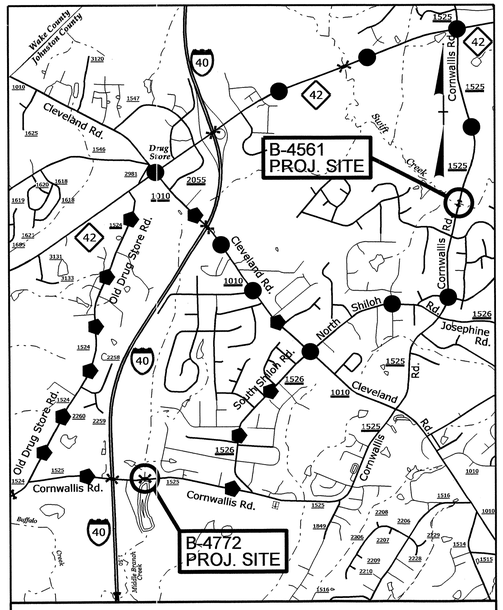
09/08/99

TIP PROJECT: B-4561 & B-4772

CONTRACT: C203088

STRUCTURES



VICINITY MAP

B–4561 OFFSITE DETOUR

B–4772 OFFSITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

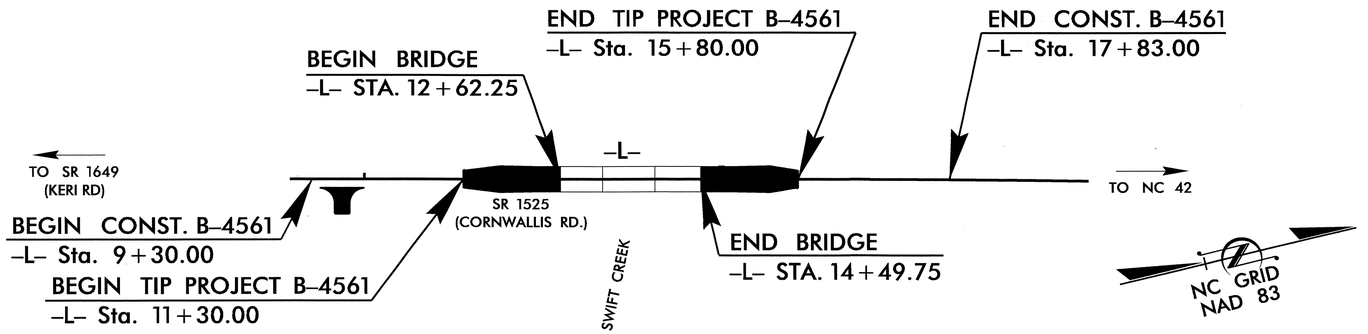
JOHNSTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–4561 /B–4772		

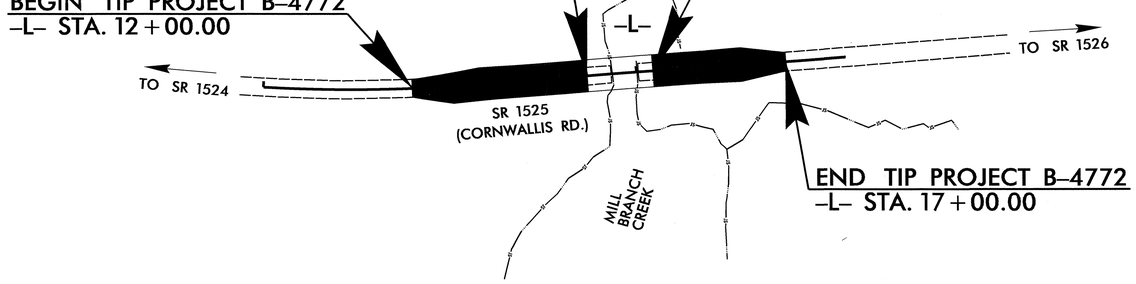
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33772.1.1	BRZ–1525(5)	P.E. (B–4561)
33772.2.1	BRZ–1525(5)	R.W. (B–4561)
33772.3.1	BRZ–1525(5)	CONST. (B–4561)
38544.1.1	BRZ–1525(9)	P.E. (B–4772)
38544.2.1	BRZ–1525(9)	R.W. (B–4772)
38544.3.1	BRZ–1525(9)	CONST. (B–4772)

LOCATION: *BRIDGE NO. 147 OVER SWIFT CREEK & BRIDGE NO. 326 OVER MILL BRANCH CREEK ON SR 1525*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE, & STRUCTURE*



B–4561



B–4772

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–4561	=	0.049 MI
LENGTH OF STRUCTURE TIP PROJECT B–4561	=	0.036 MI
TOTAL LENGTH OF TIP PROJECT B–4561	=	0.085 MI
LENGTH OF ROADWAY TIP PROJECT B–4772	=	0.078 MI
LENGTH OF STRUCTURE TIP PROJECT B–4772	=	0.017 MI
TOTAL LENGTH OF TIP PROJECT B–4772	=	0.095 MI
LENGTH OF ROADWAY TIP PROJECTS B–4561 /B–4772	=	0.127 MI
LENGTH OF STRUCTURE TIP PROJECTS B–4561 /B–4772	=	0.053 MI
TOTAL LENGTH OF TIP PROJECTS B–4561 /B–4772	=	0.180 MI

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
APRIL 16, 2013

OMAR R. AZIZI, PE
PROJECT ENGINEER

EMILY E. MURRAY, PE
PROJECT DESIGN ENGINEER

TIMOTHY L. COGGINS, PE
PROJECT DESIGN ENGINEER

08-JAN-2013 09:40
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
emurray

09/08/99

TIP PROJECT: B-4561

CONTRACT: C203088

STRUCTURES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

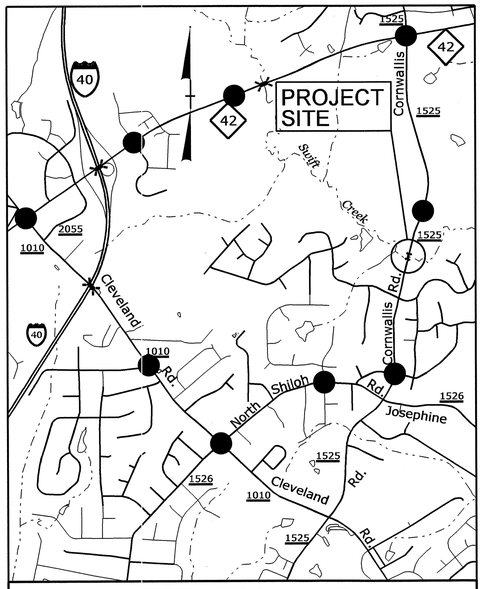
JOHNSTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4561		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33772.1.1	BRZ-1525(5)	P.E.
33772.2.1	BRZ-1525(5)	R.W.
33772.3.1	BRZ-1525(5)	CONST.

LOCATION: ***BRIDGE NO. 147 OVER SWIFT CREEK ON SR 1525***

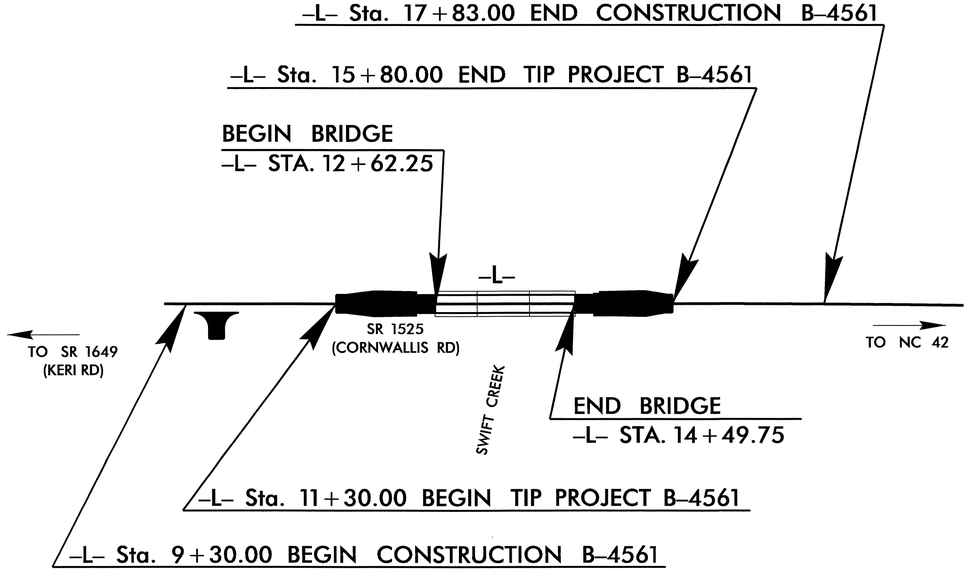
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE



VICINITY MAP

OFFSITE DETOUR

NC GRID NAD 83



DESIGN DATA

ADT 2013 = 9,400
ADT 2033 = 19,600
DHV = 10 %
D = 60 %
T = 3 % *
V = 50 MPH
* (TTST=1% + DUAL=2%)
FUNC CLASS = LOCAL RURAL
TIER = SUBREGIONAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–4561 = 0.049 MI

LENGTH OF STRUCTURE TIP PROJECT B–4561 = 0.036 MI

TOTAL LENGTH OF TIP PROJECT B–4561 = 0.085 MI

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
APRIL 16, 2013

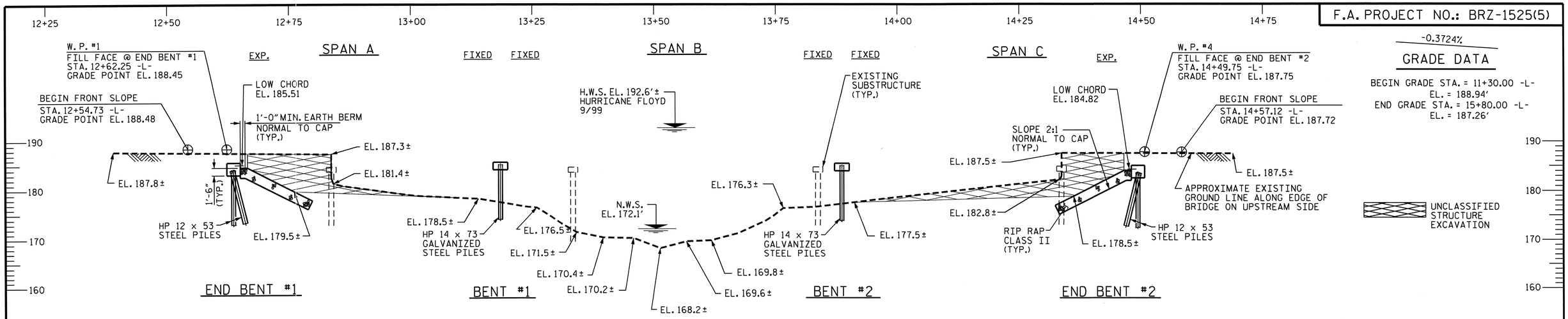
OMAR R. AZIZI, PE
PROJECT ENGINEER

EMILY. E. MURRAY, PE
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT

14-FEB-2013 14:22
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
emurray

F.A. PROJECT NO.: BRZ-1525(5)



-0.3724%

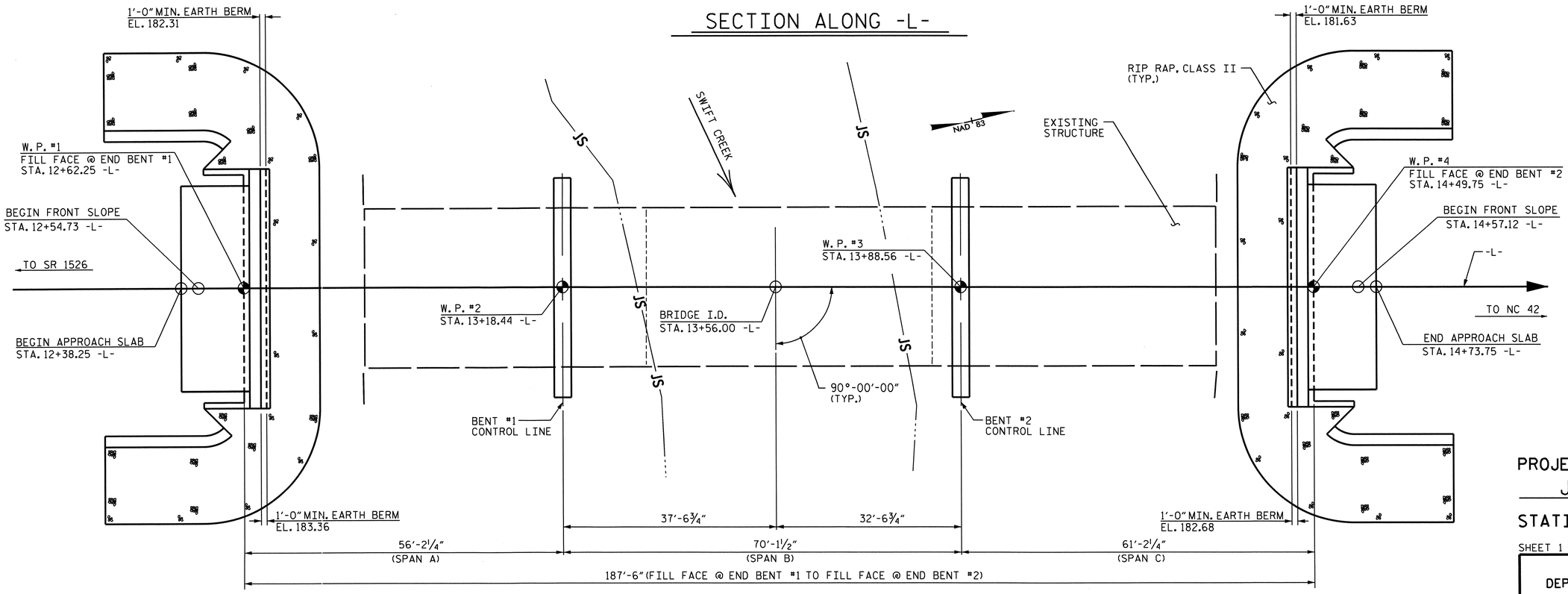
GRADE DATA

BEGIN GRADE STA. = 11+30.00 -L-
EL. = 188.94'
END GRADE STA. = 15+80.00 -L-
EL. = 187.26'

UNCLASSIFIED
STRUCTURE
EXCAVATION

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS.

SECTION ALONG -L-



PLAN

PILES NOT SHOWN FOR CLARITY.

PROJECT NO. B-4561
JOHNSTON COUNTY
STATION: 13+56.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 147

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
SWIFT CREEK
ON SR 1525 BETWEEN
SR 1526 AND NC 42

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

NORTH CAROLINA PROFESSIONAL SEAL 12214 ENGINEER OMAR R. AZIZI 1-14-13

NORTH CAROLINA PROFESSIONAL SEAL 025916 ENGINEER BRYCE E. MURRAY 1-15-13

DRAWN BY :	PEGGY ADKINS	DATE :	8-13-12
CHECKED BY :	T. L. AVERETTE	DATE :	8-27-12
DESIGN ENGINEER OF RECORD:	B. L. GREEN	DATE :	6-28-12

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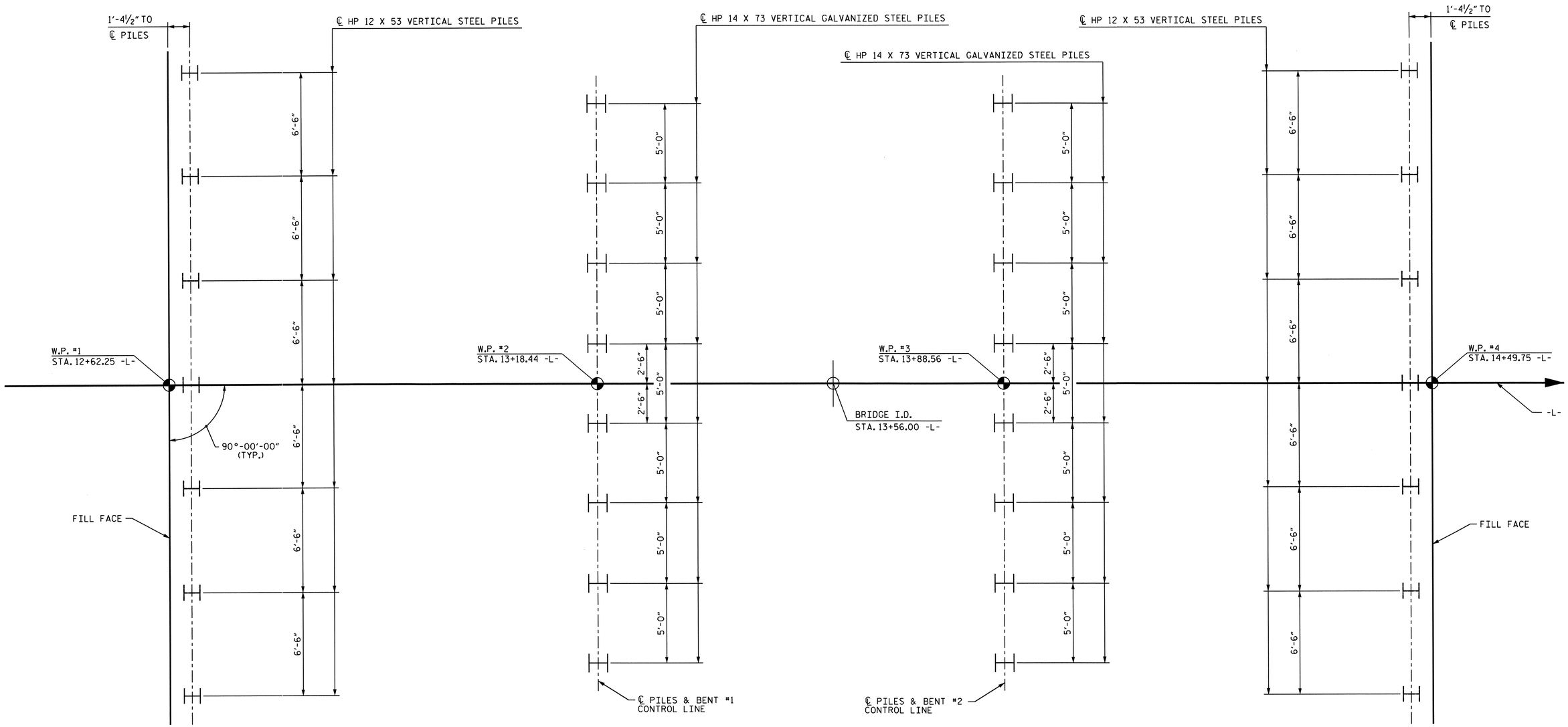
bgreen



SFGHDFH

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES.

FOUNDATION 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 75 TONS AND 80 TONS PER PILE, RESPECTIVELY.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 125 TONS AND 135 TONS PER PILE, RESPECTIVELY.

PILES AT BENT NO. 1 AND BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 140 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 AND BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 235 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

INSTALL PILES AT BENT NO. 1 AND BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 145 FT. AND 148 FT., RESPECTIVELY.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO. 1 AND BENT NO. 2 ARE ELEVATIONS 167 FT. AND 170 FT., RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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.

DRAWN BY :	PEGGY ADKINS	DATE : 8-13-12
CHECKED BY :	T. L. AVERETTE	DATE : 8-27-12
DESIGN ENGINEER OF RECORD:	B. L. GREEN	DATE : 6-28-12

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NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 2 OF 3

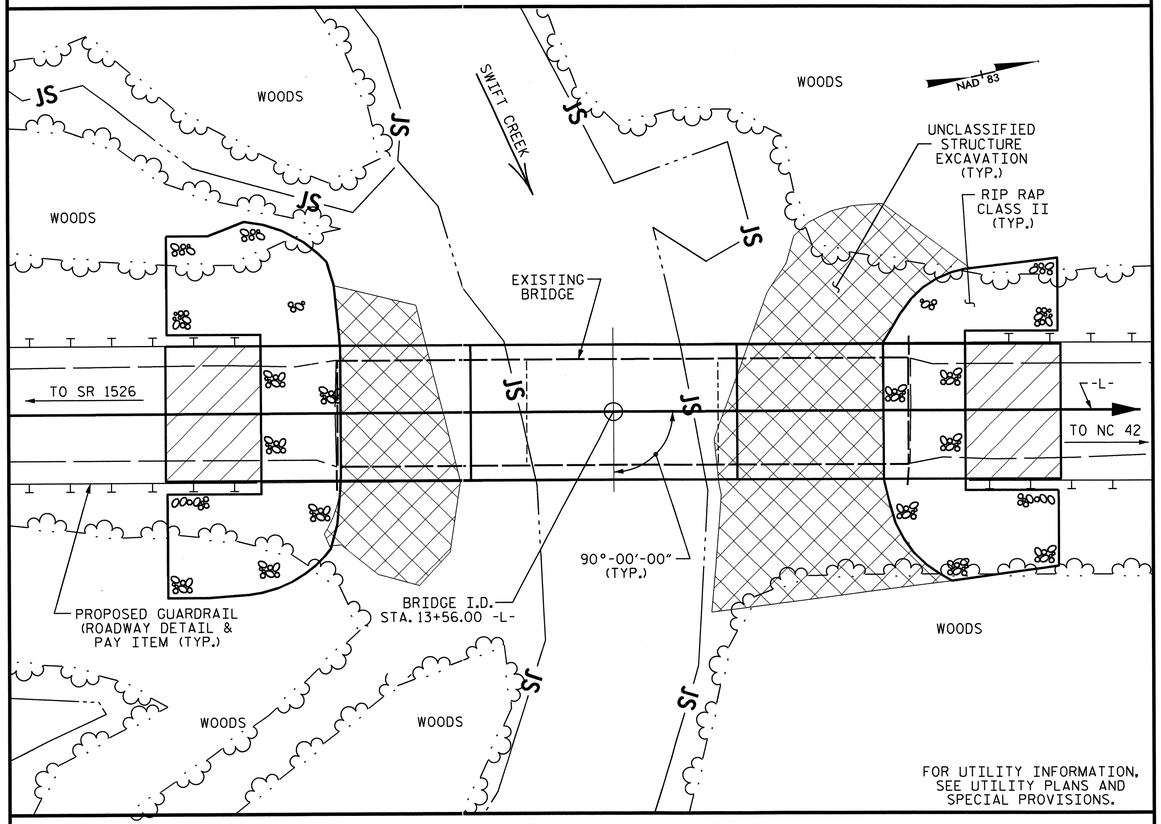
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER
SWIFT CREEK
ON SR 1525 BETWEEN
SR 1526 AND NC 42

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

BM#2: RAILROAD SPIKE IN BASE OF 20" OAK STA. 14+34.13 -L- 41.83' RT., EL. 180.46', NAD 88.



LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

THE EXISTING STRUCTURE CONSISTING OF THREE SPANS, 1 @ 50'-3", 1 @ 50'-0" & 1 @ 50'-5" WITH A CLEAR ROADWAY WIDTH OF 28'-0" AND A STEEL PLANK FLOOR DECK ON I-BEAMS SUPPORTED BY A TIMBER CAP AND TIMBER PILES AT THE END BENTS AND BENTS AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATES, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 44 FT. RIGHT AND 31 FT. LEFT AT END BENT #1 AND 78 FT. RIGHT AND 54 FT. LEFT AT END BENT #2 OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

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.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+56.00 -L-"

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.

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

FOR INTERIOR BENT NOS. 1 & 2, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEETS FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CONCRETE WEARING SURFACE	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES		HP 14 X 73 GALVANIZED STEEL PILES		PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS		3'-0" X 2'-6" PRESTRESSED CONCRETE BENT CAPS
	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	EACH	LIN.FT.	TONS	SQ. YD.	LUMP SUM	LUMP SUM	NO.	LIN.FT.	LIN.FT.
SUPERSTRUCTURE				6268	7145		LUMP SUM							370.75			LUMP SUM		36	2220.00	
END BENT NO. 1						15.2		2272	7	315			4		310	340					
BENT NO. 1											8	360	4								38.50
BENT NO. 2											8	360	4								38.50
END BENT NO. 2						15.2		2272	7	355			4		335	370					
TOTAL	LUMP SUM	1	LUMP SUM	6268	7145	30.4	LUMP SUM	4544	14	670	16	720	16	370.75	645	710	LUMP SUM	LUMP SUM	36	2220.00	77.00

HYDRAULIC DATA

DESIGN DISCHARGE	= 8,430 CFS
FREQUENCY OF DESIGN FLOOD	= 50 YR.
DESIGN HIGH WATER ELEVATION	= 188.00'
DRAINAGE AREA	= 88.9 Sq. MILES
BASE DISCHARGE (Q100)	= 9,540 CFS
BASE HIGH WATER ELEVATION	= 188.82'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 7,200 CFS
FREQUENCY OF OVERTOPPING FLOOD	= BETWEEN 10 YR. & 25 YR.
OVERTOPPING FLOOD ELEVATION	= 186.88'

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER SWIFT CREEK ON SR 1525 BETWEEN SR 1526 AND NC 42

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

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

1-15-13

DRAWN BY : PEGGY ADKINS DATE : 8-13-12
CHECKED BY : T. L. AVERETTE DATE : 8-27-12
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 6-28-12

14-FEB-2013 14:21
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bgreen

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	1.02	--	1.75	0.276	1.35	A	EL	27	0.526	1.15	A	EL	5.4	0.80	0.272	1.02	B	EL	34.500	
		HL-93 (OPERATING)	N/A		1.49	--	1.35	0.276	1.76	A	EL	27	0.526	1.49	A	EL	5.4	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.3	46.871	1.75	0.276	1.7	A	EL	27	0.526	1.37	A	EL	5.4	0.80	0.276	1.30	A	EL	27.000	
		HS-20 (OPERATING)	36.000		1.78	64.123	1.35	0.276	2.2	A	EL	27	0.526	1.78	A	EL	5.4	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.73	36.914	1.40	0.276	4.45	A	EL	27	0.526	3.91	A	EL	5.4	0.80	0.276	2.73	A	EL	27.000	
		SNGARBS2	20.000		2.12	42.448	1.40	0.276	3.46	A	EL	27	0.526	2.83	A	EL	5.4	0.80	0.276	2.12	A	EL	27.000	
		SNAGRIS2	22.000		2.05	45.048	1.40	0.276	3.34	A	EL	27	0.526	2.65	A	EL	5.4	0.80	0.276	2.05	A	EL	27.000	
		SNCOTTS3	27.250		1.36	37.143	1.40	0.276	2.22	A	EL	27	0.526	1.96	A	EL	5.4	0.80	0.276	1.36	A	EL	27.000	
		SNAGGRS4	34.925		1.17	40.904	1.40	0.276	1.91	A	EL	27	0.526	1.66	A	EL	5.4	0.80	0.276	1.17	A	EL	27.000	
		SNS5A	35.550		1.14	40.636	1.40	0.276	1.86	A	EL	27	0.526	1.71	A	EL	5.4	0.80	0.276	1.14	A	EL	27.000	
		SNS6A	39.950		1.06	42.455	1.40	0.276	1.73	A	EL	27	0.526	1.57	A	EL	5.4	0.80	0.276	1.06	A	EL	27.000	
		SNS7B	42.000		1.01	42.527	1.40	0.276	1.65	A	EL	27	0.526	1.57	A	EL	5.4	0.80	0.276	1.01	A	EL	27.000	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.3	42.903	1.40	0.276	2.12	A	EL	27	0.526	1.86	A	EL	5.4	0.80	0.276	1.30	A	EL	27.000	
		TNT4A	33.075		1.31	43.319	1.40	0.276	2.13	A	EL	27	0.526	1.79	A	EL	5.4	0.80	0.276	1.31	A	EL	27.000	
		TNT6A	41.600		1.09	45.124	1.40	0.276	1.77	A	EL	27	0.526	1.71	A	EL	5.4	0.80	0.276	1.08	A	EL	27.000	
		TNT7A	42.000		1.1	46.102	1.40	0.276	1.79	A	EL	27	0.526	1.61	A	EL	5.4	0.80	0.276	1.10	A	EL	27.000	
		TNT7B	42.000		1.15	48.116	1.40	0.276	1.87	A	EL	27	0.526	1.51	A	EL	5.4	0.80	0.276	1.15	A	EL	27.000	
		TNAGRIT4	43.000		1.08	46.620	1.40	0.276	1.77	A	EL	27	0.526	1.46	A	EL	5.4	0.80	0.276	1.08	A	EL	27.000	
		TNAGT5A	45.000		1.02	45.708	1.40	0.276	1.65	A	EL	27	0.526	1.48	A	EL	5.4	0.80	0.276	1.02	A	EL	27.000	
		TNAGT5B	45.000	(3)	1	44.899	1.40	0.276	1.63	A	EL	27	0.526	1.39	A	EL	5.4	0.80	0.276	1.00	A	EL	27.000	

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)

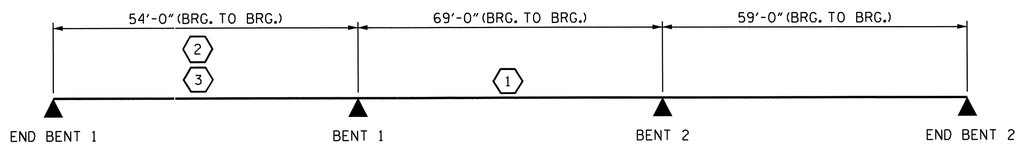
(2) DESIGN LOAD RATING (HS-20)

(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. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER CHRISTY E. MURRAY
1-15-13

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

STD. NO. LRFR1

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12
CHECKED BY : K. P. SEDAI	DATE : 8/3/12
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM

13-FEB-2013 15:02
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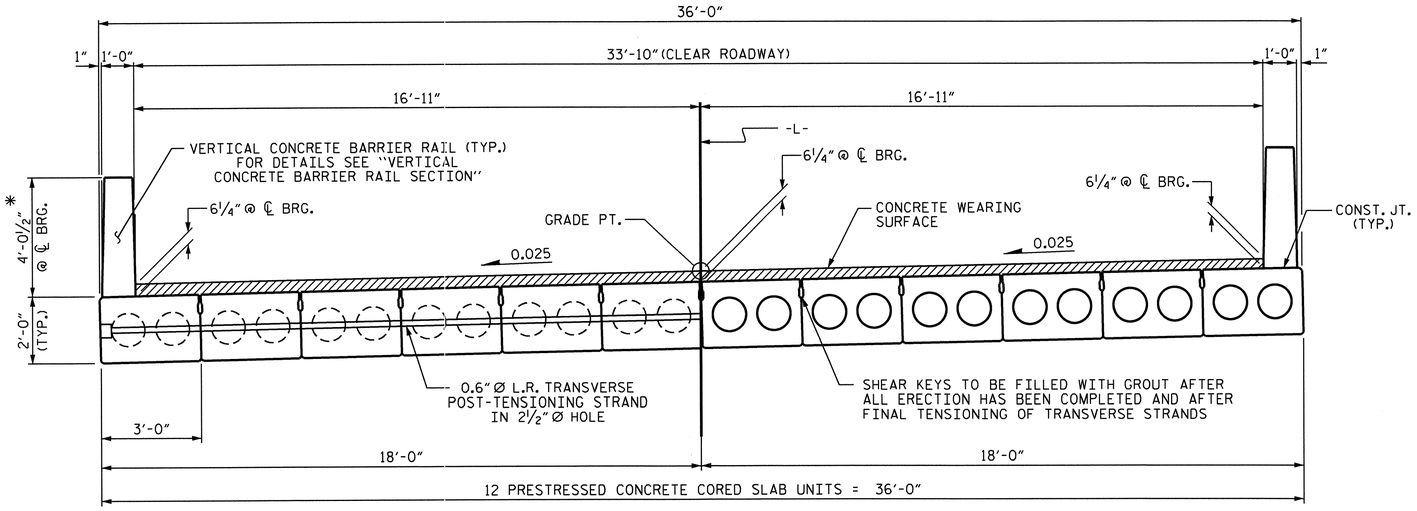
bgreen



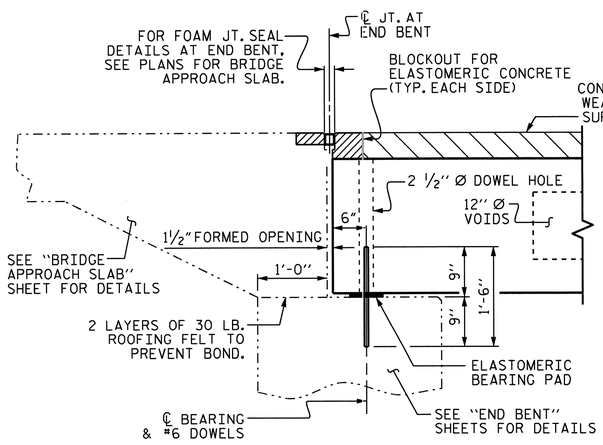
HALF SECTION AT INTERMEDIATE DIAPHRAGMS

HALF SECTION THROUGH VOIDS

TYPICAL SECTION

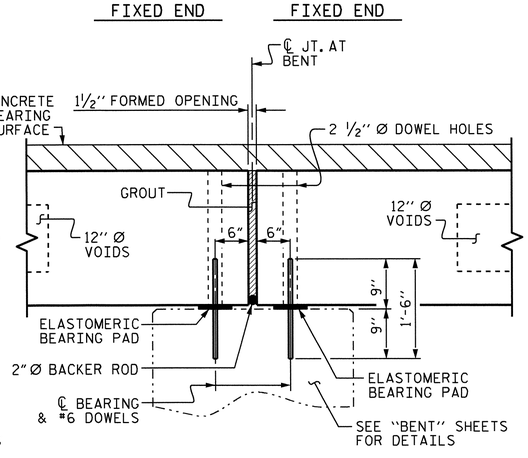
* - THE MAXIMUM BARRIER RAIL HEIGHT AND CONCRETE WEARING SURFACE THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND CONCRETE WEARING SURFACE THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND CONCRETE WEARING SURFACE THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

EXPANSION END



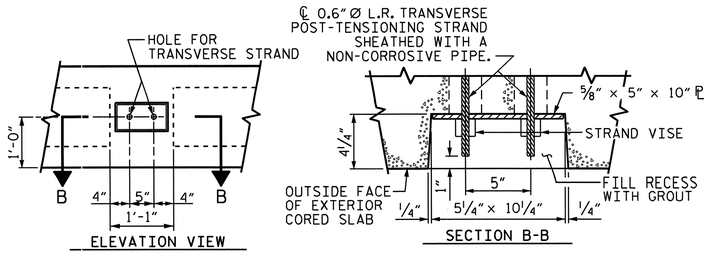
FIXED END

FIXED END

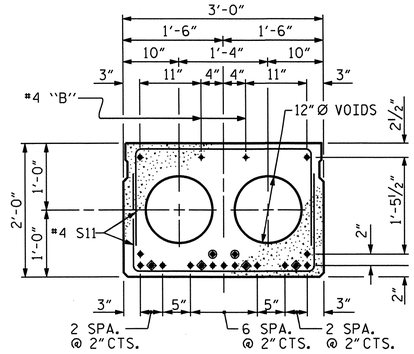


SECTION AT END BENT

SECTION AT BENT

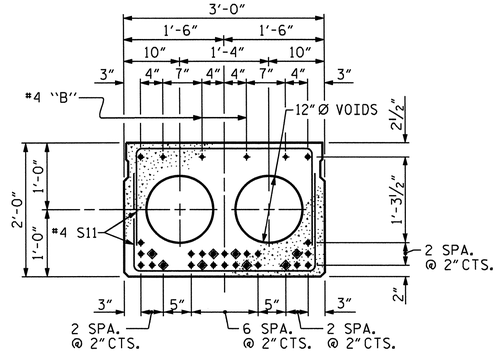


GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS



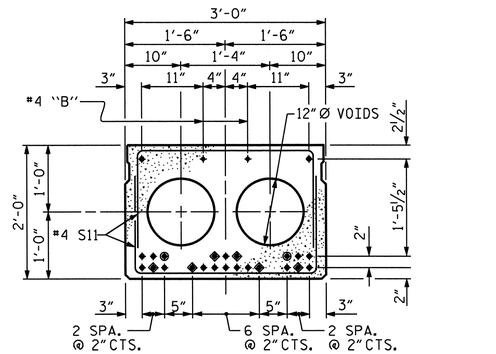
INTERIOR SLAB SECTION (55' UNIT)

(17 STRANDS REQUIRED)



INTERIOR SLAB SECTION (70' UNIT)

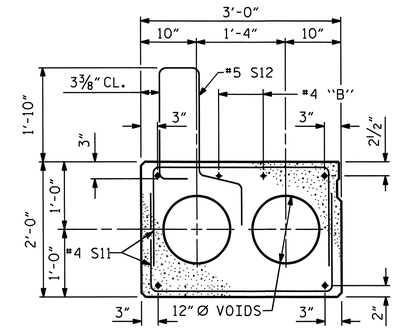
(30 STRANDS REQUIRED)



INTERIOR SLAB SECTION (60' UNIT)

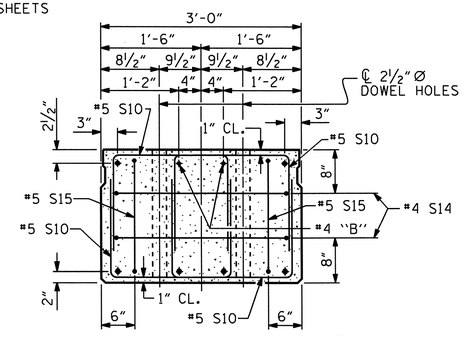
(22 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT



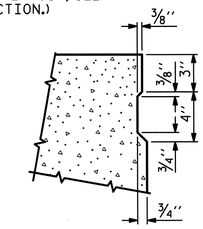
EXTERIOR SLAB SECTION

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

◆ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER TIMOTHY E. MURRAY

1-15-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12		
CHECKED BY : K. P. SEDAI	DATE : 8/3/12		
DRAWN BY : MAA 7/10	REV. 12/11	MAA/AAC	
CHECKED BY : MKT 8/10			

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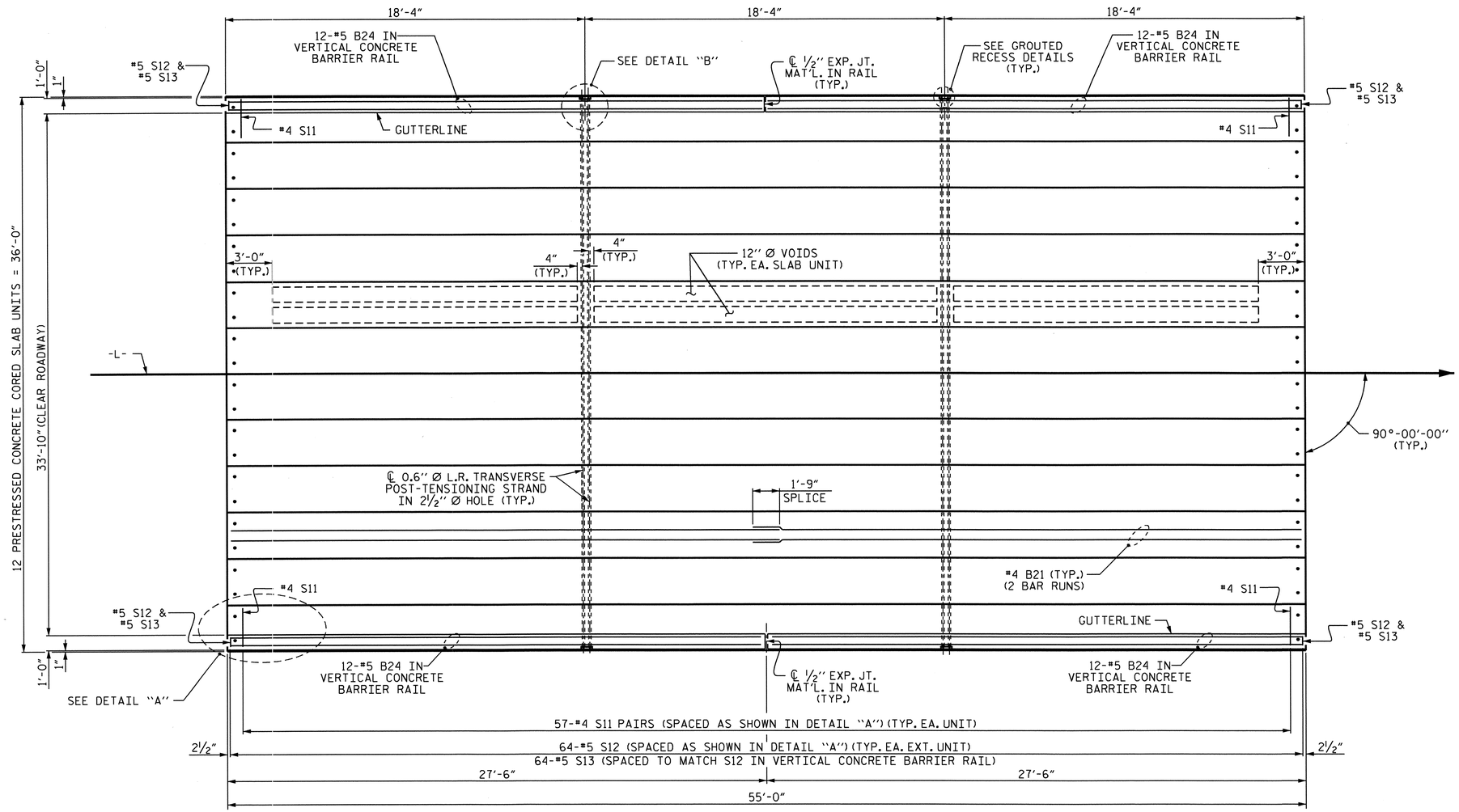
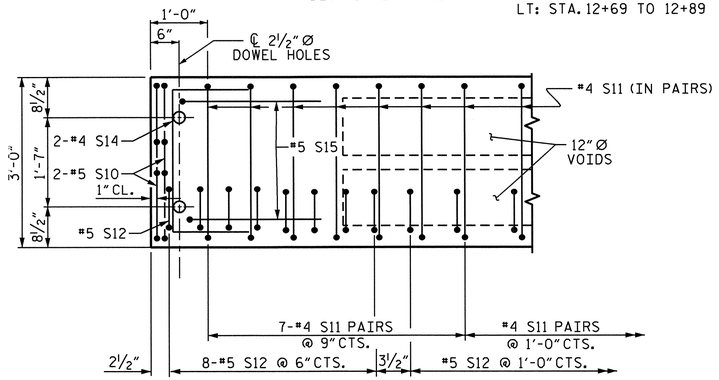


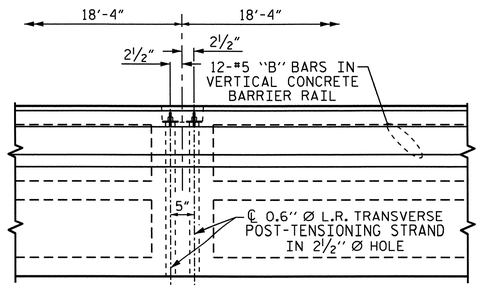
PLAN OF UNIT

DECK DRAINS ARE TO BE INSTALLED @ 5' CTS. AT THE FOLLOWING LOCATIONS:
LT: STA. 12+69 TO 12+89



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2 1/2" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 55' UNIT 33'-10" CLEAR ROADWAY 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			22

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

DRAWN BY : B. L. GREEN DATE : 6/28/12
CHECKED BY : K. P. SEDAI DATE : 8/2/12
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 6/28/12

13-FEB-2013 15:02
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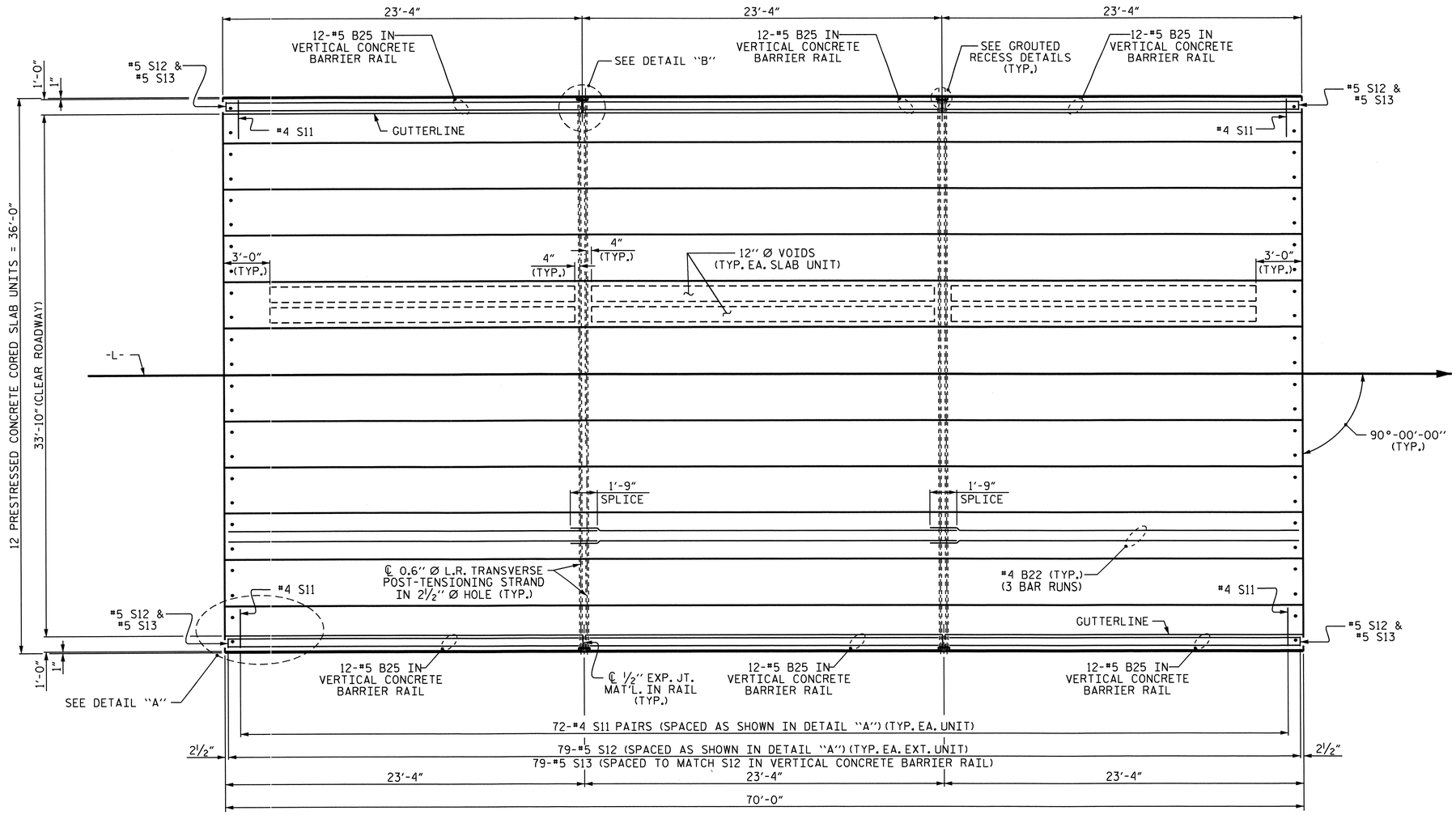
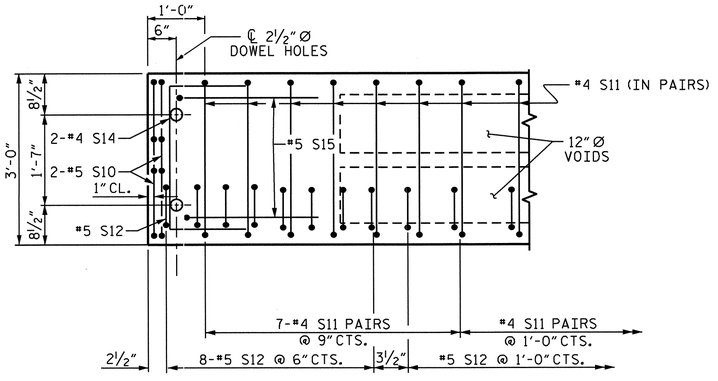
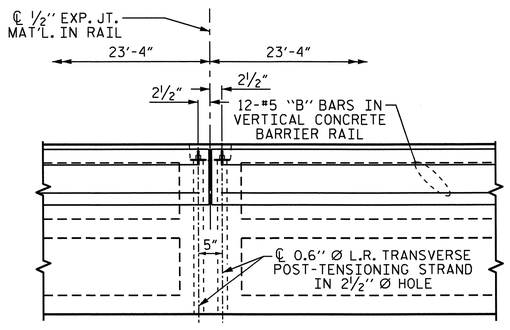


PLAN OF UNIT



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

ASSEMBLED BY :	B. L. GREEN	DATE :	6/28/12
CHECKED BY :	K. P. SEDAI	DATE :	8/2/12
DRAWN BY : MAA	6/10	REV. 12/5/11	MAA/AAC
CHECKED BY : MKT	7/10		

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PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 3 OF 6

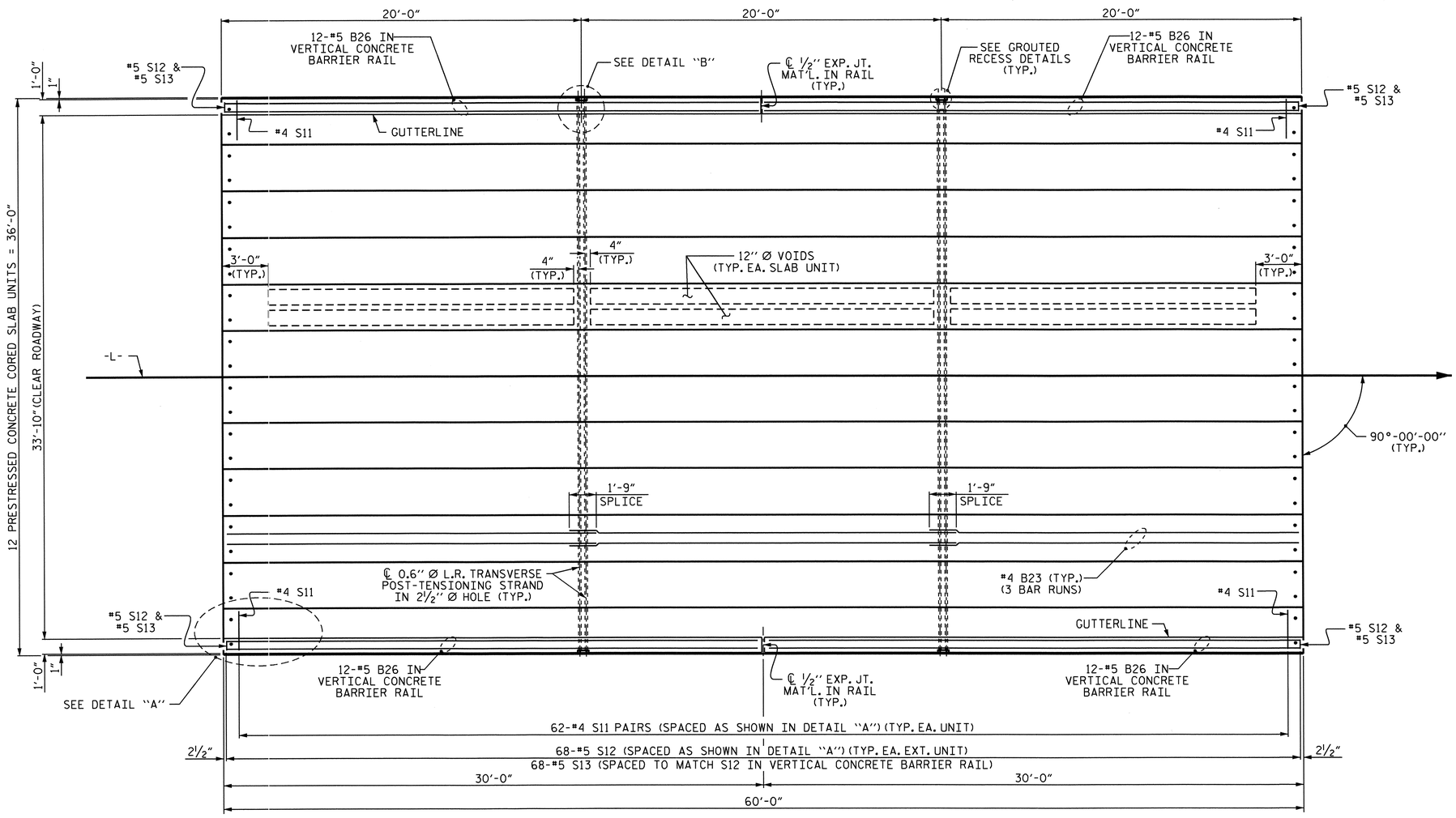
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 70' UNIT 33'-10" CLEAR ROADWAY 90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

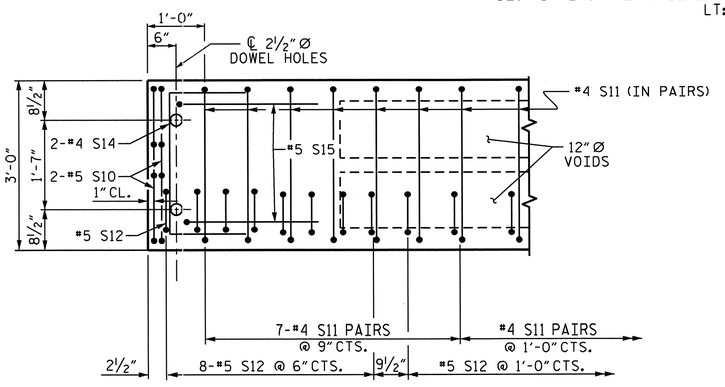
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			22

STD. NO. 24PCS_36_90S_70L



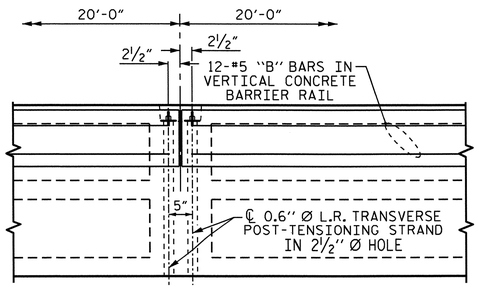
PLAN OF UNIT

DECK DRAINS ARE TO BE INSTALLED @ 5' CTS. AT THE FOLLOWING LOCATIONS:
LT: STA. 14+08 TO 14+43



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

ASSEMBLED BY :	B. L. GREEN	DATE :	6/28/12
CHECKED BY :	K. P. SEDAI	DATE :	8/2/12
DRAWN BY :	MAA	6/10	
CHECKED BY :	MKT	7/10	
REV. 12/5/11	MAA/AAC		

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PROJECT NO. B-4561
JOHNSTON COUNTY
STATION: 13+56.00 -L-

SHEET 4 OF 6

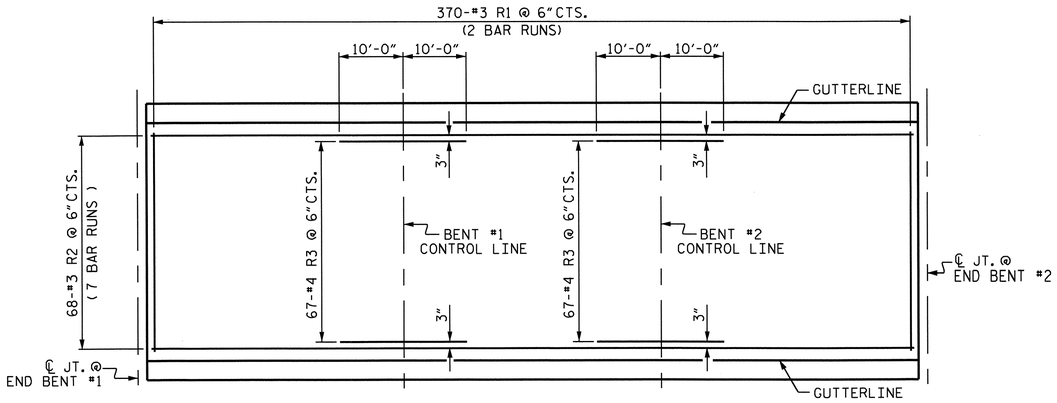
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 60' UNIT 33'-10" CLEAR ROADWAY 90° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY F. MURRAY
1-15-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			22

STD. NO. 24PCS_36_90S_60L



PLAN SHOWING CONCRETE WEARING SURFACE REINFORCING STEEL

BILL OF MATERIAL FOR CONCRETE WEARING SURFACE

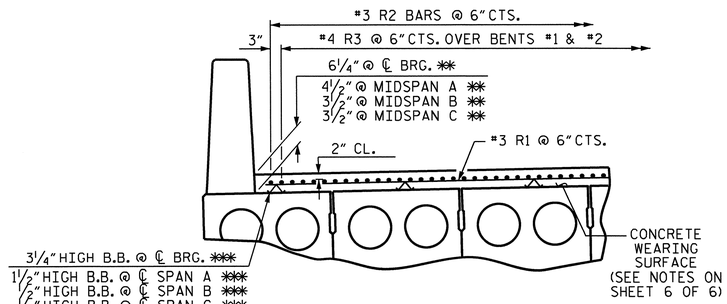
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱R1	740	#3	STR	17'-5"	4846
✱R2	476	#3	STR	27'-6"	4922
✱R3	134	#4	STR	20'-0"	1790
✱EPOXY COATED REINFORCING STEEL			LBS.		11558
CONCRETE WEARING SURFACE			SQ.FT.		6268

GROOVING BRIDGE FLOORS

APPROACH SLABS	1472	SQ.FT.
BRIDGE DECK	5673	SQ.FT.
TOTAL	7145	SQ.FT.

SPLICE LENGTH CHART

BAR SIZE	EPOXY COATED
#3	1'-3"
#4	1'-8"



REINFORCING FOR CONCRETE WEARING SURFACE

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

✱✱✱ BEAM BOLSTERS (B.B.) SHALL BE SPACED AT 2'-0" MAX. CENTERS SET 1'-0" FROM GUTTERLINE.

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE WEARING SURFACE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			22

DRAWN BY : B. L. GREEN DATE : 8/7/12
CHECKED BY : K. P. SEDAI DATE : 8/7/12

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bgreen

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	55' UNIT					
✱B24	48	48	#5	STR	27'-1"	1356
✱S13	128	128	#5	2	7'-2"	957
✱EPOXY COATED REINFORCING STEEL					LBS.	2313
CLASS AA CONCRETE					CU.YDS.	14.9
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	110.25

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

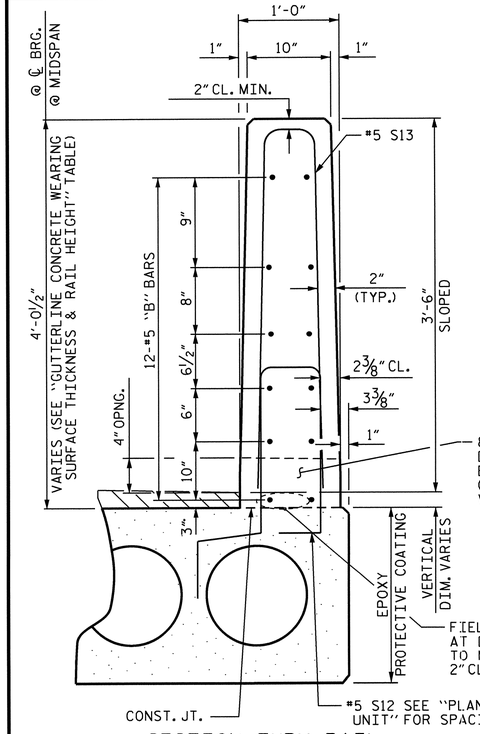
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	70' UNIT					
✱B25	72	72	#5	STR	22'-11"	1721
✱S13	158	158	#5	2	7'-2"	1181
✱EPOXY COATED REINFORCING STEEL					LBS.	2902
CLASS AA CONCRETE					CU.YDS.	18.9
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	140.25

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	60' UNIT					
✱B26	48	48	#5	STR	29'-7"	1481
✱S13	136	136	#5	2	7'-2"	1017
✱EPOXY COATED REINFORCING STEEL					LBS.	2498
CLASS AA CONCRETE					CU.YDS.	16.2
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	120.25

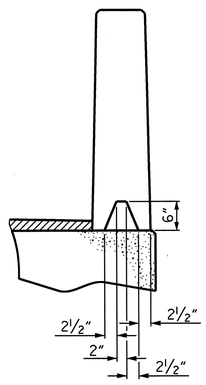
GRADE 270 STRANDS

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



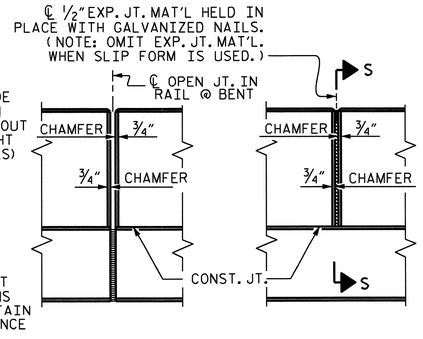
SECTION THRU RAIL

DRAIN OPENING ON LEFT SIDE ONLY

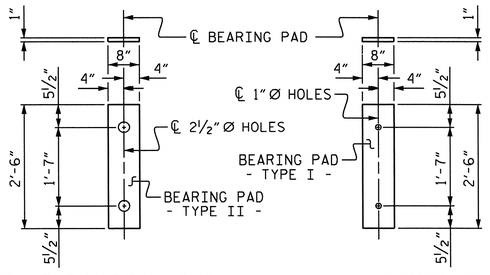


SECTION S-S

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



ELEVATION AT EXPANSION JOINTS



EXPANSION END (TYPE II - 24 REQ'D)

FIXED END (TYPE I - 48 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

VERTICAL CONCRETE BARRIER RAIL DETAILS

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12	REV. 12/11 MAA/AAC	
CHECKED BY : K. P. SEDAI	DATE : 8/3/12		
DRAWN BY : MAA 6/10			
CHECKED BY : MKT 8/10			

BILL OF MATERIAL FOR ONE 55' CORED SLAB UNIT

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B21	4	#4	STR	28'-3"	75	28'-3"	75
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	114	#4	3	5'-10"	444	5'-10"	444
✱S12	64	#5	1	6'-6"	434		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL			LBS.		604		604
✱EPOXY COATED REINFORCING STEEL			LBS.		434		
5000 P.S.I. CONCRETE			CU. YDS.		9.4		9.4
0.6" Ø L.R. STRANDS			No.		17		17

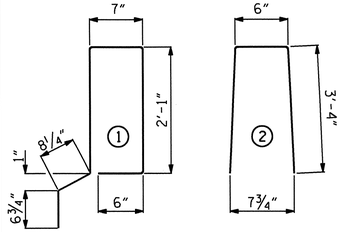
BILL OF MATERIAL FOR ONE 70' CORED SLAB UNIT

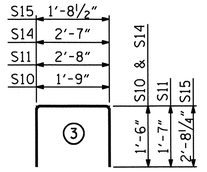
BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B22	6	#4	STR	24'-6"	98	24'-6"	98
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	144	#4	3	5'-10"	561	5'-10"	561
✱S12	79	#5	1	6'-6"	536		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL			LBS.		744		744
✱EPOXY COATED REINFORCING STEEL			LBS.		536		
8500 P.S.I. CONCRETE			CU. YDS.		11.8		11.8
0.6" Ø L.R. STRANDS			No.		30		30

BILL OF MATERIAL FOR ONE 60' CORED SLAB UNIT

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B23	6	#4	STR	21'-2"	85	21'-2"	85
S10	8	#5	3	4'-9"	40	4'-9"	40
S11	124	#4	3	5'-10"	483	5'-10"	483
✱S12	68	#5	1	6'-6"	461		
S14	4	#4	3	5'-7"	15	5'-7"	15
S15	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL			LBS.		653		653
✱EPOXY COATED REINFORCING STEEL			LBS.		461		
6000 P.S.I. CONCRETE			CU. YDS.		10.2		10.2
0.6" Ø L.R. STRANDS			No.		22		22

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 2'-0"
55' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD	3/16" ↓
FINAL CAMBER	1 13/16" ↑

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 2'-0"
70' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	3 7/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD	3/8" ↓
FINAL CAMBER	3 1/16" ↑

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 2'-0"
60' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	3 1/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD	1/4" ↓
FINAL CAMBER	2 13/16" ↑

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 CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT. THE 2½" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1½" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2" BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

PLACEMENT OF THE CONCRETE WEARING SURFACE SHALL OCCUR AFTER CASTING THE VERTICAL CONCRETE BARRIER RAILS. THE COST OF THE REINFORCING STEEL CAST WITH THE CONCRETE WEARING SURFACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE WEARING SURFACE. FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A 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.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CONCRETE WEARING SURFACE, SEE SPECIAL PROVISIONS.

GUTTERLINE CONCRETE WEARING SURFACE THICKNESS & RAIL HEIGHT

	CONCRETE WEARING SURFACE THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
55' UNITS	4½"	3'-10¾"
70' UNITS	3½"	3'-9¾"
60' UNITS	3½"	3'-9¾"

CONCRETE RELEASE STRENGTH

UNIT	PSI
55' UNITS	4000
60' UNITS	4800
70' UNITS	6800

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
55' UNIT			
EXTERIOR C.S.	2	55'-0"	110'-0"
INTERIOR C.S.	10	55'-0"	550'-0"
TOTAL	12		660'-0"

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
70' UNIT			
EXTERIOR C.S.	2	70'-0"	140'-0"
INTERIOR C.S.	10	70'-0"	700'-0"
TOTAL	12		840'-0"

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
60' UNIT			
EXTERIOR C.S.	2	60'-0"	120'-0"
INTERIOR C.S.	10	60'-0"	600'-0"
TOTAL	12		720'-0"

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 2'-0"
PRESTRESSED CONCRETE
CORED SLAB UNIT

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER
1-15-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			22

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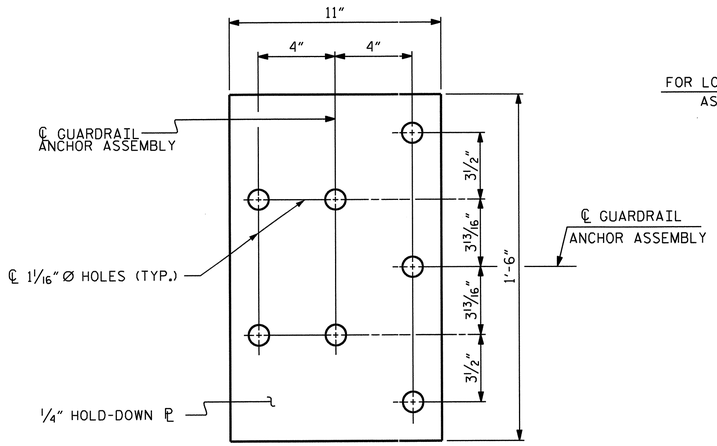

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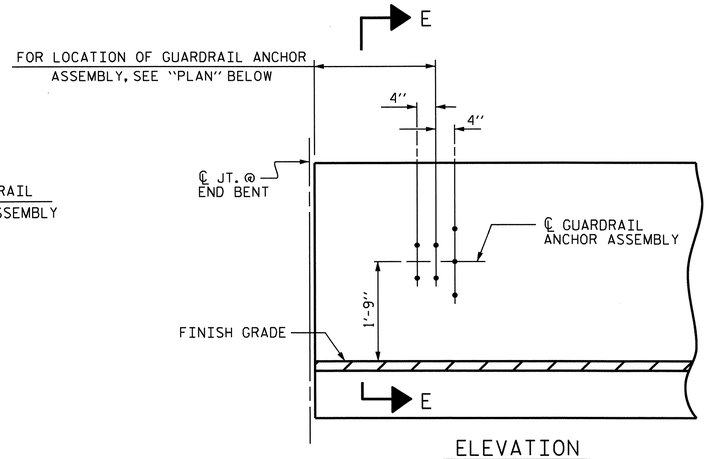


ELEVATION

NOTES

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

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.)

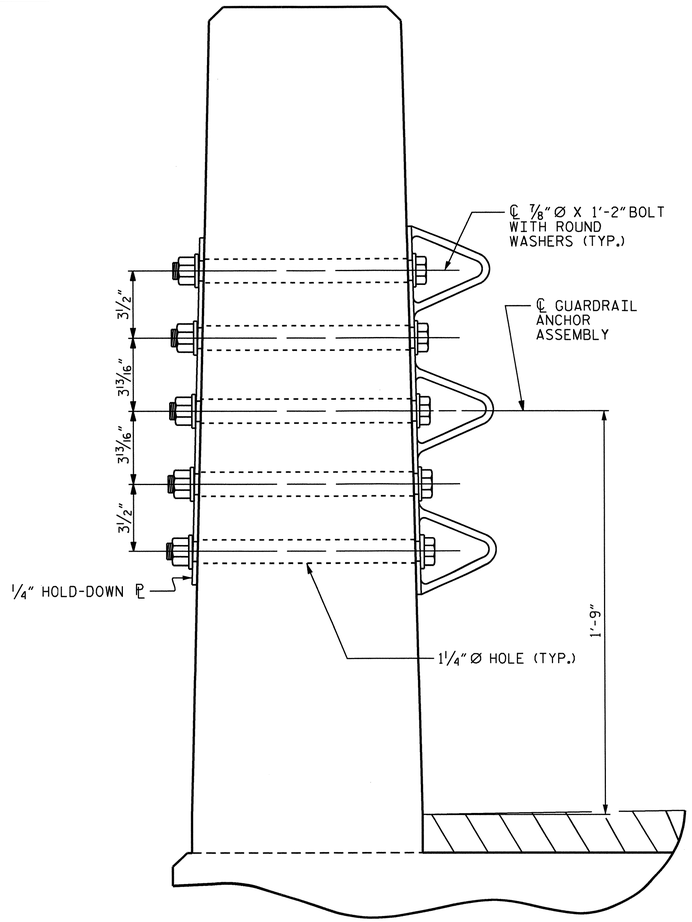
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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 VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.



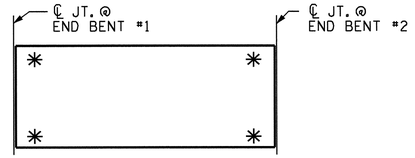
SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			22

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER GARY E. MURRAY
1-15-13

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12	ADDED 5/6/10	
CHECKED BY : K. P. SEDAI	DATE : 8/3/12	REV. 10/1/11	MAA/GM
DRAWN BY : MAA 5/10		REV. 12/5/11	MAA/GM
CHECKED BY : GM 5/10			

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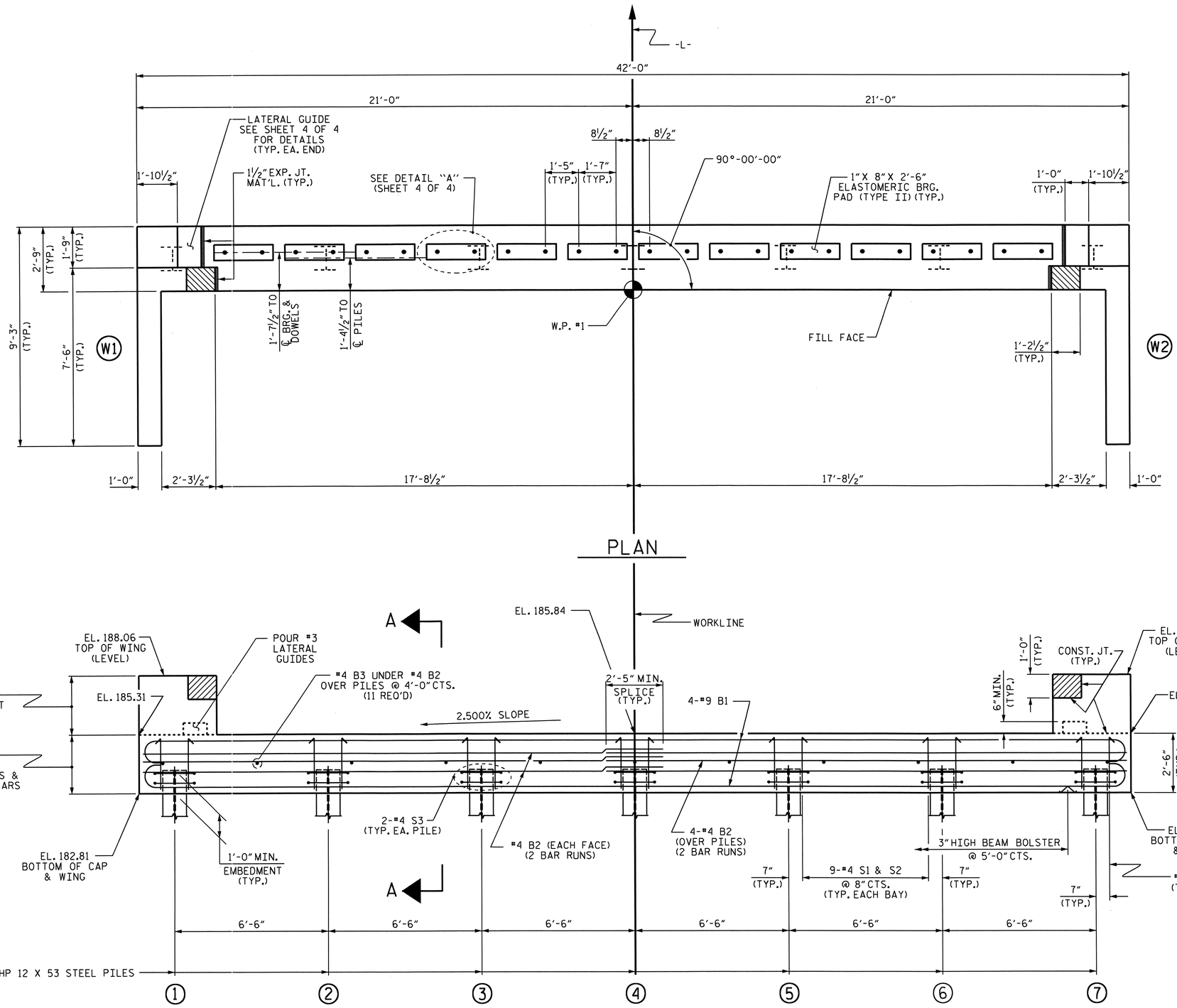
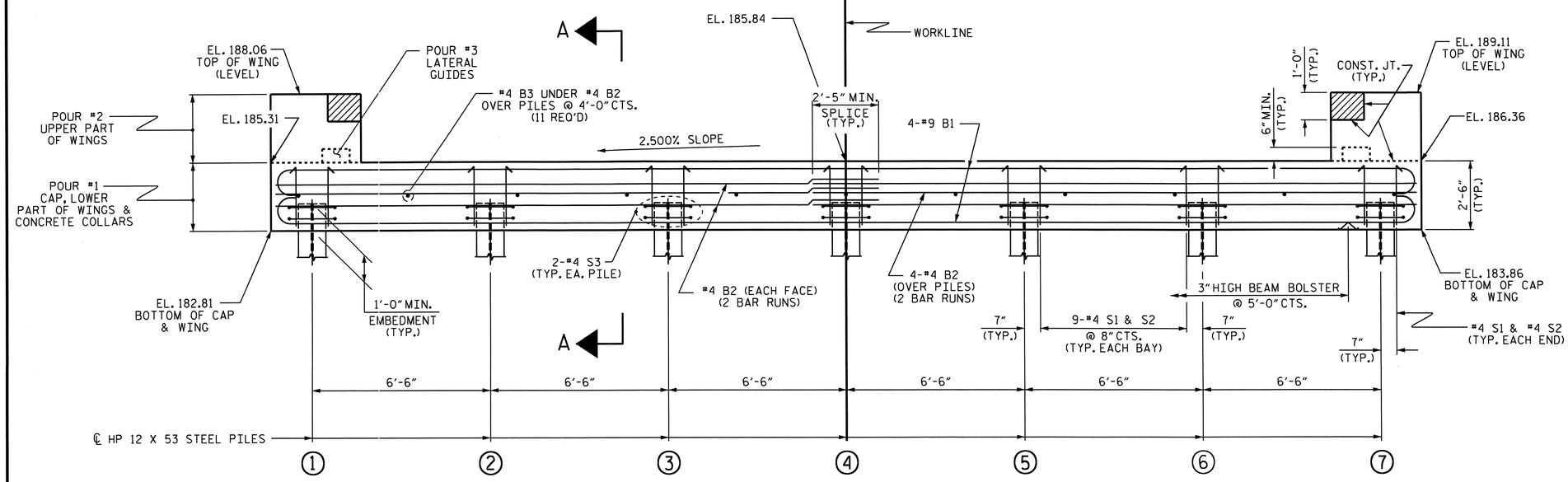


PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

TOP OF PILE ELEVATIONS

①	183.85
②	184.01
③	184.18
④	184.34
⑤	184.50
⑥	184.66
⑦	184.83

PROJECT NO. B-4561
JOHNSTON COUNTY
STATION: 13+56.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			22

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

ASSEMBLED BY :	B. L. GREEN	DATE : 6/28/12
CHECKED BY :	K. P. SEDAI	DATE : 8/3/12
DRAWN BY :	DGE	02/10
CHECKED BY :	MKT	02/10

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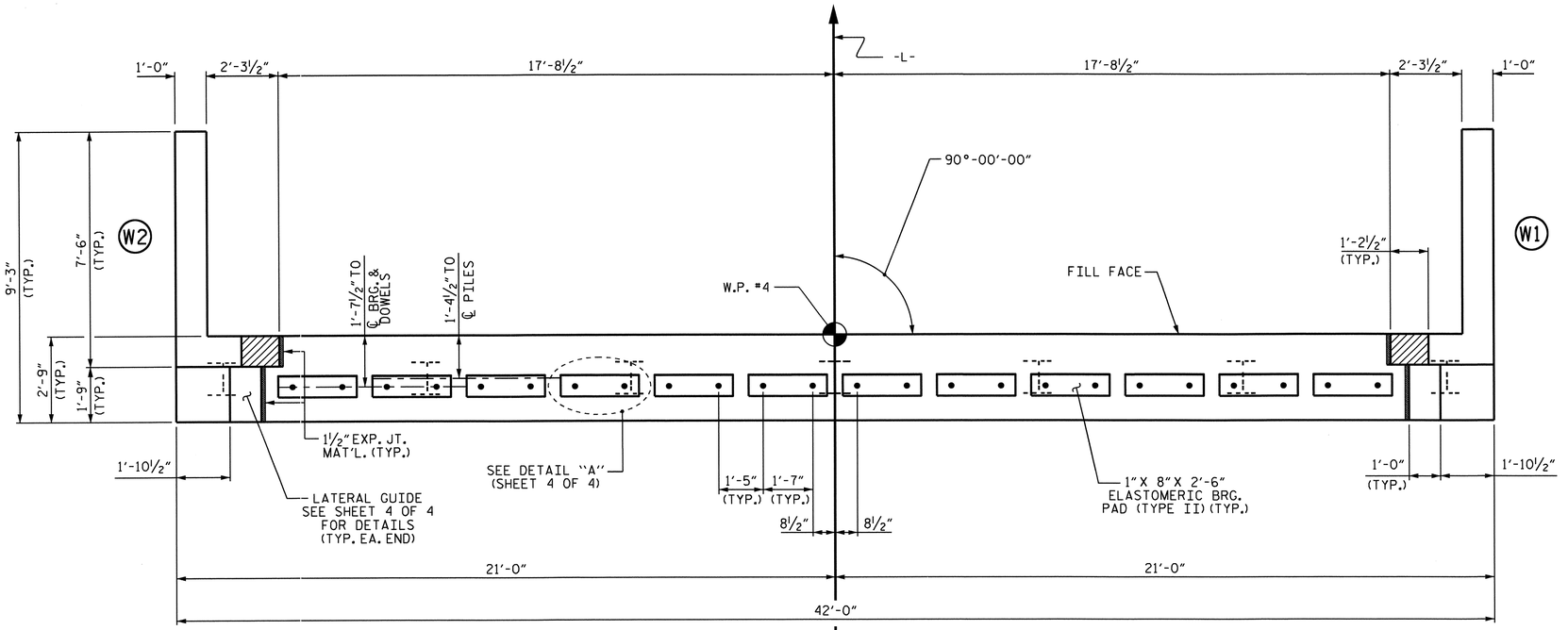

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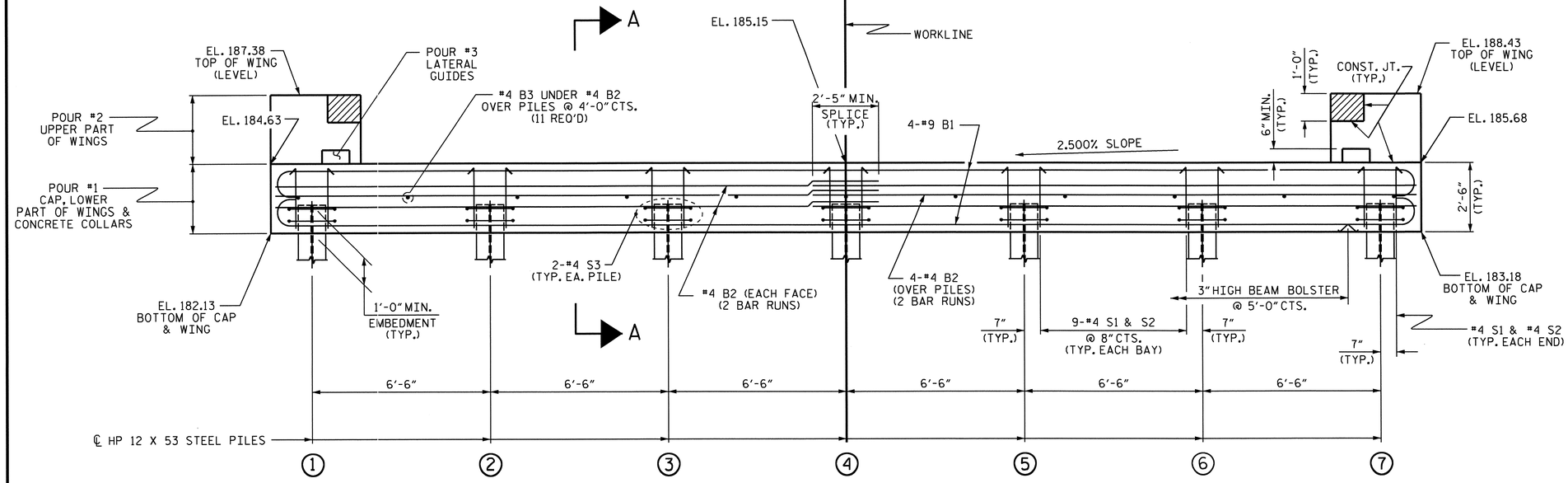

ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

TOP OF PILE ELEVATIONS	
1	183.16
2	183.33
3	183.49
4	183.65
5	183.81
6	183.98
7	184.14

PROJECT NO. B-4561
JOHNSTON COUNTY
STATION: 13+56.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			22

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

ASSEMBLED BY :	B. L. GREEN	DATE :	6/28/12
CHECKED BY :	K. P. SEDAI	DATE :	8/3/12
DRAWN BY :	DGE	02/10	
CHECKED BY :	MKT	02/10	

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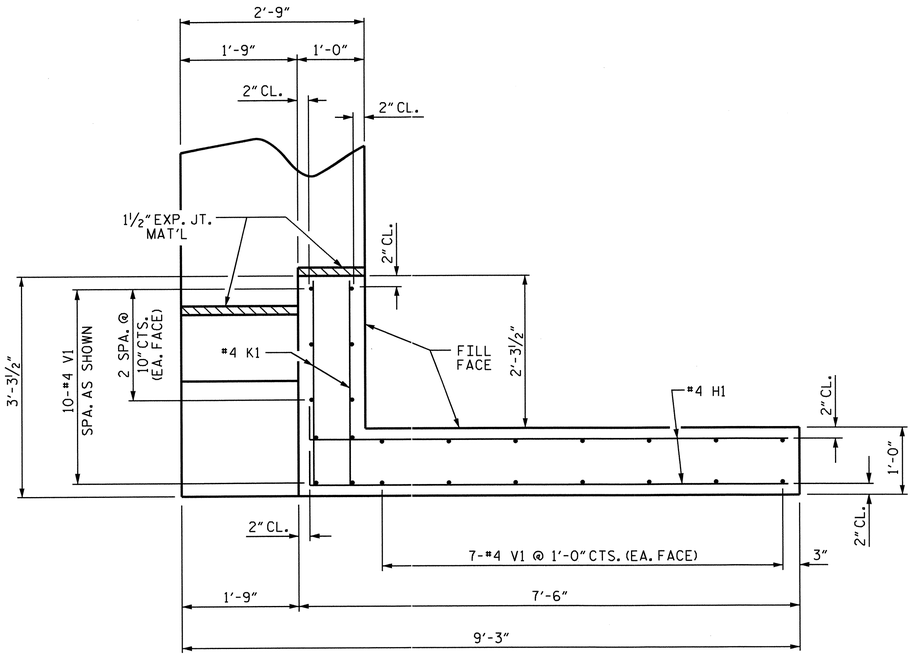
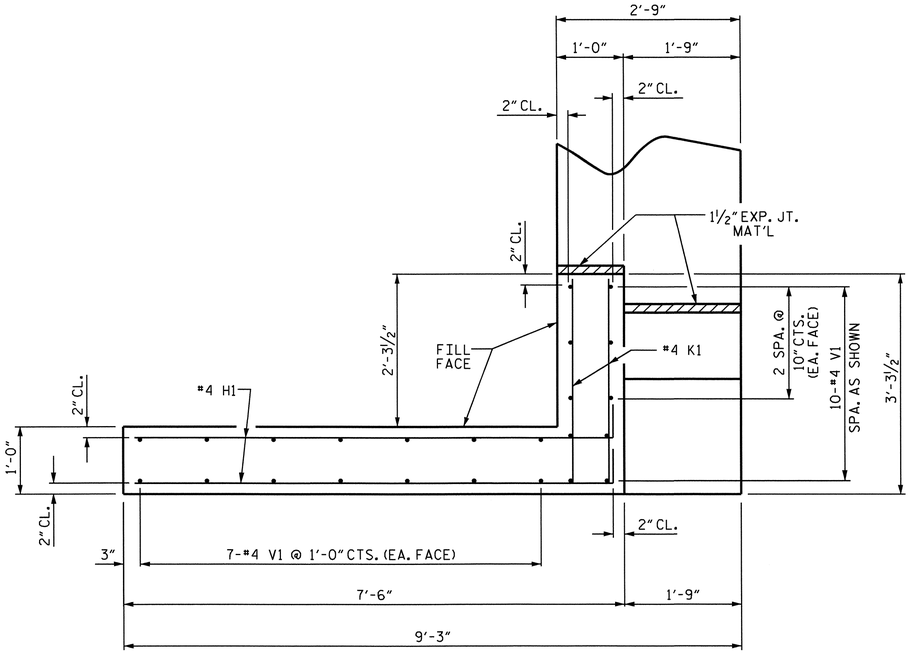
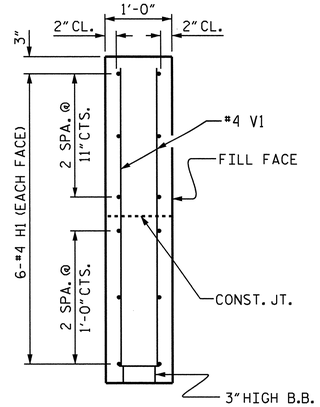


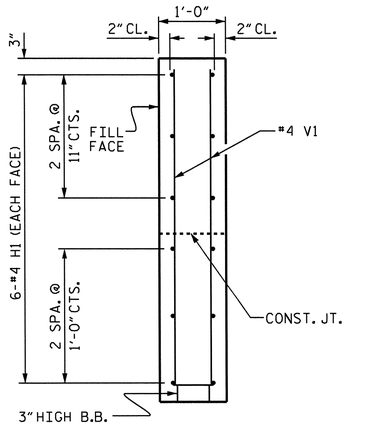
PLAN OF WING (W1)



PLAN OF WING (W2)

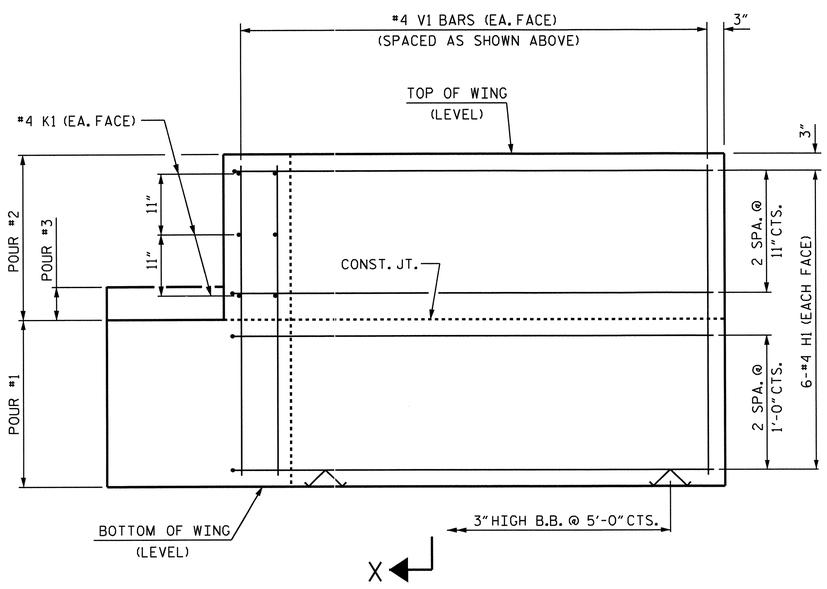


SECTION X-X



SECTION Y-Y

X



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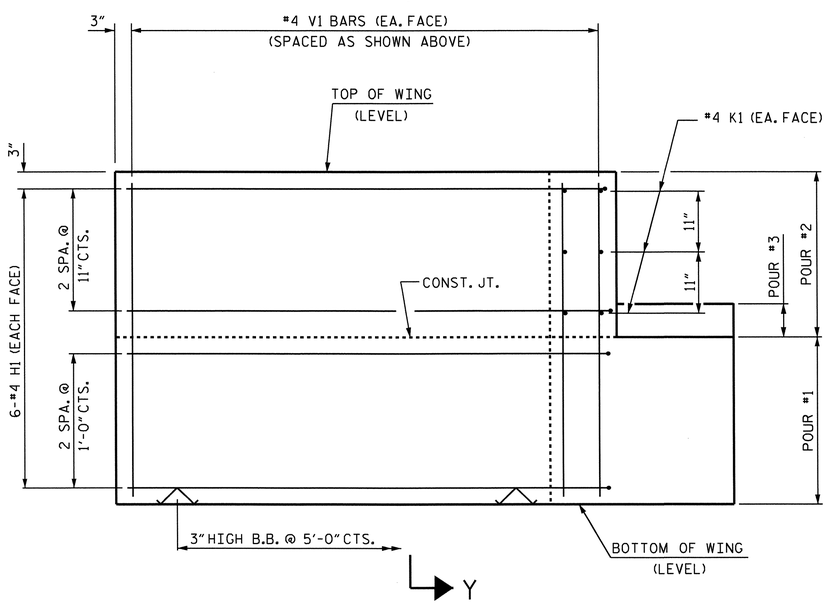
ELEVATION OF WING (W1)

Y



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ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12
CHECKED BY : K. P. SEDAI	DATE : 8/3/12
DRAWN BY : DGE 02/10	
CHECKED BY : MKT 02/10	

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NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER
DAVID E. MURRAY
1-15-13

PROJECT NO. B-4561
JOHNSTON COUNTY
STATION: 13+56.00 -L-

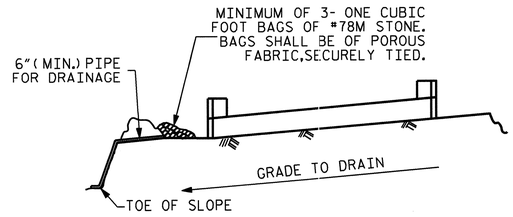
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14
1			3			TOTAL SHEETS
2			4			22

STD. NO. EB_36_90S

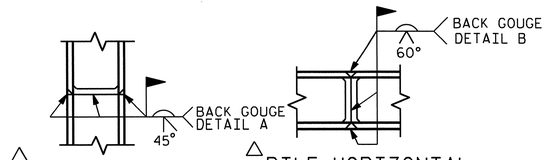


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

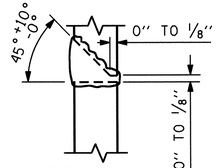
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

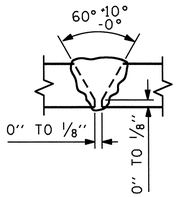


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



DETAIL A

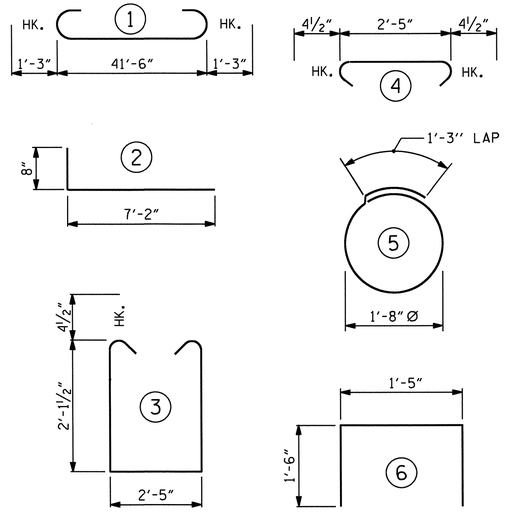


DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1		END BENT No. 2	
HP 12 X 53 STEEL PILES		HP 12 X 53 STEEL PILES	
NO: 7	LIN. FT.= 315	NO: 7	LIN. FT.= 355
PILE REDRIVES	EA. 4	PILE REDRIVES	EA. 4

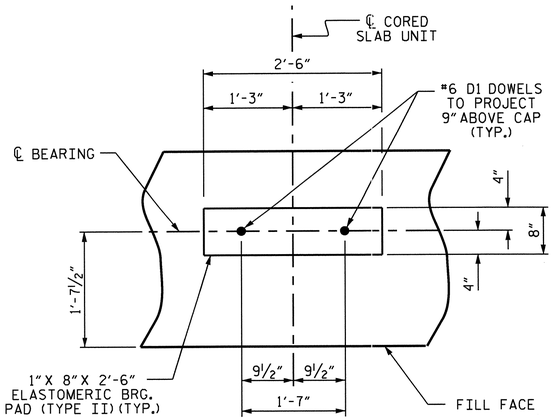
BILL OF MATERIAL
FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	44'-0"	1197
B2	16	#4	STR	22'-1"	236
B3	11	#4	STR	2'-5"	18
D1	24	#6	STR	1'-6"	54
H1	24	#4	2	7'-10"	126
K1	12	#4	STR	2'-11"	23
S1	56	#4	3	7'-5"	277
S2	56	#4	4	3'-2"	118
S3	14	#4	5	6'-6"	61
S4	4	#4	6	4'-5"	12
V1	48	#4	STR	4'-8"	150

REINFORCING STEEL (FOR ONE END BENT) 2272 LBS.

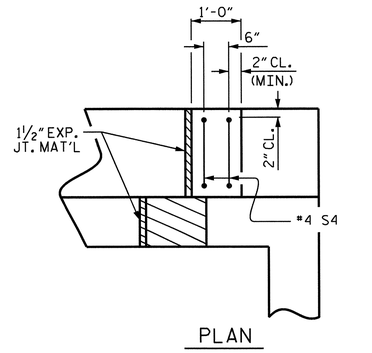
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	13.1 C.Y.
POUR #2	UPPER PART OF WINGS	2.0 C.Y.
POUR #3	LATERAL GUIDES	0.1 C.Y.
	TOTAL CLASS A CONCRETE	15.2 C.Y.

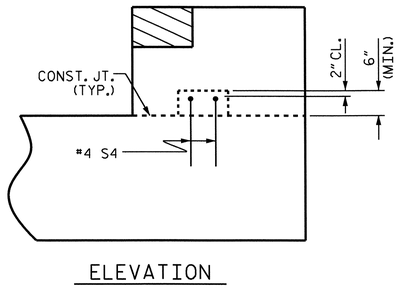


DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



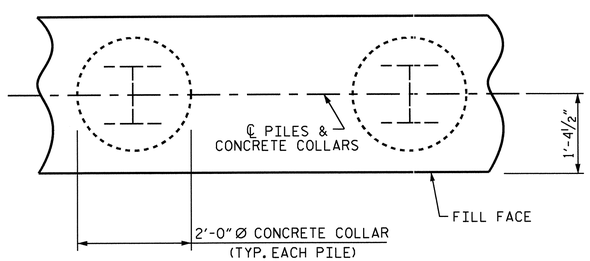
PLAN



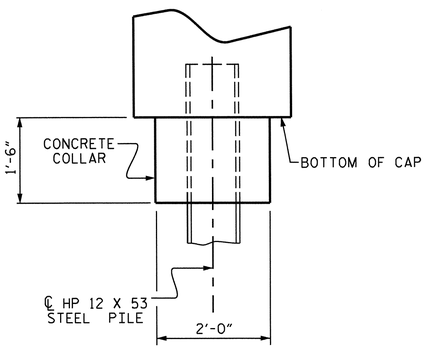
ELEVATION

LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT END SIMILAR)



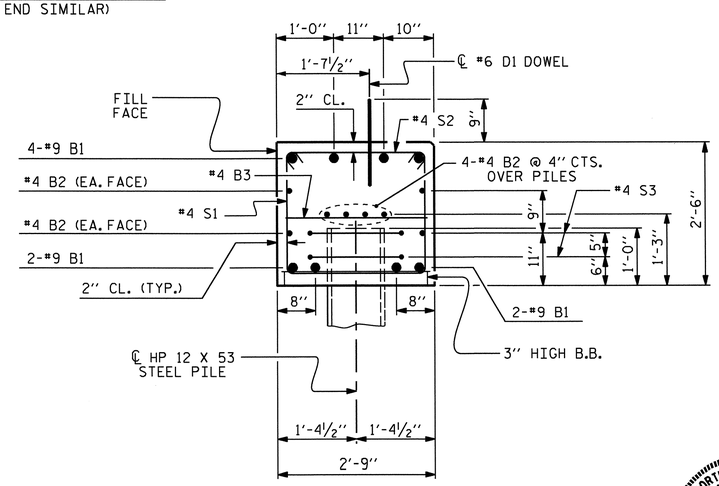
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



SECTION A-A

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

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY 1-15-13

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12	
CHECKED BY : K. P. SEDAI	DATE : 8/3/12	
DRAWN BY : DGE 02/10		
CHECKED BY : MKT 02/10		

13-FEB-2013 15:00
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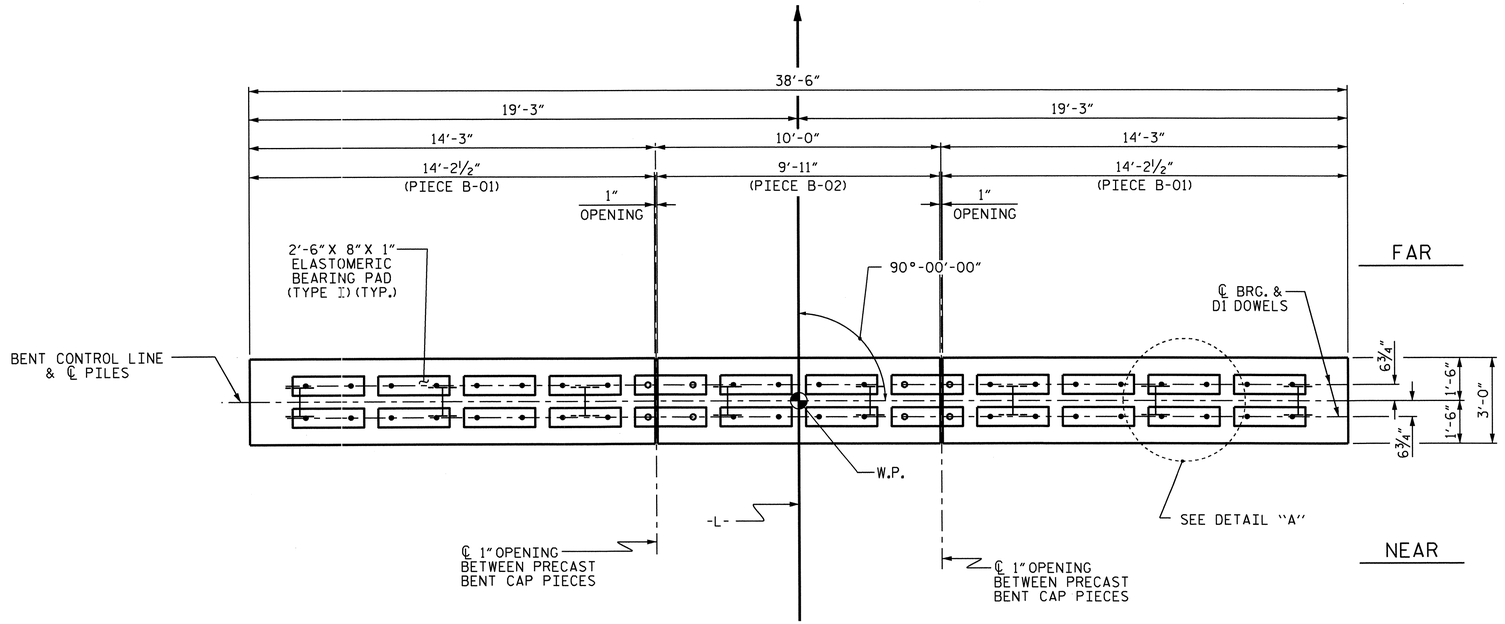
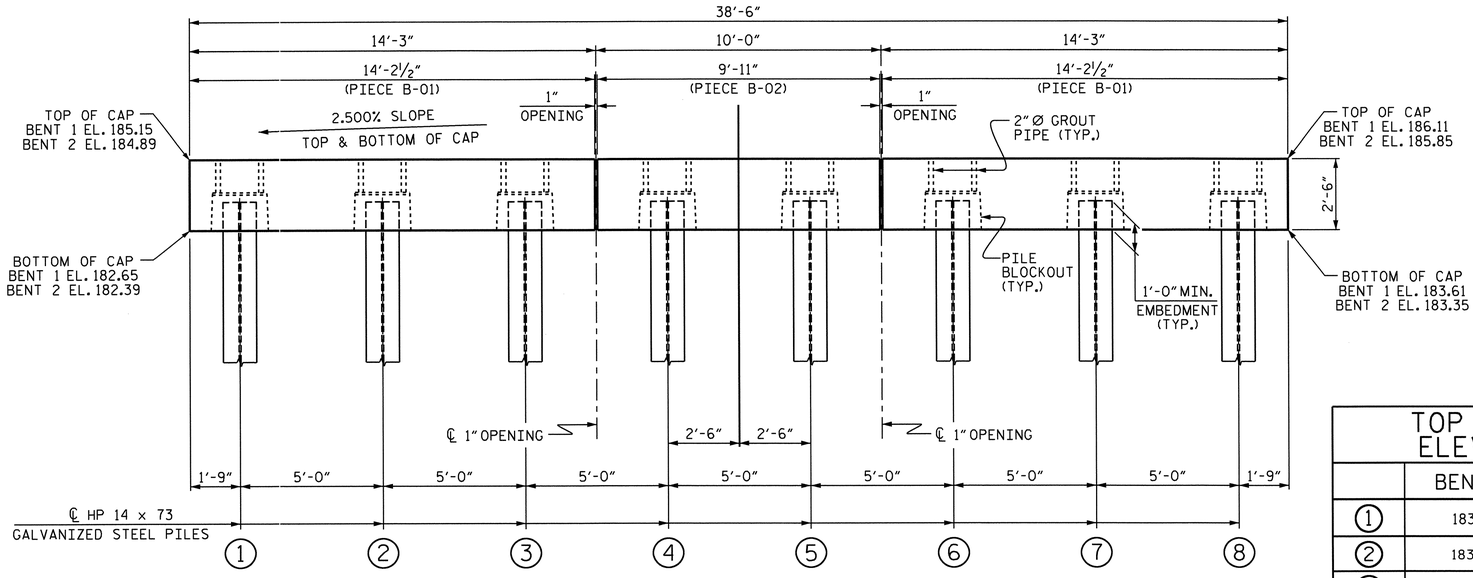
bgreen

STD. NO. EB_36_90S



PLAN

(PILE BLOCKOUTS AND GROUT PIPES NOT SHOWN FOR CLARITY)



ELEVATION

FOR 2" Ø GROUT PIPE AND PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4

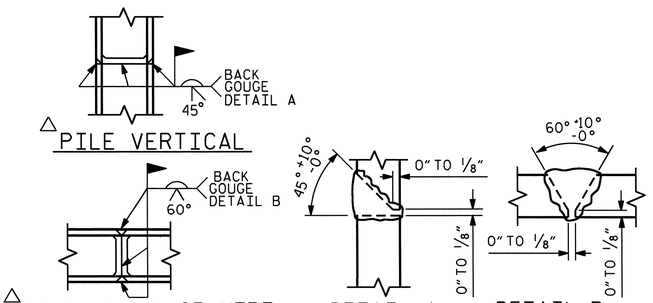
NOTES

FOR PRECAST CAP DETAILS AND BILL OF MATERIAL, SEE "PIECE B-01" & "PIECE B-02" SHEETS.

GALVANIZE THE FULL LENGTH OF EACH INTERIOR BENT PILE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

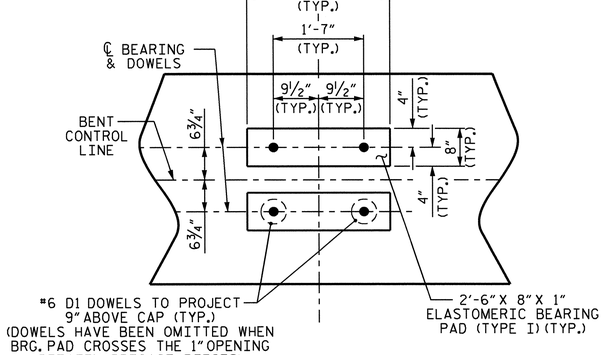
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR 3'-0" x 2'-6" PRESTRESSED CONCRETE BENT CAPS, SEE SPECIAL PROVISIONS.



PILE SPLICE DETAILS

△ POSITION OF PILE DURING WELDING.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

TOP OF PILE ELEVATIONS		
	BENT 1	BENT 2
①	183.71	183.45
②	183.83	183.57
③	183.96	183.70
④	184.08	183.82
⑤	184.21	183.95
⑥	184.33	184.07
⑦	184.46	184.20
⑧	184.58	184.32

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 & 2

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12	
CHECKED BY : K. P. SEDAI	DATE : 8/3/12	
DRAWN BY : MAA	3/12	
CHECKED BY : SHS	6/12	

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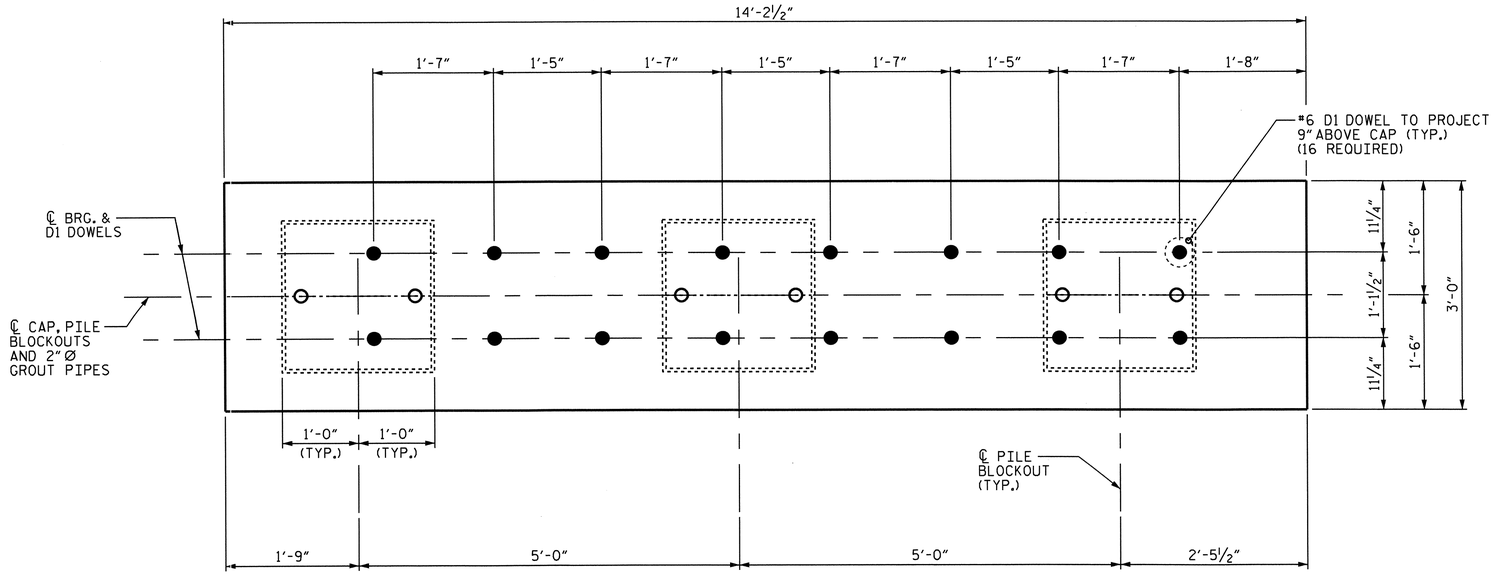
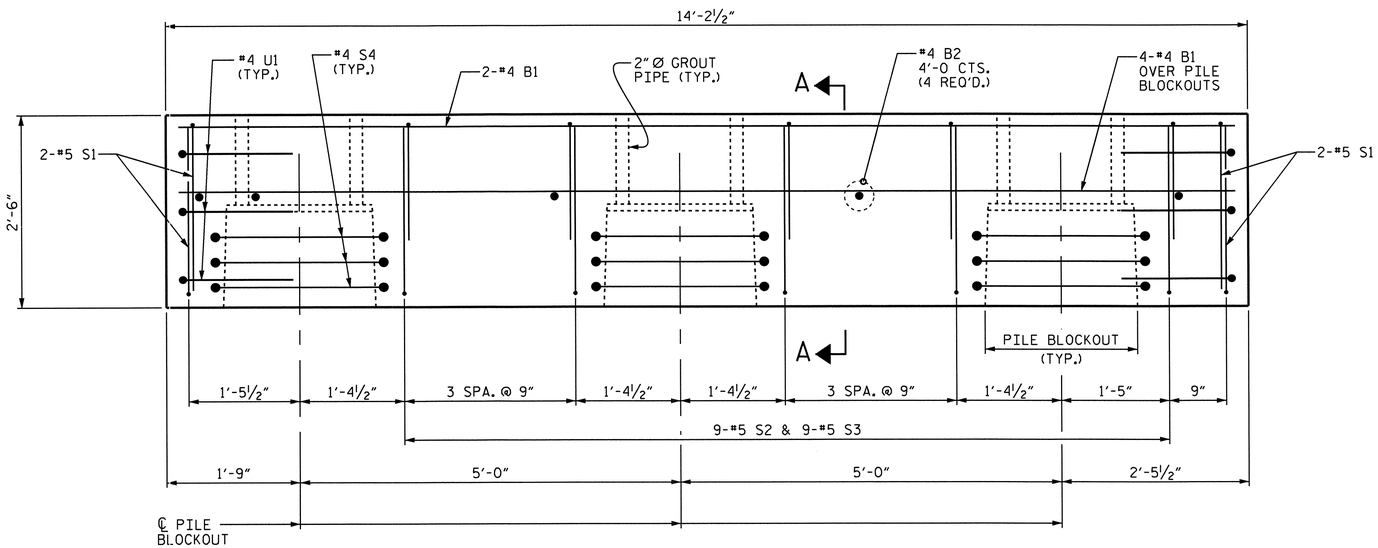
bgreen

STD. NO. 14"HP_PSBT_36_90S_<60'



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4)



ELEVATION

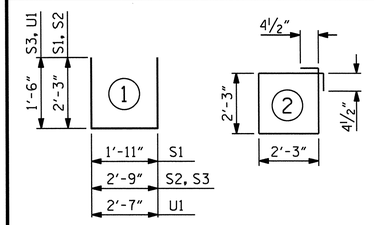
(*6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 4 OF 4.

BILL OF MATERIAL
FOR ONE PIECE B-01

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#4	STR	13'-10"	55
B2	4	#4	STR	2'-8"	7
D1	16	#6	STR	1'-6"	36
S1	8	#5	1	6'-5"	54
S2	9	#5	1	7'-3"	68
S3	9	#5	1	5'-9"	54
S4	9	#4	2	9'-9"	59
U1	6	#4	1	5'-7"	22

REINFORCING STEEL	355 LBS
4000 PSI PRESTRESS CONCRETE	3.4 C.Y.
PILE BLOCKOUT GROUT	0.6 C.Y.
0.6" Ø L.R. STRANDS	No. 12

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. B-4561
JOHNSTON COUNTY
STATION: 13+56.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST PIECE B-01

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			22

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER AMY E. MURRAY
1-18-13

ASSEMBLED BY :	B. L. GREEN	DATE :	6/28/12
CHECKED BY :	K. P. SEDAI	DATE :	8/3/12
DRAWN BY :	MAA	3/12	
CHECKED BY :	SHS	6/12	

13-FEB-2013 15:00
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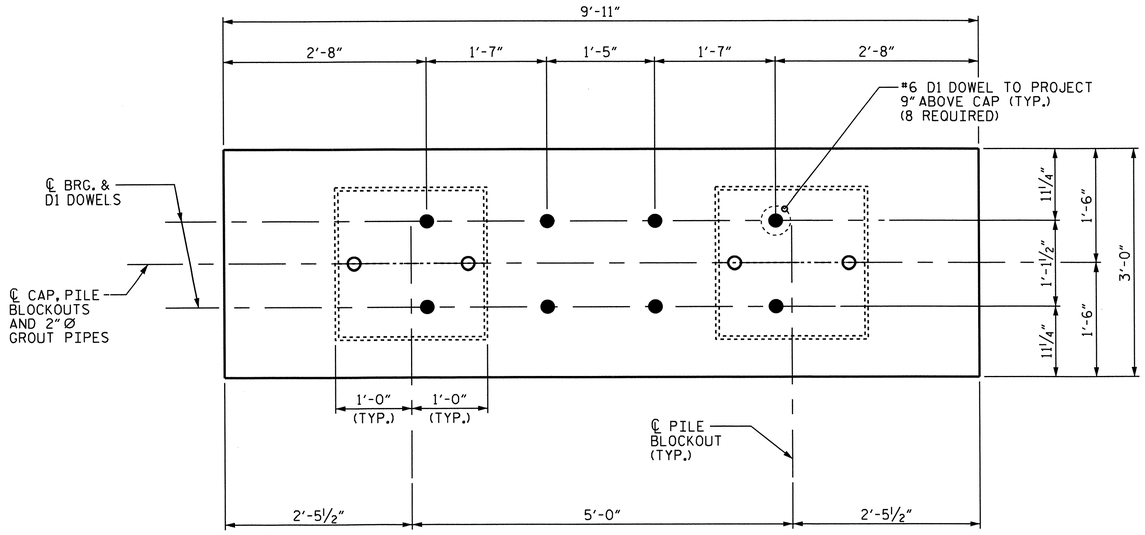
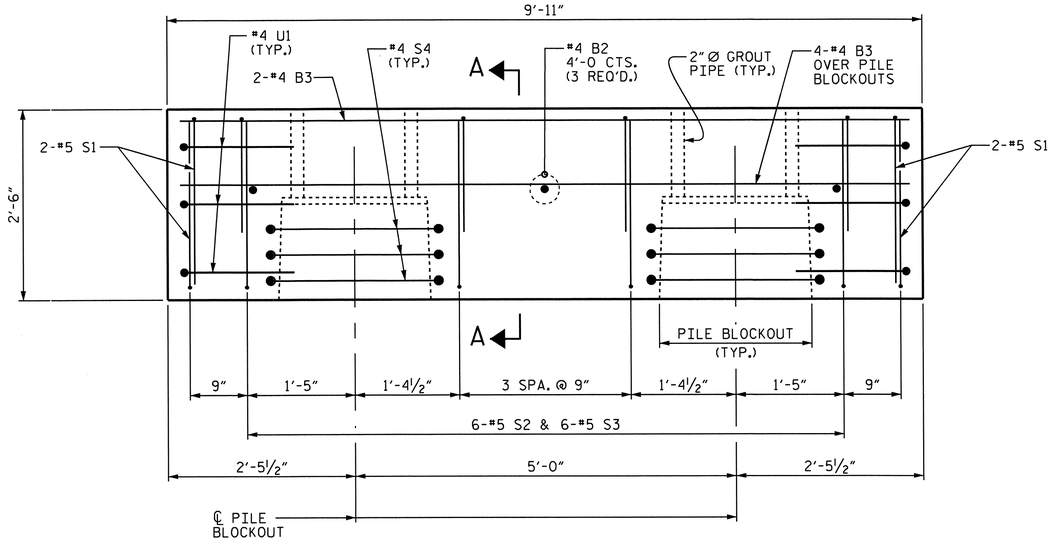
bgreen

STD. NO. 14"HP_PSBT_36_90S_<60'



PLAN

(FOR PILE BLOCKOUT DETAILS, SEE SHEET 4 OF 4)



ELEVATION

(#6 D1 DOWELS NOT SHOWN FOR CLARITY)
FOR SECTION A-A, SEE SHEET 4 OF 4.

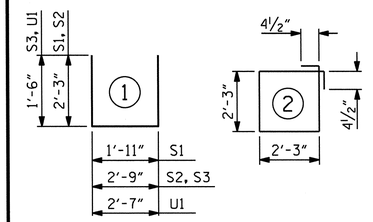
BILL OF MATERIAL

FOR ONE PIECE B-02

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B2	3	#4	STR	2'-8"	5
B3	6	#4	STR	9'-7"	38
D1	8	#6	STR	1'-6"	18
S1	8	#5	1	6'-5"	54
S2	6	#5	1	7'-3"	45
S3	6	#5	1	5'-9"	36
S4	6	#4	2	9'-9"	39
U1	6	#4	1	5'-7"	22

REINFORCING STEEL	257 LBS
4000 PSI PRESTRESS CONCRETE	2.4 C.Y.
PILE BLOCKOUT GROUT	0.4 C.Y.
0.6" Ø L.R. STRANDS	No. 12

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

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

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

PRECAST PIECE B-02

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			22

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

ASSEMBLED BY :	B. L. GREEN	DATE :	6/28/12
CHECKED BY :	K. P. SEDAI	DATE :	8/3/12
DRAWN BY :	MAA	3/12	
CHECKED BY :	SHS	6/12	

13-FEB-2013 15:00
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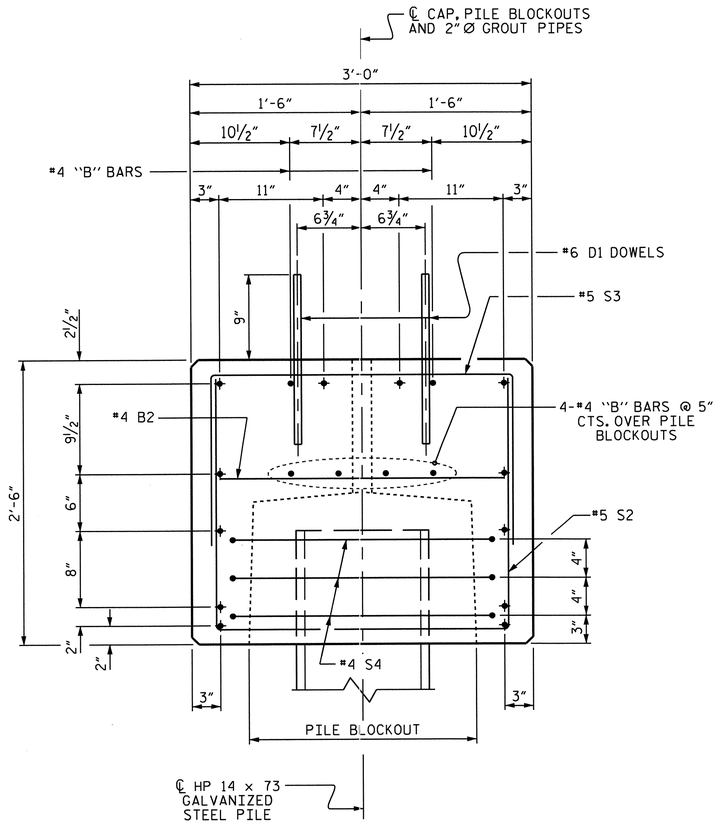
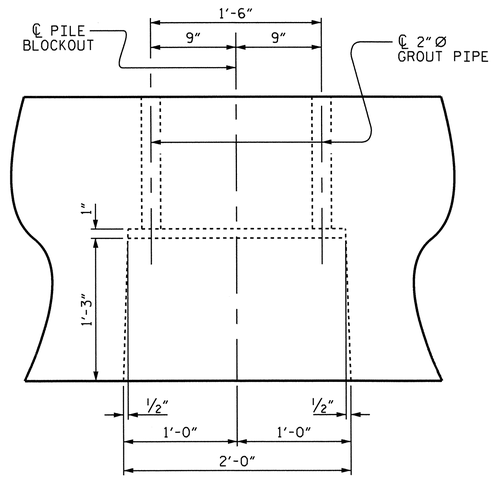
STD. NO. 14" HP_PSBT_36_90S_<60'

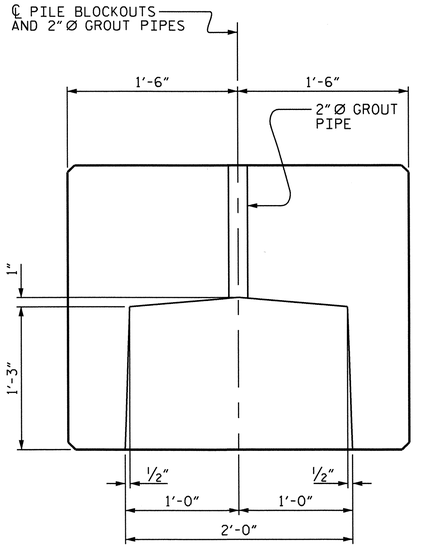


SECTION A-A

(SHOWING 0.6"Ø LOW RELAXATION STRAND LAYOUT)
(12 STRANDS)



ELEVATION



SECTION

PILE BLOCKOUT DETAILS

(DIMENSIONS ARE TYPICAL EACH BLOCKOUT)

NOTES

STIRRUPS IN PRECAST PIECES MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS AND GROUT PIPES.

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 CAST WITH THE BENT CAP SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRECAST BENT CAPS.

WHEN BENT CAPS ARE CAST, A HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING BENT CAPS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE ENDS OF THE BENT CAP SEGMENTS.

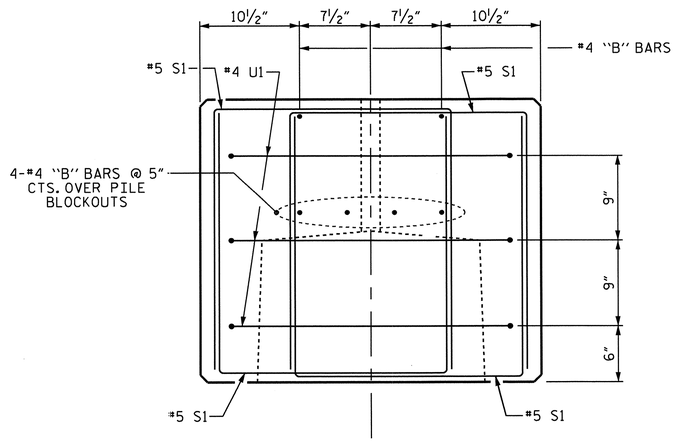
APPLY EPOXY PROTECTIVE COATING TO THE ENDS OF THE BENT CAP SEGMENTS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BENT CAPS SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI.

THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL A METHOD TO LIFT AND SUPPORT THE PRECAST CAP PIECES IN THE PROPER LOCATION AND ELEVATION AS SHOWN ON THE PLANS PRIOR TO PLACEMENT AND CURING OF THE GROUT IN THE PILE BLOCKOUTS. THE METHOD CHOSEN SHALL PROVIDE FOR A WATERTIGHT SEAL AT THE BOTTOM OF THE CAP UNTIL THE GROUT HAS HARDENED SO NO GROUT COMES IN CONTACT WITH THE STREAM.

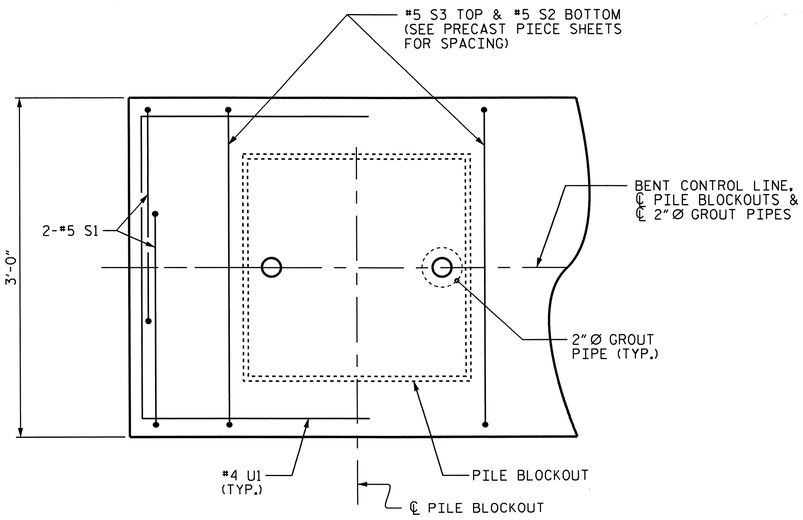
PRESTRESSED CONCRETE BENT CAPS (FOR ONE BENT)			
PIECE	LENGTH	NUMBER	TOTAL LENGTH
B-01	14'-2½"	2	28'-5"
B-02	9'-11"	1	9'-11"
TOTAL		3	38.33'

HP 14 X 73 GALVANIZED STEEL PILES (FOR ONE BENT)		
No. 8	LIN. FT.	360
PILE REDRIVES	EA.	4



END OF CAP VIEW

(TYPICAL BOTH ENDS)



PART PLAN-END OF CAP

(TYPICAL BOTH ENDS)

PROJECT NO. B-4561
JOHNSTON COUNTY
STATION: 13+56.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENTS 1 & 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			22

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12	
CHECKED BY : K. P. SEDAI	DATE : 8/3/12	
DRAWN BY : MAA 3/12		
CHECKED BY : SHS 6/12		

13-FEB-2013 15:00
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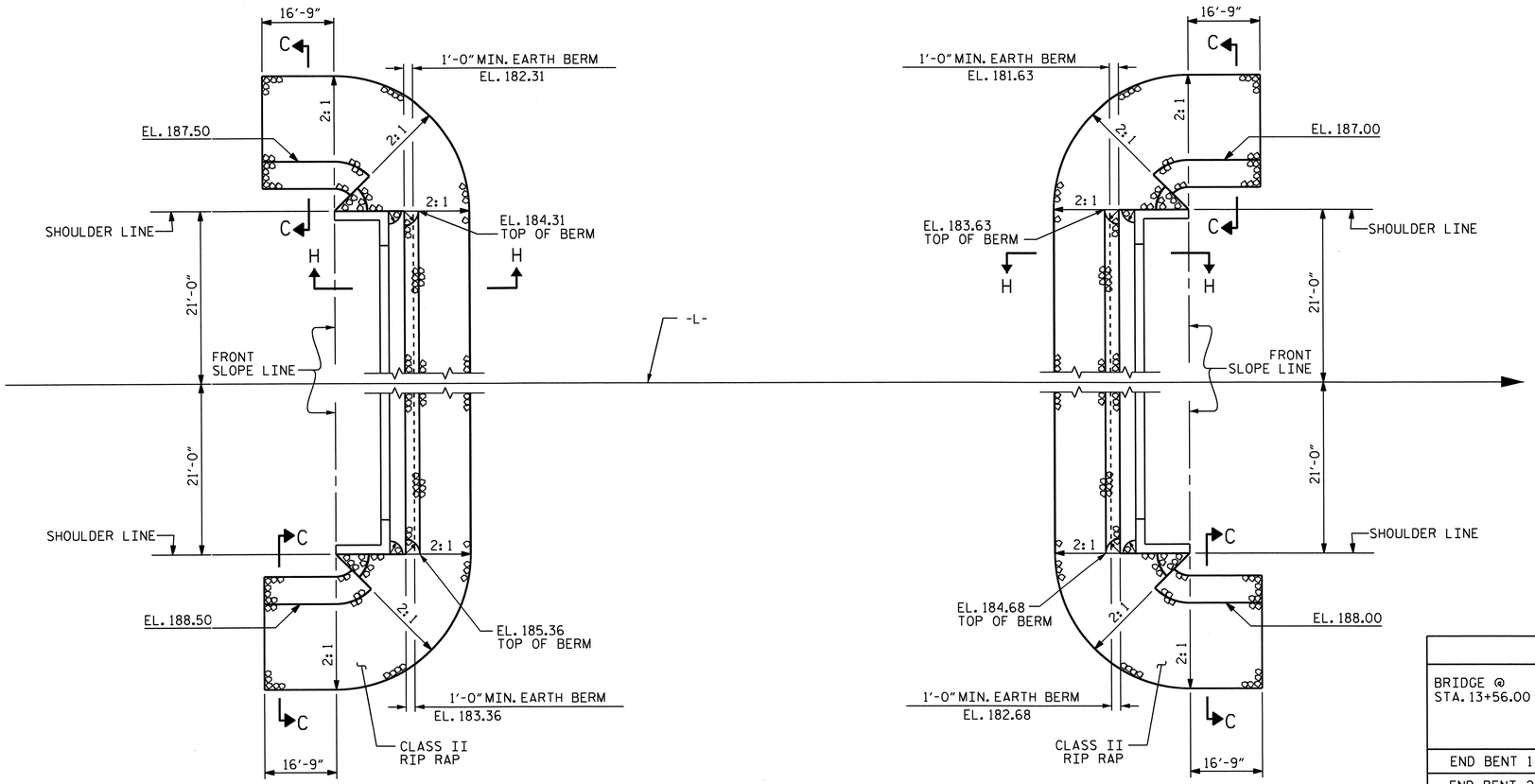
STD. NO. 14"HP_PSBT_36_90S_<60'

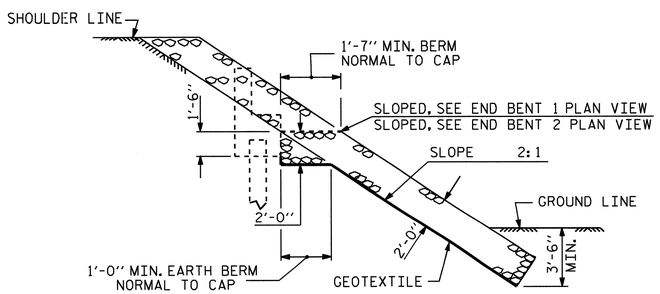


END BENT 1

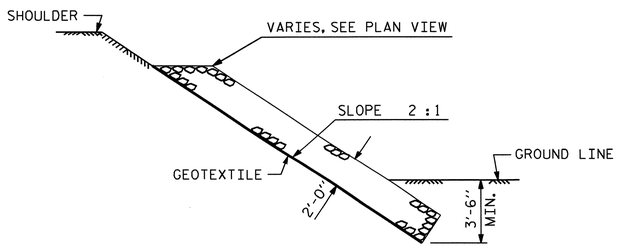
END BENT 2

PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+56.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	310	340
END BENT 2	335	370



SECTION H-H



SECTION C-C

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
1-15-13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			22

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12	
CHECKED BY : K. P. SEDAI	DATE : 8/7/12	
DRAWN BY : REK 1/84	REV. 5/1/06R	TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11	MAA/GM
	REV. 12/21/11	MAA/GM

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bgreen

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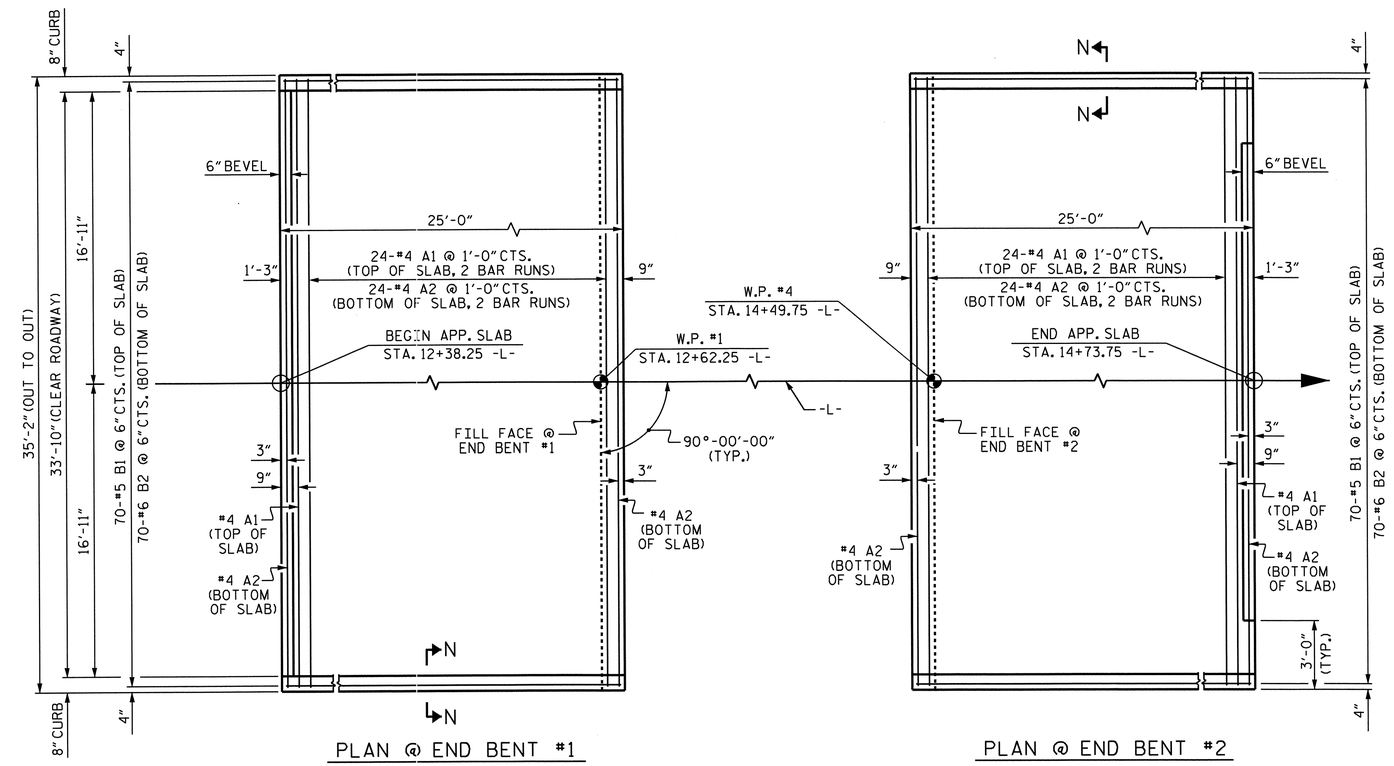
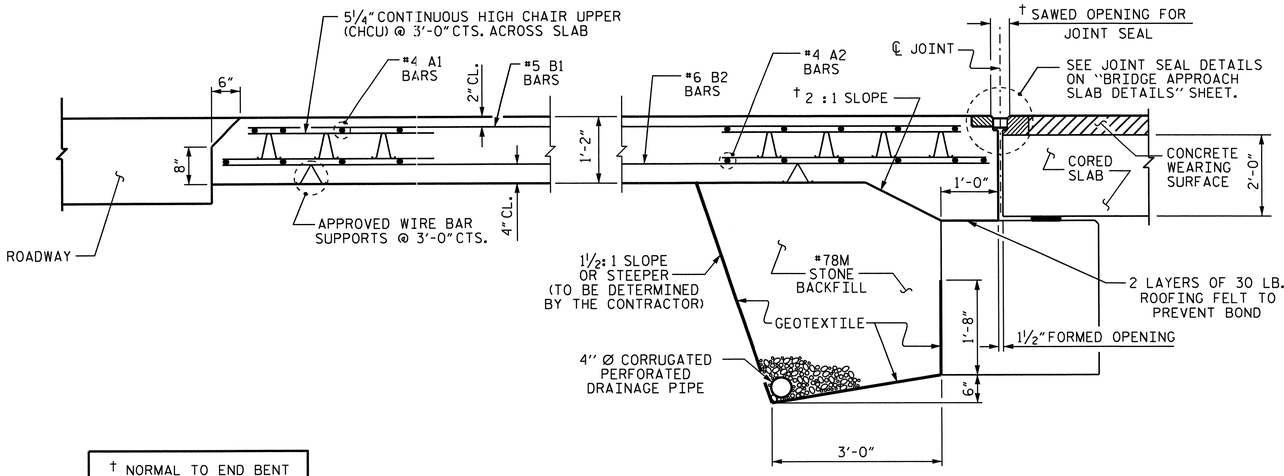
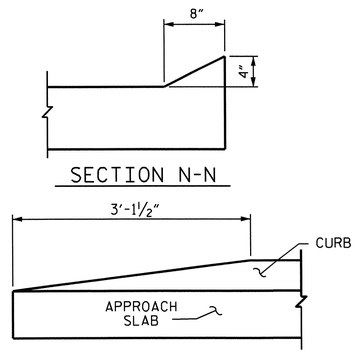


DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB



END OF CURB WITHOUT
SHOULDER BERM GUTTER

CURB DETAILS

NOTES

APPROACH SLABS SHALL BE POURED AFTER CONCRETE OVERLAY IS POURED.

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 AFTER THE CASTING OF THE BARRIER RAIL.

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 3⅞".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	50	#4	STR	18'-5"	615
A2	52	#4	STR	18'-4"	637
✳ B1	70	#5	STR	23'-8"	1728
B2	70	#6	STR	24'-8"	2593
REINFORCING STEEL				LBS.	3230
✳ EPOXY COATED REINFORCING STEEL				LBS.	2343
CLASS AA CONCRETE				C. Y.	42.4

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	50	#4	STR	18'-5"	615
A2	52	#4	STR	18'-4"	637
✳ B1	70	#5	STR	23'-8"	1728
B2	70	#6	STR	24'-8"	2593
REINFORCING STEEL				LBS.	3230
✳ EPOXY COATED REINFORCING STEEL				LBS.	2343
CLASS AA CONCRETE				C. Y.	42.4

SPLICE CHART

BAR	LENGTH
#4 A1	2'-0"
#4 A2	1'-9"

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB

(SUB-REGIONAL TIER)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			22

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

1-15-13

ASSEMBLED BY : B. L. GREEN	DATE : 6/28/12		
CHECKED BY : K. P. SEDAI	DATE : 8/3/12		
DRAWN BY : FCJ 6/87	REV. 5/1/06RR	KMM/GM	
CHECKED BY : EGA 6/87	REV. 10/1/11	MAA/GM	
	REV. 12/21/11	MAA/GM	

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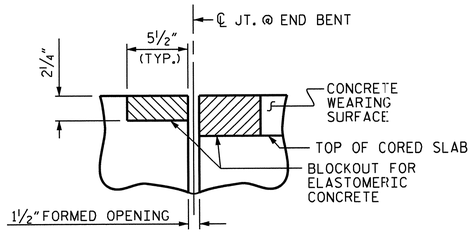
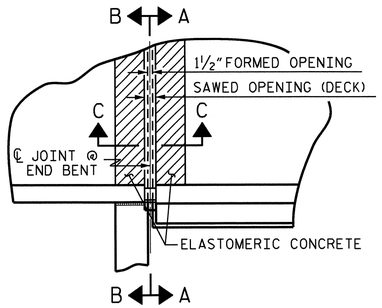
bgreen

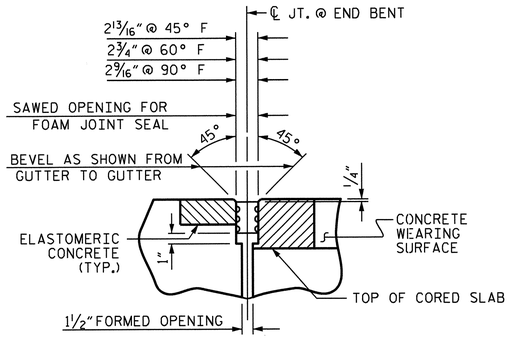


SECTION C-C

FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



PLAN

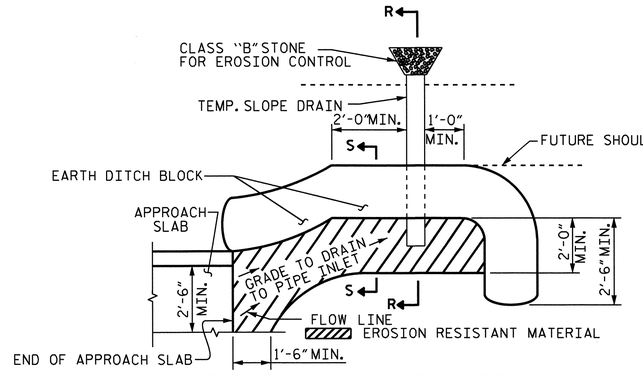


SECTION C-C

FOAM JOINT SEAL
(EXPANSION)

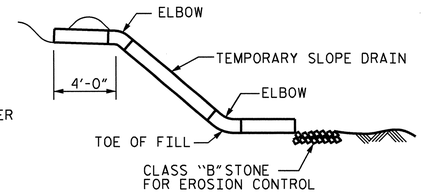
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE * (CU. FT.)
1	11.0
2	11.0
TOTAL	22.0

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

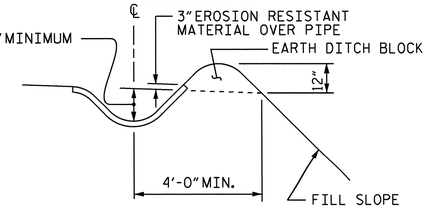


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



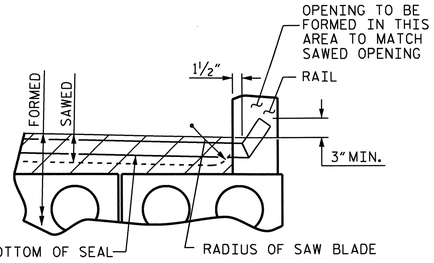
SECTION R-R



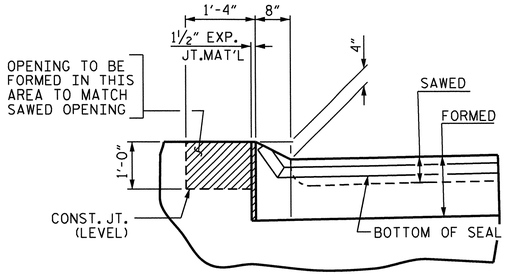
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION A-A

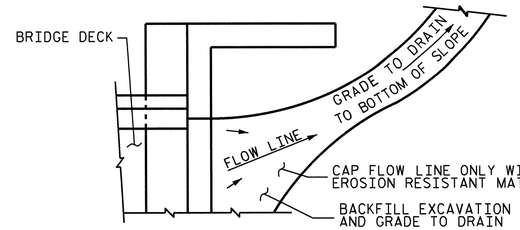


SECTION B-B

JOINT SEAL DETAILS @ END BENT

(FOR VERTICAL CONCRETE RAILS WITH CURB)

FOAM JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP AS SHOWN.



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4561

JOHNSTON COUNTY

STATION: 13+56.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

1-15-13

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

ASSEMBLED BY : B. L. GREEN		DATE : 6/28/12	
CHECKED BY : K. P. SEDAI		DATE : 8/3/12	
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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bgreen

STD. NO. BAS4

TIP NO: B-4772

CONTRACT: C203088

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4772		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38544.1.1	BRZ-1525(9)	P.E.
38544.2.1	BRZ-1525(9)	R.W.
33772.3.1	BRZ-1525(5)	CONST.

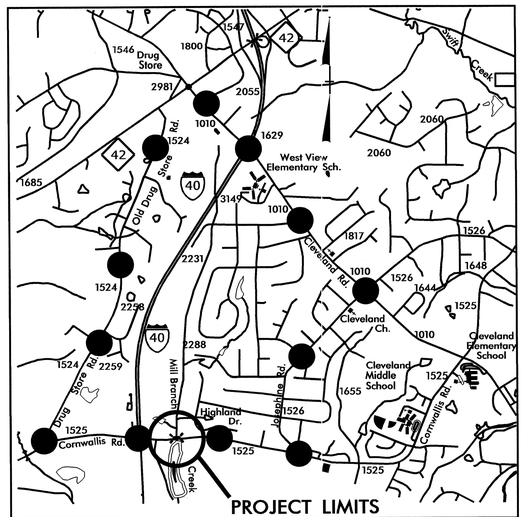
STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

JOHNSTON COUNTY

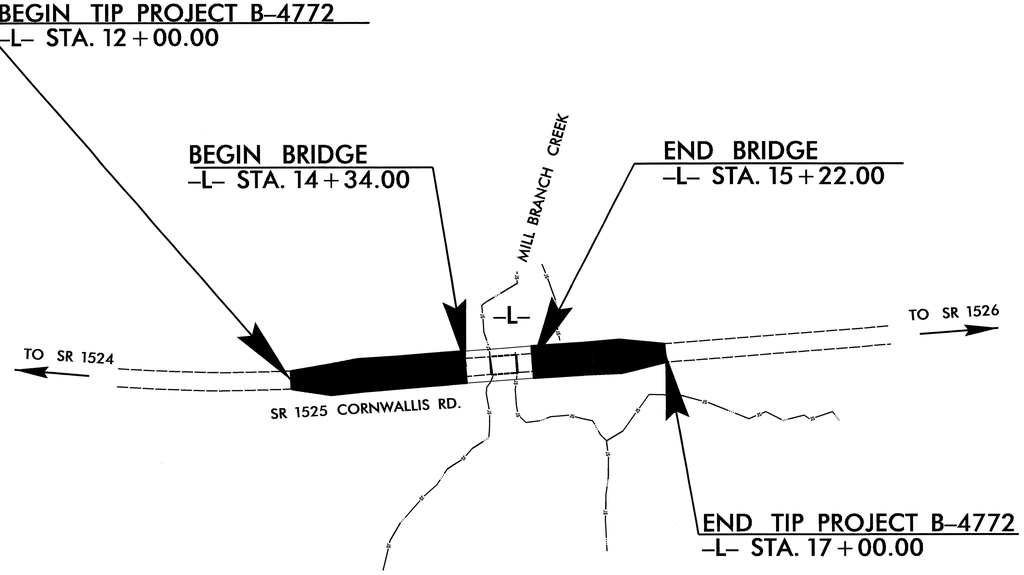
LOCATION: BRIDGE NO. 326 OVER MILL BRANCH CREEK ON SR 1525

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



VICINITY MAP

OFF-SITE DETOUR



STRUCTURES

DESIGN DATA

ADT 2013 = 3,900

ADT 2033 = 7,715

DHV = 12 %

D = 60 %

T = 6 % *

V = 60 MPH

*(TTST 1% + DUAL 5%)

FUNC. CLASS = LOCAL RURAL

TIER = SUBREGIONAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4772 = 0.078 MI

LENGTH OF STRUCTURE TIP PROJECT B-4772 = 0.017 MI

TOTAL LENGTH TIP PROJECT B-4772 = 0.095 MI

Prepared In the Office of:

DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE :

APRIL 16, 2013

OMAR R. AZIZI, PE
PROJECT ENGINEER

TIMOTHY L. COGGINS, PE
PROJECT DESIGN ENGINEER

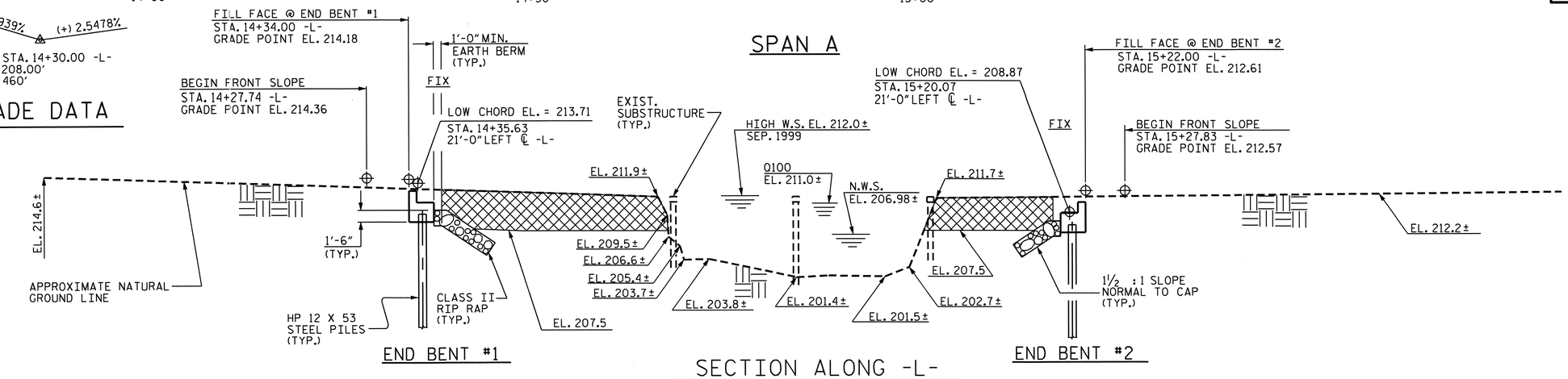
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

F.A. PROJECT NO. BRZ-1525(5)

GRADE DATA

(-) 8.3939% — (+) 2.5478%

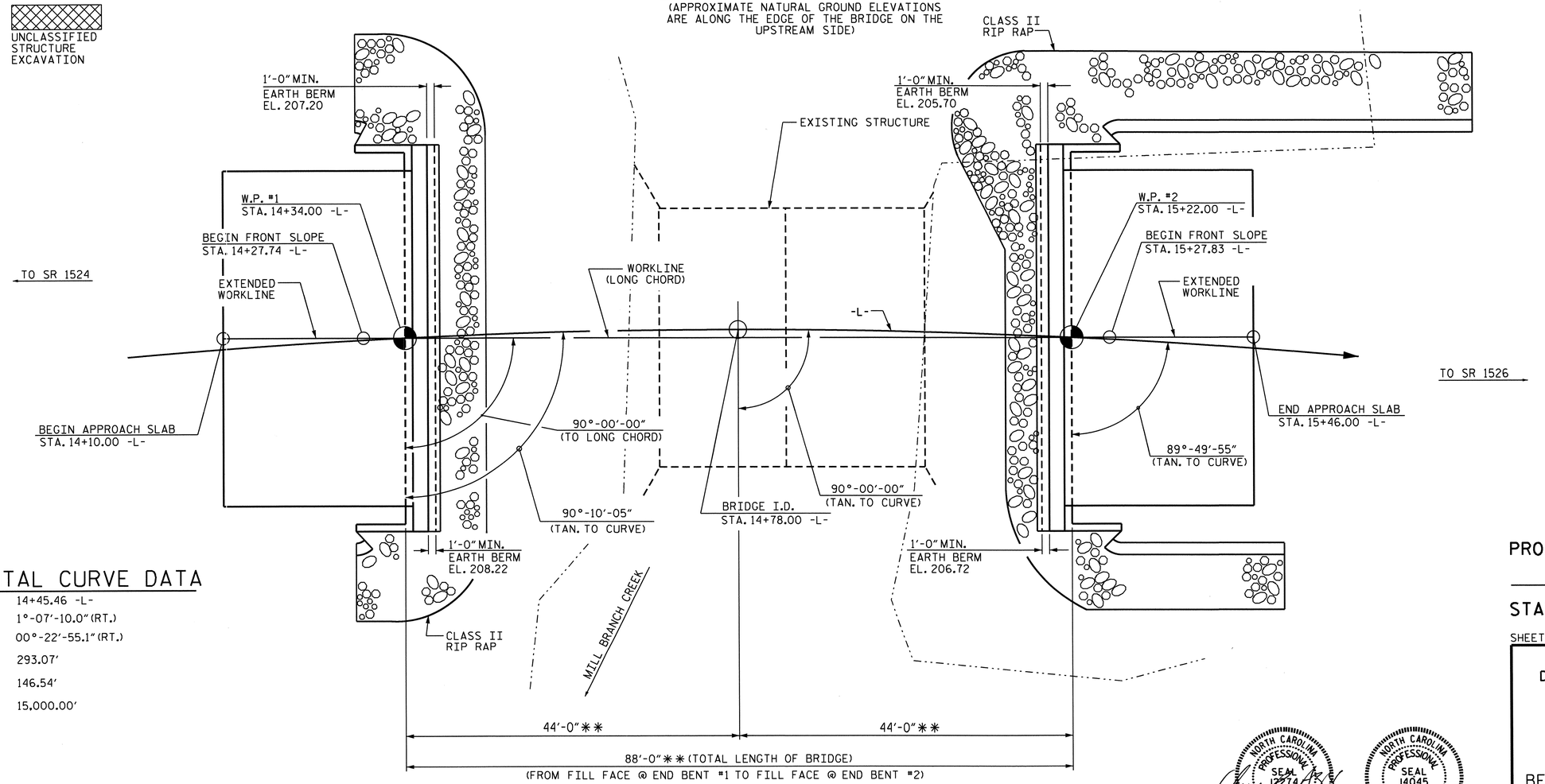
PI STA. 14+30.00 -L-
EL. 208.00'
VC 460'



SECTION ALONG -L-

(APPROXIMATE NATURAL GROUND ELEVATIONS ARE ALONG THE EDGE OF THE BRIDGE ON THE UPSTREAM SIDE)

UNCLASSIFIED
STRUCTURE
EXCAVATION



PLAN

(PILES NOT SHOWN FOR CLARITY)

** ALONG LONG CHORD

HORIZONTAL CURVE DATA

PI STA.	=	14+45.46 -L-
Δ	=	1°-07'-10.0"(RT.)
D	=	00°-22'-55.1"(RT.)
L	=	293.07'
T	=	146.54'
R	=	15,000.00'

NORTH CAROLINA PROFESSIONAL SEAL 12274 ENGINEER OMAR R. AZIZI
2-13-13

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE #326

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1525
OVER MILL BRANCH CREEK
BETWEEN SR 1524 AND SR 1526

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

DRAWN BY : M.D.PISO DATE : 10-04-12
CHECKED BY : P.PARISI DATE : 11-01-12

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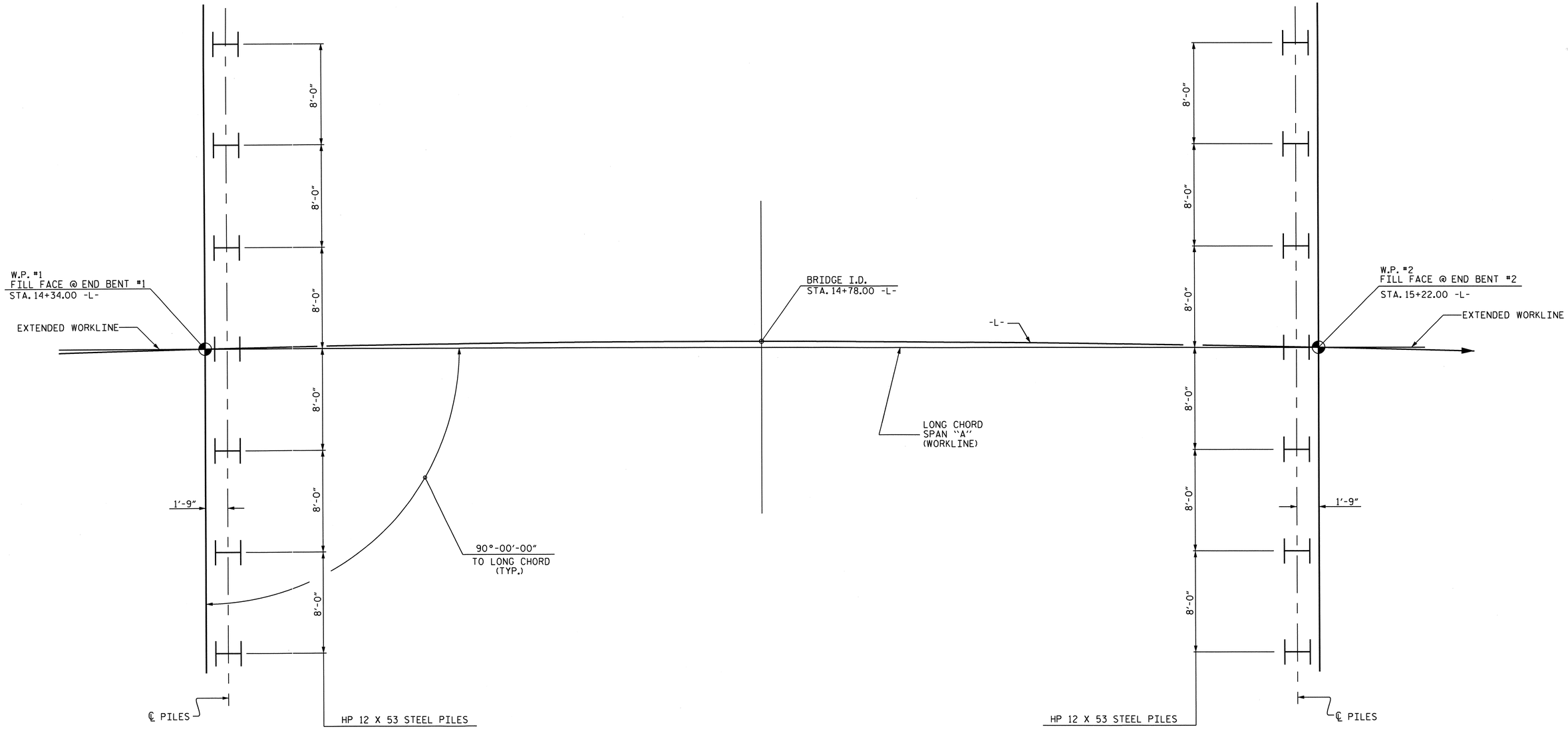

END BENT #1

END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1525
OVER MILL BRANCH CREEK
BETWEEN SR 1524 AND SR 1526

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

DRAWN BY : M.D.PISO DATE : 10-04-12
CHECKED BY : P.A.PARISI DATE : 11-01-12

08-JAN-2013 10:30
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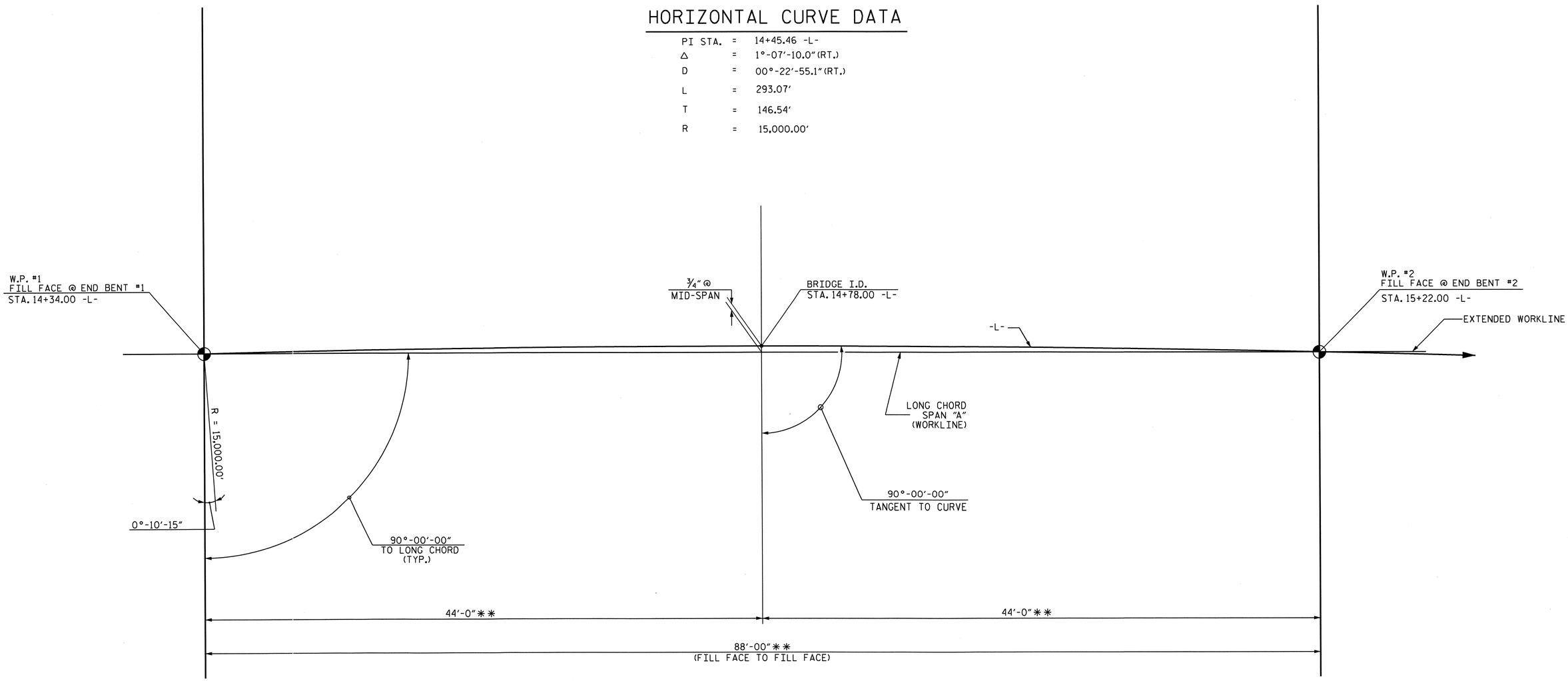
HORIZONTAL CURVE DATA

PI STA.	=	14+45.46 -L-
Δ	=	1°-07'-10.0"(RT.)
D	=	00°-22'-55.1"(RT.)
L	=	293.07'
T	=	146.54'
R	=	15,000.00'



LONG CHORD LAYOUT

BENTS ARE PARALLEL

** ALONG LONG CHORD

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1525
OVER MILL BRANCH CREEK
BETWEEN SR 1524 AND SR 1526

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY A. COGGINS
02/12/13

DRAWN BY : M.D.PISO DATE : 10-04-12
CHECKED BY : P.A.PARISI DATE : 11-01-12

08-JAN-2013 10:30
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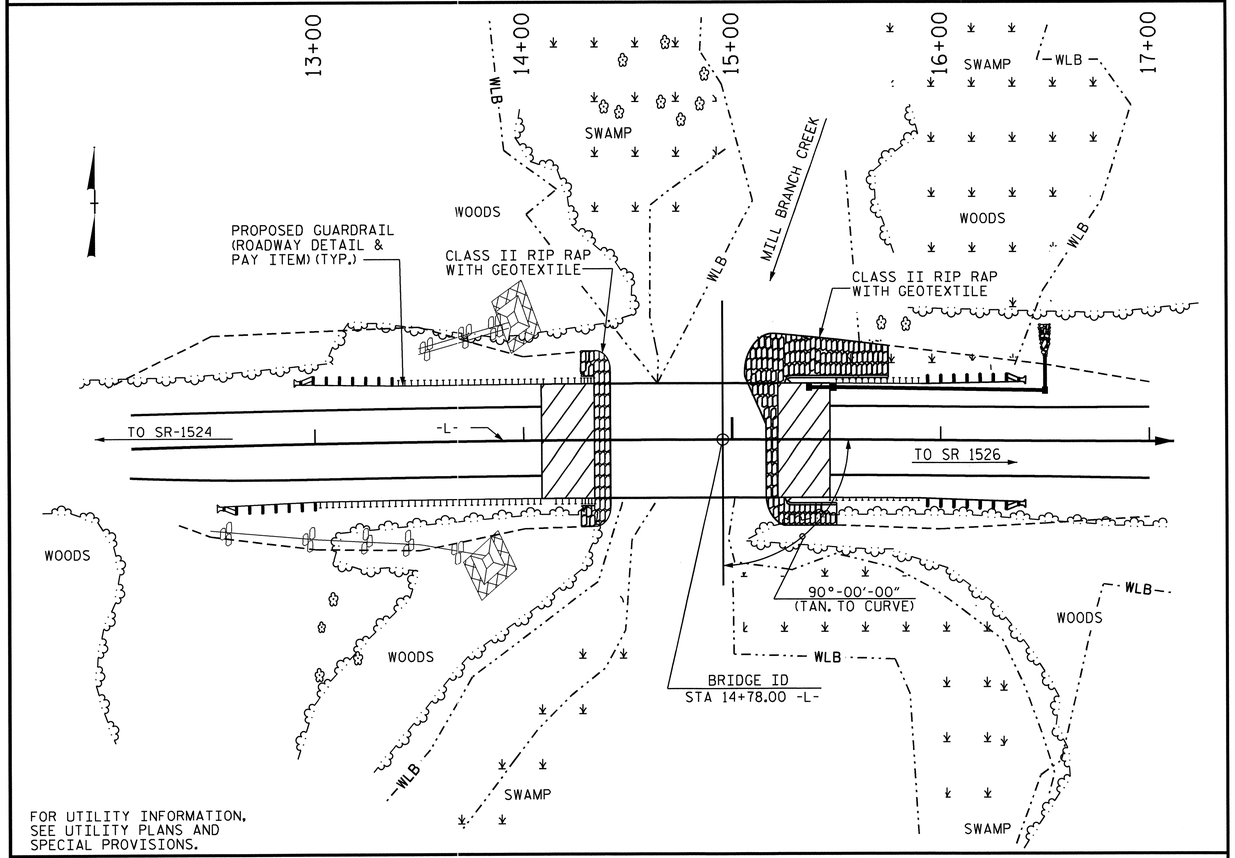
tcoggins

BENCHMARK #2: RAILROAD SPIKE IN BASE OF 15" BIRCH TREE, STA. 15+13.71-L-, 28.13' RIGHT, ELEV. 210.17'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE				LUMP SUM				171.50			LUMP SUM	15	1,286.25
END BENT NO. 1		LUMP SUM	22.6		3,915	7	285		80	90			
END BENT NO. 2		LUMP SUM	22.4		3,907	7	215		165	185			
TOTAL	LUMP SUM	LUMP SUM	45.0	LUMP SUM	7,822	14	500	171.50	245	275	LUMP SUM	15	1,286.25

HYDRAULIC DATA

DESIGN DISCHARGE	=	790 c.f.s
FREQUENCY OF DESIGN FLOOD	=	25 YEARS
DESIGN HIGH WATER ELEVATION	=	210.15'
DRAINAGE AREA	=	1.88 SQ. MI.
BASE DISCHARGE (Q100)	=	1130 c.f.s.
BASE HIGH WATER ELEVATION	=	211.00'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	=	1497 c.f.s.
FREQUENCY OF OVERTOPPING FLOOD	=	500 YEARS
OVERTOPPING FLOOD ELEVATION	=	212.88'

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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 EXISTING STRUCTURE CONSISTS OF 2 SPANS @ 17'-9", FOR A TOTAL LENGTH OF 35'-6", CLEAR ROADWAY WIDTH OF 24'-0", A REINFORCED CONCRETE FLOOR WITH ASPHALT WEARING SURFACE ON TIMBER JOISTS. END BENT #1 AND BENT #1 ARE CONSTRUCTED OF TIMBER CAPS AND PILES. END BENT #2 IS CONSTRUCTED OF H-CAPS AND H-PILES AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 30 FT EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTIING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

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

THIS BRIDGE IS LOCATED IN SESMIC ZONE 1.

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1525
OVER MILL BRANCH CREEK
BETWEEN SR 1524 AND SR 1526

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

DRAWN BY : M.D.PISO DATE : 10-04-12
CHECKED BY : P.PARISI DATE : 11-01-12

12-FEB-2013 15:55
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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	1.04	--	1.75	0.27	1.21	A	EL	42.125	0.506	1.19	A	EL	8.425	0.80	0.27	1.04	A	EL	42.125	
		HL-93(Opr)	N/A	--	1.54	--	1.35	0.27	1.57	A	EL	42.125	0.506	1.54	A	EL	8.425	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.40	50.224	1.75	0.27	1.63	A	EL	42.125	0.506	1.54	A	EL	8.425	0.80	0.27	1.40	A	EL	42.125	
		HS-20(Opr)	36.000	--	2.00	71.890	1.35	0.27	2.11	A	EL	42.125	0.506	2.00	A	EL	8.425	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.23	43.637	1.40	0.27	4.72	A	EL	42.125	0.506	4.66	A	EL	8.425	0.80	0.27	3.23	A	EL	42.125	
		SNGARBS2	20.000	--	2.37	47.457	1.40	0.27	3.46	A	EL	42.125	0.506	3.29	A	EL	8.425	0.80	0.27	2.37	A	EL	42.125	
		SNAGRIS2	22.000	--	2.23	49.112	1.40	0.27	3.26	A	EL	42.125	0.506	3.04	A	EL	8.425	0.80	0.27	2.23	A	EL	42.125	
		SNCOTTS3	27.250	--	1.61	43.803	1.40	0.27	2.34	A	EL	42.125	0.506	2.33	A	EL	8.425	0.80	0.27	1.61	A	EL	42.125	
		SNAGGRS4	34.925	--	1.33	46.433	1.40	0.27	1.94	A	EL	42.125	0.506	1.91	A	EL	8.425	0.80	0.27	1.33	A	EL	42.125	
		SNS5A	35.550	--	1.30	46.252	1.40	0.27	1.90	A	EL	42.125	0.506	1.93	A	EL	8.425	0.80	0.27	1.30	A	EL	42.125	
		SNS6A	39.950	--	1.19	47.461	1.40	0.27	1.73	A	EL	42.125	0.506	1.75	A	EL	8.425	0.80	0.27	1.19	A	EL	42.125	
		SNS7B	42.000	--	1.13	47.508	1.40	0.27	1.65	A	EL	42.125	0.506	1.71	A	EL	8.425	0.80	0.27	1.13	A	EL	42.125	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.45	47.753	1.40	0.27	2.11	A	EL	42.125	0.506	2.09	A	EL	8.425	0.80	0.27	1.45	A	EL	42.125	
		TNT4A	33.075	--	1.45	48.021	1.40	0.27	2.12	A	EL	42.125	0.506	2.04	A	EL	8.425	0.80	0.27	1.45	A	EL	42.125	
		TNT6A	41.600	--	1.18	49.159	1.40	0.27	1.72	A	EL	42.125	0.506	1.81	A	EL	8.425	0.80	0.27	1.18	A	EL	42.125	
		TNT7A	42.000	--	1.19	49.760	1.40	0.27	1.73	A	EL	42.125	0.506	1.77	A	EL	8.425	0.80	0.27	1.18	A	EL	42.125	
		TNT7B	42.000	--	1.22	51.183	1.40	0.27	1.78	A	EL	42.125	0.506	1.68	A	EL	8.425	0.80	0.27	1.22	A	EL	42.125	
		TNAGRIT4	43.000	--	1.16	50.073	1.40	0.27	1.70	A	EL	42.125	0.506	1.63	A	EL	8.425	0.80	0.27	1.16	A	EL	42.125	
		TNAGT5A	45.000	--	1.10	49.519	1.40	0.27	1.61	A	EL	42.125	0.506	1.61	A	EL	8.425	0.80	0.27	1.10	A	EL	42.125	
		TNAGT5B	45.000	3	1.09	49.019	1.40	0.27	1.59	A	EL	42.125	0.506	1.55	A	EL	8.425	0.80	0.27	1.09	A	EL	42.125	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

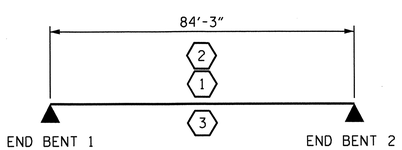
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE BOX BEAM (NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY X. GOGGINS
02/12/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			20

STR. 1 STD. NO. LRFR1

ASSEMBLED BY : Neal M. Ruffin DATE : 5/31/12
CHECKED BY : B.L. GREEN DATE : 7/30/12
DESIGN ENGINEER OF RECORD FRANCISCO GUZMAN DATE : 8/3/11

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

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

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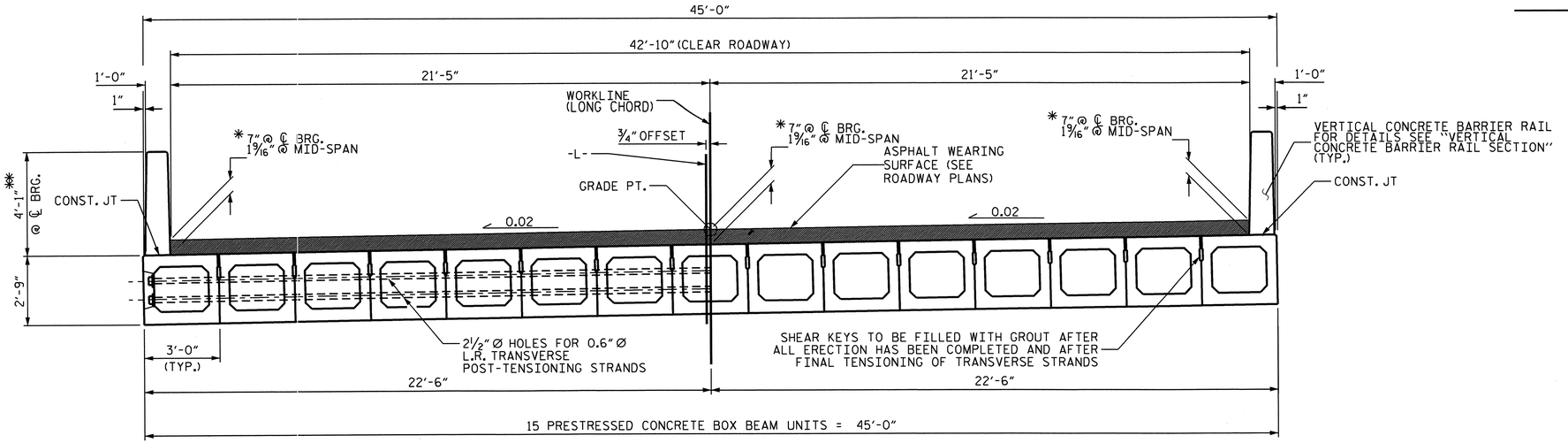


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

* BASED ON PREDICTED FINAL CAMBER AND THEORETICAL GRADE LINE ELEVATIONS

** THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

NOTES

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

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

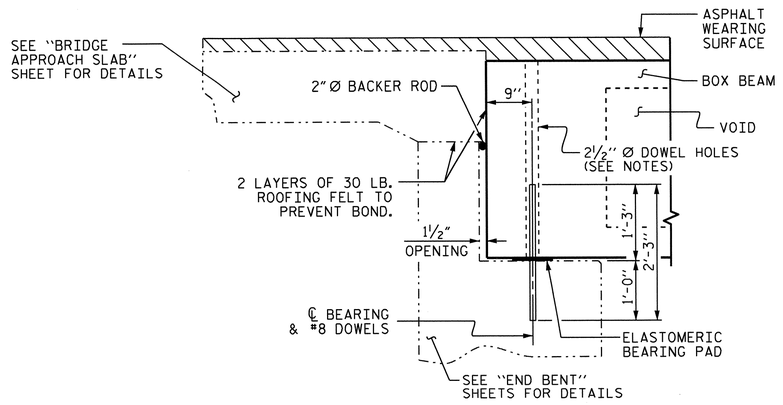
APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL 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. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FIXED END



SECTION AT END BENT

ASSEMBLED BY : Neil M. Raffin — DATE : 5/31/12
CHECKED BY : B.L. GREEN — DATE : 7/30/12
DESIGN ENGINEER OF RECORD : F. GUZMAN — DATE : 8/3/11

DRAWN BY : TLA 5/05
CHECKED BY : GM 6/05

ADDED 7/11/05R
REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM

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tcoggins

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-

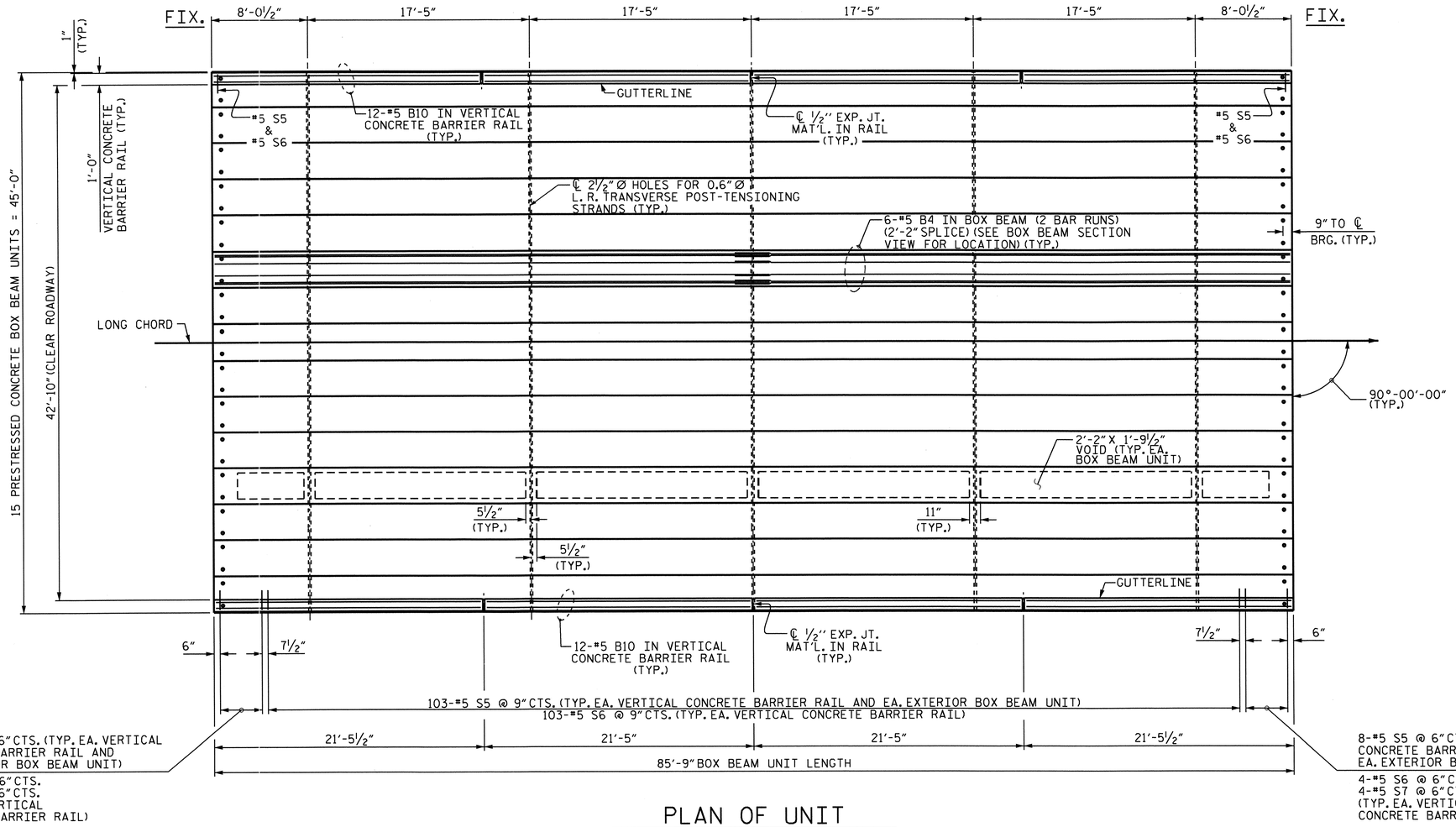
SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

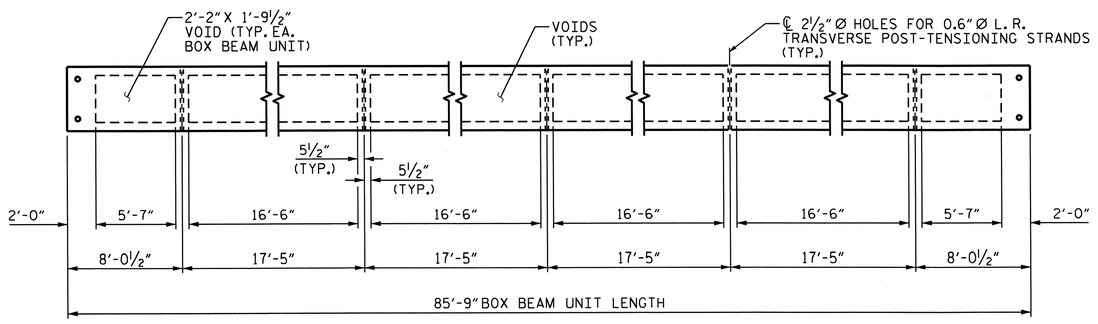
3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			20

STR. 1



PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			20

STR. 1

DRAWN BY : N. Ruffin DATE : 7/16/12
CHECKED BY : B.L. GREEN DATE : 7/30/12
DESIGN ENGINEER OF RECORD : F. GUZMAN DATE : 8/3/11

08-JAN-2013 10:29
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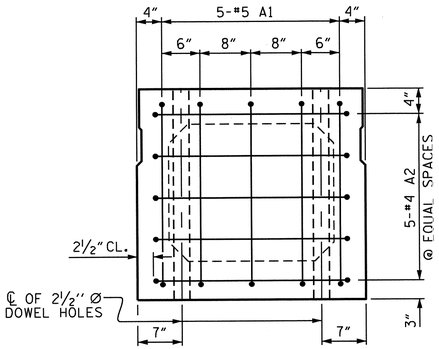
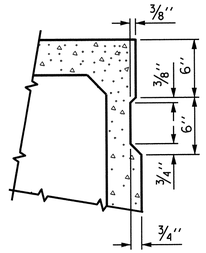


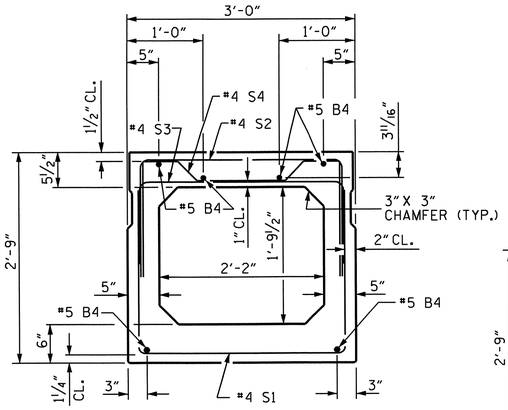
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS
AND LOCATION OF DOWEL HOLES.
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR
SECTION SIMILAR EXCEPT SHEAR KEY LOCATION.
STRAND LAYOUT NOT SHOWN.)



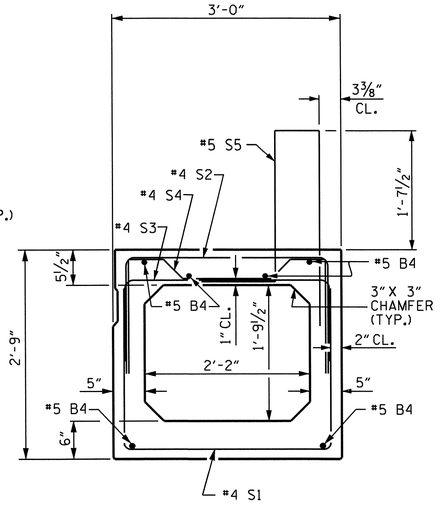
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE
OF EXTERIOR BOX BEAMS.



INTERIOR BOX BEAM SECTION

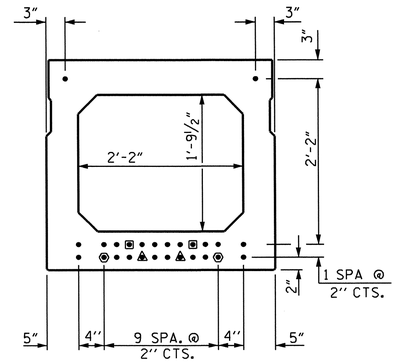
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

(26 STRANDS REQUIRED)

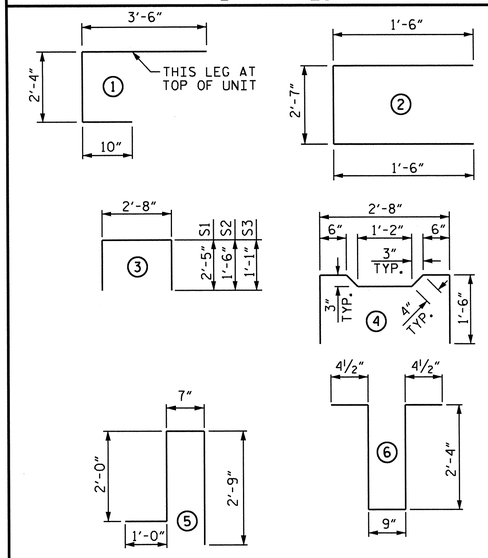
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.

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

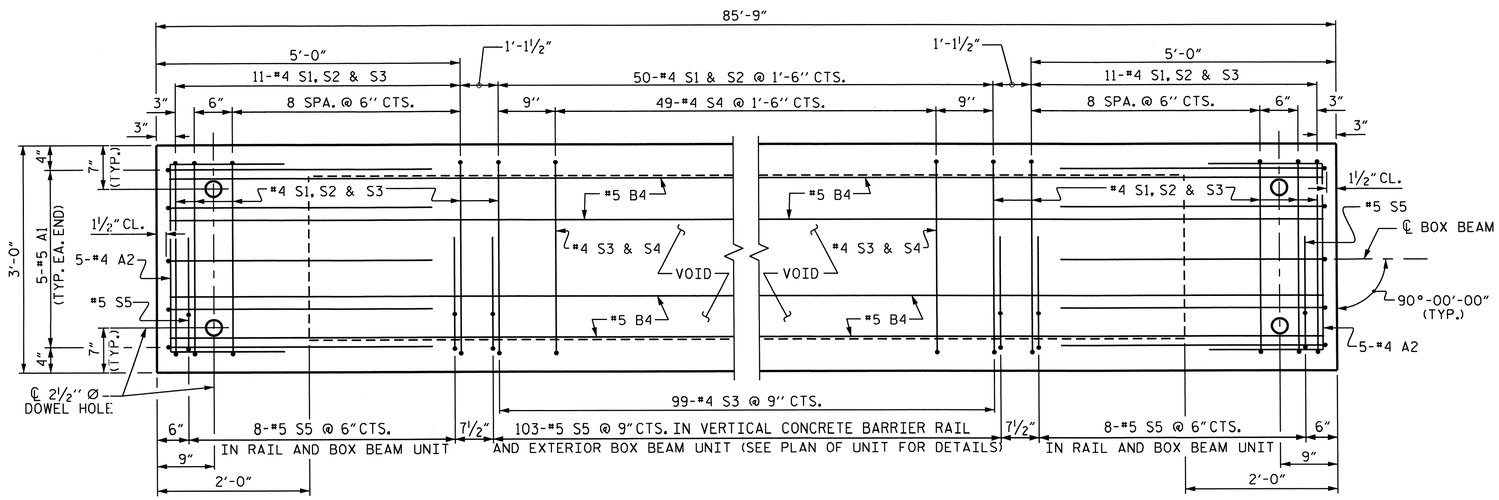
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE BOX BEAM SECTION

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	40	#4	2	5'-7"	149	5'-7"	149
B4	12	#5	STR	43'-10"	549	43'-10"	549
K1	15	#4	6	6'-2"	62	6'-2"	62
K2	10	#4	STR	2'-7"	17	2'-7"	17
S1	72	#4	3	7'-6"	361	7'-6"	361
S2	72	#4	3	5'-8"	273	5'-8"	273
S3	121	#4	3	4'-10"	391	4'-10"	391
S4	49	#4	4	5'-10"	191	5'-10"	191
✱ S5	119	#5	5	6'-4"	786	--	--
REINFORCING STEEL					2063 LBS.		2063 LBS.
✱ EPOXY COATED REINF. STEEL					786 LBS.		
6500 P.S.I. CONCRETE					15.3 CU. YDS.		15.2 CU. YDS.
0.6" Ø L.R. STRANDS					No. 26		No. 26



PLAN OF BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS.
FOR LOCATION OF DIAPHRAGMS, SEE PLAN OF UNIT.
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS.

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
SPAN "A"

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY J. COGGINS
02/12/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			20

ASSEMBLED BY : N. Ruffin		DATE : 7/16/12
CHECKED BY : B.L. GREEN		DATE : 7/30/12
DESIGN ENGINEER OF RECORD : F. GUZMAN		DATE : 8/3/11
DRAWN BY : TLA 5/05	ADDED 7/11/05	
CHECKED BY : GM 6/05	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

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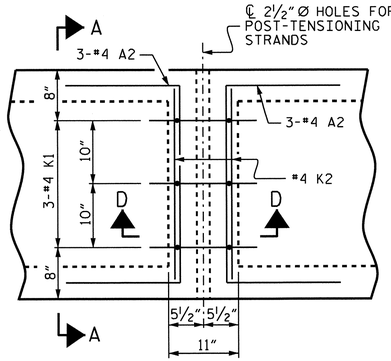
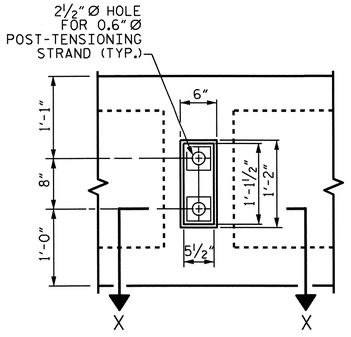
STR. 1 (SHT 1C) STD. NO. PCBB4

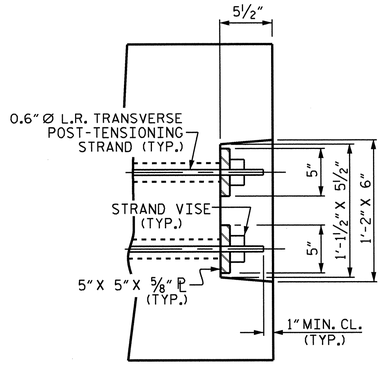


PLAN

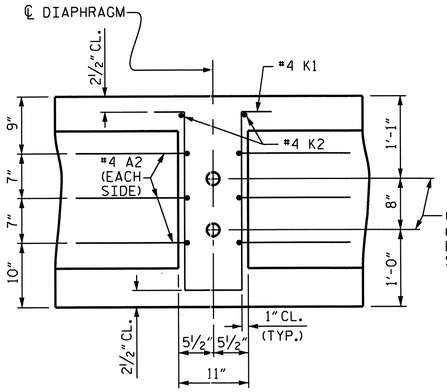


VIEW Y-Y

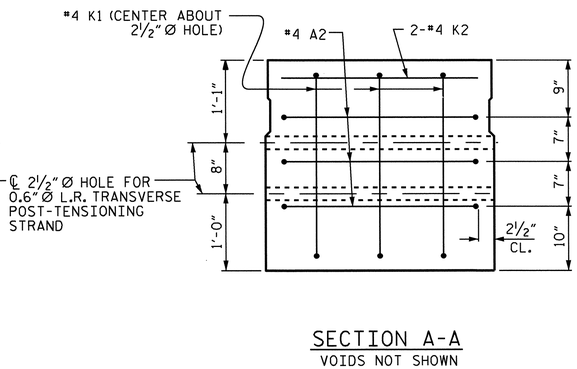
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"

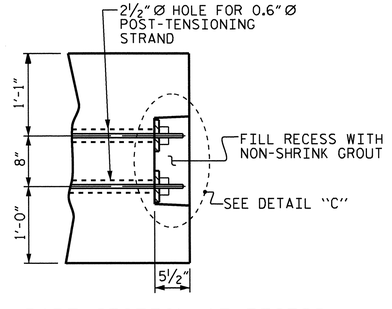


SECTION D-D

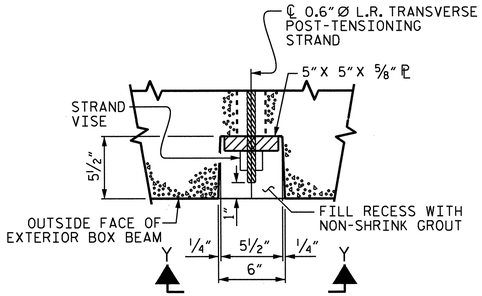


SECTION A-A

VOIDS NOT SHOWN



PART SECTION AT RECESS



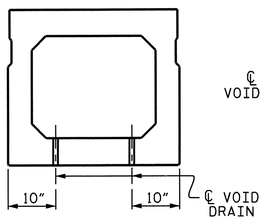
SECTION X-X

SHOWING PLAN VIEW OF GROUTED RECESS

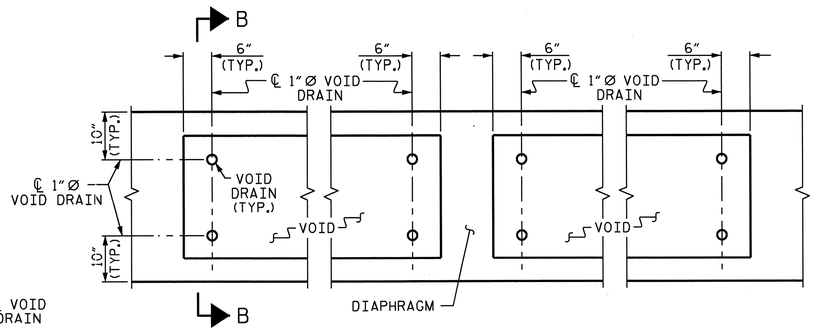
GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2½" Ø HOLE.



SECTION B-B



PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 2'-9"
85'-9" BOX BEAM UNIT	0.6"Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	3 15/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1" ↓
FINAL CAMBER	2 15/16" ↑

** INCLUDES FUTURE WEARING SURFACE

ASSEMBLED BY : N. Ruffin		DATE : 7/16/12	
CHECKED BY : B.L. GREEN		DATE : 7/30/12	
DESIGN ENGINEER OF RECORD : F. GUZMAN		DATE : 8/3/11	
DRAWN BY : TLA 5/05	ADDED 7/11/05		
CHECKED BY : GM 6/05	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

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tcoggins

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

SHEET 4 OF 5

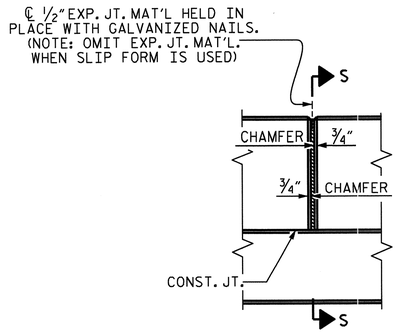
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

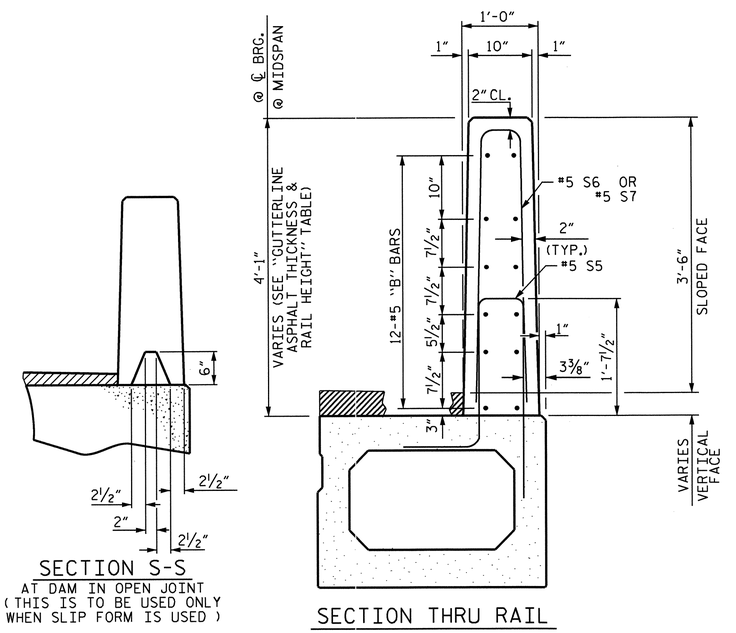
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			20

STR. 1 (SHT 1) STD. NO. PCBB5



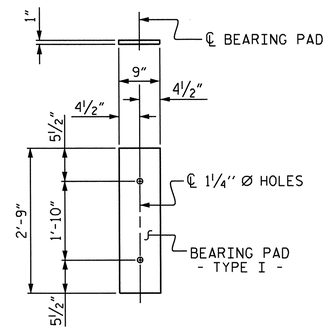
ELEVATION AT EXPANSION JOINTS



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

SECTION THRU RAIL

VERTICAL CONCRETE BARRIER RAIL DETAILS



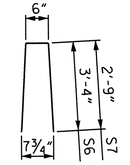
FIXED END
(TYPE I - 30 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	85'-9"	171'-6"
INTERIOR B.B.	13	85'-9"	1114'-9"
TOTAL	15	———	1286'-3"



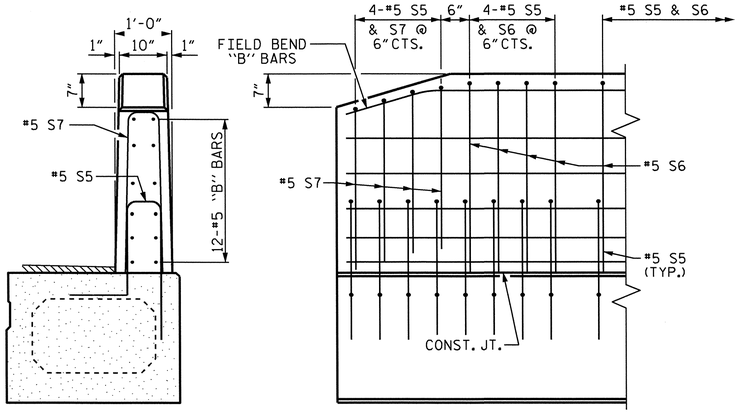
BAR TYPE
BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	85'-9" UNIT				
*B10	96	#5	STR	21'-0"	2103
* S6	222	#5	1	7'-2"	1659
* S7	16	#5	1	6'-0"	100
*EPOXY COATED REINFORCING STEEL			LBS.		3862
CLASS AA CONCRETE			CU.YDS.		21.5
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN. FT.		171.5

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
85'-9" UNITS	1 9/16"	3'-8"



END VIEW

SIDE VIEW

END OF BARRIER RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY E. COGGINS
02/12/13

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			20

STR. 1

STD. NO. PCBB8

ASSEMBLED BY : N Raffin		DATE : 7/16/12
CHECKED BY : B.L. GREEN		DATE : 7/30/12
DESIGN ENGINEER OF RECORD : F. GUZMAN		DATE : 8/3/11
DRAWN BY : TLA 5/05	REV. 5/1/06RR	TLA/GM
CHECKED BY : GM 6/05	REV. 10/1/11	MAA/GM
	REV. 10/12	MAA/GM

08-JAN-2013 10:29
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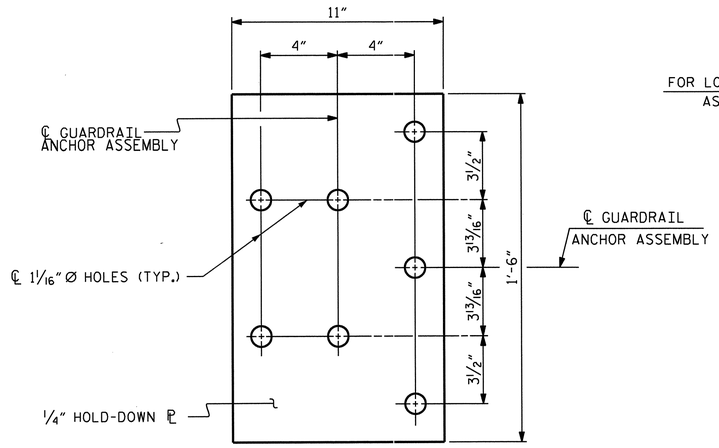
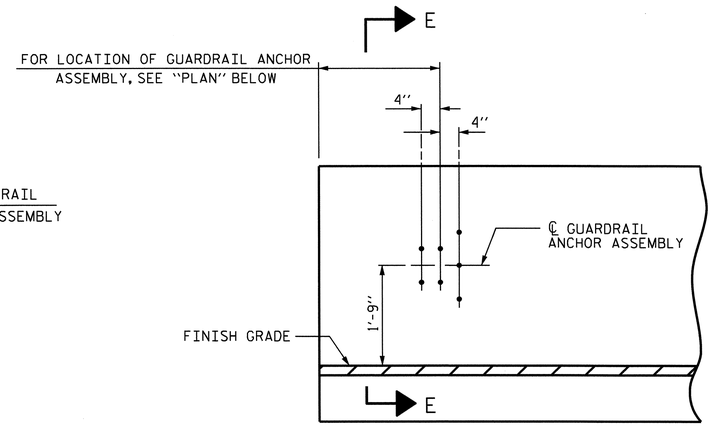
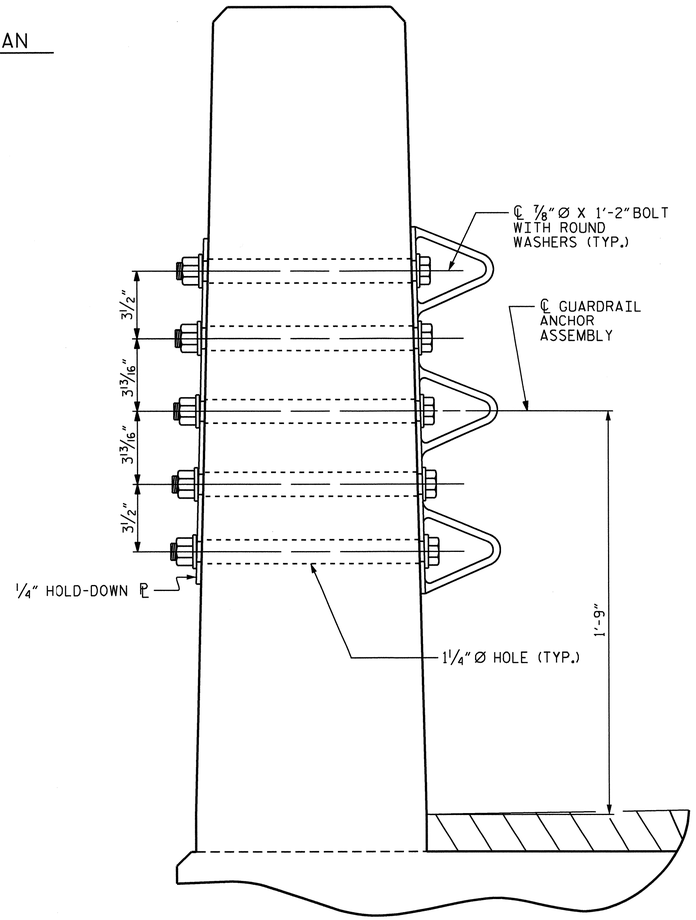
tcoggins



PLAN

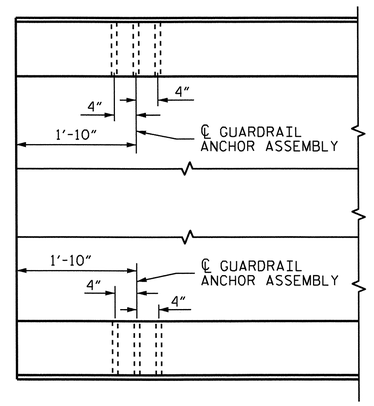


ELEVATION



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 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.

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 VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.

SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

ASSEMBLED BY : N. Ruffin		DATE : 7/16/12	
CHECKED BY : B.L. GREEN		DATE : 7/30/12	
DESIGN ENGINEER OF RECORD : F. GUZMAN		DATE : 8/3/11	
DRAWN BY : MAA 5/10	ADDED 5/6/10		
CHECKED BY : GM 5/10	REV. 10/1/11	MAA/GM	
	REV. 12/5/11	MAA/GM	

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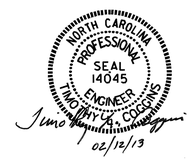
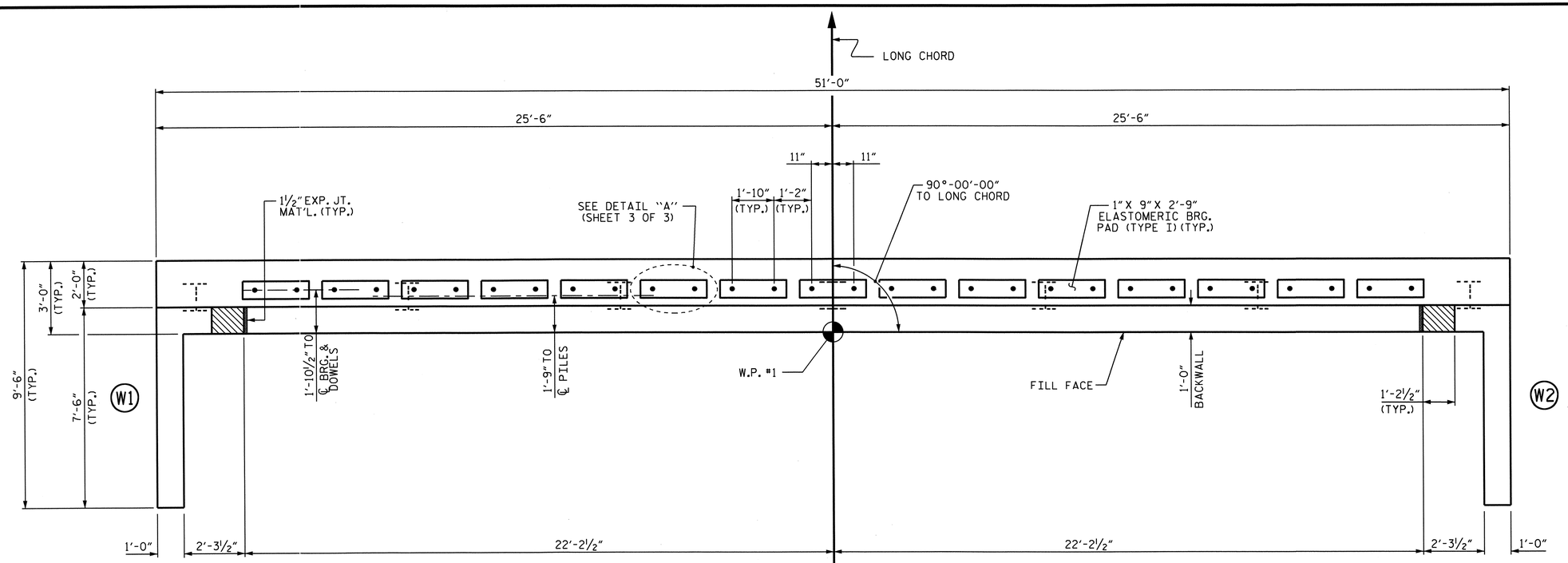


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

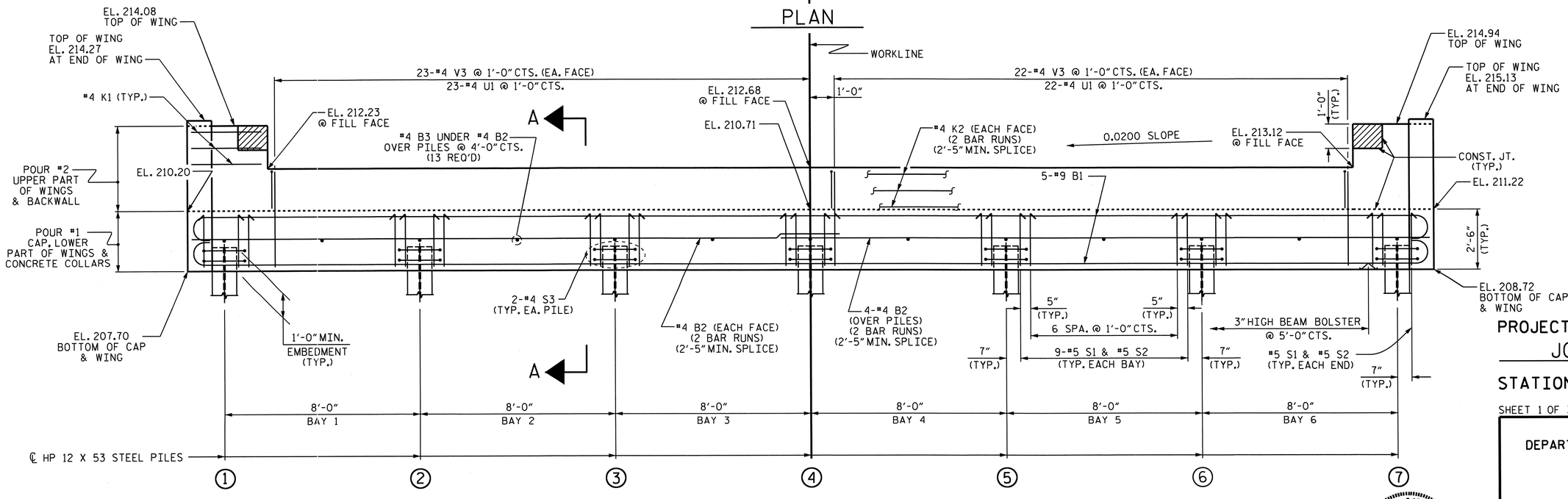
STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			20

STR. 1 (SHT 1) STD. NO. GRA3



PLAN



ELEVATION

FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

TOP OF PILE ELEVATIONS

1	208.74
2	208.90
3	209.06
4	209.22
5	209.38
6	209.54
7	209.70

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY W. COGGINS
02/12/13

ASSEMBLED BY :	N. RUFFIN	DATE :	7/24/12
CHECKED BY :	B.L. GREEN	DATE :	7/30/12
DESIGN ENGINEER OF RECORD :	F. GUZMAN	DATE :	8/3/11
DRAWN BY :	DGE 02/10		
CHECKED BY :	MKT 02/10		

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			20

STR 1

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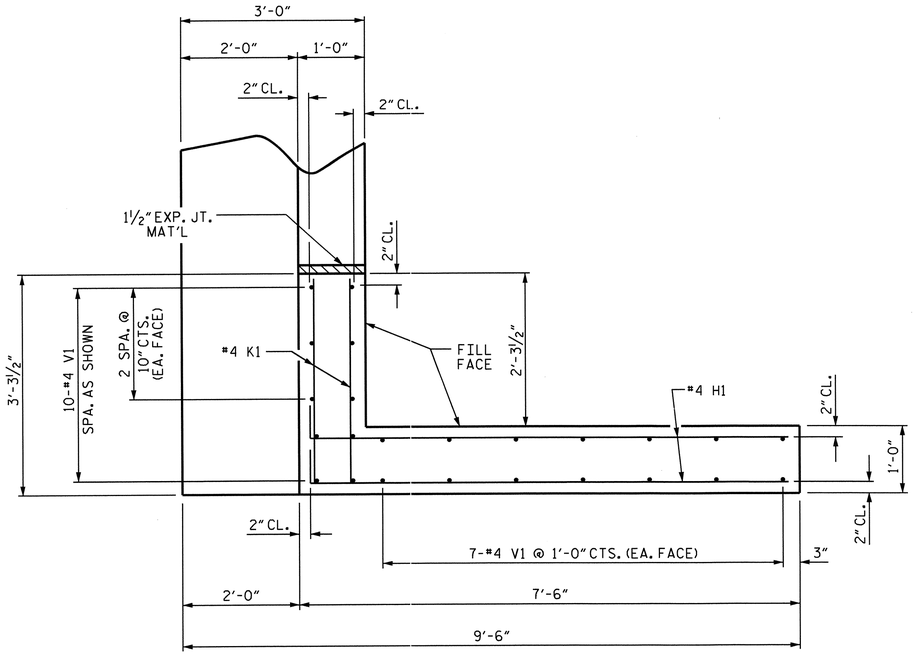
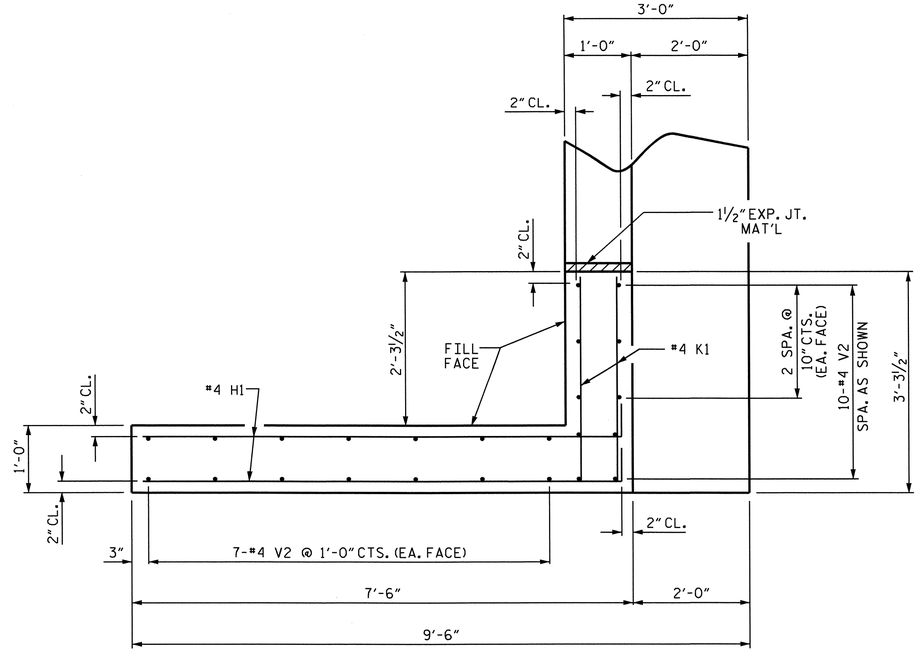
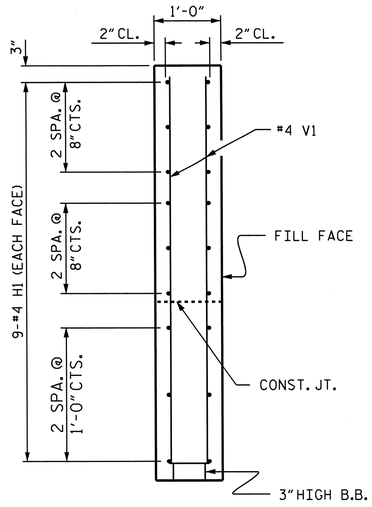


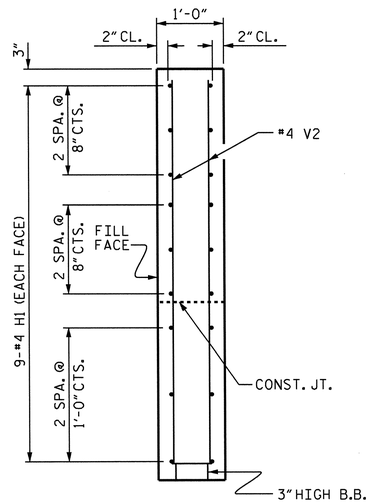
PLAN OF WING (W1)



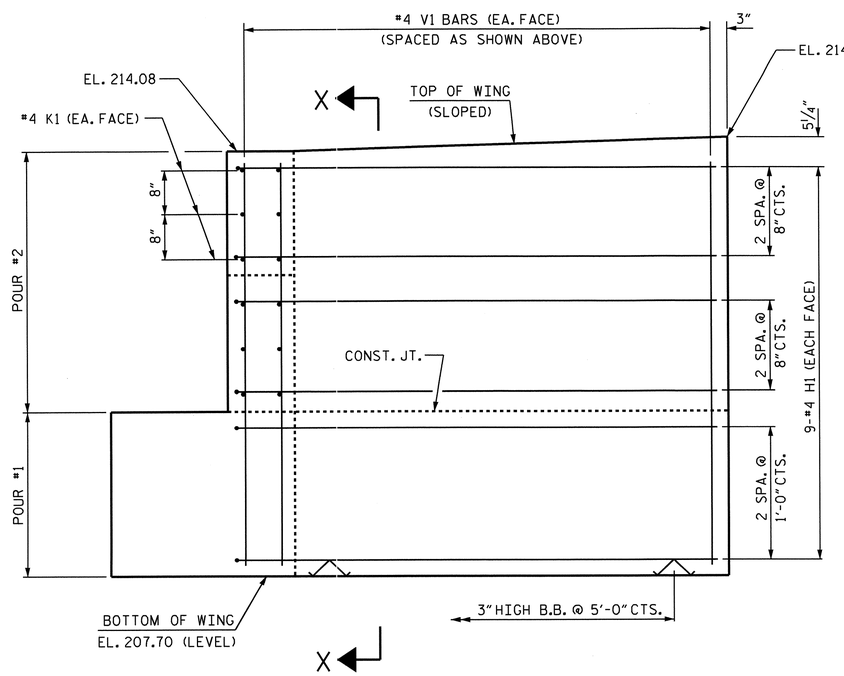
PLAN OF WING (W2)



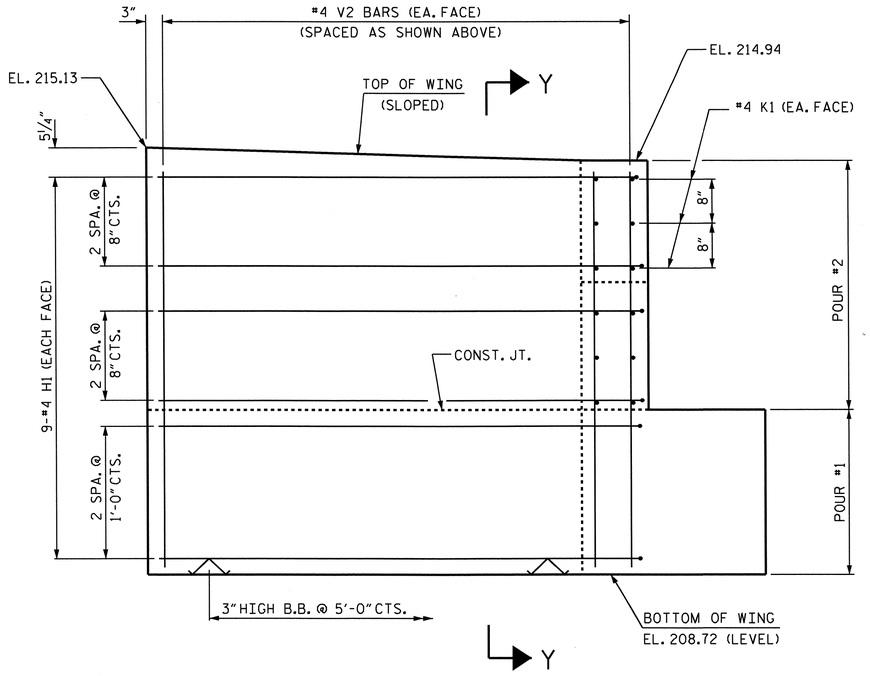
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY :	N. RUFFIN	DATE : 7/24/12
CHECKED BY :	B.L. GREEN	DATE : 7/30/12
DESIGN ENGINEER OF RECORD :	F. GUZMAN	DATE : 8/3/11
DRAWN BY : DGE 02/10		
CHECKED BY : MKT 02/10		

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NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY W. COGGINS
02/12/13

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-

SHEET 2 OF 3

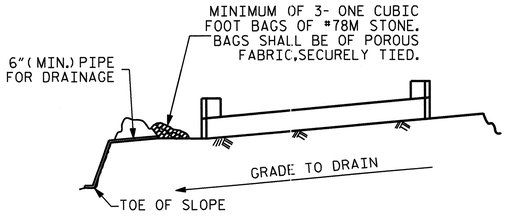
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No.1
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			20

STR 1

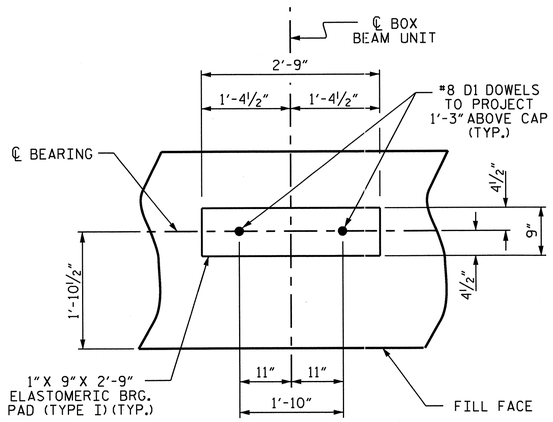


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

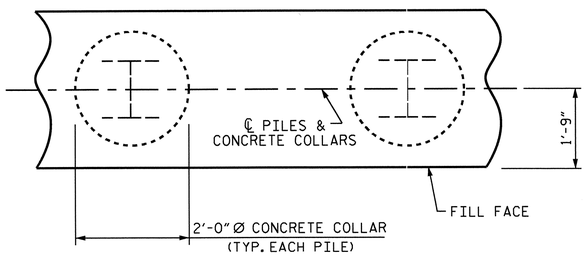
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

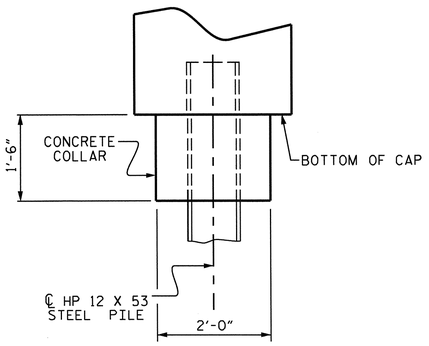


DETAIL "A"

(END BENT No. 1 SHOWN)

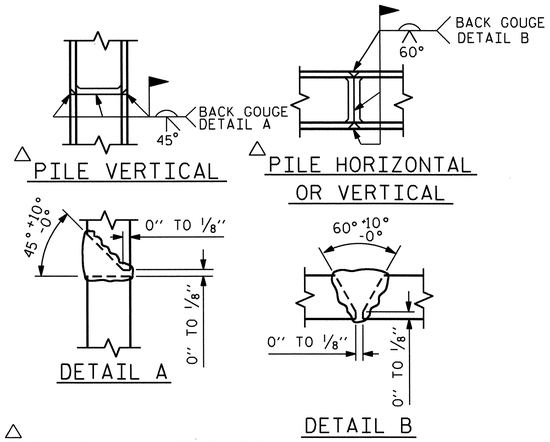


PLAN



ELEVATION

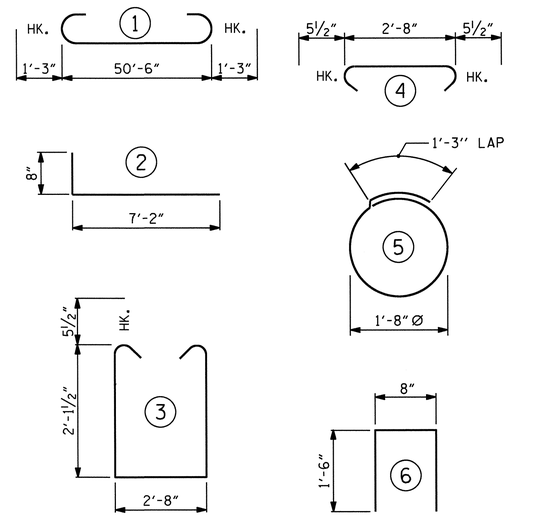
CORROSION PROTECTION FOR STEEL PILES DETAIL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	53'-0"	1802
B2	12	#4	STR	26'-7"	213
B3	13	#4	STR	2'-8"	23
D1	30	#8	STR	2'-3"	180
H1	36	#4	2	7'-10"	188
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	26'-7"	213
S1	56	#5	3	7'-10"	458
S2	56	#5	4	3'-7"	209
S3	14	#4	5	6'-6"	61
U1	45	#4	6	3'-8"	110
V1	24	#4	STR	6'-0"	96
V2	24	#4	STR	5'-10"	94
V3	90	#4	STR	4'-1"	245

REINFORCING STEEL 3915 LBS.

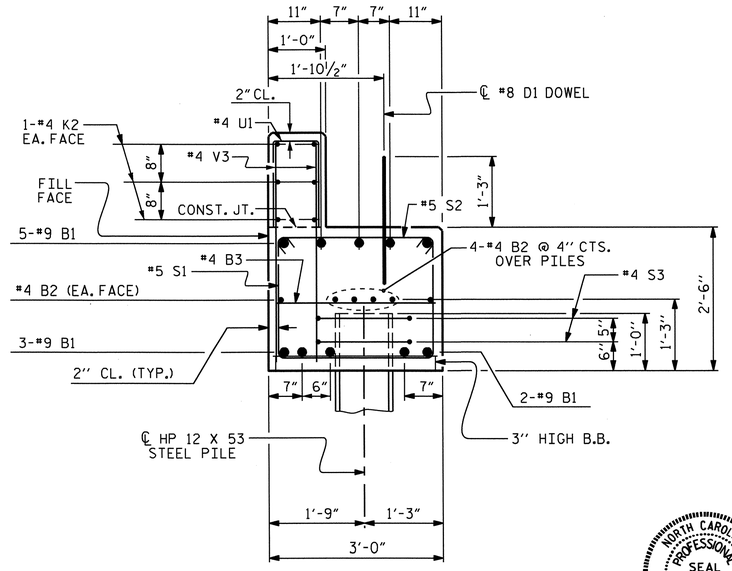
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 16.6 C.Y.

POUR #2 UPPER PART OF WINGS & BACKWALL 6.0 C.Y.

TOTAL CLASS A CONCRETE 22.6 C.Y.

END BENT No. 1
HP 12 X 53 STEEL PILES
NO: 7 LIN. FT.= 285



SECTION A-A

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY U. COGGINS
02/12/13

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			20

STR 1

ASSEMBLED BY :	N. RUFFIN	DATE : 7/24/12
CHECKED BY :	B.L. GREEN	DATE : 7/30/12
DESIGN ENGINEER OF RECORD :	F. GUZMAN	DATE : 8/3/11
DRAWN BY : DGE 02/10		
CHECKED BY : MKT 02/10		

08-JAN-2013 10:29
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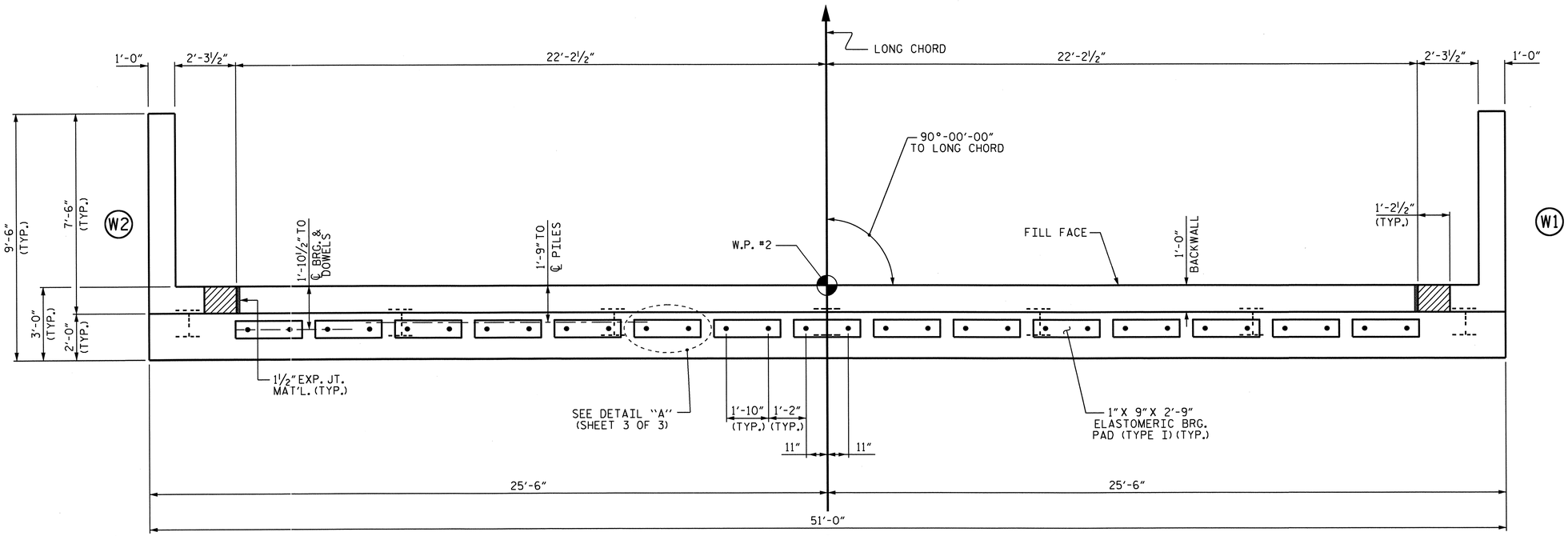
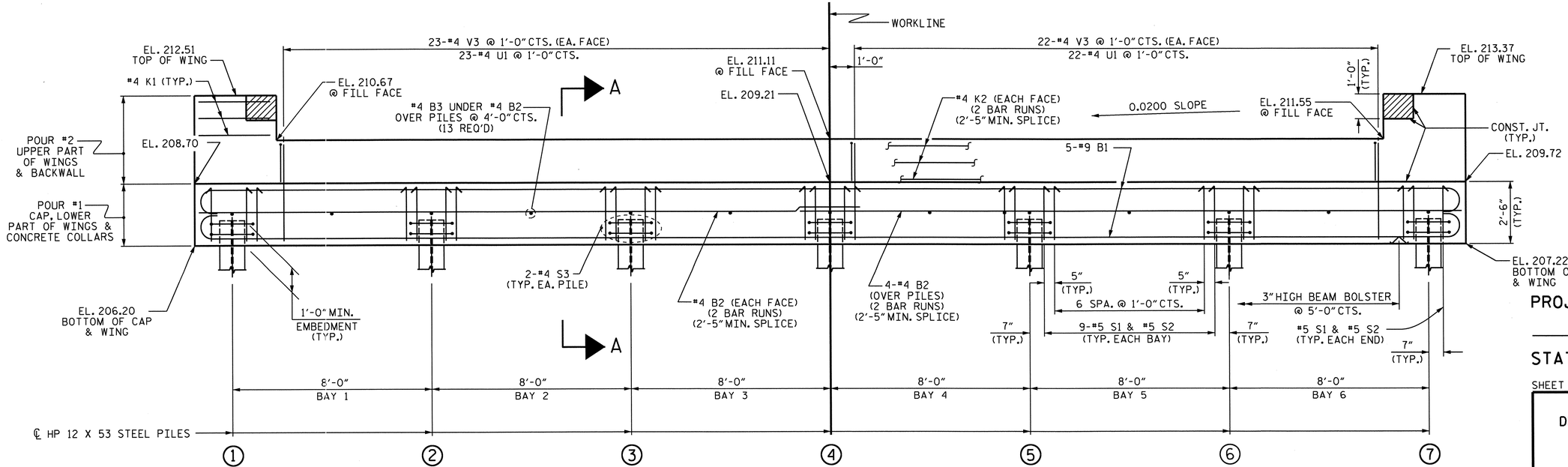
tcoggins



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

TOP OF PILE ELEVATIONS	
①	207.24
②	207.40
③	207.56
④	207.72
⑤	207.88
⑥	208.04
⑦	208.20

ASSEMBLED BY :	N. RUFFIN	DATE : 7/24/12
CHECKED BY :	B.L. GREEN	DATE : 7/30/12
DESIGN ENGINEER OF RECORD :	F. GUZMAN	DATE : 8/3/11
DRAWN BY : DGE 02/10		
CHECKED BY : MKT 02/10		

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tcoggins

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-

SHEET 1 OF 3

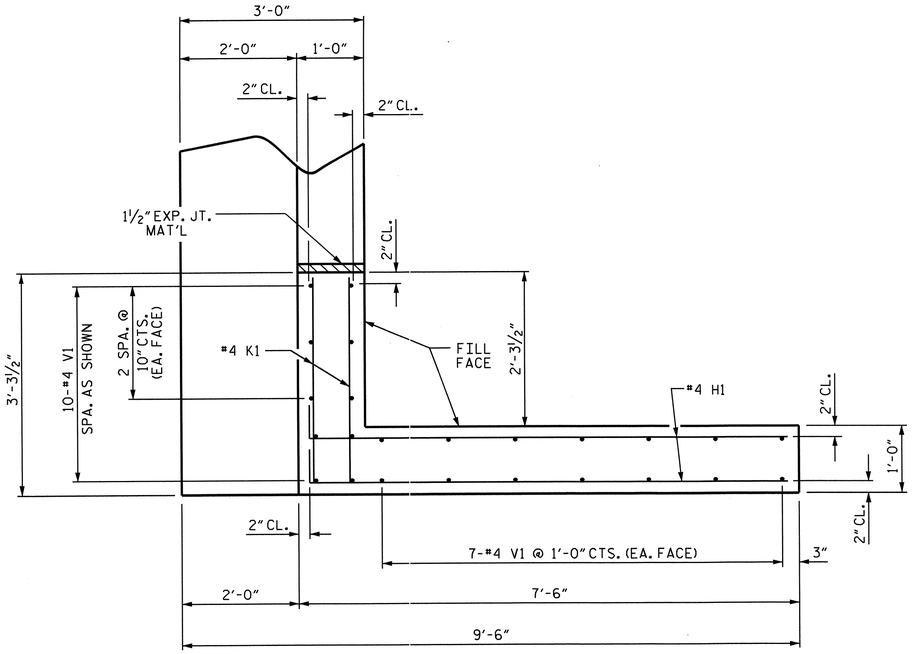
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

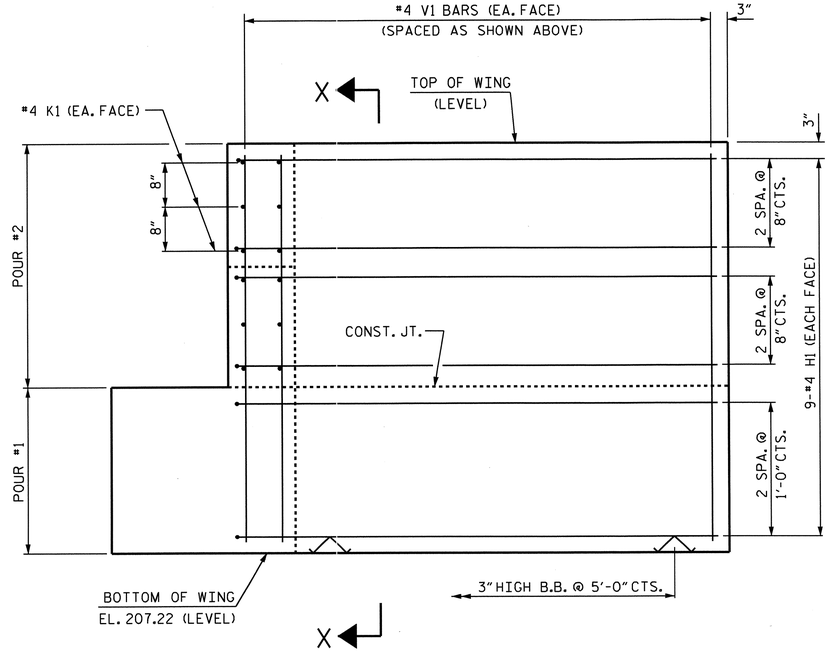
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			20

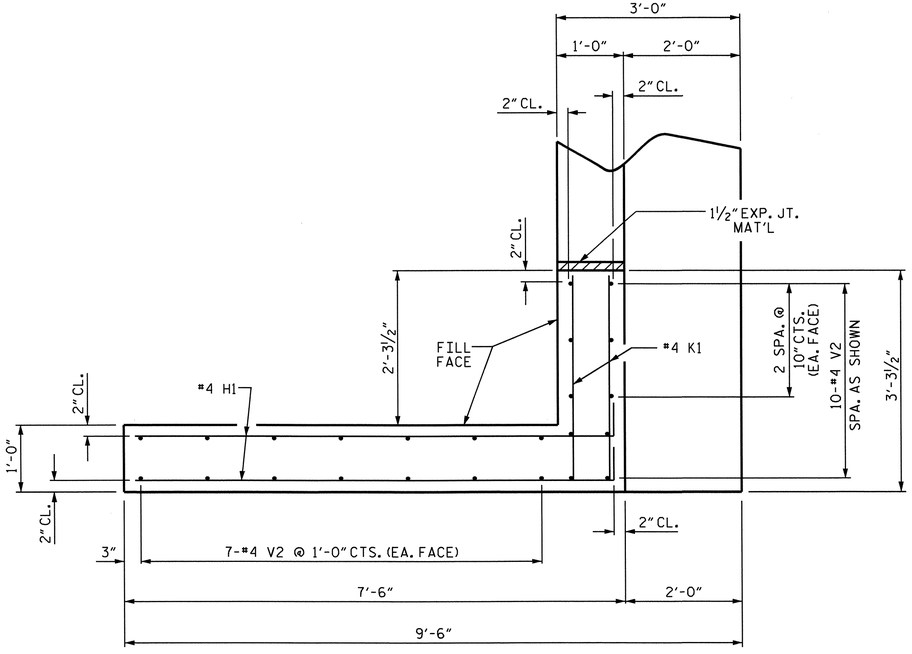
STR 1



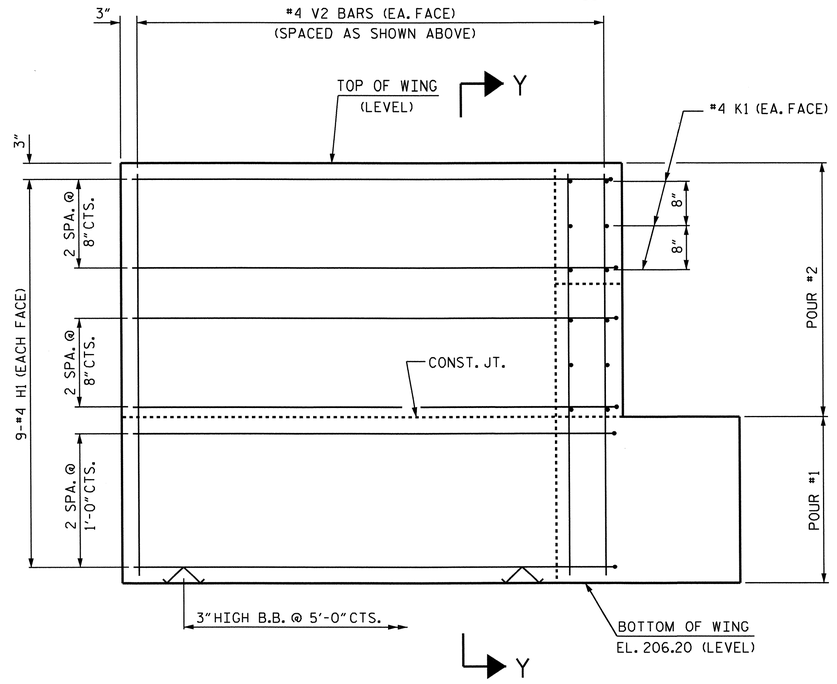
PLAN OF WING (W1)



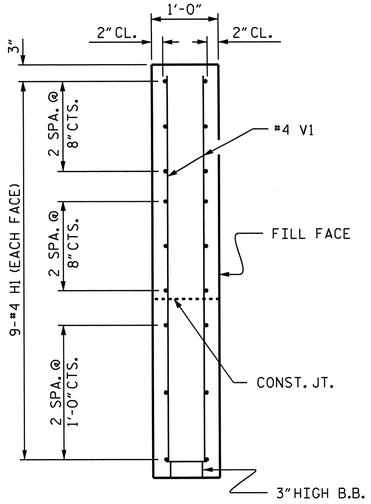
ELEVATION OF WING (W1)



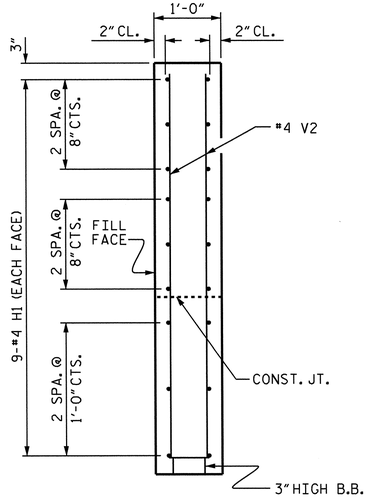
PLAN OF WING (W2)



ELEVATION OF WING (W2)



SECTION X-X



SECTION Y-Y

WING DETAILS

ASSEMBLED BY :	N. RUFFIN	DATE : 7/24/12
CHECKED BY :	B.L. GREEN	DATE : 7/30/12
DESIGN ENGINEER OF RECORD :	F. GUZMAN	DATE : 8/3/11
DRAWN BY : DGE 02/10		
CHECKED BY : MKT 02/10		

08-JAN-2013 10:29
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tcoggins

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

SHEET 2 OF 3

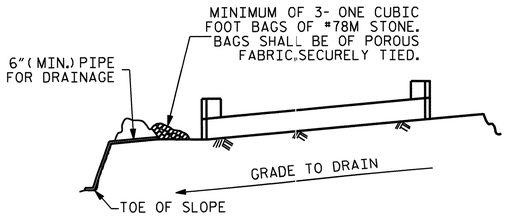
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			20

STR 1

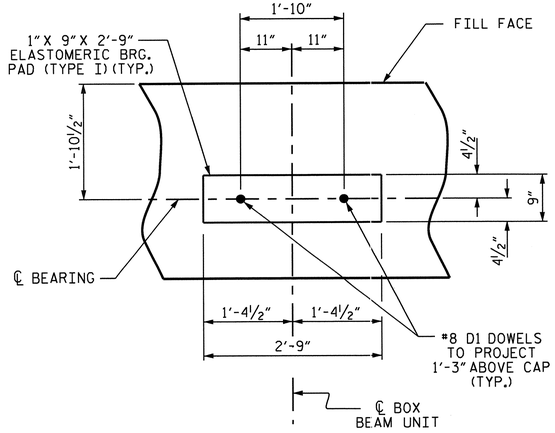


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

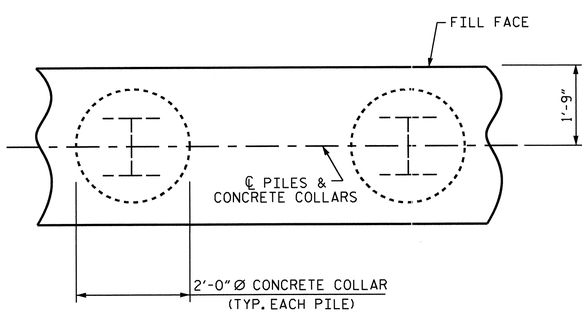
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

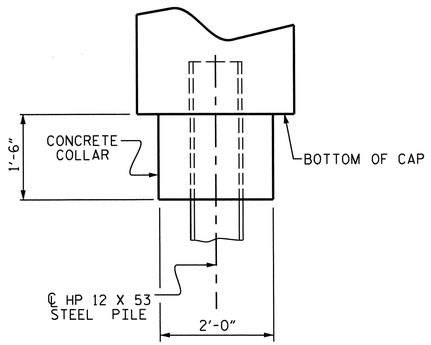


DETAIL "A"

(END BENT No. 2 SHOWN)

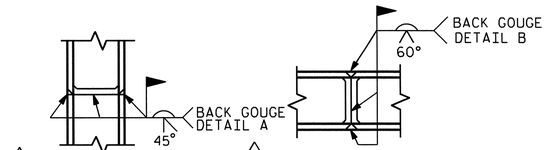


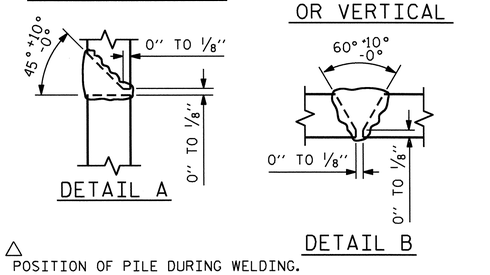
PLAN



ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

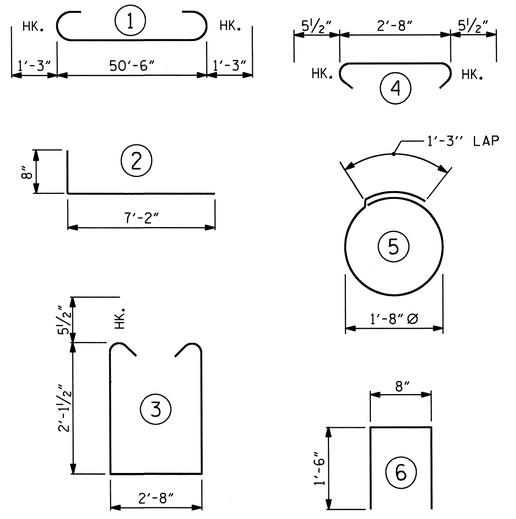




△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

FOR END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#9	1	53'-0"	1802
B2	12	#4	STR	26'-7"	213
B3	13	#4	STR	2'-8"	23
D1	30	#8	STR	2'-3"	180
H1	36	#4	2	7'-10"	188
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	26'-7"	213
S1	56	#5	3	7'-10"	458
S2	56	#5	4	3'-7"	209
S3	14	#4	5	6'-6"	61
U1	45	#4	6	3'-8"	110
V1	24	#4	STR	5'-9"	92
V2	24	#4	STR	5'-11"	95
V3	90	#4	STR	4'-0"	240

REINFORCING STEEL 3907 LBS.

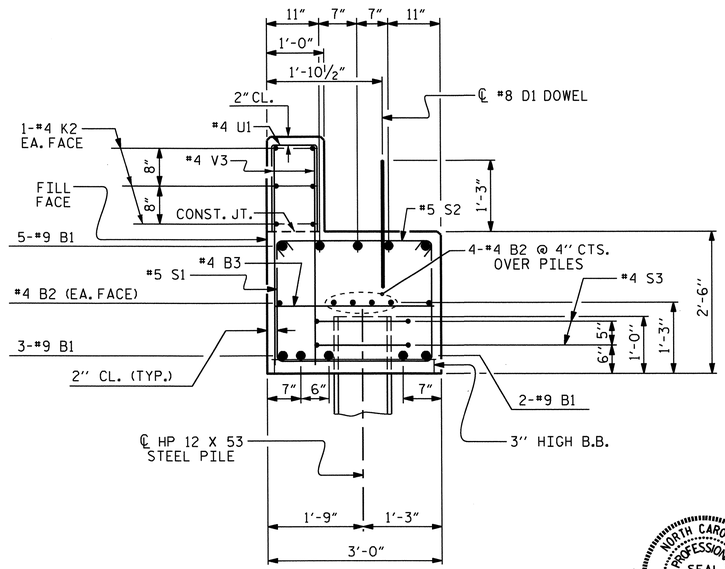
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 16.6 C.Y.

POUR #2 UPPER PART OF WINGS & BACKWALL 5.8 C.Y.

TOTAL CLASS A CONCRETE 22.4 C.Y.

END BENT No. 2
HP 12 X 53 STEEL PILES
NO: 7 LIN. FT.= 215



SECTION A-A

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY K. COGGINS
02/12/13

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			20

STR 1

ASSEMBLED BY :	N. RUFFIN	DATE : 7/24/12
CHECKED BY :	B.L. GREEN	DATE : 7/30/12
DESIGN ENGINEER OF RECORD :	F. GUZMAN	DATE : 8/3/11
DRAWN BY : DGE 02/10		
CHECKED BY : MKT 02/10		

08-JAN-2013 10:29
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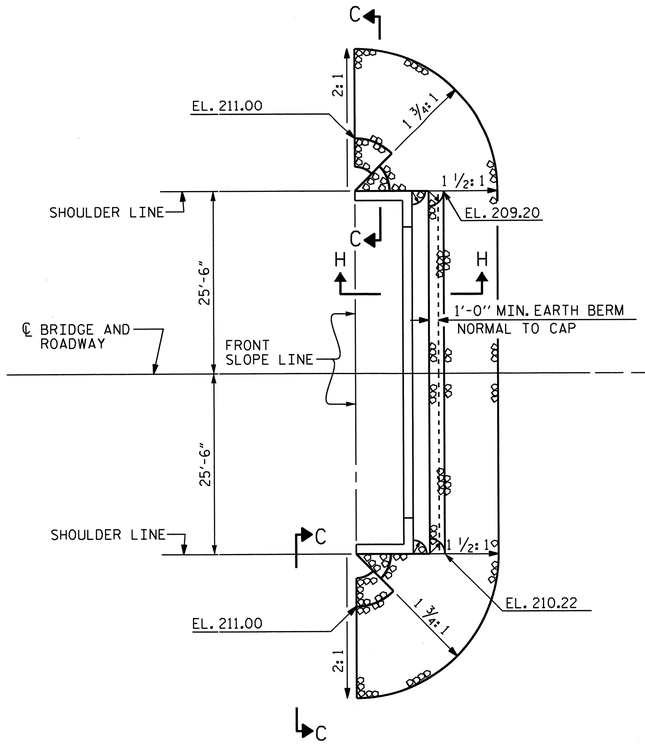
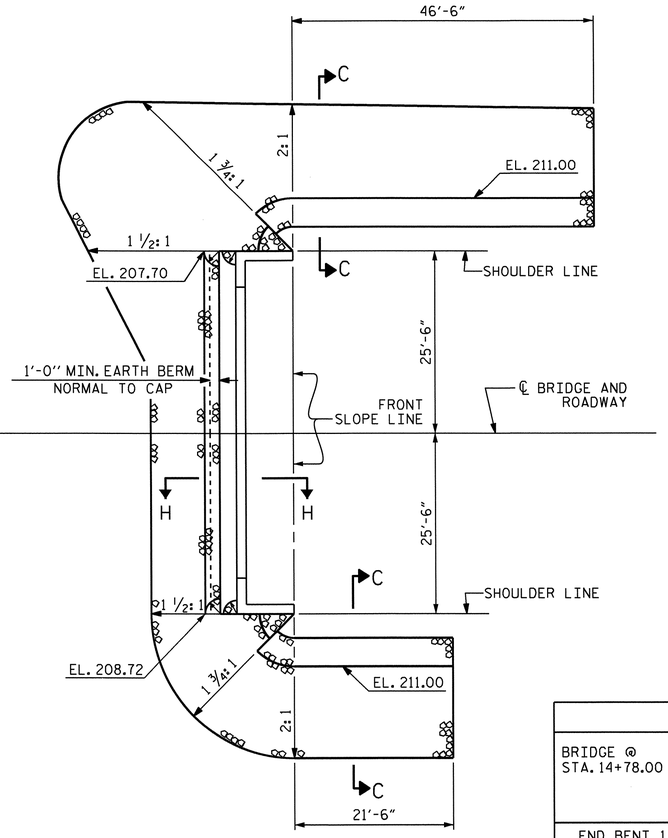




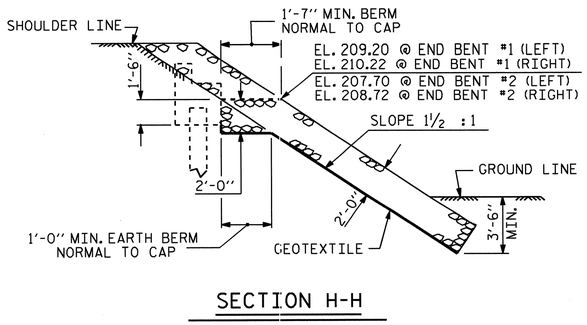
NOTES :

FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

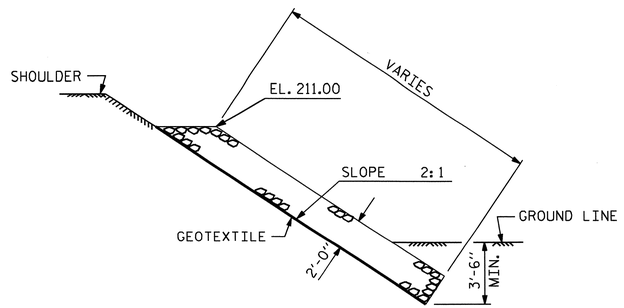
ESTIMATED QUANTITIES

BRIDGE @ STA. 14+78.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	80	90
END BENT 2	165	185

PLAN



SECTION H-H



SECTION C-C

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			20

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY L. COGGINS
02/12/13

ASSEMBLED BY : B. L. GREEN	DATE : 6/18/12		
CHECKED BY : M. D. PISO	DATE : 7/16/12		
DRAWN BY : REK 1/84	REV. 5/1/06R	TLA/GM	
CHECKED BY : RDU 1/84	REV. 10/1/11	MAA/GM	
	REV. 12/21/11	MAA/GM	

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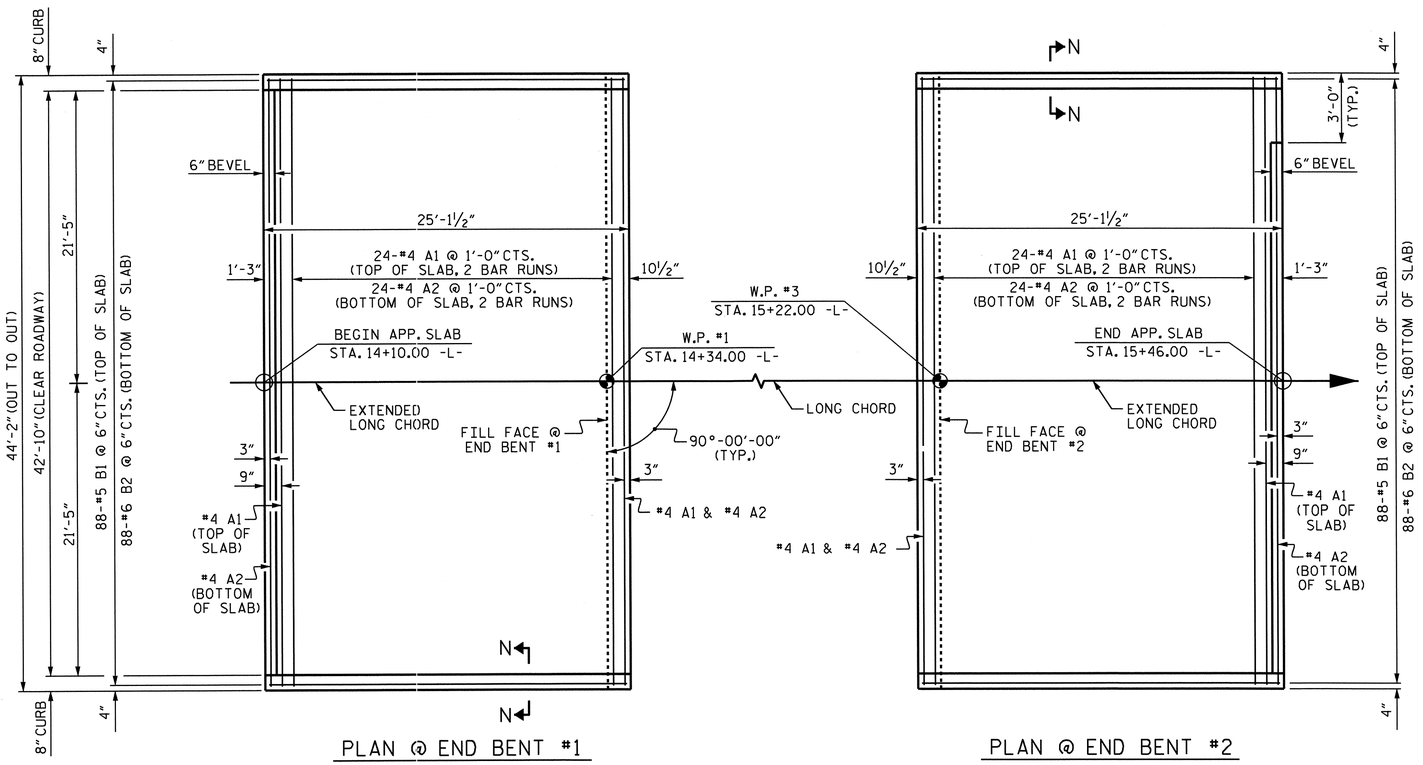
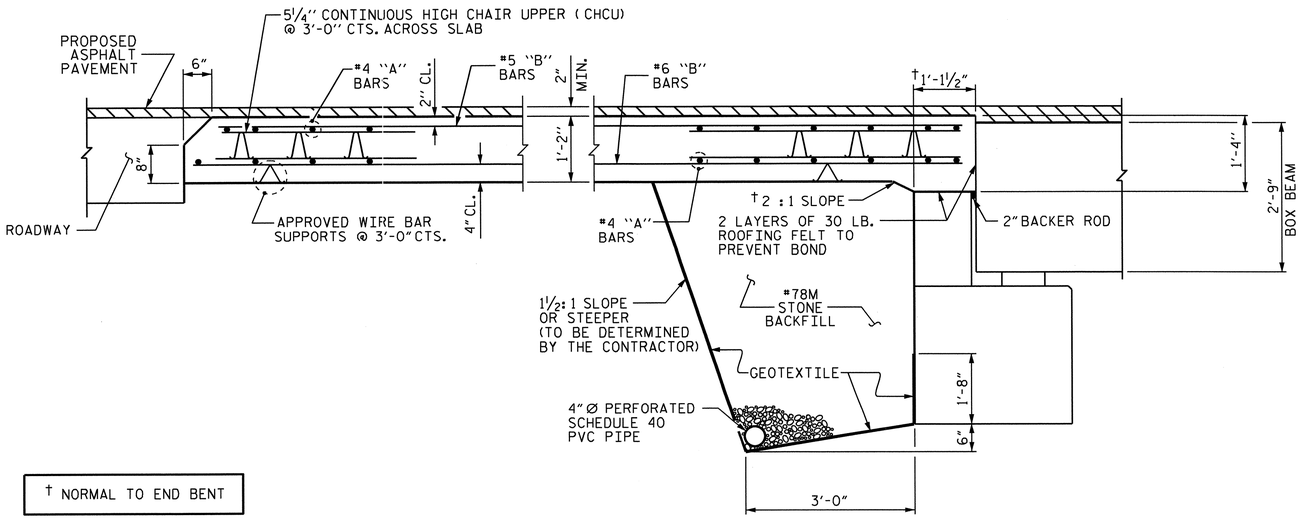
STD. NO. RR1 (Sht 2)

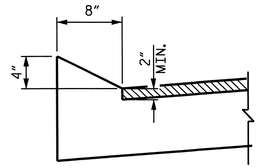


DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

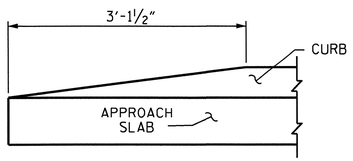


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE BOX BEAM UNIT" SHEETS.

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	52	#4	STR	22'-11"	796
A2	52	#4	STR	22'-10"	793
✱B1	88	#5	STR	24'-2"	2218
B2	88	#6	STR	24'-8"	3260
REINFORCING STEEL				LBS.	4053
✱EPOXY COATED REINFORCING STEEL				LBS.	3014
CLASS AA CONCRETE				C.Y.	48.3

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	52	#4	STR	22'-11"	796
A2	52	#4	STR	22'-10"	793
✱B1	88	#5	STR	24'-2"	2218
B2	88	#6	STR	24'-8"	3260
REINFORCING STEEL				LBS.	4053
✱EPOXY COATED REINFORCING STEEL				LBS.	3014
CLASS AA CONCRETE				C.Y.	48.3

SPLICE LENGTHS

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY W. COGGINS
02/12/13

PROJECT NO. B-4772
JOHNSTON COUNTY
STATION: 14+78.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			20

(SHT 3a) STD. NO. BAS6

ASSEMBLED BY : B. L. GREEN			DATE : 6/13/12
CHECKED BY : M. D. PISO			DATE : 7/2/12
DESIGN ENGINEER OF RECORD : F. GUZMAN			DATE : 8/3/11
DRAWN BY : KMM 3-08	REV. 9/27/11	MAA/GM	
CHECKED BY : GM 3-08	REV. 10/1/11	MAA/GM	
	REV. 12/21/11	MAA/GM	

08-JAN-2013 10:29
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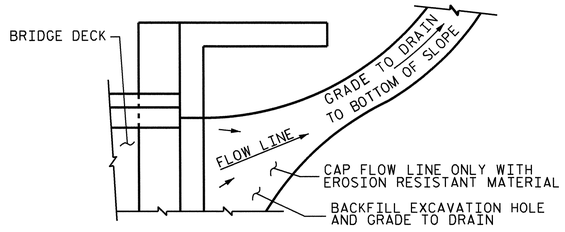
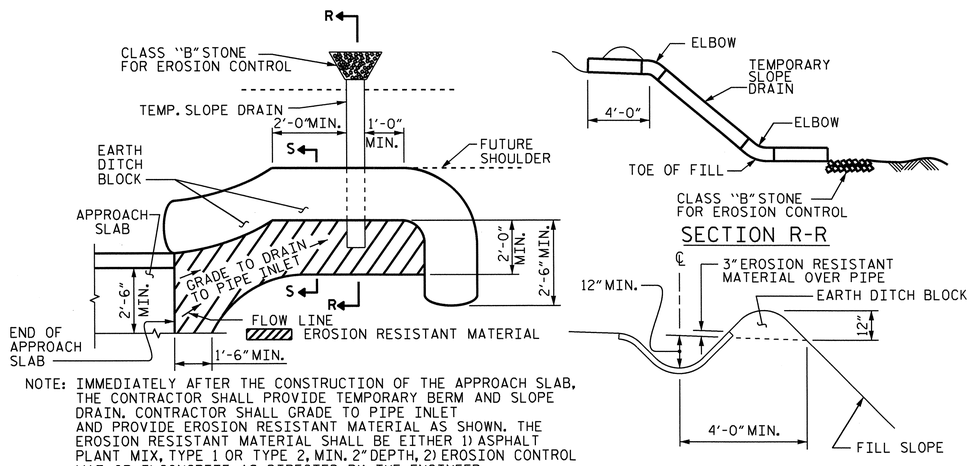


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



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)

PROJECT NO. B-4772

JOHNSTON COUNTY

STATION: 14+78.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER)

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

NORTH CAROLINA PROFESSIONAL SEAL 14045 ENGINEER TIMOTHY M. COGGINS
10/12/13

DRAWN BY : B. L. GREEN DATE : 6/13/12
CHECKED BY : M. D. PISO DATE : 7/2/12
DESIGN ENGINEER OF RECORD : F. GUZMAN DATE : 8/3/11

08-JAN-2013 10:29
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tcoggins

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.

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