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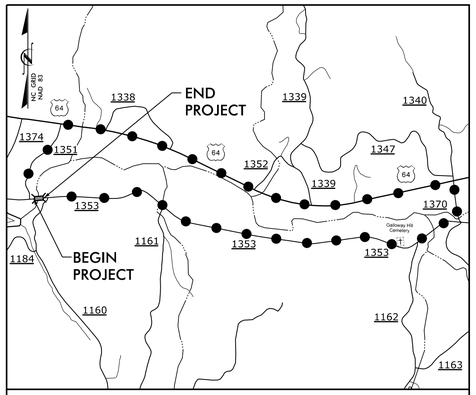
TIP NO:14SP.20221.3

CONTRACT: DN00126



VICINITY MAP

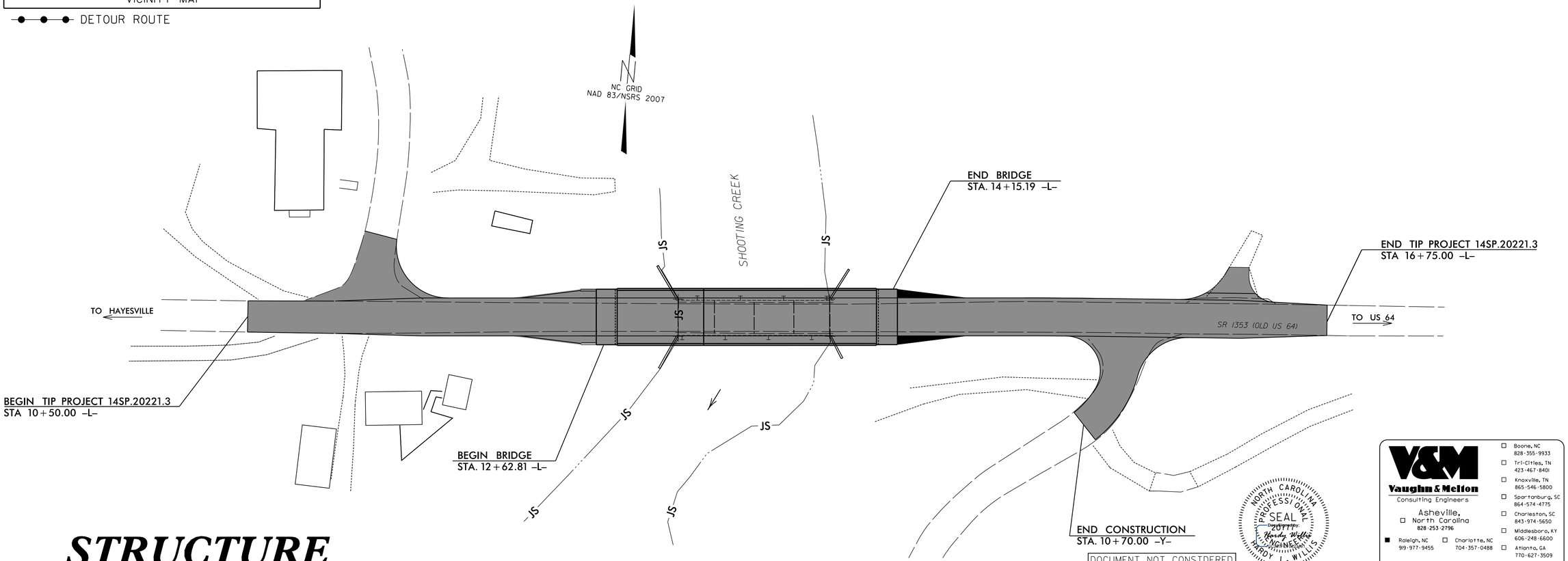
DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CLAY COUNTY

BRIDGE NO. 101 OVER SHOOTING CREEK
ON SR 1353 (OLD US 64)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	14SP.20221.3		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
14SP.20221.3	————	P.E.
14SP.20221.3	————	R/W & UTIL.
14SP.20221.3	————	CONST.



STRUCTURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
5/22/2018 10:37:01 AM PDT

V&M Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796
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Knoxville, TN 865-546-5800
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Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3509

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2010 = 1800
ADT 2025 = 3600
T = 6%
V = 50 MPH

FUNCT. CLASS = MINOR COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT 14SP.20221.3 = 0.089 MI
LENGTH STRUCTURE TIP PROJECT 14SP.20221.3 = 0.029 MI
TOTAL LENGTH OF TIP PROJECT 14SP.20221.3 = 0.118 MI

Prepared in the Office of:
VAUGHN & MELTON
1318-F PATTON AVE.
ASHEVILLE NC. 28806
FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

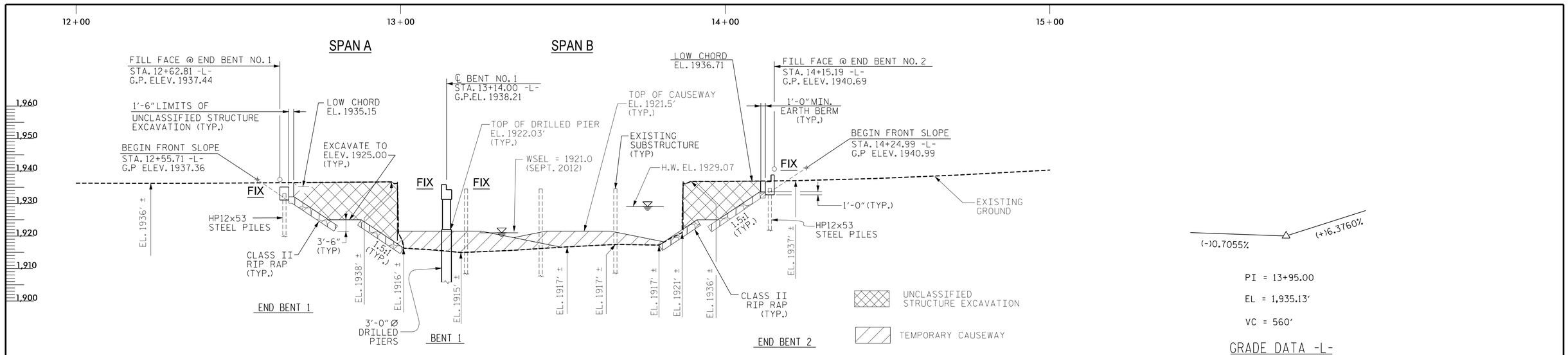
LETTING DATE :

JULY 17,2018

HARDY WILLIS, PE
PROJECT ENGINEER

CHRISTOPHER CORDELL, PE
PROJECT DESIGN ENGINEER

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



SECTION ALONG ℄ SURVEY -L-

PI = 13+95.00

EL = 1,935.13'

VC = 560'

GRADE DATA -L-

UNCLASSIFIED STRUCTURE EXCAVATION

TEMPORARY CAUSEWAY

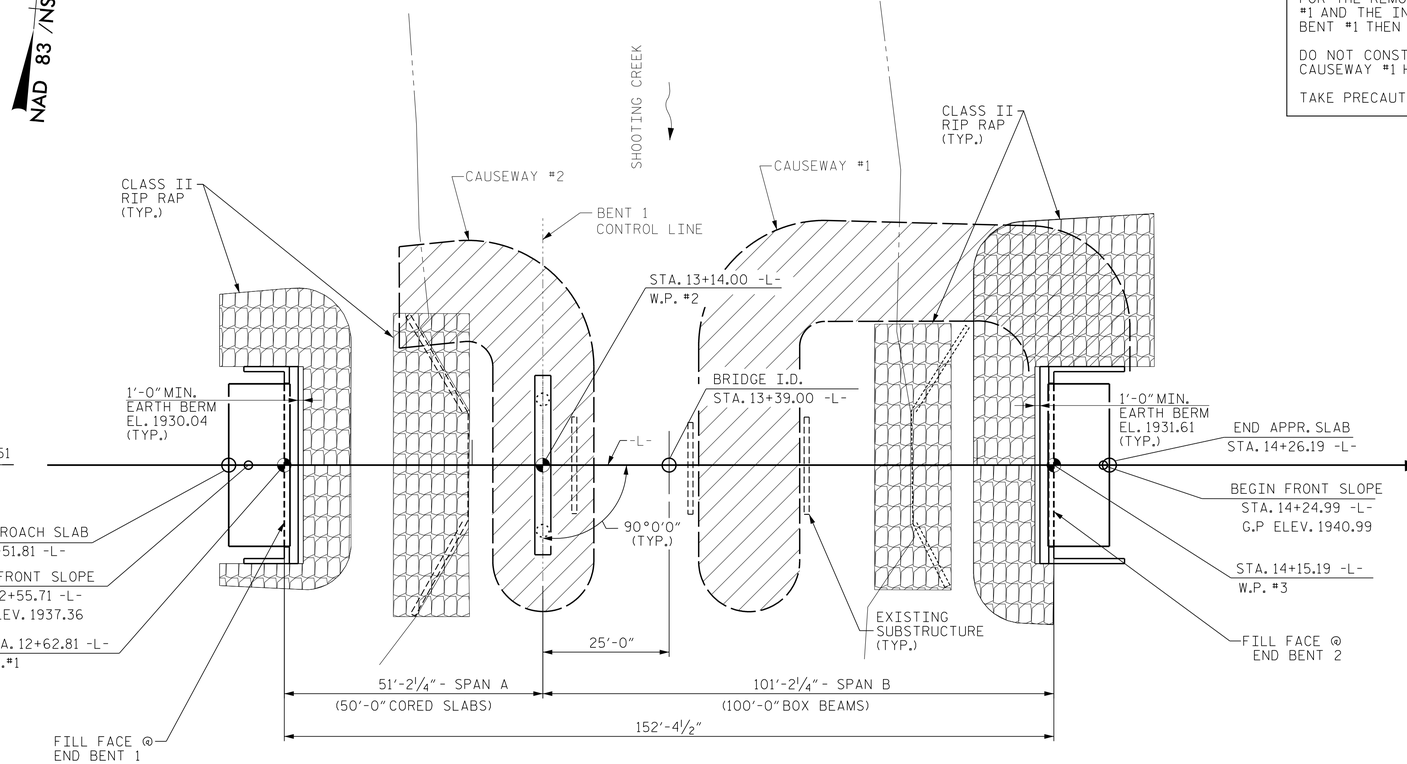
NOTE:

CAUSEWAY #1 IS TO BE CONSTRUCTED FOR THE REMOVAL OF INTERIOR BENTS #2 AND #3 THEN REMOVE CAUSEWAY #1.

NEXT CAUSEWAY #2 IS TO BE CONSTRUCTED FOR THE REMOVAL OF EXISTING INTERIOR BENT #1 AND THE INSTALLATION OF PROPOSED BENT #1 THEN REMOVED.

DO NOT CONSTRUCT CAUSEWAY #2 UNTIL CAUSEWAY #1 HAS BEEN COMPLETELY REMOVED.

TAKE PRECAUTION TO AVOID OVERHEAD UTILITIES.



PLAN ALONG ℄ SURVEY -L-

NOTES:

END BENTS AND BENT ARE PARALLEL.
PILES NOT SHOWN IN PLAN VIEW FOR CLARITY.
CORED SLABS AND BOX BEAMS ARE PARALLEL TO ℄ SURVEY -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 30177 ENGINEER HARDY L. WILLIS
9/7/2018 11:08:09 AM EDT

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Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3509

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE 101

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE on SR 1353 over SHOOTING CREEK
Between SR 1351 & SR 1160

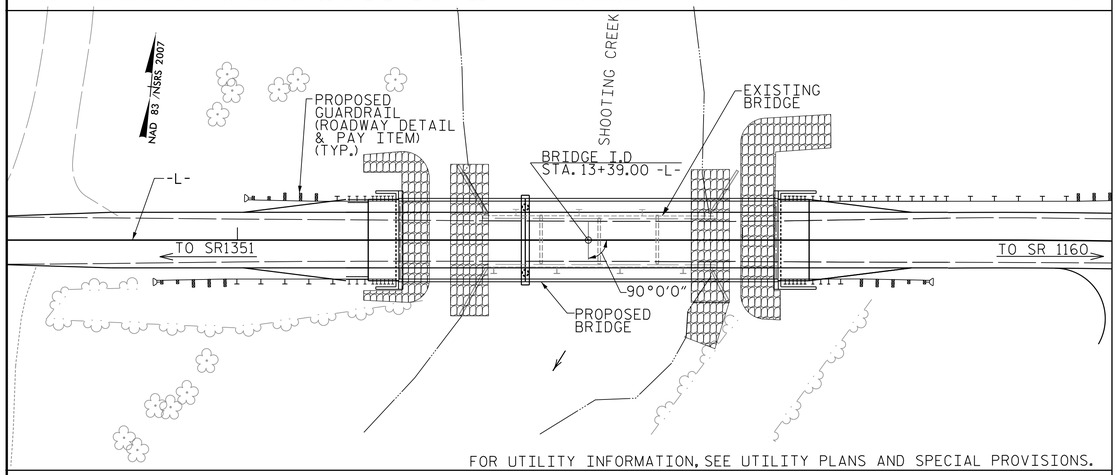
DWN. BY: AW	DATE: 11/2015
CHKD. BY: HLW	DATE: 11/2015
DES. EGR. OF RECORD: CBC	DATE: 11/2015

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

SHEET NO. S-1

TOTAL SHEETS 23

BM#1 - 8" SPIKE SET IN BASE OF 15" WHITE PINE TREE - N 496397.51, E 588464.78, STA 10+79.95, -L-, 28.48' RT., ELEV. 1937.95,



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

GENERAL NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE, CONSISTING OF FOUR SPANS, TOTALING 92-FOOT LONG (1 @ 24'-1", 1 @ 22'-10", 1 @ 22'-8", 1 @ 22'-5") WITH REINFORCED CONCRETE SLAB, 18 FEET CLEAR ROADWAY, ON CONCRETE ABUTMENTS AND PIERS, AND LOCATED AT THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE, A LOAD LIMIT MAY BE POSTED AND 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 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".

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

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.

AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENT AND BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE OF NO ADDITIONAL COST TO THE CONTRACTOR.

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

FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

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 13+39.00 -L-.

FOUNDATION 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.

DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE.

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

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED AT END BENT NO. 1. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS (AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION).

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

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

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

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

DRILLED PIERS AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 420 TONS PER PIER.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 1,907.1 FT (LT) AND 1,913.4 FT (RT) WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL PERMANENT CASINGS AT BENT NO. 1 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 1,907.1 FT (LT) AND 1,913.4 FT (RT).

INSTALL DRILLED PIERS AT BENT NO. 1 (LT) TO A TIP ELEVATION NO HIGHER THAN 1,899 FT AND WITH PENETRATION OF AT LEAST 8 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT NO. 1 (RT) TO A TIP ELEVATION NO HIGHER THAN 1,904 FT AND WITH PENETRATION OF AT LEAST 9 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 1,906.0 FT (LT) AND ELEVATION 1,912.0 FT (RT). SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 1922.9 AND HAVE AT LEAST 5 FEET OF PENETRATION INTO WEATHERED ROCK OR ROCK. SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE, & REMOVAL OF TEMPORARY ACCESS	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	3'-0" Ø DRILLED PIERS IN SOIL	3'-0" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASINGS FOR 3'-0" DIA. DRILLED PIER	PDA TESTING	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH	LUMP SUM
SUPERSTRUCTURE			LUMP SUM									
END BENT 1												LUMP SUM
BENT 1						28	35	35.3				
END BENT 2				45	55							LUMP SUM
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	45	55	28	35	35.3	1	1	1	LUMP SUM

TOTAL BILL OF MATERIAL (Cont.)

	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS		3'-0" x 3'-3" PRESTRESSED CONCRETE BOX BEAMS	
	CU. YARDS	LUMP SUM	LBS.	LBS.	EACH	NO.	LIN. FT.	EACH	LIN. FT.	TONS	SQ. YARDS	LUMP SUM	NO.	LIN. FT.	NO.	LIN. FT.
SUPERSTRUCTURE		LUMP SUM							300.25			LUMP SUM	11	550	11	1100
END BENT 1	21.7		2,636		7	7	210	7		240	265					
BENT 1	20.7		10,943	1,623												
END BENT 2	28.9		4,954			7	125			340	375					
TOTAL	71.3	LUMP SUM	18,173	1,623	7	14	335	7	300.25	580	640	LUMP SUM	11	550	11	1100

HYDRAULIC DATA

DESIGN DISCHARGE	= 5640	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 1926.9	FT
BASE DISCHARGE	= 7820	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1929.07	FT

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 10,450(+)	CFS
OVERTOPPING FREQUENCY	= 500 (+)	YRS
OVERTOPPING ELEVATION	= 1936.9	FT
DRAINAGE AREA	= 38.9	SQ MI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER WENDY L. WILLIS

9/7/2018 11:08:09 AM EDT

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Atlanta, GA 770-627-3509

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE on SR 1353 over SHOOTING CREEK
Between SR 1351 & SR 1160

DWN. BY: AW	DATE: 11/2015				
CHKD. BY: HLW	DATE: 11/2015				
DES. EGR. OF RECORD: CBC	DATE: 11/2015				

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1	AW	7/2016	3		
2			4		

SHEET NO. S-2

TOTAL SHEETS 23

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	1.287	--	1.75	0.294	1.287	A	E	24.5	0.562	1.568	A	E	1.6	0.80	0.294	1.542	A	E	24.5	
		HL-93(Opr)	N/A	--	1.668	--	1.35	0.294	1.668	A	E	24.5	0.562	2.032	A	E	1.6	0.80	0.294	--	A	E	24.5	
		HS-20(Inv)	36.000	2	1.599	57.574	1.75	0.294	1.599	A	E	24.5	0.562	1.875	A	E	1.6	0.80	0.294	1.911	A	E	24.5	
		HS-20(Opr)	36.000	--	2.073	74.633	1.35	0.294	2.073	A	E	24.5	0.562	2.431	A	E	1.6	0.80	0.294	--	A	E	24.5	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.894	52.564	1.40	0.294	4.050	A	E	24.5	0.562	5.296	A	E	1.6	0.80	0.294	3.894	A	E	24.5	
		SNGARBS2	20.000	--	3.072	61.441	1.40	0.294	3.218	A	E	24.5	0.562	3.858	A	E	1.6	0.80	0.294	3.072	A	E	24.5	
		SNAGRIS2	22.000	--	2.988	65.730	1.40	0.294	3.132	A	E	19.6	0.562	3.616	A	E	1.6	0.80	0.294	2.988	A	E	24.5	
		SNCOTTS3	27.250	--	1.941	52.901	1.40	0.294	2.025	A	E	24.5	0.562	2.655	A	E	1.6	0.80	0.294	1.941	A	E	24.5	
		SNAGGRS4	34.925	--	1.688	58.945	1.40	0.294	1.759	A	E	24.5	0.562	2.263	A	E	1.6	0.80	0.294	1.688	A	E	24.5	
		SNS5A	35.550	--	1.646	58.519	1.40	0.294	1.721	A	E	24.5	0.562	2.322	A	E	1.6	0.80	0.294	1.646	A	E	24.5	
		SNS6A	39.950	--	1.549	61.870	1.40	0.294	1.620	A	E	24.5	0.562	2.168	A	E	1.6	0.80	0.294	1.549	A	E	24.5	
		SNS7B	42.000	--	1.466	61.585	1.40	0.294	1.530	A	E	24.5	0.562	2.144	A	E	1.6	0.80	0.294	1.466	A	E	24.5	
	TTST	TNAGRIT3	33.000	--	1.885	62.195	1.40	0.294	1.966	A	E	24.5	0.562	2.532	A	E	1.6	0.80	0.294	1.885	A	E	24.5	
		TNT4A	33.075	--	1.902	62.909	1.40	0.294	1.982	A	E	24.5	0.562	2.443	A	E	1.6	0.80	0.294	1.902	A	E	24.5	
		TNT6A	41.600	--	1.584	65.907	1.40	0.294	1.654	A	E	24.5	0.562	2.344	A	E	1.6	0.80	0.294	1.584	A	E	24.5	
		TNT7A	42.000	--	1.608	67.523	1.40	0.294	1.678	A	E	24.5	0.562	2.187	A	E	1.6	0.80	0.294	1.608	A	E	24.5	
		TNT7B	42.000	--	1.677	70.426	1.40	0.294	1.753	A	E	24.5	0.562	2.067	A	E	1.6	0.80	0.294	1.677	A	E	24.5	
		TNAGRIT4	43.000	--	1.590	68.387	1.40	0.294	1.660	A	E	24.5	0.562	1.992	A	E	1.6	0.80	0.294	1.590	A	E	24.5	
		TNAGT5A	45.000	--	1.486	66.885	1.40	0.294	1.550	A	E	24.5	0.562	2.020	A	E	1.6	0.80	0.294	1.486	A	E	24.5	
		TNAGT5B	45.000	3	1.456	65.519	1.40	0.294	1.520	A	E	24.5	0.562	1.892	A	E	1.6	0.80	0.294	1.456	A	E	24.5	

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)

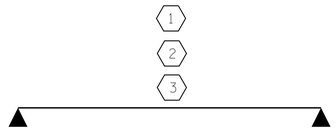
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

E - EXTERIOR GIRDER



LRFR SUMMARY

FOR SPAN 'A'

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton
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Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3509

NORTH CAROLINA PROFESSIONAL SEAL 027799 ENGINEER Handy Willis ROY L. WILLIS

5/22/2018 10:37:01 AM PDT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR 50' CORED SLAB UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY :	AW	DATE : 11/2015
CHECKED BY :	CBC	DATE : 11/2015
DRAWN BY : CVC	6/10	
CHECKED BY : DNS	6/10	

5/21/2018
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
User:wdcrutcher

STD. NO. 21LRFR1_90S_50L

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	1.047	--	1.75	0.291	**1.047**	B	E	**49.25**	0.518	2.423	B	E	2.71	0.80	0.291	1.386	B	E	49.25	
		HL-93(Opr)	N/A	--	1.357	--	1.35	0.291	1.357	B	E	49.25	0.518	3.141	B	E	2.71	0.80	0.291	--	B	E	49.25	
		HS-20(Inv)	36.000	2	1.456	52.399	1.75	0.291	**1.456**	B	E	**49.25**	0.518	3.281	B	E	2.71	0.80	0.291	1.929	B	E	49.25	
		HS-20(Opr)	36.000	--	1.887	67.924	1.35	0.291	1.887	B	E	49.25	0.518	4.253	B	E	2.71	0.80	0.291	--	B	E	49.25	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.500	47.247	1.40	0.291	3.500	B	E	49.25	0.518	8.745	B	E	2.71	0.80	0.291	3.708	B	E	49.25	
		SNGARBS2	20.000	--	3.126	62.518	1.40	0.291	3.126	B	E	49.25	0.518	7.079	B	E	2.71	0.80	0.291	3.311	B	E	49.25	
		SNAGRIS2	22.000	--	2.926	64.376	1.40	0.291	2.926	B	E	49.25	0.518	6.535	B	E	2.71	0.80	0.291	3.096	B	E	49.25	
		SNCOTTS3	27.250	--	2.145	58.464	1.40	0.291	2.145	B	E	49.25	0.518	5.054	B	E	2.71	0.80	0.291	2.272	B	E	49.25	
		SNAGGRS4	34.925	--	1.759	61.421	1.40	0.291	1.759	B	E	49.25	0.518	4.110	B	E	2.71	0.80	0.291	1.862	B	E	49.25	
		SNS5A	35.550	--	1.721	61.192	1.40	0.291	1.721	B	E	49.25	0.518	4.120	B	E	2.71	0.80	0.291	1.823	B	E	49.25	
		SNS6A	39.950	--	1.577	63.001	1.40	0.291	1.577	B	E	49.25	0.518	3.756	B	E	2.71	0.80	0.291	1.670	B	E	49.25	
		SNS7B	42.000	--	1.490	62.580	1.40	0.291	1.490	B	E	49.25	0.518	3.611	B	E	2.71	0.80	0.291	1.579	B	E	49.25	
	TTST	TNAGRIT3	33.000	--	1.905	62.863	1.40	0.291	1.905	B	E	49.25	0.518	4.460	B	E	2.71	0.80	0.291	2.017	B	E	49.25	
		TNT4A	33.075	--	1.908	63.120	1.40	0.291	1.908	B	E	49.25	0.518	4.383	B	E	2.71	0.80	0.291	2.022	B	E	49.25	
		TNT6A	41.600	--	1.547	64.350	1.40	0.291	1.547	B	E	49.25	0.518	3.772	B	E	2.71	0.80	0.291	1.640	B	E	49.25	
		TNT7A	42.000	--	1.549	65.065	1.40	0.291	1.549	B	E	49.25	0.518	3.717	B	E	2.71	0.80	0.291	1.640	B	E	49.25	
		TNT7B	42.000	--	1.586	66.633	1.40	0.291	1.586	B	E	49.25	0.518	3.561	B	E	2.71	0.80	0.291	1.679	B	E	49.25	
		TNAGRIT4	43.000	--	1.520	65.364	1.40	0.291	1.520	B	E	49.25	0.518	3.457	B	E	2.71	0.80	0.291	1.610	B	E	49.25	
		TNAGT5A	45.000	--	1.439	64.760	1.40	0.291	1.439	B	E	49.25	0.518	3.385	B	E	2.71	0.80	0.291	1.525	B	E	49.25	
		TNAGT5B	45.000	3	1.427	64.233	1.40	0.291	**1.427**	B	E	**49.25**	0.518	3.291	B	E	2.71	0.80	0.291	1.512	B	E	49.25	

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:

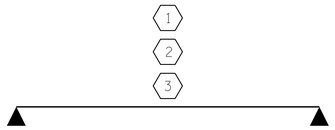
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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
E - EXTERIOR GIRDER



LRFR SUMMARY

FOR SPAN 'B'

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796
Raleigh, NC 919-977-9455
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Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Atlanta, GA 770-627-3509

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
5/22/2018 10:37:01 AM PDT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

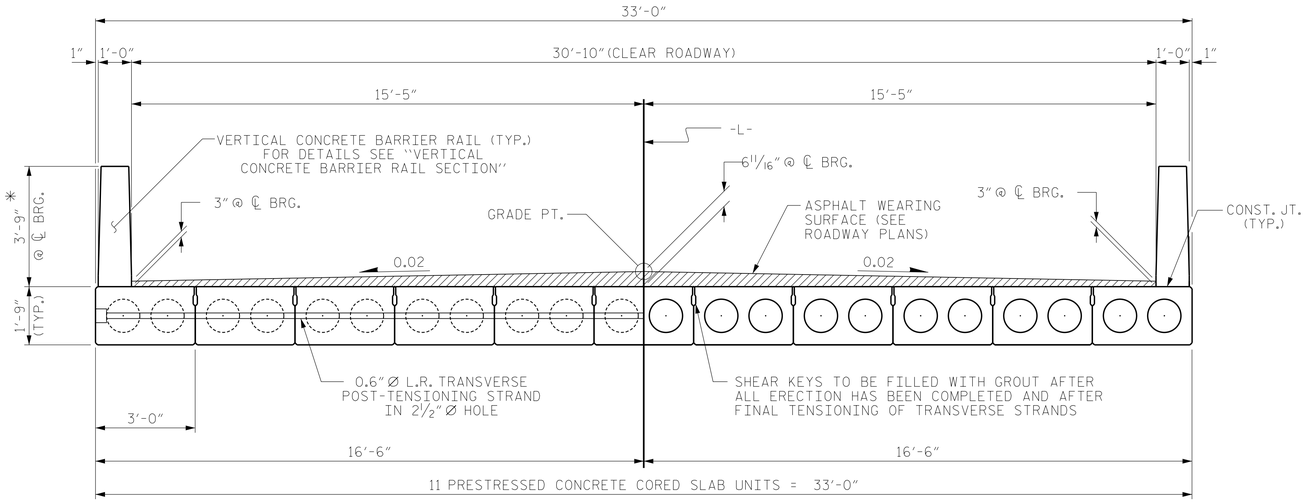
LRFR SUMMARY FOR 100' BOX BEAM UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY :	AW	DATE : 11/2015
CHECKED BY :	CBC	DATE : 11/2015
DRAWN BY : TMG	II/II	
CHECKED BY : AAC	II/II	

5/21/2018
$$$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$
User:wdcrutcher

STD. NO. 39LRFR1_90S_100L

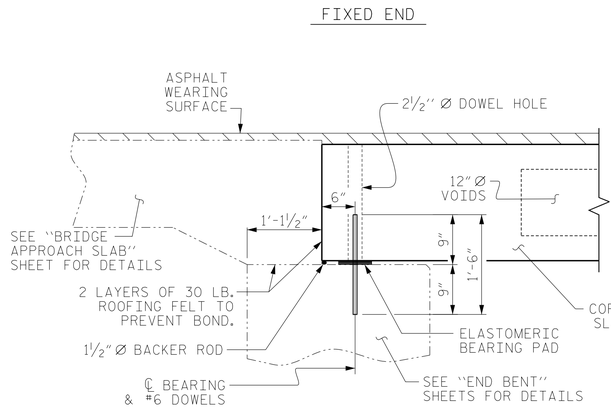


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

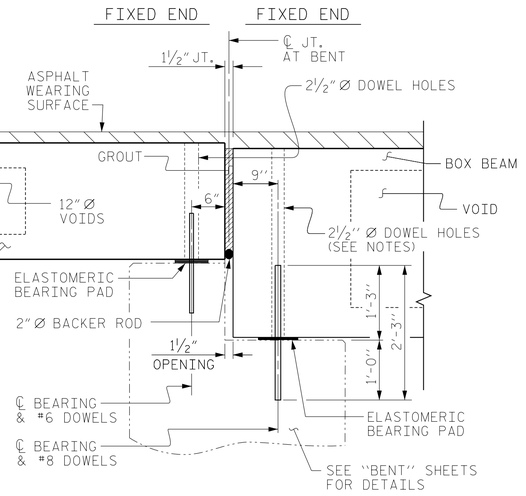
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

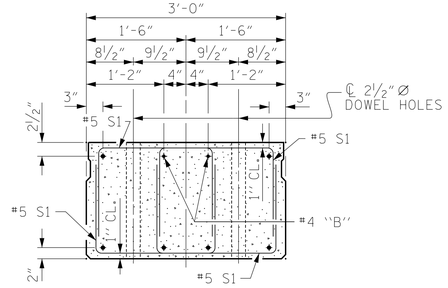
* -THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE ″VERTICAL CONCRETE BARRIER RAIL SECTION″ DETAIL.
USE ONLY S9.5B SURFACE MIX ON THE BRIDGE AND APPROACH SLABS (NO BASE COURSE).



SECTION AT END BENT

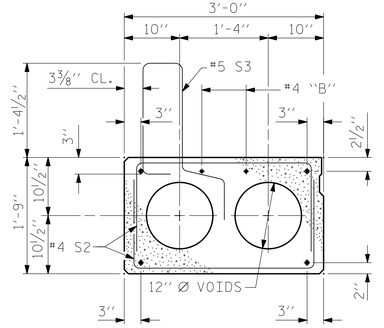


SECTION AT BENT



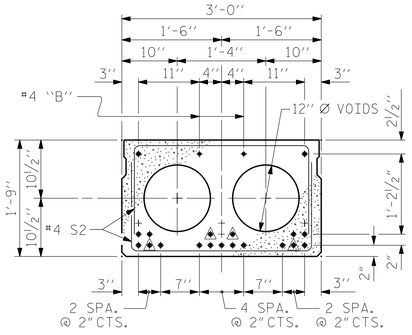
END ELEVATION

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.



EXT. SLAB SECTION

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



INTERIOR SLAB SECTION (50′ UNIT)

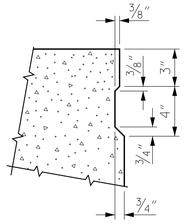
(19 STRANDS REQUIRED)

0.6″ Ø LOW RELAXATION STRAND LAYOUT

△ 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.

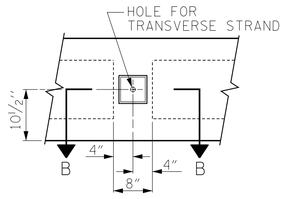
DEBONDING LEGEND

THREADED INSERT DETAIL

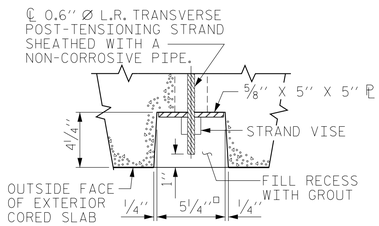


SHEAR KEY DETAIL

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



ELEVATION VIEW



SECTION B-B

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
5/22/2018 10:37:01 AM PDT

ASSEMBLED BY :	AW	DATE :	11/2015
CHECKED BY :	HLW	DATE :	11/2015
DRAWN BY : DGE	5/09	REV. 12/11	MAA/AAC
CHECKED BY : BCH	6/09	REV. 8/14	MAA/TMG

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
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Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
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Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3509

PROJECT NO. 14SP.20221.3
CLAY COUNTY
STATION: 13+39.00 -L-

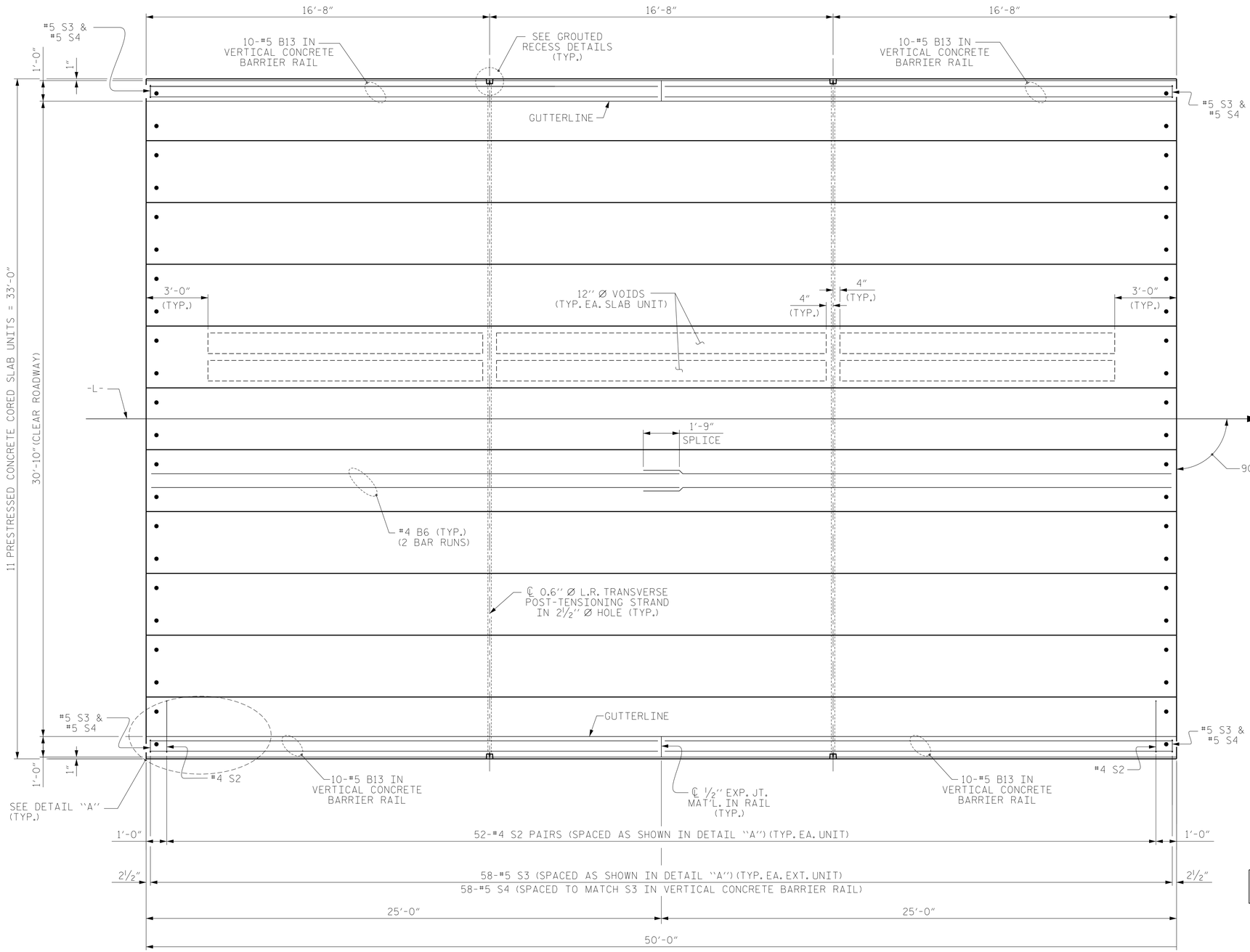
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3′-0″ X 1′-9″ PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

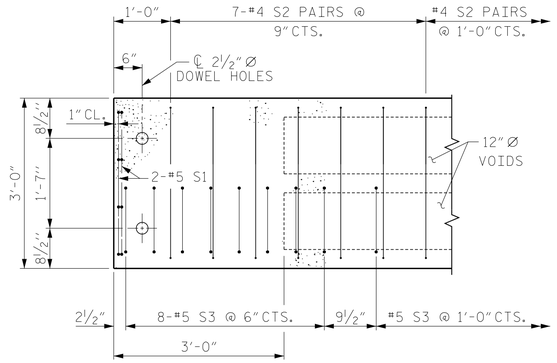
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1	AW	7/2016	3			TOTAL SHEETS
2			4			23

STD. NO. 21″PCS2_33_90S



PLAN OF UNIT

(SPAN A)



DETAIL "A"

(TYPICAL EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

ASSEMBLED BY :	AW	DATE :	11/2015
CHECKED BY :	HLW	DATE :	11/2015
DRAWN BY : DGE	3/09	REV.	12/5/11 MAA/AAC
CHECKED BY : BCH	3/09	REV.	8/14 MAA/TMG

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Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3509

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

SHEET 2 OF 3

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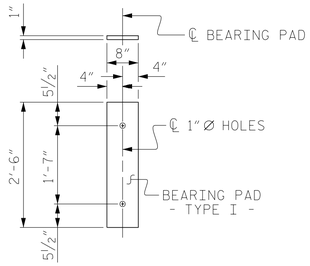
NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
5/22/2018 10:37:01 AM PDT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 50' UNIT 30'-10" CLEAR ROADWAY 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			23

STD. NO. 21"PCS_33_90S_50L



FIXED END
(TYPE I - 22 REQ'D)

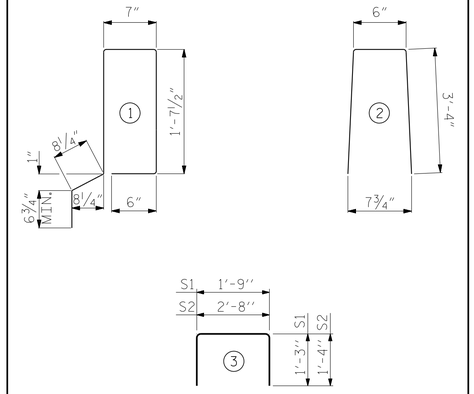
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B6	4	#4	STR	25'-9"	69	25'-9"	69
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	104	#4	3	5'-4"	371	5'-4"	371
✳ S3	58	#5	1	5'-7"	338		
REINFORCING STEEL			LBS.		475		475
✳ EPOXY COATED REINFORCING STEEL			LBS.		338		
6500 P.S.I. CONCRETE			CU. YDS.		7.1		7.1
0.6" Ø L.R. STRANDS			No.		19		19

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
50' UNIT			
EXTERIOR C.S.	2	50'-0"	100'-0"
INTERIOR C.S.	9	50'-0"	450'-0"
TOTAL	11		550'-0"

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS✳✳	RAIL HEIGHT✳✳
	@ MID-SPAN	@ MID-SPAN
50' UNITS	1½"	3'-7½"

✳✳ INCLUDES ADJUSTMENT FOR VERTICAL CURVE ORDINATE OF 7/16" DOWNWARD

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
50' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 7/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✳✳	3/8" ↓
FINAL CAMBER	1/16" ↑

✳✳ INCLUDES FUTURE WEARING SURFACE

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
	50' UNIT					
✳B13	40	40	#5	STR	24'-7"	1026
✳ S4	116	116	#5	2	7'-2"	867
✳ EPOXY COATED REINFORCING STEEL				LBS.		1893
CLASS AA CONCRETE				CU.YDS.		13.2
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		100.25

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.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

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.

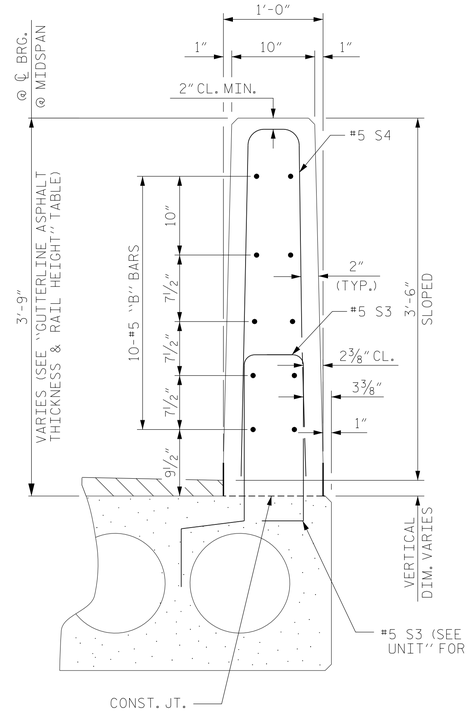
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

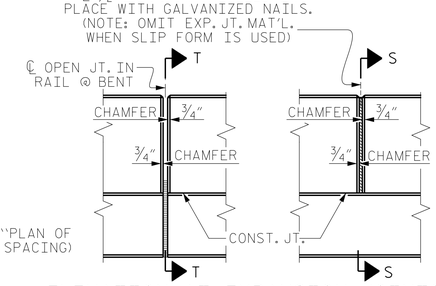
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.



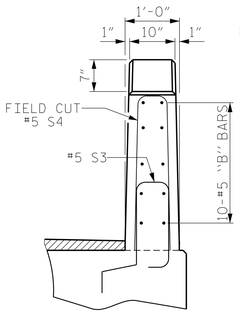
VERTICAL CONCRETE BARRIER RAIL SECTION

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

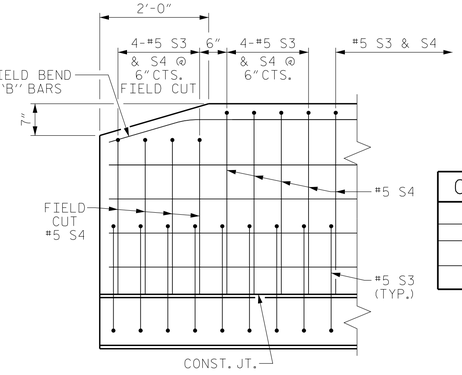
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



ELEVATION AT EXPANSION JOINTS



END VIEW



SIDE VIEW

END OF RAIL DETAILS

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

CONCRETE RELEASE STRENGTH

UNIT	PSI
50' UNITS	4900

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PROJECT NO. 14SP.20221.3
CLAY COUNTY
STATION: 13+39.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 90° SKEW

ASSEMBLED BY : AW	DATE : 11/2015
CHECKED BY : HLW	DATE : 11/2015
DRAWN BY : DGE 5/09	REV. 12/11 MAA/AAC
CHECKED BY : BCH 6/09	REV. 8/14 MAA/TMG

REVISIONS						SHEET NO.
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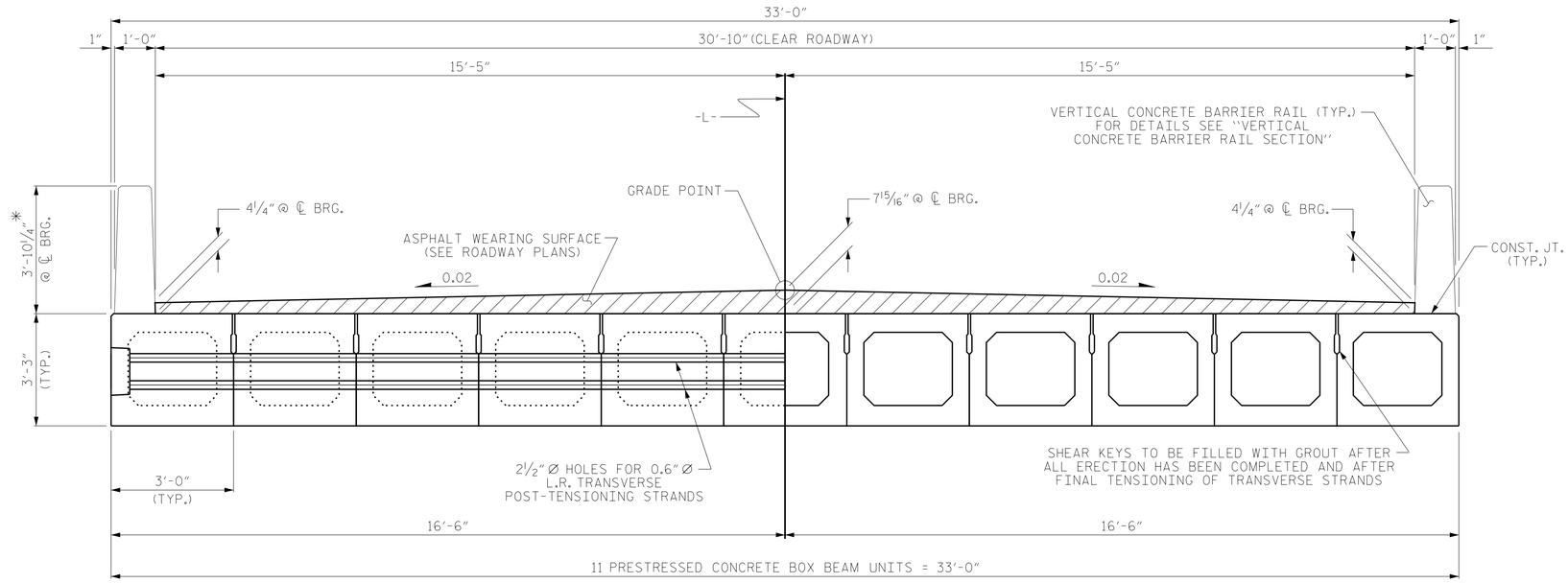
1			3			TOTAL SHEETS
2			4			23

STD. NO. 21"PCS3_33_90S



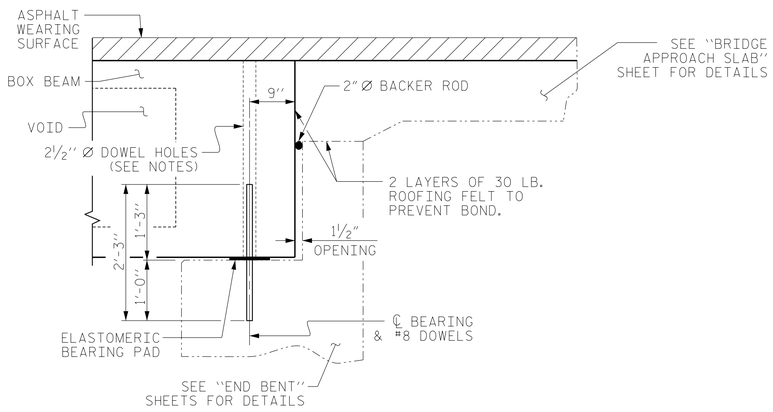
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

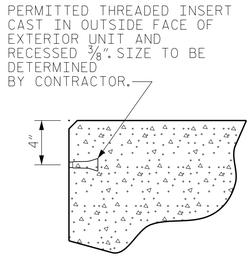
TYPICAL SECTION

* 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.
USE ONLY S9.5B SURFACE MIX ON THE BRIDGE AND APPROACH SLABS (NO BASE COURSE).

FIXED END



SECTION AT END BENT



THREADED INSERT 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.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

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

THE 2½″ 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 6000 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, 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 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 RAILSEGMENTS 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.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4′-0″ CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

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NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER Randy Wills L. WILLS
5/22/2018 10:37:01 AM PDT

PROJECT NO. 14SP.20221.3
CLAY COUNTY
STATION: 13+39.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3′-0″ X 3′-3″ PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1	AW	7/2016	3			TOTAL SHEETS
2			4			23

ASSEMBLED BY : AW	DATE : 11/2015
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DRAWN BY : DGE 8/11	REV. 8/14 MAA/TMG
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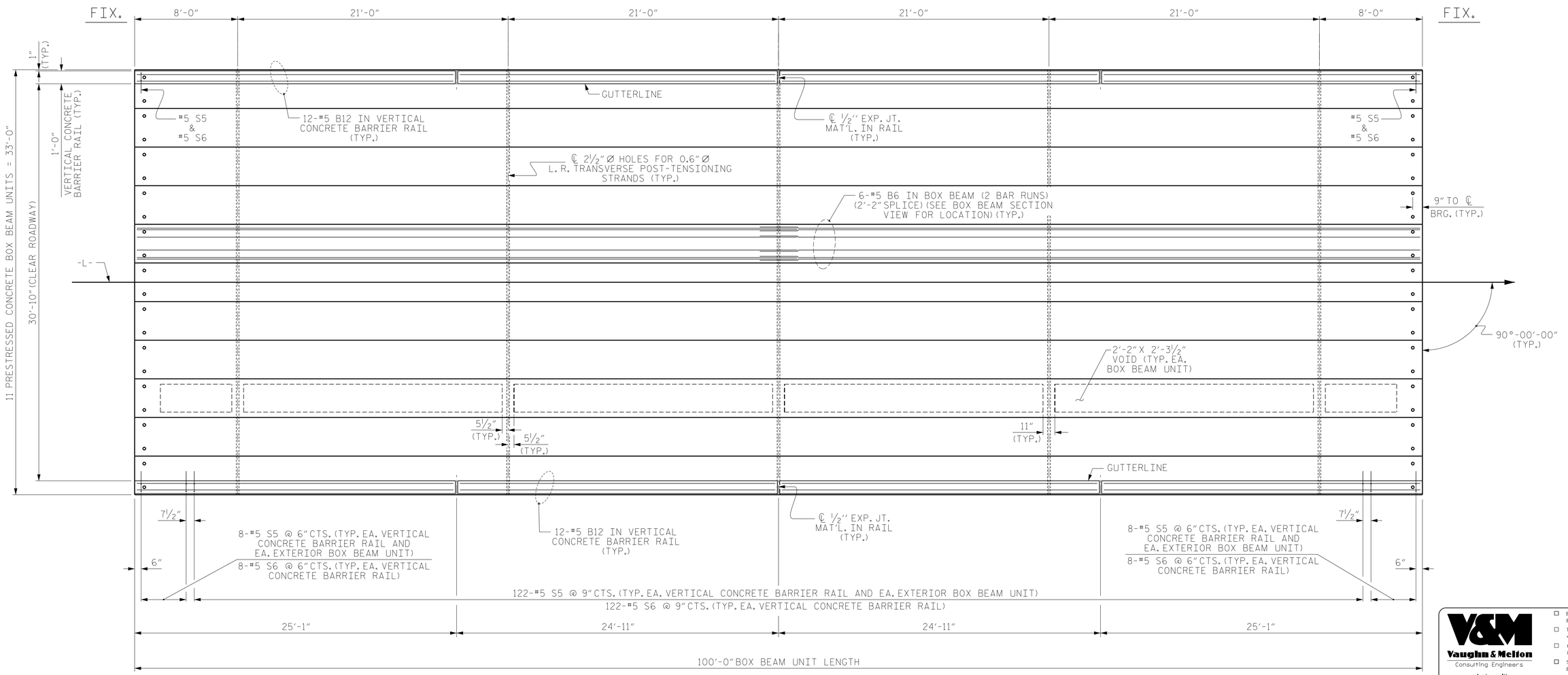
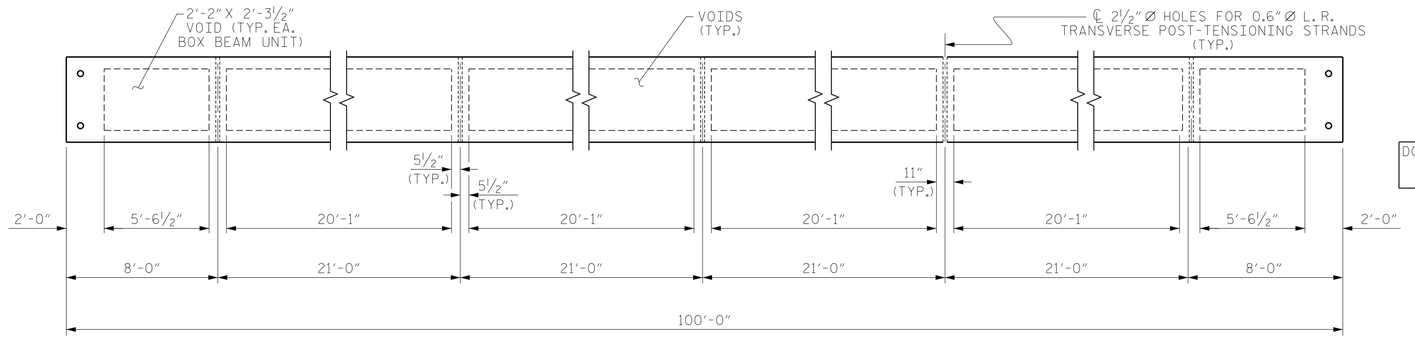
STD. NO. 39PCBB1_33



PLAN OF UNIT

(SPAN B)



DIAPHRAGM AND VOID LAYOUT

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NORTH CAROLINA PROFESSIONAL SEAL 029111 ENGINEER Hardy Wells HARDY L. WELLS
5/22/2018 10:37:01 AM PDT

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PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
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RALEIGH

PLAN OF 100' UNIT 30'-10" CLEAR ROADWAY 90° SKEW

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1			3			TOTAL SHEETS
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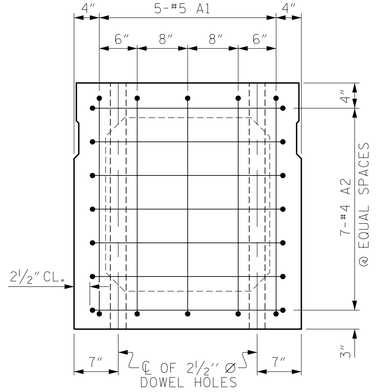
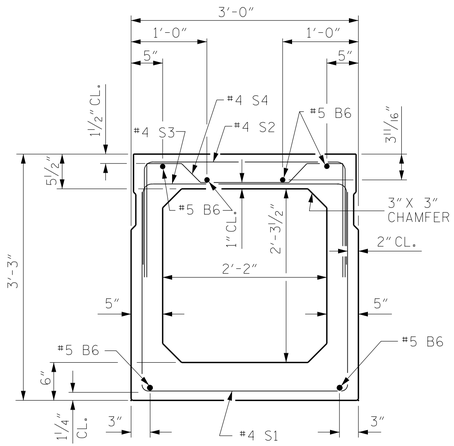
STD.NO.39PCBB_33_90S_100L



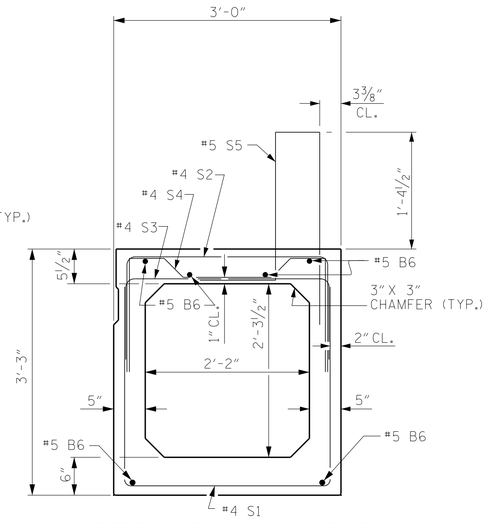
END ELEVATION

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.)



INTERIOR BOX BEAM SECTION

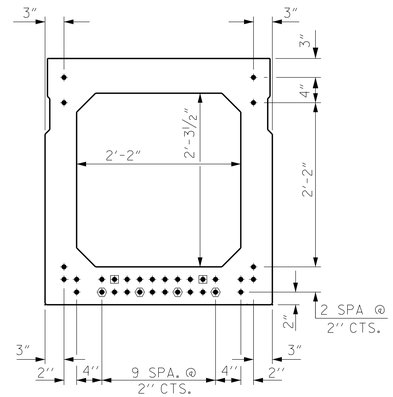
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6″ Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

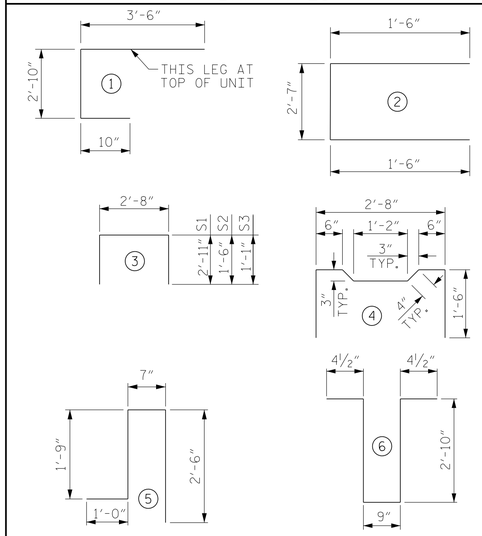
(32 STRANDS REQUIRED)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 4′-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.

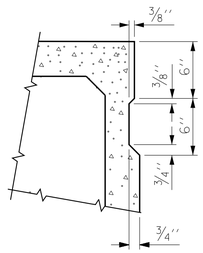
BAR TYPES



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	7′-2″	75	7′-2″	75
A2	44	#4	2	5′-7″	164	5′-7″	164
B6	12	#5	STR	50′-11″	637	50′-11″	637
K1	15	#4	6	7′-2″	72	7′-2″	72
K2	10	#4	STR	2′-7″	17	2′-7″	17
S1	81	#4	3	8′-6″	460	8′-6″	460
S2	81	#4	3	5′-8″	307	5′-8″	307
S3	141	#4	3	4′-10″	455	4′-10″	455
S4	60	#4	4	5′-10″	234	5′-10″	234
✳ S5	138	#5	5	5′-10″	840	--	--
REINFORCING STEEL					2421 LBS.		2421 LBS.
✳EPOXY COATED REINF. STEEL					840 LBS.		
8000 P.S.I. CONCRETE					19.6 CU. YDS.		19.4 CU. YDS.
0.6″ Ø L.R. STRANDS					No. 32		No. 32

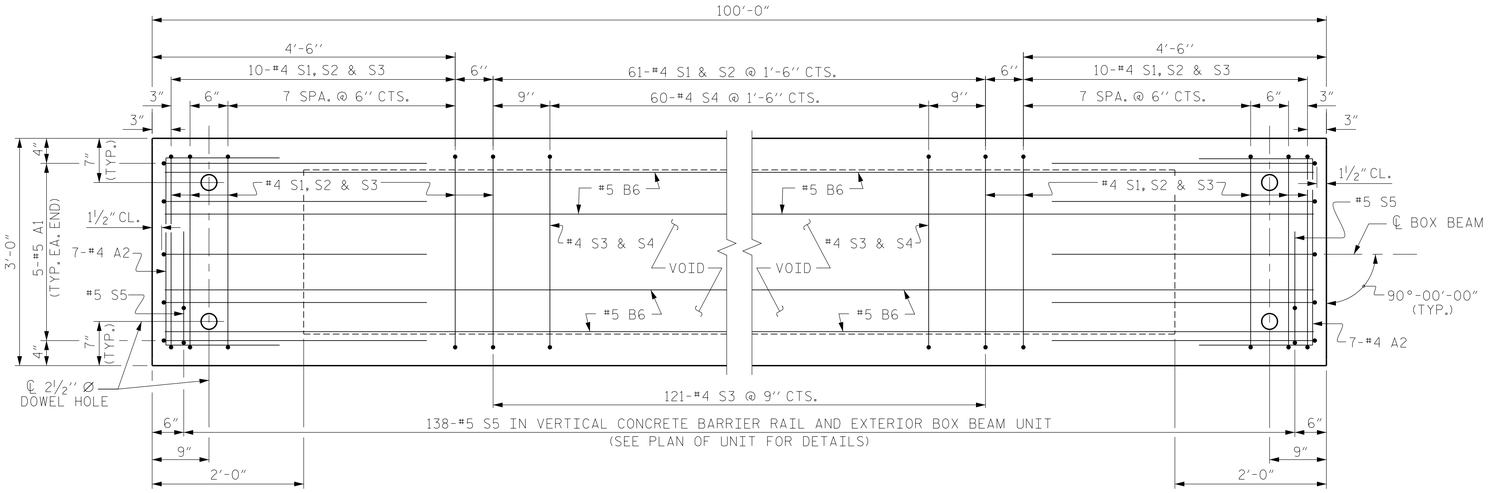


SHEAR KEY DETAIL

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

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

CONCRETE RELEASE STRENGTH	
UNIT	PSI
100′ UNITS	6000



PLAN OF BOX BEAM

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

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PROJECT NO. 14SP.20221.3
CLAY COUNTY
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SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3′-0″ X 3′-3″ PRESTRESSED CONCRETE BOX BEAM UNIT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			23

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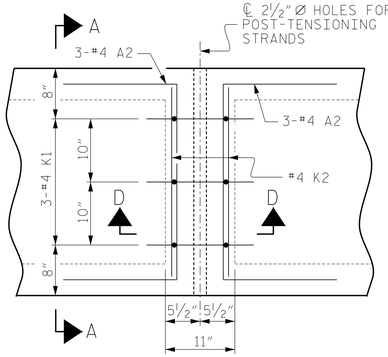
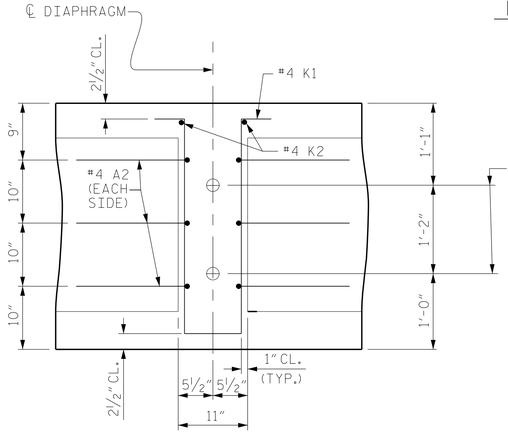
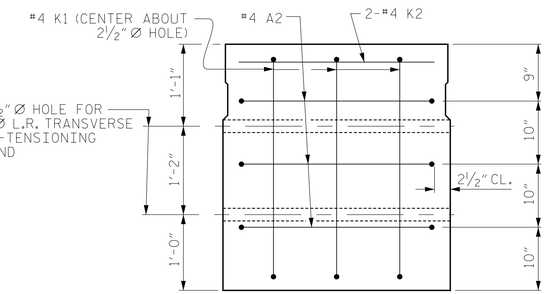


PLAN



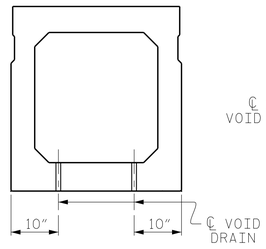
SECTION D-D



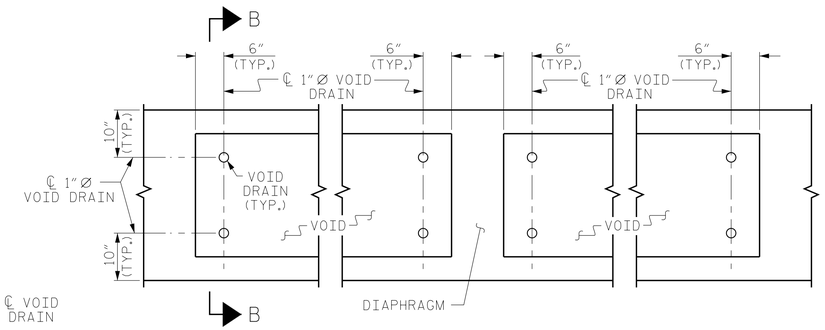
SECTION A-A
VOIDS NOT SHOWN

DOUBLE DIAPHRAGM DETAILS

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



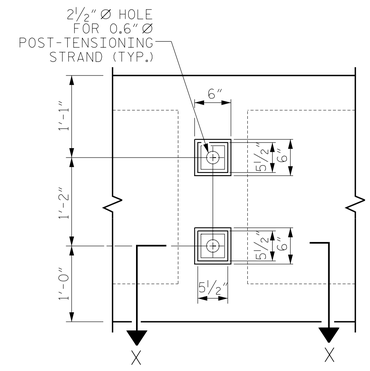
SECTION B-B



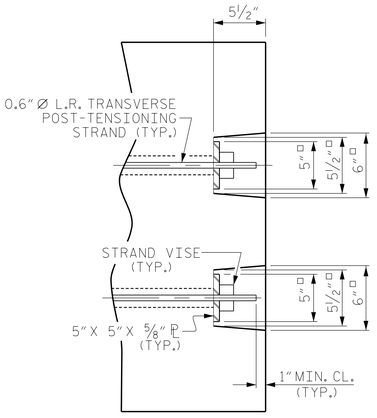
PART PLAN

VOID DRAIN DETAILS

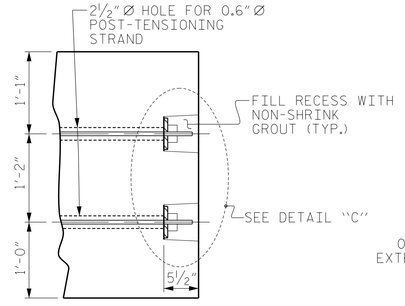
(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



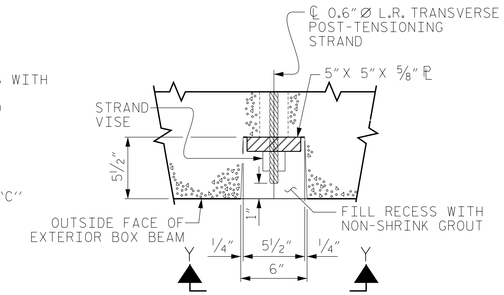
VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS



DETAIL "C"



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

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 3'-3"
100' BOX BEAM UNIT (NC)	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	1⅛" ↓
FINAL CAMBER	⅞" ↑

** INCLUDES FUTURE WEARING SURFACE

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NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
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PROJECT NO. 14SP.20221.3
CLAY COUNTY
STATION: 13+39.00 -L-
SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY : AW	DATE : 11/2015
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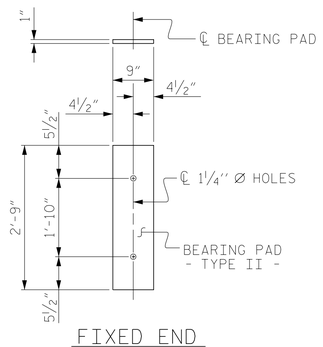
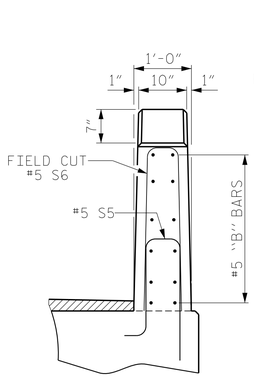
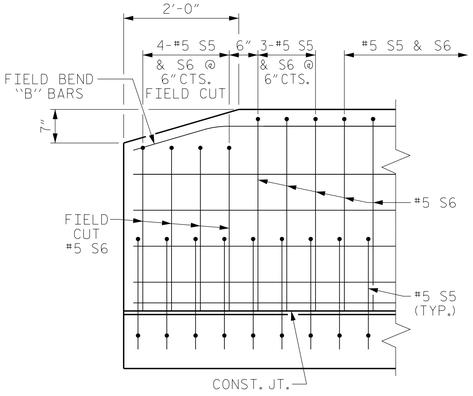


FIXED END

(TYPE II - 22 REQ'D)



END VIEW



SIDE VIEW

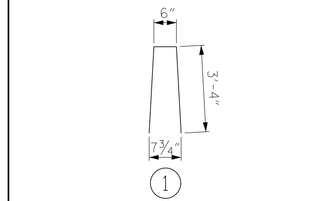
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

END OF RAIL DETAILS

BOX BEAM UNITS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	9	100'-0"	900'-0"
TOTAL	11	———	1100'-0"

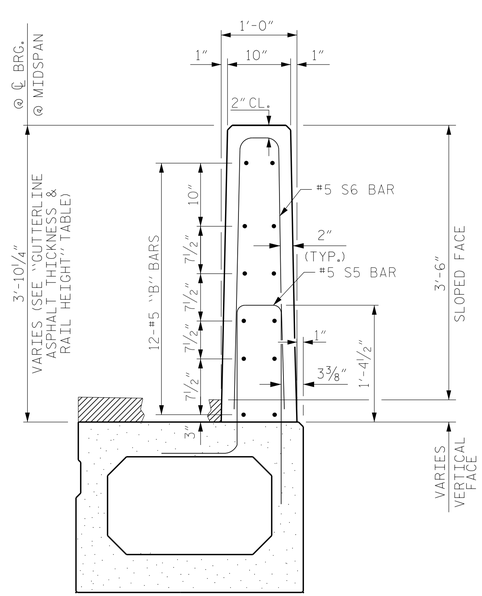


BAR TYPE

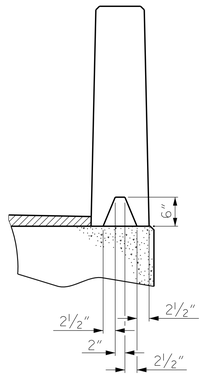
BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS 100' UNIT	SIZE	TYPE	LENGTH	WEIGHT
✳B12	96	#5	STR	24'-7"	2461
✳S6	276	#5	1	7'-2"	2063
✳EPOXY COATED REINFORCING STEEL			LBS.		4524
CLASS AA CONCRETE			CU.YDS.		26.8
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN. FT.		200.0

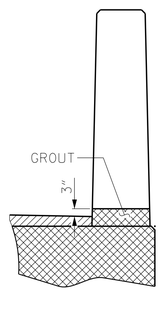


SECTION THRU RAIL



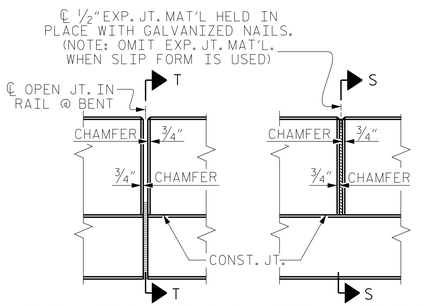
SECTION S-S

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

VERTICAL CONCRETE BARRIER RAIL DETAILS

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
100' UNITS	1 9/16"	3'-7 9/16"

✳✳ INCLUDES ADJUSTMENT FOR VERTICAL CURVE ORDINATE OF 1 13/16" DOWNWARD

V&M Vaughn & Melton Consulting Engineers
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NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
5/22/2018 10:37:01 AM PDT

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

SHEET 5 OF 5

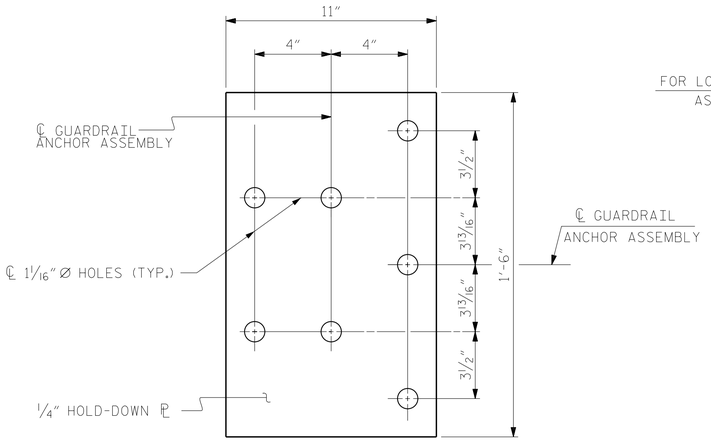
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

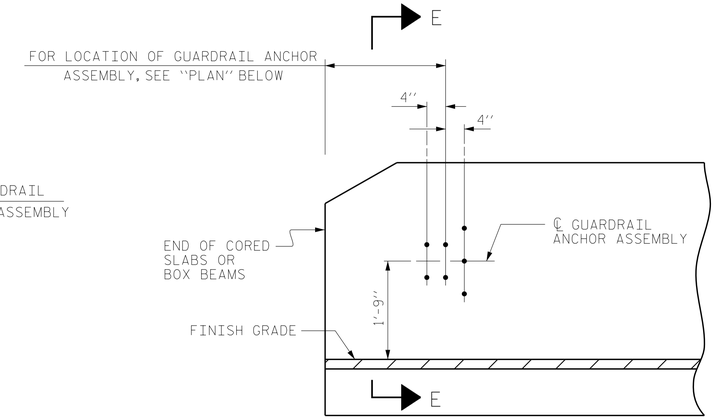
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY : AW	DATE : 11/2015
CHECKED BY : HLW	DATE : 11/2015
DRAWN BY : DGE 10/11	REV. 8/14 MAA/TMG
CHECKED BY : TMG 11/11	

STD. NO. 39PCBB8_90S

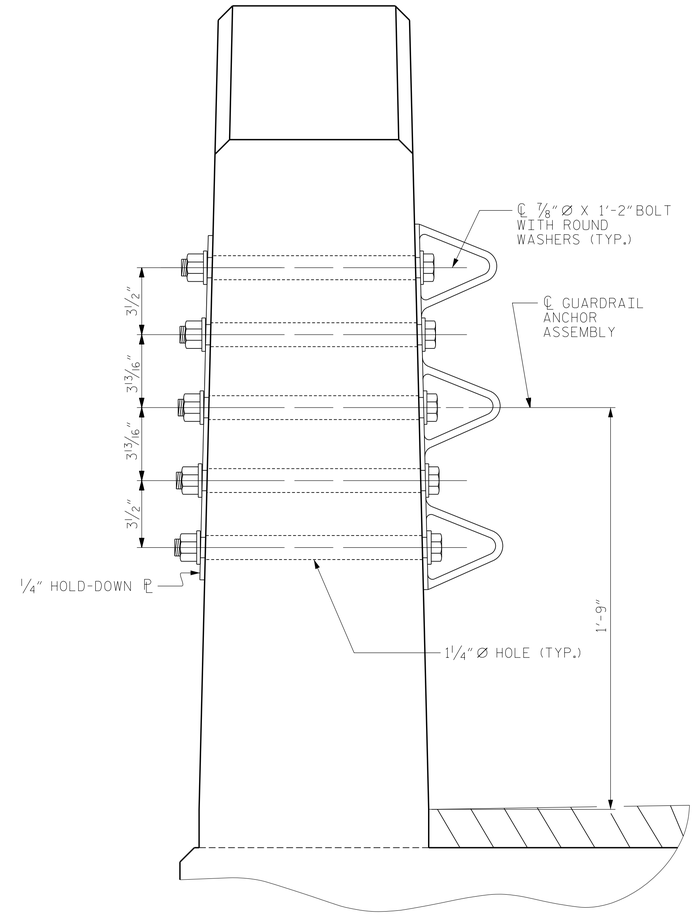


PLAN



ELEVATION

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



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS

PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

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.)

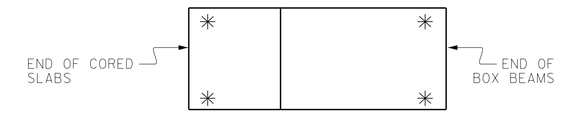
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

ASSEMBLED BY : AW	DATE : 11/2015
CHECKED BY : HLW	DATE : 11/2015
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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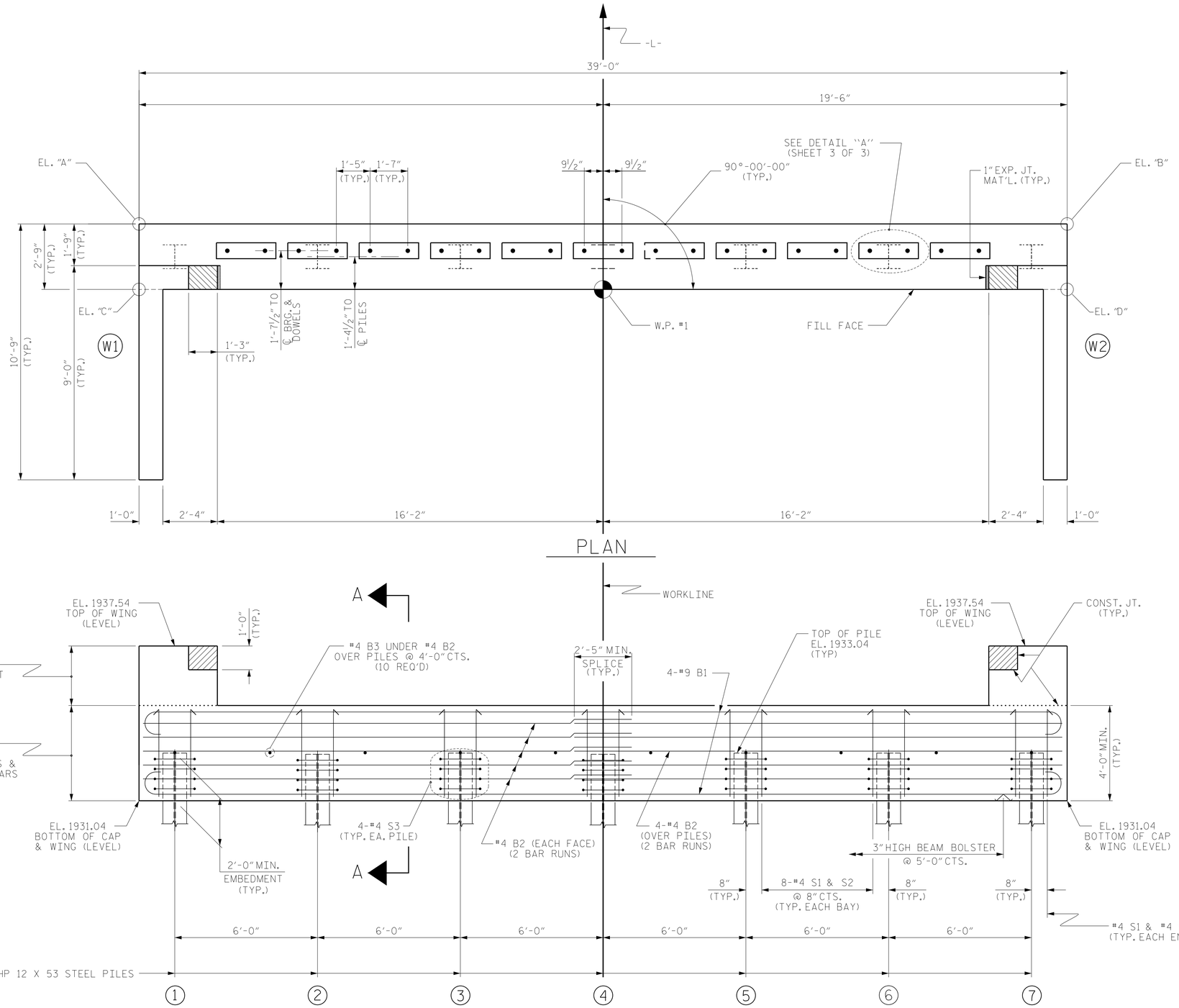
CLAY COUNTY
STATION: 13+39.00 -L-

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-13
1			3			TOTAL SHEETS
2			4			23



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 CAP ELEVATIONS	
A	1935.09
B	1935.09
C	1935.04
D	1935.04

ASSEMBLED BY :	AW	DATE : 11/2015
CHECKED BY :	HLW	DATE : 11/2015
DRAWN BY :	WJH	12/11
CHECKED BY :	AAC	12/11

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CLAY COUNTY
STATION: 13+39.00 -L-

SHEET 1 OF 3

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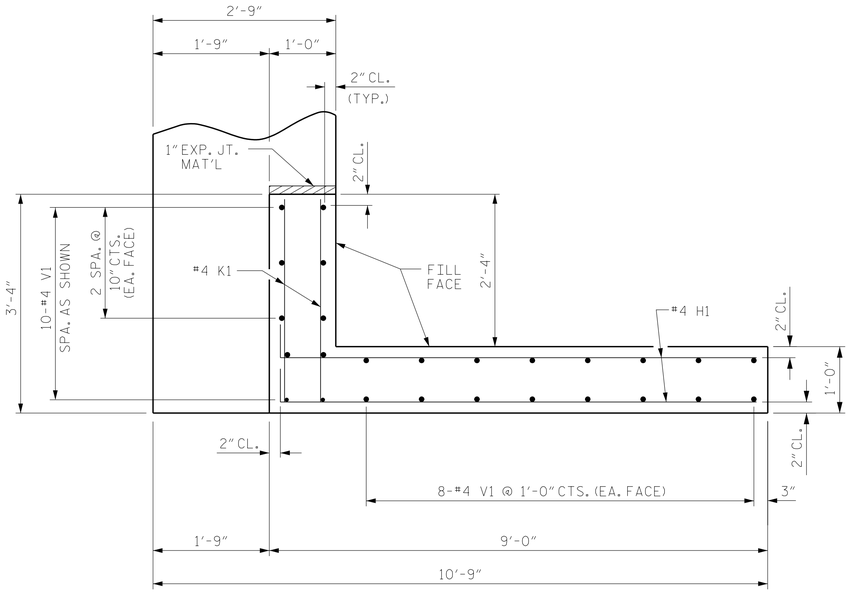
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

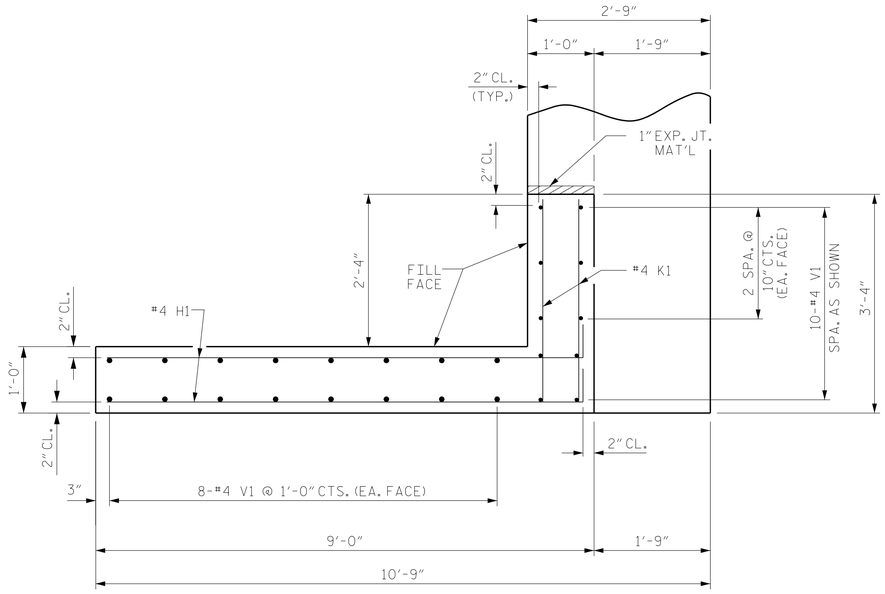
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1	AW	7/2016	3			TOTAL SHEETS
2			4			23

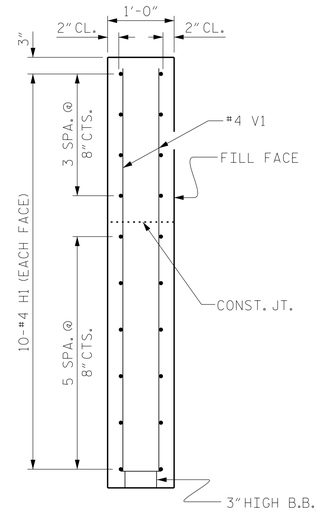
STD. NO. EB_33_90S4



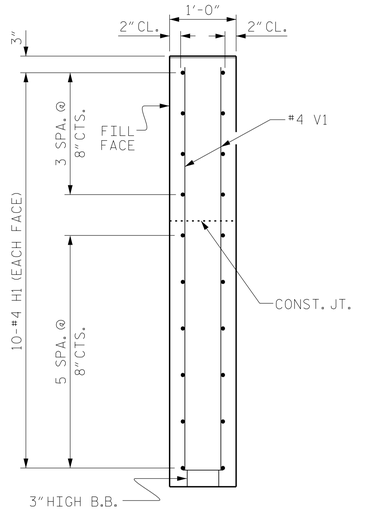
PLAN OF WING (W1)



PLAN OF WING (W2)

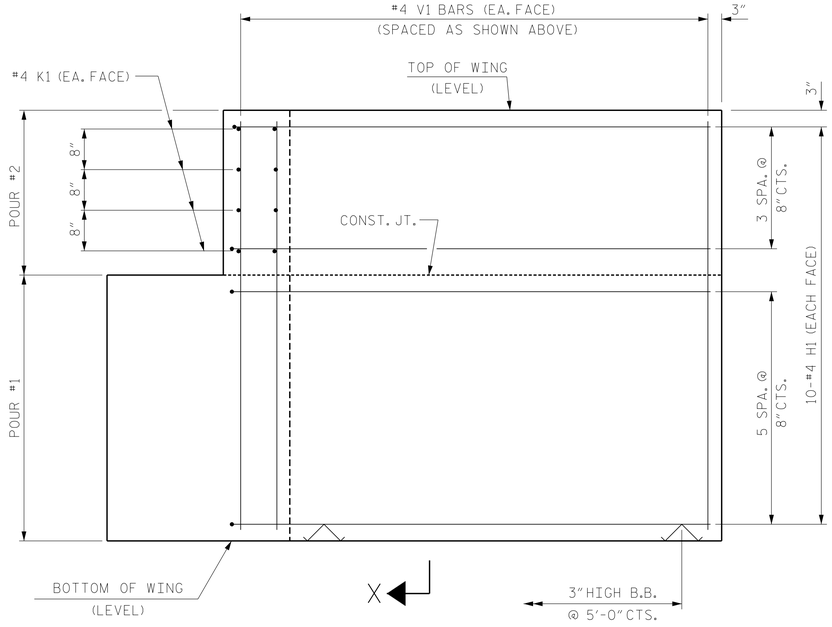


SECTION X-X

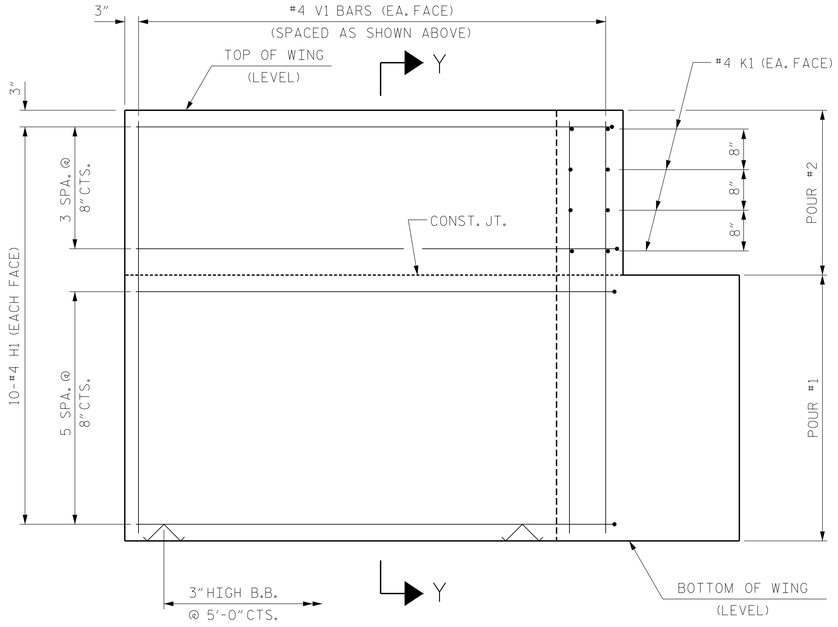


SECTION Y-Y

X



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY :	AW	DATE :	11/2015
CHECKED BY :	HLW	DATE :	11/2015
DRAWN BY :	WJH	12/11	
CHECKED BY :	AAC	12/11	

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PROJECT NO. 14SP.20221.3
CLAY COUNTY
STATION: 13+39.00 -L-

SHEET 2 OF 3

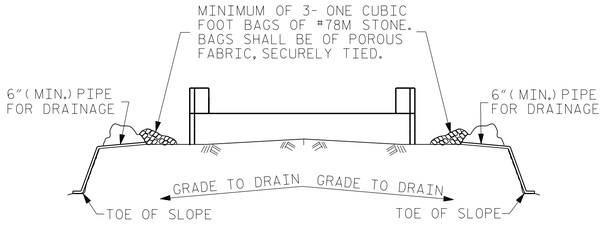
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No.1
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			23

STD. NO. EB_33_90S4

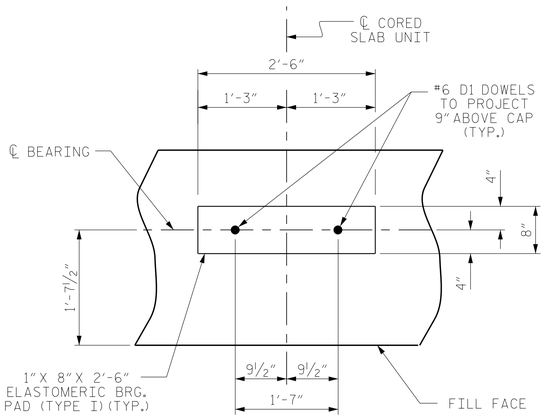


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

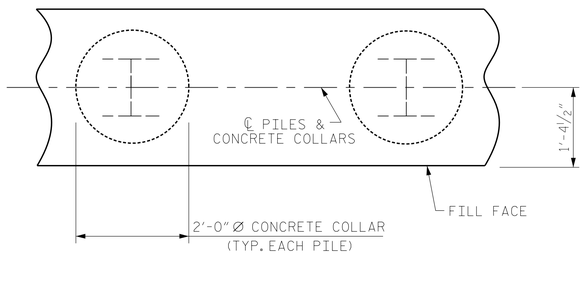
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

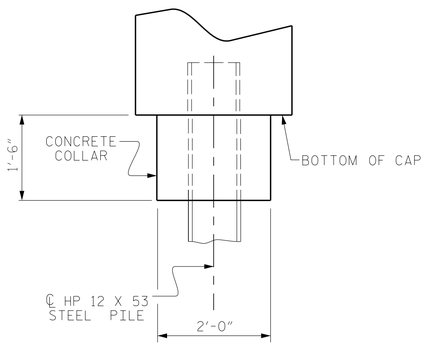


DETAIL "A"

(END BENT No. 1 SHOWN)



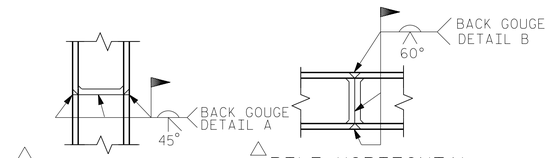
PLAN



ELEVATION

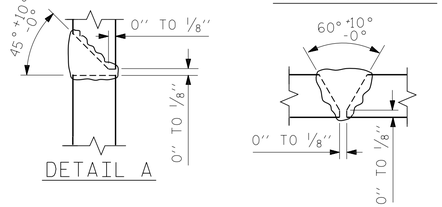
CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN)



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL

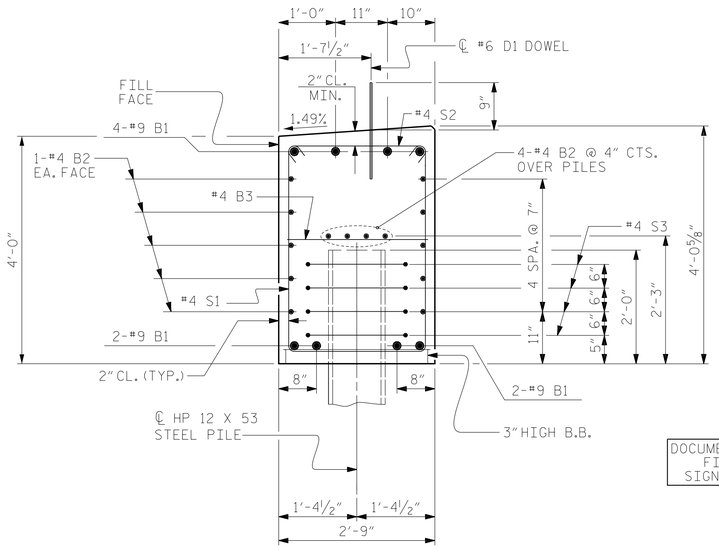


DETAIL A

DETAIL B

△ POSITION OF PILE DURING WELDING.

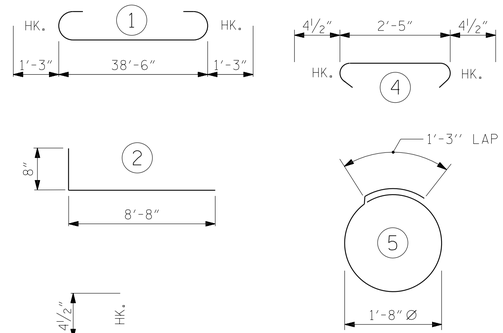
PILE SPLICE DETAILS



SECTION A-A

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PILE DRIVING EQUIPMENT SETUP FOR HP 12X53 STEEL PILES EACH = 7

HP 12 X 53 STEEL PILES NO: 7 LIN. FT.= 210

STEEL PILE POINTS NO: 7

BILL OF MATERIAL

FOR END BENT No.1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	40	#4	2	9'-4"	249
K1	16	#4	STR	2'-11"	31
S1	50	#4	3	10'-5"	348
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
V1	52	#4	STR	6'-2"	214

REINFORCING STEEL 2636 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP, LOWER PART OF WINGS & COLLARS 19.6 C.Y.

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

TOTAL CLASS A CONCRETE 21.7 C.Y.

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PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE

END BENT No. 1 DETAILS

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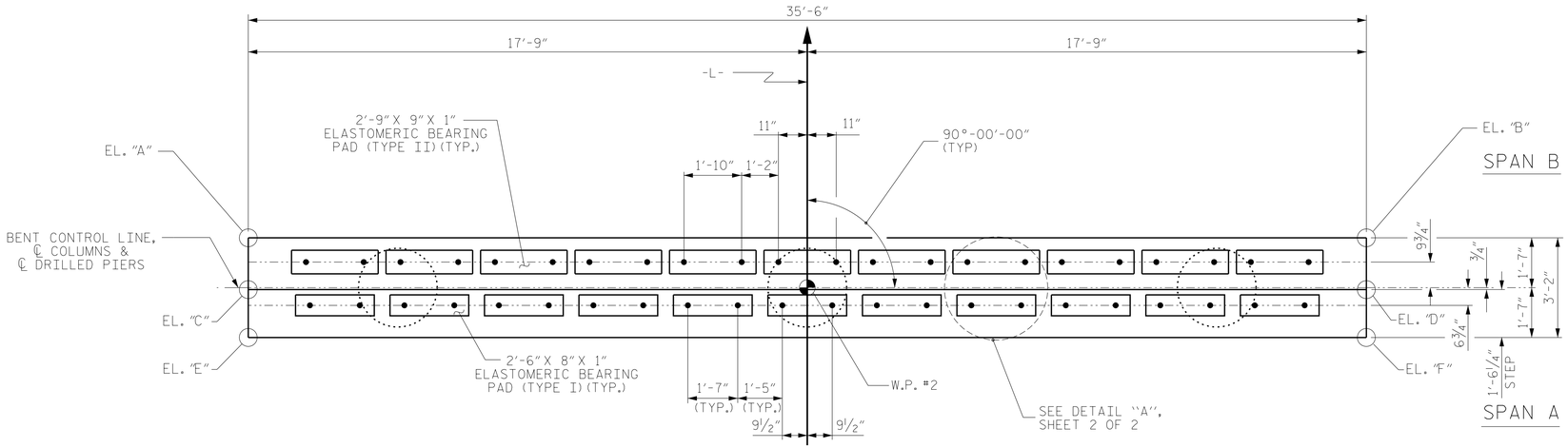
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1	AW	7/2016	3			TOTAL SHEETS
2			4			23

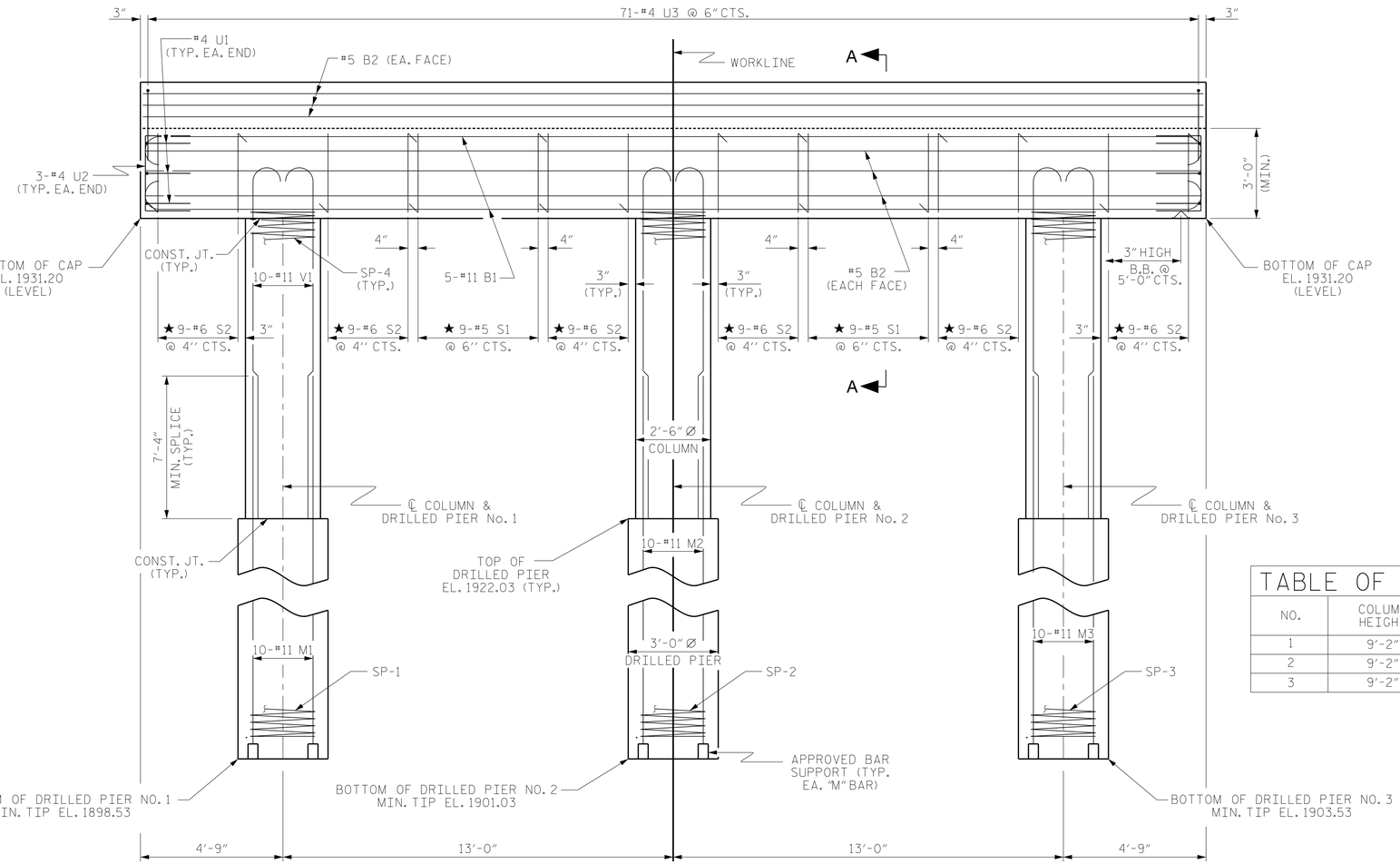
ASSEMBLED BY :	AW	DATE : 11/2015
CHECKED BY :	HLW	DATE : 11/2015
DRAWN BY :	WJH 12/11	
CHECKED BY :	AAC 12/11	

5/21/2018
$$$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
User:wdcrutcher

STD. NO. EB_33_90S4



PLAN



ELEVATION

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

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."

★ INVERT ALTERNATE STIRRUPS.

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

TOP OF CAP ELEVATIONS	
(A)	1934.24
(B)	1934.24
(C)	1935.81 (UPPER)
	1934.20 (LOWER)
(D)	1935.81 (UPPER)
	1934.20 (LOWER)
(E)	1935.79 (UPPER)
(F)	1935.79 (UPPER)

TABLE OF DIMENSIONS		
NO.	COLUMN HEIGHT	DRILLED PIER MIN. HEIGHT
1	9'-2"	23'-6"
2	9'-2"	21'-0"
3	9'-2"	18'-6"

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Middlesboro, KY 606-248-6600
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PROJECT NO. 14SP.20221.3
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SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

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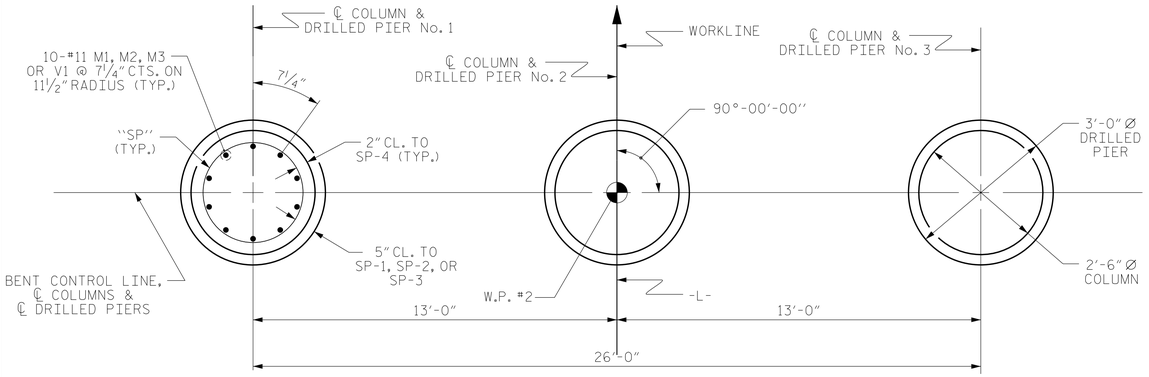
NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER Hardy Lee Willis HARDY L. WILLIS
5/22/2018 10:37:01 AM PDT

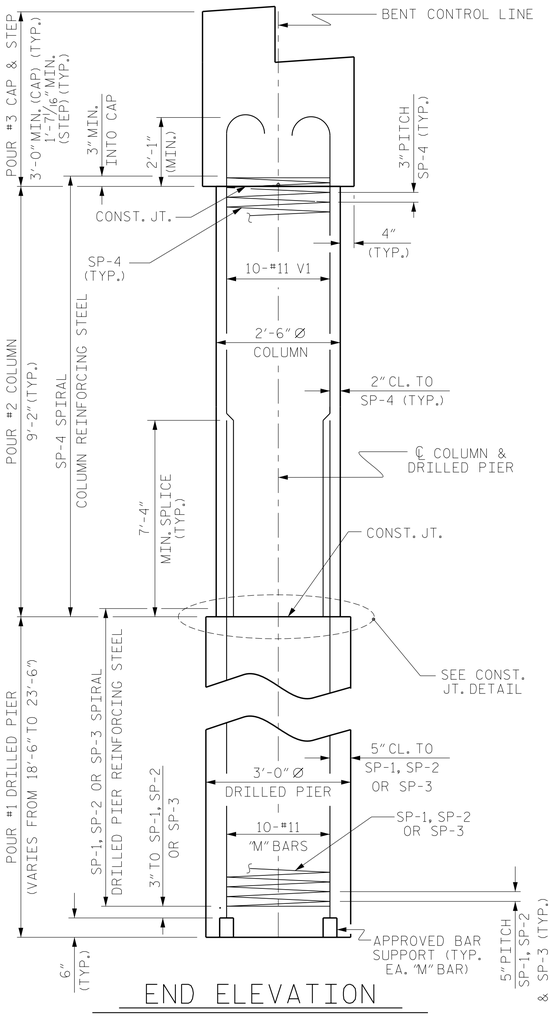
ASSEMBLED BY :	AW	DATE :	11/2015
CHECKED BY :	HLW	DATE :	11/2015
DRAWN BY :	DGE	03/10	
CHECKED BY :	MKT	03/10	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1	AW	7/2016	3			TOTAL SHEETS
2			4			23

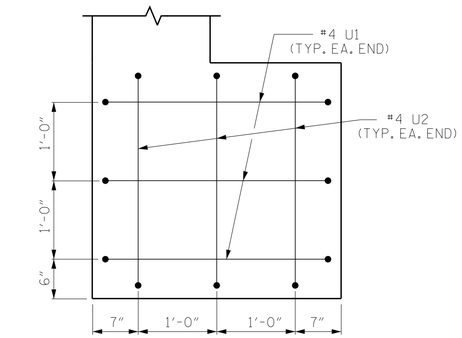
STD. NO. DP_BT_33_90S_<50'



PLAN OF DRILLED PIERS & COLUMNS

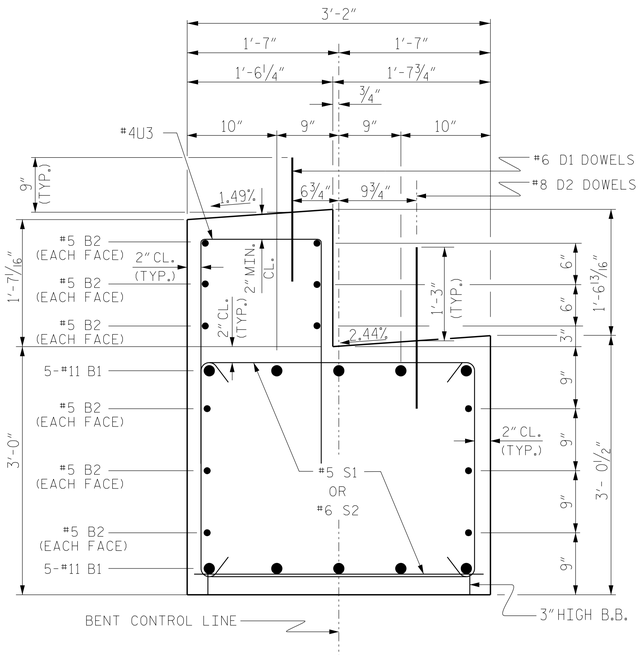


END ELEVATION



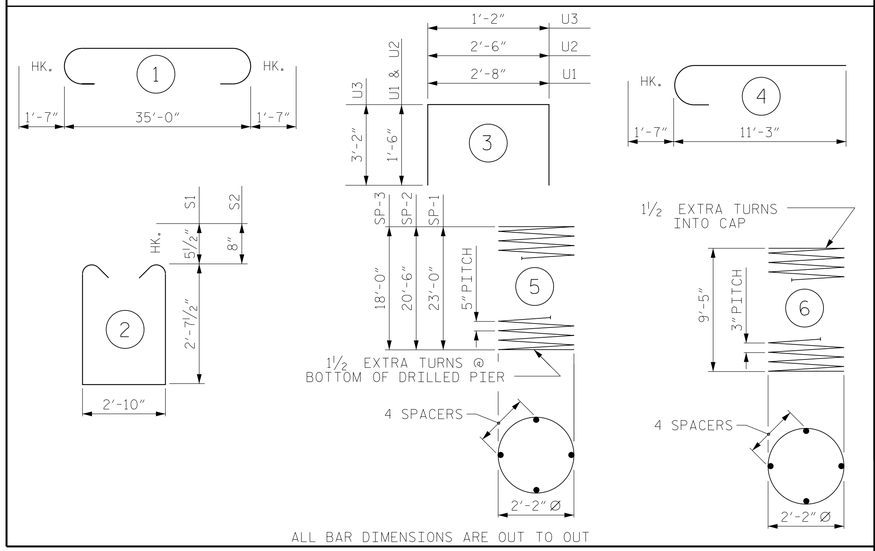
END OF CAP VIEW

(TYPICAL BOTH ENDS)

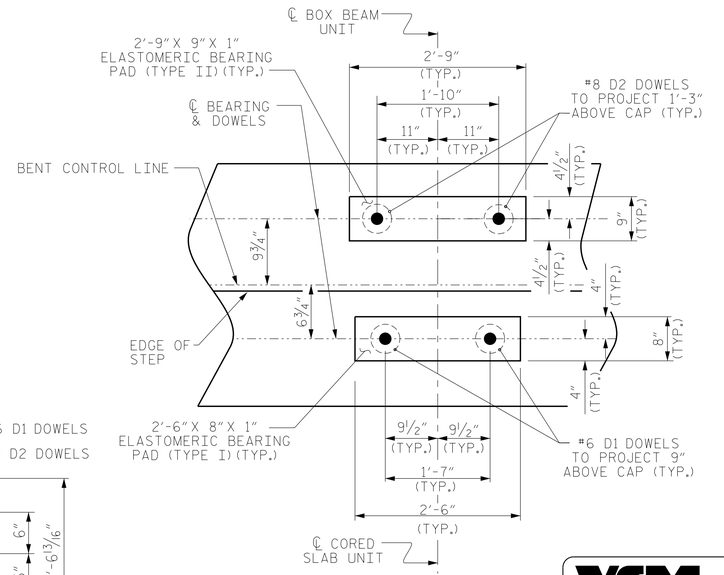


SECTION A-A

BAR TYPES

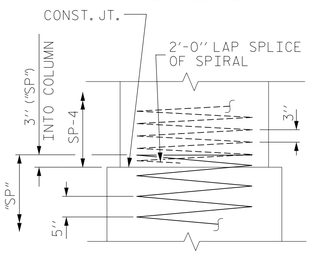


ALL BAR DIMENSIONS ARE OUT TO OUT



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)



CONSTRUCTION JOINT DETAIL

BILL OF MATERIAL

FOR BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	38'-2"	2028
B2	12	#5	STR	35'-2"	440
D1	22	#6	STR	1'-6"	50
D2	22	#8	STR	2'-3"	132
M1	10	#11	STR	33'-4"	1771
M2	10	#11	STR	30'-10"	1638
M3	10	#11	STR	28'-4"	1505
S1	18	#5	2	9'-0"	168
S2	54	#6	2	9'-5"	764
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-6"	22
U3	71	#4	3	7'-6"	356
V1	30	#11	4	12'-10"	2046

REINFORCING STEEL 10,943 LBS.

SP-1	1	✳	5	389'-4"	406
SP-2	1	✳	5	349'-2"	364
SP-3	1	✳	5	309'-1"	322
SP-4	3	✳✳	6	265'-0"	531

SPIRAL COLUMN REINFORCING STEEL 1623 LBS.

✳ THE SP-1, SP-2, SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

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

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	5.0 C.Y.
POUR #3 (CAP & STEP)	15.7 C.Y.
TOTAL CLASS A CONCRETE	20.7 C.Y.

DRILLED PIERS: (FOR ONE BENT)

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	16.5 C.Y.
3'-0" Ø DRILLED PIERS NOT IN SOIL	35 LIN. FT.
3'-0" Ø DRILLED PIERS IN SOIL	28 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	35.3 LIN. FT.
CSL TUBES	270.0 LIN. FT.

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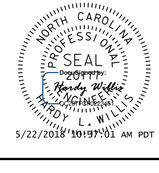

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			23

ASSEMBLED BY :	AW	DATE : 11/2015
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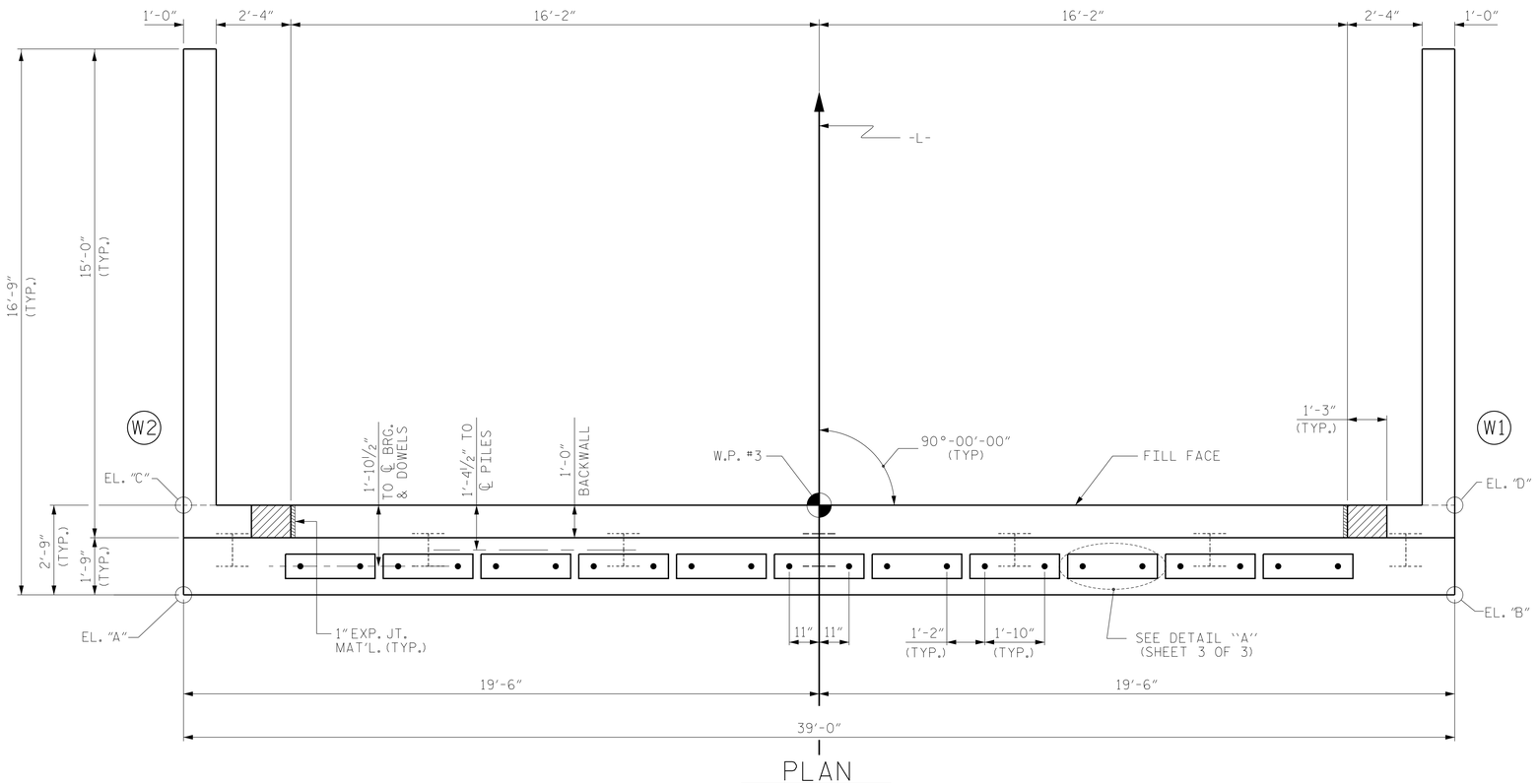
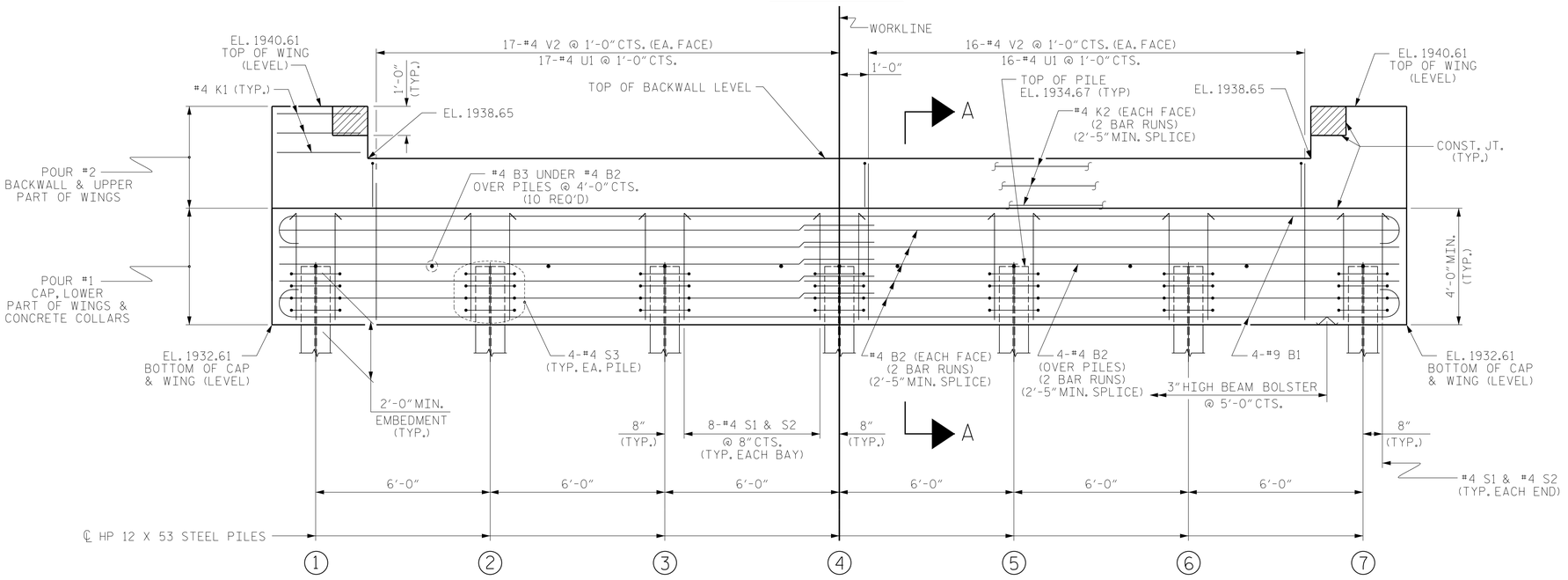


PLAN



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 CAP ELEVATIONS	
A	1936.61
B	1936.61
C	1936.67
D	1936.67

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CLAY COUNTY
STATION: 13+39.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

ASSEMBLED BY : AW	DATE : 11/2015
CHECKED BY : HLW	DATE : 11/2015
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CHECKED BY : AAC 12/11	.

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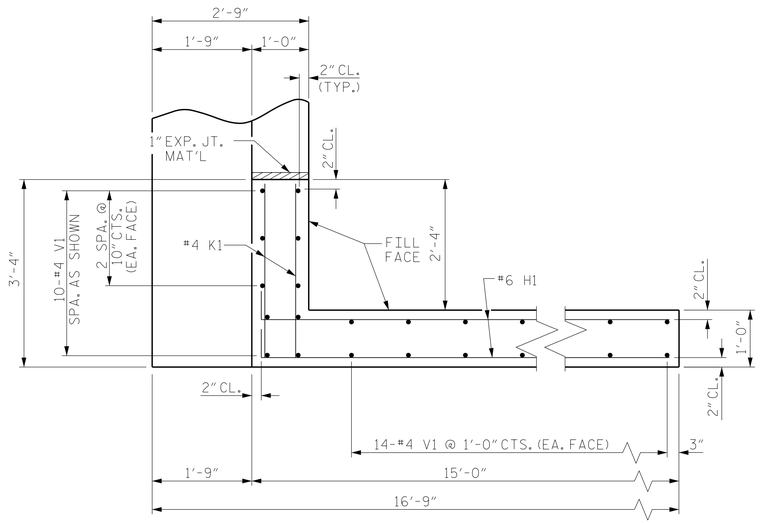
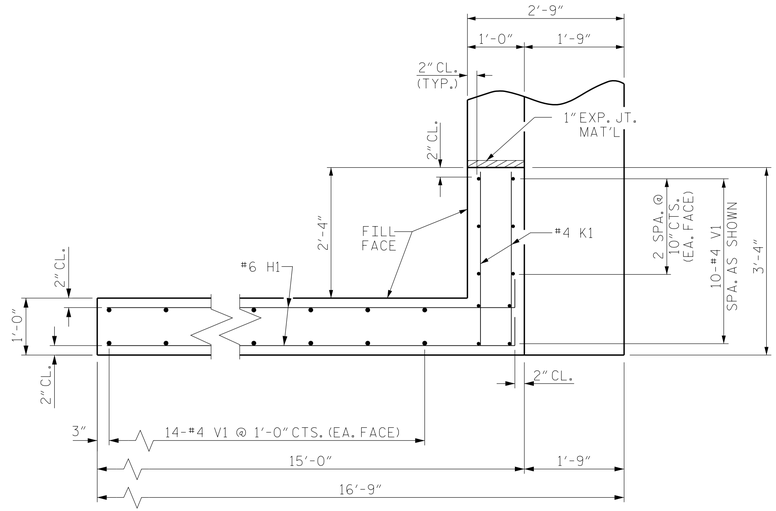
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1	AW	7/13/16	3			TOTAL SHEETS
2			4			23

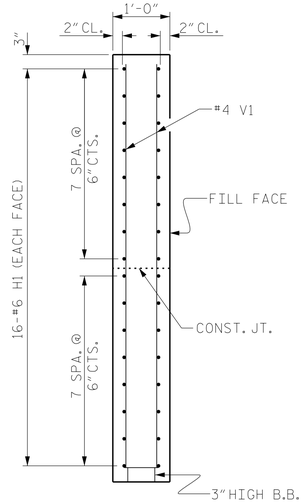
STD. NO. EB_33_90S4_33BB



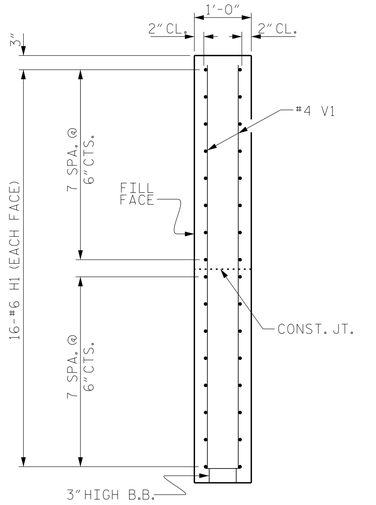
PLAN OF WING (W1)



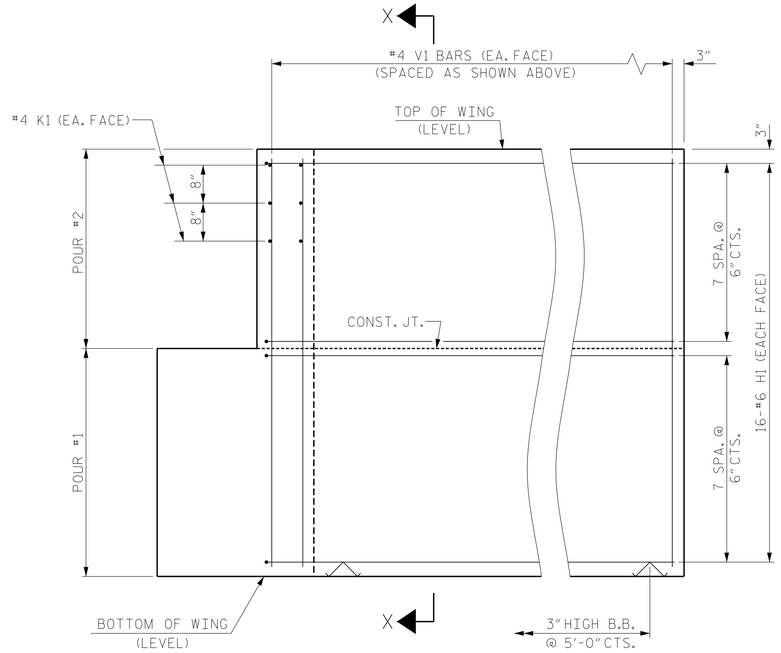
PLAN OF WING (W2)



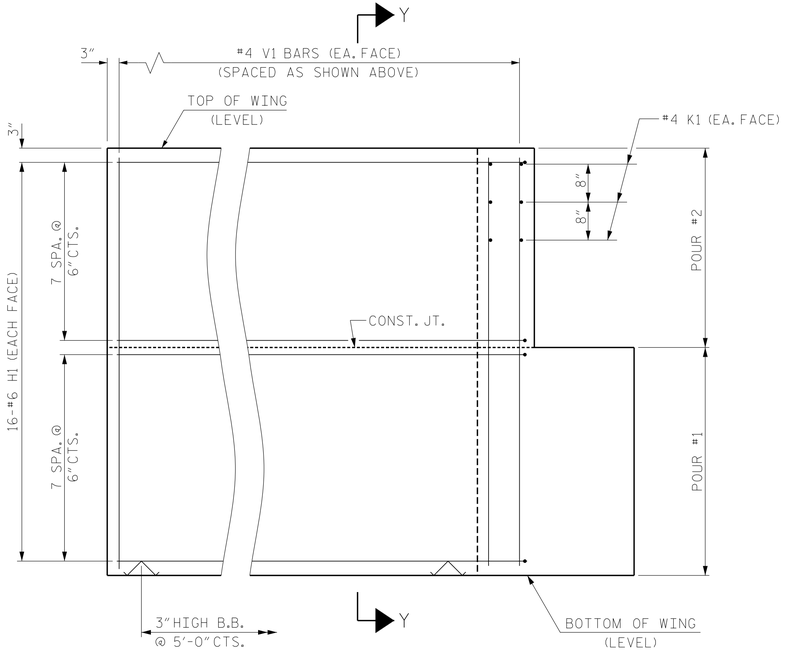
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : AW	DATE : 11/2015		
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SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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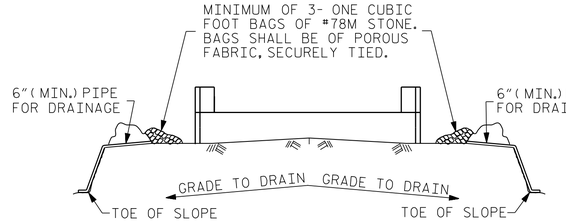
SUBSTRUCTURE

END BENT No. 2
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			23

STD. NO. EB_33_90S4_39BB

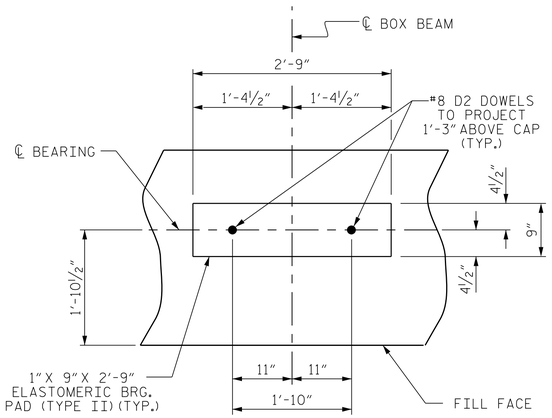


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

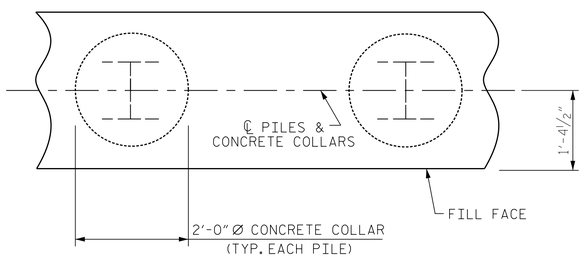
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

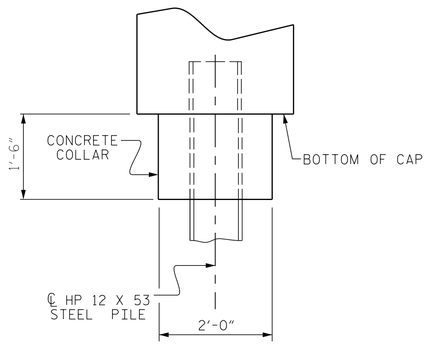


DETAIL "A"

(END BENT No. 2 SHOWN)



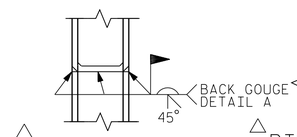
PLAN



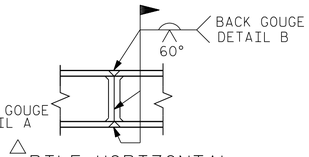
ELEVATION

CORROSION PROTECTION FOR STEEL PILES DETAIL

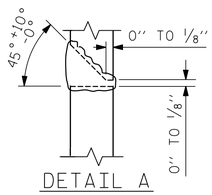
(END BENT No. 2 SHOWN)



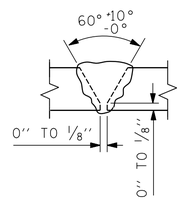
△ PILE VERTICAL



△ PILE HORIZONTAL OR VERTICAL



DETAIL A

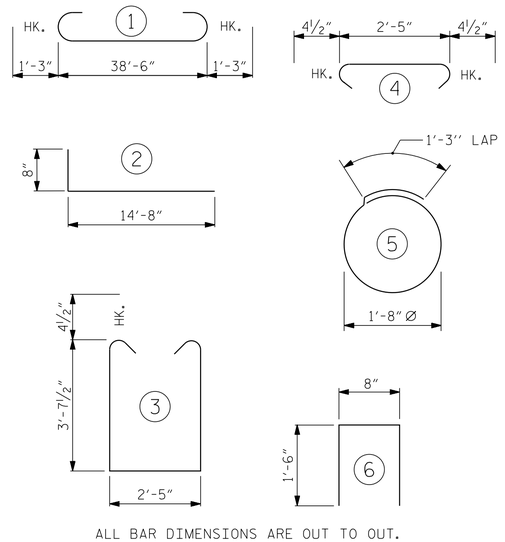


DETAIL B

△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

HP 12 X 53 STEEL PILES	NO: 7	LIN. FT.= 125
STEEL PILE POINTS	NO: 7	

PILE EXCAVATION IN SOIL: 45 LIN. FT.
PILE EXCAVATION NOT IN SOIL: 55 LIN. FT.

BILL OF MATERIAL

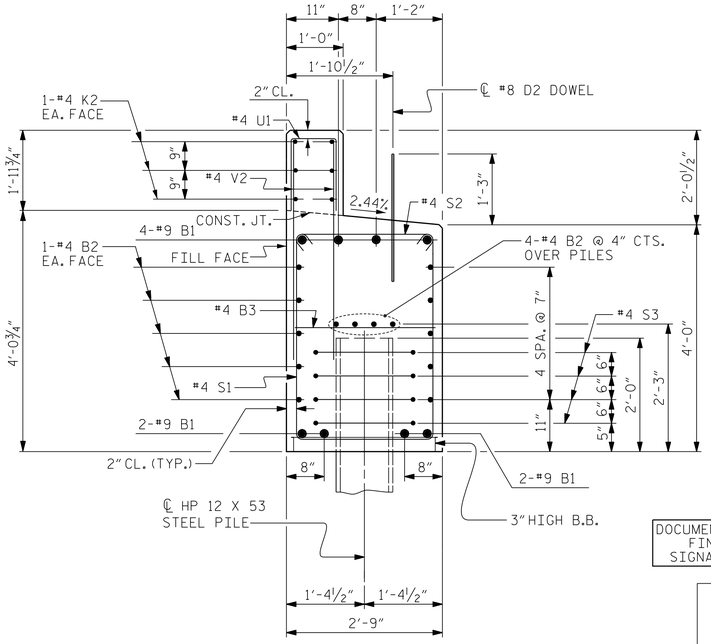
FOR END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D2	22	#8	STR	2'-3"	132
H1	64	#6	2	15'-4"	1474
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	20'-7"	165
S1	50	#4	3	10'-5"	348
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
U1	33	#4	6	3'-8"	81
V1	76	#4	STR	7'-8"	385
V2	66	#4	STR	5'-8"	250

REINFORCING STEEL 4594 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	21.4 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	7.5 C.Y.
TOTAL CLASS A CONCRETE		28.9 C.Y.



SECTION A-A

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

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PROJECT NO. 14SP.20221.3

CLAY COUNTY

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SHEET 3 OF 3

STATE OF NORTH CAROLINA
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SUBSTRUCTURE

END BENT No. 2 DETAILS

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NORTH CAROLINA PROFESSIONAL SEAL 029777 ENGINEER HARRY L. WILLIS
9/7/2018 11:18:09 AM EDT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1	AW	7/13/16	3			TOTAL SHEETS
2			4			23

ASSEMBLED BY :	AW	DATE :	11/2015
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DRAWN BY : WJH	12/11	REV. 8/14	MAA/TMG
CHECKED BY : AAC	12/11		

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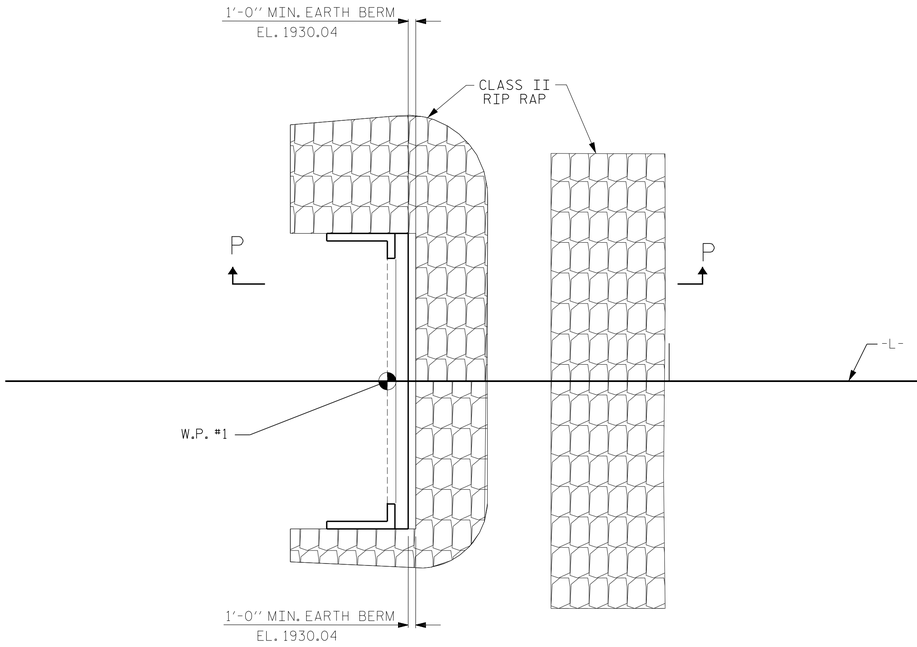
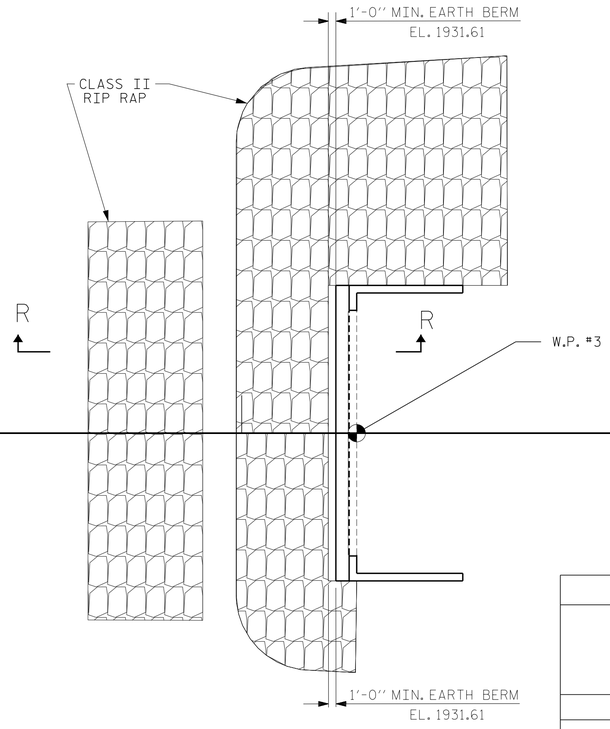


END BENT NO. 1



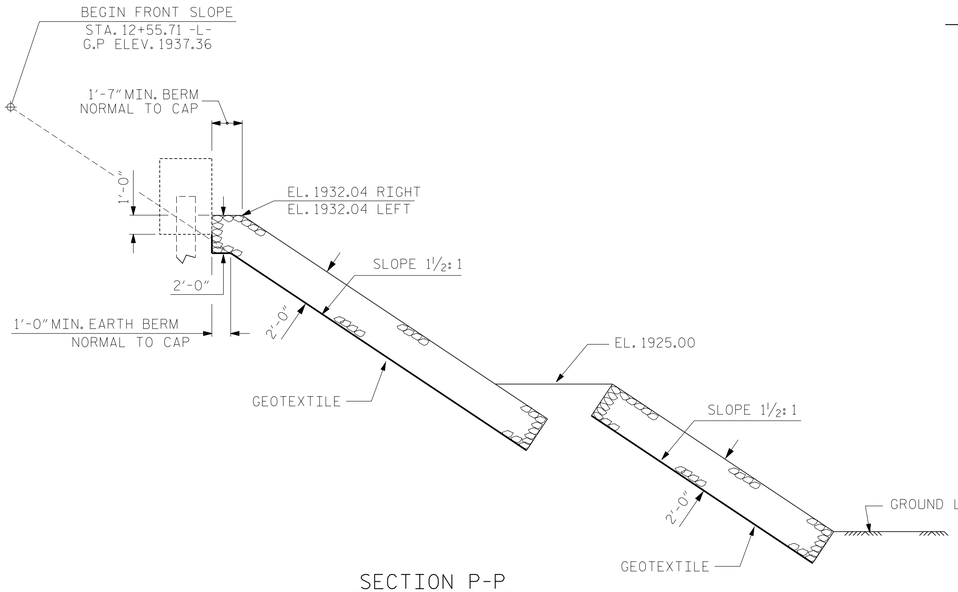
END BENT NO. 2

NOTES :

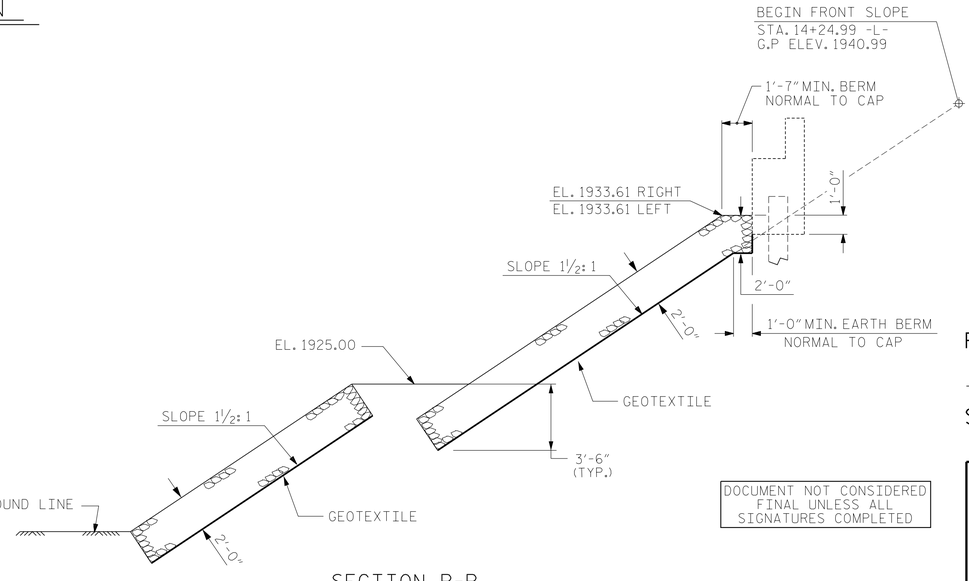
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+39.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	240	265
END BENT 2	340	375

PLAN



SECTION P-P
BERM RIP RAPPED



SECTION R-R
BERM RIP RAPPED

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Vaughn & Melton
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Knoxville, TN 865-546-5800
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Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3509

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

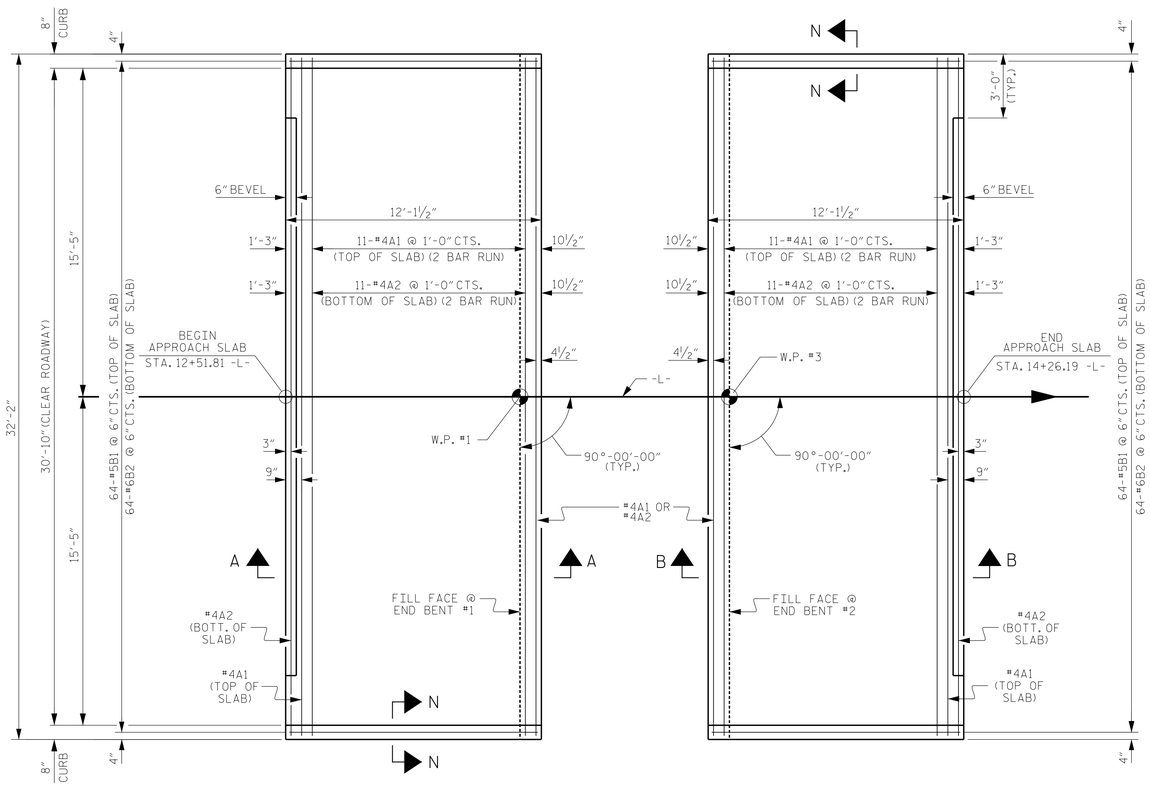
RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLIS
5/22/2018 10:37:01 AM PDT

ASSEMBLED BY : AW	DATE : 11/2015
CHECKED BY : CBC	DATE : 11/2015
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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			23

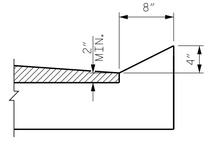
STD. NO. RR1



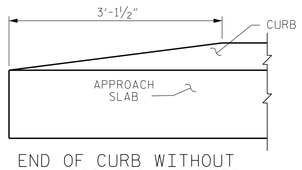
PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

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

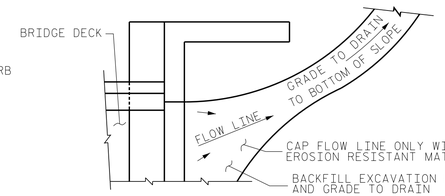
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL 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

BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
* B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1412
* EPOXY COATED REINFORCING STEEL				LBS.	1039
CLASS AA CONCRETE				C.Y.	18.5

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	16'-11"	294
A2	26	#4	STR	16'-9"	291
* B1	64	#5	STR	11'-2"	745
B2	64	#6	STR	11'-8"	1121
REINFORCING STEEL				LBS.	1412
* EPOXY COATED REINFORCING STEEL				LBS.	1039
CLASS AA CONCRETE				C.Y.	17.2

SPLICE LENGTHS

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

PLAN VIEW

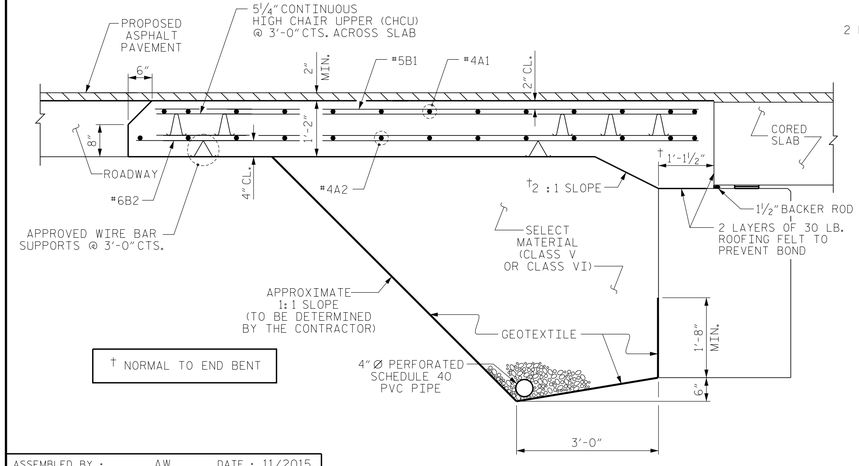
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

SECTION R-R

SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

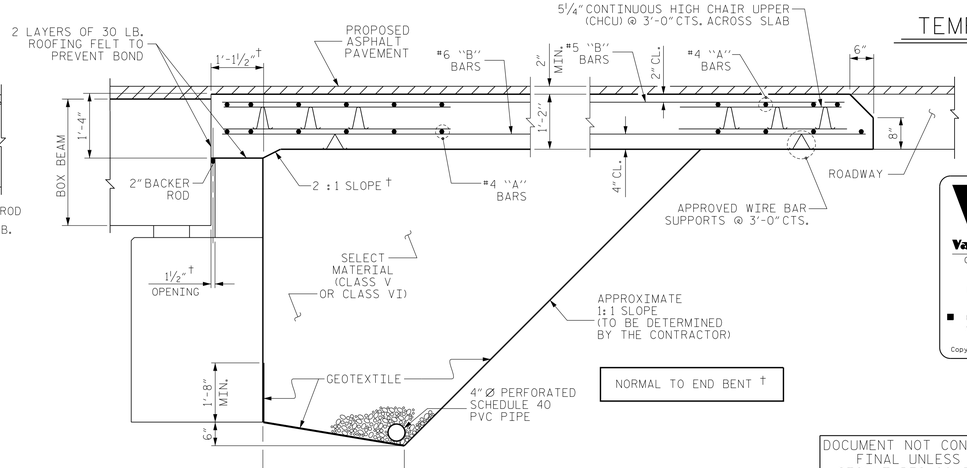
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



† NORMAL TO END BENT

SECTION A-A THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)



NORMAL TO END BENT †

SECTION B-B THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

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Atlanta, GA 770-627-3509

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 20777 ENGINEER HARDY L. WILLS
Docusigned by: Hardy Wills
5/22/2018 10:57:01 AM PDT

PROJECT NO. 14SP.20221.3

CLAY COUNTY

STATION: 13+39.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB & BOX BEAM UNIT (SUB-REGIONAL TIER) 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1	AW	7/13/16	3			TOTAL SHEETS
2			4			23

ASSEMBLED BY :	AW	DATE :	11/2015
CHECKED BY :	HLW	DATE :	11/2015
DRAWN BY : SHS/MAA	5-09	REV. 12-11	MAA/AAC
CHECKED BY : BCH	5-09	REV. 8-14	MAA/TMG

STD. NO. BAS_33_90S

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 2018 "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 ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" 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 ¼" 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 ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (/) RGW REV. 5-7-03 RWW (/) JTE REV. 10-1-11 MAA (/) GM
REV. 8-16-99 RWW (/) LES REV. 5-1-06 TLA (/) GM REV. 12-17 MAA (/) THC

5/21/2018
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User:wdcrutcher