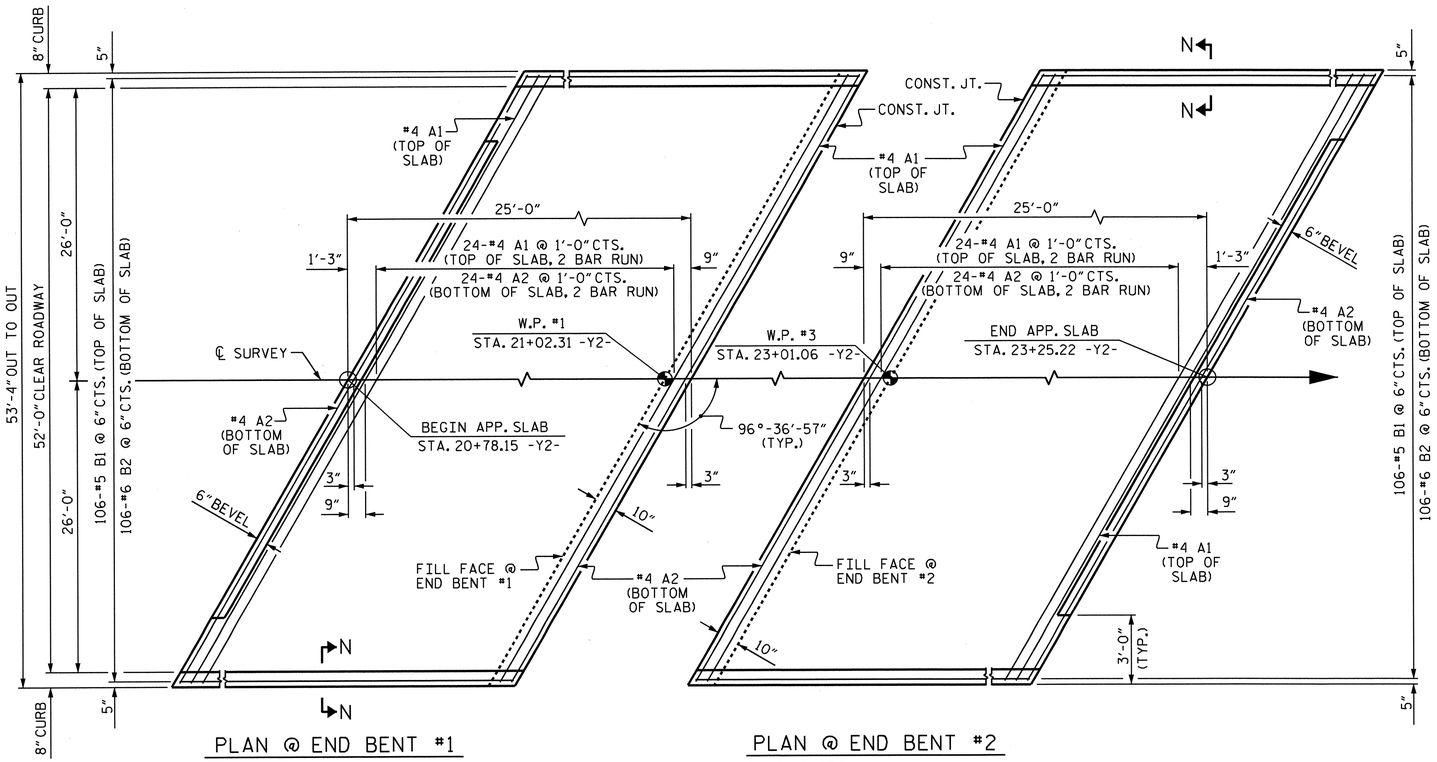
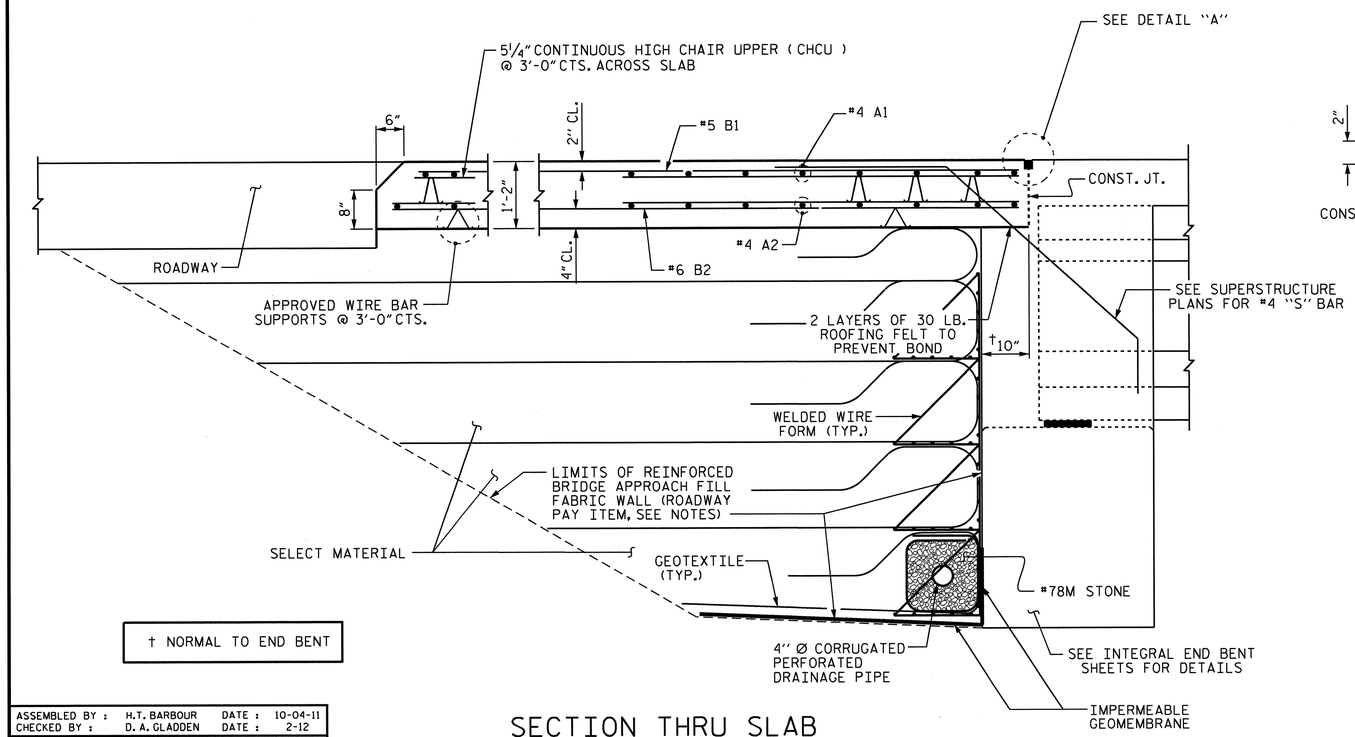
bklappenbach



PLAN @ END BENT #1

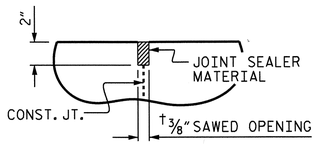
PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

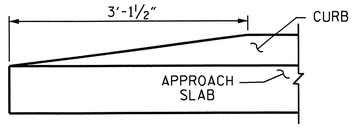


† NORMAL TO END BENT

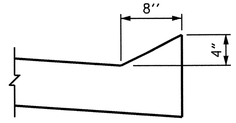
SECTION THRU SLAB



DETAIL "A"



END OF CURB WITHOUT SHOULDER BERM GUTTER



SECTION N-N

NOTES

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

FOR 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	27'-9"	964
A2	52	#4	STR	27'-7"	958
* B1	106	#5	STR	24'-2"	2672
B2	106	#6	STR	24'-7"	3914
REINFORCING STEEL				4872	LBS.
* EPOXY COATED REINFORCING STEEL				3636	LBS.
CLASS AA CONCRETE					
POUR #1 - SLAB & CURB				58.2	C.Y.

SPLICE LENGTHS

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

ASSEMBLED BY :	H.T. BARBOUR	DATE :	10-04-11
CHECKED BY :	D. A. GLADDEN	DATE :	2-12
DRAWN BY : TLA	10/05	ADDED 5/1/06RR	KMM/GM
CHECKED BY : GM	5/06	REV. 10/1/11	MAA/GM
		REV. 12/21/11	MAA/GM

02-JAN-2013 11:35
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tbarbour

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE E. MOWERY D. KLAPPENBACH
3-5-2013

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

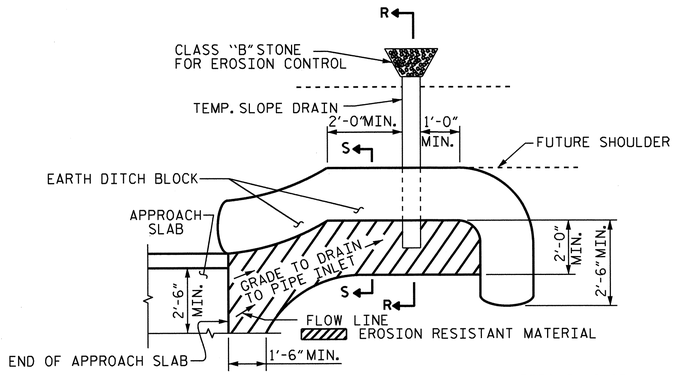
STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			96

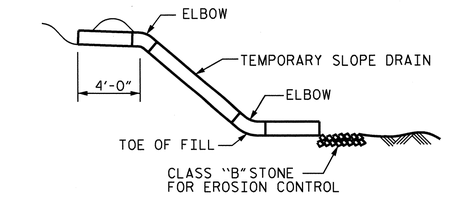
STR #1

STD. NO. BAS5 (SHT 2b)

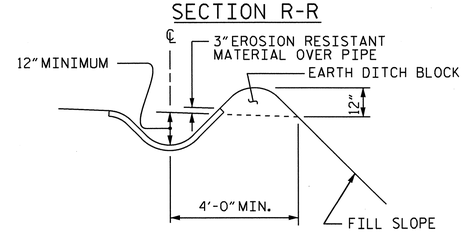


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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



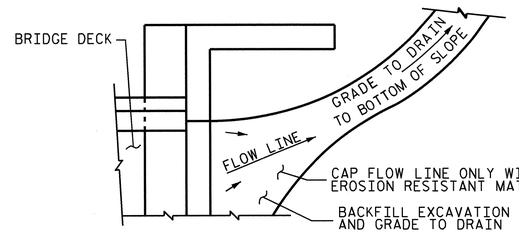
SECTION R-R



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

ASSEMBLED BY :	H.T. BARBOUR	DATE :	10-04-11
CHECKED BY :	D. A. GLADDEN	DATE :	2-12
DRAWN BY : FCJ	11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB	11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06RR	MAA/KMM

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bklappenbach

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 43+66.99-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-5-2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			96

STR #1 STD. NO. BAS10

F.A. PROJECT NO. NHF-74(141)

35+50 36+00 36+50 37+00 37+50 38+00 38+50 39+00 39+50

+4.9404% -2.5500%

P. I. STA. = 37+40.00 -RAMP B-
EL. = 928.130
V. C. = 760'

GRADE DATA -RAMP B-

930 920 910 900 890 880 870

SPAN A

FILL FACE @ END BENT #1
STA. 36+06.67 -RAMP B-
GRADE POINT EL. 918.54

1'-2" MIN. BERM
NORMAL TO CAP

EXP.

1½:1 SLOPE
NORMAL TO CAP

4" CONCRETE
SLOPE PROTECTION

FILL

1'-6"

EL. 901.0±

HP 12X53
STEEL PILES
(TYP.)

EL. 901.0±

APPROXIMATE
EXISTING
GROUND LINE

PAVED DITCH
(RDWY. DETAIL
& PAY ITEM)

EL. 902.0±

EL. 902.0±

EL. 903.0±

EL. 905.0±

TEMP.
BENT

MIN. VERTICAL
CLEARACE

19'-4"

TOP OF FOOTING
EL. 888.92

EL. 907.0±

FIX.

HP 12X53
STEEL PILES
(TYP.)

SPAN B

EL. 911.0±

EL. 908.0±

EL. 909.0±

MIN. VERTICAL
CLEARACE

17'-3"

1'-1" MIN. BERM
NORMAL TO CAP

1½:1 SLOPE
NORMAL TO CAP

4" CONCRETE
SLOPE
PROTECTION

EXP.

EL. 911.0±

EL. 912.0±

PAVED DITCH
(RDWY. DETAIL
& PAY ITEM)

FILL FACE @ END BENT #2
STA. 39+24.17 -RAMP B-
GRADE POINT EL. 921.54

FILL

1'-6"

EL. 912.0±

EL. 912.0±

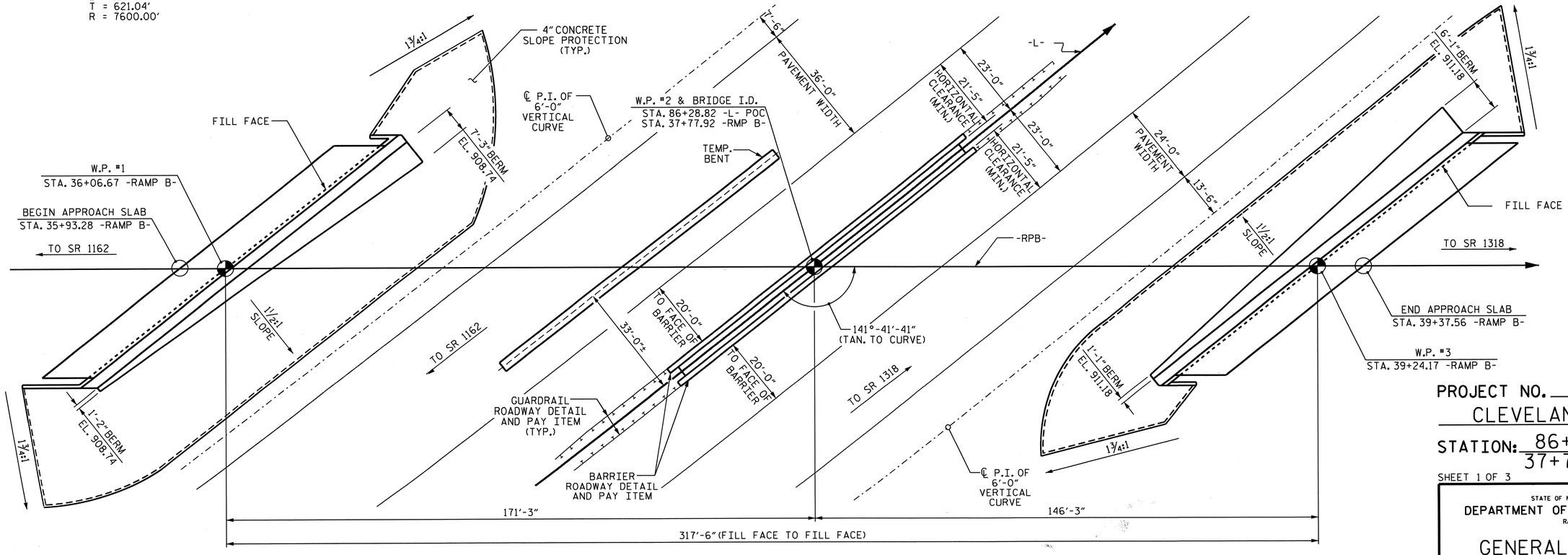
END BENT #1 BENT #1 END BENT #2

SECTION ALONG SURVEY LINE -RAMP B-

(BENTS ON SECTION AT RIGHT ANGLES TO BENTS)

HORIZONTAL CURVE DATA

PI. STA. 87+95.02 -L-
Δ = 09°-20'-35.7" (LT)
D = 0°-45'-14.0"
L = 1239.34'
T = 621.04'
R = 7600.00'



PLAN

(PILES AND FOOTING NOT SHOWN IN PLAN VIEW)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-
37+77.92 -RPB-

SHEET 1 OF 3 BRIDGE NO. 452

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER US 74
ON RAMP B BETWEEN
SR 1162 AND SR 1318

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHUCK CHARLES HUNT 1/11/13

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR. 1-5-13

DRAWN BY : D. A. DAVENPORT DATE : 01/25/12
CHECKED BY : M.K. BEARD DATE : 5/8/12

03-JAN-2013 11:49
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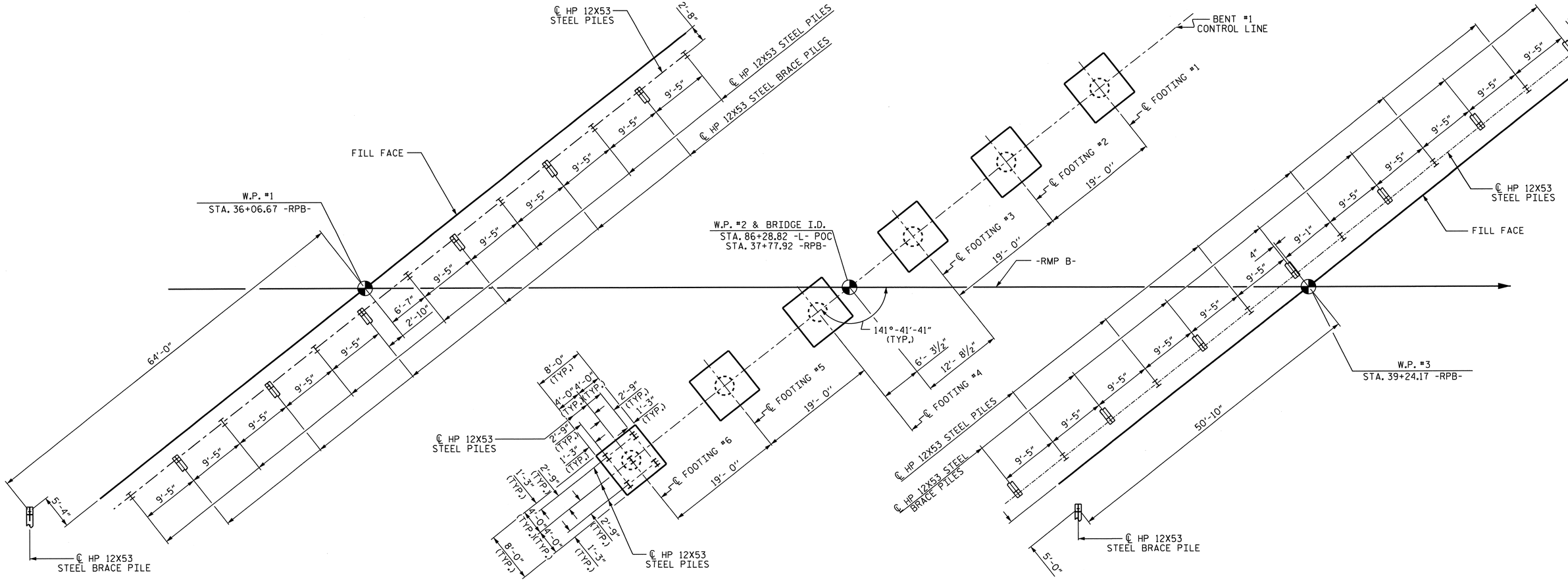
adavenport

STR #2



FOUNDATION LAYOUT

BATTER PILES IN END BENTS ARE BATTERED 3:12.

FOR PILES SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

DRIVE PILES AT END BENT #1 AND END BENT #2 TO A REQUIRED DRIVING RESISTANCE OF 250 TONS PER PILE.

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

DRIVE PILES AT BENT #1 TO A REQUIRED DRIVING RESISTANCE OF 260 TONS PER PILE.

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

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT JR

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER US 74
ON RAMP B BETWEEN
SR 1162 AND SR 1318

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			96

STR #2

DRAWN BY : D. A. DAVENPORT DATE : 01/25/12
CHECKED BY : M.K. BEARD DATE : 5/8/12

03-JAN-2013 11:49
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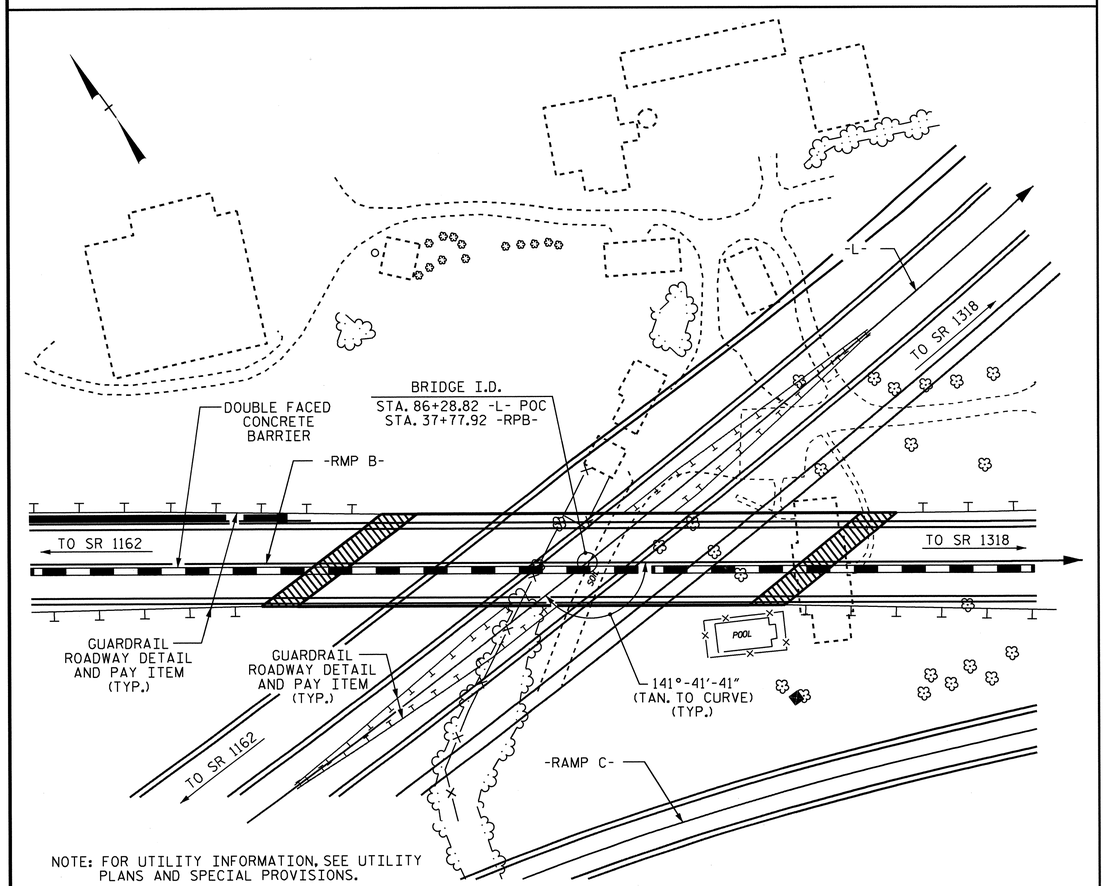
ddavenport

BENCHMARK: BM #5 RAIL ROAD SPIKE IN 28"OAK STA. 19+34.59 -Y4-, EL. 908.11



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

LOCATION SKETCH

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 REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

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.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

GIRDER ERECTION SEQUENCE

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION. ONE EXTERIOR GIRDER AND ITS ADJACENT INTERIOR GIRDER SHALL BE ERECTED WITH ALL DIAPHRAGMS AND LATERAL BRACING BETWEEN THE GIRDERS IN PLACE AND ALL BOLTS TIGHTENED PRIOR TO RELEASE OF THE GIRDERS. THE REMAINING GIRDERS SHALL THEN BE ERECTED WITH DIAPHRAGMS CONNECTING THE GIRDER TO THE ADJACENT ERECTED GIRDER AND ALL BOLTS TIGHTENED BEFORE RELEASING THE GIRDER.

A MINIMUM OF ONE TEMPORARY BENT SHALL BE USED.

TEMPORARY BENTS SHALL REMAIN IN PLACE UNTIL ALL CROSS FRAMES AND LATERAL BRACING ARE IN PLACE AND HIGH STRENGTH BOLTS TIGHTENED.

THE LOCATION OF THE TEMPORARY BENT SHOWN ON SHEET 1 IS AN APPROXIMATE LOCATION AND SHALL BE ADJUSTED BY THE CONTRACTOR AS NECESSARY.

PLANS FOR THE TEMPORARY BENT, ERECTION SEQUENCE AND TEMPORARY BENT REMOVAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

THE TEMPORARY BENT SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NORTH CAROLINA.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, TO ENSURE STABILITY OF THE GIRDERS, AVOID UPLIFT OF THE GIRDERS AT THE TEMPORARY ERECTION BENTS AND MAINTAIN PLUMBNESS OF THE GIRDER WEBS.

THE CONTRACTOR'S ERECTION PLAN SHALL INCLUDE A METHOD OF TEMPORARY BENT REMOVAL THAT WILL UNIFORMLY APPLY THE STRUCTURAL STEEL WEIGHT TO THE BRIDGE CROSS FRAMES.

GIRDERS SHALL BE ERECTED AS FOLLOWS. THE FIRST GIRDER SECTION SHALL BE PLACED FROM END BENT #1 TO THE TEMPORARY BENT. THE REMAINING PORTION OF THE GIRDER SHALL BE ERECTED FROM END BENT #2 TO THE BOLTED FIELD SPLICE AT THE TEMPORARY BENT. THE CONTRACTOR MAY SUBMIT ALTERNATE ERECTION METHODS. PLANS FOR SUCH ERECTION METHODS SHALL BE APPROVED BY THE ENGINEER.

FOR TEMPORARY BENTS, SEE SPECIAL PROVISIONS

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP12X53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	CONCRETE MEDIAN BARRIER RAIL	4" SLOPE PROTECTION	POT BEARINGS	FOAM JOINT SEALS
	LUMP SUM	EA.	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	APPROX. LBS.	NO.	LIN.FT.	EA.	LIN.FT.	LIN.FT.	SQ.YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			21,126	18,918		LUMP SUM			872,300				628.28	347.30		LUMP SUM	LUMP SUM
END BENT #1					92.8		14,239			14	1190	13			895		
BENT #1	LUMP SUM				127.5		18,497	2,778		30	1500	24					
END BENT #2					104.2		14,962			14	770	13			755		
TOTAL	LUMP SUM	1	21,126	18,918	324.5	LUMP SUM	47,698	2,778	872,300	58	3460	50	628.28	347.30	1650	LUMP SUM	LUMP SUM

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER US 74
ON RAMP B BETWEEN
SR 1162 AND SR 1318

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR.
1-3-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : D. A. DAVENPORT DATE : 01/25/12
CHECKED BY : M.K. BEARD DATE : 5/8/12

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STR #2

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE II 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	1.06	--	1.75	.738	1.30	A	INT	166.95	1.311	1.06	A	INT	0.00	1.30	.738	1.44	A	INT	166.95	
		HL-93 (OPERATING)	N/A		1.37	--	1.35	.738	1.68	A	INT	166.95	1.311	1.37	A	INT	0.00	1.00	.738	1.88	A	INT	166.95	
		HS-20 (INVENTORY)	36.00	2	1.60	57.60	1.75	.738	2.94	A	INT	166.95	1.311	1.60	A	INT	0.00	1.30	.800	3.22	A	EXT	66.78	
		HS-20 (OPERATING)	36.00		2.07	74.52	1.35	.738	3.82	A	INT	166.95	1.311	2.07	A	INT	0.00	1.00	.800	4.19	A	EXT	66.78	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		5.04	68.04	1.40	.738	9.61	A	INT	166.95	1.311	5.04	A	INT	0.00	1.30	.796	7.88	B	EXT	92.27	
		SNGARBS2	20.000		3.49	69.80	1.40	.738	6.60	A	INT	166.95	1.311	3.49	A	INT	0.00	1.30	.796	5.59	B	EXT	92.27	
		SNAGRIS2	22.000		3.20	70.40	1.40	.738	6.04	A	INT	166.95	1.311	3.20	A	INT	0.00	1.30	.796	5.18	B	EXT	92.27	
		SNCOTTS3	27.250		2.51	68.40	1.40	.738	4.72	A	INT	166.95	1.311	2.51	A	INT	0.00	1.30	.796	3.93	B	EXT	92.27	
		SNAGGRS4	34.925		2.02	70.55	1.40	.738	3.66	A	INT	166.95	1.311	2.02	A	INT	0.00	1.30	.800	3.18	A	EXT	66.78	
		SNS5A	35.550		2.01	71.46	1.40	.738	3.60	A	INT	166.95	1.311	2.01	A	INT	0.00	1.30	.800	3.13	A	EXT	66.78	
		SNS6A	39.950		1.81	72.31	1.40	.738	3.21	A	INT	166.95	1.311	1.81	A	INT	0.00	1.30	.800	2.82	A	EXT	66.78	
		SNS7B	42.000		1.75	73.50	1.40	.738	3.05	A	INT	166.95	1.311	1.75	A	INT	0.00	1.30	.800	2.69	A	EXT	66.78	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.17	71.61	1.40	.738	3.92	A	INT	166.95	1.311	2.17	A	INT	0.00	1.30	.800	3.44	A	EXT	66.78	
		TNT4A	33.075		2.14	70.78	1.40	.738	3.88	A	INT	166.95	1.311	2.14	A	INT	0.00	1.30	.800	3.42	A	EXT	66.78	
		TNT6A	41.600		1.81	75.30	1.40	.738	3.09	A	INT	166.95	1.311	1.81	A	INT	0.00	1.30	.800	2.76	A	EXT	66.78	
		TNT7A	42.000		1.78	74.76	1.40	.738	3.07	A	INT	166.95	1.311	1.78	A	INT	0.00	1.30	.800	2.75	A	EXT	66.78	
		TNT7B	42.000		1.73	72.66	1.40	.738	3.08	A	INT	166.95	1.311	1.73	A	INT	0.00	1.30	.800	2.78	A	EXT	66.78	
		TNAGRIT4	43.000		1.68	72.24	1.40	.738	2.99	A	INT	166.95	1.311	1.68	A	INT	0.00	1.30	.800	2.70	A	EXT	66.78	
		TNAGT5A	45.000		1.64	73.80	1.40	.738	2.86	A	INT	166.95	1.311	1.64	A	INT	0.00	1.30	.800	2.57	A	EXT	66.78	
		TNAGT5B	45.000	3	1.60	72.00	1.40	.738	2.85	A	INT	166.95	1.311	1.60	A	INT	0.00	1.30	.800	2.55	A	EXT	66.78	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75																					

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

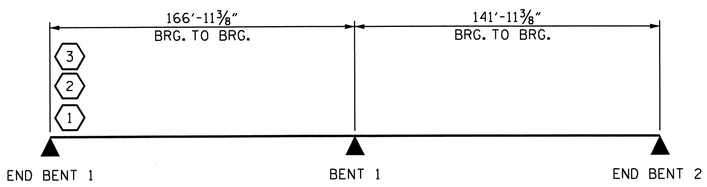
1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93) **
(2) DESIGN LOAD RATING (HS-20) **
(3) LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER ANDRE DAVENPORT
9/7/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			96

ASSEMBLED BY : D.A. DAVENPORT DATE : 02/29/12
CHECKED BY : M.K. BEARD DATE : 05/08/12
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08
REV. 11/12/08 RR MAA/GM
REV. 10/1/11 MAA/GM

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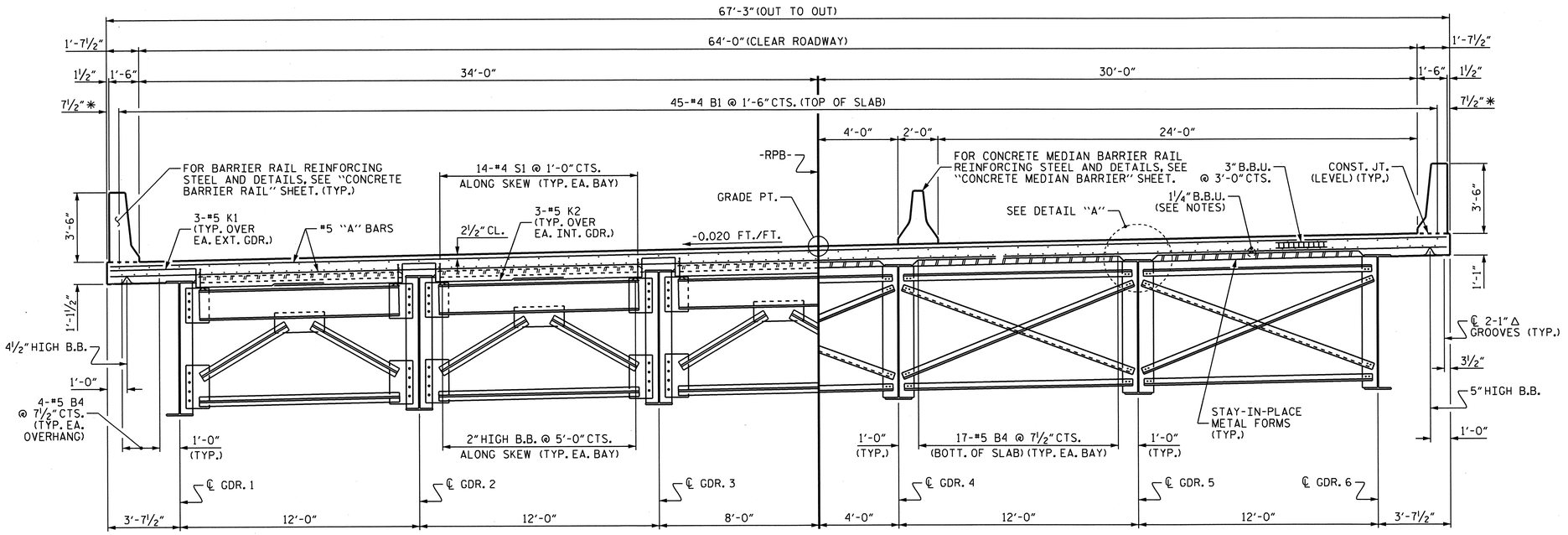
STR.#2

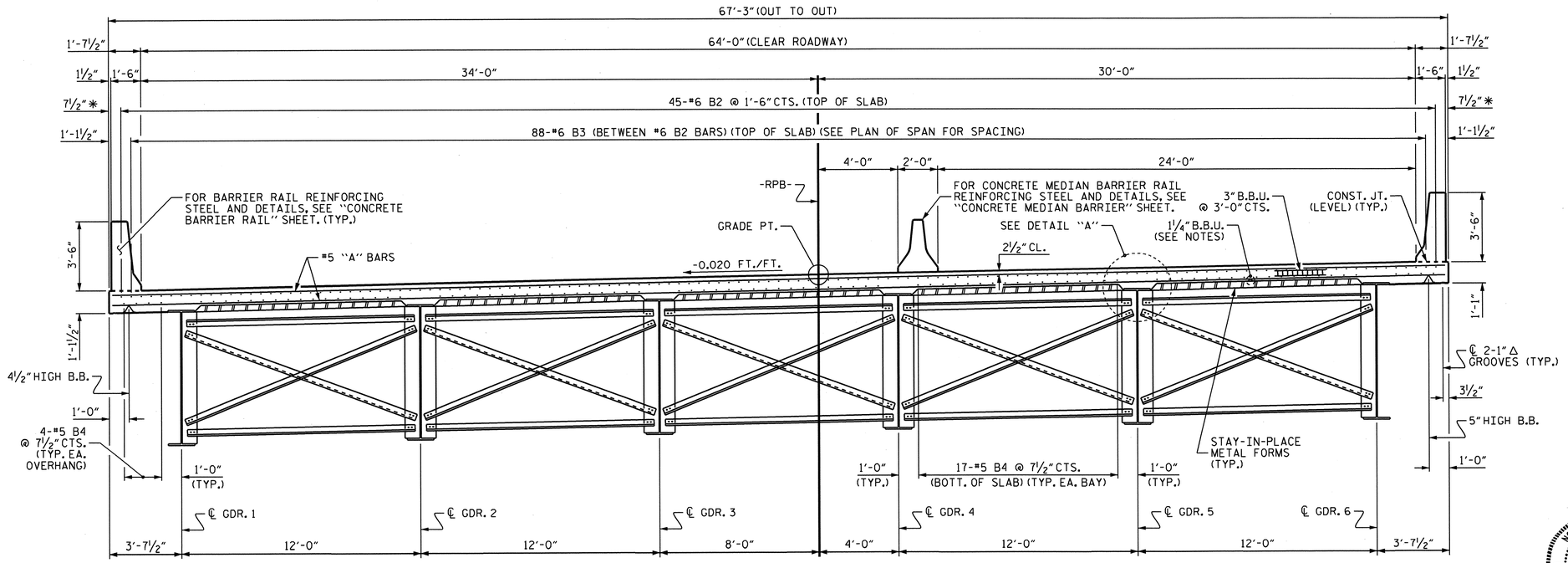
STD. NO. LRFR3



PARTIAL TYPICAL SECTION
(SHOWING END BENT DIAPHRAGMS)

PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

TYPICAL SECTION



TYPICAL SECTION AT BENT DIAPHRAGM

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE STAY-IN-PLACE METAL 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.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN STAY-IN-PLACE METAL FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE STAY-IN-PLACE METAL FORM WORKING DRAWINGS.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

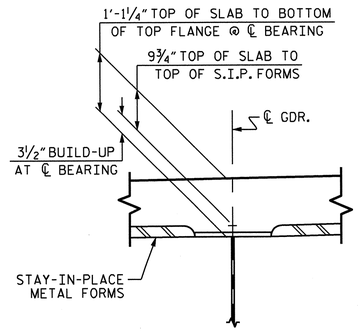
BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDUPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN POT BEARING DEPTH OF 1/2", SEE SPECIAL PROVISION FOR POT BEARINGS.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

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

* EXTERIOR "B" BAR IN TOP OF SLAB MAY BE SHIFTED AS NECESSARY FOR TIEING OF BARRIER RAIL REINFORCING.



DETAIL "A"

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 86+28.82 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER DAVID A. PORT, JR.
11-15-12

DRAWN BY : E.C. LOCKLEAR DATE : 5-02-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

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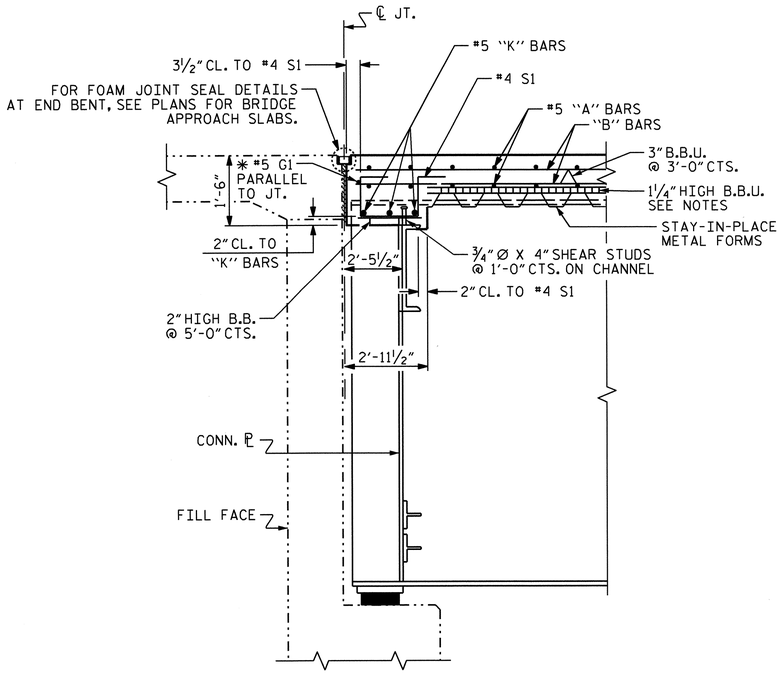
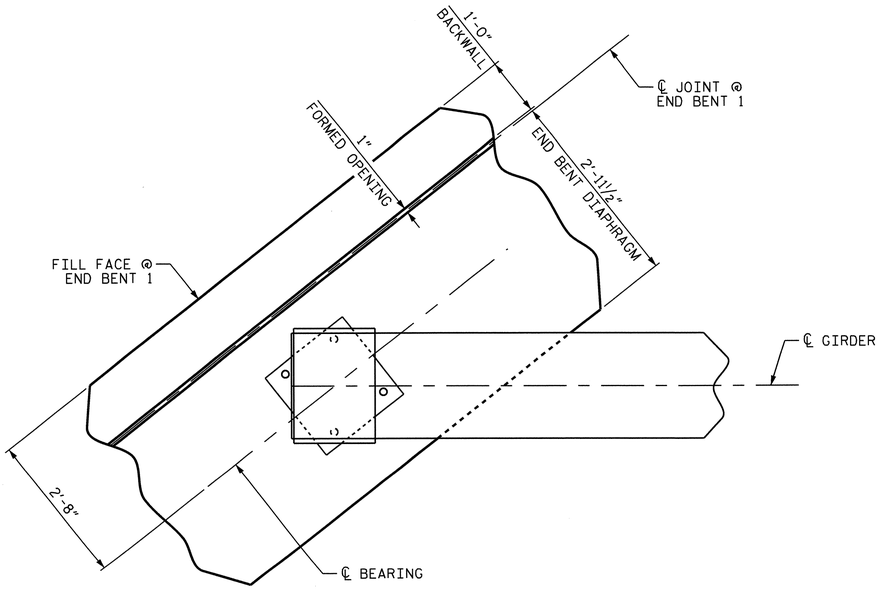


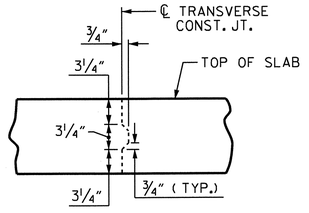
SECTION AT END BENT

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



PLAN AT END BENT #1

(END BENT #2 SIMILAR)



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT JR.
3/7/12

DRAWN BY : E.C. LOCKLEAR DATE : 5-02-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

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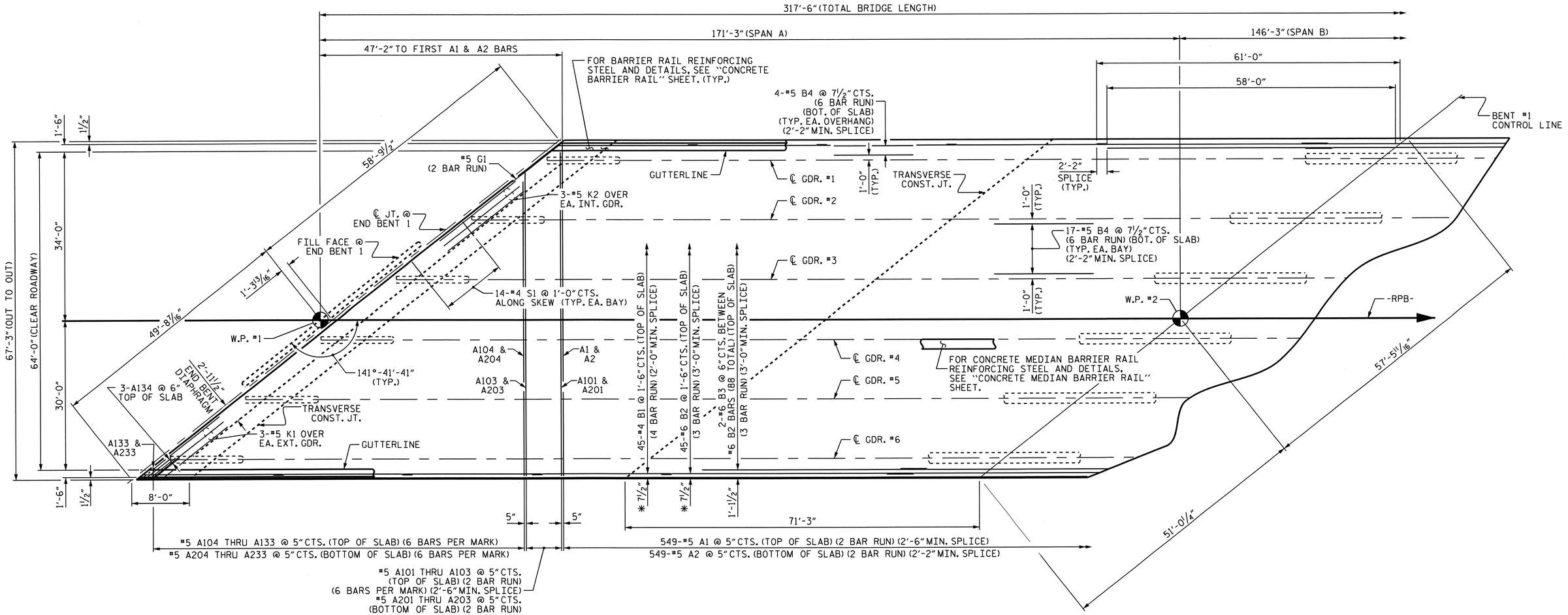

PLAN OF SPAN A

*EXTERIOR "B" BAR IN TOP OF SLAB MAY BE SHIFTED AS NECESSARY FOR TIEING OF BARRIER RAIL REINFORCING.

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR.
9/7/12

DRAWN BY : E.C. LOCKLEAR DATE : 5-03-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

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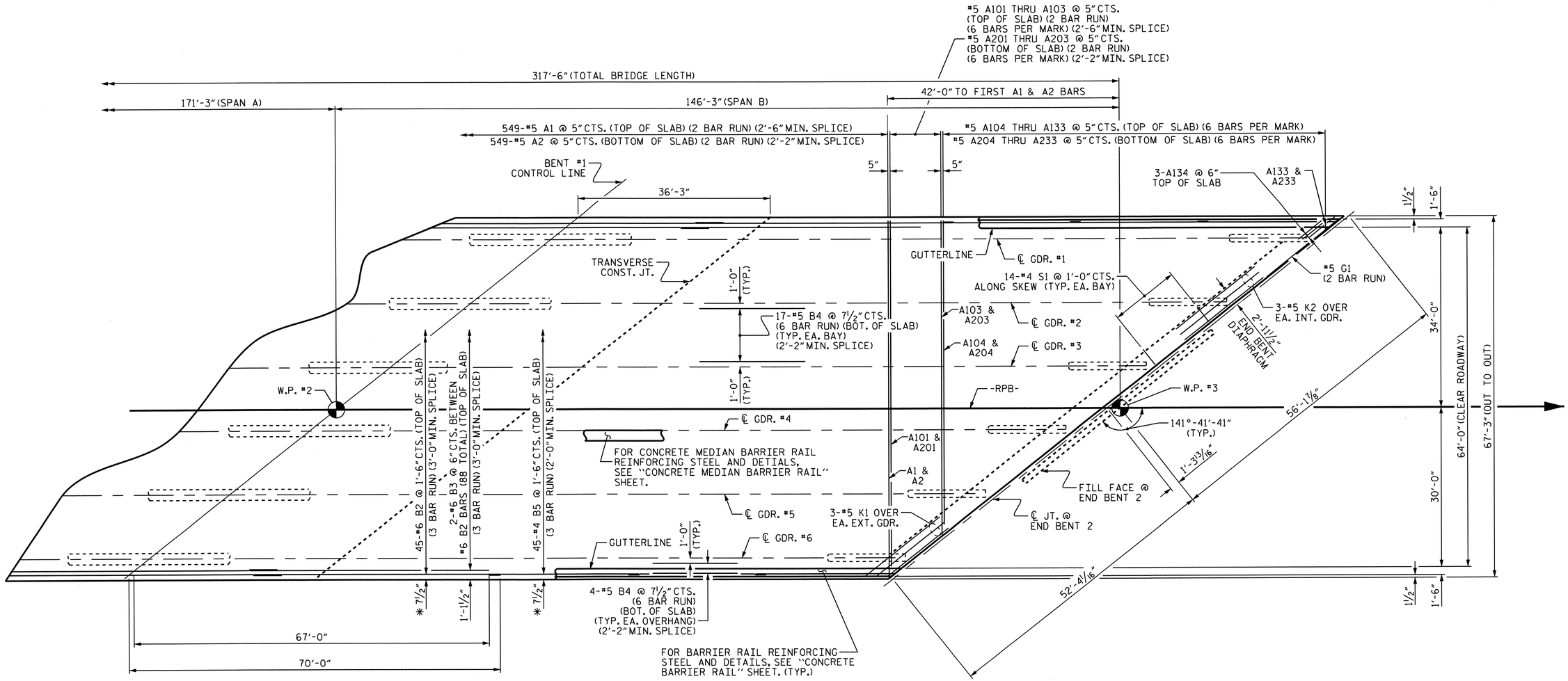

PLAN OF SPAN B

*EXTERIOR "B" BAR IN TOP OF SLAB MAY BE SHIFTED AS NECESSARY FOR TIEING OF BARRIER RAIL REINFORCING.

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT JR.
D. Andre Davenport 9/7/12

DRAWN BY : E.C. LOCKLEAR DATE : 5-03-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

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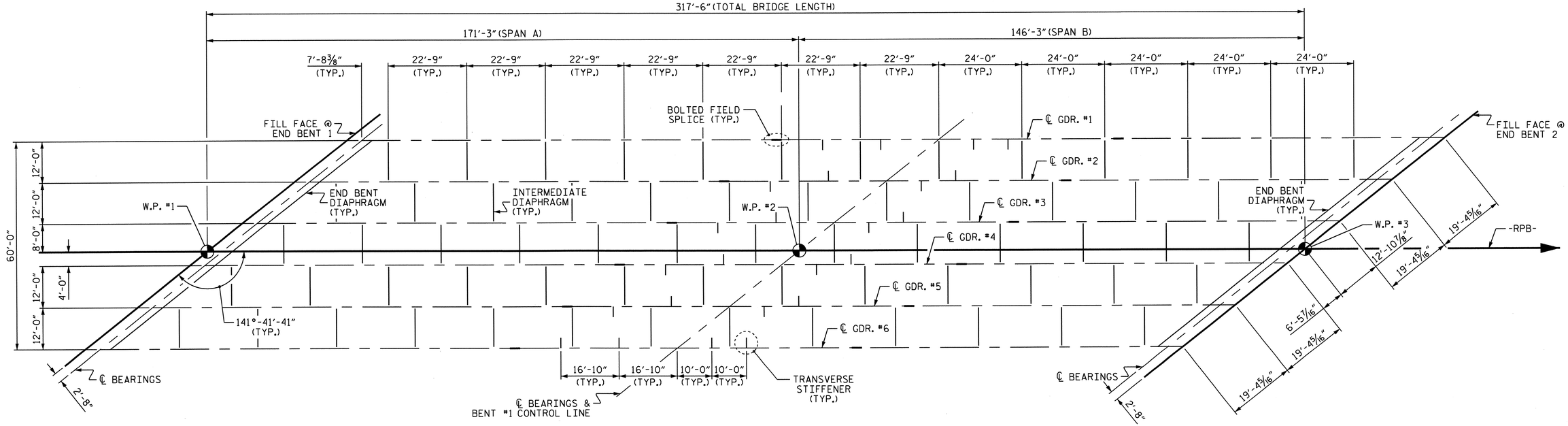

FRAMING PLAN

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER DANDRE DAVENPORT
9/7/12

DRAWN BY : E.C. LOCKLEAR DATE : 5-04-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

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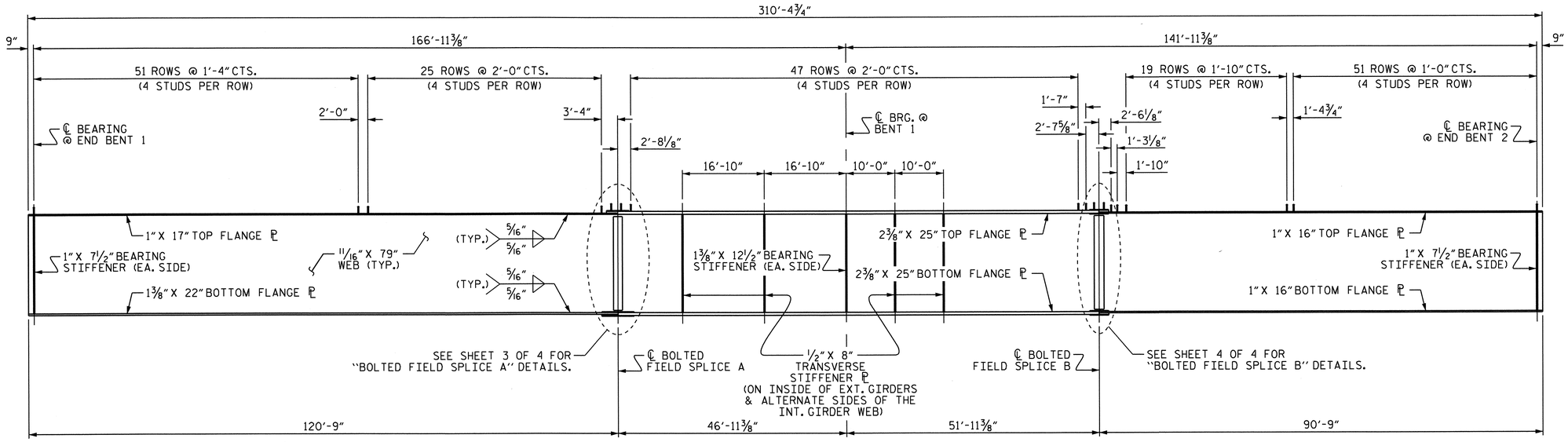
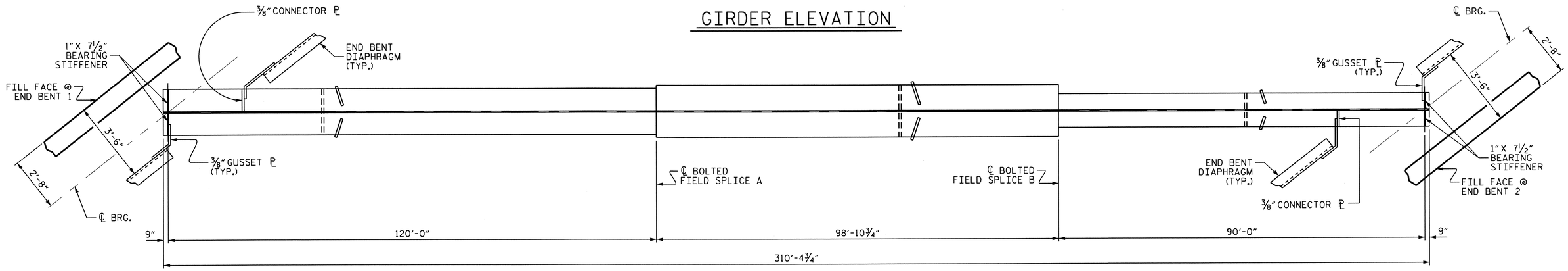
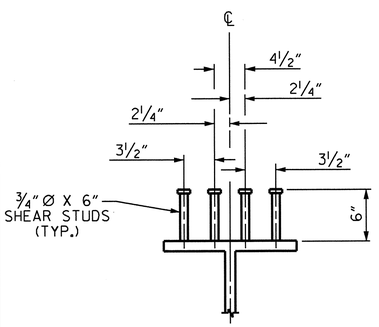


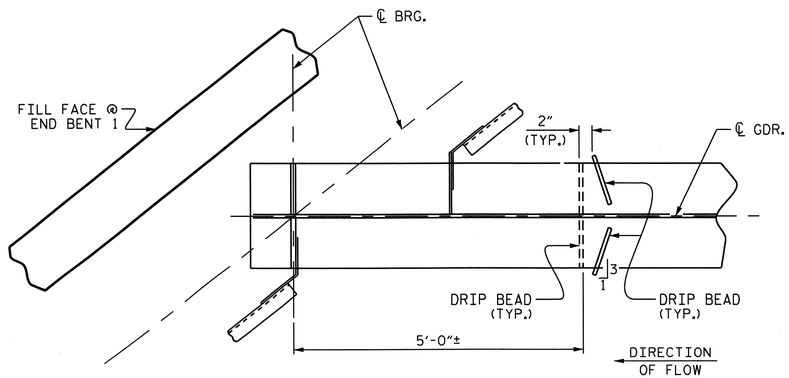
GIRDER ELEVATION



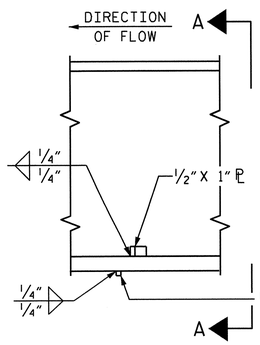
BOTTOM FLANGE DETAIL



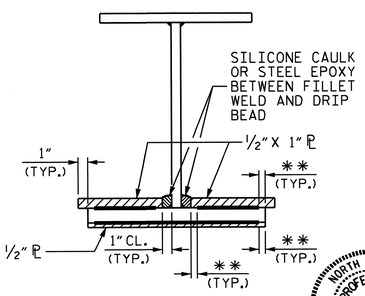
SHEAR STUD DETAILS



PART PLAN - BOTTOM FLANGE



SECTION



VIEW A-A

**¼" ± ⅛"

DRIP BEAD DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT JR.
9/7/12

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 86+28.82 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			96

STR. #2

DRAWN BY : E.C. LOCKLEAR DATE : 5-19-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

04-SEP-2012 14:26
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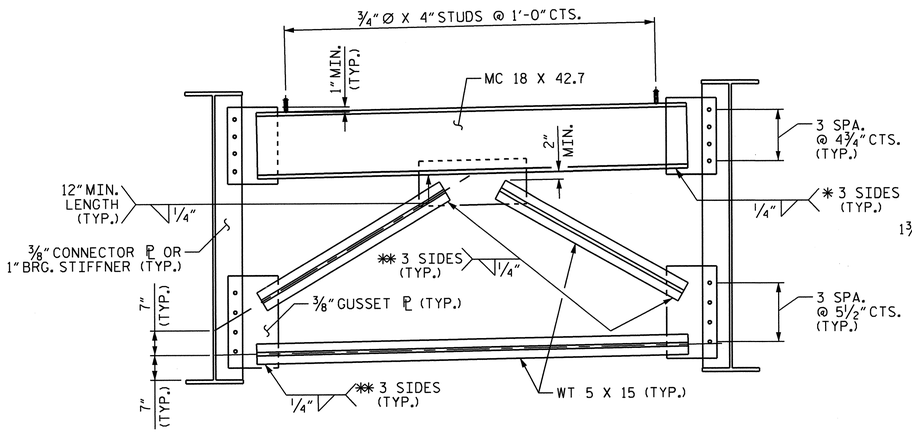
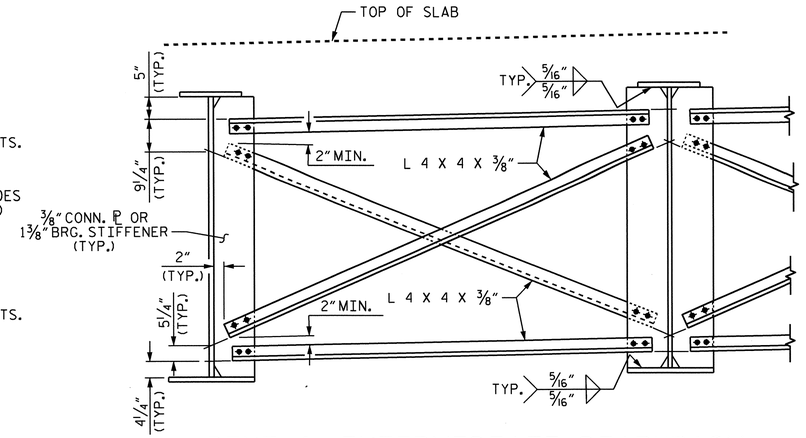
adavenport

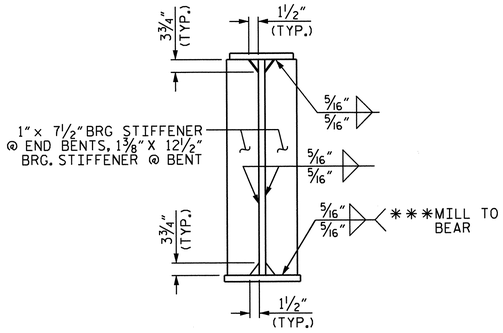


END BENT DIAPHRAGM

* 14" MIN. WELD LENGTH
** 8" MIN. WELD LENGTH

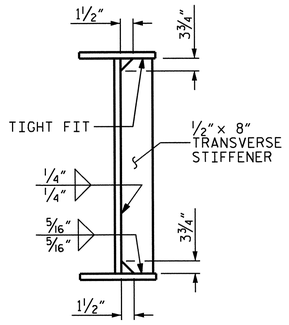


BENT & INTERMEDIATE DIAPHRAGM

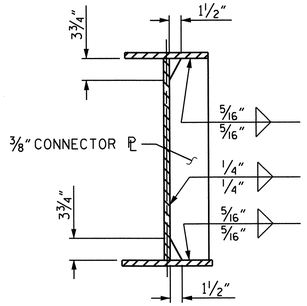


BEARING STIFFENER

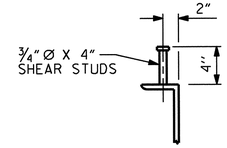
*** WELD TO BOTTOM FLANGE IS ONLY REQUIRED WHEN BEARING STIFFENER IS ALSO CONNECTOR PLATE



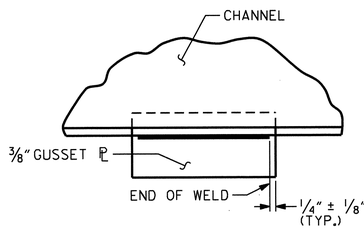
TRANSVERSE STIFFENER



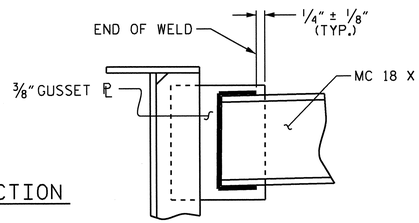
CONNECTOR PLATE DETAILS



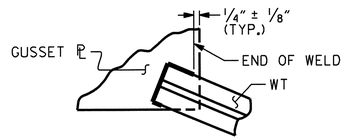
END BENT CROSSFRAME SHEAR STUD DETAIL



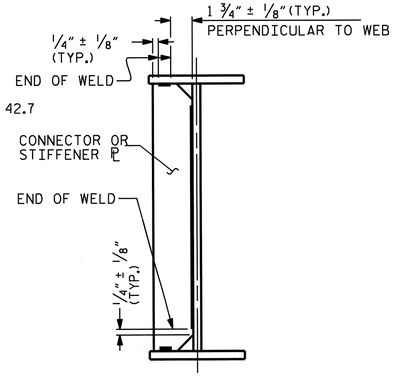
TYPICAL GUESSET PLATE CONNECTION



TYPICAL CHANNEL TO GUSSET PLATE CONNECTIONS

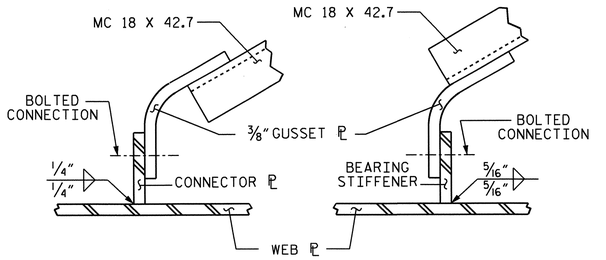


TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS



WITH CONNECTOR PL WITH BEARING STIFFENER

GUSSET PLATE DETAIL

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIAMETER HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

TENSION ON THE ASTM A325 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP. GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR.
1-3-13

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 86+28.82 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 5-13-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

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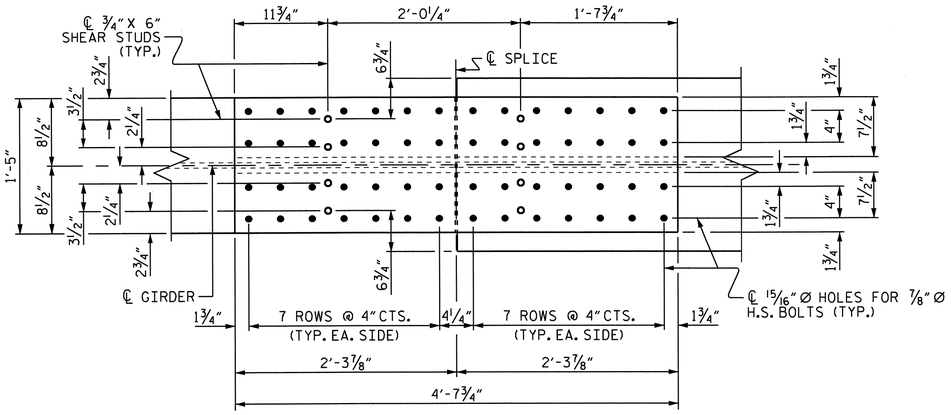
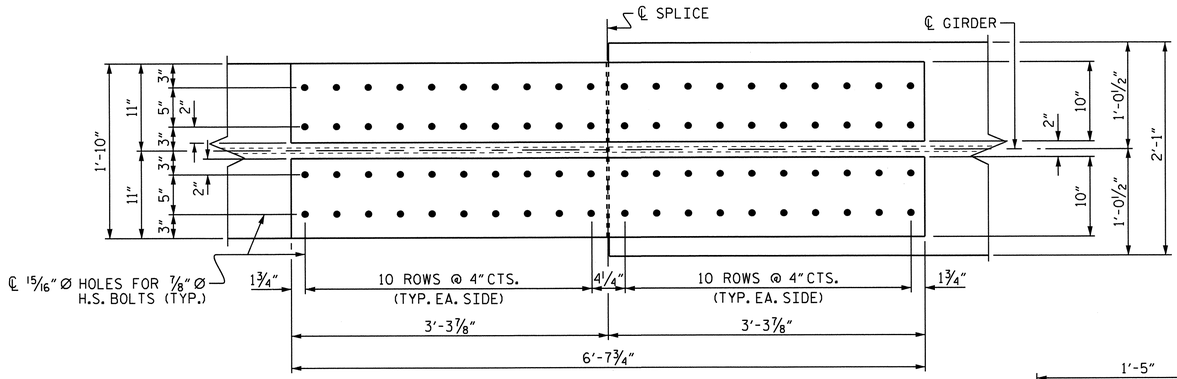
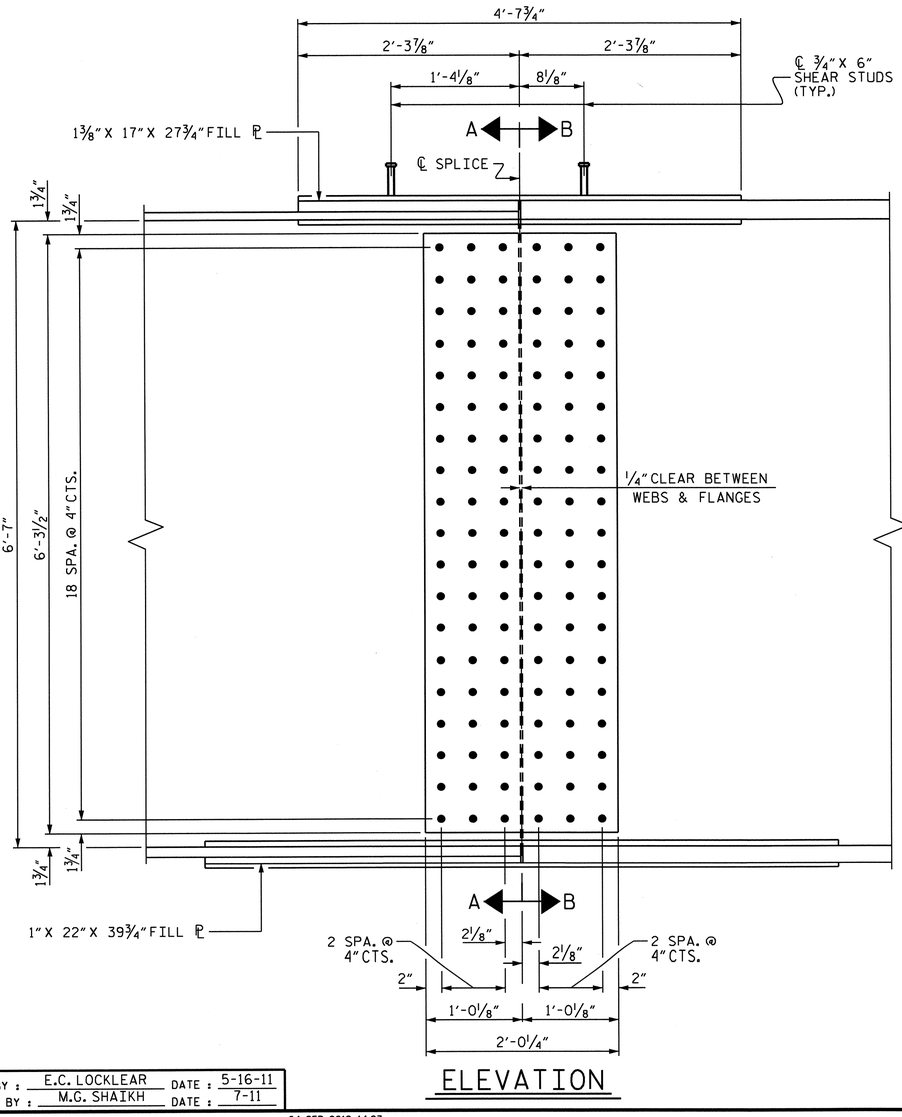
STR. #2



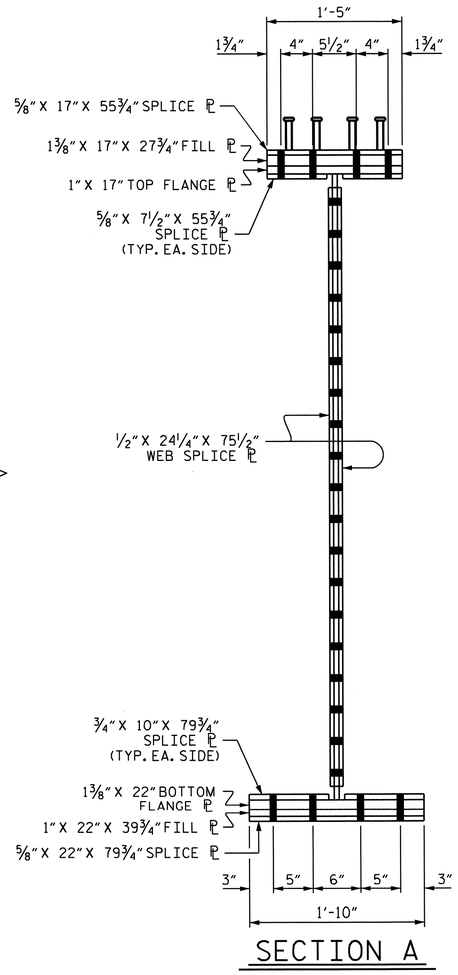
PLAN (TOP OF TOP FLANGE)



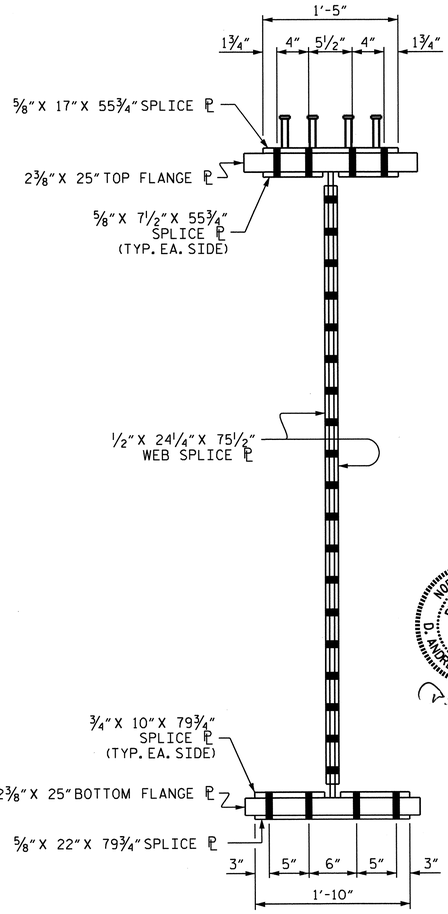
PLAN (TOP OF BOTTOM FLANGE)



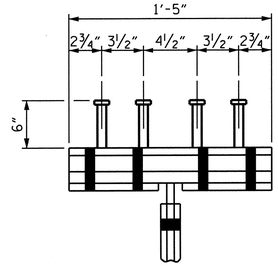
ELEVATION



SECTION A

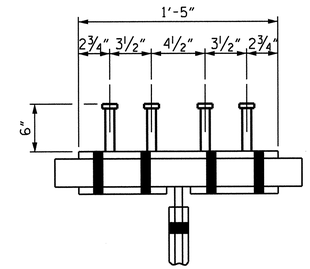


SECTION B



SHEAR STUD DETAIL FOR TOP FLANGE SECTION A SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.



SHEAR STUD DETAIL FOR TOP FLANGE SECTION B SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE' D'ATREMPORT, JR. 9/7/12

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL BOLTED FIELD SPLICE A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			96

STR. #2

DRAWN BY : E.C. LOCKLEAR DATE : 5-16-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

04-SEP-2012 14:27
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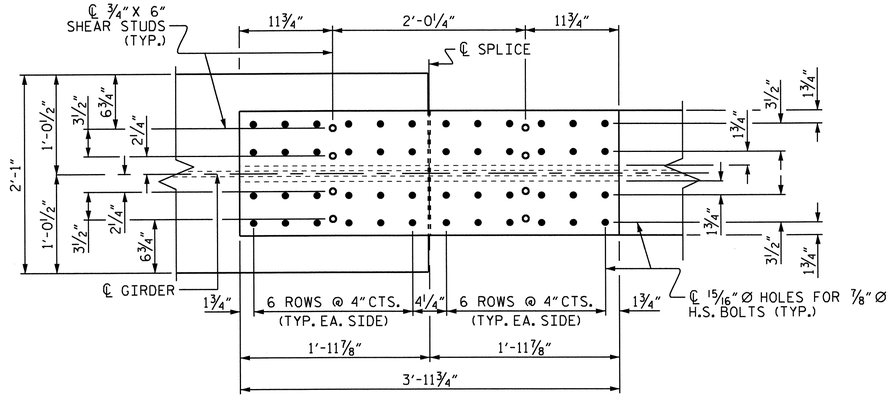
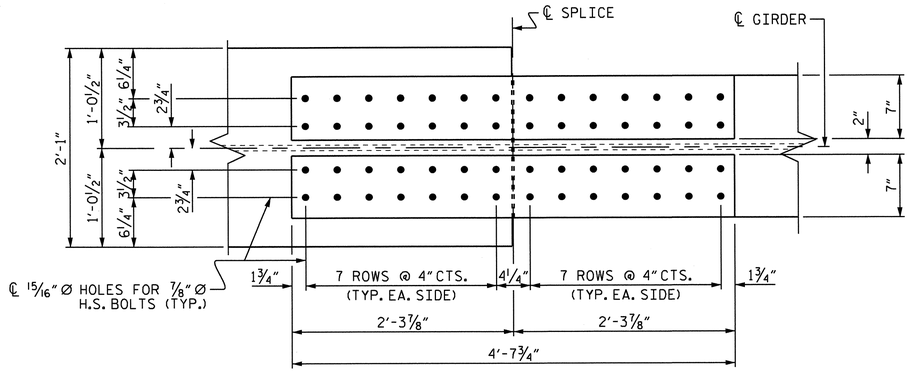
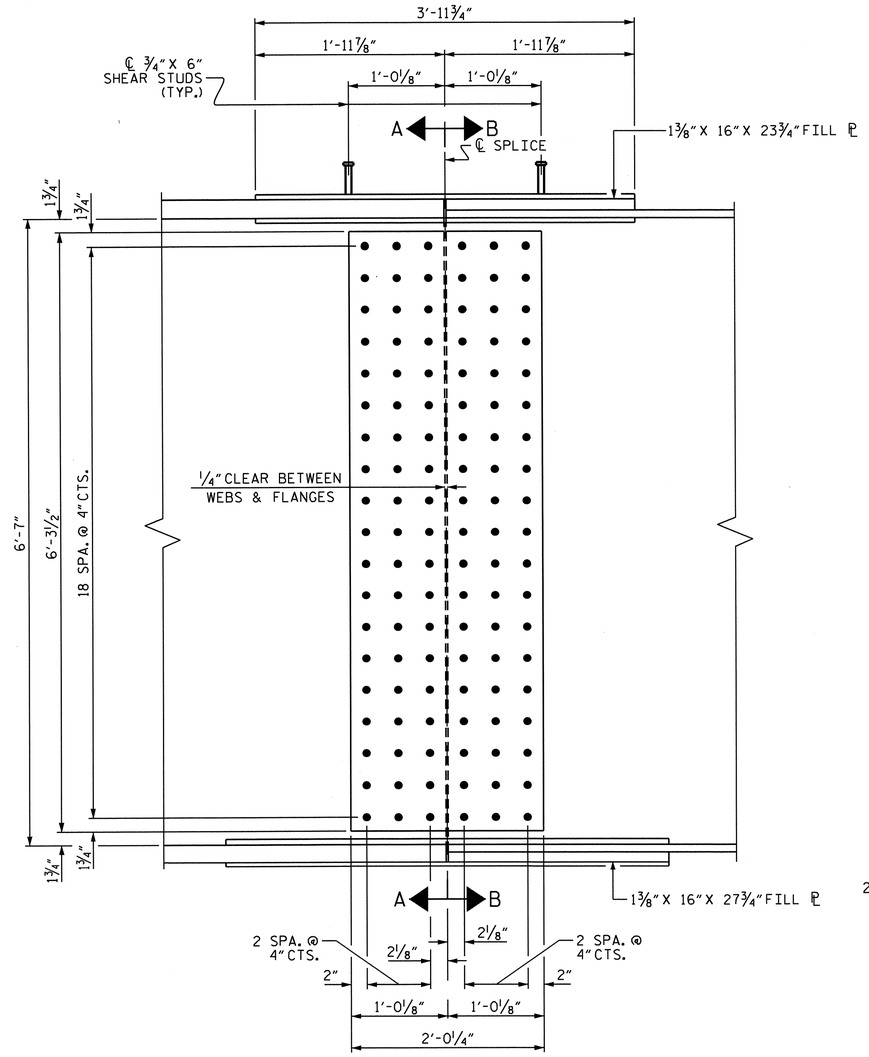


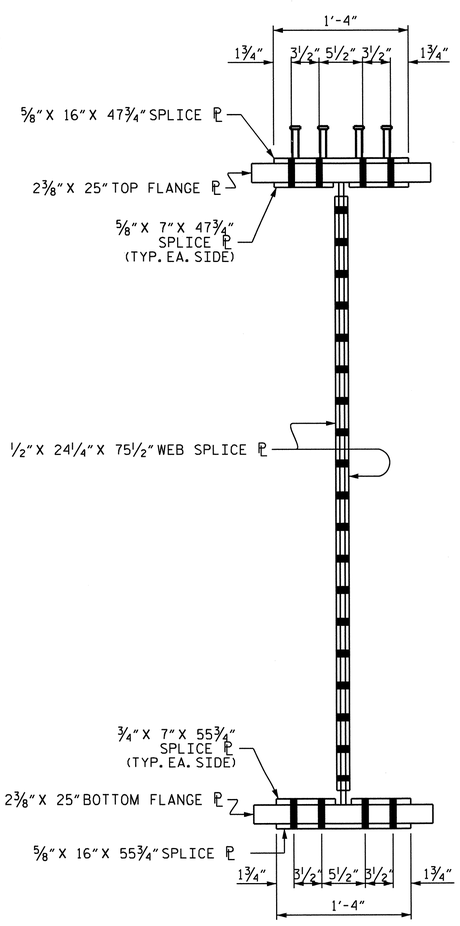
PLAN (TOP OF TOP FLANGE)



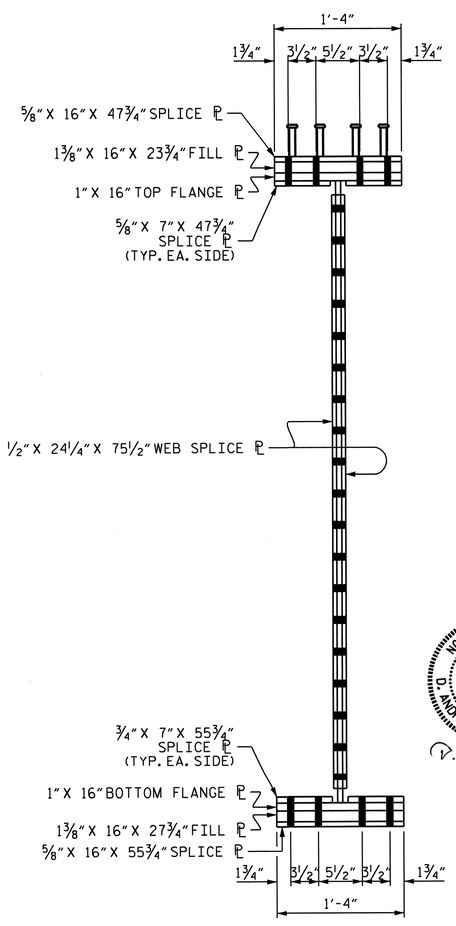
PLAN (TOP OF BOTTOM FLANGE)



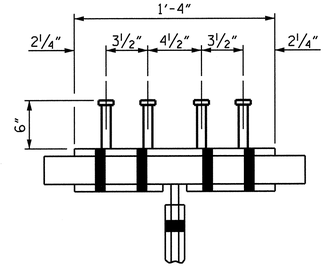
ELEVATION



SECTION A

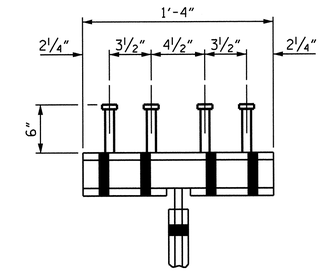


SECTION B



SHEAR STUD DETAIL FOR TOP FLANGE SECTION A SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.



SHEAR STUD DETAIL FOR TOP FLANGE SECTION B SPLICE PLATE

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF PLATE BEFORE FIELD ASSEMBLY.

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR.
9/7/12

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 86+28.82 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL BOLTED FIELD SPLICE B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 5-17-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

04-SEP-2012 14:27
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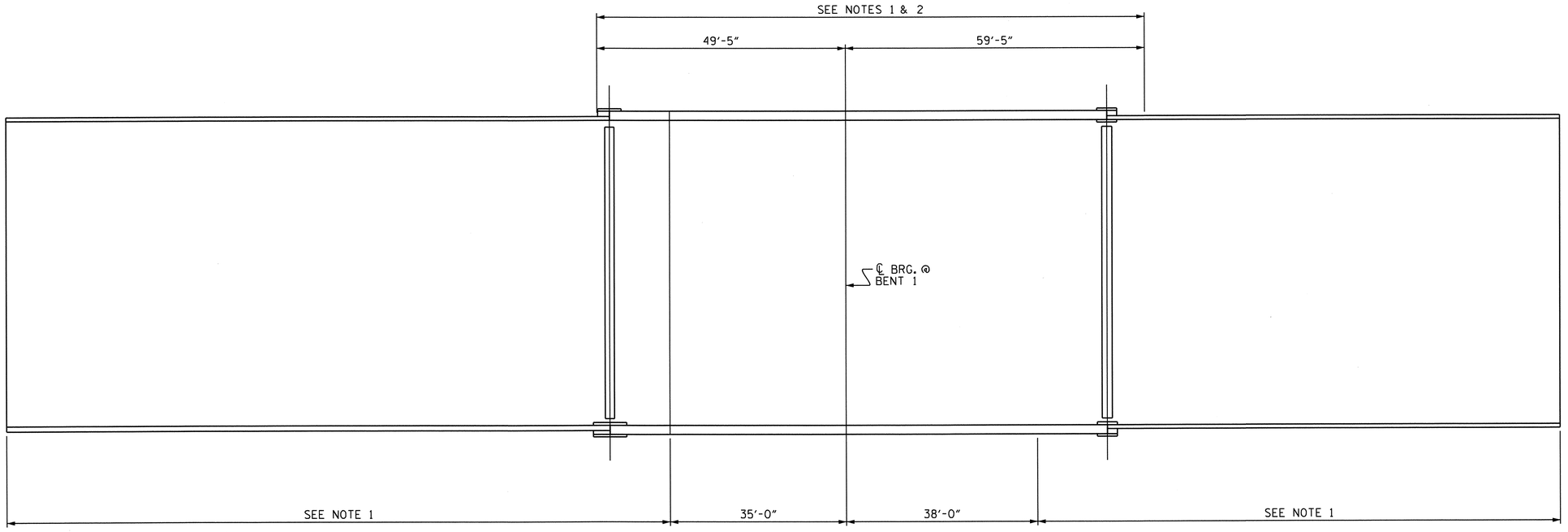
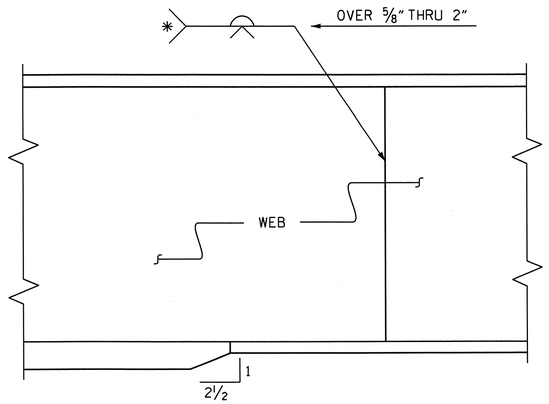
STR. #2



NOTE ① : CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHIN THESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

NOTE ② : NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS



ELEVATION

TYPICAL WEB BUTT JOINT

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS.

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR. 9/7/12

DRAWN BY : E.C. LOCKLEAR DATE : 5-19-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

04-SEP-2012 14:26
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STR. #2

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

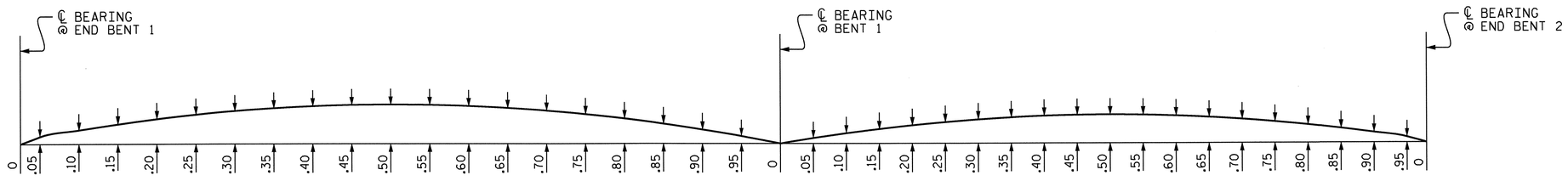
	SPAN A GIRDERS 1 THROUGH 6																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.018	0.035	0.051	0.065	0.076	0.085	0.090	0.093	0.093	0.089	0.083	0.075	0.065	0.054	0.043	0.032	0.022	0.013	0.005	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.053	0.103	0.149	0.189	0.222	0.247	0.263	0.270	0.268	0.258	0.241	0.217	0.188	0.156	0.123	0.091	0.062	0.035	0.014	0.000
DEFLECTION DUE TO WEIGHT OF RAIL ↓	0.000	0.003	0.006	0.009	0.011	0.013	0.015	0.016	0.016	0.016	0.016	0.015	0.013	0.012	0.010	0.008	0.006	0.004	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.074	0.144	0.209	0.265	0.311	0.347	0.369	0.379	0.377	0.363	0.339	0.305	0.265	0.220	0.174	0.129	0.088	0.050	0.020	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.065	0.124	0.175	0.220	0.258	0.288	0.313	0.330	0.340	0.343	0.340	0.330	0.313	0.288	0.258	0.220	0.175	0.124	0.065	0.000
REQUIRED CAMBER ↑	0	1 11/16"	3 3/16"	4 5/8"	5 13/16"	6 13/16"	7 5/8"	8 3/16"	8 1/2"	8 5/8"	8 1/2"	8 1/8"	7 5/8"	6 15/16"	6 1/8"	5 3/16"	4 3/16"	3 1/8"	2 1/16"	1"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN B GIRDERS 1 THROUGH 6																				
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	-0.002	-0.003	-0.002	0.001	0.004	0.007	0.011	0.016	0.020	0.024	0.027	0.029	0.029	0.029	0.027	0.023	0.019	0.013	0.007	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	-0.006	-0.006	-0.002	0.006	0.016	0.027	0.040	0.053	0.066	0.078	0.087	0.093	0.095	0.092	0.085	0.075	0.059	0.042	0.021	0.000
DEFLECTION DUE TO WEIGHT OF RAIL ↓	0.000	0.000	0.000	0.000	0.001	0.001	0.002	0.003	0.004	0.005	0.005	0.006	0.006	0.006	0.006	0.005	0.005	0.004	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	-0.008	-0.009	-0.004	0.008	0.021	0.036	0.054	0.073	0.091	0.107	0.120	0.128	0.130	0.127	0.117	0.103	0.082	0.058	0.029	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.047	0.089	0.127	0.159	0.186	0.209	0.226	0.238	0.246	0.248	0.246	0.238	0.226	0.209	0.186	0.159	0.127	0.089	0.047	0.000
REQUIRED CAMBER ↑	0	1/2"	15/16"	1 1/2"	2"	2 1/2"	2 15/16"	3 3/8"	3 3/4"	4 1/16"	4 1/4"	4 3/8"	4 3/8"	4 1/4"	4"	3 5/8"	3 1/8"	2 1/2"	1 3/4"	15/16"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).



SPAN "A"

SPAN "B"

SCHEMATIC OF CAMBER ORDINATES

FOR CAMBER VALUES AT EACH GIDER TWENTIETH POINT, SEE TABLE ABOVE.
SLOPE FOR ZERO CAMBER BASE LINE VARIES.

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
9/7/12

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 5-05-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

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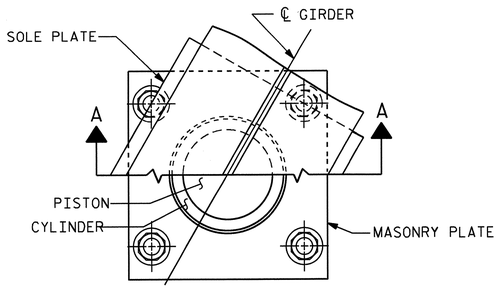
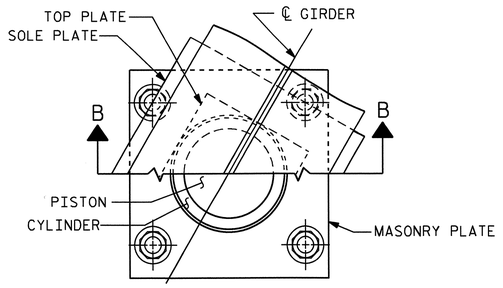
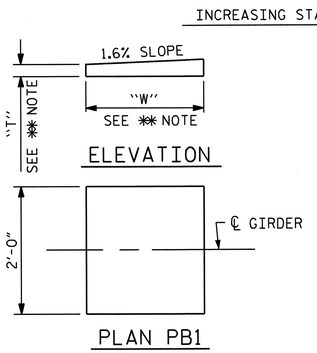
STR. #2



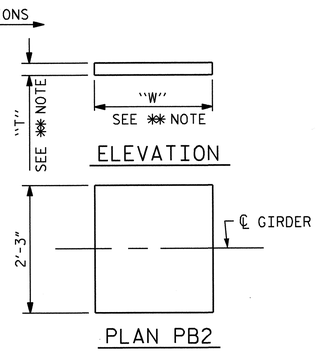
CUT-AWAY PLAN



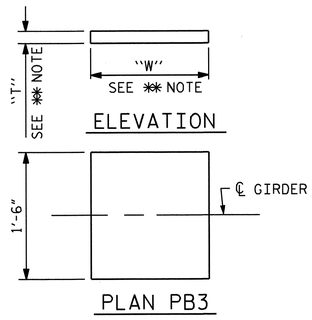
CUT-AWAY PLAN



PLAN PB1



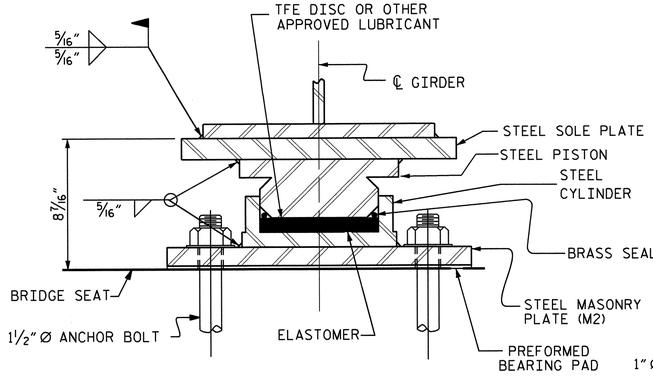
PLAN PB2



PLAN PB3

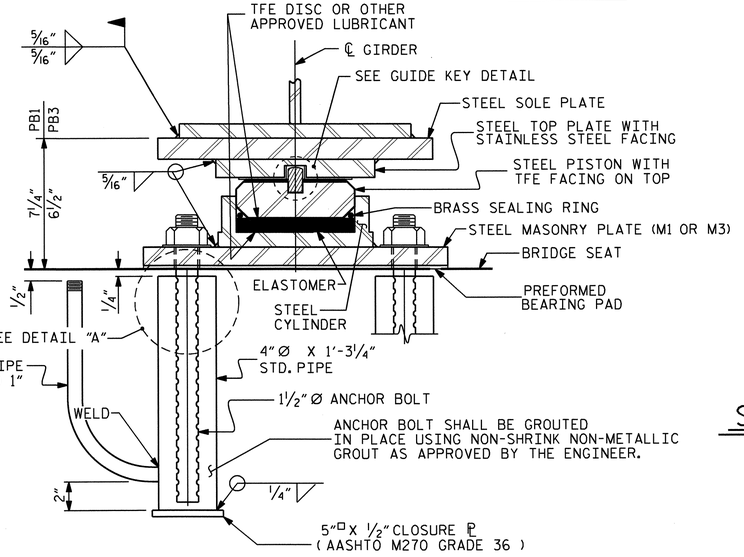
✱✱ NOTE:
DIMENSIONS "W" AND "T" ARE TO BE DETERMINED BY THE MANUFACTURER.

SOLE PLATE DETAILS



SECTION A-A

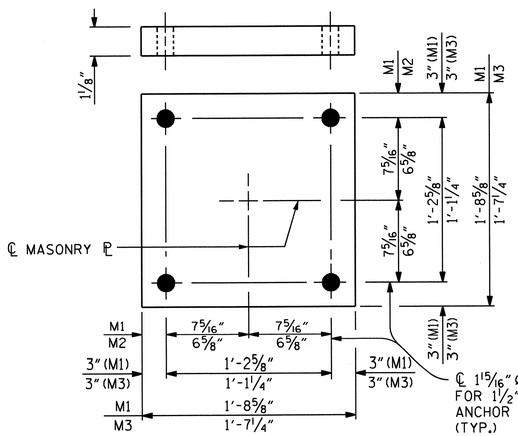
PB2, FIXED
(6 REQ'D.)



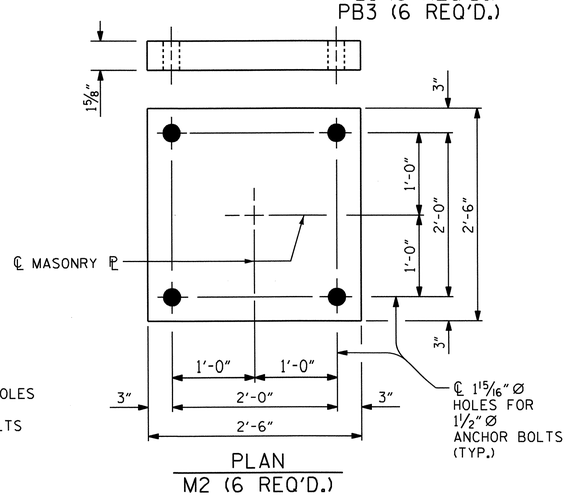
SECTION B-B

PB1 & PB3, EXP.
PB1 (6 REQ'D.)
PB3 (6 REQ'D.)

POT BEARING DETAILS



PLAN
M1 (6 REQ'D.)
M3 (6 REQ'D.)



PLAN
M2 (6 REQ'D.)

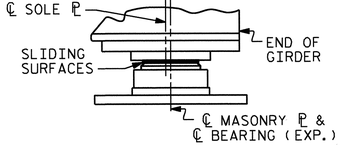
MASONRY PLATE DETAILS

TABLE FOR LOADS AND MOVEMENT							
BEARING	LOCATION	UNFACTORED VERTICAL LOAD (KIPS)				FACTORED LATERAL LOAD (KIPS)	TOTAL MOVEMENT (INCHES)
		DEAD		LIVE	TOTAL		
		DC	DW	LL+IM			
PB1 (EXP.)	END BENT 1	151	19	147	317	47.6	1 1/16"
PB2 (FIXED)	BENT 1	513	64	289	866	129.9	0
PB3 (EXP.)	END BENT 2	108	15	139	262	39.3	7/8"

TABLE FOR PLATE SETTING DATA (EXPANSION POT BEARINGS)				
TEMPERATURE AT TIME OF SETTING	30° F	60° F	90° F	*
END BENT 1	-5/16"	0	5/16"	-1/16"
END BENT 2	-1/4"	0	1/4"	-3/16"

✱ CORRECTION FOR END ROTATION DUE TO WEIGHT OF SLAB AND COMPOSITE DEAD LOAD.

TEMPERATURE SETTING DETAIL



NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR ELASTOMER.

AFTER BEARING ASSEMBLY IS IN PLACE AND ANCHOR BOLTS HAVE BEEN FINALLY POSITIONED. THEY SHALL BE GROUTED IN PLACE AS SHOWN.

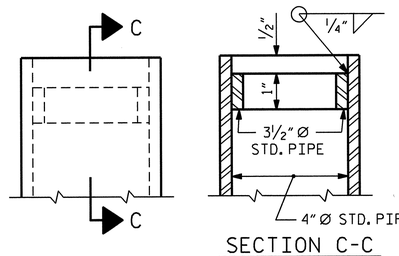
THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THIS ASSEMBLY NEED NOT BE GALVANIZED.

SOLE PLATES SHOULD BE WELDED TO BEAM FLANGES AND ANCHOR BOLTS SHOULD BE GROUTED BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

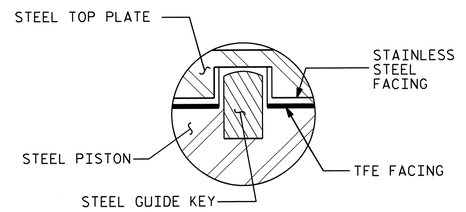
FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE CONTRACTOR MAY SUBSTITUTE DISC BEARINGS FOR THE POT BEARINGS SHOWN. FOR OPTIONAL DISC BEARINGS, SEE SPECIAL PROVISIONS.



SECTION C-C

DETAIL "A"



GUIDE KEY DETAIL

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

POT BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			96

ASSEMBLED BY : E.C. LOCKLEAR DATE : 5-11-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

DRAWN BY : RWW 8/99
CHECKED BY : LES 8/99

REV. 5/7/03 RWW/JTE
REV. 5/1/06R TLA/GM
REV. 10/1/11R MAA/GM

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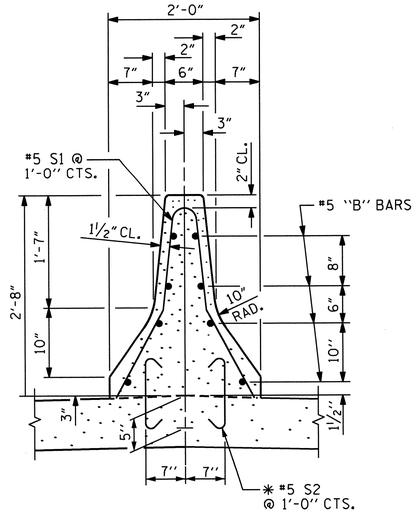
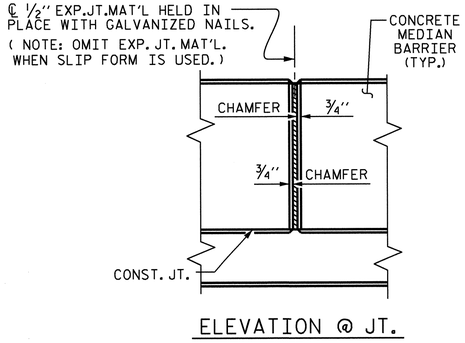
STR. #2

STD. NO. PB1



SECTION A-A

* #5 S2 (MAY BE PUSHED INTO GREEN CONCRETE AFTER SCREEDING)



ELEVATION @ JT.

CONCRETE MEDIAN BARRIER

NOTES

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

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE MEDIAN BARRIER.

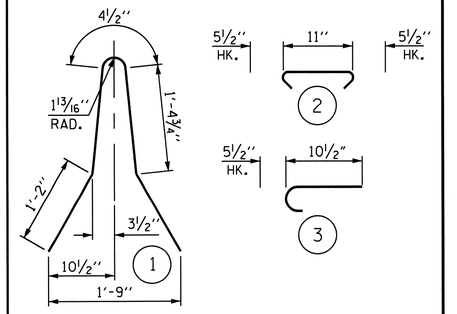
ALL REINFORCING STEEL IN MEDIAN BARRIER SHALL BE EPOXY COATED.

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

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

BAR TYPES

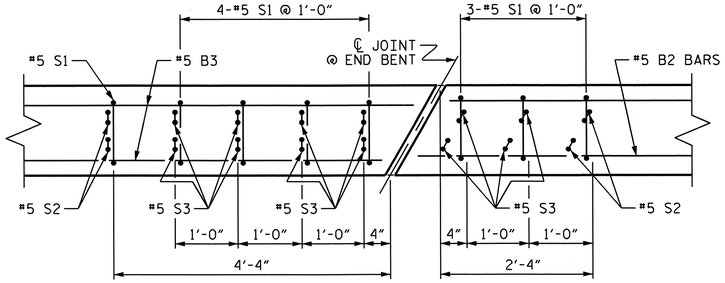
ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

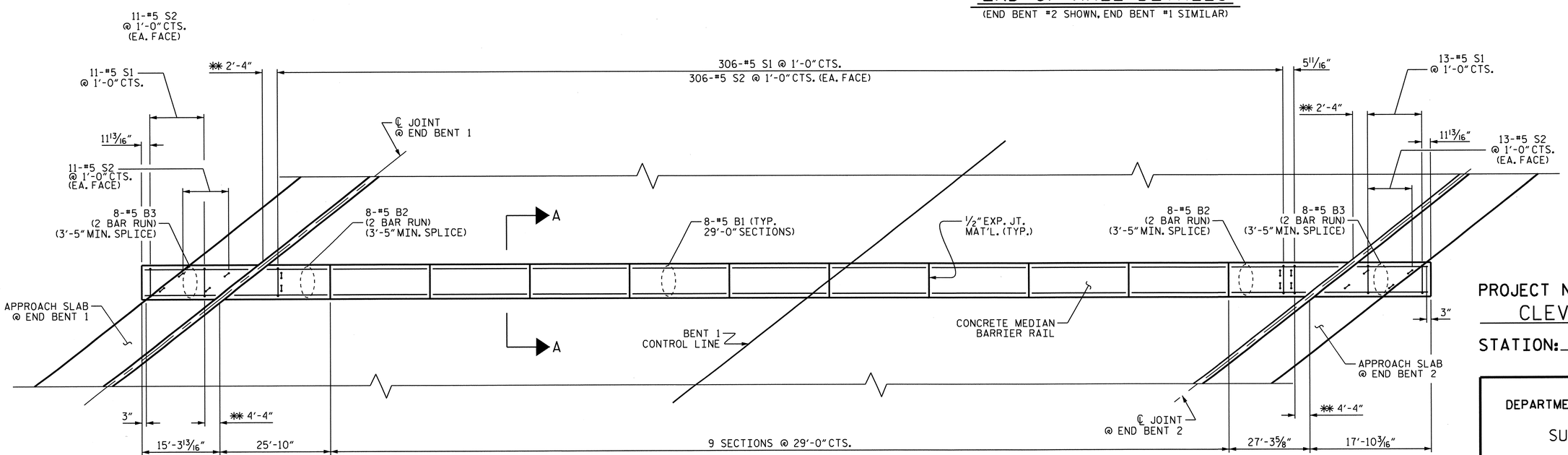
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	72	#5	STR	28'-7"	2146
* B2	32	#5	STR	16'-5"	548
* B3	32	#5	STR	10'-5"	348
* S1	344	#5	1	5'-6"	1973
* S2	660	#5	2	1'-10"	1262
* S3	24	#5	3	1'-4"	33

* EPOXY COATED REINFORCING STEEL	LBS. 6310
CLASS AA CONCRETE	CU. YDS. 35.2
CONCRETE MEDIAN BARRIER RAIL	LIN. FT. 347.30



END OF RAIL DETAILS

(END BENT #2 SHOWN, END BENT #1 SIMILAR)



PLAN

** FOR REINFORCING STEEL IN THIS AREA, SEE "END OF RAIL DETAILS."

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE MEDIAN BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 5-26-11
CHECKED BY : M.G. SHAIKH DATE : 7-11

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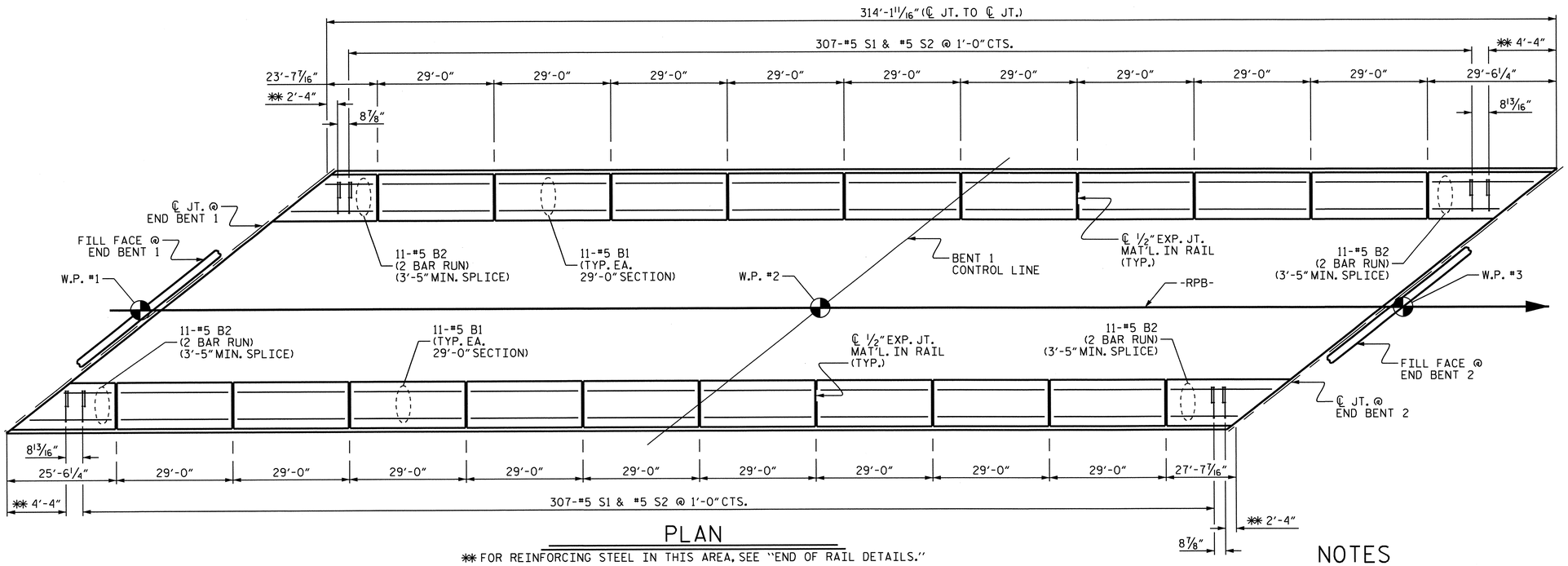
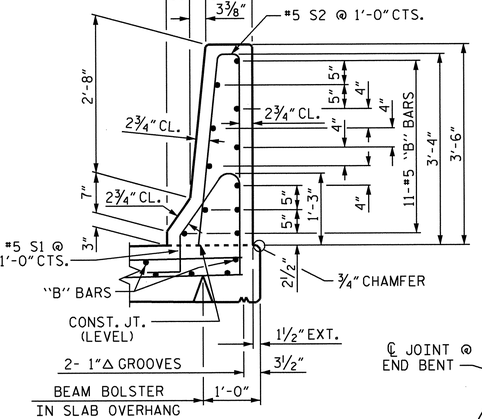
STR. #2

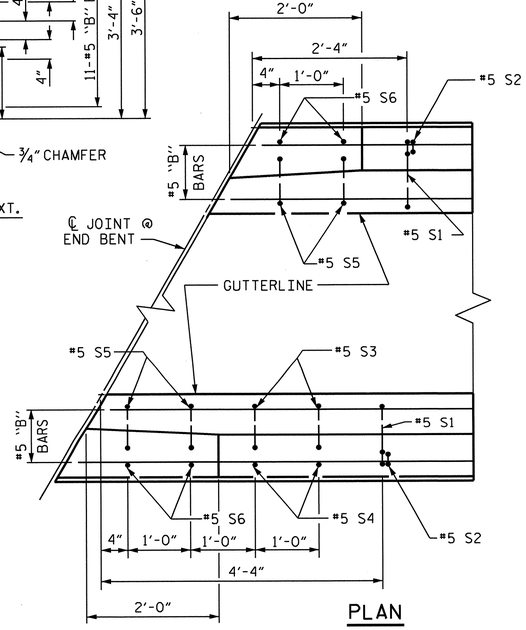


PLAN

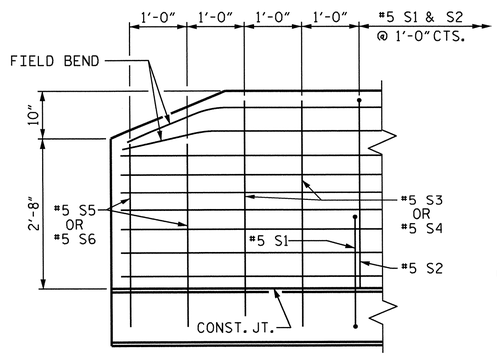
** FOR REINFORCING STEEL IN THIS AREA, SEE "END OF RAIL DETAILS."



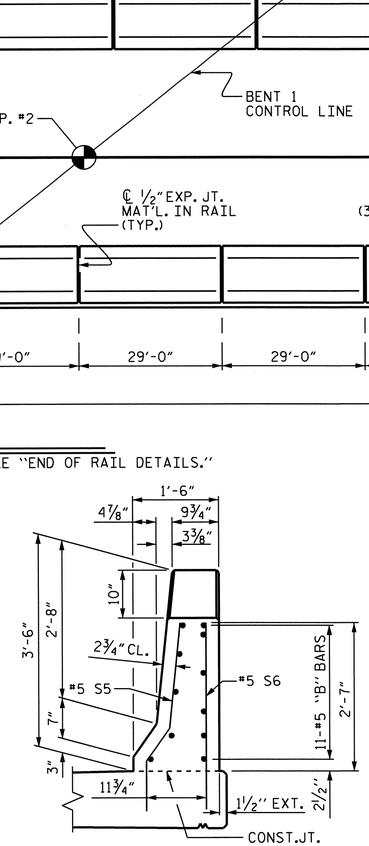
SECTION THRU RAIL



PLAN



SIDE VIEW



END VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

NOTES

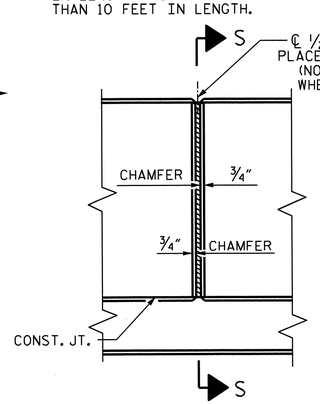
THE BARRIER RAIL IN EACH CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

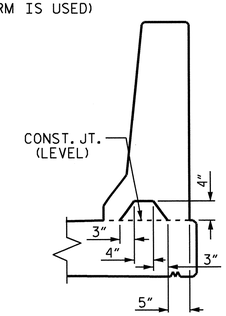
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

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



ELEVATION AT EXPANSION JOINTS

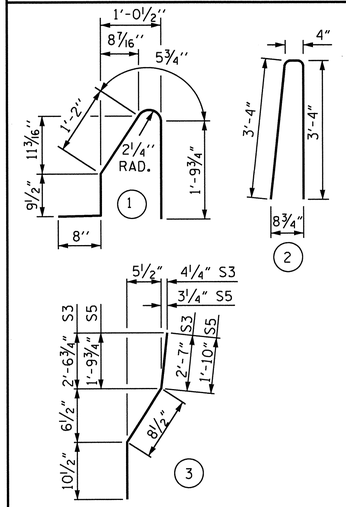


SECTION S-S

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

BARRIER RAIL DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	198	#5	STR	28'-7"	5903
* B2	88	#5	STR	16'-1"	1476
* S1	618	#5	1	4'-11"	3169
* S2	618	#5	2	6'-10"	4405
* S3	4	#5	3	4'-1"	17
* S4	4	#5	STR	4'-0"	17
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27

* EPOXY COATED REINFORCING STEEL	15043 LBS.
CLASS AA CONCRETE	85.5 CU. YDS.
CONCRETE BARRIER RAIL	628.28 LIN. FT.

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER ANDREW DAVENPORT

1-3-13

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : E.C. LOCKLEAR DATE : 5/09/11
CHECKED BY : M.G. SHAIKH DATE : 7/11

03-JAN-2013 12:02
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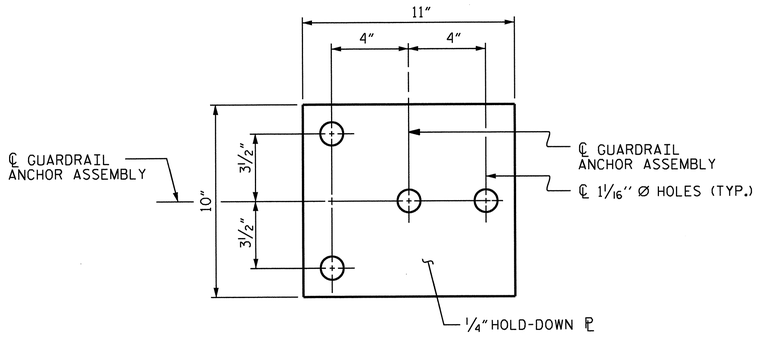
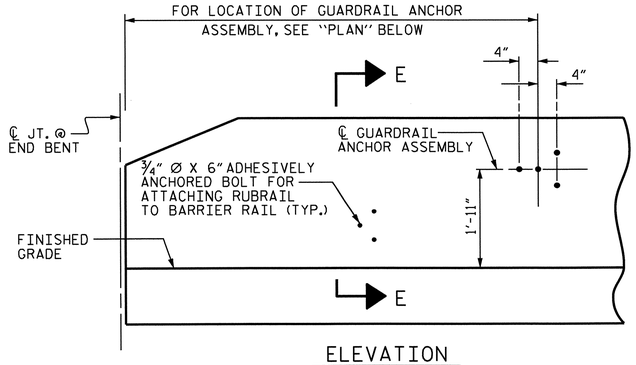
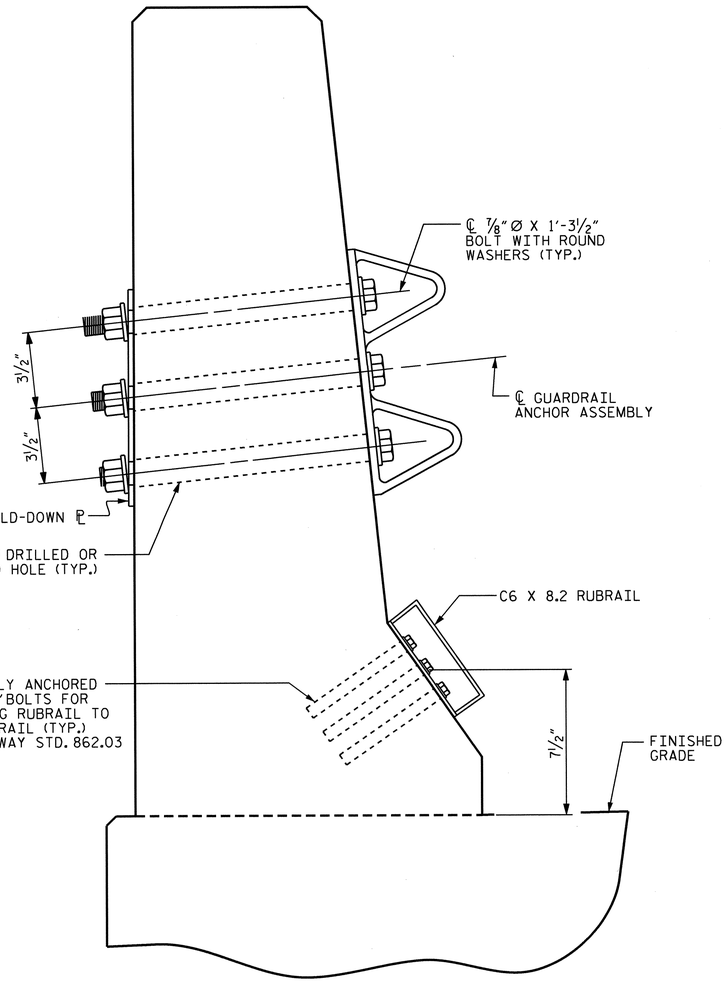
STR. #2



PLAN

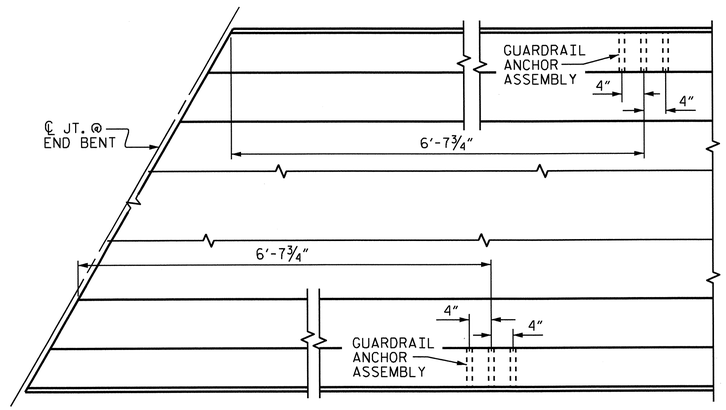


ELEVATION



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.)

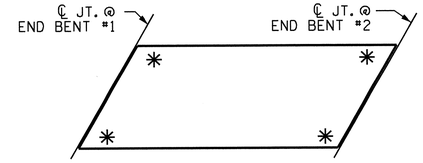
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT JR.
1-3-13

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 5-09-11	REV. 10/1/11	MAA/GM
CHECKED BY : M.G. SHAIKH	DATE : 7-11	REV. 7/12	MAA/GM
DRAWN BY : TLA 5/06		REV. 10/12	MAA/GM
CHECKED BY : GM 5/06			

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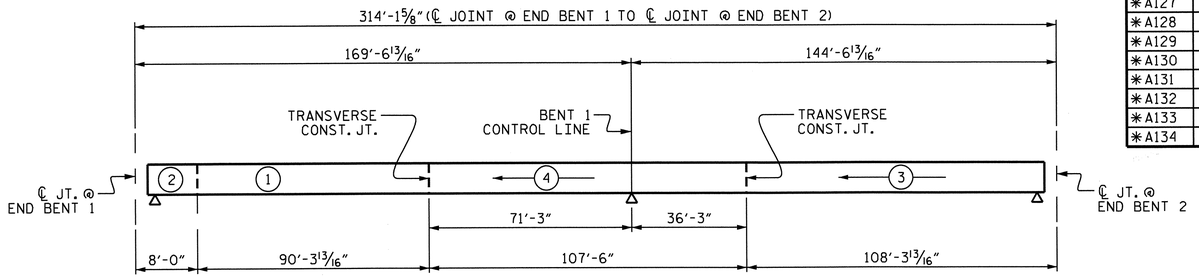
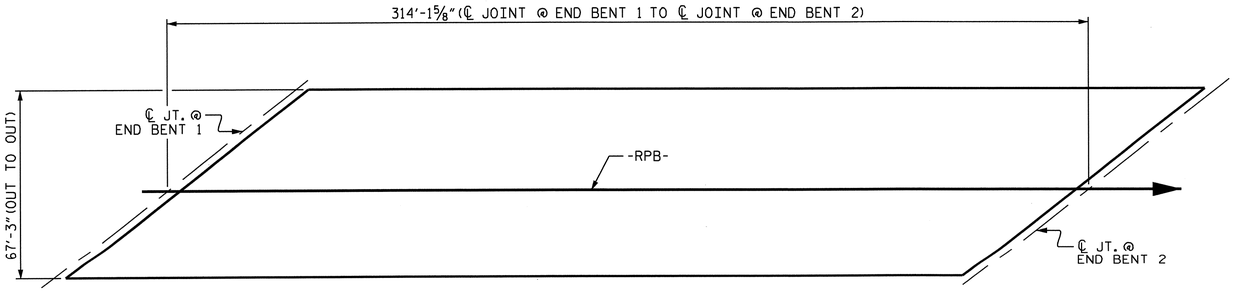
(SHT 1b) STD. NO. GRA2

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"			



POURING SEQUENCE



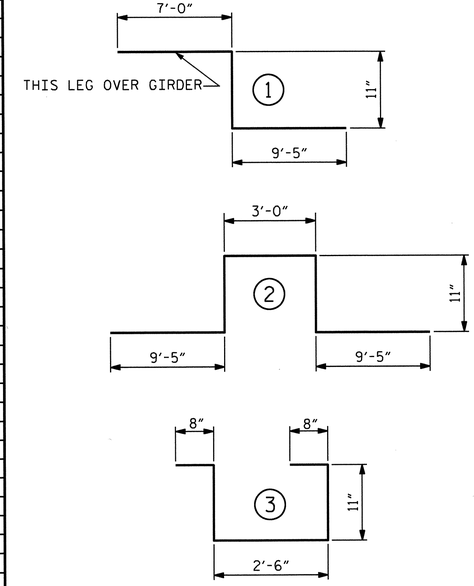
LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 21,126)

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	1098	#5	STR	34'-9"	39796	A201	24	#5	STR	33'-8"	843
A2	1098	#5	STR	34'-7"	39605	A202	24	#5	STR	32'-8"	818
						A203	24	#5	STR	31'-8"	793
✱A101	24	#5	STR	33'-10"	847	A204	12	#5	STR	59'-2"	741
✱A102	24	#5	STR	32'-10"	822	A205	12	#5	STR	57'-2"	715
✱A103	24	#5	STR	31'-10"	797	A206	12	#5	STR	55'-2"	690
✱A104	12	#5	STR	59'-2"	741	A207	12	#5	STR	53'-3"	666
✱A105	12	#5	STR	57'-2"	715	A208	12	#5	STR	51'-3"	641
✱A106	12	#5	STR	55'-2"	690	A209	12	#5	STR	49'-3"	616
✱A107	12	#5	STR	53'-3"	666	A210	12	#5	STR	47'-4"	592
✱A108	12	#5	STR	51'-3"	641	A211	12	#5	STR	45'-4"	567
✱A109	12	#5	STR	49'-3"	616	A212	12	#5	STR	43'-4"	542
✱A110	12	#5	STR	47'-4"	592	A213	12	#5	STR	41'-4"	517
✱A111	12	#5	STR	45'-4"	567	A214	12	#5	STR	39'-5"	493
✱A112	12	#5	STR	43'-4"	542	A215	12	#5	STR	37'-5"	468
✱A113	12	#5	STR	41'-4"	517	A216	12	#5	STR	35'-5"	443
✱A114	12	#5	STR	39'-5"	493	A217	12	#5	STR	33'-6"	419
✱A115	12	#5	STR	37'-5"	468	A218	12	#5	STR	31'-6"	394
✱A116	12	#5	STR	35'-5"	443	A219	12	#5	STR	29'-6"	369
✱A117	12	#5	STR	33'-6"	419	A220	12	#5	STR	27'-7"	345
✱A118	12	#5	STR	31'-6"	394	A221	12	#5	STR	25'-7"	320
✱A119	12	#5	STR	29'-6"	369	A222	12	#5	STR	23'-7"	295
✱A120	12	#5	STR	27'-7"	345	A223	12	#5	STR	21'-7"	270
✱A121	12	#5	STR	25'-7"	320	A224	12	#5	STR	19'-8"	246
✱A122	12	#5	STR	23'-7"	295	A225	12	#5	STR	17'-8"	221
✱A123	12	#5	STR	21'-7"	270	A226	12	#5	STR	15'-8"	196
✱A124	12	#5	STR	19'-8"	246	A227	12	#5	STR	13'-9"	172
✱A125	12	#5	STR	17'-8"	221	A128	12	#5	STR	11'-9"	147
✱A126	12	#5	STR	15'-8"	196	A229	12	#5	STR	9'-9"	122
✱A127	12	#5	STR	13'-9"	172	A230	12	#5	STR	7'-10"	98
✱A128	12	#5	STR	11'-9"	147	A231	12	#5	STR	5'-10"	73
✱A129	12	#5	STR	9'-9"	122	A232	12	#5	STR	3'-10"	48
✱A130	12	#5	STR	7'-10"	98	A233	12	#5	STR	1'-11"	24
✱A131	12	#5	STR	5'-10"	73						
✱A132	12	#5	STR	3'-10"	48	✱B1	180	#4	STR	29'-1"	3497
✱A133	12	#5	STR	1'-11"	24	✱B2	135	#6	STR	45'-8"	9260
✱A134	6	#6	STR	6'-3"	56	✱B3	264	#6	STR	43'-8"	17315
						B4	558	#5	STR	54'-1"	31476
						✱B5	135	#4	STR	26'-9"	2412
						✱G1	4	#5	STR	55'-4"	231
						✱K1	12	#5	1	17'-4"	217
						✱K2	24	#5	2	23'-8"	592
						✱S1	140	#4	3	5'-8"	530

REINFORCING STEEL	LBS.	84,985
✱ EPOXY COATED REINFORCING STEEL	LBS.	87,822

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	✱EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
POUR #1	213.2		
POUR #2	22.9		
POUR #3	260.1		
POUR #4	256.4		
✱✱ TOTALS	752.6	84,985	87,822

✱✱ QUANTITIES FOR BARRIER RAIL AND MEDIAN BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,446	SQ.FT.
BRIDGE DECK	17,472	SQ.FT.
TOTAL	18,918	SQ.FT.

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 5-24-11		
CHECKED BY : M.G. SHAIKH	DATE : 7-11		
DRAWN BY : JMB 5/87	REV. 8/16/99	RWW/LES	
CHECKED BY : SJD 9/87	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

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NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
9/7/12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

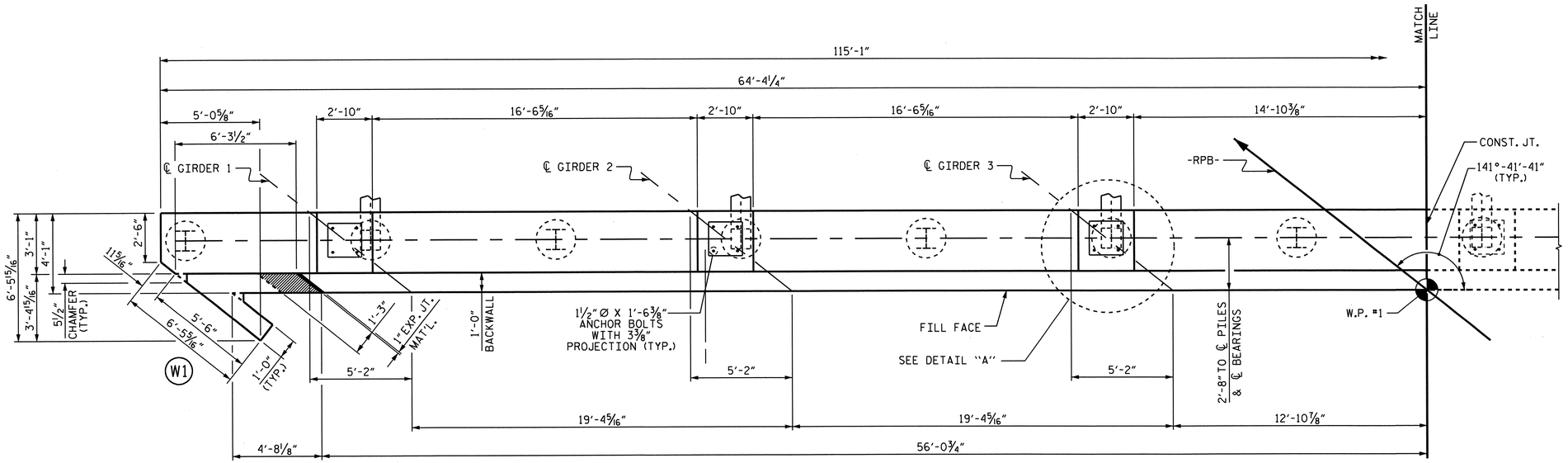
SUPERSTRUCTURE BILL OF MATERIAL

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

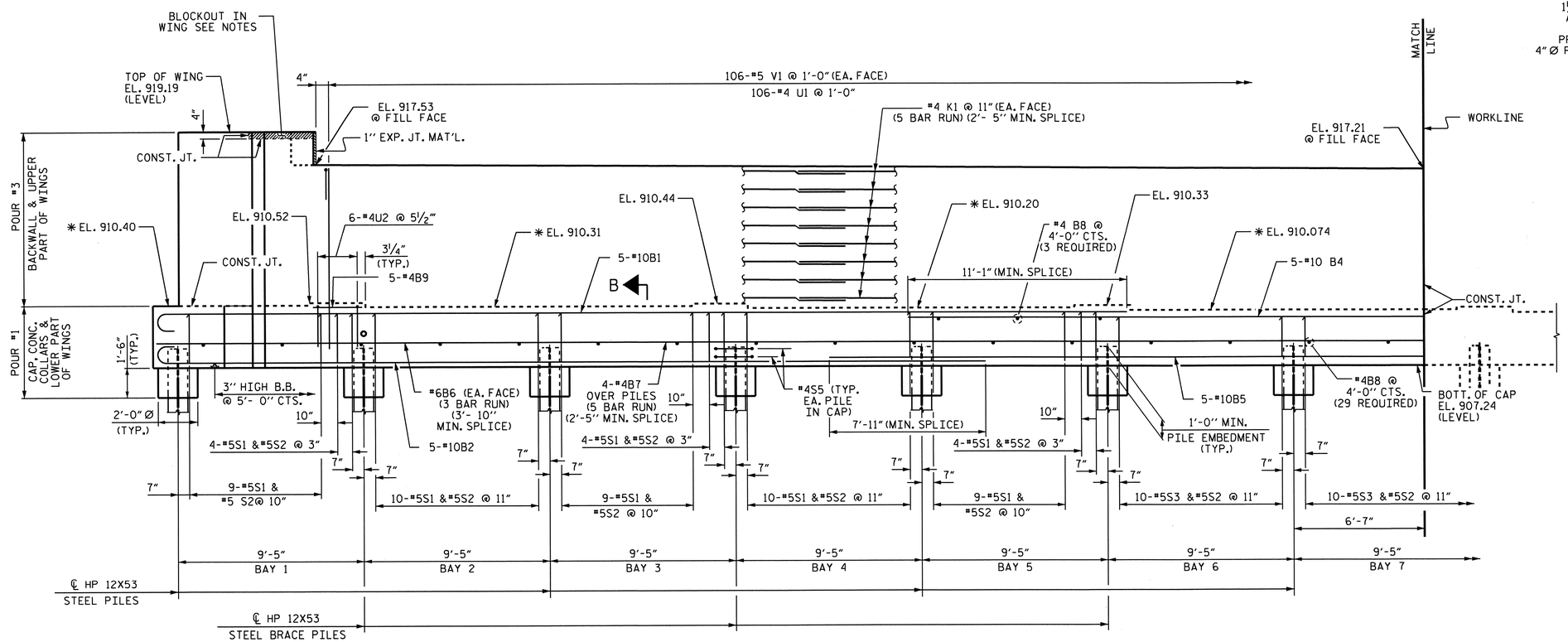
SHEET NO. S-52

TOTAL SHEETS 96

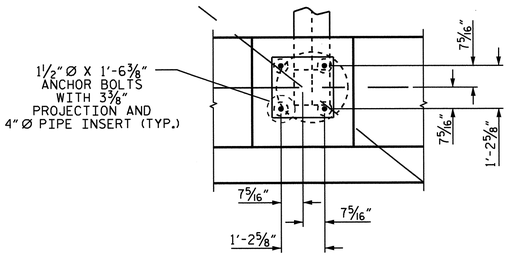
STR. #2 STD. NO. BOM1



PLAN



ELEVATION



DETAIL "A"
(TYP. EA. GIRDER)

NOTES

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

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.

* FOR LOCATION OF ELEVATIONS BETWEEN BUILDUPS, SEE SECTION A-A ON SHEET 4 OF 4.

FOR PIPE INSERT DETAILS, SEE BEARING SHEET.

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

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			96

STR #2

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER ANDREW DAVENPORT JR

DRAWN BY : M. G. SHAIKH DATE : 09-08-11
CHECKED BY : E. C. LOCKLEAR DATE : 10-10-11

03-JAN-2013 11:45
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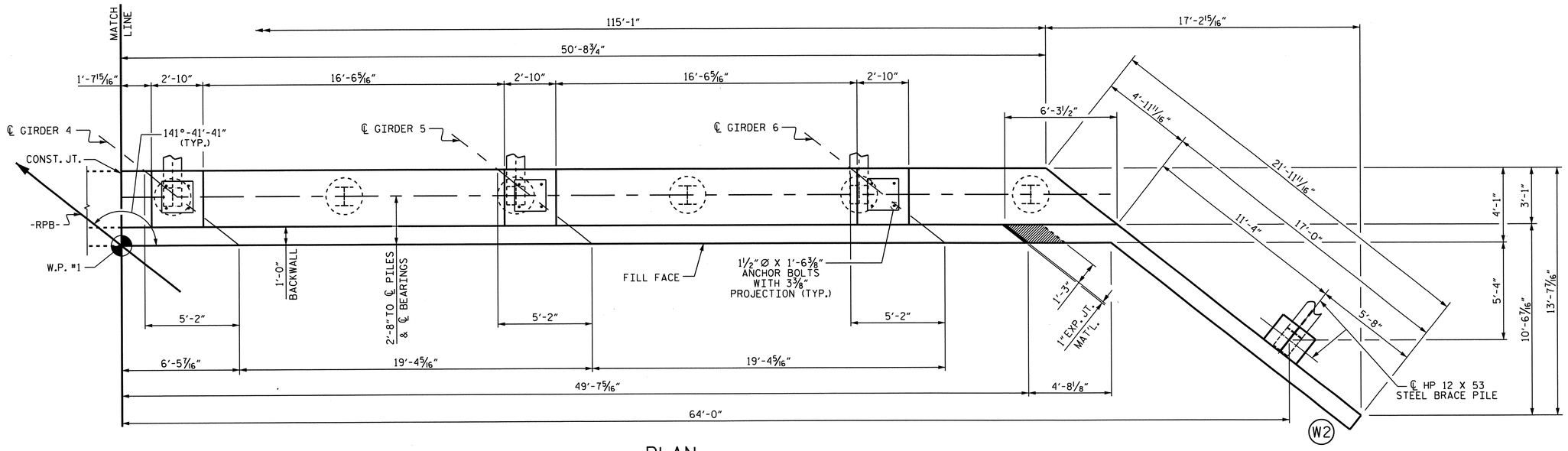
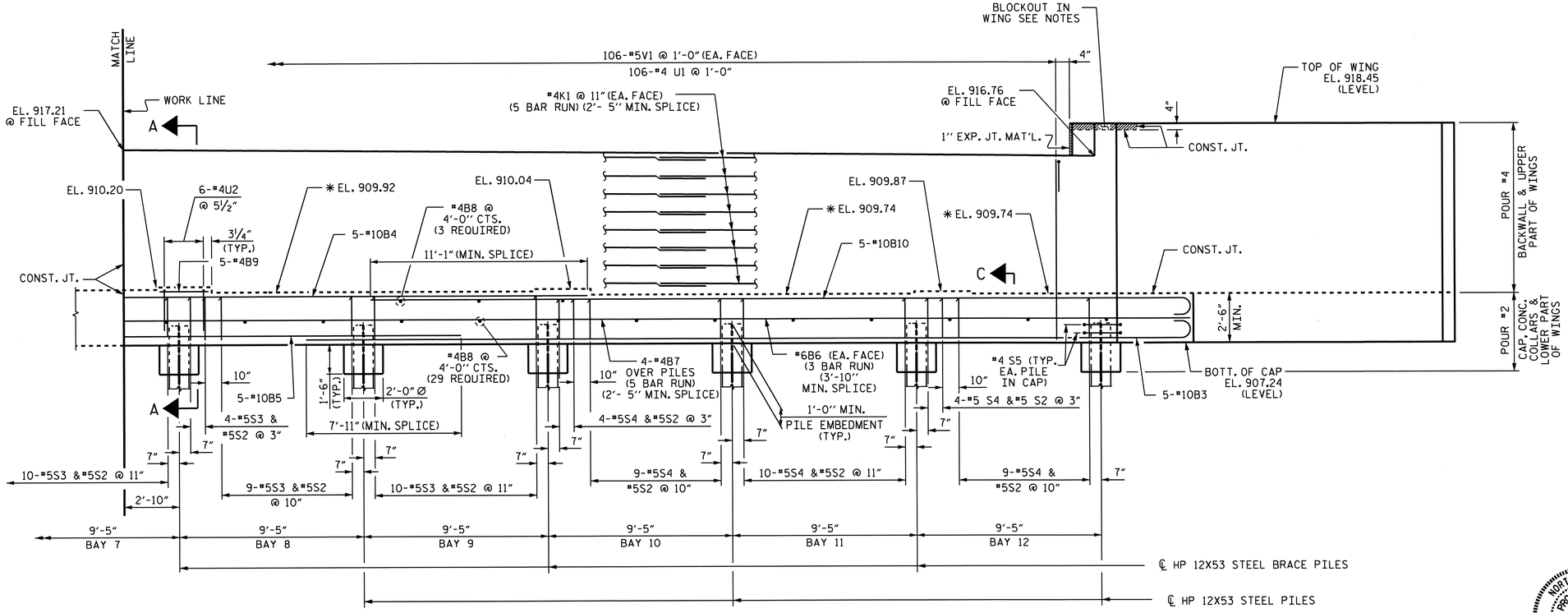


PLAN



ELEVATION
(BRACE PILE IN WING NOT SHOWN)

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 86+28.82 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : M. G. SHAIKH DATE : 09-08-11
CHECKED BY : E. C. LOCKLEAR DATE : 10-10-11

03-JAN-2013 11:45
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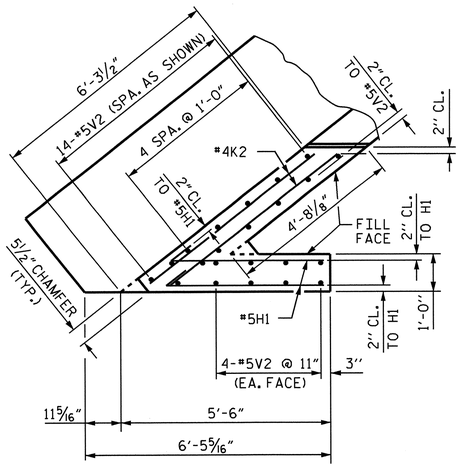
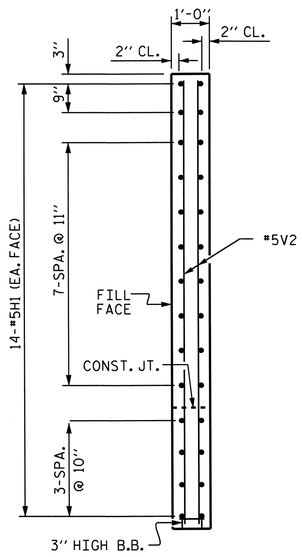
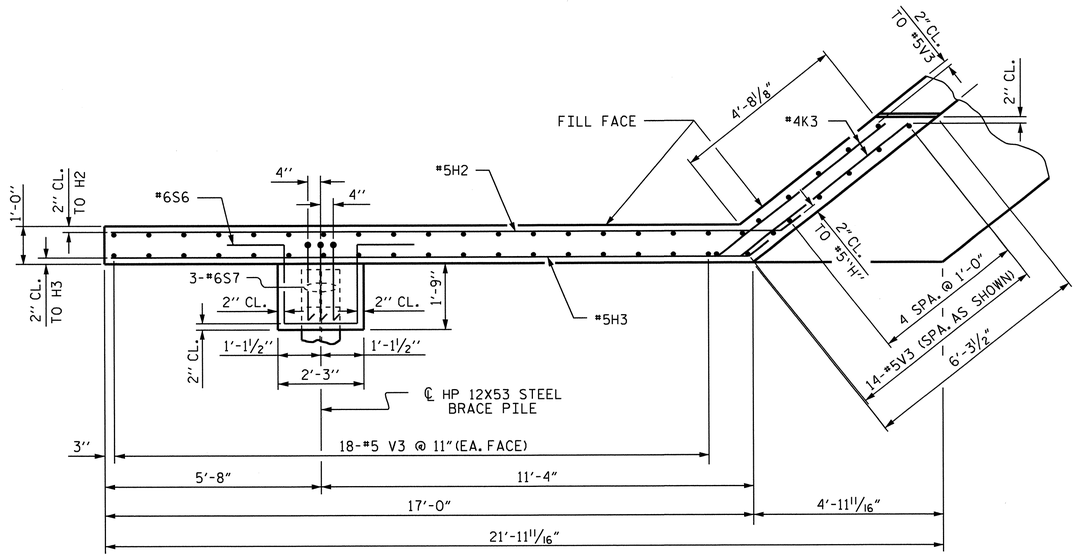
STR #2



PLAN OF LEFT WING (W1)



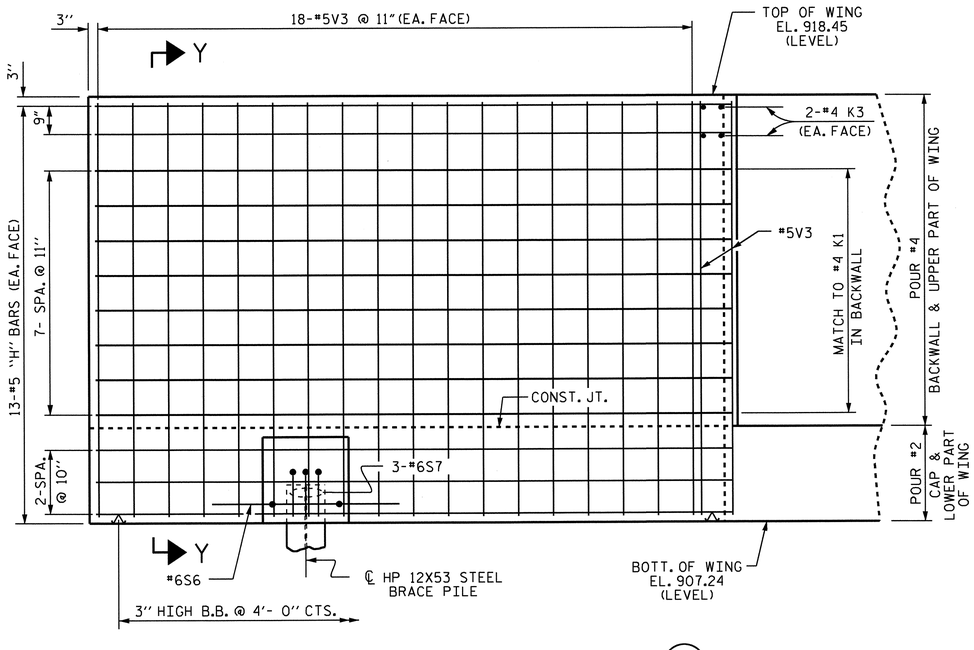
SECTION X-X



PLAN OF RIGHT WING (W2)

ELEVATION OF LEFT WING (W1)

SECTION Y-Y



ELEVATION OF RIGHT WING (W2)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			96

STR #2

DRAWN BY : M. G. SHAIKH DATE : 09-15-11
CHECKED BY : E. C. LOCKLEAR DATE : 10-10-11

04-SEP-2012 14:31
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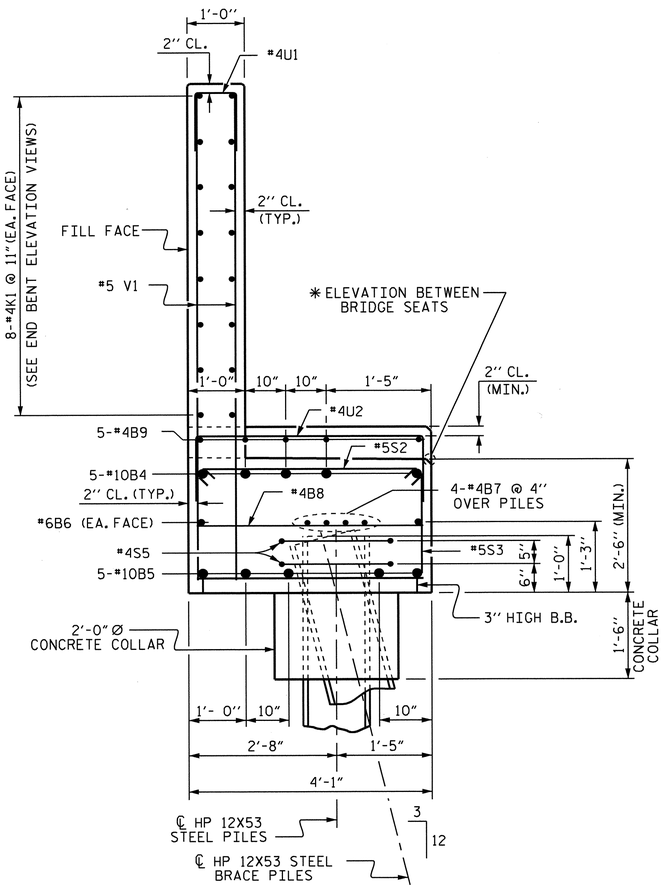
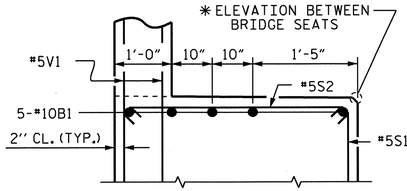
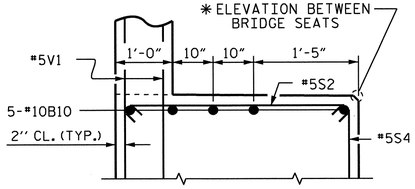


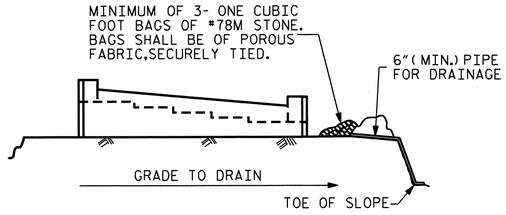
SECTION A-A



PARTIAL SECTION B-B



PARTIAL SECTION C-C



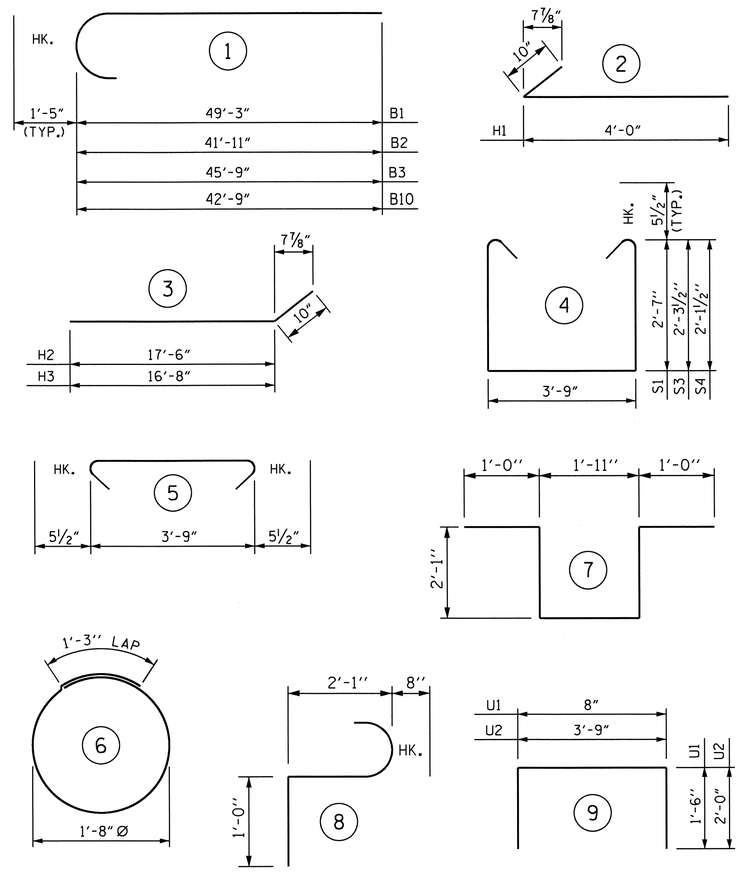
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

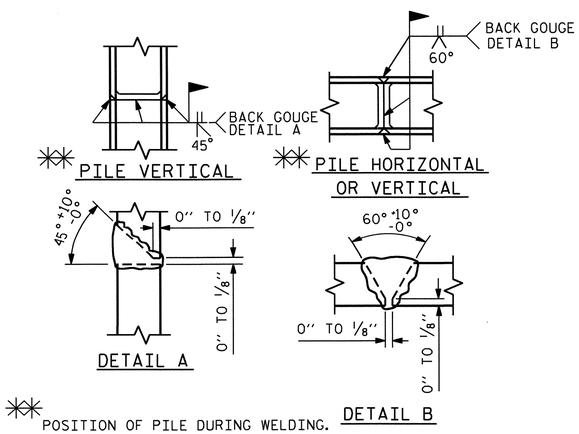
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



✳✳ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	1	50'-8"	1090
B2	5	#10	1	43'-4"	932
B3	5	#10	1	47'-2"	1015
B4	5	#10	STR	49-10"	1072
B5	5	#10	STR	45'-11"	988
B6	6	#6	STR	41'-10"	377
B7	20	#4	STR	25'-6"	341
B8	35	#4	STR	3'-9"	88
B9	10	#4	STR	2'-6"	17
B10	5	#10	1	44'-2"	950
H1	28	#5	2	4'-10"	141
H2	13	#5	3	18'-4"	249
H3	13	#5	3	17'-6"	237
K1	80	#4	STR	25'-6"	1363
K2	4	#4	STR	5'-6"	15
K3	4	#4	STR	5'-7"	15
S1	59	#5	4	9'-10"	605
S2	138	#5	5	4'-8"	672
S3	43	#5	4	9'-3"	415
S4	36	#5	4	8'-11"	335
S5	26	#4	6	6'-6"	113
S6	1	#6	7	8'-1"	12
S7	3	#6	8	3'-9"	17
U1	106	#4	9	3'-8"	260
U2	12	#4	9	7'-9"	62
V1	212	#5	STR	9'-2"	2027
V2	22	#5	STR	11'-7"	266
V3	50	#5	STR	10'-10"	565

REINFORCING STEEL = 14239

CLASS A CONCRETE

POUR #1 (CAP, LOWER PART OF WINGS & CONCRETE COLLARS) = 30.5 C.Y.

POUR #2 (CAP, LOWER PART OF WINGS & CONCRETE COLLARS) = 24.1 C.Y.

POUR #3 (BACKWALL & UPPER PART OF WINGS) = 16.8 C.Y.

POUR #4 (BACKWALL & UPPER PART OF WINGS) = 21.4 C.Y.

TOTAL = 92.8 C.Y.

HP 12X53 STEEL PILES
NO. 14 1190 LIN. FT.

PILE REDRIVES EACH 13

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT
1-4-13

DRAWN BY : M. G. SHAIKH DATE : 09-19-11
CHECKED BY : E. C. LOCKLEAR DATE : 10-10-11

04-JAN-2013 07:25
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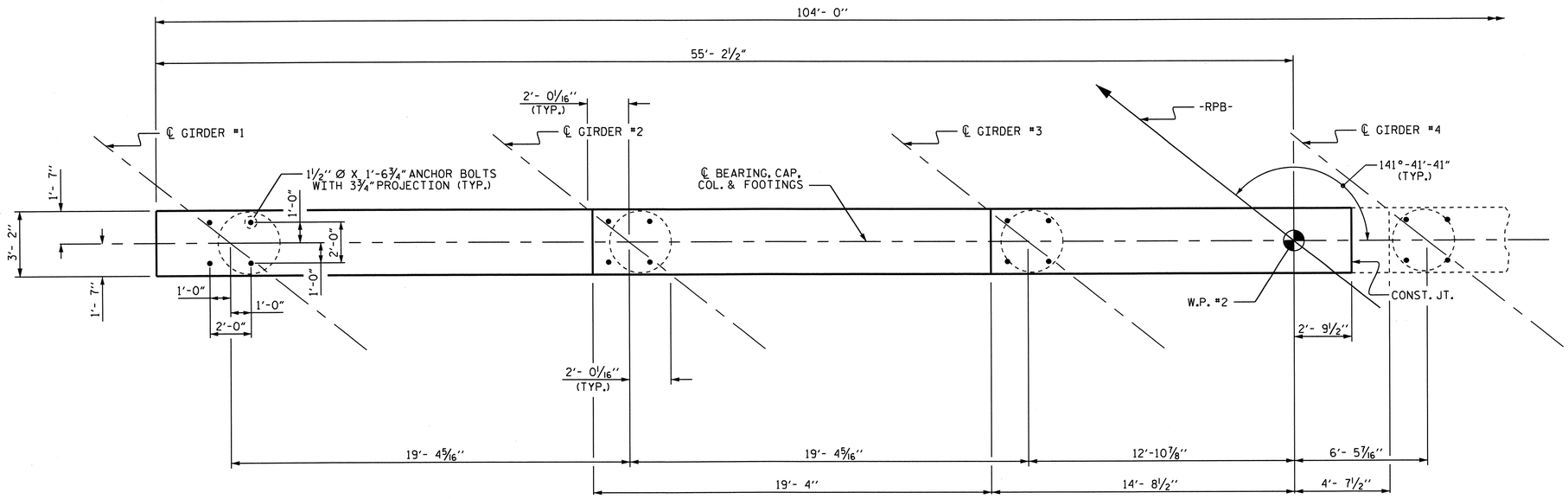
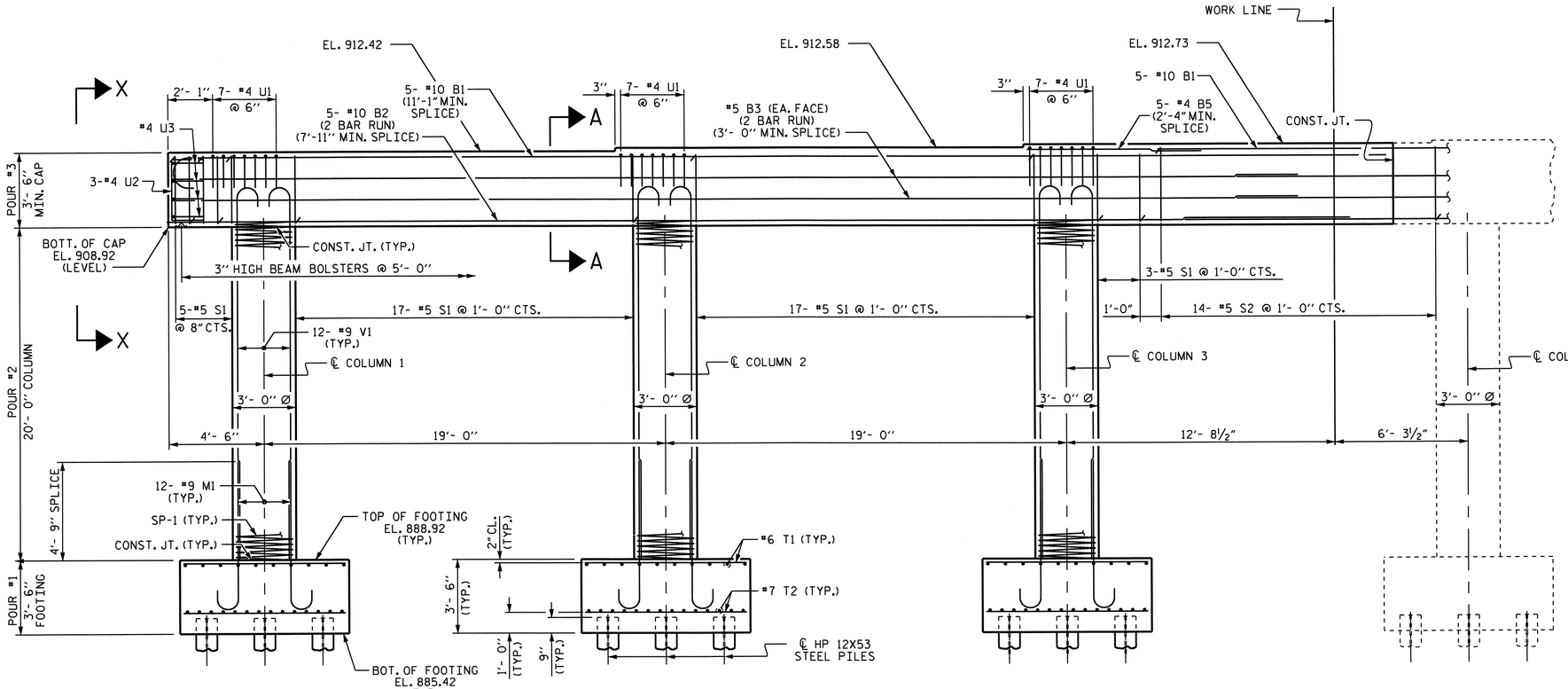
adavenport

STR #2



PART PLAN (LEFT SIDE)



PART ELEVATION (LEFT SIDE)

(ALL FOOTINGS AND COLUMNS ARE IDENTICAL)

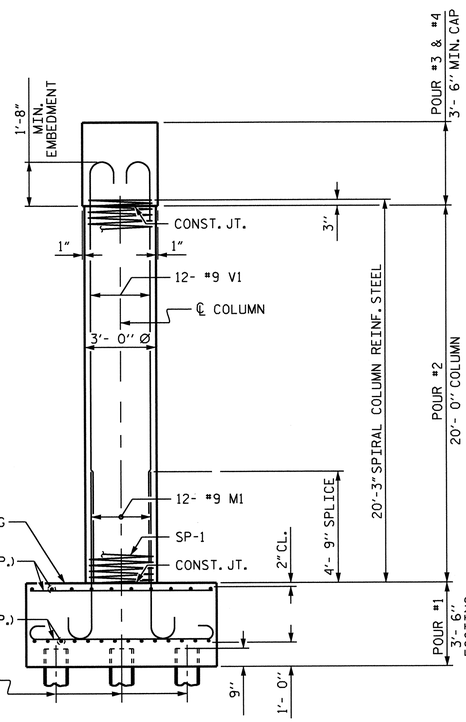
NOTES

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

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

FOR PILE SPLICE DETAILS, SEE END BENT #1.

INVERT ALTERNATE STIRRUPS.



END ELEVATION

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
9/7/12

DRAWN BY : D. A. GLADDEN DATE : 10-24-11
CHECKED BY : K.D. LAYNE DATE : 1-25-12

05-SEP-2012 14:11
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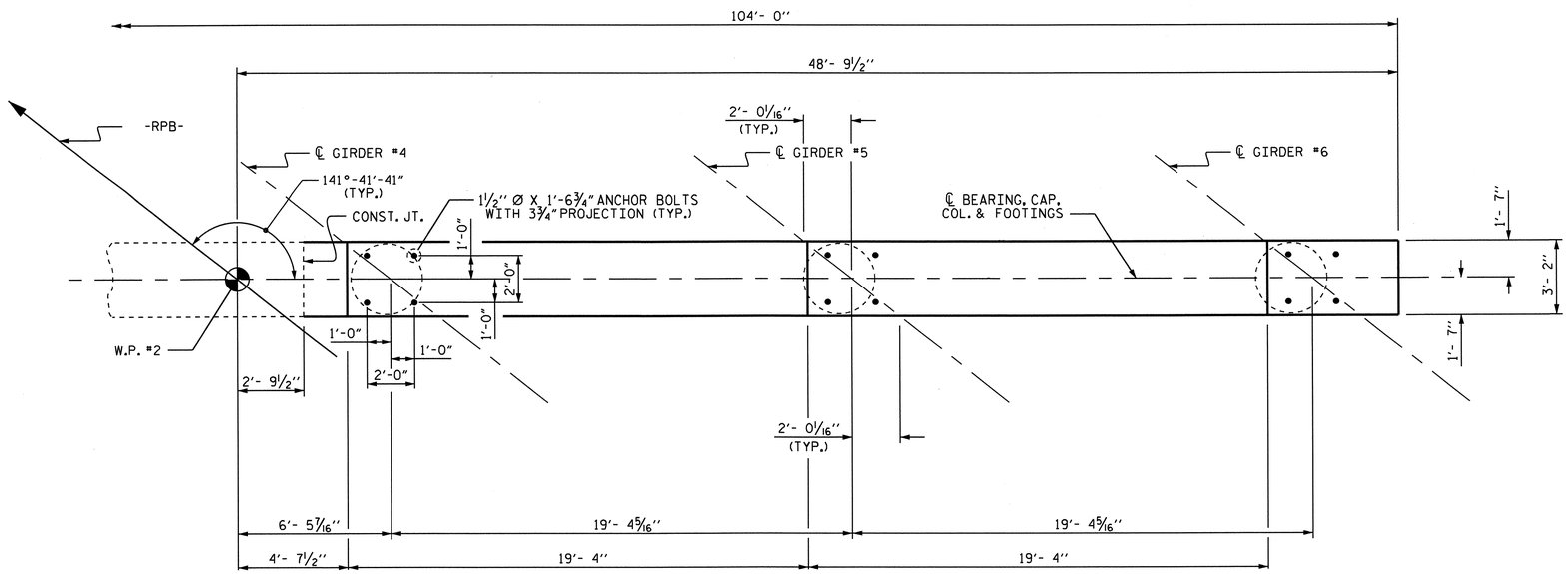
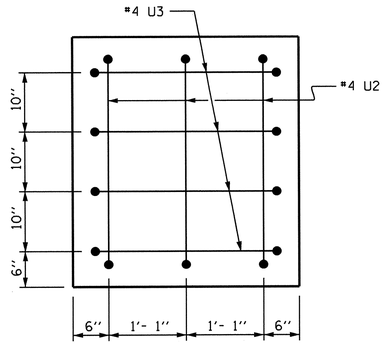
ADAVENPORT

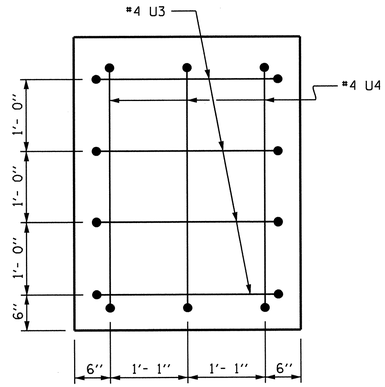
STR. #2



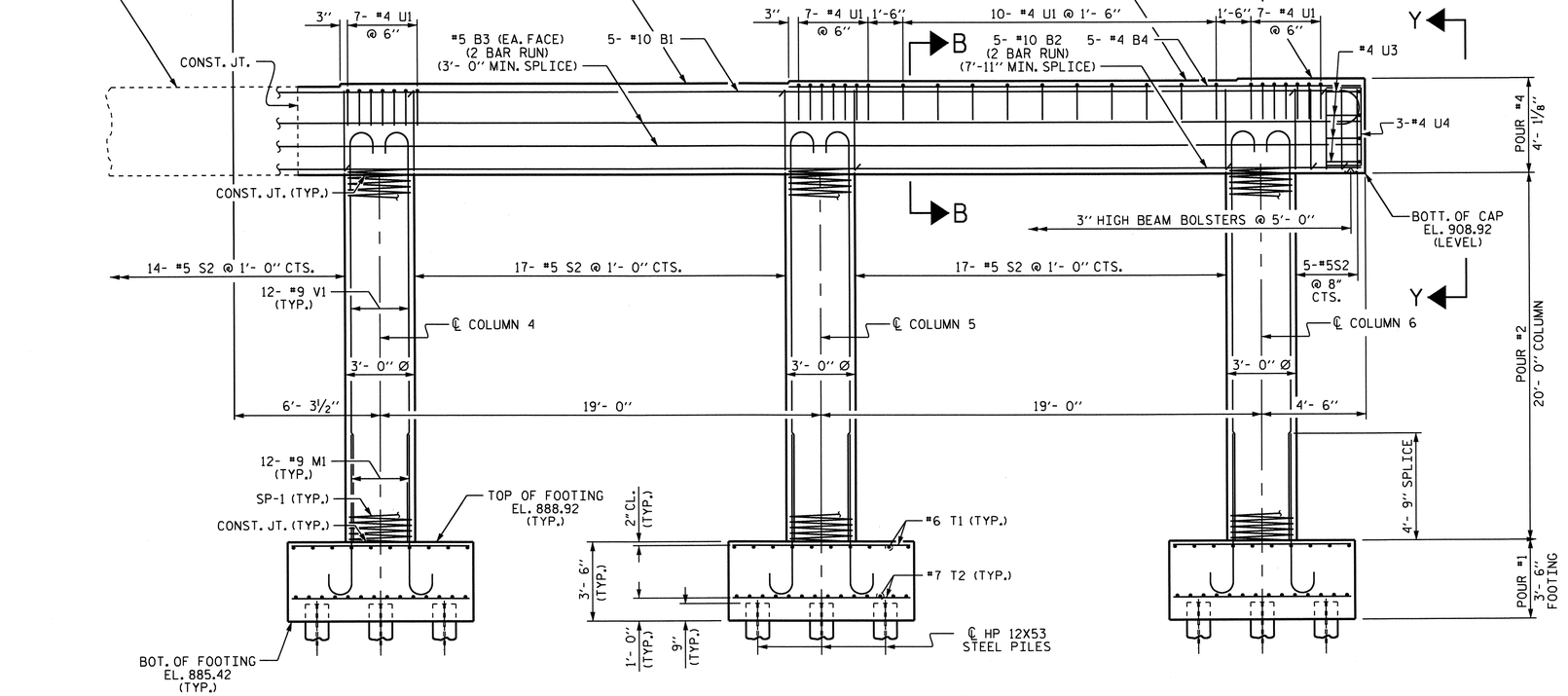
PART PLAN (RIGHT SIDE)



SECTION X-X



SECTION Y-Y



PART ELEVATION (RIGHT SIDE)

(ALL FOOTINGS AND COLUMNS ARE IDENTICAL)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT JR.
9/7/12

DRAWN BY : D. A. GLADDEN DATE : 10-24-11
CHECKED BY : K.D. LAYNE DATE : 1-25-12

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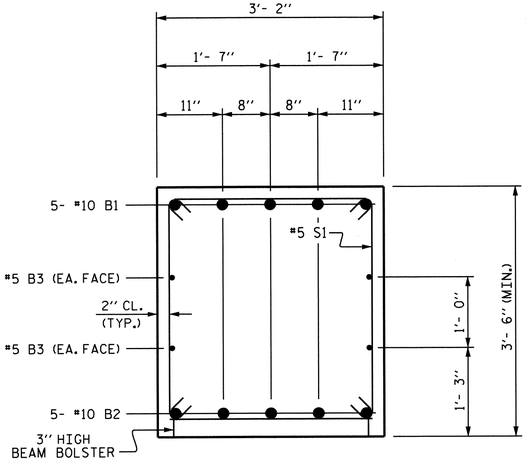
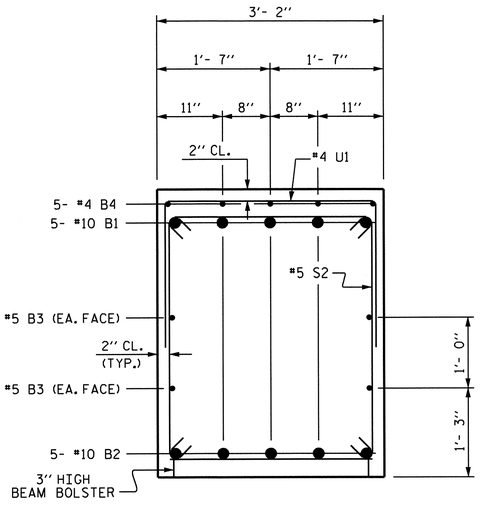
ADAVENPORT

STR. #2

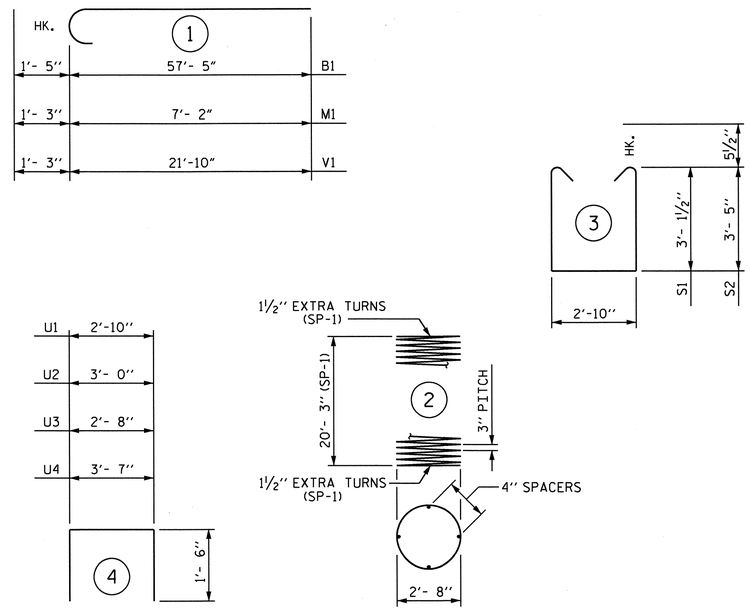


SECTION A-A
(INVERT ALTERNATE STIRRUPS)



SECTION B-B
(INVERT ALTERNATE STIRRUPS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	58'-10"	2532
B2	10	#10	STR	55'-10"	2403
B3	8	#5	STR	53'- 4"	445
B4	5	#4	STR	24'- 6"	82
B5	5	#4	STR	8'- 3"	28
M1	72	#9	1	8'- 5"	2060
S1	42	#5	3	10'- 0"	438
S2	53	#5	3	10'- 7"	585
T1	120	#6	STR	7'- 8"	1382
T2	168	#7	STR	7'- 8"	2633
U1	52	#4	4	5'-10"	203
U2	3	#4	4	6'- 0"	12
U3	8	#4	4	5'- 8"	30
U4	3	#4	4	6'- 7"	13
V1	72	#9	1	23'- 1"	5651

REINFORCING STEEL 18497 LBS.

SP-1 6 #4 2 693'- 1" 2778

SPIRAL REINFORCING STEEL 2778 LBS.

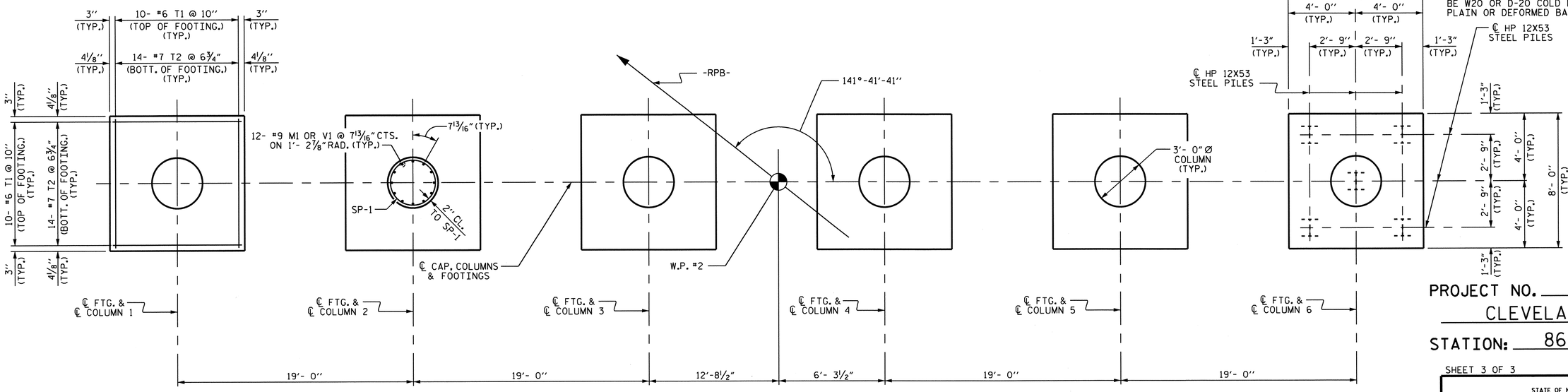
CLASS A CONCRETE BREAKDOWN

POUR #1 (FOOTINGS)	49.8 C.Y.
POUR #2 (COLUMNS)	31.4 C.Y.
POUR #3 (CAP)	25.8 C.Y.
POUR #4 (CAP)	20.5 C.Y.
TOTAL	127.5 C.Y.

HP 12X53 STEEL PILES
NO. 30 1500 LIN. FT.

PILE REDRIVES EACH 24

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



PLAN FOOTINGS
ALL COLUMNS AND FOOTINGS ARE IDENTICAL

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
1-5-12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS 96
2			4			

DRAWN BY : D. A. GLADDEN DATE : 10-24-11
CHECKED BY : K.D. LAYNE DATE : 1-25-12

03-JAN-2013 11:46
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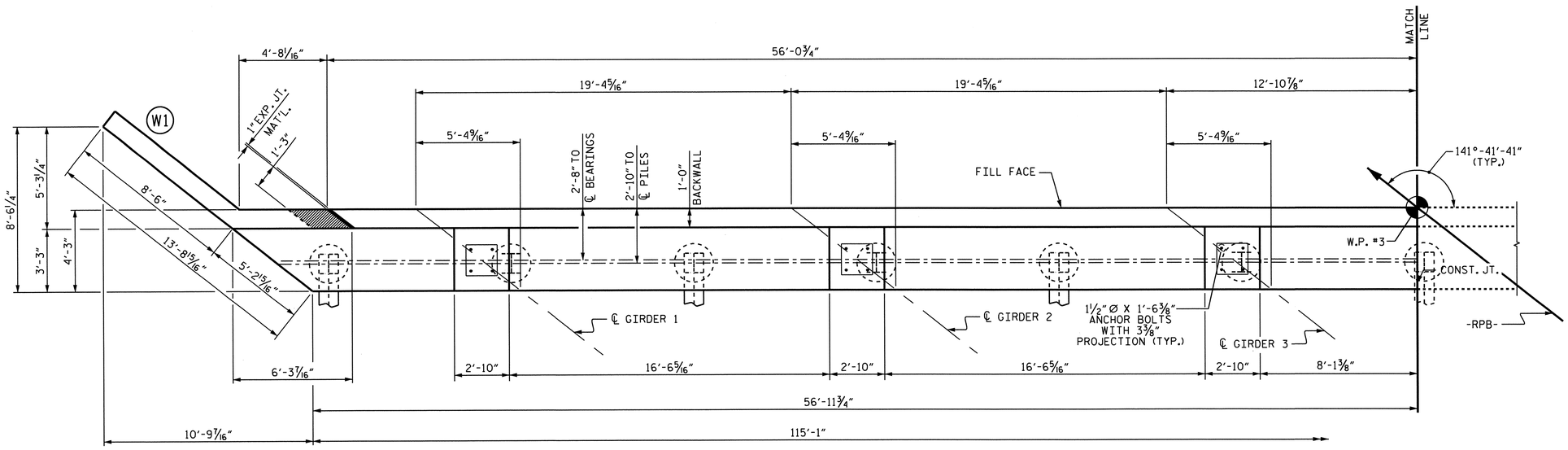
STR. #2



PLAN

NOTES

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

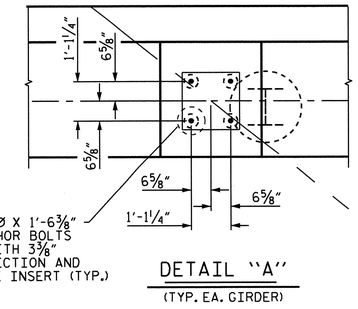
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

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.

*FOR LOCATION OF ELEVATIONS BETWEEN BUILDUPS, SEE SECTION A-A ON SHEET 4 OF 4.

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



DETAIL "A"
(TYP. EA. GIRDER)

ELEVATION

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			96

STR #2

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR

DRAWN BY : M. G. SHAIKH DATE : 09-22-11
CHECKED BY : E. C. LOCKLEAR DATE : 10-10-11

03-JAN-2013 11:45
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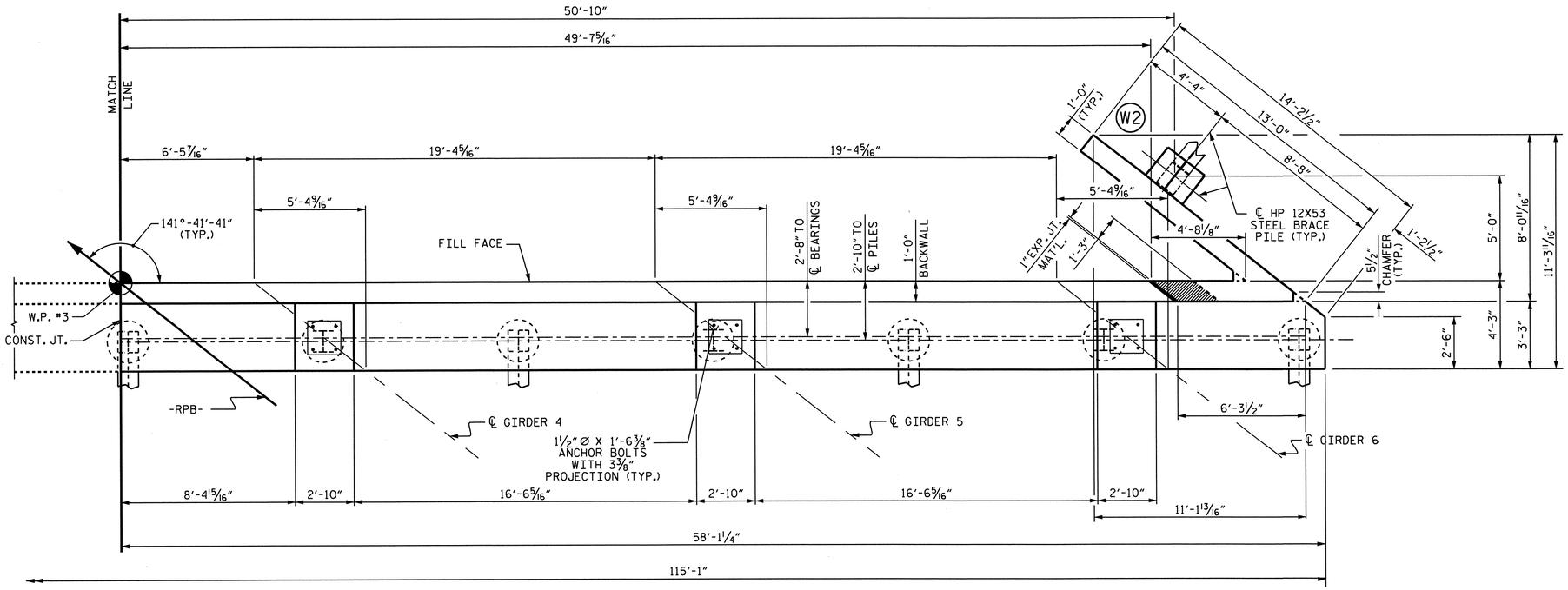
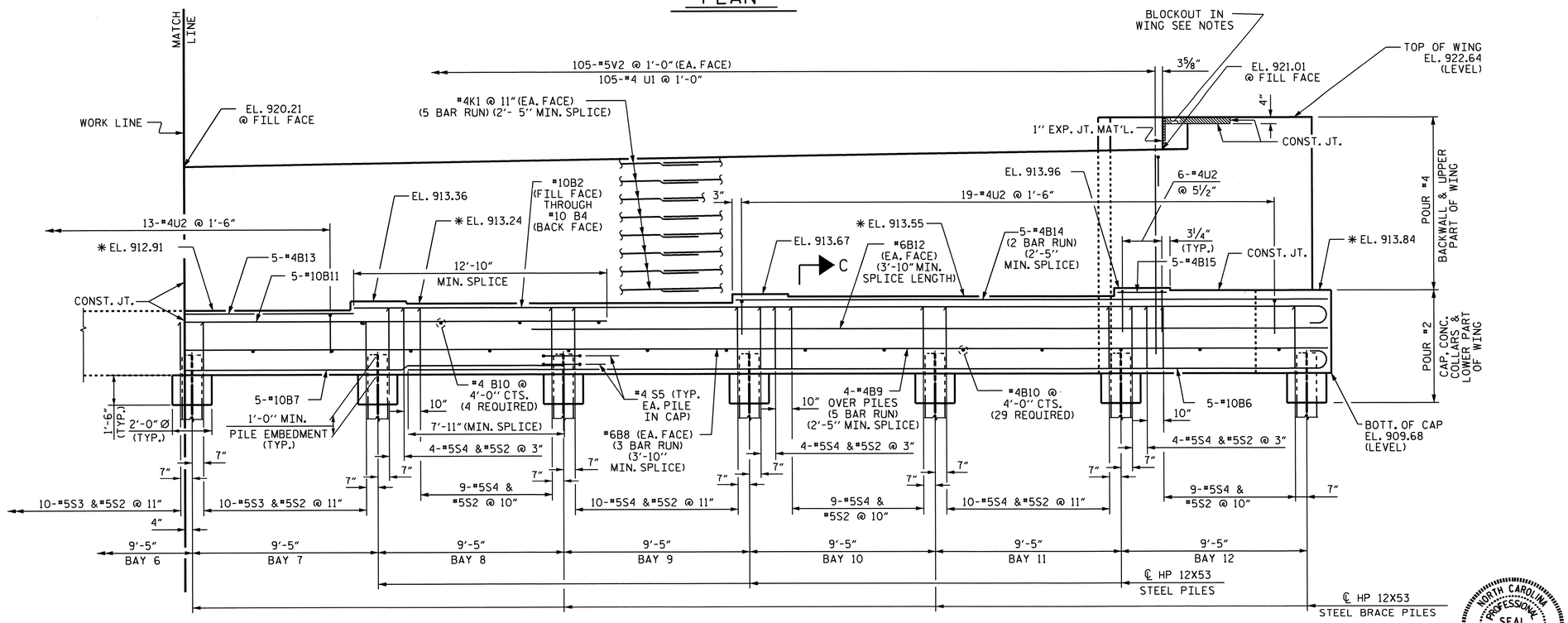


PLAN



ELEVATION

(BRACE PILE IN WING NOT SHOWN)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			96

STR #2

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.

DRAWN BY : M. G. SHAIKH DATE : 09-22-11
CHECKED BY : E. C. LOCKLEAR DATE : 10-10-11

03-JAN-2013 11:45
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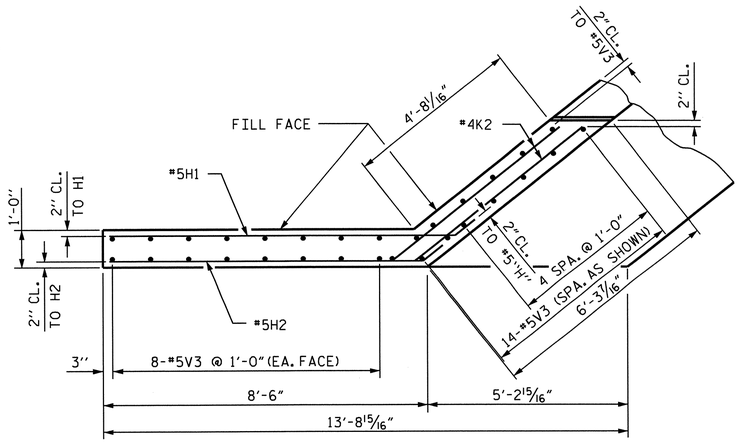
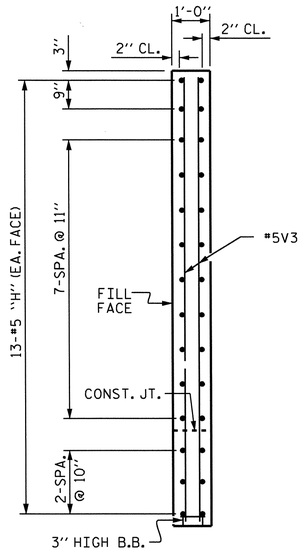
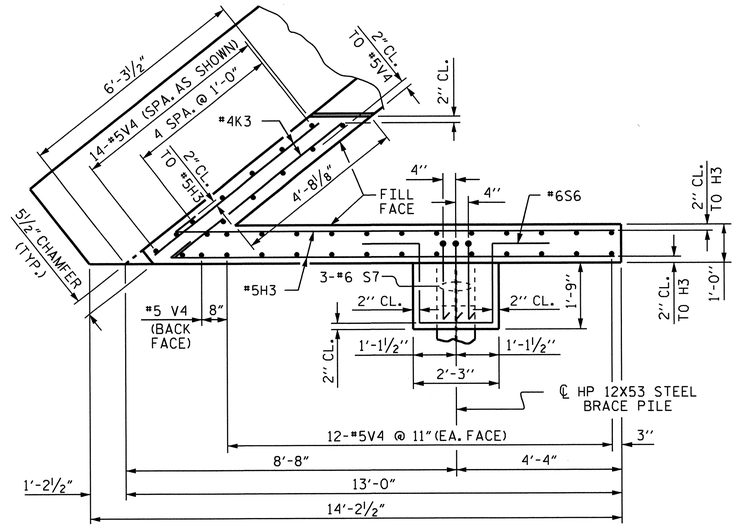


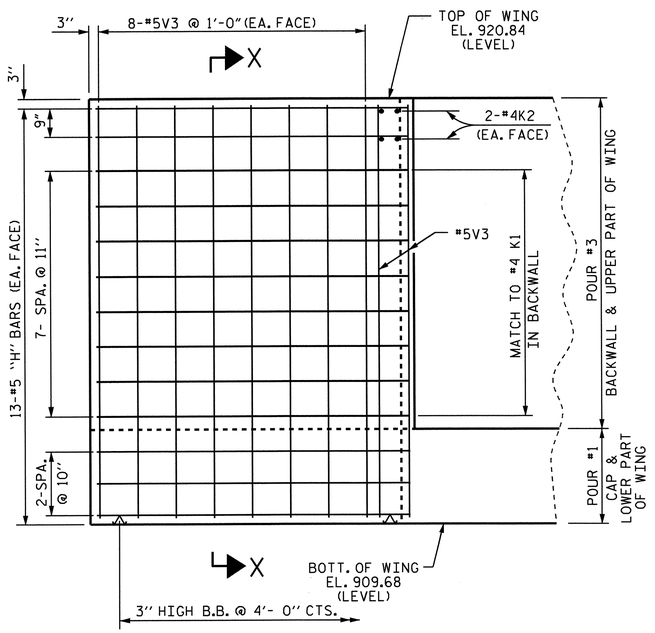
PLAN OF LEFT WING (W1)



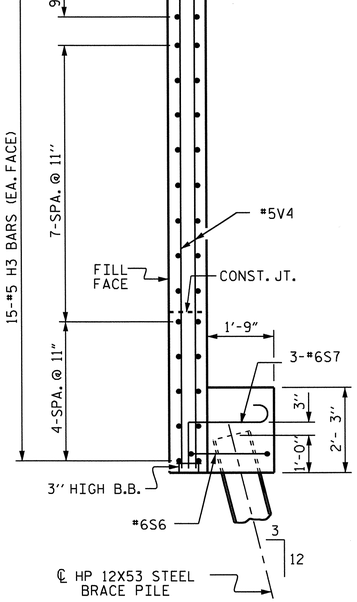
SECTION X-X



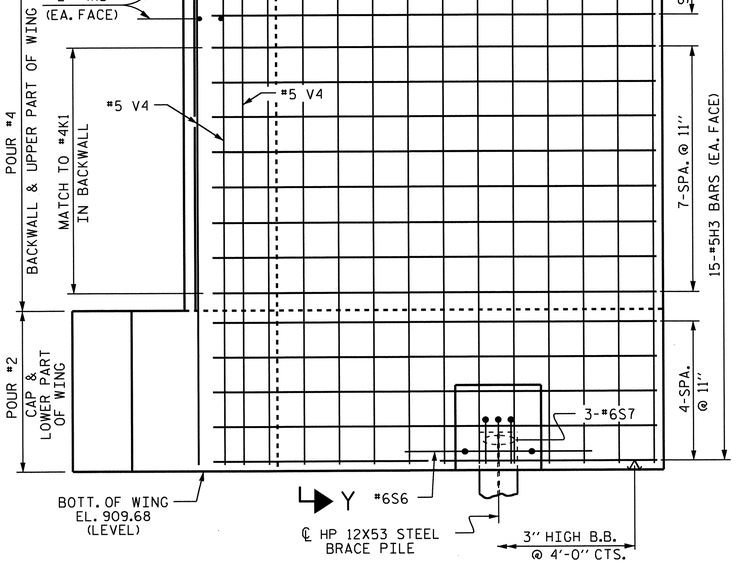
PLAN OF RIGHT WING (W2)



ELEVATION OF LEFT WING (W1)



SECTION Y-Y



ELEVATION OF RIGHT WING (W2)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			96

STR #2

DRAWN BY : M. G. SHAIKH DATE : 09-26-11
CHECKED BY : E. C. LOCKLEAR DATE : 10-10-11

04-SEP-2012 14:32
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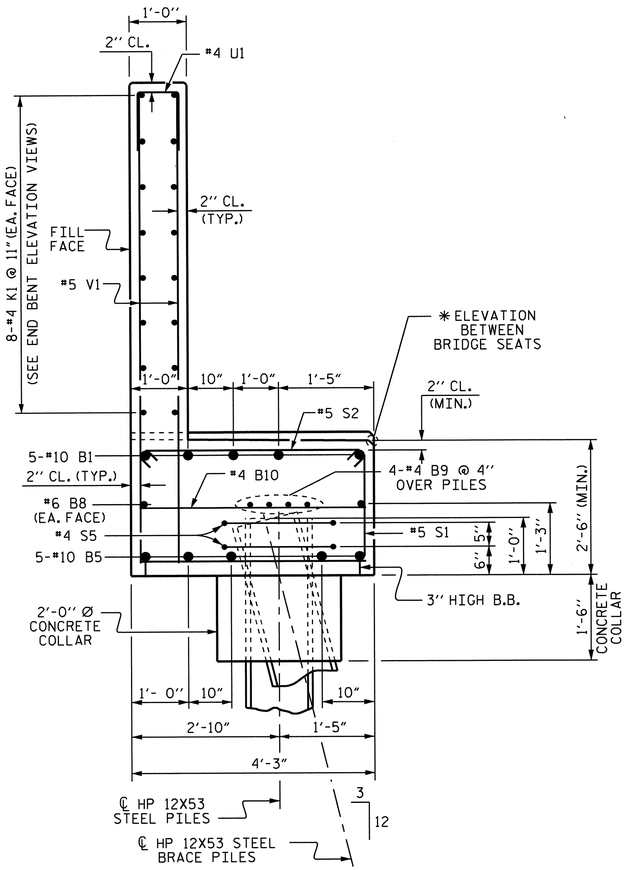
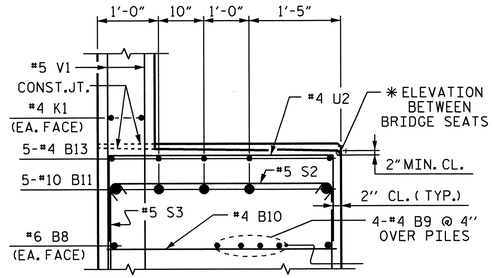
ddavenport

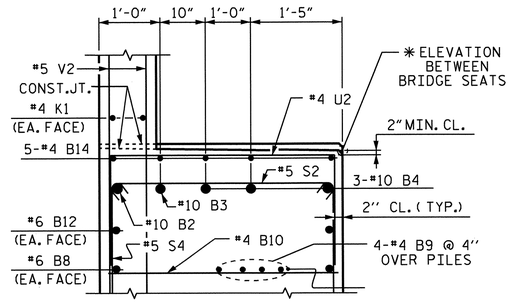
NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER DAVE D. NORTH DAVENPORT, JR.
9/7/12



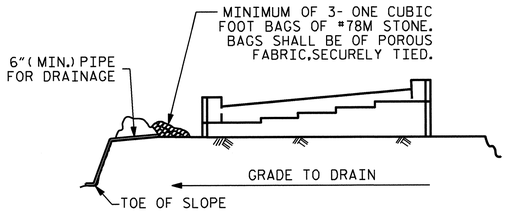
SECTION A-A



PARTIAL SECTION B-B



PARTIAL SECTION C-C



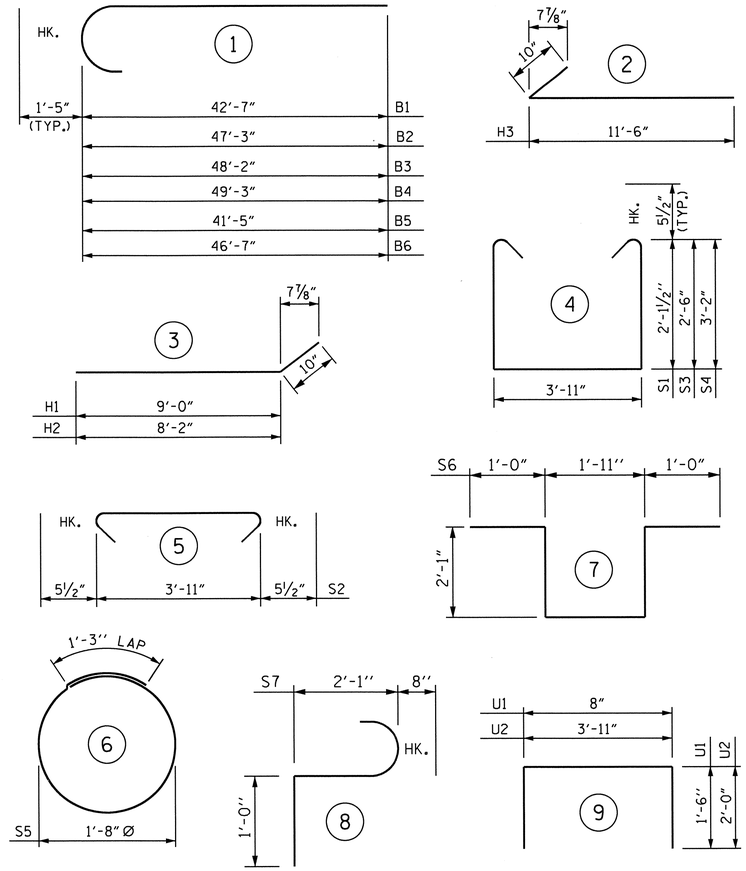
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

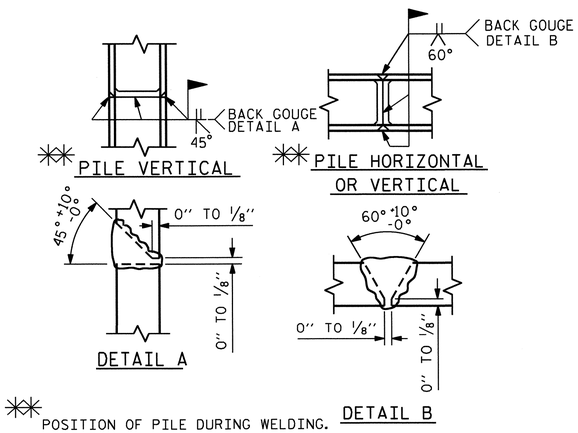
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



✱✱ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	#10	1	44'-0"	947
B2	1	#10	1	48'-8"	209
B3	1	#10	1	49'-7"	213
B4	3	#10	1	50'-8"	654
B5	5	#10	1	42'-10"	922
B6	5	#10	1	48'-0"	1033
B7	5	#10	STR	47'-4"	1018
B8	6	#6	STR	41'-10"	377
B9	20	#4	STR	25'-6"	341
B10	36	#4	STR	3'-11"	94
B11	5	#10	STR	51'-7"	1110
B12	2	#6	STR	40'-5"	121
B13	5	#4	STR	19'-4"	65
B14	10	#4	STR	16'-3"	109
B15	5	#4	STR	2'-6"	8
H1	13	#5	3	9'-10"	133
H2	13	#5	3	9'-0"	122
H3	30	#5	2	12'-4"	386
K1	80	#4	STR	25'-6"	1363
K2	4	#4	STR	5'-7"	15
K3	4	#4	STR	5'-6"	15
S1	36	#5	4	9'-1"	341
S2	138	#5	5	4'-10"	696
S3	43	#5	4	9'-10"	441
S4	59	#5	4	11'-2"	687
S5	26	#4	6	6'-6"	113
S6	1	#6	7	8'-1"	12
S7	3	#6	8	3'-9"	17
U1	105	#4	9	3'-8"	257
U2	38	#4	9	7'-11"	201
V1	110	#5	STR	9'-1"	1042
V2	100	#5	STR	10'-1"	1052
V3	30	#5	STR	10'-9"	336
V4	39	#5	STR	12'-7"	512

REINFORCING STEEL = 14962 LBS

CLASS A CONCRETE

POUR #1 (CAP, LOWER PART OF WINGS & CONCRETE COLLARS)	= 33.1 C.Y.
POUR #2 (CAP, LOWER PART OF WINGS & CONCRETE COLLARS)	= 32.4 C.Y.
POUR #3 (BACKWALL & UPPER PART OF WINGS)	= 19.5 C.Y.
POUR #4 (BACKWALL & UPPER PART OF WINGS)	= 19.2 C.Y.
TOTAL	= 104.2 C.Y.

HP 12X53 STEEL PILES		
NO. 14	770	LIN. FT.
PILE REDRIVES	EACH 13	

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT

DRAWN BY : M. G. SHAIKH DATE : 09-27-11
CHECKED BY : E. C. LOCKLEAR DATE : 10-10-11

03-JAN-2013 11:44
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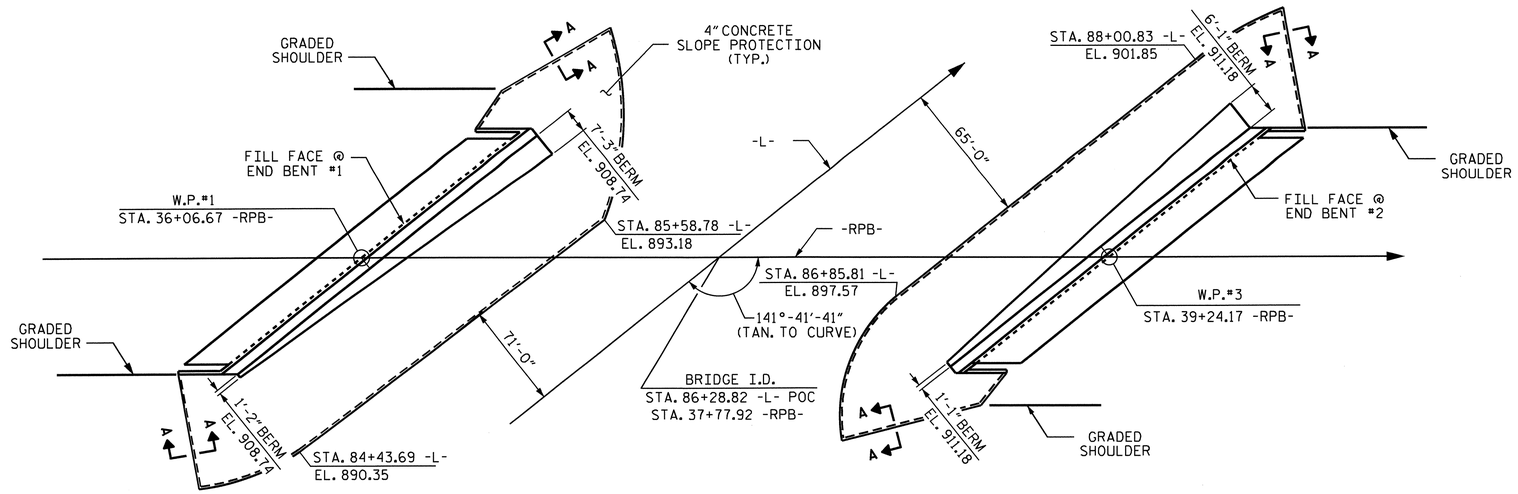
adavenport

STR #2



PLAN

GENERAL NOTES

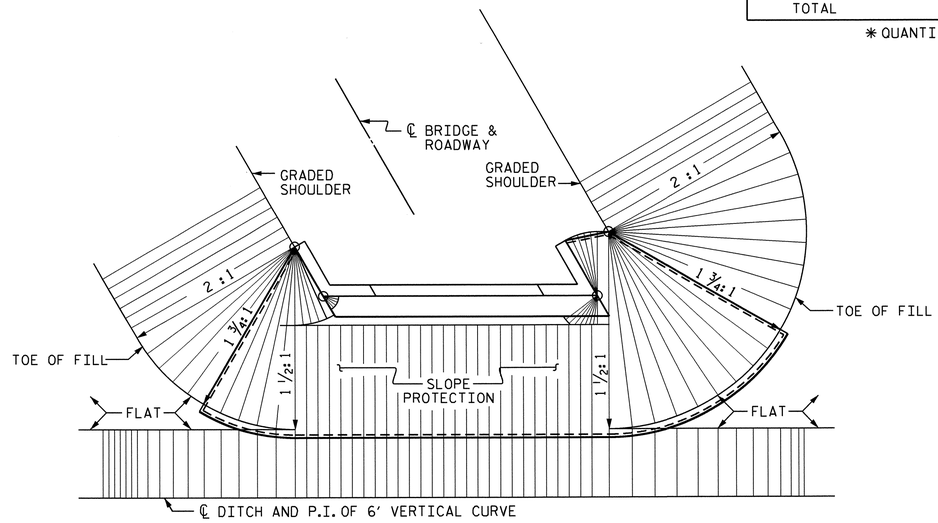
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. 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. 86+28.82 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	895	1790
END BENT 2	755	1510
TOTAL	1650	3300

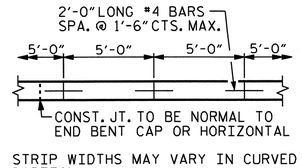
* QUANTITY SHOWN IS BASED ON 5' POURS.

SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH



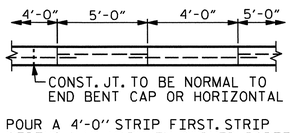
PLAN - END BENT WITH SWEPT BACK WINGS - SKEWED

(1 1/2: 1 SLOPE)



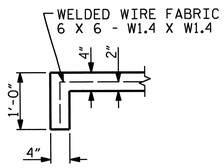
STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL



SECTION A-A

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			96

ASSEMBLED BY : W. B. HILL	DATE : 05/11		
CHECKED BY : D.A. DAVENPORT	DATE : 01/24/12		
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	

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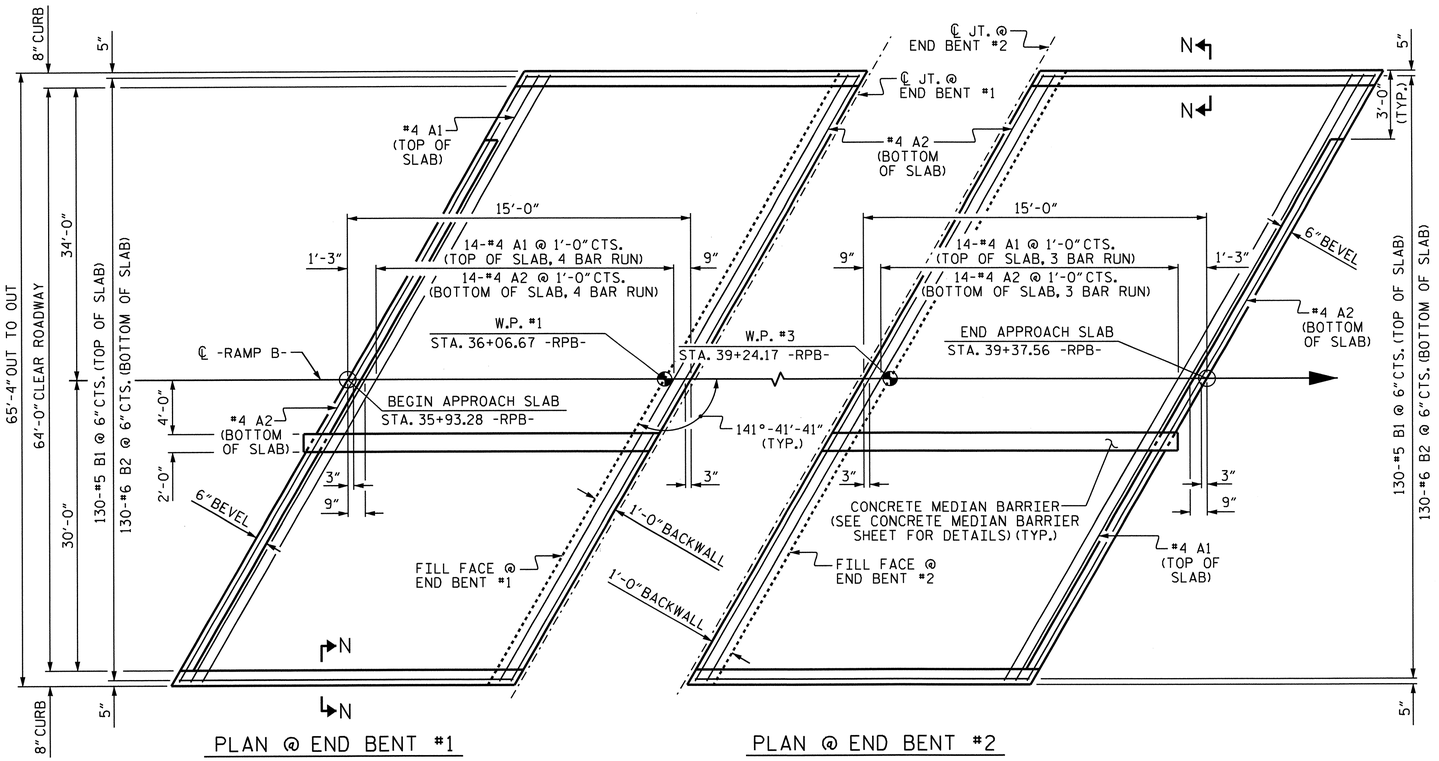
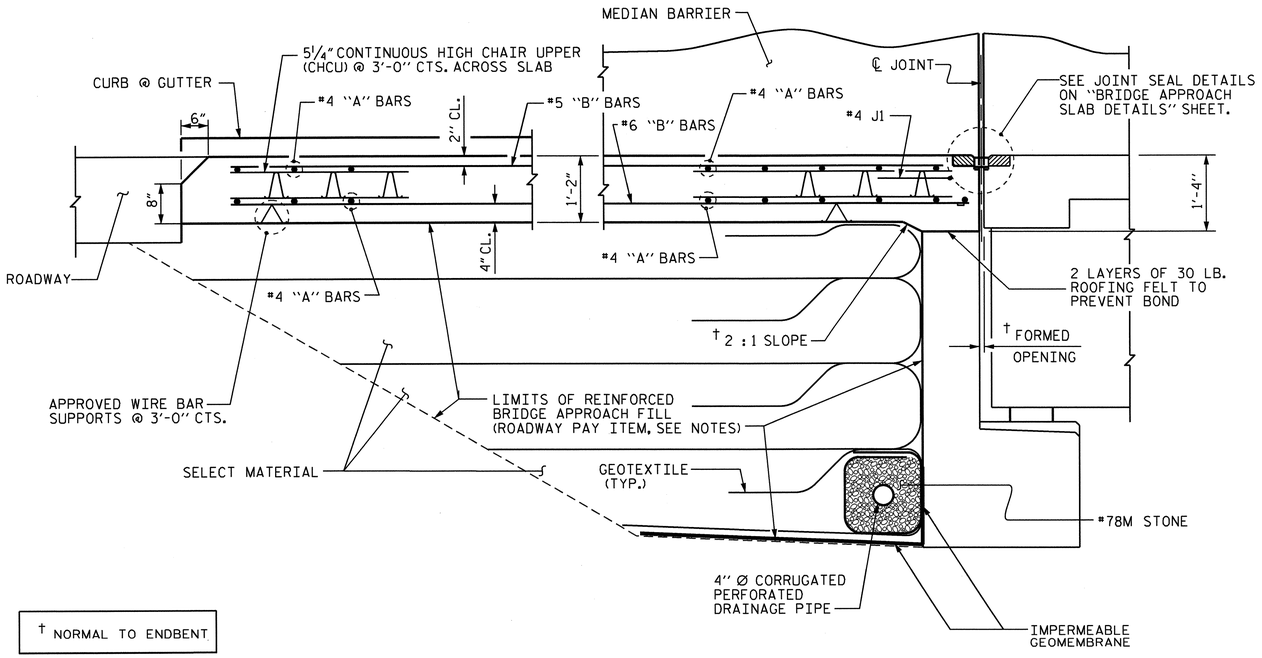
STR.#2

STD. NO. SP1 (SHT 6)



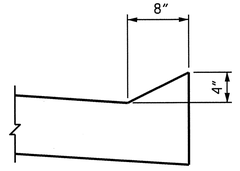
PLAN @ END BENT #1 PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

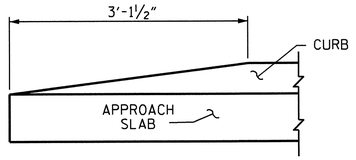


† NORMAL TO ENDBENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

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

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

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	60	#4	STR	27'-9"	1112
A2	64	#4	STR	27'-7"	1179
* B1	130	#5	STR	12'-10"	1740
B2	130	#6	STR	14'-5"	2815
REINFORCING STEEL				LBS.	3994
* EPOXY COATED REINFORCING STEEL				LBS.	2852
CLASS AA CONCRETE				C.Y.	43.2

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	60	#4	STR	27'-9"	1112
A2	64	#4	STR	27'-7"	1179
* B1	130	#5	STR	12'-10"	1740
B2	130	#6	STR	14'-5"	2815
REINFORCING STEEL				LBS.	3994
* EPOXY COATED REINFORCING STEEL				LBS.	2852
CLASS AA CONCRETE				C.Y.	43.2

SPLICE LENGTHS

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

PROJECT NO. R-2707AA

CLEVELARD COUNTY

STATION: 86+28.82 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER ANDREW VAP DAVENPORT
9/7/12

ASSEMBLED BY :	J. OERTER	DATE :	07/12
CHECKED BY :	D. DAVENPORT	DATE :	07/12
DRAWN BY : EEM 3/95	REV. 5/1/06RR		KMM/GM
CHECKED BY : VAP 3/95	REV. 10/1/11		MAA/GM
	REV. 12/21/11		MAA/GM

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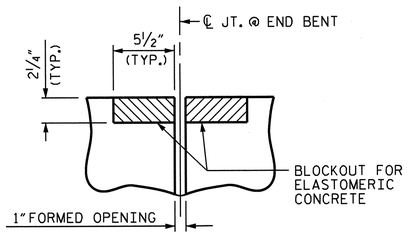
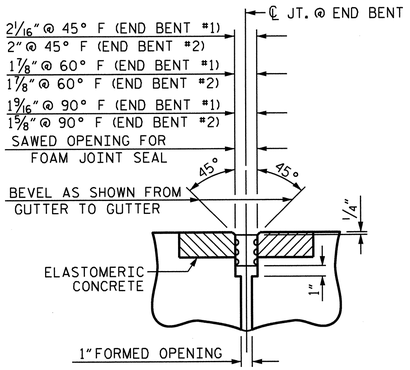


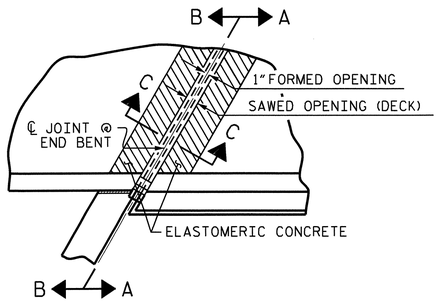
SECTION C-C

FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)

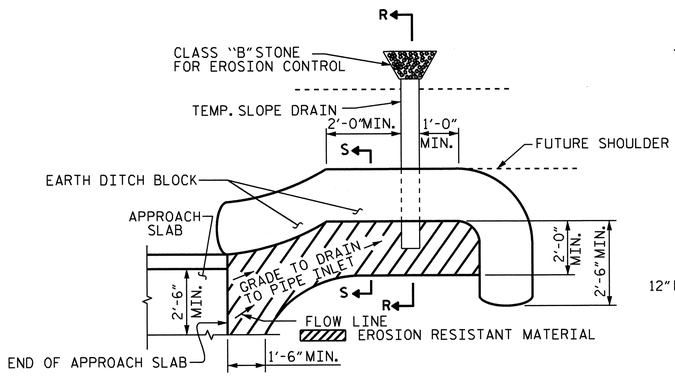


SECTION C-C

FOAM JOINT SEAL
(EXPANSION)

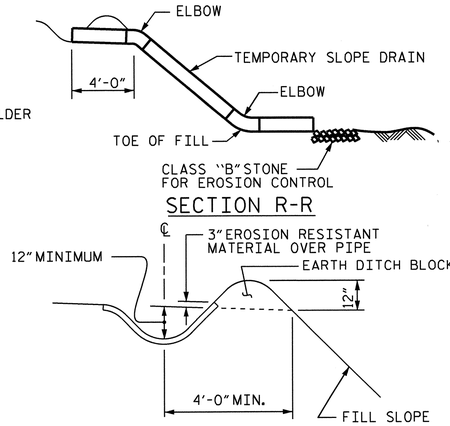


PLAN



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

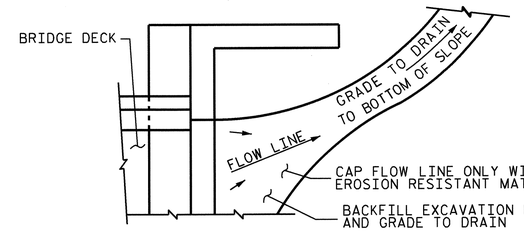


SECTION R-R

SECTION S-S

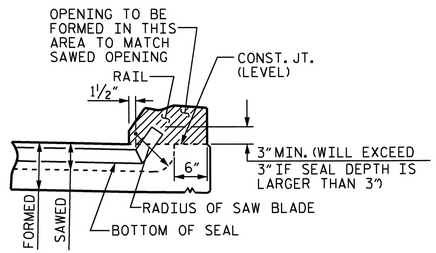
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

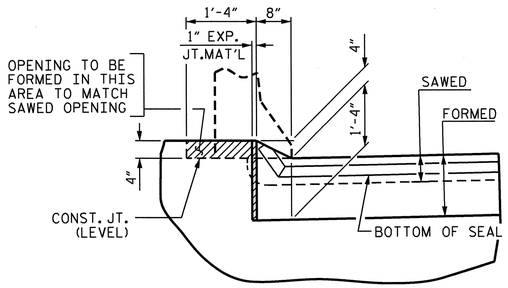


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



SECTION A-A



SECTION B-B

JOINT SEAL DETAILS @ END BENT

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	17.8
2	17.8
TOTAL	35.6

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 86+28.82 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH
SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D'ANDRE DAVENPORT, JR.
9/7/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			96

ASSEMBLED BY :	W. B. HILL	DATE :	05/09
CHECKED BY :	D. GLADDEN	DATE :	01/20/12
DRAWN BY : FCJ	11/88	REV. 5/7/03	RWW/JTE
CHECKED BY : ARB	11/88	REV. 5/1/06RRR	MAA/KMM
		REV. 10/1/11	MAA/GM

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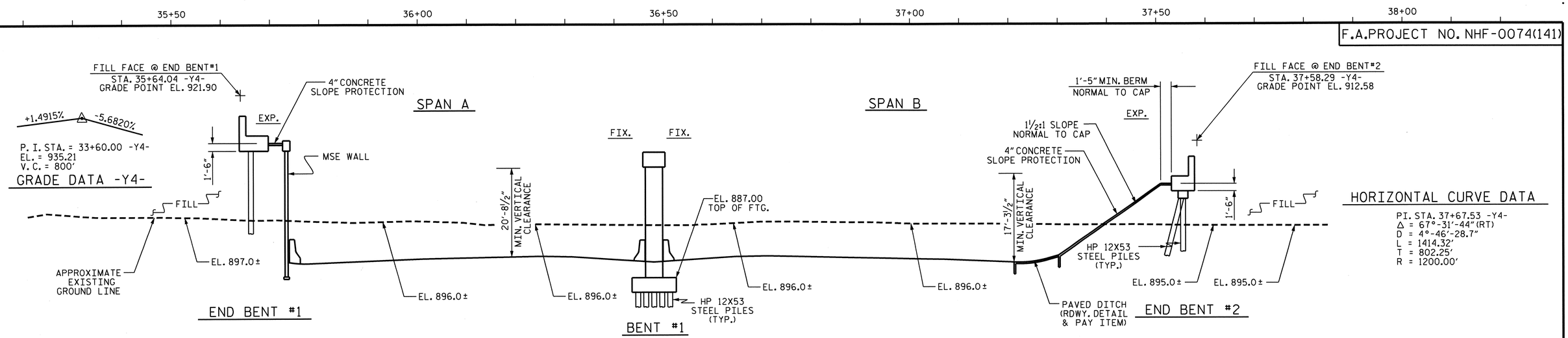
STD. NO. BAS4 (SHT 1b)

F.A.PROJECT NO. NHF-0074(141)

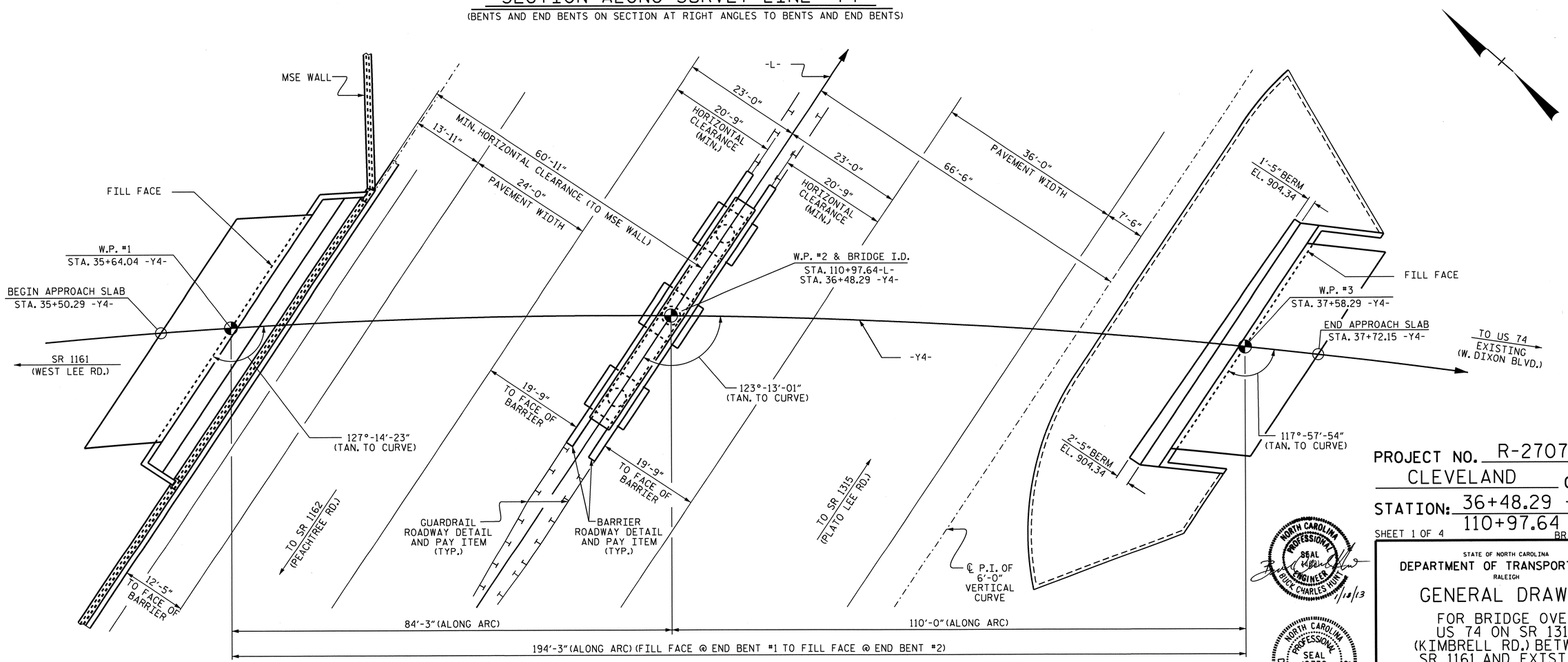


HORIZONTAL CURVE DATA

PI. STA. 37+67.53 -Y4-
Δ = 67°-31'-44"(RT)
D = 4°-46'-28.7"
L = 1414.32'
T = 802.25'
R = 1200.00'

SECTION ALONG SURVEY LINE -Y4-

(BENTS AND END BENTS ON SECTION AT RIGHT ANGLES TO BENTS AND END BENTS)



PLAN

(PILES NOT SHOWN IN PLAN VIEW)

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 36+48.29 -Y4-
110+97.64 -L-
SHEET 1 OF 4
BRIDGE NO. 453

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER US 74 ON SR 1318 (KIMBRELL RD.) BETWEEN SR 1161 AND EXISTING US 74

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 024161 ENGINEER BUCK CHARLES HUNT 1/10/13

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT JR 1-4-13

DRAWN BY : D.A. DAVENPORT DATE : 02-23-12
CHECKED BY : G.W. DICKEY DATE : 06/04/12

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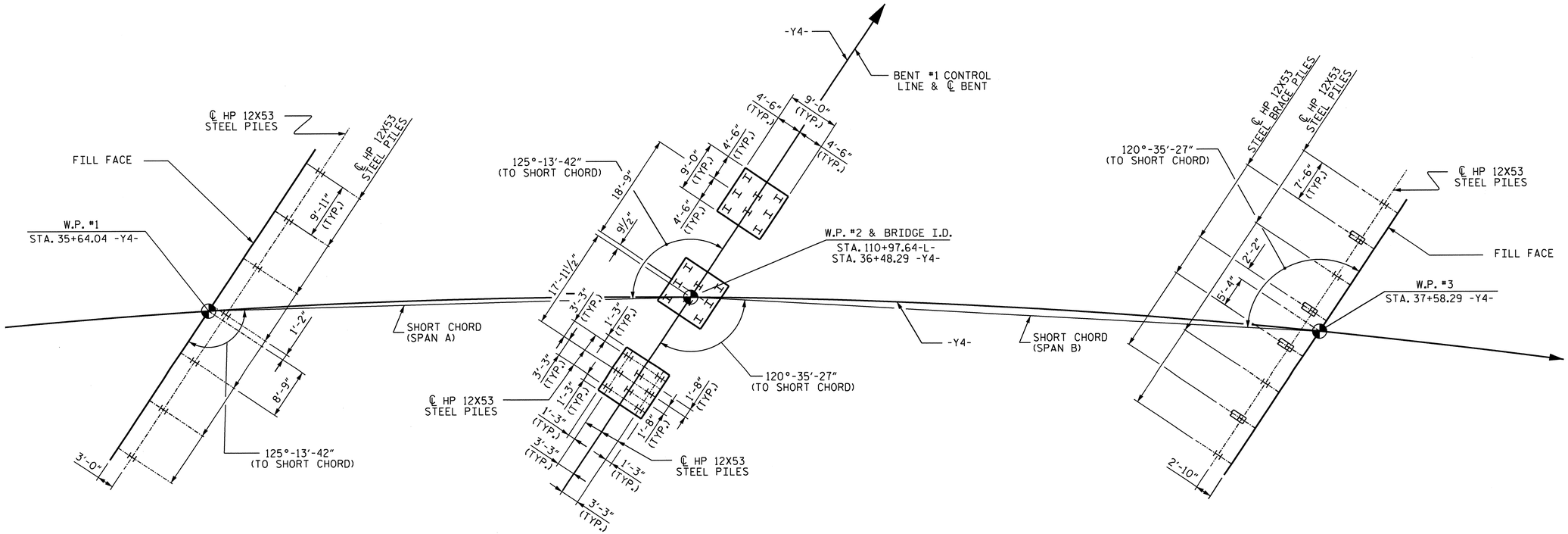
kbeard

STR #3



END BENT #1 BENT #1 END BENT #2

FOUNDATION LAYOUT

BRACE PILES IN END BENTS ARE BATTERED 3:12.

BRACE PILES IN BENT ARE BATTERED 1½:12.

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

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

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

PILES AT BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT BENT #1 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.

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

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

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

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR
1-4-13

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER US 74 ON SR 1318 (KIMBRELL RD.) BETWEEN SR 1161 AND EXISTING US 74

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : D.A. DAVENPORT DATE : 02/28/12
CHECKED BY : G.W. DICKEY DATE : 06/04/12

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kbeard

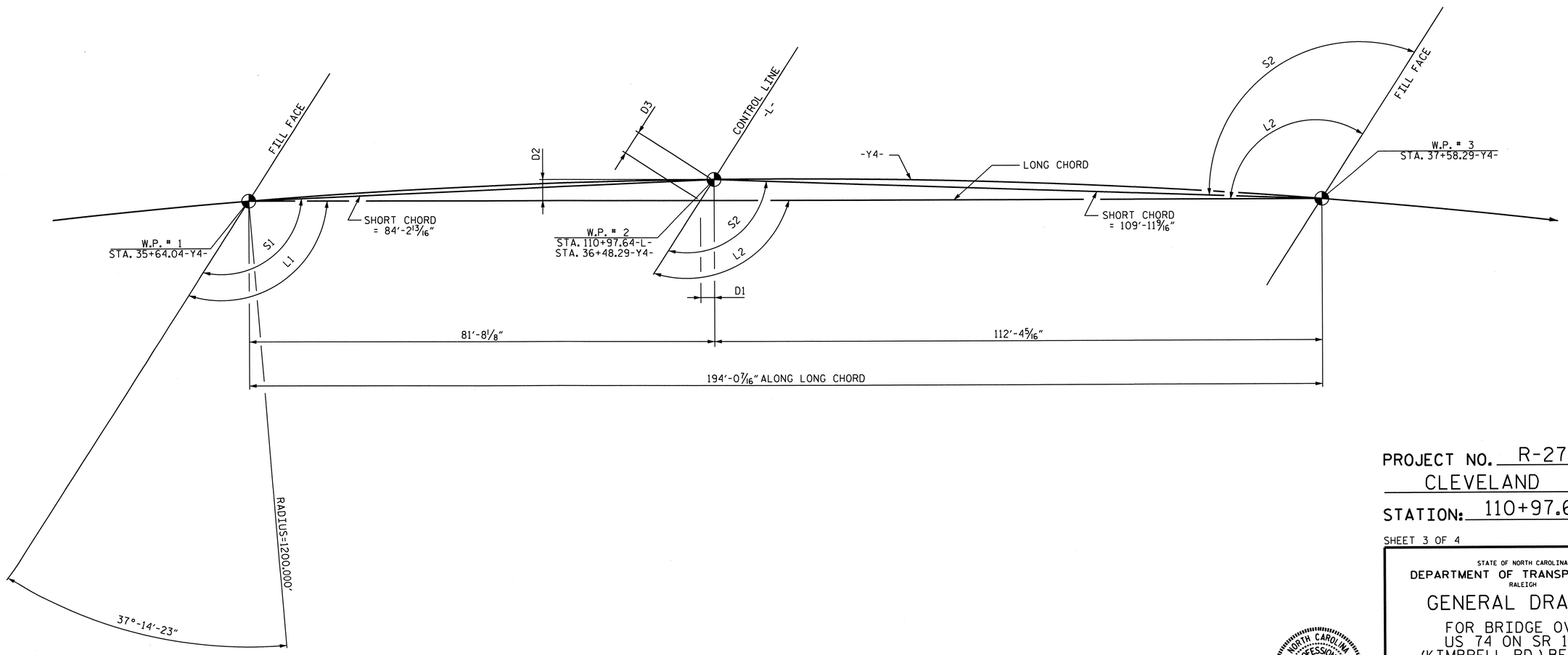
STR.#3

ANGLES			
LONG CHORD		SHORT CHORD	
L1	122°-36′-08″	S1	125°-13′-42″
L2	122°-36′-08″	S2	120°-35′-27″

HORIZONTAL CURVE DATA -Y4-

P.I. = 37+67.53 -Y4-
DELTA = 67°-31′-44″(RT.)
D = 4°-46′-28.7″
L = 1414.32 FT.
T = 802.25 FT.
R = 1200.000 FT.

OFFSETS
D1=2′-5⅝″
D2=3′-10⁵⁄₁₆″
D3=4′-7″



LONG CHORD

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
US 74 ON SR 1318
(KIMBRELL RD.) BETWEEN
SR 1161 AND EXISTING
US 74

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR.
9/10/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : D.A. DAVENPORT DATE : 02/28/12
CHECKED BY : G.W. DICKEY DATE : 06/04/12

28-AUG-2012 08:42
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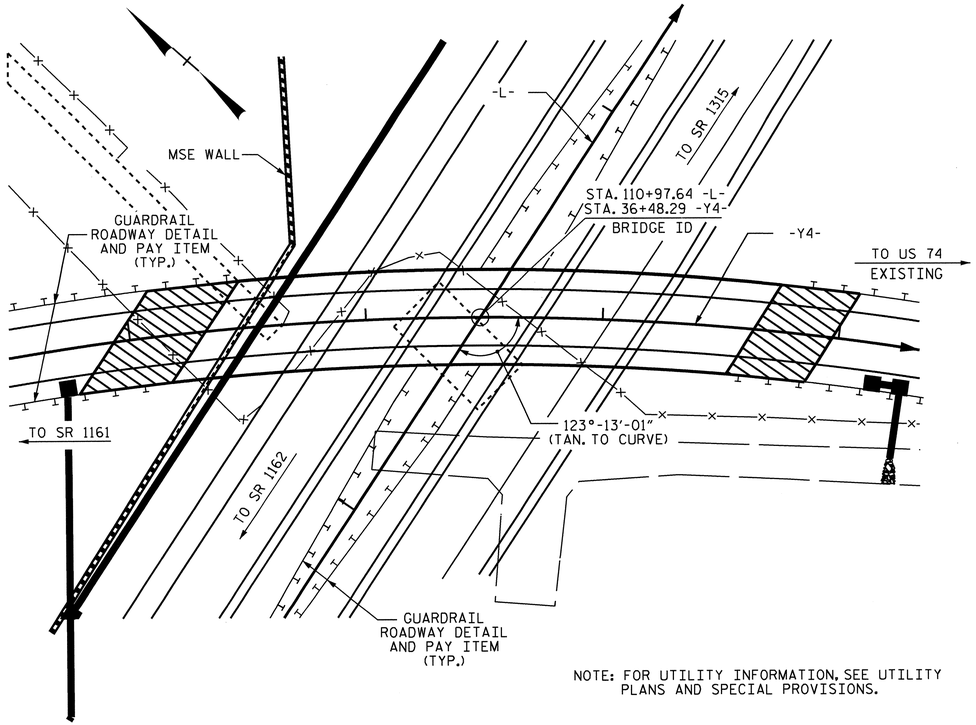
ADAVENPORT

STR.#3

BENCHMARK: BM #5 RAILROAD SPIKE IN 28"Ø OAK STA. 19+34.59 -Y4-, EL. 908.11



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

LOCATION SKETCH

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 REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

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

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

OBSERVE A THREE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT #1 AND #2. THE WAITING PERIODS MAY BE REDUCED BY THE ENGINEER AFTER THE REVIEW AND ACCEPTANCE OF SETTLEMENT DATA THAT HAS BEEN OBTAINED BY EMBANKMENT MONITORING USING SURVEY HUBS. INSTALLATION AND MONITORING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

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

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.

WORK SHALL NOT BE STARTED ON THIS BRIDGE UNTIL ROADWAY SECTION HAS BEEN EXCAVATED.

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL REINFORCING STEEL	63" PRESTRESSED CONCRETE GIRDERS		HP 12X53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	FOAM JOINT SEALS
	LUMP SUM	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			8294	8091					10	939.51				383.64		LUMP SUM	LUMP SUM
END BENT 1					48.1		8724				7	385	7		22		
BENT 1	LUMP SUM				88.7		11892	1655			24	1020	24				
END BENT 2					44.8		6963				8	440	8		313		
TOTAL	LUMP SUM	1	8294	8091	181.6	LUMP SUM	27579	1655	10	939.51	39	1845	39	383.64	335	LUMP SUM	LUMP SUM

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT
1-4-13

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
US 74 ON SR 1318
(KIMBRELL RD.) BETWEEN
SR 1161 AND EXISTING
US 74

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			96

STR #3

DRAWN BY : D.A. DAVENPORT DATE : 02/23/12
CHECKED BY : G.W. DICKEY DATE : 06/04/12

04-JAN-2013 11:56
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kbeard

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						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	⟨1⟩	1.08	--	1.75	0.812	1.29	A	ER	40.056	0.973	1.22	A	ER	24.034	0.80	0.831	1.08	B	ER	53.075	
		HL-93(Opr)	N/A	--	1.58	--	1.35	0.812	1.67	A	ER	40.056	0.973	1.58	A	ER	24.034	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	⟨2⟩	1.50	54.006	1.75	0.812	1.7	A	ER	40.056	0.973	1.5	A	ER	24.034	0.80	0.812	1.50	A	ER	40.056	
		HS-20(Opr)	36.000	--	1.94	70.008	1.35	0.812	2.21	A	ER	40.056	0.973	1.94	A	ER	24.034	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.45	46.611	1.4	0.812	4.89	A	ER	40.056	0.973	4.37	A	ER	24.034	0.80	0.812	3.45	A	ER	40.056	
		SNGARBS2	20.000	--	2.55	50.938	1.4	0.812	3.61	A	ER	40.056	0.973	3.14	A	ER	24.034	0.80	0.812	2.55	A	ER	40.056	
		SNAGRIS2	22.000	--	2.40	52.826	1.4	0.812	3.4	A	ER	40.056	0.973	2.92	A	ER	24.034	0.80	0.812	2.40	A	ER	40.056	
		SNCOTTS3	27.250	--	1.72	46.799	1.4	0.812	2.43	A	ER	40.056	0.973	2.18	A	ER	24.034	0.80	0.812	1.72	A	ER	40.056	
		SNAGGRS4	34.925	--	1.42	49.774	1.4	0.812	2.02	A	ER	40.056	0.973	1.83	A	ER	24.034	0.80	0.812	1.43	A	ER	40.056	
		SNS5A	35.550	--	1.39	49.569	1.4	0.812	1.98	A	ER	40.056	0.973	1.87	A	ER	24.034	0.80	0.812	1.39	A	ER	40.056	
		SNS6A	39.950	--	1.28	50.943	1.4	0.812	1.81	A	ER	40.056	0.973	1.71	A	ER	24.034	0.80	0.812	1.28	A	ER	40.056	
		SNS7B	42.000	--	1.21	50.997	1.4	0.812	1.72	A	ER	40.056	0.973	1.69	A	ER	24.034	0.80	0.812	1.21	A	ER	40.056	
	TTST	TNAGRIT3	33.000	--	1.55	51.275	1.4	0.812	2.2	A	ER	40.056	0.973	2.03	A	ER	24.034	0.80	0.812	1.55	A	ER	40.056	
		TNT4A	33.075	--	1.56	51.58	1.4	0.812	2.21	A	ER	40.056	0.973	1.97	A	ER	24.034	0.80	0.812	1.56	A	ER	40.056	
		TNT6A	41.600	--	1.27	52.88	1.4	0.812	1.8	A	ER	40.056	0.973	1.82	A	ER	24.034	0.80	0.812	1.27	A	ER	40.056	
		TNT7A	42.000	--	1.28	53.566	1.4	0.812	1.81	A	ER	40.056	0.973	1.78	A	ER	24.034	0.80	0.812	1.28	A	ER	40.056	
		TNT7B	42.000	--	1.31	55.199	1.4	0.812	1.86	A	ER	40.056	0.973	1.65	A	ER	24.034	0.80	0.812	1.31	A	ER	40.056	
		TNAGRIT4	43.000	--	1.25	53.926	1.4	0.812	1.78	A	ER	40.056	0.973	1.59	A	ER	24.034	0.80	0.812	1.25	A	ER	40.056	
		TNAGT5A	45.000	--	1.18	53.291	1.4	0.812	1.68	A	ER	40.056	0.973	1.59	A	ER	24.034	0.80	0.812	1.18	A	ER	40.056	
		TNAGT5B	45.000	⟨3⟩	1.17	52.719	1.4	0.812	1.66	A	ER	40.056	0.973	1.51	A	ER	24.034	0.80	0.812	1.17	A	ER	40.056	

LOAD FACTORS:

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

NOTES:

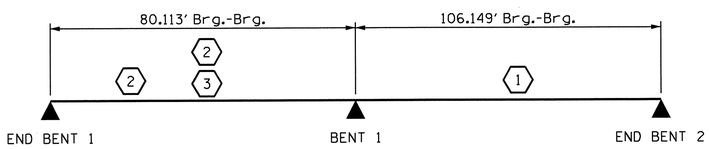
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

1.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING
⟨1⟩ DESIGN LOAD RATING (HL-93)
⟨2⟩ DESIGN LOAD RATING (HS-20)
⟨3⟩ LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE
GIRDER LOCATION
I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
1-4-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-71
1			3			TOTAL SHEETS
2			4			96

ASSEMBLED BY : D.A. DAVENPORT DATE : 03/08/12
CHECKED BY : C.W. DICKEY DATE : 06/04/12
DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08
REV. 11/12/08R MAA/GM

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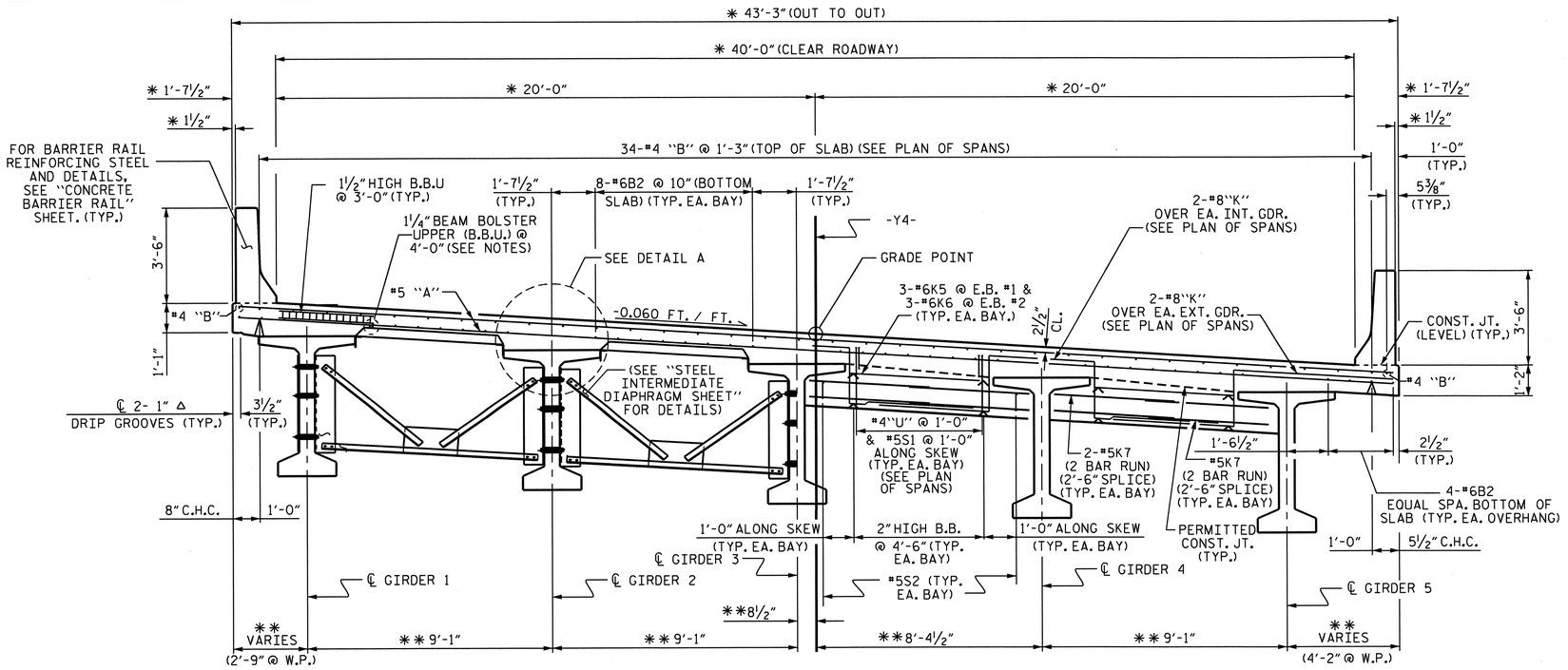
STR.#3

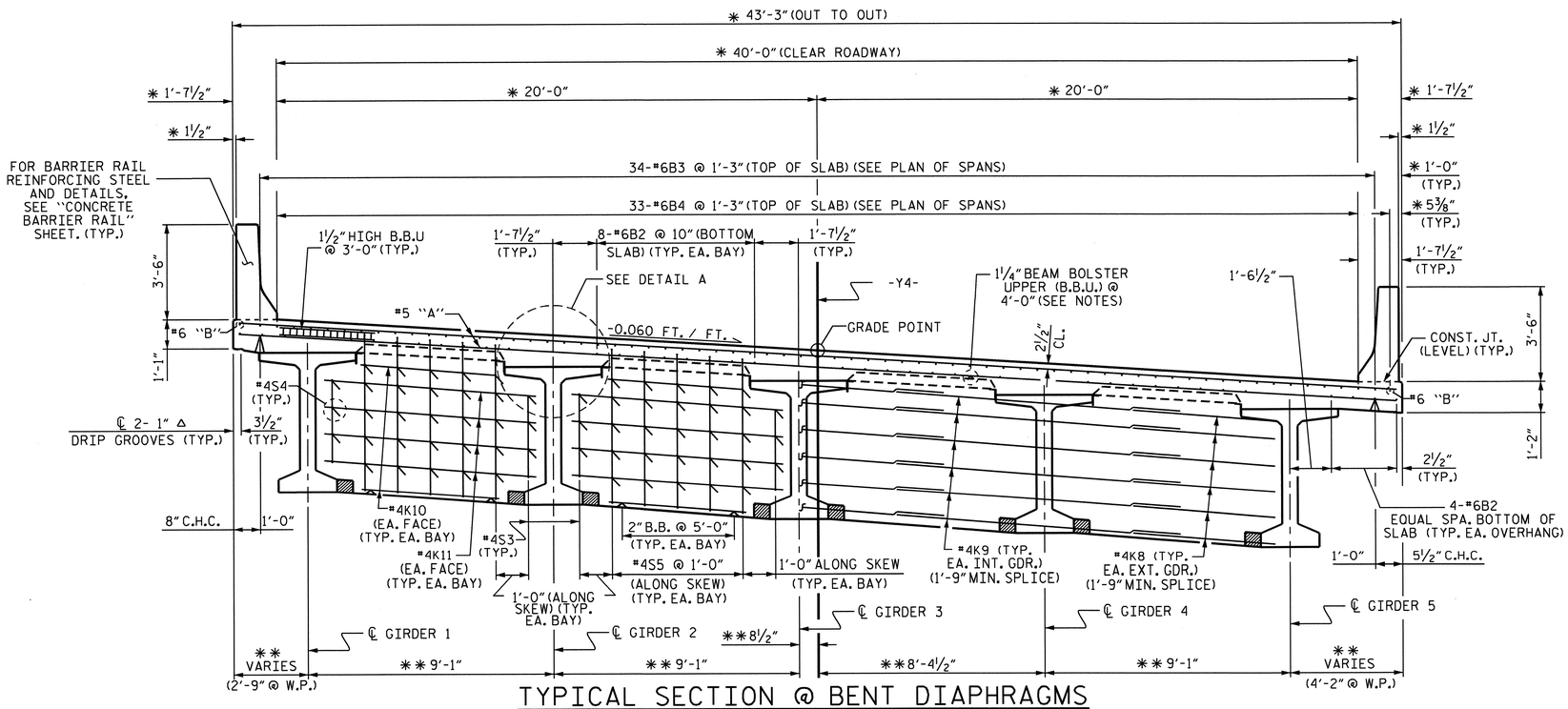
STD. NO. LRFR1



PART TYPICAL SECTION @ INTERMEDIATE DIAPHRAGMS

PART TYPICAL SECTION @ END BENT DIAPHRAGMS

TYPICAL SECTION



TYPICAL SECTION @ BENT DIAPHRAGMS

NOTES

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

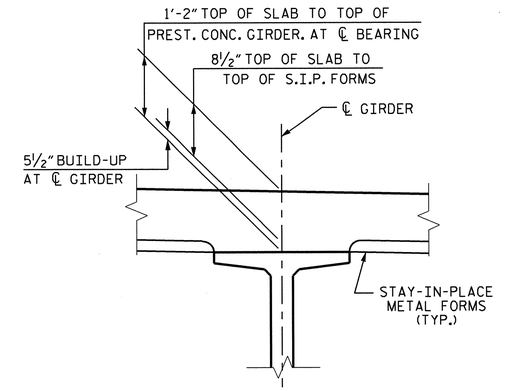
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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

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

* RADIAL DIMENSION

** RADIAL THROUGH THE WORK POINT



DETAIL A

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-72
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT
1-4-13

DRAWN BY : H. T. BARBOUR DATE : 8-17-10
CHECKED BY : E. C. LOCKLEAR DATE : 2-11

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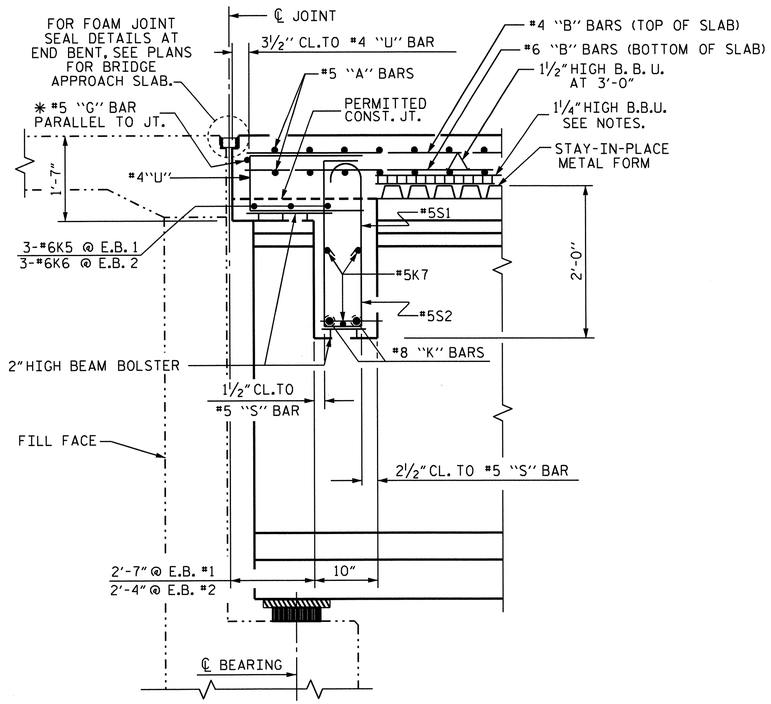
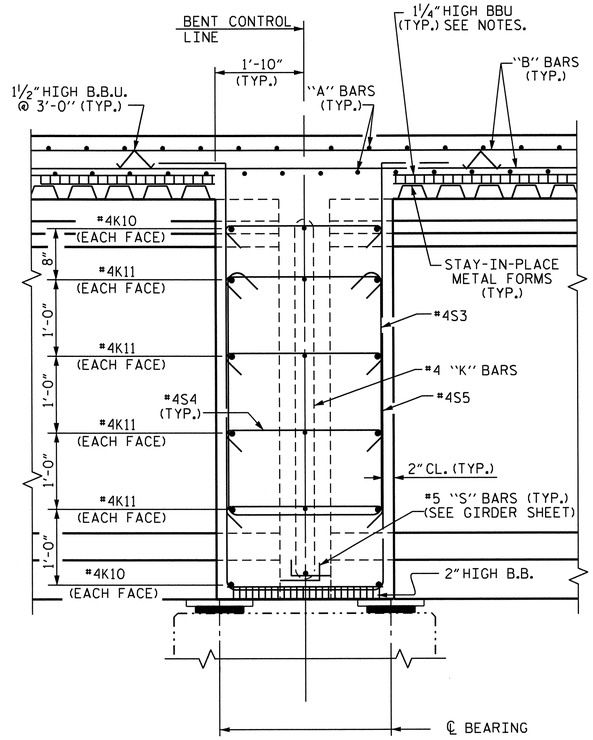
STR. #3

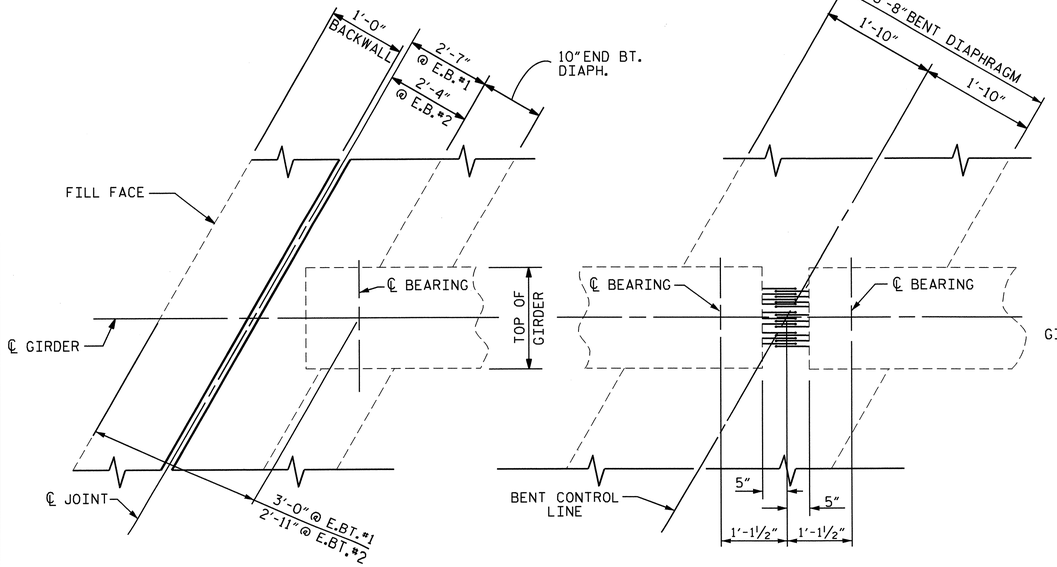


SECTION @ END BENTS

* "G" BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS



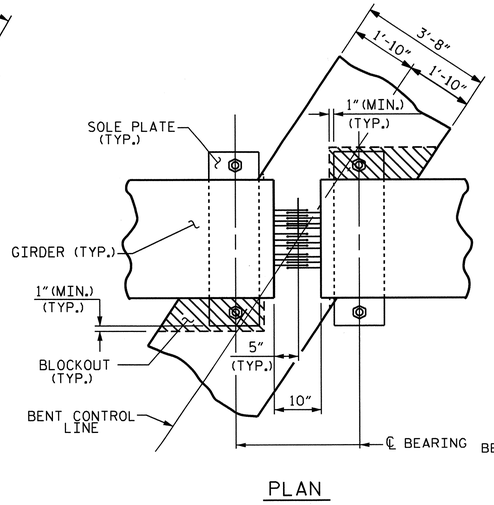
SECTION @ BENT DIAPHRAGM



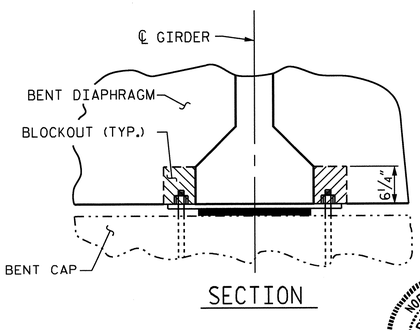
END BENT DIAPHRAGM

BENT DIAPHRAGM

PLAN

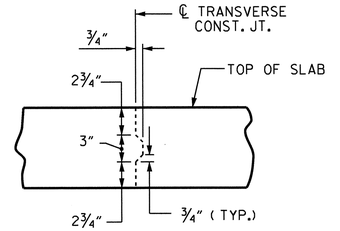


PLAN



SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-73
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
9/10/12

DRAWN BY : H. T. BARBOUR DATE : 8-17-10
CHECKED BY : E. C. LOCKLEAR DATE : 2-11

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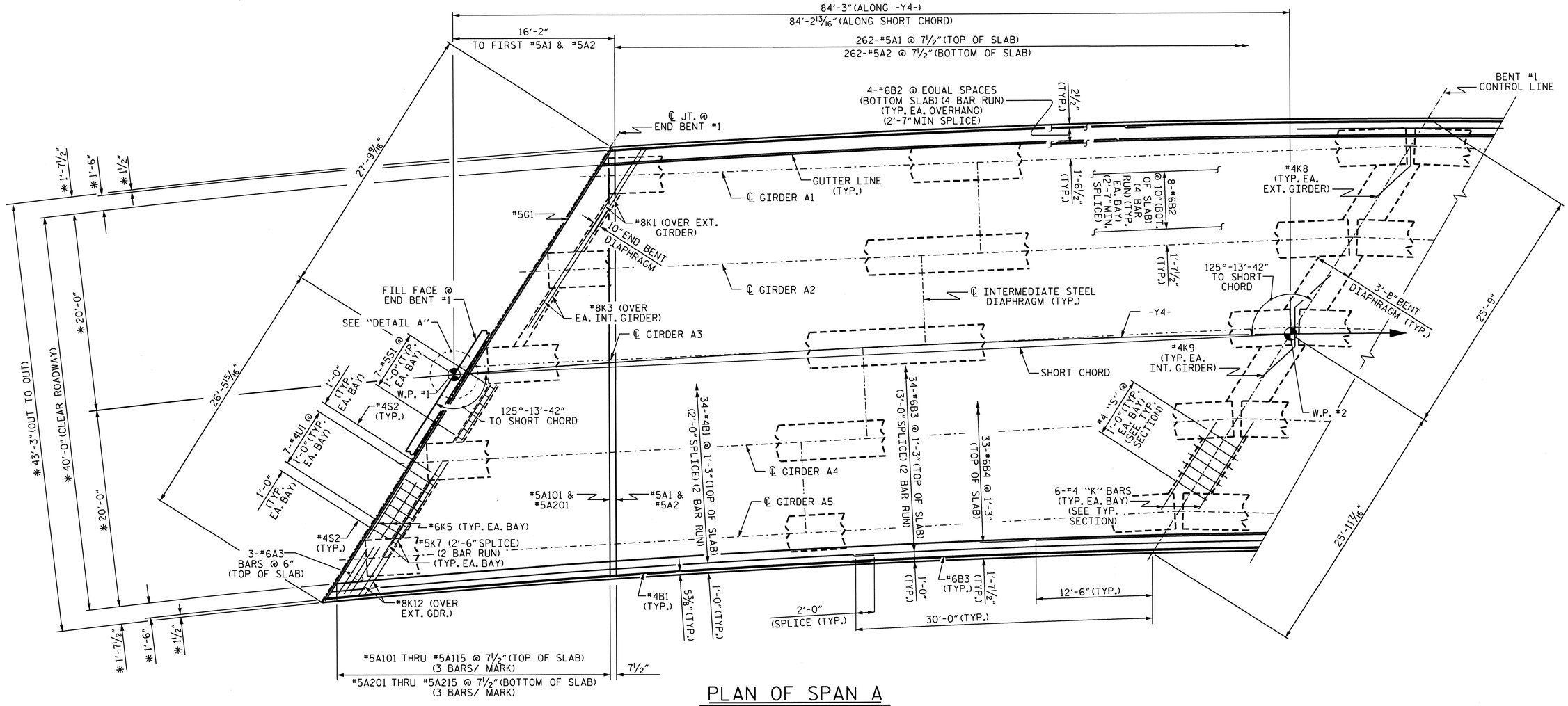
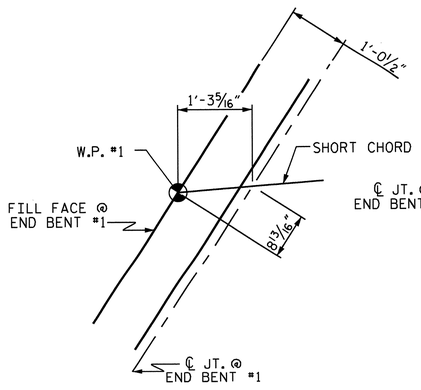


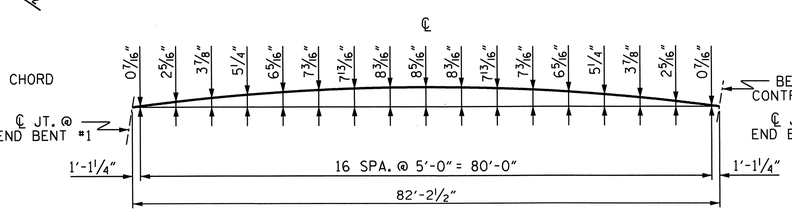
PLAN OF SPAN A

*RADIAL DIMENSIONS

"A" BARS ARE SPACED ALONG THE LONG CHORD & PERPENDICULAR TO LONG CHORD.

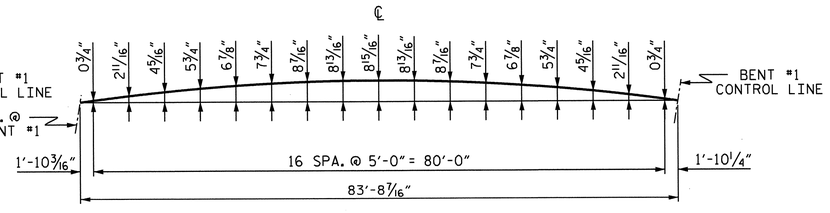


DETAIL A



ARC OFFSETS

(LEFT SIDE)



ARC OFFSETS

(RIGHT SIDE)

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR
9/10/12

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-74
1			3			TOTAL SHEETS
2			4			96

STR. #3

DRAWN BY : H. T. BARBOUR DATE : 8-27-10
CHECKED BY : E. C. LOCKLEAR DATE : 1-11

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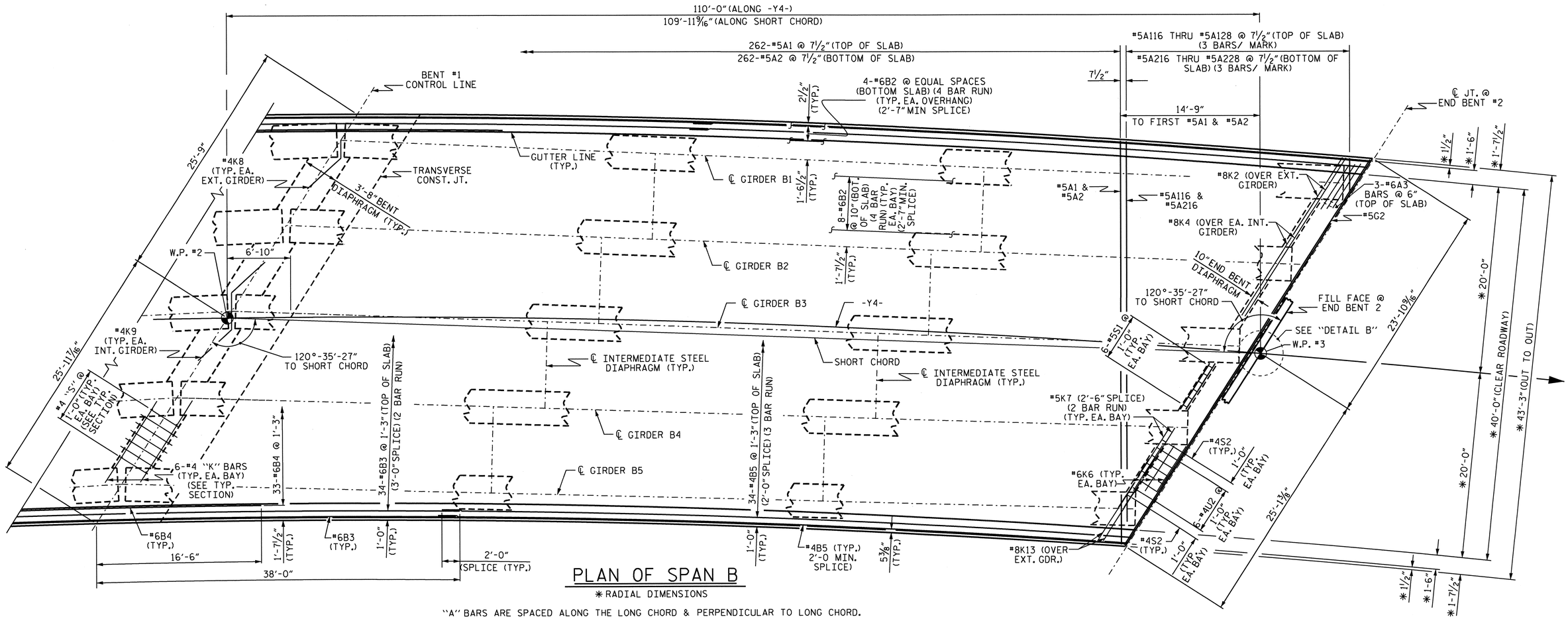
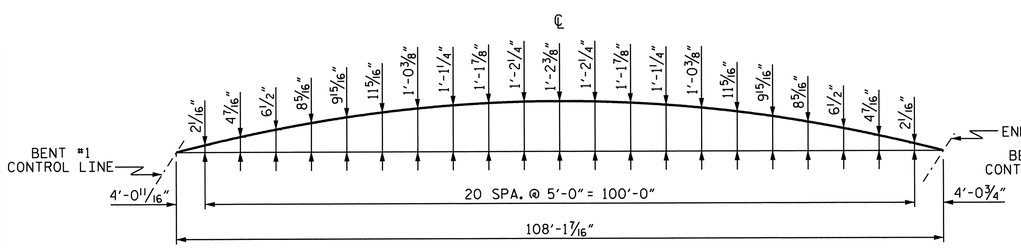
ADAVENPORT



PLAN OF SPAN B

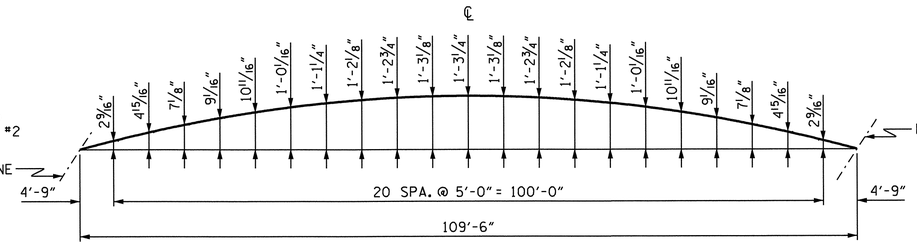
* RADIAL DIMENSIONS

"A" BARS ARE SPACED ALONG THE LONG CHORD & PERPENDICULAR TO LONG CHORD.



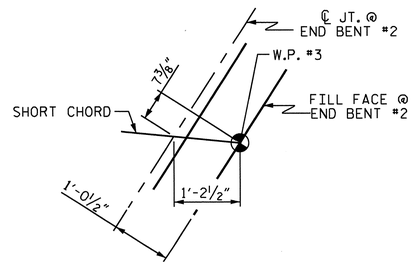
ARC OFFSETS

(LEFT SIDE)



ARC OFFSETS

(RIGHT SIDE)



DETAIL B

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE PLAN OF SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-75
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.

1-4-13

DRAWN BY : H. T. BARBOUR DATE : 9-1-10
CHECKED BY : E. C. LOCKLEAR DATE : 1-11

04-JAN-2013 11:53
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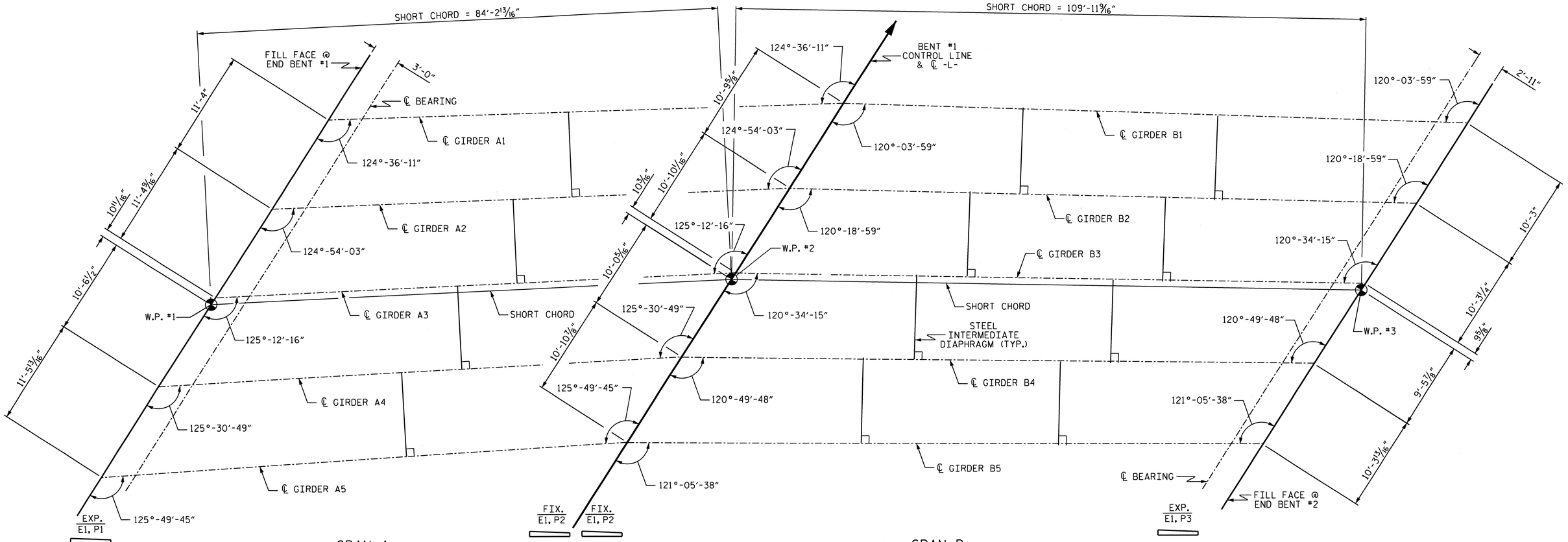
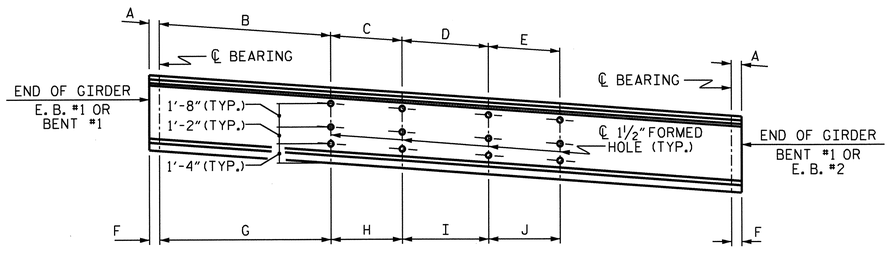


SPAN A

SPAN B



GIRDER ELEVATION

SEE TABLE "A" FOR DIMENSIONS

TABLE A

		SLOPED DISTANCES						HORIZONTAL DISTANCES				
	GIRDER #	A	B	C	D	E		F	G	H	I	J
SPAN A	A1	8 1/2"	36'-3 3/8"	———	———	———		8 1/2"	36'-3"	———	———	———
	A2	8 1/2"	36'-4 11/16"	6'-4 3/8"	———	———		8 1/2"	36'-4 5/16"	6'-4 5/16"	———	———
	A3	8 7/16"	36'-6"	6'-5 5/16"	———	———		8 1/2"	36'-5 5/8"	6'-5 3/16"	———	———
	A4	8 1/2"	36'-7 1/16"	6'-6 3/16"	———	———		8 1/2"	36'-7 1/16"	6'-6 1/8"	———	———
	A5	8 1/2"	43'-4"	———	———	———		8 1/2"	43'-3 1/2"	———	———	———
SPAN B	B1	8 1/2"	32'-3 7/8"	35'-0 5/8"	———	———		8 1/2"	32'-3 5/16"	35'-0 1/16"	———	———
	B2	8 1/2"	32'-4 5/8"	5'-4 3/4"	29'-8 15/16"	5'-3 11/16"		8 1/2"	32'-4 1/16"	5'-4 11/16"	29'-8 7/16"	5'-3 5/8"
	B3	8 1/2"	32'-5 3/8"	5'-5 7/16"	29'-9 3/8"	5'-4 5/16"'		8 1/2"	32'-4 7/8"	5'-5 3/8"	29'-8 15/16"	5'-4 1/4"
	B4	8 1/2"	32'-6 3/16"	5'-6 1/8"	29'-9 7/8"	5'-5"		8 1/2"	32'-5 5/8"	5'-6 1/16"	29'-9 3/8"	5'-4 7/8"
	B5	8 1/2"	38'-1 7/8"	35'-4"	———	———		8 1/2"	38'-1 1/4"	35'-3 7/16"	———	———

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER DAVID ANDREW DAVENPORT, JR.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-76
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : H. T. BARBOUR DATE : 9-20-10

CHECKED BY : E. C. LOCKLEAR DATE : 1-11

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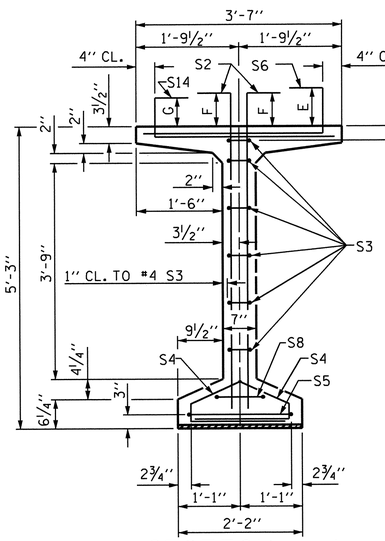
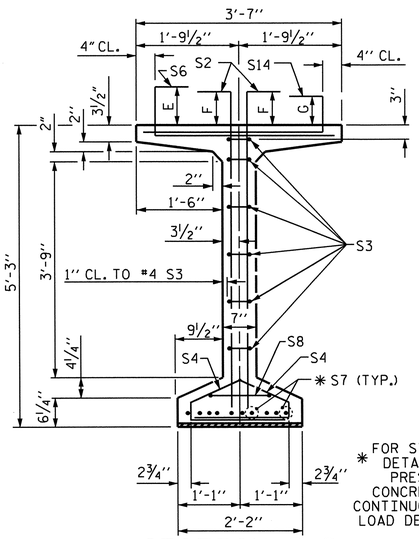
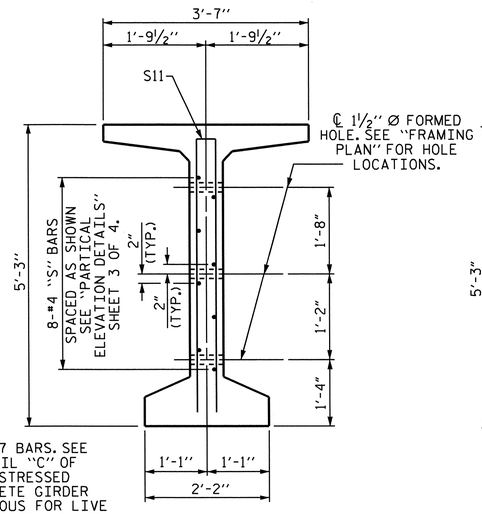
STR. #3



SECTION A-A



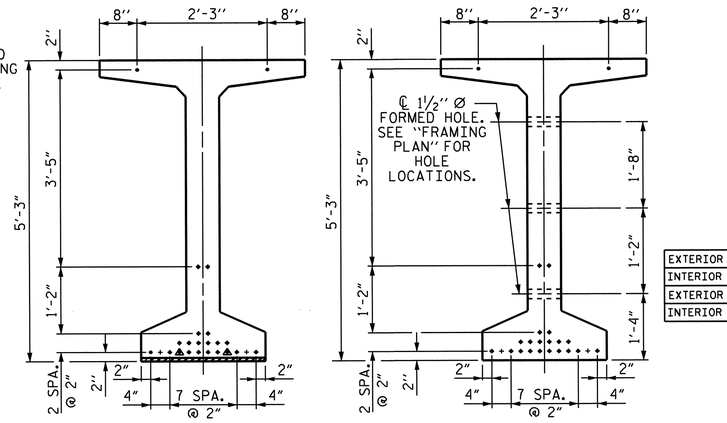
SECTION B-B



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

SECTION @ INTERMEDIATE DIAPHRAGMS

(S1, S6, S14 AND S9 BARS NOT SHOWN)
(SEE PARTIAL ELEVATIONS SHEET 3 OF 4)



AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

● FULLY BONDED STRANDS

△ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

0.6" Ø L. R. GRADE 270 STRANDS

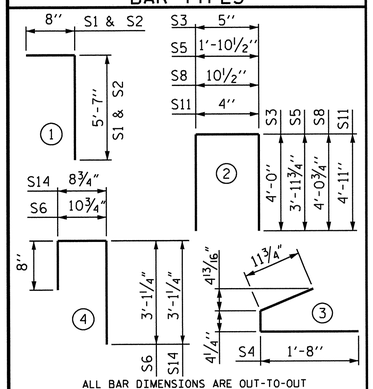
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR.

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	150	#4	1	6'-3"	626
	S2	24	#5	1	6'-3"	156
	S3	12	#4	2	8'-5"	67
	S4	72	#4	3	3'-0"	144
	S5	1	#5	2	9'-10"	10
	S6	87	#5	4	4'-8"	423
	✱ S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
	S9	29	#5	STR	3'-3"	98
	S10	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S11	4	#5	2	10'-2"	42
INTERIOR GDR.	S11	8	#5	2	10'-2"	85
EXTERIOR GDR.	S12	8	#4	STR	8'-0"	43
INTERIOR GDR.	S13	8	#4	STR	14'-7"	78
	S14	87	#5	4	4'-6"	408

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

BAR TYPES



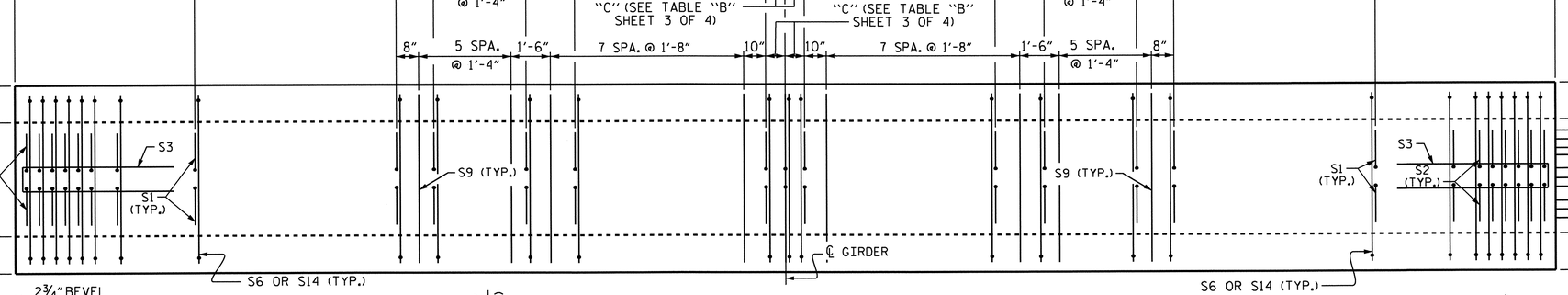
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

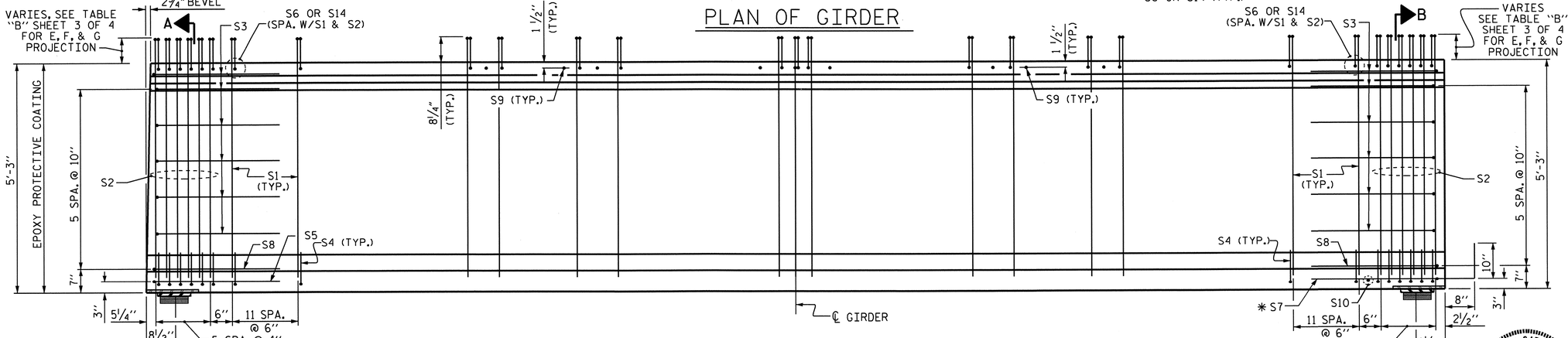
	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	2075	16.0	22
INTERIOR GIRDER	2153	16.0	22

GIRDERS REQUIRED

SPAN A	NUMBER	SLOPED LENGTH
A1	1	80'-3¾"
A2	1	80'-7¼"
A3	1	80'-10¾"
A4	1	81'-2½"
A5	1	81'-6⅜"
TOTAL	5	404.55'



PLAN OF GIRDER



ELEVATION OF GIRDER

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.

ASSEMBLED BY : H. T. BARBOUR	DATE : 9-10-10
CHECKED BY : E. C. LOCKLEAR	DATE : 1-11
DRAWN BY : EEM 2/6/97	REV. 10/17/00 RWW/LES
CHECKED BY : VAP 2/6/97	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-77
1			3			TOTAL SHEETS
2			4			96

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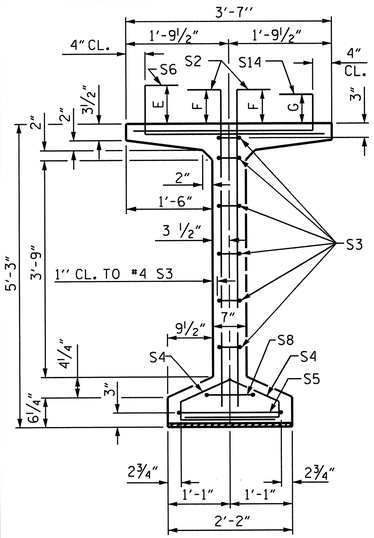
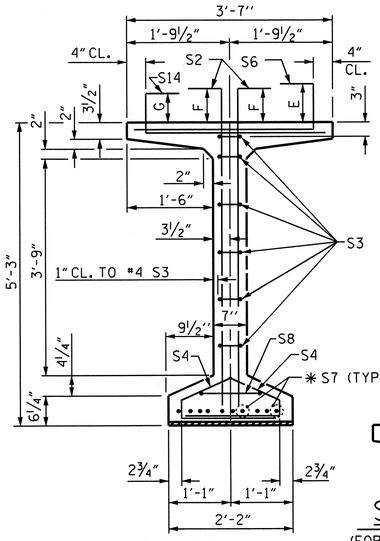
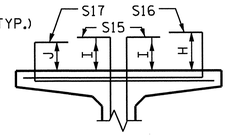


SECTION A-A



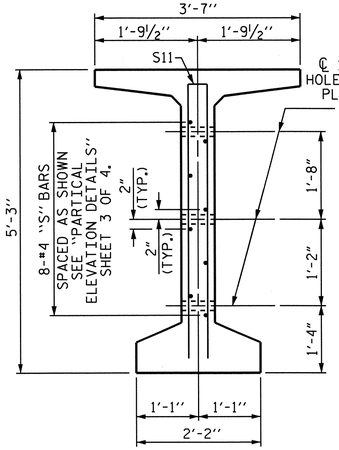
SECTION B-B

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



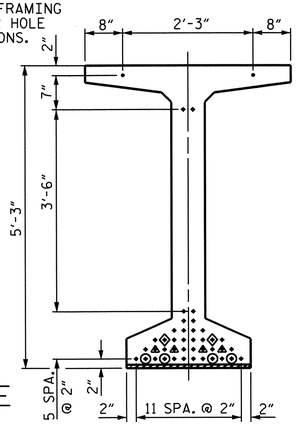
SECTION C-C

(FOR STIRRUP PROJECTION SEE TABLE B SHEET 3 OF 4)

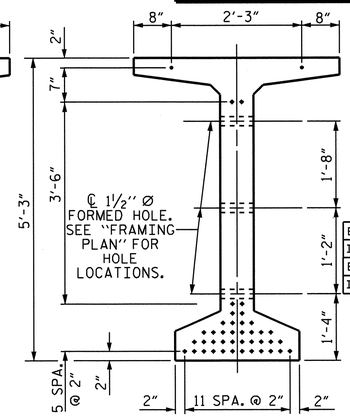


SECTION @ INTERMEDIATE DIAPHRAGMS

(S9, S15, S16 AND S17 BARS NOT SHOWN)
(SEE PARTIAL ELEVATIONS SHEET 3 OF 4)



AT END OF GIRDER



AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◈ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER
- ◬ STRANDS DEBONDED FOR 18'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER

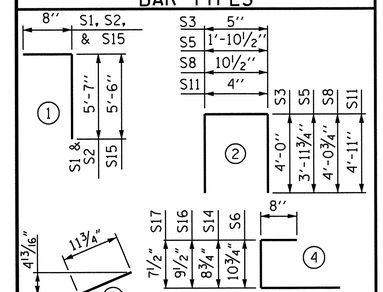
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR.

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	84	#4	1	6'-3"	351
S2	24	#6	1	6'-3"	225
S3	12	#4	2	8'-5"	67
S4	72	#4	3	3'-0"	144
S5	1	#5	2	9'-10"	10
S6	54	#5	4	4'-8"	263
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	33	#5	STR	3'-3"	112
S10	1	#3	STR	1'-10"	1
S11	8	#5	2	10'-2"	85
S11	16	#5	2	10'-2"	170
S12	16	#4	STR	8'-0"	86
S13	16	#4	STR	13'-7"	145
S14	54	#5	4	4'-6"	253
S15	94	#5	1	6'-2"	605
S16	47	#5	4	4'-6"	221
S17	47	#5	4	4'-4"	212

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	9000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	2692	21.2	42
INTERIOR GIRDER	2836	21.2	42

GIRDERS REQUIRED

SPAN B	NUMBER	SLOPED LENGTH
B1	1	106'-5¼"
B2	1	106'-8½"
B3	1	106'-11¾"
B4	1	107'-3¼"
B5	1	107'-6¾"
TOTAL	5	534.96'

PROJECT NO. R-2707AA

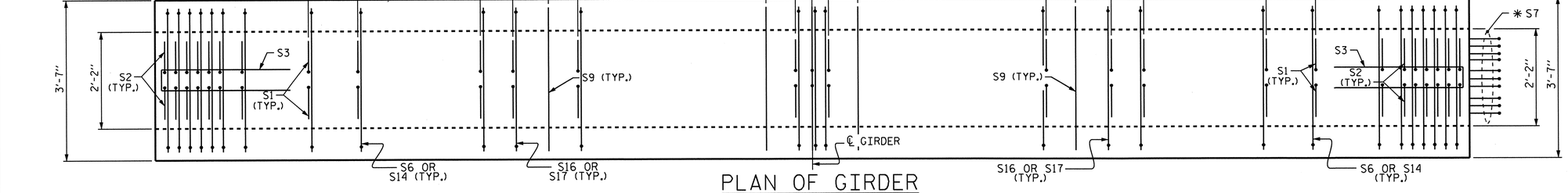
CLEVELAND COUNTY

STATION: 110+97.64 -L-

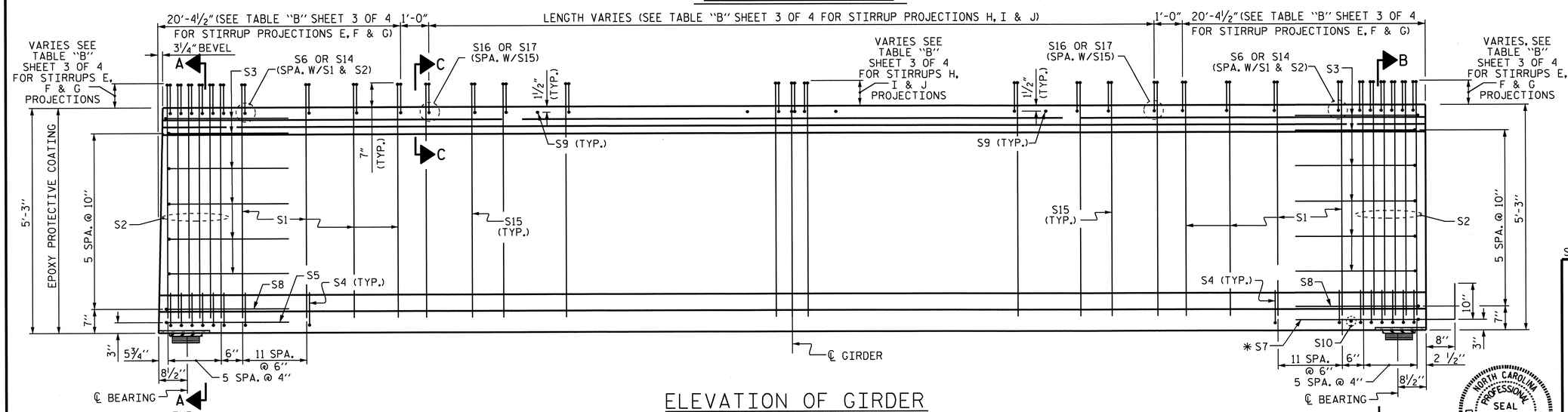
SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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



PLAN OF GIRDER



ELEVATION OF GIRDER

ASSEMBLED BY : H. T. BARBOUR	DATE : 9-10-10
CHECKED BY : E. C. LOCKLEAR	DATE : 1-11
DRAWN BY : EEM 2/6/97	REV. 10/17/00 RWW/LES
CHECKED BY : VAP 2/6/97	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-78
1			3			TOTAL SHEETS
2			4			96

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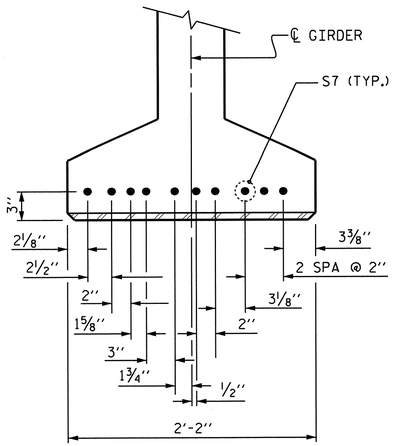
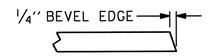


DETAIL "C"



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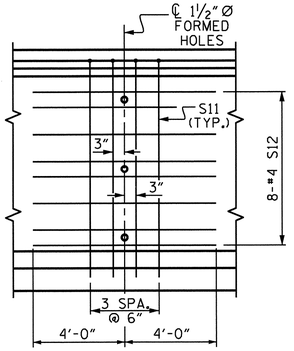
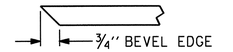


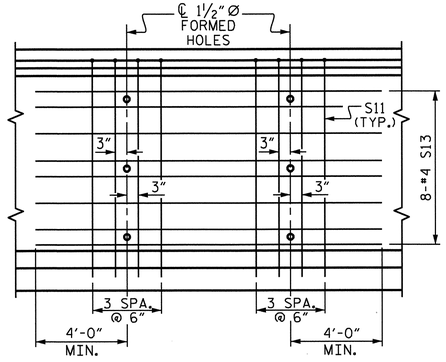
PARTIAL ELEVATION @ INTERMEDIATE DIAPHRAGM

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 & 5 (FOR EXTERIOR GIRDERS)



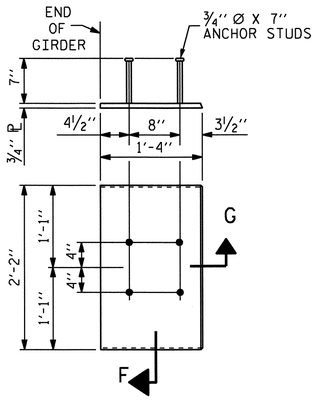
SECTION "F"

(SEE NOTES)



PARTIAL ELEVATION @ INTERMEDIATE DIAPHRAGM

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2, 3 AND 4 (FOR INTERIOR GIRDERS)



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

(2 REQ'D PER GIRDER)

NOTES

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

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. 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 4000 PSI FOR SPAN A AND 7300 PSI FOR SPAN B.

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

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

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

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

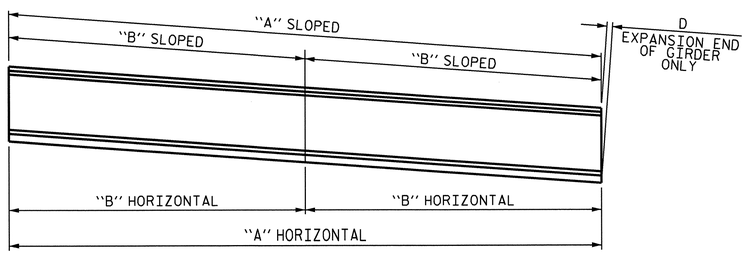
0.6" Ø LOW RELAXATION	SPAN A GIRDER 1-5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.054	0.101	0.139	0.162	0.170	0.162	0.139	0.101	0.054	0
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.019	0.035	0.049	0.057	0.060	0.057	0.049	0.035	0.019	0
FINAL CAMBER ↑	0	7/16"	13/16"	1 1/16"	1 1/4"	1 5/16"	1 1/4"	1 1/16"	13/16"	7/16"	0

0.6" Ø LOW RELAXATION	SPAN B GIRDER 1-5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.133	0.252	0.345	0.404	0.424	0.404	0.345	0.252	0.133	0
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.046	0.087	0.120	0.140	0.147	0.140	0.120	0.087	0.046	0
FINAL CAMBER ↑	0	1 1/16"	2"	2 11/16"	3 3/16"	3 5/16"	3 3/16"	2 11/16"	2"	1 1/16"	0

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

TABLE B

	GIRDER #	A SLOPED	A HORIZONTAL	B SLOPED	B HORIZONTAL	C	D	E	F	G	H	I	J
SPAN A	A1	80'-3 3/4"	80'-2 7/8"	40'-1 7/8"	40'-1 7/16"	10 3/8"	2 3/4"	9 1/4"	8 1/4"	7 1/4"	———	———	———
	A2	80'-7 1/4"	80'-6 3/8"	40'-3 5/8"	40'-3 3/16"	1'-0 1/8"	2 3/4"	9 1/4"	8 1/4"	7 1/4"	———	———	———
	A3	80'-10 3/4"	80'-9 15/16"	40'-5 3/8"	40'-4 15/16"	1'-1 7/8"	2 3/4"	9 1/4"	8 1/4"	7 1/4"	———	———	———
	A4	81'-2 1/2"	81'-1 5/8"	40'-7 1/4"	40'-6 13/16"	1'-3 3/4"	2 3/4"	9 1/4"	8 1/4"	7 1/4"	———	———	———
	A5	81'-6 3/8"	81'-5 1/2"	40'-9 3/16"	40'-8 3/4"	1'-5 11/16"	2 3/4"	9 1/4"	8 1/4"	7 1/4"	———	———	———
SPAN B	B1	106'-5 1/4"	106'-3 3/16"	53'-2 5/8"	53'-1 13/16"	10 1/8"	3 1/4"	9 1/4"	8 1/4"	7 1/4"	8"	7"	6"
	B2	106'-8 1/2"	106'-6 3/4"	53'-4 1/4"	53'-3 3/8"	11 3/4"	3 1/4"	9 1/4"	8 1/4"	7 1/4"	8"	7"	6"
	B3	106'-11 3/4"	106'-10 1/8"	53'-5 7/8"	53'-5 1/16"	1'-1 3/8"	3 1/4"	9 1/4"	8 1/4"	7 1/4"	8"	7"	6"
	B4	107'-3 1/4"	107'-1 9/16"	53'-7 5/8"	53'-6 3/4"	1'-3 1/8"	3 1/4"	9 1/4"	8 1/4"	7 1/4"	8"	7"	6"
	B5	107'-6 3/4"	107'-5 1/8"	53'-9 3/8"	53'-8 9/16"	1'-4 7/8"	3 1/4"	9 1/4"	8 1/4"	7 1/4"	8"	7"	6"



GIRDER DIMENSIONS

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS AND DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
1-10-13

ASSEMBLED BY : H. T. BARBOUR DATE : 9-14-10	
CHECKED BY : E. C. LOCKLEAR DATE : 1-11	
DRAWN BY : ELR 11/91	REV. 7/10/01RR LES/RDR
CHECKED BY : GRP 11/91	REV. 5/1/06 TLA/GM
	REV. 10/01/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-79
1			3			TOTAL SHEETS
2			4			96

STR. #3

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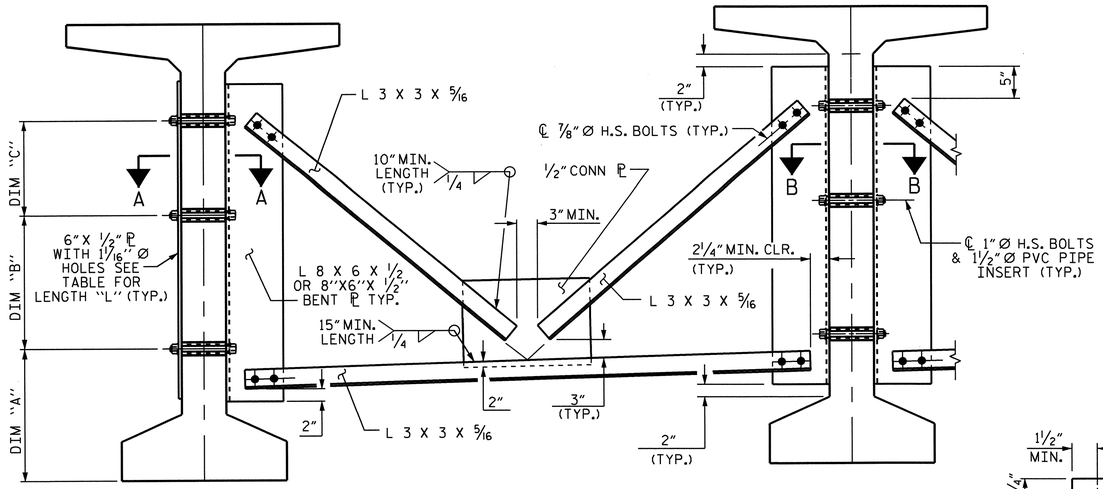
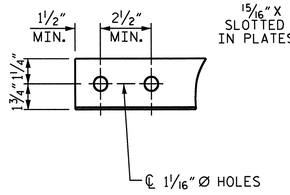


EXTERIOR GIRDER

INTERIOR GIRDER

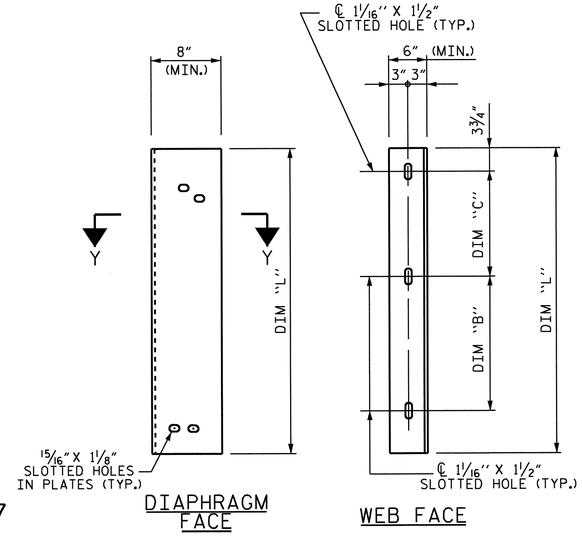
PART SECTION AT INTERMEDIATE DIAPHRAGM

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



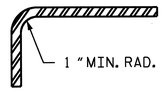
ANGLE END

(L 3 X 3 X 5/16)



DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTOR PLATE DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

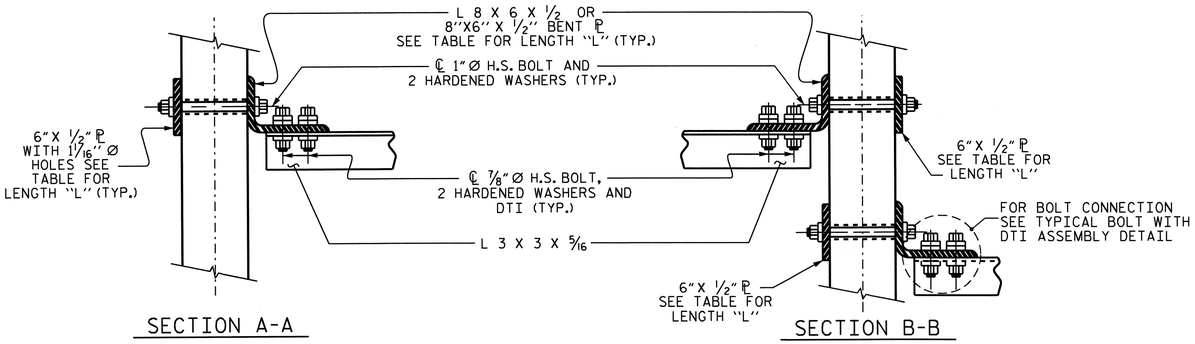
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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

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

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

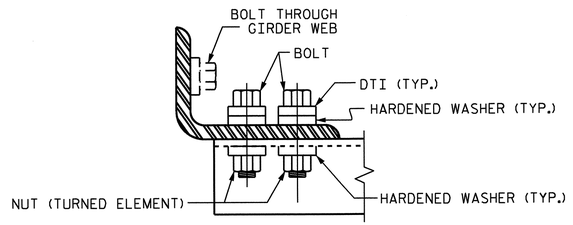
THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.



SECTION A-A

SECTION B-B

CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

TABLE

GIRDER TYPE	DIM "A"	DIM "B"	DIM "C"	DIM "L"
63" BULB TEE	1'-4"	1'-2"	1'-8"	3'-5"

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD INTERMEDIATE STEEL DIAPHRAGMS FOR 63" & 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-80
1			3			TOTAL SHEETS
2			4			96

STR. #3 STD. NO. PCG11

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER ANDREA A. DAVENPORT
9/10/12

ASSEMBLED BY : H. T. BARBOUR	DATE : 10-04-11
CHECKED BY : E. C. LOCKLEAR	DATE : 02/11
DRAWN BY : RWW 11/09	ADDED 11/23/09R
CHECKED BY : GM 11/09	REV. 10/1/11 MAA/GM

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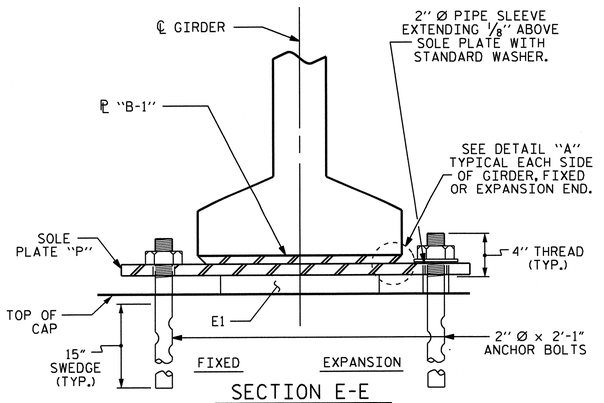
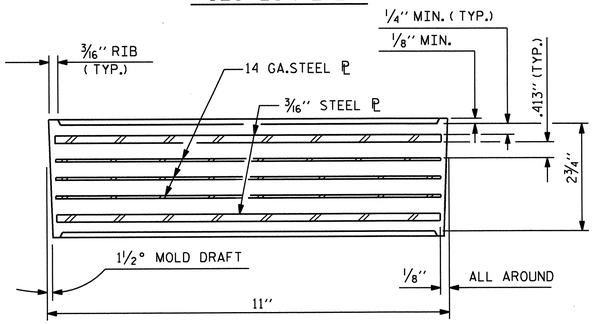
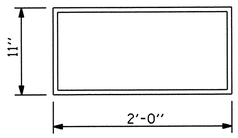


SECTION E-E



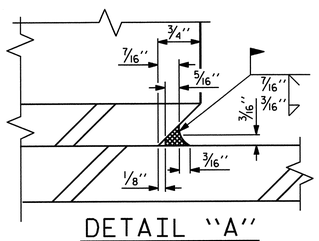
TYPICAL SECTION OF ELASTOMERIC BEARINGS



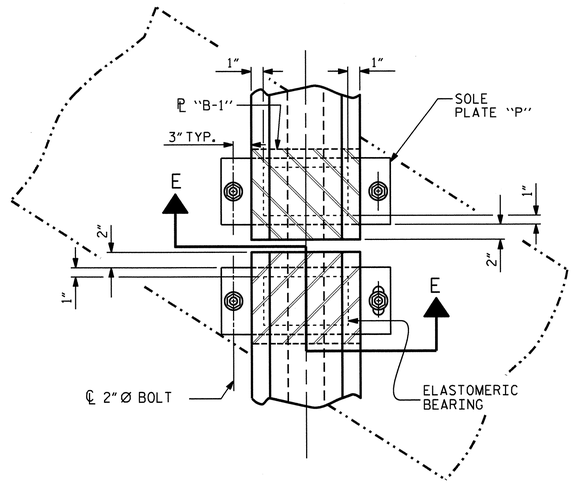
E1 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VII

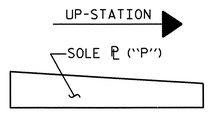


DETAIL "A"

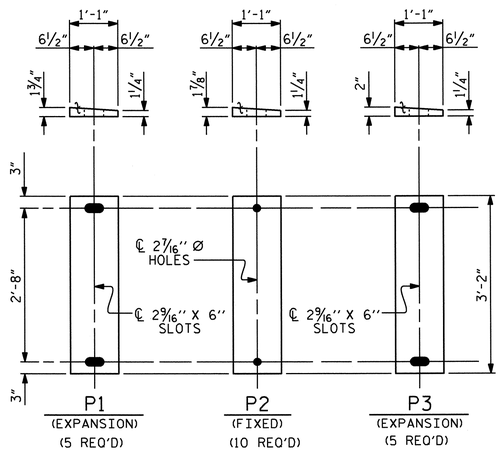


TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



SOLE ℄ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

NOTES

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

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

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

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

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE VII	264 K

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

ASSEMBLED BY : H. T. BARBOUR	DATE : 9-15-10
CHECKED BY : E. C. LOCKLEAR	DATE : 1-11
DRAWN BY : EEM 2/97	REV. 10/17/00 RWW/LES
CHECKED BY : VAP 2/97	REV. 5/1/06 TLA/GM
	REV. 10/01/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-81
1			3			TOTAL SHEETS
2			4			96

STR. #3 STD. No. EB4 (SHT 3)

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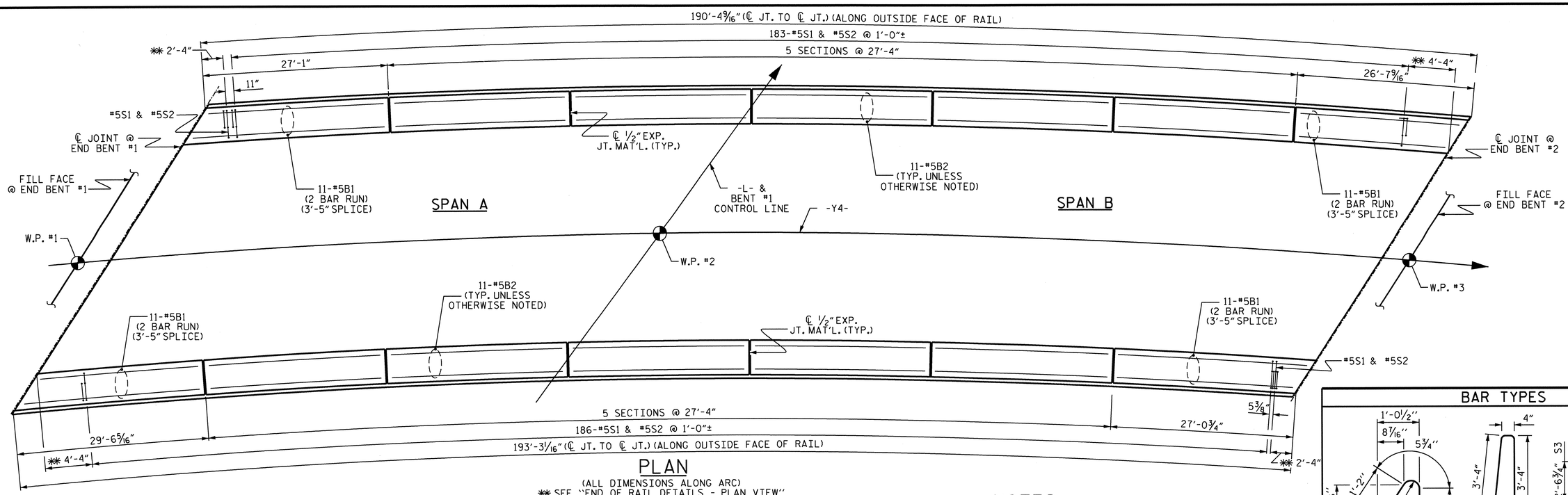
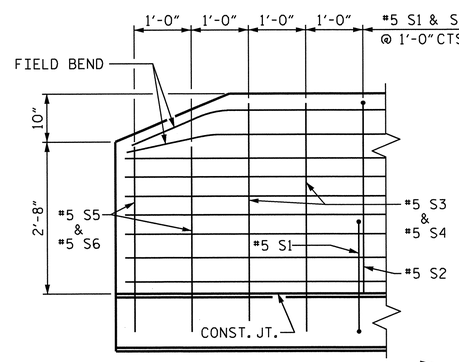
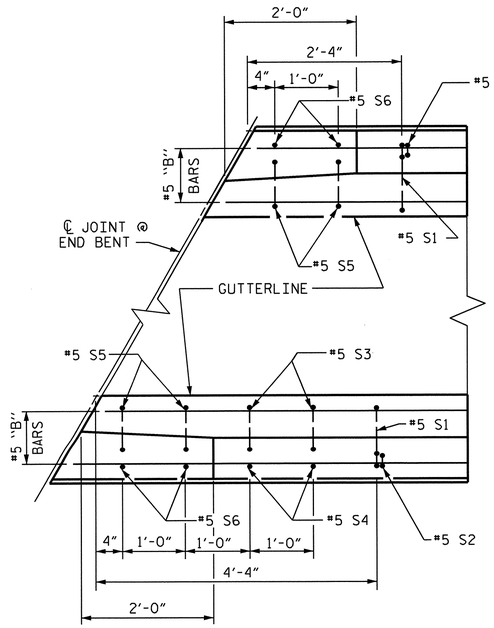


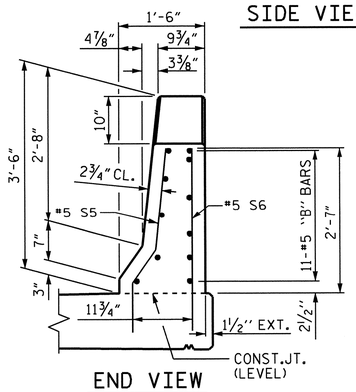
PLAN

(ALL DIMENSIONS ALONG ARC)
✱✱ SEE "END OF RAIL DETAILS - PLAN VIEW" FOR ADDITIONAL REINFORCING STEEL.

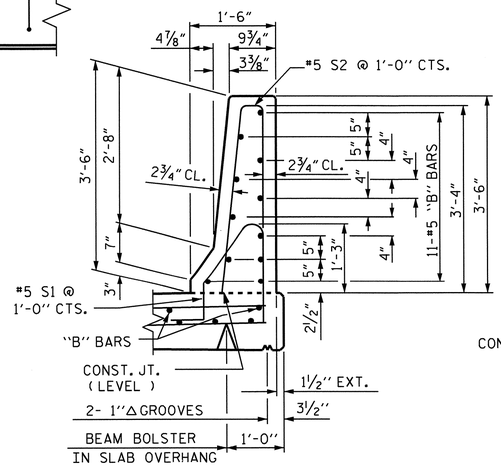


SIDE VIEW

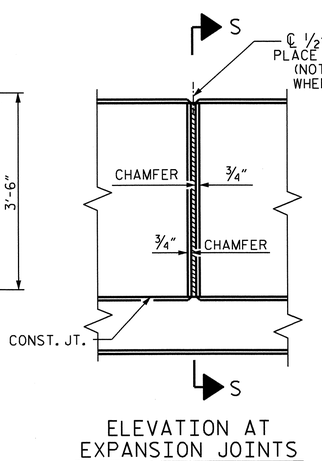




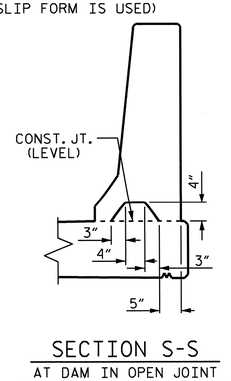
END VIEW



SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS



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

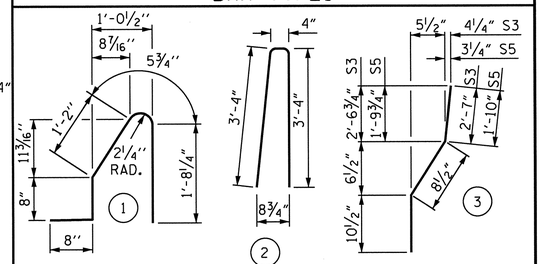
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	88	#5	STR	16'-2"	1484
✱ B2	110	#5	STR	26'-11"	3088
✱ S1	371	#5	1	4'-8"	1806
✱ S2	371	#5	2	7'-0"	2709
✱ 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
✱ EPOXY COATED REINF. STEEL					9177 LBS.
CLASS AA CONCRETE					52.2 CU. YDS.
CONCRETE BARRIER RAIL					383.64 LIN. FT.

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR.
1-9-13

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

BARRIER RAIL DETAILS

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-82
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : H. T. BARBOUR DATE : 9-21-10
CHECKED BY : E. C. LOCKLEAR DATE : 1-11

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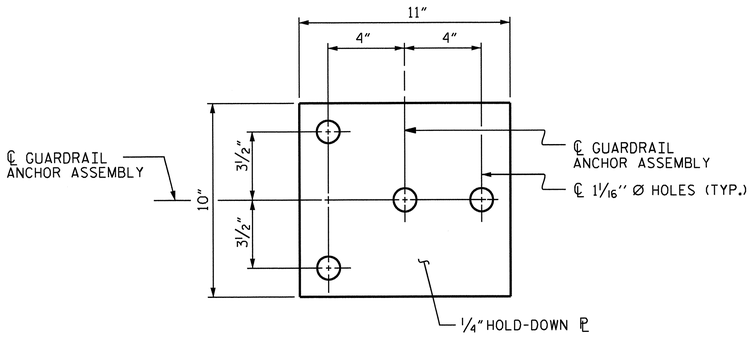
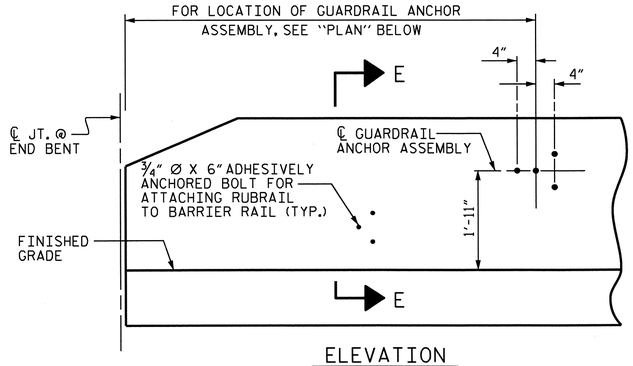


PLAN



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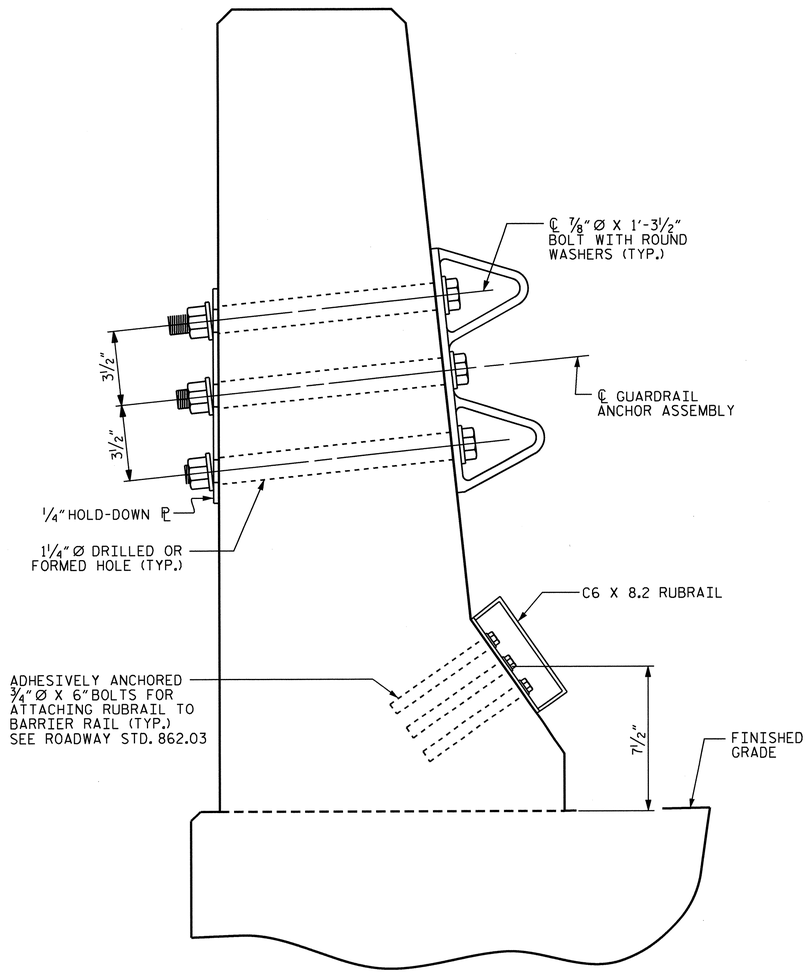
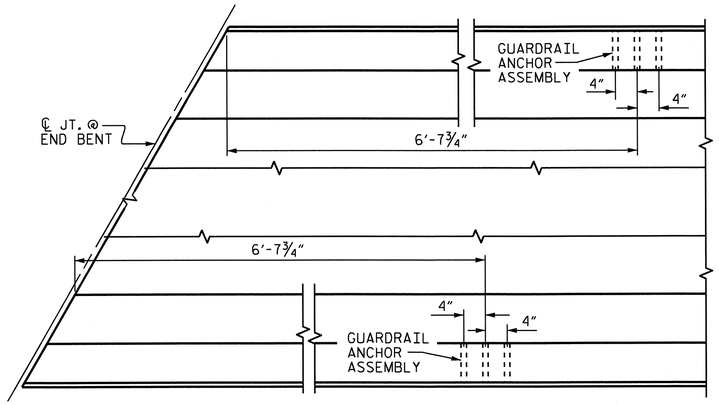


SECTION E-E

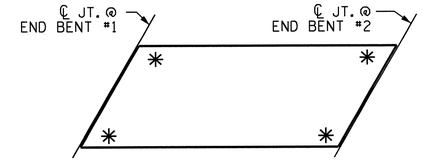
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

NOTES

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

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

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

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

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

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

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

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

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

ASSEMBLED BY : H. T. BARBOUR	DATE : 9-21-10
CHECKED BY : E. C. LOCKLEAR	DATE : 1-11

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-83
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR.

04-JAN-2013 11:50
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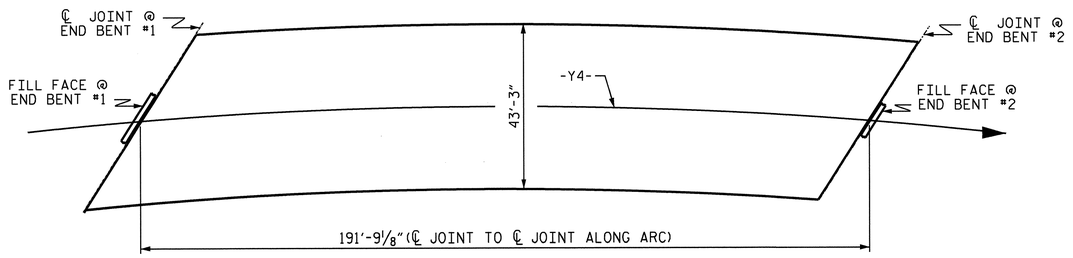
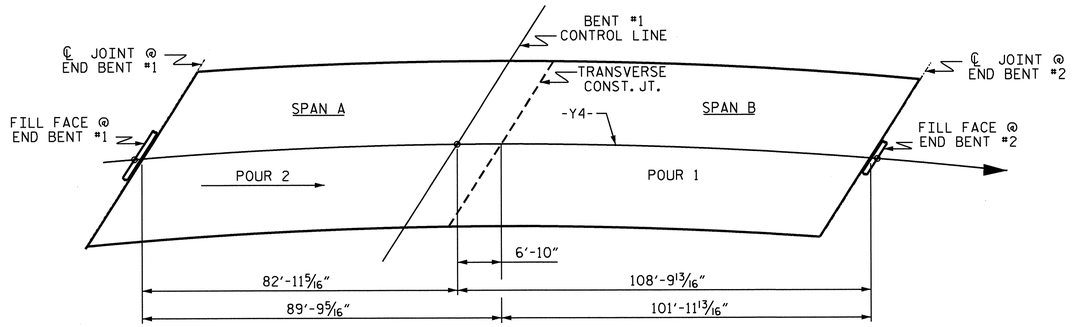
kbeard

(SHT 1b) STD. NO. GRA2

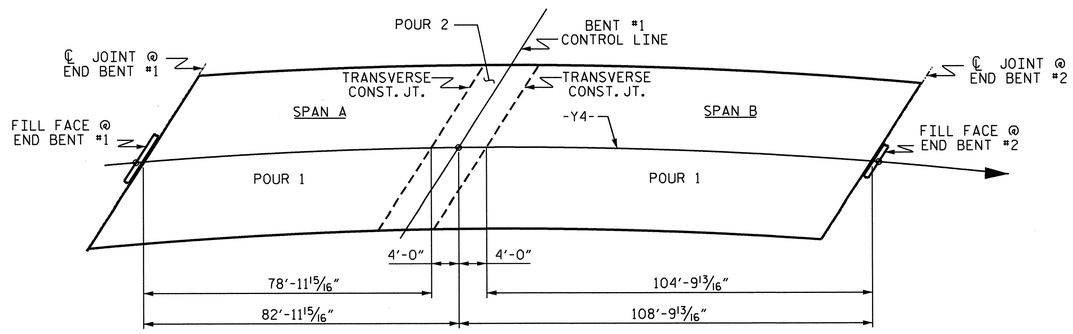


LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 8294)



POURING SEQUENCE

(ALL DIMENSIONS ARE ALONG ARC)



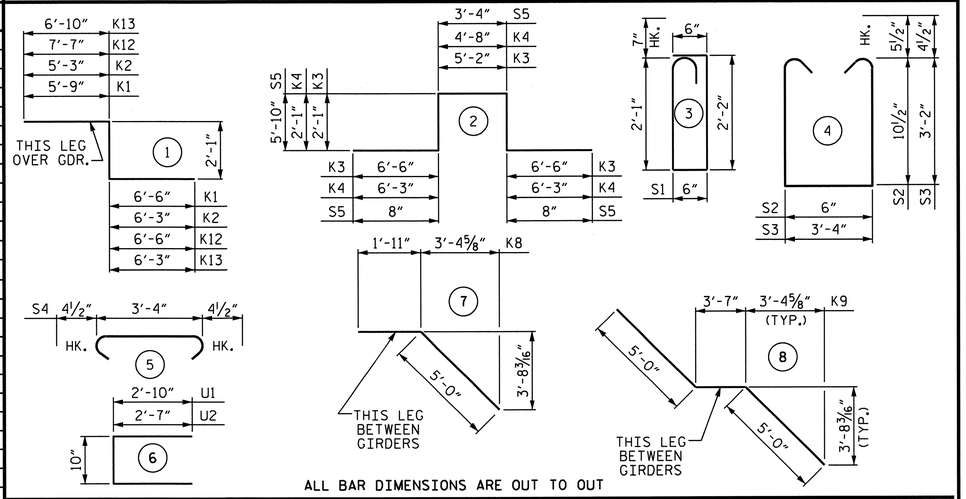
OPTIONAL POURING SEQUENCE

(ALL DIMENSIONS ARE ALONG ARC)

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	262	#5	STR	43'-0"	11750
A2	262	#5	STR	43'-0"	11750
✱A3	6	#6	STR	8'-0"	72
✱A101	3	#5	STR	40'-5"	126
✱A102	3	#5	STR	37'-8"	118
✱A103	3	#5	STR	34'-10"	109
✱A104	3	#5	STR	32'-1"	100
✱A105	3	#5	STR	29'-3"	92
✱A106	3	#5	STR	26'-6"	83
✱A107	3	#5	STR	23'-8"	74
✱A108	3	#5	STR	20'-11"	65
✱A109	3	#5	STR	18'-2"	57
✱A110	3	#5	STR	15'-4"	48
✱A111	3	#5	STR	12'-7"	39
✱A112	3	#5	STR	9'-10"	31
✱A113	3	#5	STR	7'-1"	22
✱A114	3	#5	STR	4'-4"	14
✱A115	3	#5	STR	1'-7"	5
✱A116	3	#5	STR	40'-3"	126
✱A117	3	#5	STR	37'-2"	116
✱A118	3	#5	STR	34'-1"	107
✱A119	3	#5	STR	31'-0"	97
✱A120	3	#5	STR	28'-0"	88
✱A121	3	#5	STR	24'-11"	78
✱A122	3	#5	STR	21'-10"	68
✱A123	3	#5	STR	18'-9"	59
✱A124	3	#5	STR	15'-8"	49
✱A125	3	#5	STR	12'-7"	39
✱A126	3	#5	STR	9'-6'	30
✱A127	3	#5	STR	6'-5"	20
✱A128	3	#5	STR	3'-3"	10
A201	3	#5	STR	40'-5"	126
A202	3	#5	STR	37'-8"	118
A203	3	#5	STR	34'-10"	109
A204	3	#5	STR	32'-1"	100
A205	3	#5	STR	29'-3"	92
A206	3	#5	STR	26'-6"	83
A207	3	#5	STR	23'-8"	74
A208	3	#5	STR	20'-11"	65
A209	3	#5	STR	18'-2"	57
A210	3	#5	STR	15'-4"	48
A211	3	#5	STR	12'-7"	39
A212	3	#5	STR	9'-10"	31
A213	3	#5	STR	7'-1"	22
A214	3	#5	STR	4'-4"	14
A215	3	#5	STR	1'-7"	5
A216	3	#5	STR	40'-3"	126
A217	3	#5	STR	37'-2"	116
A218	3	#5	STR	34'-1"	107
A219	3	#5	STR	31'-0"	97
A220	3	#5	STR	28'-0"	88
A221	3	#5	STR	24'-11"	78
A222	3	#5	STR	21'-10"	68
A223	3	#5	STR	18'-9"	59
A224	3	#5	STR	15'-8"	49
A225	3	#5	STR	12'-7"	39
A226	3	#5	STR	9'-6'	30
A227	3	#5	STR	6'-5"	20
A228	3	#5	STR	3'-3"	10
✱B1	72	#4	STR	28'-9"	1383
B2	160	#6	STR	50'-2"	12056
✱B3	72	#6	STR	35'-6"	3839
✱B4	33	#6	STR	29'-0''	1437
✱B5	108	#4	STR	25'-10"	1864
✱G1	1	#5	STR	53'-10"	56
✱G2	1	#5	STR	48'-7"	51

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱K1	2	#8	1	14'-4"	77
✱K2	2	#8	1	13'-7"	73
✱K3	6	#8	2	22'-4"	358
✱K4	6	#8	2	21'-4"	342
✱K5	12	#6	STR	6'-6''	117
✱K6	12	#6	STR	5'-9"	104
✱K7	48	#5	STR	6'-9"	338
K8	12	#4	7	6'-11"	55
K9	18	#4	8	13'-7"	163
K10	16	#4	STR	6'-5"	69
K11	32	#4	STR	9'-9"	208
✱K12	2	#8	1	16'-2"	86
✱K13	2	#8	1	15'-2"	81
✱S1	52	#5	3	5'-10"	316
✱S2	16	#5	4	3'-2"	53
S3	8	#4	4	10'-5"	56
S4	124	#4	5	4'-1"	338
S5	20	#4	2	16'-4"	218
✱U1	28	#4	6	6'-6"	122
✱U2	24	#4	6	6'-0"	96

REINFORCING STEEL = 26783 LBS
✱EPOXY COATED REINF. STEEL = 24485 LBS

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	✱EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR #1	165.9		
POUR #2	179.4		
TOTALS✱✱	345.3	26783	24485

✱✱QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	1053	SQ.FT.
BRIDGE DECK	7038	SQ.FT.
TOTAL	8091	SQ.FT.

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
1-4-13

ASSEMBLED BY : H. T. BARBOUR	DATE : 10-1-10		
CHECKED BY : E.C. LOCKLEAR	DATE : 2-11		
DRAWN BY : JMB 5/87	REV. 6/1/94	EEM/GRP	
CHECKED BY : SJD 9/87	REV. 8/16/99	RWW/LES	
	REV. 5/1/06	TLA/GM	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-84
1			3			TOTAL SHEETS
2			4			96

STR. #3 STD. NO. BOM2

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NOTES

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

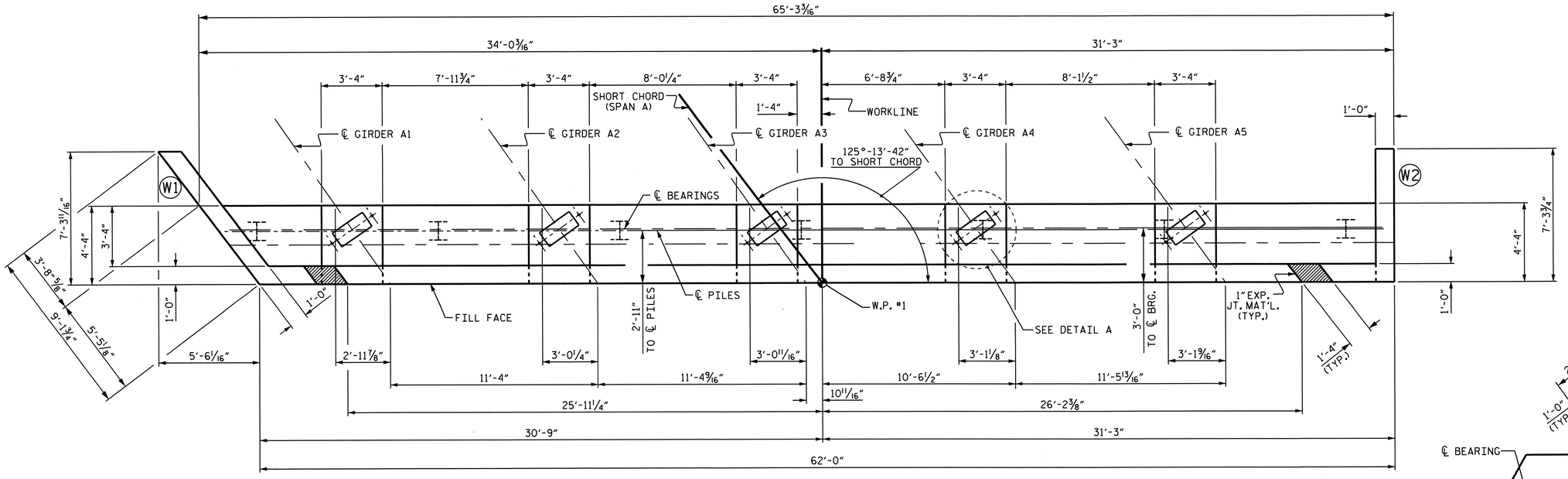
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

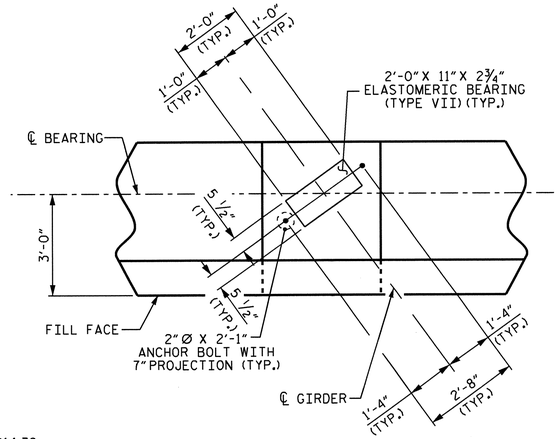
THE TOP SURFACE OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

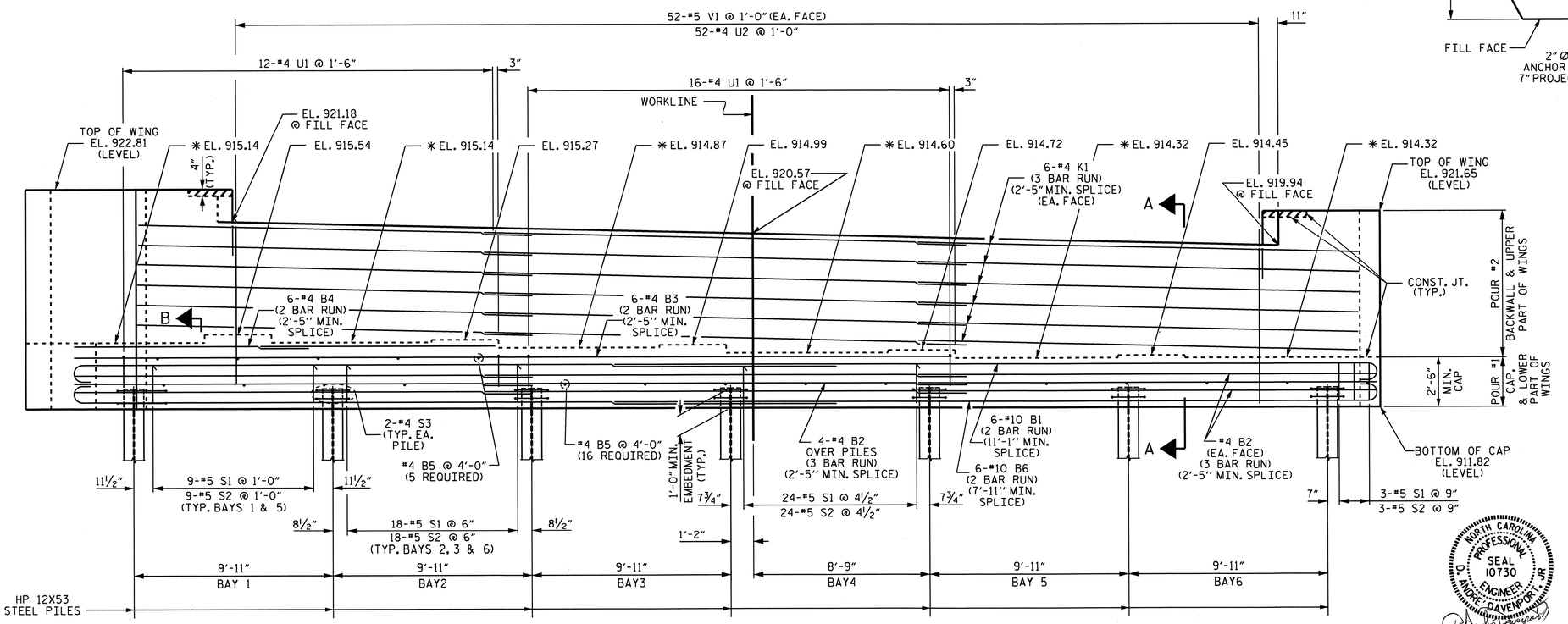
FOR GALVANIZED REINFORCING STRAPS, SEE MSE RETAINING WALL PLANS.



PLAN



DETAIL A



ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT
1-4-13

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-85
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : H. T. BARBOUR DATE : 10-27-11
CHECKED BY : D.A. DAVENPORT DATE : 3-27-12

04-JAN-2013 11:49
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STR.#3

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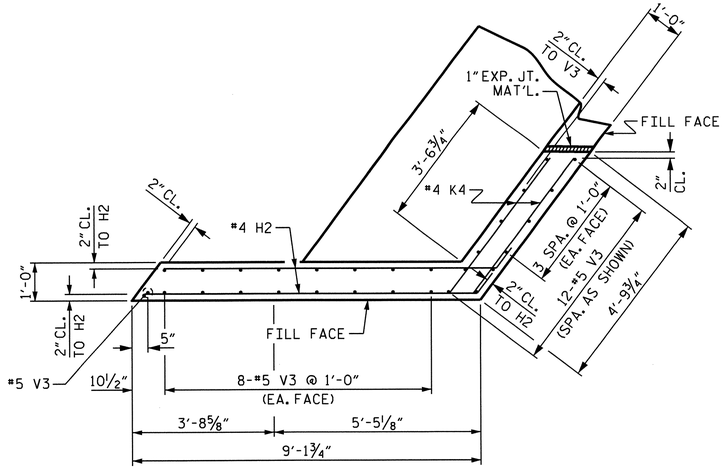
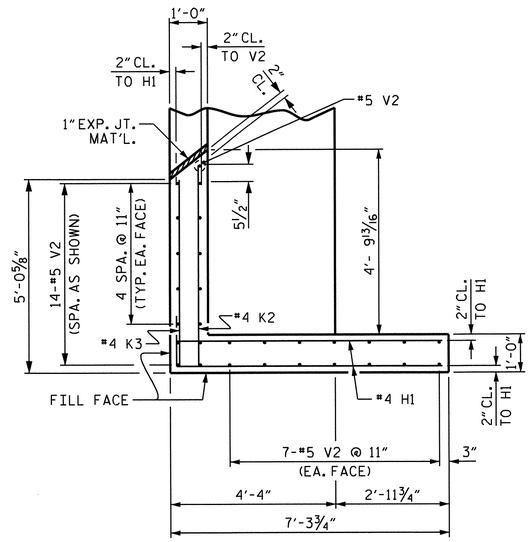
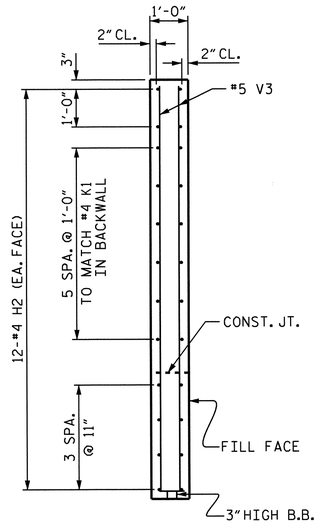


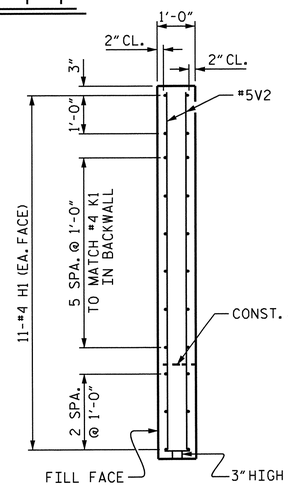
PLAN OF WING (W1)



PLAN OF WING (W2)



SECTION Y-Y



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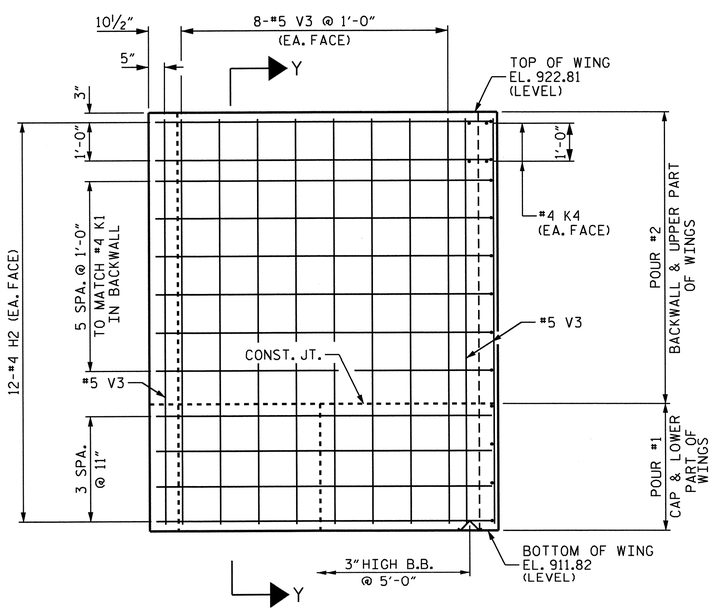
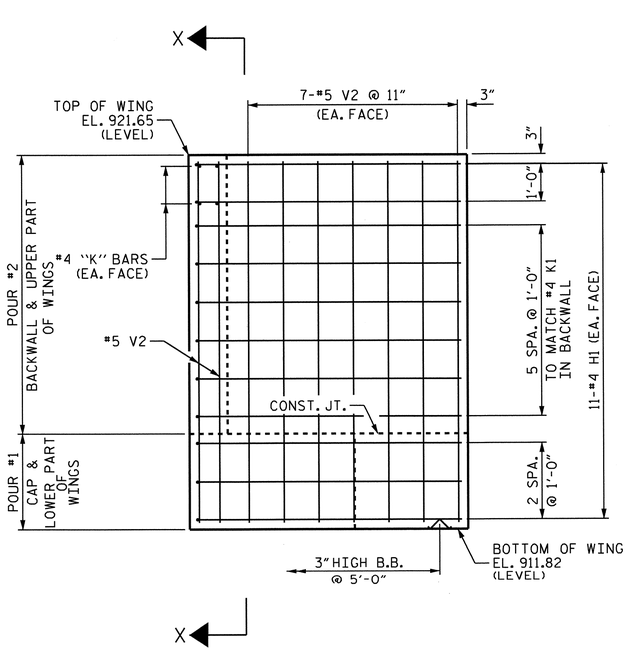


ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-86
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT JR.

DRAWN BY : H. T. BARBOUR DATE : 11-01-11
CHECKED BY : D.A. DAVENPORT DATE : 3-29-12

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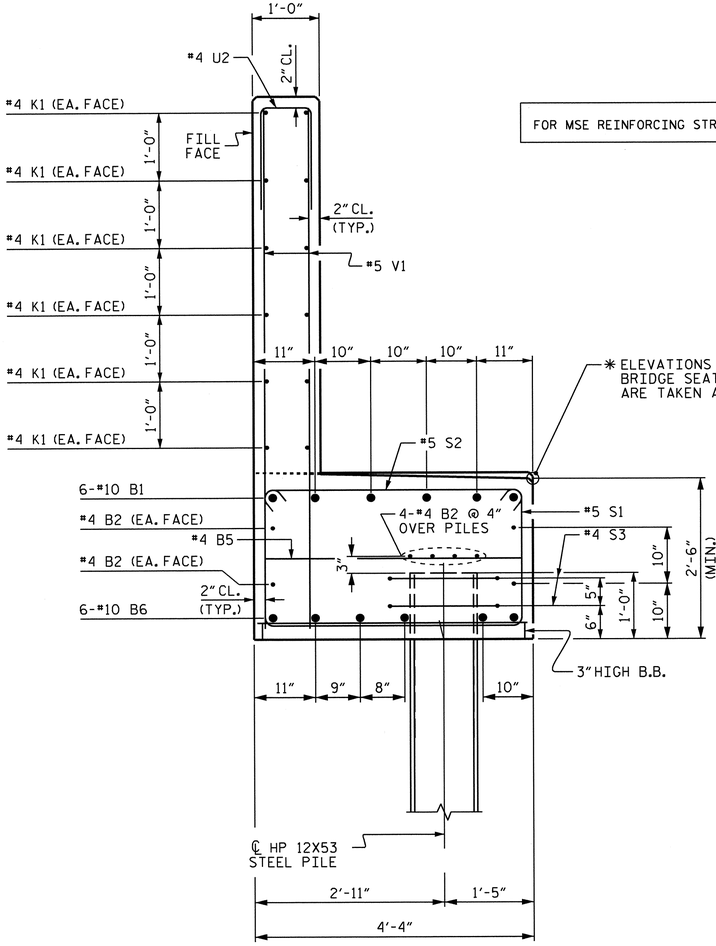
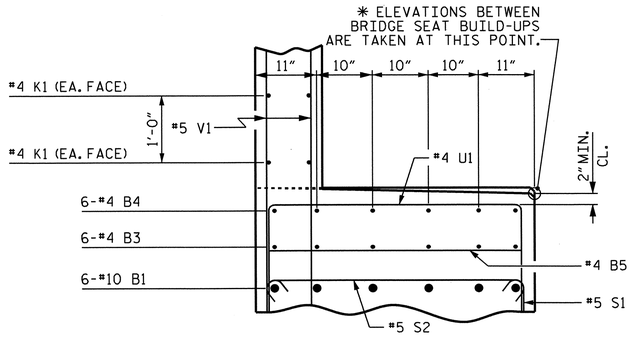
STR.#3

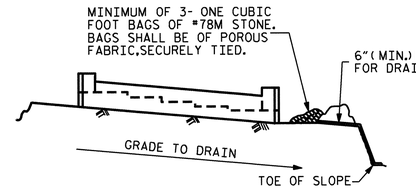


SECTION A-A

FOR MSE REINFORCING STRAPS IN BACKFILL CONNECTED TO END BENT, SEE "MSE RETAINING WALL" SHEETS.



PARTIAL SECTION B-B



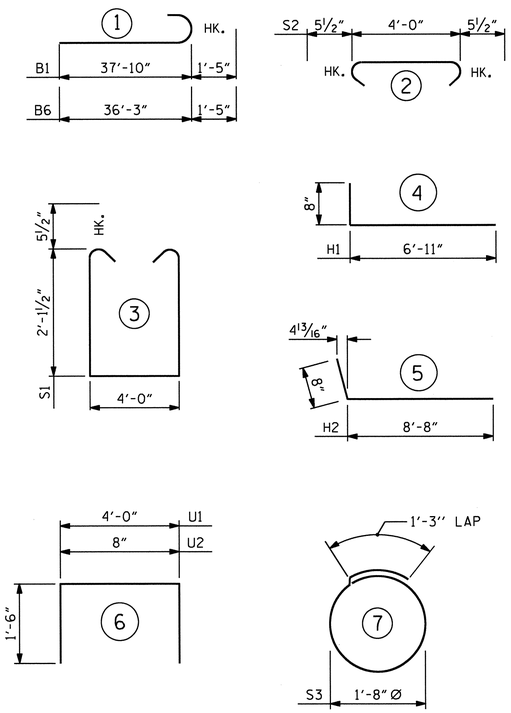
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



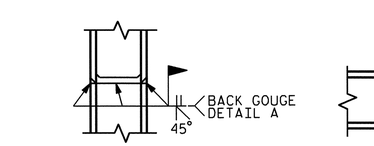
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

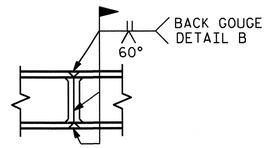
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#10	1	39'-3"	2027
B2	24	#4	STR	23'-3"	373
B3	12	#4	STR	23'-0"	184
B4	12	#4	STR	11'-8"	94
B5	21	#4	STR	4'-0"	56
B6	12	#10	1	37'-8"	1945
H1	22	#4	4	7'-7"	111
H2	24	#4	5	9'-4"	150
K1	36	#4	STR	22'-5"	539
K2	2	#4	STR	5'-3"	7
K3	2	#4	STR	4'-10"	6
K4	4	#4	STR	4'-4"	12
S1	99	#5	3	9'-2"	947
S2	99	#5	2	4'-11"	508
S3	14	#4	7	6'-6"	61
U1	28	#4	6	7'-0"	131
U2	52	#4	6	3'-8"	127
V1	104	#5	STR	7'-9"	841
V2	29	#5	STR	9'-5"	285
V3	29	#5	STR	10'-7"	320

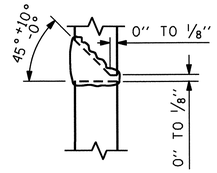
REINFORCING STEEL	LBS.	8,724
CLASS A CONCRETE BREAKDOWN :		
POUR #1 - CAP, LOWER WINGS	CU. YDS.	31.0
POUR #2 - BACKWALL & UPPER WINGS	CU. YDS.	17.1
TOTAL	CU. YDS.	48.1
HP 12x53 STEEL PILES NO. = 7	LIN. FT.	385
PILE REDRIVES	EACH	7



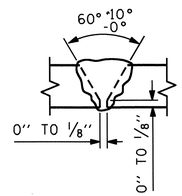
** PILE VERTICAL



** PILE HORIZONTAL OR VERTICAL



DETAIL A



DETAIL B

** POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-87
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
1-4-13

DRAWN BY : H. T. BARBOUR DATE : 11-01-11
CHECKED BY : D.A. DAVENPORT DATE : 3-29-12

04-JAN-2013 14:07
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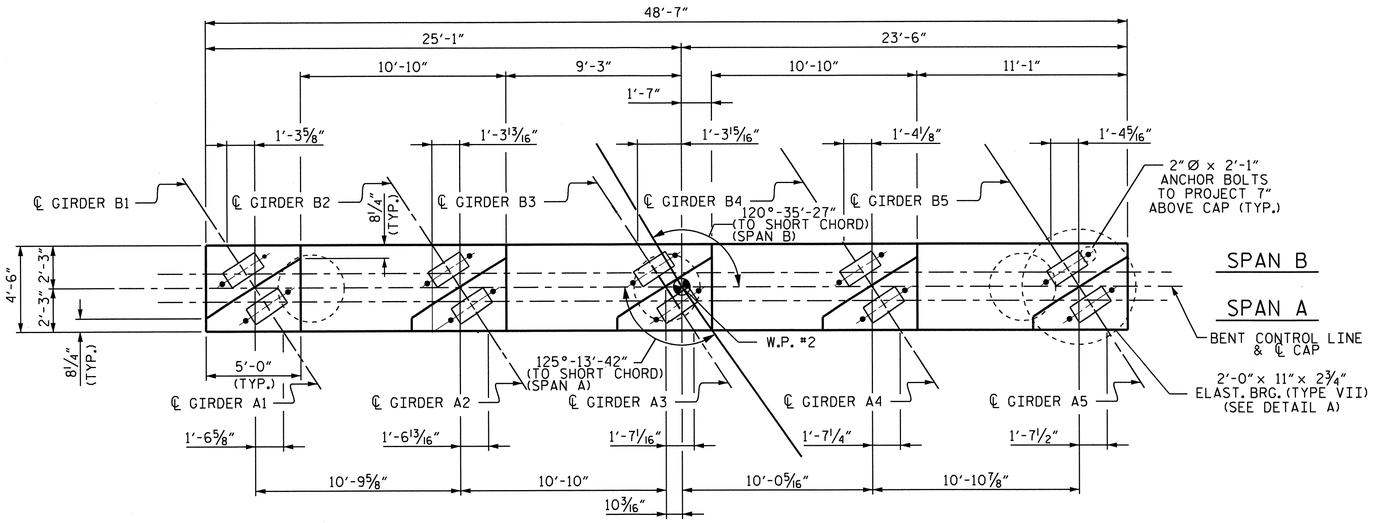
adavenport

STR.#3



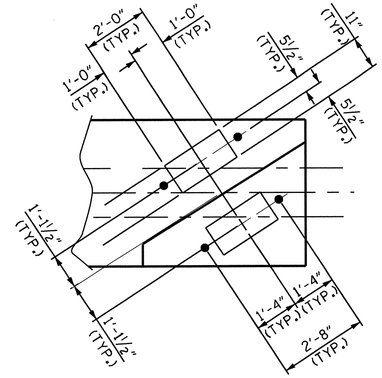
PLAN OF CAP

NOTES

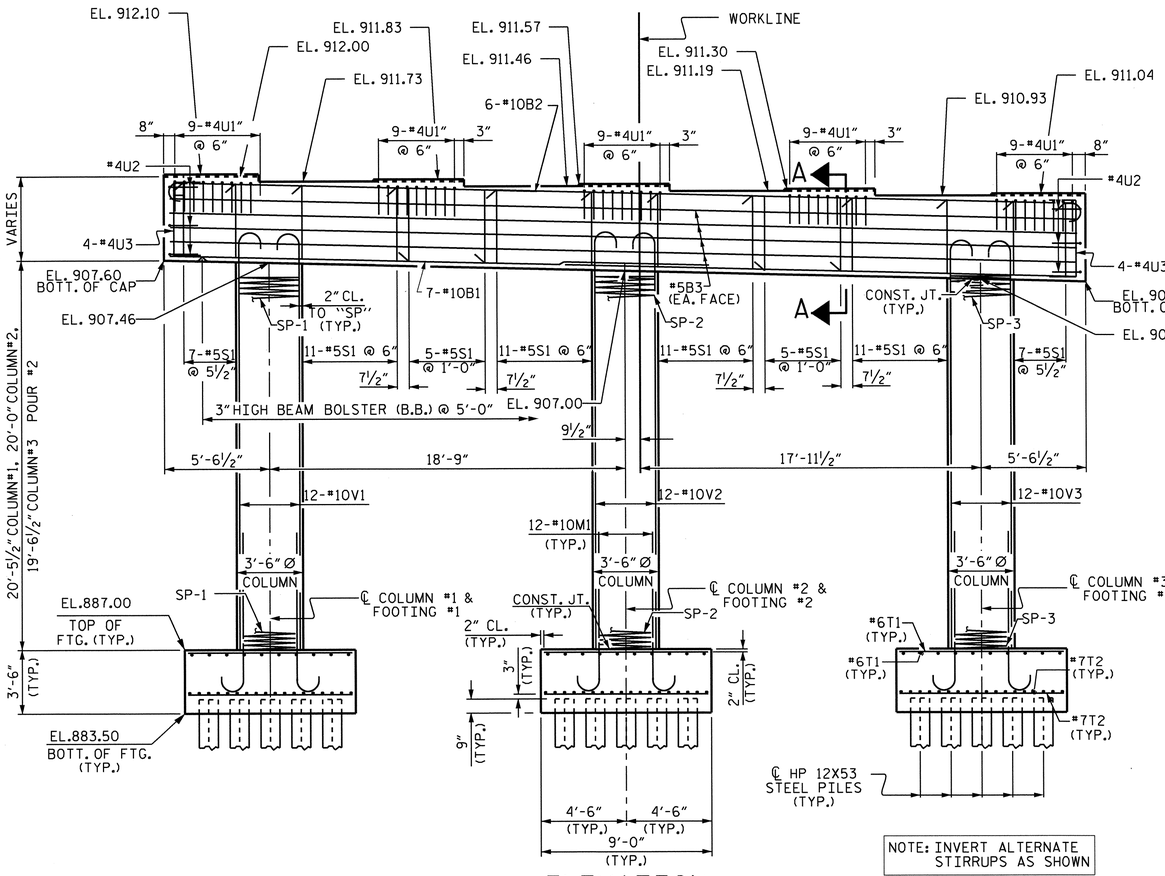
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR PILE SPLICE DETAILS, SEE END BENT #1.

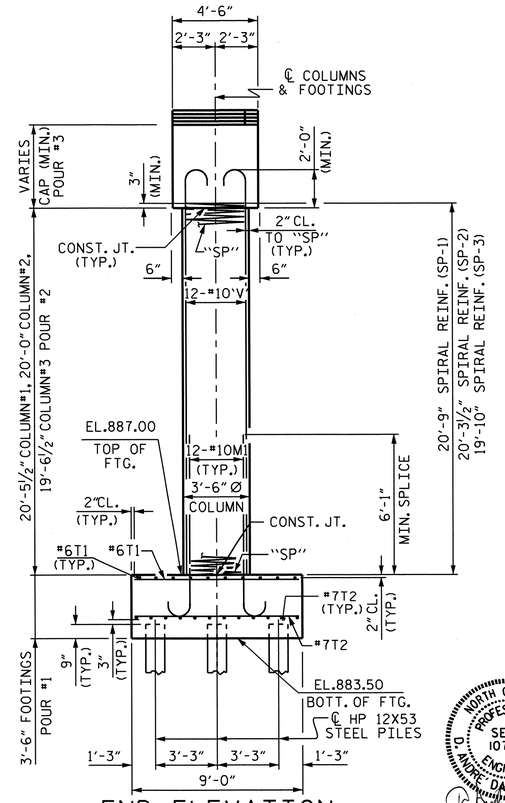


DETAIL A



NOTE: INVERT ALTERNATE STIRRUPS AS SHOWN

ELEVATION



END ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER ANDREW DAVENPORT, JR
1-4-13

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-88
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : D.A. DAVENPORT DATE : 04/03/12
CHECKED BY : R.L. CHESSON DATE : 04/12

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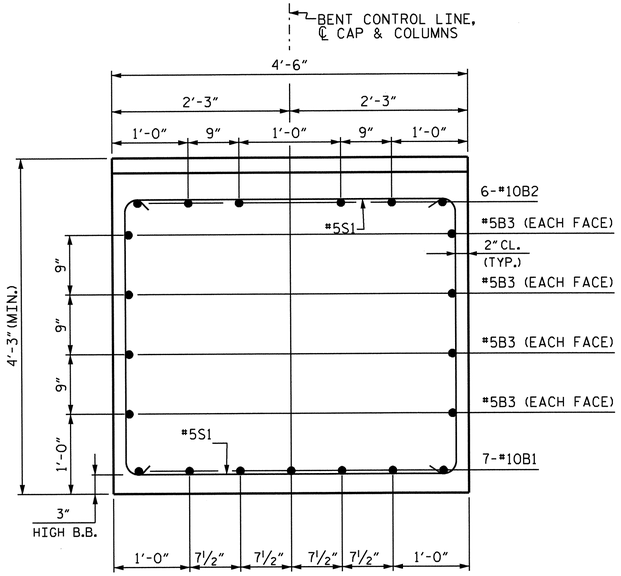
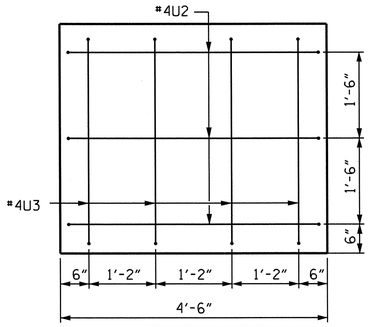


SECTION A-A

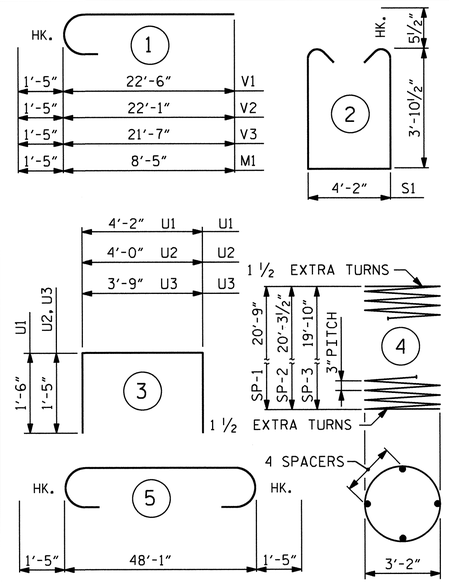


END VIEW

2" MIN. CONCRETE COVER FROM END OF CAP REQUIRED FOR ALL #4U2, AND #4U3 BARS.

#4U2 AND #4U3 BARS MAY BE SHIFTED UP TO 2" TO CLEAR "B" BARS.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	STR	48'-3"	1453
B2	6	#10	5	50'-11"	1315
B3	8	#5	STR	48'-3"	403
M1	36	#10	1	9'-10"	1523
S1	68	#5	2	12'-10"	910
T1	60	#6	STR	8'-8"	781
T2	90	#7	STR	8'-8"	1594
U1	45	#4	3	7'-2"	215
U2	6	#4	3	6'-10"	27
U3	8	#4	3	6'-7"	35
V1	12	#10	1	23'-11"	1235
V2	12	#10	1	23'-6"	1213
V3	12	#10	1	23'-0"	1188

REINFORCING STEEL = 11892 LBS

SP-1	1	✱	4	843'-3"	563
SP-2	1	✱	4	826'-1"	552
SP-3	1	✱	4	808'-11"	540

SPIRAL REINFORCING STEEL = 1655 LBS

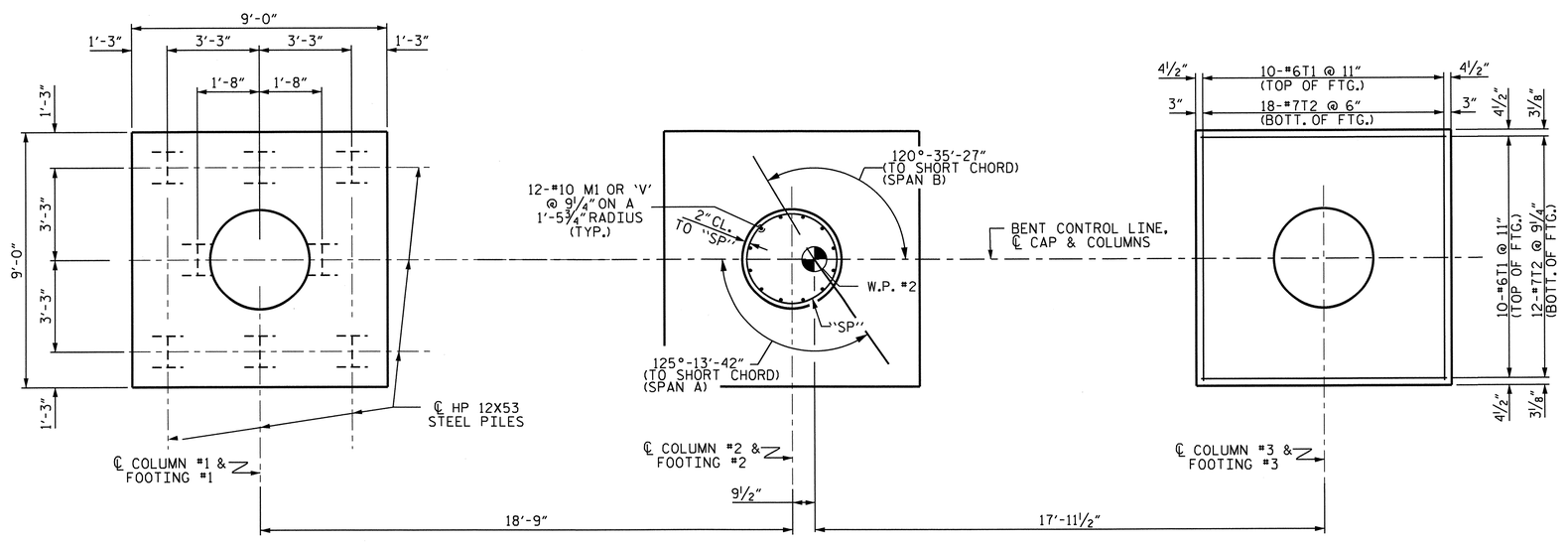
CLASS A CONCRETE (CU. YDS.)

POUR #1 (FOOTINGS)	31.5
POUR #2 (COLUMNS)	21.4
POUR #3 (CAP)	35.8
TOTAL	88.7

HP 12X53 STEEL PILES
NO. 24 LIN. FEET 1020

PILE REDRIVES
EACH 24

FOUNDATION EXCAVATION LUMP SUM



PLAN OF FOOTINGS

ALL FOOTINGS ARE TYPICAL

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT

9/10/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-89
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : D.A. DAVENPORT DATE : 04/03/12
CHECKED BY : R.L. CHESSON DATE : 04/12

STR. #3

NOTES

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

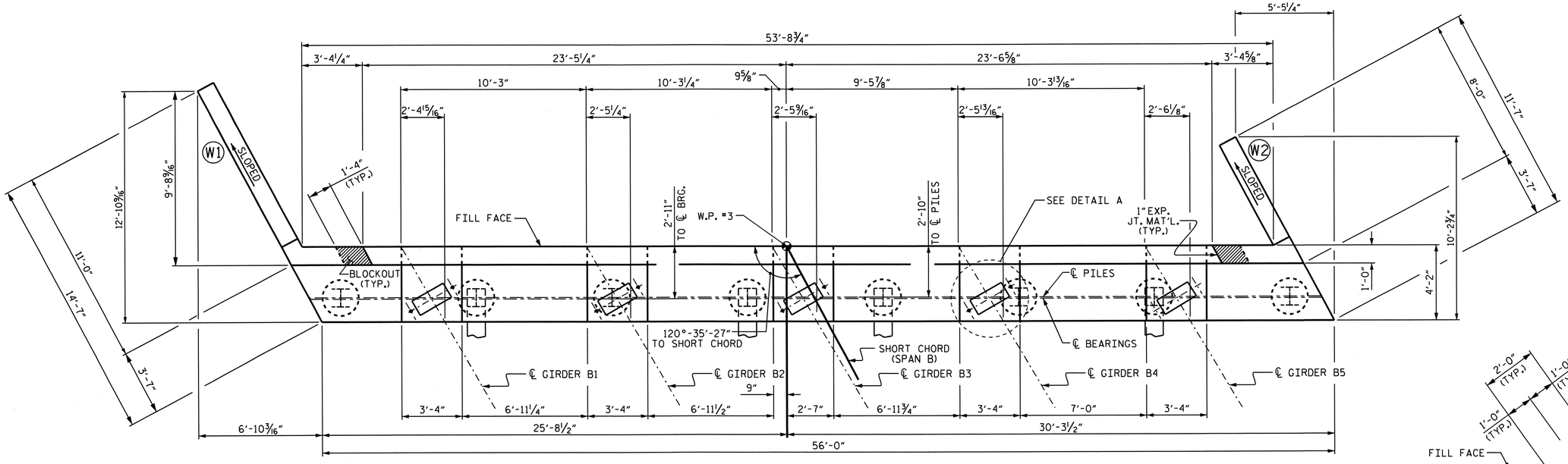
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

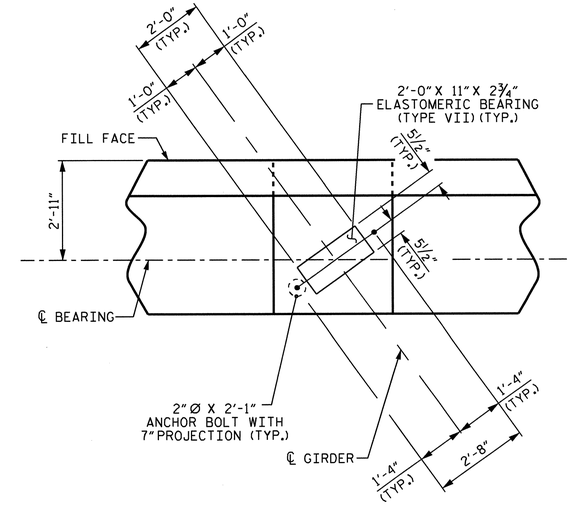
THE TOP SURFACE OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

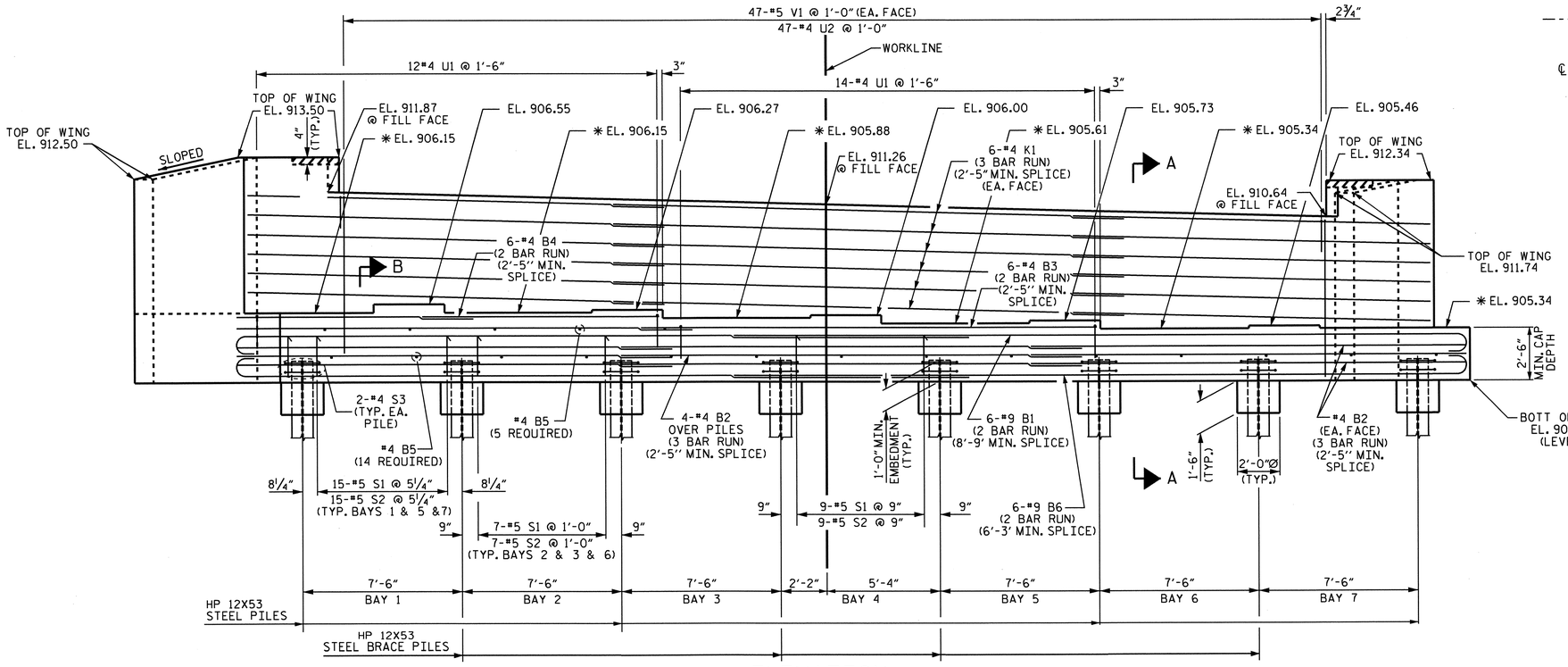
INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



DETAIL A



ELEVATION

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT
9/10/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-90
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : H. T. BARBOUR DATE : 11-02-11
CHECKED BY : D.A. DAVENPORT DATE : 3-29-12

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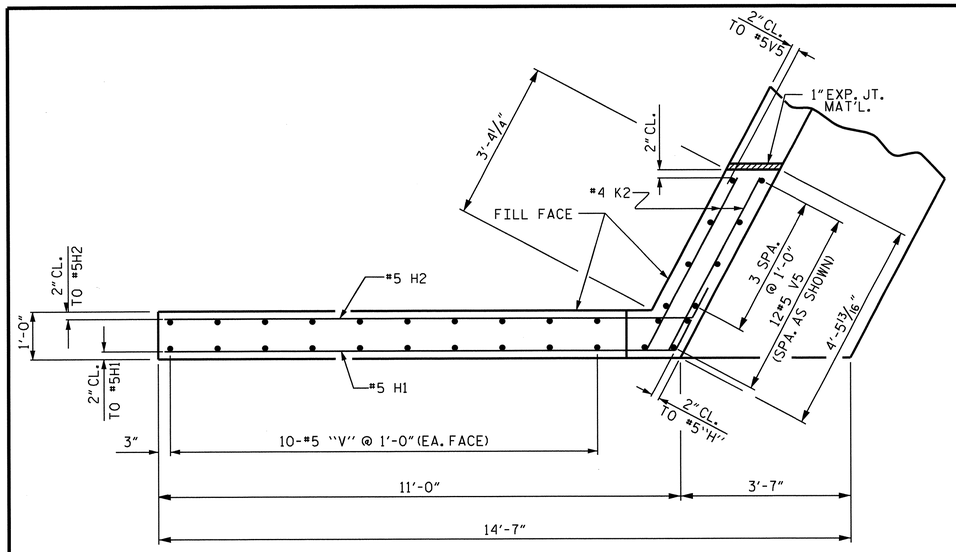
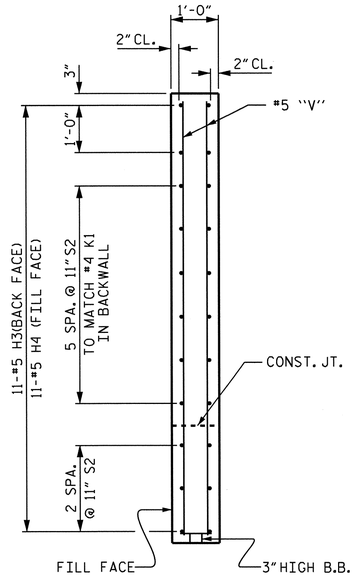
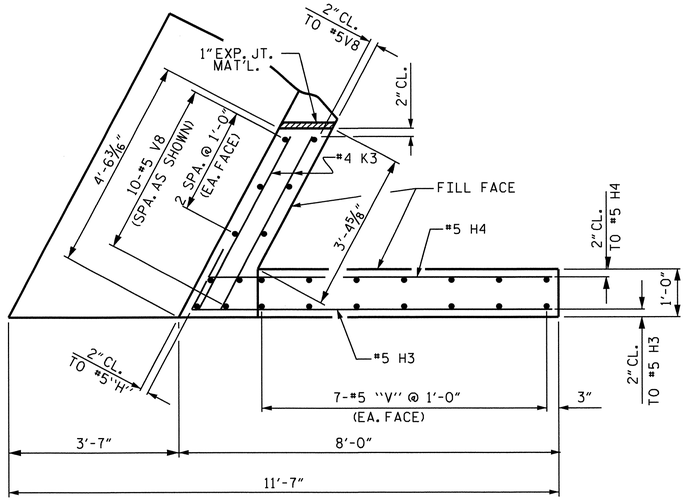


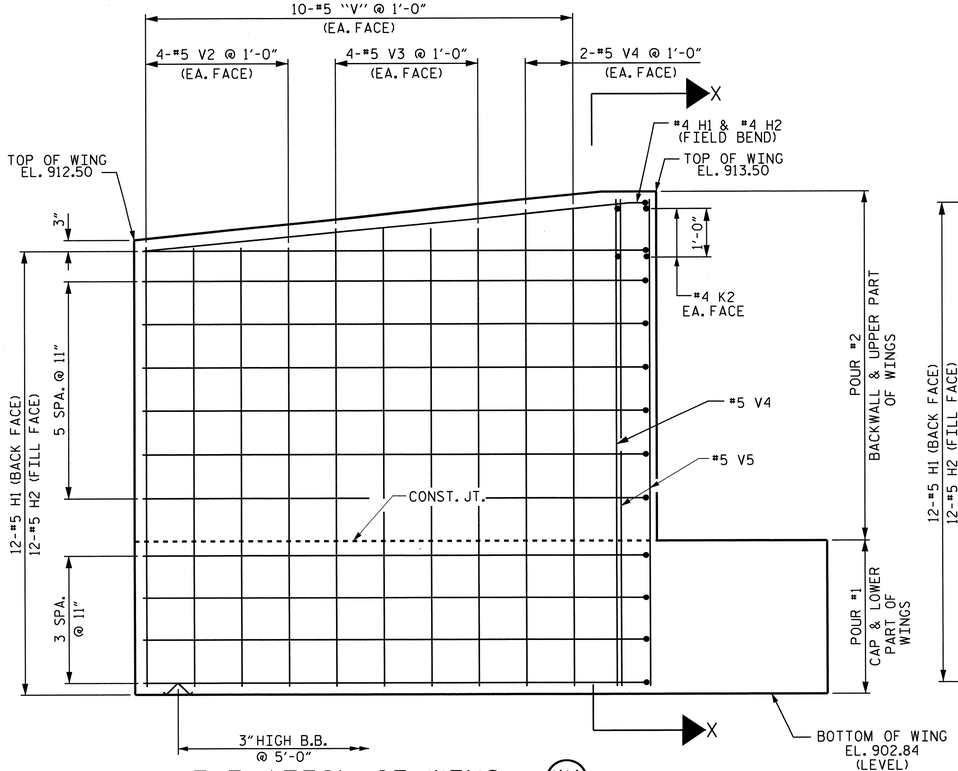
PLAN OF WING - (W1)



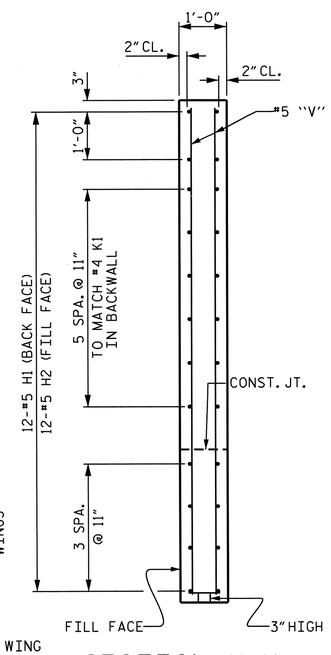
SECTION Y-Y



PLAN OF WING - (W2)



ELEVATION OF WING - (W1)



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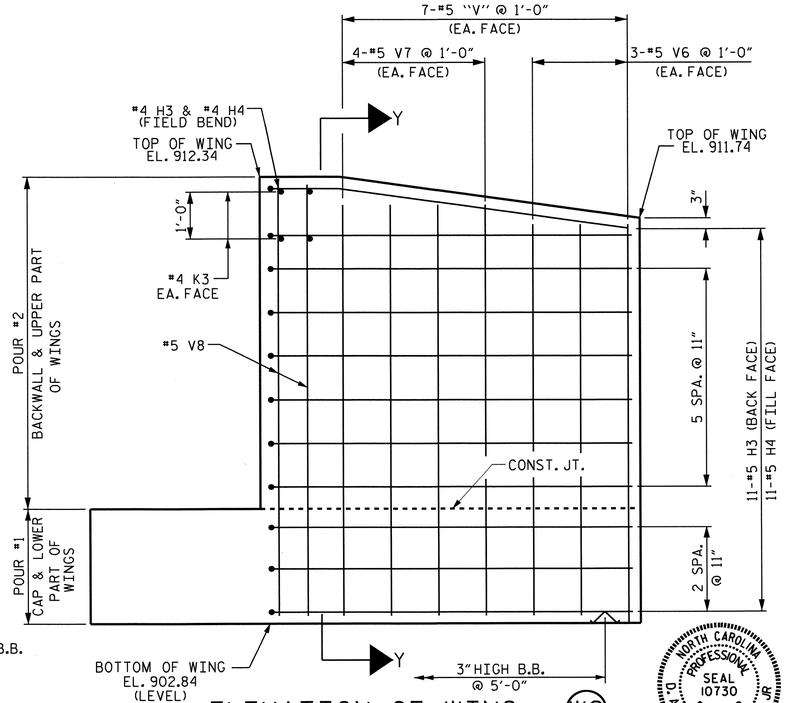

ELEVATION OF WING - (W2)

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.
1-4-13

DRAWN BY : H. T. BARBOUR DATE : 11-04-11
CHECKED BY : D.A. DAVENPORT DATE : 3-29-12

04-JAN-2013 11:46
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kbeard

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 110+97.64 -L-

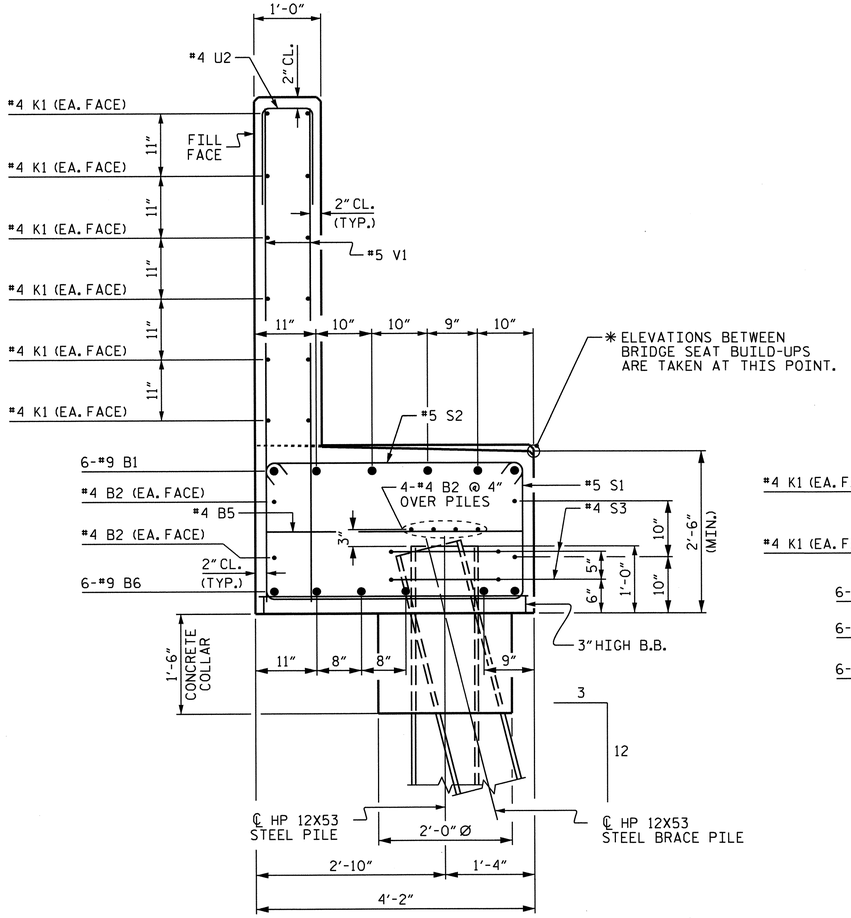
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

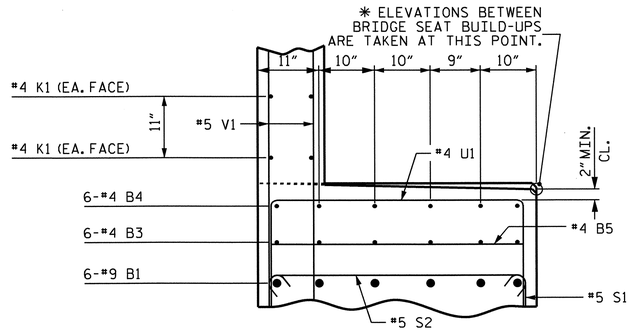
SUBSTRUCTURE END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-91
1			3			TOTAL SHEETS
2			4			96

STR.#3

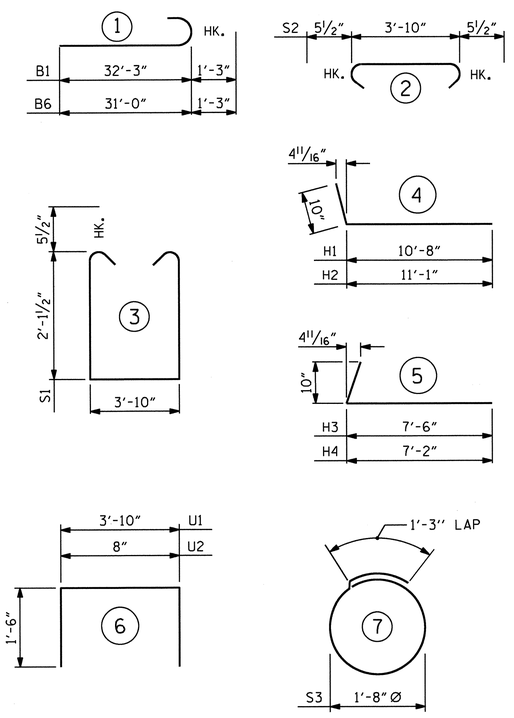


SECTION A-A



PARTIAL SECTION B-B

BAR TYPES



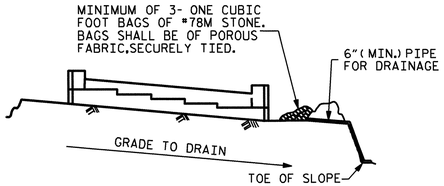
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#9	1	33'-6"	1367
B2	24	#4	STR	20'-2"	323
B3	12	#4	STR	21'-5"	172
B4	12	#4	STR	11'-1"	89
B5	19	#4	STR	3'-10"	49
B6	12	#9	1	32'-3"	1316
H1	12	#5	4	11'-6"	144
H2	12	#5	4	11'-11"	149
H3	11	#5	5	8'-4"	96
H4	11	#5	5	8'-0"	92
K1	36	#4	STR	20'-2"	485
K2	4	#4	STR	4'-1"	11
K3	4	#4	STR	4'-2"	11
S1	75	#5	3	9'-0"	704
S2	75	#5	2	4'-9"	372
S3	16	#4	7	6'-6"	69
U1	26	#4	6	6'-10"	119
U2	47	#4	6	3'-8"	115
V1	94	#5	STR	7'-5"	727
V2	8	#5	STR	9'-4"	78
V3	8	#5	STR	9'-8"	81
V4	4	#5	STR	10'-1"	42
V5	12	#5	STR	10'-3"	128
V6	6	#5	STR	8'-7"	54
V7	8	#5	STR	8'-10"	74
V8	10	#5	STR	9'-2"	96

REINFORCING STEEL	LBS.	6,963
CLASS A CONCRETE BREAKDOWN :		
POUR #1 - CAP, LOWER WINGS & CONCRETE COLLAR	CU. YDS.	28.9
POUR #2 - BACKWALL & UPPER WINGS	CU. YDS.	15.9
TOTAL	CU. YDS.	44.8
HP 12x53 STEEL PILES NO. = 8	LIN. FT.	440
PILE REDRIVES	EACH	8

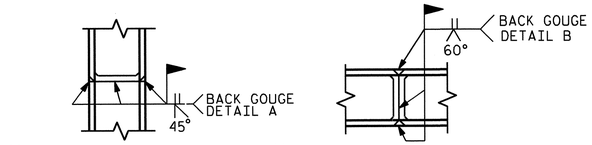


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

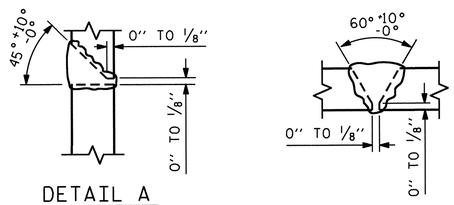
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



** PILE VERTICAL

** PILE HORIZONTAL OR VERTICAL



** POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-92
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR

DRAWN BY : H. T. BARBOUR DATE : 11-07-11
CHECKED BY : D.A. DAVENPORT DATE : 3-29-12

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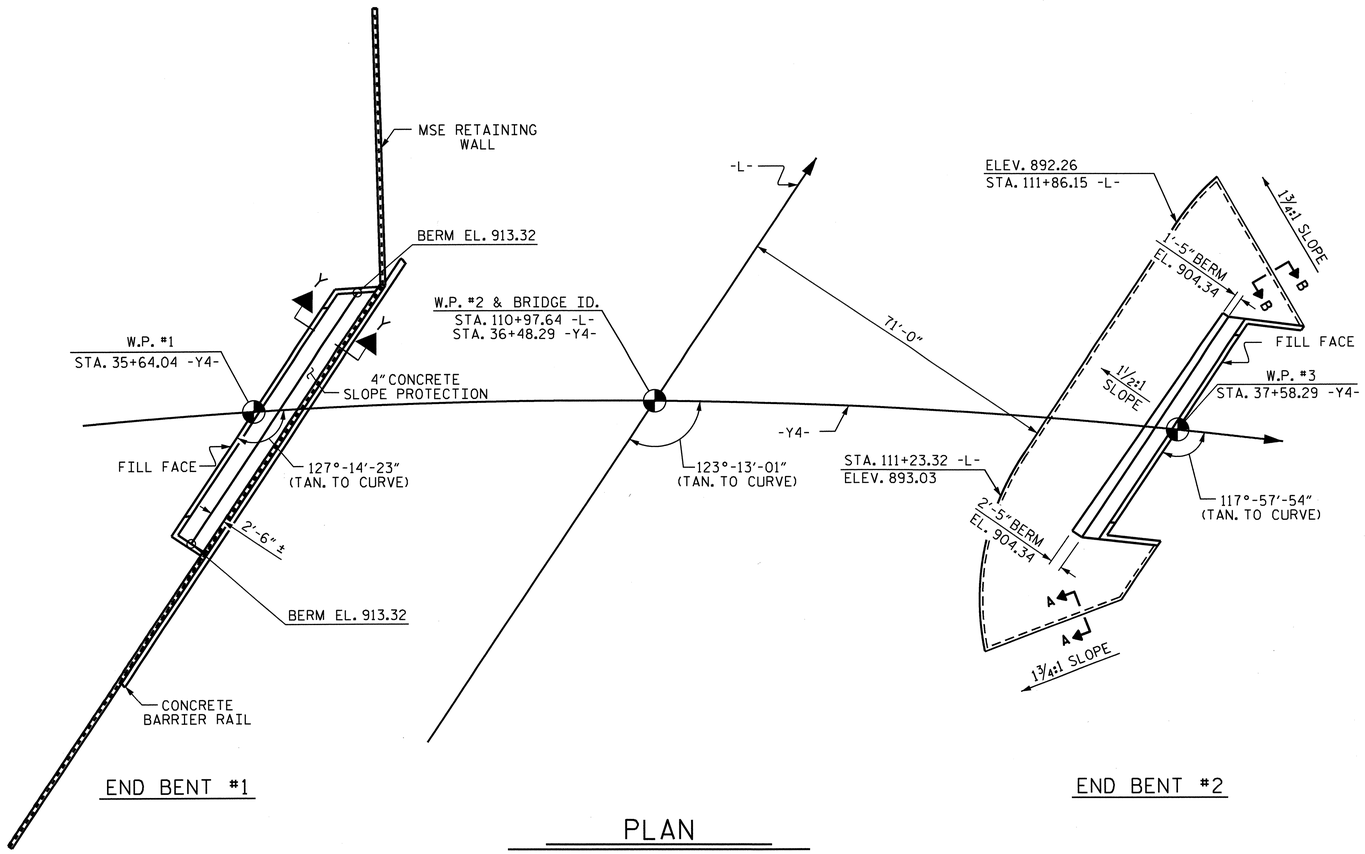


END BENT #1

END BENT #2

PLAN

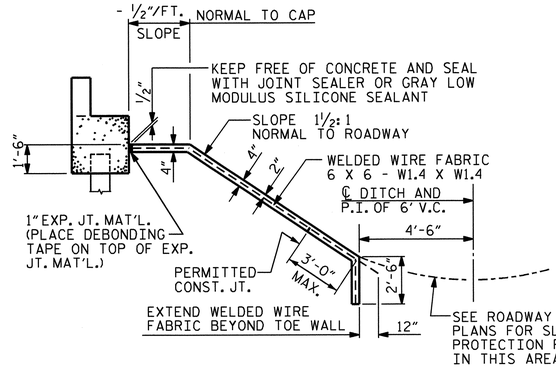
GENERAL NOTES

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.

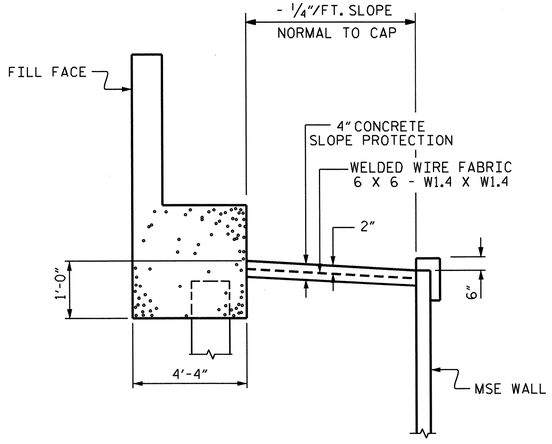
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL 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. 110+97.64 -L-	4" SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT #1	22	44
END BENT #2	313	626
TOTAL	335	662

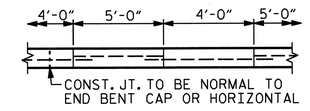
* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH

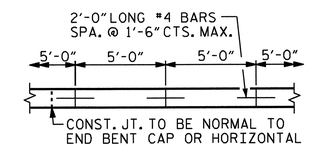


SECTION Y-Y

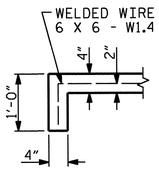


POUR A 4'-0" STRIP FIRST.

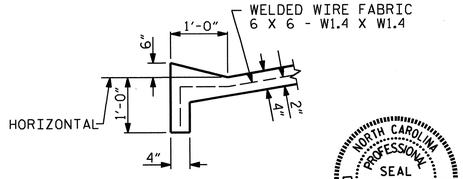
OPTIONAL POURING DETAIL



POURING DETAIL



SECTION A-A



SECTION B-B

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-93
1			3			TOTAL SHEETS
2			4			96

ASSEMBLED BY : D.A. DAVENPORT		DATE : 04/09/12
CHECKED BY : G.W. DICKEY		DATE : 05/18/12
DRAWN BY : ELR 5/92	REV. 7/10/01	LES/RDR
CHECKED BY : GRP 6/92	REV. 5/17/03	RWW/JTE
	REV. 5/1/06	TLA/GM

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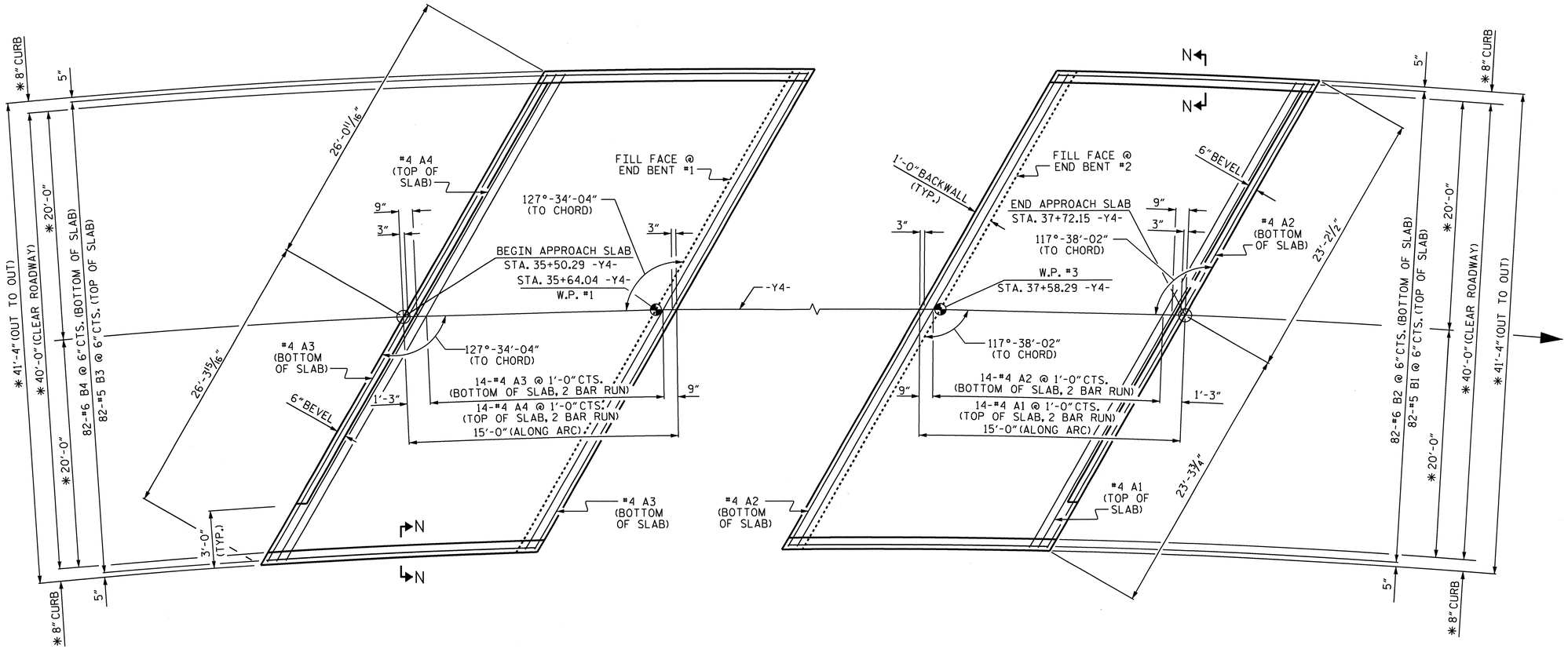

PLAN @ END BENT #1

(CHORD = 13'-9")

PLAN @ END BENT #2

(CHORD = 13'-10 3/8")

*RADIAL DIMENSION

ARC OFFSETS ARE NEGLIGIBLE

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT, JR.

9/10/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-94
1			3			TOTAL SHEETS
2			4			96

DRAWN BY : W.B. HILL DATE : 07/09

CHECKED BY : D. A. DAVENPORT DATE : 01/18/12

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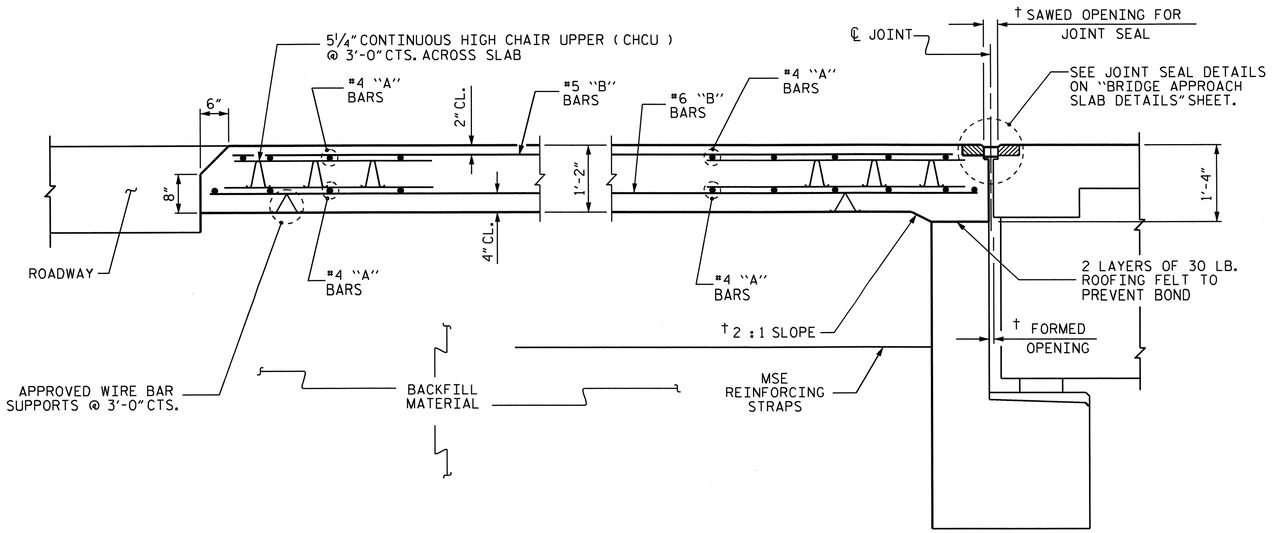
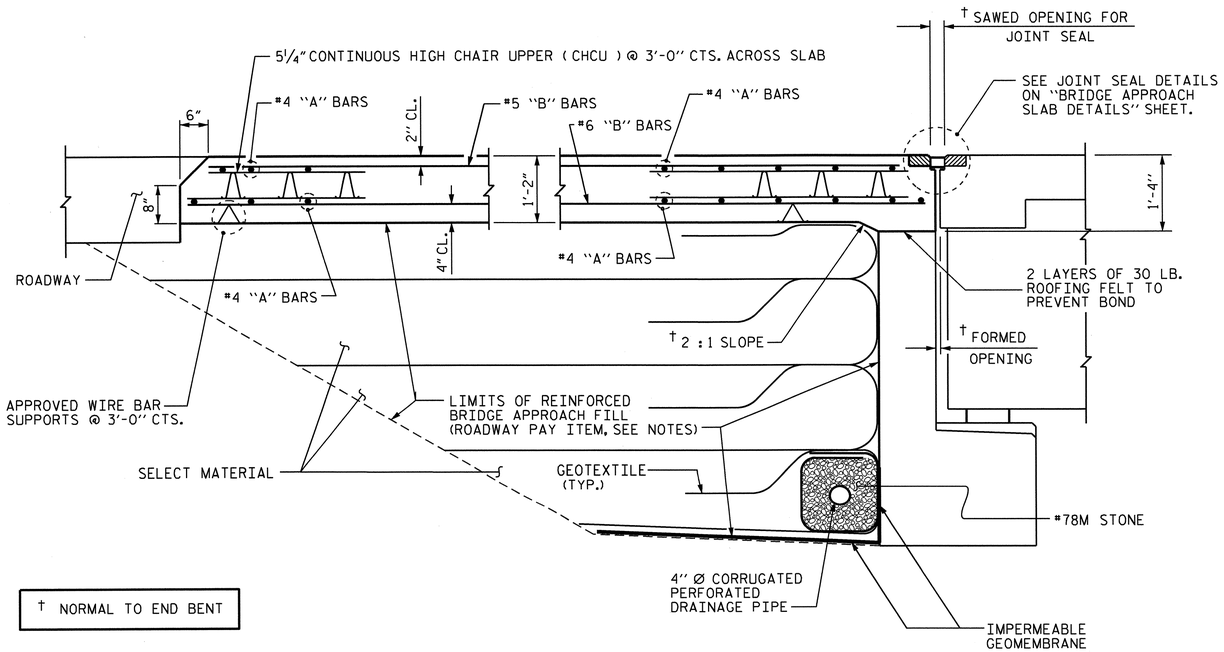
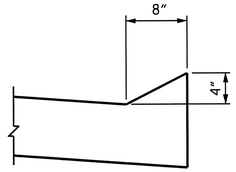


SECTION THRU SLAB @ END BENT #1

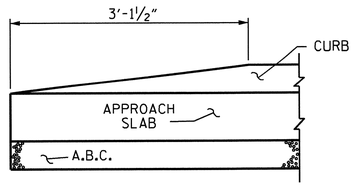


† NORMAL TO END BENT

SECTION THRU SLAB @ END BENT #2



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

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

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

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR GALVANIZED REINFORCING STRAPS AND BACKFILL MATERIAL, SEE MSE RETAINING WALL PLANS AND SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A3	32	#4	STR	26'-7"	568
✱A4	30	#4	STR	26'-9"	536
✱B3	82	#5	STR	13'-9"	1176
B4	82	#6	STR	14'-5"	1776
REINFORCING STEEL				LBS.	2344
✱EPOXY COATED REINFORCING STEEL				LBS.	1712
CLASS AA CONCRETE				C. Y.	27.0

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	30	#4	STR	24'-1"	483
A2	32	#4	STR	24'-0"	513
✱B1	82	#5	STR	13'-10"	1183
B2	82	#6	STR	14'-7"	1796
REINFORCING STEEL				LBS.	2309
✱EPOXY COATED REINFORCING STEEL				LBS.	1666
CLASS AA CONCRETE				C. Y.	27.0

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-95
1			3			TOTAL SHEETS
2			4			96

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDREW DAVENPORT

9/10/12

ASSEMBLED BY : W.B. HILL	DATE : 07/09	REV. 5/1/06R	KMM/GM
CHECKED BY : D. A. DAVENPORT	DATE : 01/18/12	REV. 10/1/11	KMM/GM
DRAWN BY : EEM 3/95		REV. 12/21/11	MMA/GM
CHECKED BY : VAP 3/95			

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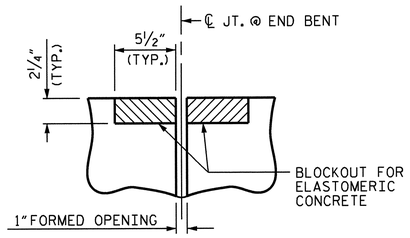
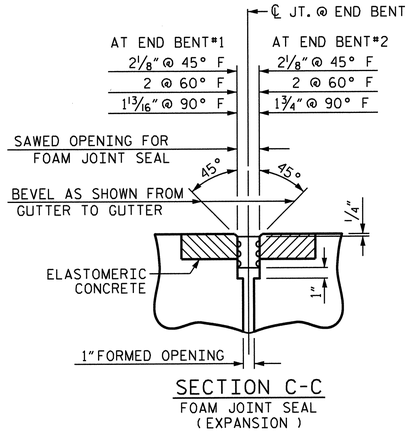
STD. NO. BAS2 (SHT 1b)



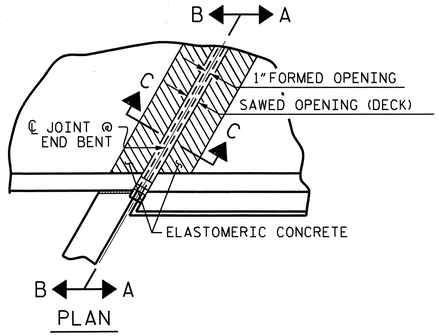
SECTION C-C

FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

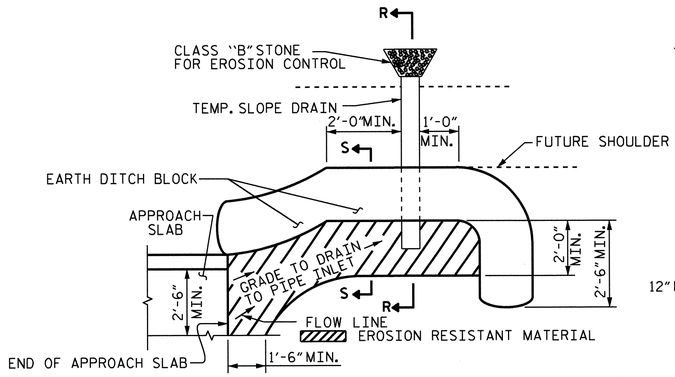


SECTION C-C

FOAM JOINT SEAL
(EXPANSION)

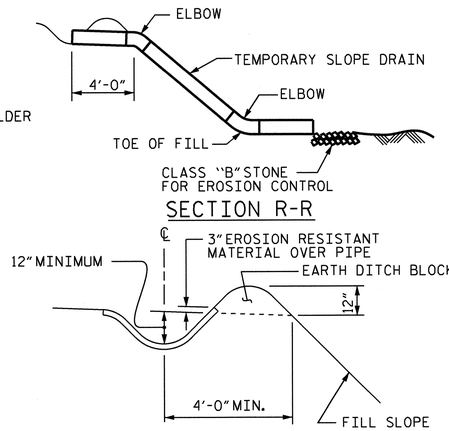


PLAN



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

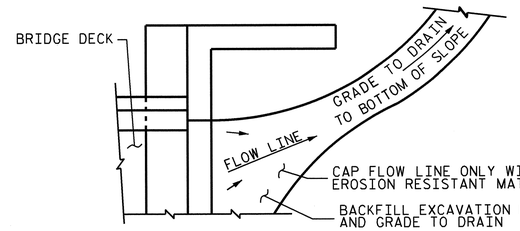
PLAN VIEW



SECTION S-S

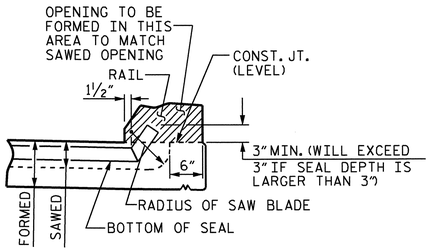
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

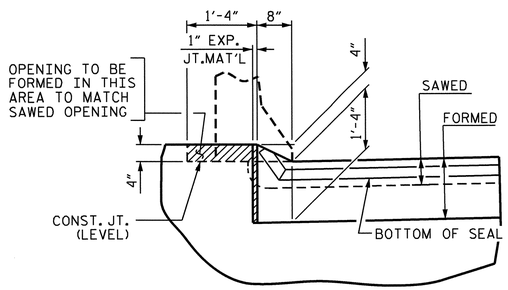


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



SECTION A-A



SECTION B-B

JOINT SEAL DETAILS @ END BENT

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	8.9
2	8.0
TOTAL	16.9

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 110+97.64 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 10730 ENGINEER D. ANDRE DAVENPORT, JR.
9/6/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-96
1			3			TOTAL SHEETS
2			4			96

STR.#3

STD. NO. BAS4 (SHT 1b)

ASSEMBLED BY : W. B. HILL	DATE : 07/09		
CHECKED BY : D. A. DAVENPORT	DATE : 01/18/12		
DRAWN BY : FCJ 11/88	REV. 5/7/03	RWW/JTE	
CHECKED BY : ARB 11/88	REV. 5/1/06R	MAA/KMM	
	REV. 10/1/11	MAA/GM	

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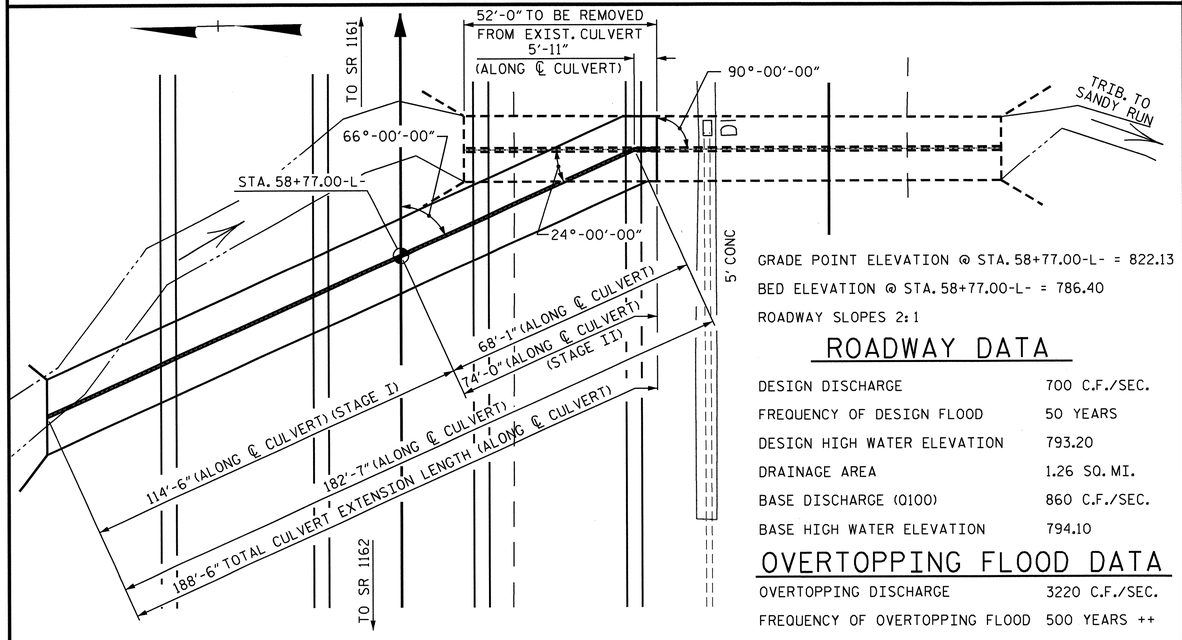
ddavenport

BM # 2 RAIL ROAD SPIKE IN 30"Ø OAK ℄ STA. 26+62.27-L-, EL. 865.94'



GRADE POINT ELEVATION @ STA. 58+77.00-L- = 822.13

BED ELEVATION @ STA. 58+77.00-L- = 786.40

ROADWAY SLOPES 2:1

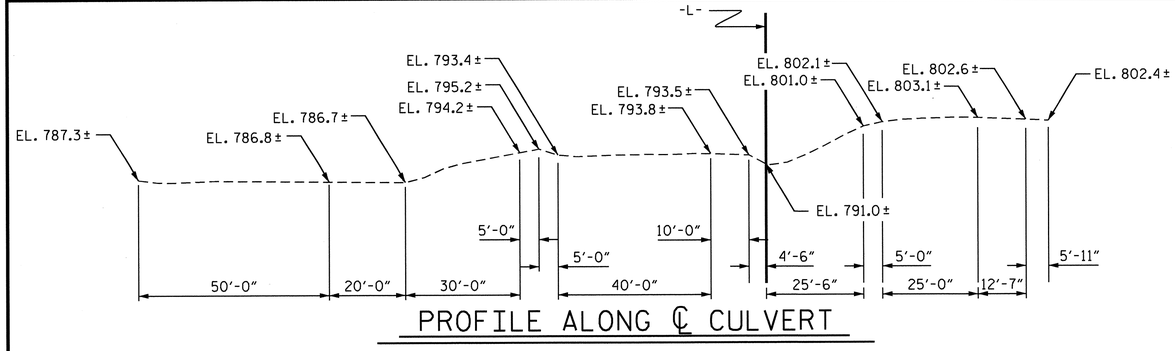
ROADWAY DATA

DESIGN DISCHARGE	700 C.F./SEC.
FREQUENCY OF DESIGN FLOOD	50 YEARS
DESIGN HIGH WATER ELEVATION	793.20
DRAINAGE AREA	1.26 SQ. MI.
BASE DISCHARGE (0100)	860 C.F./SEC.
BASE HIGH WATER ELEVATION	794.10

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	3220 C.F./SEC.
FREQUENCY OF OVERTOPPING FLOOD	500 YEARS ++
OVERTOPPING FLOOD ELEVATION	812.60

LOCATION SKETCH



PROFILE ALONG ℄ CULVERT

BILL OF MATERIAL

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	276	4	1	4'-7"	845
A2	344	4	1	4'-7"	1053
A100	147	5	STR.	17'-8"	2709
A101	2	5	STR.	14'-10"	31
A102	2	5	STR.	11'-6"	24
A103	2	5	STR.	8'-1"	17
A104	2	5	STR.	4'-9"	10
A200	177	5	STR.	17'-8"	3261
A201	2	5	STR.	15'-5"	32
A202	2	5	STR.	12'-7"	26
A203	2	5	STR.	9'-9"	20
A204	2	5	STR.	7'-0"	15
A205	2	5	STR.	4'-2"	9
A300	147	5	STR.	17'-8"	2709
A301	2	5	STR.	14'-10"	31
A302	2	5	STR.	11'-6"	24
A303	2	5	STR.	8'-1"	17
A304	2	5	STR.	4'-9"	10
A400	177	6	STR.	17'-8"	4697
A401	2	6	STR.	15'-5"	46
A402	2	6	STR.	12'-7"	38
A403	2	6	STR.	9'-9"	29
A404	2	6	STR.	7'-0"	21
A405	2	6	STR.	4'-2"	13
B1	232	4	STR.	9'-9"	1511
B2	232	4	STR.	7'-4"	1136
B3	229	4	STR.	9'-9"	1491
C1	450	4	STR.	25'-8"	7715
D1	5	6	STR.	3'-4"	25
G1	4	5	STR.	19'-4"	81
S1	3	8	STR.	19'-4"	155
S2	3	8	STR.	19'-4"	155

STAGE I REINFORCING STEEL 27956 LBS.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	177	4	1	4'-7"	542
A2	221	4	1	4'-7"	677
A100	104	5	STR.	17'-8"	1916
A200	124	5	STR.	17'-8"	2285
A300	104	5	STR.	17'-8"	1916
A400	124	6	STR.	17'-8"	3290
B1	149	4	STR.	9'-9"	970
B2	149	4	STR.	7'-4"	730
B3	147	4	STR.	9'-9"	957
C2	270	4	STR.	27'-1"	4885
D2	45	6	STR.	2'-6"	169
S3	3	6	STR.	19'-4"	87
S4	3	6	STR.	19'-4"	87

STAGE II REINFORCING STEEL 18511 LBS.

CLASS A CONCRETE STAGE I

BARREL @ 2.13 CY/FT 243.9 C.Y.

WING ETC. 14.6 C.Y.

STAGE I TOTAL 258.5 C.Y.

REINFORCING STEEL STAGE I

BARREL 27956 LBS.

WINGS ETC. 833 LBS.

STAGE I TOTAL 28789 LBS.

CLASS A CONCRETE STAGE II

BARREL @ 2.13 CY/FT 157.6 C.Y.

STAGE II TOTAL 157.6 C.Y.

REINFORCING STEEL STAGE II

BARREL 18511 LBS.

STAGE II TOTAL 18511 LBS.

TOTAL STRUCTURE QUANTITIES

TOTAL CLASS A CONCRETE 416.1 C.Y.

TOTAL REINFORCING 47300 LBS.

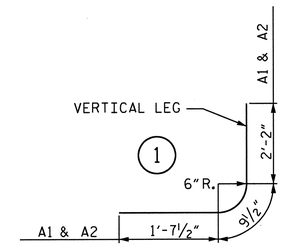
FOUNDATION COND. MAT'L. 239 TONS

CULVERT EXCAVATION LUMP SUM

REMOVAL OF EXISTING STRUCTURE LUMP SUM

F.A. PROJ. NO.: NHF-0074(141)

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT

SPLICE CHART		
BAR	SIZE	SPLICE LENGTH
"C"	4	1'-11"

NOTES

ASSUMED LIVE LOAD ----------HL-93 OR ALTERNATE LOADING.

DESIGN FILL----------MAX. 18.32, MIN. 17.17

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WINGS, FOOTINGS, AND FLOOR SLAB FOR STAGE I, INCLUDING 4" OF ALL VERTICAL WALLS OF STAGE I.
2. THE REMAINING PORTIONS OF THE WALLS OF STAGE I AND WINGS FULL HEIGHT.
3. ROOF SLAB AND HEADWALL FOR STAGE I.
4. FLOOR SLAB FOR STAGE II, INCLUDING 4" OF ALL VERTICAL WALLS OF STAGE II.
5. THE REMAINING PORTIONS OF THE WALLS OF STAGE II.
6. ROOF SLAB FOR STAGE II.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

THE EXISTING 8' X 8' DOUBLE BARREL REINFORCED CONCRETE BOX CULVERT LOCATED AT THE PROPOSED SITE SHALL BE REMOVED TO THE LIMITS SHOWN.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

NORTH CAROLINA PROFESSIONAL SEAL 13014 ENGINEER QUANG H. NGUYEN
Quang H. Nguyen 3-8-13

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-5-2013

DRAWN BY : H. T. BARBOUR DATE : 7-27-12

CHECKED BY : H. KIM DATE : 10-12

27-DEC-2012 15:35
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tbarbour

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 58+77.00-L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT 66° SKEW

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

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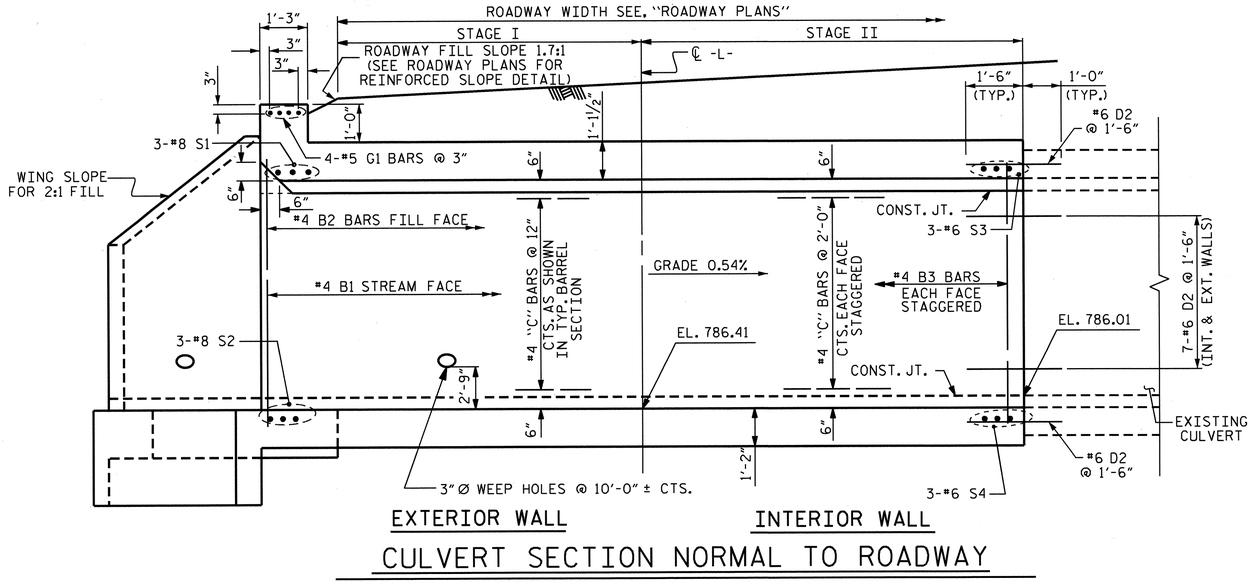
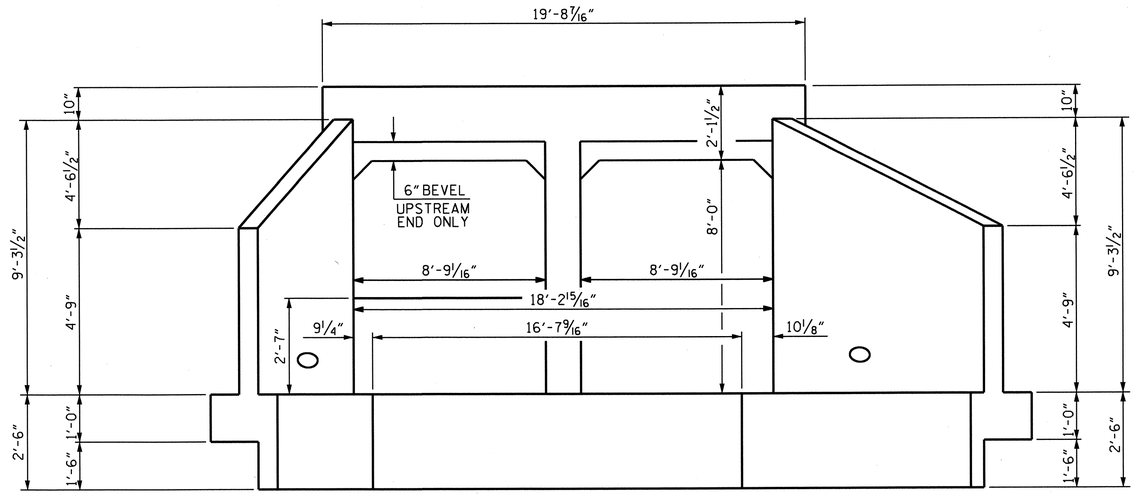
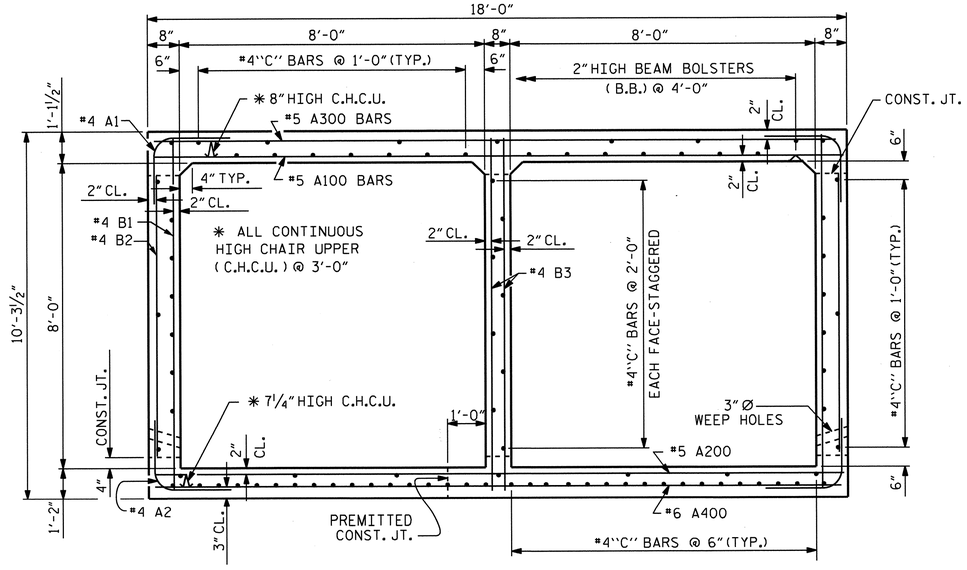


CULVERT SECTION NORMAL TO ROADWAY



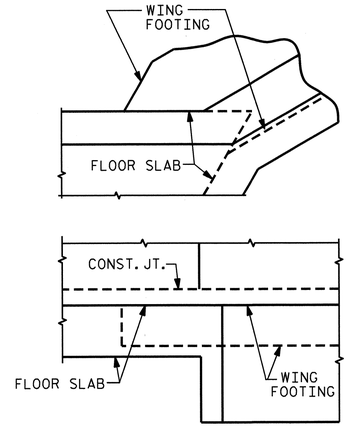
END ELEVATION NORMAL TO SKEW

(INLET END SHOWN)



RIGHT ANGLE SECTION OF BARREL

THERE ARE 90 "C" BARS IN SECTION OF BARREL.



DETAIL

CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING

REVISED 11-19-99 BY M.M. CHECKED BY R.W.W.
REDRAWN 10-1-90 BY P. DONOVAN CHECKED BY ARB

ASSEMBLED BY : H. T. BARBOUR DATE : 7-27-12 CHECKED BY : H. KIM DATE : 10-12	SPECIAL
DRAWN BY : JERRY HARRIS DATE : JUNE 1971 CHECKED BY : JOEL JOHNSON DATE : JULY 1971	STANDARD

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 58+77.00-L-

SHEET 2 OF 7

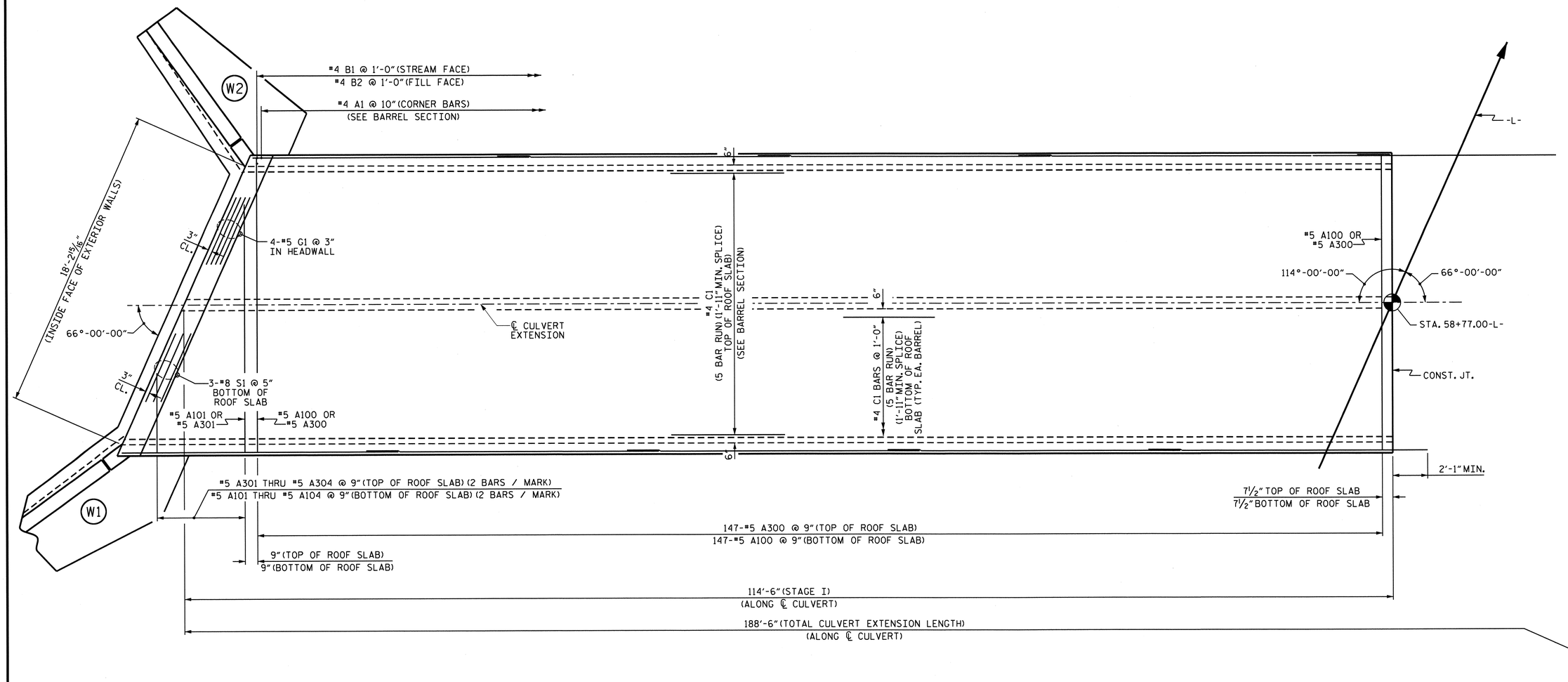
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT 66° SKEW

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

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH 3-4-2013

STD. NO. CB32



STAGE I
ROOF SLAB PLAN

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 58+77.00-L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT (LEFT EXTENSION) (STAGE I)

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-9-2017

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

DRAWN BY : H. T. BARBOUR DATE : 9-21-12
CHECKED BY : H. KIM DATE : 10-12

27-DEC-2012 15:36
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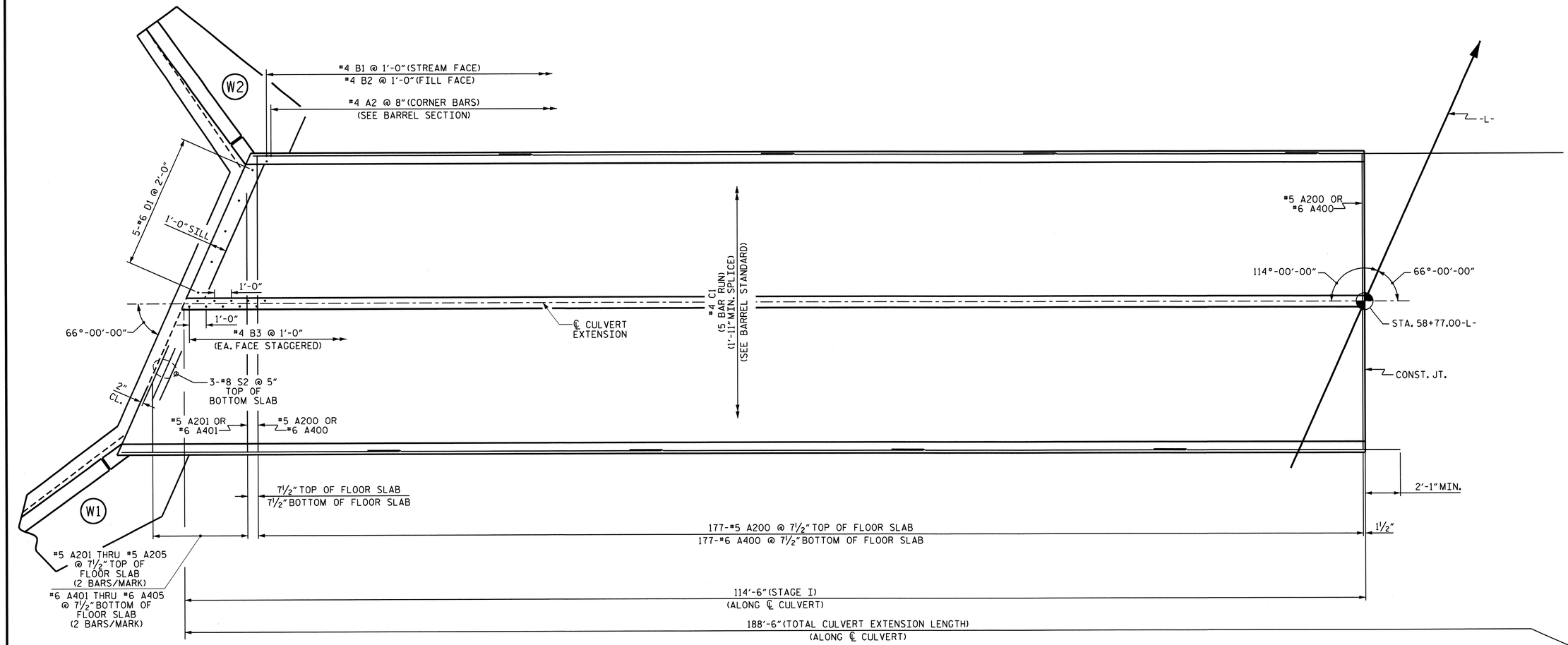
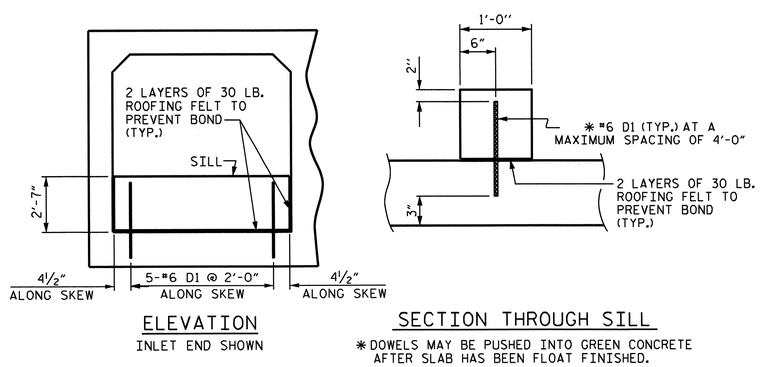
tbarbour



STAGE I
FLOOR SLAB PLAN



ELEVATION
INLET END SHOWN

SECTION THROUGH SILL
* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

CULVERT SILL DETAILS

PROJECT NO. R-2707AA
CLEVELAND COUNTY
STATION: 58+77.00-L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT.
CONCRETE BOX CULVERT
(LEFT EXTENSION)
(STAGE I)

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-8-2013

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

DRAWN BY : H. T. BARBOUR DATE : 9-25-12
CHECKED BY : H. KIM DATE : 10-12

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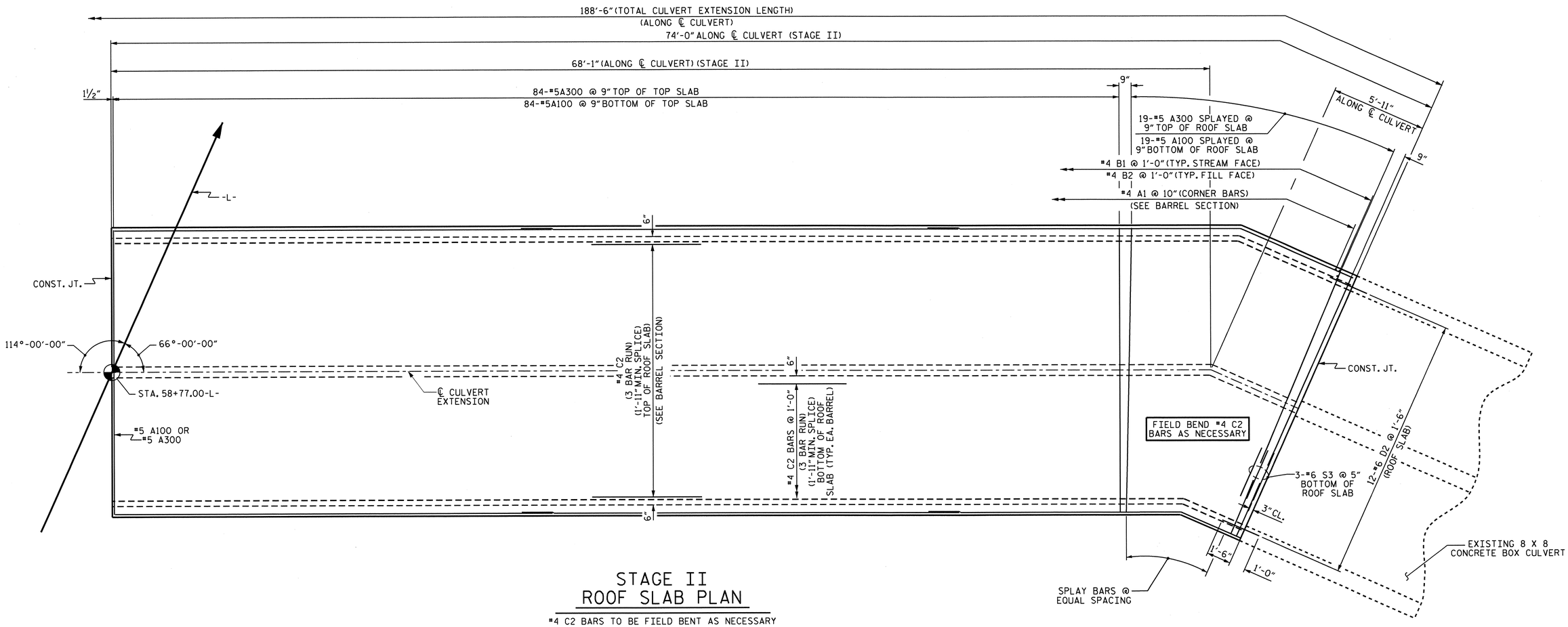
tbarbour



STAGE II
ROOF SLAB PLAN

#4 C2 BARS TO BE FIELD BENT AS NECESSARY

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 58+77.00-L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT (LEFT EXTENSION) (STAGE II)

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-4-2013

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS 7
2			4			

DRAWN BY : H. T. BARBOUR DATE : 9-21-12
CHECKED BY : H. KIM DATE : 10-12

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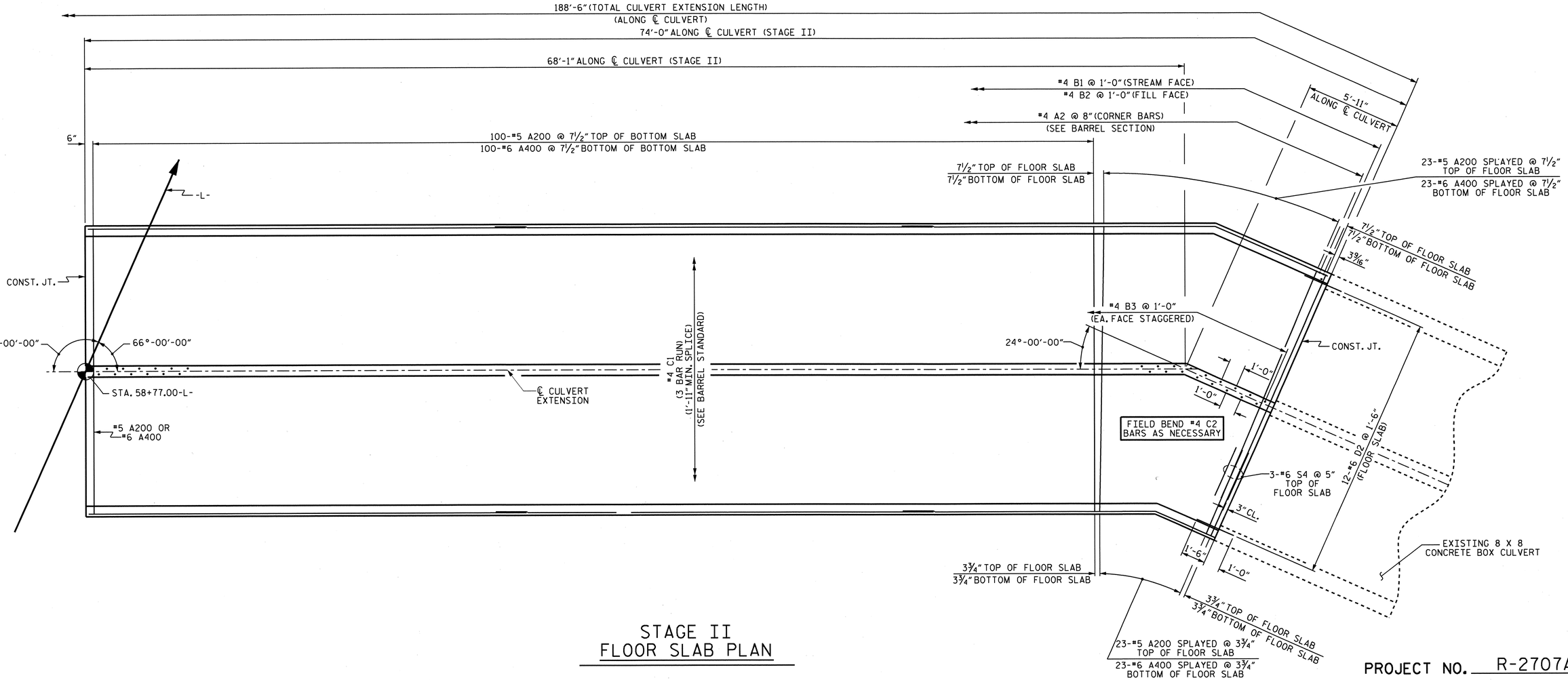

STAGE II
FLOOR SLAB PLAN

PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 58+77.00-L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 8 FT. X 8 FT. CONCRETE BOX CULVERT (LEFT EXTENSION) (STAGE II)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS 7
2			4			

NORTH CAROLINA PROFESSIONAL SEAL 15825 ENGINEER BRUCE D. KLAPPENBACH
3-9-2013

DRAWN BY : H. T. BARBOUR DATE : 9-25-12
CHECKED BY : H. KIM DATE : 10-12

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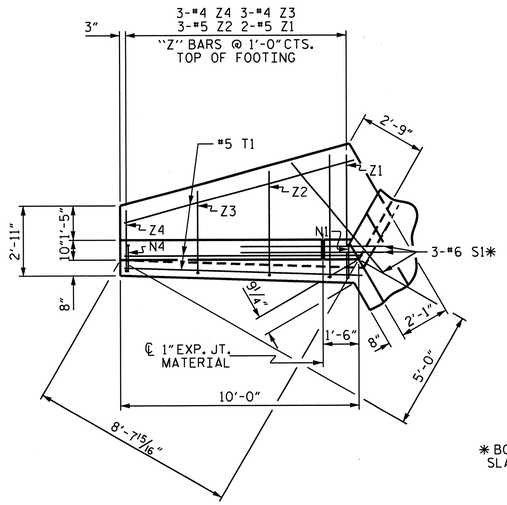
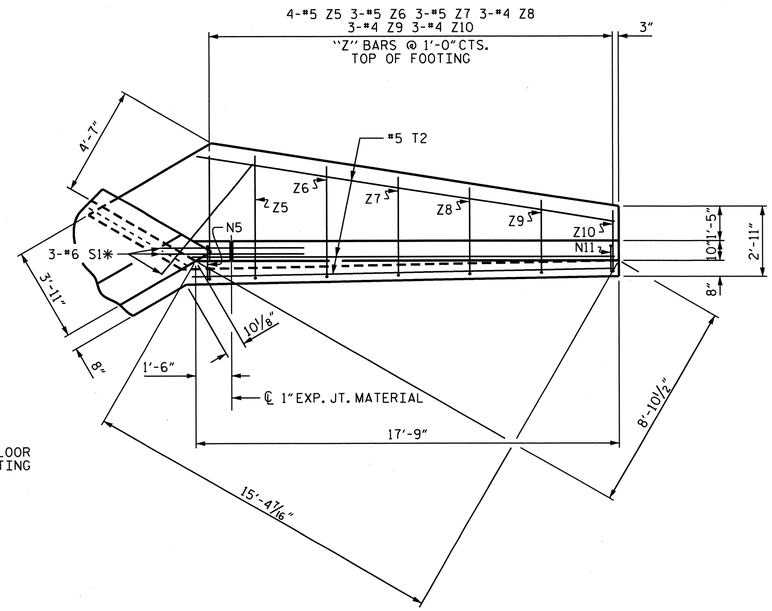
bklappenbach

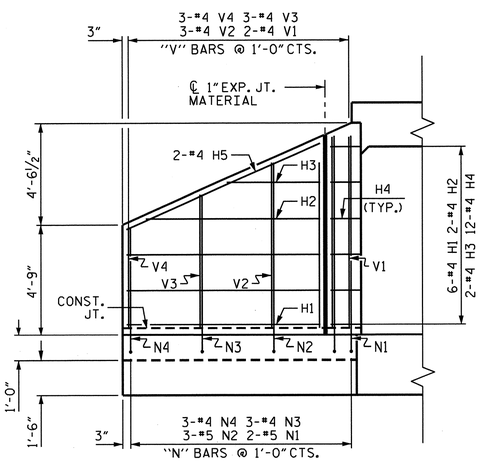


* BOTTOM OF FLOOR SLAB AND FOOTING

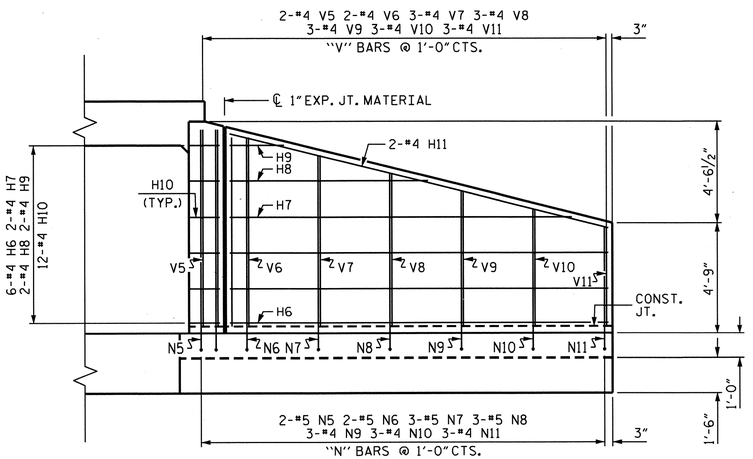
PLAN W2



PLAN W1



ELEVATION W2

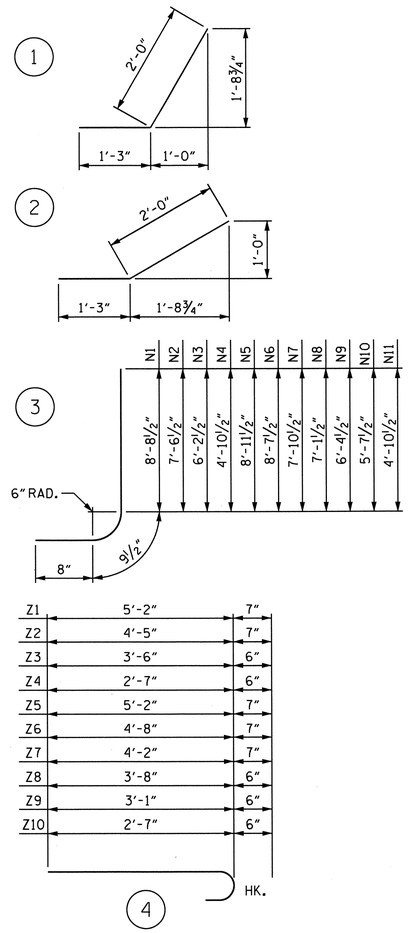


ELEVATION W1

ASSEMBLED BY : H. T. BARBOUR	DATE : 7-27-12
CHECKED BY : H. KIM	DATE : 10-12
DRAWN BY : CCJ 11/99	
CHECKED BY : RWW 03/00	

BAR TYPES

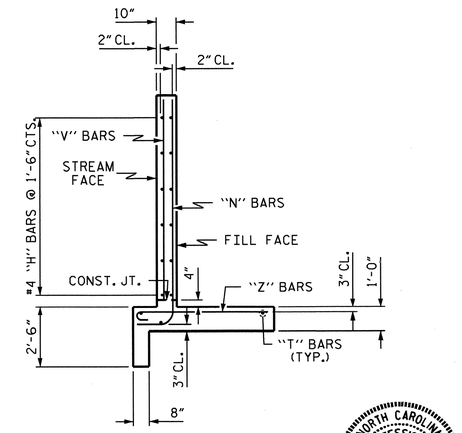
ALL BAR DIMENSIONS ARE OUT TO OUT.



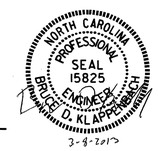
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	6	#4	STR	8'-1"	32
H2	2	#4	STR	7'-3"	10
H3	2	#4	STR	3'-11"	5
H4	12	#4	1	3'-3"	26
H5	2	#4	STR	8'-10"	12
H6	6	#4	STR	15'-10"	63
H7	2	#4	STR	14'-4"	19
H8	2	#4	STR	8'-3"	11
H9	2	#4	STR	2'-3"	3
H10	12	#4	2	3'-3"	26
H11	2	#4	STR	16'-4"	22
N1	2	#5	3	10'-2"	21
N2	3	#5	3	9'-0"	28
N3	3	#4	3	7'-8"	15
N4	3	#4	3	6'-4"	13
N5	2	#5	3	10'-5"	22
N6	2	#5	3	10'-1"	21
N7	3	#5	3	9'-4"	29
N8	3	#5	3	8'-7"	27
N9	3	#4	3	7'-10"	16
N10	3	#4	3	7'-1"	14
N11	3	#4	3	6'-4"	13
S1	6	#6	STR	6'-0"	54
T1	3	#5	STR	10'-0"	31
T2	3	#5	STR	17'-9"	56
V1	2	#4	STR	8'-1"	11
V2	3	#4	STR	7'-0"	14
V3	3	#4	STR	5'-8"	11
V4	3	#4	STR	4'-4"	9
V5	2	#4	STR	8'-4"	11
V6	2	#4	STR	8'-0"	11
V7	3	#4	STR	7'-3"	15
V8	3	#4	STR	6'-6"	13
V9	3	#4	STR	5'-9"	12
V10	3	#4	STR	5'-0"	10
V11	3	#4	STR	4'-3"	9
Z1	2	#5	4	5'-9"	12
Z2	3	#5	4	5'-0"	16
Z3	3	#4	4	4'-0"	8
Z4	3	#4	4	3'-1"	6
Z5	4	#5	4	5'-9"	24
Z6	3	#5	4	5'-3"	16
Z7	3	#5	4	4'-9"	15
Z8	3	#4	4	4'-2"	8
Z9	3	#4	4	3'-7"	7
Z10	3	#4	4	3'-1"	6

REINFORCING STEEL FOR 2 WINGS	833 LBS
CLASS A CONCRETE	
2 WINGS	12.2 CY
1 HEADWALL	.9 CY
1 END CURTAIN WALL	1.5 CY
TOTAL	14.6 CY



TYPICAL WING SECTION



PROJECT NO. R-2707AA

CLEVELAND COUNTY

STATION: 58+77.00-L-

SHEET 7 OF 7

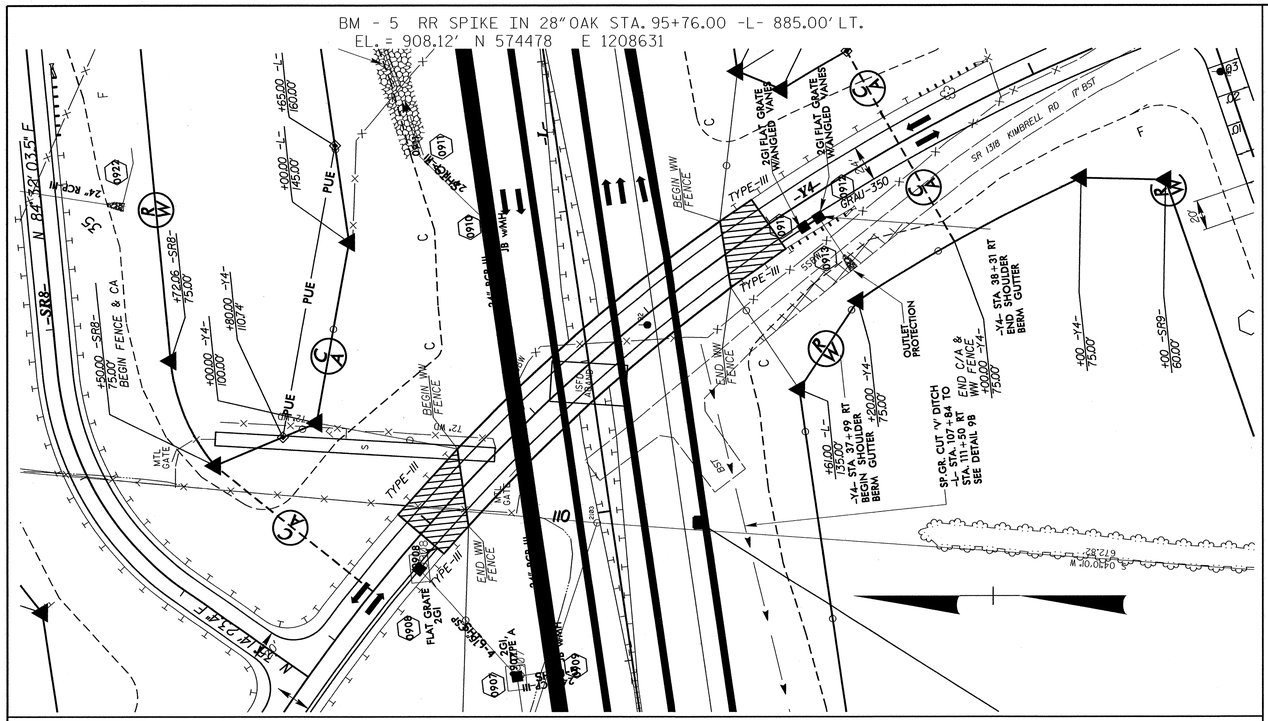
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD WINGS FOR CONCRETE BOX CULVERT

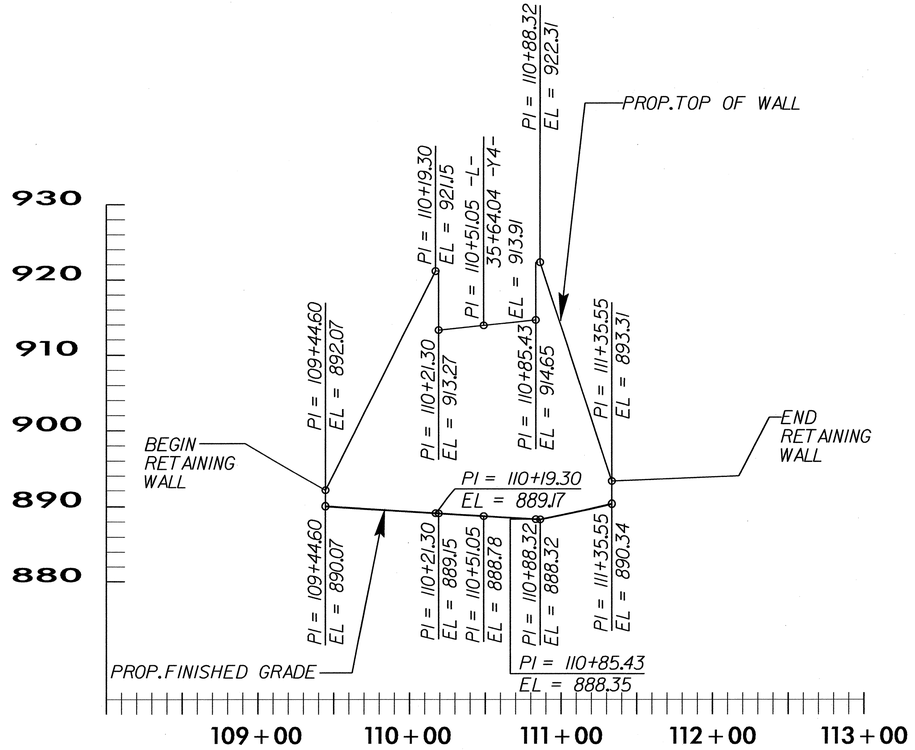
H = 8'-0" SLOPE = 2:1

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

STD. NO. CW6008



LOCATION SKETCH



PREPARED BY: JTW	DATE: 11/12
REVIEWED BY: SCC	DATE: 11/12

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER ELAINE C CLARK

SIGNATURE 12/14/12 DATE

ENGINEER

SIGNATURE DATE

RETAINING WALL ELEVATIONS

-L- STA	OFFSET FROM ℄ (LEFT)	ELEV @ TOP OF WALL	* PROPOSED FINISHED GRADE	*EXPOSED WALL HEIGHT	** DESIGN WALL HEIGHT "H"
109+44.60	60.00	892.07	890.07	2.00	1.50
110+19.30	60.00	921.15	889.17	31.98	31.48
110+21.30	60.00	913.27	889.15	24.12	23.62
110+51.05	60.00	913.91	888.78	25.13	24.63
110+85.43	60.00	914.65	888.35	26.30	25.80
110+88.32	60.00	922.31	888.32	33.99	33.49
111+35.55	94.00	893.31	890.34	2.97	2.47

* ELEVATION @ PROPOSED FINISHED GRADE AND EXPOSED WALL HEIGHT DO NOT INCLUDE EMBEDMENT DEPTH

TOTAL STRUCTURE QUANTITIES

MSE RETAINING WALL 3887 SQ. FT.

PROJECT NO.: R-2707AA

CLEVELAND *COUNTY*

STATION: 109+44.60 -L- TO 111+35.55 -L-

SHEET 1 OF 3

GEOTECHNICAL ENGINEERING UNIT

☐ *EASTERN REGIONAL OFFICE*

☒ *WESTERN REGIONAL OFFICE*

☐ *CONTRACT OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

SIGNATURE 12/19/12 DATE

ENGINEER

SIGNATURE DATE

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR THE RETAINING WALL AT END BENT 1.

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR THE RETAINING WALL AT END BENT 1.

A SMOOTH ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS AT END BENT 1.

A DRAIN MAY BE REQUIRED FOR THE RETAINING WALL AT END BENT 1.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL AT END BENT 1, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 6500 LB/SF
4) MINIMUM REINFORCEMENT LENGTH (L) = 1 * H
5) MINIMUM EMBEDMENT ELEVATION = 2 FT. BELOW FINISHED GRADE
6) AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	125	34	0
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.			

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	28	50

DESIGN REINFORCEMENT CONNECTED TO END BENT CAP FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 LOCATED AT STATION 35+64.04 -Y4-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 35+64.04 -Y4- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DESIGN RETAINING WALL AT END BENT 1 FOR VERTICAL PIPES (PILE DRIVING SLEEVES) EXTENDING THROUGH THE WALL REINFORCED ZONE AT THE PILE LOCATIONS SHOWN ON THE FOUNDATION PLANS. VERIFY PILE SLEEVE LOCATIONS AND ELEVATIONS BEFORE BEGINNING THE MSE WALL DESIGN AND CONSTRUCTION. MAINTAIN PLUMB PILE SLEEVES DURING WALL CONSTRUCTION.

DESIGN RETAINING WALLS AT END BENT 1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

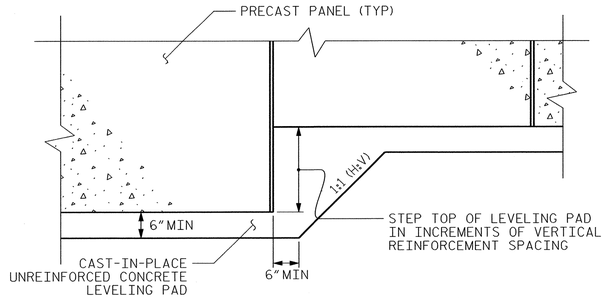
PILES DRIVING SLEEVES FOR END BENTS 1 SHALL BE INSTALLED BEFORE CONSTRUCTION ON THE WALL BEGINS.

AFTER PILES HAVE BEEN DRIVEN, FILL PILES DRIVING SLEEVES AT END BENT 1 WITH DRY SELECT MATERIAL, CLASS III, TYPE I, BEFORE CONSTRUCTION OF THE END BENT CAP BEGINS.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS AT END BENT 1.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS AT END BENT 1 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

"TEMPORARY SHORING" MAY REQUIRED FOR THE RETAINING WALL AT END BENT 1 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY, STRUCTURE OR TRAFFIC CONTROL PLANS AS NEEDED.



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PREPARED BY: JTW	DATE: 11/12
REVIEWED BY: SCC	DATE: 11/12

PROJECT NO.: R-2707AA

CLEVELAND ***COUNTY***

STATION: 109+44.60 -L- TO 111+35.55 -L-

SHEET 2 OF 3

GEOTECHNICAL ENGINEERING UNIT

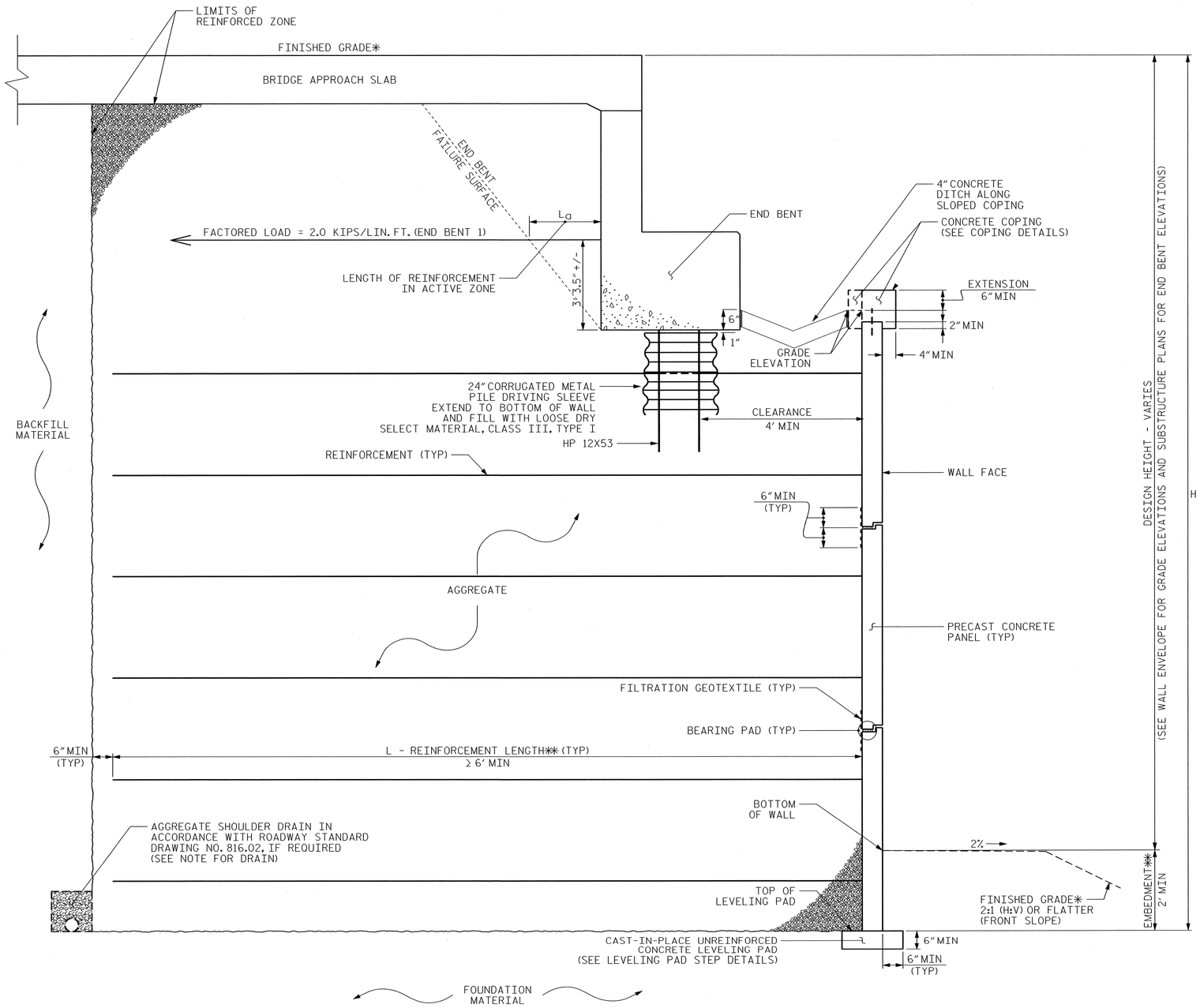
☐ ***EASTERN REGIONAL OFFICE***
☒ ***WESTERN REGIONAL OFFICE***
☐ ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL

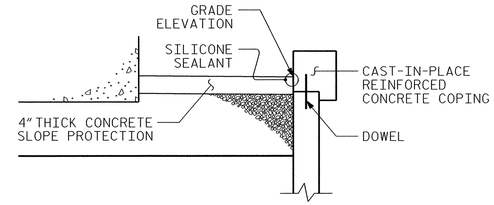
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-2
1	-	-	3	-	-	TOTAL SHEETS
2	-	-	4	-	-	3

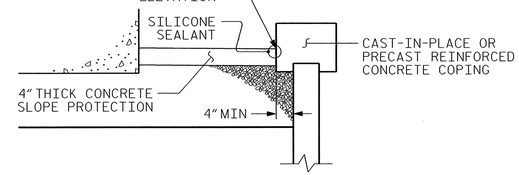
GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK — SIGNATURE: Shane Clark 11/14/12 — DATE	SIGNATURE — DATE



MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.





COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

PREPARED BY: JTW	DATE: 11/12
REVIEWED BY: SCC	DATE: 11/12

PROJECT NO.: R-2707AA
CLEVELAND ***COUNTY***
STATION: 109+44.60 -L- TO 111+35.55 -L-

SHEET 3 OF 3

GEOTECHNICAL ENGINEERING UNIT

☐ ***EASTERN REGIONAL OFFICE***
☒ ***WESTERN REGIONAL OFFICE***
☐ ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALL

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8"Ø SHEAR STUDS FOR THE 3/4"Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8"Ø STUDS FOR 4 - 3/4"Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8"Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4"Ø STUDS BASED ON THE RATIO OF 3 - 7/8"Ø STUDS FOR 4 - 3/4"Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE REV. 10-1-11 MAA (W) GM
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM