TIP PROJECT: B-4756

CONTRACT: C203306

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4756		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38528.1.1	BRZ-2128(1)	P.E.
38528.2.1	BRZ-2128(1)	ROW/UTIL
38528.3.FD1	BRZ-2128(1)	CONSTRUCTION

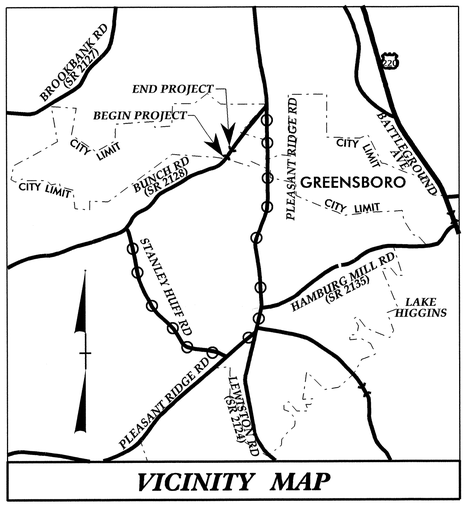
LOCATION:

BRIDGE NO. 120 OVER REEDY FORK CREEK ON SR 2128 (BUNCH ROAD)

TYPE OF WORK:

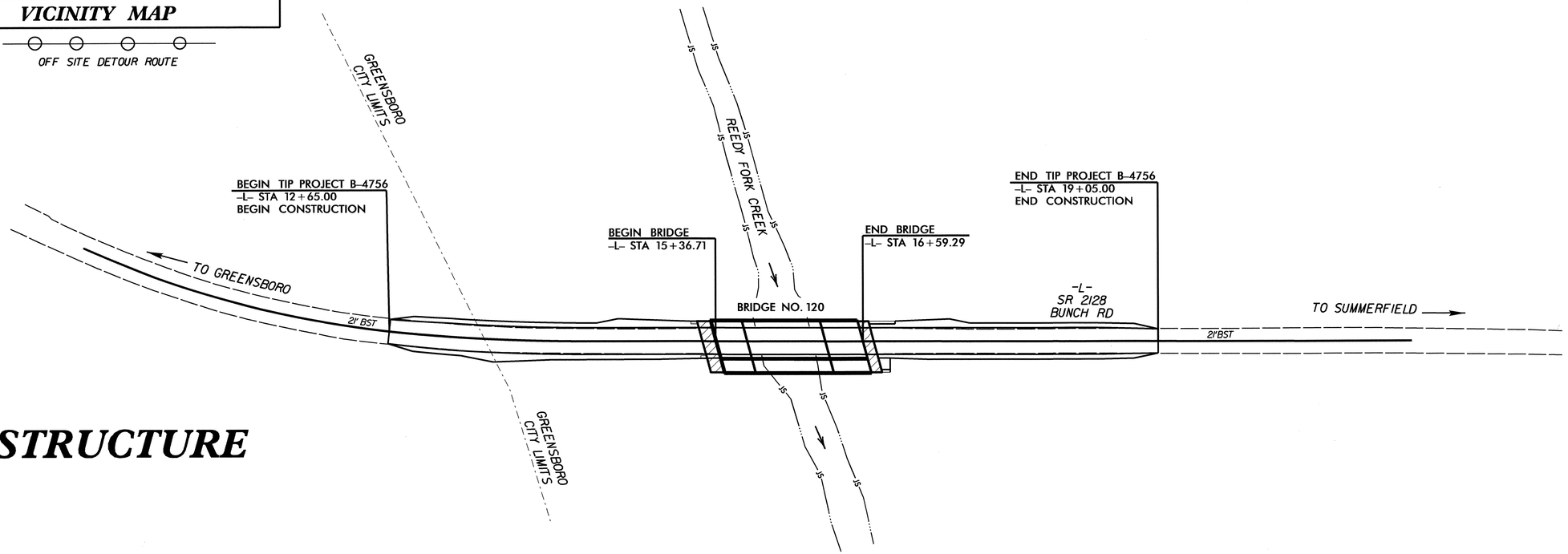
GRADING, PAVING, DRAINAGE, AND STRUCTURE

NC GRID
NAD 83/NSRS 2007



VICINITY MAP

OFF SITE DETOUR ROUTE



STRUCTURE

DESIGN DATA

ADT 2013 = 1100
ADT 2035 = 1700
DHV = 12%
D = 60%
T = 8% *
V = 50 MPH
* (TTST 1% + DUAL 7%)
FUNC CLASS = LOCAL RURAL

SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4756 = 0.098 MILES
LENGTH STRUCTURE TIP PROJECT B-4756 = 0.023 MILES
TOTAL LENGTH OF TIP PROJECT B-4756 = 0.121 MILES

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

2012 STANDARD SPECIFICATIONS

LETTING DATE:
NOVEMBER 19, 2013

OMAR R. AZIZI, P.E.
PROJECT ENGINEER

EMILY E. MURRAY, P.E.
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT

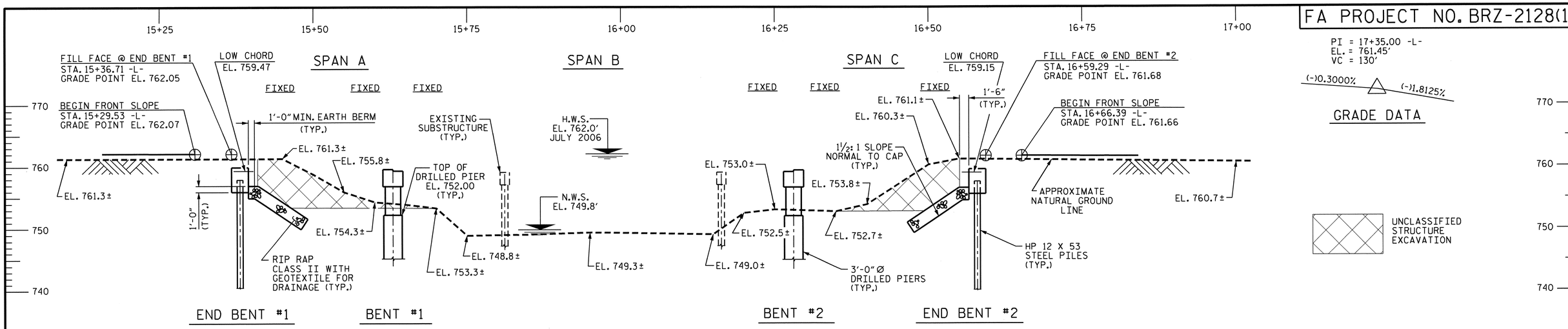
23-SEP-2013 08:35
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
emurray

FA PROJECT NO. BRZ-2128(1)

PI = 17+35.00 -L-
EL. = 761.45'
VC = 130'

(-)0.3000% (-)1.8125%

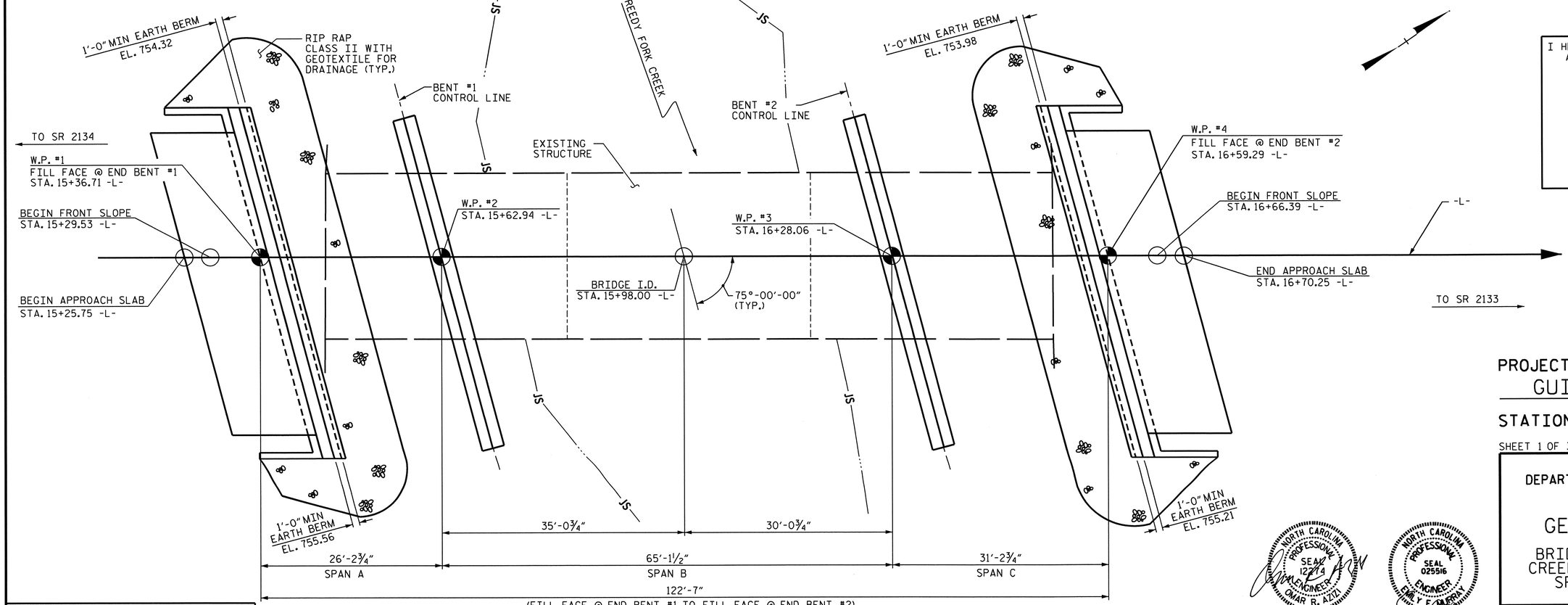
GRADE DATA



UNCLASSIFIED STRUCTURE EXCAVATION

SECTION ALONG -L-

(SECTIONS AT END BENTS AND BENTS ARE TAKEN AT RIGHT ANGLES.)



PLAN

(PILES NOT SHOWN FOR CLARITY)

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

NORTH CAROLINA PROFESSIONAL SEAL 12774 ENGINEER OMAR R. AZIZI
9/23/13

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 120

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER REEDY FORK CREEK ON SR 2128 BETWEEN SR 2134 AND SR 2133

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

DESIGN ENGINEER OF RECORD: B.L. GREEN DATE : 8-8-13

DRAWN BY : PEGGY ADKINS DATE : 4-25-13

CHECKED BY : B.L. GREEN DATE : 7-2-13

23-SEP-2013 08:49
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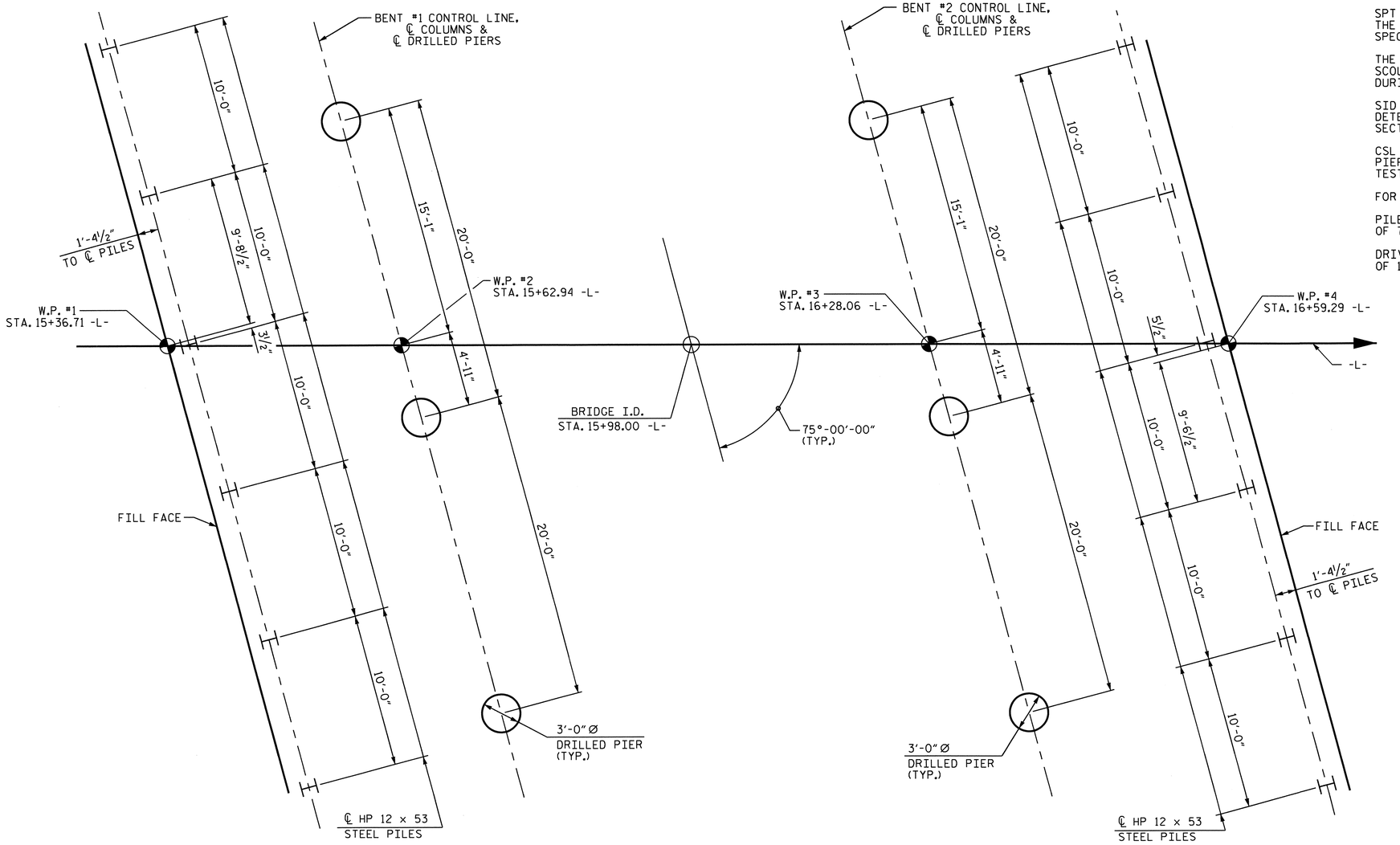
emurray



NOTES:

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

DRILLED PIERS AT BENTS NOS. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 440 AND 455 TONS PER PIER, RESPECTIVELY. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 12 TSF.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NOS. 1 AND 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 735 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL DRILLED PIERS AT BENT NO. 1 AND BENT NO. 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 710 FEET, SATISFY THE REQUIRED TIP RESISTANCE AND HAVE A PENETRATION OF AT LEAST 10 FEET INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

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

THE SCOUR CRITICAL ELEVATION FOR BENT NOS. 1 AND 2 IS ELEVATION 730 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

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

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NOS. 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE.

DRIVE PILES AT END BENT NOS. 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 115 TONS PER PILE.

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER REEDY FORK CREEK ON SR 2128 BETWEEN SR 2134 AND SR 2133

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

9/23/13

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

DRAWN BY : PEGGY ADKINS DATE : 6-4-13
CHECKED BY : B.L. GREEN DATE : 7-2-13
DESIGN ENGINEER OF RECORD: B.L. GREEN DATE : 8-8-13

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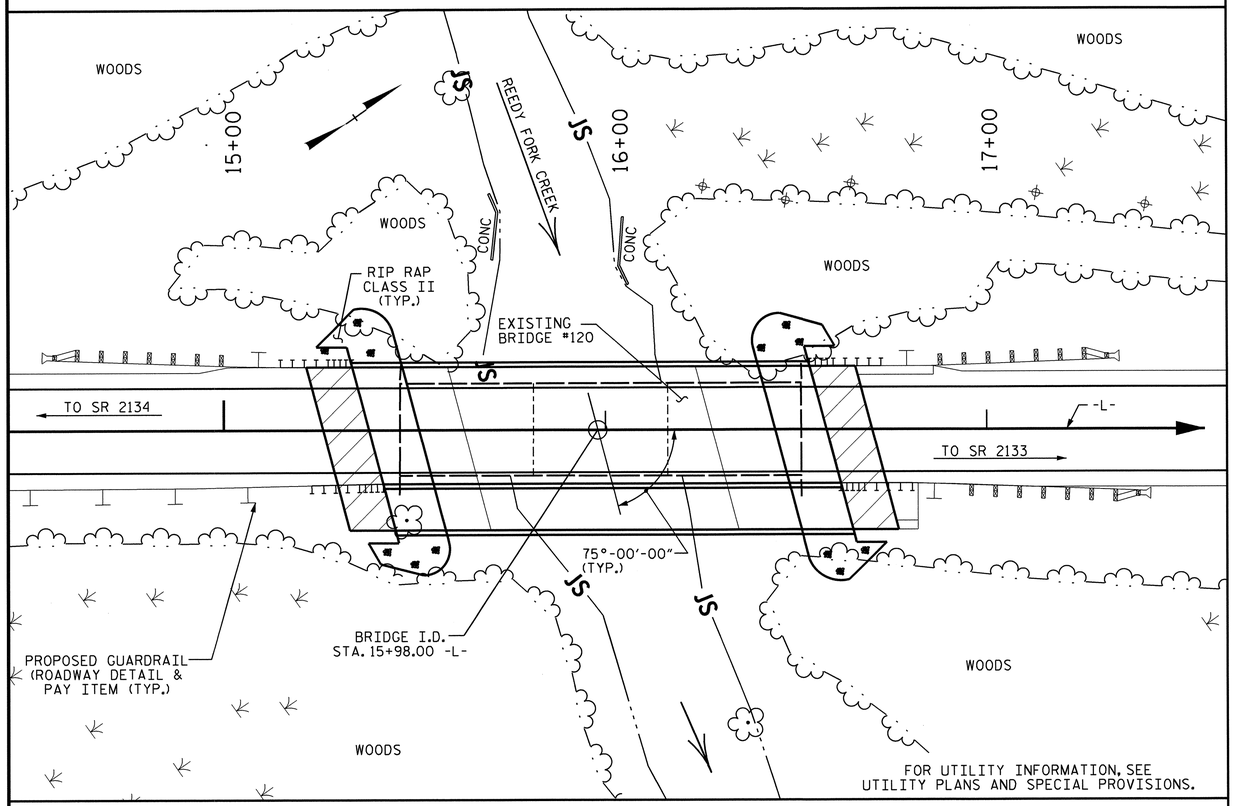
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	3'-0" DIA. DRILLED PIER IN SOIL	3'-0" DIA. DRILLED PIER NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-0" DIA. DRILLED PIER	SID INSPEC-TIONS	SPT TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES		TWO BAR METAL RAIL	1'-2" X 2'-10½" CONCRETE PARAPET	1'-2" X 4'-4½" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LIN.FT.	LIN.FT.	LIN.FT.	EACH	EACH	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	TONS	SQ.YDS.	LUMP SUM	NO.	LIN.FT.	NO.	LIN.FT.
SUPERSTRUCTURE										LUMP SUM					224.89	240.50	120.25			LUMP SUM	30	825.00	15	975.00
END BENT NO. 1								LUMP SUM	27.1		3128		6	240				113	126					
BENT NO. 1		102.0	24.0	51.0					22.2		11487	2373												
BENT NO. 2		102.0	24.0	51.0					22.1		11466	2364												
END BENT NO. 2								LUMP SUM	27.0		3118		6	270				137	152					
TOTAL	LUMP SUM	204.0	48.0	102.0	1	1	1	LUMP SUM	98.4	LUMP SUM	29199	4737	12	510	224.89	240.50	120.25	250	278	LUMP SUM	30	825.00	15	975.00

BM #1: RAILROAD SPIKE IN 15" BIRCH, STA. 16+67.87 -L-, 145.78' RT., EL. 753.11', NAVD 88.



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	= 3900 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR.
DESIGN HIGH WATER ELEVATION	= 758.6'
DRAINAGE AREA	= 27.7 Sq. MILES
BASE DISCHARGE (Q100)	= 5500 CFS
BASE HIGH WATER ELEVATION	= 760.0'

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 3900 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 25 YR.
OVERTOPPING FLOOD ELEVATION	= >757.7'

DRAWN BY : PEGGY ADKINS DATE : 4-25-13
CHECKED BY : B.L. GREEN DATE : 7-2-13

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emurray

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED. CRANES AND DRIVING EQUIPMENT WILL NOT BE PERMITTED ON CORED SLAB UNITS FOR SPAN B.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 35 FT LEFT AND 40 FT RIGHT SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS, 1 @ 35'-4", 1 @ 35'-0", 1 @ 35'-3" WITH A STEEL PLANK DECK ON I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 24.0 FT. ON TIMBER CAPS ON TIMBER PILES AT THE END BENTS AND INTERIOR BENTS WITH STEEL CAP AND PILE CRUTCHES AT THE INTERIOR BENTS AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

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 15+98.00 -L-."

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.

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.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

PROJECT NO. B-4756
GUILFORD COUNTY
STATION: 15+98.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER REEDY FORK CREEK ON SR 2128 BETWEEN SR 2134 AND SR 2133

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

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	1.09	--	1.75	0.269	1.11	B	EL	31.978	0.603	**1.09**	B	EL	**3.198**	0.80	0.269	1.11	B	EL	31.978	
		HL-93(Opr)	N/A	--	1.42	--	1.35	0.269	1.44	B	EL	31.978	0.603	1.42	B	EL	3.198	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.35	48.574	1.75	0.269	1.43	B	EL	31.978	0.603	**1.35**	B	EL	**3.198**	0.80	0.269	1.43	B	EL	31.978	
		HS-20(Opr)	36.000	--	1.75	62.966	1.35	0.269	1.85	B	EL	31.978	0.603	1.75	B	EL	3.198	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.13	42.254	1.40	0.269	3.92	B	EL	31.978	0.633	3.34	A	EL	1.198	0.80	0.269	3.13	B	EL	31.978	
		SNGARBS2	20.000	--	2.37	47.386	1.40	0.269	2.97	B	EL	31.978	0.625	2.67	C	EL	1.448	0.80	0.269	2.37	B	EL	31.978	
		SNAGRIS2	22.000	--	2.26	49.710	1.40	0.269	2.83	B	EL	31.978	0.625	2.57	C	EL	1.448	0.80	0.269	2.26	B	EL	31.978	
		SNCOTTS3	27.250	--	1.56	42.472	1.40	0.269	1.95	B	EL	31.978	0.633	1.69	A	EL	1.198	0.80	0.269	1.56	B	EL	31.978	
		SNAGGRS4	34.925	--	1.32	45.980	1.40	0.269	1.65	B	EL	31.978	0.625	1.60	C	EL	1.448	0.80	0.269	1.32	B	EL	31.978	
		SNS5A	35.550	--	1.29	45.734	1.40	0.269	1.61	B	EL	31.978	0.603	1.68	B	EL	3.198	0.80	0.269	1.29	B	EL	31.978	
		SNS6A	39.950	--	1.19	47.392	1.40	0.269	1.48	B	EL	31.978	0.603	1.54	B	EL	3.198	0.80	0.269	1.19	B	EL	31.978	
		SNS7B	42.000	--	1.13	47.457	1.40	0.269	1.41	B	EL	31.978	0.603	1.52	B	EL	3.198	0.80	0.269	1.13	B	EL	31.978	
	TTST	TNAGRIT3	33.000	--	1.45	47.797	1.40	0.269	1.81	B	EL	31.978	0.603	1.83	B	EL	3.198	0.80	0.269	1.45	B	EL	31.978	
		TNT4A	33.075	--	1.46	48.171	1.40	0.269	1.82	B	EL	31.978	0.625	1.77	C	EL	1.448	0.80	0.269	1.46	B	EL	31.978	
		TNT6A	41.600	--	1.20	49.777	1.40	0.269	1.50	B	EL	31.978	0.603	1.62	B	EL	3.198	0.80	0.269	1.20	B	EL	31.978	
		TNT7A	42.000	--	1.21	50.637	1.40	0.269	1.51	B	EL	31.978	0.603	1.58	B	EL	3.198	0.80	0.269	1.21	B	EL	31.978	
		TNT7B	42.000	--	1.26	52.710	1.40	0.269	1.57	B	EL	31.978	0.603	1.48	B	EL	3.198	0.80	0.269	1.25	B	EL	31.978	
		TNAGRIT4	43.000	--	1.19	51.089	1.40	0.269	1.49	B	EL	31.978	0.603	1.43	B	EL	3.198	0.80	0.269	1.19	B	EL	31.978	
		TNAGT5A	45.000	--	1.12	50.292	1.40	0.269	1.40	B	EL	31.978	0.603	1.43	B	EL	3.198	0.80	0.269	1.12	B	EL	31.978	
		TNAGT5B	45.000	3	1.10	49.578	1.40	0.269	1.38	B	EL	31.978	0.603	1.36	B	EL	3.198	0.80	0.269	**1.10**	B	EL	**31.978**	

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)

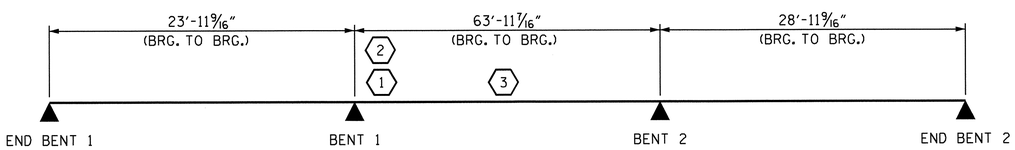
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨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-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/22/13

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

STD. NO. LRFR1

DRAWN BY : B. L. GREEN DATE : 9/18/12
CHECKED BY : PEGGY ADKINS DATE : 5/30/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

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

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

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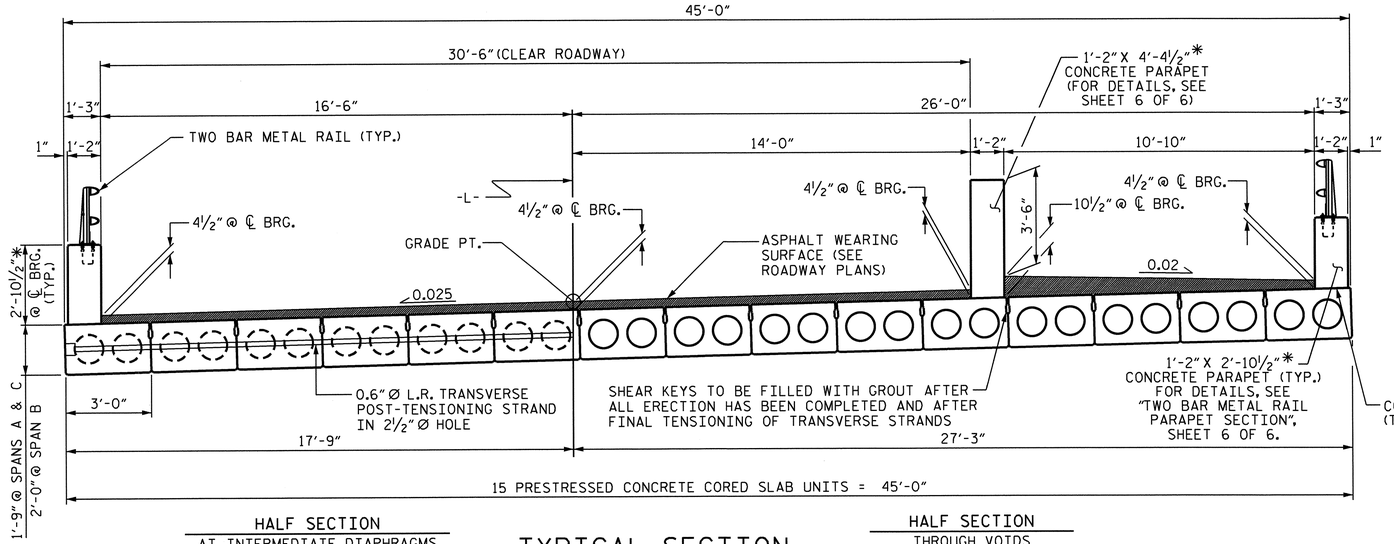
emurray

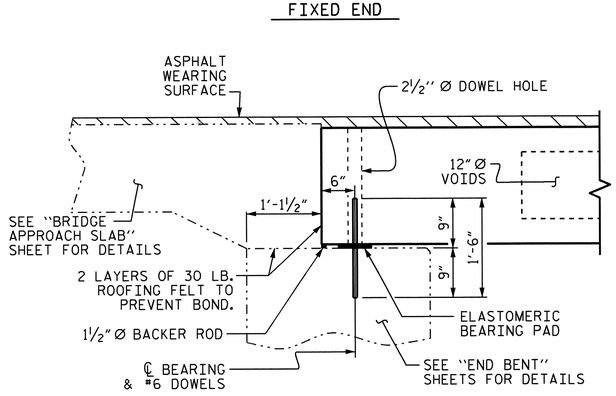


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

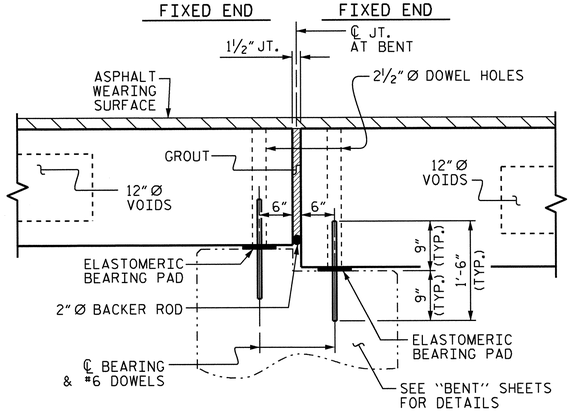
HALF SECTION
THROUGH VOIDS

TYPICAL SECTION

* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS, SEE TABLE ON SHEET 5 OF 6.

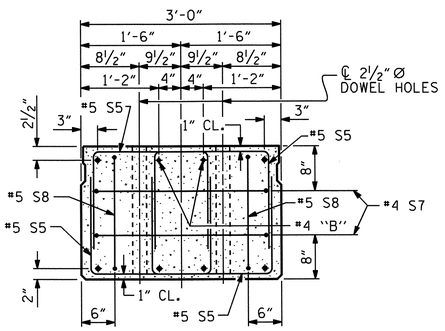


SECTION AT END BENT



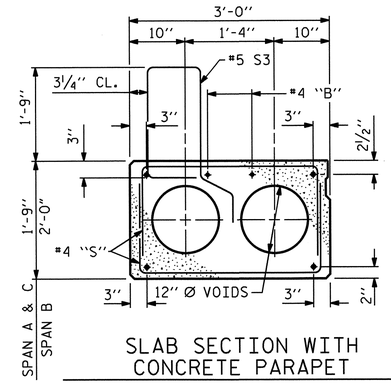
SECTION AT BENT No. 1

(BENT No. 2 SIM.)



END ELEVATION FOR 65' UNIT

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



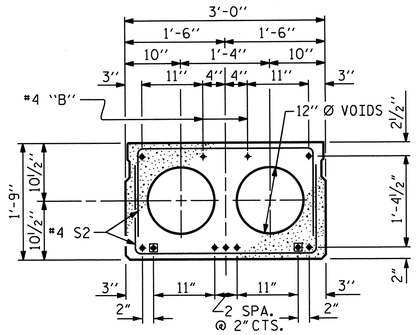
SLAB SECTION WITH CONCRETE PARAPET

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTIONS.)
(INTERIOR SECTION WITH PARAPET WILL HAVE SHEAR KEY DETAIL ON BOTH SIDES.)

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

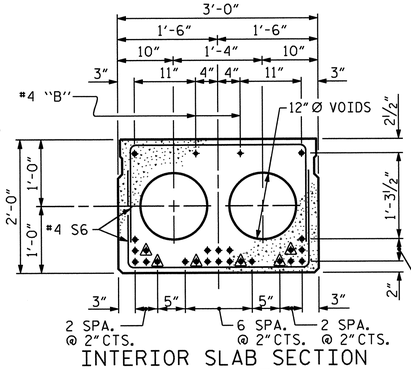
◉ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND



INTERIOR SLAB SECTION (25' UNIT & 30' UNIT)

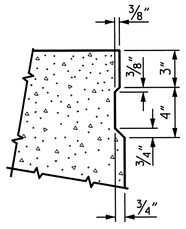
(9 STRANDS REQUIRED)



INTERIOR SLAB SECTION (65' UNIT)

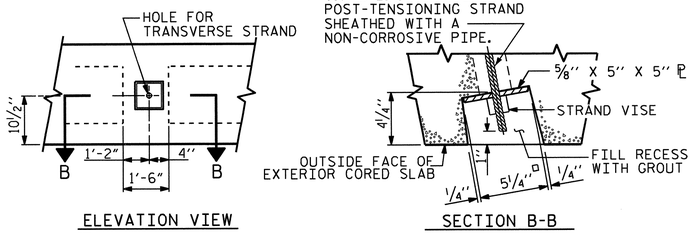
(24 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

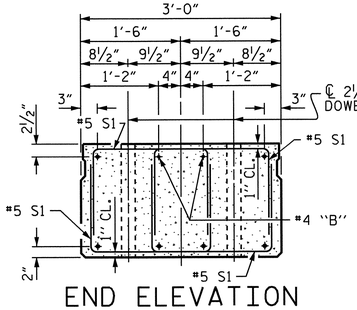


SHEAR KEY DETAIL

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

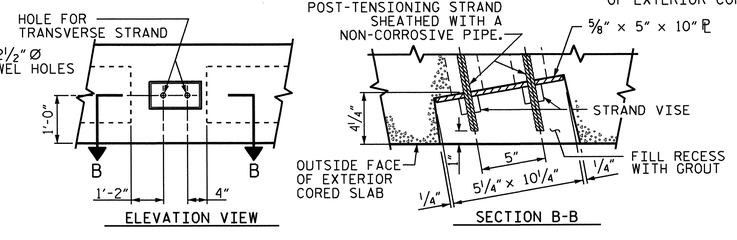


GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS FOR 25' UNIT & 30' UNIT



END ELEVATION FOR 25' UNIT AND 30' UNIT

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



GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS FOR 65' UNIT

PROJECT NO. B-4756
GUILFORD COUNTY
STATION: 15+98.00 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE CORED SLAB UNIT 75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

DRAWN BY :	B.L. GREEN	DATE : 9/18/12
CHECKED BY :	PEGGY ADKINS	DATE : 5/30/13
DESIGN ENGINEER OF RECORD:	B.L. GREEN	DATE : 8/8/13

08-AUG-2013 14:21
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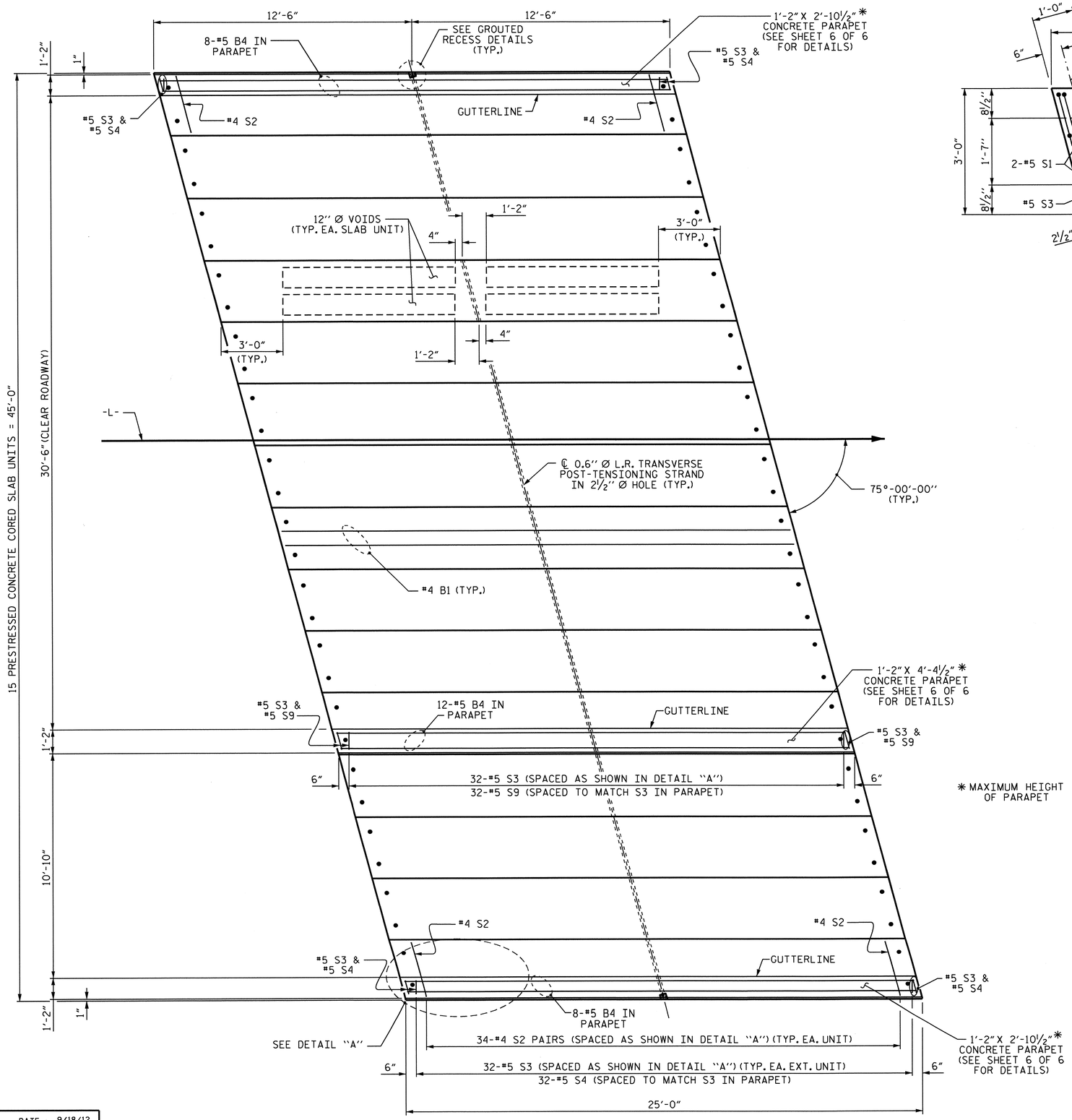
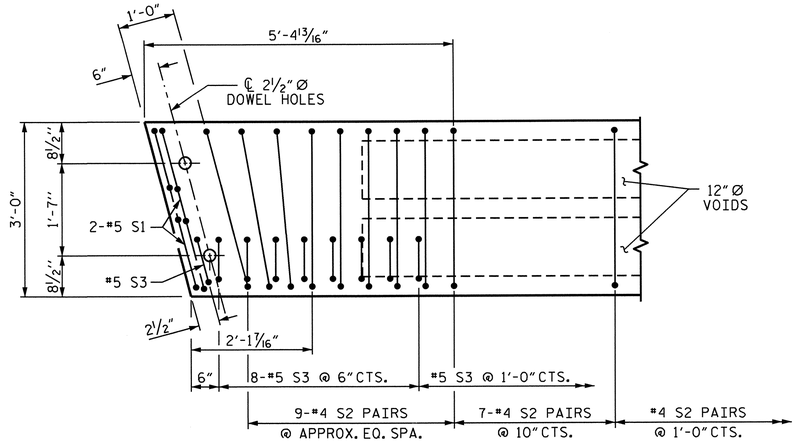
taverette



PLAN OF UNIT



DETAIL "A"

NOTE: UNITS WITH CONCRETE PARAPET SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 25' UNIT
75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

DRAWN BY : B. L. GREEN DATE : 9/18/12
CHECKED BY : PEGGY ADKINS DATE : 5/30/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

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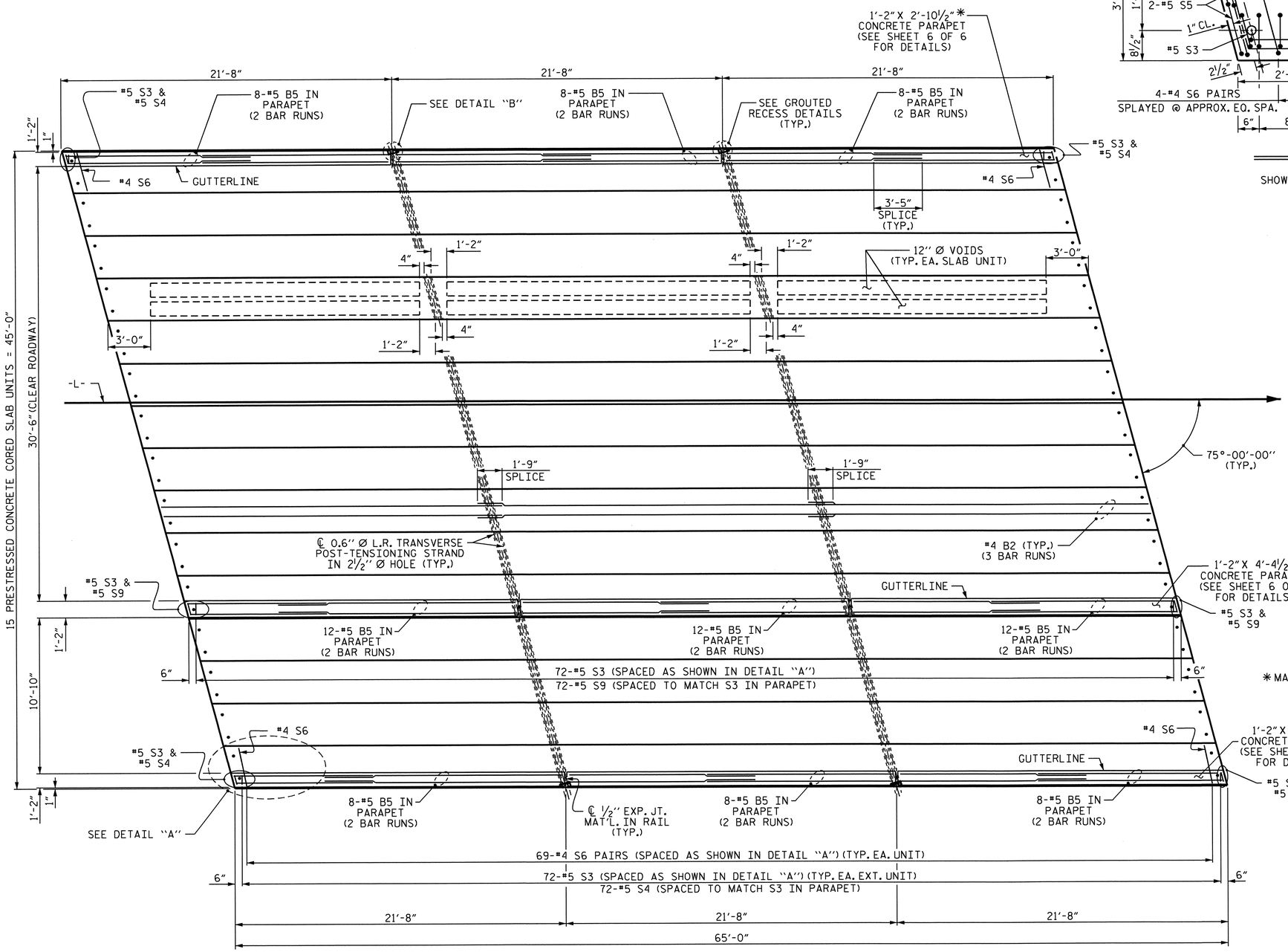
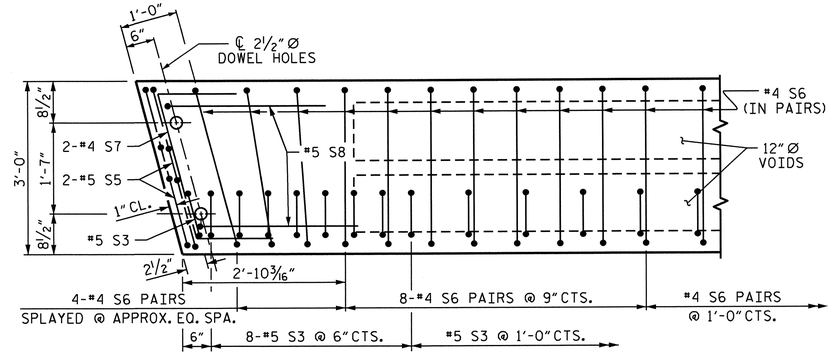
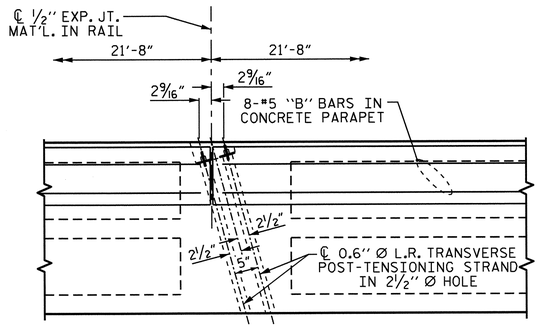


PLAN OF UNIT



DETAIL "A"

NOTE: UNITS WITH CONCRETE PARAPET SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT *5 S3 BARS.



DETAIL "B"

*4 S6 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 65' UNIT
75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY K. MURPHY
9/23/13

DRAWN BY : B. L. GREEN DATE : 9/18/12
CHECKED BY : PEGGY ADKINS DATE : 5/30/12
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

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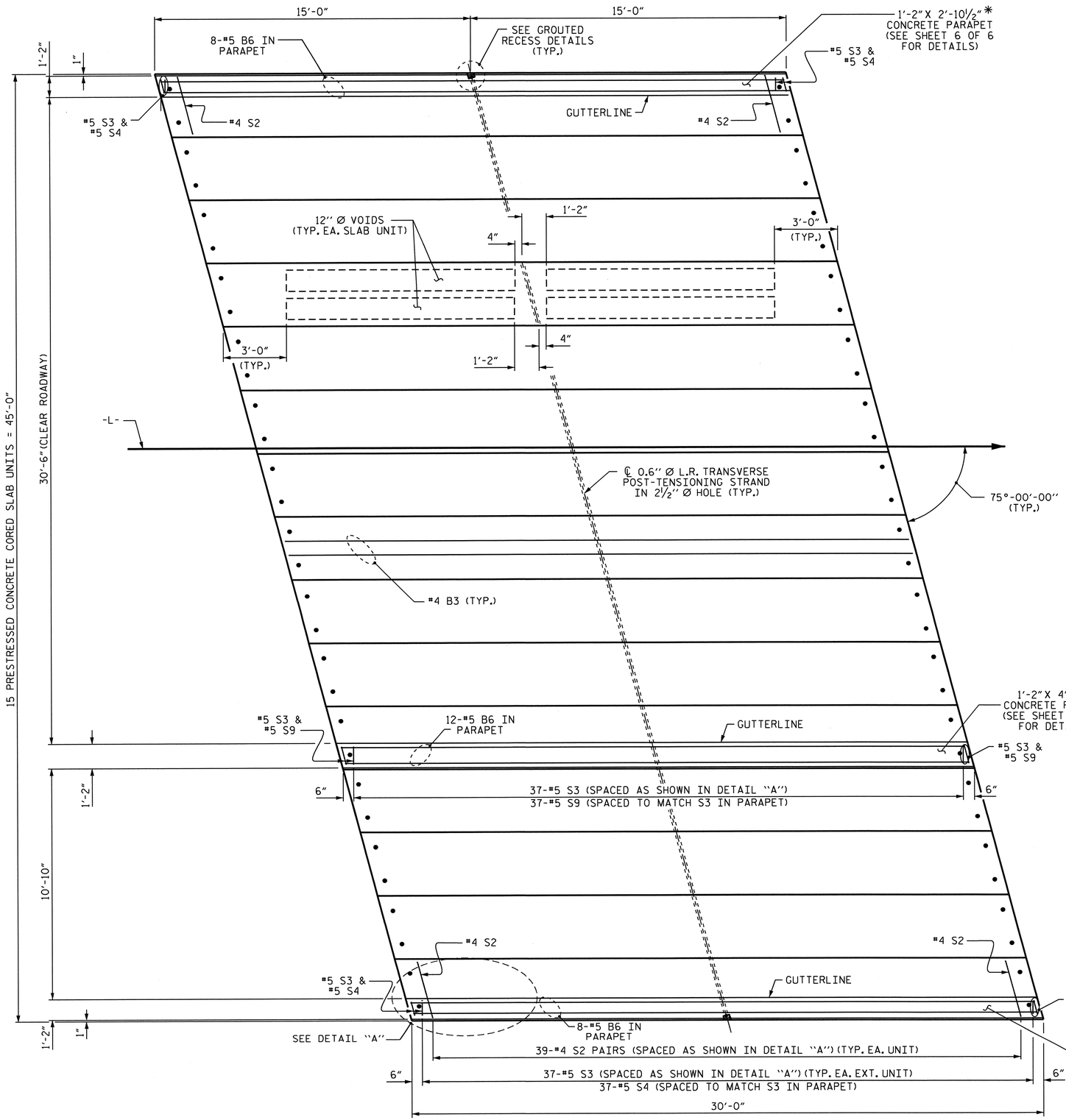
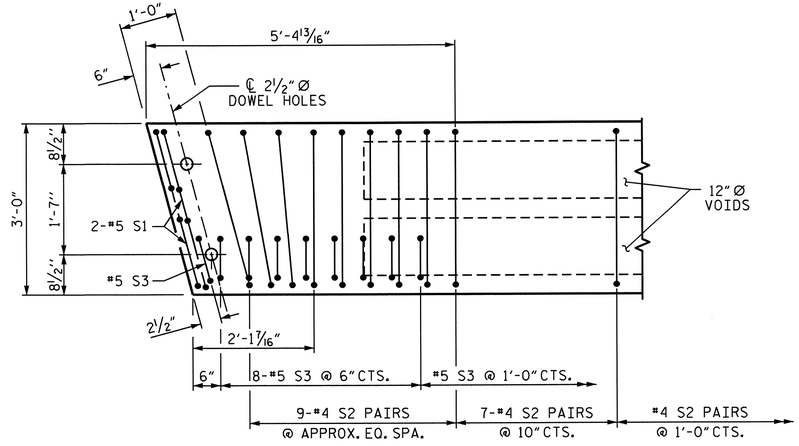
taverette



PLAN OF UNIT



DETAIL "A"

NOTE: UNITS WITH CONCRETE PARAPET SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

* MAXIMUM HEIGHT OF PARAPET

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 30' UNIT
75° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MARSH
9/23/13

DRAWN BY : B. L. GREEN DATE : 9/18/12
CHECKED BY : PEGGY ADKINS DATE : 5/30/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:20
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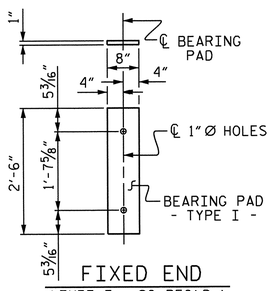


FIXED END
(TYPE I - 90 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
25' UNIT			
UNIT WITH CONCRETE PARAPET	3	25'-0"	75'-0"
INTERIOR C.S.	12	25'-0"	300'-0"
TOTAL	15		375'-0"

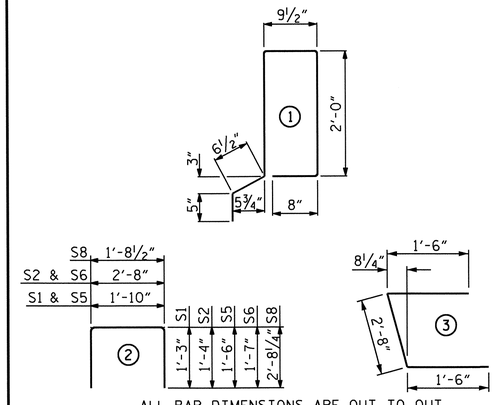
CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
65' UNIT			
UNIT WITH CONCRETE PARAPET	3	65'-0"	195'-0"
INTERIOR C.S.	12	65'-0"	780'-0"
TOTAL	15		975'-0"

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
30' UNIT			
UNIT WITH CONCRETE PARAPET	3	30'-0"	90'-0"
INTERIOR C.S.	12	30'-0"	360'-0"
TOTAL	15		450'-0"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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

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

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

ALL REINFORCING STEEL IN CONCRETE 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.

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

FOR 65' UNITS, MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S2 OR #4 S6 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT

				UNIT WITH CONCRETE PARAPET		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B1	2	#4	STR	24'-7"	33	24'-7"	33
S1	8	#5	2	4'-4"	36	4'-3"	35
S2	68	#4	2	5'-4"	242	5'-4"	242
✱ S3	34	#5	1	6'-5"	228		
REINFORCING STEEL			LBS.		311		311
✱EPOXY COATED REINFORCING STEEL			LBS.		228		
5000 P.S.I. CONCRETE			CU. YDS.		3.8		3.8
0.6" Ø L.R. STRANDS			No.		9		9

BILL OF MATERIAL FOR ONE 65' CORED SLAB UNIT

				UNIT WITH CONCRETE PARAPET		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B2	6	#4	STR	22'-10"	92	22'-10"	92
✱ S3	74	#5	1	6'-5"	495		
S5	8	#5	2	4'-10"	40	4'-10"	40
S6	138	#4	2	5'-10"	538	5'-10"	538
S7	4	#4	3	5'-8"	15	5'-8"	15
S8	4	#5	3	7'-1"	30	7'-1"	30
REINFORCING STEEL			LBS.		715		715
✱EPOXY COATED REINFORCING STEEL			LBS.		495		
6000 P.S.I. CONCRETE			CU. YDS.		11.2		11.2
0.6" Ø L.R. STRANDS			No.		24		24

BILL OF MATERIAL FOR ONE 30' CORED SLAB UNIT

				UNIT WITH CONCRETE PARAPET		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B3	2	#4	STR	29'-7"	40	29'-7"	40
S1	8	#5	2	4'-4"	36	4'-3"	35
S2	78	#4	2	5'-4"	278	5'-4"	278
✱ S3	39	#5	1	6'-5"	261		
REINFORCING STEEL			LBS.		354		354
✱EPOXY COATED REINFORCING STEEL			LBS.		261		
5000 P.S.I. CONCRETE			CU. YDS.		4.5		4.5
0.6" Ø L.R. STRANDS			No.		9		9

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
25' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	5/16" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	1/16" ↓
FINAL CAMBER	1/4" ↑

✱✱ INCLUDES FUTURE WEARING SURFACE

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 2'-0"
65' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	3 1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	5/8" ↓
FINAL CAMBER	2 7/8" ↑

✱✱ INCLUDES FUTURE WEARING SURFACE

DEAD LOAD DEFLECTION AND CAMBER

	3'-0" x 1'-9"
30' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	3/8" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	1/16" ↓
FINAL CAMBER	5/16" ↑

✱✱ INCLUDES FUTURE WEARING SURFACE

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
	SUPERED SECTION	EXT. UNITS	INT. UNIT
25' UNITS	4 1/4"	2'-10 1/4"	4'-4 1/4"
65' UNITS	1 5/8"	2'-7 5/8"	4'-1 5/8"
30' UNITS	4 1/8"	2'-10 1/8"	4'-4 1/8"

CONCRETE RELEASE STRENGTH

UNIT	PSI
25' & 30' UNITS	4000
65' UNITS	4800

GRADE 270 STRANDS

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

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE CORED SLAB UNIT 75° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

9/23/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : B. L. GREEN DATE : 9/18/12
CHECKED BY : PEGGY ADKINS DATE : 5/30/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:19
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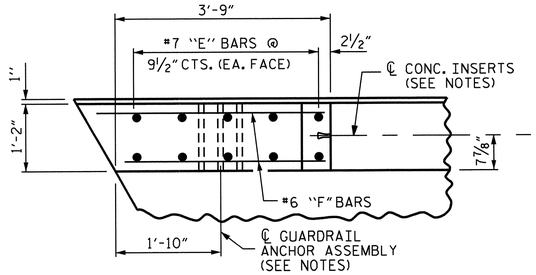
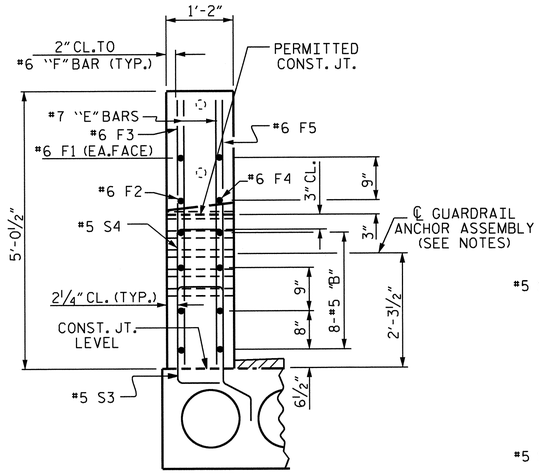
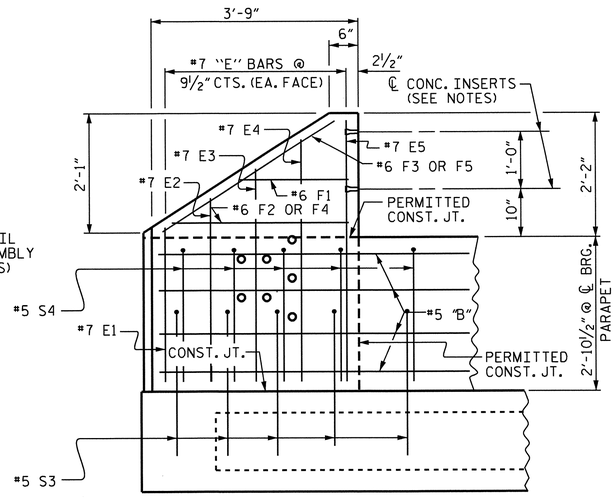
taverette



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

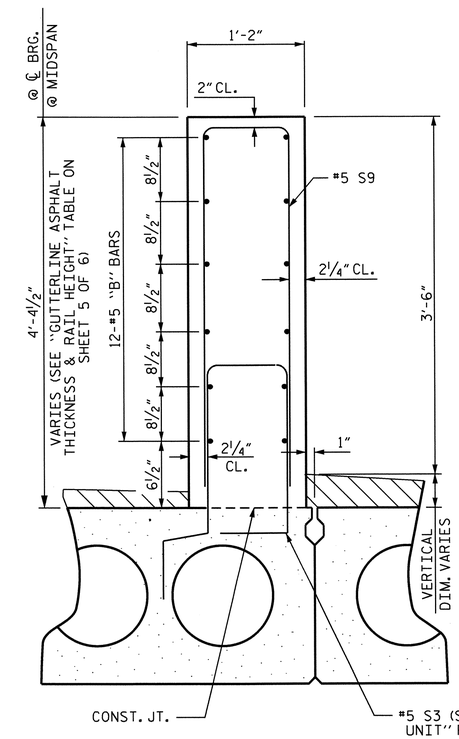
NOTES

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 1 OF 3 AND "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS".

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

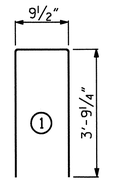
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT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

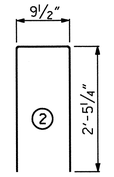


SECTION THRU 1'-2" X 4'-4½"* PARAPET

* MAXIMUM HEIGHT OF PARAPET

BAR TYPES





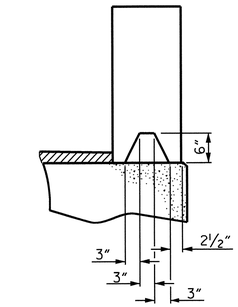
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 1'-2" X 4'-4½" CONCRETE PARAPET

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B4	12	#5	STR	24'-7"	308
* B5	72	#5	STR	12'-5"	932
* B6	12	#5	STR	29'-7"	370
* S9	147	#5	1	8'-4"	1278
* EPOXY COATED REINFORCING STEEL		LBS.			2888
CLASS AA CONCRETE		CU.YDS.			22.7
1'-2" X 4'-4½" CONCRETE PARAPET		LIN. FT.			120.25

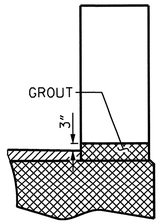
BILL OF MATERIAL FOR TWO 1'-2" X 2'-10½" PARAPETS AND FOUR END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B4	16	#5	STR	24'-7"	410
* B5	96	#5	STR	12'-5"	1243
* B6	16	#5	STR	29'-7"	494
* E1	8	#7	STR	3'-0"	49
* E2	8	#7	STR	3'-5"	56
* E3	8	#7	STR	3'-10"	63
* E4	8	#7	STR	4'-3"	69
* E5	8	#7	STR	4'-7"	75
* F1	8	#6	STR	2'-2"	26
* F2	4	#6	STR	3'-5"	21
* F3	4	#6	STR	4'-0"	24
* F4	4	#6	STR	3'-3"	20
* F5	4	#6	STR	3'-6"	21
* S4	294	#5	2	5'-8"	1738
* EPOXY COATED REINFORCING STEEL		LBS.			4309
CLASS AA CONCRETE		CU.YDS.			29.8
1'-2" X 2'-10½" CONCRETE PARAPET		LIN. FT.			240.50



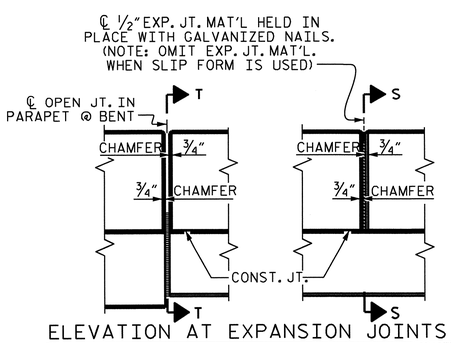
SECTION S-S

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

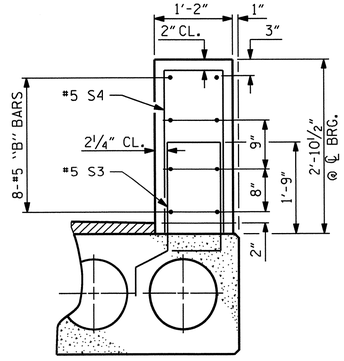


SECTION T-T

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



ELEVATION AT EXPANSION JOINTS



TWO BAR METAL RAIL PARAPET SECTION

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE CORED SLAB UNIT 75° SKEW

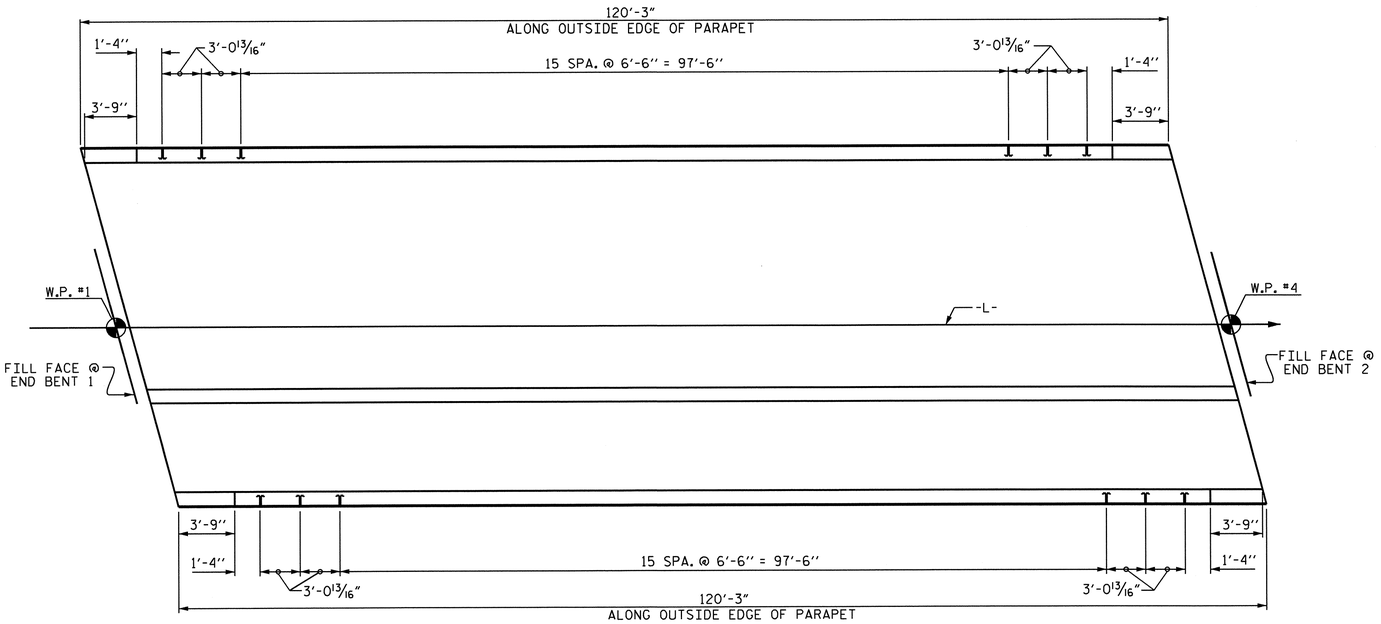
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

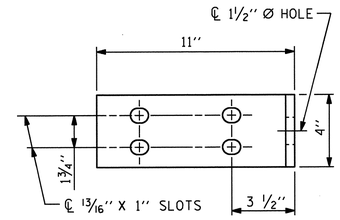
9/23/13

DRAWN BY :	B. L. GREEN	DATE :	9/18/12
CHECKED BY :	PEGGY ADKINS	DATE :	5/30/13
DESIGN ENGINEER OF RECORD:	B. L. GREEN	DATE :	8/8/13

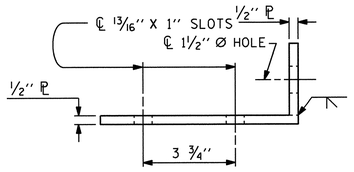
08-AUG-2013 14:19
R:\TIPProjects-B\B4756\Structures\Plans\bgreen\B-4756_SD_CS.dgn
taverette



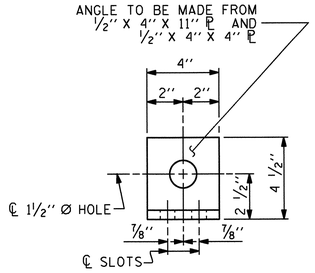
PLAN OF RAIL POST SPACINGS



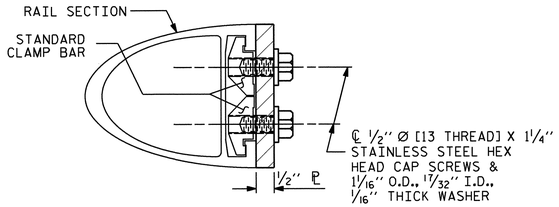
ELEVATION



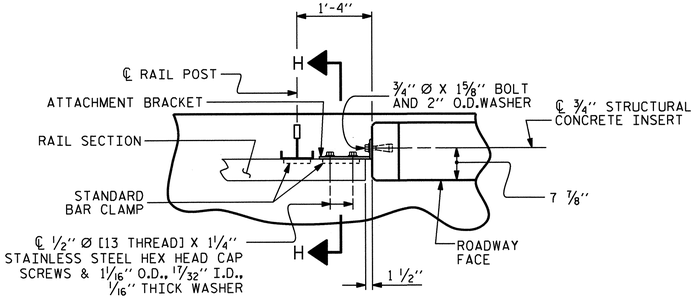
TOP VIEW



END VIEW



SECTION H-H



PLAN - RAIL AND 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).

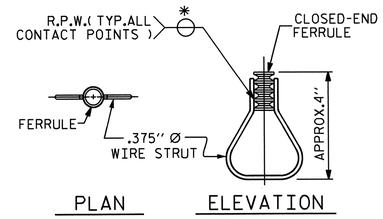
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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.

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS
TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY C. MURRAY
9/23/13

ASSEMBLED BY : B. L. GREEN		DATE : 9/18/12	
CHECKED BY : PEGGY ADKINS		DATE : 5/30/13	
DRAWN BY : FCJ 1/88	REV. 5/7/03	RWW/JTE	
CHECKED BY : CRK 3/89	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

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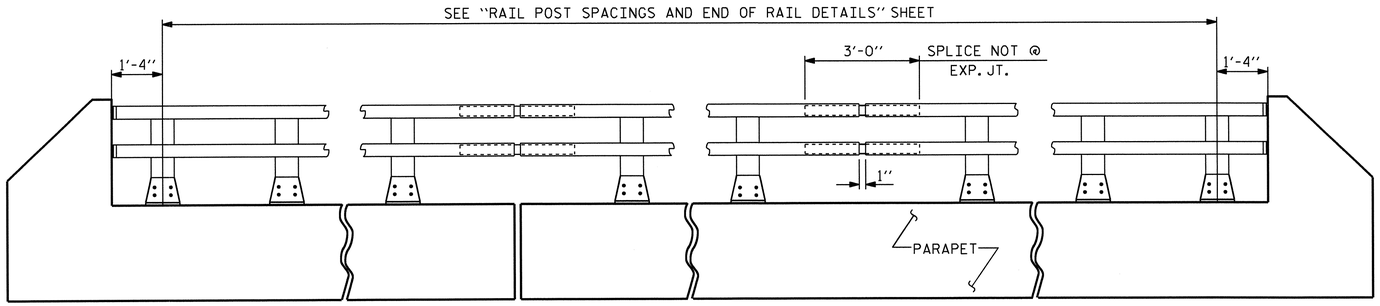
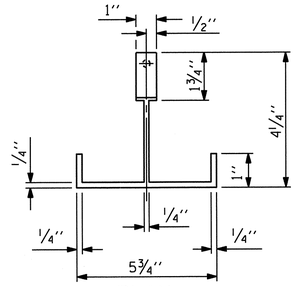
taverette

STD. NO. BMR2

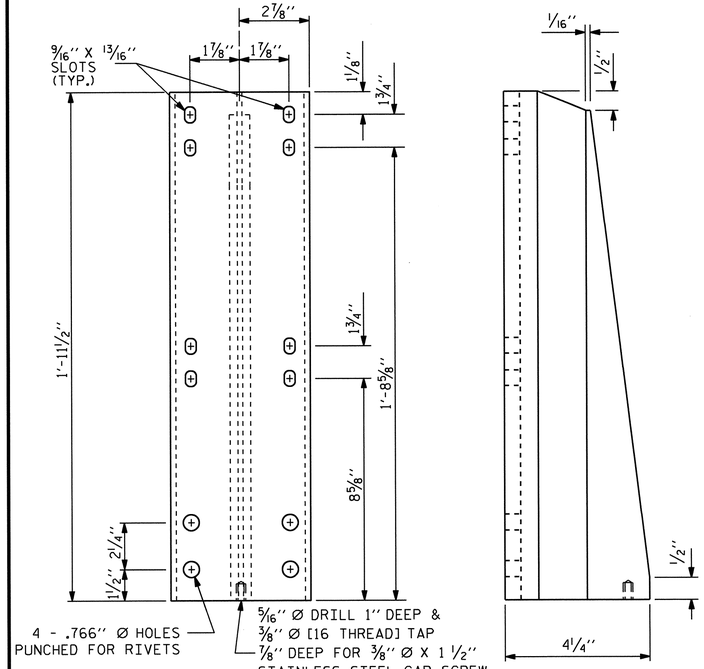


ELEVATION

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

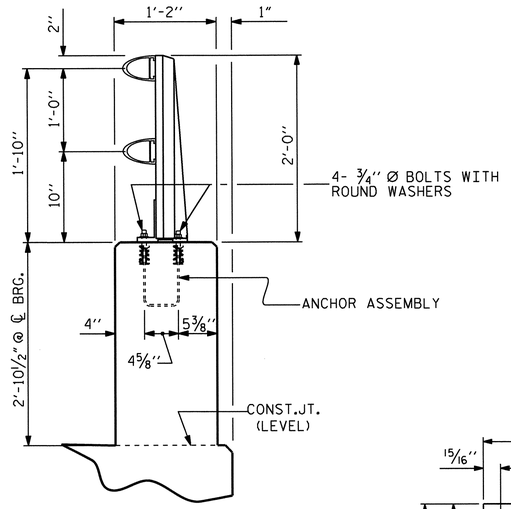


PLAN

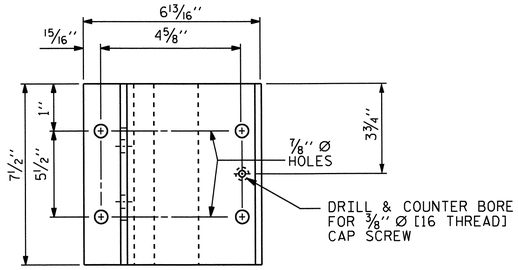


FRONT ELEVATION SIDE ELEVATION

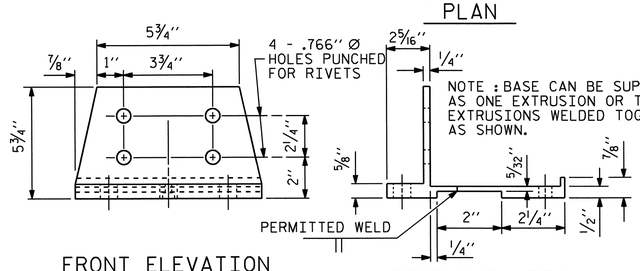
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

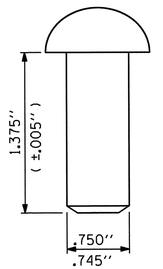


PLAN



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.

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.

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

PAY LENGTH = 224.89 LIN. FT.

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			27

STD. NO. BMR3

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

9/23/13

ASSEMBLED BY : B. L. GREEN	DATE : 9/18/12	
CHECKED BY : PEGGY ADKINS	DATE : 5/30/13	
DRAWN BY : EEM 6/94	REV. 5/7/03R	RWW/JTE
CHECKED BY : RGW 6/94	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

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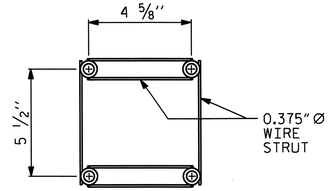
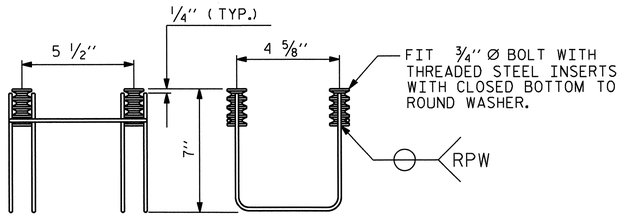
taverette



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(40 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.

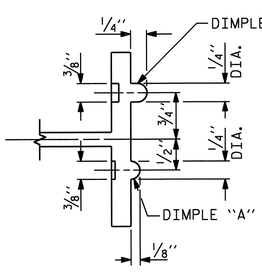
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

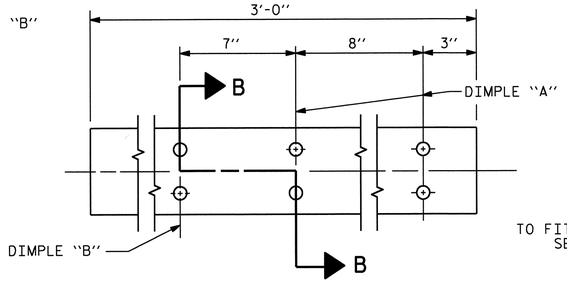
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

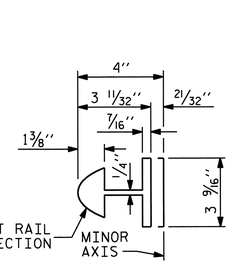
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4''Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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.



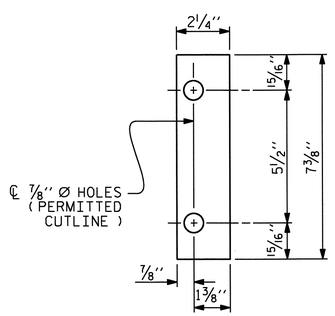
SECTION B - B



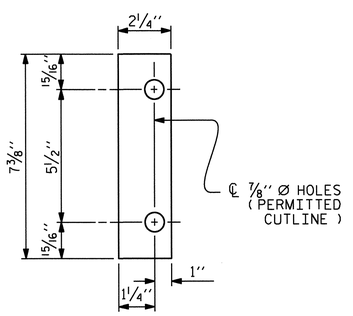


BAR SECTION

EXPANSION BAR DETAILS



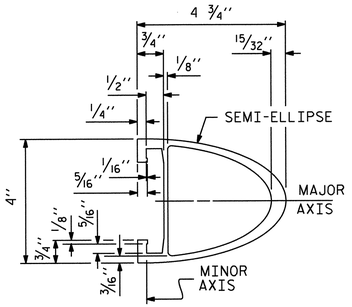
FRONT PLATE



REAR PLATE

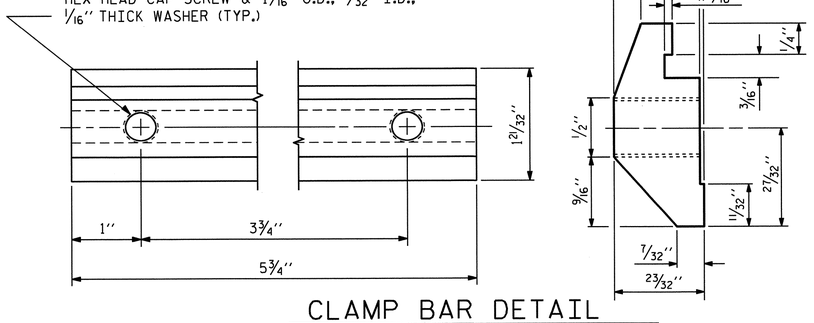
SHIM DETAILS

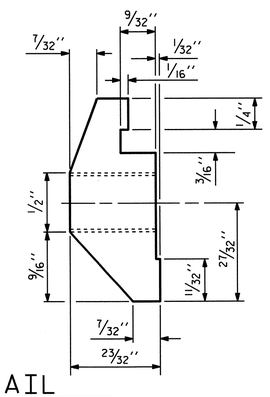
NOTE :
SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.



RAIL SECTION

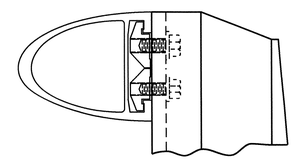
1/2'' Ø [13 THREAD] HOLE FOR 1/2'' Ø X 1'' STAINLESS STEEL HEX HEAD CAP SCREW & 1 1/16'' O.D., 17/32'' I.D., 1/16'' THICK WASHER (TYP.)



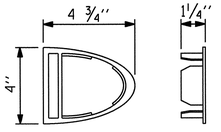


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4756
GUILFORD COUNTY
STATION: 15+98.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			27

ASSEMBLED BY : B. L. GREEN DATE : 9/18/12
CHECKED BY : PEGGY ADKINS DATE : 5/30/13

DRAWN BY : EEM 6/94
CHECKED BY : RGW 6/94

REV. 8/16/99 MAB/LES
REV. 5/1/06R KMM/GM
REV. 10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER BRADLEY E. MURRAY
9/23/13

08-AUG-2013 14:18
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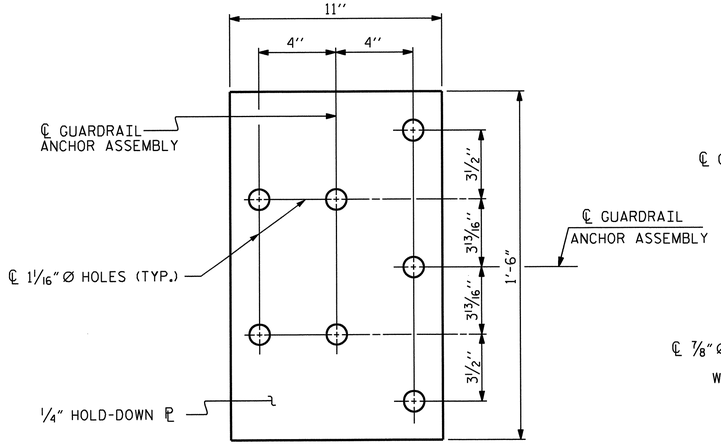
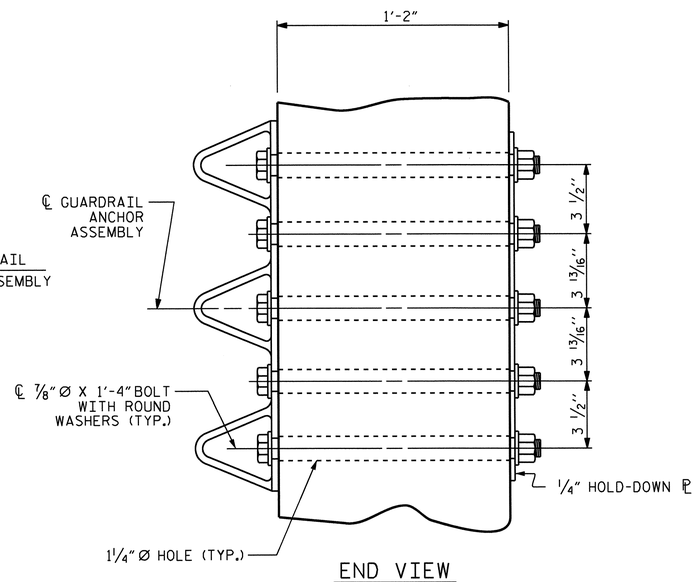
taverette

STD. NO. BMR4



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.

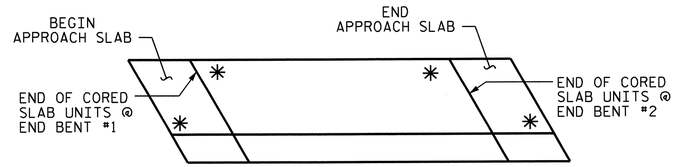
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

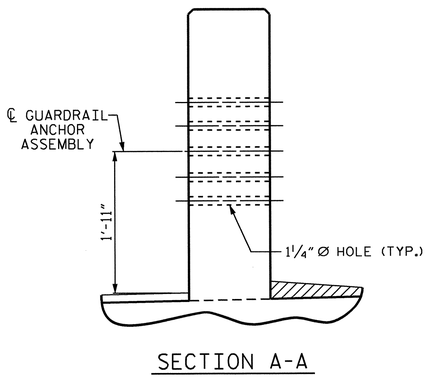
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.

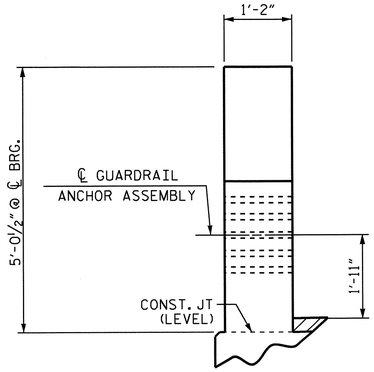


SKETCH SHOWING POINTS OF ATTACHMENT

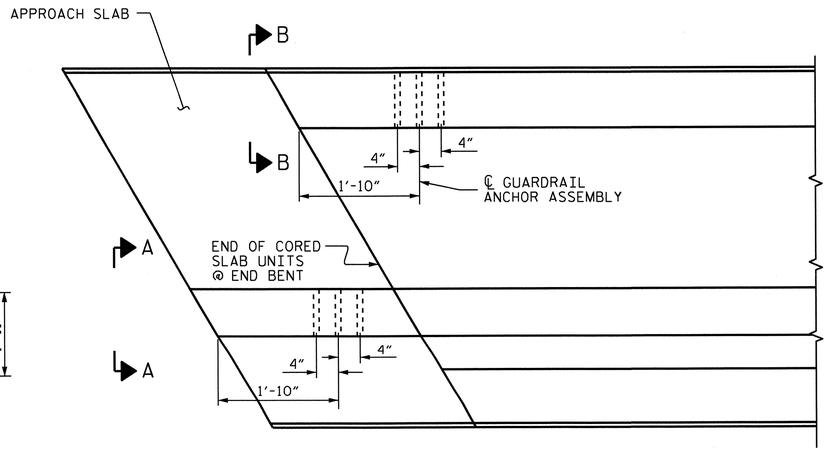
* LOCATION OF GUARDRAIL ATTACHMENT



SECTION A-A



SECTION B-B



PLAN

END BENT #1 SHOWN, END BENT #2 SIMILAR

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS AND 1'-2" X 4'-4 1/2" PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			27

STD. NO. GRA3

ASSEMBLED BY : B. L. GREEN DATE : 9/18/12
CHECKED BY : PEGGY ADKINS DATE : 5/30/13

DRAWN BY : MAA 5/10
CHECKED BY : GM 5/10

ADDED 5/6/10
REV. 10/1/11 MAA/GM
REV. 12/5/11 MAA/GM

LOCATION OF GUARDRAIL ANCHOR AT END POST & PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

08-AUG-2013 14:18
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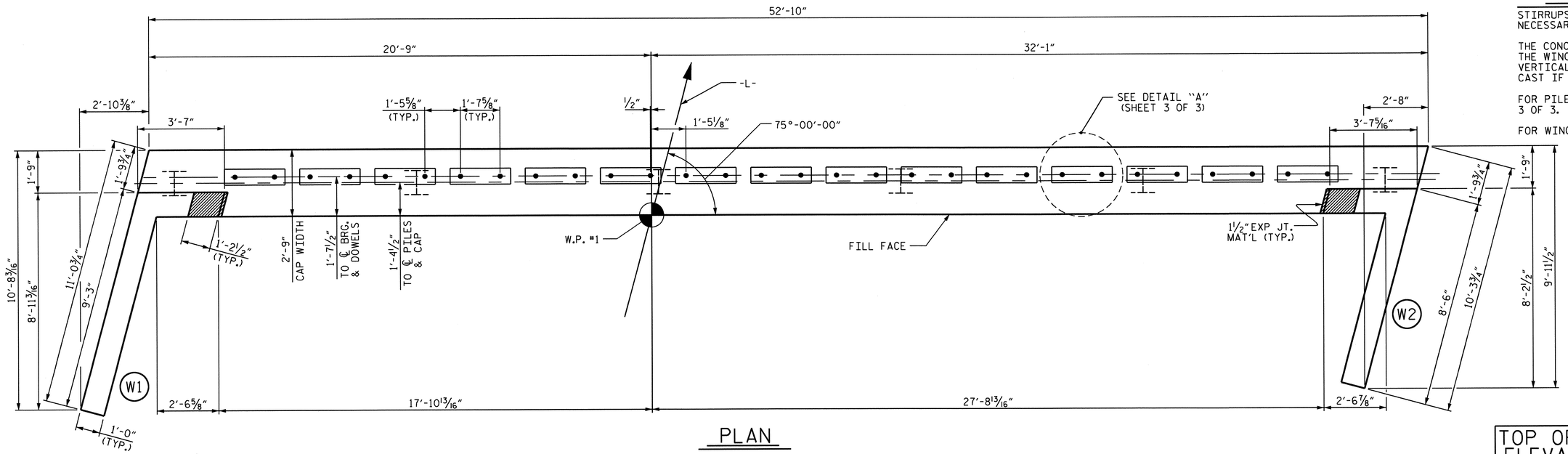
taverette



PLAN

NOTES

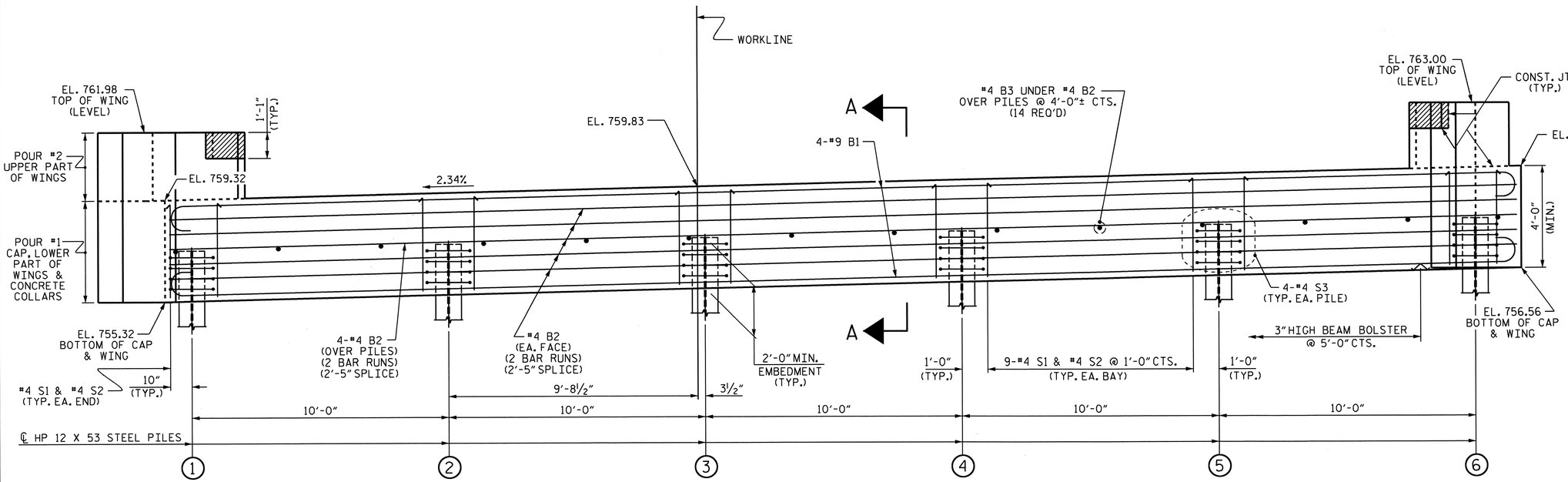
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

TOP OF PILE ELEVATIONS	
①	757.36
②	757.59
③	757.83
④	758.06
⑤	758.29
⑥	758.53



ELEVATION

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

PROJECT NO. B-4756
GUILFORD COUNTY
STATION: 15+98.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER
CARY E. MURRAY
9/23/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : B. L. GREEN DATE : 8/27/12
CHECKED BY : PEGGY PARISI DATE : 6/6/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:17
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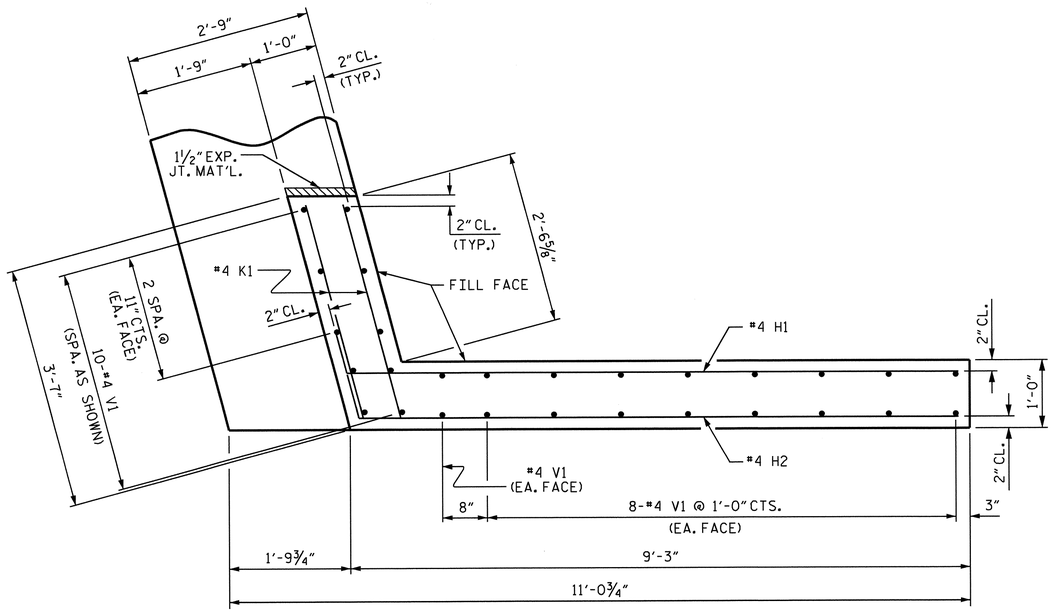
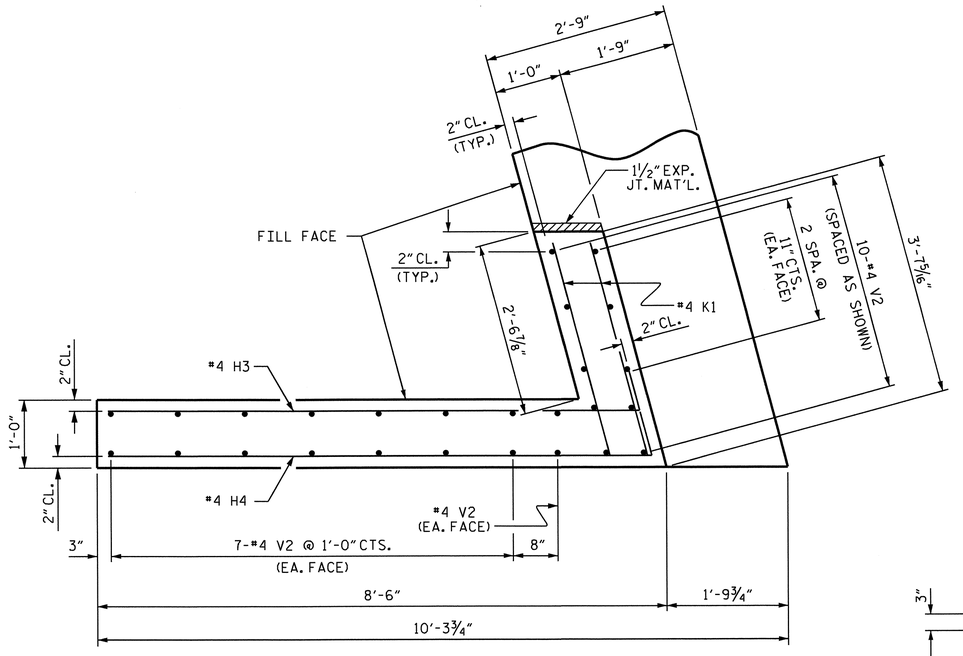
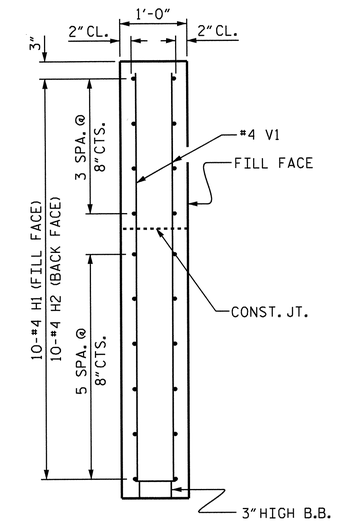
taverette



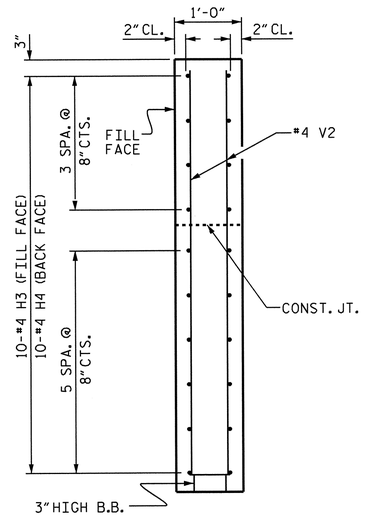
PLAN OF WING (W1)



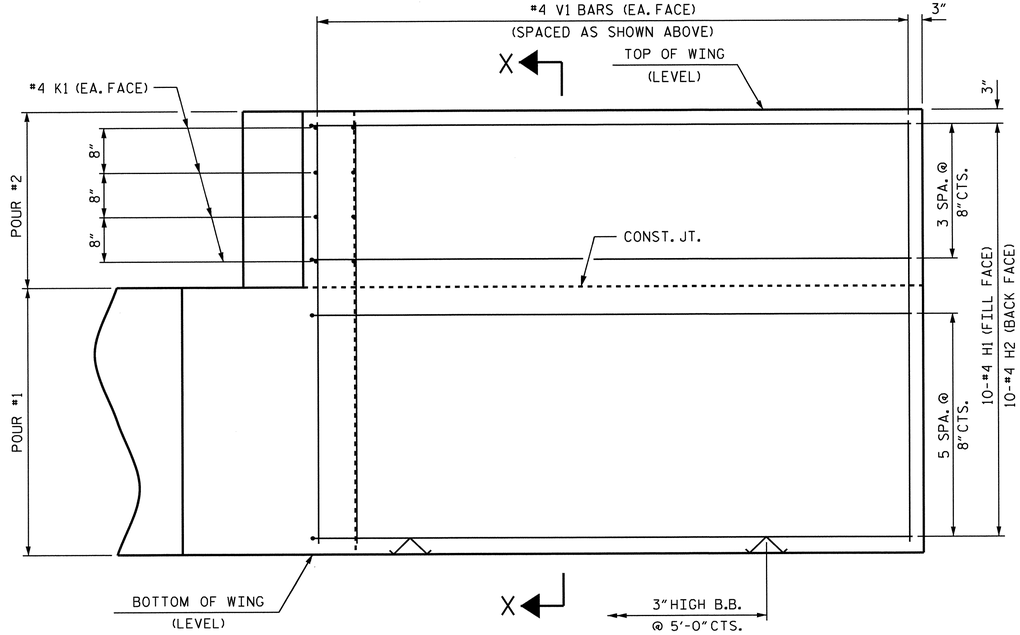
PLAN OF WING (W2)



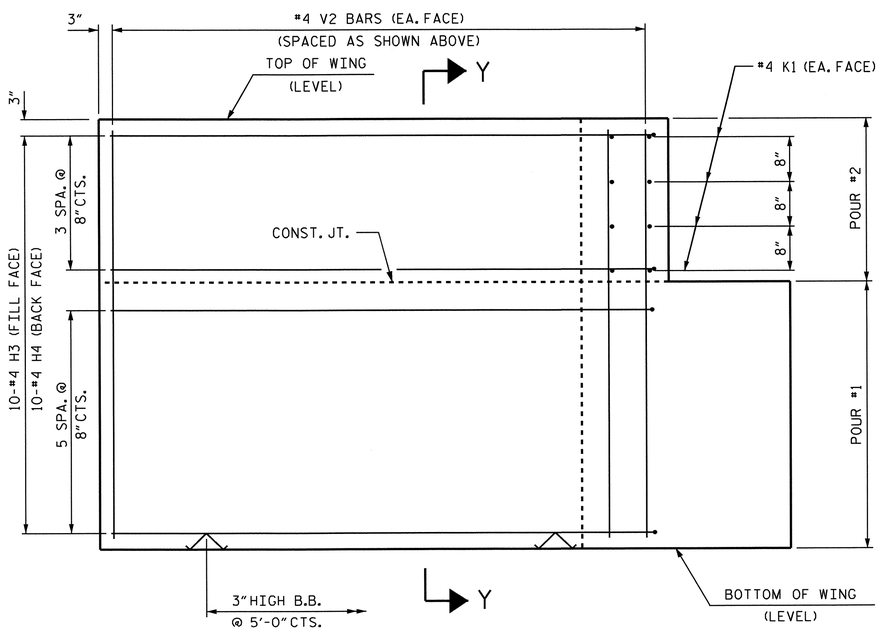
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

9/23/13

DRAWN BY : B. L. GREEN DATE : 8/27/12
CHECKED BY : PEGGY PARISI DATE : 6/6/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:17
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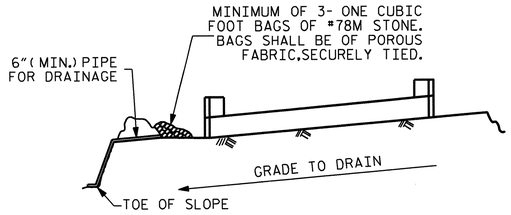
taverette

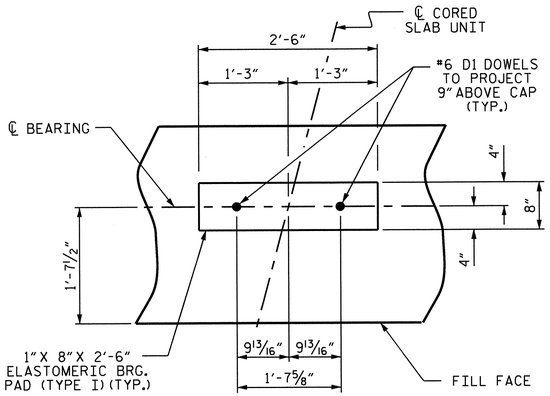


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

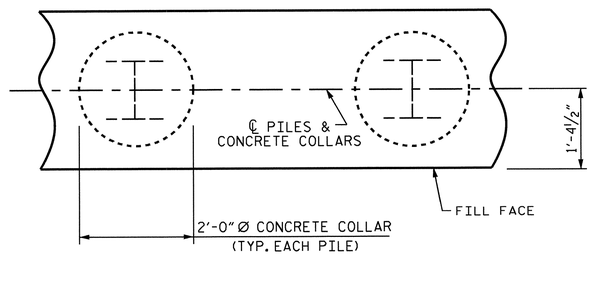
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

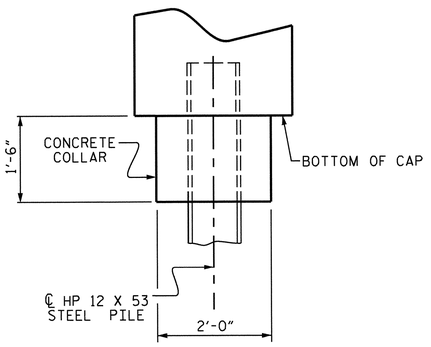
TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

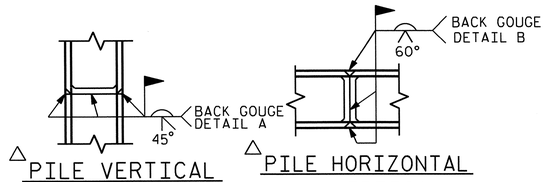


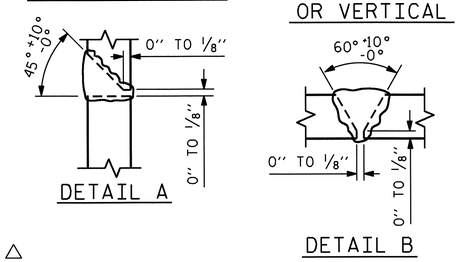
PLAN



ELEVATION

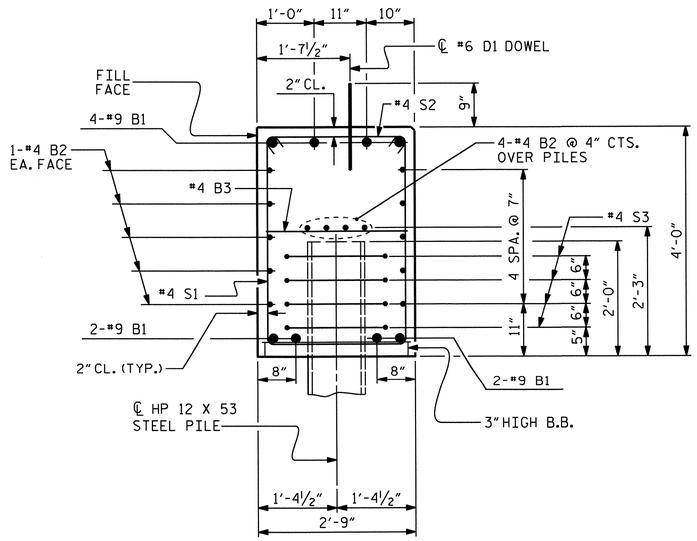
CORROSION PROTECTION FOR STEEL PILES DETAIL





△ POSITION OF PILE DURING WELDING.

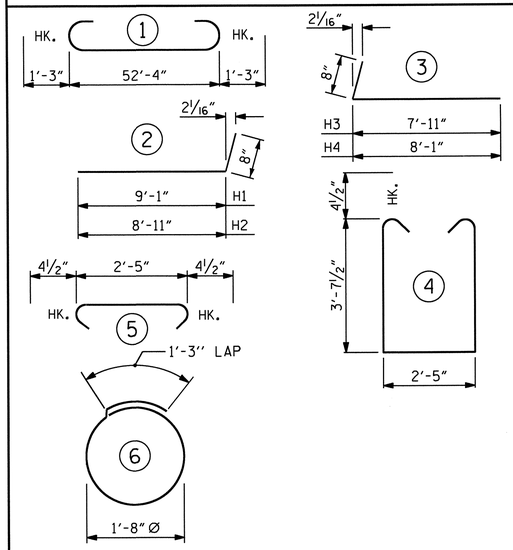
PILE SPLICE DETAILS



SECTION A-A

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 1
HP 12 X 53 STEEL PILES
NO: 6 LIN. FT.= 240

BILL OF MATERIAL

END BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	54'-10"	1491
B2	28	#4	STR	27'-6"	514
B3	14	#4	STR	2'-5"	23
D1	30	#6	STR	1'-6"	68
H1	10	#4	2	9'-9"	65
H2	10	#4	2	9'-7"	64
H3	10	#4	3	8'-7"	57
H4	10	#4	3	8'-9"	58
K1	16	#4	STR	3'-3"	35
S1	47	#4	4	10'-5"	327
S2	47	#4	5	3'-2"	99
S3	24	#4	6	6'-6"	104
V1	28	#4	STR	6'-3"	117
V2	26	#4	STR	6'-1"	106
REINFORCING STEEL					3128 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	24.9 C.Y.
POUR #2	UPPER PART OF WINGS	2.2 C.Y.
TOTAL CLASS A CONCRETE		27.1 C.Y.

PROJECT NO. B-4756
GUILFORD COUNTY
STATION: 15+98.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

DRAWN BY : B. L. GREEN DATE : 8/27/12
CHECKED BY : PEGGY PARISI DATE : 6/6/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:17
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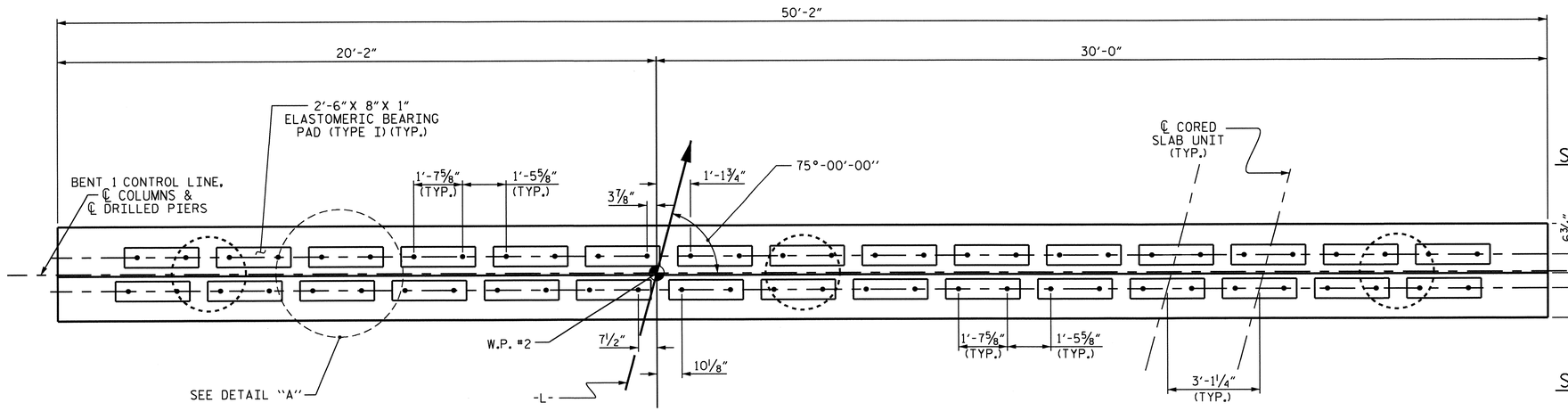
taverette



NOTES

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

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

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

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

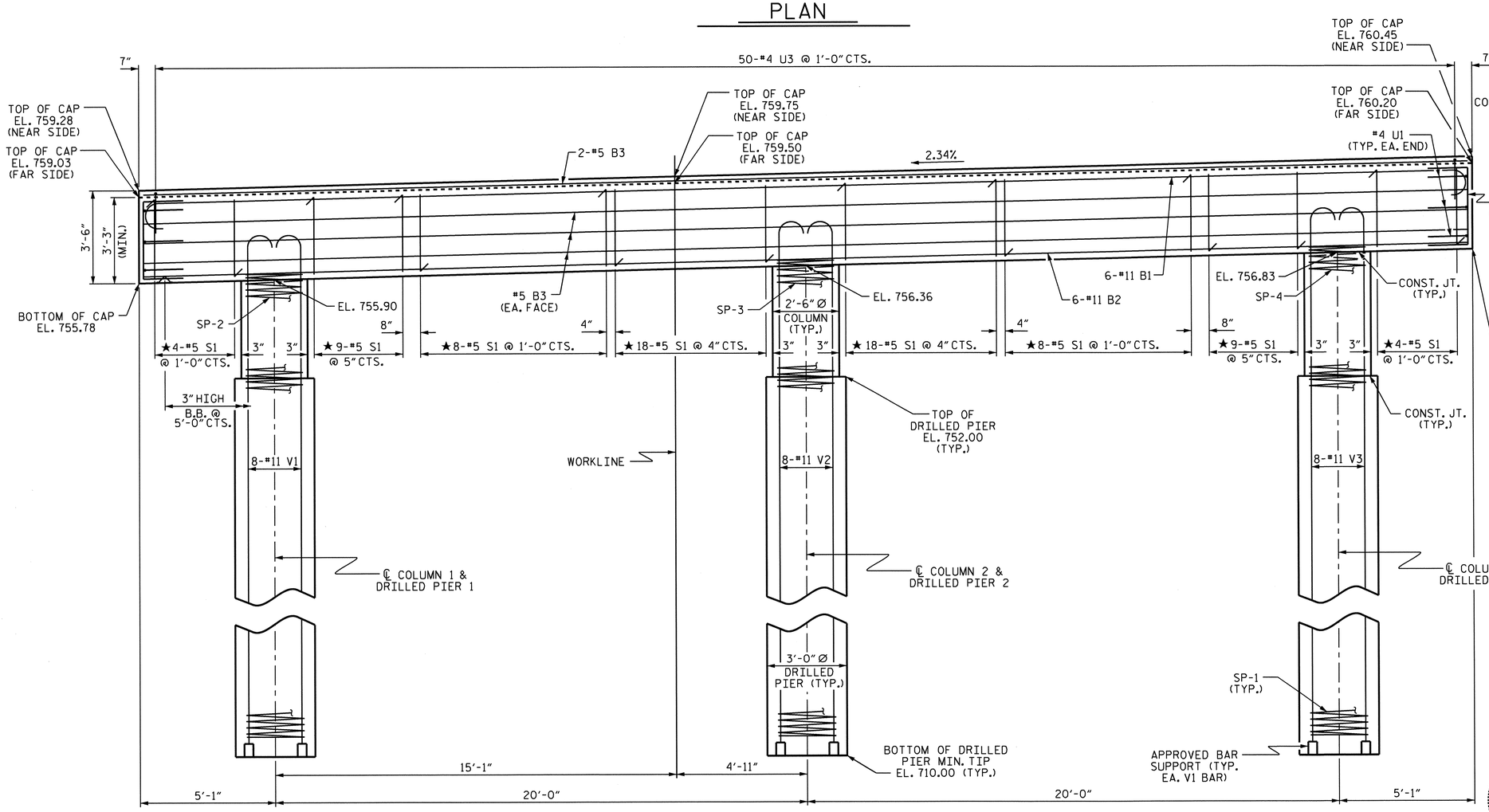
★INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

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

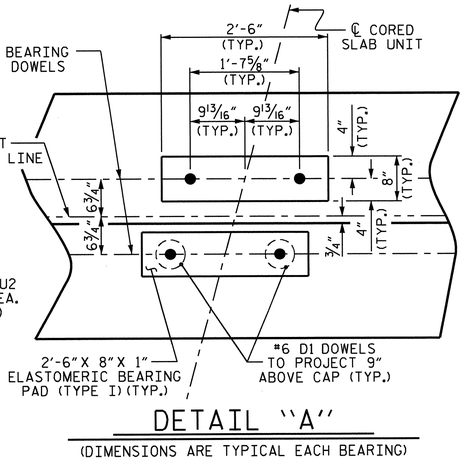
SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIERS WILL NOT BE PERMITTED.

PLAN



ELEVATION

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



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : B. L. GREEN DATE : 9/26/12
CHECKED BY : PEGGY PARISI DATE : 6/5/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER BENJAMIN L. GREEN 9/23/13

23-SEP-2013 09:30
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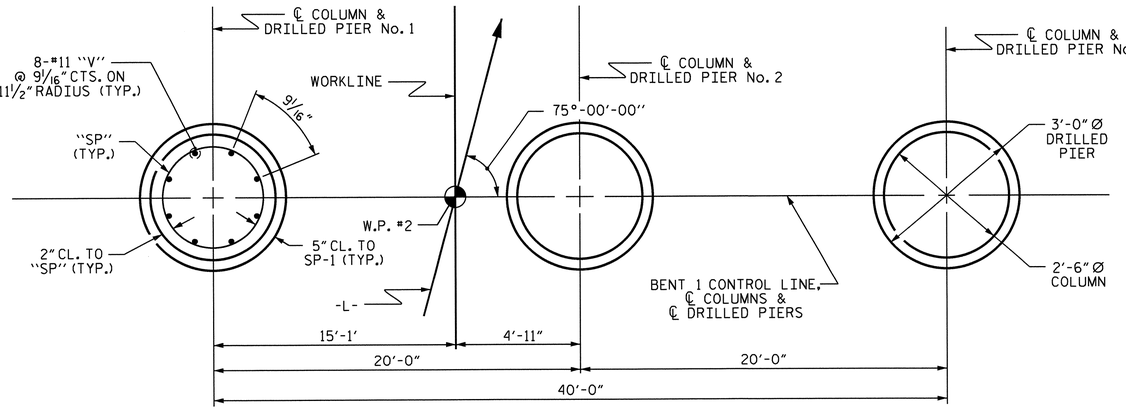
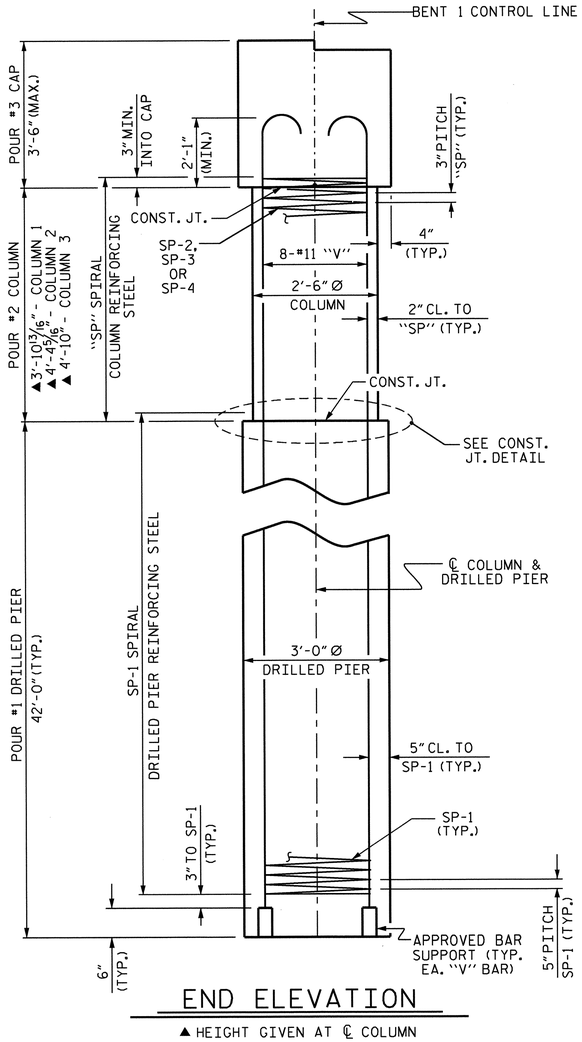
emurray

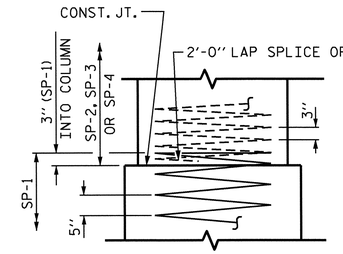


PLAN OF DRILLED PIERS & COLUMNS

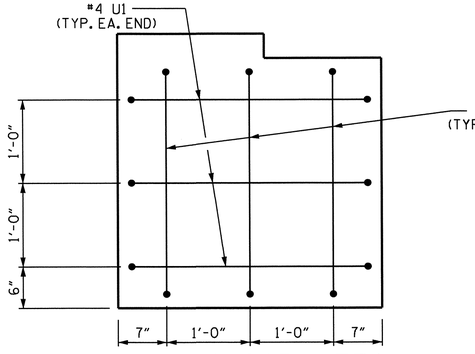


END ELEVATION

▲ HEIGHT GIVEN AT ℄ COLUMN

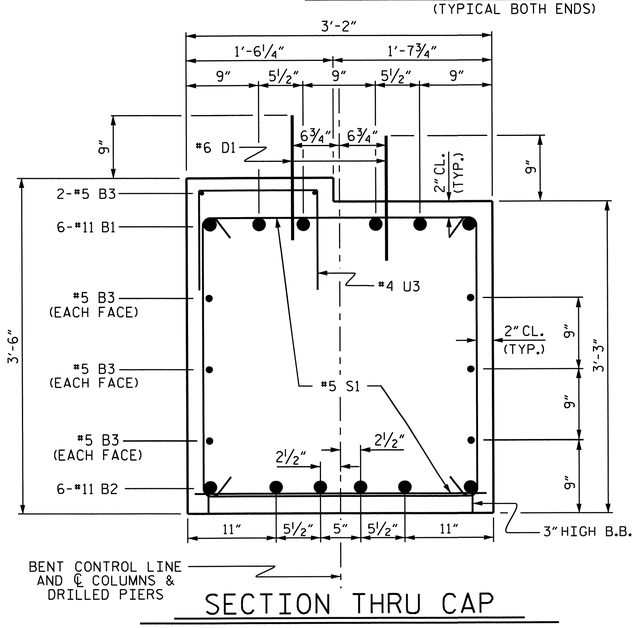


CONSTRUCTION JOINT DETAIL



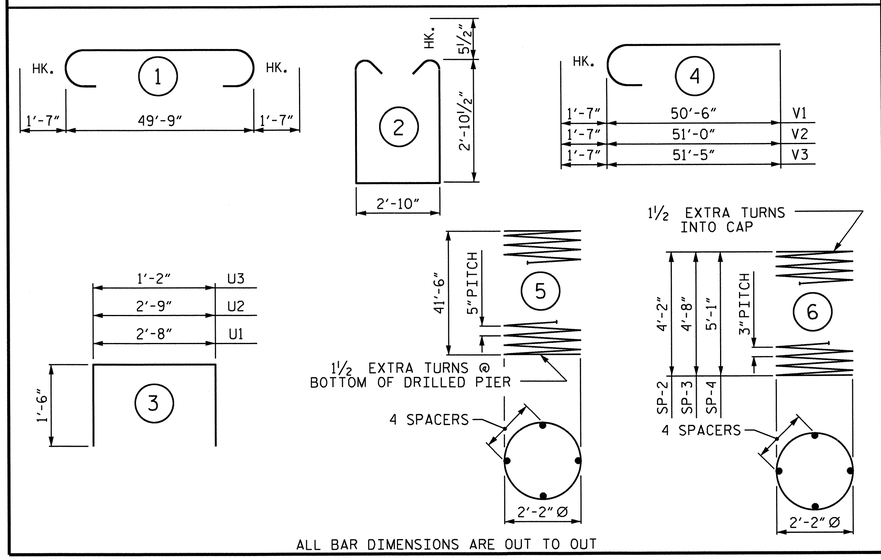
END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION THRU CAP

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	52'-11"	1687
B2	6	#11	STR	49'-10"	1589
B3	8	#5	STR	49'-10"	416
D1	60	#6	STR	1'-6"	135
S1	78	#5	2	9'-6"	773
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-9"	23
U3	50	#4	3	4'-2"	139
V1	8	#11	4	52'-1"	2214
V2	8	#11	4	52'-7"	2235
V3	8	#11	4	53'-0"	2253

REINFORCING STEEL 11487 LBS.

SP-1	3	*	5	673'-0"	2106
SP-2	1	**	6	120'-10"	81
SP-3	1	**	6	133'-5"	89
SP-4	1	**	6	145'-11"	97

SPIRAL COLUMN REINFORCING STEEL 2373 LBS.

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

** THE SP-2, SP-3 & SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	2.4 C.Y.
POUR #3 (CAP)	19.8 C.Y.
TOTAL CLASS A CONCRETE	22.2 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	33.0 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	24.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	102.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	51.0 LIN. FT.
CSL TUBES	522.0 LIN. FT.

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EARLY E. MURRAY 9/23/13

DRAWN BY : B. L. GREEN DATE : 9/26/12
CHECKED BY : PEGGY PARISI DATE : 6/5/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:15
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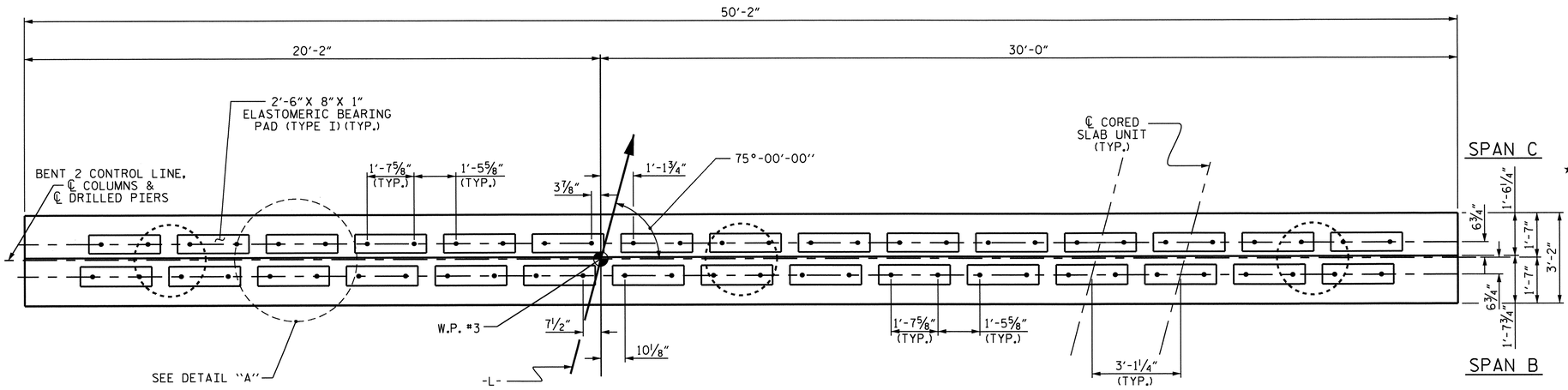
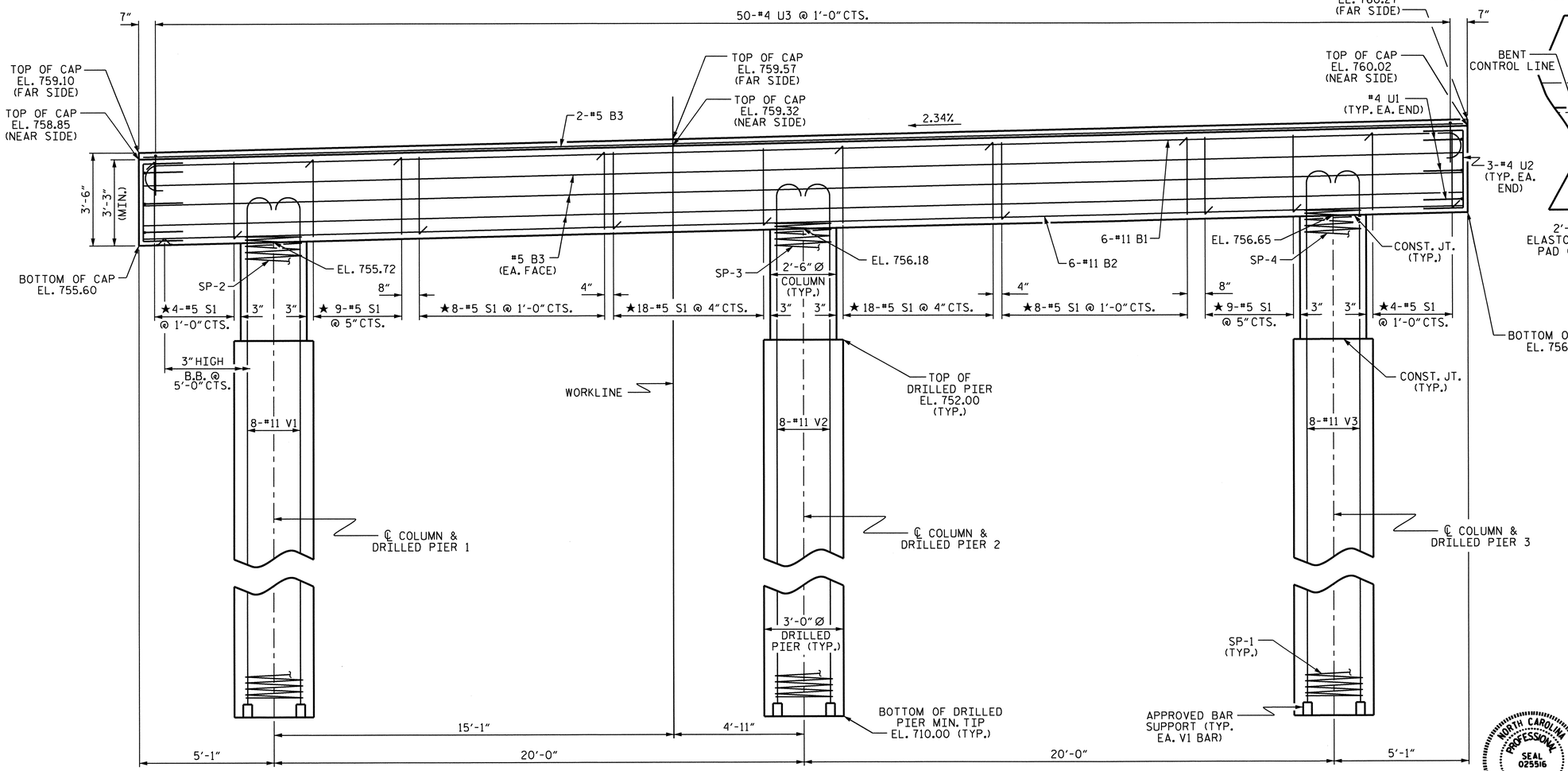
taverette

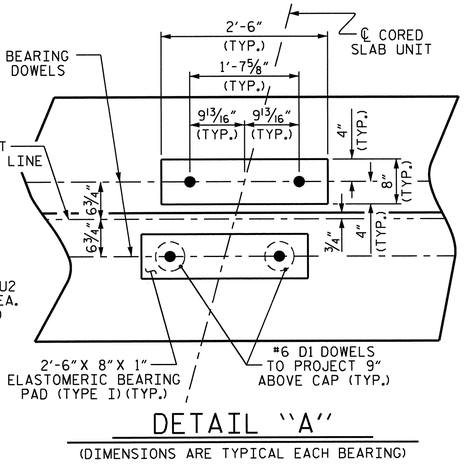


PLAN



ELEVATION

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



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

NOTES

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

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

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

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

★INVERT ALTERNATE STIRRUPS.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

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

SPLICING OF THE LONGITUDINAL BARS IN THE DRILLED PIERS WILL NOT BE PERMITTED.

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

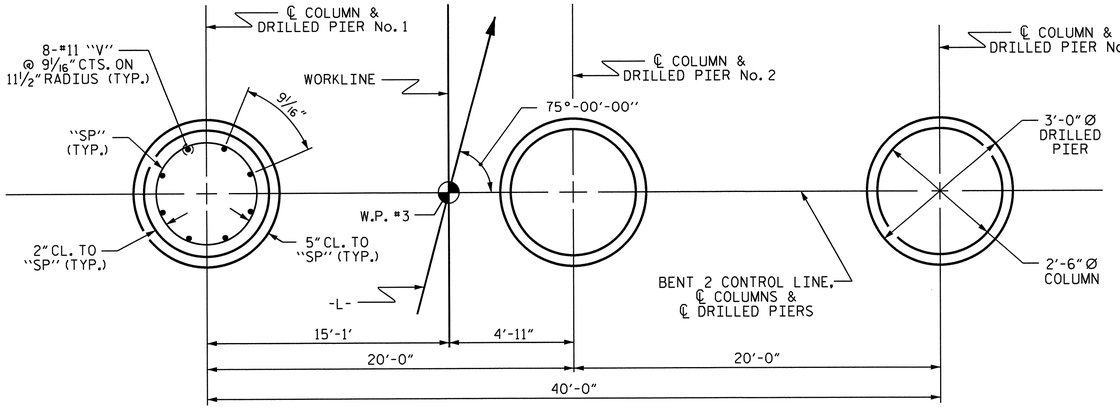
BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			27

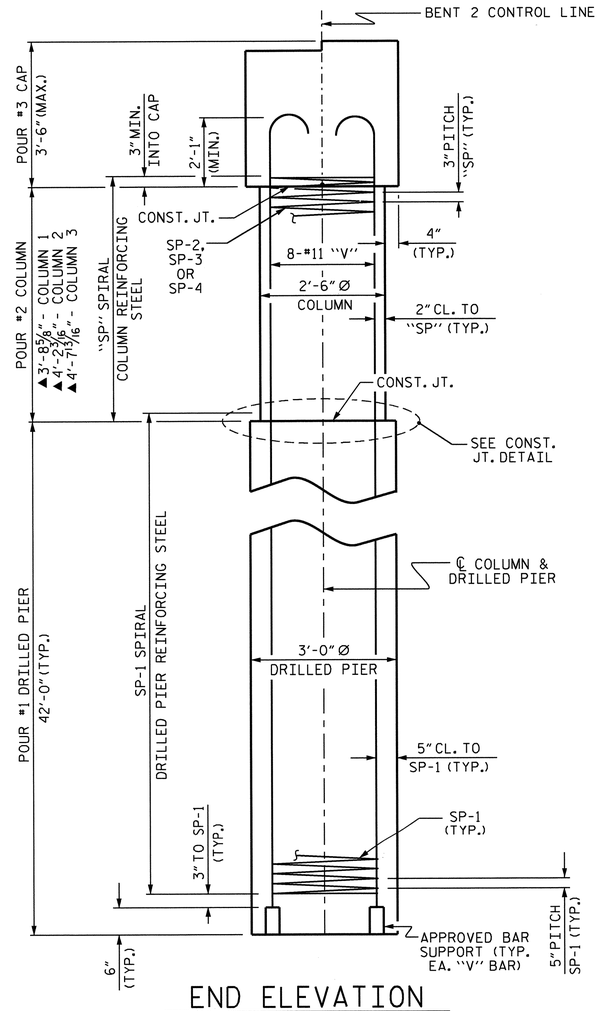
NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

DRAWN BY : B. L. GREEN DATE : 9/26/12
CHECKED BY : PEGGY PARISI DATE : 6/5/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

23-SEP-2013 09:30
R:\TIPProjects-B\B4756\Structures\Plans\bgreen\B-4756_SD_B*.dgn
emurray

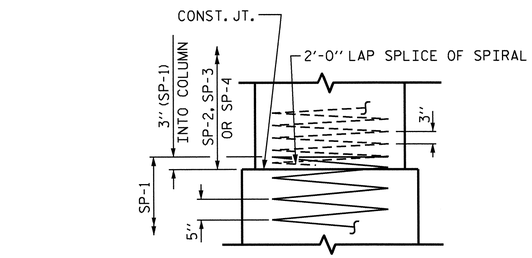


PLAN OF DRILLED PIERS & COLUMNS

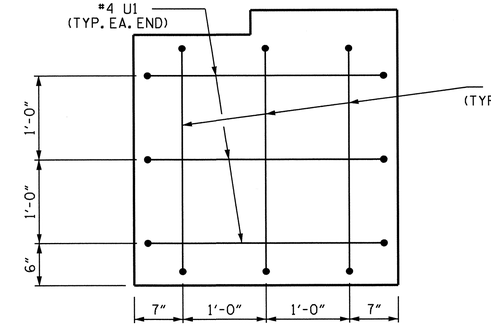


END ELEVATION

▲ HEIGHT GIVEN AT ℄ COLUMN

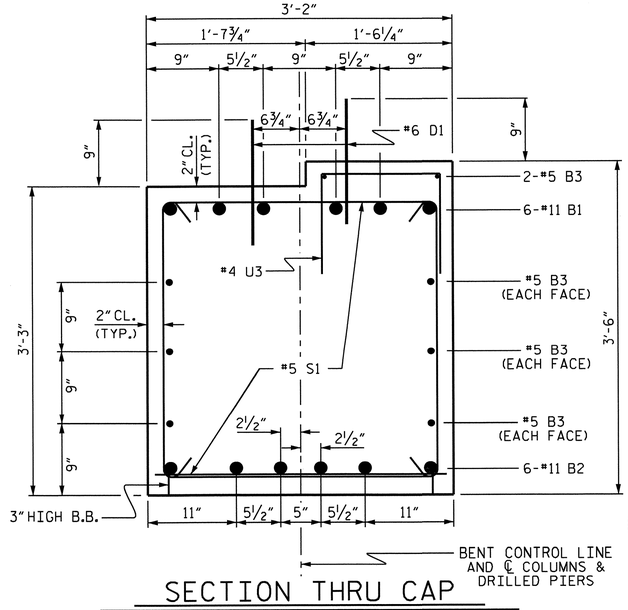


CONSTRUCTION JOINT DETAIL



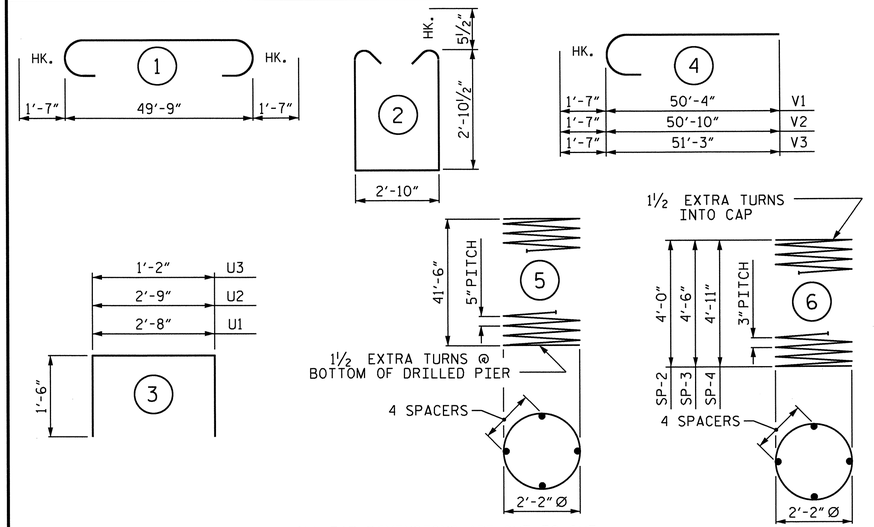
END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION THRU CAP

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	1	52'-11"	1687
B2	6	#11	STR	49'-10"	1589
B3	8	#5	STR	49'-10"	416
D1	60	#6	STR	1'-6"	135
S1	78	#5	2	9'-6"	773
U1	6	#4	3	5'-8"	23
U2	6	#4	3	5'-9"	23
U3	50	#4	3	4'-2"	139
V1	8	#11	4	51'-11"	2207
V2	8	#11	4	52'-5"	2228
V3	8	#11	4	52'-10"	2246

REINFORCING STEEL 11466 LBS.

SP-1	3	*	5	673'-0"	2106
SP-2	1	**	6	116'-1"	78
SP-3	1	**	6	128'-6"	86
SP-4	1	**	6	141'-0"	94

SPIRAL COLUMN REINFORCING STEEL 2364 LBS.

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

** THE SP-2, SP-3 & SP-4 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	2.3 C.Y.
POUR #3 (CAP)	19.8 C.Y.
TOTAL CLASS A CONCRETE	22.1 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	33.0 C.Y.
3'-0" Ø DRILLED PIER NOT IN SOIL	24.0 LIN. FT.
3'-0" Ø DRILLED PIER IN SOIL	102.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-0" Ø DRILLED PIER	51.0 LIN. FT.
CSL TUBES	522.0 LIN. FT.

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

DRAWN BY :	B.L. GREEN	DATE :	9/26/12
CHECKED BY :	PEGGY PARISI	DATE :	6/5/13
DESIGN ENGINEER OF RECORD:	B.L. GREEN	DATE :	8/8/13

08-AUG-2013 14:15
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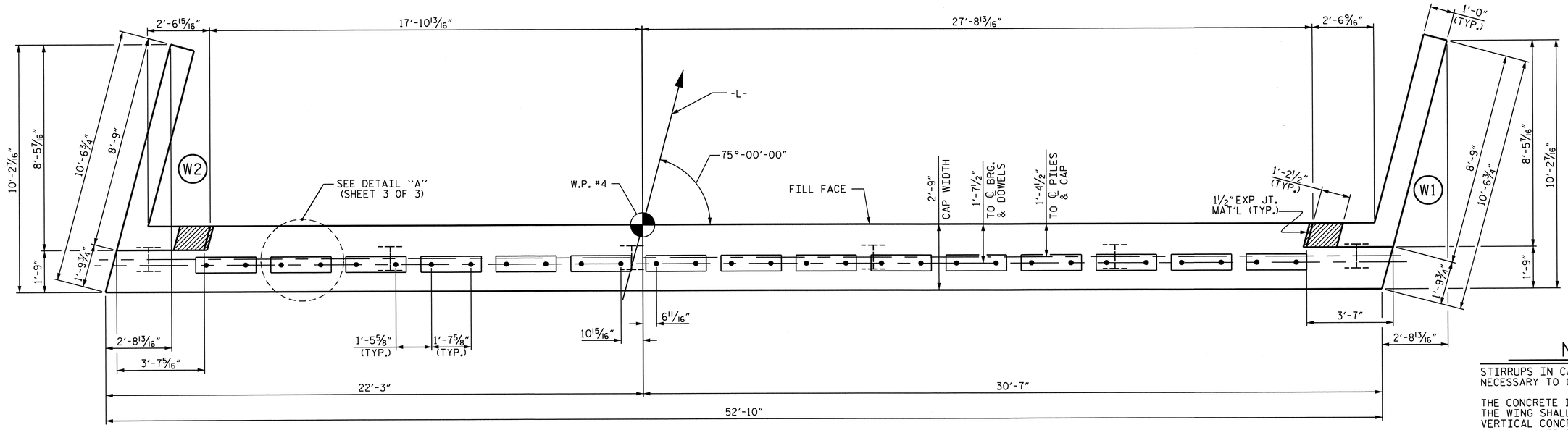
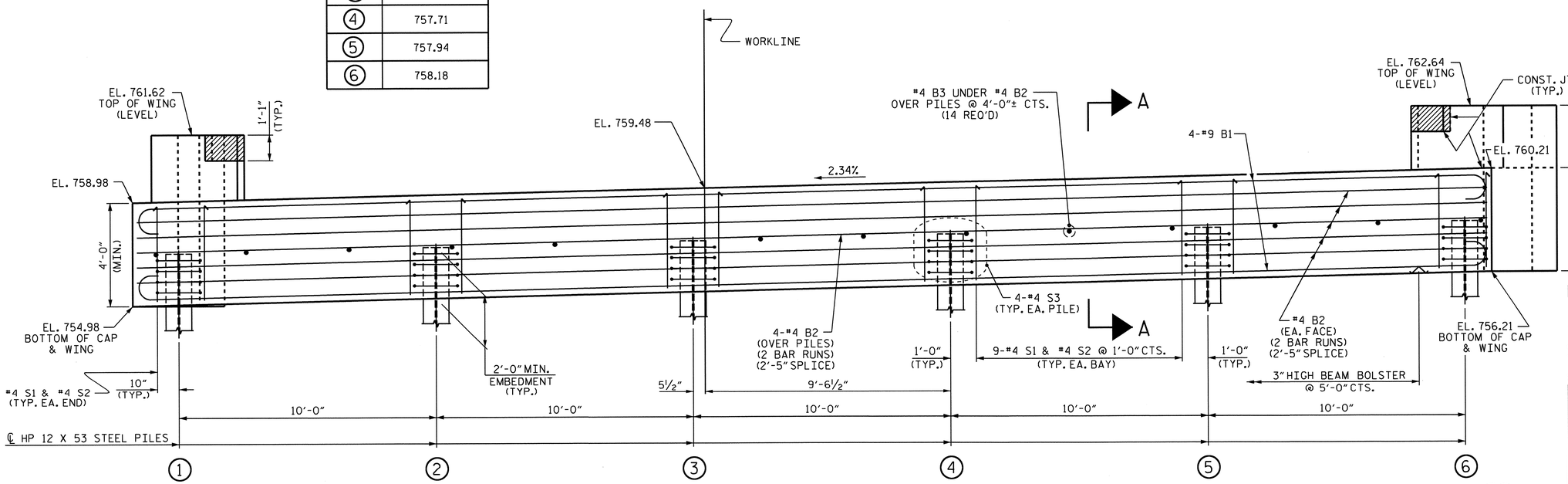
taverette



PLAN

TOP OF PILE ELEVATIONS	
①	757.01
②	757.24
③	757.48
④	757.71
⑤	757.94
⑥	758.18



ELEVATION

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

NOTES

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

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

FOR WING DETAILS, SEE SHEET 2 OF 3.

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			27

DRAWN BY : B. L. GREEN DATE : 8/27/12
CHECKED BY : PEGGY PARISI DATE : 6/6/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:12
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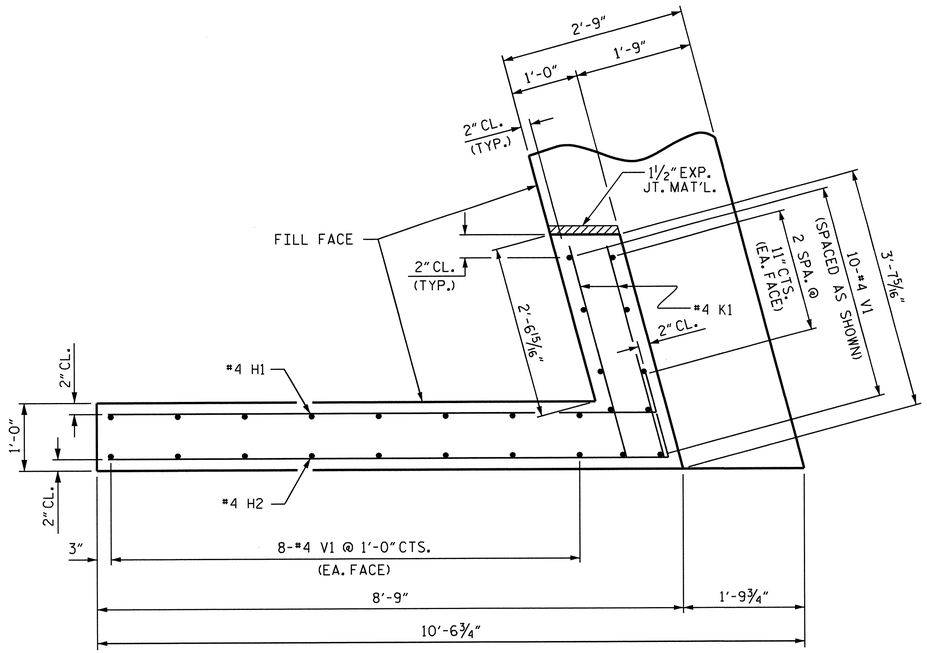
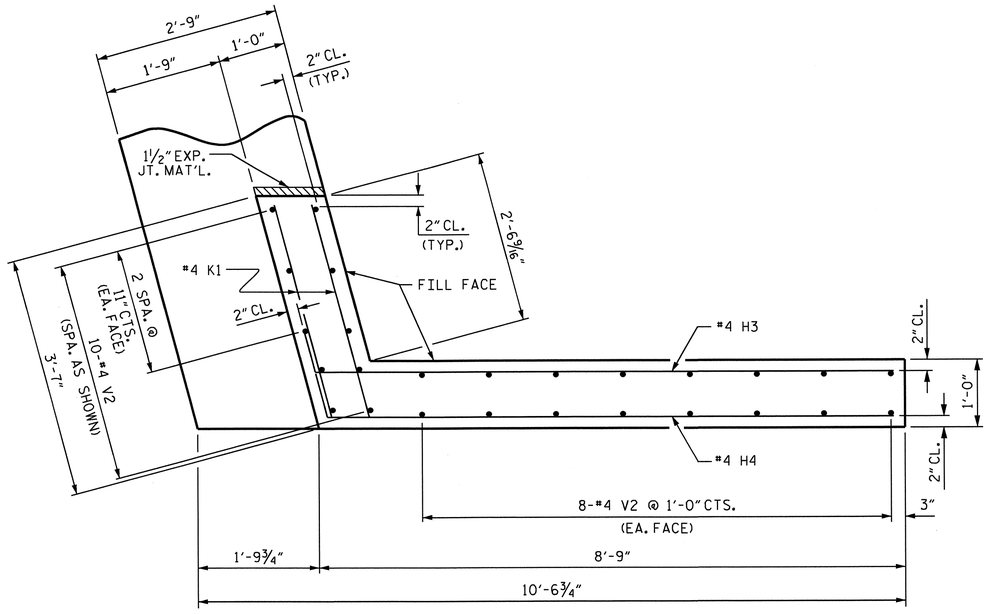
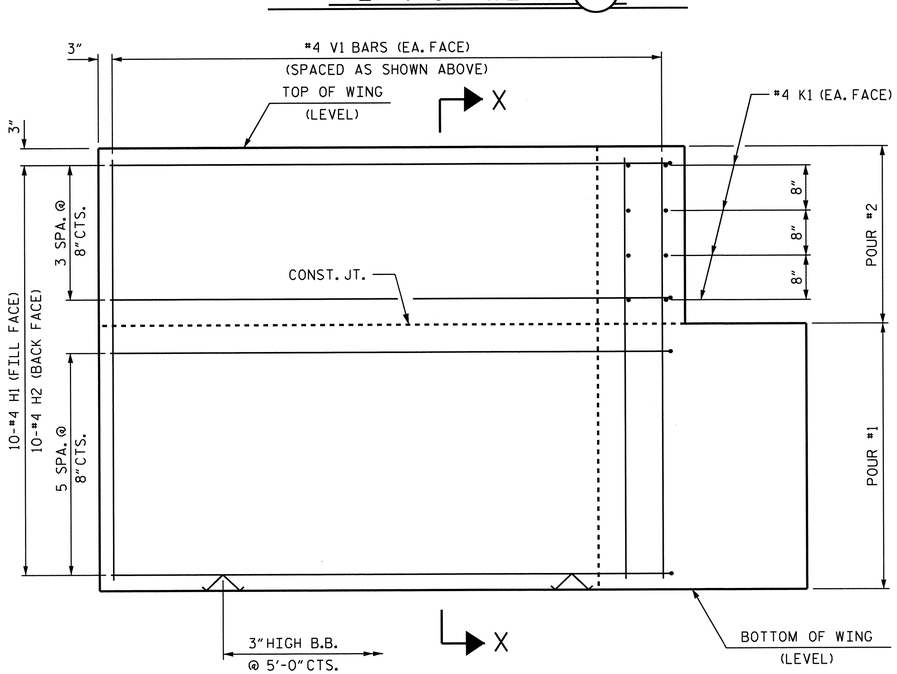
taverette



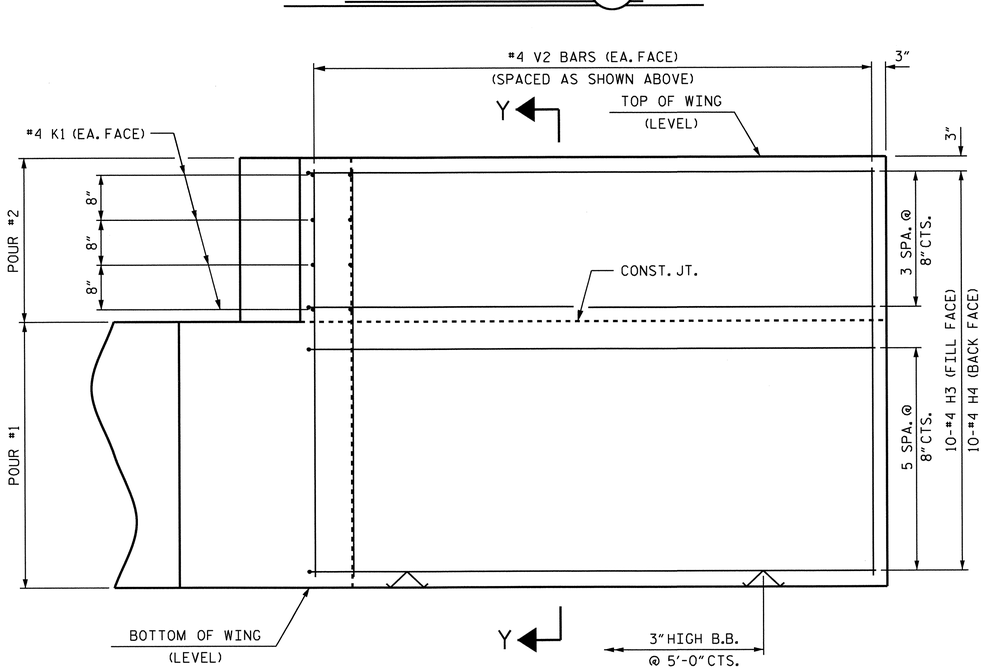
PLAN OF WING (W2)



PLAN OF WING (W1)

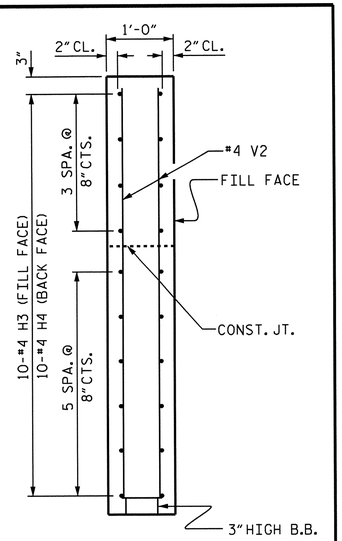


ELEVATION OF WING (W2)

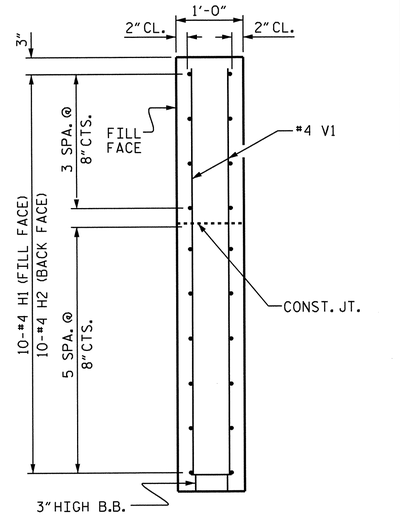


ELEVATION OF WING (W1)

WING DETAILS



SECTION Y-Y



SECTION X-X

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

DRAWN BY : B. L. GREEN DATE : 8/27/12
CHECKED BY : PEGGY PARISI DATE : 6/6/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:11
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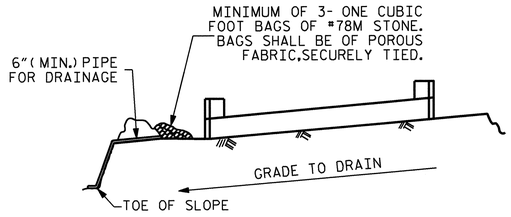
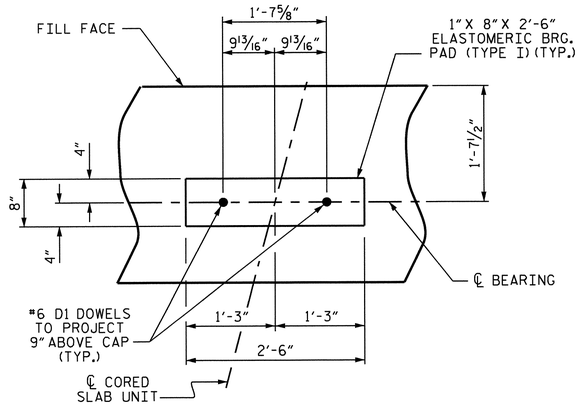


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

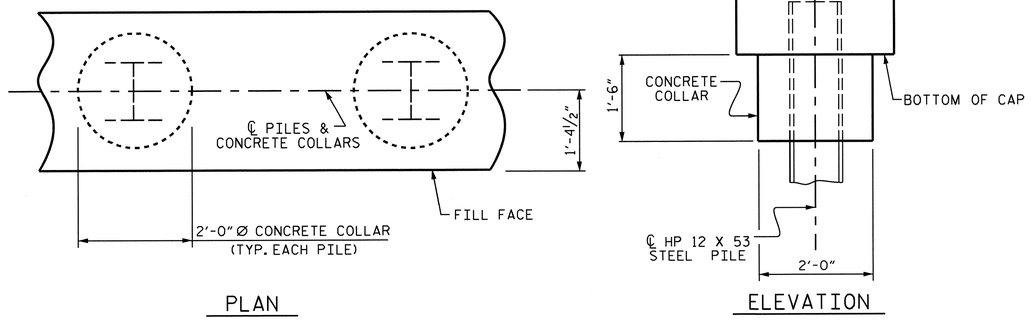
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT

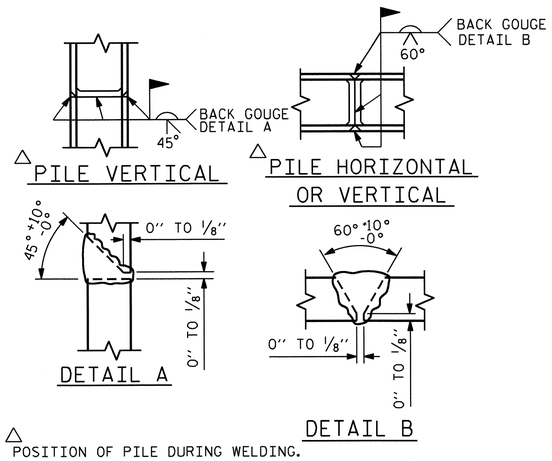


DETAIL "A"



PLAN ELEVATION

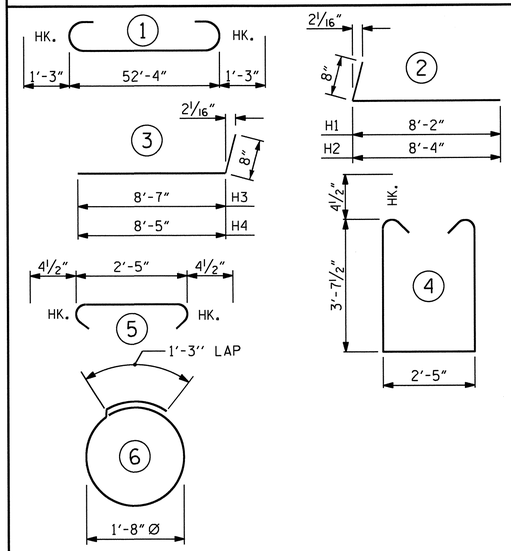
CORROSION PROTECTION FOR STEEL PILES DETAIL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

END BENT No. 2
HP 12 X 53 STEEL PILES
NO: 6 LIN. FT.= 270

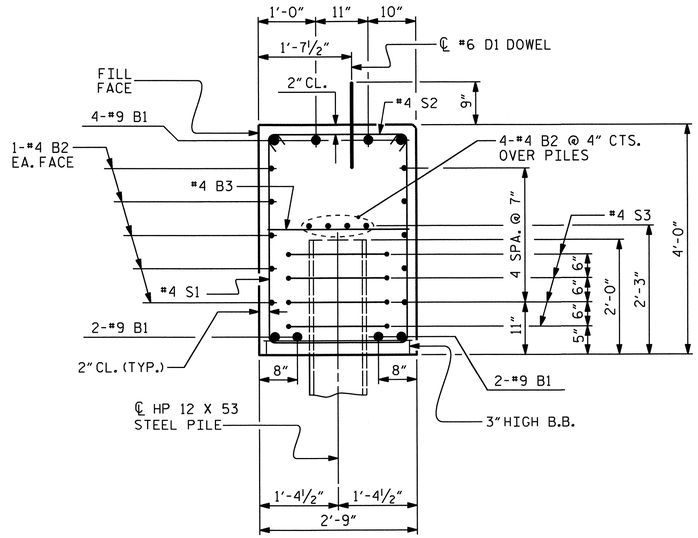
BILL OF MATERIAL

END BENT NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	54'-10"	1491
B2	28	#4	STR	27'-6"	514
B3	14	#4	STR	2'-5"	23
D1	30	#6	STR	1'-6"	68
H1	10	#4	2	8'-10"	59
H2	10	#4	2	9'-0"	60
H3	10	#4	3	9'-3"	62
H4	10	#4	3	9'-1"	61
K1	16	#4	STR	3'-3"	35
S1	47	#4	4	10'-5"	327
S2	47	#4	5	3'-2"	99
S3	24	#4	6	6'-6"	104
V1	26	#4	STR	6'-3"	109
V2	26	#4	STR	6'-1"	106
REINFORCING STEEL					3118 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	24.9 C.Y.
POUR #2	UPPER PART OF WINGS	2.1 C.Y.
TOTAL CLASS A CONCRETE		27.0 C.Y.



SECTION A-A

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

PROJECT NO. B-4756
GUILFORD COUNTY
STATION: 15+98.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			27

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY
9/23/13

DRAWN BY : B. L. GREEN DATE : 8/27/12
CHECKED BY : PEGGY PARISI DATE : 6/6/13
DESIGN ENGINEER OF RECORD: B. L. GREEN DATE : 8/8/13

08-AUG-2013 14:11
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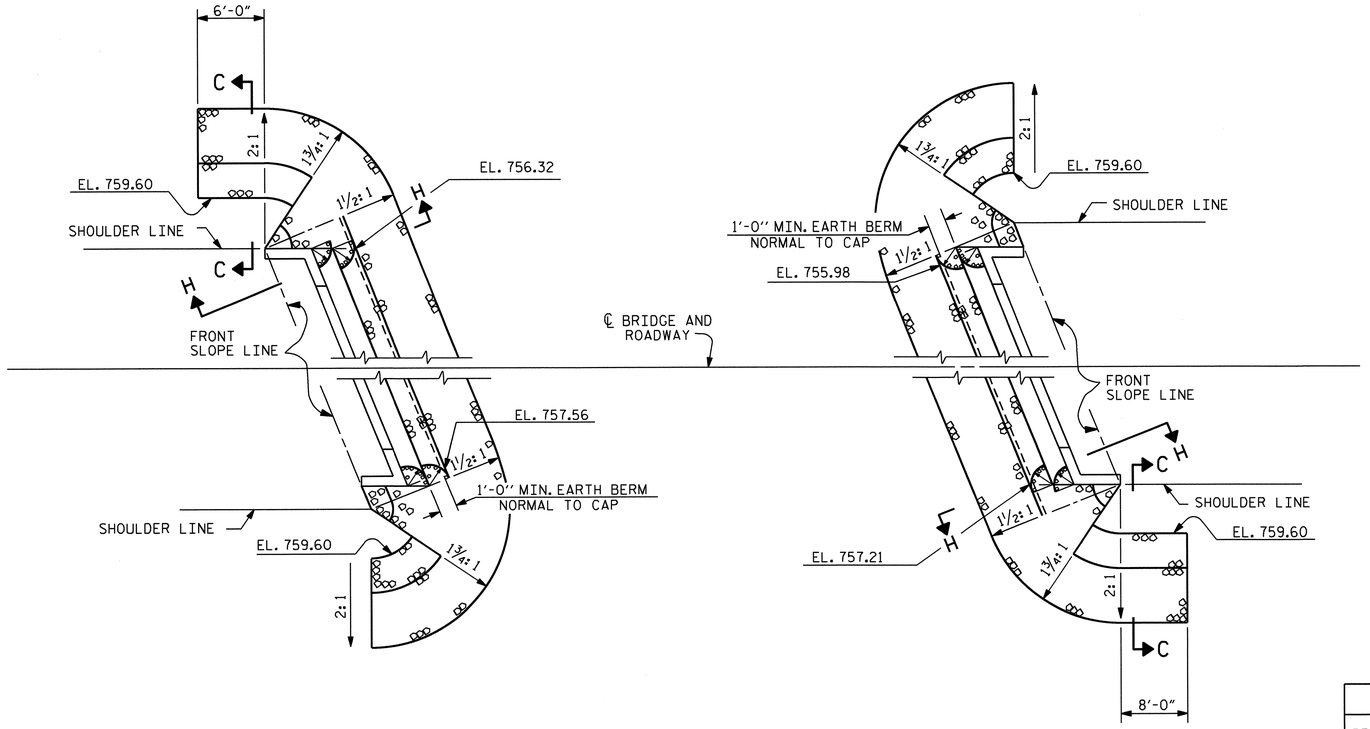
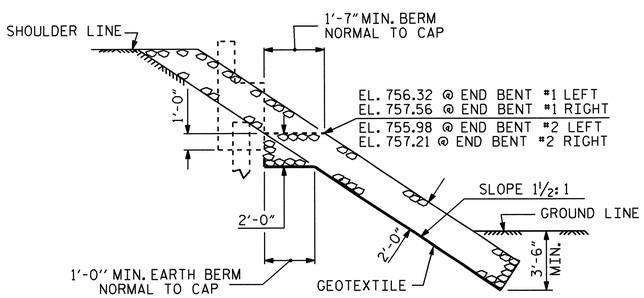
taverette

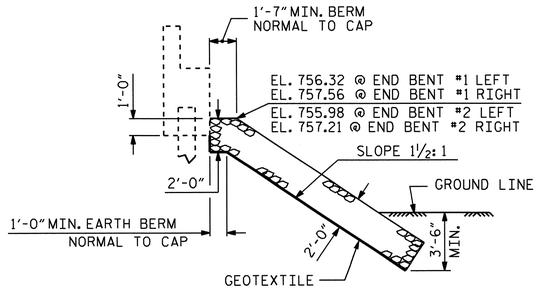


PLAN

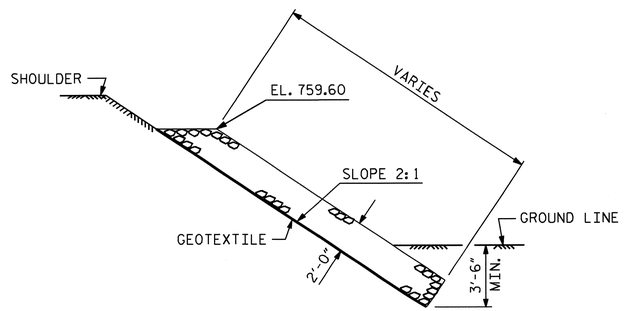
ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+98.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	113	126
END BENT 2	137	152



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4756
GUILFORD COUNTY
STATION: 15+98.00 -L-

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

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY C. MURRAY
9/23/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			27

ASSEMBLED BY : PEGGY ADKINS DATE : 6-11-13
CHECKED BY : B.L. GREEN DATE : 7-3-13

DRAWN BY : REK 1/84
CHECKED BY : RDU 1/84

REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM
REV. 12/21/11 MAA/GM

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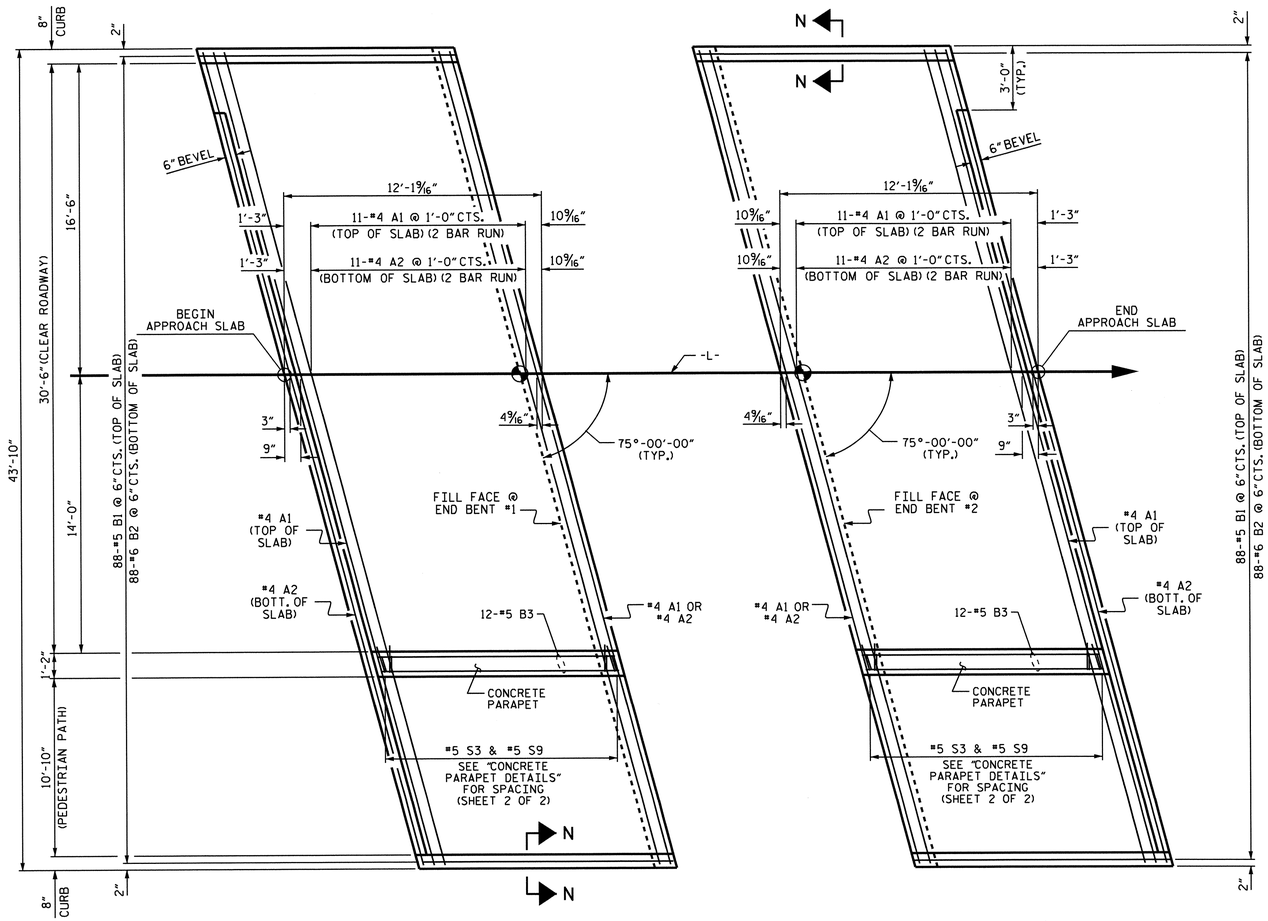
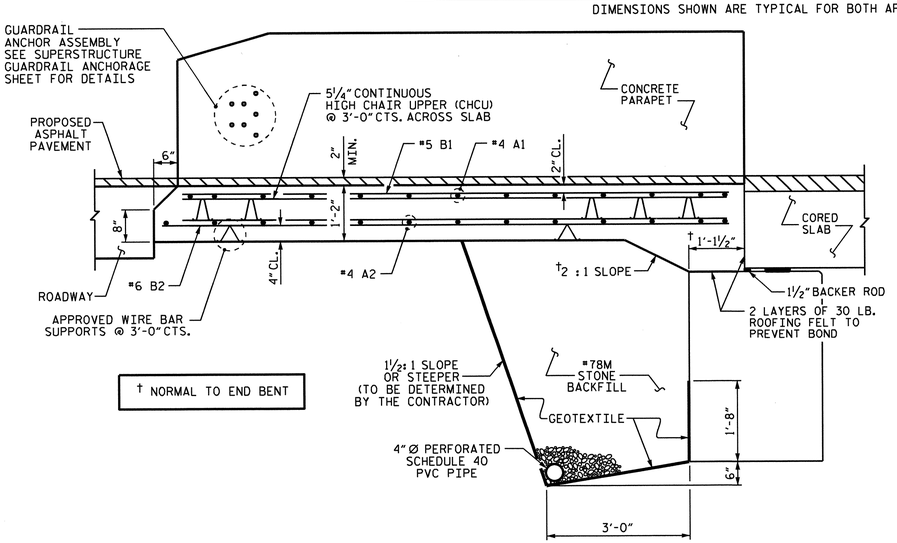
STD. NO. RR1 (Sht 1)



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

NOTES

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

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

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

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

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

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

APPROACH SLAB GROOVING IS NOT REQUIRED.

THE COST OF THE CONCRETE PARAPET ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR APPROACH SLABS.

BILL OF MATERIAL

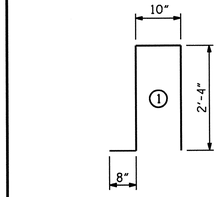
APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	23'-7"	410
A2	26	#4	STR	23'-5"	407
* B1	88	#5	STR	11'-3"	1033
B2	88	#6	STR	11'-9"	1553
* S3	17	#5	1	6'-2"	109
REINFORCING STEEL				LBS.	1960
* EPOXY COATED REINFORCING STEEL				LBS.	1552
CLASS AA CONCRETE				C.Y.	26.4

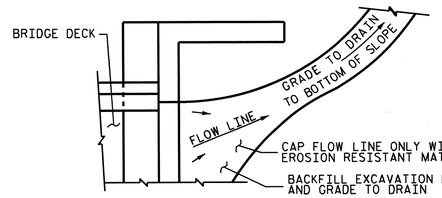
APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	26	#4	STR	23'-7"	410
A2	26	#4	STR	23'-5"	407
* B1	88	#5	STR	11'-3"	1033
B2	88	#6	STR	11'-9"	1553
* S3	17	#5	1	6'-2"	109
REINFORCING STEEL				LBS.	1960
* EPOXY COATED REINFORCING STEEL				LBS.	1552
CLASS AA CONCRETE				C.Y.	26.4

BAR TYPE

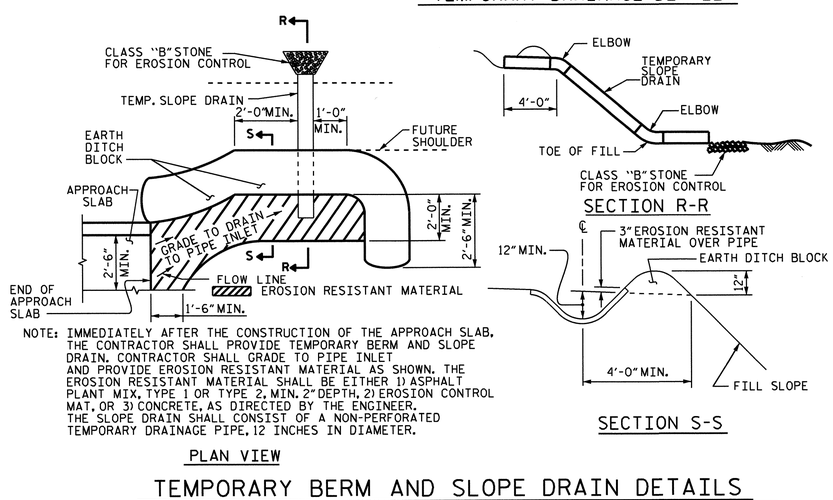


ALL BAR DIMENSIONS ARE OUT TO OUT



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

TEMPORARY DRAINAGE DETAIL

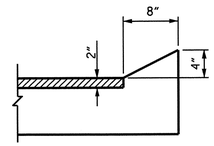


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

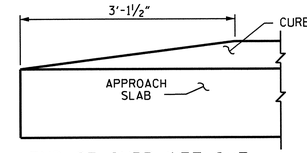
PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

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

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT (SUB-REGIONAL TIER) 75° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY A. MARRAY

9/23/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			27

ASSEMBLED BY : PEGGY ADKINS	DATE : 6-11-13
CHECKED BY : B.L. GREEN	DATE : 7-3-13
DRAWN BY : SHS/MAA 5-09	REV. 12-11 MAA/AAC
CHECKED BY : BCH 5-09	

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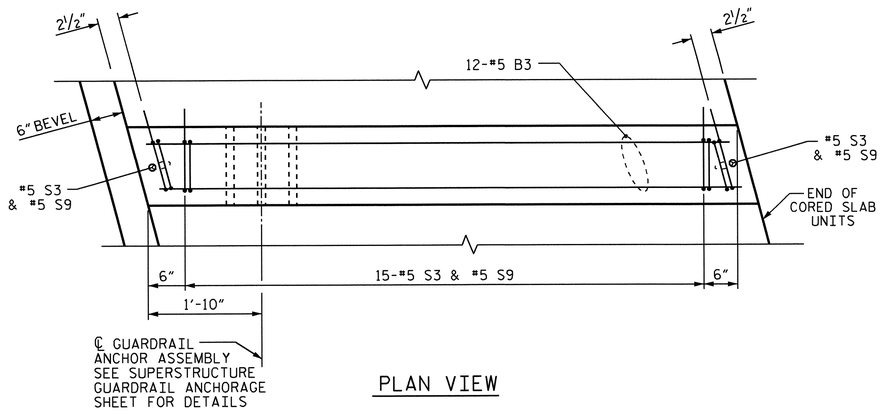
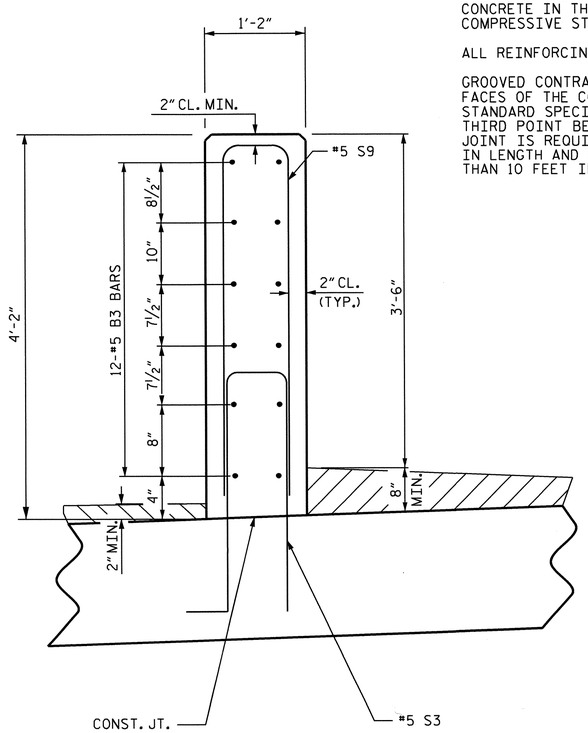
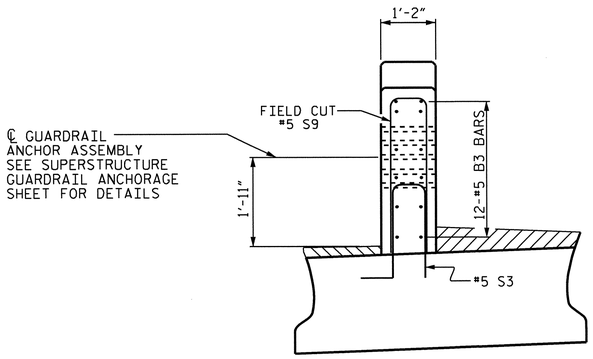


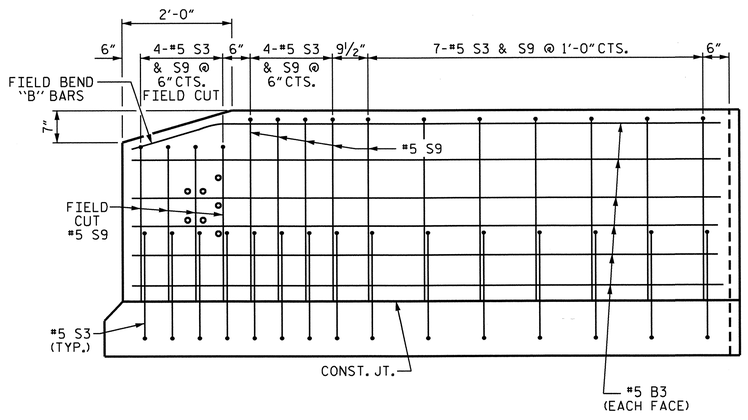
PLAN VIEW



CONCRETE PARAPET SECTION



END VIEW



SIDE VIEW

CONCRETE PARAPET DETAILS

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

NOTES

THE CONCRETE PARAPET ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL CONCRETE IN THE APPROACH SLAB HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN THE CONCRETE PARAPET SHALL BE EPOXY COATED.

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

BILL OF MATERIAL

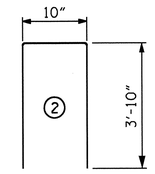
CONCRETE PARAPET

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B3	24	#5	STR	11'-3"	282
✳S9	34	#5	2	8'-6"	301
✳EPOXY COATED REINFORCING STEEL				LBS.	583
CLASS AA CONCRETE				C. Y.	4.1

1'-2" X 4'-2" CONCRETE PARAPET

LIN. FT. 23.22

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4756

GUILFORD COUNTY

STATION: 15+98.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB CONCRETE PARAPET DETAILS

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

NORTH CAROLINA PROFESSIONAL SEAL 025516 ENGINEER EMILY E. MURRAY

9/23/13

ASSEMBLED BY : PEGGY ADKINS	DATE : 6-12-13		
CHECKED BY : B.L. GREEN	DATE : 7-3-13		
DRAWN BY : DGE 5/09	REV. 12/11	MAA/AAC	
CHECKED BY : BCH 6/09			

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taverette

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM @ RGW REV. 5-7-03 RWW @ JTE REV. 10-1-11 MAA @ GM
REV. 8-16-99 RWW @ LES REV. 5-1-06 TLA @ GM