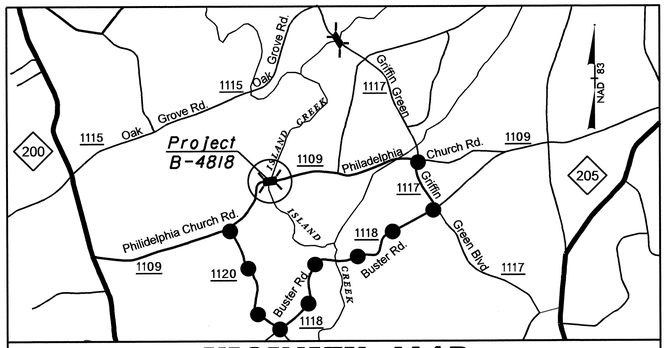
TIP PROJECT: B-4818

CONTRACT: C203286



VICINITY MAP

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARY

DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

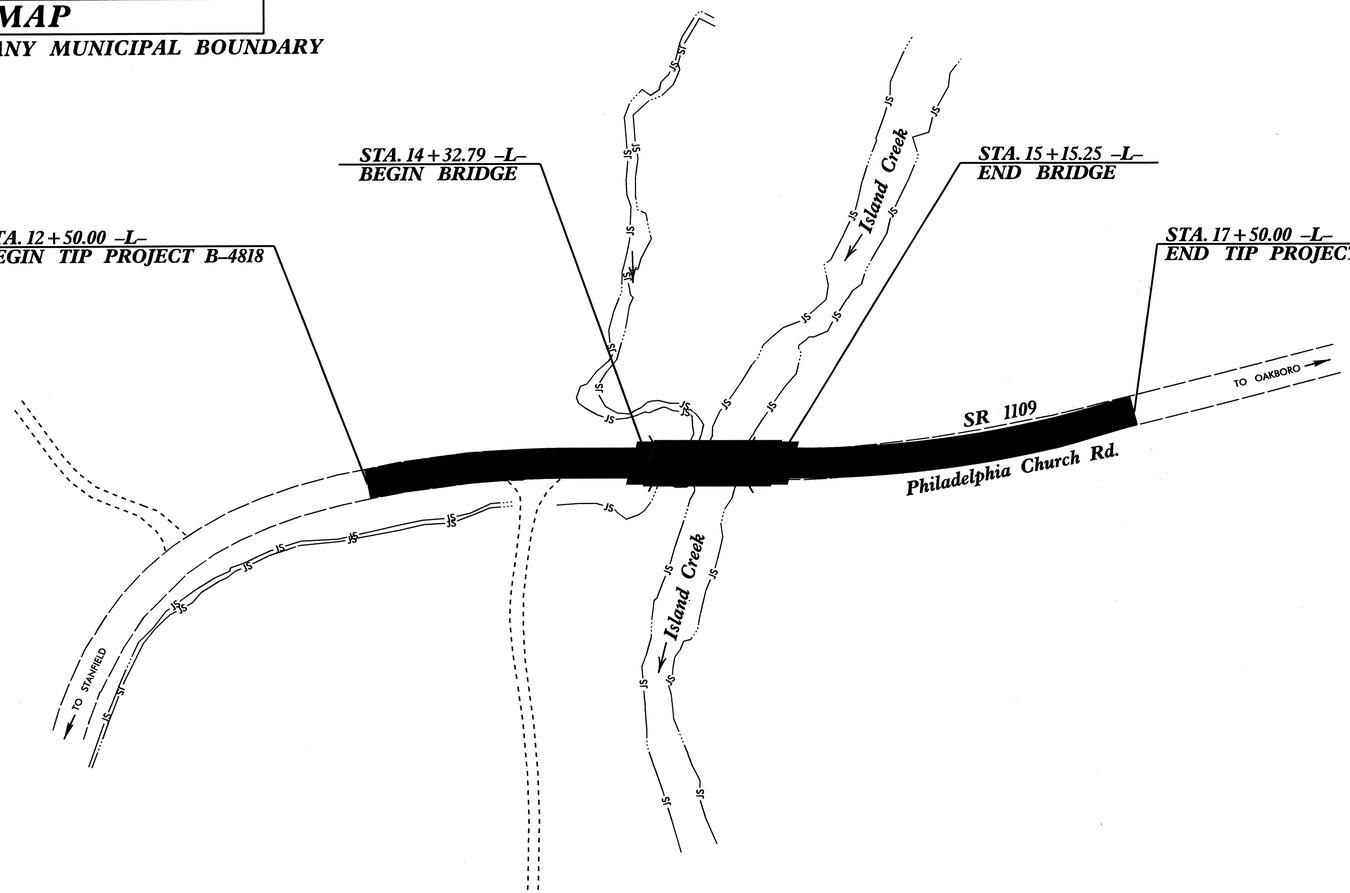
STANLY COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4818		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38588.1.1	BRZ-1109(7)	P.E.
38588.2.1	BRZ-1109(7)	R/W & UTIL
38588.3.FD1	BRZ-1109(7)	CONSTR.

LOCATION: BRIDGE NO. 138 ON SR 1109 (PHILADELPHIA CHURCH ROAD) OVER ISLAND CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



STRUCTURE

DESIGN DATA	
ADT 2013	= 473
ADT 2035	= 600
DHV	= 10%
D	≒ 60%
*T	= 5%
V	= 55 MPH

SUB REGIONAL TIER
LOCAL CLASSIFICATION
* TTST 2% + DUAL 3%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4818	= .079 MILES
LENGTH STRUCTURE TIP PROJECT B-4818	= .016 MILES
TOTAL LENGTH ROADWAY TIP PROJECT B-4818	= .095 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 BIRCH RIDGE DR., RALEIGH, NC 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE:
DECEMBER 17, 2013

B. C. Hunt, PE
PROJECT ENGINEER

V. A. Patel, PE
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT

STATE STRUCTURES ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

21-AUG-2013 13:00
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
tharrold

F.A. PROJECT No. BRZ-1109(7)

GRADE DATA

-5.1288% +0.3500%

PI = 14+15.00 -L-
EL. 401.56
VC=320'

14+00 14+50 15+00

410 400 390

FILL FACE AT END BENT 1
STA. 14+32.79-L-
GRADE POINT EL. 403.35

1'-0" MIN. EARTH BERM

1'-7" BERM

BEGIN FRONT SLOPE
STA. 14+24.77-L-
GRADE POINT EL. 403.53

SPAN A

SPAN B

FIX FIX FIX

EL. 403.0±
EL. 401.0±
LOW CHORD EL. 400.89
EL. 401.0±

0100 W.S. EL. 403.61

HISTORIC HIGH W.S. EL. 401.7 (10 YEARS)

NORMAL W.S. EL. 394.1

EL. 403.0±

1'-0"

EL. 393.0±

TEMPORARY ROCK CAUSEWAY

TOP OF DRILLED PIER EL. 395.25

1½:1 SLOPE NORMAL TO CAP (TYP.)

EL. 393.0±

UNCLASSIFIED STRUCTURE EXCAVATION (TYP.)

EARTH BERM VARIES

FILL FACE AT END BENT 2
STA. 15+15.25 -L-
GRADE POINT EL. 402.22

EL. 401.0±

EXISTING STRUCTURE (TYP.)

EL. 403.0±

LOW CHORD EL. 399.81

FIX

EL. 403.0±

APPROXIMATE NATURAL GROUND LINE

EL. 394.0±

1'-0"

EL. 397.0

EL. 397.0

1'-0"

CLASS II RIP RAP (TYP.)

HP 12X53 STEEL PILES (TYP.)

END BENT 1 BENT 1 END BENT 2

SECTION ALONG -L-

(SECTION TAKEN AT RIGHT ANGLE TO BENT AND END BENTS)

VARIES

CLASS B RIP RAP

1'-0" (MIN.)

1½:1 (TYP.)

2'-0" (MIN.)

NORMAL WATER SURFACE

CLASS II RIP RAP

STREAM BED

DETAIL OF TEMPORARY ROCK CAUSEWAY

CLASS B RIP RAP

1'-0" MIN. EARTH BERM EL. 395.79

2'-0" ±

CLASS II RIP RAP

TO NC 200

1½:1

12'-0" ±

10'-0" ±

BEGIN APPROACH SLAB
STA. 14+21.83-L-

W.P. #1
STA. 14+32.79-L-

BRIDGE IDENTITY
STA. 14+74.02-L-

BEGIN FRONT SLOPE
STA. 14+24.77-L-

FILL FACE

W.P. #2
STA. 14+59.02-L-

TEMPORARY ROCK CAUSEWAY

ISLAND CREEK

CLASS II RIP RAP

1'-0" MIN. EARTH BERM EL. 395.93

26'-2¾"

15'-0"

56'-2¾"

82'-5½" (FILL FACE TO FILL FACE)

10'-0" EARTH BERM EL. 396.71

EXISTING STRUCTURE (TYP.)

1½:1

FILL FACE

W.P. #3
STA. 15+15.25-L-

END APPROACH SLAB
STA. 15+26.21-L-

-L-

105°-00'-00" (TYP.)

TO SR 1117

CLASS II RIP RAP

10'-0" EARTH BERM EL. 396.85

PLAN

(PILES NOT SHOWN FOR CLARITY)

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 1 OF 3 REPLACES BRIDGE #138

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
ISLAND CREEK ON SR 1109
(PHILADELPHIA CHURCH RD.)
BETWEEN NC 200 AND SR 1117

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

NORTH CAROLINA PROFESSIONAL SEAL 14091 ENGINEER BRUCE CHARLES HUNT
10/16/13

NORTH CAROLINA PROFESSIONAL SEAL 23370 ENGINEER VIPUL A. PATEL
10/16/13

DRAWN BY : J. G. KHARVA DATE : 8/12
CHECKED BY : K. D. LAYNE DATE : 2/13
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 9/10/13

21-AUG-2013 13:00
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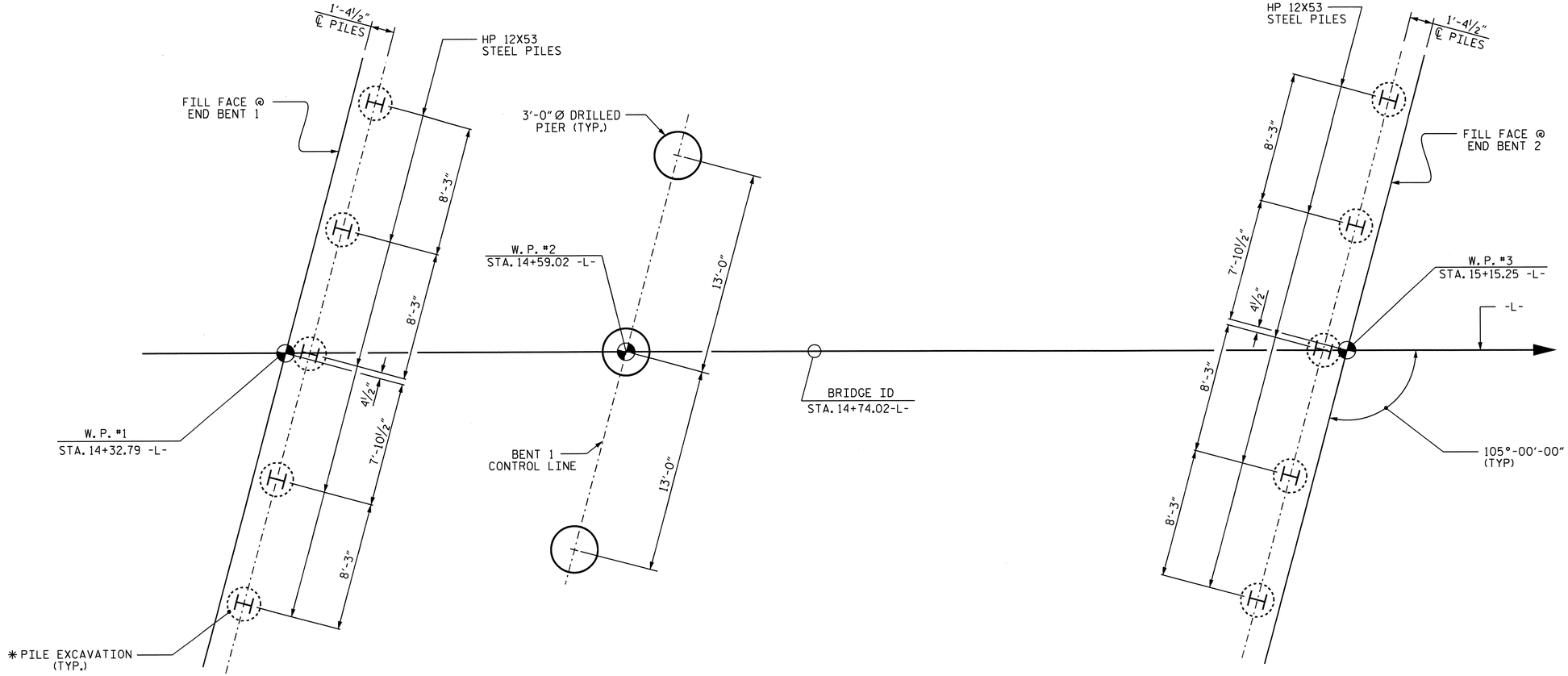
thcarroll



END BENT 1 BENT 1 END BENT 2

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES & DRILLED PIERS ARE SHOWN TO CENTERLINE OF PILES AND DRILLED PIERS)

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE.

* PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 1. EXCAVATE HOLES AT PILE LOCATIONS TO EL. 392.0. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATION.

CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 260 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 30.0 TSF.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. IF REQUIRED, DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 393.0 WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASINGS.

INSTALL DRILLED PIERS AT BENT NO. 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 386.0 WITH THE REQUIRED TIP RESISTANCE AND PENETRATION OF AT LEAST 6 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 392.0. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

SPT MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. FOR SPT TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE.

* PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO EL. 393.0. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATION.

CONCRETE OR GROUT REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 2.

DRAWN BY :	J. G. KHARVA	DATE :	9/12
CHECKED BY :	K. D. LAYNE	DATE :	2/13
DESIGN ENGINEER OF RECORD:	V. A. PATEL	DATE :	9/10/13

21-AUG-2013 13:00
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thcarroll

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
10/16/13

PROJECT NO. B-4818
STANLY COUNTY
STATION: 14+74.02 -L-

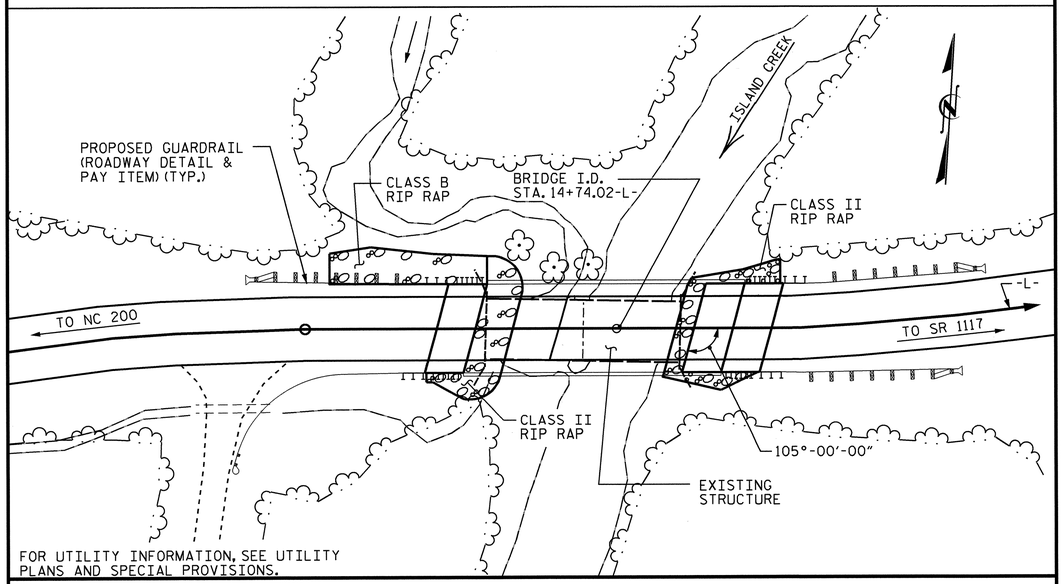
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER ISLAND CREEK ON SR 1109 (PHILADELPHIA CHURCH RD.) BETWEEN NC 200 AND SR 1117

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

BENCH MARK #2 R.R. SPIKE IN 24" OAK, STA. 15+88.96-L- 59.27' LEFT, ELEV. 401.78, NAVD 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.

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 25 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 EXISTING STRUCTURE CONSISTING OF 2 SPANS (2 @ 30'-3") WITH AN ASPHALT WEARING SURFACE ON A TIMBER DECK AND STEEL GIRDERS WITH A CLEAR ROADWAY OF 19.2 FT. ON TIMBER CAPS, PILES AND BULKHEADS AT END BENTS, AND TIMBER CAP AND PILES ENCASED IN CONCRETE AT BENT LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 14+74.02 -L-.

IN AS MUCH 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 14+74.02 -L-."

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

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

FOR 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.

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

HYDRAULIC DATA

DESIGN DISCHARGE	= 2300 CFS
FREQUENCY OF DESIGN FLOOD	= 10 YRS.
DESIGN HIGH WATER ELEVATION	= 401.7
DRAINAGE AREA	= 17.3 SQ. MI.
BASE DISCHARGE (Q100)	= 4200 CFS
BASE HIGH WATER ELEVATION	= 403.6

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 2826 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 10 YR. +
OVERTOPPING FLOOD ELEVATION	= 402.1

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMP. ACCESS	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-0" DIA. DRILLED PIERS IN SOIL	3'-0" DIA. DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIER	SID INSPECTIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM
SUPERSTRUCTURE											
END BENT 1			20.0	25.0							
BENT 1					6.8	21.0	6.8	1	1	1	
END BENT 2			20.0	25.0							
TOTAL	LUMP SUM	LUMP SUM	40.0	50.0	6.8	21.0	6.8	1	1	1	LUMP SUM

TOTAL BILL OF MATERIAL

	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP12X53 STEEL PILES		VERTICAL BARRIER RAIL	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	
	CU. YDS.	LUMP SUM	LBS	LBS	NO.	LIN. FT.	LIN. FT.	TONS	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE		LUMP SUM					160.50				LUMP SUM	20	800.00
END BENT 1	20.5		2522		5	50.0		55	70	140			
BENT 1	14.0		5236	615									
END BENT 2	20.5		2522		5	50.0			45	50			
TOTAL	55.0	LUMP SUM	10280	615	10	100.0	160.50	55	115	190	LUMP SUM	20	800.00

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER
ISLAND CREEK ON SR 1109
(PHILADELPHIA CHURCH RD.)
BETWEEN NC 200 AND SR 1117

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
10/16/13

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

DRAWN BY : J.G. KHARVA DATE : 9/12
CHECKED BY : K. D. LAYNE DATE : 2/13
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 9/10/13

16-OCT-2013 13:56
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vpatel

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR CORED SLAB UNITS

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	1.233	--	1.75	0.279	2.57	25'	EL	11.982	0.637	**1.23**	25'	EL	**1.198**	0.80	0.279	2.37	25'	EL	11.982	
		HL-93(Opr)	N/A	--	1.598	--	1.35	0.279	3.34	25'	EL	11.982	0.637	1.6	25'	EL	1.198	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.428	51.406	1.75	0.279	3.82	25'	EL	11.982	0.637	**1.43**	25'	EL	**1.198**	0.80	0.279	3.52	25'	EL	11.982	
		HS-20(Opr)	36.000	--	1.851	66.637	1.35	0.279	4.95	25'	EL	11.982	0.637	1.85	25'	EL	1.198	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.307	44.639	1.4	0.279	6.95	25'	EL	11.982	0.637	3.31	25'	EL	1.198	0.80	0.279	5.11	25'	EL	11.982	
		SNGARBS2	20.000	--	2.65	53	1.4	0.279	6.5	25'	EL	11.982	0.637	2.65	25'	EL	1.198	0.80	0.279	4.79	25'	EL	11.982	
		SNAGRIS2	22.000	--	2.596	57.117	1.4	0.279	6.95	25'	EL	11.982	0.637	2.6	25'	EL	1.198	0.80	0.279	5.11	25'	EL	11.982	
		SNCOTTS3	27.250	--	1.678	45.729	1.4	0.279	3.64	25'	EL	11.982	0.637	1.68	25'	EL	1.198	0.80	0.279	2.68	25'	EL	11.982	
		SNAGGRS4	34.925	--	1.615	56.393	1.4	0.279	3.62	25'	EL	11.982	0.637	1.61	25'	EL	1.198	0.80	0.279	2.66	25'	EL	11.982	
		SNS5A	35.550	--	1.687	59.981	1.4	0.279	3.51	25'	EL	11.982	0.637	1.69	25'	EL	1.198	0.80	0.279	2.58	25'	EL	11.982	
		SNS6A	39.950	--	1.618	64.639	1.4	0.279	3.29	25'	EL	11.982	0.637	1.62	25'	EL	1.198	0.80	0.279	2.42	25'	EL	11.982	
		SNS7B	42.000	--	1.63	68.445	1.4	0.279	3.29	25'	EL	11.982	0.637	1.63	25'	EL	1.198	0.80	0.279	2.41	25'	EL	11.982	
	TTST	TNAGRIT3	33.000	--	1.982	65.415	1.4	0.279	4.64	25'	EL	11.982	0.637	1.98	25'	EL	1.198	0.80	0.279	3.41	25'	EL	11.982	
		TNT4A	33.075	--	1.798	59.466	1.4	0.279	4.02	25'	EL	11.982	0.637	1.8	25'	EL	1.198	0.80	0.279	2.96	25'	EL	11.982	
		TNT6A	41.600	--	1.694	70.481	1.4	0.279	3.78	25'	EL	11.982	0.637	1.69	25'	EL	1.198	0.80	0.279	2.78	25'	EL	11.982	
		TNT7A	42.000	--	1.687	70.851	1.4	0.279	3.9	25'	EL	11.982	0.637	1.69	25'	EL	1.198	0.80	0.279	2.87	25'	EL	11.982	
		TNT7B	42.000	--	1.628	68.365	1.4	0.279	3.52	25'	EL	11.982	0.637	1.63	25'	EL	1.198	0.80	0.279	2.59	25'	EL	11.982	
		TNAGRIT4	43.000	--	1.625	69.855	1.4	0.279	3.78	25'	EL	11.982	0.637	1.62	25'	EL	1.198	0.80	0.279	2.77	25'	EL	11.982	
		TNAGT5A	45.000	--	1.657	74.558	1.4	0.279	3.78	25'	EL	11.982	0.637	1.66	25'	EL	1.198	0.80	0.279	2.77	25'	EL	11.982	
		TNAGT5B	45.000	3	1.503	67.632	1.4	0.279	3.72	25'	EL	9.586	0.637	**1.5**	25'	EL	**1.198**	0.80	0.279	2.75	25'	EL	9.586	

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)

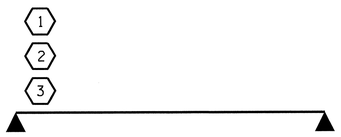
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPAN 'A'

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR 25' CORED SLAB UNIT 105° SKEW (NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
10/16/13

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

ASSEMBLED BY :	J. G. KHARVA	DATE :	8/12
CHECKED BY :	H. T. DIEU	DATE :	8/12
DRAWN BY :	CVC		6/10
CHECKED BY :	DNS		6/10

21-AUG-2013 13:00
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STD. NO. 21LRFR1_75&105S_25L

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR CORED SLAB UNITS

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	1.065	--	1.75	0.27	1.25	55′	EL	26.982	0.616	1.12	55′	EL	5.396	0.80	0.27	**1.07**	55′	EL	**26.982**	
		HL-93(Opr)	N/A	--	1.452	--	1.35	0.27	1.61	55′	EL	26.982	0.616	1.45	55′	EL	5.396	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.335	48.043	1.75	0.27	1.56	55′	EL	26.982	0.616	1.34	55′	EL	5.396	0.80	0.27	**1.33**	55′	EL	**26.982**	
		HS-20(Opr)	36.000	--	1.734	62.425	1.35	0.27	2.02	55′	EL	26.982	0.616	1.73	55′	EL	5.396	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.802	37.83	1.4	0.27	4.09	55′	EL	26.982	0.616	3.81	55′	EL	5.396	0.80	0.27	2.80	55′	EL	26.982	
		SNGARBS2	20.000	--	2.175	43.506	1.4	0.27	3.18	55′	EL	26.982	0.616	2.76	55′	EL	5.396	0.80	0.27	2.18	55′	EL	26.982	
		SNAGRIS2	22.000	--	2.099	46.173	1.4	0.27	3.07	55′	EL	26.982	0.616	2.58	55′	EL	5.396	0.80	0.27	2.10	55′	EL	26.982	
		SNCOTTS3	27.250	--	1.397	38.065	1.4	0.27	2.04	55′	EL	26.982	0.616	1.91	55′	EL	5.396	0.80	0.27	1.40	55′	EL	26.982	
		SNAGGRS4	34.925	--	1.2	41.922	1.4	0.27	1.75	55′	EL	26.982	0.616	1.62	55′	EL	5.396	0.80	0.27	1.20	55′	EL	26.982	
		SNS5A	35.550	--	1.172	41.648	1.4	0.27	1.71	55′	EL	26.982	0.616	1.66	55′	EL	5.396	0.80	0.27	1.17	55′	EL	26.982	
		SNS6A	39.950	--	1.089	43.514	1.4	0.27	1.59	55′	EL	26.982	0.616	1.53	55′	EL	5.396	0.80	0.27	1.09	55′	EL	26.982	
		SNS7B	42.000	--	1.038	43.587	1.4	0.27	1.52	55′	EL	26.982	0.616	1.53	55′	EL	5.396	0.80	0.27	1.04	55′	EL	26.982	
	TTST	TNAGRIT3	33.000	--	1.333	43.973	1.4	0.27	1.95	55′	EL	26.982	0.616	1.81	55′	EL	5.396	0.80	0.27	1.33	55′	EL	26.982	
		TNT4A	33.075	--	1.342	44.4	1.4	0.27	1.96	55′	EL	26.982	0.616	1.75	55′	EL	5.396	0.80	0.27	1.34	55′	EL	26.982	
		TNT6A	41.600	--	1.112	46.252	1.4	0.27	1.62	55′	EL	26.982	0.616	1.67	55′	EL	5.396	0.80	0.27	1.11	55′	EL	26.982	
		TNT7A	42.000	--	1.125	47.255	1.4	0.27	1.64	55′	EL	26.982	0.616	1.56	55′	EL	5.396	0.80	0.27	1.13	55′	EL	26.982	
		TNT7B	42.000	--	1.174	49.318	1.4	0.27	1.72	55′	EL	26.982	0.616	1.47	55′	EL	5.396	0.80	0.27	1.17	55′	EL	26.982	
		TNAGRIT4	43.000	--	1.111	47.786	1.4	0.27	1.62	55′	EL	26.982	0.616	1.42	55′	EL	5.396	0.80	0.27	1.11	55′	EL	26.982	
		TNAGT5A	45.000	--	1.041	46.851	1.4	0.27	1.52	55′	EL	26.982	0.616	1.44	55′	EL	5.396	0.80	0.27	1.04	55′	EL	26.982	
		TNAGT5B	45.000	3	1.023	46.02	1.4	0.27	1.49	55′	EL	26.982	0.616	1.35	55′	EL	5.396	0.80	0.27	**1.02**	55′	EL	**26.982**	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

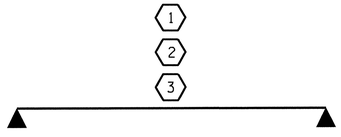
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

FOR SPAN 'B'

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR 55′ CORED SLAB UNIT 105° SKEW
(NON-INTERSTATE TRAFFIC)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATIL
10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY :	J. G. KHARVA	DATE :	8/12
CHECKED BY :	H. T. DIEU	DATE :	8/12
DRAWN BY : CVC	6/10		
CHECKED BY : DNS	6/10		

21-AUG-2013 13:00
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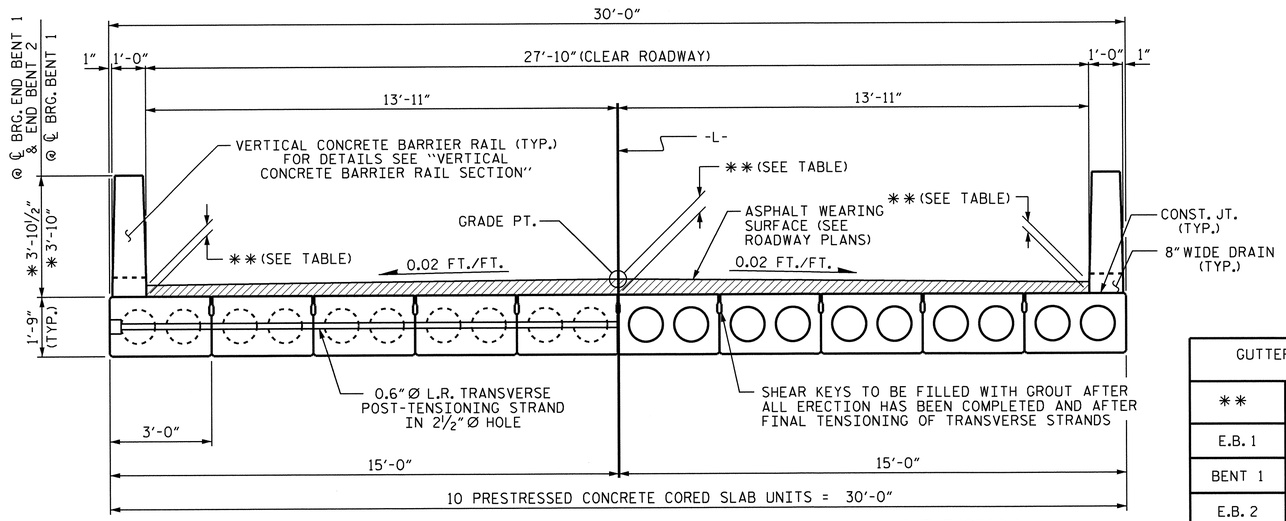
STD. NO. 21LRFR1_75&105S_55L



HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

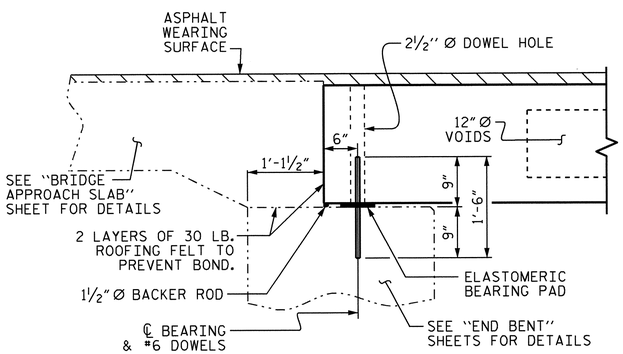
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

* - 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.

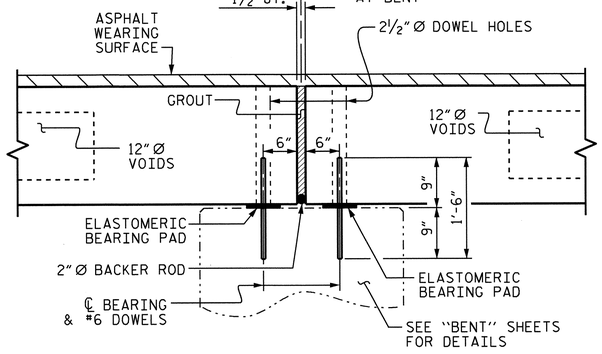
GUTTERLINE ASPHALT THICKNESS @ ℄ BRG.			
**	LEFT GUTTER	-L-	RIGHT GUTTER
E.B. 1	3¾"	7½"	4½"
BENT 1	3¾"	7¼"	4"
E.B. 2	4½"	7½"	3¾"

FIXED END

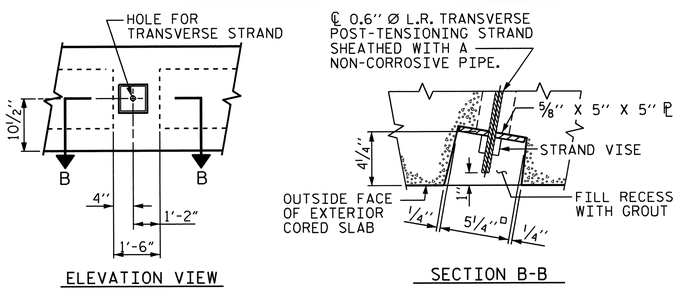


SECTION AT END BENT

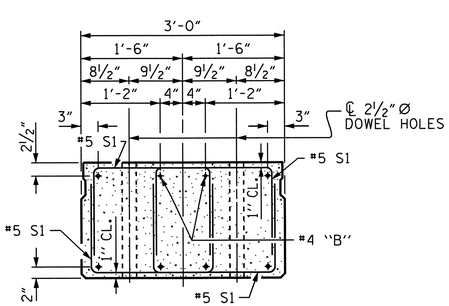
FIXED END FIXED END



SECTION AT BENT

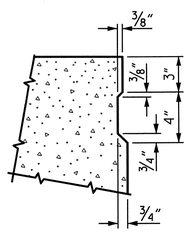


GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



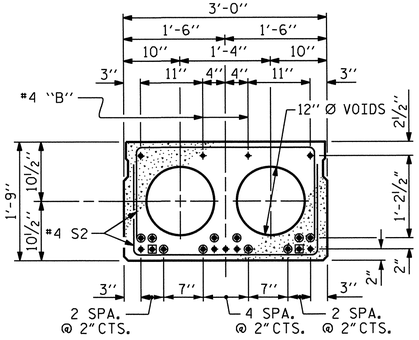
END ELEVATION

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.

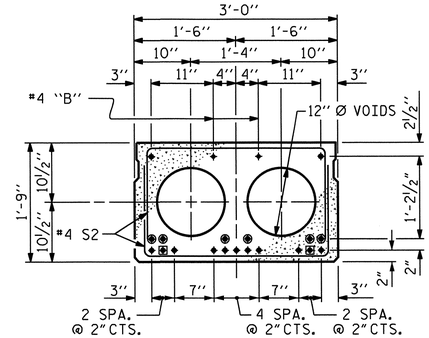


SHEAR KEY DETAIL

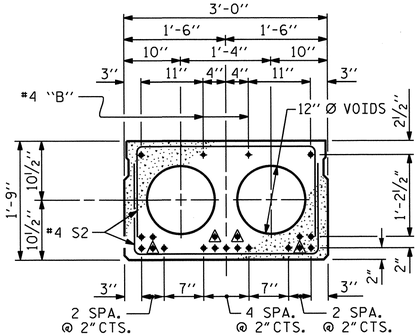
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.



INTERIOR SLAB SECTION
(25', 30' & 35' UNIT)
(9 STRANDS REQUIRED)

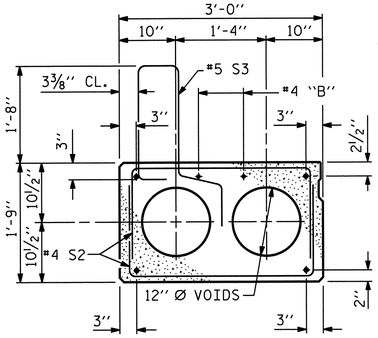


INTERIOR SLAB SECTION
(40' & 45' UNIT)
(13 STRANDS REQUIRED)



INTERIOR SLAB SECTION
(50' & 55' UNIT)
(19 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT



EXT. SLAB SECTION

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

△ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

▣ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-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-4818
STANLY COUNTY
STATION: 14+74.02 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : J. C. KHARVA	DATE : 8/12		
CHECKED BY : H. T. DIEU	DATE : 8/12		
DRAWN BY : DGE 5/09	REV. 12/11	MAA/AAC	
CHECKED BY : BCH 6/09			

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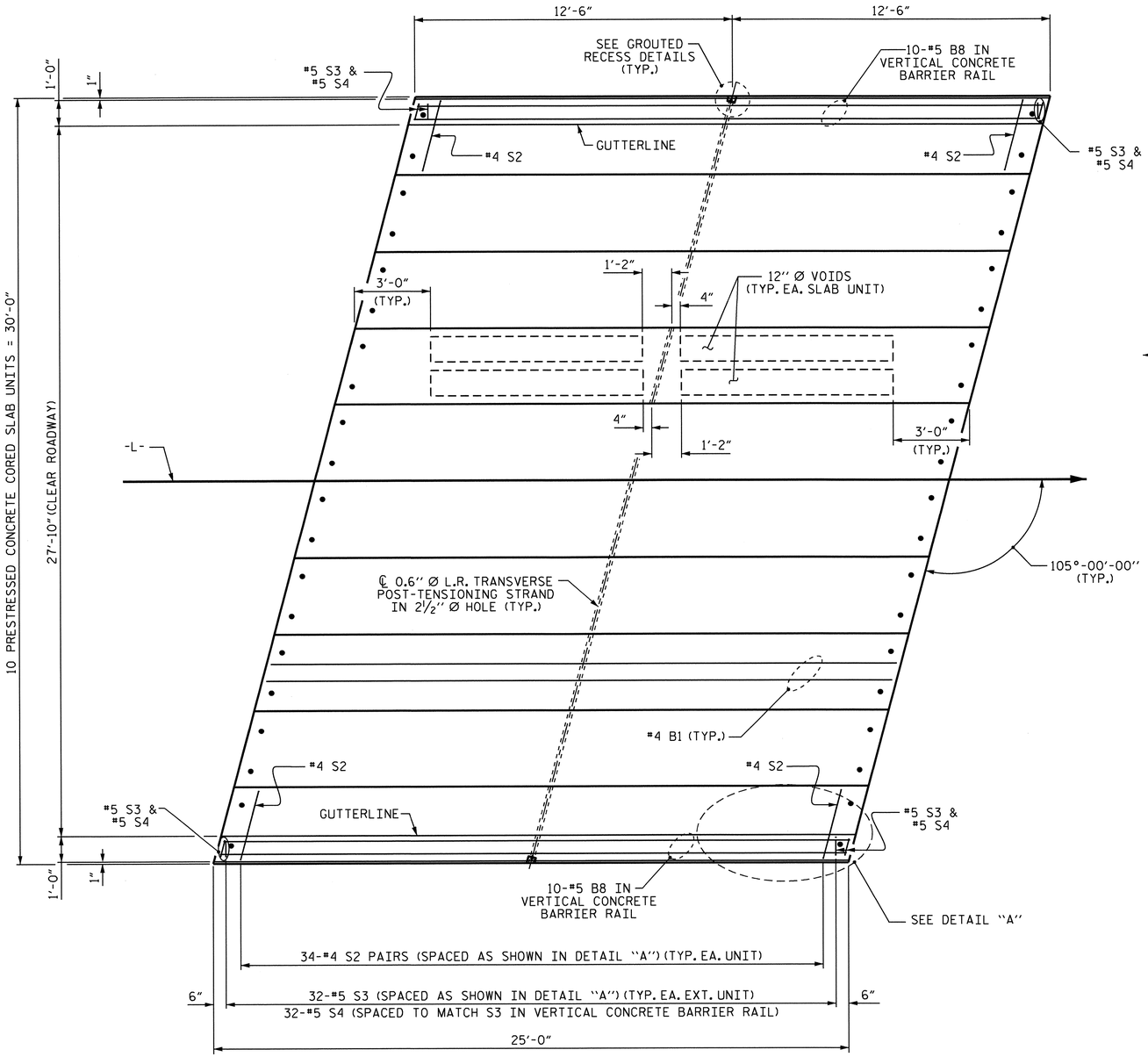
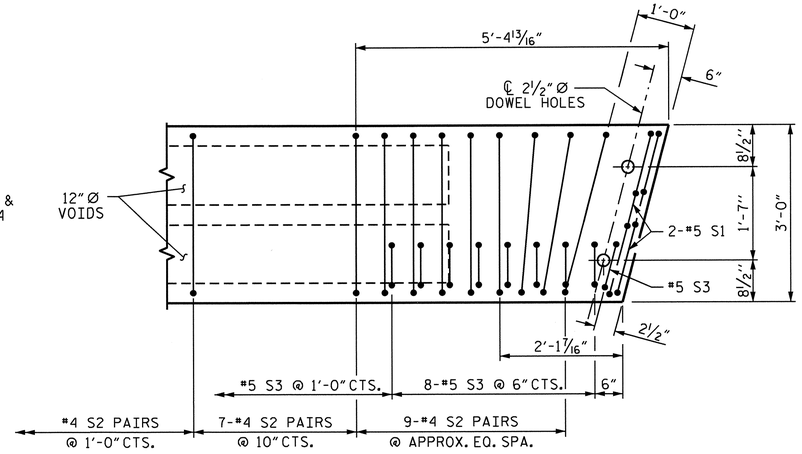
STD. NO. 21"PCS2_30_105S



PLAN OF UNIT

(SPAN A)



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 25' UNIT 27'-10" CLEAR ROADWAY 105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL

10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : J. G. KHARVA		DATE :	8/12
CHECKED BY : H. T. DIEU		DATE :	8/12
DRAWN BY : DGE	3/09	REV. 12/5/11	MAA/AAC
CHECKED BY : BCH	3/09		

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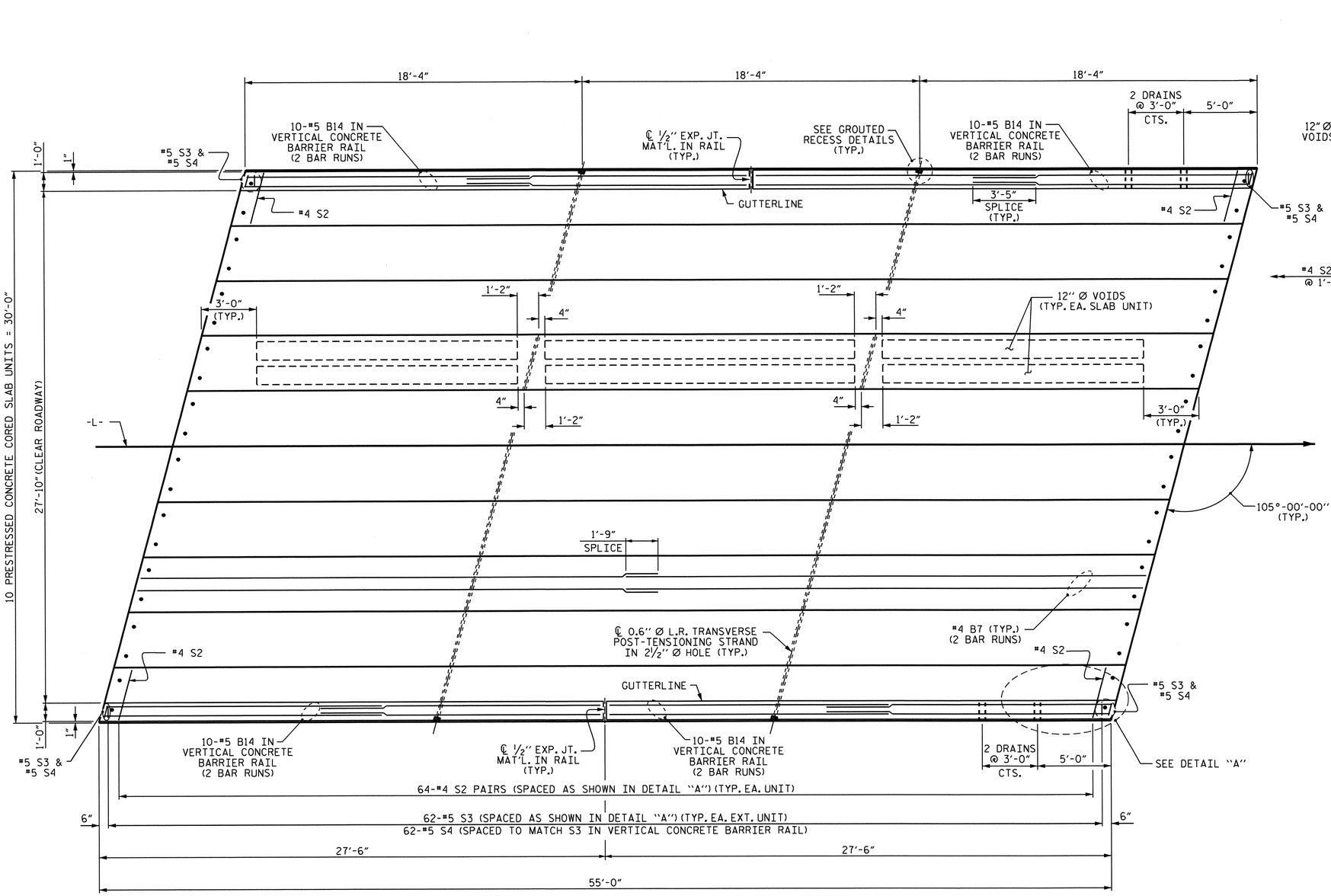
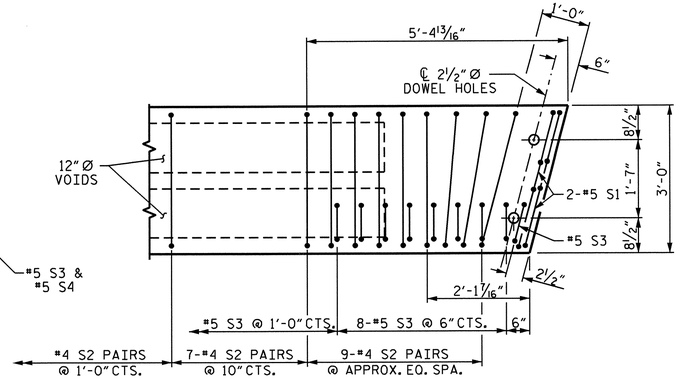
STD. NO. 21"PCS_30_105S_25L



PLAN OF UNIT

(SPAN B)



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 55' UNIT
27'-10" CLEAR ROADWAY
105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			19

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIMAL A. PATEL
10/16/13

ASSEMBLED BY :	J. C. KHARVA	DATE :	8/12
CHECKED BY :	H. T. DIEU	DATE :	8/12
DRAWN BY : DGE	3/09	REV. 12/5/11	MAA/AAC
CHECKED BY : BCH	3/09		

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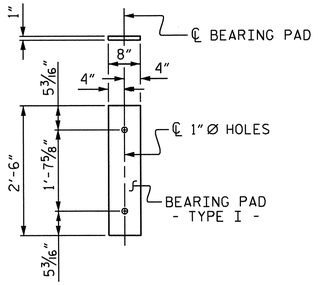
STD. NO. 21" PCS_30_105S_55L



FIXED END
(TYPE I - 40 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

CONCRETE RELEASE STRENGTH	
UNIT	PSI
25', 30' & 35' UNITS	4000
40' & 45' UNITS	4000
50' & 55' UNITS	4900

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

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 BACKER RODS 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.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL 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.

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.

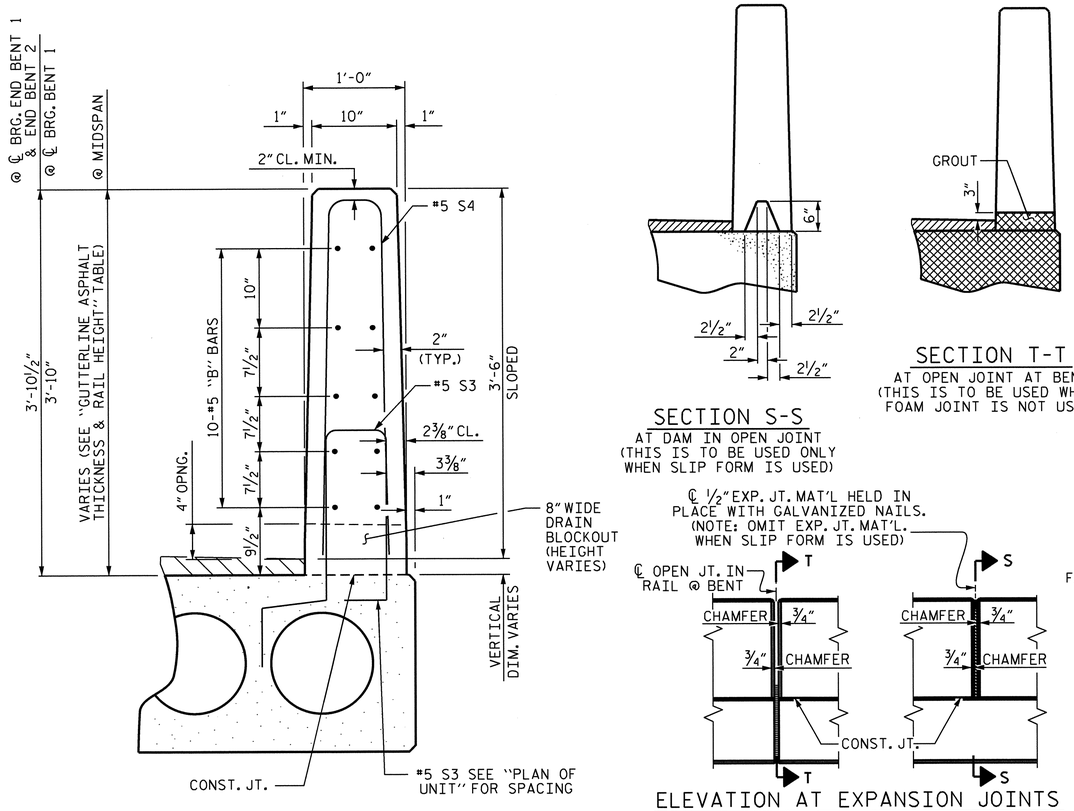
TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE VERTICAL CONCRETE BARRIER RAIL SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.

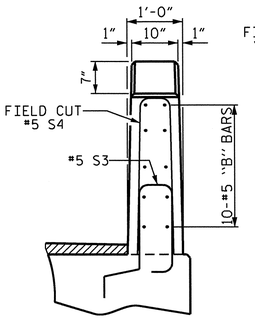


VERTICAL CONCRETE BARRIER RAIL SECTION

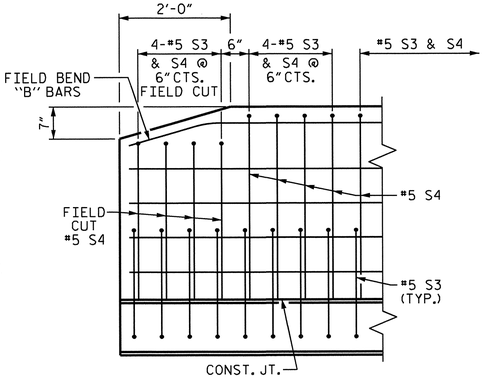
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)

SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)

ELEVATION AT EXPANSION JOINTS



END VIEW



SIDE VIEW

END OF RAIL DETAILS

PROJECT NO. B-4818
STANLY COUNTY
STATION: 14+74.02 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
Vipul Patel
10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : J. G. KHARVA	DATE : 8/12
CHECKED BY : H. T. DIEU	DATE : 8/12
DRAWN BY : DGE 5/09	REV. 12/11 MAA/AAC
CHECKED BY : BCH 6/09	

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STD. NO. 21"PCS3_30_105S

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
27'-10" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
	NORMAL CROWN SECTION	
25' UNITS	4 1/8"	3'-10 1/8"
55' UNITS	2 1/4"	3'-8 1/4"

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-9"
25', 30' & 35' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓
FINAL CAMBER	3/8" ↑

** INCLUDES FUTURE WEARING SURFACE

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-9"
50' & 55' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/4" ↓
FINAL CAMBER	2 1/4" ↑

** INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
25' UNIT			
EXTERIOR C.S.	2	25'-0"	50'-0"
INTERIOR C.S.	8	25'-0"	200'-0"
TOTAL	10		250'-0"

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
55' UNIT			
EXTERIOR C.S.	2	55'-0"	110'-0"
INTERIOR C.S.	8	55'-0"	440'-0"
TOTAL	10		550'-0"

BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	2	#4	STR	24'-7"	33	24'-7"	33
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	68	#4	3	5'-4"	242	5'-4"	242
* S3	34	#5	1	6'-2"	219		
REINFORCING STEEL			LBS.		310		310
* EPOXY COATED REINFORCING STEEL			LBS.		219		
5000 P.S.I. CONCRETE			CU. YDS.		3.8		3.8
0.6" Ø L.R. STRANDS			No.		9		9

BILL OF MATERIAL FOR ONE 55' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B7	4	#4	STR	28'-3"	75	28'-3"	75
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	128	#4	3	5'-4"	456	5'-4"	456
* S3	64	#5	1	6'-2"	412		
REINFORCING STEEL			LBS.		566		566
* EPOXY COATED REINFORCING STEEL			LBS.		412		
6500 P.S.I. CONCRETE			CU. YDS.		7.9		7.9
0.6" Ø L.R. STRANDS			No.		19		19

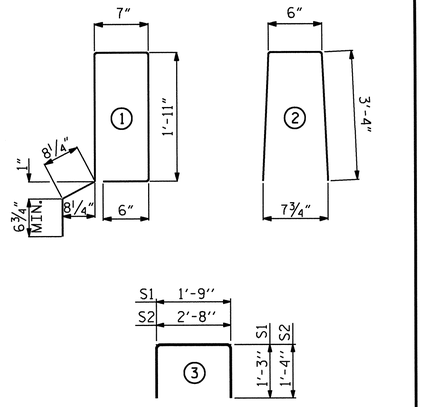
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	25' UNIT					
* B8	20	20	#5	STR	24'-6"	511
* S4	68	68	#5	2	7'-2"	508
* EPOXY COATED REINFORCING STEEL				LBS.		1019
CLASS AA CONCRETE				CU.YDS.		6.6
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		50.25

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	55' UNIT					
*B14	80	80	#5	STR	15'-5"	1286
* S4	128	128	#5	2	7'-2"	957
* EPOXY COATED REINFORCING STEEL				LBS.		2243
CLASS AA CONCRETE				CU.YDS.		14.4
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		110.25

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL

10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			19

STD. NO. 21"PCS3_30_105S

ASSEMBLED BY : J. G. KHARVA	DATE : 8/12		
CHECKED BY : H. T. DIEU	DATE : 8/12		
DRAWN BY : DGE 5/09	REV. 12/11	MAA/AAC	
CHECKED BY : BCH 6/09			

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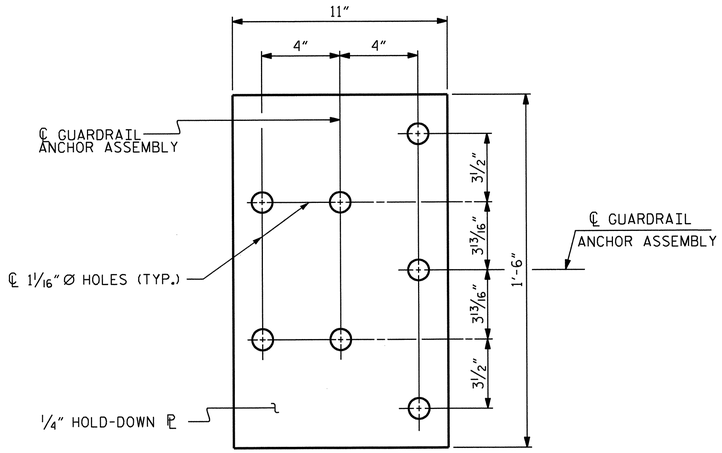
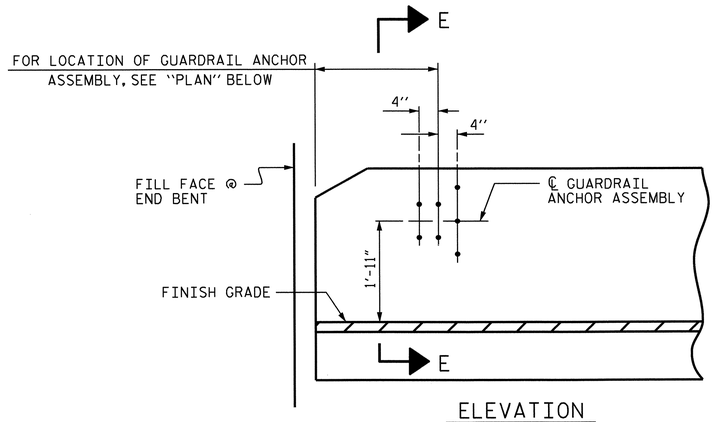


PLAN



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.)

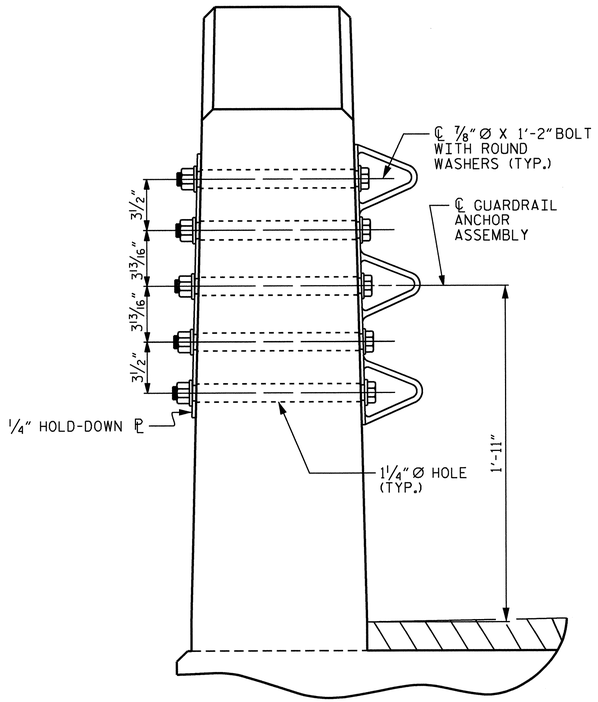
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

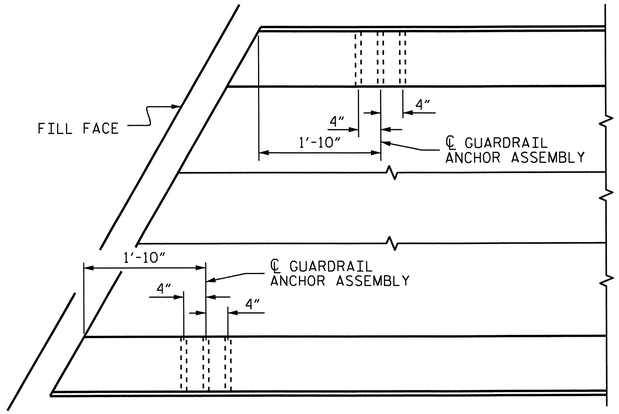
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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

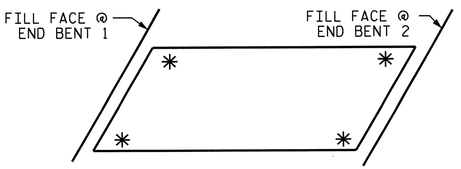
GUARDRAIL ANCHOR ASSEMBLY DETAILS



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-4818

STANLY COUNTY

STATION: 14+74.02 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE FOR VERTICAL CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL
10/17/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : J. G. KHARVA	DATE : 9/12
CHECKED BY : K. D. LAYNE	DATE : 2/13
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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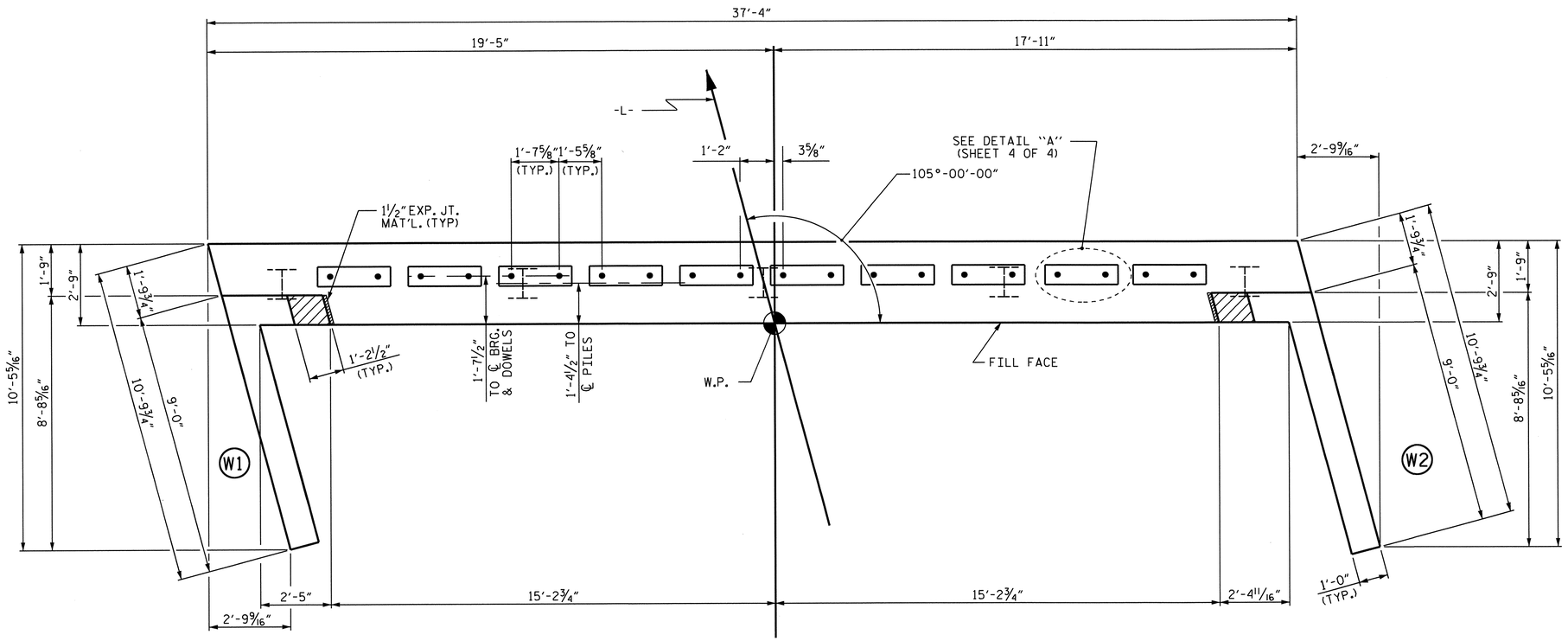
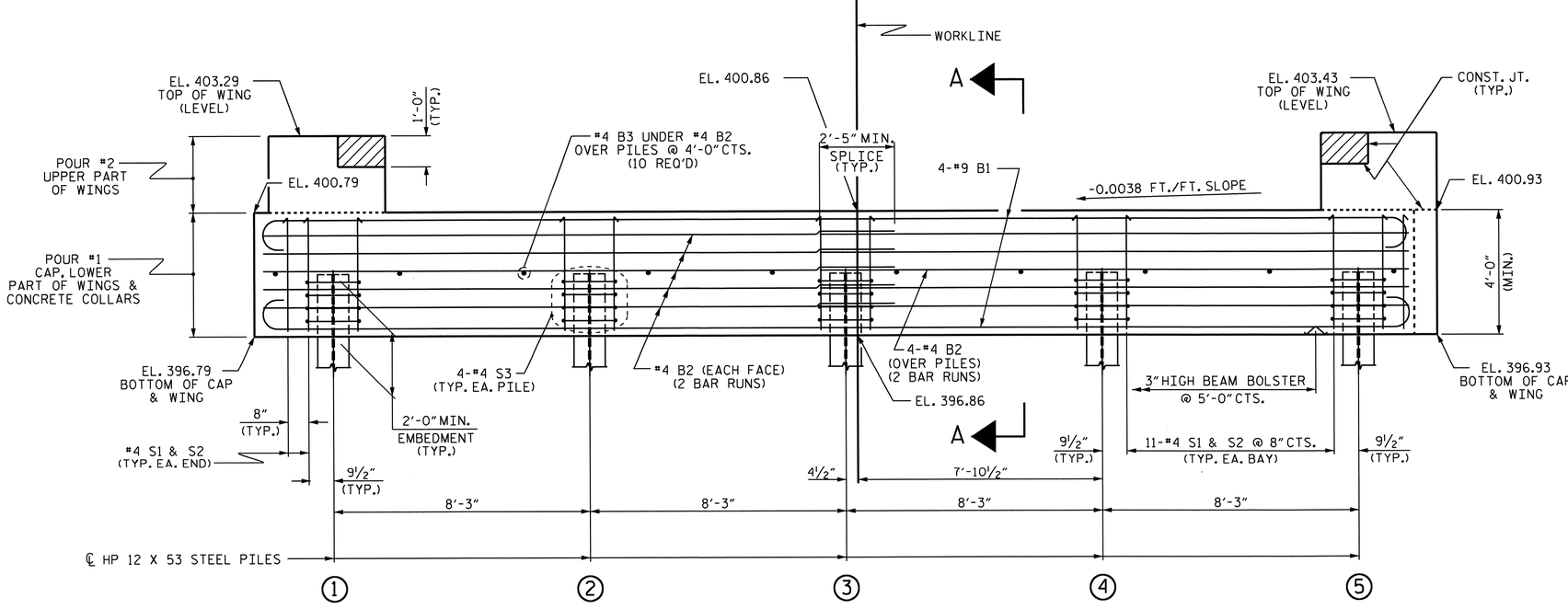
(SHT 2) STD. NO. GRA3



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 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.

TOP OF PILE ELEVATIONS	
①	398.80
②	398.83
③	398.86
④	398.89
⑤	398.92

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRAL A. PATEL
10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : J. G. KHARVA	DATE : 8/12
CHECKED BY : H. T. DIEU	DATE : 8/12
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

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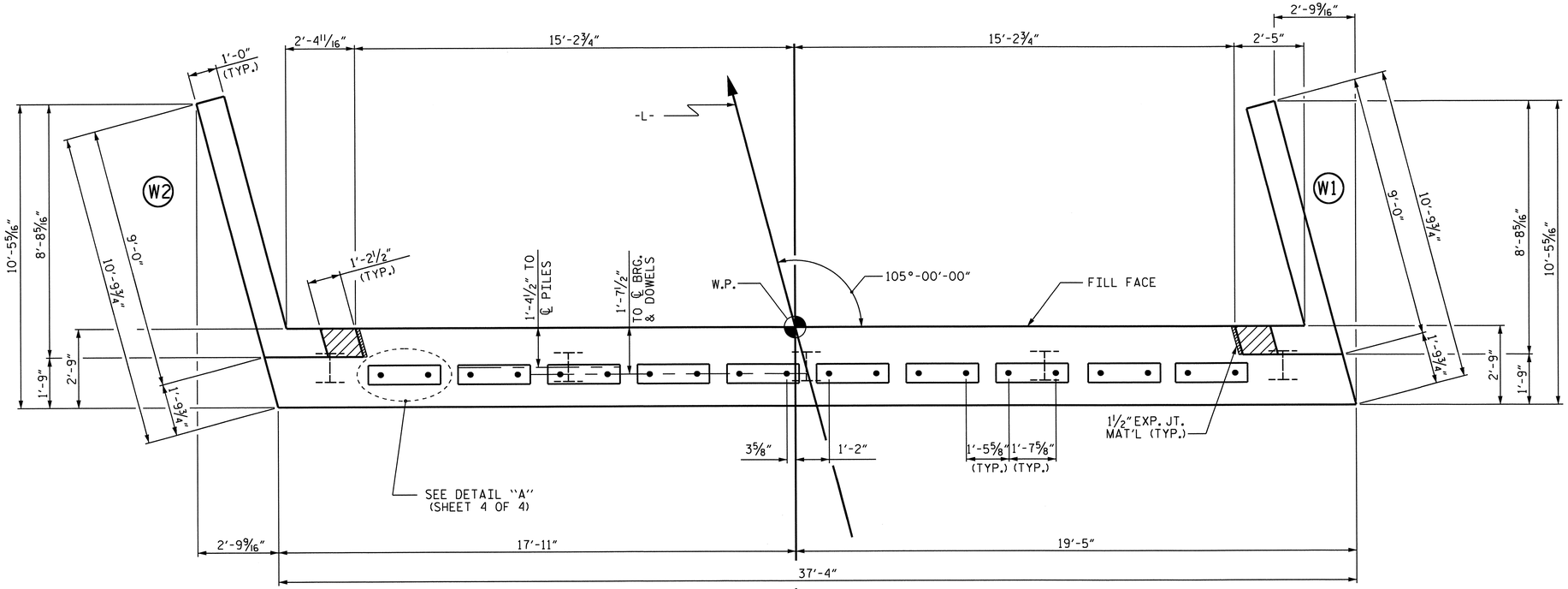
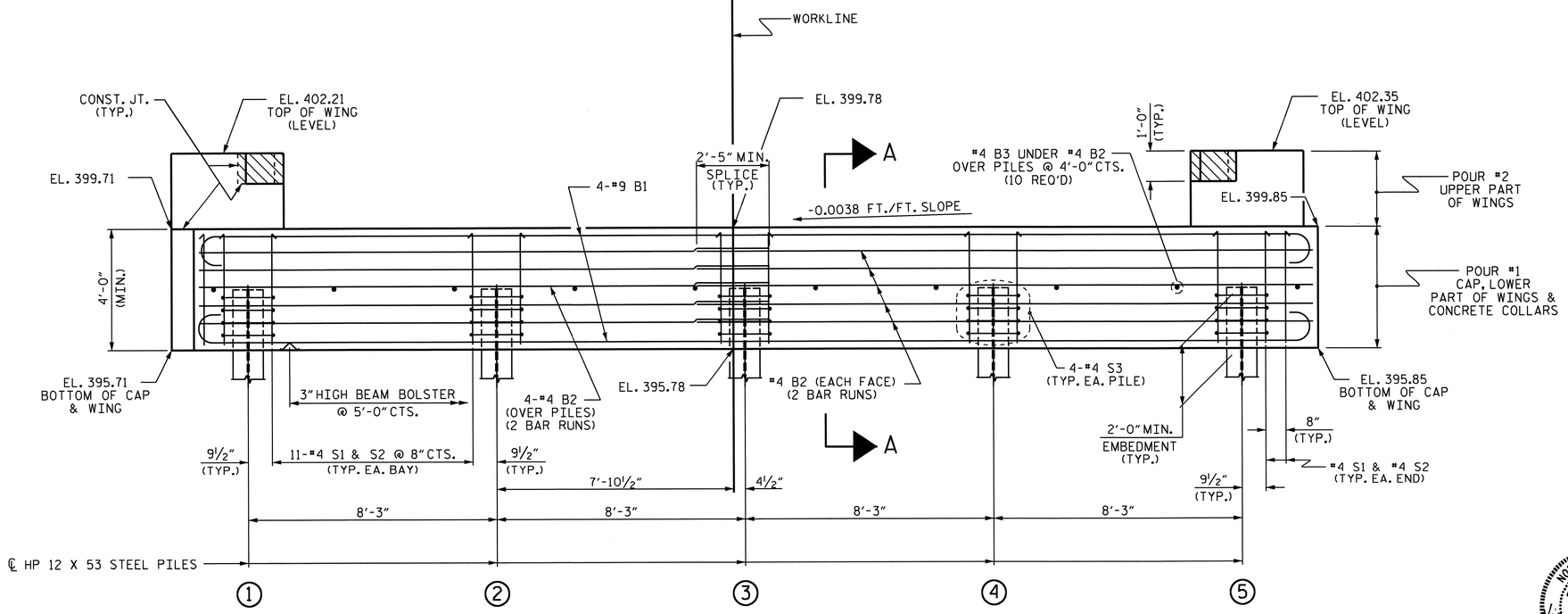
STD. NO. EB_30_105S4



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 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.

TOP OF PILE ELEVATIONS	
①	397.72
②	397.75
③	397.78
④	397.81
⑤	397.84

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : J. G. KHARVA	DATE : 8/12
CHECKED BY : H. T. DIEU	DATE : 8/12
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

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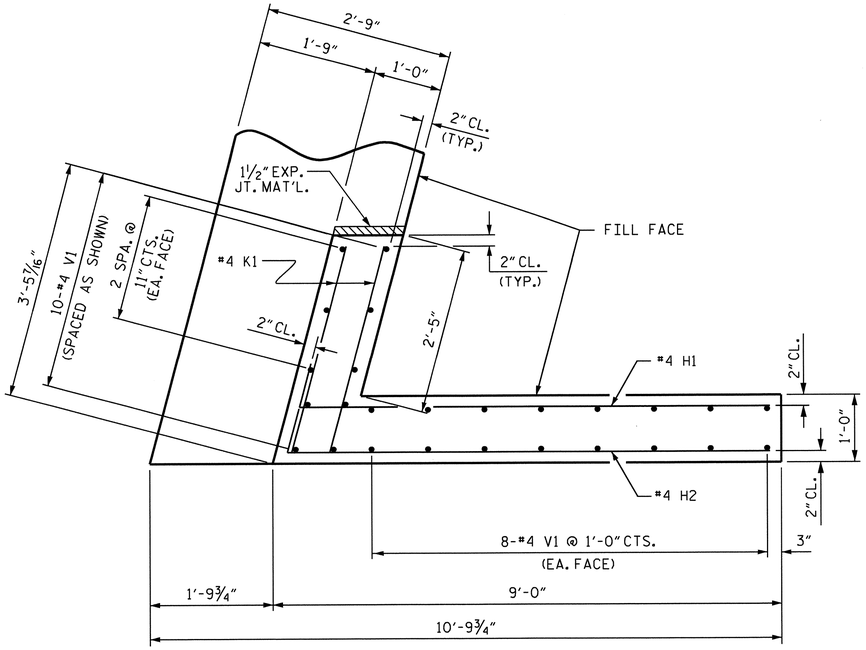
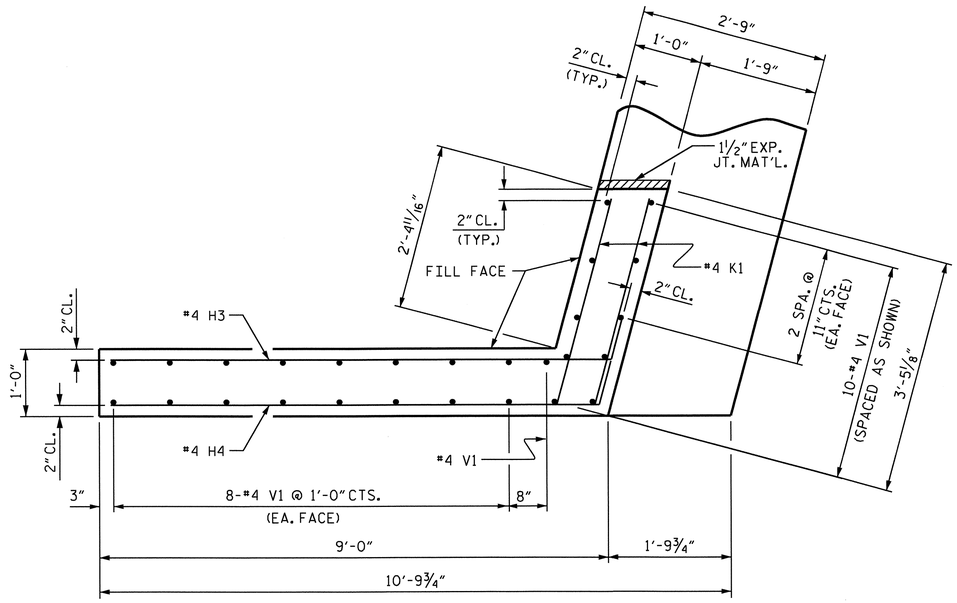
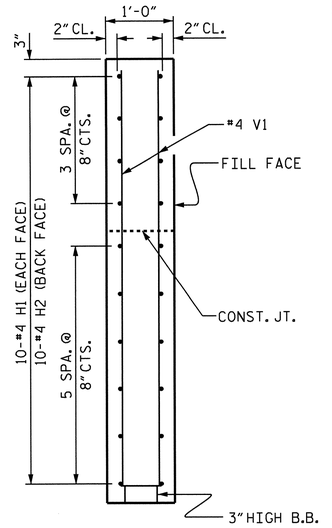
STD. NO. EB_30_105S4



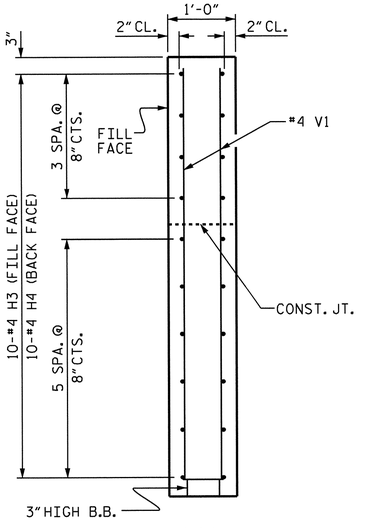
PLAN OF WING (W1)



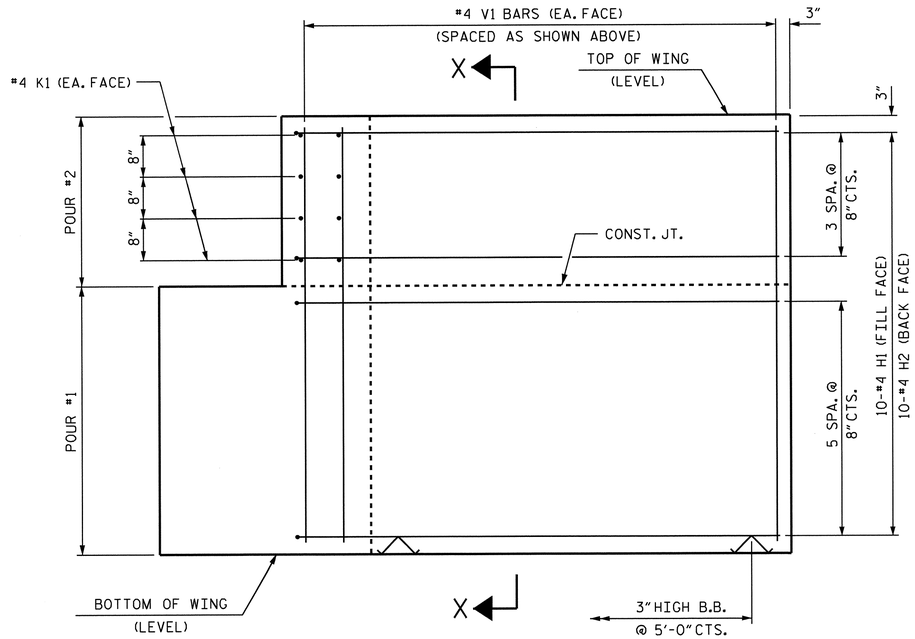
PLAN OF WING (W2)



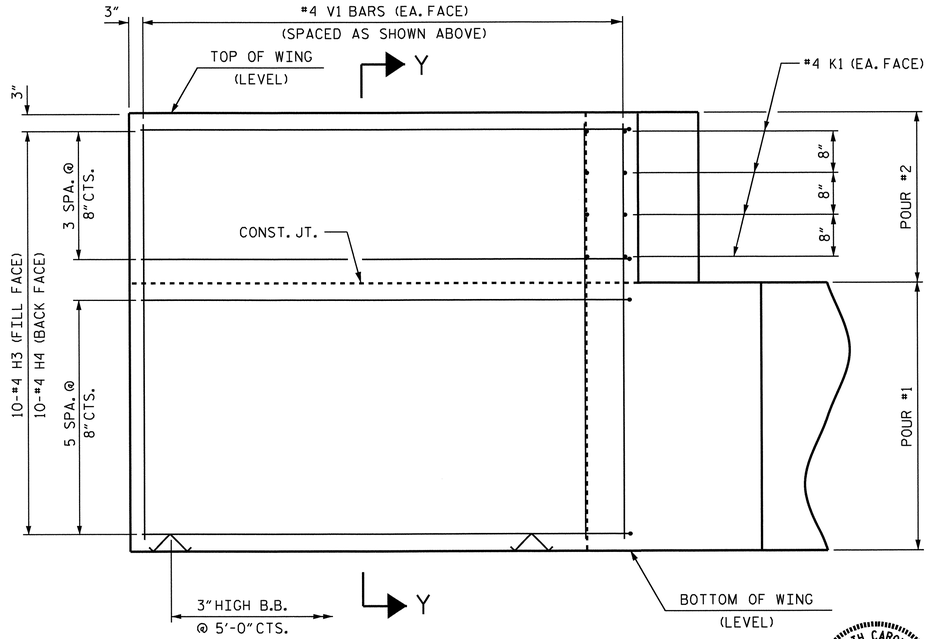
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : J. C. KHARVA	DATE : 8/12		
CHECKED BY : H. T. DIEU	DATE : 8/12		
DRAWN BY : WJH 12/11			
CHECKED BY : AAC 12/11			

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NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
10/16/13

PROJECT NO. B-4818
STANLY COUNTY
STATION: 14+74..02 -L-

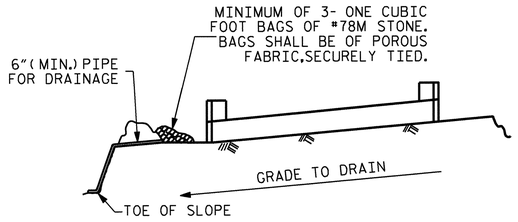
SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			19

STD. NO. EB_30_105S4

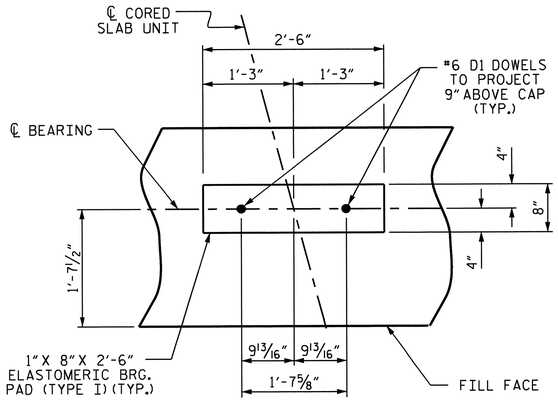


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

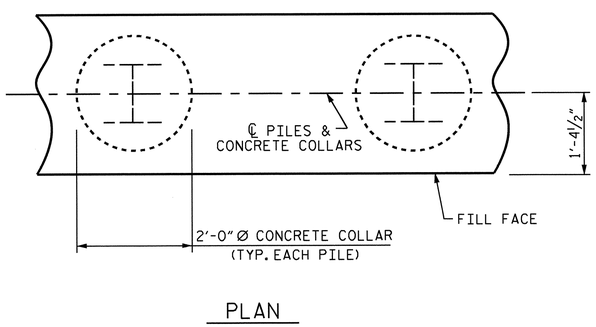
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

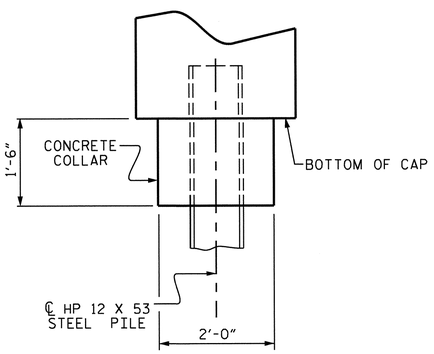


DETAIL "A"

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



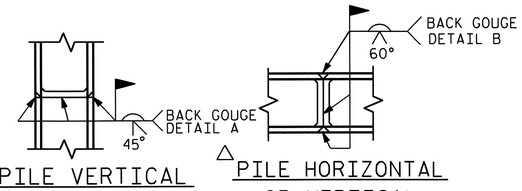
PLAN



ELEVATION

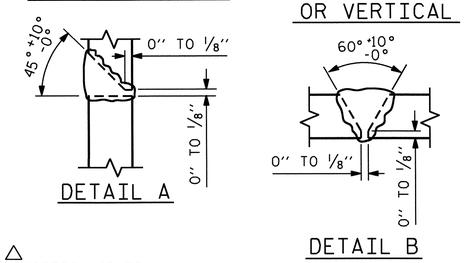
CORROSION PROTECTION FOR STEEL PILES DETAIL

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



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



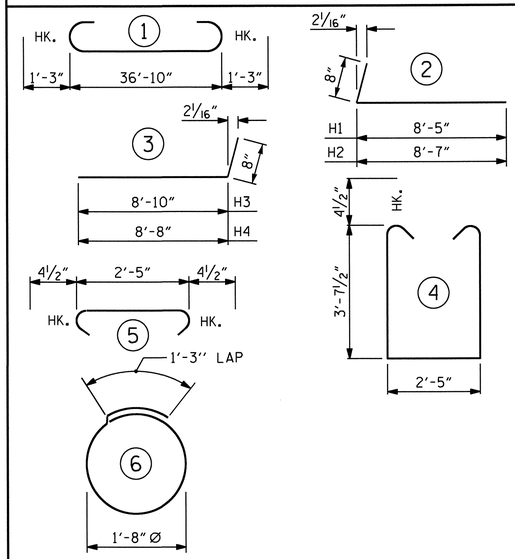
DETAIL A

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: 5 LIN. FT.= 50.0	NO: 5 LIN. FT.= 50.0
PILE EXCAVATION IN SOIL LIN. FT.= 20.0	PILE EXCAVATION IN SOIL LIN. FT.= 20.0
PILE EXCAVATION NOT IN SOIL LIN. FT.= 25.0	PILE EXCAVATION NOT IN SOIL LIN. FT.= 25.0

BILL OF MATERIAL FOR ONE END BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	39'-4"	1070
B2	28	#4	STR	19'-9"	369
B3	10	#4	STR	2'-5"	16
D1	20	#6	STR	1'-6"	45
H1	10	#4	2	9'-1"	61
H2	10	#4	2	9'-3"	62
H3	10	#4	3	9'-6"	63
H4	10	#4	3	9'-4"	62
K1	16	#4	STR	3'-1"	33
S1	48	#4	4	10'-5"	334
S2	48	#4	5	3'-2"	102
S3	20	#4	6	6'-6"	87
V1	53	#4	STR	6'-2"	218

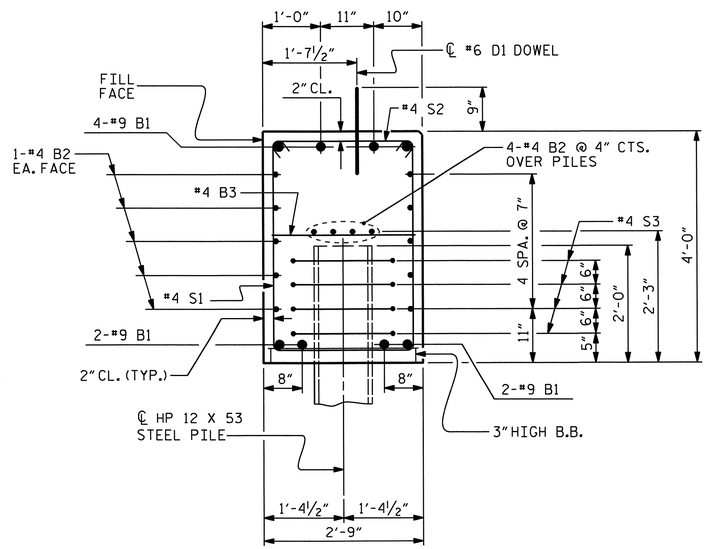
REINFORCING STEEL (FOR ONE END BENT) 2522 LBS.

CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 18.4 C.Y.

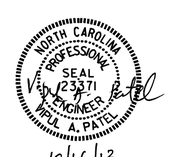
POUR #2 UPPER PART OF WINGS 2.1 C.Y.

TOTAL CLASS A CONCRETE 20.5 C.Y.



SECTION A-A

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



PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 & 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY : J. G. KHARVA	DATE : 8/12
CHECKED BY : H. T. DIEU	DATE : 8/12
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

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STD. NO. EB_30_105S4

NOTES

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

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

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

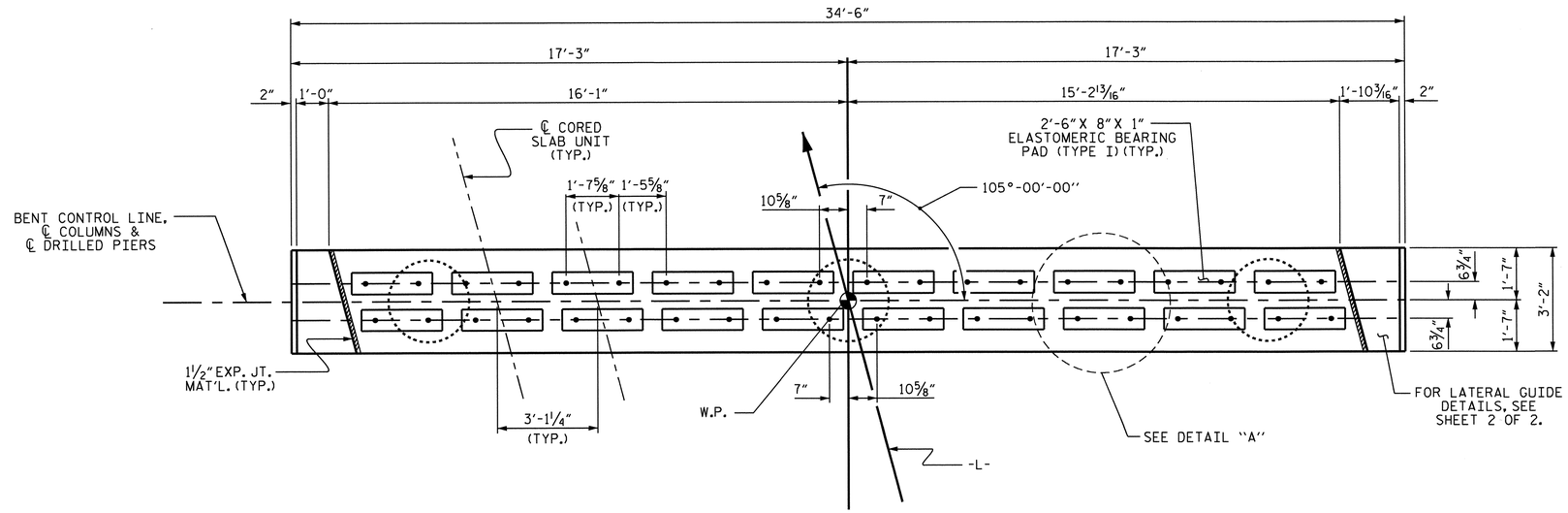
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

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

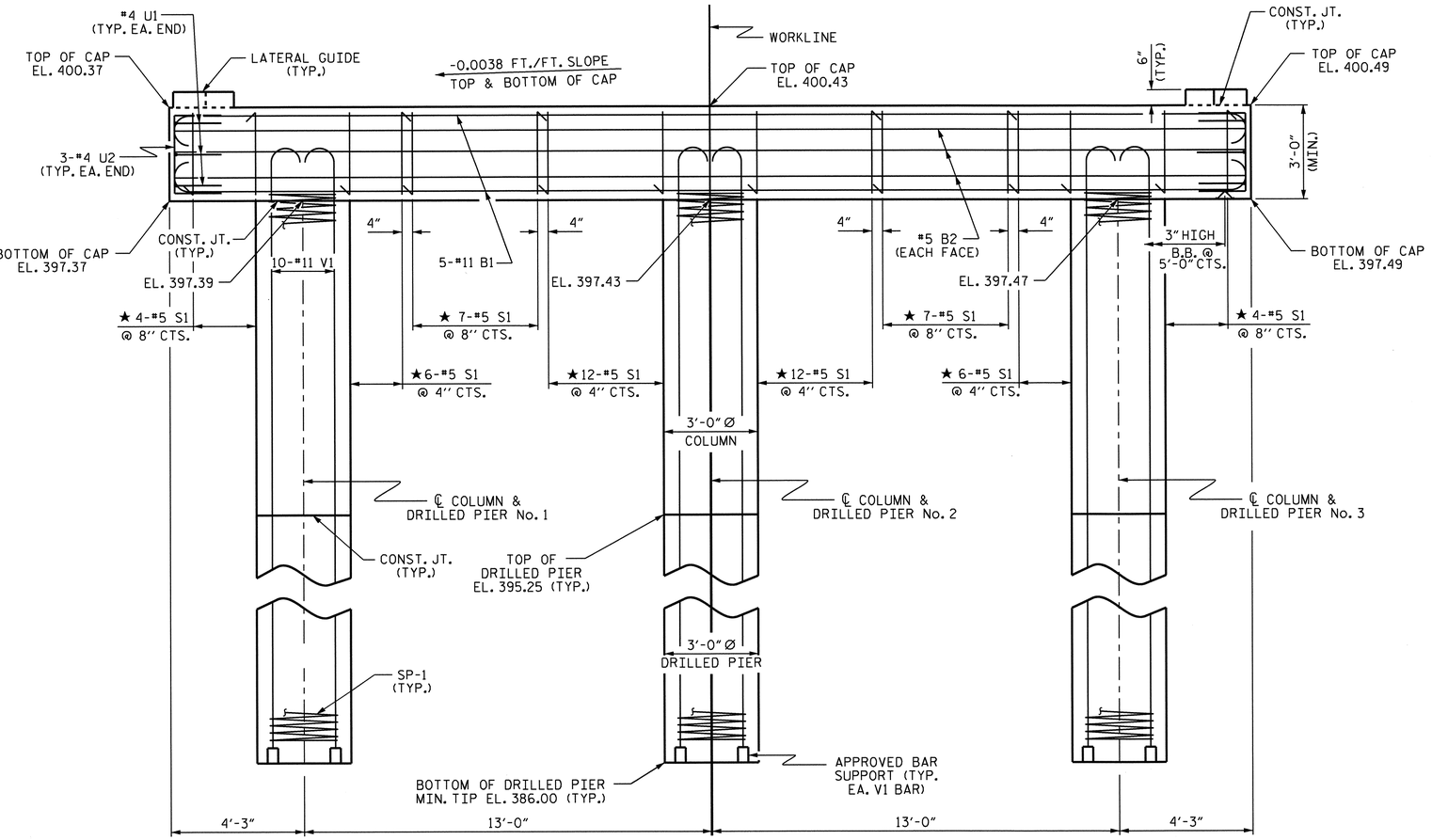
★ INVERT ALTERNATE STIRRUPS.

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

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

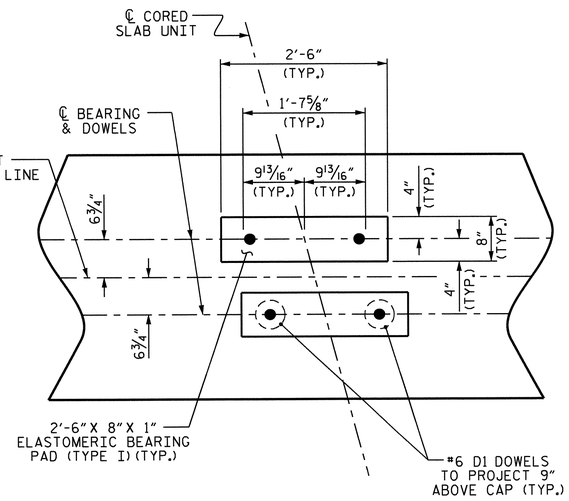


PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFAT

10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			19

ASSEMBLED BY :	J. G. KHARVA	DATE :	8/12
CHECKED BY :	H. T. DIEU	DATE :	8/12
DRAWN BY :	DGE 04/10		
CHECKED BY :	MKT 04/10		

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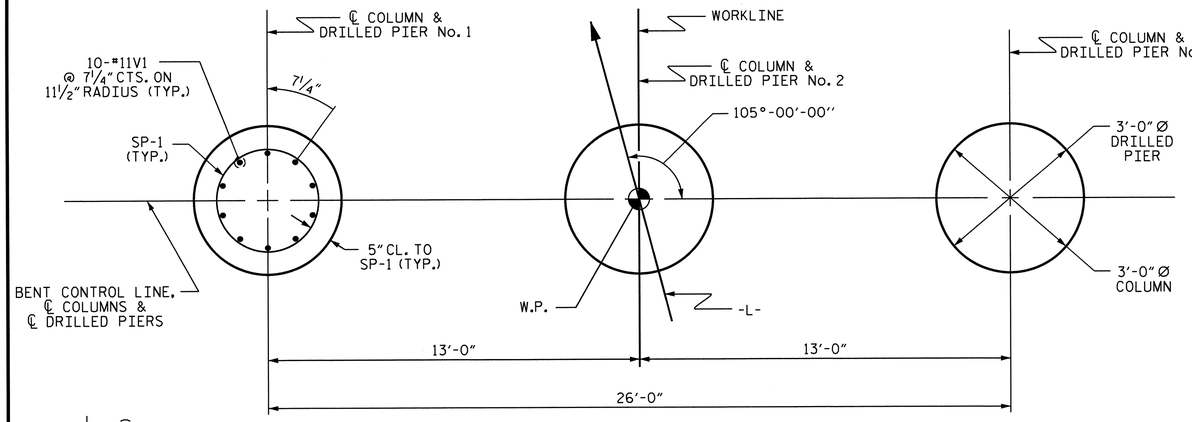
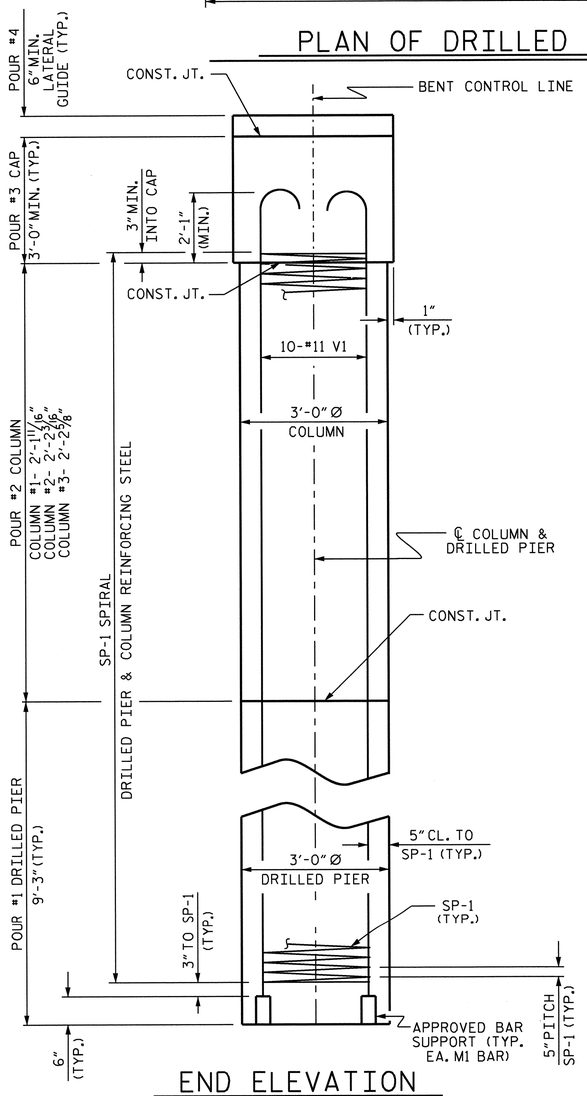
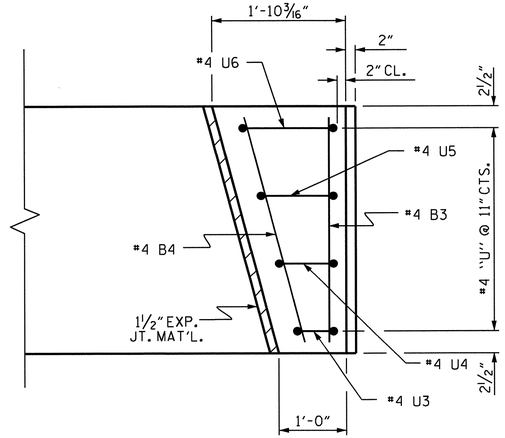
STD. NO. DP_BT_30_105S_<50'



PLAN OF DRILLED PIERS & COLUMNS



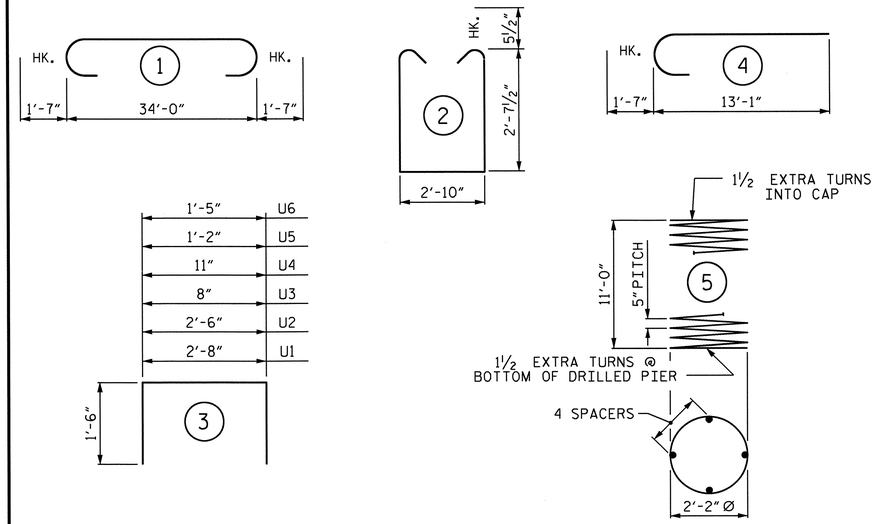
END ELEVATION



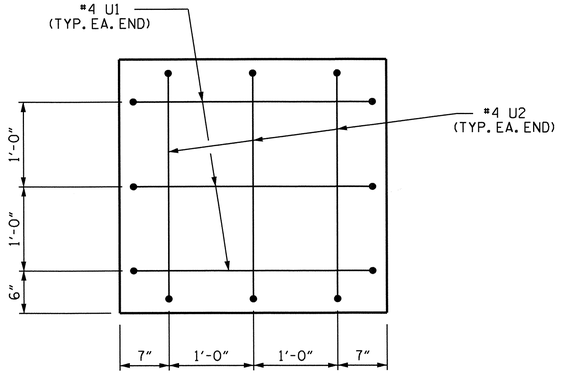
LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)

BAR TYPES

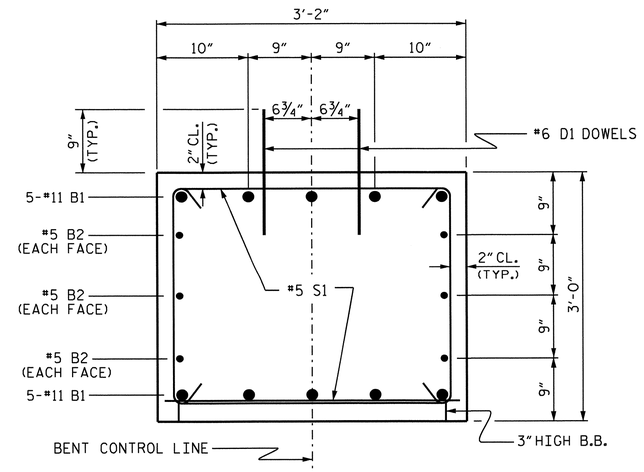


ALL BAR DIMENSIONS ARE OUT TO OUT



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION THRU CAP

BILL OF MATERIAL FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	37'-2"	1975
B2	6	#5	STR	34'-2"	214
B3	2	#4	STR	2'-10"	4
B4	2	#4	STR	2'-11"	4
D1	40	#6	STR	1'-6"	90
S1	58	#5	2	9'-0"	544
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	2	#4	3	3'-8"	5
U4	2	#4	3	3'-11"	5
U5	2	#4	3	4'-2"	6
U6	2	#4	3	4'-5"	6
V1	30	#11	4	14'-8"	2338

REINFORCING STEEL (FOR ONE BENT) 5236 LBS.

SP-1	3	*	5	196'-5"	615

SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 615

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #2 (COLUMNS)	1.7 C.Y.
POUR #3 (CAP)	12.1 C.Y.
POUR #4 (LATERAL GUIDE)	0.2 C.Y.
TOTAL CLASS A CONCRETE	14.0 C.Y.

DRILLED PIERS: (FOR ONE BENT)

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	7.3 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	21.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	6.8 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	6.8 LIN. FT.
SID INSPECTIONS	1 EA.
SPT TESTING	1 EA.
CSL TESTING	1 EA.
CSL TUBES	129.0 LIN. FT.

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			19

NORTH CAROLINA PROFESSIONAL SEAL 17230 ENGINEER WAEL S. ARAFA
10/16/13

ASSEMBLED BY :	J. G. KHARVA	DATE :	8/12
CHECKED BY :	H. T. DIEU	DATE :	8/12
DRAWN BY :	DGE	03/10	
CHECKED BY :	MKT	03/10	

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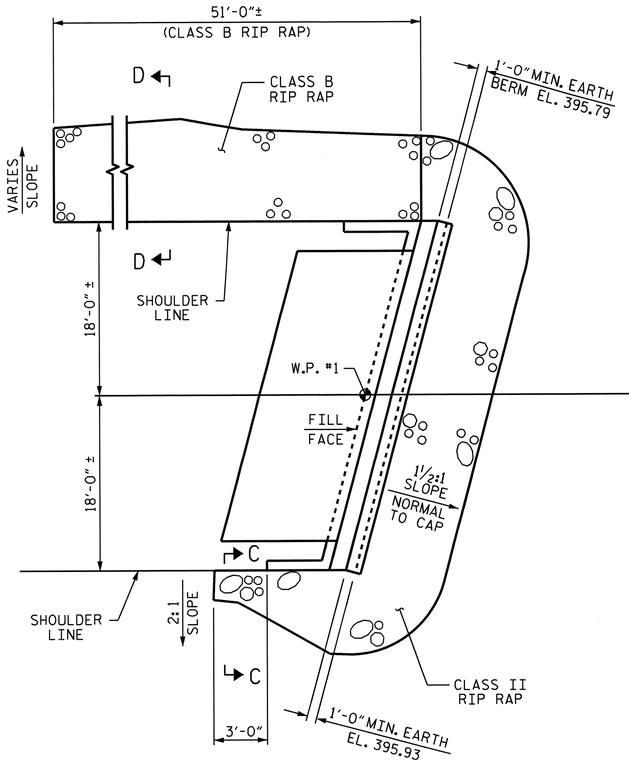
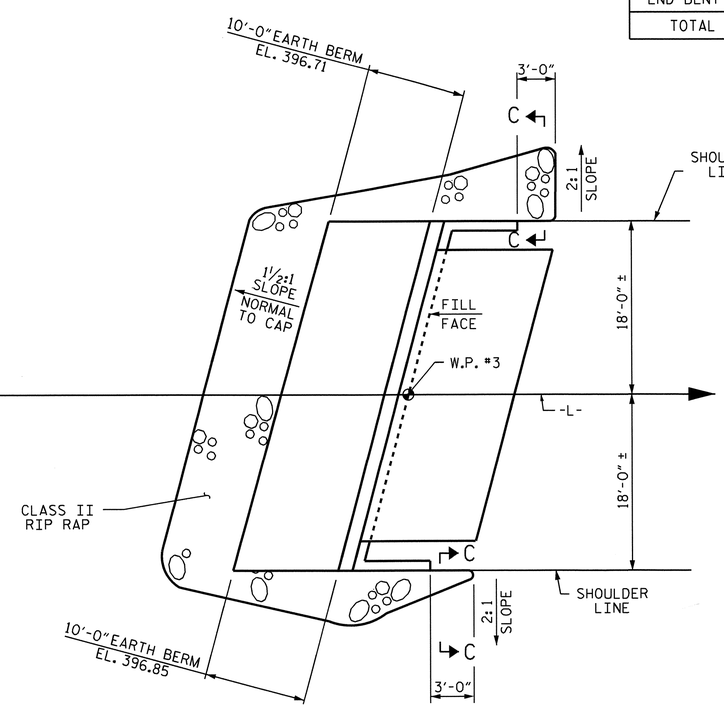
STD. NO. DP_BT_30_105S_<50'

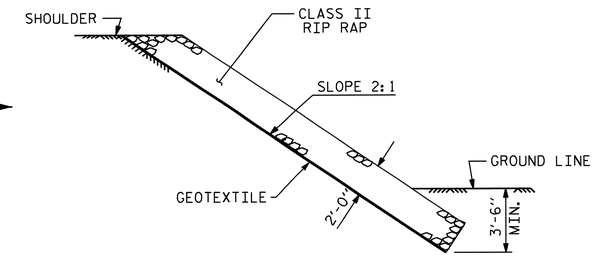
ESTIMATED QUANTITIES			
BRIDGE @ STA. 14+74.02-L-	RIP RAP CLASS B	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	TONS	SQUARE YARDS
END BENT 1	55	70	140
END BENT 2		45	50
TOTAL	55	115	190



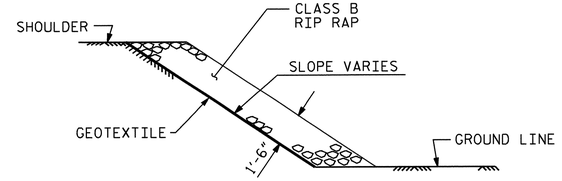
END BENT 1



END BENT 2

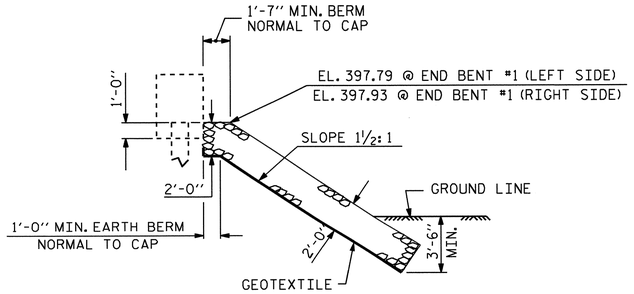


SECTION C-C

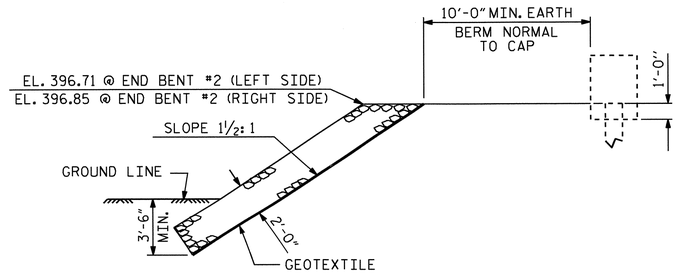


SECTION D-D

PLAN OF RIP RAP



℄ SECTION @ END BENT 1
BERM RIP RAPPED



℄ SECTION @ END BENT 2
BERM RIP RAPPED

PROJECT NO. B-4818
STANLY COUNTY
STATION: 14+74.02 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
10/16/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			19

DRAWN BY : J. G. KHARVA DATE : 8/12
CHECKED BY : K. D. LAYNE DATE : 2/13
DESIGN ENGINEER OF RECORD: V. A. PATEL DATE : 9/10/13

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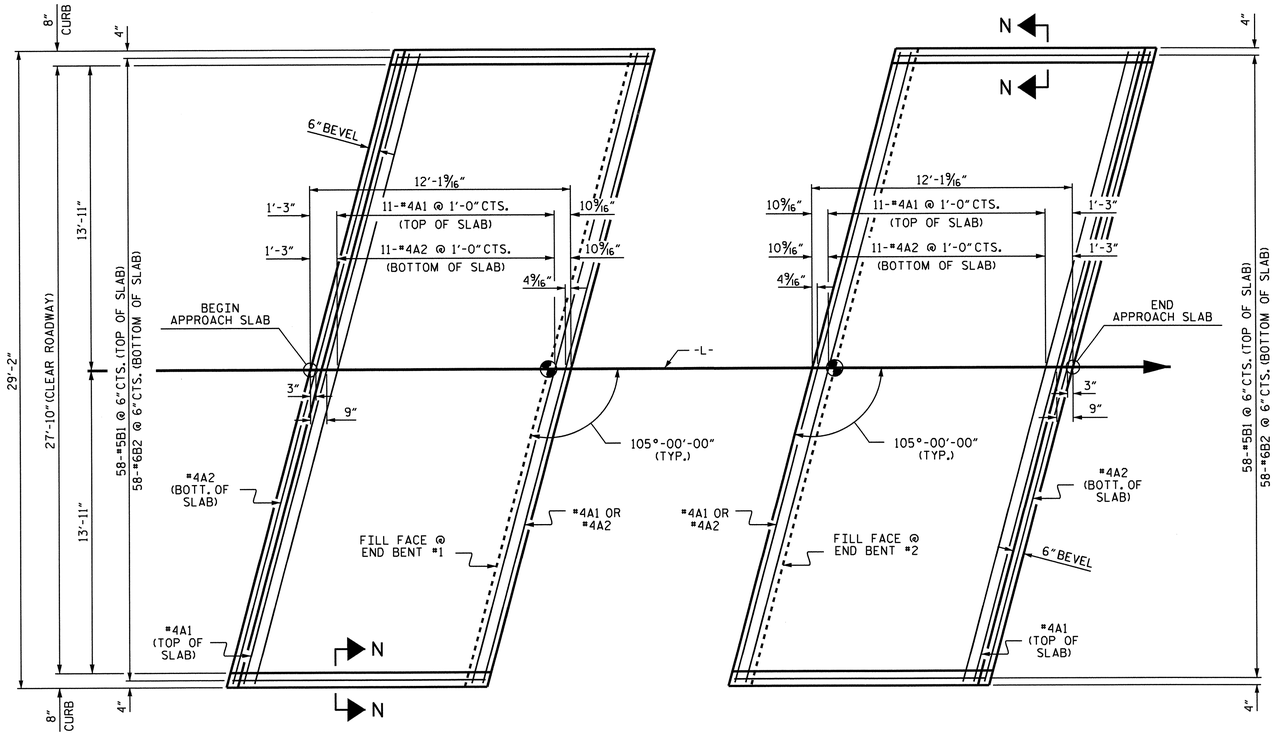
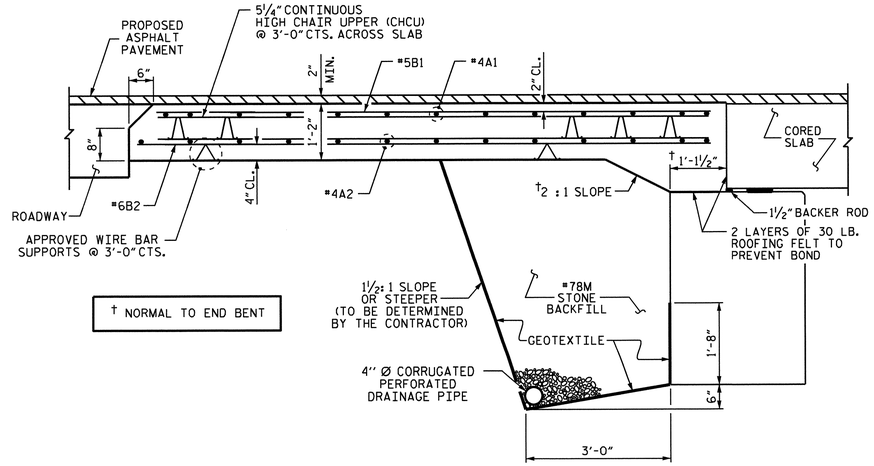


PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION THRU SLAB

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.

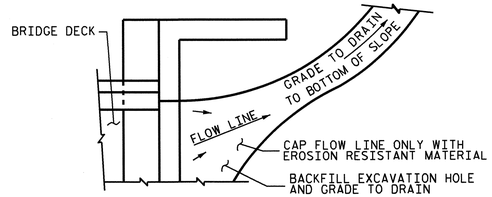
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#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.

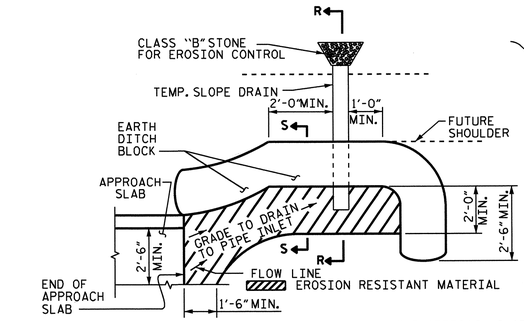
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

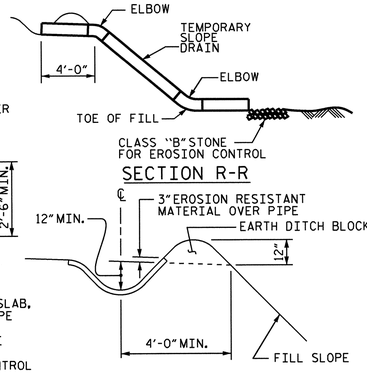


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

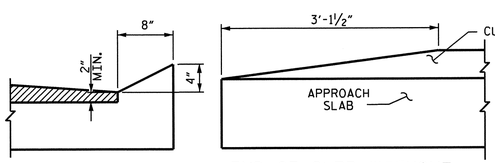


SECTION S-S

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N

END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

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

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

10/16/13

PROJECT NO. B-4818

STANLY COUNTY

STATION: 14+74.02 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 105° SKEW

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

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
* B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1268
* EPOXY COATED REINFORCING STEEL				LBS.	929
CLASS AA CONCRETE				C. Y.	16.9

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	29'-10"	259
A2	13	#4	STR	29'-10"	259
* B1	58	#5	STR	11'-1"	670
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1268
* EPOXY COATED REINFORCING STEEL				LBS.	929
CLASS AA CONCRETE				C. Y.	16.9

ASSEMBLED BY : J. G. KHARVA	DATE : 8/12
CHECKED BY : H. T. DIEU	DATE : 8/12
DRAWN BY : SHS/MAA 5-09	REV. 12-11 MAA/AAC
CHECKED BY : BCH 5-09	

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STD. NO. BAS_30_105S

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

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