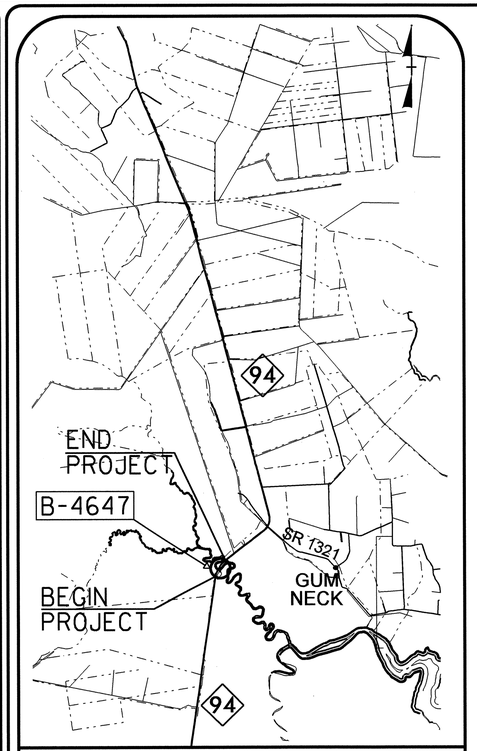
TIP PROJECT: B-4647

CONTRACT: C203000 TI



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

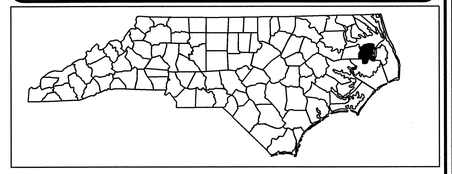
TYRRELL COUNTY

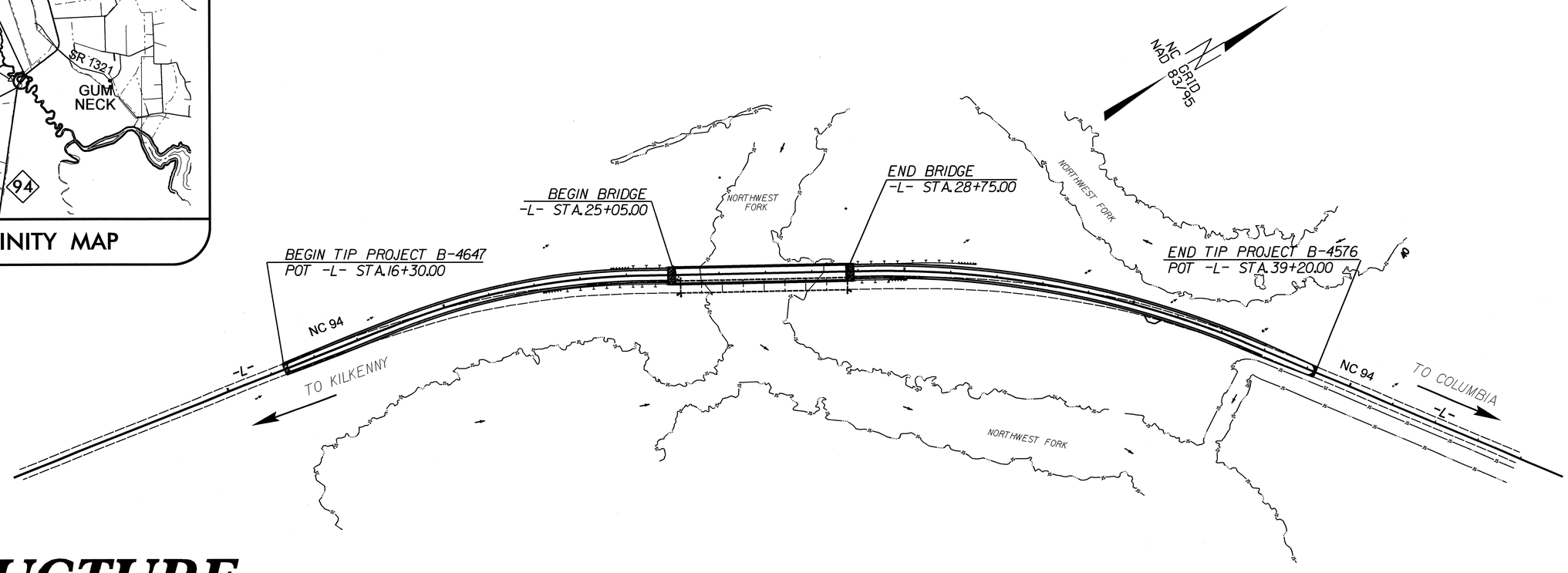
LOCATION: BRIDGE NO. 6 OVER NORTHWEST FORK ON NC 94

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4647		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33813.1.1	BRSTP-94 (1)	PE
33813.2.1	BRSTP-94 (1)	R/W & UTIL.
33813.3.1	BRSTP-94 (1)	CONST.





STRUCTURE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2011 = 870
ADT 2030 = 1300
DHV = 10 %
D = 60 %
T = 6 % *
V = 60 MPH

* TTST 3 % DUAL 3 %

FUNC CLASS = MAJOR COLLECTOR

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4647 = 0.364 MI.

LENGTH OF STRUCTURE TIP PROJECT B-4647 = 0.070 MI.

TOTAL LENGTH OF TIP PROJECT B-4647 = 0.434 MI.

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

2012 STANDARD SPECIFICATIONS

LETTING DATE:
MARCH 20, 2012

N. N. BULLOCK, PE
PROJECT ENGINEER

D. R. CALHOUN, PE
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

03-NOV-2011 11:22
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bhgroady

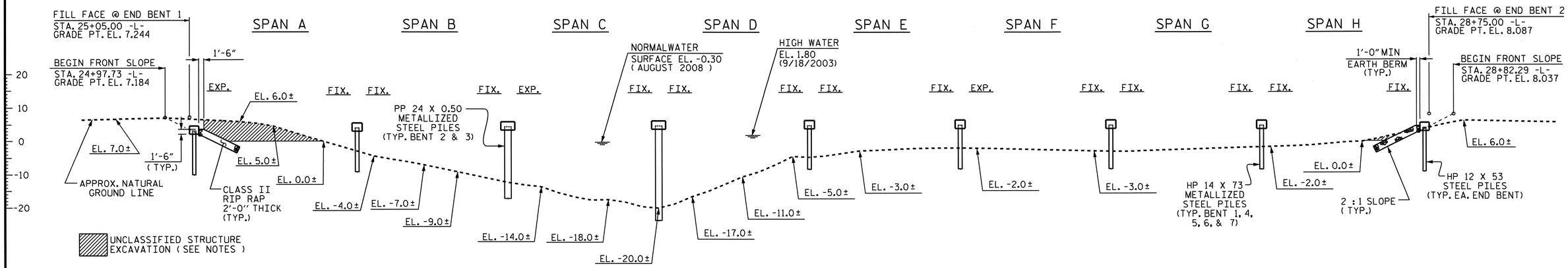
F.A. PROJECT NO. : BRSTP-94 (1)

25+00 25+50 26+00 26+50 27+00 27+50 28+00 28+50

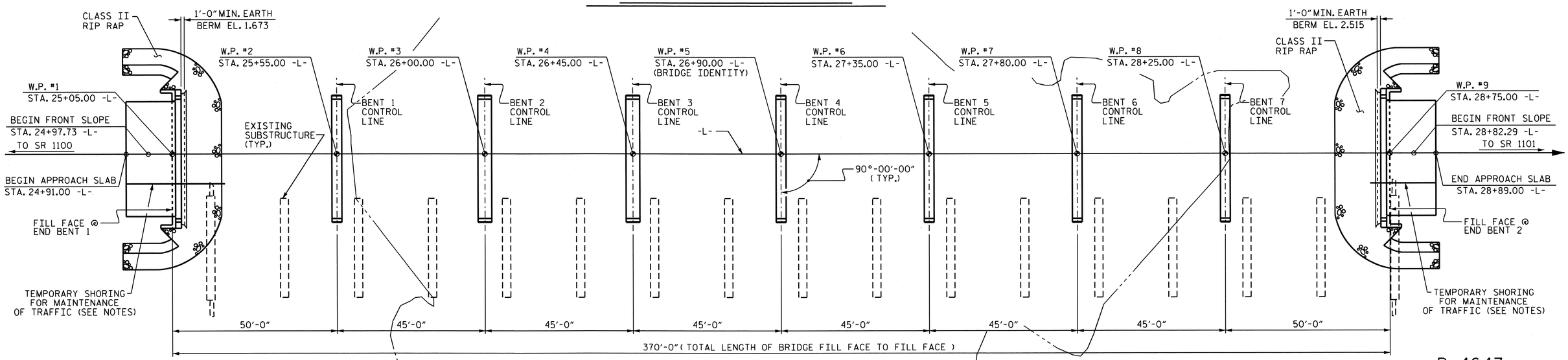
GRADE DATA

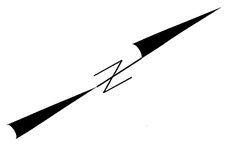
+0.8354% △ -1.1632%

P.I. = 27+75.00 -L-
EL. = 9.50
V.C. = 400'



SECTION ALONG -L-





NORTHWEST FORK
ALLIGATOR RIVER

PLAN

(PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE #6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 94 OVER NORTHWEST FORK ALLIGATOR RIVER BETWEEN SR 1100 AND SR 1101

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

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

DRAWN BY : B.N. GRADY DATE : 9/12/11
CHECKED BY : E.G. ALLEN DATE : 9/20/11

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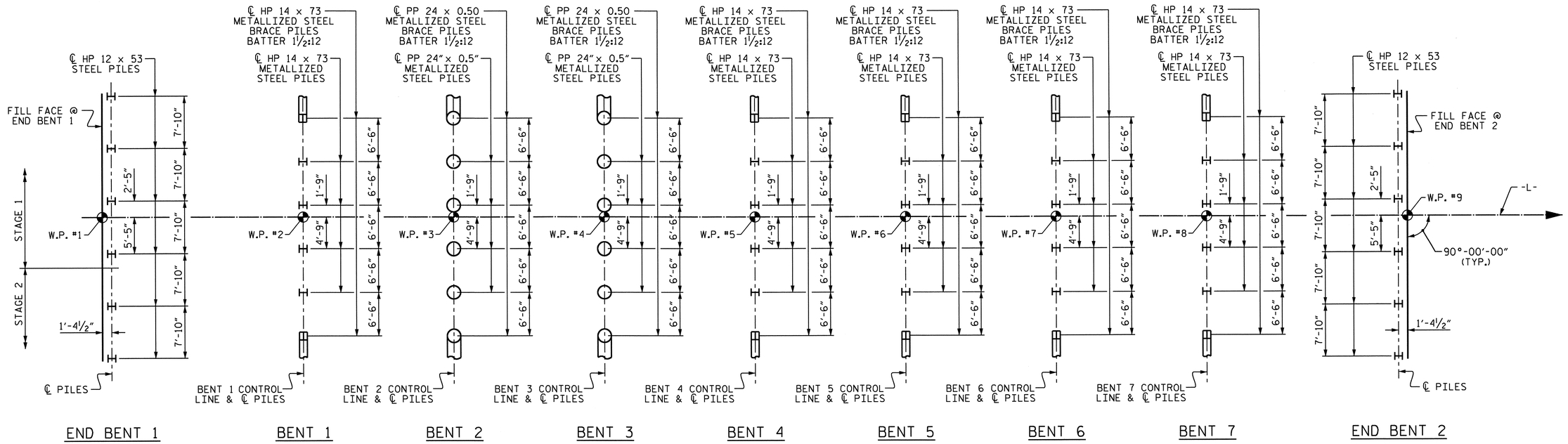

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO CENTERLINE OF PILES)

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.

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 16 (8 @ 22'-6" CONTINUOUS) REINFORCED CONCRETE FLOOR SPANS ON STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 26'-2" ON REINFORCED CONCRETE CAP END BENTS AND INTERIOR BENTS ON TIMBER PILES AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. SEE SPECIAL PROVISION FOR "REMOVAL OF EXISTING STRUCTURE @ STA. 26+90.00 -L-."

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 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.

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

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

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 26+90.00 -L-."

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

ALL BAR SUPPORTS USED IN THE PARAPET AND BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL METALLIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

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 SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOUNDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT 1 AND END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 80 TONS PER PILE.

DRIVE PILES AT END BENT 1 AND END BENT 2 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.

PILES AT BENT 1 AND BENT 7 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.

DRIVE PILES AT BENT 1 AND BENT 7 TO A REQUIRED DRIVING RESISTANCE OF 180 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG AND SCOUR.

PILES AT BENT 2 THROUGH BENT 6 ARE DESIGNED FOR A FACTORED RESISTANCE OF 125 TONS PER PILE.

DRIVE PILES AT BENT 2 THROUGH BENT 6 TO A REQUIRED DRIVING RESISTANCE OF 170 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG AND SCOUR.

INSTALL PILES AT BENT 1, 2, 3, 4, 5, 6, AND 7 TO A TIP ELEVATION NO HIGHER THAN -38 FT, -53 FT, -63 FT, -44 FT, -41 FT, -38 FT, AND -32 FT, RESPECTIVELY.

THE SCOUR CRITICAL ELEVATIONS FOR BENT 1, 2, 3, 4, 5, 6, AND 7 ARE ELEVATION -12 FT, -21 FT, -29 FT, -13 FT, -10 FT, -11 FT, AND -10 FT, RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PIPE PILE PLATES MAY BE REQUIRED FOR STEEL PIPE PILES AT BENT 2 AND BENT 3. THE ENGINEER WILL DETERMINE THE NEED FOR PIPE PILE PLATES AFTER DRIVING TEST PILES OR A FEW INITIAL PRODUCTION PILES. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING, OR REDRIVING IS REQUIRED. ONE PDA TEST FOR END BENTS, BENT 1 OR BENT 4 THROUGH 7, AND ONE PDA TEST FOR BENT 2 OR BENT 3 ARE RECOMMENDED. THE ENGINEER WILL DETERMINE THE LOCATIONS FOR PDA TESTS. FOR PILE DRIVING ANALYZER, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 94 OVER NORTHWEST FORK ALLIGATOR RIVER BETWEEN SR 1100 AND SR 1101

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

DRAWN BY : B.N. GRADY DATE : 9/12/11
CHECKED BY : E.G. ALLEN DATE : 9/20/11

03-NOV-2011 11:21
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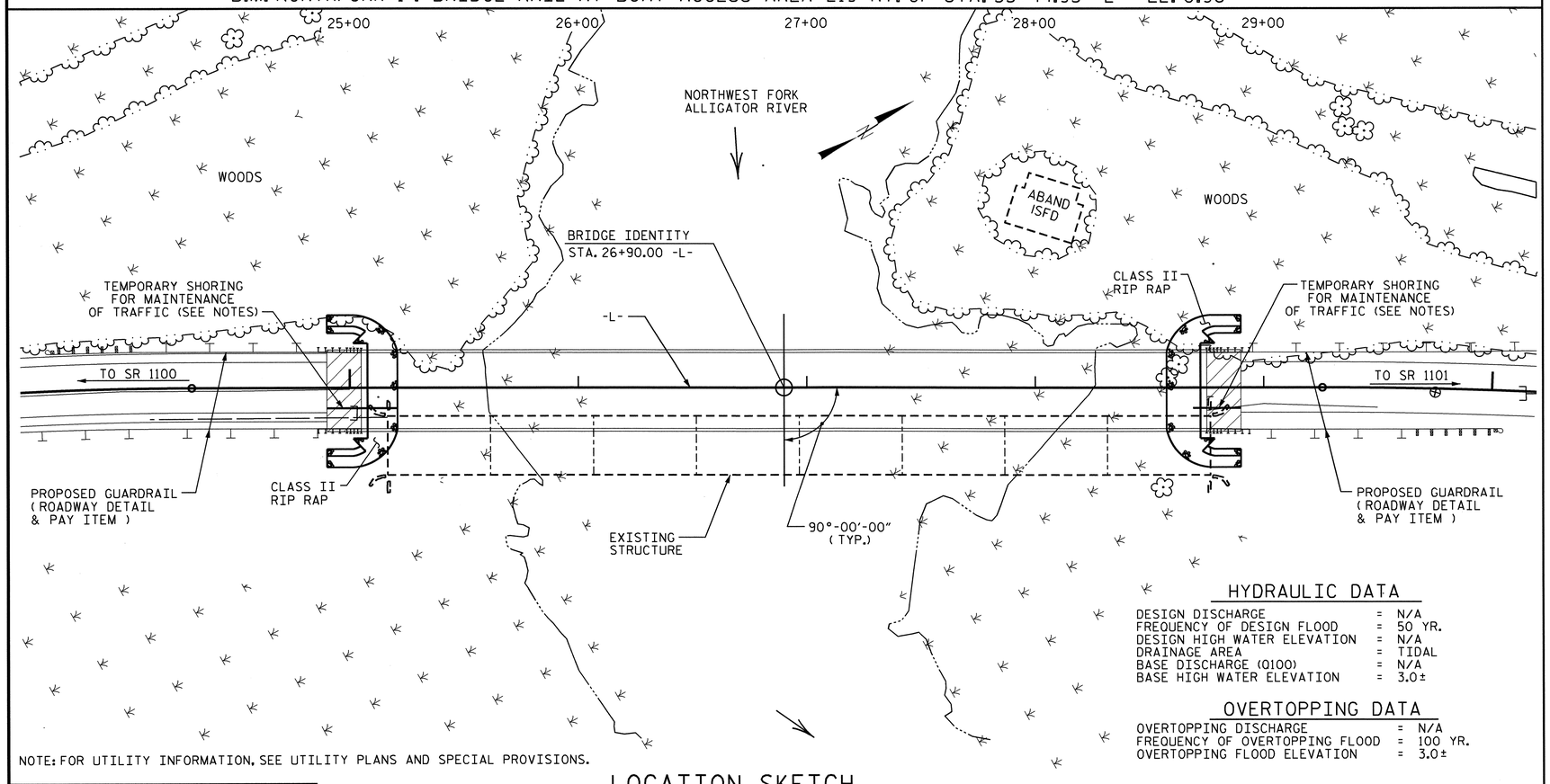
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS AA CONCRETE	BRIDGE APPROACH SLABS	EPOXY COATED REINFORCING STEEL	HP 12 X 53 STEEL PILES		▲ HP 14 X 73 METALLIZED STEEL PILES		▲ PP 24 X 0.50 METALLIZED STEEL PILES		PIPE PILE PLATES	PILE REDRIVES	TWO BAR METAL RAIL	1'-2" x 2'-7½" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	EACH	EACH	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE					LUMP SUM										720.50	735.50			LUMP SUM	96	4402.50
END BENT 1			LUMP SUM	16.1		2185	6	450						6			109	121			
BENT 1				10.9		2567			6	510				6							
BENT 2				14.4		2756					6	540	6	6							
BENT 3				14.4		2756					6	540	6	6							
BENT 4				10.9		2567			6	540				6							
BENT 5				10.9		2567			6	540				6							
BENT 6				10.9		2567			6	570				6							
BENT 7				10.9		2567			6	510				6							
END BENT 2			LUMP SUM	16.1		2185	6	480						6			122	136			
TOTAL	LUMP SUM	2	LUMP SUM	115.5	LUMP SUM	22717	12	930	30	2670	12	1080	12	54	720.50	735.50	231	257	LUMP SUM	96	4402.50

▲ FOR INTERIOR BENTS, ONLY PARTIAL METALLIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET(S) FOR REQUIRED METALLIZED LENGTHS. PAYMENT FOR PARTIALLY METALLIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR METALLIZED STEEL PILES. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).

B.M. NORTHFORK 1 : BRIDGE NAIL AT BOAT ACCESS AREA 219' RT. OF STA. 35+44.93 -L- EL. 0.96



HYDRAULIC DATA

DESIGN DISCHARGE	=	N/A
FREQUENCY OF DESIGN FLOOD	=	50 YR.
DESIGN HIGH WATER ELEVATION	=	N/A
DRAINAGE AREA	=	TIDAL
BASE DISCHARGE (Q100)	=	N/A
BASE HIGH WATER ELEVATION	=	3.0±

OVERTOPPING DATA

OVERTOPPING DISCHARGE	=	N/A
FREQUENCY OF OVERTOPPING FLOOD	=	100 YR.
OVERTOPPING FLOOD ELEVATION	=	3.0±

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

LOCATION SKETCH

DRAWN BY : B.N. GRADY	DATE : 9/12/11
CHECKED BY : E.G. ALLEN	DATE : 9/20/11

08-DEC-2011 14:27
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NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON NC 94 OVER NORTHWEST FORK ALLIGATOR RIVER BETWEEN SR 1100 AND SR 1101

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

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	1.101	--	1.75	0.276	1.53	H	EL	23.906	0.529	1.1	H	EL	2.391	0.80	0.276	1.28	H	EL	23.906	
		HL-93(Opr)	N/A	--	1.427	--	1.35	0.276	1.98	H	EL	23.906	0.529	1.43	H	EL	2.391	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.31	47.147	1.75	0.276	1.89	H	EL	23.906	0.529	1.31	H	EL	2.391	0.80	0.276	1.59	H	EL	23.906	
		HS-20(Opr)	36.000	--	1.698	61.117	1.35	0.276	2.45	H	EL	23.906	0.529	1.7	H	EL	2.391	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.203	43.246	1.4	0.276	4.77	H	EL	23.906	0.529	3.68	H	EL	2.391	0.80	0.276	3.20	H	EL	23.906	
		SNGARBS2	20.000	--	2.542	50.836	1.4	0.276	3.79	H	EL	23.906	0.529	2.68	H	EL	2.391	0.80	0.276	2.54	H	EL	23.906	
		SNAGRIS2	22.000	--	2.462	54.172	1.4	0.276	3.66	H	EL	28.688	0.529	2.52	H	EL	2.391	0.80	0.276	2.46	H	EL	23.906	
		SNCOTTS3	27.250	--	1.598	43.554	1.4	0.276	2.38	H	EL	23.906	0.529	1.84	H	EL	2.391	0.80	0.276	1.60	H	EL	23.906	
		SNAGGRS4	34.925	--	1.394	48.684	1.4	0.276	2.08	H	EL	23.906	0.529	1.58	H	EL	2.391	0.80	0.276	1.39	H	EL	23.906	
		SNS5A	35.550	--	1.359	48.314	1.4	0.276	2.02	H	EL	23.906	0.529	1.62	H	EL	2.391	0.80	0.276	1.36	H	EL	23.906	
		SNS6A	39.950	--	1.273	50.846	1.4	0.276	1.9	H	EL	23.906	0.529	1.5	H	EL	2.391	0.80	0.276	1.27	H	EL	23.906	
		SNS7B	42.000	--	1.213	50.947	1.4	0.276	1.81	H	EL	23.906	0.529	1.5	H	EL	2.391	0.80	0.276	1.21	H	EL	23.906	
	TTST	TNAGRIT3	33.000	--	1.56	51.475	1.4	0.276	2.32	H	EL	23.906	0.529	1.77	H	EL	2.391	0.80	0.276	1.56	H	EL	23.906	
		TNT4A	33.075	--	1.574	52.062	1.4	0.276	2.34	H	EL	23.906	0.529	1.7	H	EL	2.391	0.80	0.276	1.57	H	EL	23.906	
		TNT6A	41.600	--	1.313	54.629	1.4	0.276	1.96	H	EL	23.906	0.529	1.64	H	EL	2.391	0.80	0.276	1.31	H	EL	23.906	
		TNT7A	42.000	--	1.334	56.035	1.4	0.276	1.99	H	EL	23.906	0.529	1.53	H	EL	2.391	0.80	0.276	1.33	H	EL	23.906	
		TNT7B	42.000	--	1.39	58.397	1.4	0.276	2.07	H	EL	23.906	0.529	1.45	H	EL	2.391	0.80	0.276	1.39	H	EL	23.906	
		TNAGRIT4	43.000	--	1.321	56.785	1.4	0.276	1.97	H	EL	23.906	0.529	1.39	H	EL	2.391	0.80	0.276	1.32	H	EL	23.906	
		TNAGT5A	45.000	--	1.233	55.468	1.4	0.276	1.84	H	EL	23.906	0.529	1.42	H	EL	2.391	0.80	0.276	1.23	H	EL	23.906	
		TNAGT5B	45.000	3	1.207	54.306	1.4	0.276	1.8	H	EL	23.906	0.529	1.32	H	EL	2.391	0.80	0.276	1.21	H	EL	23.906	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

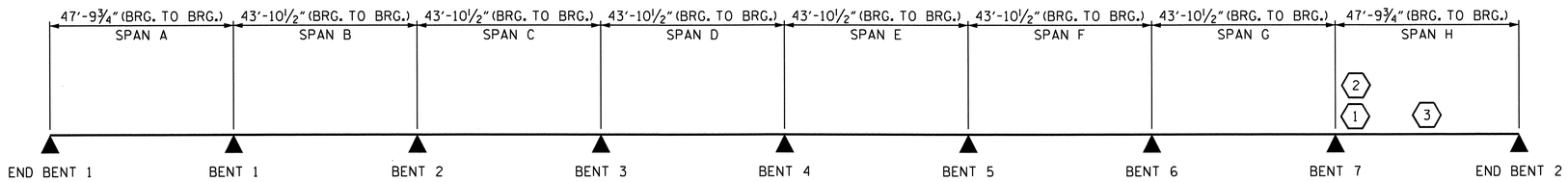
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-4647
TYRRELL COUNTY
STATION: 26+90.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

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

STD. NO. LRFR1

ASSEMBLED BY : K. P. SEDAI	DATE : 9/9/11
CHECKED BY : W. S. ARAFAT	DATE : 9/15/11
DRAWN BY : MAA 1/08	REV. 11/12/08 MAA/GM
CHECKED BY : GM/DI 2/08	

03-NOV-2011 11:21
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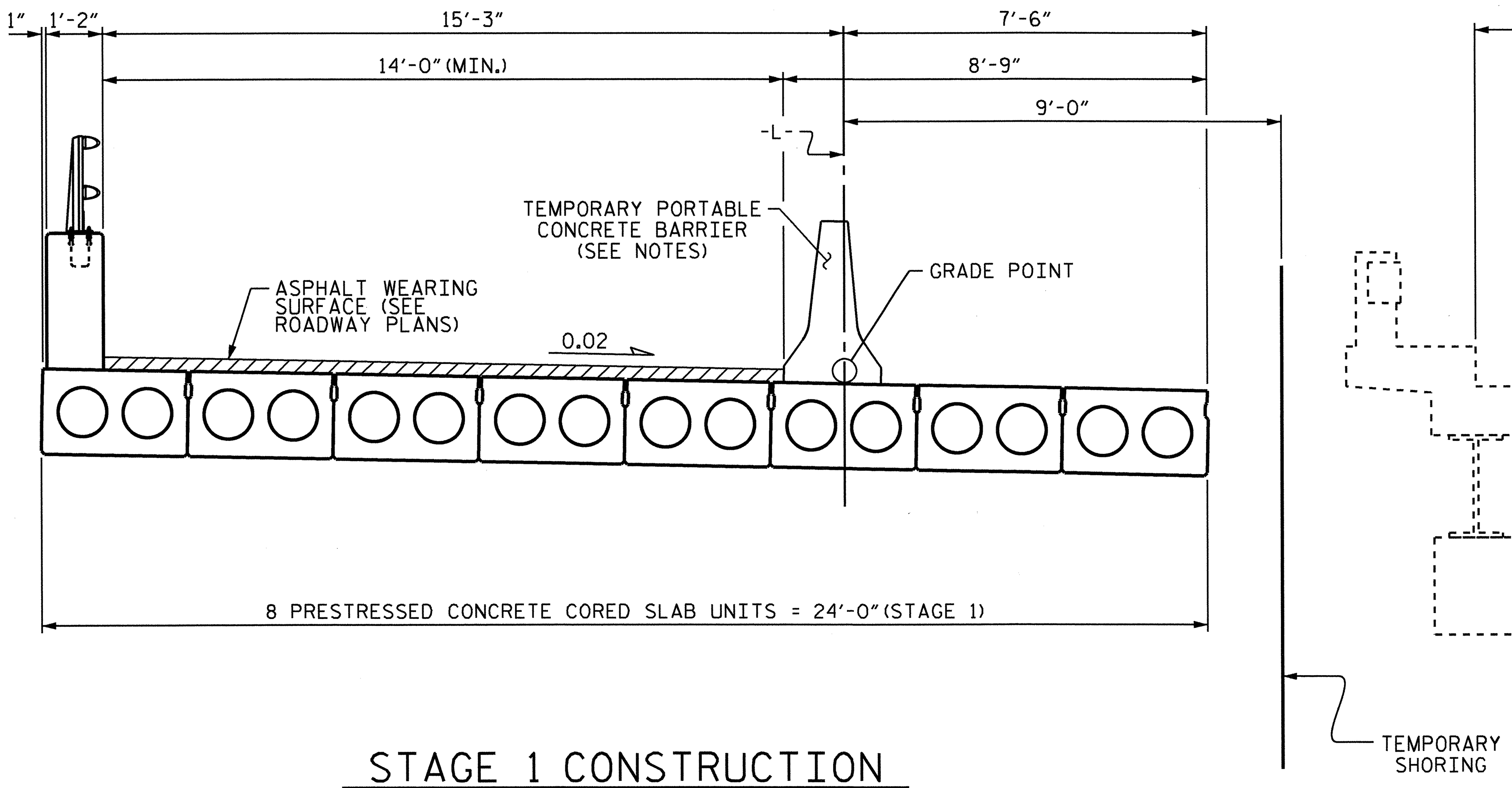
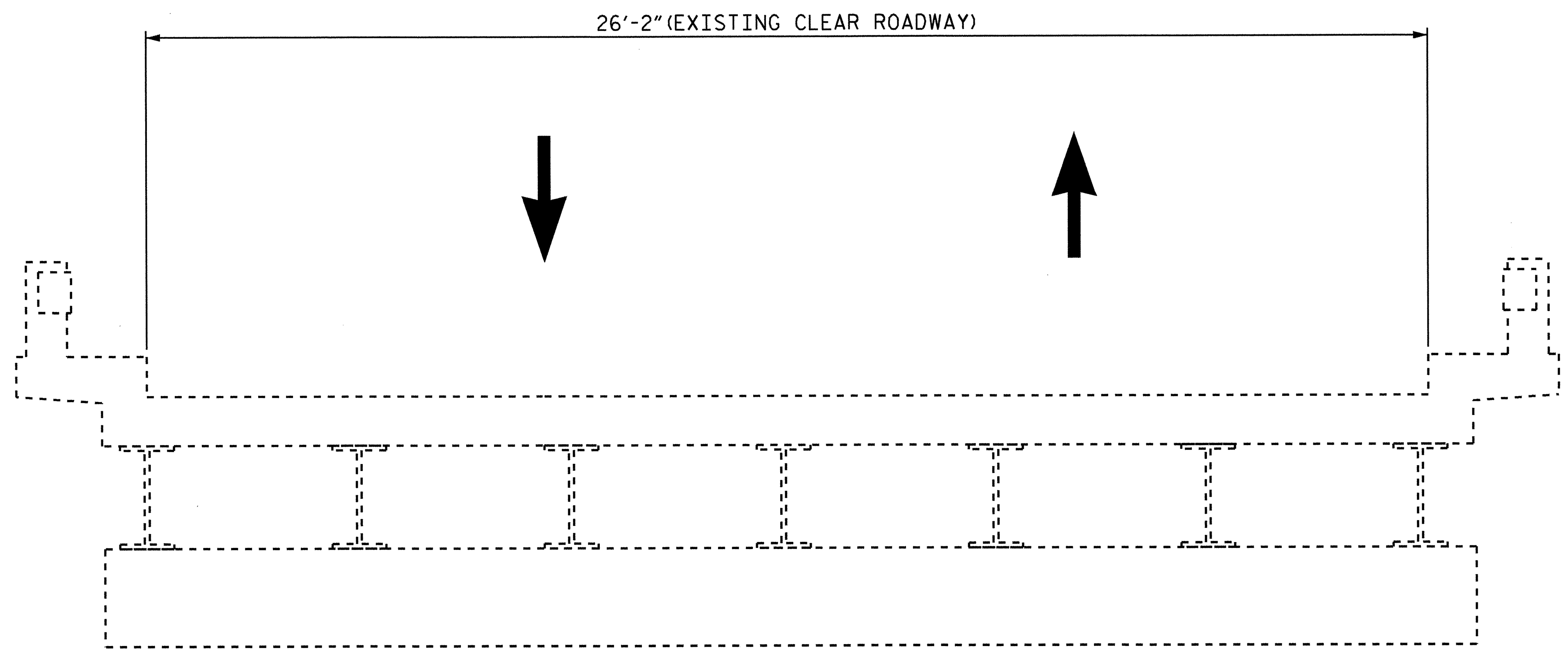
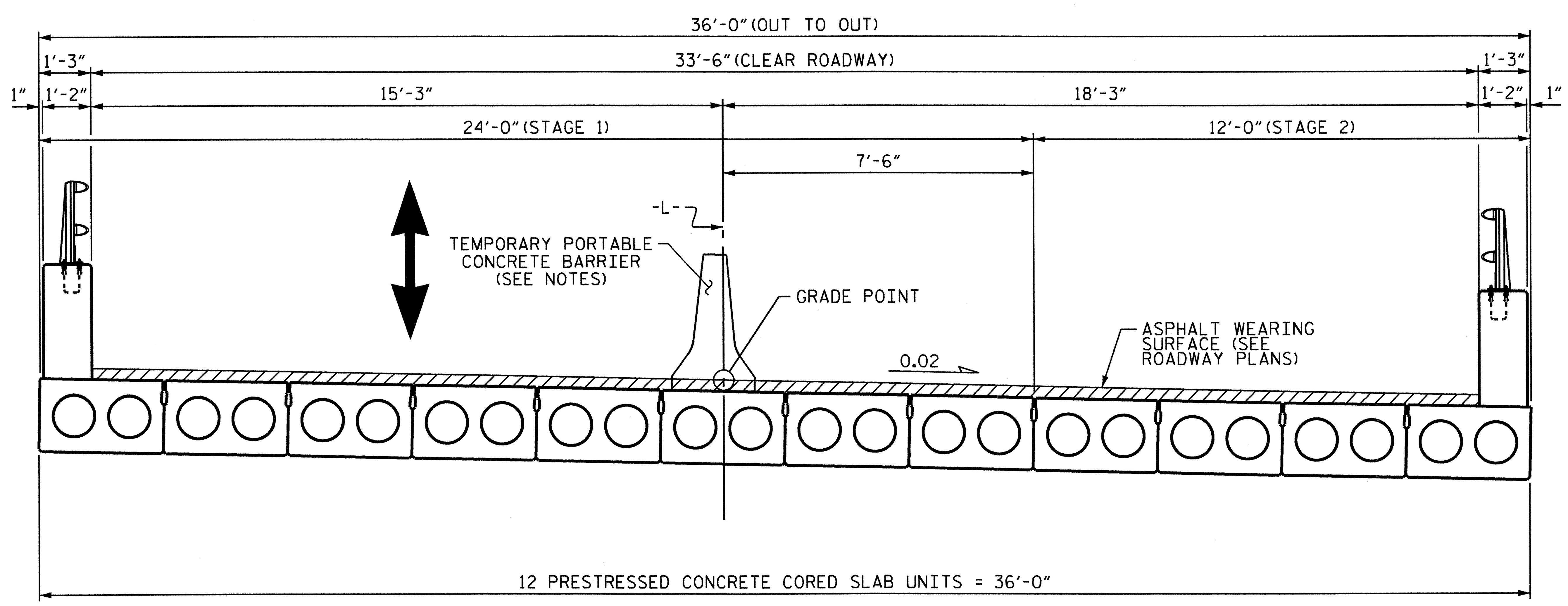


STAGE 1 CONSTRUCTION



STAGE 1 TRAFFIC

(EXISTING STRUCTURE)



STAGE 2 CONSTRUCTION AND TRAFFIC

REMOVE EXISTING STRUCTURE, CONSTRUCT STAGE 2

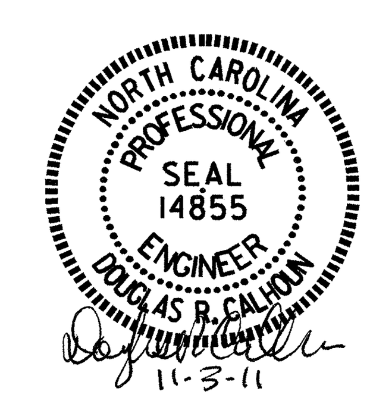
NOTES:

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE TEMPORARY CONCRETE BARRIERS.

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : B.N. GRADY   DATE : 9/21/11
CHECKED BY : E.G. ALLEN   DATE : 9/29/11

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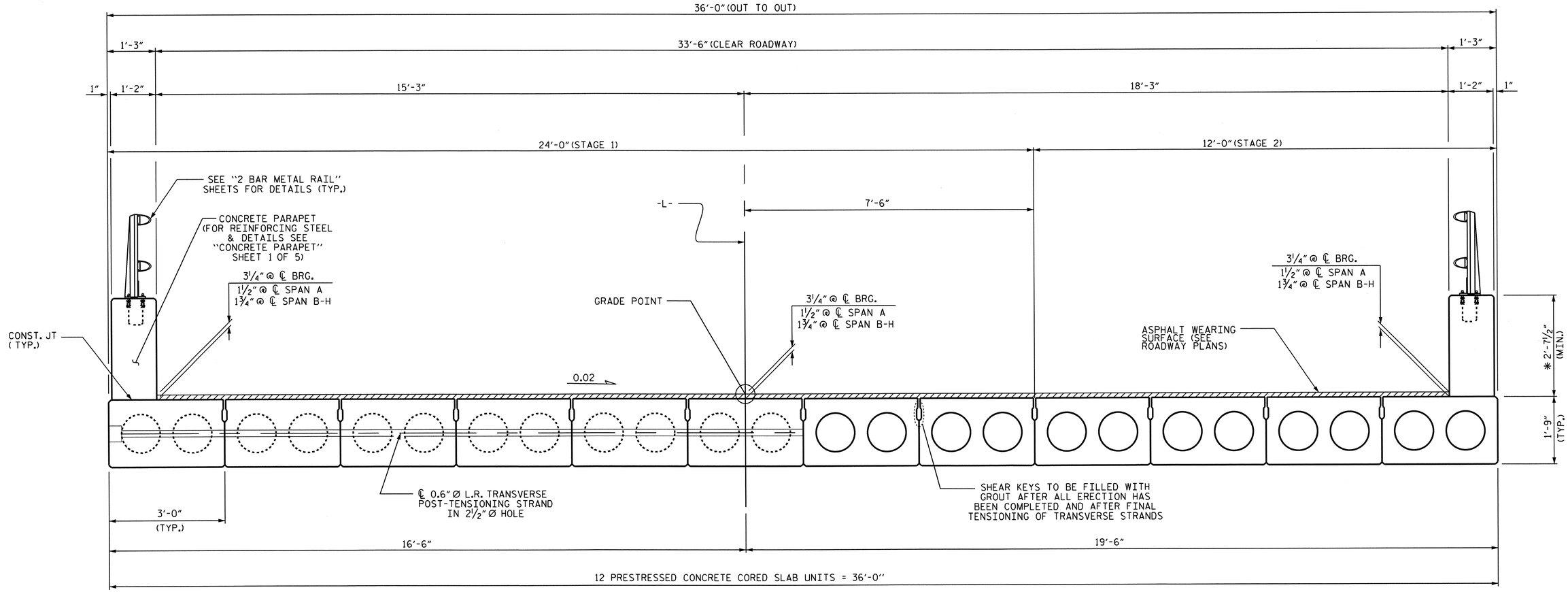

HALF SECTION @ DIAPHRAGMS

TYPICAL SECTION

HALF SECTION @ VOIDS

*THE MINIMUM HEIGHT OF THE PARAPET IS SHOWN. THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 1 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN

11-3-11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.L. WALTON DATE : 6/19/09
CHECKED BY : B.N. GRADY DATE : 2/21/11

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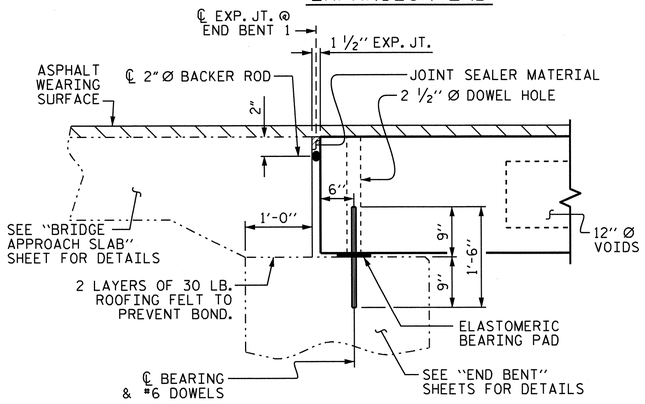
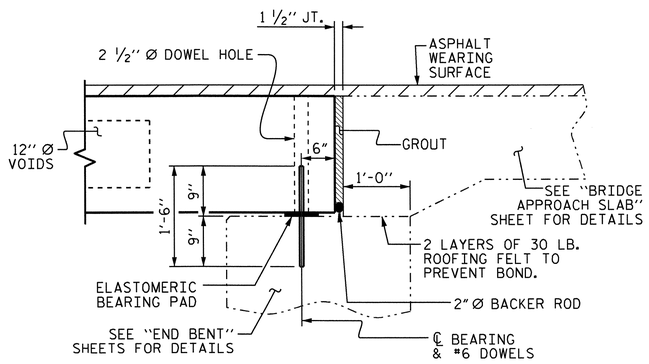
EXPANSION END



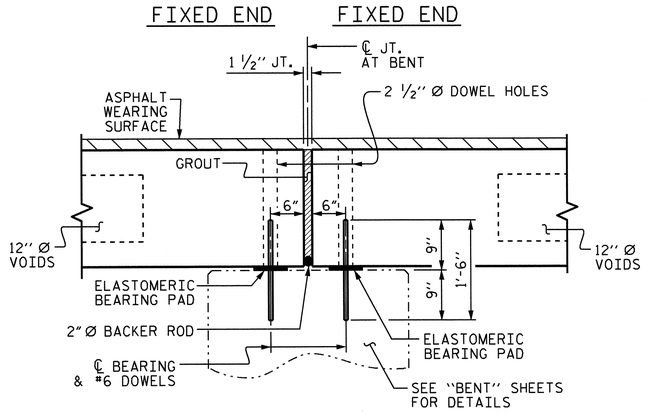
SECTION AT END BENT 1

FIXED END



SECTION AT END BENT 2

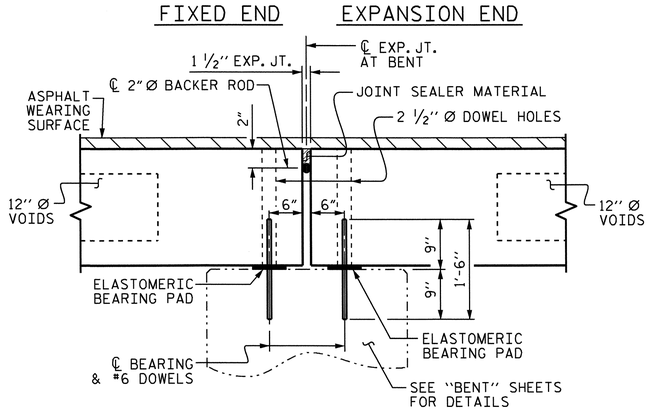
FIXED END — FIXED END



SECTION AT BENT

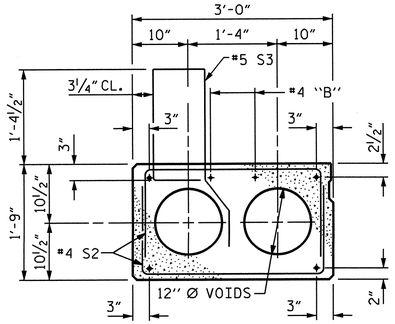
(BENTS 1, 3, 4, 6 & 7)

FIXED END — EXPANSION END



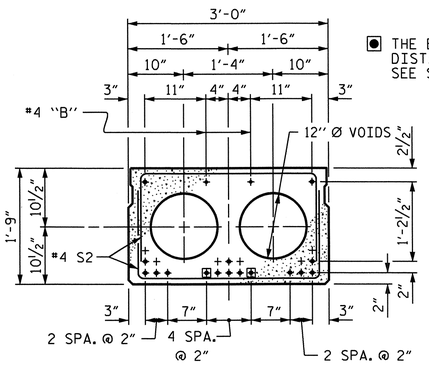
SECTION AT BENT

(BENTS 2 & 5)



EXTERIOR SLAB SECTION

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

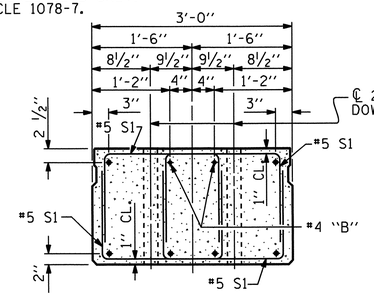


INTERIOR SLAB SECTION

(16 STRANDS, 2 SHEATHED)

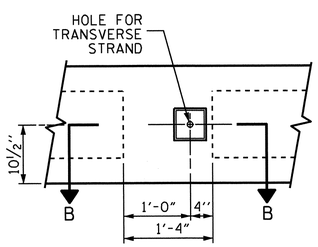
0.6" Ø LOW RELAXATION STRAND LAYOUT

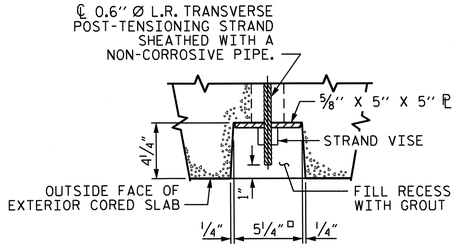
● THE BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 4'-0" FROM END OF THE CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



END ELEVATION

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

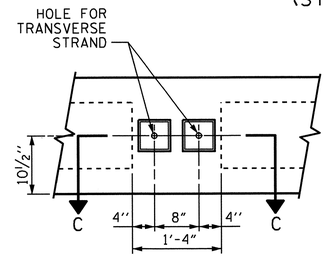


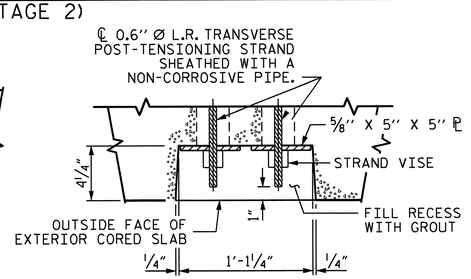


ELEVATION VIEW — SECTION B-B

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

(STAGE 2)

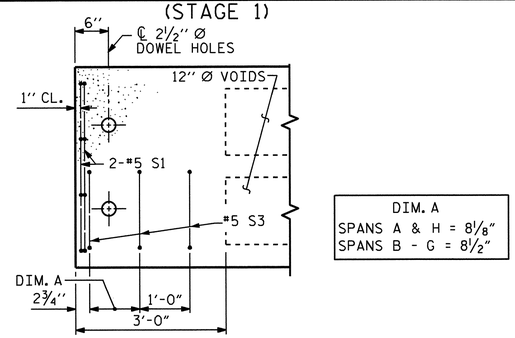




ELEVATION VIEW — SECTION C-C

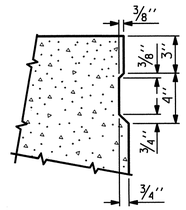
GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS

(STAGE 1)



PART PLAN-EXTERIOR SECTION

NOTE: EXTERIOR SECTION SHOWN-INTERIOR SECTION SIMILAR EXCEPT OMIT S3 BARS.



SHEAR KEY DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

PROJECT NO. B-4647
TYRRELL COUNTY
STATION: 26+90.00 -L-
SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

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

ASSEMBLED BY : J.L. WALTON		DATE : 6/19/09			
CHECKED BY : B.N. GRADY		DATE : 2-21-11			
DRAWN BY : WJH 4/89	REV. 10/17/00 RWW/LES				
CHECKED BY : FCJ 5/89	REV. 7/10/01RR RWW/LES				
	REV. 5/1/06R TLA/GM				

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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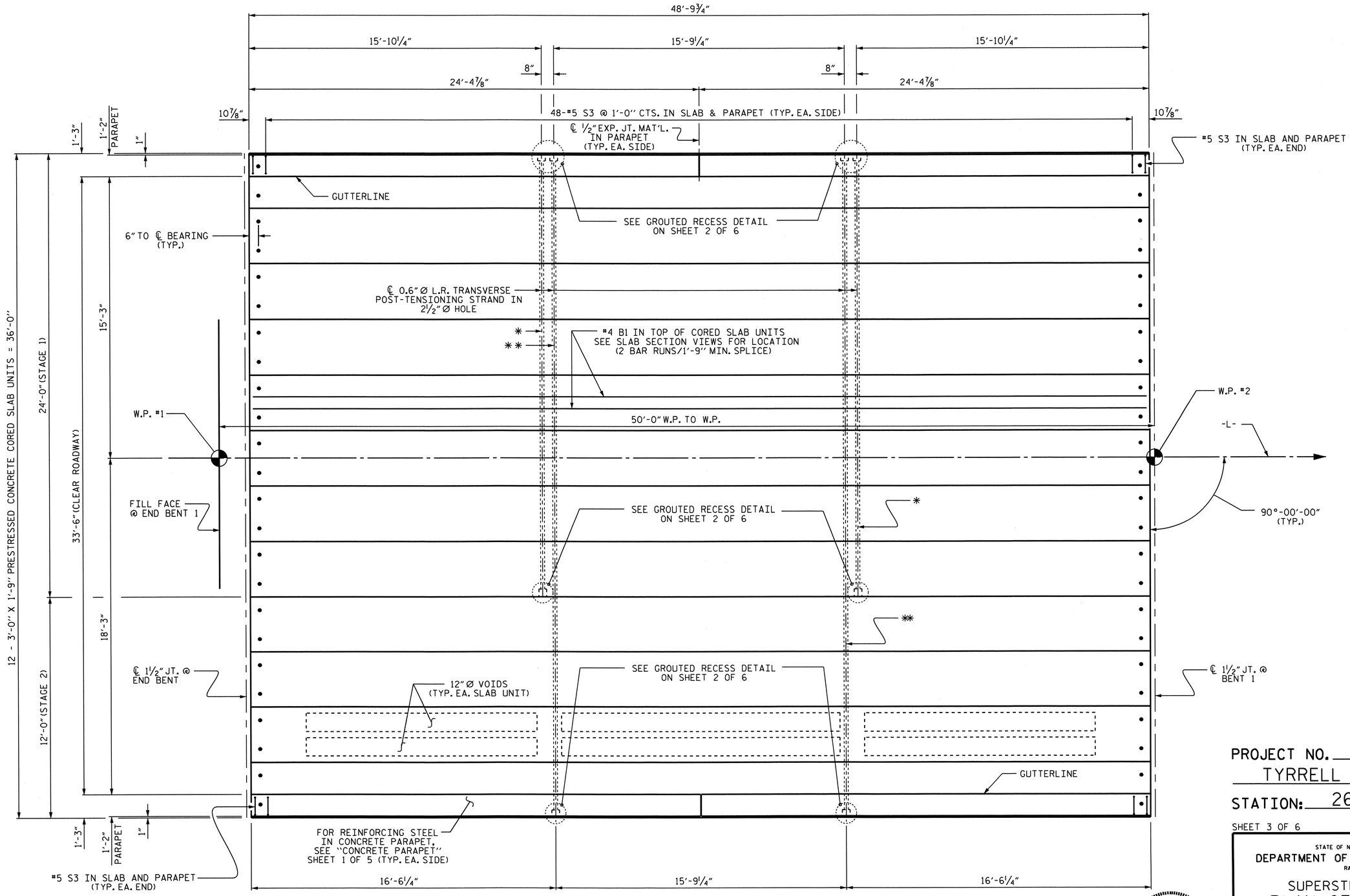
(SHT 3) STD. NO. PCS2



SPAN A

(SPAN A SHOWN, SPAN H SIMILAR)

NOTES:

* STRAND GOES THRU 8 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE 1 CONSTRUCTION).

** STRAND GOES THRU 12 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE 2 CONSTRUCTION).

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPANS A & H

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.L. WALTON DATE : 6/19/09
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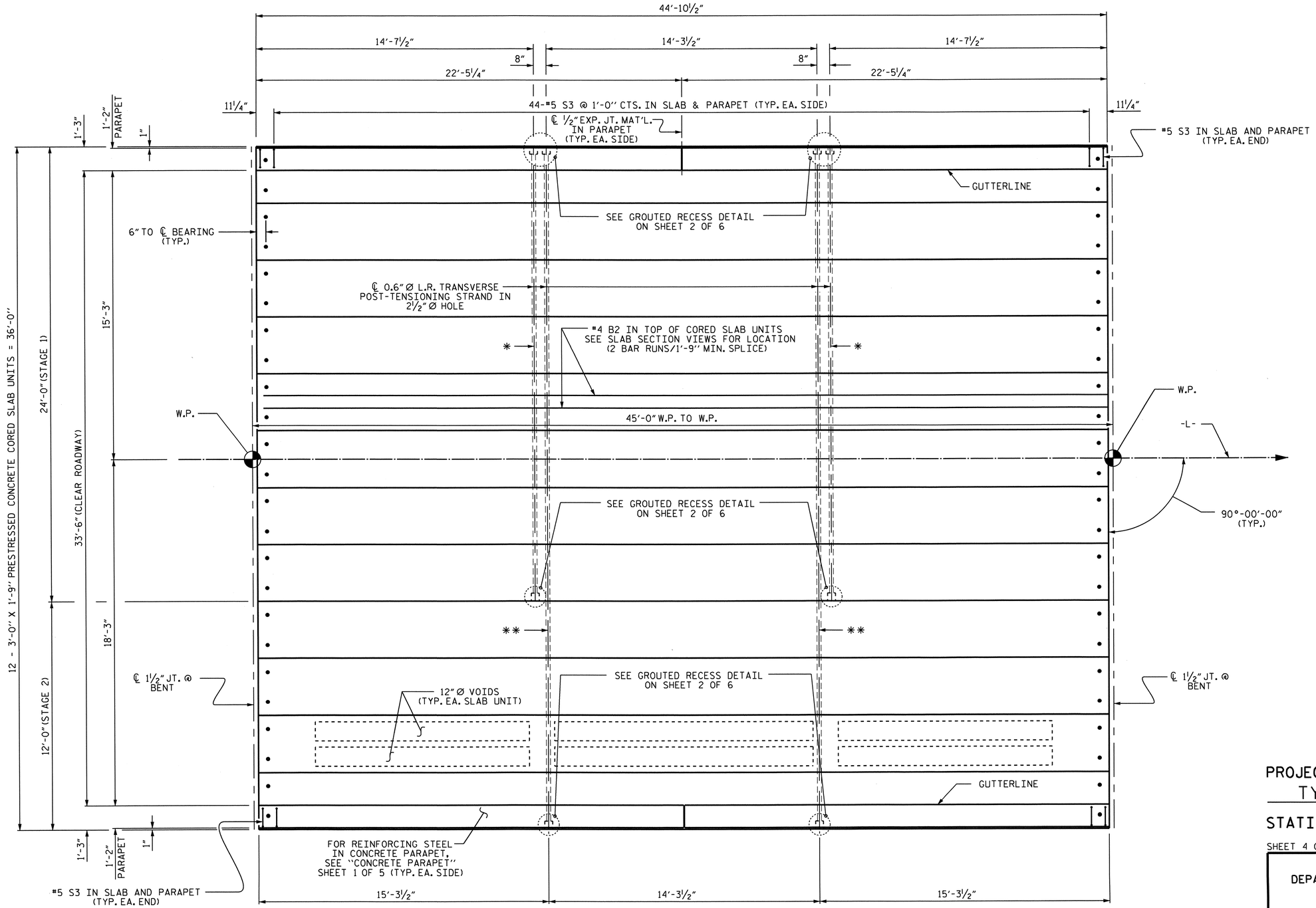

PLAN OF SPAN

NOTES:

* STRAND GOES THRU 8 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE 1 CONSTRUCTION).

** STRAND GOES THRU 12 CORED SLAB UNITS (TO BE TENSIONED DURING STAGE 2 CONSTRUCTION).

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPANS
SPANS B THRU G

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

DRAWN BY : J.L. WALTON DATE : 6/19/09
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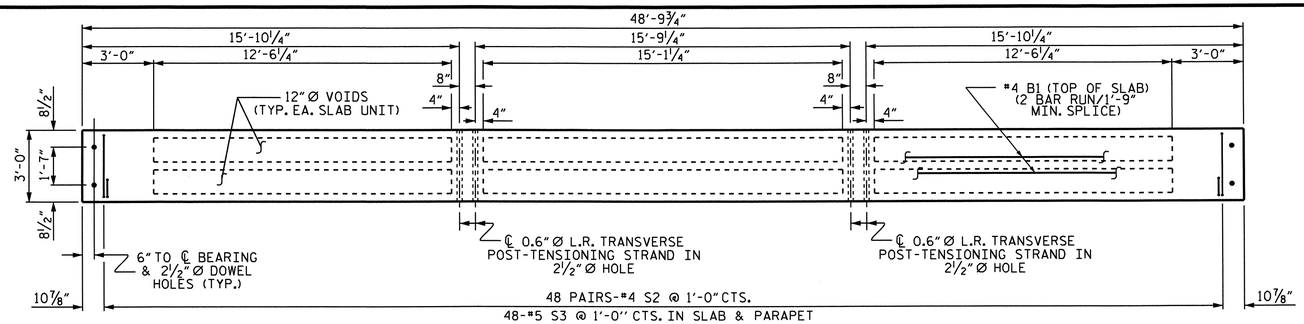
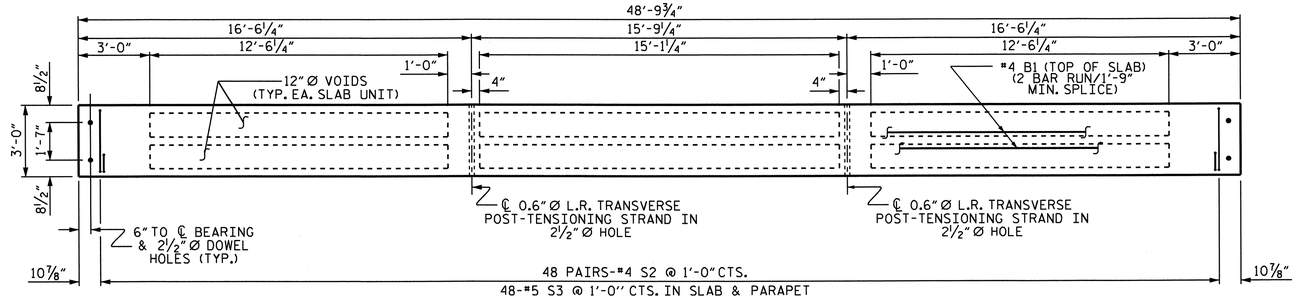


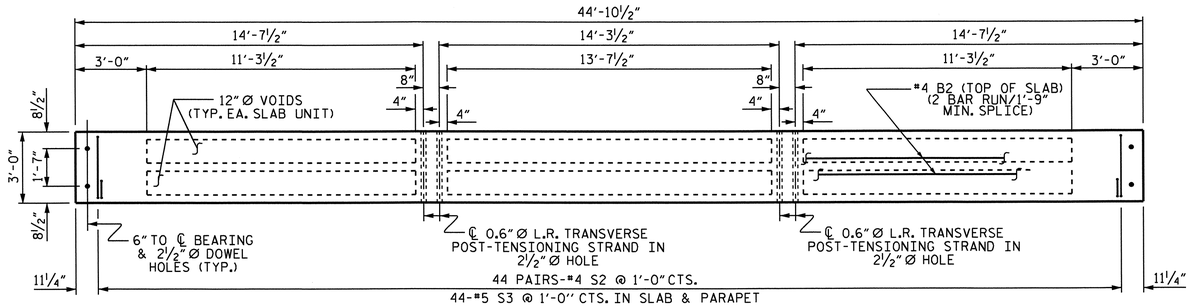
PLAN OF CORED SLAB UNIT STAGE 1 (SPANS A & H)

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)
FOR REINFORCING STEEL AT END OF CORED SLABS SEE "PART PLAN EXTERIOR SECTION" SHEET 2 OF 6.



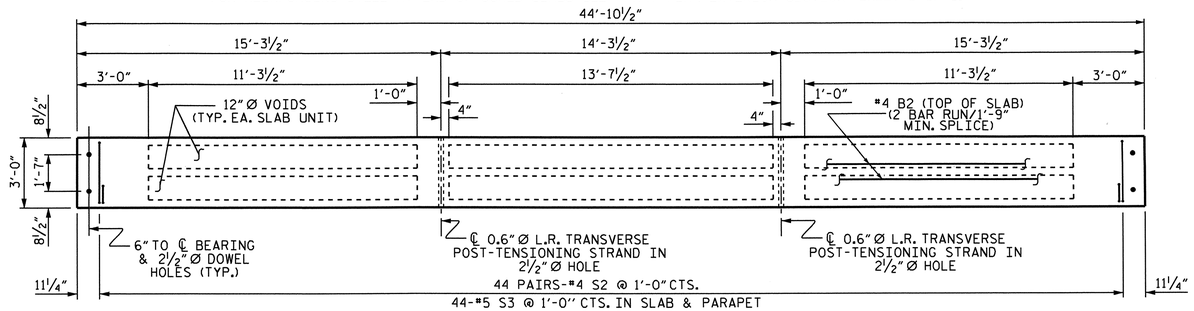
PLAN OF CORED SLAB UNIT STAGE 2 (SPANS A & H)

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)
FOR REINFORCING STEEL AT END OF CORED SLABS SEE "PART PLAN EXTERIOR SECTION" SHEET 2 OF 6.



PLAN OF CORED SLAB UNIT STAGE 1 (SPANS B THRU G)

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)
FOR REINFORCING STEEL AT END OF CORED SLABS SEE "PART PLAN EXTERIOR SECTION" SHEET 2 OF 6.



PLAN OF CORED SLAB UNIT STAGE 2 (SPANS B THRU G)

(EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT S3 BARS)
FOR REINFORCING STEEL AT END OF CORED SLABS SEE "PART PLAN EXTERIOR SECTION" SHEET 2 OF 6.

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DAVID A. R. CALHOUN
11-3-11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
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BILL OF MATERIAL FOR ONE CORED SLAB SECTION

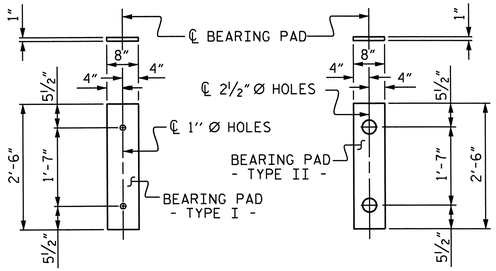
SPANS A AND H

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B1	4	#4	STR	25'-2"	67	25'-2"	67
S1	8	#5	1	4'-3"	35	4'-3"	35
S2	96	#4	1	5'-4"	342	5'-4"	342
* S3	50	#5	2	5'-8"	296		
REINFORCING STEEL					LBS. 444		LBS. 444
*EPOXY COATED REINFORCING STEEL					LBS. 296		
6000 P.S.I. CONCRETE					CU. YDS. 6.9		CU. YDS. 6.9
0.6" Ø L.R. STRANDS					No. 16		No. 16

BILL OF MATERIAL FOR ONE CORED SLAB SECTION

SPANS B THRU G

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
B2	4	#4	STR	23'-2"	62	23'-2"	62
S1	8	#5	1	4'-3"	35	4'-3"	35
S2	88	#4	1	5'-4"	314	5'-4"	314
* S3	46	#5	2	5'-8"	272		
REINFORCING STEEL					LBS. 411		LBS. 411
*EPOXY COATED REINFORCING STEEL					LBS. 272		
6000 P.S.I. CONCRETE					CU. YDS. 6.5		CU. YDS. 6.5
0.6" Ø L.R. STRANDS					No. 16		No. 16

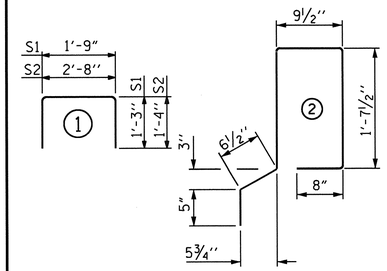


FIXED END
(TYPE I - 156 REQ'D.)

EXPANSION END
(TYPE II - 36 REQ'D.)

ELASTOMERIC BEARING DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

GRADE 270 STRANDS

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

DEAD LOAD DEFLECTION AND CAMBER

	SPANS A & H	SPANS B THRU G
CAMBER (SLAB ALONE IN PLACE) ↑	1⅞"	1¾"
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** ↓	¼"	3/16"
FINAL CAMBER ↑	1⅝"	1 9/16"

** INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR C.S. (SPANS A & H)	4	48'-9¾	195'-3"
INTERIOR C.S. (SPANS A & H)	20	48'-9¾	976'-3"
EXTERIOR C.S. (SPANS B THRU G)	12	44'-10½	538'-6"
INTERIOR C.S. (SPANS B THRU G)	60	44'-10½	2692'-6"
TOTAL	96		4402'-6"

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4800 PSI.

ALL REINFORCING STEEL IN PARAPETS AND END POSTS 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.

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

PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. NO SEPARATE PAYMENT WILL BE MADE FOR THE CALCIUM NITRITE CORROSION INHIBITOR.

PRESTRESSED CONCRETE CORED SLAB UNITS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : J.L. WALTON DATE : 7/10/09
CHECKED BY : B.N. GRADY DATE : 2/21/11

DRAWN BY : WJH 4/89
CHECKED BY : FCJ 5/89

REV. 7/10/01 RWW/LES
REV. 5/7/03RRR RWW/JTE
REV. 5/1/06 TLA/GM

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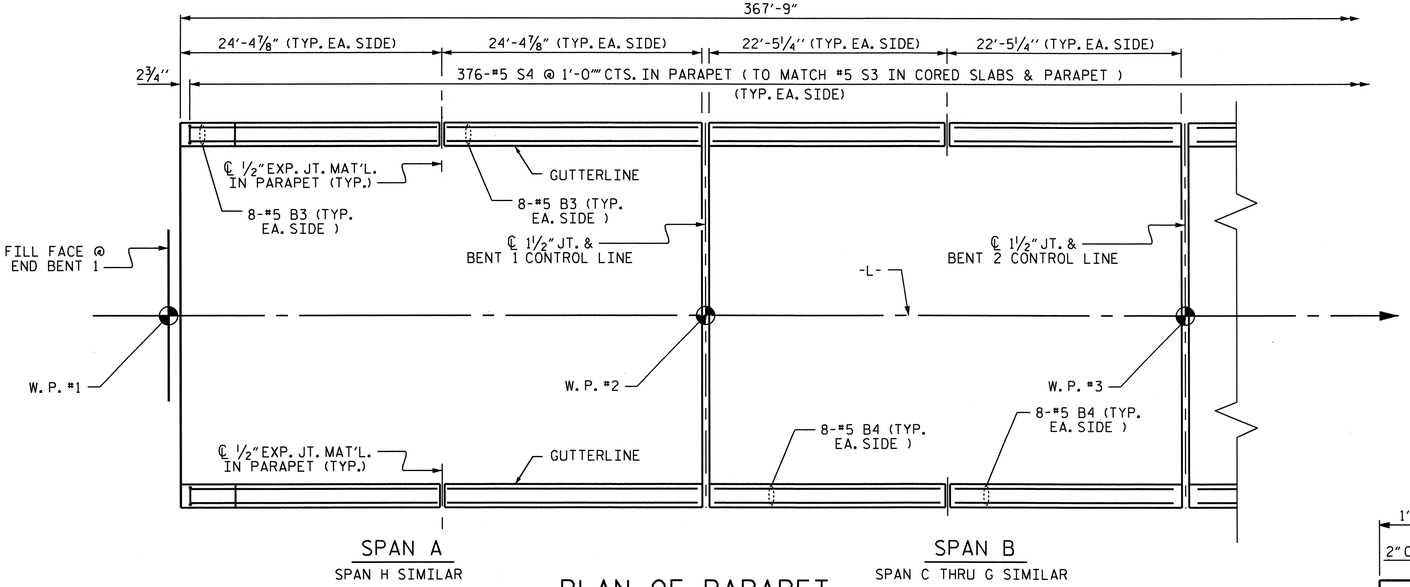
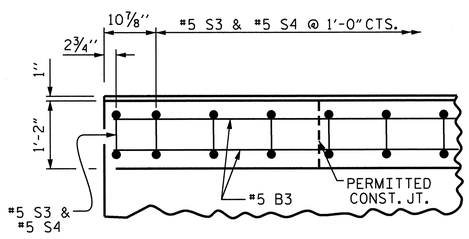
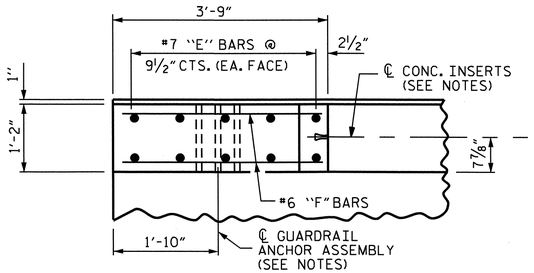
(SHT 3) STD. NO. PCS3

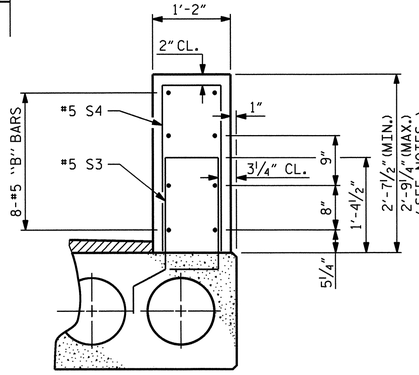


PLAN OF PARAPET

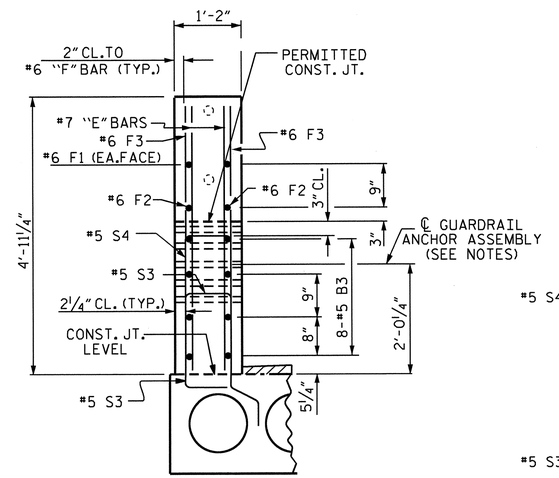




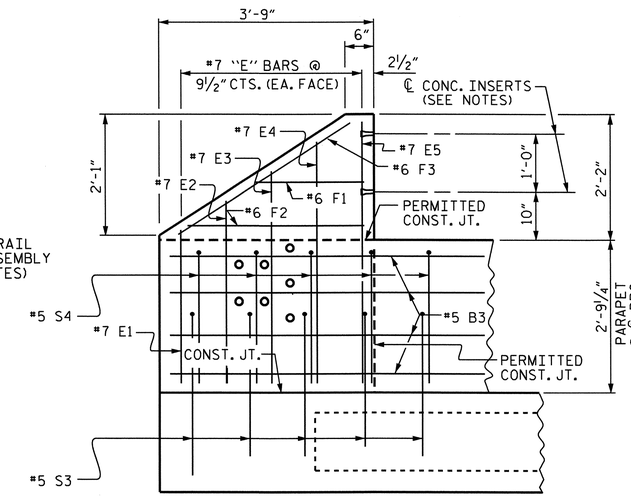
PLAN OF END POST



TWO BAR METAL RAIL PARAPET SECTION

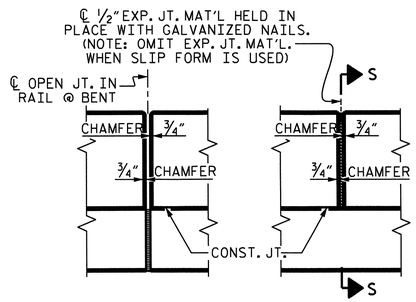


END VIEW

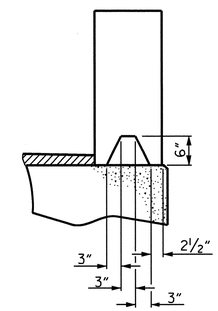


ELEVATION

PARAPET AND END POST FOR TWO-BAR RAIL



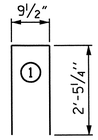
ELEVATION AT EXPANSION JOINTS



SECTION S-S

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL PARAPETS AND END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B3	64	#5	STR	24'-0"	1602
✱B4	192	#5	STR	22'-1"	4422
✱E1	8	#7	STR	2'-8"	44
✱E2	8	#7	STR	3'-2"	52
✱E3	8	#7	STR	3'-8"	60
✱E4	8	#7	STR	4'-3"	69
✱E5	8	#7	STR	4'-7"	75
✱F1	8	#6	STR	1'-10"	22
✱F2	8	#6	STR	3'-0"	36
✱F3	8	#6	STR	3'-8"	44
✱S4	752	#5	1	5'-8"	4445

✱EPOXY COATED REINF. STEEL = 10871 LBS

CLASS AA CONCRETE 85.7 C.Y.

CONCRETE PARAPET 735.50 L.F.

NOTES

ALL REINFORCING STEEL IN THE PARAPETS AND END POSTS SHALL BE EPOXY COATED.

FOR DETAILS OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET 4 OF 5 AND "GUARDRAIL ANCHORAGE DETAILS" SHEET 5 OF 5.

#5 S3 BARS ARE INCLUDED IN THE BILL OF MATERIAL FOR CORED SLAB UNITS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 FT. TO 10 FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH

ALL BAR SUPPORTS USED IN THE PARAPET AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE HEIGHT OF THE PARAPET VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE.

THE 1/2" EXPANSION JOINT IN THE PARAPET MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE #5 S3 & #5 S4 BARS.

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CONCRETE PARAPET AND PARAPET END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.L. WALTON DATE : 7/14/09
CHECKED BY : B.N. GRADY DATE : 2/21/11

03-NOV-2011 11:19
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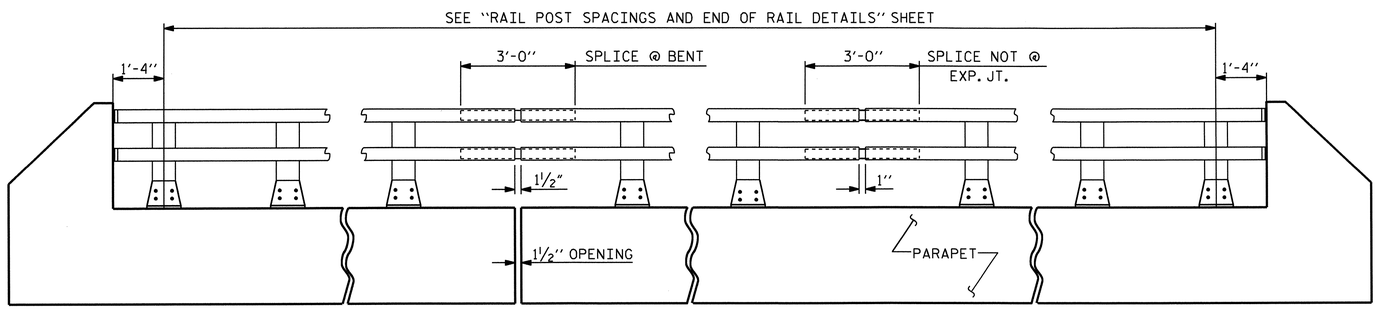
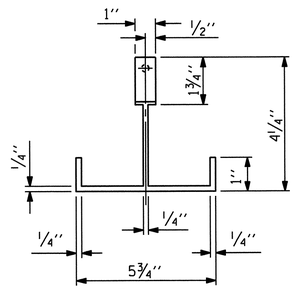
bngrady

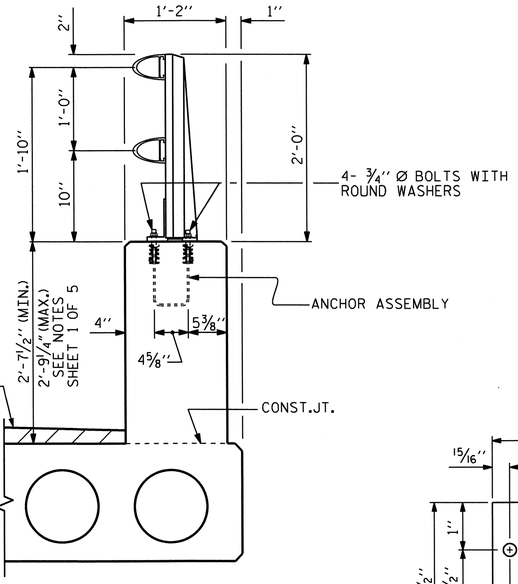


ELEVATION

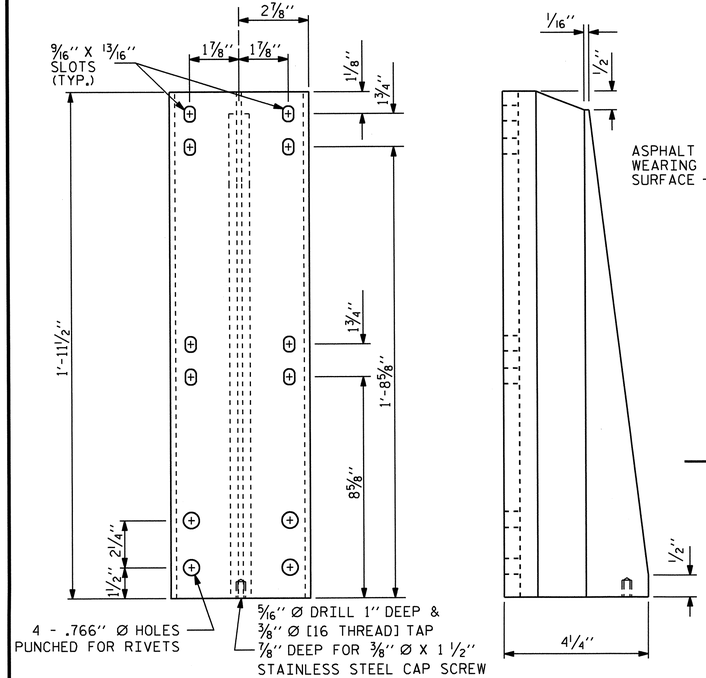
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



PLAN



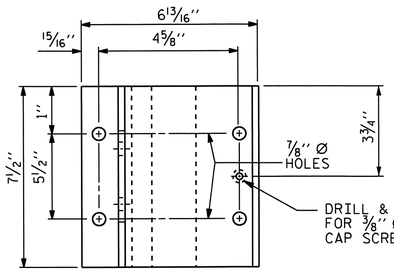
SECTION THRU PARAPET AND RAIL



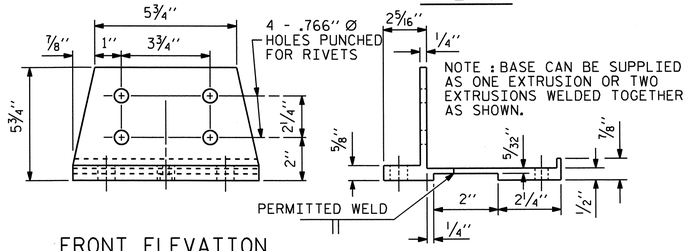
FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST



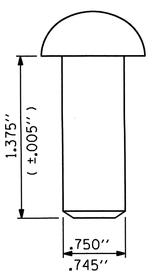
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

PAY LENGTH = 720.50 LIN. FT.

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
2 BAR METAL RAIL

ASSEMBLED BY : J.L. WALTON		DATE : 7-17-09			
CHECKED BY : B.N. GRADY		DATE : 2/21/11			
DRAWN BY : EEM 6/94	REV. 10/17/00	LES/RDR			
CHECKED BY : RGW 6/94	REV. 5/7/03R	RWW/JTE			
	REV. 5/1/06	TLA/GM			

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			30

STD. NO. BMR3

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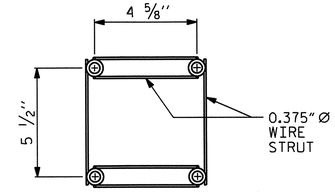
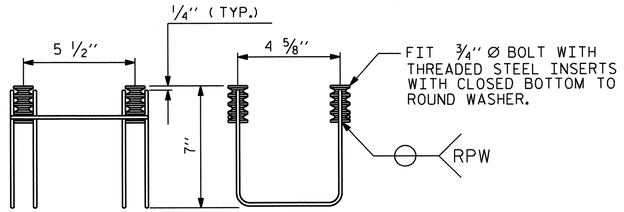


PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(120 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS 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.

C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16'' Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

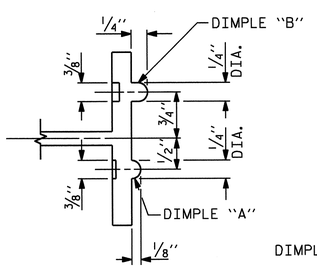
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

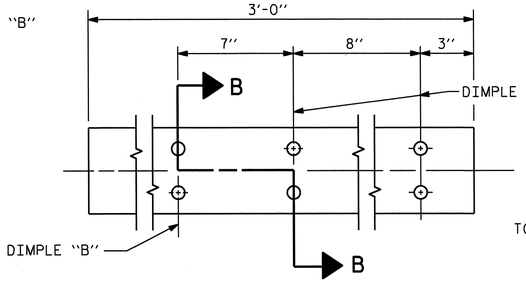
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

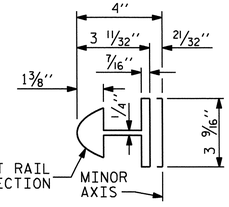
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4"Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



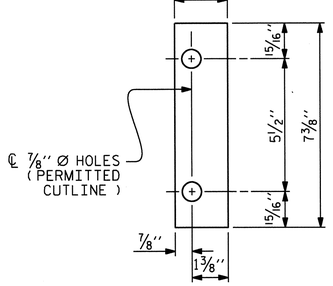
SECTION B - B



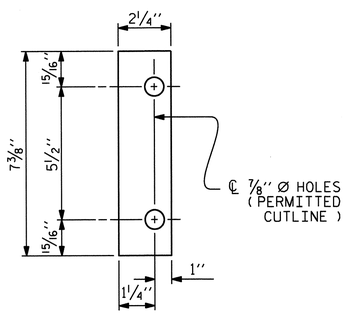


BAR SECTION

EXPANSION BAR DETAILS



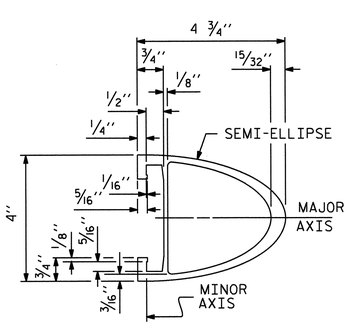
FRONT PLATE



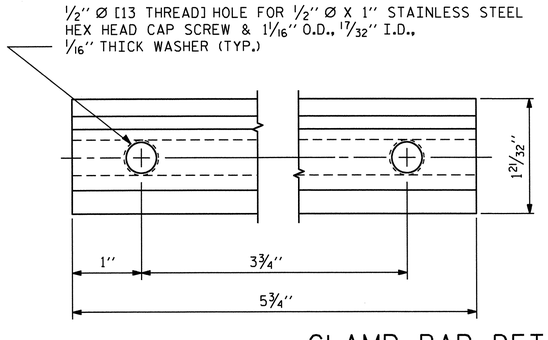
REAR PLATE

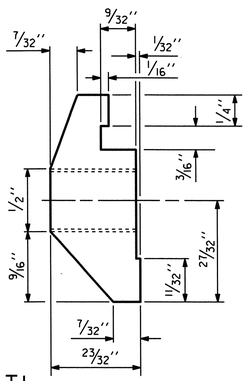
SHIM DETAILS

NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



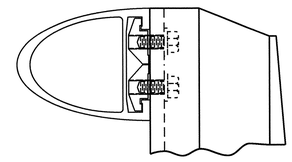
RAIL SECTION



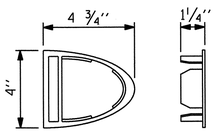


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4647
TYRRELL COUNTY
STATION: 26+90.00 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : J.L. WALTON	DATE : 7-17-09	
CHECKED BY : B.N. GRADY	DATE : 2/21/11	
DRAWN BY : EEM 6/94	REV. 2/6/97	EEM/RGW
CHECKED BY : RGW 6/94	REV. 8/16/99	MAB/LES
	REV. 5/1/06R	KMM/GM

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

STD. NO. BMR4

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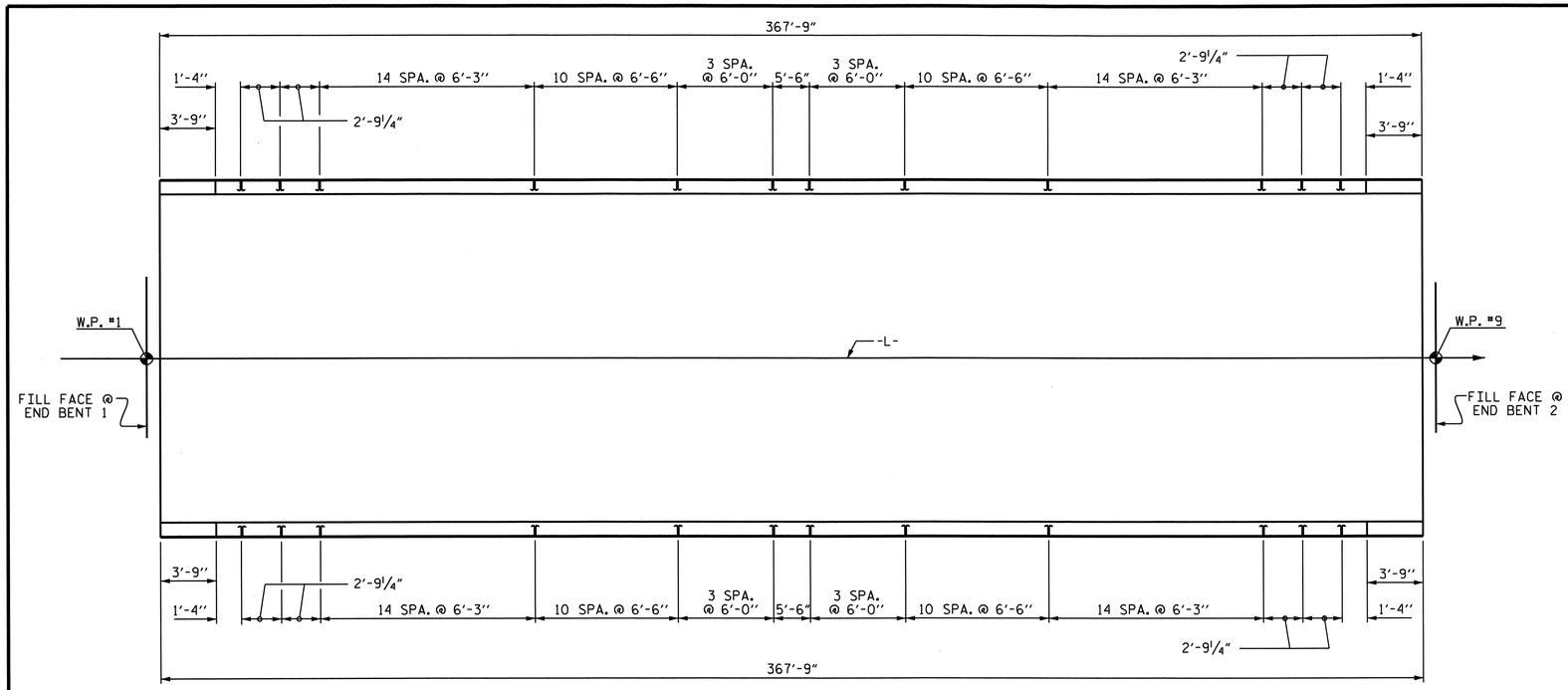
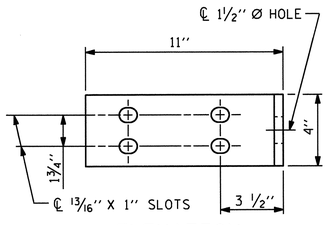
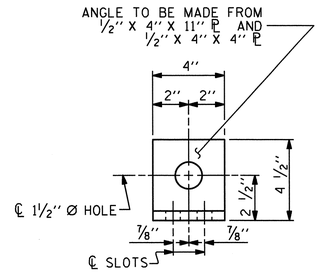


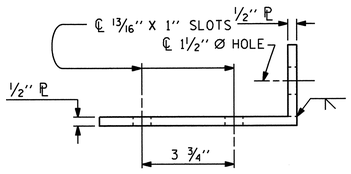
PLAN OF RAIL POST SPACINGS



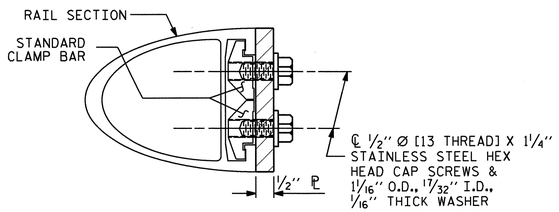
ELEVATION



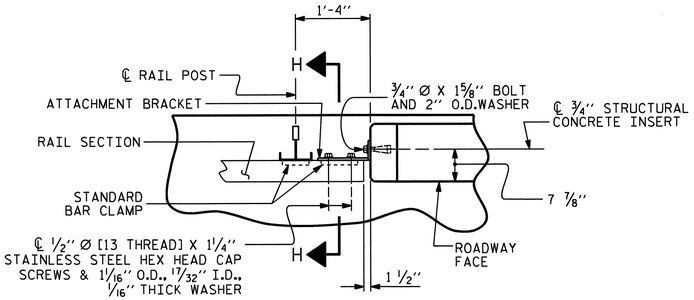
END VIEW (FIX AND EXP.)



TOP VIEW



SECTION H-H (FIX)



PLAN - RAIL AND END POST

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

NOTES

METAL RAIL TO END POST CONNECTION

THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).

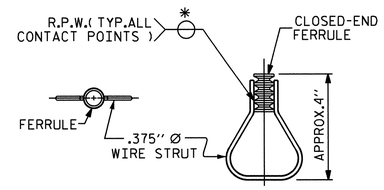
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS
FOR ONE OR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			30

STD. NO. BMR2

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

ASSEMBLED BY : J.L. WALTON		DATE : 7-17-09	
CHECKED BY : B.N. GRADY		DATE : 2/21/11	
DRAWN BY : FCJ 1/88	REV. 10/17/00	LES/RDR	
CHECKED BY : CRK 3/89	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06	TLA/GM	

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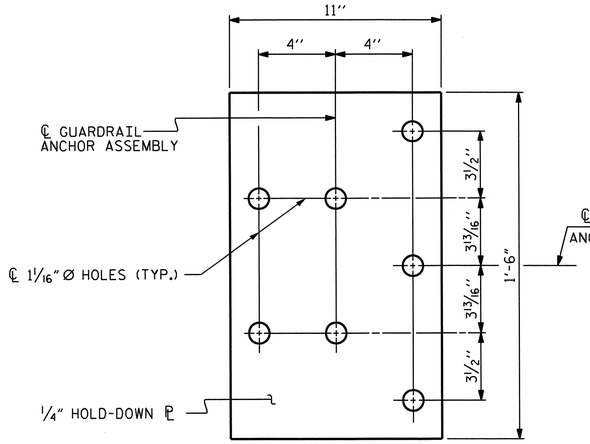
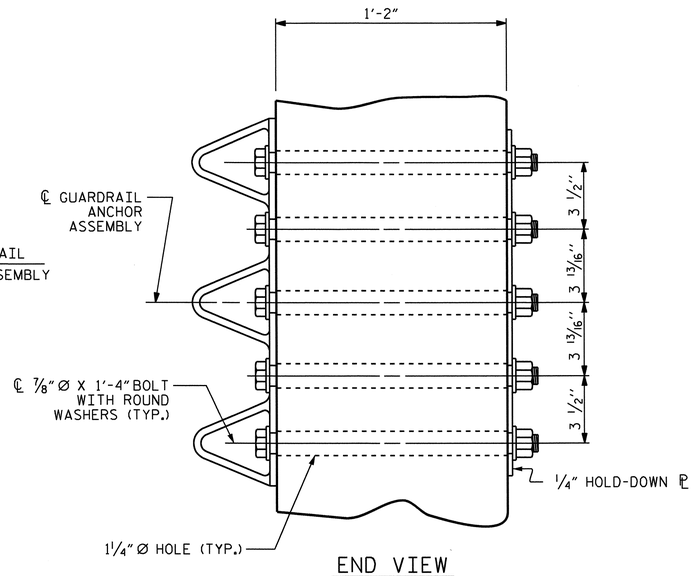
bngrady



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

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.

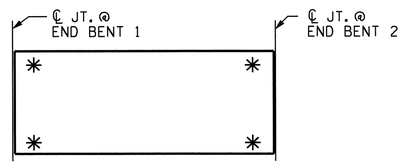
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

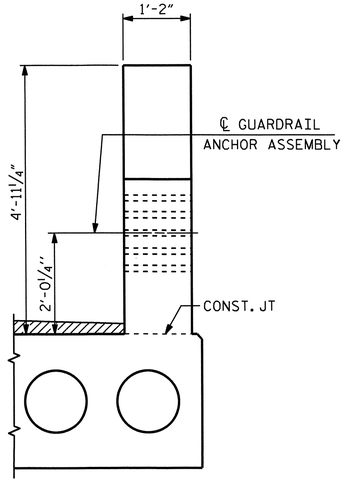
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.

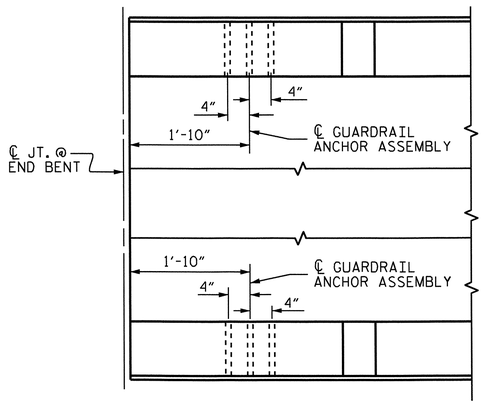


SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY : J.L. WALTON	DATE : 7/17/09
CHECKED BY : B.N. GRADY	DATE : 2/21/11
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	

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NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

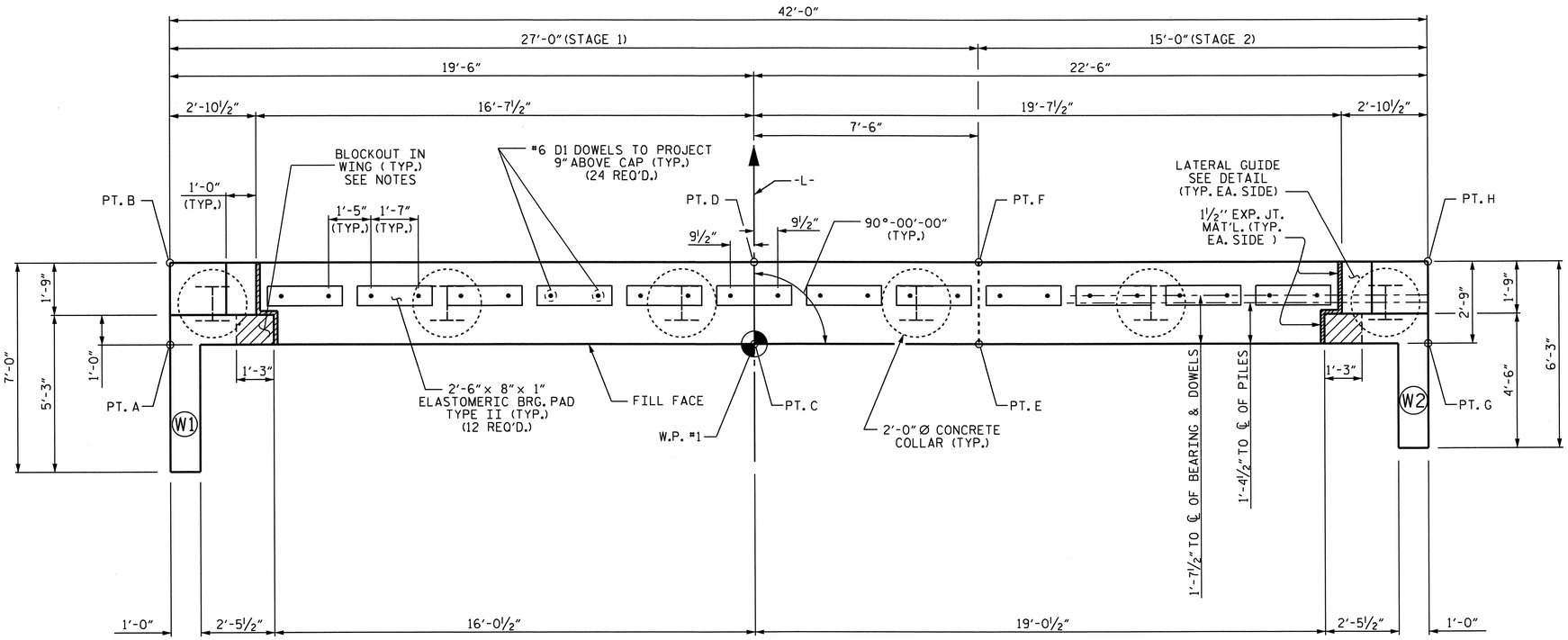
PROJECT NO. B-4647
TYRRELL COUNTY
STATION: 26+90.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			30

(SHT 4) STD. NO. GRA3



PLAN

NOTES

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

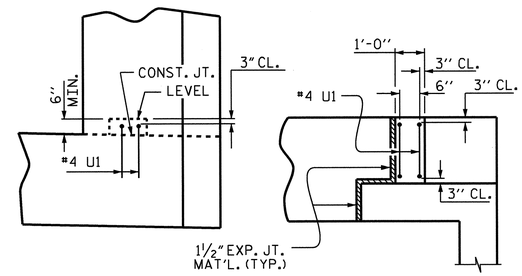
THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

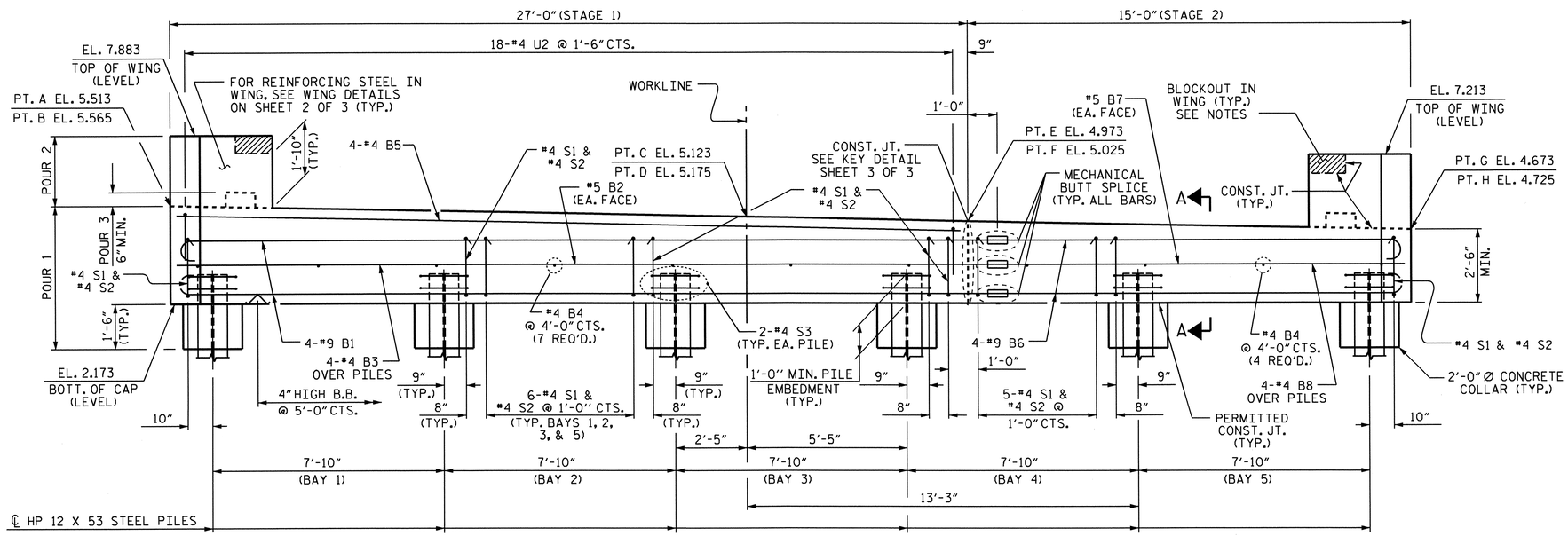
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

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

FOR MECHANICAL BUTT SPLICES, SEE SECTION 1070-9 OF THE STANDARD SPECIFICATIONS.



ELEVATION PLAN



ELEVATION

LATERAL GUIDE

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

DRAWN BY : J.L. WALTON DATE : 1-8-10
CHECKED BY : B.N. GRADY DATE : 2-8-10

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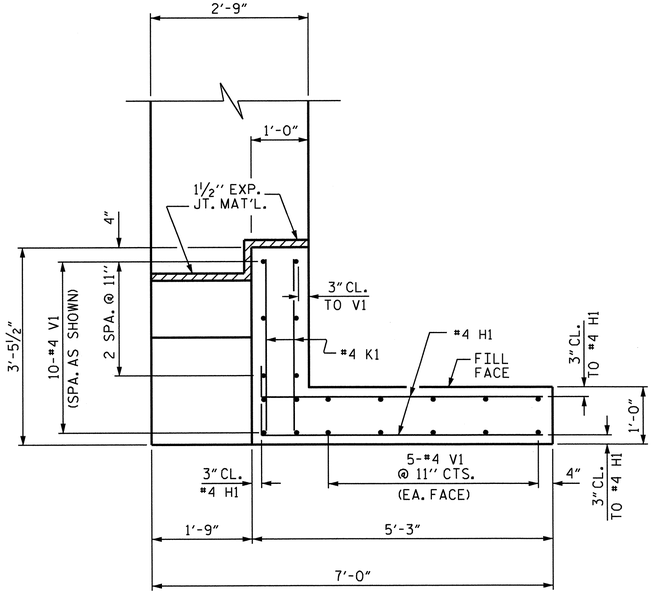
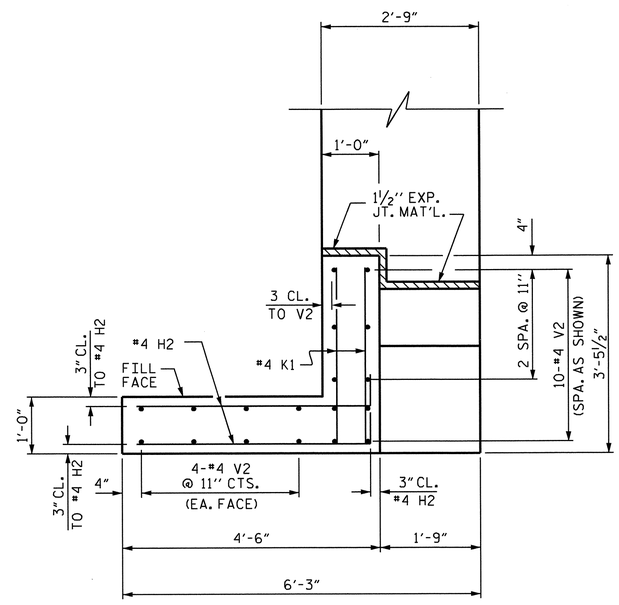


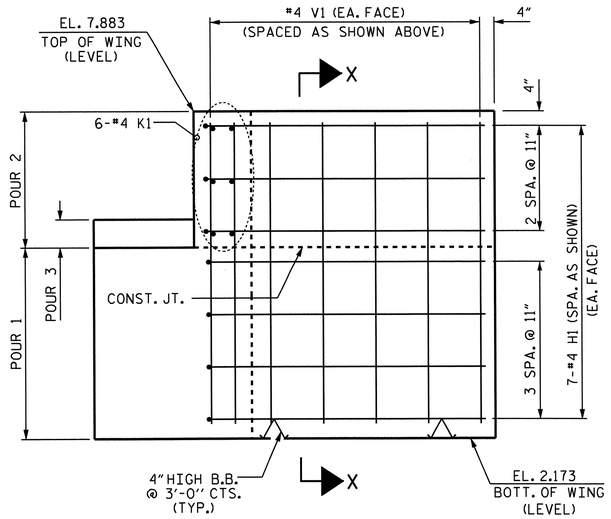
PLAN OF WING - W1

(STAGE 1)



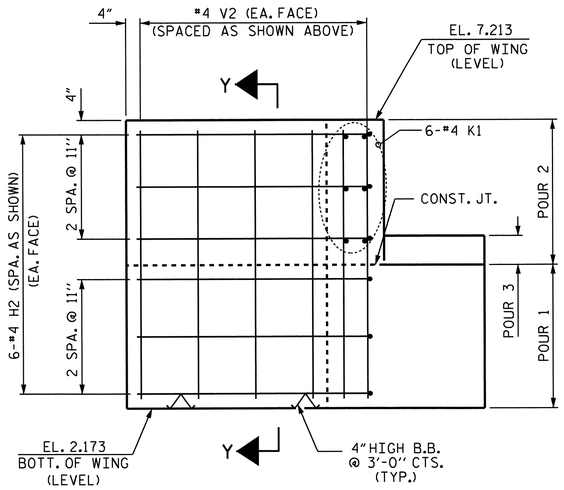
PLAN OF WING - W2

(STAGE 2)



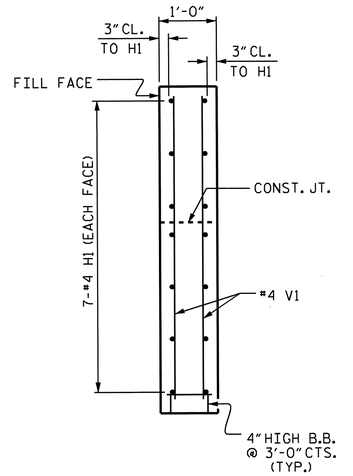
ELEVATION OF WING - W1

(STAGE 1)

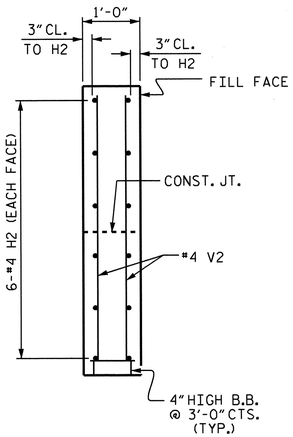


ELEVATION OF WING - W2

(STAGE 2)



SECTION X-X



SECTION Y-Y

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DAVID R. CALHOUN

11-3-11

DRAWN BY : J. L. WALTON DATE : 1/21/10
CHECKED BY : B. N. GRADY DATE : 2/9/10

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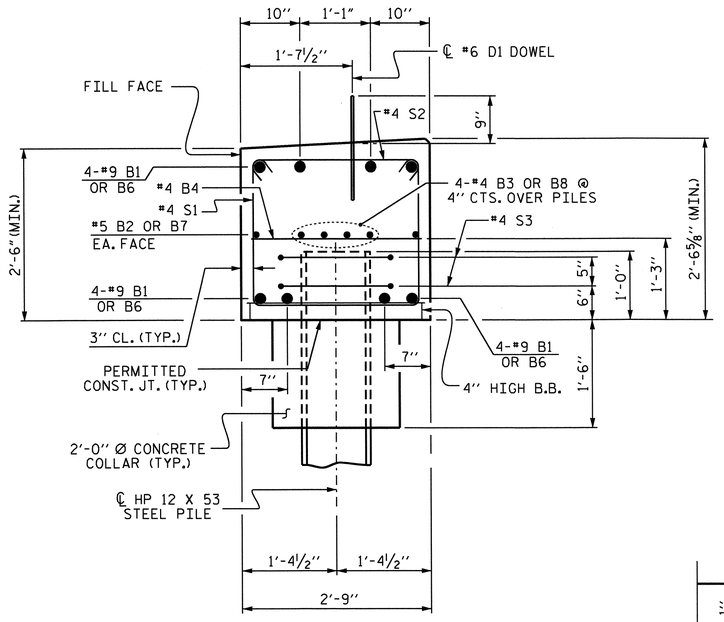
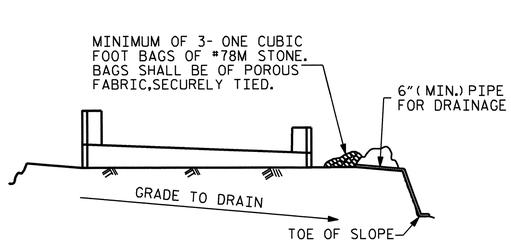


SECTION A-A



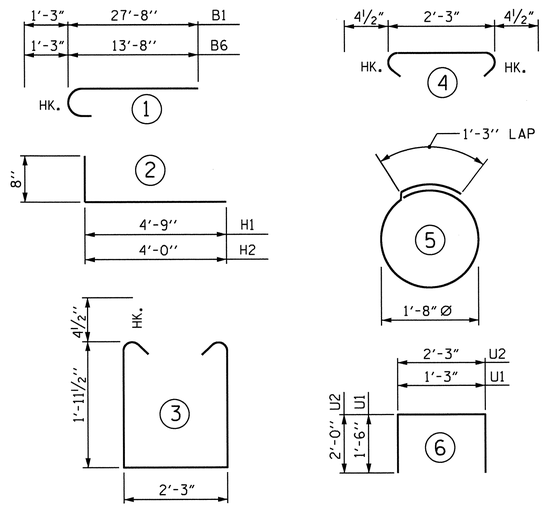
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

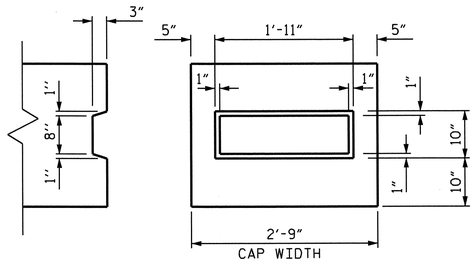
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

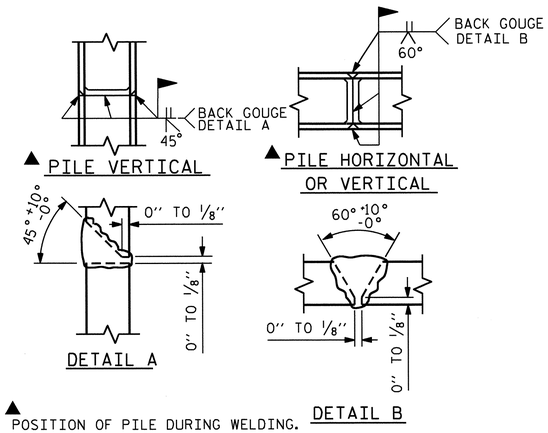
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



KEY DETAIL



▲ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

END BENT 1 (STAGE 1)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B1	8	#9	1	28'-11"	787
✱B2	2	#5	STR	27'-9"	58
✱B3	4	#4	STR	27'-9"	74
✱B4	7	#4	STR	2'-3"	11
✱B5	4	#4	STR	26'-6"	71
✱D1	16	#6	STR	1'-6"	36
✱H1	14	#4	2	5'-5"	51
✱K1	6	#4	STR	2'-11"	12
✱S1	27	#4	3	6'-11"	125
✱S2	27	#4	4	3'-0"	54
✱S3	8	#4	5	6'-6"	35
✱U1	2	#4	6	4'-3"	6
✱U2	18	#4	6	6'-3"	75
✱V1	20	#4	STR	5'-2"	69

✱EPOXY COATED REINFORCING STEEL LBS 1464

CLASS AA CONCRETE BREAKDOWN

POUR 1 (CAP, CONCRETE COLLARS & LOWER PART OF WING)	C.Y.	9.7
POUR 2 (UPPER PART OF WING)	C.Y.	0.7
POUR 3 (LATERAL GUIDE)	C.Y.	0.1
TOTAL	C.Y.	10.5

HP 12 X 53 STEEL PILES :
NO.: 4 LIN. FT.: 300

PILE REDRIVES NO. 4

END BENT 1 (STAGE 2)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B4	4	#4	STR	2'-3"	6
✱B6	8	#9	1	14'-11"	406
✱B7	2	#5	STR	13'-9"	29
✱B8	4	#4	STR	13'-9"	37
✱D1	8	#6	STR	1'-6"	18
✱H2	12	#4	2	4'-8"	37
✱K1	6	#4	STR	2'-11"	12
✱S1	15	#4	3	6'-11"	69
✱S2	15	#4	4	3'-0"	30
✱S3	4	#4	5	6'-6"	17
✱U1	2	#4	6	4'-3"	6
✱V2	18	#4	STR	4'-6"	54

✱EPOXY COATED REINFORCING STEEL LBS 721

CLASS AA CONCRETE BREAKDOWN

POUR 1 (CAP, CONCRETE COLLARS & LOWER PART OF WING)	C.Y.	4.8
POUR 2 (UPPER PART OF WING)	C.Y.	0.7
POUR 3 (LATERAL GUIDE)	C.Y.	0.1
TOTAL	C.Y.	5.6

HP 12 X 53 STEEL PILES :
NO.: 2 LIN. FT.: 150

PILE REDRIVES NO. 2

TOTAL BILL OF MATERIAL

✱EPOXY COATED REINFORCING STEEL		LBS.	2185
CLASS AA CONCRETE		C.Y.	16.1
12 X 53 STEEL PILES	No.: 6	LIN. FT.	450
PILE REDRIVES		NO.:	6

PROJECT NO. B-4647
TYRRELL COUNTY
STATION: 26+90.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J. L. WALTON DATE : 1/21/10
CHECKED BY : B. N. GRADY DATE : 2/9/10

03-NOV-2011 11:18
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bngrady

NOTES

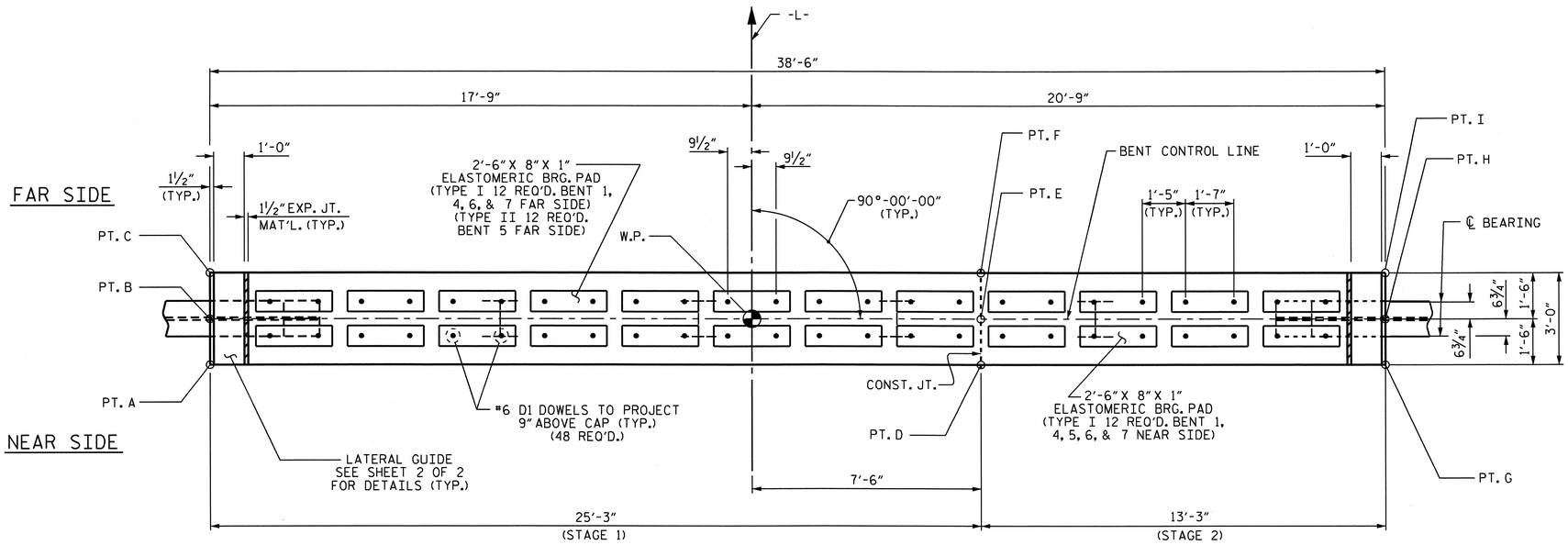
STIRRUPS IN CAP MY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

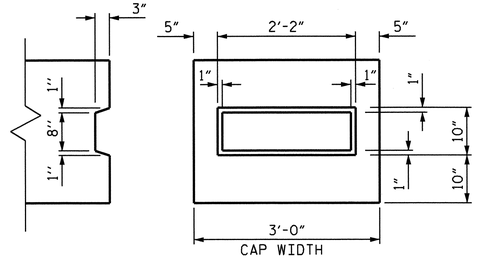
THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

METALLIZE THE TOP 29 FEET OF EACH INTERIOR BENT PILE. FOR THERMAL SPRAYED COATINGS (METALLIZTION), SEE SPECIAL PROVISIONS.

FOR MECHANICAL BUTT SPLICES, SEE SECTION 1070-9 OF THE STANDARD SPECIFICATIONS.

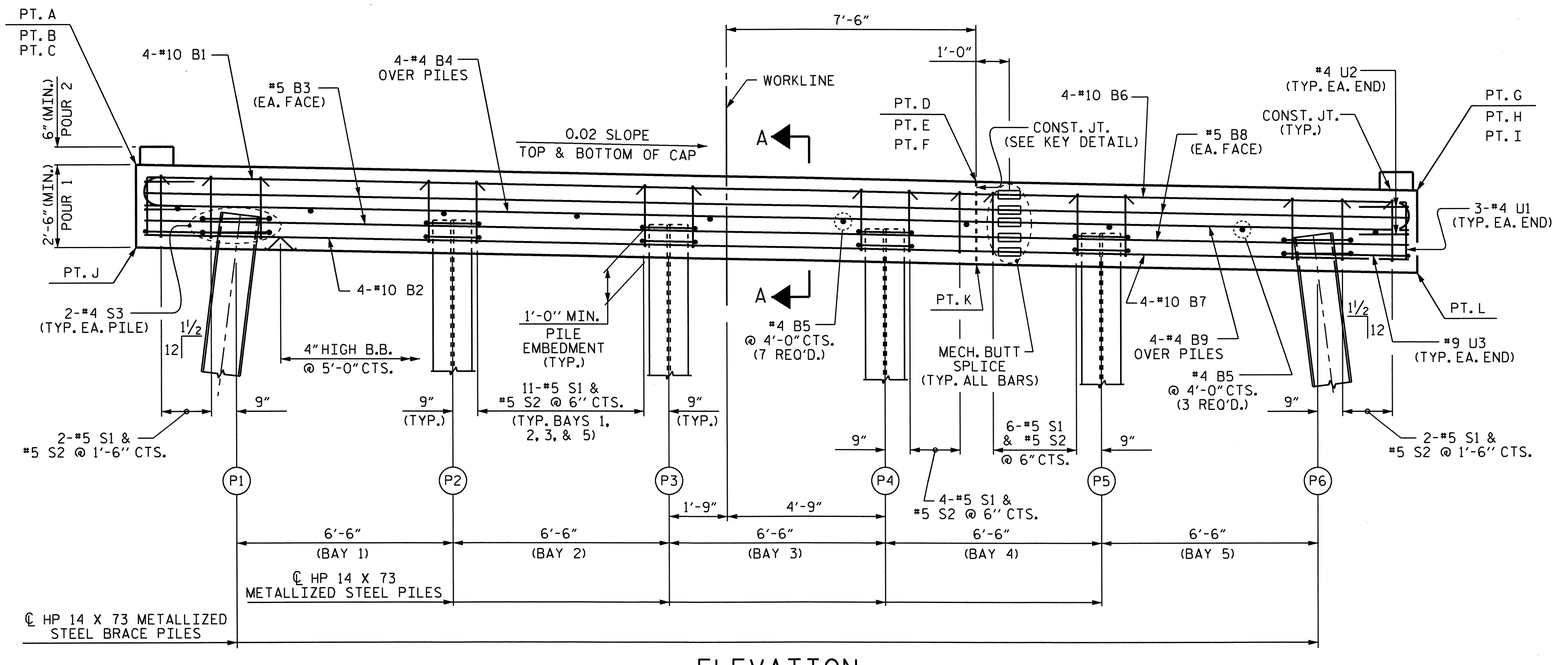


PLAN



KEY DETAIL

(STAGE 1)



ELEVATION

TOP OF PILE ELEVATIONS					
	BENT 1	BENT 4	BENT 5	BENT 6	BENT 7
①	4.358	5.156	5.223	5.188	5.053
②	4.228	5.026	5.093	5.058	4.923
③	4.098	4.896	4.963	4.928	4.793
④	3.968	4.766	4.833	4.798	4.663
⑤	3.838	4.636	4.703	4.668	4.533
⑥	3.708	4.506	4.573	4.538	4.403

CAP ELEVATIONS													
W.P.	BENT NO.	PT.A	PT.B	PT.C	PT.D	PT.E	PT.F	PT.G	PT.H	PT.I	PT.J	PT.K	PT.L
2	1	5.906	5.906	5.938	5.401	5.401	5.433	5.136	5.136	5.168	3.406	2.901	2.636
5	4	6.704	6.704	6.725	6.199	6.199	6.220	5.934	5.934	5.955	4.204	3.699	3.434
6	5	6.787	6.771	6.787	6.282	6.266	6.282	6.017	6.001	6.017	4.271	3.766	3.501
7	6	6.757	6.736	6.736	6.252	6.231	6.231	5.987	5.966	5.966	4.236	3.731	3.466
8	7	6.622	6.601	6.601	6.117	6.096	6.096	5.852	5.831	5.831	4.101	3.596	3.331

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS 1, 4, 5, 6, & 7

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

DRAWN BY : J. L. WALTON DATE : 2-9-10
CHECKED BY : B.N. GRADY DATE : 9/19/11

03-NOV-2011 11:18
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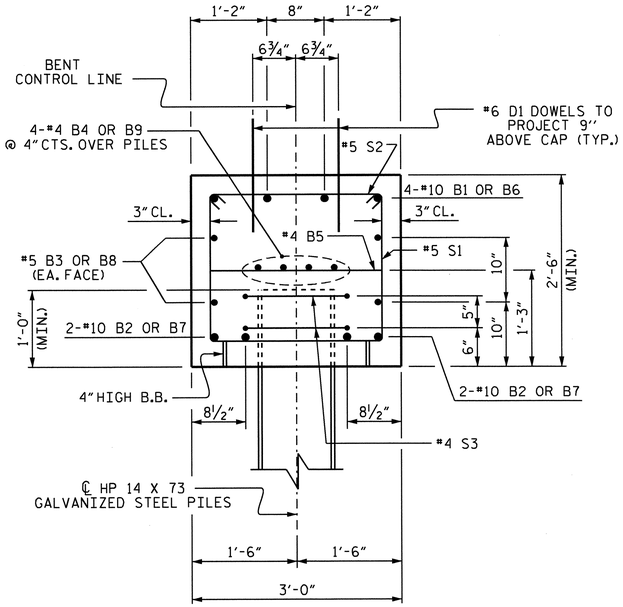
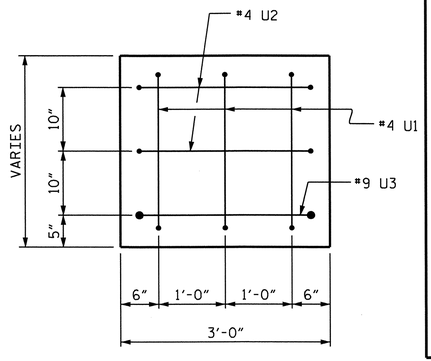
bngrady



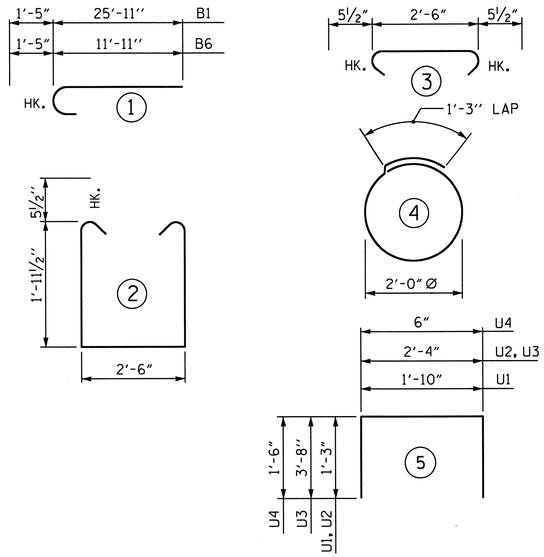
SECTION A-A



END VIEW

(BENT ENDS TYPICAL)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT (5 REQ'D.)

STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B1	4	#10	1	27'-4"	470
✱B2	4	#10	STR	26'-0"	448
✱B3	4	#5	STR	26'-0"	108
✱B4	4	#4	STR	26'-0"	69
✱B5	9	#4	STR	2'-6"	15
✱D1	32	#6	STR	1'-6"	72
✱S1	39	#5	2	7'-4"	298
✱S2	39	#5	3	3'-5"	139
✱S3	8	#4	4	7'-7"	41
✱U1	3	#4	5	4'-4"	9
✱U2	2	#4	5	4'-10"	6
✱U3	1	#9	5	9'-8"	32
✱U4	4	#4	5	3'-6"	9

✱EPOXY COATED REINFORCING STEEL 1716 LBS.

CLASS AA CONCRETE
POUR 1 (CAP) C.Y. 7.0
POUR 2 (LATERAL GUIDE) C.Y. 0.1
TOTAL C.Y. 7.1

HP 14 X 73 METALLIZED STEEL PILES

	NO.	LIN. FT.
BENT 1	4	340
BENT 4	4	360
BENT 5	4	360
BENT 6	4	380
BENT 7	4	340

PILE REDRIVES : BENT 1 NO. : 4; BENT 4 NO. : 4; BENT 5 NO. : 4; BENT 6 NO. : 4; BENT 7 NO. : 4

STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B5	5	#4	STR	2'-6"	8
✱B6	4	#10	1	13'-4"	229
✱B7	4	#10	STR	12'-0"	207
✱B8	4	#5	STR	12'-0"	50
✱B9	4	#4	STR	12'-0"	32
✱D1	16	#6	STR	1'-6"	36
✱S1	19	#5	2	7'-4"	145
✱S2	19	#5	3	3'-5"	68
✱S3	4	#4	4	7'-7"	20
✱U1	3	#4	5	4'-4"	9
✱U2	2	#4	5	4'-10"	6
✱U3	1	#9	5	9'-8"	32
✱U4	4	#4	5	3'-6"	9

✱EPOXY COATED REINFORCING STEEL 851 LBS.

CLASS A CONCRETE
POUR 1 (CAP) C.Y. 3.7
POUR 2 (LATERAL GUIDE) C.Y. 0.1
TOTAL C.Y. 3.8

HP 14 X 73 METALLIZED STEEL PILES

	NO.	LIN. FT.
BENT 1	2	170
BENT 4	2	180
BENT 5	2	180
BENT 6	2	190
BENT 7	2	170

PILE REDRIVES : BENT 1 NO. : 2; BENT 4 NO. : 2; BENT 5 NO. : 2; BENT 6 NO. : 2; BENT 7 NO. : 2

TOTAL BILL OF MATERIAL

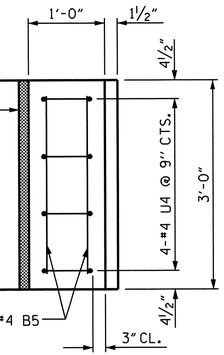
✱EPOXY COATED REINFORCING STEEL 2567 LBS.

CLASS AA CONCRETE C.Y. 10.9

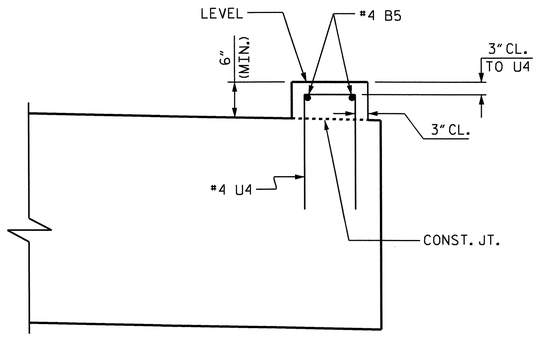
HP 14 X 73 METALLIZED STEEL PILES

	NO.	LIN. FT.
BENT 1	6	510
BENT 4	6	540
BENT 5	6	540
BENT 6	6	570
BENT 7	6	510

PILE REDRIVES : BENT 1 NO. : 6; BENT 4 NO. : 6; BENT 5 NO. : 6; BENT 6 NO. : 6; BENT 7 NO. : 6



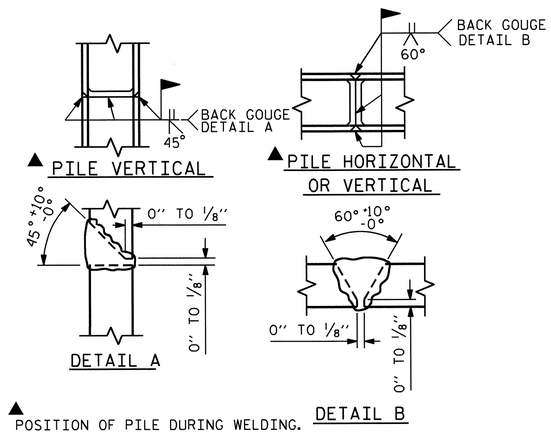
PLAN



ELEVATION

LATERAL GUIDE REINFORCING DETAIL

(RIGHT END OF THE CAP SHOWN, LEFT END SIMILAR)



▲ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENTS 1, 4, 5, 6, & 7

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALLISON
11-3-11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.L. WALTON DATE : 2-9-10
CHECKED BY : B.N. GRADY DATE : 9/19/11

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NOTES

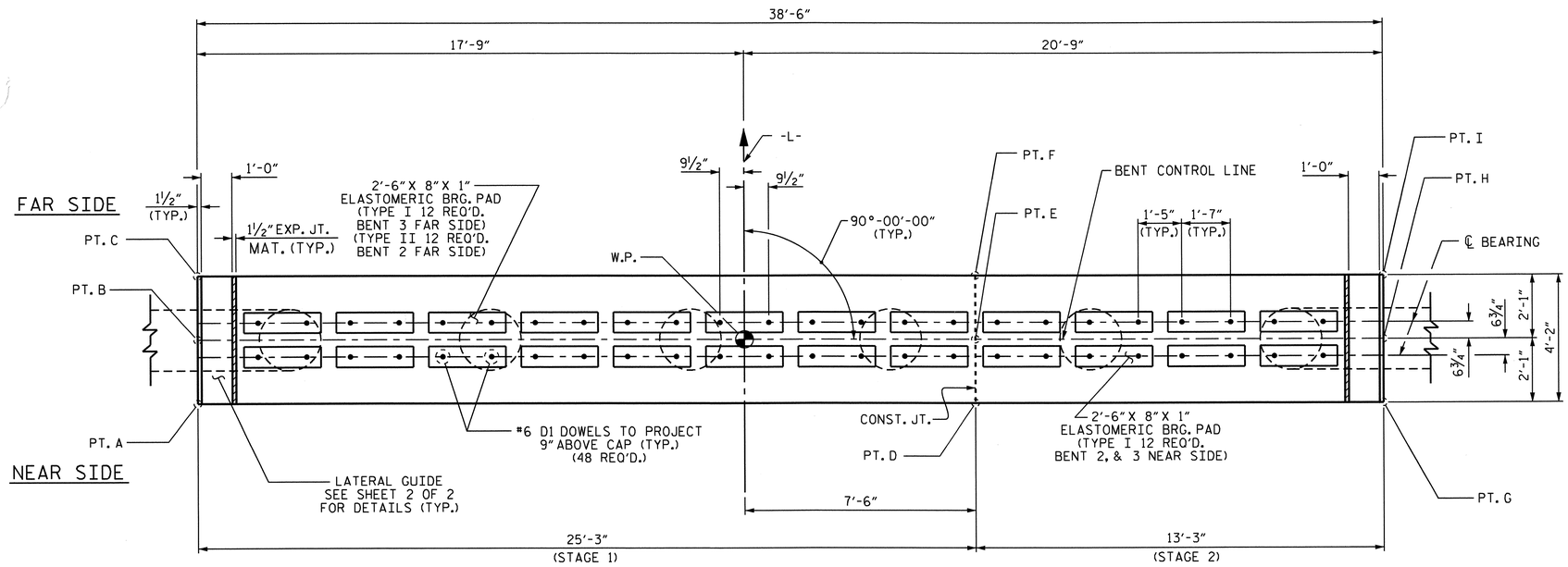
STIRRUPS IN CAP MY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

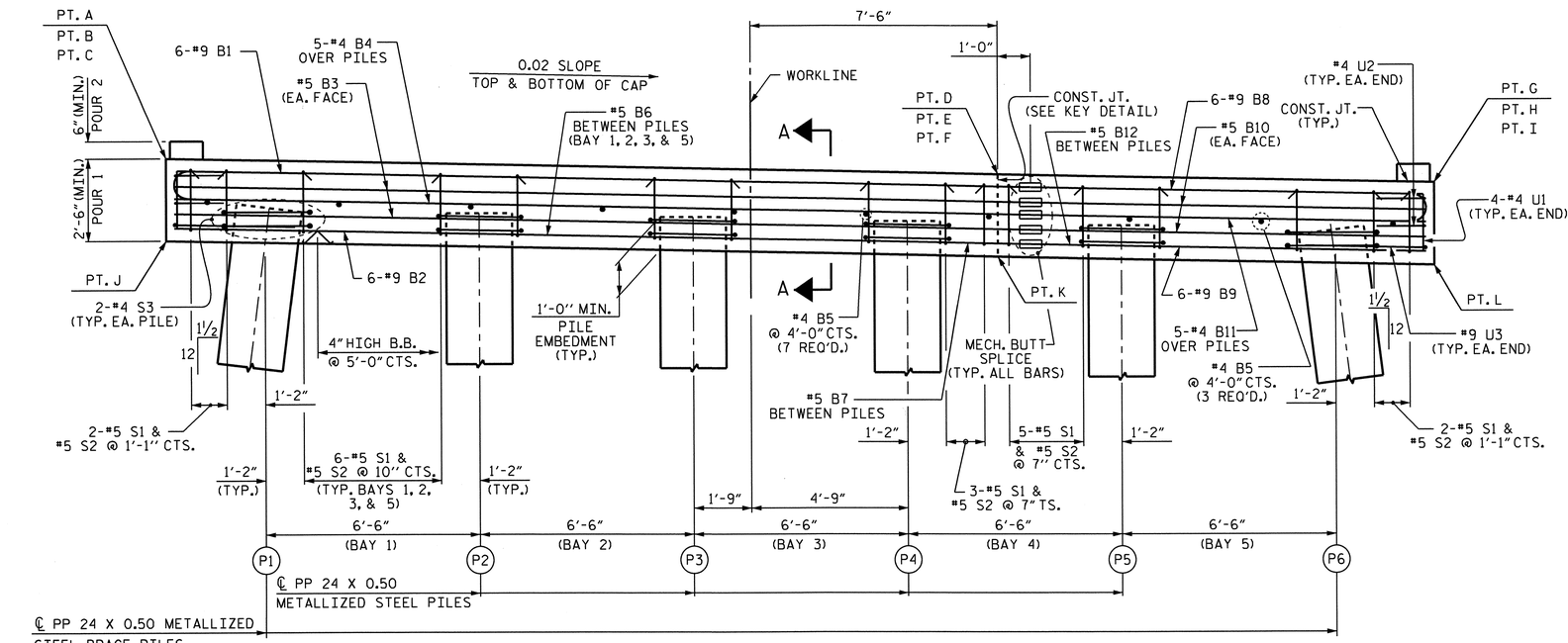
THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

METALLIZE THE TOP 36 FEET OF EACH INTERIOR BENT PILE, FOR THERMAL SPRAYED COATINGS (METALLIZTION), SEE SPECIAL PROVISIONS.

FOR MECHANICAL BUTT SPLICES, SEE SECTION 1070-9 OF THE STANDARD SPECIFICATIONS.

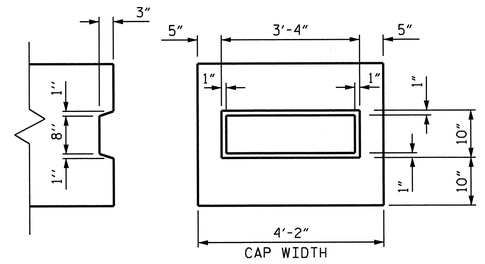


PLAN



ELEVATION

CAP ELEVATIONS													
W.P.	BENT NO.	PT.A	PT.B	PT.C	PT.D	PT.E	PT.F	PT.G	PT.H	PT.I	PT.J	PT.K	PT.L
3	2	6.267	6.267	6.304	5.762	5.762	5.799	5.497	5.497	5.534	3.767	3.262	2.997
4	3	6.537	6.537	6.568	6.032	6.032	6.063	5.767	5.767	5.798	4.037	3.532	3.267



KEY DETAIL

(STAGE 1)

TOP OF PILE ELEVATIONS		
	BENT 2	BENT 3
①	4.727	4.997
②	4.597	4.867
③	4.467	4.737
④	4.337	4.607
⑤	4.207	4.477
⑥	4.077	4.347

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2 & 3

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
(1-3-11)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J. L. WALTON DATE : 2-9-10
CHECKED BY : B.N. GRADY DATE : 9/19/11

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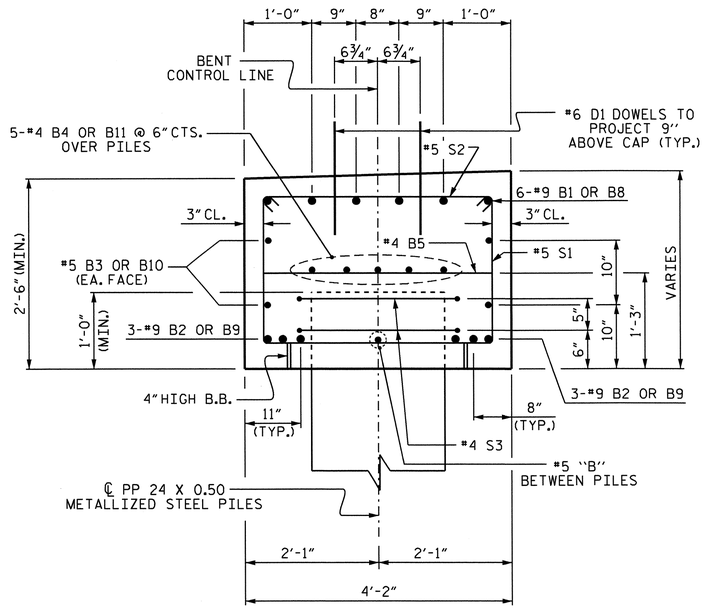
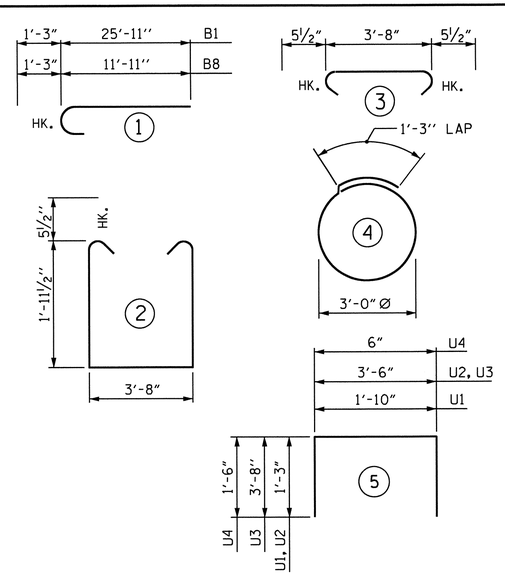


SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL FOR ONE BENT (2 REQ'D.)

STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B1	6	#9	1	27'-2"	554
✱B2	6	#9	STR	26'-0"	530
✱B3	4	#5	STR	26'-0"	108
✱B4	5	#4	STR	26'-0"	87
✱B5	9	#4	STR	3'-8"	22
✱B6	3	#5	STR	4'-0"	13
✱B7	1	#5	STR	2'-6"	3
✱D1	32	#6	STR	1'-6''	72
✱S1	23	#5	2	8'-6''	204
✱S2	23	#5	3	4'-7"	110
✱S3	8	#4	4	10'-8"	57
✱U1	4	#4	5	4'-4"	12
✱U2	2	#4	5	6'-0"	8
✱U3	1	#9	5	10'-10"	37
✱U4	4	#4	5	3'-6"	9

✱EPOXY COATED REINFORCING STEEL 1826 LBS.

CLASS AA CONCRETE
▲POUR 1 (CAP) C.Y. 9.3
POUR 2 (LATERAL GUIDE) C.Y. 0.1
▲TOTAL C.Y. 9.4

PP 24 X 0.50 METALLIZED STEEL PILES

	NO.	LIN. FT.
BENT 2	4	360
BENT 3	4	360

PILE REDRIVES : BENT 2 NO. : 4
BENT 3 NO. : 4

PIPE PILE PLATES : BENT 2 NO. : 4
BENT 3 NO. : 4

STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B5	5	#4	STR	3'-8"	12
✱B6	1	#5	STR	4'-0"	4
✱B8	6	#9	1	13'-2"	269
✱B9	6	#9	STR	12'-0''	245
✱B10	4	#5	STR	12'-0"	50
✱B11	5	#4	STR	12'-0"	40
✱B12	1	#5	STR	1'-6"	2
✱D1	16	#6	STR	1'-6''	36
✱S1	13	#5	2	8'-6"	115
✱S2	13	#5	3	4'-7"	62
✱S3	4	#4	4	10'-8"	29
✱U1	4	#4	5	4'-4"	12
✱U2	2	#4	5	6'-0"	8
✱U3	1	#9	5	10'-10"	37
✱U4	4	#4	5	3'-6"	9

✱EPOXY COATED REINFORCING STEEL 930 LBS.

CLASS AA CONCRETE
▲POUR 1 (CAP) C.Y. 4.9
POUR 2 (LATERAL GUIDE) C.Y. 0.1
▲TOTAL C.Y. 5.0

PP 24 X 0.50 METALLIZED STEEL PILES

	NO.	LIN. FT.
BENT 2	2	180
BENT 3	2	180

PILE REDRIVES : BENT 2 NO. : 2
BENT 3 NO. : 2

PIPE PILE PLATES : BENT 2 NO. : 2
BENT 3 NO. : 2

▲CONCRETE DISPLACED BY THE 24"STEEL PIPE PILES HAS BEEN DEDUCTED FROM THE CONCRETE TOTAL.

TOTAL BILL OF MATERIAL

✱EPOXY COATED REINFORCING STEEL 2756 LBS.

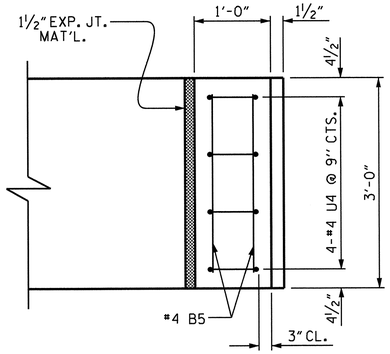
CLASS AA CONCRETE C.Y. 14.4

PP 24 X 0.50 METALLIZED STEEL PILES

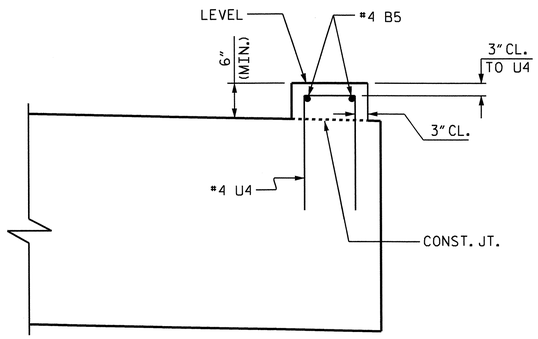
	NO.	LIN. FT.
BENT 2	6	540
BENT 3	6	540

PILE REDRIVES : BENT 2 NO. : 6
BENT 3 NO. : 6

PIPE PILE PLATES : BENT 2 NO. : 6
BENT 3 NO. : 6



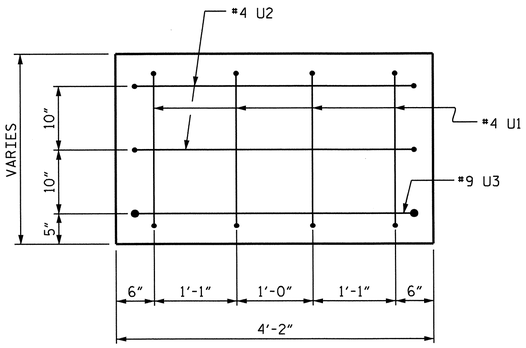
PLAN



ELEVATION

LATERAL GUIDE REINFORCING DETAIL

(RIGHT END OF THE CAP SHOWN, LEFT END SIMILAR)



END VIEW

(BOTH ENDS TYPICAL)

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

PROJECT NO. B-4647
TYRRELL COUNTY
STATION: 26+90.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 2 & 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			30

DRAWN BY : J.L. WALTON DATE : 2-9-10
CHECKED BY : B.N. GRADY DATE : 9/19/11

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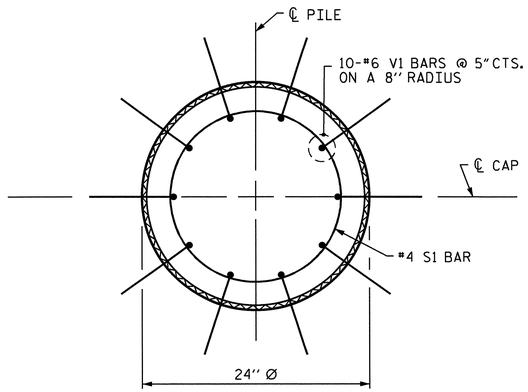

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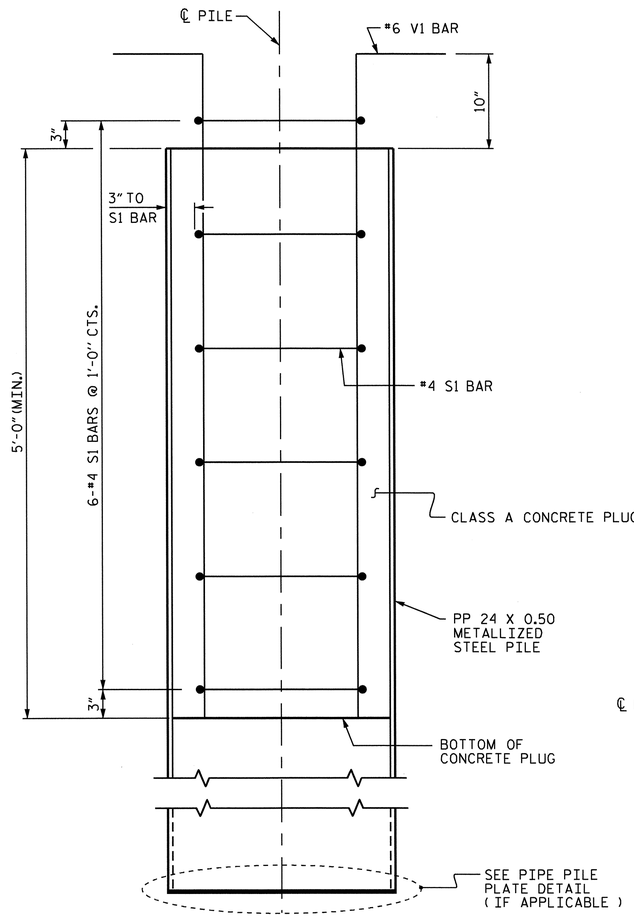
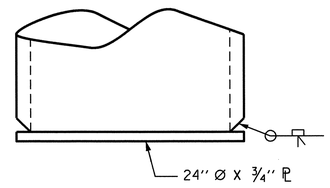


ELEVATION

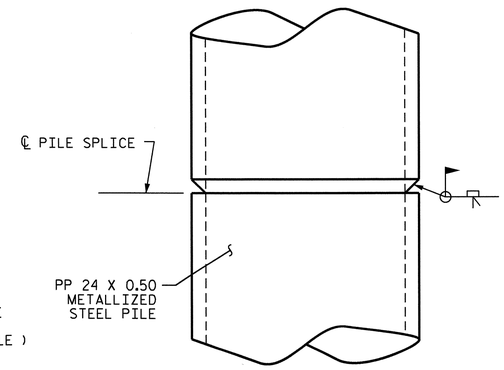
PP 24 X 0.50 METALLIZED STEEL PILE

(OPEN OR CLOSED END)



PIPE PILE PLATE DETAIL

(IF APPLICABLE)



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

APPLY AN 8 MIL THICK 1350 ALUMINUM (W-A1-1350) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO THE UPPER PORTION OF THE PILES FOR THE LENGTHS STATED ON THE BENT PLANS, IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZING OR METALLIZING PIPE PILE PLATES IS NOT REQUIRED.

PIPE PILE PLATES, IF REQUIRED, SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FOR OPEN END PIPE PILES, REMOVE ENOUGH SOIL AND WATER FROM INSIDE THE PILES TO CONSTRUCT THE CONCRETE PLUG WITHOUT FOULING THE CONCRETE.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

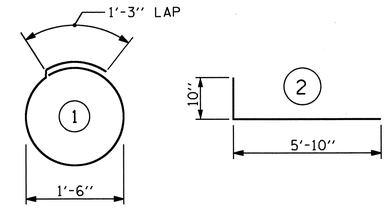
THE REINFORCING STEEL, CLASS A CONCRETE, AND METALLIZING ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 24 X 0.625 STEEL PILES.

AFTER DRIVING THE PILES APPLY 1 COAT EACH OF 1080-12 BROWN AND 1080-12 GRAY PAINT TO THE EMBEDDED SECTION OF THE METALLIZED PILE PRIOR TO CONCRETE EMBEDMENT IN ACCORDANCE WITH SECTION 442 OF THE STANDARD SPECIFICATIONS.

BILL OF MATERIAL FOR ONE PP 24 X 0.50 METALLIZED STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S1	6	#4	1	6'-0"	24
V1	10	#6	2	6'-8"	100
REINFORCING STEEL =				124	lbs
CLASS AA CONCRETE					
5'-0" MINIMUM PLUG					0.5 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

ASSEMBLED BY : J.L. WALTON		DATE : 2-16-10			
CHECKED BY : B.N. GRADY		DATE : 3-11-10			
DRAWN BY : TLA 8/05	ADDED 10/1/05				
CHECKED BY : GM 9/05	REV. 5/1/06R MAA/KMM				
	REV. 10/1/11 MAA/GM				

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NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER THOMAS L. ALLRAN
11-3-11

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 3 OF 3

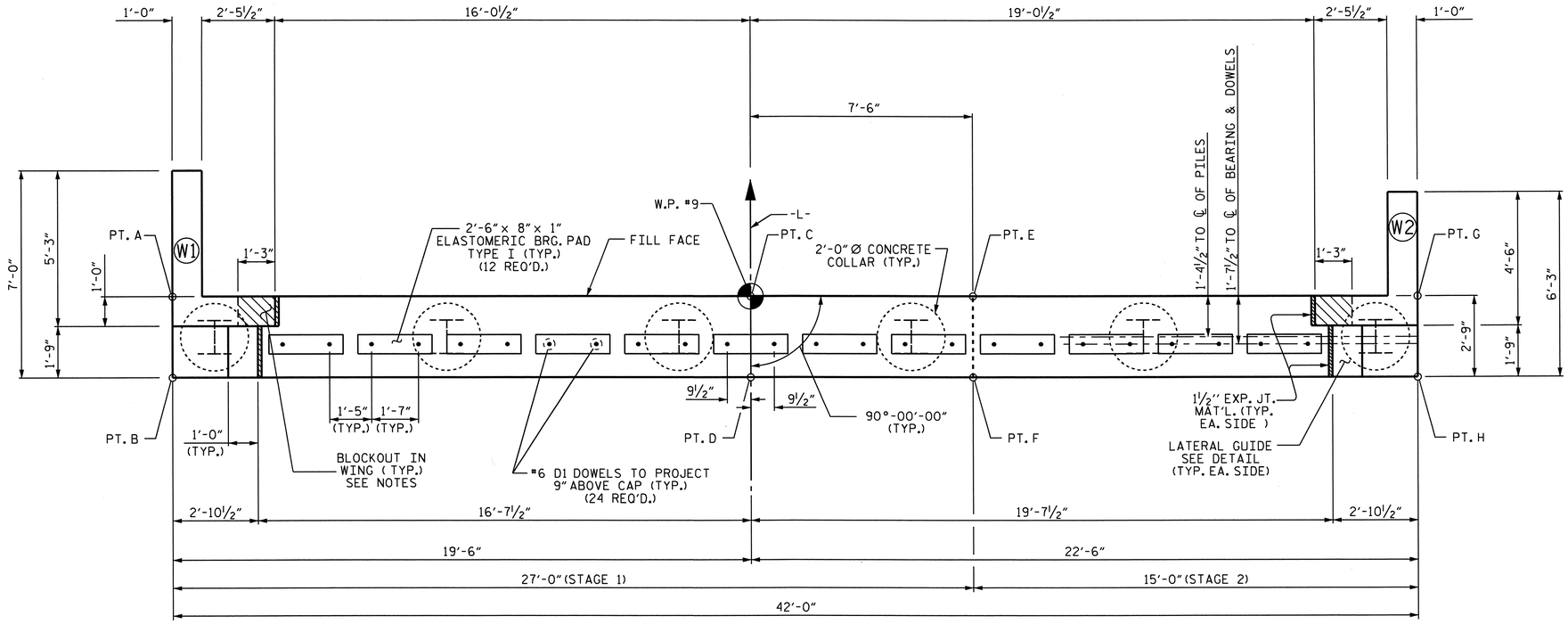
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

24" STEEL PIPE PILE BENT 2 & 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			30

STD. NO. SPP4



PLAN

NOTES

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

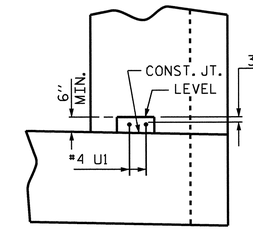
THE LATERAL GUIDE AT EACH END OF THE CAP IS NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

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

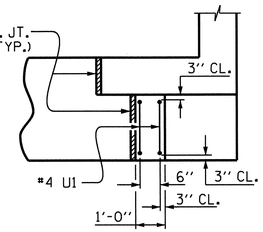
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

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

FOR MECHANICAL BUTT SPLICES, SEE SECTION 1070-9 OF THE STANDARD SPECIFICATIONS.



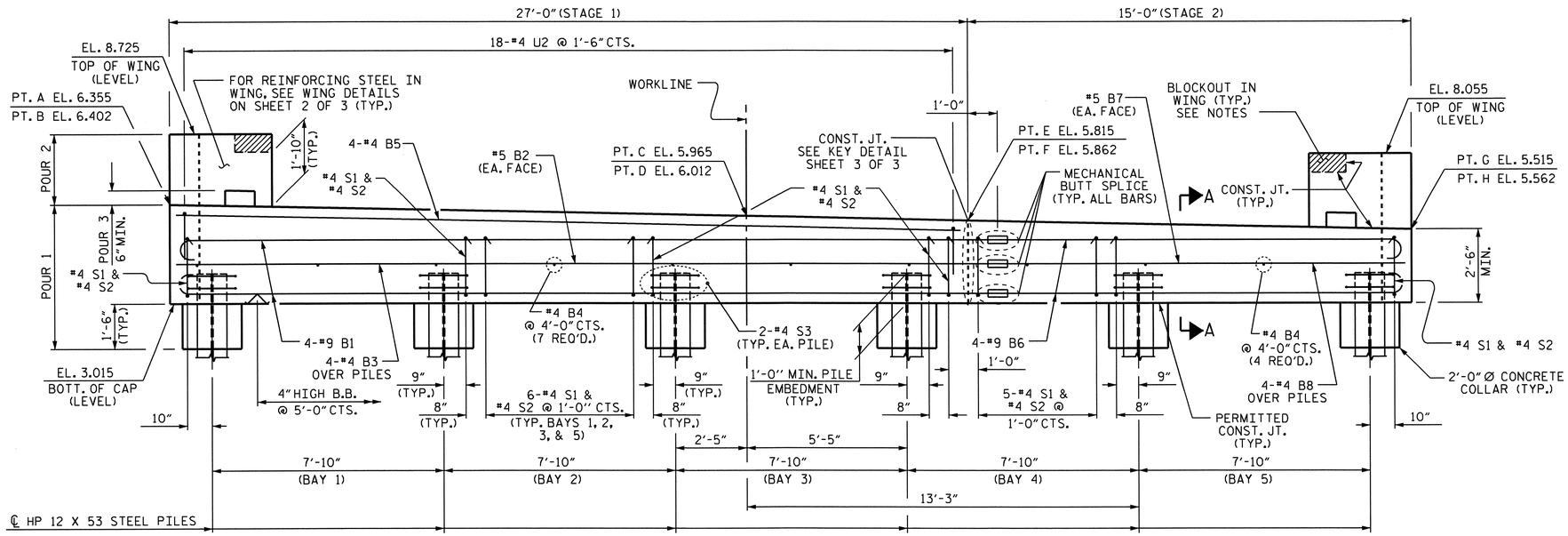
ELEVATION



PLAN

LATERAL GUIDE

(RIGHT SIDE SHOWN, LEFT SIDE SIMILAR)



ELEVATION

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALLEN

11-3-11

DRAWN BY : J. L. WALTON DATE : 1-8-10
CHECKED BY : B.N. GRADY DATE : 2-8-10

03-NOV-2011 11:17
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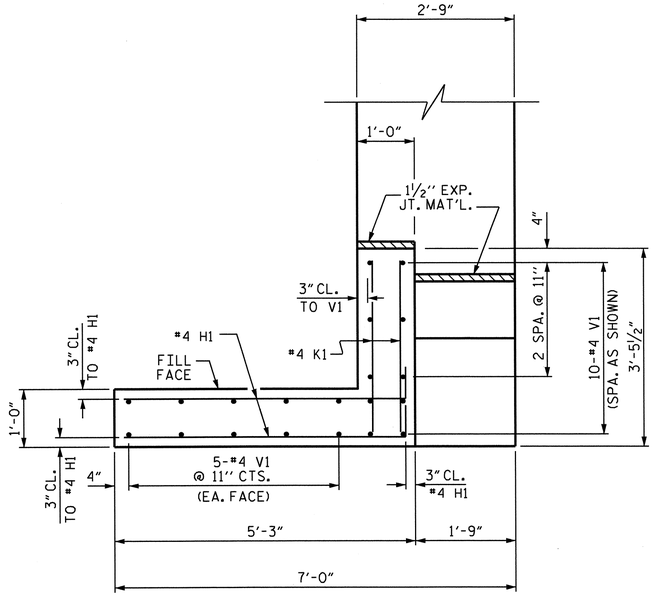
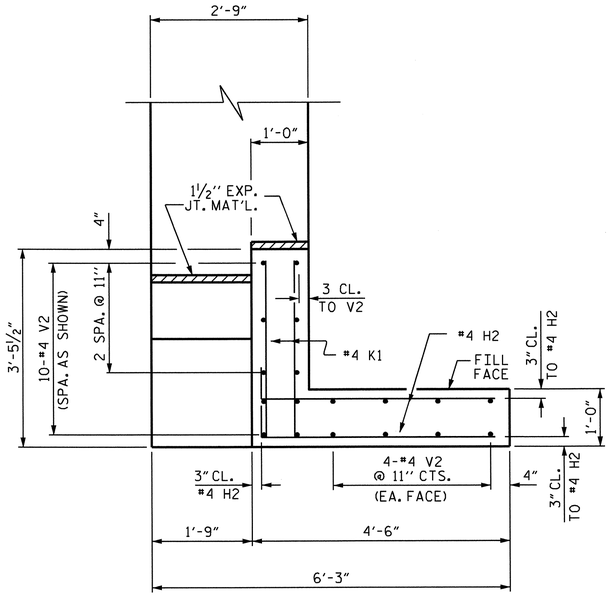


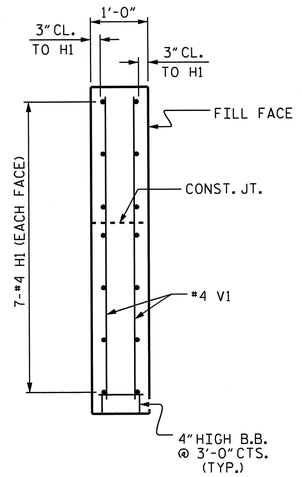
PLAN OF WING - W1

(STAGE 1)

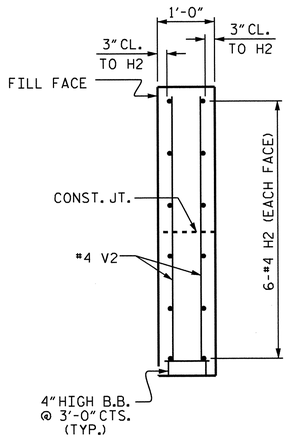


PLAN OF WING - W2

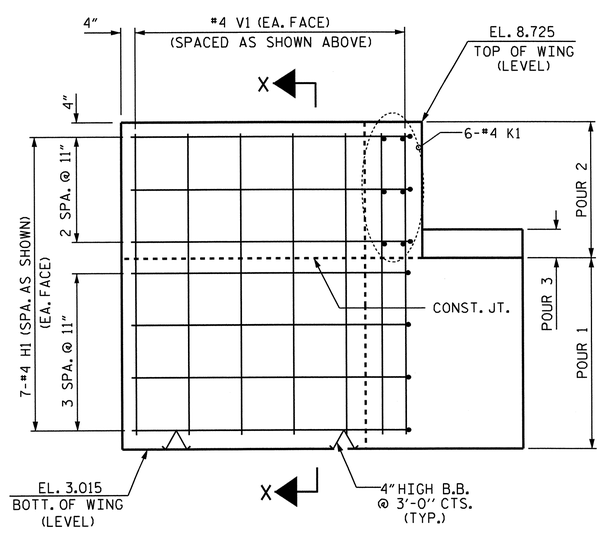
(STAGE 2)



SECTION X-X

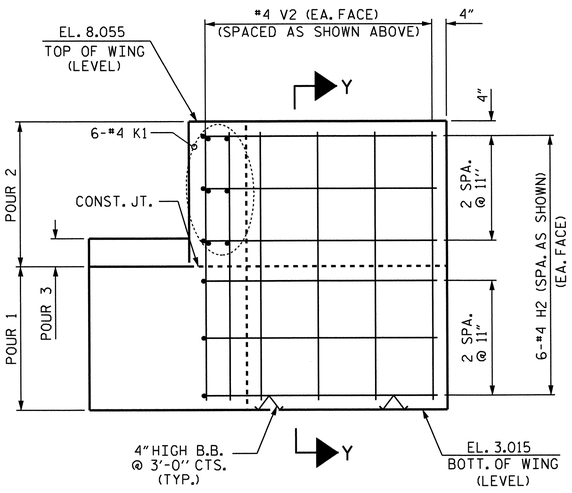


SECTION Y-Y



ELEVATION OF WING - W1

(STAGE 1)



ELEVATION OF WING - W2

(STAGE 2)

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN

11-3-11

DRAWN BY : J. L. WALTON DATE : 1/21/10
CHECKED BY : B. N. GRADY DATE : 2/9/10

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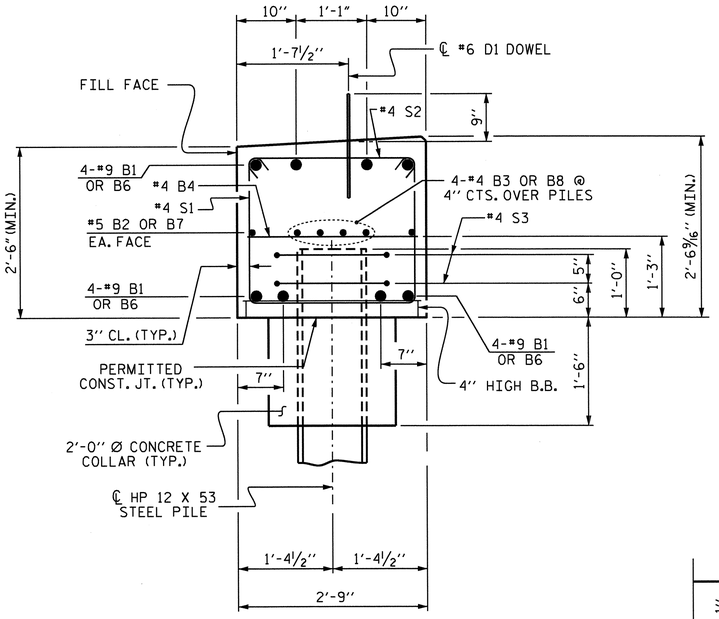
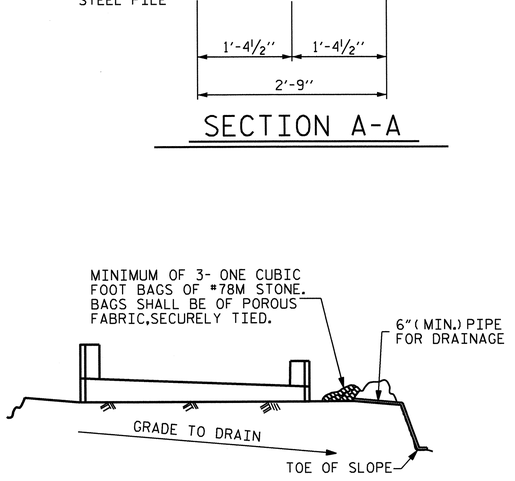


SECTION A-A

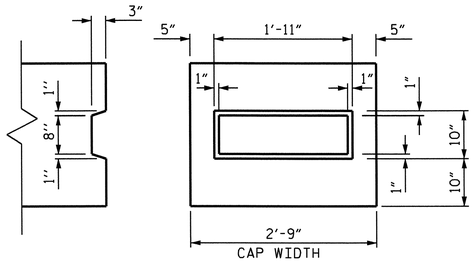


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

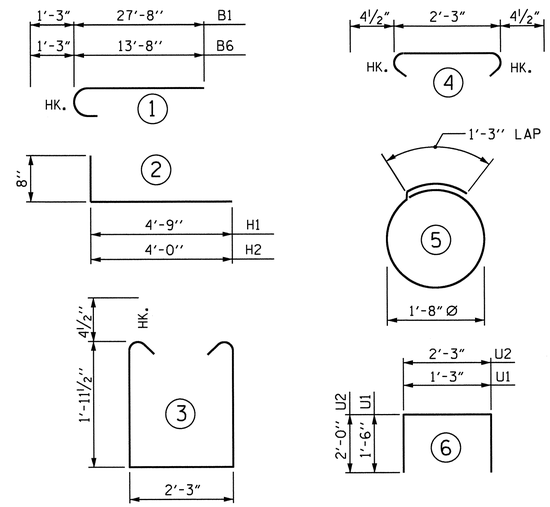
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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



KEY DETAIL



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2 (STAGE 1)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B1	8	#9	1	28'-11''	787
✱B2	2	#5	STR	27'-9''	58
✱B3	4	#4	STR	27'-9''	74
✱B4	7	#4	STR	2'-3''	11
✱B5	4	#4	STR	26'-6''	71
✱D1	16	#6	STR	1'-6''	36
✱H1	14	#4	2	5'-5''	51
✱K1	6	#4	STR	2'-11''	12
✱S1	27	#4	3	6'-11''	125
✱S2	27	#4	4	3'-0''	54
✱S3	8	#4	5	6'-6''	35
✱U1	2	#4	6	4'-3''	6
✱U2	18	#4	6	6'-3''	75
✱V1	20	#4	STR	5'-2''	69
✱EPOXY COATED REINFORCING STEEL				LBS	1464

CLASS AA CONCRETE BREAKDOWN

POUR 1 (CAP, CONCRETE COLLARS & LOWER PART OF WING)	C.Y.	9.7
POUR 2 (UPPER PART OF WING)	C.Y.	0.7
POUR 3 (LATERAL GUIDE)	C.Y.	0.1
TOTAL	C.Y.	10.5

HP 12 X 53 STEEL PILES :
NO.: 4 LIN. FT.: 320

PILE REDRIVES NO. 4

END BENT 2 (STAGE 2)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B4	4	#4	STR	2'-3''	6
✱B6	8	#9	1	14'-11''	406
✱B7	2	#5	STR	13'-9''	29
✱B8	4	#4	STR	13'-9''	37
✱D1	8	#6	STR	1'-6''	18
✱H2	12	#4	2	4'-8''	37
✱K1	6	#4	STR	2'-11''	12
✱S1	15	#4	3	6'-11''	69
✱S2	15	#4	4	3'-0''	30
✱S3	4	#4	5	6'-6''	17
✱U1	2	#4	6	4'-3''	6
✱V2	18	#4	STR	4'-6''	54
✱EPOXY COATED REINFORCING STEEL				LBS	721

CLASS AA CONCRETE BREAKDOWN

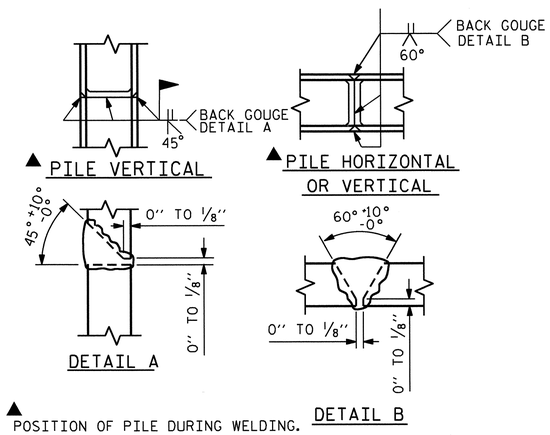
POUR 1 (CAP, CONCRETE COLLARS & LOWER PART OF WING)	C.Y.	4.8
POUR 2 (UPPER PART OF WING)	C.Y.	0.7
POUR 3 (LATERAL GUIDE)	C.Y.	0.1
TOTAL	C.Y.	5.6

HP 12 X 53 STEEL PILES :
NO.: 2 LIN. FT.: 160

PILE REDRIVES NO. 2

TOTAL BILL OF MATERIAL

✱EPOXY COATED REINFORCING STEEL	LBS.	2185	
CLASS AA CONCRETE	C.Y.	16.1	
12 X 53 STEEL PILES	No.: 6	LIN. FT.	480
PILE REDRIVES	NO.:	6	



▲ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. B-4647
TYRRELL COUNTY
STATION: 26+90.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			30

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

DRAWN BY : J. L. WALTON DATE : 1/21/10
CHECKED BY : B. N. GRADY DATE : 2/9/10

03-NOV-2011 11:17
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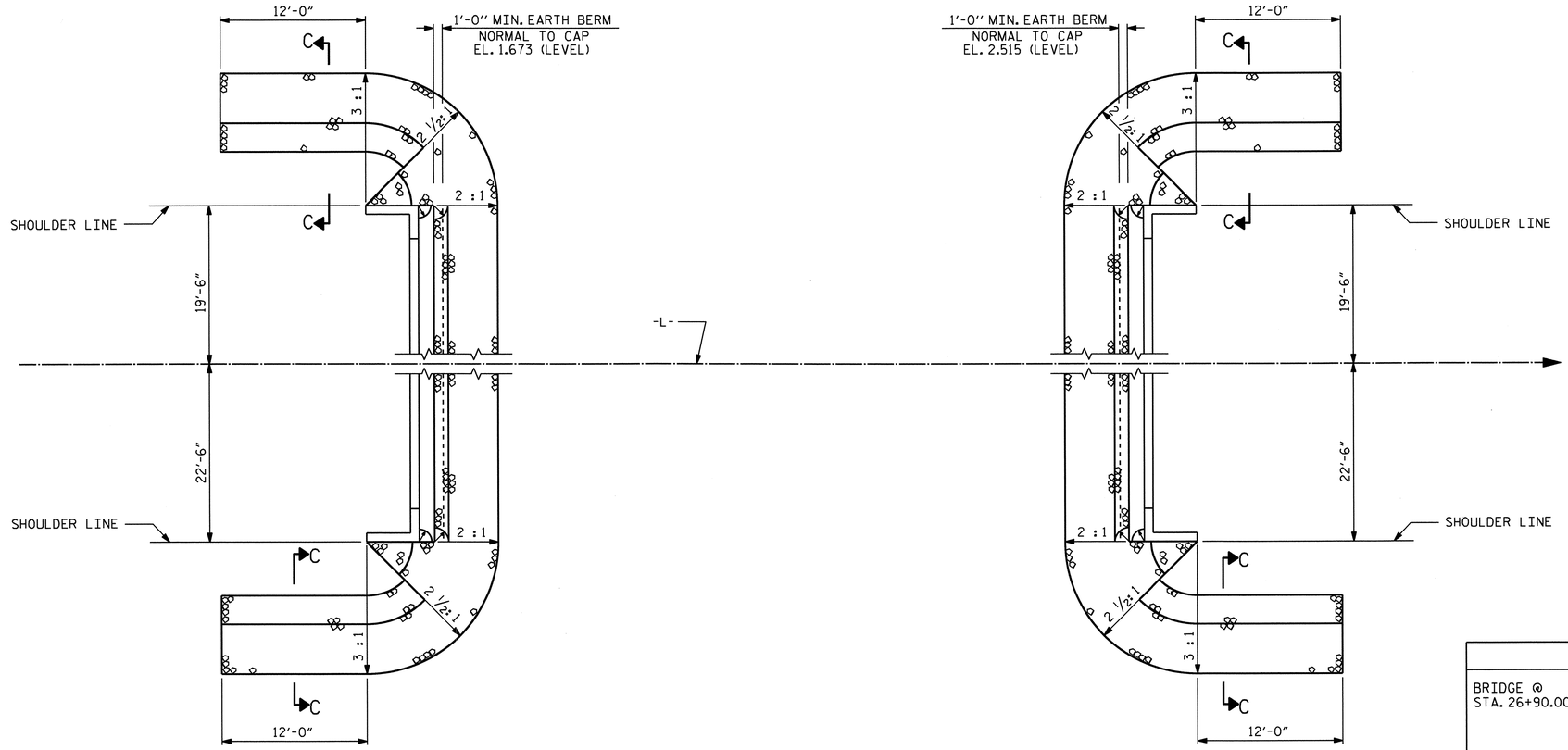
bngrady

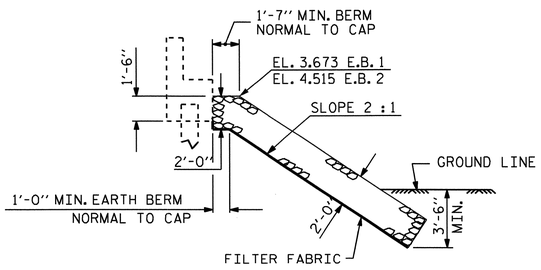


END BENT 1

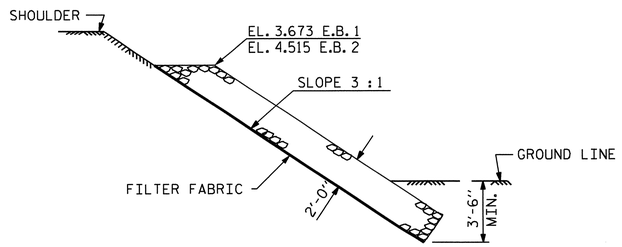
END BENT 2

PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 26+90.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	109	121
END BENT 2	122	136



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4647
TYRRELL COUNTY
STATION: 26+90.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			30

SKEW 90° STD. NO. RR2

ASSEMBLED BY : J.L. WALTON	DATE : 3-17-11	
CHECKED BY : E.M. NOLTING	DATE : 3-25-11	
DRAWN BY : FCJ 2/88	REV. 8/16/99	RWW/LES
CHECKED BY : ARB 8/88	REV. 10/17/00	RWW/LES
	REV. 5/1/06R	TLA/GM

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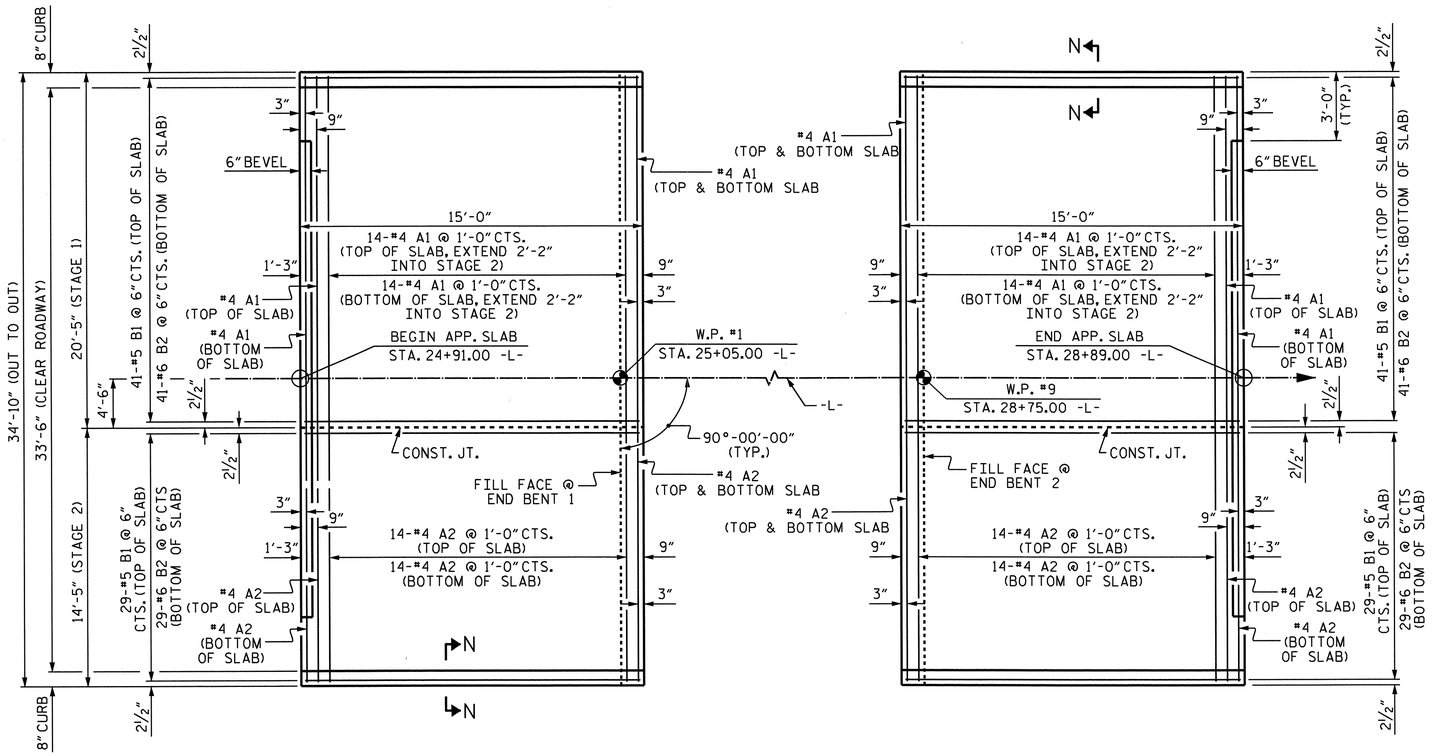
bngrady



PLAN @ END BENT 1

PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

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

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

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

THE JOINT AT END BENT 2 SHALL BE GROUTED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

THE CONTRACTOR HAS THE OPTION TO OMIT GROUT BETWEEN THE APPROACH SLAB AND THE CORED SLAB UNITS AND POUR THE APPROACH SLAB DIRECTLY AGAINST THE CORED SLAB UNITS ONLY AT END BENT 2. SEE "OPTIONAL JOINT DETAIL".

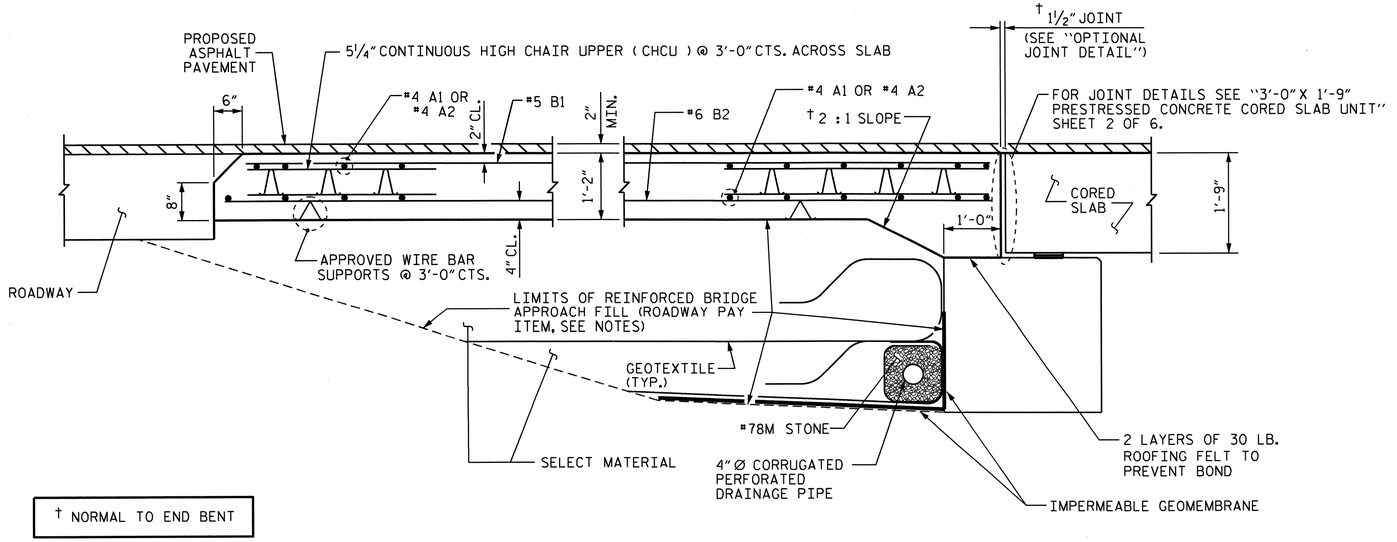
BILL OF MATERIAL

FOR ONE APPROACH SLAB (STAGE 1 - 2 REQ'D.)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	32	#4	STR	22'-5"	479
* B1	41	#5	STR	14'-3"	609
* B2	41	#6	STR	14'-8"	903
* EPOXY COATED REINFORCING STEEL				LBS.	1991
CLASS AA CONCRETE				C. Y.	14.0

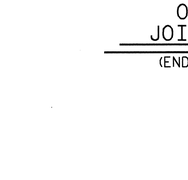
FOR ONE APPROACH SLAB (STAGE 2 - 2 REQ'D.)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A2	32	#4	STR	14'-1"	301
* B1	29	#5	STR	14'-3"	431
* B2	29	#6	STR	14'-8"	639
* EPOXY COATED REINFORCING STEEL				LBS.	1371
CLASS AA CONCRETE				C. Y.	9.9

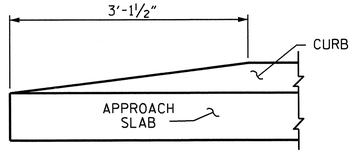


† NORMAL TO END BENT

SECTION THRU SLAB



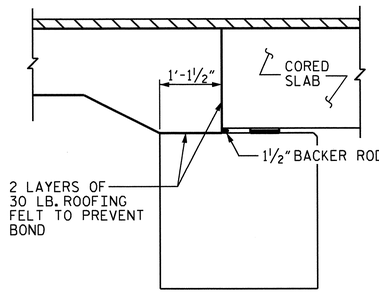
SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

(OMIT TAPER WHEN SHOULDER BERM GUTTER IS REQUIRED)

CURB DETAILS



OPTIONAL JOINT DETAIL

(END BENT 2 ONLY)

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			30

ASSEMBLED BY : B.N. GRADY	DATE : 11-1-11	
CHECKED BY : D.R. CALHOUN	DATE : 11-1-11	
DRAWN BY : FCJ 6/87	REV. 5/7/03R	RWW/JTE
CHECKED BY : EGA 6/87	REV. 5/1/06RR	KMM/GM
	REV. 10/1/11	MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

03-NOV-2011 11:16
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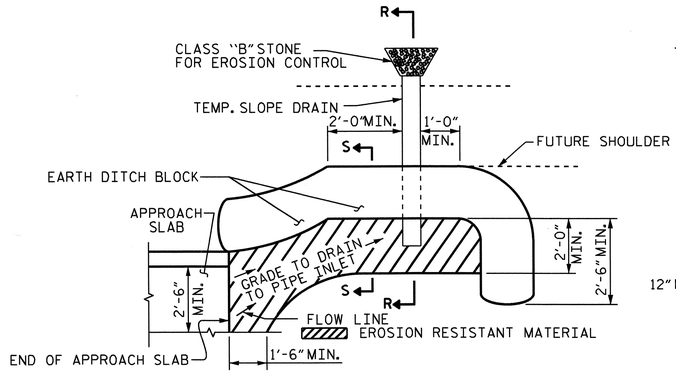
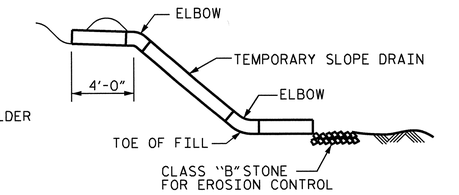
STD. NO. BAS3 (SHT 1)

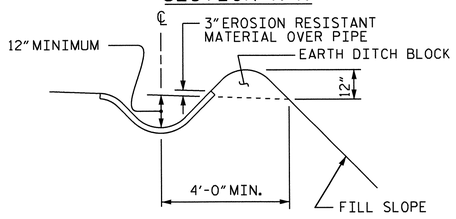


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



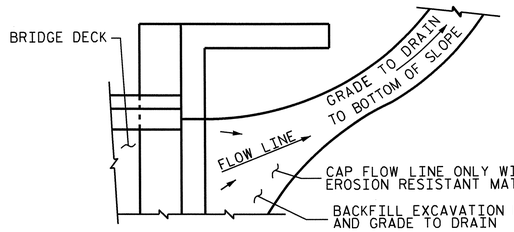
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

ASSEMBLED BY : B.N. GRADY		DATE : 11-1-11	
CHECKED BY : D.R. CALHOUN		DATE : 11-1-11	
DRAWN BY : FCJ 11/88	REV. 5/7/03	RWW/JTE	
CHECKED BY : ARB 11/88	REV. 5/1/06RRR	MAA/KMM	
	REV. 10/1/11	MAA/GM	

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NORTH CAROLINA PROFESSIONAL SEAL 14855 ENGINEER DOUGLAS R. CALHOUN
11-3-11

PROJECT NO. B-4647

TYRRELL COUNTY

STATION: 26+90.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

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

STD. NO. BAS4

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 2006 "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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