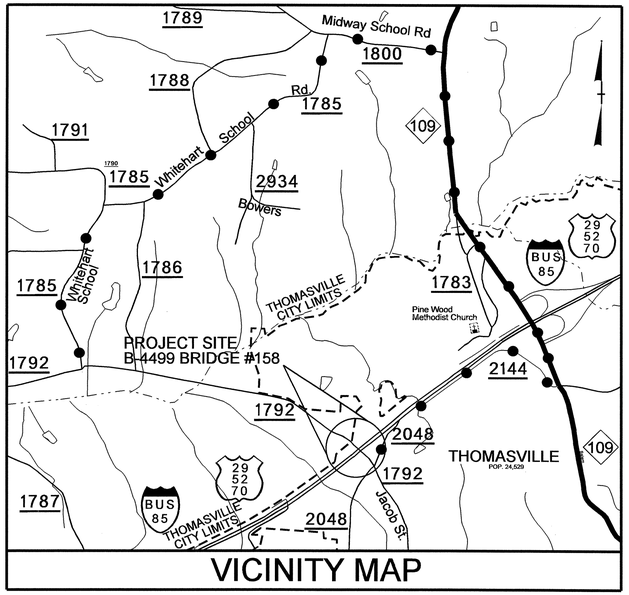
TIP PROJECT: B-4499

CONTRACT: C202438

STRUCTURE



VICINITY MAP

DETOUR

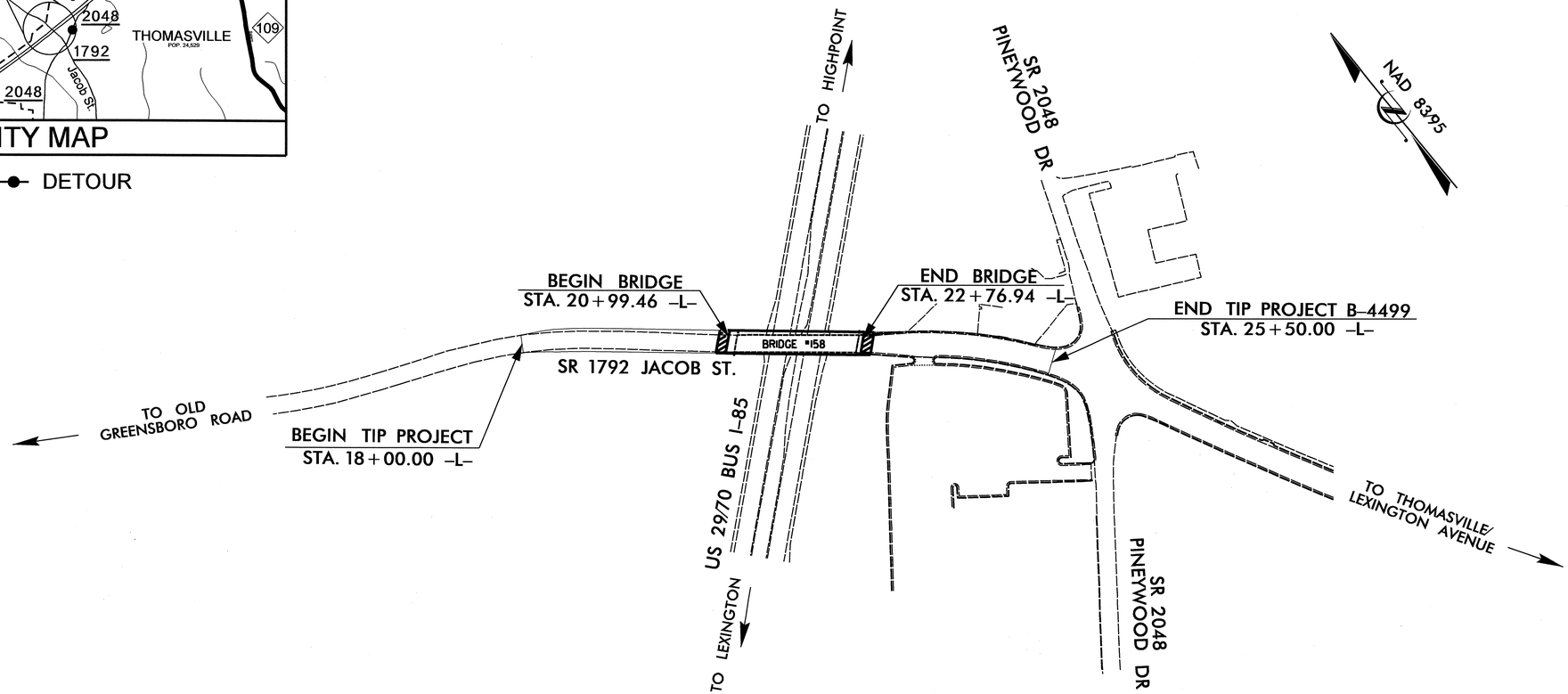
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
DAVIDSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4499		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
33732.1.1	BRZ-1792(2)	P.E.
33732.2.1	BRZ-1792(2)	UTIL. & R/W
33732.3.1	BRZ-1792(2)	CONST.

LOCATION: BRIDGE NO. 158 OVER US 29/70/I-85 BUSINESS ON SR 1792 (MARTIN LUTHER KING, JR. DRIVE)

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2009 = 2620 VPD
ADT 2030 = 4400 VPD
DHV = 60 %
D = 11 %
T = 6 % *
V = 40 MPH
* TTST 2% DUAL 4%
FUNC. CLASS : COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4499 = 0.108 MI

LENGTH STRUCTURE TIP PROJECT B-4499 = 0.034 MI

TOTAL LENGTH TIP PROJECT B-4499 = 0.142 MI

Prepared in the Office of:

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE :

AUGUST 16, 2011

J. C. FRYE, P.E.
PROJECT ENGINEER

T. H. FANG, P.E.
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

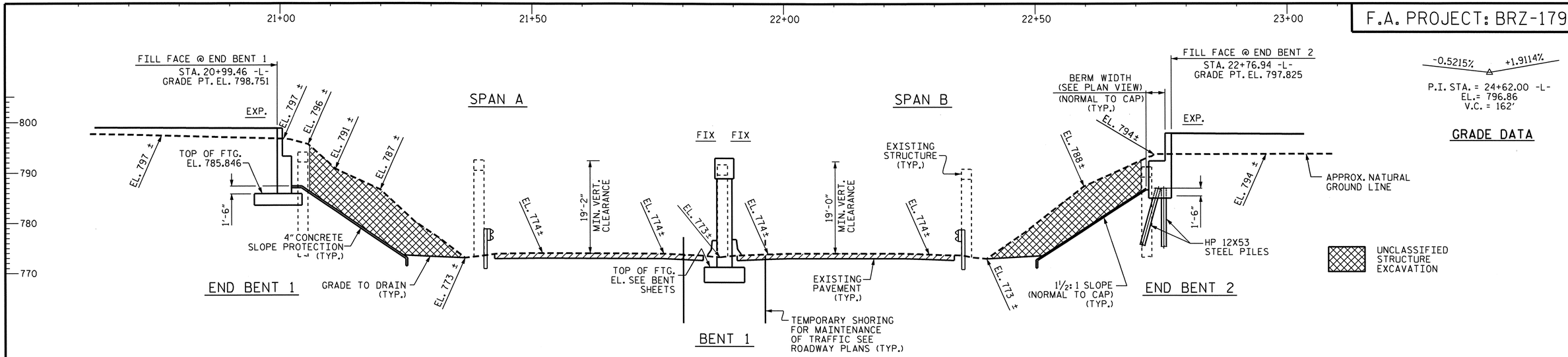
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

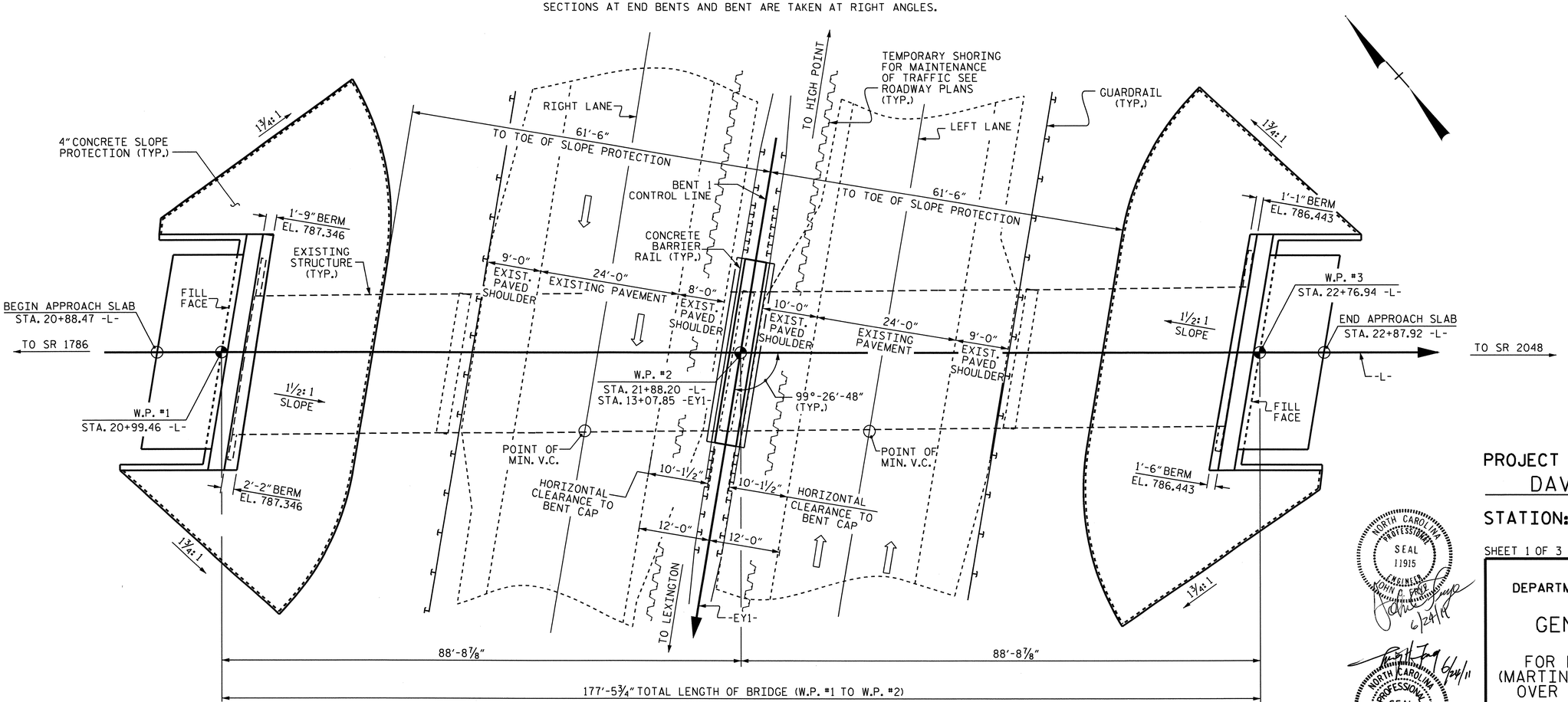
APPROVED
DIVISION ADMINISTRATOR *DATE*

F.A. PROJECT: BRZ-1792 (2)



SECTION ALONG -L-

SECTIONS AT END BENTS AND BENT ARE TAKEN AT RIGHT ANGLES.



PLAN

FOUNDATIONS NOT SHOWN FOR CLARITY

DRAWN BY : S. DOMBROWSKI DATE : 10/30/08
CHECKED BY : T. H. FANG DATE : 2/09/09

24-JUN-2011 10:27
K:\TIPProjects-B\B4499\Structures\LightWt\FinalPlans\b4499_sd_gd_lw.dgn
tfang

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. GRUP
6/24/11

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
6/24/11

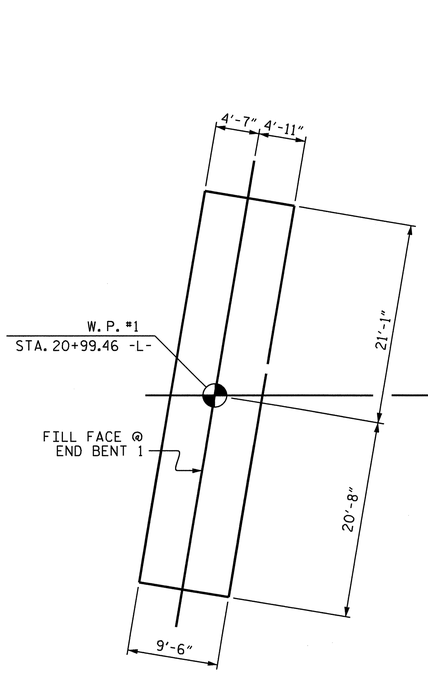
PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-
13+07.85 -EY1-
SHEET 1 OF 3 REPLACES BRIDGE #158

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

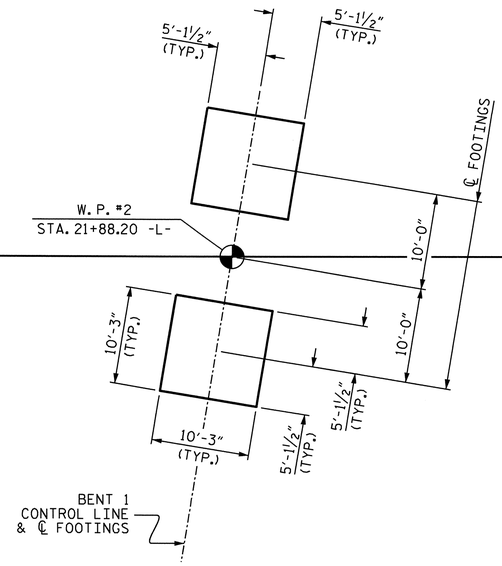
GENERAL DRAWING

FOR BRIDGE ON SR 1792
(MARTIN LUTHER KING JR. DR.)
OVER US-29/70/I-85 BUS.

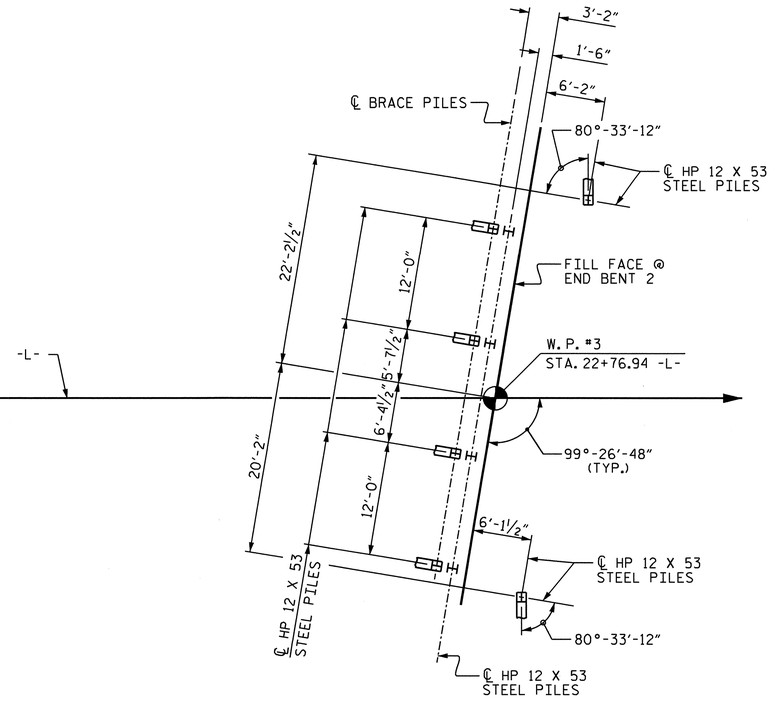
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			32



END BENT 1



BENT 1



END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT THE BOTTOM OF CAP.

NOTES:

FOR PILES, SEE SPECIAL PROVISIONS.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR STEEL PILES AT END BENT 2.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING, OR REDRIVING IS REQUIRED. FOR PILE DRIVING ANALYZER, SEE PILES SPECIAL PROVISIONS.

SPREAD FOOTINGS AT END BENT 1 AND BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 7 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 15 TSF JUST BEFORE PLACING CONCRETE.

SPREAD FOOTINGS AT END BENT 1 AND BENT 1 MUST BE PLACED ON WEATHERED ROCK OR ROCK. AN NCDOT - GEU GEOTECHNICAL ENGINEER FROM THE WESTERN REGIONAL OFFICE SHOULD OBSERVE AND APPROVE THE FOOTING BEARING GRADE. IF ADEQUATE MATERIAL IS NOT ENCOUNTERED AT THE PLAN BOTTOM OF FOOTING ELEVATION, EXCAVATE DOWN TO WEATHERED ROCK OR ROCK AND POUR A MUD MAT OF 3,000 PSI CONCRETE TO THE PLAN BOTTOM OF FOOTING ELEVATION. THE CONCRETE SHOULD BE PLACED AGAINST THE NATIVE SOIL ON THE SIDEWALLS. THE WIDTH OF THE MUD MAT SHOULD ENCOMPASS AN AREA ON A 1:2 (H:V) ANGLE DOWN FROM THE BOTTOM OF FOOTING TO THE TOP OF WEATHERED ROCK OR ROCK.

NORTH CAROLINA PROFESSIONAL SEAL 036443 ENGINEER KOREY NEWTON

5/9/2011

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1792
(MARTIN LUTHER KING JR.
DRIVE) OVER
US-29/70/I-85 BUS.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 4/18/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

09-MAY-2011 10:20
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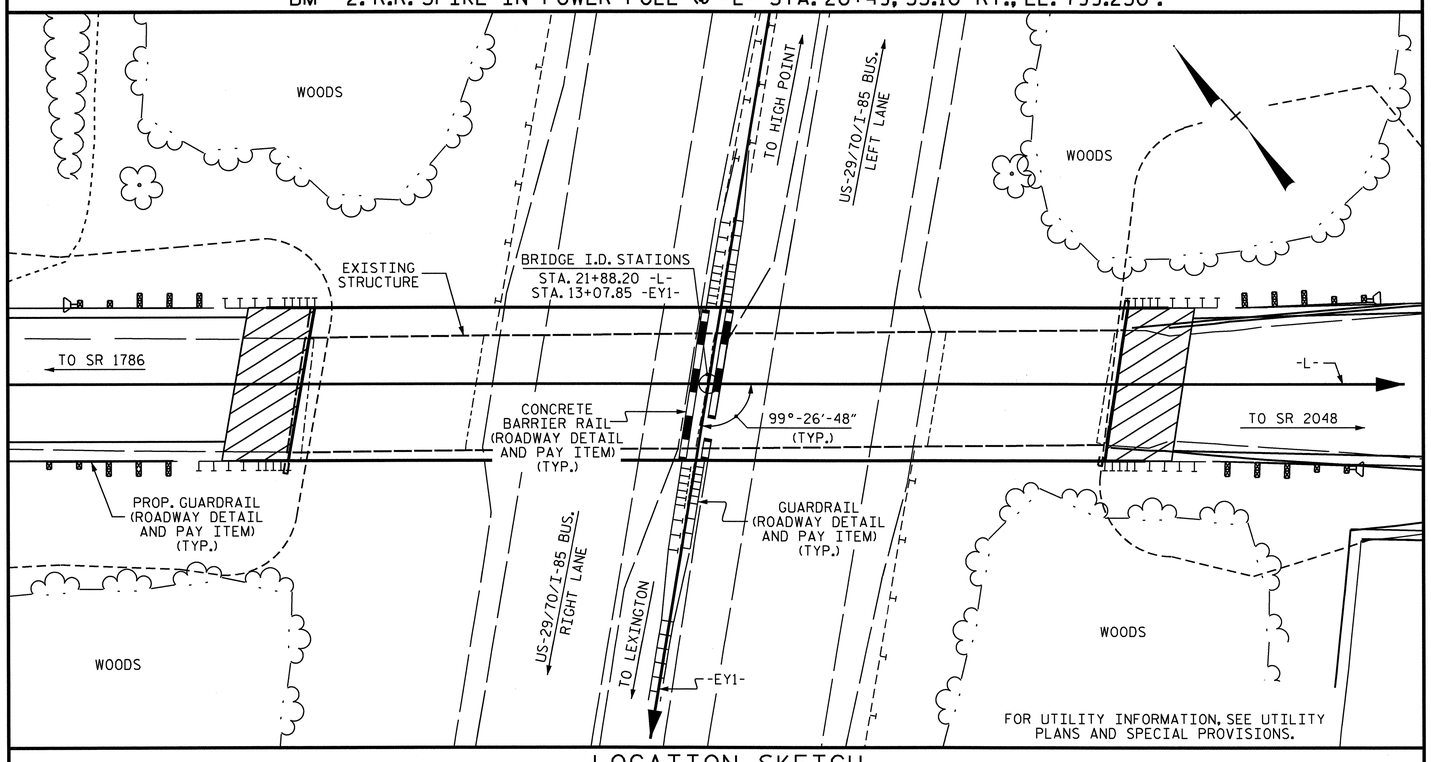
qtnguyen

NCBDS

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	PDA TESTING	PDA ASSISTANCE	UNCLASSIFIED STRUCTURE EXCAVATION	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	TWO BAR METAL RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	REINFORCED CONCRETE DECK SLAB (ALL LIGHT-WEIGHT CONCRETE)	45" PRESTRESSED CONCRETE GIRDER (SAND LIGHT-WEIGHT CONCRETE)		1'-2" X 2'-6" CONCRETE PARAPET (ALL LIGHT-WEIGHT CONCRETE)
	LUMP SUM	LUMP SUM	EACH	EACH	LUMP SUM	SQ. FT.	CU. YDS.	LUMP SUM	LB.	LB.	NO.	LIN. FT.	EACH	LIN. FT.	SQ. YD.	LUMP SUM	LUMP SUM	SQ. FT.	NO.	LIN. FT.	LIN.FT.
SUPERSTRUCTURE						5,667										LUMP SUM	LUMP SUM	6,065	8	694.7	350.56
END BENT 1		LUMP SUM					84.4		7,161						345						
BENT 1		LUMP SUM					49.4		7,381	865											
END BENT 2			1	1			73.2		6,582		10	175	10	335.50	320						
TOTAL	LUMP SUM	LUMP SUM	1	1	LUMP SUM	5,667	207.0	LUMP SUM	21,124	865	10	175	10	335.50	665	LUMP SUM	LUMP SUM	6,065	8	694.7	350.56

BM #2: R.R. SPIKE IN POWER POLE @ -L- STA. 20+49, 33.10 RT., EL. 799.230'.



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL- 93 OR ALTERNATE LOADING.

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 50 FEET. RIGHT AND LEFT SIDE AT END BENTS 1 AND 2 OF THE CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

THE SUBSTRUCTURE OF 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.

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 21+88.20 -L-".

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS: 1 @ 37'-6", 2 @ 48'-6", 1 @ 37'-6"; 24'-0" CLEAR ROADWAY WIDTH AND A RC DECK ON I-BEAMS; END BENT 1 CONSISTING OF RC CAPS ON ROCK FOUNDATION, INTERIOR BENT CONSISTING RCP&B ON SPREAD FOOTINGS, END BENT 2 CONSISTING OF RC SPILL THRU AND LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

DECK AND PARAPETS SHALL BE CONSTRUCTED OF ALL LIGHTWEIGHT CONCRETE. FOR ALL LIGHTWEIGHT CONCRETE FOR DECK AND PARAPETS, SEE SPECIAL PROVISIONS.

PRESTRESS CONCRETE GIRDERS SHALL BE CONSTRUCTED OF SAND LIGHTWEIGHT CONCRETE. FOR SAND LIGHTWEIGHT CONCRETE FOR GIRDERS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

POUR 2 OF END BENT 1 AND POUR 1 OF END BENT 2 ARE CONSIDERED MASS CONCRETE. FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

FOR FORMS FOR CONCRETE BRIDGE DECKS, SEE SPECIAL PROVISIONS.

FOR ADDITIONAL LIGHT WEIGHT CONCRETE CYLINDERS, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

6/24/11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1792 (MARTIN LUTHER KING JR. DRIVE) OVER US-29/70/I-85 BUS.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : S. DOMBROWSKI DATE : 10-30-08
CHECKED BY : JOHN FRYE DATE : 04-05-11

23-JUN-2011 15:50
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qtnguyen

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 (INVENTORY)	N/A	(1)	1.01	--	1.75	0.827	1.47	A	EL	40.21	0.851	1.07	A	EL	32.51	0.80	0.827	1.01	A	EL	41.92	
		HL-93 (OPERATING)	N/A	--	1.48	--	1.35	0.827	1.91	A	EL	40.21	0.927	1.48	A	I	3.54	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.37	49.32	1.75	0.827	1.98	A	EL	39.36	0.927	1.49	A	I	3.54	0.80	0.827	1.37	A	EL	41.92	
		HS-20 (OPERATING)	36.000	--	1.74	62.64	1.35	0.827	2.57	A	EL	39.36	0.927	1.74	A	I	3.54	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.18	42.93	1.40	0.827	5.77	A	EL	40.21	0.927	3.68	A	I	3.54	0.80	0.827	3.18	A	EL	41.92	
		SNGARBS2	20.000	--	2.32	46.40	1.40	0.827	4.21	A	EL	39.36	0.927	2.83	A	I	3.54	0.80	0.827	2.32	A	EL	41.92	
		SNAGRIS2	22.000	--	2.18	47.96	1.40	0.827	3.94	A	EL	47.06	0.927	2.62	A	I	3.54	0.80	0.827	2.18	A	EL	41.07	
		SNCOTTS3	27.250	--	1.58	43.06	1.40	0.827	2.88	A	EL	42.78	0.927	2.03	A	I	3.54	0.80	0.827	1.58	A	EL	42.78	
		SNAGGRS4	34.925	--	1.31	45.75	1.40	0.827	2.37	A	EL	40.21	0.927	1.67	A	I	3.54	0.80	0.827	1.31	A	EL	41.92	
		SNS5A	35.550	--	1.28	45.50	1.40	0.827	2.33	A	EL	42.78	0.927	1.68	A	I	3.54	0.80	0.827	1.28	A	EL	42.78	
		SNS6A	39.950	--	1.17	46.74	1.40	0.827	2.12	A	EL	40.21	0.927	1.58	A	I	3.54	0.80	0.827	1.17	A	EL	42.78	
		SNS7B	42.000	--	1.11	46.62	1.40	0.827	2.02	A	EL	42.78	0.927	1.56	A	I	3.54	0.80	0.827	1.11	A	EL	42.78	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.42	46.86	1.40	0.827	2.59	A	EL	42.78	0.927	1.82	A	I	3.54	0.80	0.827	1.42	A	EL	42.78	
		TNT4A	33.075	--	1.42	46.97	1.40	0.827	2.59	A	EL	40.21	0.927	1.78	A	I	3.54	0.80	0.827	1.42	A	EL	41.92	
		TNT6A	41.600	--	1.15	48.26	1.40	0.827	2.11	A	EL	40.21	0.927	1.60	A	I	3.54	0.80	0.827	1.16	A	EL	42.78	
		TNT7A	42.000	--	1.18	48.72	1.40	0.827	2.11	A	EL	40.21	0.927	1.59	A	I	3.54	0.80	0.827	1.16	A	EL	41.92	
		TNT7B	42.000	--	1.19	49.98	1.40	0.827	2.15	A	EL	47.06	0.927	1.55	A	I	3.54	0.80	0.827	1.19	A	EL	41.07	
		TNAGRIT4	43.000	--	1.14	49.02	1.40	0.827	2.07	A	EL	39.36	0.927	1.53	A	I	3.54	0.80	0.827	1.14	A	EL	41.92	
		TNAGT5A	45.000	--	1.08	48.60	1.40	0.827	1.96	A	EL	42.78	0.927	1.51	A	I	3.54	0.80	0.827	1.08	A	EL	42.78	
		TNAGT5B	45.000	(3)	1.07	48.15	1.40	0.827	1.94	A	EL	40.21	0.927	1.49	A	I	3.54	0.80	0.827	1.07	A	EL	41.92	

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. SPANS A AND B ARE EQUAL. CONTROLLING POINTS FOR SPAN A ARE MIRRORED ABOUT ℄ BENT 1 TO OBTAIN CONTROLLING POINTS FOR SPAN B.
2. THE GIRDERS CONSIST OF SAND LIGHTWEIGHT CONCRETE.
3. GIRDER DESIGN WAS PERFORMED USING AASHTO LRFD 4TH EDITION (2009).
4. PRESTRESS LOSS ESTIMATES USED FOR GIRDER DESIGN WERE OBTAINED FROM THE "APPROXIMATE METHOD" (LRFD 5.9.5.3).
5. GIRDER DESIGN WAS PERFORMED USING THE FOLLOWING RESISTANCE FACTORS :

   FOR MOMENT: 1.0
   FOR SHEAR: 0.7

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

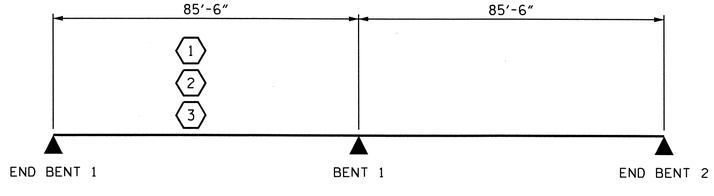
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

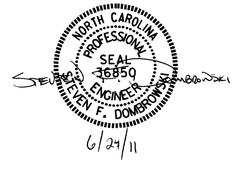
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY



6/24/11

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : S. DOMBROWSKI	DATE : 04/28/11
CHECKED BY : J. A. YANNACCONE	DATE : 5/5/2011
DRAWN BY : MAA 1/08	REV. 11/12/08R MAA/GM
CHECKED BY : GM/DI 2/08	

23-JUN-2011 15:50
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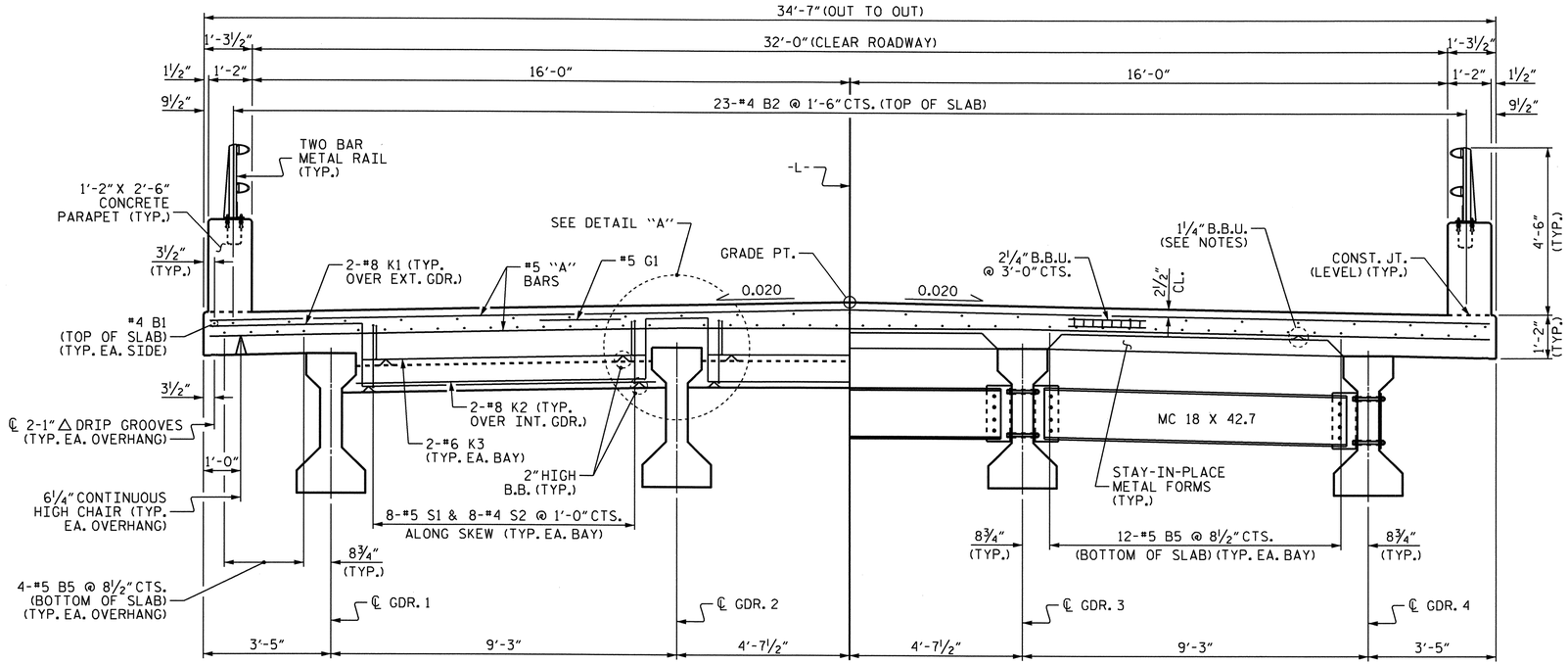
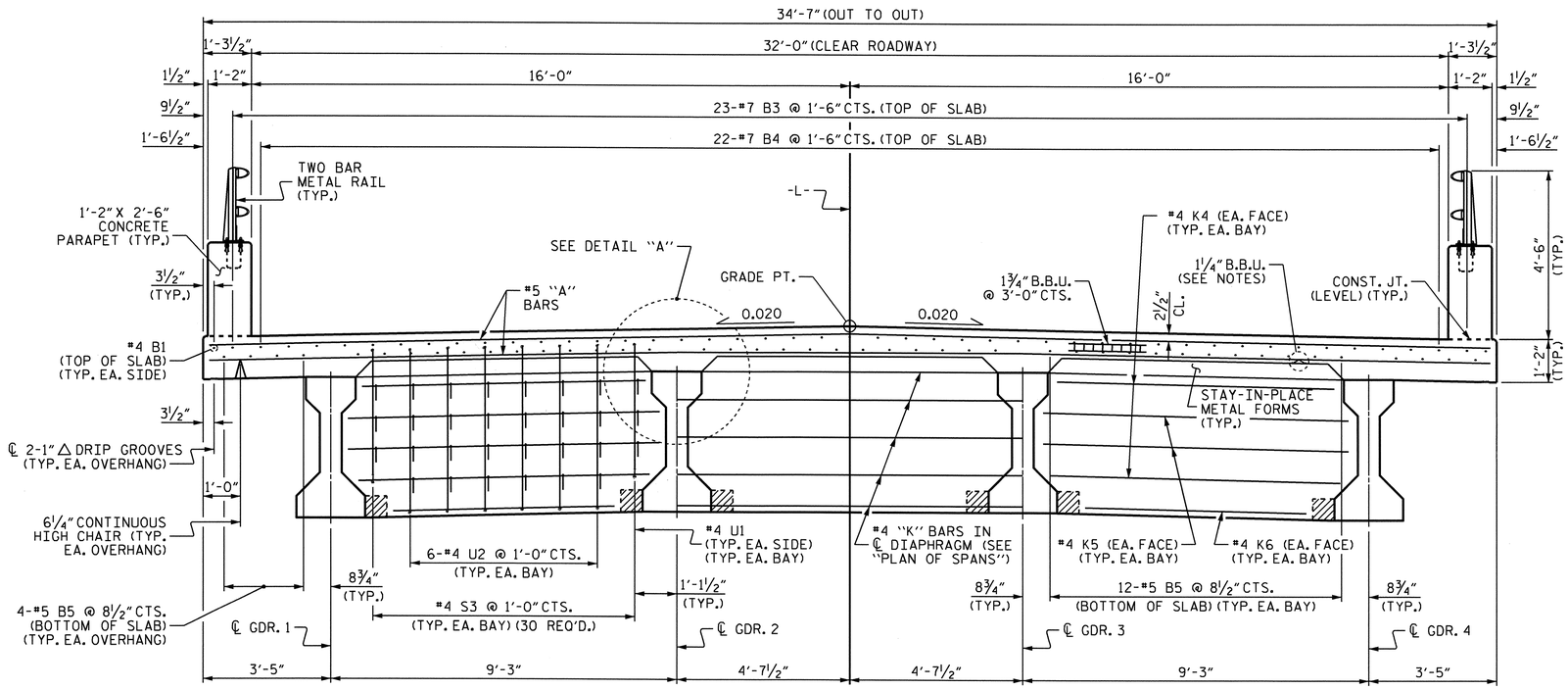
qtnguyen



AT END BENT

AT MID-SPAN

TYPICAL SECTION



TYPICAL SECTION

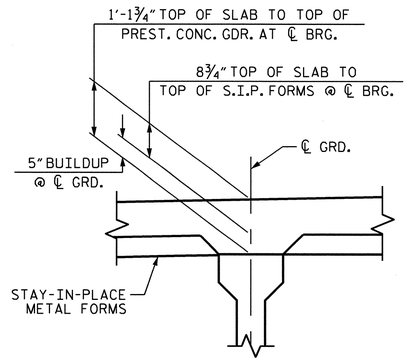
AT CONTINUOUS BENT DIAPHRAGMS

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.



DETAIL "A"

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE
5/9/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 2-1-11
CHECKED BY : JOHN FRYE DATE : 4-5-11

09-MAY-2011 10:20
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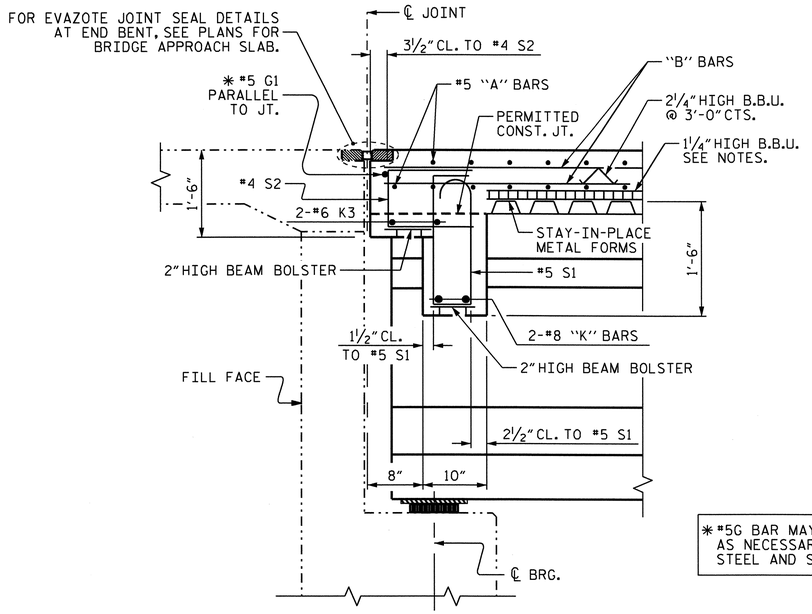
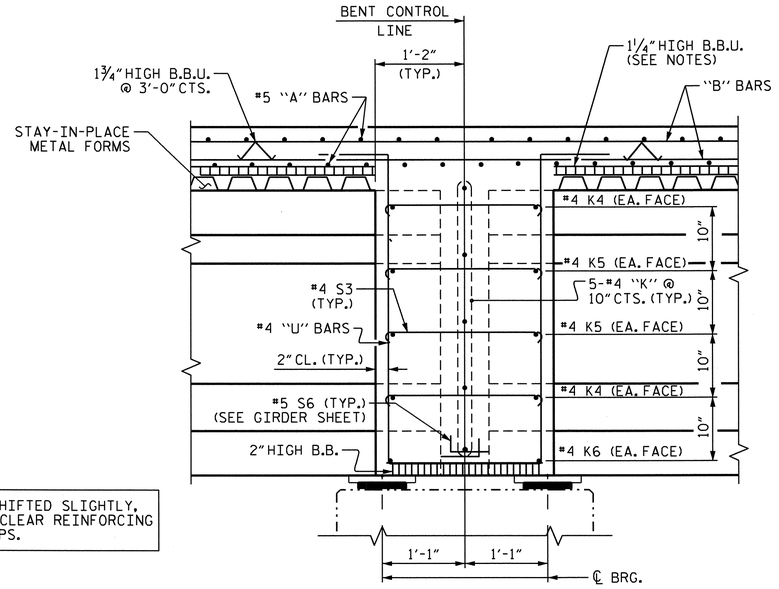
qtnguyen

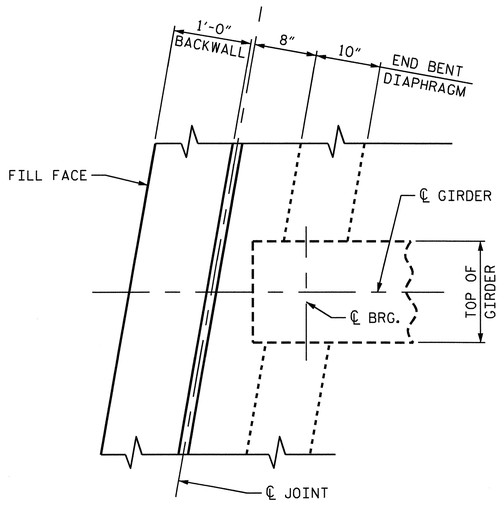


SECTION A-A

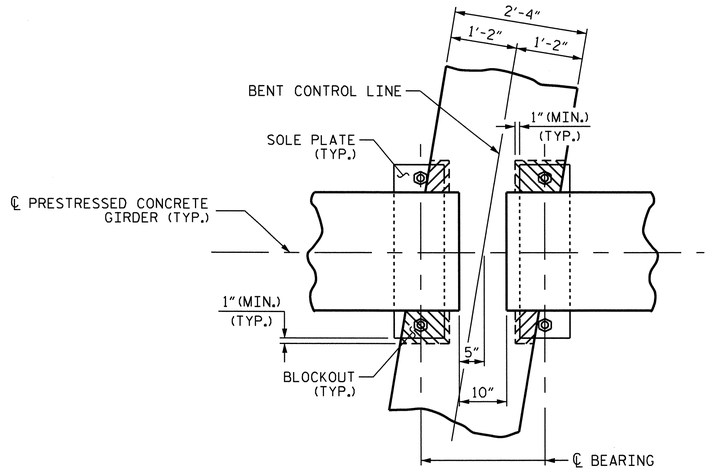


SECTION B-B

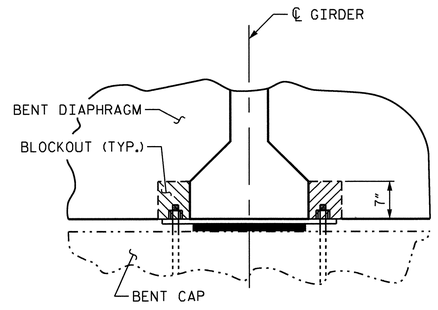
* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



PLAN VIEW OF END BENT DIAPHRAGM



PLAN



SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE
6/24/11

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 2-1-11
CHECKED BY : JOHN FRYE DATE : 4-5-11

23-JUN-2011 16:00
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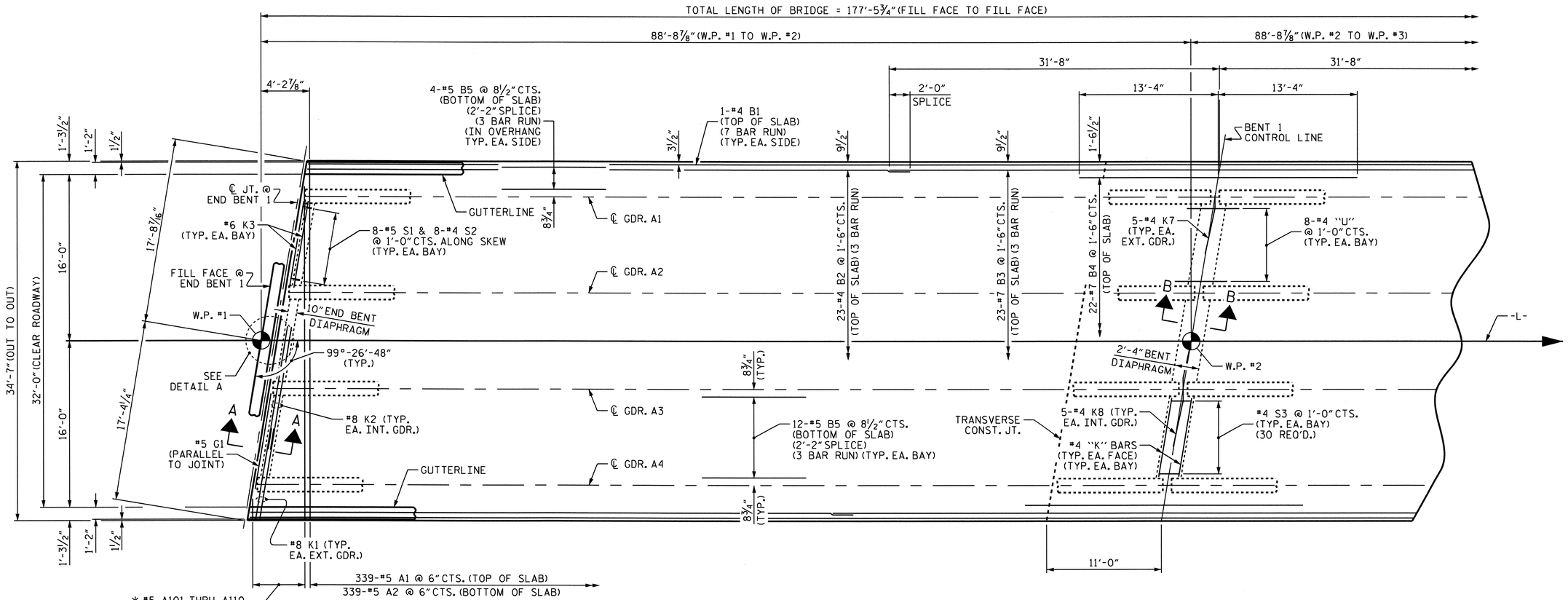
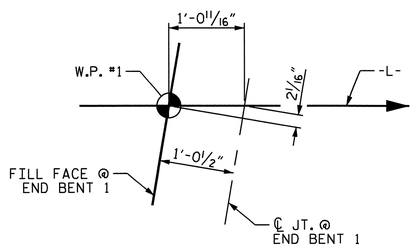


SPAN A

* SET A101 THRU A110 BARS 2" CLEAR FROM THE BLOCKOUT FOR ELASTOMERIC CONCRETE.



DETAIL A

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			32

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

6/24/11

DRAWN BY : E.C. LOCKLEAR DATE : 2-2-11

CHECKED BY : JOHN FRYE DATE : 4-5-11

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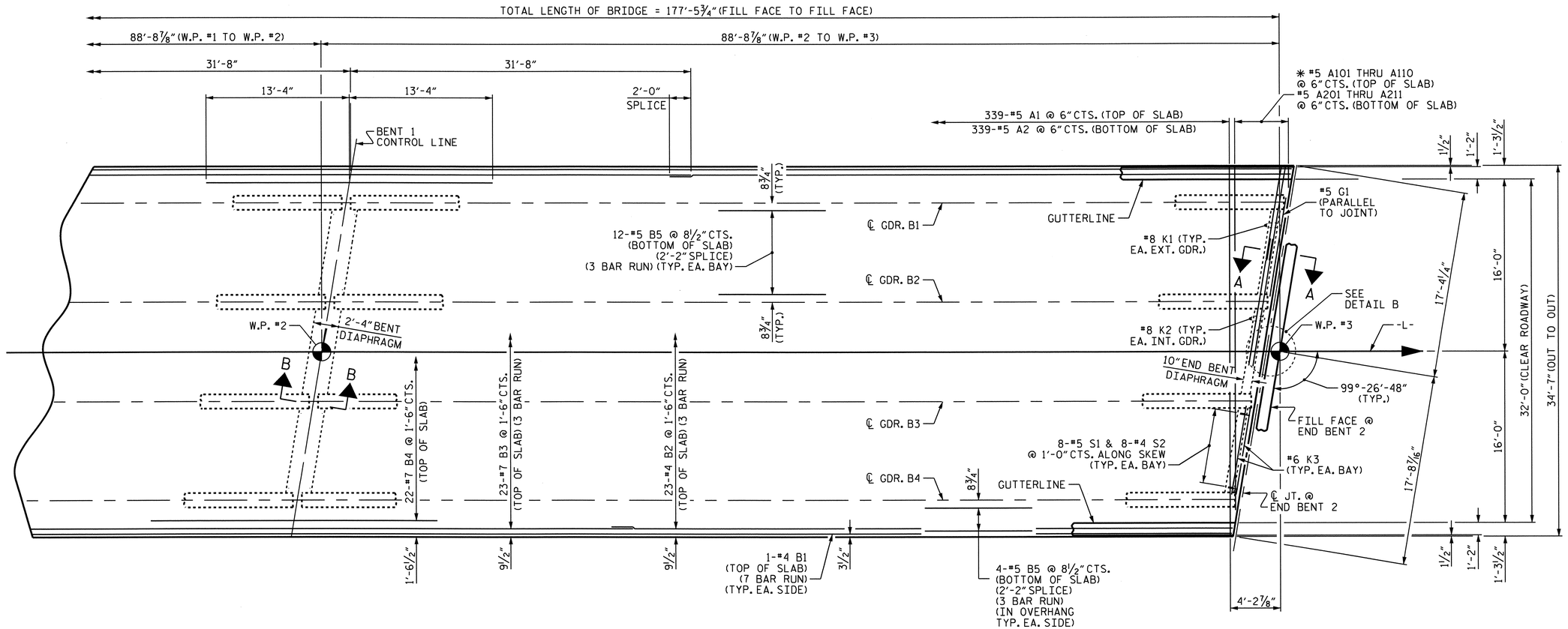

SPAN B

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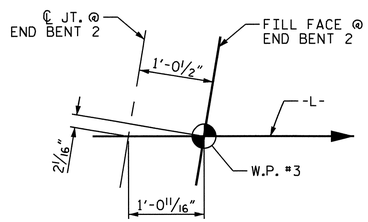

DETAIL B

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			32

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

DRAWN BY : E.C. LOCKLEAR DATE : 2-2-11
CHECKED BY : JOHN FRYE DATE : 4-5-11

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DEAD LOAD DEFLECTION TABLE

0.6"Ø LOW RELAXATION	SPANS A & B																					
	GIRDERS 1 & 4											GIRDERS 2 & 3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.205	0.363	0.476	0.543	0.566	0.543	0.476	0.363	0.205	0	0	0.205	0.363	0.476	0.543	0.566	0.543	0.476	0.363	0.205	0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.061	0.134	0.187	0.219	0.229	0.219	0.187	0.134	0.061	0	0	0.067	0.143	0.198	0.231	0.242	0.231	0.198	0.143	0.067	0
FINAL CAMBER ↑	0	1¾"	2¾"	3⁷⁄₁₆"	3⅞"	4¹⁄₁₆"	3⅞"	3⁷⁄₁₆"	2¾"	1¾"	0	0	1¹¹⁄₁₆"	2⅝"	3⁵⁄₁₆"	3¾"	3⅞"	3¾"	3⁵⁄₁₆"	2⅝"	1¹¹⁄₁₆"	0

✱ INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6700 PSI FOR ALL SPANS.

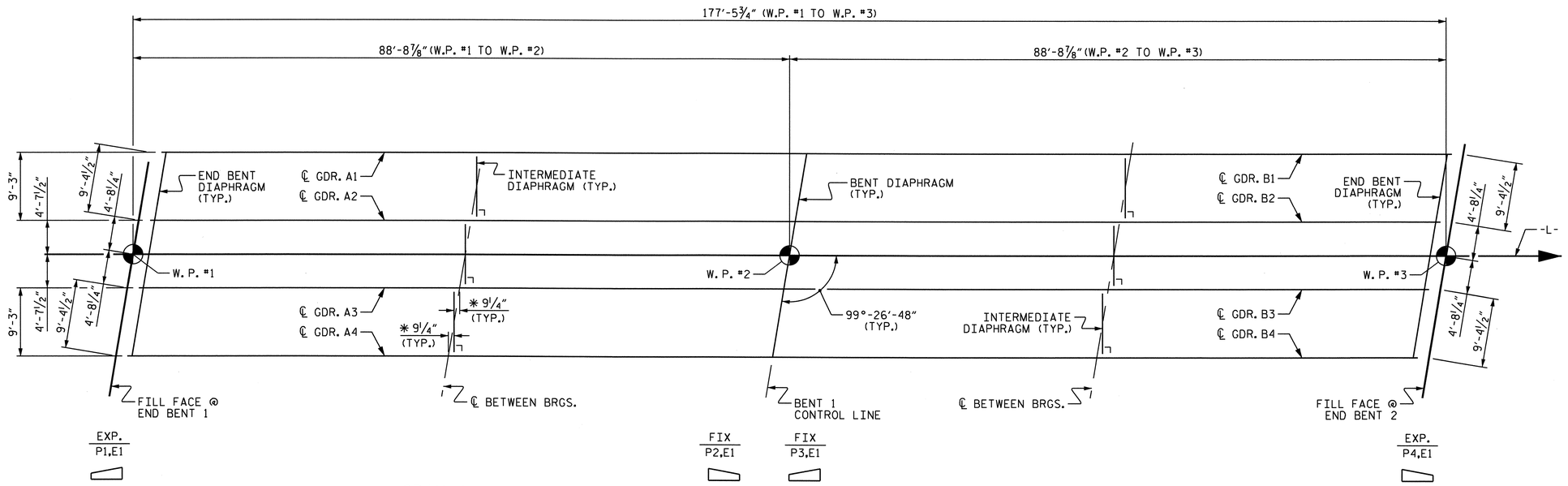
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

PRESTRESS CONCRETE GIRDERS SHALL BE CONSTRUCTED USING SAN LIGHTWEIGHT CONCRETE. FOR SAND LIGHTWEIGHT CONCRETE FOR GIRDERS, SEE SPECIAL PROVISIONS.

FOR ADDITIONAL LIGHTWEIGHT CONCRETE CYLINDERS, SEE SPECIAL PROVISIONS.



FRAMING PLAN

✱ DIMENSIONS MEASURING INTERMEDIATE DIAPHRAGMS ARE SHOWN TO THE BACK FACE OF CHANNEL.

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE
6/24/11

STATE OF NORTH CAROLINA
NORTH CAROLINA PROFESSIONAL SEAL 36850 ENGINEER STEVEN F. DOMERACKI
6/24/11

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

FRAMING PLAN & DEAD LOAD DEFLECTION TABLE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 7-8-09
CHECKED BY : JOHN FRYE DATE : 4-5-11

24-JUN-2011 12:26
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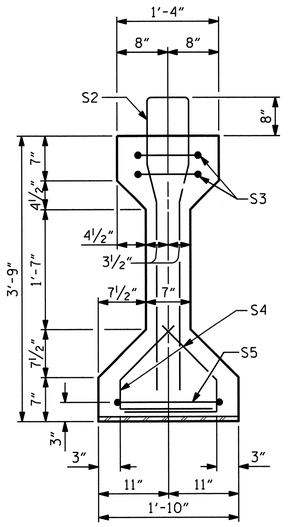
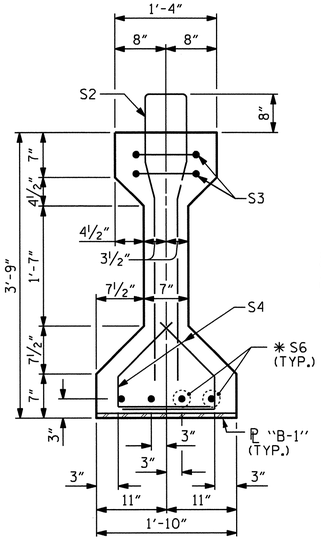
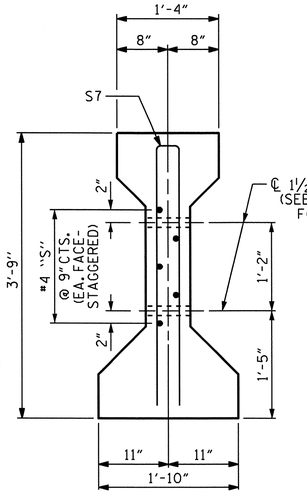


SECTION A-A



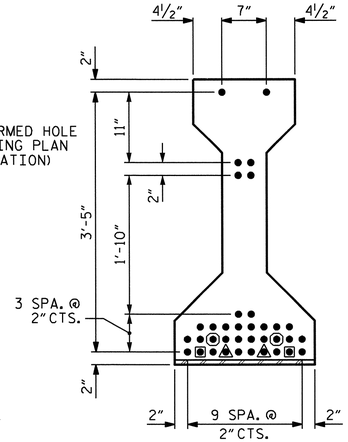
SECTION B-B

(FOR EMBEDDED ℄ "B-1" DETAILS SEE SHEET 2 OF 2)

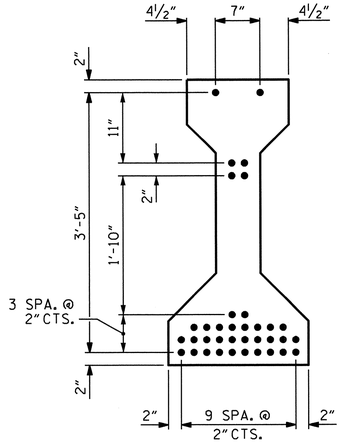


SECTION C-C

(S1 BARS NOT SHOWN)



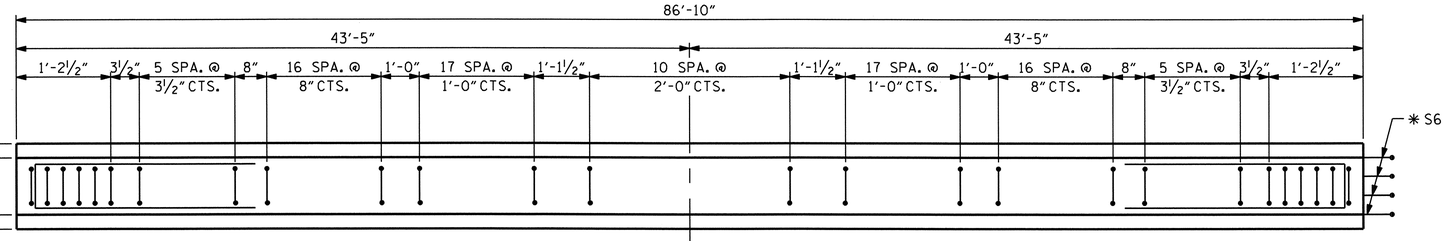
AT END OF GIRDER



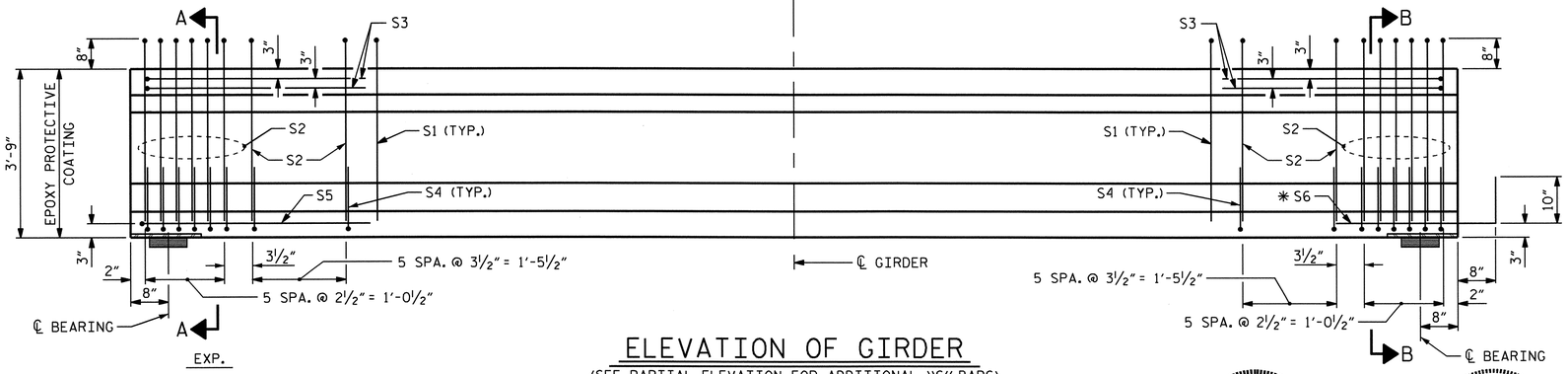
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

▣ STRANDS DEBONDED FOR 26'-0" FROM END OF GIRDER
⊙ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER
◬ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
(36 STRANDS, ALL STRAIGHT, 6 DEBONDED)

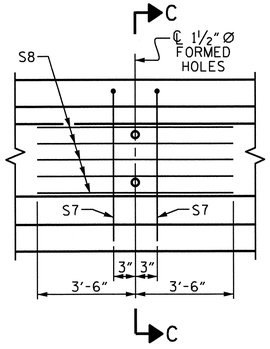


PLAN OF GIRDER

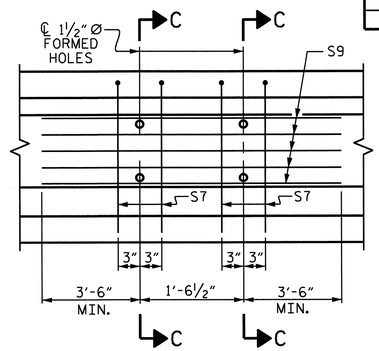


ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



EXTERIOR GIRDER



INTERIOR GIRDER

PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

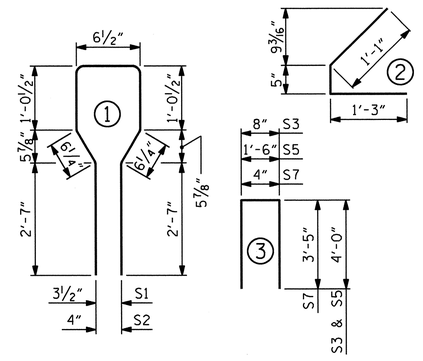
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	81	#4	1	8'-10"	478
	S2	24	#5	1	8'-10"	221
	S3	4	#4	3	8'-8"	23
	S4	48	#4	2	2'-9"	88
	S5	1	#4	3	9'-6"	6
	✱S6	4	#5	STR	3'-8"	15
EXT. GDR.	S7	2	#5	3	7'-2"	15
EXT. GDR.	S8	5	#4	STR	7'-0"	23
INT. GDR.	S7	4	#5	3	7'-2"	30
INT. GDR.	S9	5	#4	STR	8'-7"	29

✱ NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8500 PSI SAND LIGHT-WEIGHT CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
INTERIOR	891	12.5	36
EXTERIOR	869	12.5	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	86'-10"	694.67'

FOR PRESTRESSED CONCRETE GIRDER NOTES, SEE FRAMING PLAN SHEET.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-4-11
CHECKED BY : JOHN FRYE	DATE : 4-5-11
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06R TLA/GM

NORTH CAROLINA PROFESSIONAL SEAL 36850 ENGINEER STEVEN F. DOMBROWSKI 6/24/11

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN G. FRYE 6/24/11

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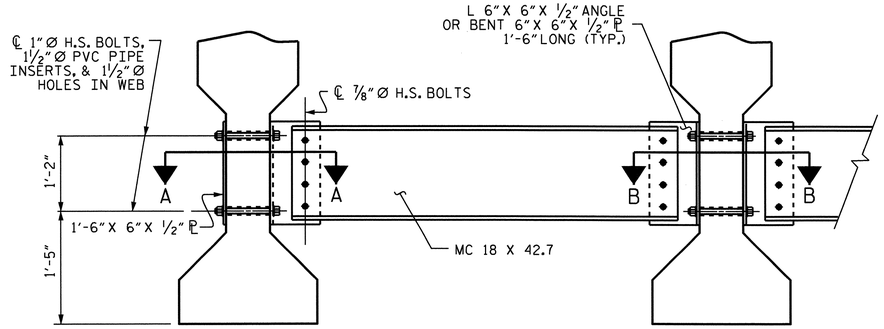
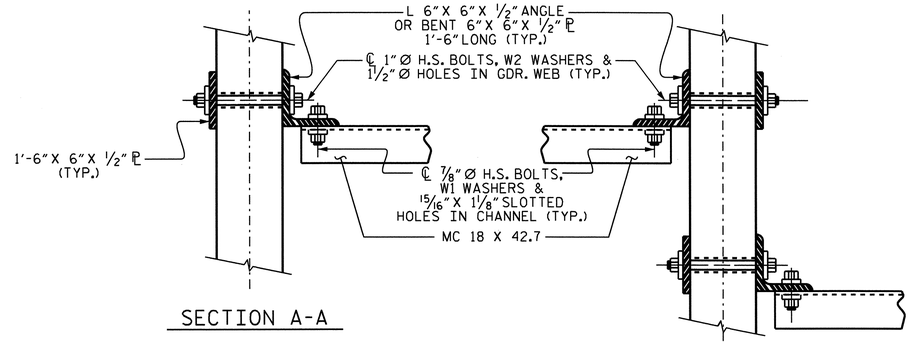


EXTERIOR GIRDER

INTERIOR GIRDER

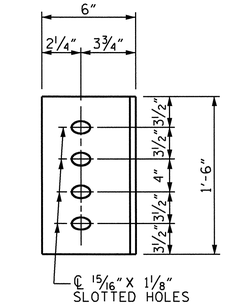
PART SECTION AT INTERMEDIATE DIAPHRAGM

(TYPICAL FOR EACH BAY)

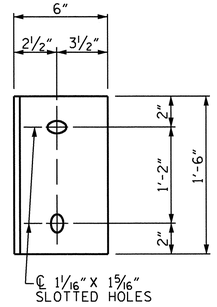


SECTION A-A

SECTION B-B



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

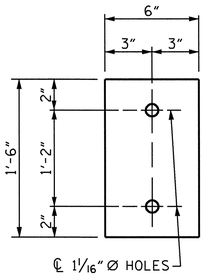
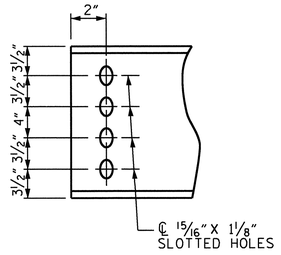


PLATE DETAILS



CHANNEL END

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL, CONNECTOR PLATES AND PLATE WASHERS SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE PLATES, BENT PLATES, CHANNELS, ANGLES, AND PLATE WASHERS SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, AND WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. HARDENED WASHERS AND DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS IN THE CHANNEL MEMBER CONNECTION.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

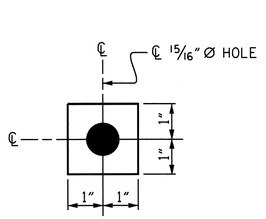
CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

CONNECTION DETAILS

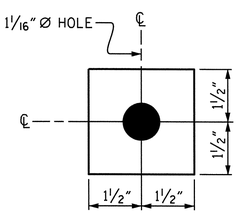
FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.



W1

ℙ 7/16" X 2" X 2"

USE WITH ⅞" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS

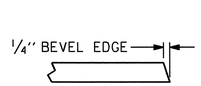


W2

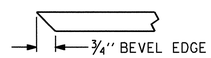
ℙ 7/16" X 3" X 3"

USE WITH 1" Ø HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

WASHER DETAILS

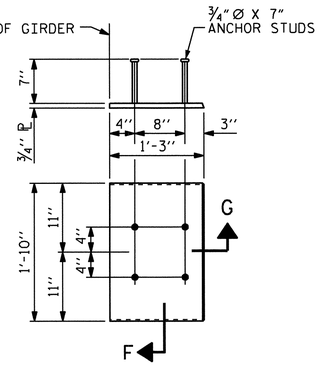


SECTION "G"



SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)

NORTH CAROLINA PROFESSIONAL SEAL 36850 ENGINEER STEVEN F. DOMBROWSKI

6/24/11

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-10-11
CHECKED BY : JOHN FRYE	DATE : 4-5-11
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06R KMM/GM

24-JUN-2011 12:27
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OTNGUYEN

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 2

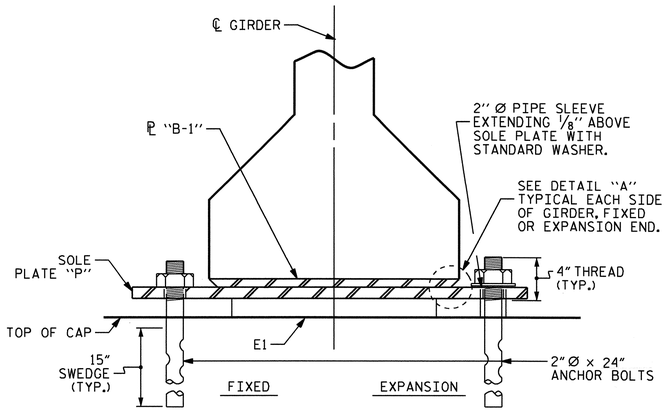
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

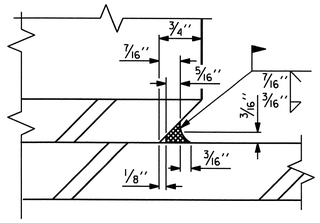
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			32

STD. NO. PCG12

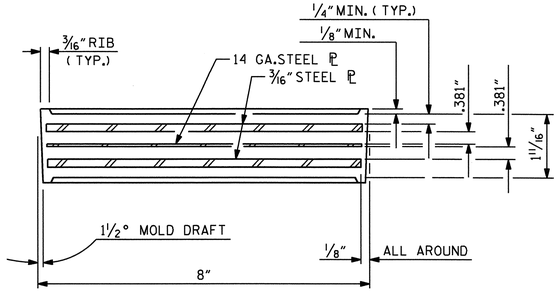


SECTION E-E

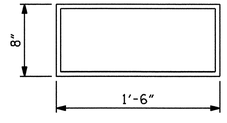


DETAIL "A"

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE III	115 K



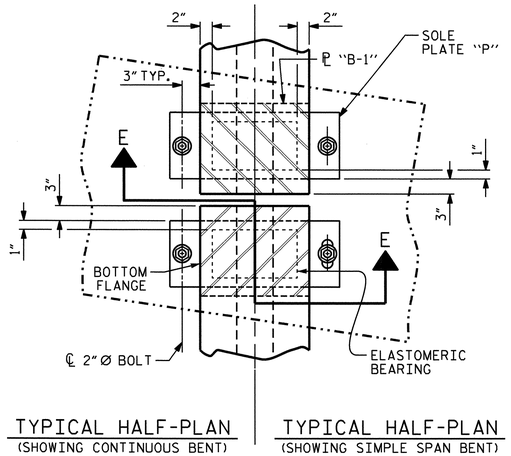
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (16 REQ'D)

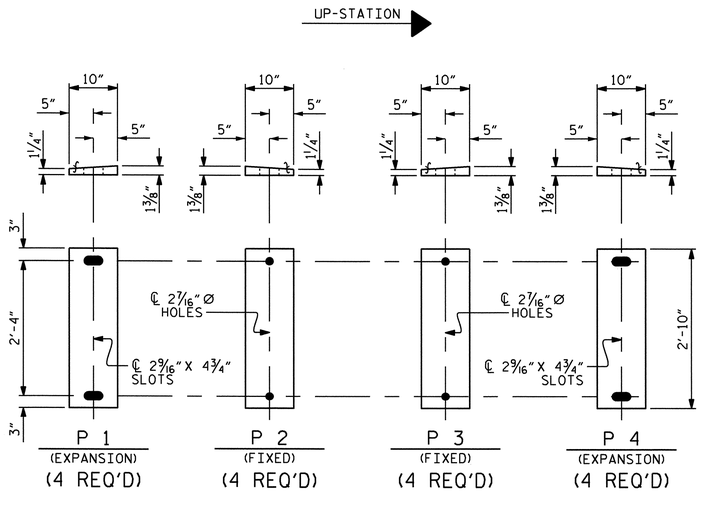
PLAN VIEW OF ELASTOMERIC BEARING

TYPE III



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



SOLE PLATE DETAILS ("P")

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

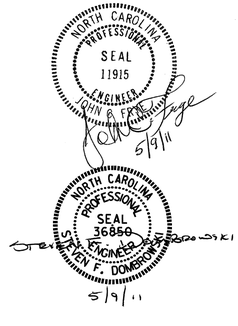
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : E.C. LOCKLEAR	DATE :	2-3-11
CHECKED BY : JOHN FRYE	DATE :	4-5-11
DRAWN BY : WJH 8/89	REV. 10/17/00	RWW/LES
CHECKED BY : CRK 8/89	REV. 7/10/01	RWW/LES
	REV. 5/1/06	TLA/GM

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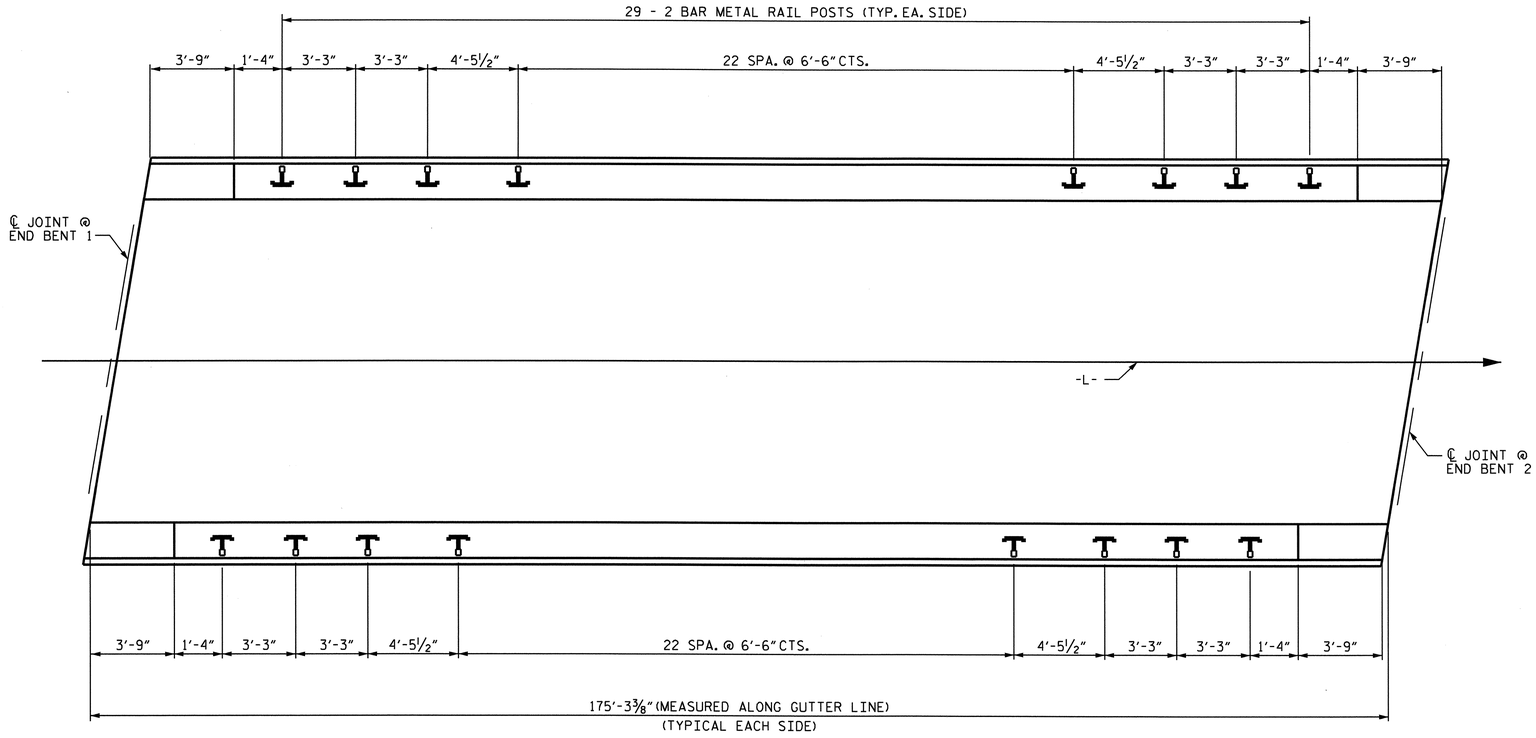
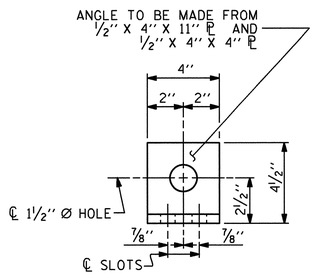
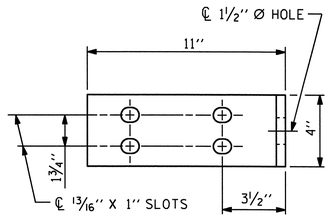
STD. NO. EB3



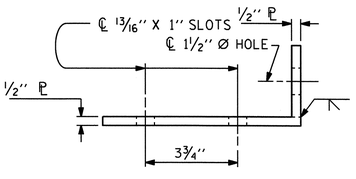
PLAN OF RAIL POST SPACINGS



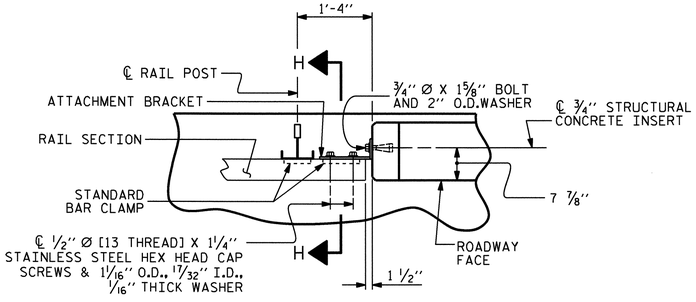
END VIEW



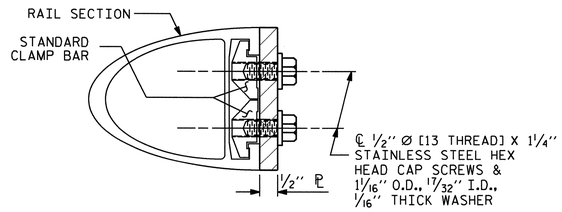
ELEVATION



TOP VIEW

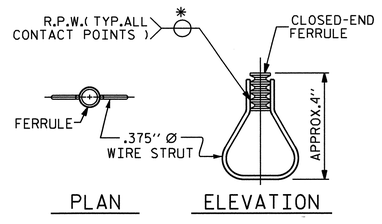


PLAN - RAIL AND END POST



SECTION H-H

DETAILS FOR ATTACHING METAL RAIL TO END POST



STRUCTURAL CONCRETE INSERT

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

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.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			32

STD. NO. BMR2

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-4-11		
CHECKED BY : JOHN FRYE	DATE : 4-5-11		
DRAWN BY : FCJ 1/88	REV. 10/17/00	LES/RDR	
CHECKED BY : CRK 3/89	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06	TLA/GM	

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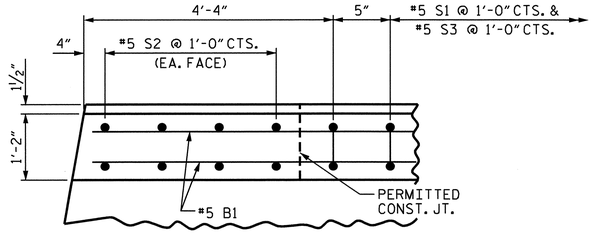
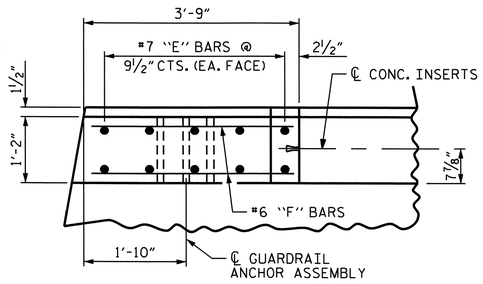
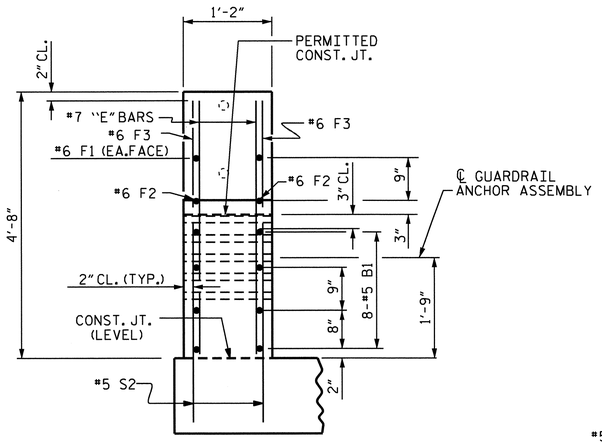
qtnguyen



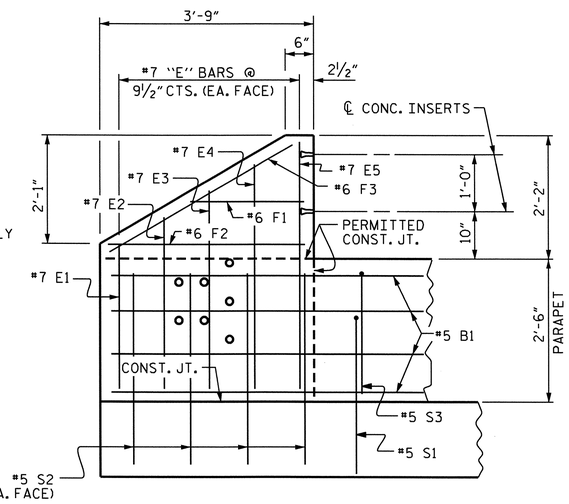
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

ALL S2 BARS ARE TO BE ADHESIVELY ANCHORED.

NOTES

PARAPETS SHALL BE CONSTRUCTED OF ALL LIGHTWEIGHT CONCRETE. FOR ALL LIGHT-WEIGHT CONCRETE FOR DECK AND PARAPETS, SEE SPECIAL PROVISIONS.

FOR ADDITIONAL CONCRETE CYLINDERS, SEE SPECIAL PROVISIONS.

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

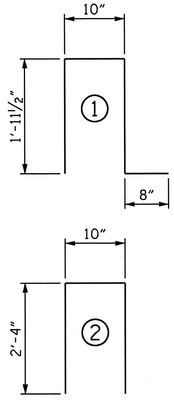
ALL REINFORCING STEEL IN THE PARAPET SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

FOR DETAIL OF CONCRETE INSERTS, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGEDETAILS" SHEET.

BAR TYPE



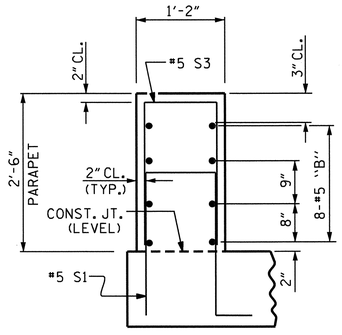
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

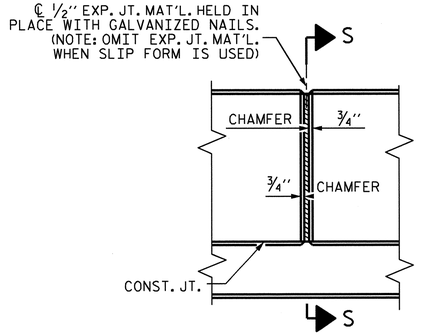
FOR PARAPETS & END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	32	#5	STR	27'-2"	907
✱ B2	64	#5	STR	29'-8"	1980
✱ E1	8	#7	STR	2'-6"	41
✱ E2	8	#7	STR	3'-0"	49
✱ E3	8	#7	STR	3'-6"	57
✱ E4	8	#7	STR	4'-0"	65
✱ E5	8	#7	STR	4'-4"	71
✱ F1	8	#6	STR	1'-10	22
✱ F2	8	#6	STR	2'-11"	35
✱ F3	8	#6	STR	3'-7"	43
✱ S1	336	#5	1	5'-5"	1898
✱ S2	32	#5	STR	3'-2"	106
✱ S3	336	#5	2	5'-6"	1927

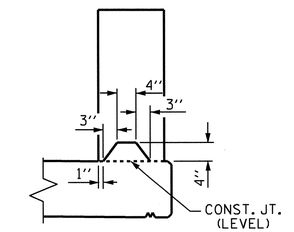
✱ EPOXY COATED REINF. STEEL	LBS.	7202
ALL LIGHTWEIGHT CONCRETE (4500 PSI)		
END POSTS	CU. YDS.	2.4
PARAPETS	CU. YDS.	37.9
TOTAL	CU. YDS.	40.3
CONCRETE PARAPET	LIN. FT.	350.56



SECTION THROUGH PARAPET

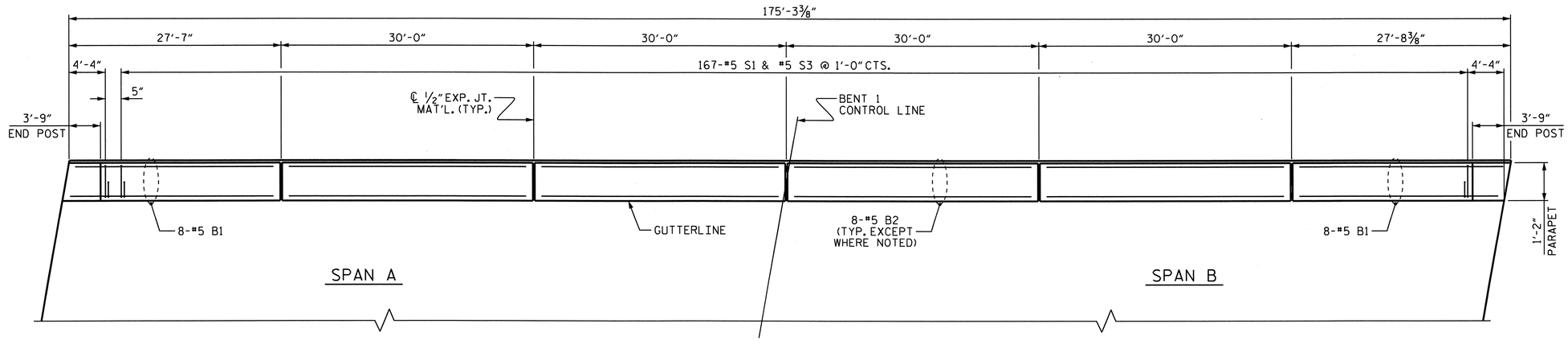


ELEVATION AT EXPANSION JOINTS



SECTION S-S

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



PLAN OF PARAPET

DIMENSIONS ARE ALONG OUTSIDE FACE OF PARAPET
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR.

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN G. FRYE 4/27/11

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PARAPET AND END POST DETAILS FOR TWO BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 2-8-11
CHECKED BY : JOHN FRYE DATE : 4-5-11

23-JUN-2011 15:51
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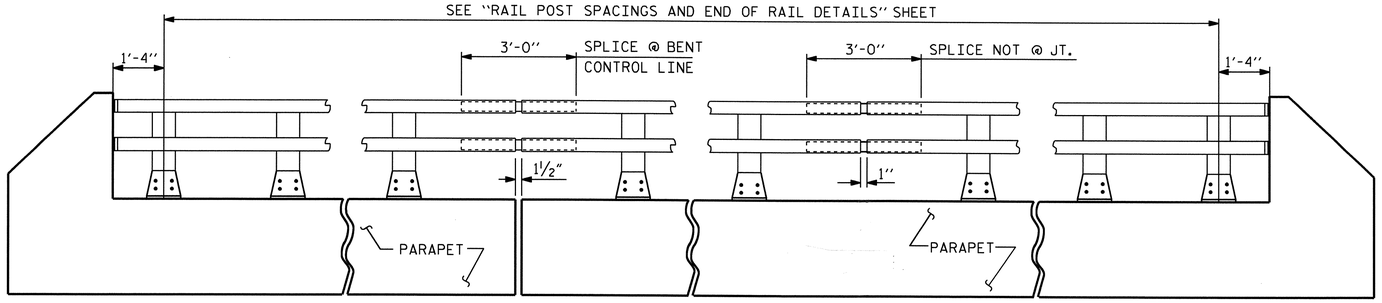
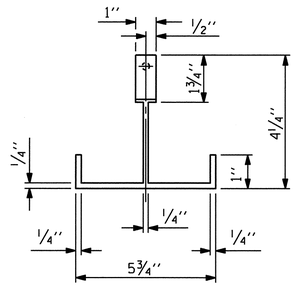
qtnguyen

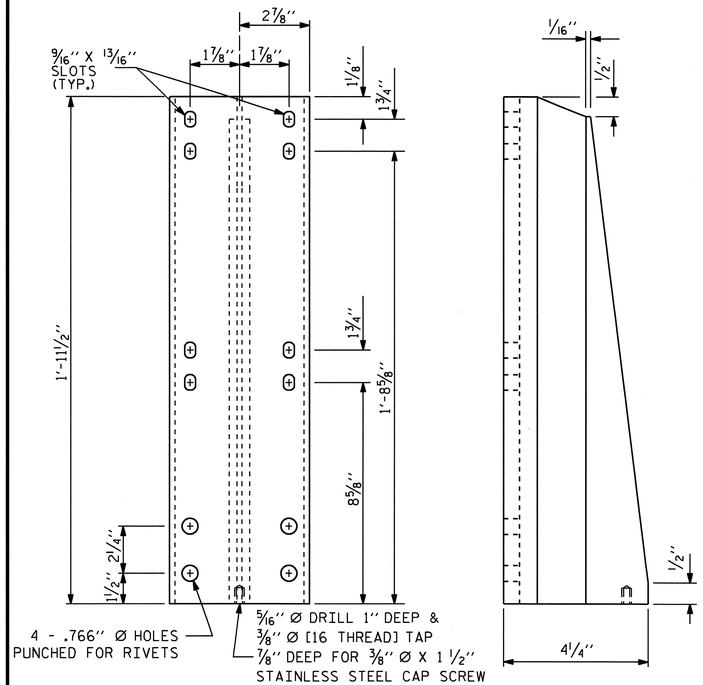


ELEVATION

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



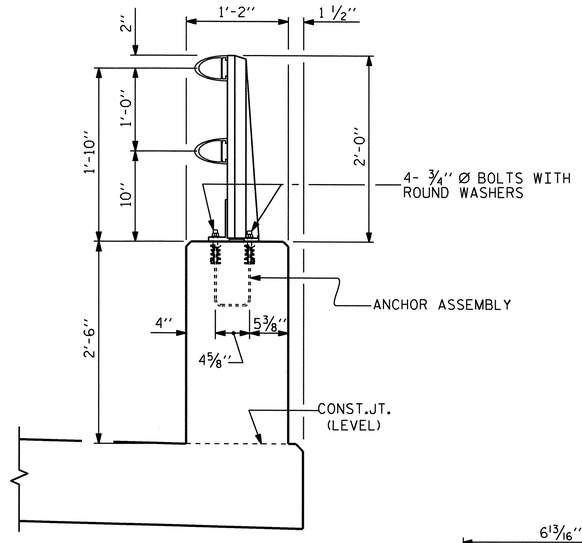
PLAN



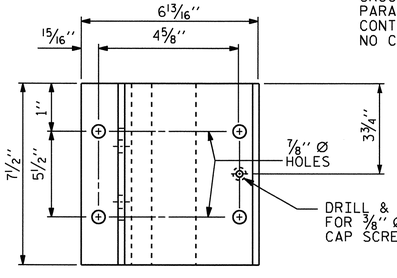
FRONT ELEVATION

SIDE ELEVATION

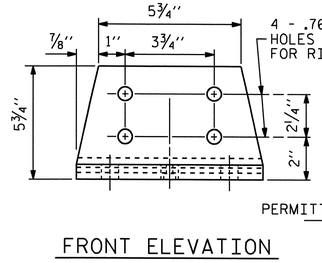
DETAILS OF POST



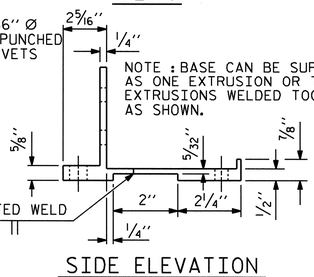
SECTION THRU PARAPET AND RAIL



PLAN

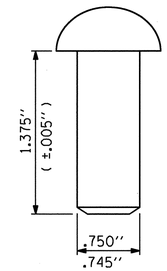


FRONT ELEVATION



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.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 335.56 LIN. FT.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE 5/9/11

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-8-11
CHECKED BY : JOHN FRYE	DATE : 4-5-11

DRAWN BY : EEM 6/94	REV. 10/17/00	LES/RDR
CHECKED BY : RGW 6/94	REV. 5/7/03R	RWW/LTE
	REV. 5/1/06	TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			32

STD. NO. BMR3

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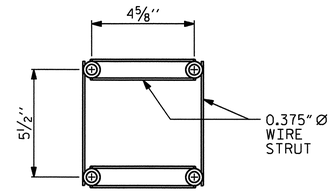
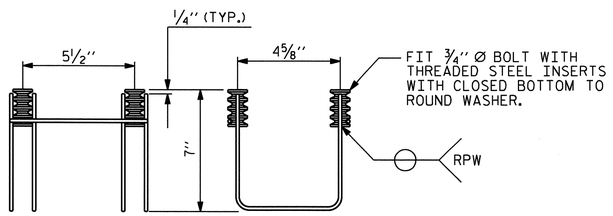


PLAN



SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 1¾''

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(58 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 ¾'' FERRULES.

B. 4 - ¾'' Ø X 2½'' 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 ¾'' Ø X 2½'' 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.

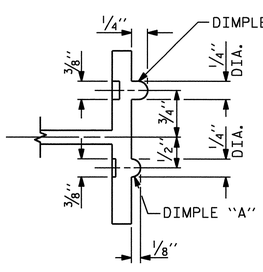
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

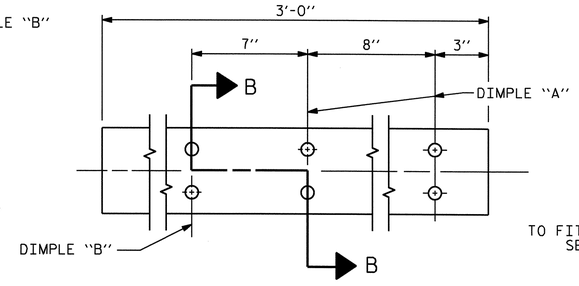
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

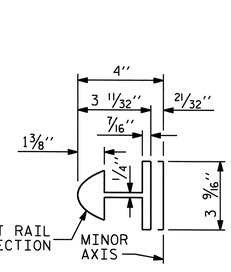
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

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



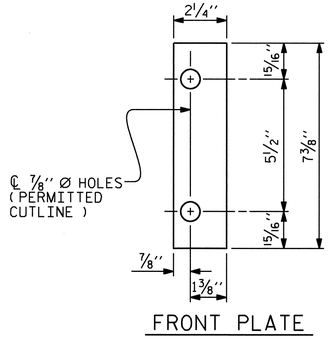
SECTION B-B



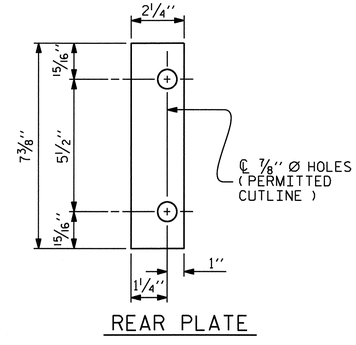


BAR SECTION

EXPANSION BAR DETAILS



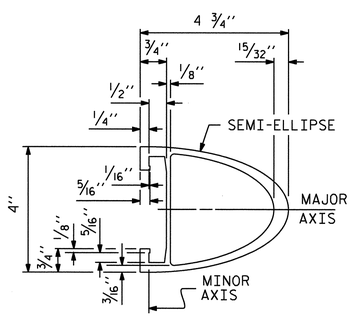
FRONT PLATE



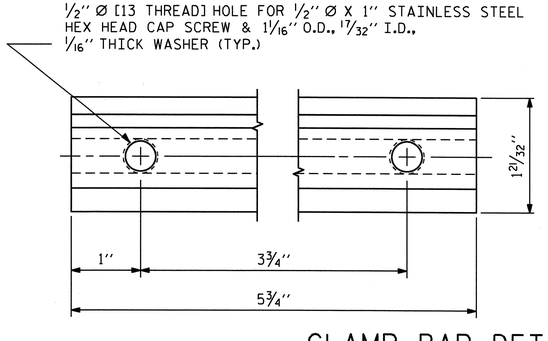
REAR PLATE

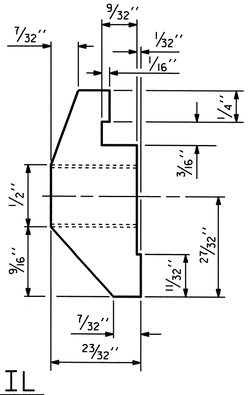
SHIM DETAILS

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



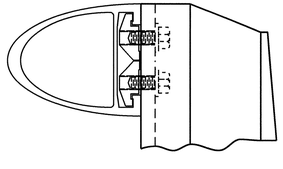
RAIL SECTION



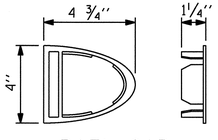


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-8-11				
CHECKED BY : JOHN FRYE	DATE : 4-5-11				
DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RGW	REVISIONS			SHEET NO. S-16
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES	NO. BY: DATE:	NO. BY: DATE:		
	REV. 5/1/06R KMM/GM	1	3		TOTAL SHEETS 32
		2	4		

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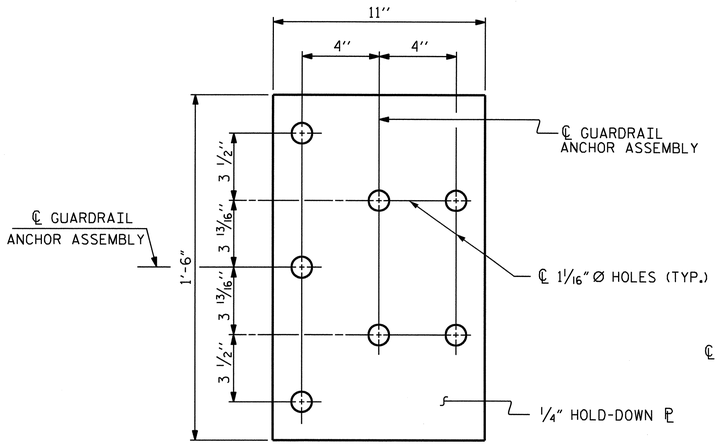
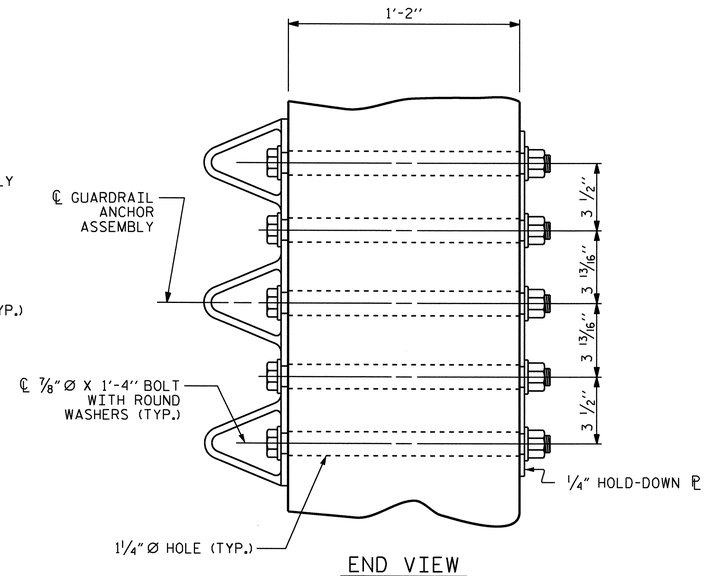
STD. NO. BMR4



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.

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

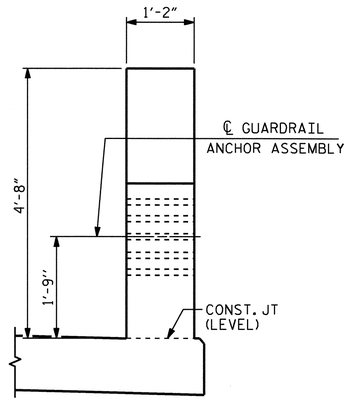
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

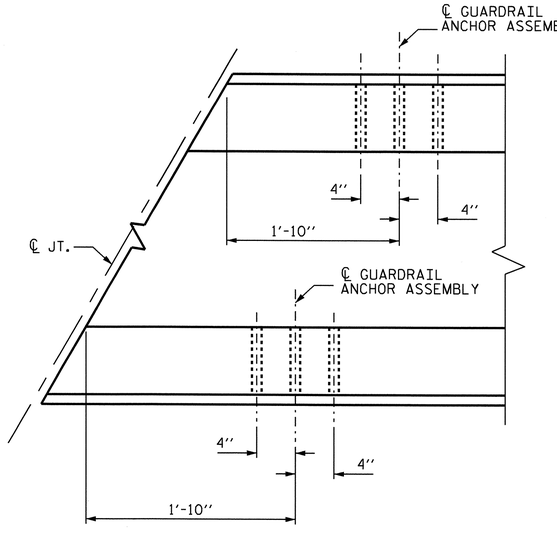
THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN A FRYE
5/9/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : E.C. LOCKLEAR DATE : 2-8-11 CHECKED BY : JOHN FRYE DATE : 4-5-11	
DRAWN BY : MAA 5/10 CHECKED BY : GM 5/10	ADDED 5/6/10

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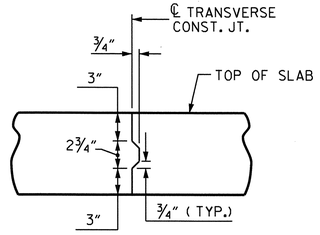
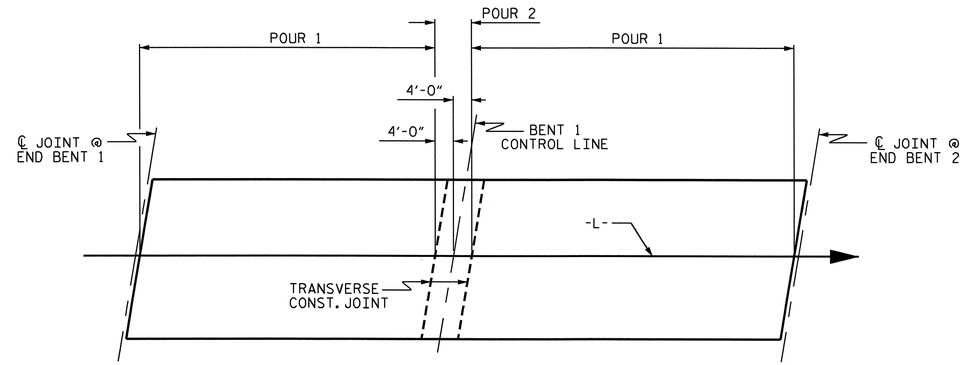
STD. NO. GRA3

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



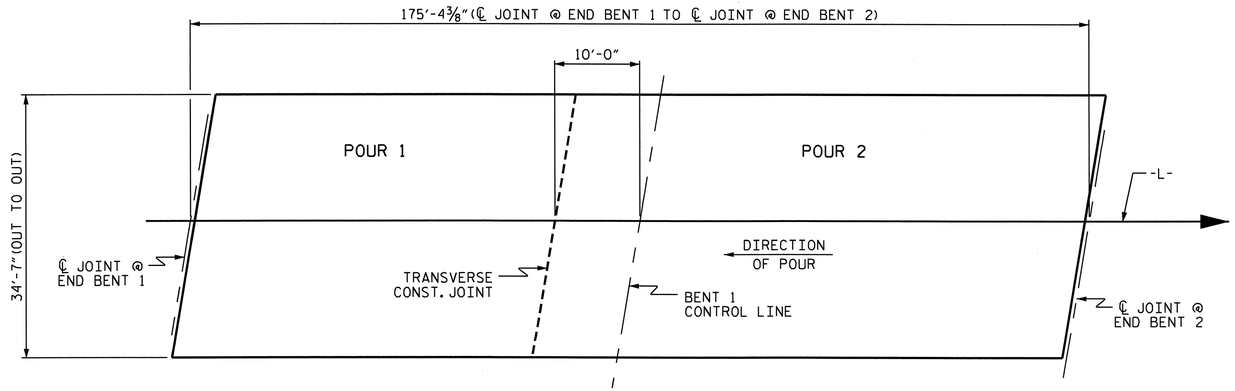
TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT



OPTIONAL POURING SEQUENCE

POUR 2 CANNOT BE STARTED UNTIL BOTH ADJACENT POURS 1 REACH A MINIMUM OF 3000 PSI.



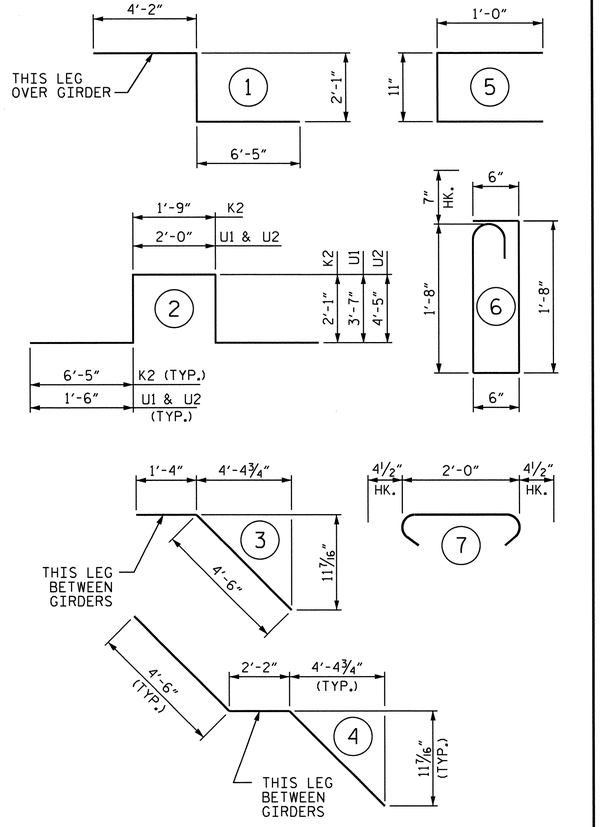
POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 6,065)

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	339	#5	STR	34'-3"	12110
A2	339	#5	STR	34'-3"	12110
✱A101	2	#5	STR	29'-11"	61
✱A102	2	#5	STR	26'-11"	55
✱A103	2	#5	STR	23'-11"	48
✱A104	2	#5	STR	20'-11"	42
✱A105	2	#5	STR	17'-11"	36
✱A106	2	#5	STR	14'-11"	30
✱A107	2	#5	STR	11'-11"	23
✱A108	2	#5	STR	8'-11"	17
✱A109	2	#5	STR	5'-11"	11
✱A110	2	#5	STR	2'-11"	5
A201	2	#5	STR	31'-11"	67
A202	2	#5	STR	28'-11"	60
A203	2	#5	STR	25'-11"	54
A204	2	#5	STR	22'-11"	48
A205	2	#5	STR	19'-11"	42
A206	2	#5	STR	16'-11"	35
A207	2	#5	STR	13'-11"	29
A208	2	#5	STR	10'-11"	23
A209	2	#5	STR	7'-11"	17
A210	2	#5	STR	4'-11"	10
A211	2	#5	STR	1'-11"	4
✱B1	14	#4	STR	26'-9"	250
✱B2	138	#4	STR	20'-8"	1905
✱B3	69	#7	STR	24'-8"	3479
✱B4	22	#7	STR	26'-8"	1199
B5	132	#5	STR	59'-10"	8238
✱G1	2	#5	STR	34'-8"	72
✱K1	8	#8	1	12'-8"	271
✱K2	8	#8	2	18'-9"	401
✱K3	12	#6	STR	7'-8"	138
K4	12	#4	STR	7'-8"	61
K5	12	#4	STR	8'-5"	67
K6	6	#4	STR	6'-0"	24
K7	10	#4	3	5'-7"	37
K8	10	#4	4	11'-2"	75
✱S1	48	#5	6	4'-11"	246
✱S2	48	#4	5	2'-11"	94
S3	90	#4	7	2'-11"	175
U1	6	#4	2	12'-1"	49
U2	18	#4	2	13'-10"	166
REINFORCING STEEL			LBS.		21,380
✱EPOXY COATED REINFORCING STEEL			LBS.		20,491

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

SUPERSTRUCTURE BILL OF MATERIAL

	ALL LIGHTWEIGHT CONCRETE (4500 PSI)	REINFORCING STEEL	✱ EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
POUR 1	95.8		
POUR 2	128.8		
TOTALS▲	224.6	21,380	20,491

▲QUANTITIES FOR PARAPETS & END POSTS ARE NOT INCLUDED.

GROOVING BRIDGE FLOORS		
APPROACH SLABS	620	SQ.FT.
BRIDGE DECK	5047	SQ.FT.
TOTAL	5,667	SQ.FT.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

6/24/11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			32

STD. NO. BOM2

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-9-11		
CHECKED BY : JOHN FRYE	DATE : 4-5-11		
DRAWN BY : JMB 5/87	REV. 6/1/94	EEM/GRP	
CHECKED BY : SJD 9/87	REV. 8/16/99	RWW/LES	
	REV. 5/1/06	TLA/GM	

23-JUN-2011 15:51
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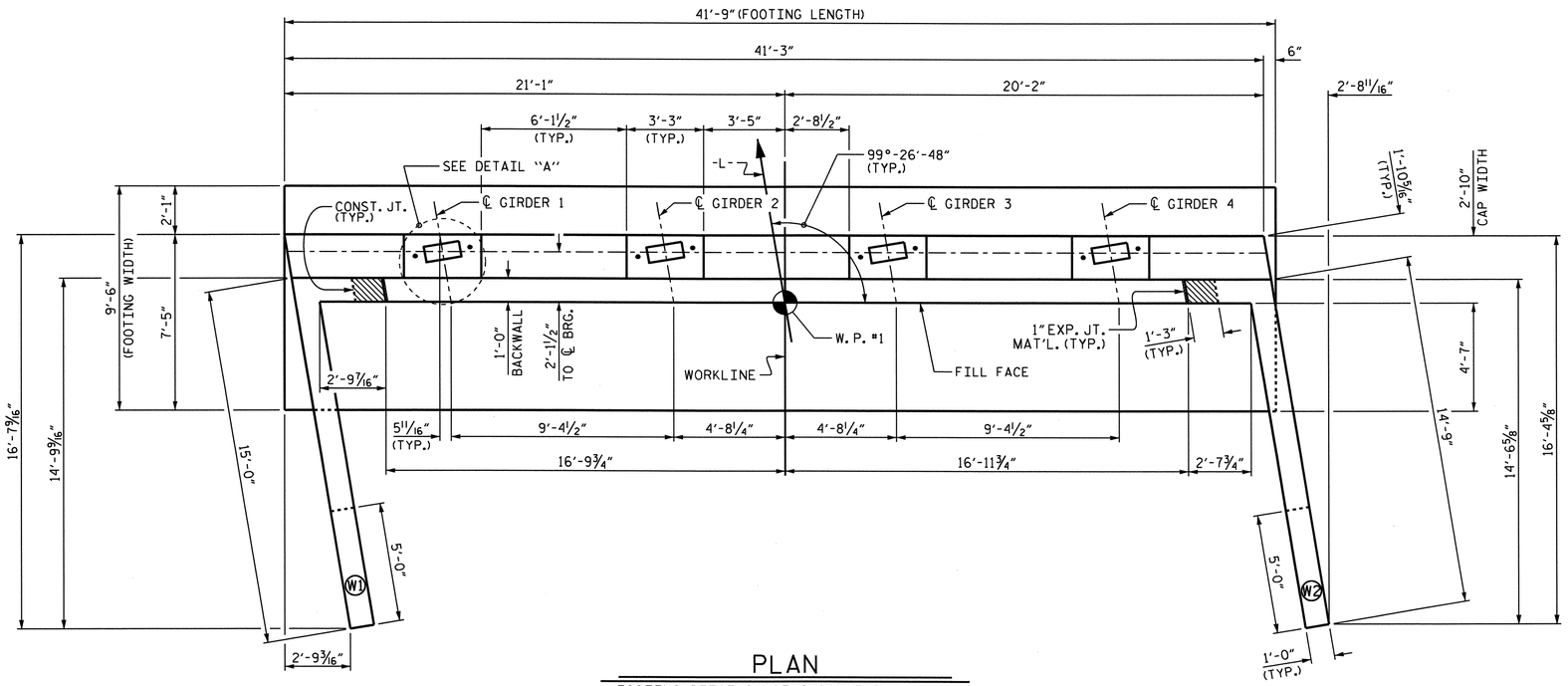
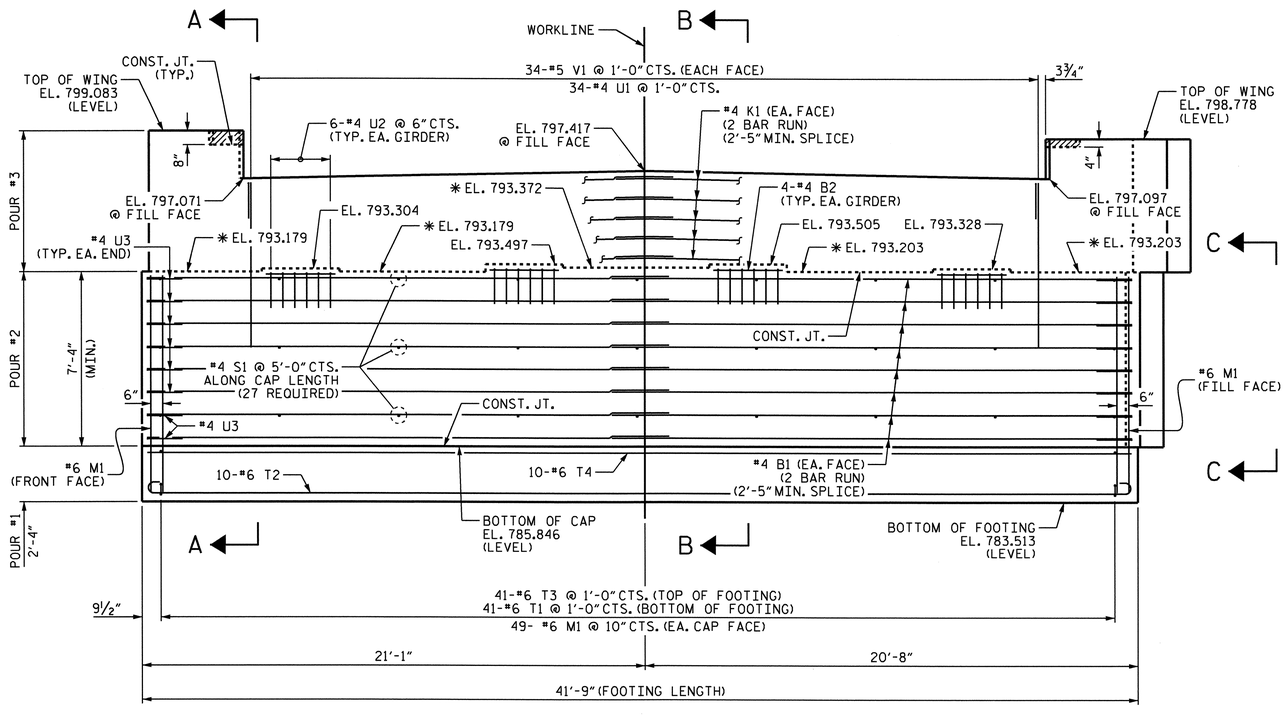
qtnguyen



PLAN

FOOTING DETAILS NOT SHOWN FOR CLARITY



ELEVATION

LEFT WING NOT SHOWN FOR CLARITY

NOTES

REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

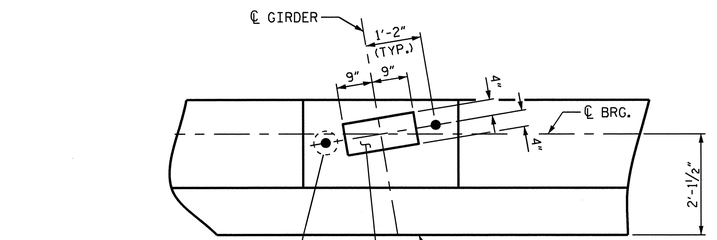
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

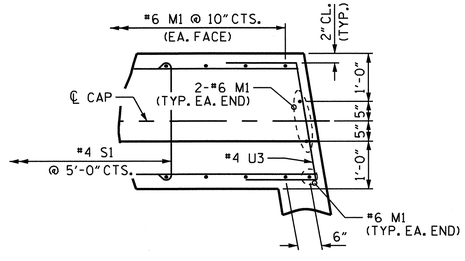
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET IS CAST IF SLIP FORMING IS USED.

POUR 2 IS CONSIDERED MASS CONCRETE. FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



DETAIL "A"



CAP PART PLAN VIEW

RIGHT END SHOWN (LEFT END SIMILAR)

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 036445 ENGINEER KOREY NEWTON

6/23/2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 5/4/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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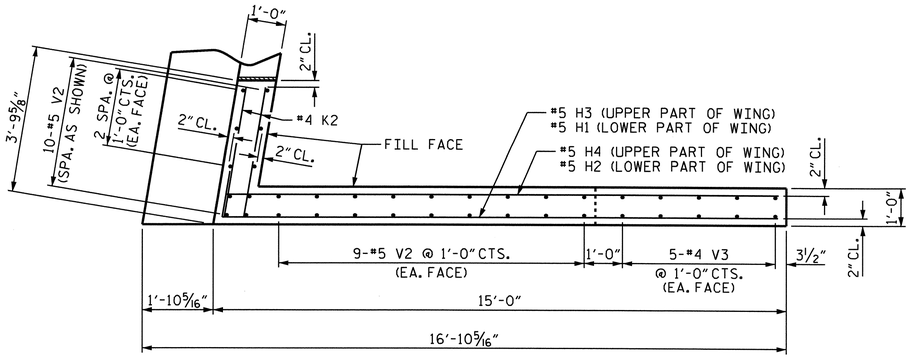
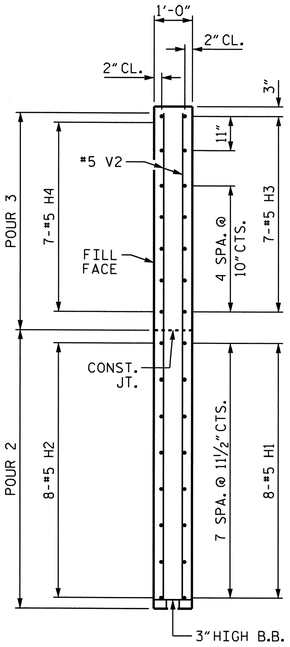
kpnewton

NC605

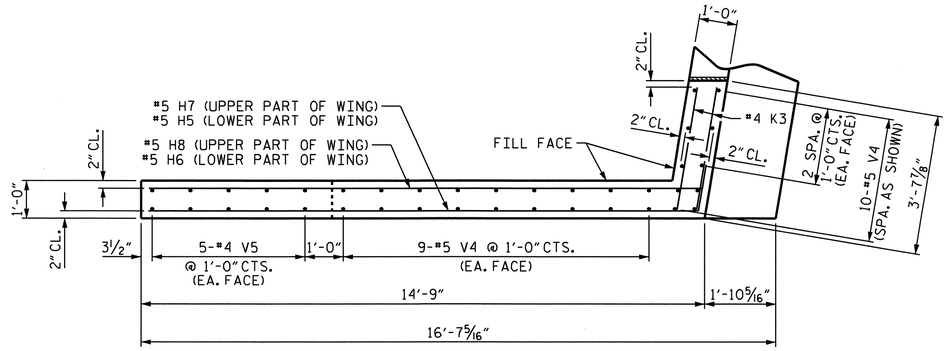


PLAN OF WING W1

FOOTING NOT SHOWN FOR CLARITY

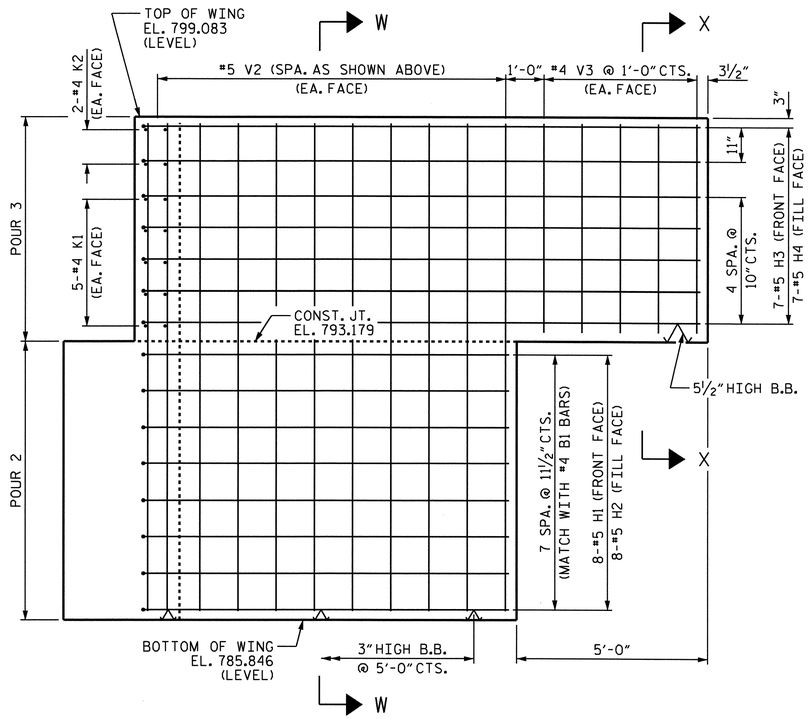


SECTION W-W



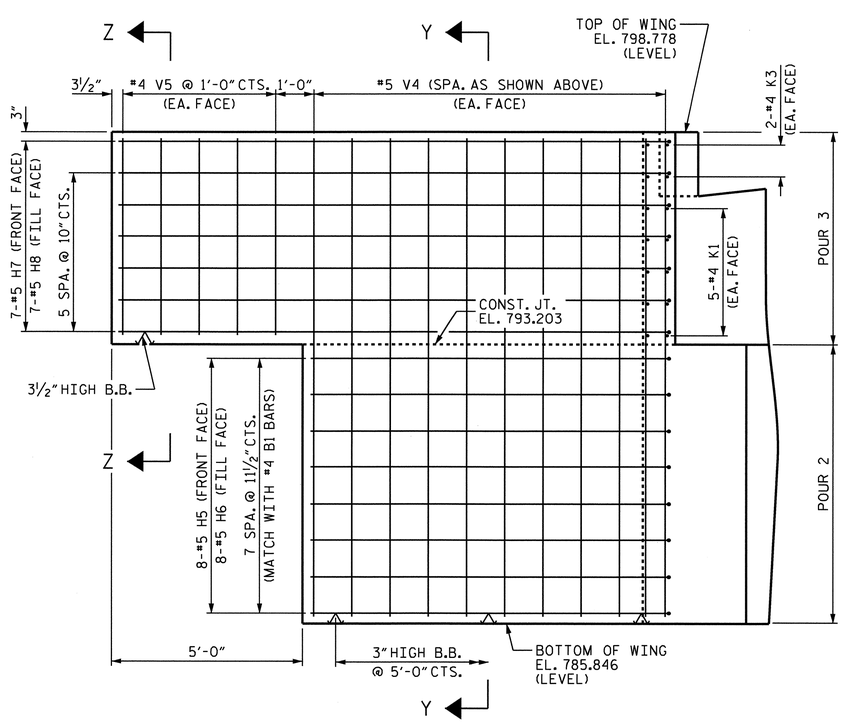
PLAN OF WING W2

FOOTING NOT SHOWN FOR CLARITY



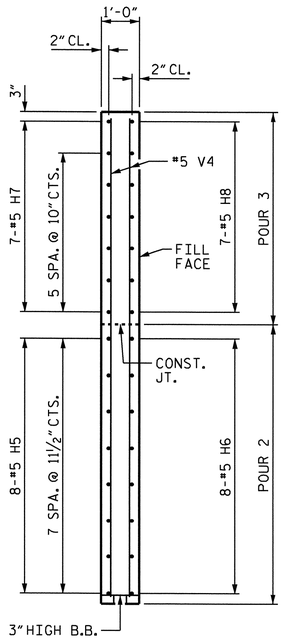
ELEVATION OF WING W1

FOOTING NOT SHOWN FOR CLARITY

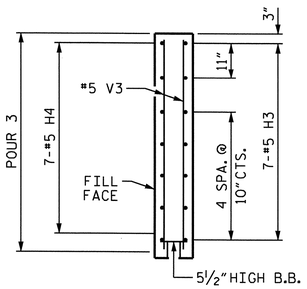


ELEVATION OF WING W2

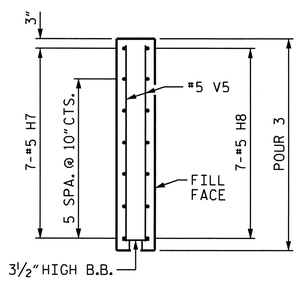
FOOTING NOT SHOWN FOR CLARITY



SECTION Y-Y



SECTION X-X



SECTION Z-Z

STATE OF NORTH CAROLINA
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER KOREY NEWTON
5/11/2011

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 2/10/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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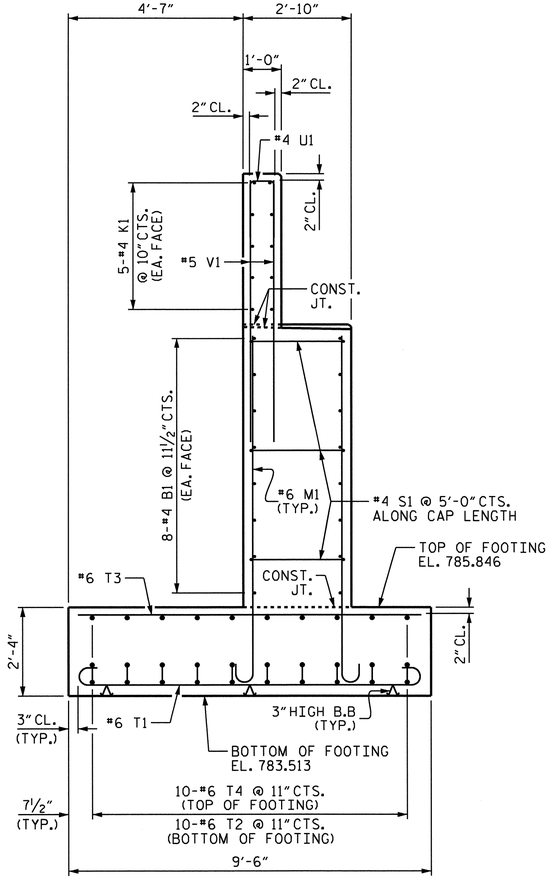
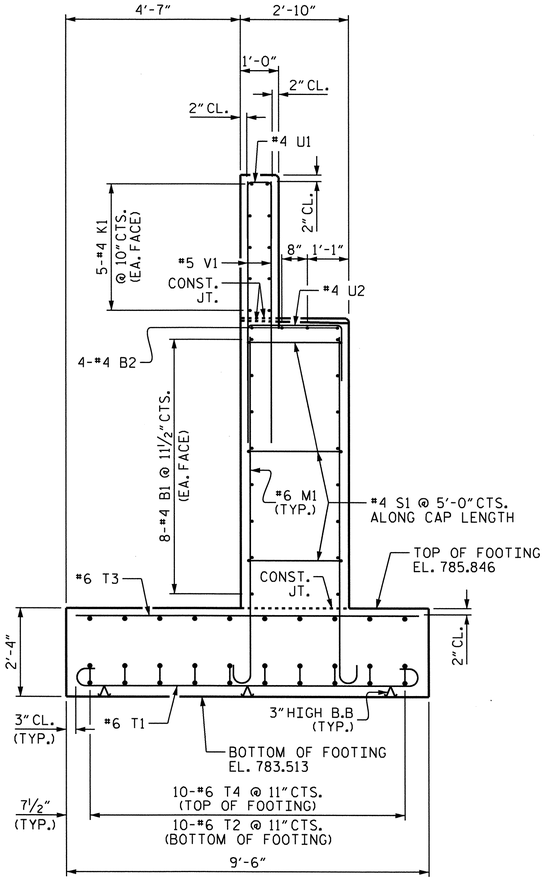
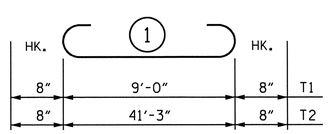


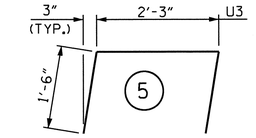
SECTION A-A

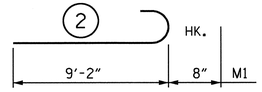


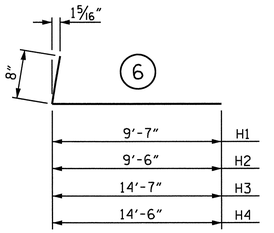
SECTION B-B

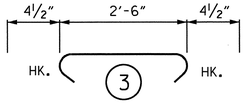
BAR TYPES

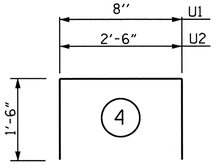


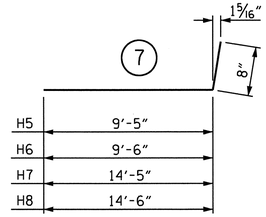












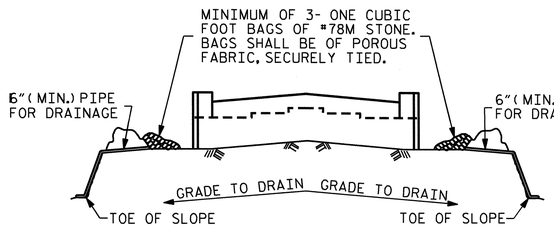
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	32	#4	STR	21'-8"	463
B2	16	#4	STR	2'-11"	31
H1	8	#5	6	10'-3"	86
H2	8	#5	6	10'-2"	87
H3	7	#5	6	15'-3"	111
H4	7	#5	6	15'-2"	111
H5	8	#5	7	10'-1"	84
H6	8	#5	7	10'-2"	85
H7	7	#5	7	15'-1"	110
H8	7	#5	7	15'-2"	111
K1	20	#4	STR	21'-8"	289
K2	4	#4	STR	3'-5"	9
K3	4	#4	STR	3'-3"	9
M1	104	#6	2	9'-10"	1536
S1	27	#4	3	3'-3"	59
T1	41	#6	1	10'-4"	636
T2	10	#6	1	42'-7"	640
T3	41	#6	STR	9'-0"	554
T4	10	#6	STR	41'-3"	620
U1	34	#4	4	3'-8"	83
U2	24	#4	4	5'-6"	88
U3	16	#4	5	5'-3"	56
V1	68	#5	STR	6'-11"	491
V2	28	#5	STR	12'-10"	375
V3	10	#4	STR	5'-6"	37
V4	28	#5	STR	12'-7"	367
V5	10	#4	STR	5'-2"	35

REINFORCING STEEL	LBS.	7161
CLASS A CONCRETE		
POUR 1 (FOOTING)		34.3 C.Y.
POUR 2 (CAP & LOWER WINGS)		37.5 C.Y.
POUR 3 (BACKWALL & UPPER WINGS)		12.6 C.Y.
TOTAL		84.4 C.Y.
FOUNDATION EXCAVATION		LUMP SUM

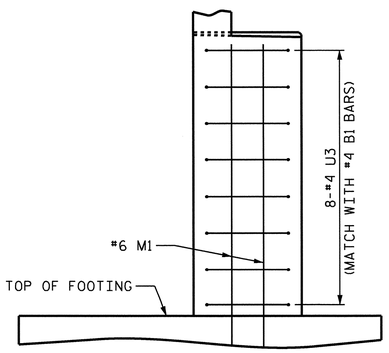


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

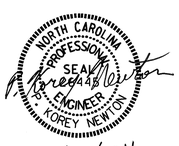
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



VIEW C-C

EA. END SIMILAR



6/23/2011

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 4/20/11
CHECKED BY : J. C. FRYE DATE : 4/28/11

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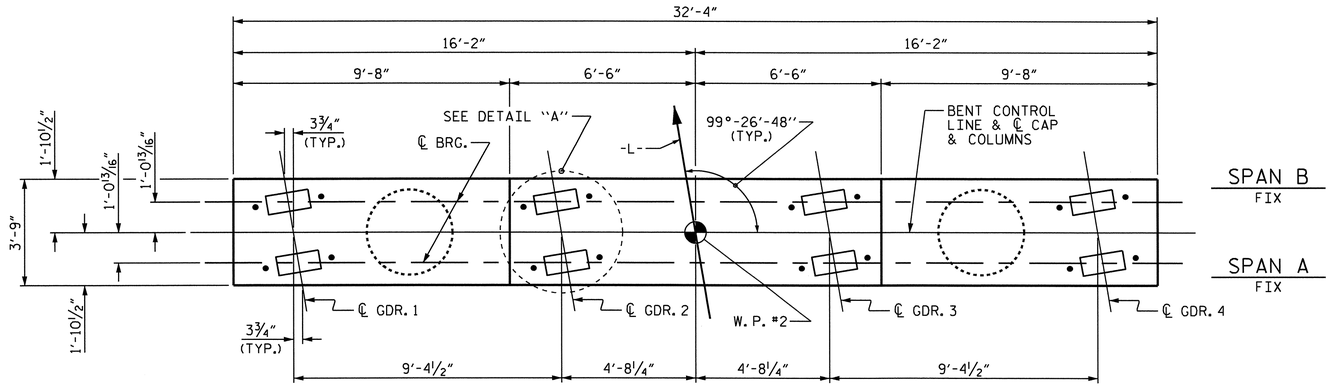
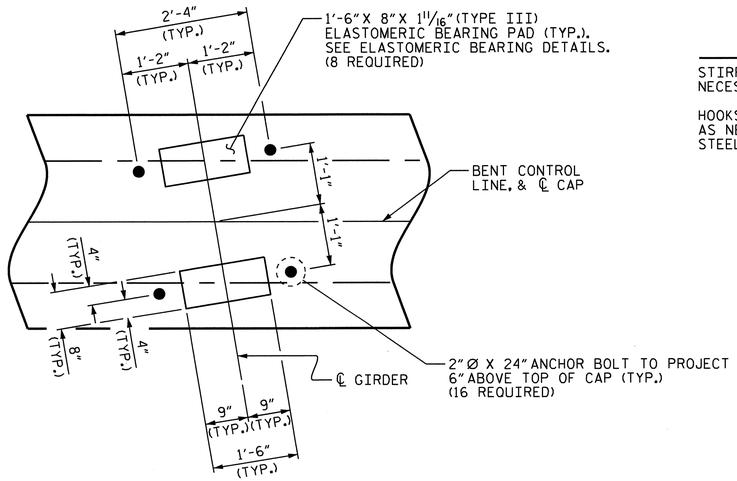
kpnewton

NCDOT



PLAN

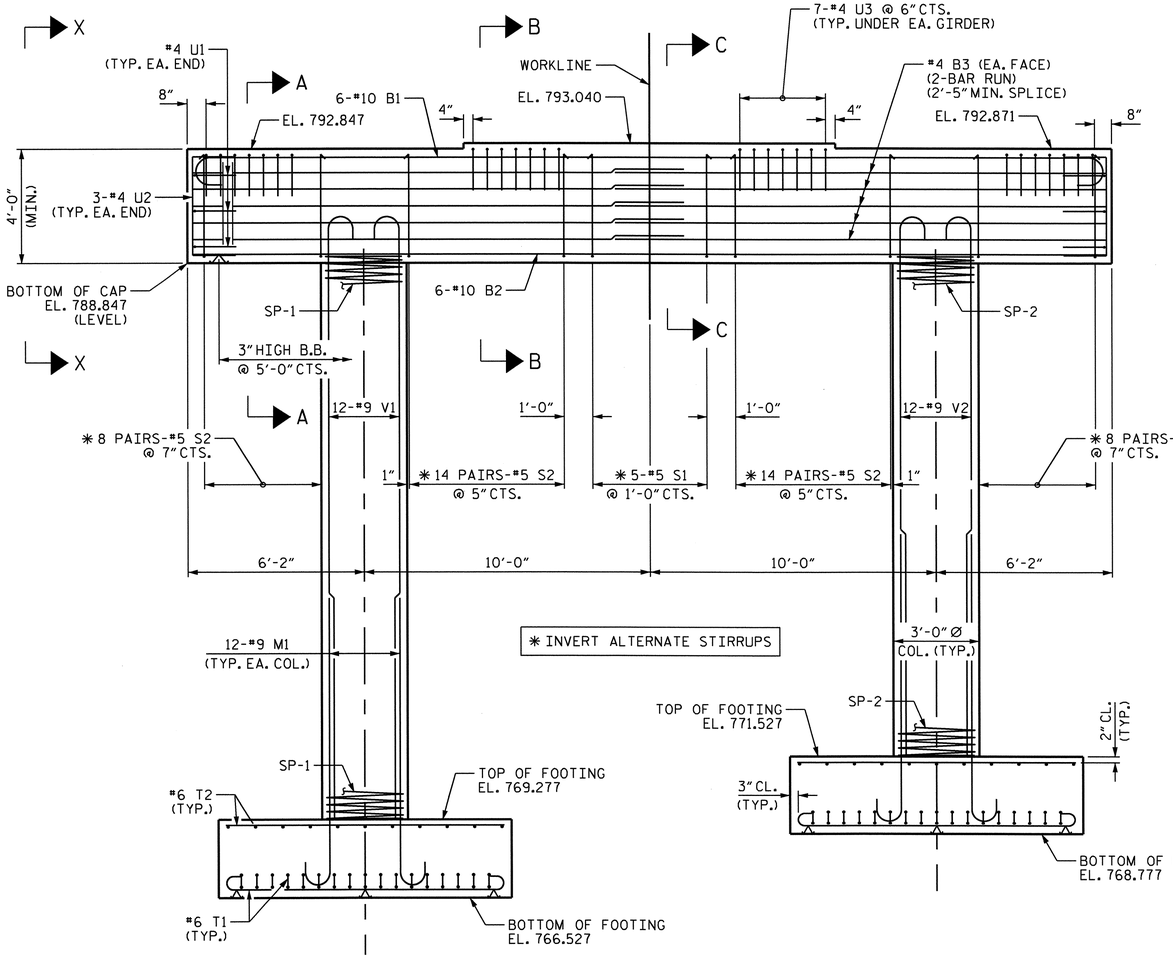


DETAIL "A"

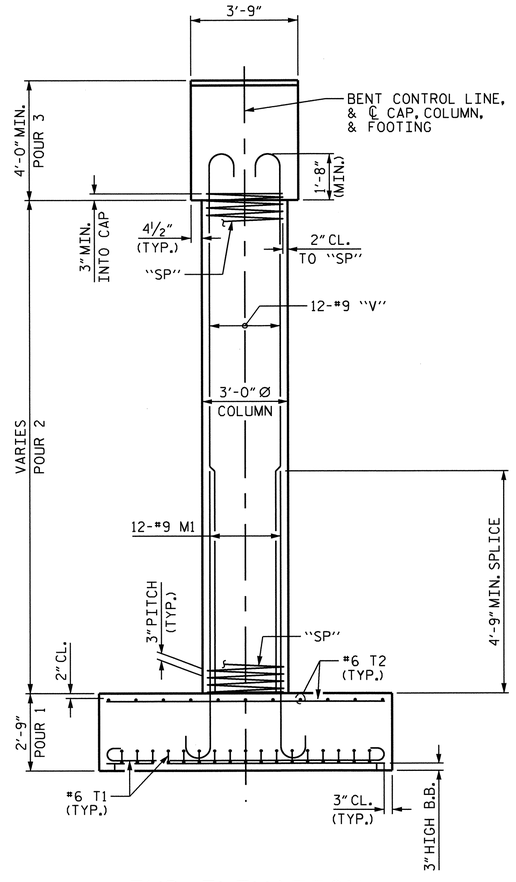
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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



ELEVATION



END ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL P. K. NEWTON P.E. ENGINEER KORREY NEWTON

6/23/2011

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 1/19/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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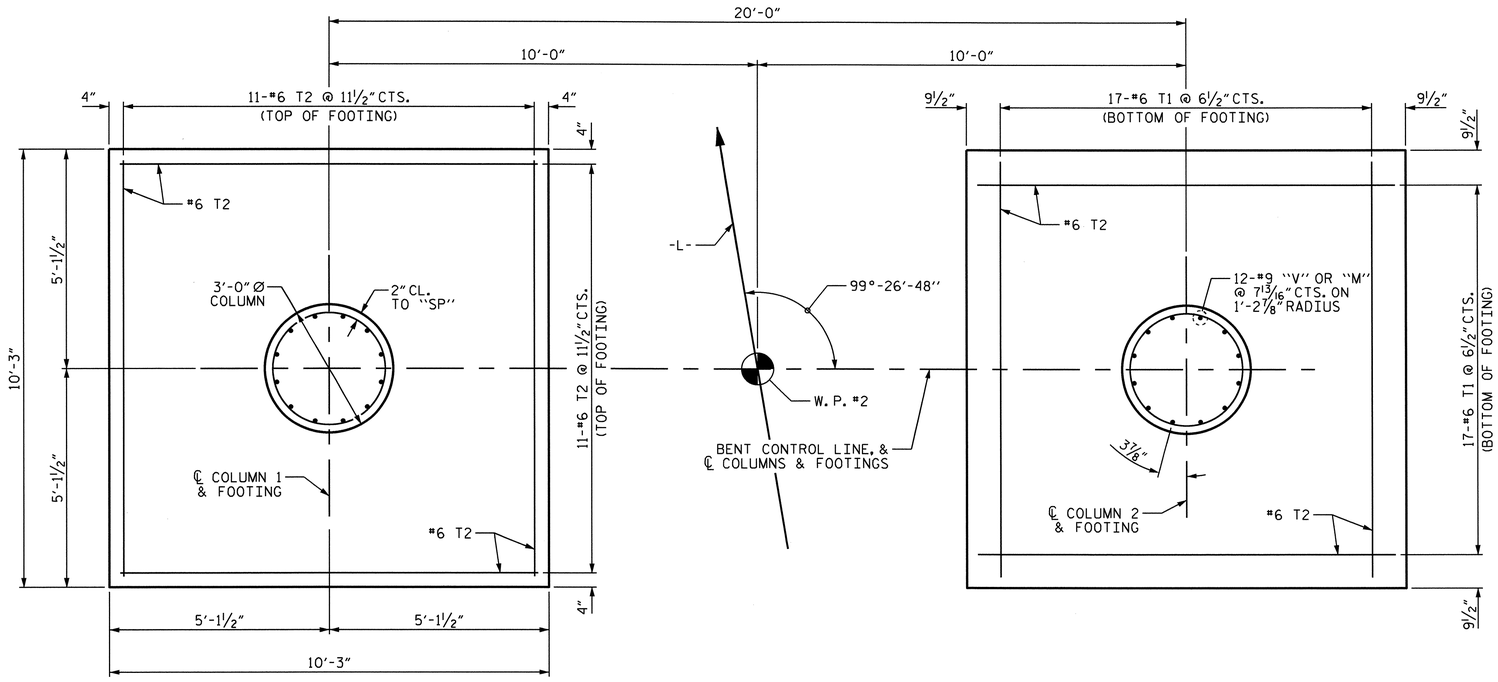
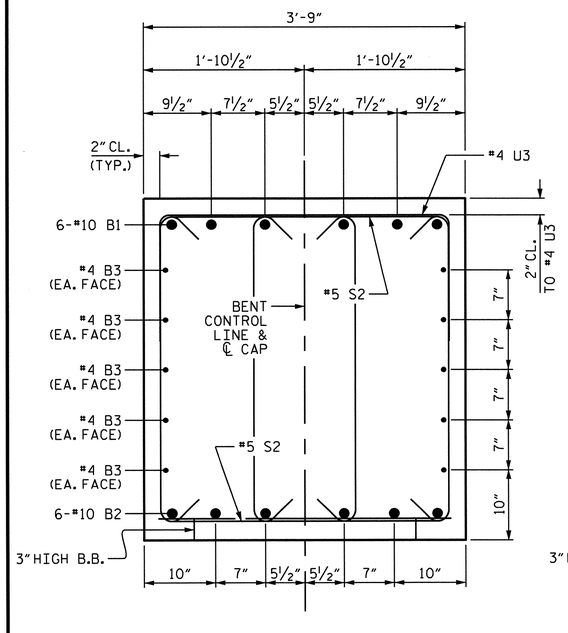
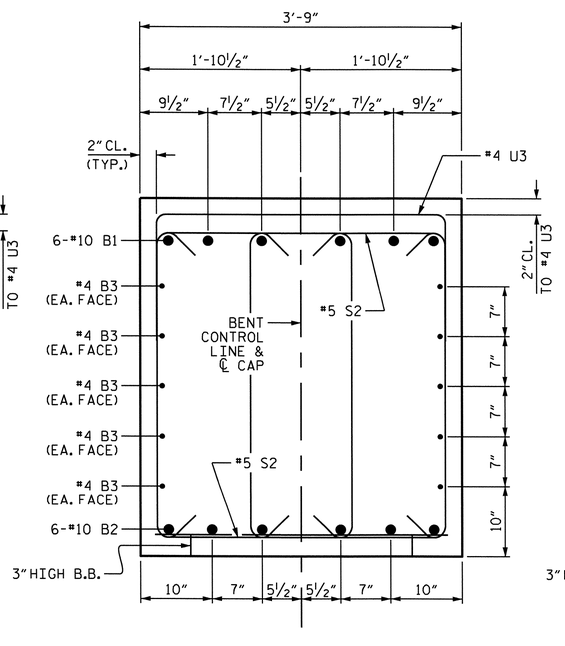


PLAN OF FOOTINGS & COLUMNS

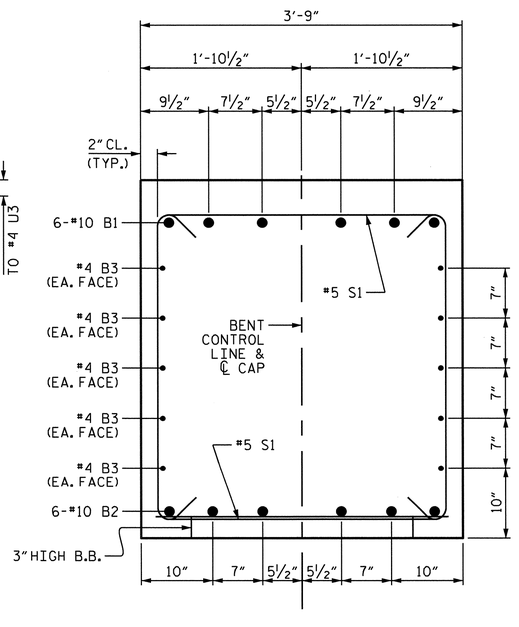
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING AND COLUMN.)



SECTION A-A



SECTION B-B



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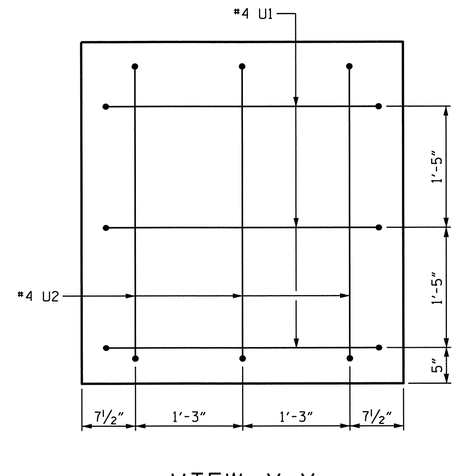
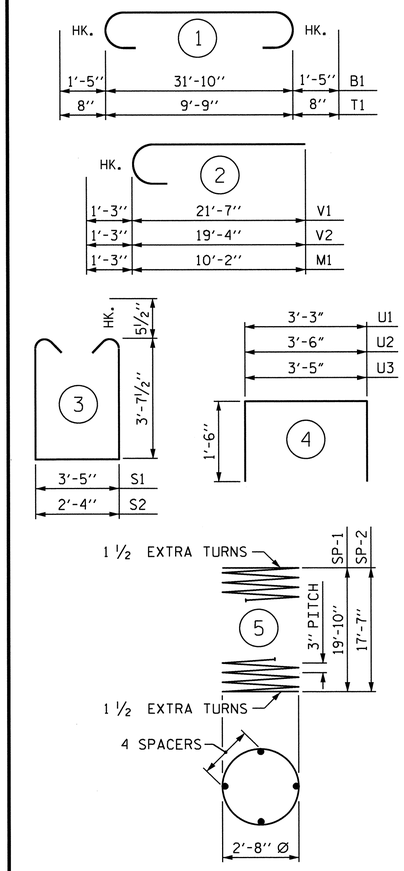


VIEW X-X

(TYP. EA. END)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	1	34'-8"	895
B2	6	#10	STR	32'-0"	826
B3	20	#4	STR	17'-3"	230
M1	24	#9	2	8'-5"	687
S1	5	#5	3	11'-7"	60
S2	88	#5	3	10'-6"	964
T1	68	#6	1	11'-1"	1132
T2	44	#6	STR	9'-9"	644
U1	6	#4	4	6'-3"	25
U2	6	#4	4	6'-6"	26
U3	28	#4	4	6'-5"	120
V1	12	#9	2	22'-10"	932
V2	12	#9	2	20'-7"	840

REINFORCING STEEL				LBS	7381
SP-1	1	**	5	684'-10"	457
SP-2	1	**	5	610'-7"	408

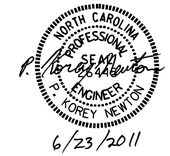
TOTAL SPIRAL COLUMN REINFORCING STEEL 865

CLASS A CONCRETE BREAKDOWN:

POUR 1 (FOOTINGS)	21.4 C.Y.
POUR 2 (COLUMNS)	9.7 C.Y.
POUR 3 (CAP)	18.3 C.Y.
TOTAL CLASS A CONCRETE	49.4 C.Y.

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

FOUNDATION EXCAVATION LUMP SUM



PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 1/19/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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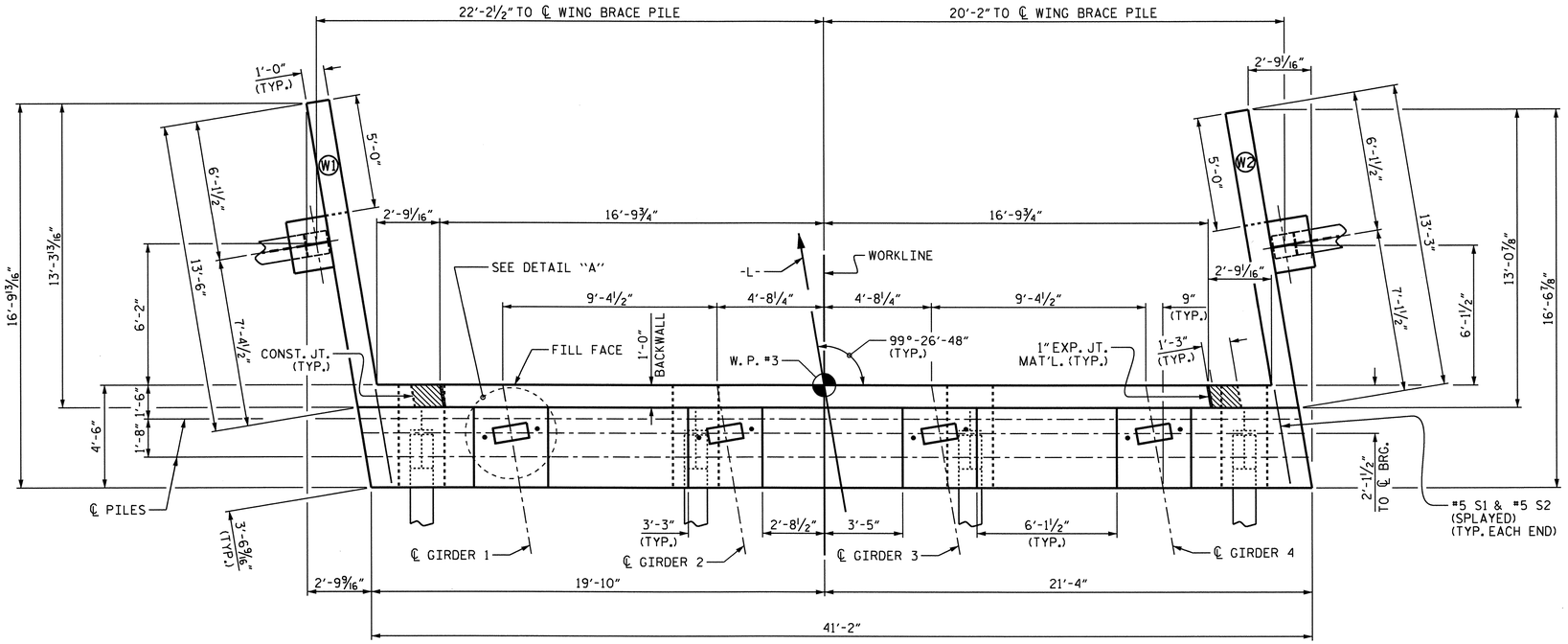
kpnewton

NCDOT



PLAN

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

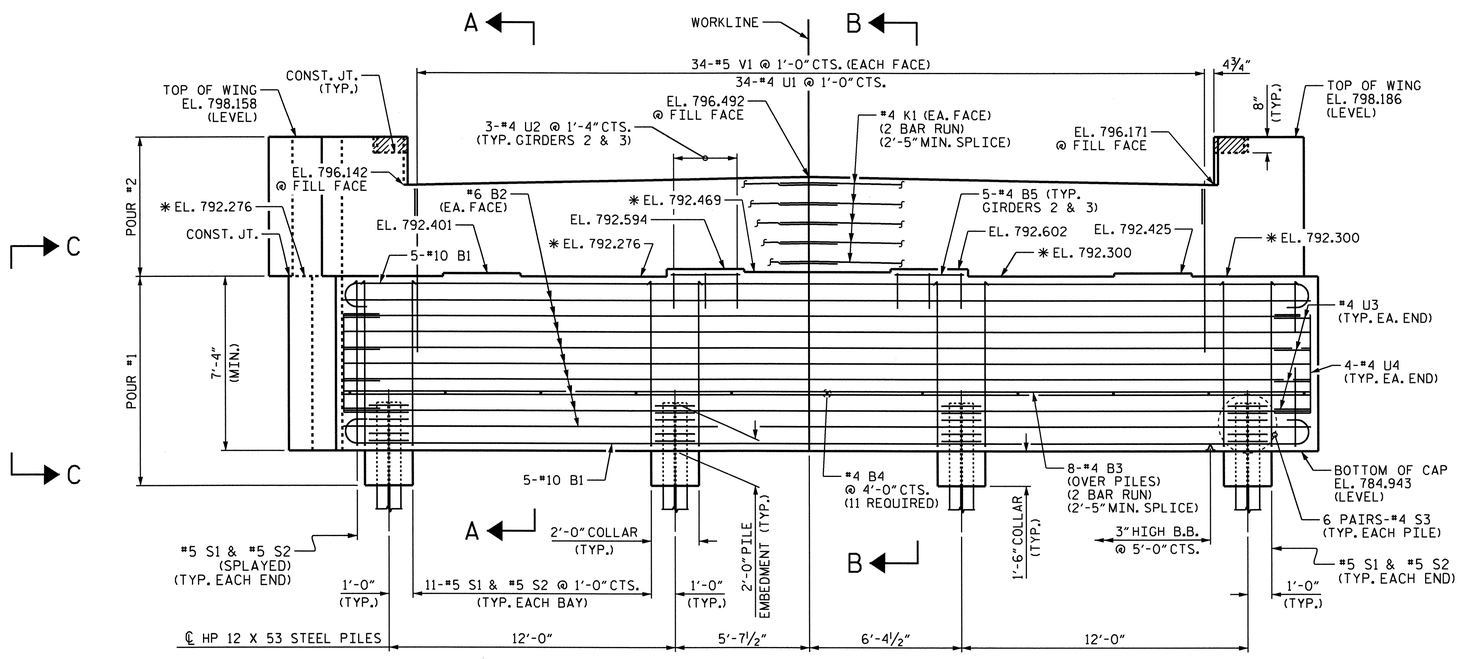
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

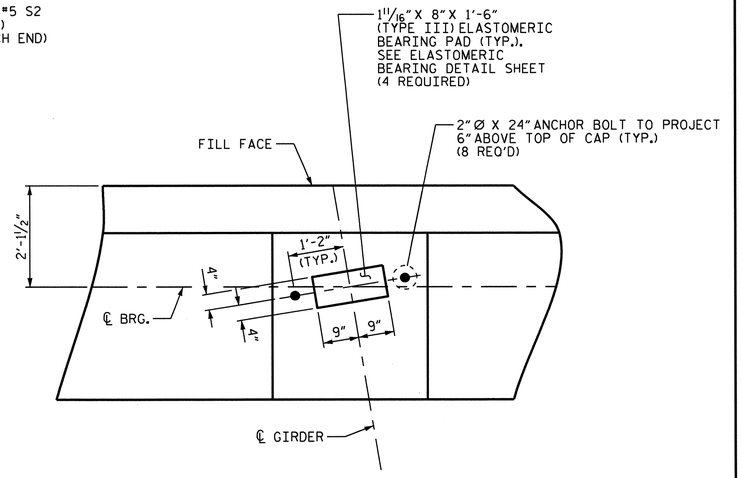
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET IS CAST IF SLIP FORMING IS USED.

POUR 1 IS CONSIDERED MASS CONCRETE. FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



ELEVATION

BRACE PILES IN WINGS AND WING DETAILS NOT SHOWN FOR CLARITY.



DETAIL "A"

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 026945 ENGINEER K. NEWTON

6/24/2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 2/10/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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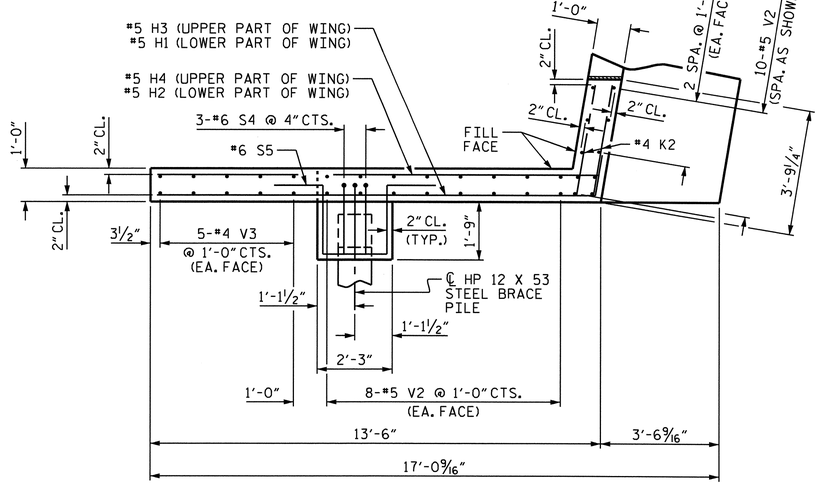
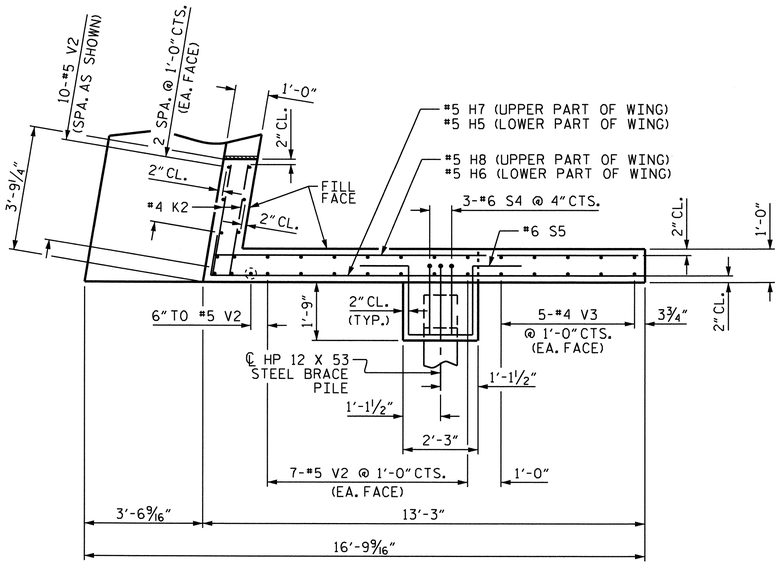
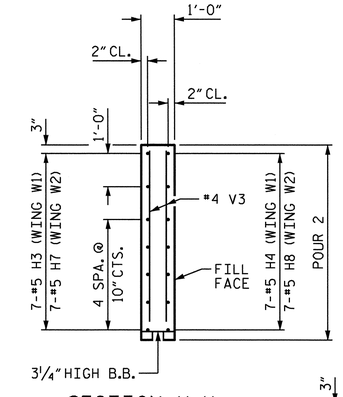
NC005



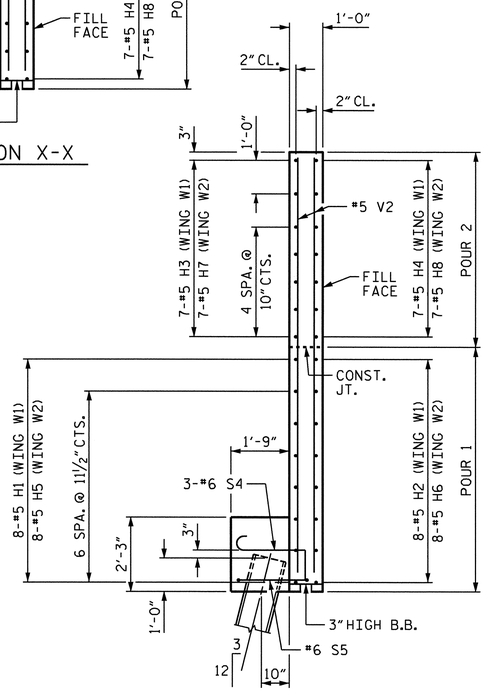
PLAN OF WING W1



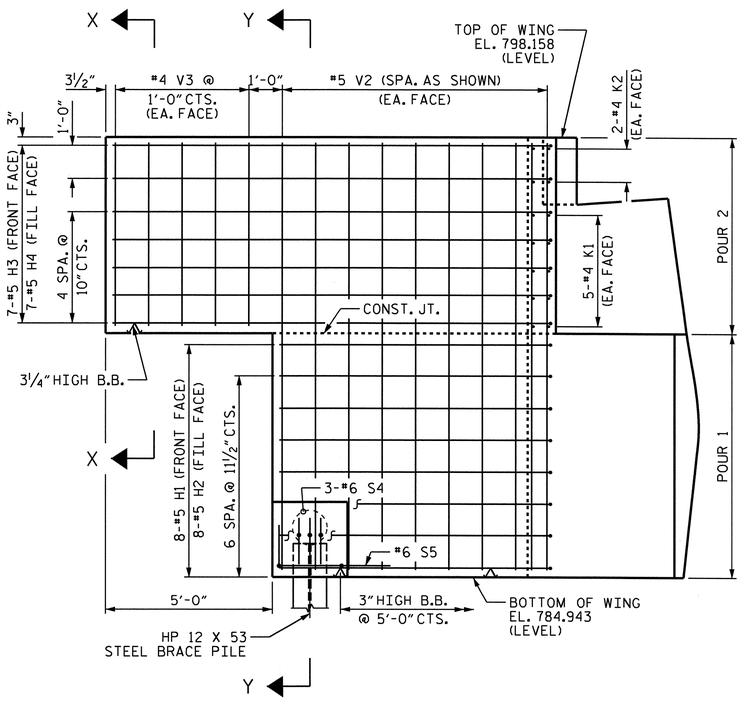
PLAN OF WING W2



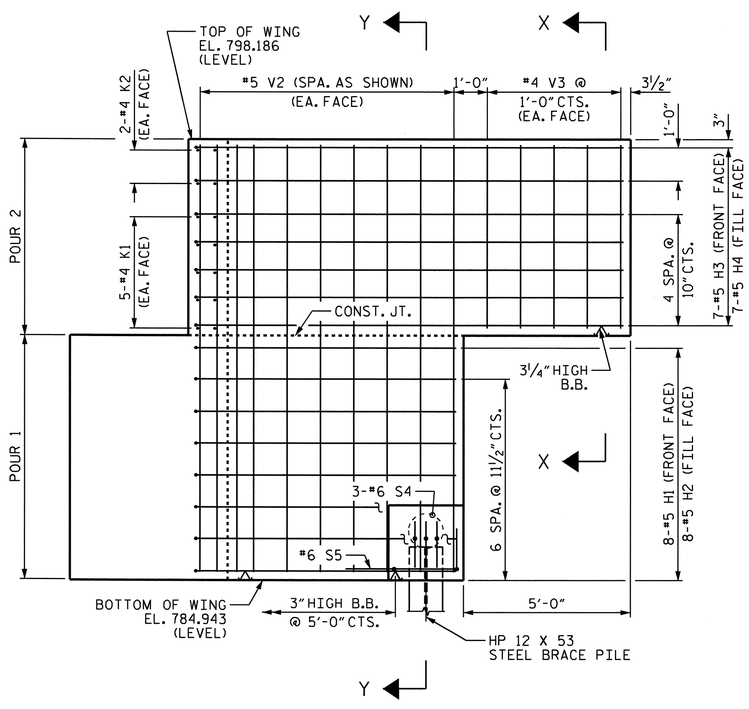
SECTION X-X



SECTION Y-Y



ELEVATION OF WING W1



ELEVATION OF WING W2

5/11/2011

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 2/15/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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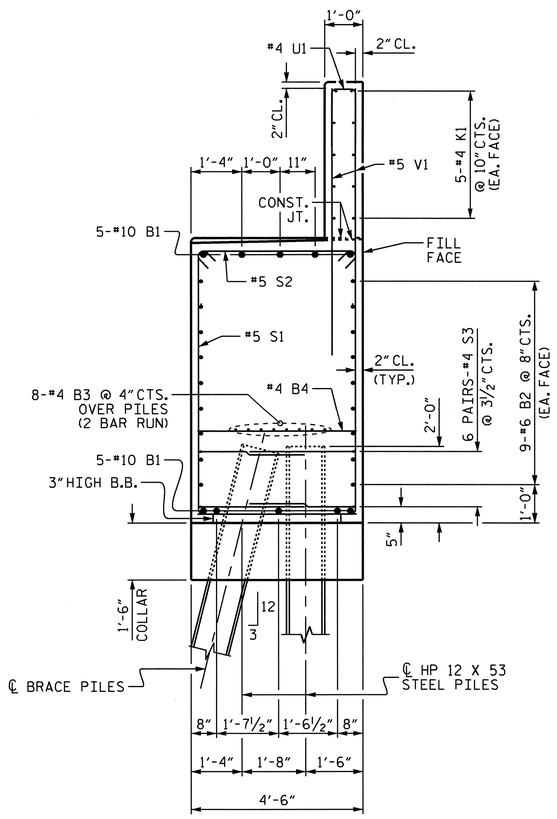
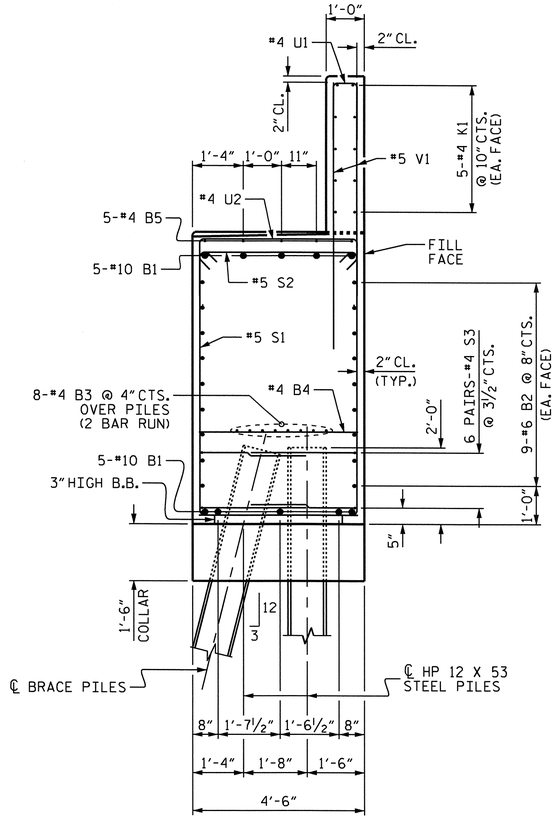
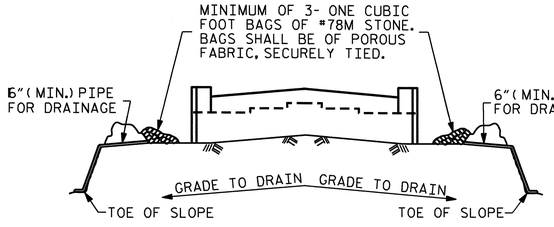


SECTION A-A



SECTION B-B



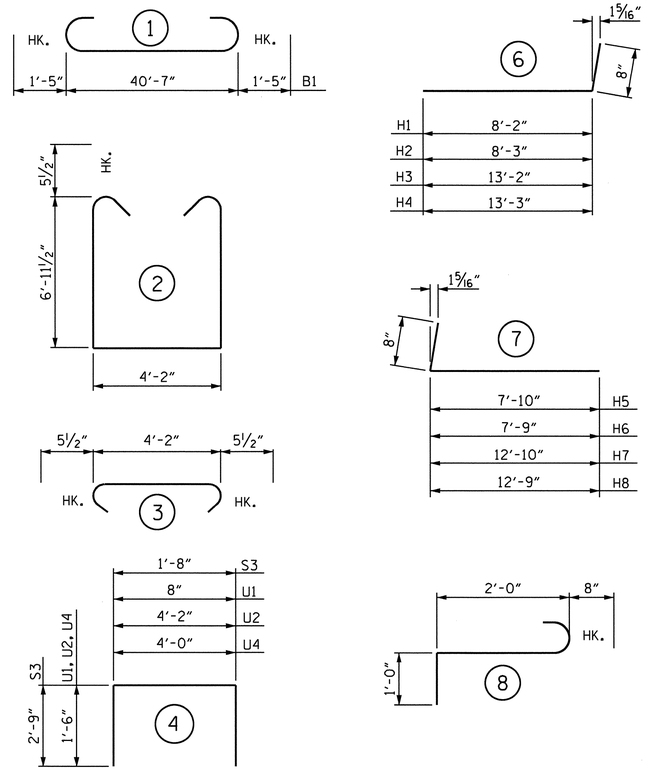
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

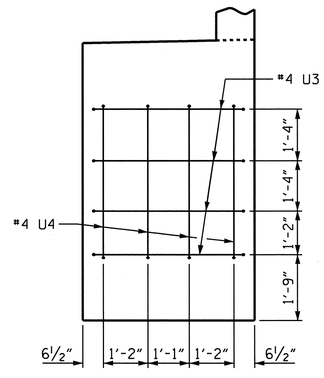
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



VIEW C-C

EA. END SIMILAR

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	43'-5"	1868
B2	18	#6	STR	40'-9"	1102
B3	16	#4	STR	21'-8"	232
B4	11	#4	STR	4'-2"	31
B5	10	#4	STR	2'-11"	19
H1	8	#5	6	8'-10"	74
H2	8	#5	6	8'-11"	74
H3	7	#5	6	13'-10"	101
H4	7	#5	6	13'-11"	102
H5	8	#5	7	8'-6"	71
H6	8	#5	7	8'-5"	70
H7	7	#5	7	13'-6"	99
H8	7	#5	7	13'-5"	98
K1	20	#4	STR	21'-8"	289
K2	8	#4	STR	3'-5"	18
S1	35	#5	2	19'-0"	694
S2	35	#5	3	5'-1"	186
S3	48	#4	4	7'-2"	230
S4	6	#6	8	3'-8"	33
S5	2	#6	9	9'-1"	27
U1	34	#4	4	3'-8"	83
U2	6	#4	4	7'-2"	29
U3	8	#4	5	7'-1"	38
U4	8	#4	4	7'-0"	37
V1	68	#5	STR	6'-11"	491
V2	51	#5	STR	12'-10"	683
V3	20	#4	STR	5'-6"	73

REINFORCING STEEL LBS. 6852

CLASS A CONCRETE

POUR 1	(COLLARS, CAP, & LOWER WINGS)	61.0 C.Y.
POUR 2	(BACKWALL & UPPER WINGS)	12.2 C.Y.
TOTAL		73.2 C.Y.

HP 12 X 53 STEEL PILES

NUMBER = 10 LIN. FT. = 175

STEEL PILE POINTS EA. 10

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 2/10/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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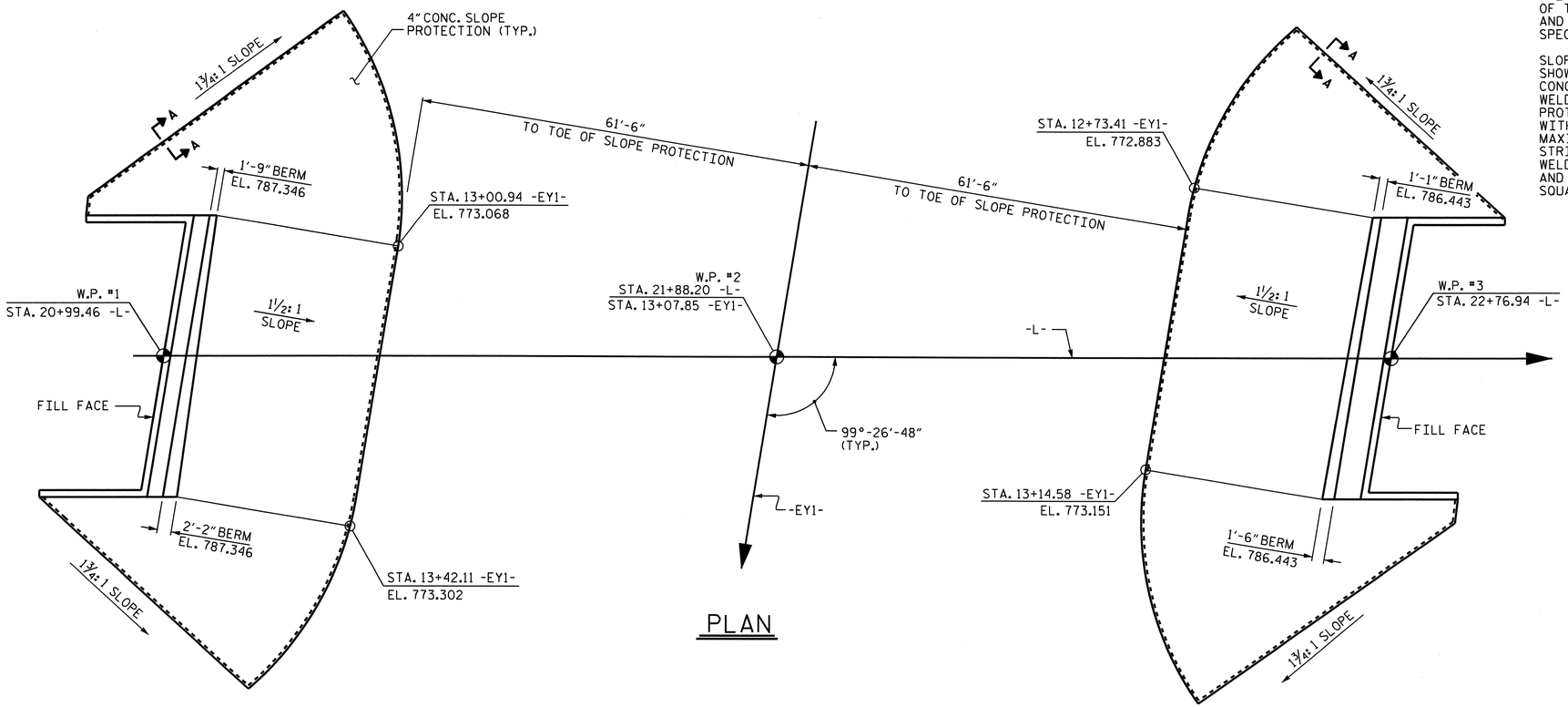


PLAN

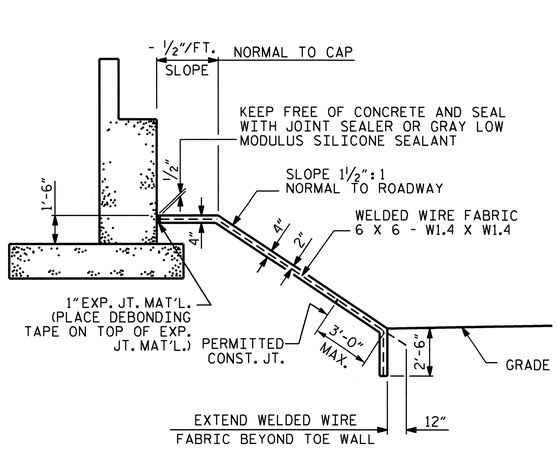
GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

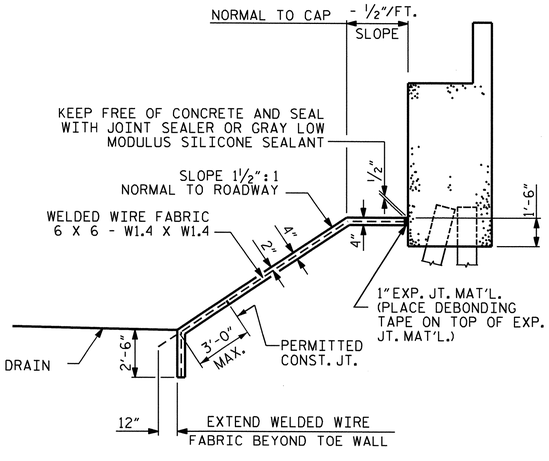
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE ''POURING DETAIL'' WITH 2'-0'' LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6'' MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE ''OPTIONAL POURING DETAIL'' WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6''. THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 21+88.20 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	345	690
END BENT 2	320	640

* QUANTITY SHOWN IS BASED ON 5' POURS.

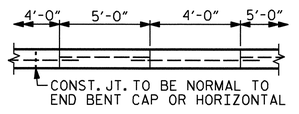


AT END BENT 1



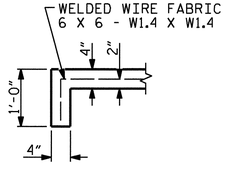
AT END BENT 1

SECTION ALONG ℄ ROADWAY

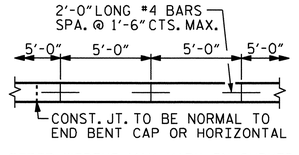


POUR A 4'-0'' STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



SECTION A-A



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

6/23/11

ASSEMBLED BY : Z. H. BROWN	DATE : 8/4/09
CHECKED BY : K. C. COMPTON	DATE : 5/5/11

DRAWN BY : ELR 5/92	REV. 7/10/01 LES/RDR
CHECKED BY : GRP 6/92	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			32

STD. NO. SP1 (SHT 6)

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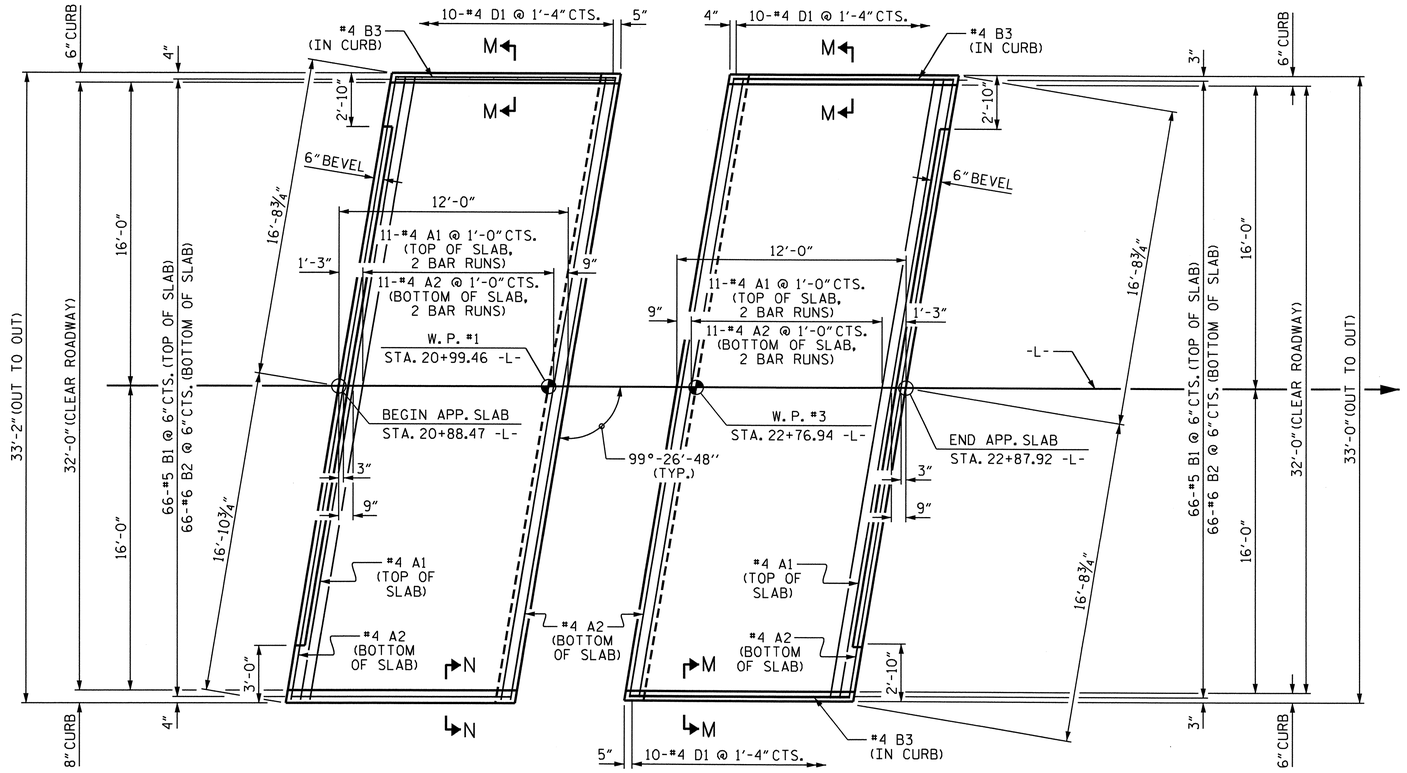
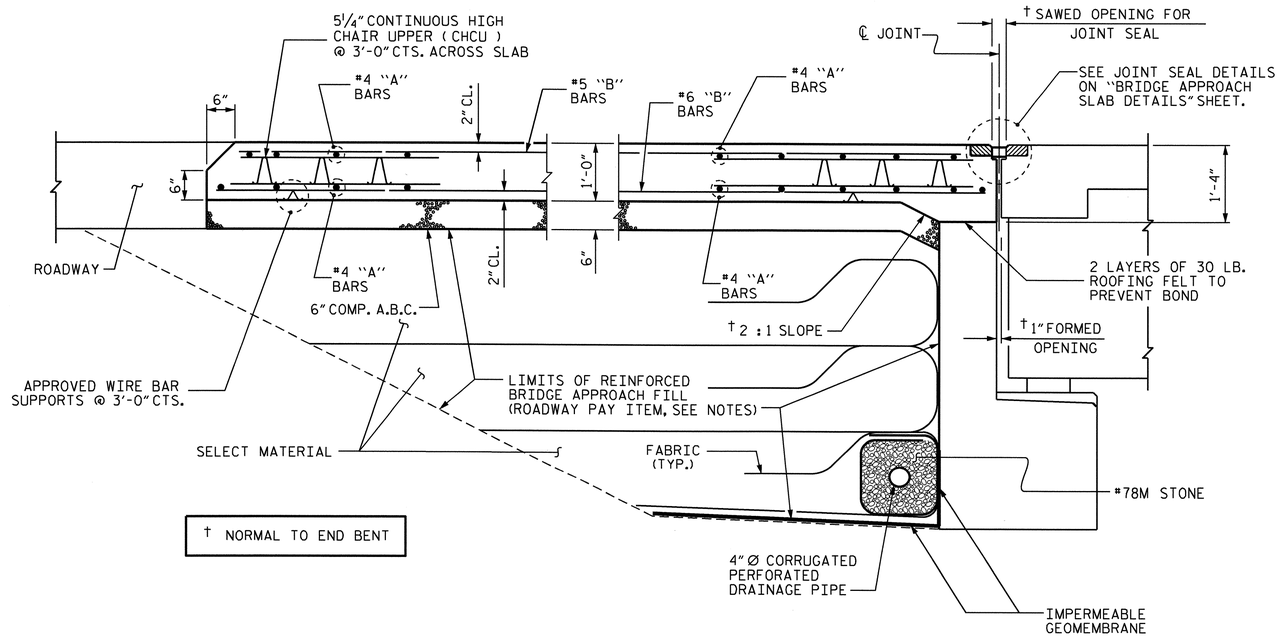




SECTION THRU SLAB

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND END POST.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

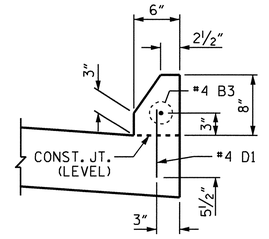
BILL OF MATERIAL

APPROACH SLAB AT E.B.1

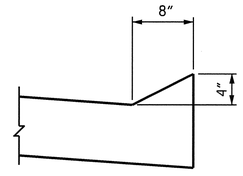
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	24	#4	STR	17'-8"	283
A2	26	#4	STR	17'-8"	307
✱B1	66	#5	STR	10'-9"	740
B2	66	#6	STR	11'-7"	1148
✱B3	1	#4	STR	11'-7"	8
✱D1	10	#4	STR	9"	5
REINFORCING STEEL				LBS.	1455
✱EPOXY COATED REINFORCING STEEL				LBS.	1036
CLASS AA CONCRETE				C.Y.	15.2

APPROACH SLAB AT E.B.2

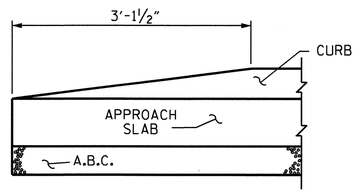
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	24	#4	STR	17'-7"	282
A2	26	#4	STR	17'-7"	305
✱B1	66	#5	STR	10'-9"	740
B2	66	#6	STR	11'-7"	1148
✱B3	2	#4	STR	11'-7"	15
✱D1	20	#4	STR	9"	10
REINFORCING STEEL				LBS.	1453
✱EPOXY COATED REINFORCING STEEL				LBS.	1104
CLASS AA CONCRETE				C.Y.	15.2



SECTION M-M



SECTION N-N
END BENT 1 RIGHT SIDE



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER R. S. KOREY NEWTON

5/9/2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			32

STD. NO. BAS4

ASSEMBLED BY : P.K. NEWTON		DATE : 5/3/11	
CHECKED BY : W.F. PARKER		DATE : 5/4/11	
DRAWN BY : EEM 3/95	REV. 7/10/01	LES/RDR	
CHECKED BY : VAP 3/95	REV. 5/7/03R	RWW/JTE	
	REV. 5/1/06R	KMM/GM	

09-MAY-2011 10:20
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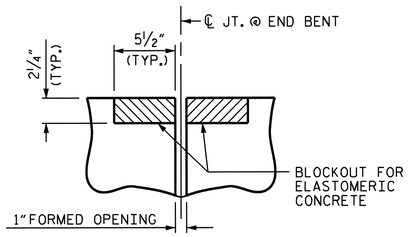
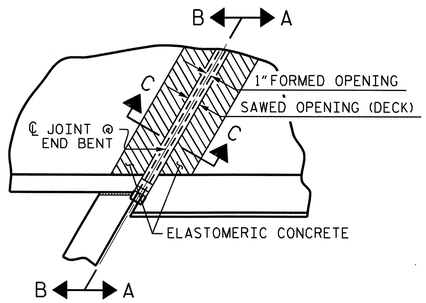
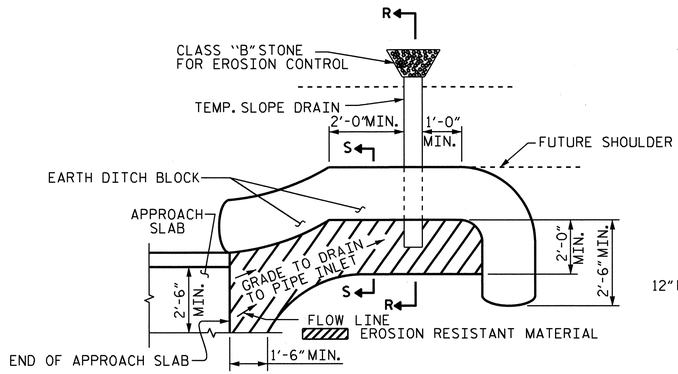
qtnguyen



SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

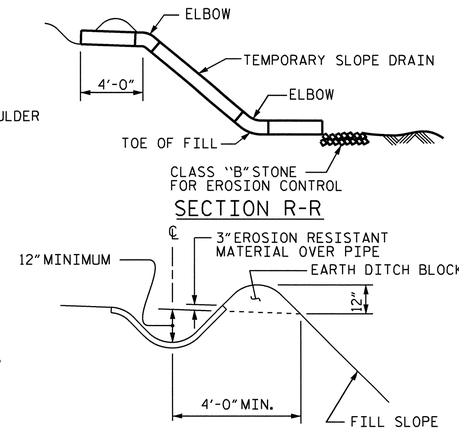


PLAN
END BENT 1 RIGHT SIDE



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

PLAN VIEW

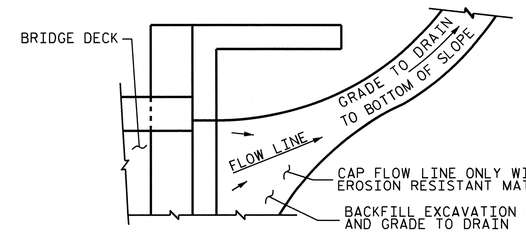


SECTION R-R

SECTION S-S

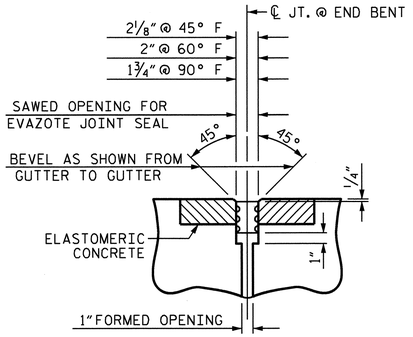
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

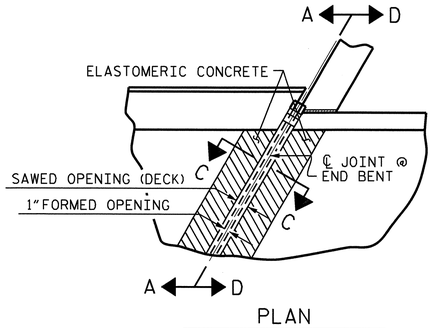


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

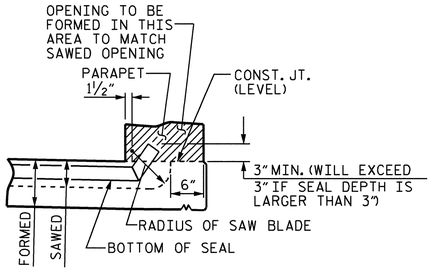
TEMPORARY DRAINAGE DETAIL



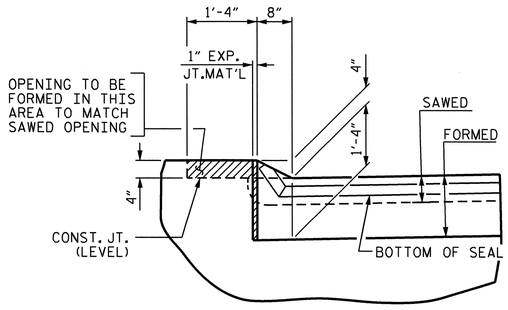
SECTION C-C
EVAZOTE JOINT SEAL
(EXPANSION)



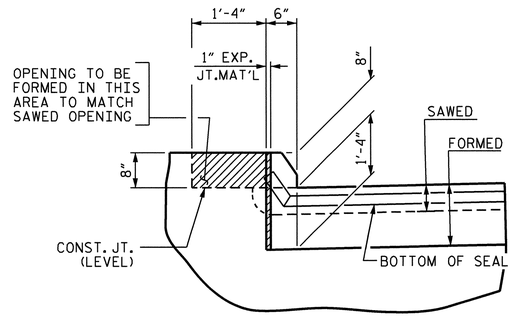
PLAN
ALL EXCEPT END BENT 1 RIGHT SIDE



SECTION A-A



SECTION B-B
AT END BENT 1 RIGHT SIDE



SECTION D-D
ALL EXCEPT END BENT 1 RIGHT SIDE

ELASTOMERIC CONCRETE	
END BENT	* ELASTOMERIC CONCRETE (CU. FT.)
1	5.6
2	5.6
TOTAL	11.2

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

JOINT SEAL DETAILS @ END BENT

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND END POST.

P. K. NEWTON SEAL 029448 ENGINEER KOREY NEWTON
6/23/2011

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			32

STD. NO. BAS10

ASSEMBLED BY : P. K. NEWTON		DATE : 5/3/11
CHECKED BY : W. F. PARKER		DATE : 5/4/11
DRAWN BY : FCJ 11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03	RWW/JTE
	REV. 5/1/06RR	MAA/KMM

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kpnewton

OVERHANG BRACKET CALCULATION INSTRUCTIONS

AASHTO SHAPES - TYPES III, IV, V, AND VI

1. RECORD KNOWN INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
2. CALCULATE THE MAXIMUM SCREED LOAD PER BRACKET (SLPB) WITH AN ESTIMATED R = 1.5. SLPB = R X W. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
3. WITH THE ESTIMATED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE THE BRACKET SPACING, S.
4. CALCULATE S/D1 AND S/D2, ROUNDING UP TO NEAREST VALUE IN TABLE 2. ENTER TABLE 2 AND DETERMINE R VALUE.
5. CALCULATE REVISED SLPB. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
6. WITH THE REVISED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE AND 45 HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3 OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE REVISED BRACKET SPACING, S.
7. CONTINUE ITERATIONS OF STEPS 4-6 UNTIL THE REVISED BRACKET SPACING, S, IS THE SAME AS THE PREVIOUS S VALUE.
8. CHECK LUMBER JOIST SPACING: WITH BRACKET SPACING VALUE, S, ROUND THIS VALUE UP TO THE NEAREST VALUE OF ALLOWABLE SPAN LENGTH OF JOIST OF TABLE 3. USING THIS VALUE, ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE, DETERMINE JOIST SPACING FROM TABLE 3. IF NECESSARY, ADJUST LUMBER JOIST SIZE AND/OR JOIST SPACING TO MEET ALLOWABLE SPAN LENGTH OF JOIST.
9. CONVERSELY, IF THE DESIRED JOIST SPACING IS KNOWN, USE THIS ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE TO DETERMINE IF ALLOWABLE SPAN LENGTH OF JOIST IS GREATER THAN THE BRACKET SPACING, S. IF NECESSARY, ADJUST LUMBER JOIST SIZE TO MEET REQUIREMENTS OF ALLOWABLE SPAN LENGTH OF JOIST AND JOIST SPACING.
10. RECORD REMAINING INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" FORM.
11. SUBMIT FORM AND CALCULATIONS FOR REVIEW AND APPROVAL.

TABLE 1-1 (FOR USE ON **UP TO 2'-0" OVERHANG Ⓛ** & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (in)	BRACKET Ⓚ DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	40				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	50				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
12	30					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	40					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	50					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
14	30					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	40					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	50					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
16	30					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	40					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	50					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000

TABLE 1-2 (FOR USE ON **OVER 2'-0" TO 2'-6" OVERHANG Ⓛ** & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (in)	BRACKET Ⓚ DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	40					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	50					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
12	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
	50					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
14	30					2'-7"	3'-0"	3'-5"	3'-10"	5'-2"	4000
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
	40					2'-7"	3'-0"	3'-5"	3'-10"	5'-2"	4000
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
	50					2'-7"	3'-0"	3'-5"	3'-10"	5'-2"	4000
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
16	30					2'-1"	2'-5"	2'-9"	3'-4"	4'-6"	4000
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000
	40					2'-1"	2'-5"	2'-9"	3'-4"	4'-6"	4000
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000
	50					2'-1"	2'-5"	2'-9"	3'-4"	4'-6"	4000
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000

TABLE 1-3 (FOR USE ON **OVER 2'-6" TO 3'-0" OVERHANG Ⓛ** & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (in)	BRACKET Ⓚ DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
						4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
	50					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
12	30						2'-2"	2'-7"	2'-11"	4'-0"	4000
						3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
	40						2'-2"	2'-7"	2'-11"	4'-0"	4000
		2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
	50						2'-2"	2'-7"	2'-11"	4'-0"	4000
		2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
14	30						2'-0"	2'-4"	2'-8"	3'-8"	4000
					3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000
	40						2'-0"	2'-4"	2'-8"	3'-8"	4000
		2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000
	50						2'-0"	2'-4"	2'-8"	3'-8"	4000
		2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000
16	30						2'-1"	2'-5"	3'-4"	4000	
					2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000
	40						2'-1"	2'-5"	3'-4"	4000	
		2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000
	50						2'-1"	2'-5"	3'-4"	4000	
		2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000

TABLE 1-4 (FOR USE ON **OVER 3'-0" TO 3'-6" OVERHANG Ⓛ** & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (in)	BRACKET Ⓚ DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30						2'-1"	2'-5"	2'-9"	3'-10"	4000
						2'-3"	2'-11"	3'-7"	4'-3"	5'-9"	6000
	40						2'-1"	2'-5"	2'-9"	3'-10"	4000
					2'-4"	3'-0"	3'-7"	4'-1"	4'-5"	5'-9"	6000
	50						2'-1"	2'-5"	2'-9"	3'-10"	4000
		2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000
12	30							2'-2"	2'-6"	3'-5"	4000
						2'-1"	2'-8"	3'-4"	3'-11"	5'-2"	6000
	40							2'-2"	2'-6"	3'-5"	4000
					2'-2"	2'-9"	3'-4"	3'-7"	3'-11"	4'-3"	6000
	50							2'-2"	2'-6"	3'-5"	4000
		2'-1"	2'-4"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	5'-2"	6000
14	30								2'-3"	3'-1"	4000
						2'-0"	2'-6"	3'-1"	3'-8"	4'-8"	6000
	40								2'-3"	3'-1"	4000
					2'-0"	2'-7"	3'-0"	3'-3"	3'-6"	3'-10"	6000
	50								2'-3"	3'-1"	4000
			2'-2"	2'-5"	2'-8"	3'-0"	3'-3"	3'-6"	3'-10"	4'-8"	6000
16	30								2'-0"	2'-9"	4000
							2'-4"	2'-10"	3'-5"	4'-3"	6000
	40								2'-0"	2'-9"	4000
						2'-5"	2'-8"	2'-11"	3'-3"	3'-6"	6000
	50								2'-0"	2'-9"	4000
				2'-2"	2'-5"	2'-8"	2'-11"	3'-3"	3'-6"	4'-3"	6000

DEFINITIONS

SLPB = SCREED LOAD PER BRACKET (R x W)
R = SCREED LOAD FACTOR, OBTAINED FROM TABLE 2
W = WHEEL LOAD
S = BRACKET SPACING
T = AVERAGE SLAB THICKNESS
SWL = SAFE WORKING LOAD
K = DIMENSION DEFINED ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
L = OVERHANG MEASURED FROM EDGE OF TOP FLANGE TO EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK
AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO
Chang-Chuan Victor Chao
5-9-2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

09-MAY-2011 10:04
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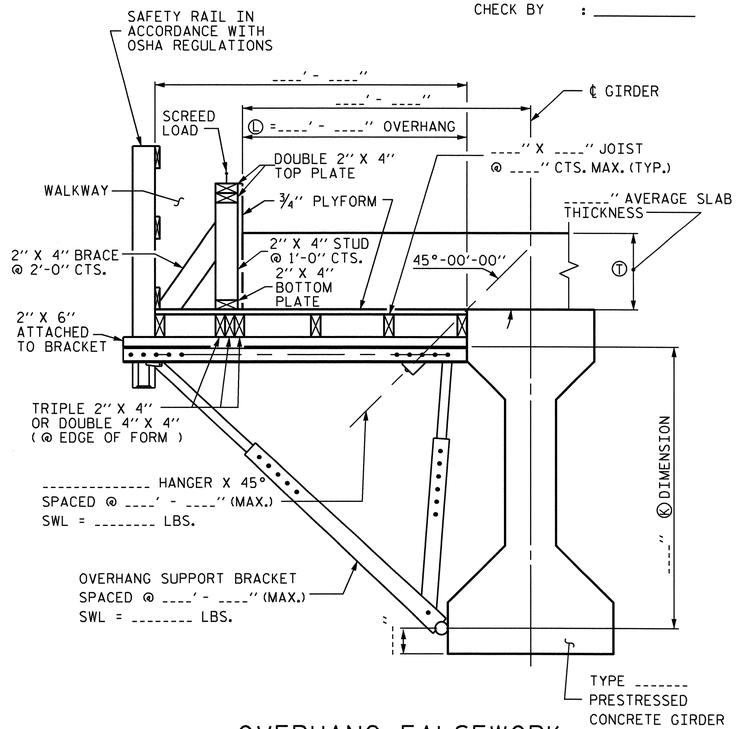
ttfang

OF1

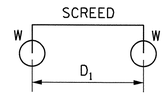
BRIDGE OVERHANG BRACKET SUMMARY

TOTAL SCREED WEIGHT = _____ LBS.
NUMBER OF SCREED WHEELS = _____
SCREED WHEEL LOAD (W) = _____LBS.
SCREED LOAD PER BRACKET = _____ LBS.

PROJECT No. : _____
COUNTY : _____
STATION : _____
DESCRIPTION : _____
DATE : _____
DESIGN BY : _____
CHECK BY : _____

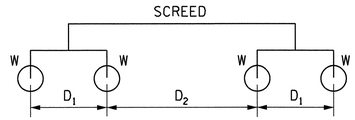


OVERHANG FALSEWORK



4-WHEEL MACHINE

4 WHEEL MACHINE	
S/D1	R
<= 1.0	1.00
1.1	1.09
1.2	1.17
1.3	1.23
1.4	1.29
1.5	1.33
1.6	1.38
1.7	1.41
1.8	1.44
1.9	1.47
2.0	1.50
2.2	1.55
2.4	1.58
2.6	1.62
2.8	1.64
3.0	1.67
3.5	1.71
4.0	1.75



8-WHEEL MACHINE

TABLE 2: SCREED LOAD FACTOR "R"

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																		
		S/D2																		
S/D1		<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
	<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.58	1.62	1.64	1.67	1.71	1.75
	1.1	1.09	1.18	1.26	1.32	1.38	1.42	1.47	1.50	1.54	1.56	1.59	1.64	1.67	1.71	1.73	1.76	1.81	1.84
	1.2	1.17	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92
	1.3	1.23	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.68	1.70	1.73	1.78	1.81	1.85	1.87	1.90	1.95	1.98
	1.4	1.29	1.38	1.45	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
	1.5	1.33	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92	1.95	1.98	2.00	2.10	2.17
	1.6	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.85	1.88	1.92	1.96	1.99	2.04	2.08	2.18	2.25
	1.7	1.41	1.50	1.58	1.64	1.70	1.75	1.79	1.82	1.86	1.89	1.91	1.96	2.00	2.05	2.11	2.16	2.25	2.32
	1.8	1.44	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.99	2.06	2.12	2.17	2.22	2.32	2.39
	1.9	1.47	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.04	2.11	2.18	2.23	2.28	2.38	2.45
	2.0	1.50	1.59	1.67	1.73	1.79	1.83	1.88	1.91	1.94	1.97	2.00	2.09	2.17	2.23	2.29	2.33	2.43	2.50
	2.2	1.55	1.64	1.71	1.78	1.83	1.88	1.92	1.96	1.99	2.04	2.09	2.18	2.26	2.32	2.38	2.42	2.52	2.59
	2.4	1.58	1.67	1.75	1.81	1.87	1.92	1.96	2.00	2.06	2.11	2.17	2.26	2.33	2.40	2.45	2.50	2.60	2.67
	2.6	1.62	1.71	1.78	1.85	1.90	1.95	1.99	2.05	2.12	2.18	2.23	2.32	2.40	2.46	2.52	2.56	2.66	2.73
	2.8	1.64	1.73	1.81	1.87	1.93	1.98	2.04	2.11	2.17	2.23	2.29	2.38	2.45	2.52	2.57	2.62	2.71	2.79
	3.0	1.67	1.76	1.83	1.90	1.95	2.00	2.08	2.16	2.22	2.28	2.33	2.42	2.50	2.56	2.62	2.67	2.76	2.83
	3.5	1.71	1.81	1.88	1.95	2.00	2.10	2.18	2.25	2.32	2.38	2.43	2.52	2.60	2.66	2.71	2.76	2.86	2.93
	4.0	1.75	1.84	1.92	1.98	2.07	2.17	2.25	2.32	2.39	2.45	2.50	2.59	2.67	2.73	2.79	2.83	2.93	3.00

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

AVG. SLAB THICKNESS Ⓣ (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
		THE ALLOWABLE SPAN LENGTH OF JOISTS			
10	2 X 4	———	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	———	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	———	4' - 0"	4' - 6"	5' - 0"
	4 X 4	———	5' - 6"	6' - 0"	6' - 4"
16	2 X 4	———	4' - 0"	4' - 3"	4' - 9"
	4 X 4	———	5' - 3"	5' - 9"	6' - 3"

NOTES

DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

SUBMITTALS UTILIZING THE INSTRUCTIONS AND PROCEDURES DESCRIBED ON SHEET 1 OF 3 SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS AND SPECIAL PROVISIONS, EXCEPT THAT CALCULATIONS FOR OVERHANG FALSEWORK NEED NOT BE SEALED BY A REGISTERED ENGINEER.

FOR OVERHANG FALSEWORK BRACING DESIGN, SEE SHEET 3 OF 3.

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK
AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
5-9-2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

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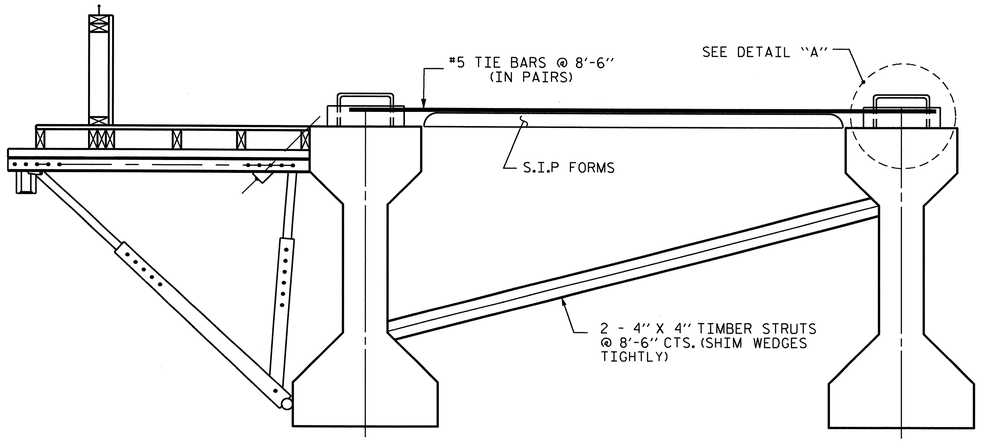
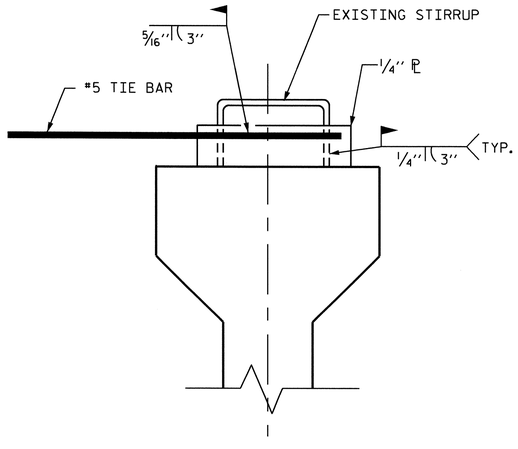


EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



DETAIL "A"

NOTES:

EACH #5 TIE BAR SHALL BE WELDED TO ONE STIRRUP LOOP AS SHOWN IN DETAIL "A". #5 TIE BARS SHALL BE WELDED TO TWO ADJACENT STIRRUPS OF THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER BETWEEN PERMANENT DIAPHRAGMS. WELD STEEL PLATES IN BETWEEN THE TIE BARS AND THE STIRRUP LOOP. WELDING TWO TIE BARS TO THE SAME STIRRUP LOOP SHALL NOT BE PERMITTED.

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 8'-6" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
5-9-2011

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

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PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK
AASHTO TYPES
III, IV, V, AND VI

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			32

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM

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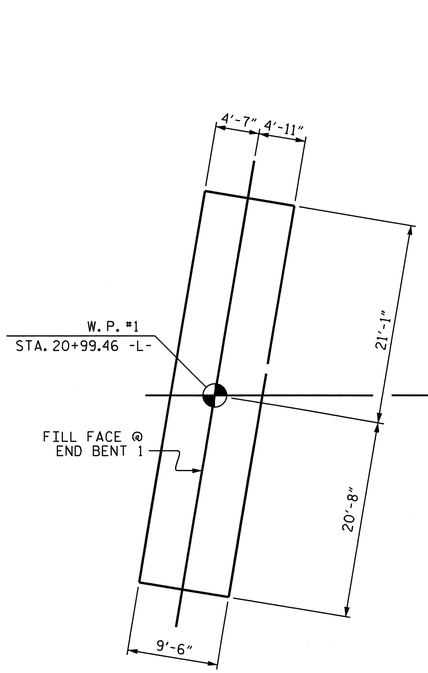
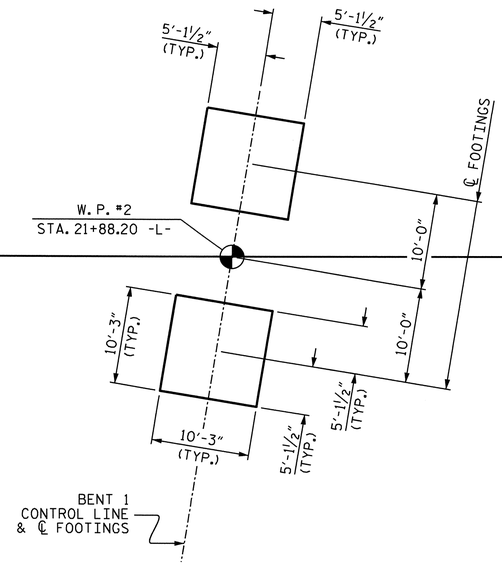
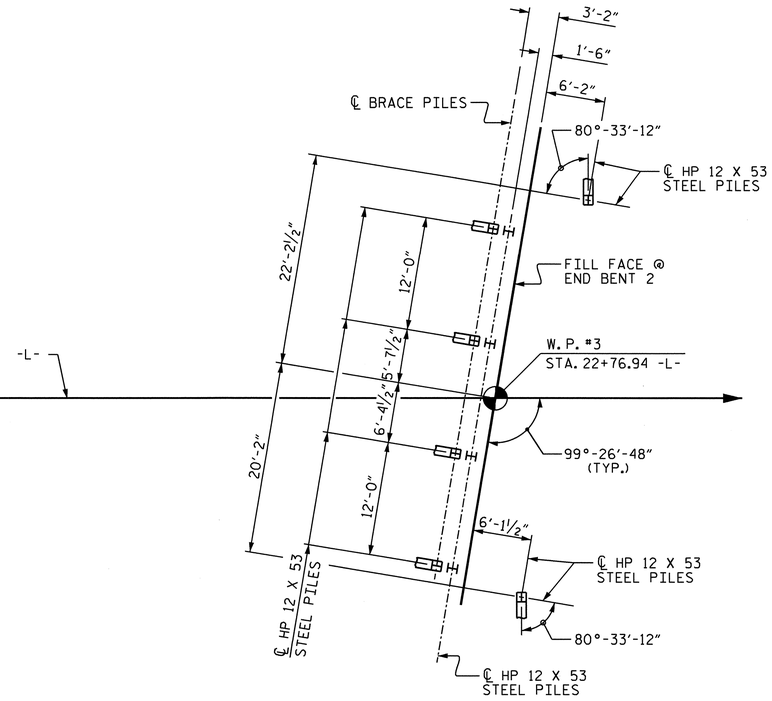


END BENT 1



BENT 1



END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE AT THE BOTTOM OF CAP.

NOTES:

FOR PILES, SEE SPECIAL PROVISIONS.

PILES AT END BENT 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 95 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 160 TONS PER PILE.

STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR STEEL PILES AT END BENT 2.

TESTING THE FIRST PRODUCTION PILE WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING, OR REDRIVING IS REQUIRED. FOR PILE DRIVING ANALYZER, SEE PILES SPECIAL PROVISIONS.

SPREAD FOOTINGS AT END BENT 1 AND BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 7 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 15 TSF JUST BEFORE PLACING CONCRETE.

SPREAD FOOTINGS AT END BENT 1 AND BENT 1 MUST BE PLACED ON WEATHERED ROCK OR ROCK. AN NCDOT - GEU GEOTECHNICAL ENGINEER FROM THE WESTERN REGIONAL OFFICE SHOULD OBSERVE AND APPROVE THE FOOTING BEARING GRADE. IF ADEQUATE MATERIAL IS NOT ENCOUNTERED AT THE PLAN BOTTOM OF FOOTING ELEVATION, EXCAVATE DOWN TO WEATHERED ROCK OR ROCK AND POUR A MUD MAT OF 3,000 PSI CONCRETE TO THE PLAN BOTTOM OF FOOTING ELEVATION. THE CONCRETE SHOULD BE PLACED AGAINST THE NATIVE SOIL ON THE SIDEWALLS. THE WIDTH OF THE MUD MAT SHOULD ENCOMPASS AN AREA ON A 1:2 (H:V) ANGLE DOWN FROM THE BOTTOM OF FOOTING TO THE TOP OF WEATHERED ROCK OR ROCK.

NORTH CAROLINA PROFESSIONAL SEAL 036443 ENGINEER KOREY NEWTON

5/9/2011

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1792
(MARTIN LUTHER KING JR.
DRIVE) OVER
US-29/70/I-85 BUS.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 4/18/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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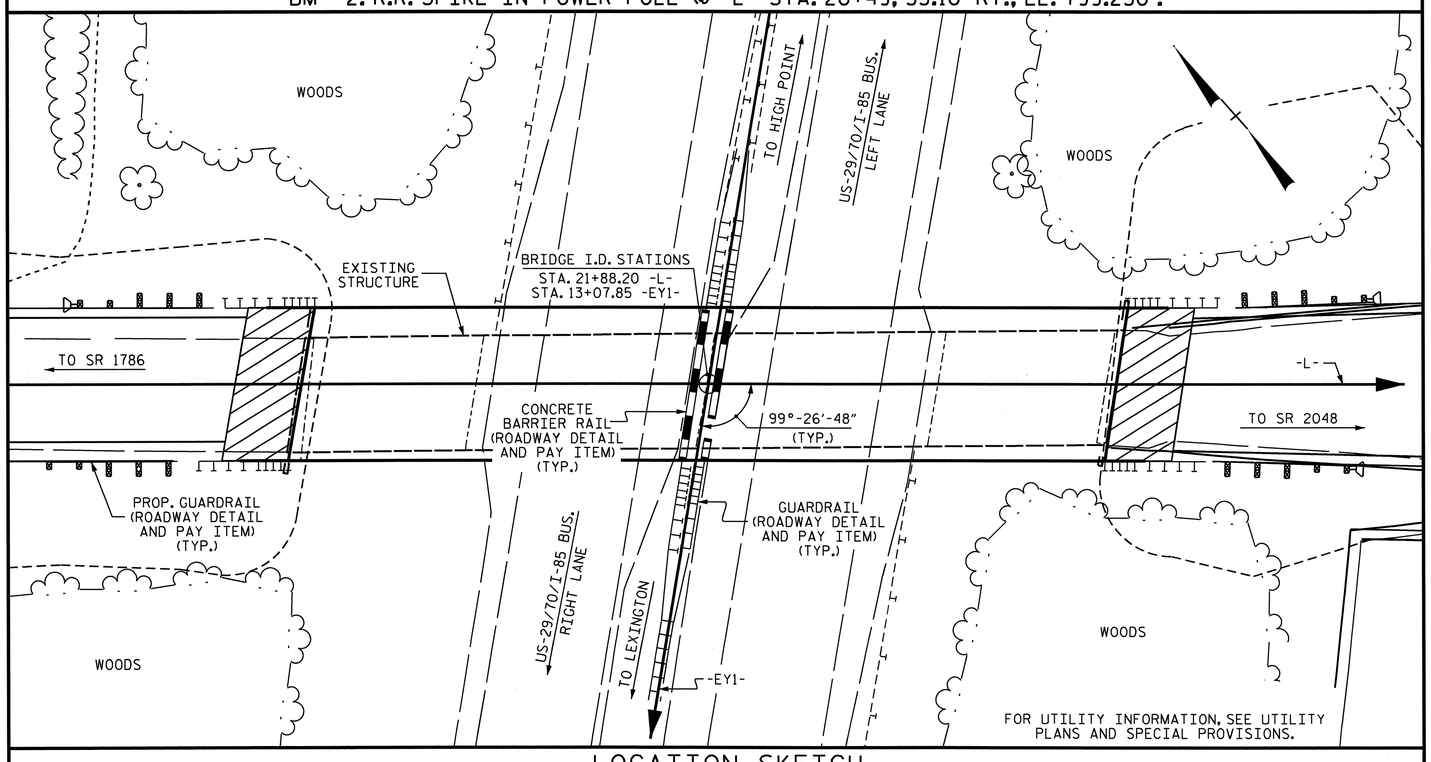
NCBDS

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	PDA TESTING	PDA ASSISTANCE	UNCLASSIFIED STRUCTURE EXCAVATION	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	TWO BAR METAL RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	REINFORCED CONCRETE DECK SLAB (ALL LIGHT-WEIGHT CONCRETE)	45" PRESTRESSED CONCRETE GIRDER (SAND LIGHT-WEIGHT CONCRETE)		1'-2" X 2'-6" CONCRETE PARAPET (ALL LIGHT-WEIGHT CONCRETE)
	LUMP SUM	LUMP SUM	EACH	EACH	LUMP SUM	SQ. FT.	CU. YDS.	LUMP SUM	LB.	LB.	NO.	LIN. FT.	EACH	LIN. FT.	SQ. YD.	LUMP SUM	LUMP SUM	SQ. FT.	NO.	LIN. FT.	LIN.FT.
SUPERSTRUCTURE						5,667										LUMP SUM	LUMP SUM	6,065	8	694.7	350.56
END BENT 1		LUMP SUM					84.4		7,161						345						
BENT 1		LUMP SUM					49.4		7,381	865											
END BENT 2			1	1			73.2		6,582		10	175	10	335.50	320						
TOTAL	LUMP SUM	LUMP SUM	1	1	LUMP SUM	5,667	207.0	LUMP SUM	21,124	865	10	175	10	335.50	665	LUMP SUM	LUMP SUM	6,065	8	694.7	350.56

BM #2: R.R. SPIKE IN POWER POLE @ -L- STA. 20+49, 33.10 RT., EL. 799.230'.



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL- 93 OR ALTERNATE LOADING.

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

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 50 FEET. RIGHT AND LEFT SIDE AT END BENTS 1 AND 2 OF THE CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION.

THE SUBSTRUCTURE OF 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.

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 21+88.20 -L-".

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS: 1 @ 37'-6", 2 @ 48'-6", 1 @ 37'-6"; 24'-0" CLEAR ROADWAY WIDTH AND A RC DECK ON I-BEAMS; END BENT 1 CONSISTING OF RC CAPS ON ROCK FOUNDATION, INTERIOR BENT CONSISTING RCP&B ON SPREAD FOOTINGS, END BENT 2 CONSISTING OF RC SPILL THRU AND LOCATED AT THE PROPOSED STRUCTURE SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

THE CLASS AA CONCRETE IN THE BRIDGE DECK SHALL CONTAIN FLY ASH OR GROUND GRANULATED BLAST FURNACE SLAG AT THE SUBSTITUTION RATE SPECIFIED IN ARTICLE 1024-1 AND IN ACCORDANCE WITH ARTICLES 1024-5 AND 1024-6 OF THE STANDARD SPECIFICATIONS. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE REINFORCED CONCRETE DECK SLAB.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

DECK AND PARAPETS SHALL BE CONSTRUCTED OF ALL LIGHTWEIGHT CONCRETE. FOR ALL LIGHTWEIGHT CONCRETE FOR DECK AND PARAPETS, SEE SPECIAL PROVISIONS.

PRESTRESS CONCRETE GIRDERS SHALL BE CONSTRUCTED OF SAND LIGHTWEIGHT CONCRETE. FOR SAND LIGHTWEIGHT CONCRETE FOR GIRDERS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

POUR 2 OF END BENT 1 AND POUR 1 OF END BENT 2 ARE CONSIDERED MASS CONCRETE. FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

FOR FORMS FOR CONCRETE BRIDGE DECKS, SEE SPECIAL PROVISIONS.

FOR ADDITIONAL LIGHT WEIGHT CONCRETE CYLINDERS, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

6/24/11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1792 (MARTIN LUTHER KING JR. DRIVE) OVER US-29/70/I-85 BUS.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : S. DOMBROWSKI DATE : 10-30-08
CHECKED BY : JOHN FRYE DATE : 04-05-11

23-JUN-2011 15:50
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LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT					
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	1.01	--	1.75	0.827	1.47	A	EL	40.21	0.851	1.07	A	EL	32.51	0.80	0.827	1.01	A	EL	41.92	
		HL-93 (OPERATING)	N/A	--	1.48	--	1.35	0.827	1.91	A	EL	40.21	0.927	1.48	A	I	3.54	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	(2)	1.37	49.32	1.75	0.827	1.98	A	EL	39.36	0.927	1.49	A	I	3.54	0.80	0.827	1.37	A	EL	41.92	
		HS-20 (OPERATING)	36.000	--	1.74	62.64	1.35	0.827	2.57	A	EL	39.36	0.927	1.74	A	I	3.54	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.18	42.93	1.40	0.827	5.77	A	EL	40.21	0.927	3.68	A	I	3.54	0.80	0.827	3.18	A	EL	41.92	
		SNGARBS2	20.000	--	2.32	46.40	1.40	0.827	4.21	A	EL	39.36	0.927	2.83	A	I	3.54	0.80	0.827	2.32	A	EL	41.92	
		SNAGRIS2	22.000	--	2.18	47.96	1.40	0.827	3.94	A	EL	47.06	0.927	2.62	A	I	3.54	0.80	0.827	2.18	A	EL	41.07	
		SNCOTTS3	27.250	--	1.58	43.06	1.40	0.827	2.88	A	EL	42.78	0.927	2.03	A	I	3.54	0.80	0.827	1.58	A	EL	42.78	
		SNAGGRS4	34.925	--	1.31	45.75	1.40	0.827	2.37	A	EL	40.21	0.927	1.67	A	I	3.54	0.80	0.827	1.31	A	EL	41.92	
		SNS5A	35.550	--	1.28	45.50	1.40	0.827	2.33	A	EL	42.78	0.927	1.68	A	I	3.54	0.80	0.827	1.28	A	EL	42.78	
		SNS6A	39.950	--	1.17	46.74	1.40	0.827	2.12	A	EL	40.21	0.927	1.58	A	I	3.54	0.80	0.827	1.17	A	EL	42.78	
		SNS7B	42.000	--	1.11	46.62	1.40	0.827	2.02	A	EL	42.78	0.927	1.56	A	I	3.54	0.80	0.827	1.11	A	EL	42.78	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.42	46.86	1.40	0.827	2.59	A	EL	42.78	0.927	1.82	A	I	3.54	0.80	0.827	1.42	A	EL	42.78	
		TNT4A	33.075	--	1.42	46.97	1.40	0.827	2.59	A	EL	40.21	0.927	1.78	A	I	3.54	0.80	0.827	1.42	A	EL	41.92	
		TNT6A	41.600	--	1.15	48.26	1.40	0.827	2.11	A	EL	40.21	0.927	1.60	A	I	3.54	0.80	0.827	1.16	A	EL	42.78	
		TNT7A	42.000	--	1.18	48.72	1.40	0.827	2.11	A	EL	40.21	0.927	1.59	A	I	3.54	0.80	0.827	1.16	A	EL	41.92	
		TNT7B	42.000	--	1.19	49.98	1.40	0.827	2.15	A	EL	47.06	0.927	1.55	A	I	3.54	0.80	0.827	1.19	A	EL	41.07	
		TNAGRIT4	43.000	--	1.14	49.02	1.40	0.827	2.07	A	EL	39.36	0.927	1.53	A	I	3.54	0.80	0.827	1.14	A	EL	41.92	
		TNAGT5A	45.000	--	1.08	48.60	1.40	0.827	1.96	A	EL	42.78	0.927	1.51	A	I	3.54	0.80	0.827	1.08	A	EL	42.78	
		TNAGT5B	45.000	(3)	1.07	48.15	1.40	0.827	1.94	A	EL	40.21	0.927	1.49	A	I	3.54	0.80	0.827	1.07	A	EL	41.92	

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. SPANS A AND B ARE EQUAL. CONTROLLING POINTS FOR SPAN A ARE MIRRORED ABOUT ℄ BENT 1 TO OBTAIN CONTROLLING POINTS FOR SPAN B.
2. THE GIRDERS CONSIST OF SAND LIGHTWEIGHT CONCRETE.
3. GIRDER DESIGN WAS PERFORMED USING AASHTO LRFD 4TH EDITION (2009).
4. PRESTRESS LOSS ESTIMATES USED FOR GIRDER DESIGN WERE OBTAINED FROM THE "APPROXIMATE METHOD" (LRFD 5.9.5.3).
5. GIRDER DESIGN WAS PERFORMED USING THE FOLLOWING RESISTANCE FACTORS :

   FOR MOMENT: 1.0
   FOR SHEAR: 0.7

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

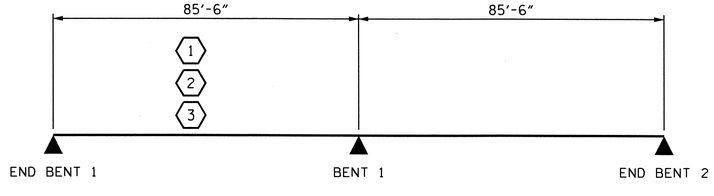
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

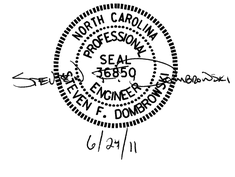
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY



6/24/11

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : S. DOMBROWSKI	DATE : 04/28/11
CHECKED BY : J. A. YANNACCONE	DATE : 5/5/2011
DRAWN BY : MAA 1/08	REV. 11/12/08R MAA/GM
CHECKED BY : GM/DI 2/08	

23-JUN-2011 15:50
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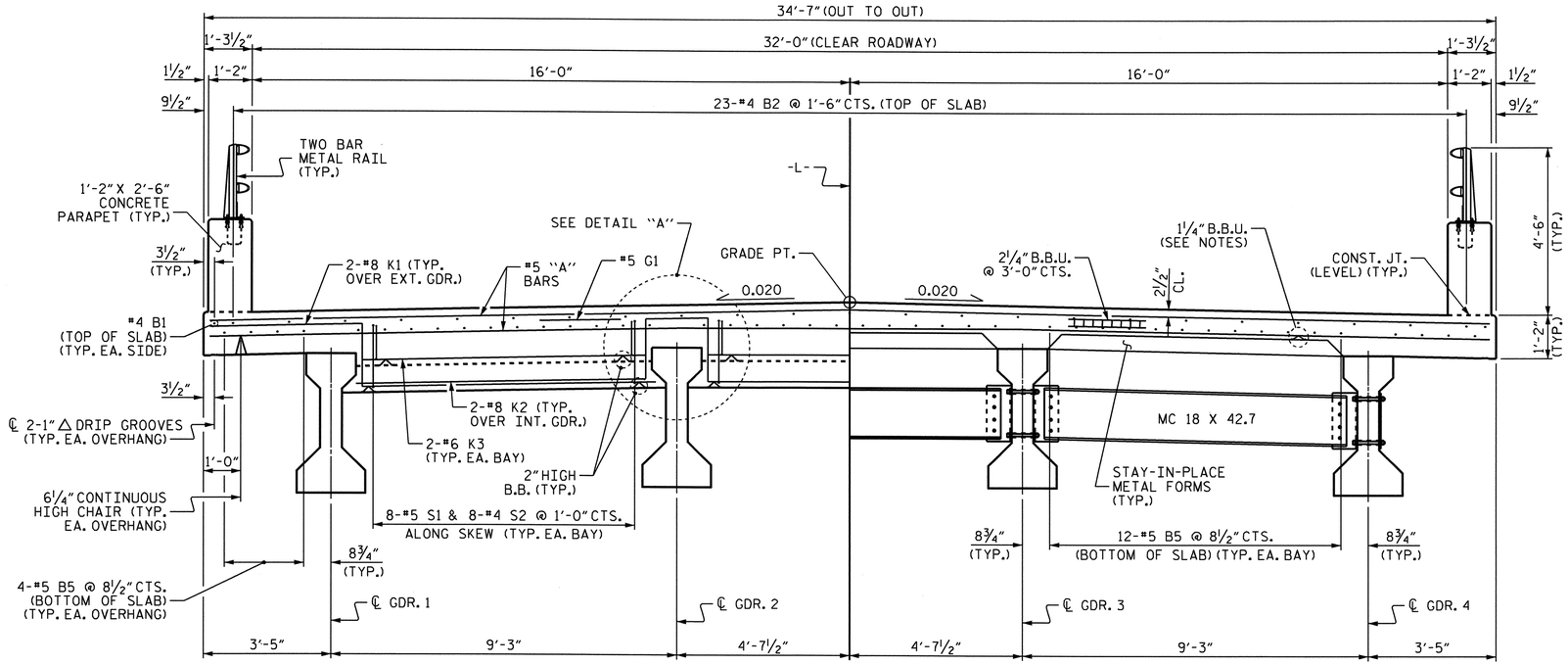
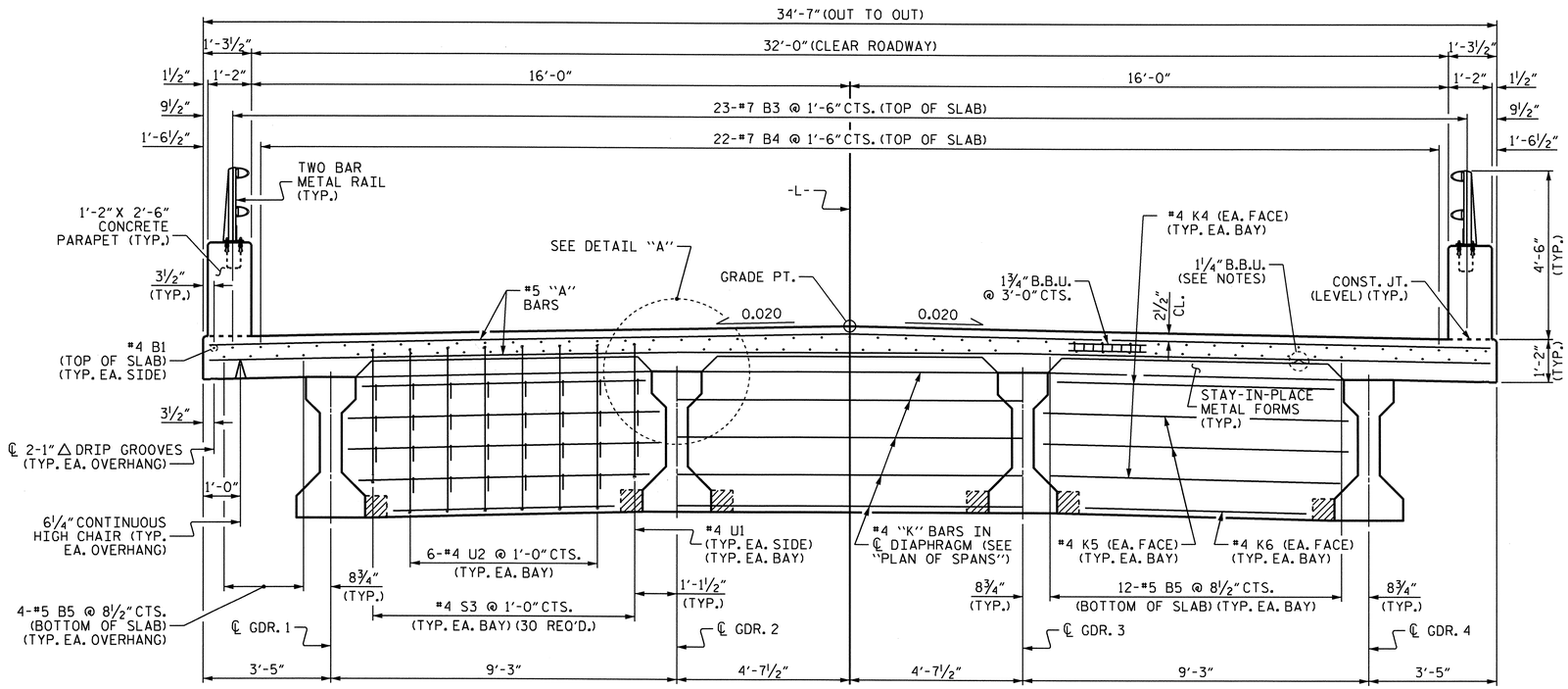


AT END BENT

AT MID-SPAN

TYPICAL SECTION



TYPICAL SECTION

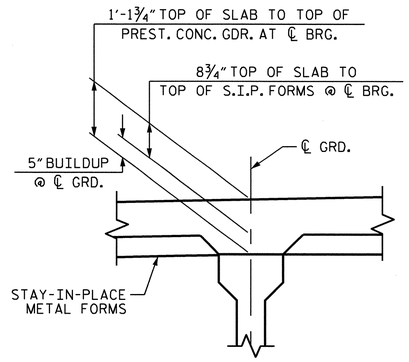
AT CONTINUOUS BENT DIAPHRAGMS

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.



DETAIL "A"

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE
5/9/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 2-1-11
CHECKED BY : JOHN FRYE DATE : 4-5-11

09-MAY-2011 10:20
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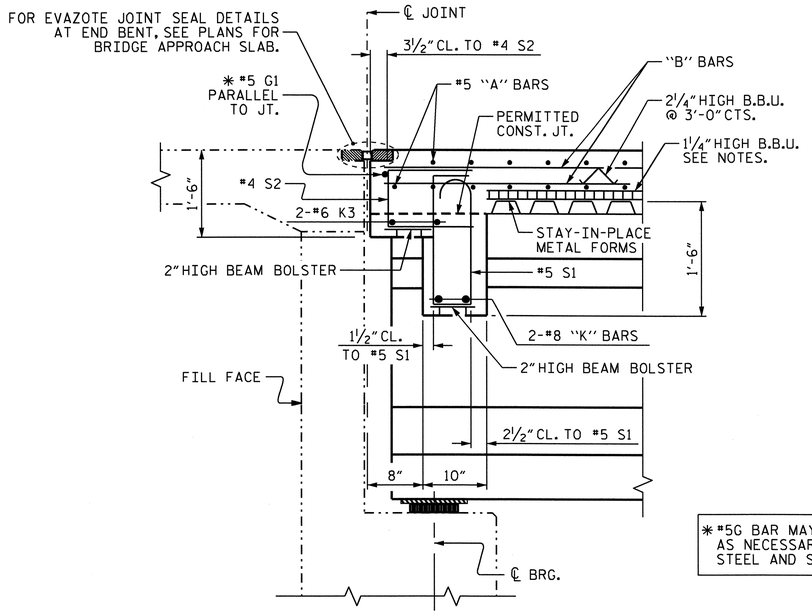
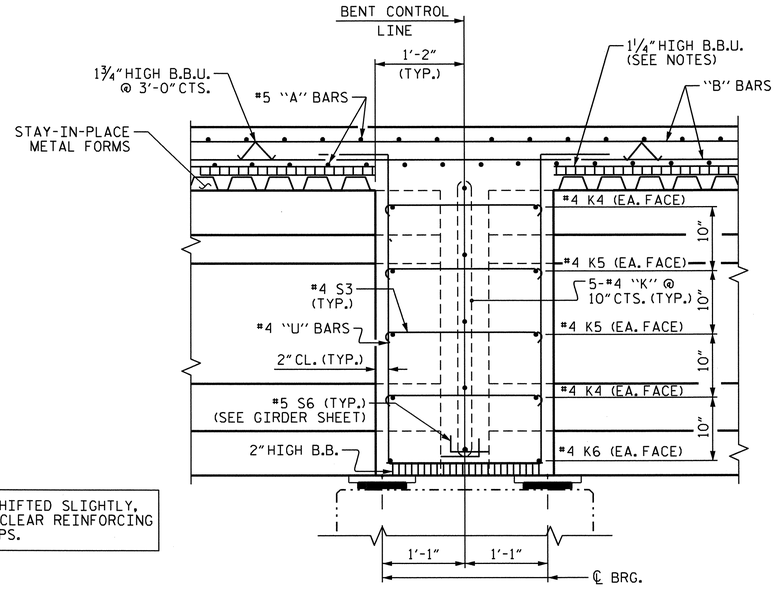
qtnguyen

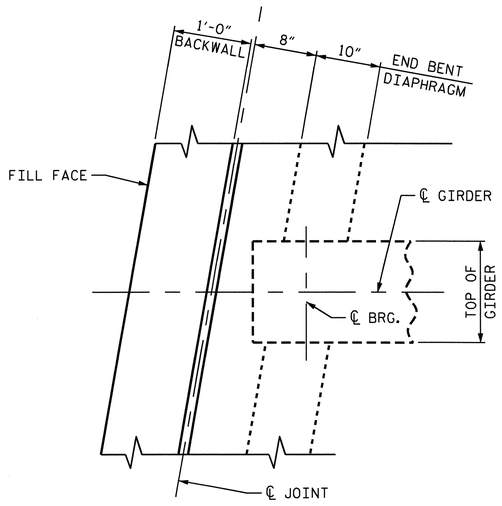


SECTION A-A

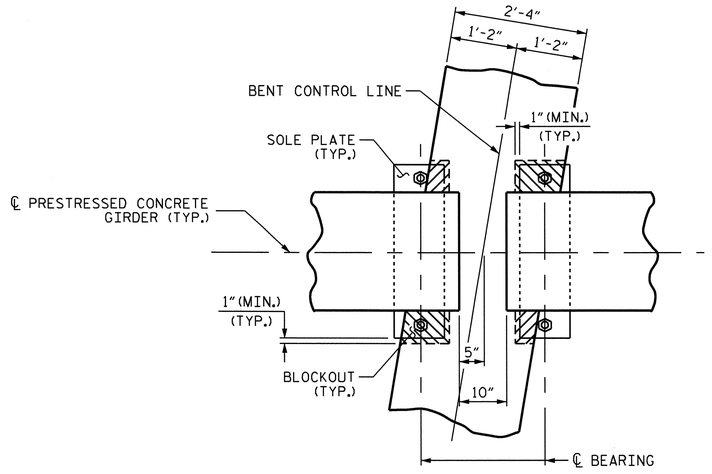


SECTION B-B

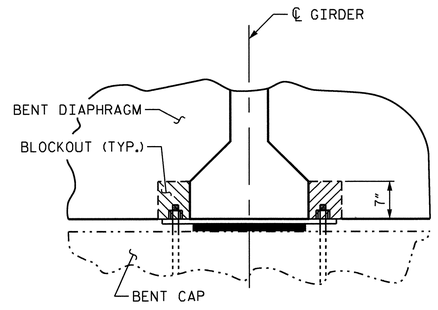
* #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



PLAN VIEW OF END BENT DIAPHRAGM



PLAN



SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE
6/24/11

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 2-1-11
CHECKED BY : JOHN FRYE DATE : 4-5-11

23-JUN-2011 16:00
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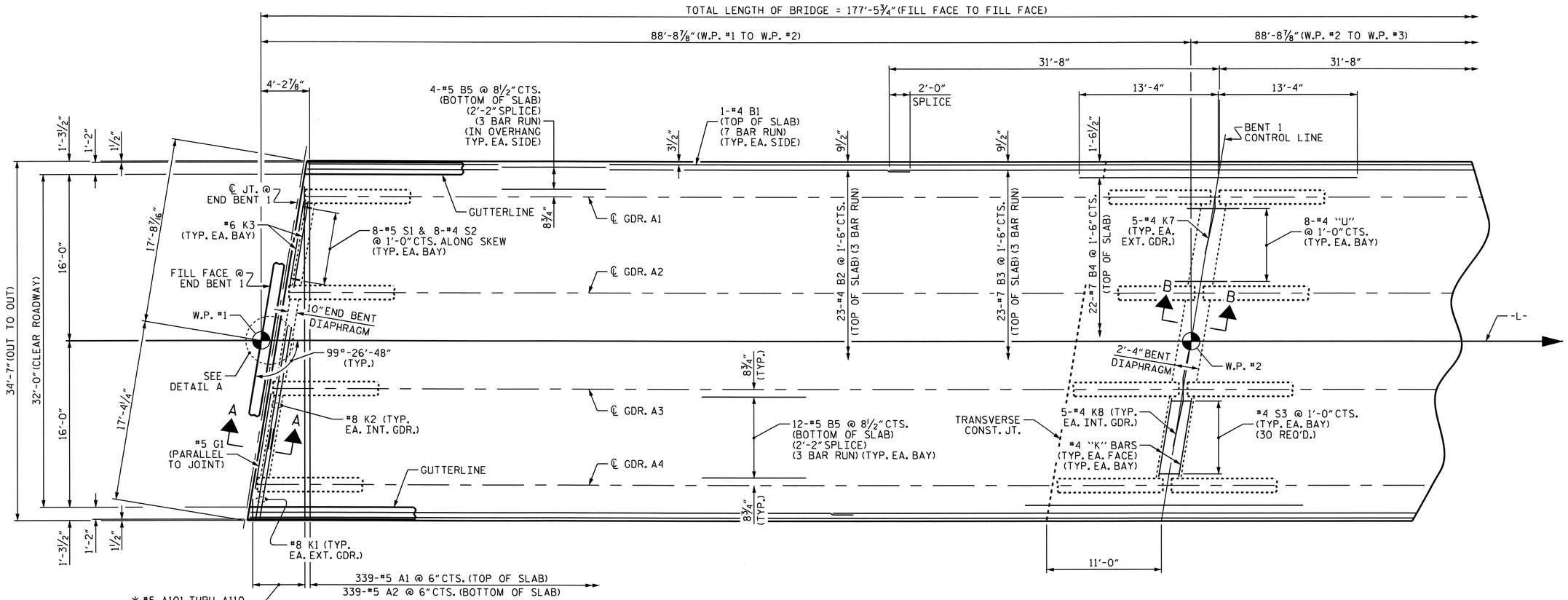
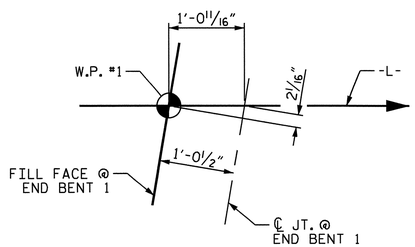


SPAN A

* SET A101 THRU A110 BARS 2" CLEAR FROM THE BLOCKOUT FOR ELASTOMERIC CONCRETE.



DETAIL A

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			32

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

6/24/11

DRAWN BY : E.C. LOCKLEAR DATE : 2-2-11

CHECKED BY : JOHN FRYE DATE : 4-5-11

23-JUN-2011 16:00
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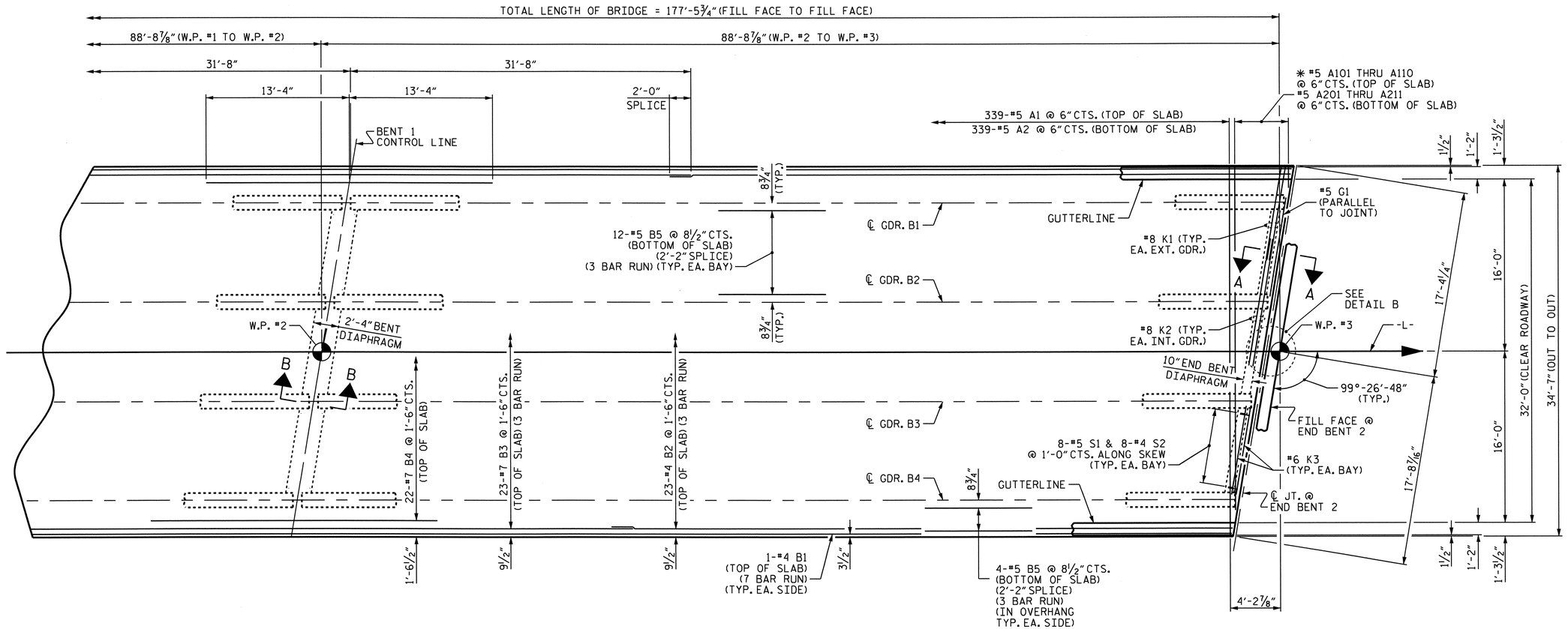
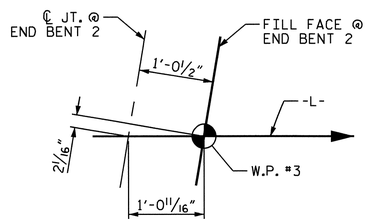


SPAN B

* SET A101 THRU A110 BARS 2" CLEAR FROM THE BLOCKOUT FOR ELASTOMERIC CONCRETE.



DETAIL B

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			32

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

DRAWN BY : E.C. LOCKLEAR DATE : 2-2-11
CHECKED BY : JOHN FRYE DATE : 4-5-11

23-JUN-2011 15:50
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DEAD LOAD DEFLECTION TABLE

0.6"Ø LOW RELAXATION	SPANS A & B																					
	GIRDERS 1 & 4											GIRDERS 2 & 3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.205	0.363	0.476	0.543	0.566	0.543	0.476	0.363	0.205	0	0	0.205	0.363	0.476	0.543	0.566	0.543	0.476	0.363	0.205	0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.061	0.134	0.187	0.219	0.229	0.219	0.187	0.134	0.061	0	0	0.067	0.143	0.198	0.231	0.242	0.231	0.198	0.143	0.067	0
FINAL CAMBER ↑	0	1¾"	2¾"	3⁷⁄₁₆"	3⅞"	4¹⁄₁₆"	3⅞"	3⁷⁄₁₆"	2¾"	1¾"	0	0	1¹¹⁄₁₆"	2⅝"	3⁵⁄₁₆"	3¾"	3⅞"	3¾"	3⁵⁄₁₆"	2⅝"	1¹¹⁄₁₆"	0

✱ INCLUDES FUTURE WEARING SURFACE
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

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 SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6700 PSI FOR ALL SPANS.

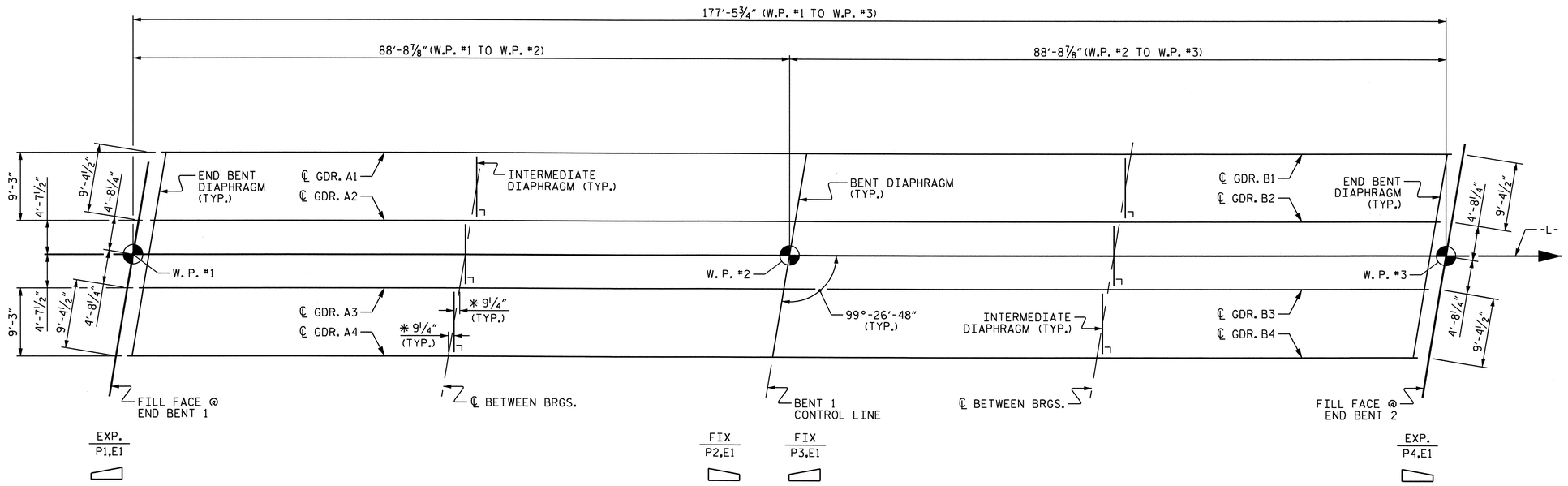
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

PRESTRESS CONCRETE GIRDERS SHALL BE CONSTRUCTED USING SAN LIGHTWEIGHT CONCRETE. FOR SAND LIGHTWEIGHT CONCRETE FOR GIRDERS, SEE SPECIAL PROVISIONS.

FOR ADDITIONAL LIGHTWEIGHT CONCRETE CYLINDERS, SEE SPECIAL PROVISIONS.



FRAMING PLAN

✱ DIMENSIONS MEASURING INTERMEDIATE DIAPHRAGMS ARE SHOWN TO THE BACK FACE OF CHANNEL.

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE
6/24/11

STATE OF NORTH CAROLINA
NORTH CAROLINA PROFESSIONAL SEAL 36850 ENGINEER STEVEN F. DOMERACKI
6/24/11

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

FRAMING PLAN & DEAD LOAD DEFLECTION TABLE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 7-8-09
CHECKED BY : JOHN FRYE DATE : 4-5-11

24-JUN-2011 12:26
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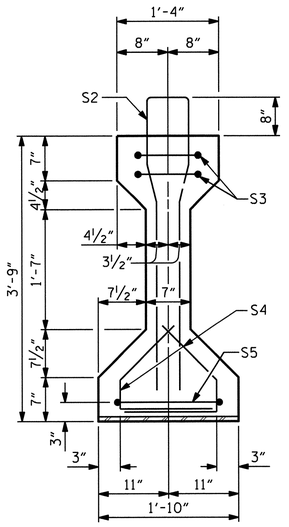
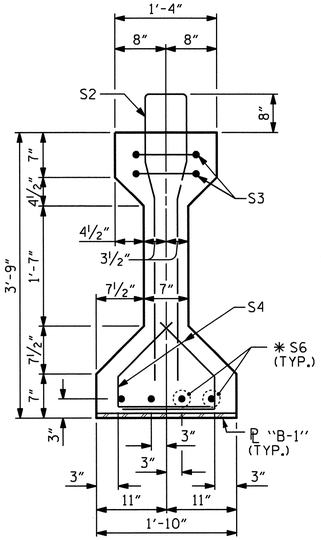
OTNGUYEN

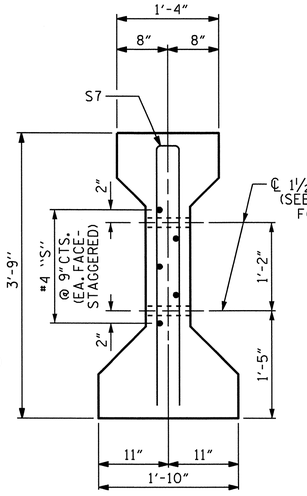


SECTION A-A



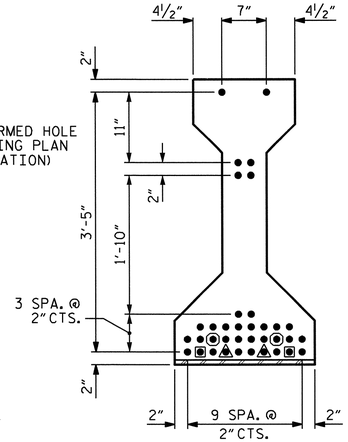
SECTION B-B

(FOR EMBEDDED ℄ "B-1" DETAILS SEE SHEET 2 OF 2)

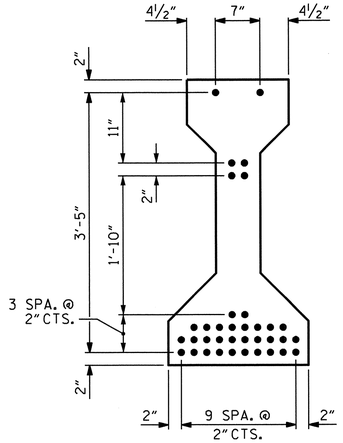


SECTION C-C

(S1 BARS NOT SHOWN)



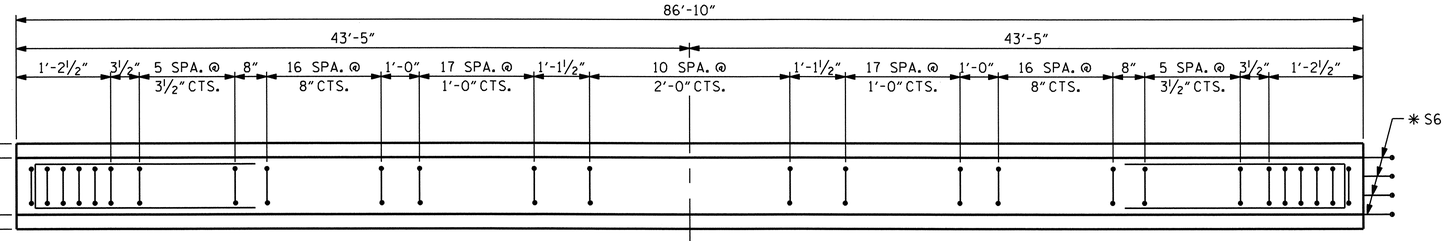
AT END OF GIRDER



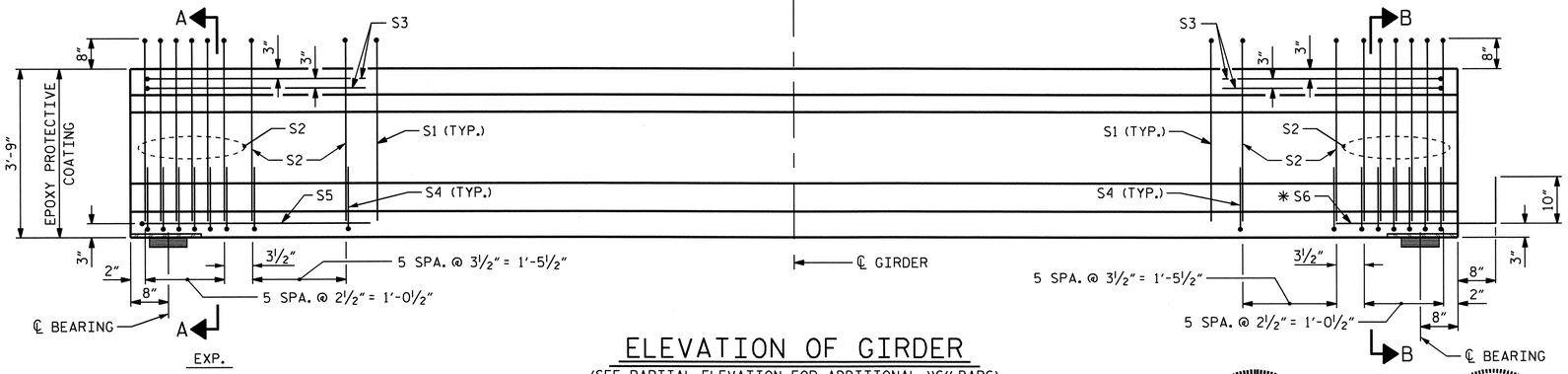
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

▣ STRANDS DEBONDED FOR 26'-0" FROM END OF GIRDER
⊙ STRANDS DEBONDED FOR 16'-0" FROM END OF GIRDER
◬ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
(36 STRANDS, ALL STRAIGHT, 6 DEBONDED)

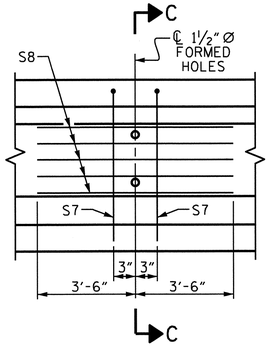


PLAN OF GIRDER

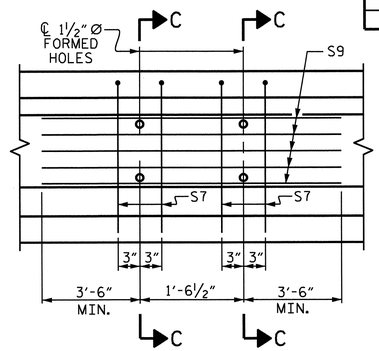


ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



EXTERIOR GIRDER



INTERIOR GIRDER

PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

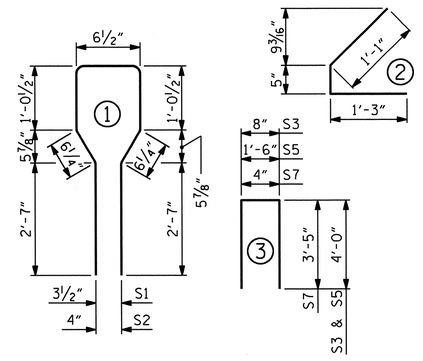
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	81	#4	1	8'-10"	478
	S2	24	#5	1	8'-10"	221
	S3	4	#4	3	8'-8"	23
	S4	48	#4	2	2'-9"	88
	S5	1	#4	3	9'-6"	6
	✱S6	4	#5	STR	3'-8"	15
EXT. GDR.	S7	2	#5	3	7'-2"	15
EXT. GDR.	S8	5	#4	STR	7'-0"	23
INT. GDR.	S7	4	#5	3	7'-2"	30
INT. GDR.	S9	5	#4	STR	8'-7"	29

✱ NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8500 PSI SAND LIGHT-WEIGHT CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
INTERIOR	891	12.5	36
EXTERIOR	869	12.5	36

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	86'-10"	694.67'

FOR PRESTRESSED CONCRETE GIRDER NOTES, SEE FRAMING PLAN SHEET.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-4-11
CHECKED BY : JOHN FRYE	DATE : 4-5-11
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06R TLA/GM

NORTH CAROLINA PROFESSIONAL SEAL 36850 ENGINEER STEVEN F. DOMBROWSKI 6/24/11

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN G. FRYE 6/24/11

24-JUN-2011 12:27
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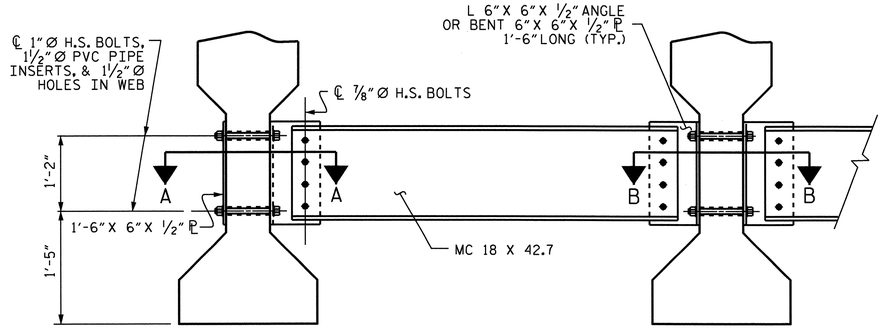
OTNGUYEN

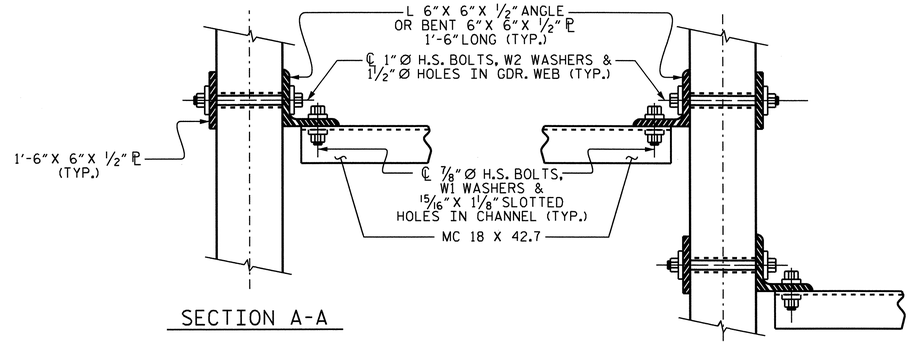


EXTERIOR GIRDER

INTERIOR GIRDER

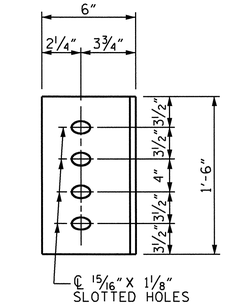
PART SECTION AT INTERMEDIATE DIAPHRAGM

(TYPICAL FOR EACH BAY)

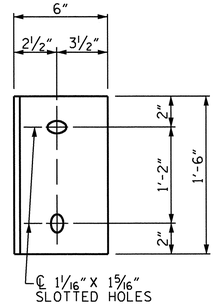


SECTION A-A

SECTION B-B



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

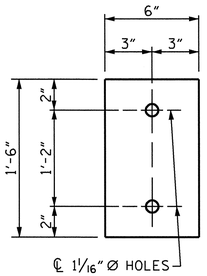
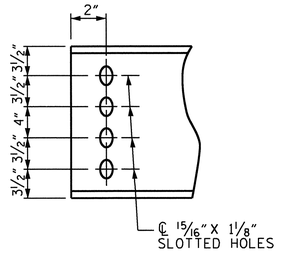


PLATE DETAILS



CHANNEL END

STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL, CONNECTOR PLATES AND PLATE WASHERS SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR DIRECT TENSION INDICATORS, SEE SPECIAL PROVISIONS.

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE PLATES, BENT PLATES, CHANNELS, ANGLES, AND PLATE WASHERS SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, AND WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. HARDENED WASHERS AND DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS IN THE CHANNEL MEMBER CONNECTION.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

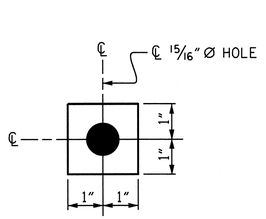
CONTRACTOR SHALL SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

CONNECTION DETAILS

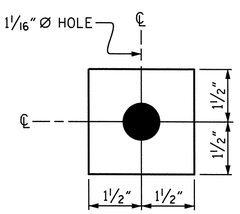
FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "FRAMING PLAN" SHEET.



W1

ℙ 7/16" X 2" X 2"

USE WITH ⅞" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS

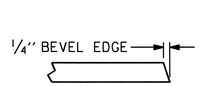


W2

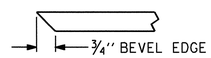
ℙ 7/16" X 3" X 3"

USE WITH 1" Ø HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

WASHER DETAILS

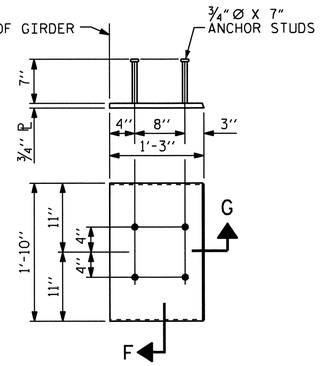


SECTION "G"



SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)

NORTH CAROLINA PROFESSIONAL SEAL 36850 ENGINEER STEVEN F. DOMBROWSKI

6/24/11

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-10-11
CHECKED BY : JOHN FRYE	DATE : 4-5-11
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06R KMM/GM

24-JUN-2011 12:27
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OTNGUYEN

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 2

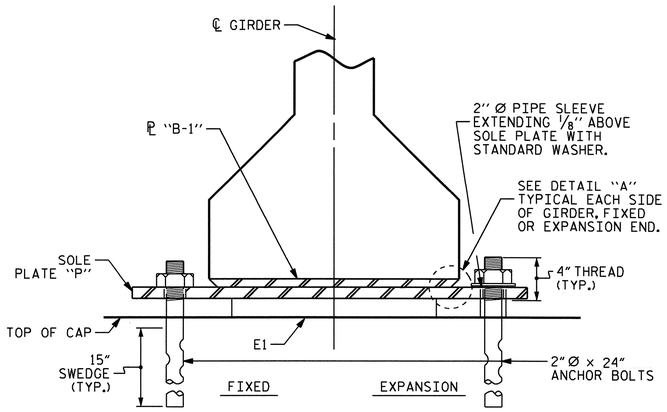
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

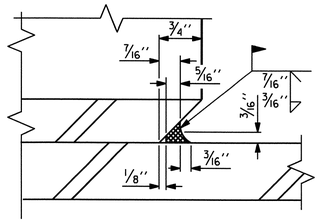
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			32

STD. NO. PCG12

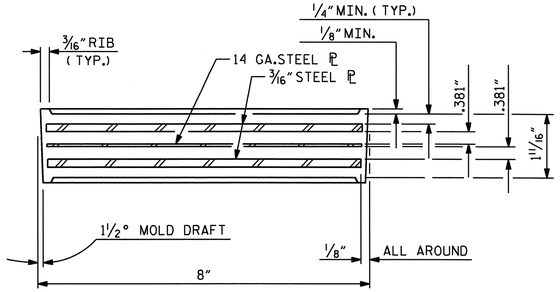


SECTION E-E

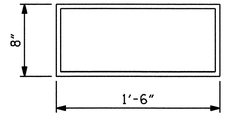


DETAIL "A"

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE III	115 K



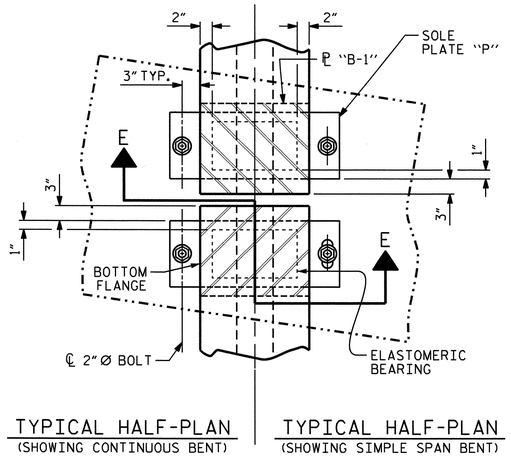
TYPICAL SECTION OF ELASTOMERIC BEARINGS



E1 (16 REQ'D)

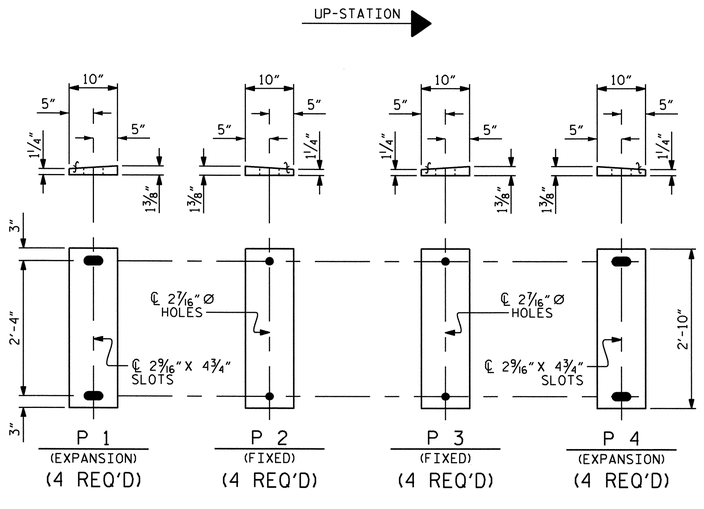
PLAN VIEW OF ELASTOMERIC BEARING

TYPE III



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)



SOLE PLATE DETAILS ("P")

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

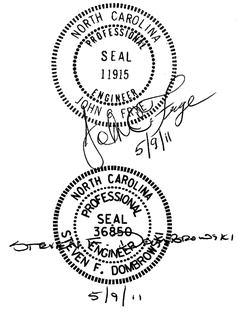
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

WHEN WELDING THE SOLE PLATE TO THE EMBEDDED PLATE IN THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : E.C. LOCKLEAR	DATE :	2-3-11
CHECKED BY : JOHN FRYE	DATE :	4-5-11
DRAWN BY : WJH 8/89	REV. 10/17/00	RWW/LES
CHECKED BY : CRK 8/89	REV. 7/10/01	RWW/LES
	REV. 5/1/06	TLA/GM

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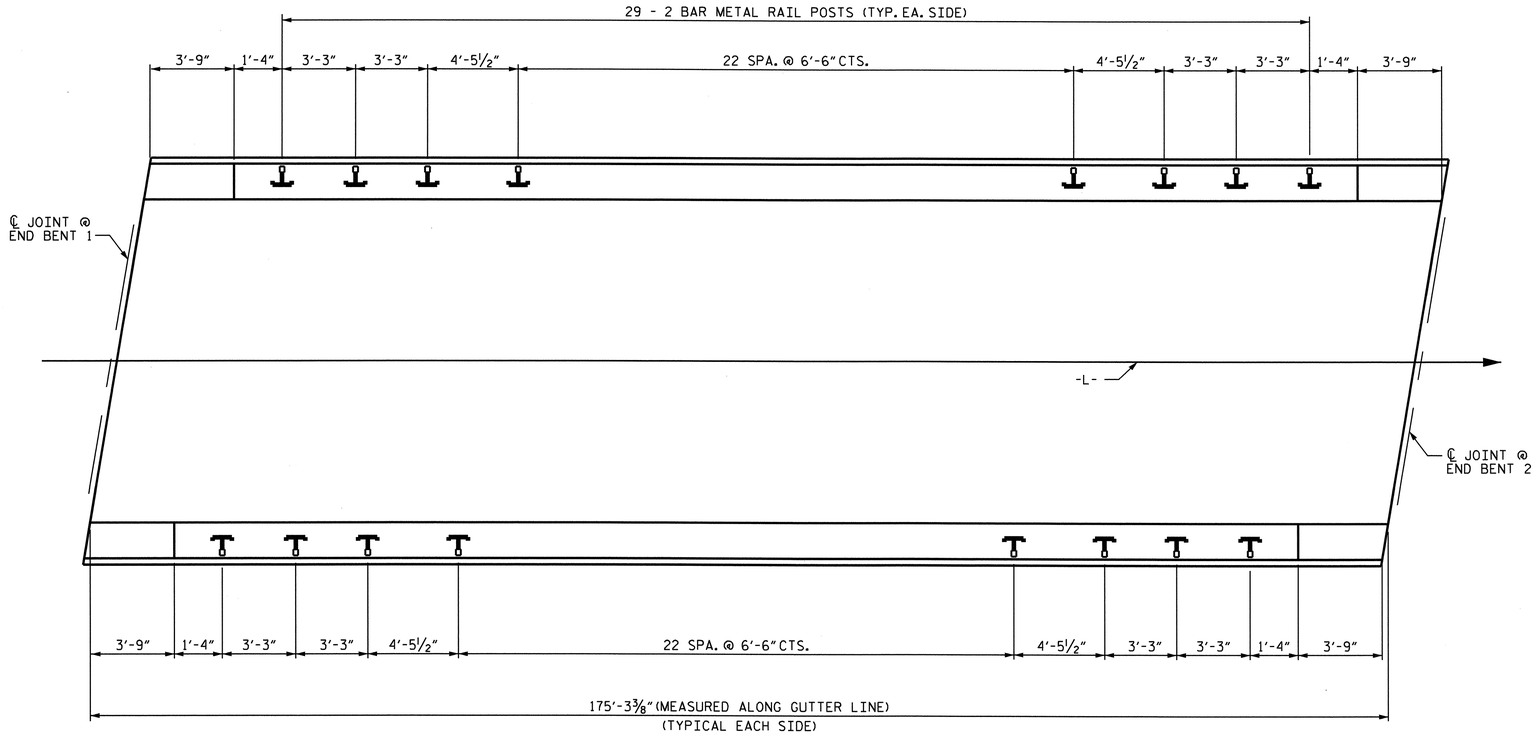
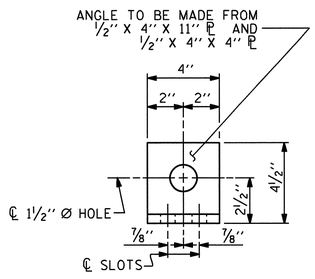
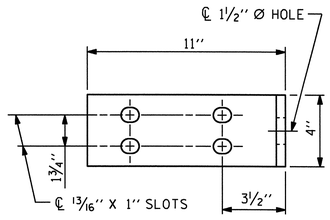
STD. NO. EB3



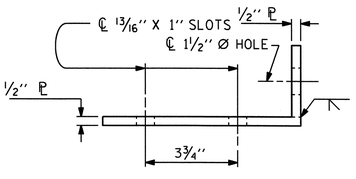
PLAN OF RAIL POST SPACINGS



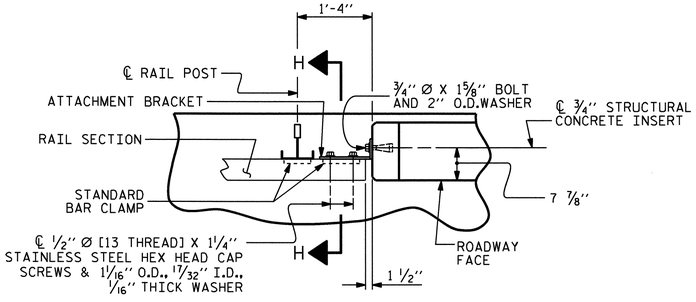
END VIEW



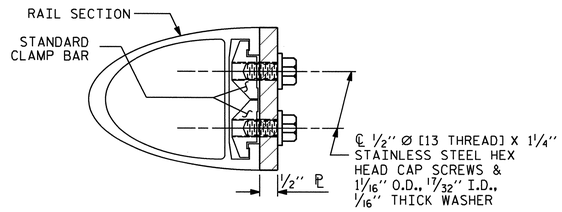
ELEVATION



TOP VIEW

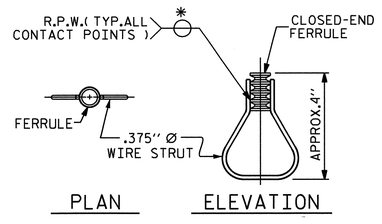


PLAN - RAIL AND END POST



SECTION H-H

DETAILS FOR ATTACHING METAL RAIL TO END POST



STRUCTURAL CONCRETE INSERT

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

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.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			32

STD. NO. BMR2

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-4-11		
CHECKED BY : JOHN FRYE	DATE : 4-5-11		
DRAWN BY : FCJ 1/88	REV. 10/17/00	LES/RDR	
CHECKED BY : CRK 3/89	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06	TLA/GM	

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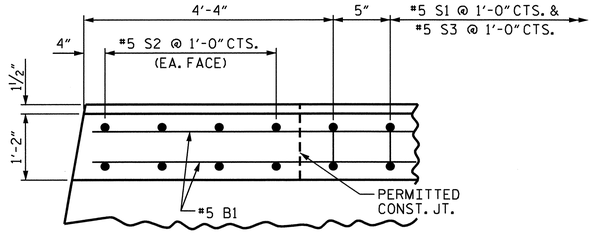
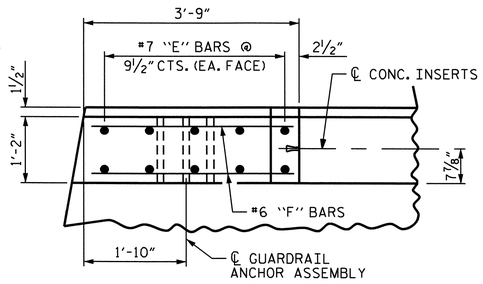
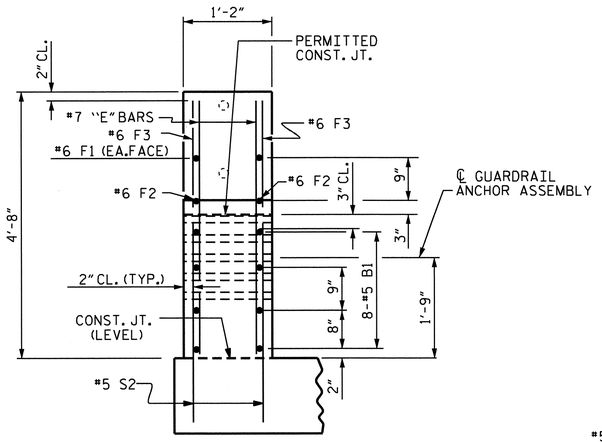


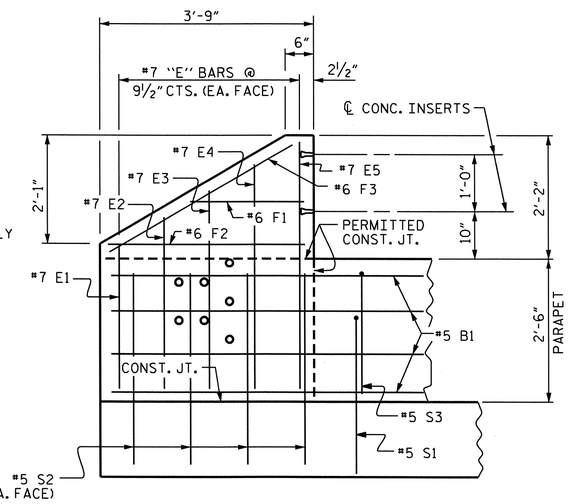
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

ALL S2 BARS ARE TO BE ADHESIVELY ANCHORED.

NOTES

PARAPETS SHALL BE CONSTRUCTED OF ALL LIGHTWEIGHT CONCRETE. FOR ALL LIGHT-WEIGHT CONCRETE FOR DECK AND PARAPETS, SEE SPECIAL PROVISIONS.

FOR ADDITIONAL CONCRETE CYLINDERS, SEE SPECIAL PROVISIONS.

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

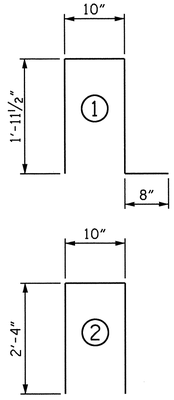
ALL REINFORCING STEEL IN THE PARAPET SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

FOR DETAIL OF CONCRETE INSERTS, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGEDETAILS" SHEET.

BAR TYPE



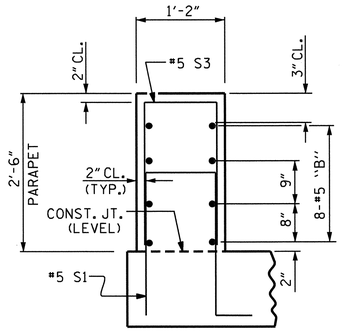
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

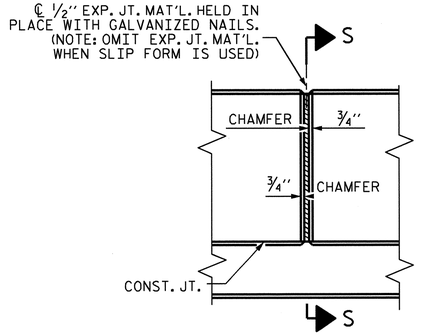
FOR PARAPETS & END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	32	#5	STR	27'-2"	907
✱ B2	64	#5	STR	29'-8"	1980
✱ E1	8	#7	STR	2'-6"	41
✱ E2	8	#7	STR	3'-0"	49
✱ E3	8	#7	STR	3'-6"	57
✱ E4	8	#7	STR	4'-0"	65
✱ E5	8	#7	STR	4'-4"	71
✱ F1	8	#6	STR	1'-10	22
✱ F2	8	#6	STR	2'-11"	35
✱ F3	8	#6	STR	3'-7"	43
✱ S1	336	#5	1	5'-5"	1898
✱ S2	32	#5	STR	3'-2"	106
✱ S3	336	#5	2	5'-6"	1927

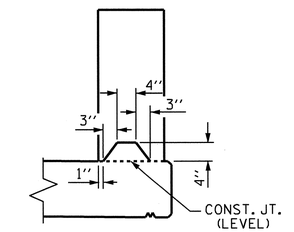
✱ EPOXY COATED REINF. STEEL	LBS.	7202
ALL LIGHTWEIGHT CONCRETE (4500 PSI)		
END POSTS	CU. YDS.	2.4
PARAPETS	CU. YDS.	37.9
TOTAL	CU. YDS.	40.3
CONCRETE PARAPET	LIN. FT.	350.56



SECTION THROUGH PARAPET

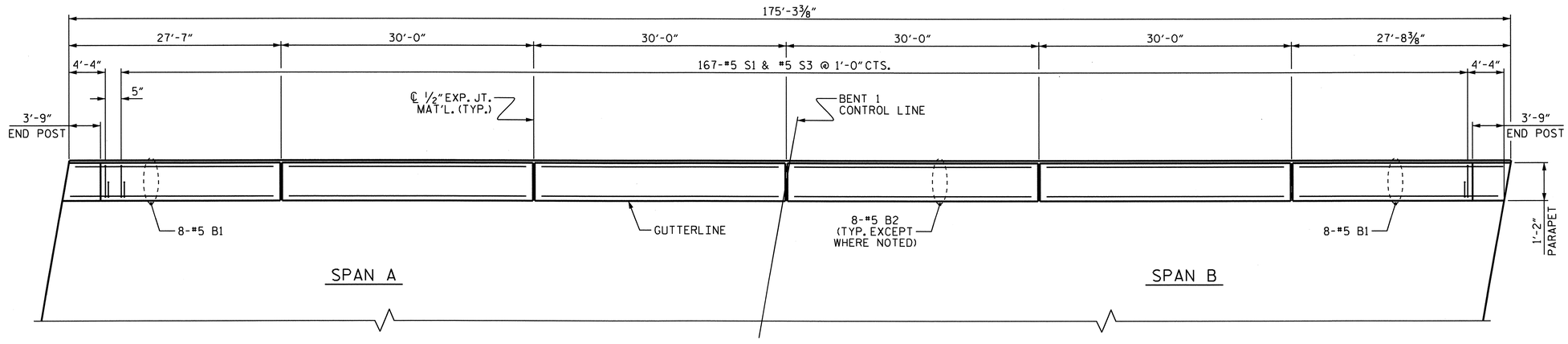


ELEVATION AT EXPANSION JOINTS



SECTION S-S

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



PLAN OF PARAPET

DIMENSIONS ARE ALONG OUTSIDE FACE OF PARAPET
LEFT SIDE SHOWN, RIGHT SIDE SIMILAR.

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN G. FRYE 4/27/11

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PARAPET AND END POST DETAILS FOR TWO BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : E.C. LOCKLEAR DATE : 2-8-11
CHECKED BY : JOHN FRYE DATE : 4-5-11

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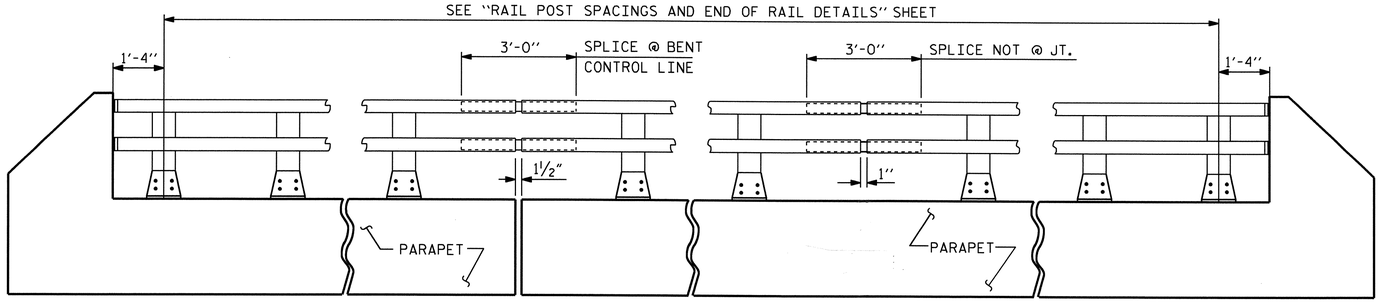
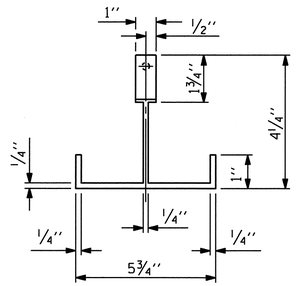
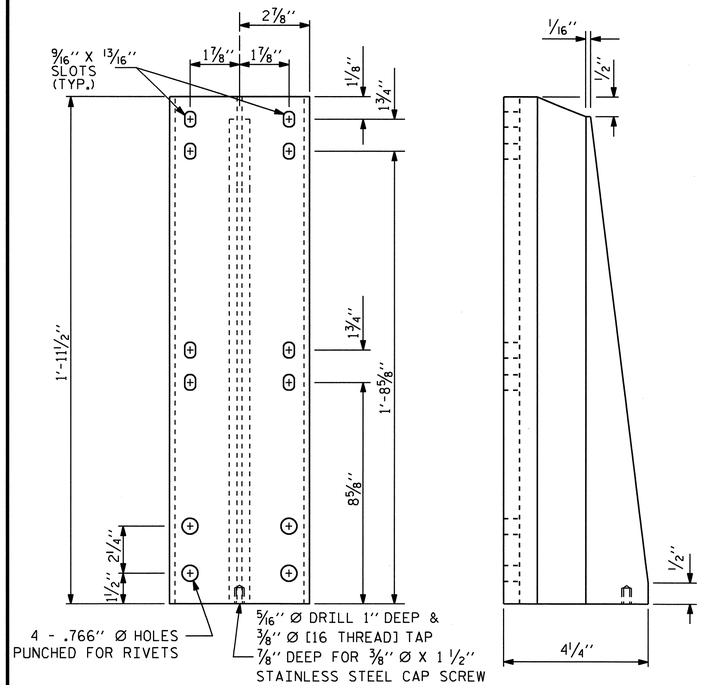


ELEVATION

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



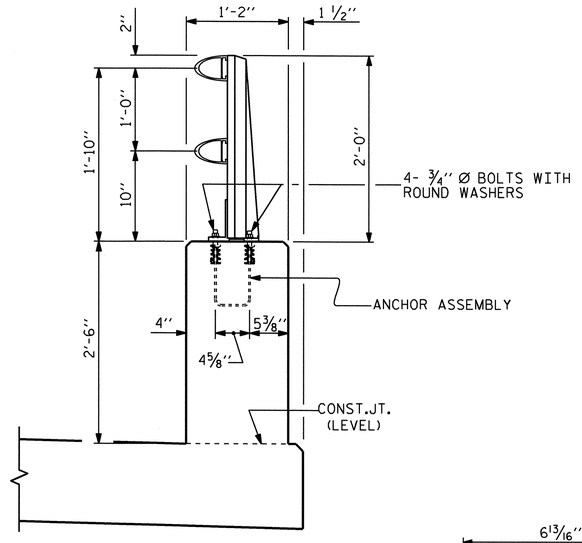
PLAN



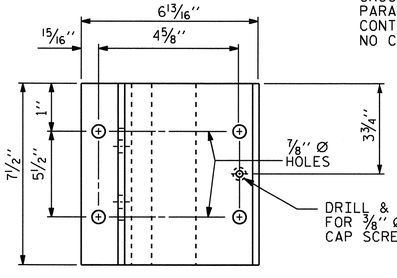
FRONT ELEVATION

SIDE ELEVATION

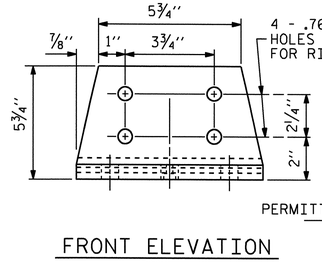
DETAILS OF POST



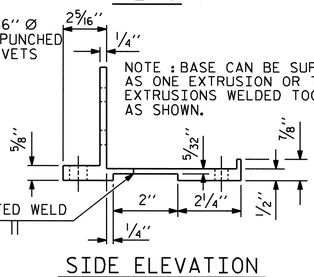
SECTION THRU PARAPET AND RAIL



PLAN

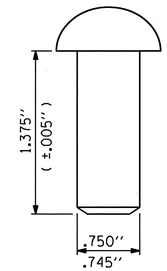


FRONT ELEVATION



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.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 335.56 LIN. FT.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE 5/9/11

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-8-11
CHECKED BY : JOHN FRYE	DATE : 4-5-11

DRAWN BY : EEM 6/94	REV. 10/17/00	LES/RDR
CHECKED BY : RGW 6/94	REV. 5/7/03R	RWW/LTE
	REV. 5/1/06	TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			32

STD. NO. BMR3

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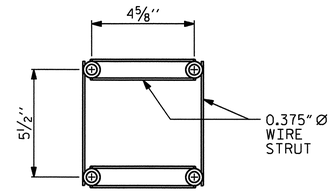
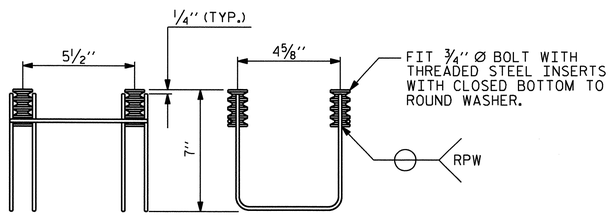


PLAN



SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 1¾''

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(58 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 ¾'' FERRULES.

B. 4 - ¾'' Ø X 2½'' 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 ¾'' Ø X 2½'' 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.

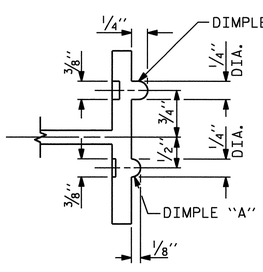
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

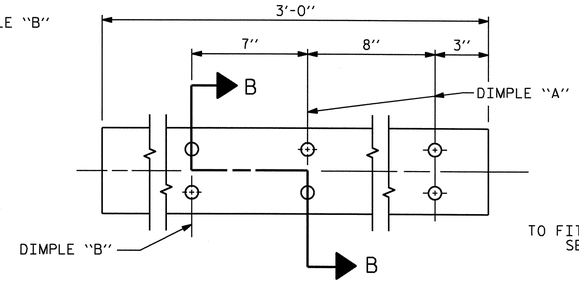
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

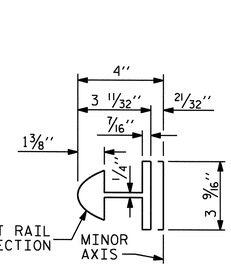
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

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



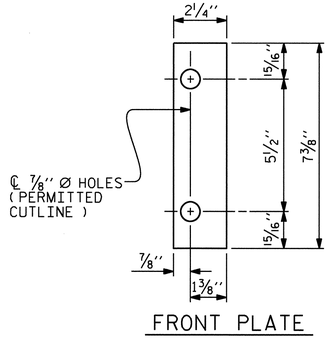
SECTION B-B



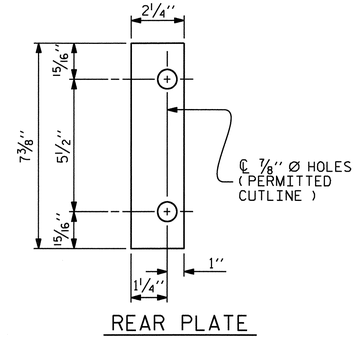


BAR SECTION

EXPANSION BAR DETAILS



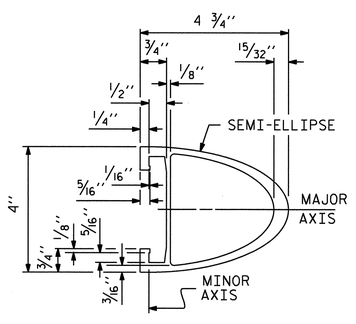
FRONT PLATE



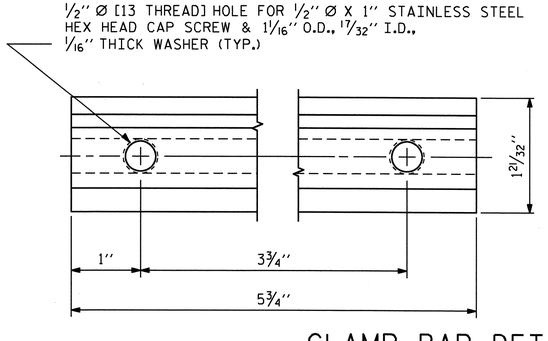
REAR PLATE

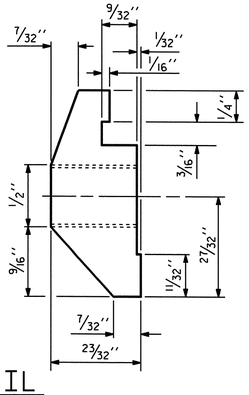
SHIM DETAILS

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



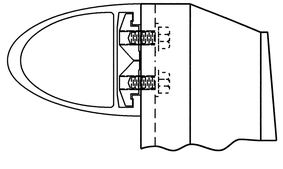
RAIL SECTION



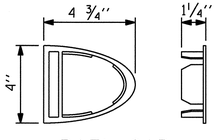


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-8-11				
CHECKED BY : JOHN FRYE	DATE : 4-5-11				
DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RGW	REVISIONS			SHEET NO. S-16
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES	NO. BY: DATE:	NO. BY: DATE:		
	REV. 5/1/06R KMM/GM	1	3		TOTAL SHEETS 32
		2	4		

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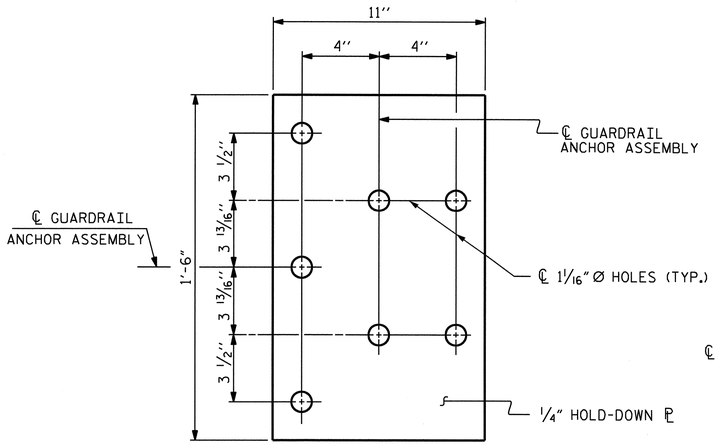
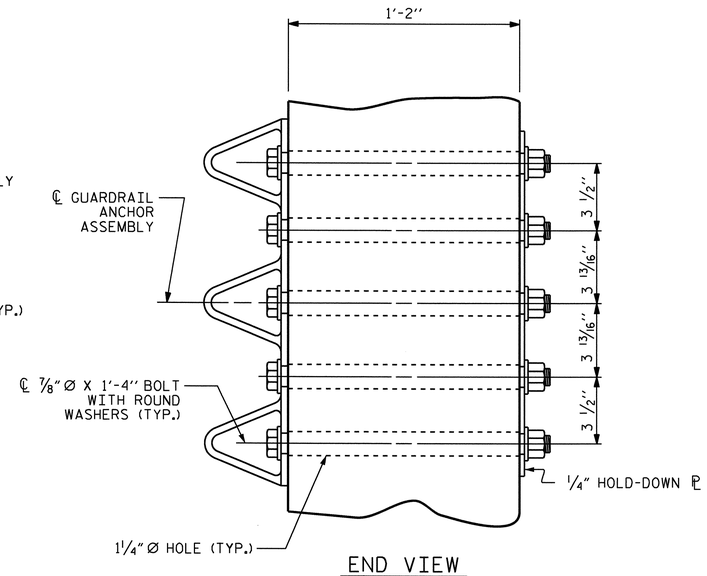
STD. NO. BMR4



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.

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

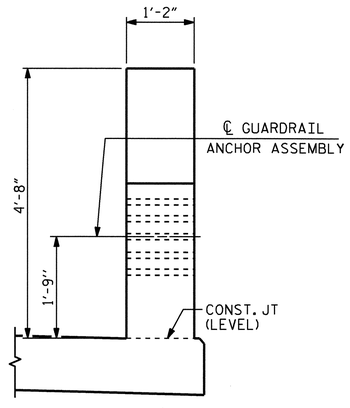
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

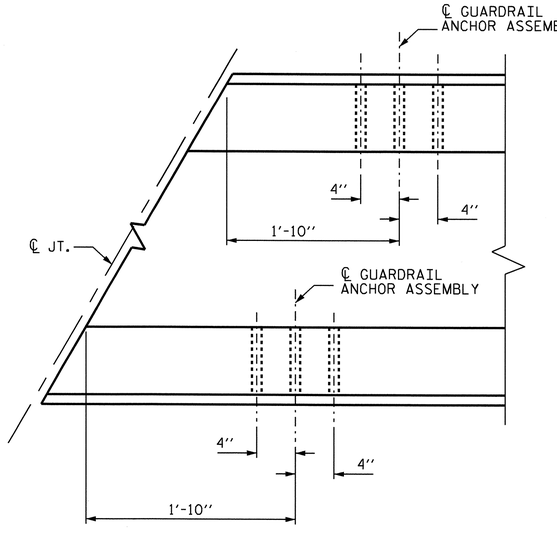
THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN A FRYE
5/9/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY : E.C. LOCKLEAR DATE : 2-8-11 CHECKED BY : JOHN FRYE DATE : 4-5-11	
DRAWN BY : MAA 5/10 CHECKED BY : GM 5/10	ADDED 5/6/10

09-MAY-2011 10:20
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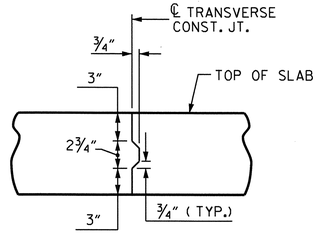
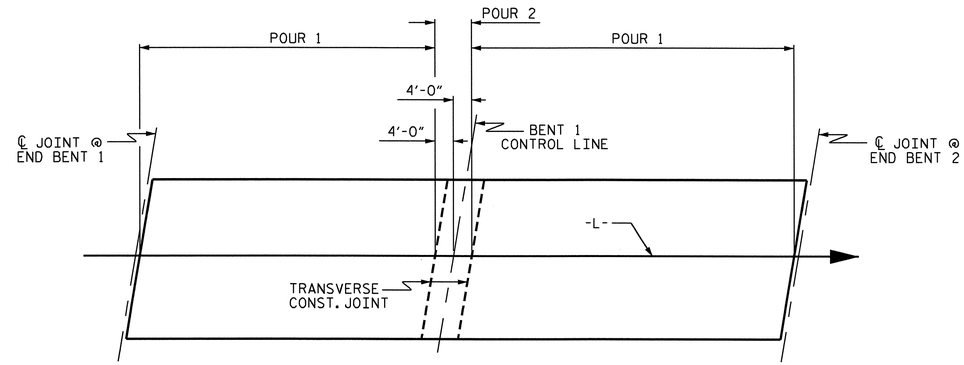
STD. NO. GRA3

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER RAIL
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"
#5	2'-6"	2'-2"	2'-6"	2'-2"	3'-5"
#6	3'-0"	2'-7"	3'-10"	2'-7"	4'-4"
#7	5'-3"	3'-6"			
#8	6'-10"	4'-7"			



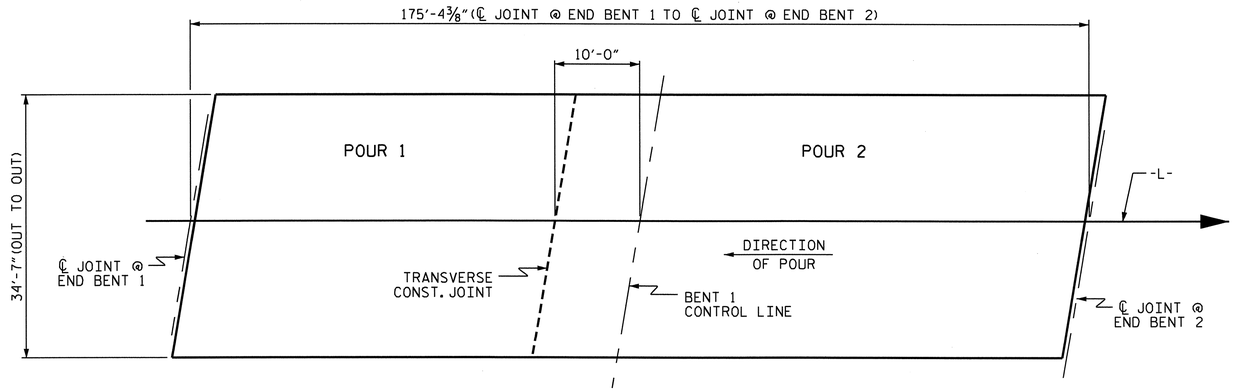
TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT



OPTIONAL POURING SEQUENCE

POUR 2 CANNOT BE STARTED UNTIL BOTH ADJACENT POURS 1 REACH A MINIMUM OF 3000 PSI.



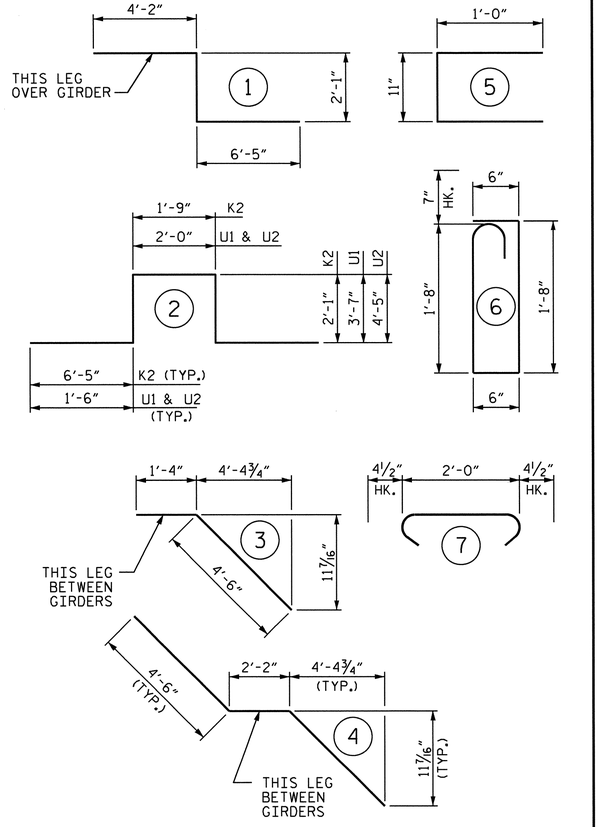
POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 6,065)

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	339	#5	STR	34'-3"	12110
A2	339	#5	STR	34'-3"	12110
✱A101	2	#5	STR	29'-11"	61
✱A102	2	#5	STR	26'-11"	55
✱A103	2	#5	STR	23'-11"	48
✱A104	2	#5	STR	20'-11"	42
✱A105	2	#5	STR	17'-11"	36
✱A106	2	#5	STR	14'-11"	30
✱A107	2	#5	STR	11'-11"	23
✱A108	2	#5	STR	8'-11"	17
✱A109	2	#5	STR	5'-11"	11
✱A110	2	#5	STR	2'-11"	5
A201	2	#5	STR	31'-11"	67
A202	2	#5	STR	28'-11"	60
A203	2	#5	STR	25'-11"	54
A204	2	#5	STR	22'-11"	48
A205	2	#5	STR	19'-11"	42
A206	2	#5	STR	16'-11"	35
A207	2	#5	STR	13'-11"	29
A208	2	#5	STR	10'-11"	23
A209	2	#5	STR	7'-11"	17
A210	2	#5	STR	4'-11"	10
A211	2	#5	STR	1'-11"	4
✱B1	14	#4	STR	26'-9"	250
✱B2	138	#4	STR	20'-8"	1905
✱B3	69	#7	STR	24'-8"	3479
✱B4	22	#7	STR	26'-8"	1199
B5	132	#5	STR	59'-10"	8238
✱G1	2	#5	STR	34'-8"	72
✱K1	8	#8	1	12'-8"	271
✱K2	8	#8	2	18'-9"	401
✱K3	12	#6	STR	7'-8"	138
K4	12	#4	STR	7'-8"	61
K5	12	#4	STR	8'-5"	67
K6	6	#4	STR	6'-0"	24
K7	10	#4	3	5'-7"	37
K8	10	#4	4	11'-2"	75
✱S1	48	#5	6	4'-11"	246
✱S2	48	#4	5	2'-11"	94
S3	90	#4	7	2'-11"	175
U1	6	#4	2	12'-1"	49
U2	18	#4	2	13'-10"	166
REINFORCING STEEL			LBS.		21,380
✱EPOXY COATED REINFORCING STEEL			LBS.		20,491

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

SUPERSTRUCTURE BILL OF MATERIAL

	ALL LIGHTWEIGHT CONCRETE (4500 PSI)	REINFORCING STEEL	✱ EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
POUR 1	95.8		
POUR 2	128.8		
TOTALS▲	224.6	21,380	20,491

▲QUANTITIES FOR PARAPETS & END POSTS ARE NOT INCLUDED.

GROOVING BRIDGE FLOORS		
APPROACH SLABS	620	SQ.FT.
BRIDGE DECK	5047	SQ.FT.
TOTAL	5,667	SQ.FT.

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. FRYE

6/24/11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			32

STD. NO. BOM2

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 2-9-11		
CHECKED BY : JOHN FRYE	DATE : 4-5-11		
DRAWN BY : JMB 5/87	REV. 6/1/94	EEM/GRP	
CHECKED BY : SJD 9/87	REV. 8/16/99	RWW/LES	
	REV. 5/1/06	TLA/GM	

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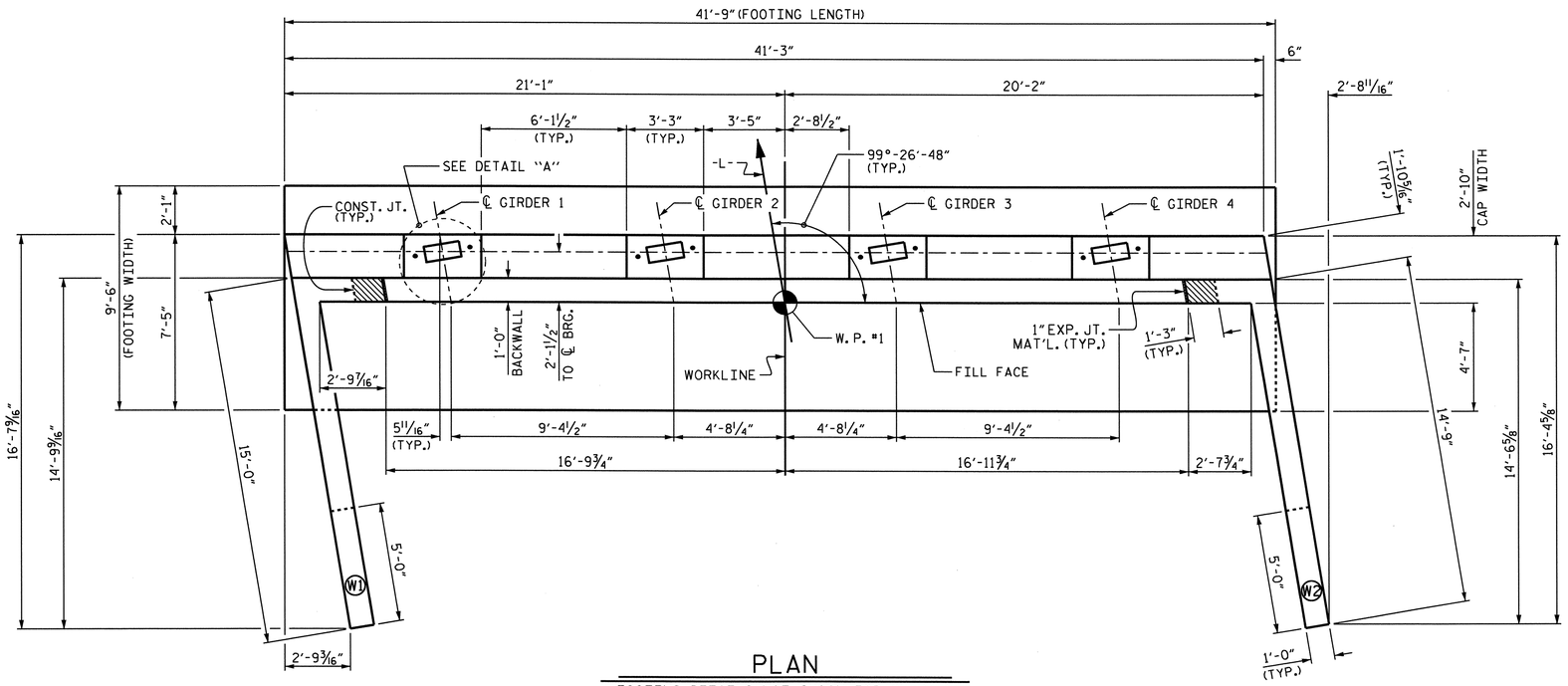
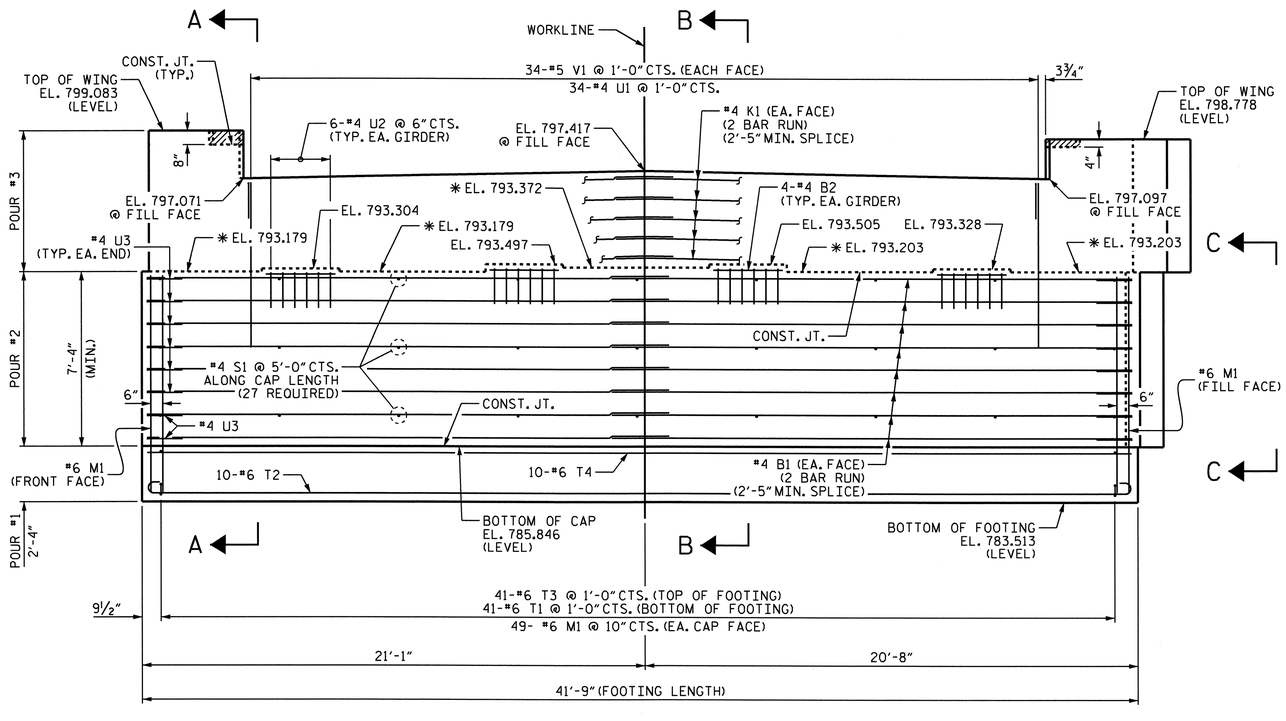


PLAN

FOOTING DETAILS NOT SHOWN FOR CLARITY



ELEVATION

LEFT WING NOT SHOWN FOR CLARITY

NOTES

REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

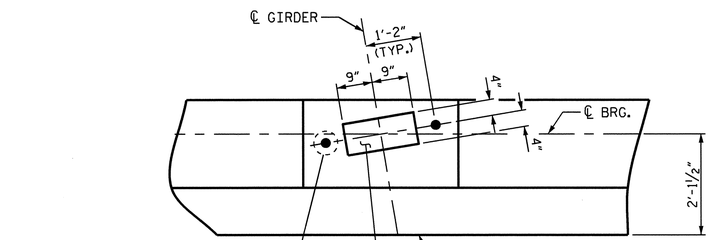
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

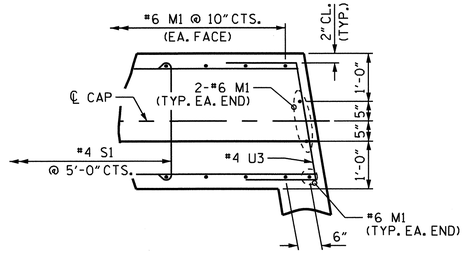
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET IS CAST IF SLIP FORMING IS USED.

POUR 2 IS CONSIDERED MASS CONCRETE. FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



DETAIL "A"



CAP PART PLAN VIEW

RIGHT END SHOWN (LEFT END SIMILAR)

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 036445 ENGINEER KOREY NEWTON

6/23/2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 5/4/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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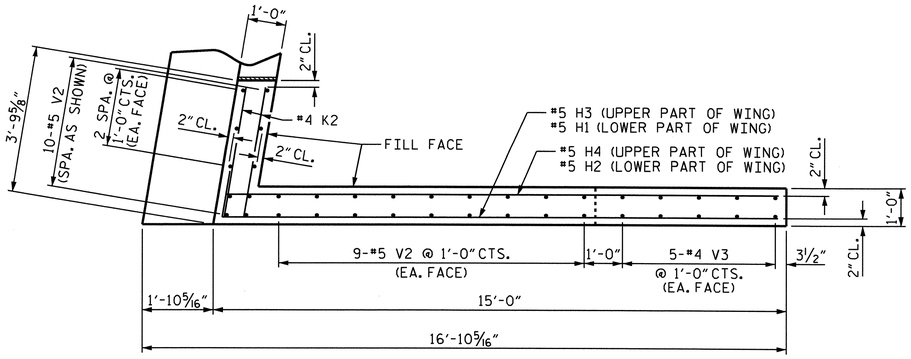
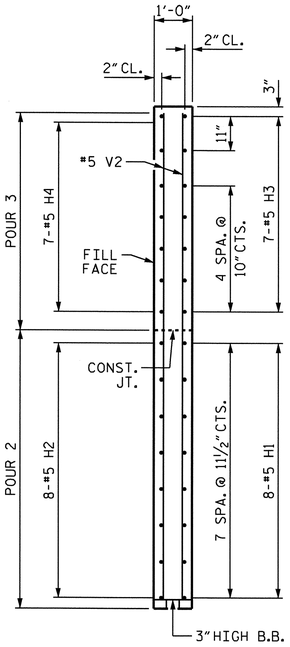
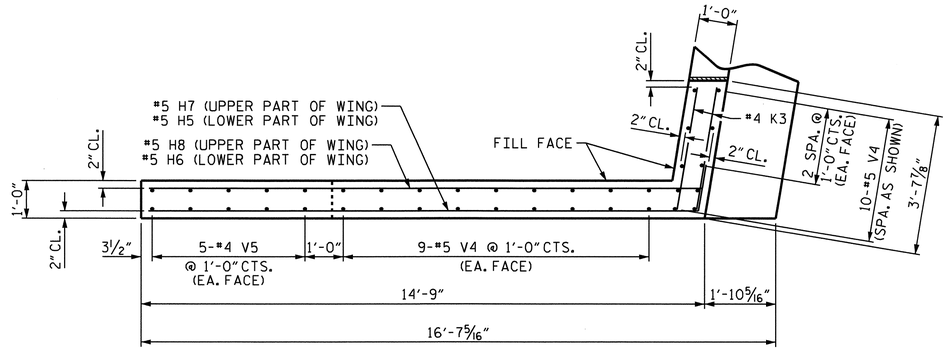


PLAN OF WING W1

FOOTING NOT SHOWN FOR CLARITY

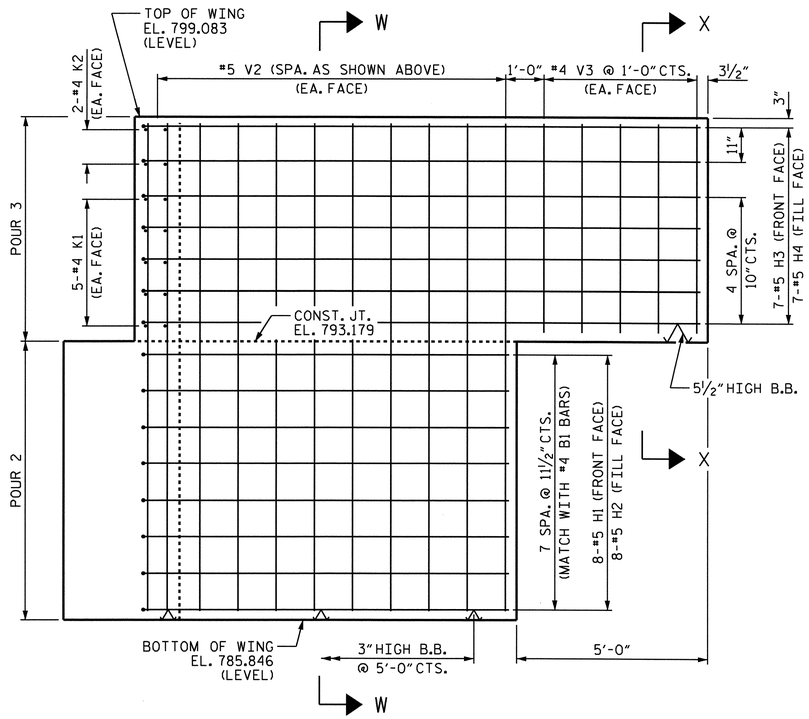


SECTION W-W



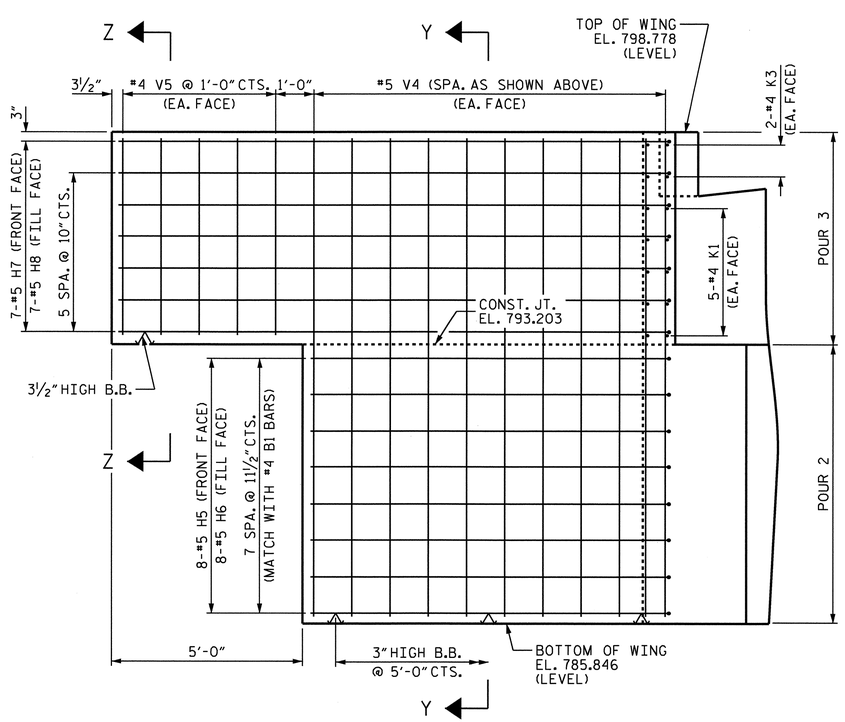
PLAN OF WING W2

FOOTING NOT SHOWN FOR CLARITY



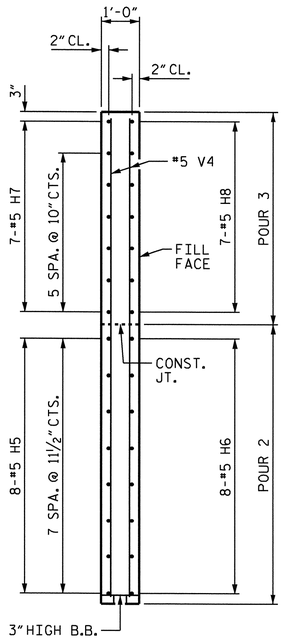
ELEVATION OF WING W1

FOOTING NOT SHOWN FOR CLARITY

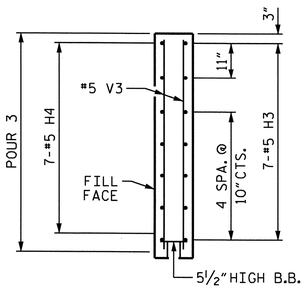


ELEVATION OF WING W2

FOOTING NOT SHOWN FOR CLARITY



SECTION Y-Y



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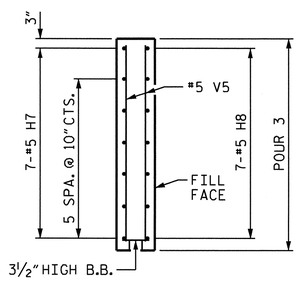

SECTION Z-Z

STATE OF NORTH CAROLINA
NORTH CAROLINA PROFESSIONAL SEAL ENGINEER KOREY NEWTON
5/11/2011

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 2/10/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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kpnewton

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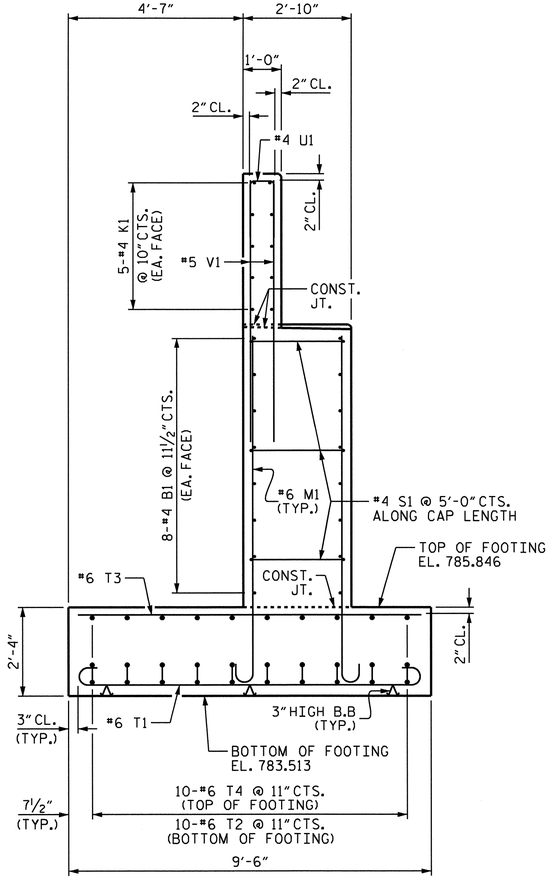
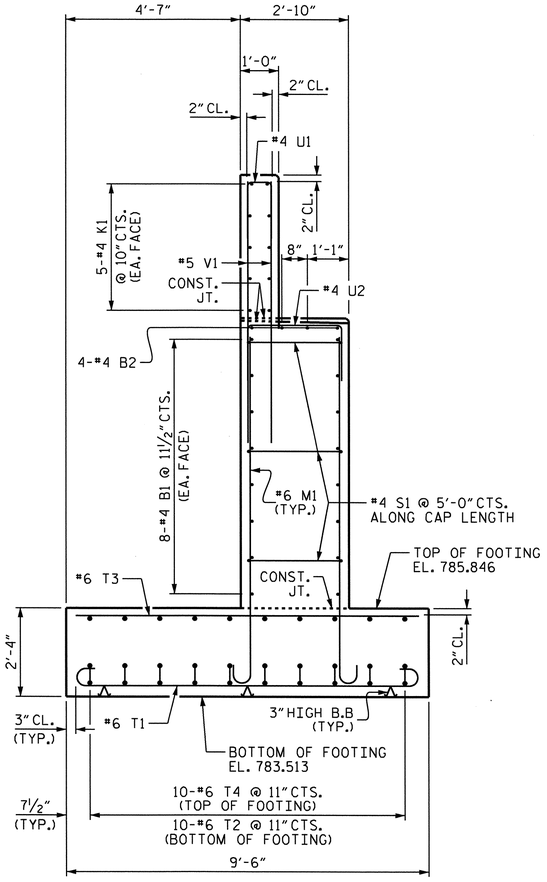
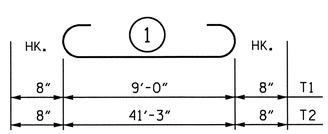


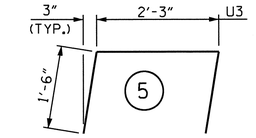
SECTION A-A

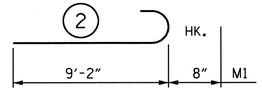


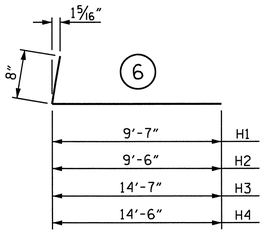
SECTION B-B

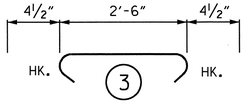
BAR TYPES

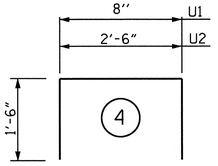


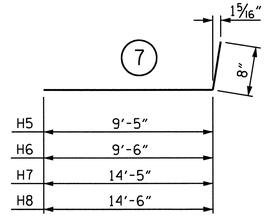












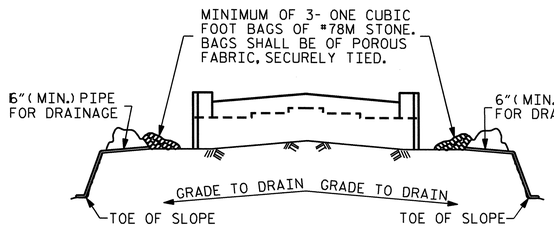
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	32	#4	STR	21'-8"	463
B2	16	#4	STR	2'-11"	31
H1	8	#5	6	10'-3"	86
H2	8	#5	6	10'-2"	87
H3	7	#5	6	15'-3"	111
H4	7	#5	6	15'-2"	111
H5	8	#5	7	10'-1"	84
H6	8	#5	7	10'-2"	85
H7	7	#5	7	15'-1"	110
H8	7	#5	7	15'-2"	111
K1	20	#4	STR	21'-8"	289
K2	4	#4	STR	3'-5"	9
K3	4	#4	STR	3'-3"	9
M1	104	#6	2	9'-10"	1536
S1	27	#4	3	3'-3"	59
T1	41	#6	1	10'-4"	636
T2	10	#6	1	42'-7"	640
T3	41	#6	STR	9'-0"	554
T4	10	#6	STR	41'-3"	620
U1	34	#4	4	3'-8"	83
U2	24	#4	4	5'-6"	88
U3	16	#4	5	5'-3"	56
V1	68	#5	STR	6'-11"	491
V2	28	#5	STR	12'-10"	375
V3	10	#4	STR	5'-6"	37
V4	28	#5	STR	12'-7"	367
V5	10	#4	STR	5'-2"	35

REINFORCING STEEL	LBS.	7161
CLASS A CONCRETE		
POUR 1 (FOOTING)		34.3 C.Y.
POUR 2 (CAP & LOWER WINGS)		37.5 C.Y.
POUR 3 (BACKWALL & UPPER WINGS)		12.6 C.Y.
TOTAL		84.4 C.Y.
FOUNDATION EXCAVATION		LUMP SUM

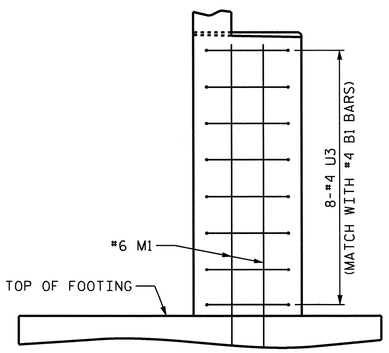


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

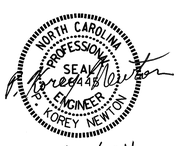
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



VIEW C-C

EA. END SIMILAR



6/23/2011

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			32

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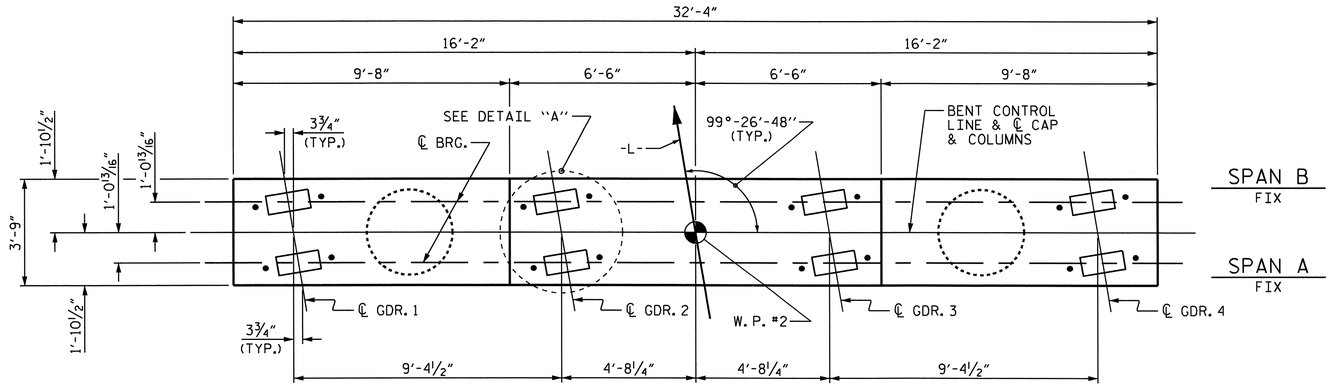
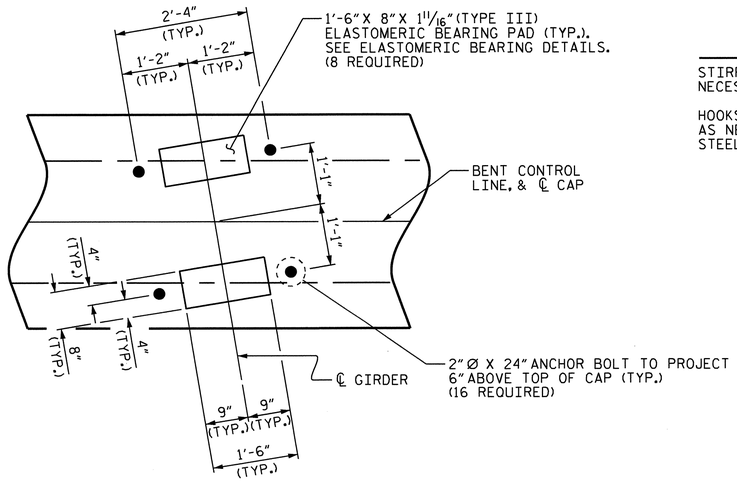


PLAN

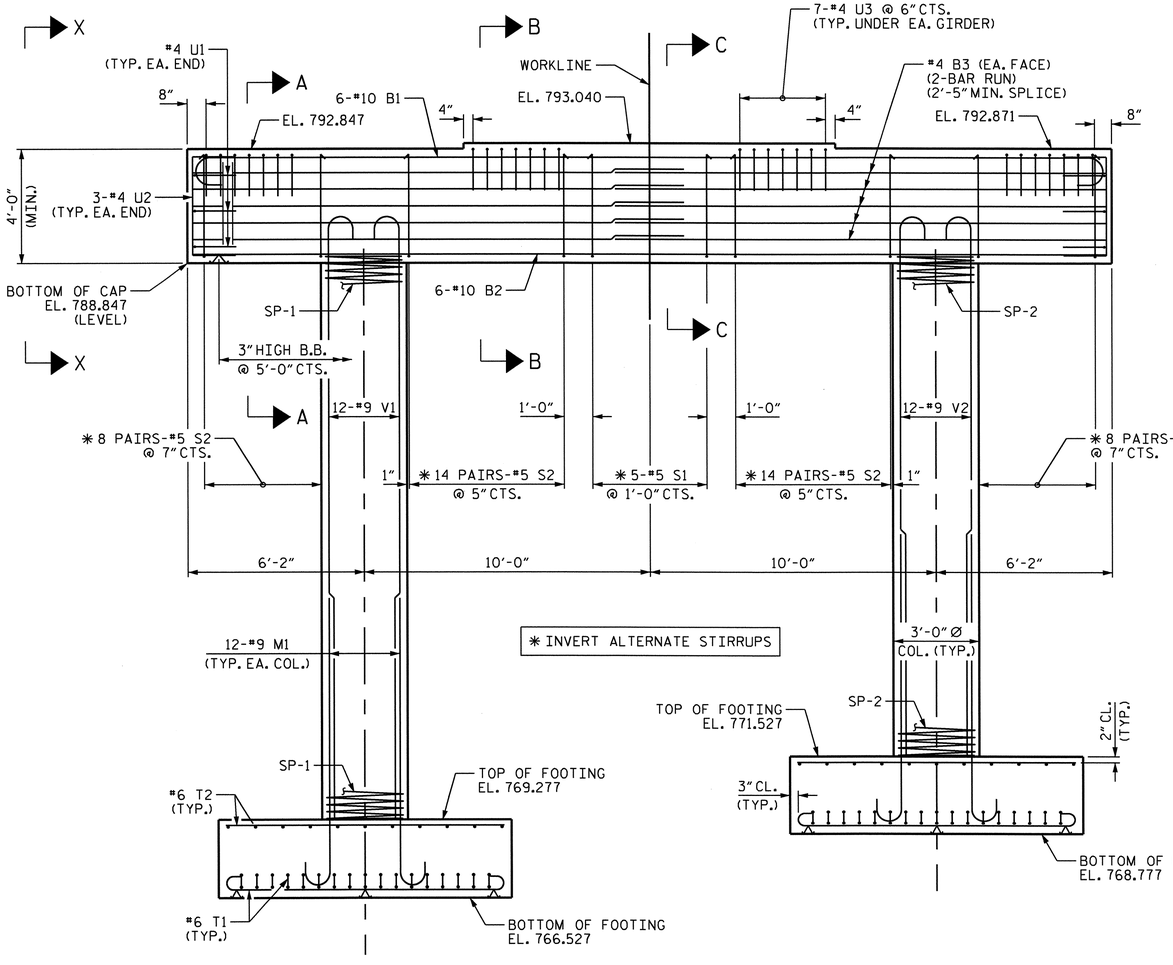


DETAIL "A"

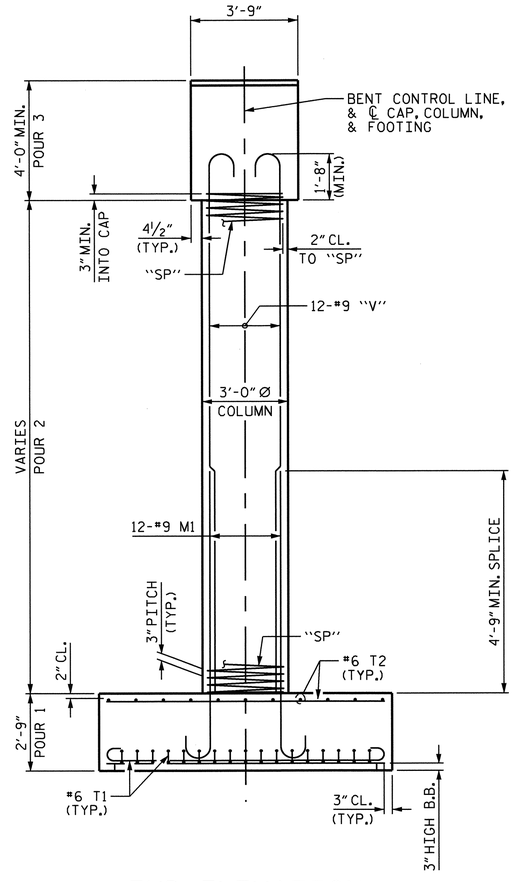
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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



ELEVATION



END ELEVATION

NORTH CAROLINA PROFESSIONAL SEAL P. K. NEWTON P.E. ENGINEER KORREY NEWTON

6/23/2011

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 1/19/11
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kpnewton

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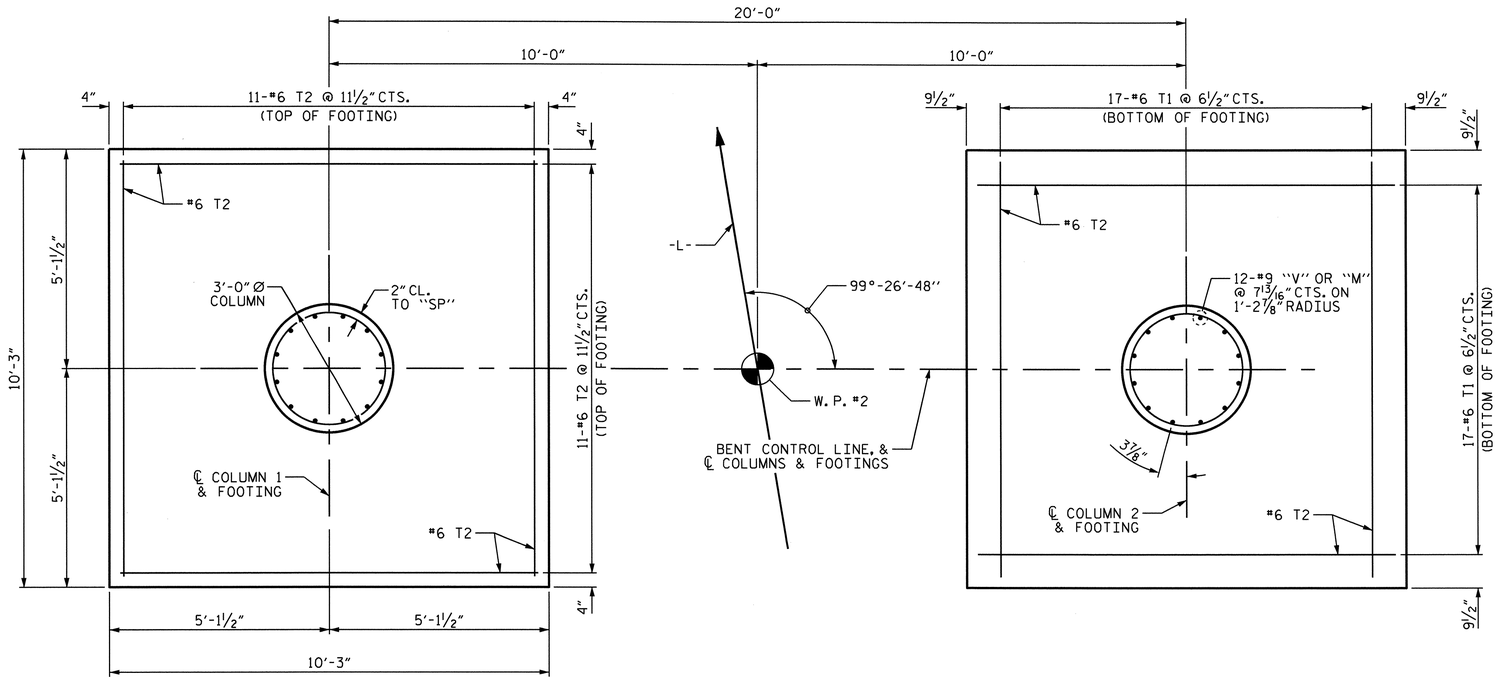
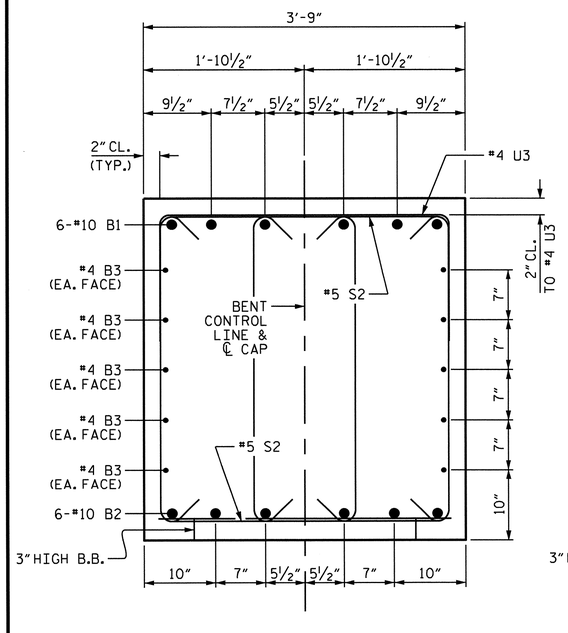
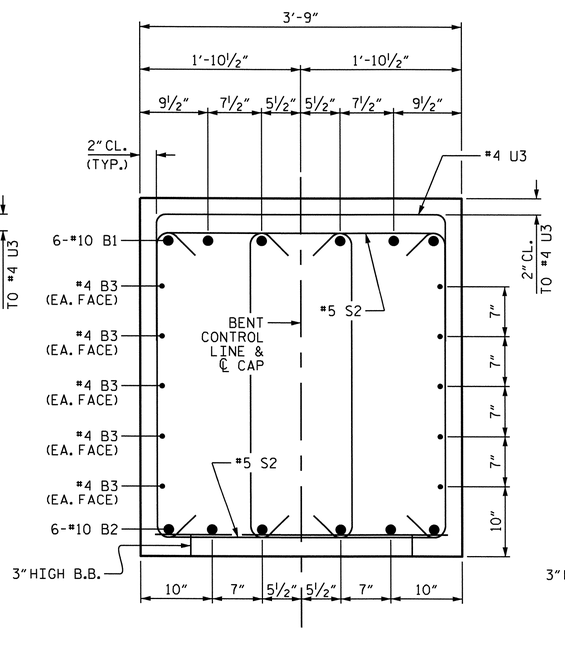


PLAN OF FOOTINGS & COLUMNS

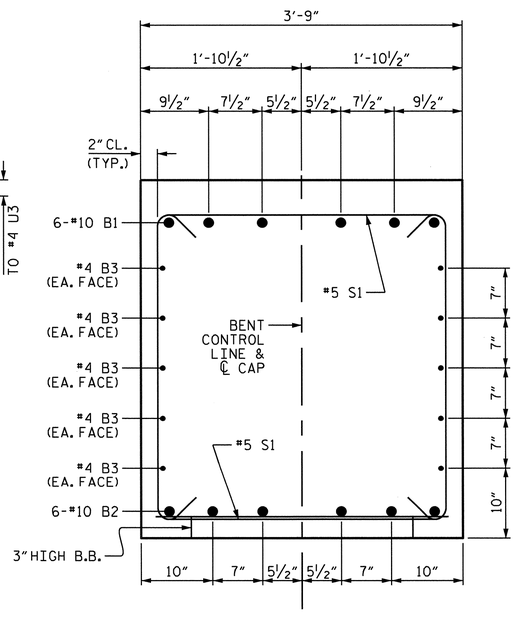
(REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING AND COLUMN.)



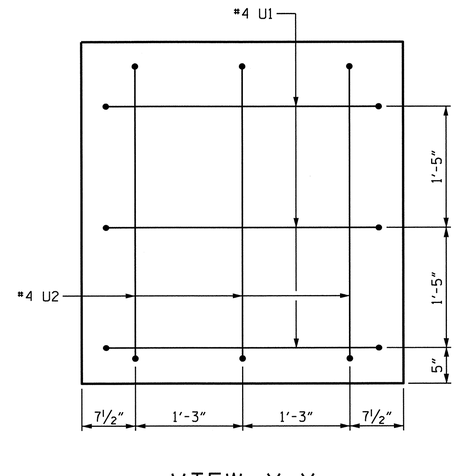
SECTION A-A



SECTION B-B



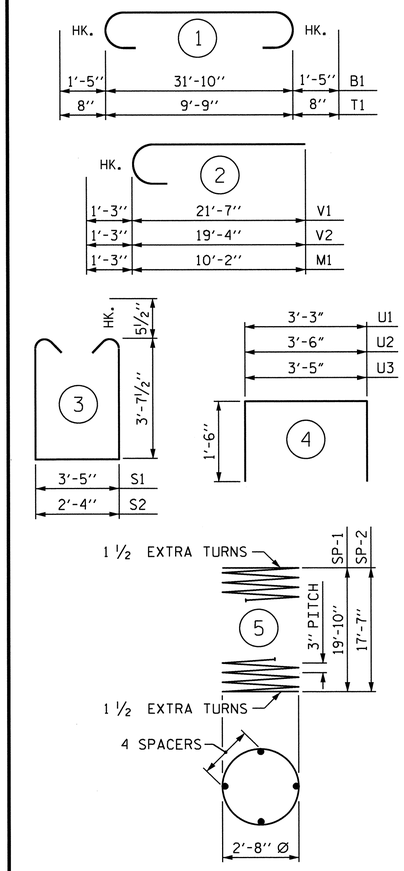
SECTION C-C



VIEW X-X

(TYP. EA. END)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#10	1	34'-8"	895
B2	6	#10	STR	32'-0"	826
B3	20	#4	STR	17'-3"	230
M1	24	#9	2	8'-5"	687
S1	5	#5	3	11'-7"	60
S2	88	#5	3	10'-6"	964
T1	68	#6	1	11'-1"	1132
T2	44	#6	STR	9'-9"	644
U1	6	#4	4	6'-3"	25
U2	6	#4	4	6'-6"	26
U3	28	#4	4	6'-5"	120
V1	12	#9	2	22'-10"	932
V2	12	#9	2	20'-7"	840

REINFORCING STEEL				LBS	7381
SP-1	1	**	5	684'-10"	457
SP-2	1	**	5	610'-7"	408

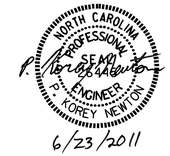
TOTAL SPIRAL COLUMN REINFORCING STEEL 865

CLASS A CONCRETE BREAKDOWN:

POUR 1 (FOOTINGS)	21.4 C.Y.
POUR 2 (COLUMNS)	9.7 C.Y.
POUR 3 (CAP)	18.3 C.Y.
TOTAL CLASS A CONCRETE	49.4 C.Y.

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

FOUNDATION EXCAVATION LUMP SUM



PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 1/19/11
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kpnewton

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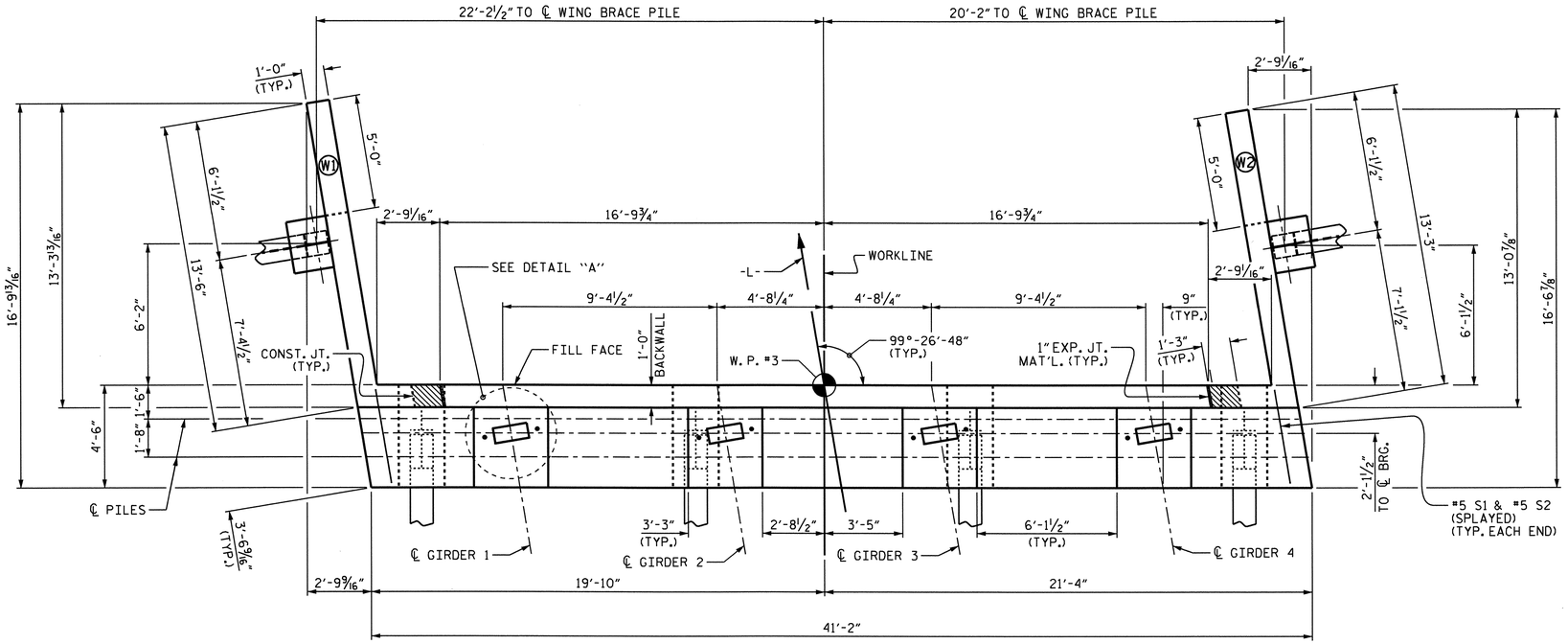


PLAN

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

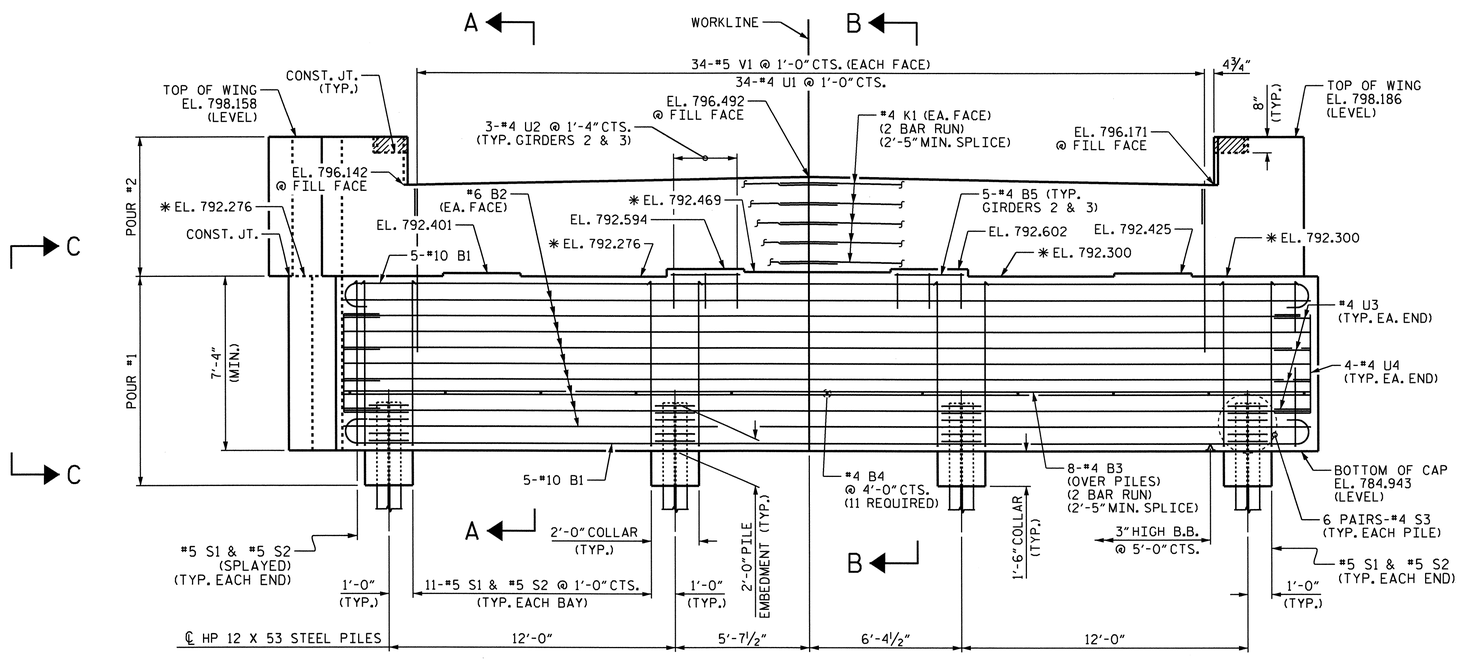
THE TOP SURFACE AREAS OF THE END BENT CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

* THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

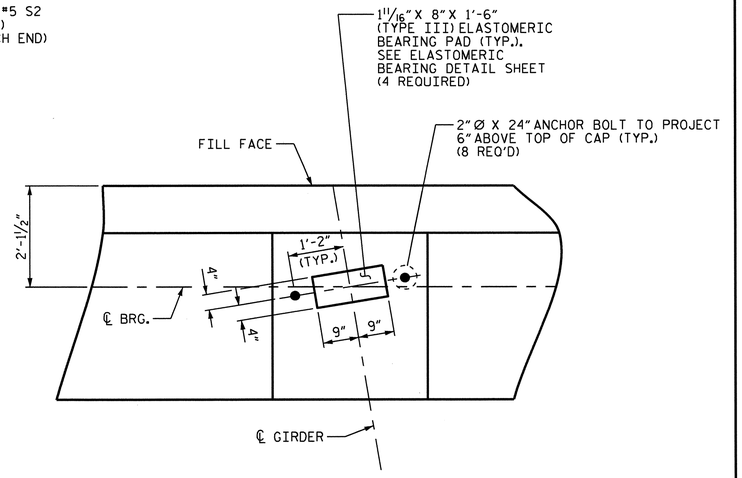
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE PARAPET IS CAST IF SLIP FORMING IS USED.

POUR 1 IS CONSIDERED MASS CONCRETE. FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.



ELEVATION

BRACE PILES IN WINGS AND WING DETAILS NOT SHOWN FOR CLARITY.



DETAIL "A"

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 026945 ENGINEER K. NEWTON

6/24/2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 2/10/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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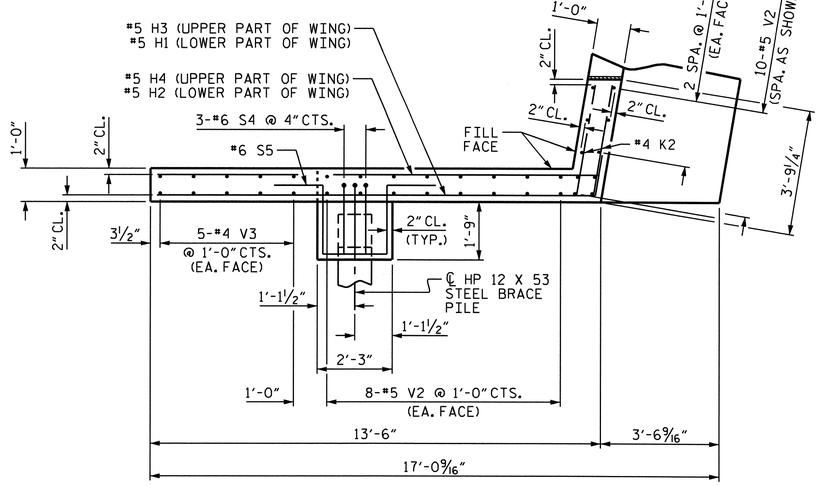
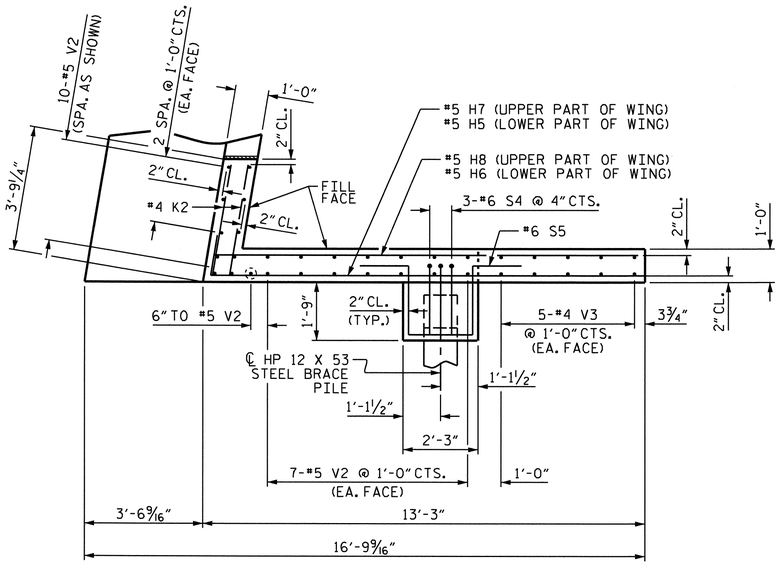
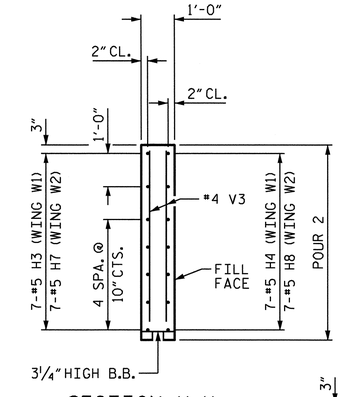


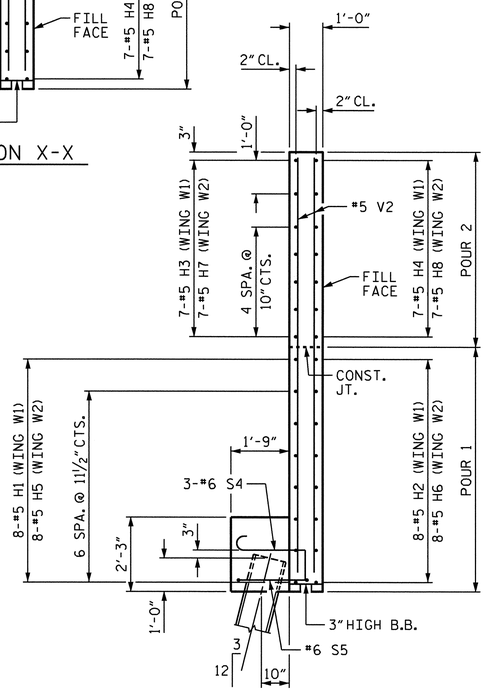
PLAN OF WING W1



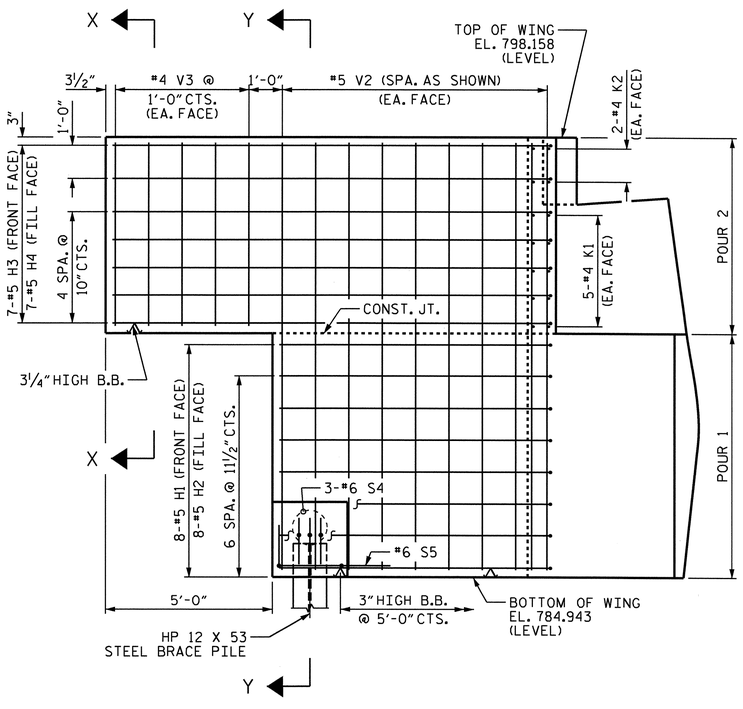
PLAN OF WING W2



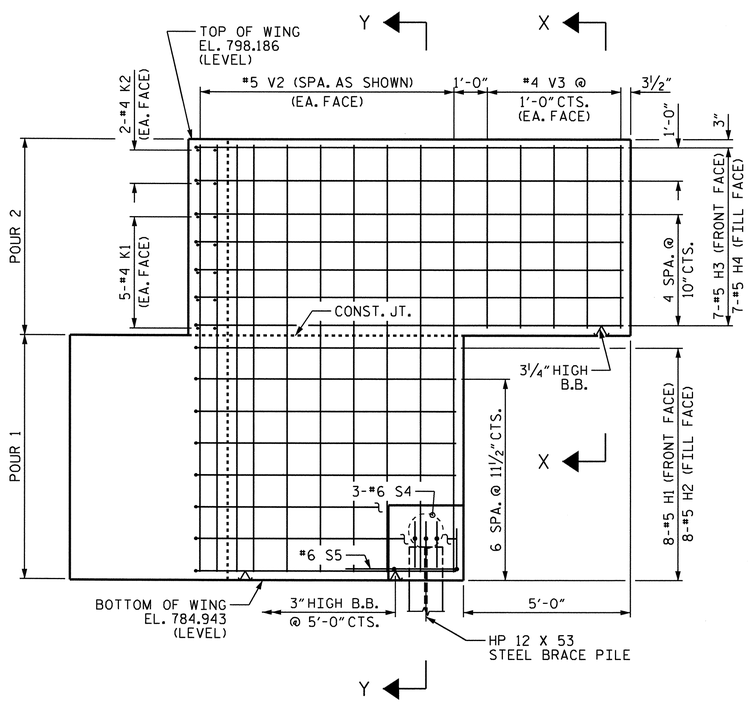
SECTION X-X



SECTION Y-Y



ELEVATION OF WING W1



ELEVATION OF WING W2

5/11/2011

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 2/15/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

11-MAY-2011 16:06
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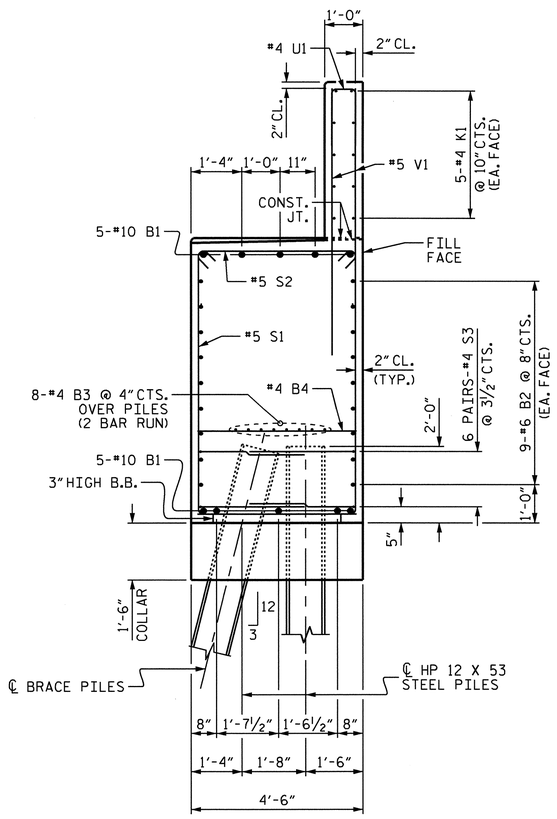
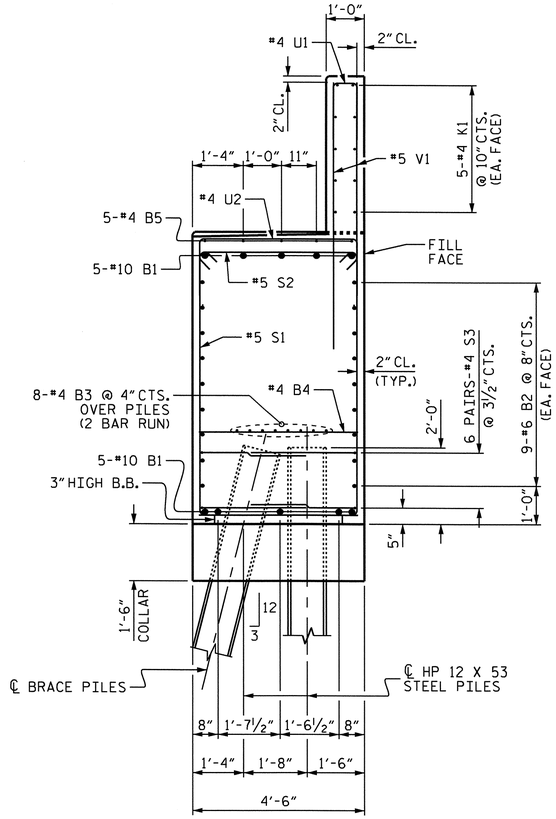
kpnewton

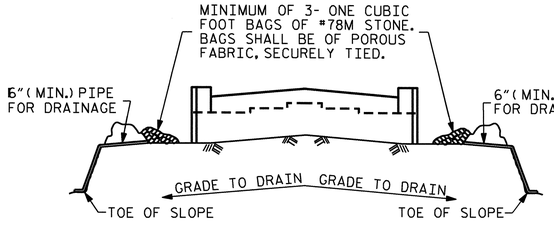
NCDOT



SECTION A-A



SECTION B-B



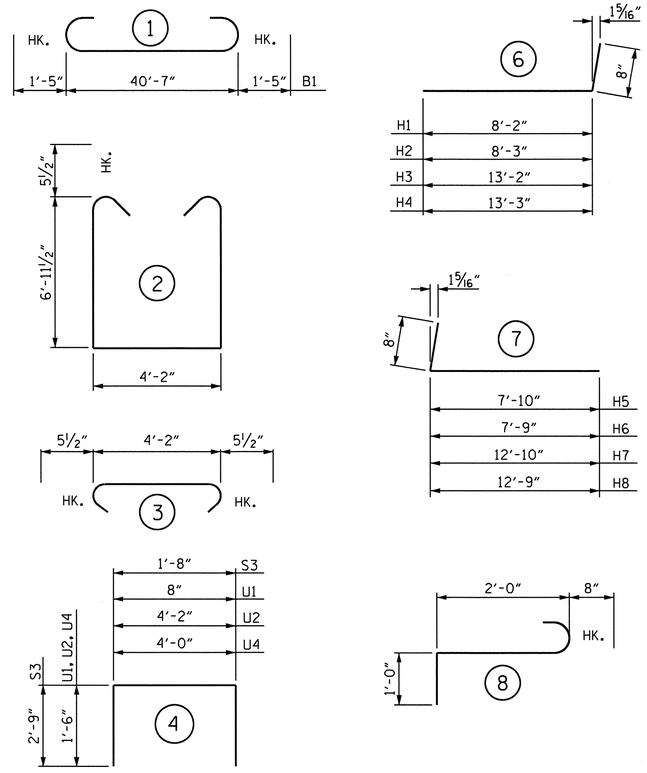
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

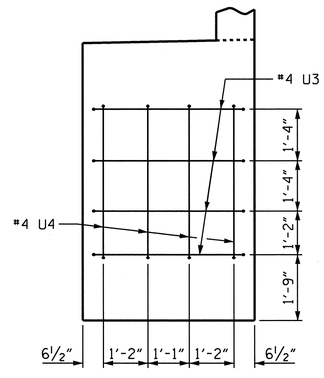
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



VIEW C-C

EA. END SIMILAR

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	1	43'-5"	1868
B2	18	#6	STR	40'-9"	1102
B3	16	#4	STR	21'-8"	232
B4	11	#4	STR	4'-2"	31
B5	10	#4	STR	2'-11"	19
H1	8	#5	6	8'-10"	74
H2	8	#5	6	8'-11"	74
H3	7	#5	6	13'-10"	101
H4	7	#5	6	13'-11"	102
H5	8	#5	7	8'-6"	71
H6	8	#5	7	8'-5"	70
H7	7	#5	7	13'-6"	99
H8	7	#5	7	13'-5"	98
K1	20	#4	STR	21'-8"	289
K2	8	#4	STR	3'-5"	18
S1	35	#5	2	19'-0"	694
S2	35	#5	3	5'-1"	186
S3	48	#4	4	7'-2"	230
S4	6	#6	8	3'-8"	33
S5	2	#6	9	9'-1"	27
U1	34	#4	4	3'-8"	83
U2	6	#4	4	7'-2"	29
U3	8	#4	5	7'-1"	38
U4	8	#4	4	7'-0"	37
V1	68	#5	STR	6'-11"	491
V2	51	#5	STR	12'-10"	683
V3	20	#4	STR	5'-6"	73

REINFORCING STEEL LBS. 6852

CLASS A CONCRETE

POUR 1	(COLLARS, CAP, & LOWER WINGS)	61.0 C.Y.
POUR 2	(BACKWALL & UPPER WINGS)	12.2 C.Y.
TOTAL		73.2 C.Y.

HP 12 X 53 STEEL PILES

NUMBER = 10 LIN. FT. = 175

STEEL PILE POINTS EA. 10

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			32

DRAWN BY : P. K. NEWTON DATE : 2/10/11
CHECKED BY : J. C. FRYE DATE : 4/18/11

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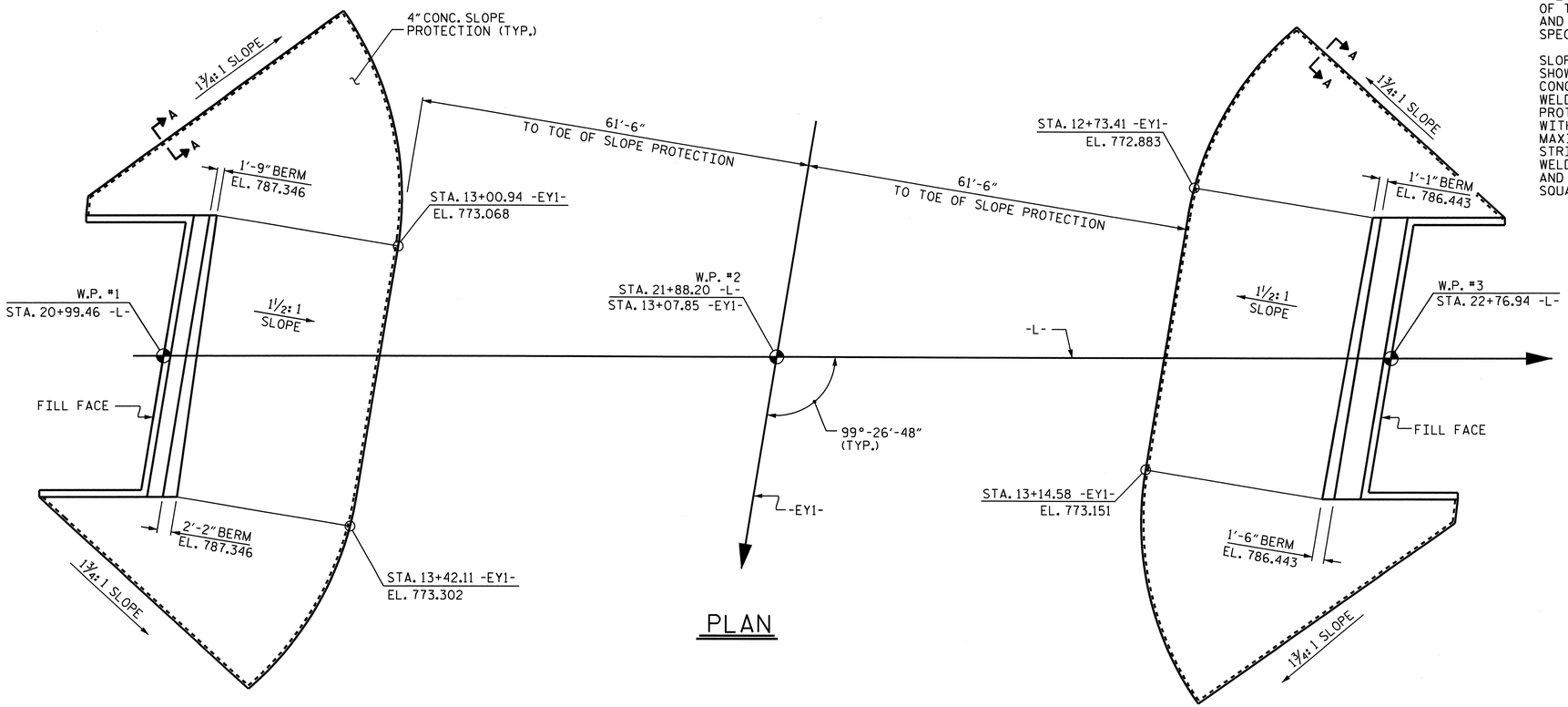


PLAN

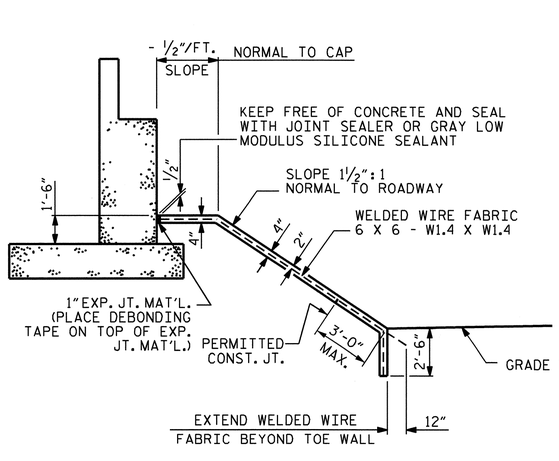
GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

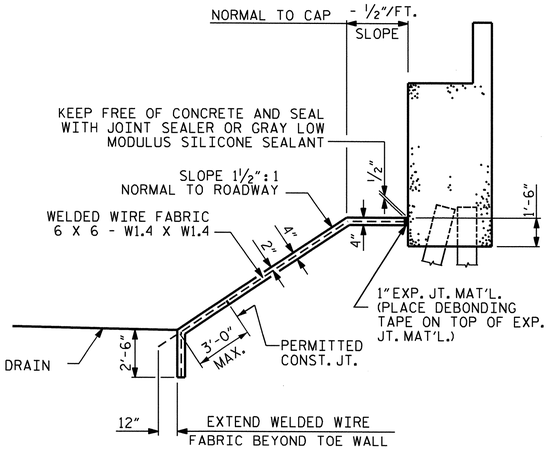
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE ''POURING DETAIL'' WITH 2'-0'' LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6'' MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE ''OPTIONAL POURING DETAIL'' WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6''. THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 21+88.20 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	345	690
END BENT 2	320	640

* QUANTITY SHOWN IS BASED ON 5' POURS.

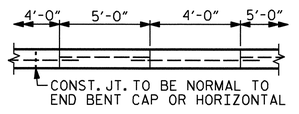


AT END BENT 1



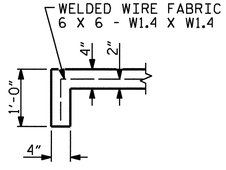
AT END BENT 1

SECTION ALONG ℄ ROADWAY

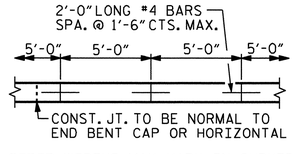


POUR A 4'-0'' STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



SECTION A-A



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

6/23/11

ASSEMBLED BY : Z. H. BROWN	DATE : 8/4/09
CHECKED BY : K. C. COMPTON	DATE : 5/5/11

DRAWN BY : ELR 5/92	REV. 7/10/01 LES/RDR
CHECKED BY : GRP 6/92	REV. 5/7/03 RWW/JTE
	REV. 5/1/06 TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			32

STD. NO. SP1 (SHT 6)

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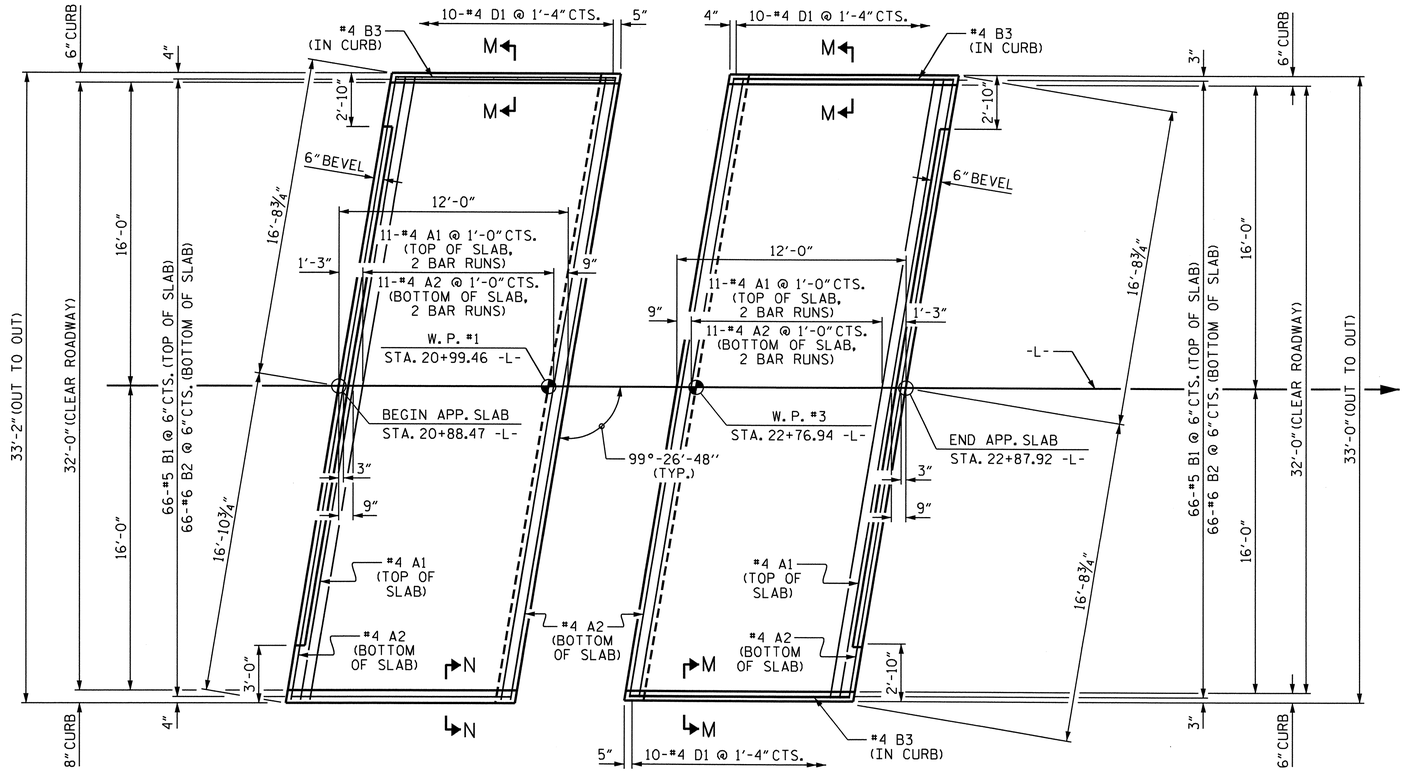
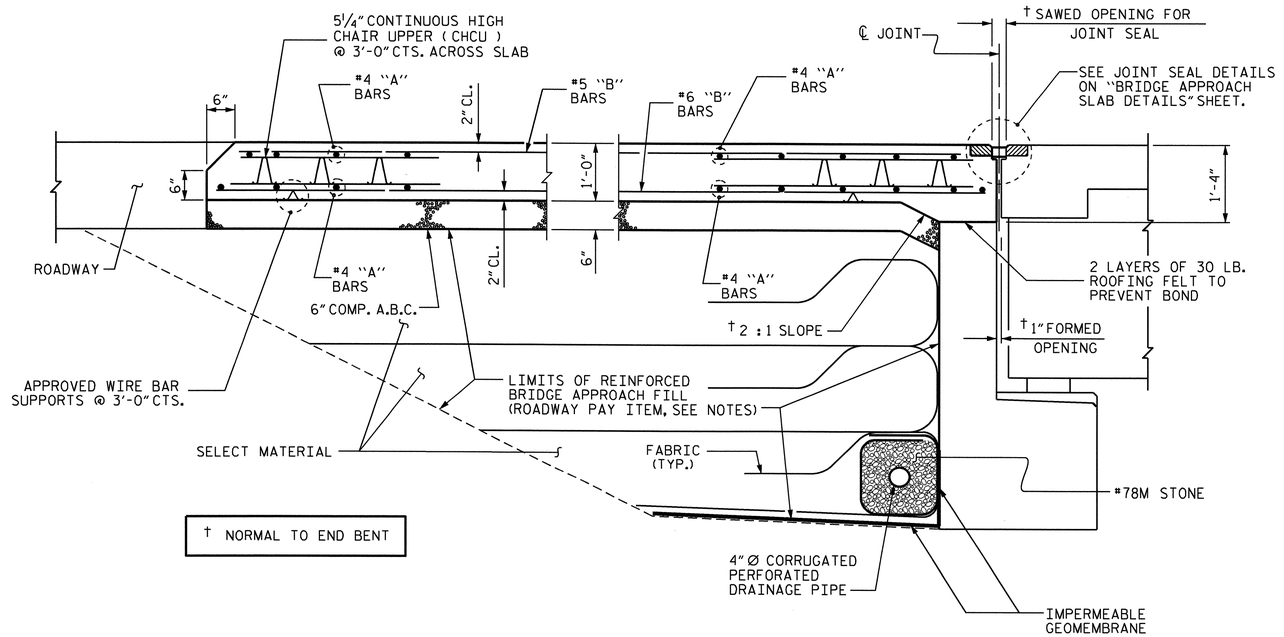




SECTION THRU SLAB

NOTES

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND END POST.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

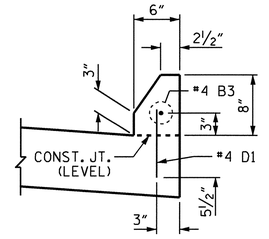
BILL OF MATERIAL

APPROACH SLAB AT E.B.1

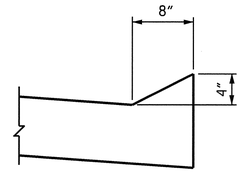
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	24	#4	STR	17'-8"	283
A2	26	#4	STR	17'-8"	307
✱B1	66	#5	STR	10'-9"	740
B2	66	#6	STR	11'-7"	1148
✱B3	1	#4	STR	11'-7"	8
✱D1	10	#4	STR	9"	5
REINFORCING STEEL				LBS.	1455
✱EPOXY COATED REINFORCING STEEL				LBS.	1036
CLASS AA CONCRETE				C.Y.	15.2

APPROACH SLAB AT E.B.2

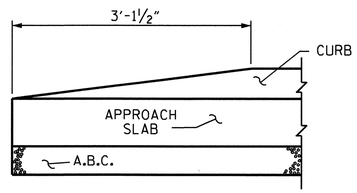
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	24	#4	STR	17'-7"	282
A2	26	#4	STR	17'-7"	305
✱B1	66	#5	STR	10'-9"	740
B2	66	#6	STR	11'-7"	1148
✱B3	2	#4	STR	11'-7"	15
✱D1	20	#4	STR	9"	10
REINFORCING STEEL				LBS.	1453
✱EPOXY COATED REINFORCING STEEL				LBS.	1104
CLASS AA CONCRETE				C.Y.	15.2



SECTION M-M



SECTION N-N
END BENT 1 RIGHT SIDE



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER R. S. KOREY NEWTON

5/9/2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			32

STD. NO. BAS4

ASSEMBLED BY : P.K. NEWTON		DATE : 5/3/11	
CHECKED BY : W.F. PARKER		DATE : 5/4/11	
DRAWN BY : EEM 3/95	REV. 7/10/01	LES/RDR	
CHECKED BY : VAP 3/95	REV. 5/7/03R	RWW/JTE	
	REV. 5/1/06R	KMM/GM	

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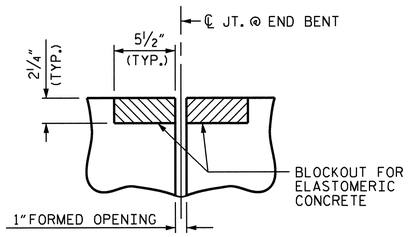
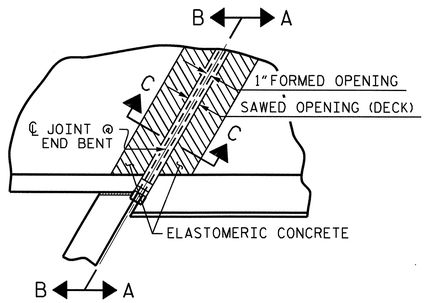
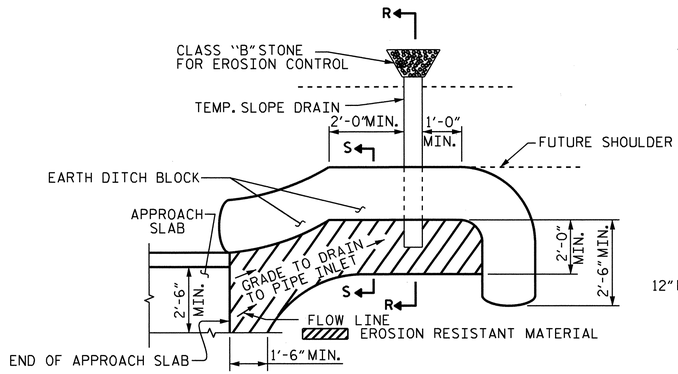


SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

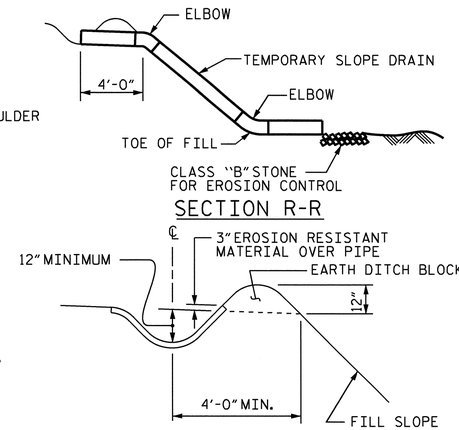


PLAN
END BENT 1 RIGHT SIDE



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

PLAN VIEW

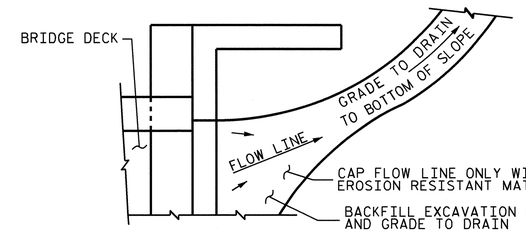


SECTION R-R

SECTION S-S

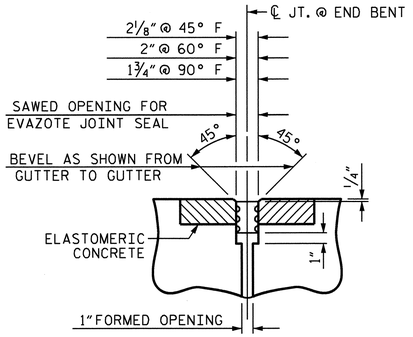
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

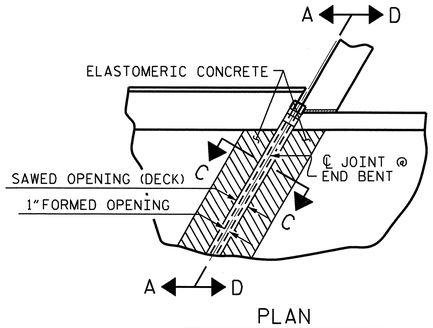


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

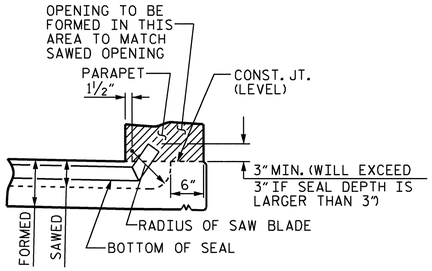
TEMPORARY DRAINAGE DETAIL



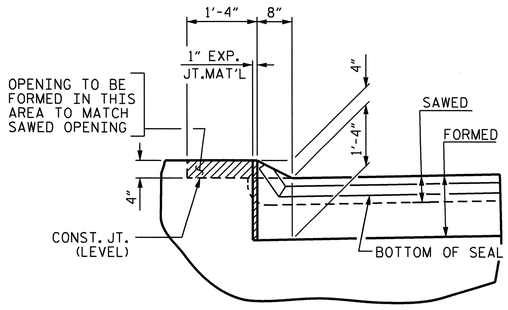
SECTION C-C
EVAZOTE JOINT SEAL
(EXPANSION)



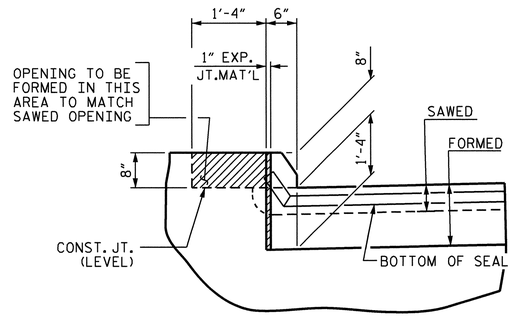
PLAN
ALL EXCEPT END BENT 1 RIGHT SIDE



SECTION A-A



SECTION B-B
AT END BENT 1 RIGHT SIDE



SECTION D-D
ALL EXCEPT END BENT 1 RIGHT SIDE

ELASTOMERIC CONCRETE	
END BENT	* ELASTOMERIC CONCRETE (CU. FT.)
1	5.6
2	5.6
TOTAL	11.2

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

JOINT SEAL DETAILS @ END BENT

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND END POST.

P. K. NEWTON SEAL 029448 ENGINEER KOREY NEWTON
6/23/2011

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			32

STD. NO. BAS10

ASSEMBLED BY : P. K. NEWTON		DATE : 5/3/11
CHECKED BY : W. F. PARKER		DATE : 5/4/11
DRAWN BY : FCJ 11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03	RWW/JTE
	REV. 5/1/06RR	MAA/KMM

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kpnewton

OVERHANG BRACKET CALCULATION INSTRUCTIONS

AASHTO SHAPES - TYPES III, IV, V, AND VI

1. RECORD KNOWN INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
2. CALCULATE THE MAXIMUM SCREED LOAD PER BRACKET (SLPB) WITH AN ESTIMATED R = 1.5. SLPB = R X W. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
3. WITH THE ESTIMATED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE, AND 45° HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE THE BRACKET SPACING, S.
4. CALCULATE S/D1 AND S/D2, ROUNDING UP TO NEAREST VALUE IN TABLE 2. ENTER TABLE 2 AND DETERMINE R VALUE.
5. CALCULATE REVISED SLPB. ROUND VALUE UP TO NEAREST SLPB VALUE INDICATED ON APPROPRIATE TABLE 1-1, 1-2, 1-3, OR 1-4.
6. WITH THE REVISED SLPB, OVERHANG SLAB THICKNESS, "K" VALUE AND 45 HANGER SAFE WORKING LOAD (SWL), ENTER THE APPROPRIATE TABLE 1-1, 1-2, 1-3 OR 1-4 (BASED ON OVERHANG DIMENSION) AND DETERMINE REVISED BRACKET SPACING, S.
7. CONTINUE ITERATIONS OF STEPS 4-6 UNTIL THE REVISED BRACKET SPACING, S, IS THE SAME AS THE PREVIOUS S VALUE.
8. CHECK LUMBER JOIST SPACING: WITH BRACKET SPACING VALUE, S, ROUND THIS VALUE UP TO THE NEAREST VALUE OF ALLOWABLE SPAN LENGTH OF JOIST OF TABLE 3. USING THIS VALUE, ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE, DETERMINE JOIST SPACING FROM TABLE 3. IF NECESSARY, ADJUST LUMBER JOIST SIZE AND/OR JOIST SPACING TO MEET ALLOWABLE SPAN LENGTH OF JOIST.
9. CONVERSELY, IF THE DESIRED JOIST SPACING IS KNOWN, USE THIS ALONG WITH THE AVERAGE OVERHANG SLAB THICKNESS AND THE LUMBER JOIST SIZE TO DETERMINE IF ALLOWABLE SPAN LENGTH OF JOIST IS GREATER THAN THE BRACKET SPACING, S. IF NECESSARY, ADJUST LUMBER JOIST SIZE TO MEET REQUIREMENTS OF ALLOWABLE SPAN LENGTH OF JOIST AND JOIST SPACING.
10. RECORD REMAINING INFORMATION ON "BRIDGE OVERHANG BRACKET SUMMARY" FORM.
11. SUBMIT FORM AND CALCULATIONS FOR REVIEW AND APPROVAL.

TABLE 1-1 (FOR USE ON **UP TO 2'-0" OVERHANG Ⓛ** & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (in)	BRACKET Ⓚ DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	40				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	50				2'-1"	2'-7"	3'-2"	3'-8"	4'-2"	5'-9"	4000
		3'-6"	4'-0"	4'-5"	4'-9"	5'-1"	5'-3"	5'-5"	5'-7"	6'-7"	6000
12	30					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	40					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
	50					2'-4"	2'-10"	3'-4"	3'-9"	5'-2"	4000
		3'-2"	3'-7"	4'-1"	4'-7"	5'-0"	5'-2"	5'-4"	5'-7"	6'-5"	6000
14	30					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	40					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
	50					2'-2"	2'-7"	3'-0"	3'-5"	4'-9"	4000
		2'-10"	3'-4"	3'-9"	4'-2"	4'-7"	5'-0"	5'-4"	5'-7"	6'-4"	6000
16	30					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	40					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000
	50					2'-0"	2'-4"	2'-9"	3'-2"	4'-4"	4000
		2'-8"	3'-0"	3'-5"	3'-10"	4'-3"	4'-7"	5'-0"	5'-5"	6'-3"	6000

TABLE 1-2 (FOR USE ON **OVER 2'-0" TO 2'-6" OVERHANG Ⓛ** & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (in)	BRACKET Ⓚ DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	40					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
	50					2'-4"	2'-9"	3'-3"	3'-8"	5'-1"	4000
		3'-1"	3'-6"	4'-0"	4'-5"	4'-11"	5'-3"	5'-5"	5'-7"	6'-7"	6000
12	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
	50					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-5"	6000
14	30					2'-7"	3'-0"	3'-5"	3'-10"	5'-2"	4000
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
	40					2'-7"	3'-0"	3'-5"	3'-10"	5'-2"	4000
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
	50					2'-7"	3'-0"	3'-5"	3'-10"	5'-2"	4000
		2'-6"	2'-10"	3'-3"	3'-7"	4'-0"	4'-4"	4'-9"	5'-1"	6'-3"	6000
16	30					2'-1"	2'-5"	2'-9"	3'-4"	4'-6"	4000
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000
	40					2'-1"	2'-5"	2'-9"	3'-4"	4'-6"	4000
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000
	50					2'-1"	2'-5"	2'-9"	3'-4"	4'-6"	4000
		2'-3"	2'-7"	2'-11"	3'-4"	3'-8"	4'-0"	4'-4"	4'-8"	5'-8"	6000

TABLE 1-3 (FOR USE ON **OVER 2'-6" TO 3'-0" OVERHANG Ⓛ** & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (in)	BRACKET Ⓚ DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
						4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
	40					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
	50					2'-1"	2'-6"	2'-11"	3'-4"	4'-6"	4000
		2'-9"	3'-2"	3'-7"	4'-0"	4'-5"	4'-10"	5'-3"	5'-7"	6'-7"	6000
12	30						2'-2"	2'-7"	2'-11"	4'-0"	4000
						3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
	40						2'-2"	2'-7"	2'-11"	4'-0"	4000
		2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
	50						2'-2"	2'-7"	2'-11"	4'-0"	4000
		2'-5"	2'-10"	3'-2"	3'-6"	3'-11"	4'-3"	4'-8"	5'-0"	6'-1"	6000
14	30						2'-0"	2'-4"	2'-8"	3'-8"	4000
					3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000
	40						2'-0"	2'-4"	2'-8"	3'-8"	4000
		2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000
	50						2'-0"	2'-4"	2'-8"	3'-8"	4000
		2'-2"	2'-6"	2'-10"	3'-2"	3'-6"	3'-10"	4'-2"	4'-6"	5'-6"	6000
16	30						2'-1"	2'-5"	3'-4"	4000	
					2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000
	40						2'-1"	2'-5"	3'-4"	4000	
		2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000
	50						2'-1"	2'-5"	3'-4"	4000	
		2'-0"	2'-4"	2'-7"	2'-11"	3'-2"	3'-6"	3'-10"	4'-1"	5'-0"	6000

TABLE 1-4 (FOR USE ON **OVER 3'-0" TO 3'-6" OVERHANG Ⓛ** & 54" HORIZONTAL LEG LENGTH OF THE OVERHANG BRACKET)

AVG. SLAB THICKNESS Ⓣ (in)	BRACKET Ⓚ DIMENSION (in)	SCREED LOAD PER BRACKET									45° HANGER SWL (lbs)
		2500 lbs.	2250 lbs.	2000 lbs.	1750 lbs.	1500 lbs.	1250 lbs.	1000 lbs.	750 lbs.	0 lbs.	
		BRACKET SPACING									
10	30						2'-1"	2'-5"	2'-9"	3'-10"	4000
						2'-3"	2'-11"	3'-7"	4'-3"	5'-9"	6000
	40						2'-1"	2'-5"	2'-9"	3'-10"	4000
					2'-4"	3'-0"	3'-7"	4'-1"	4'-5"	5'-9"	6000
	50						2'-1"	2'-5"	2'-9"	3'-10"	4000
		2'-4"	2'-8"	3'-0"	3'-4"	3'-8"	4'-1"	4'-5"	4'-9"	5'-9"	6000
12	30							2'-2"	2'-6"	3'-5"	4000
						2'-1"	2'-8"	3'-4"	3'-11"	5'-2"	6000
	40							2'-2"	2'-6"	3'-5"	4000
					2'-2"	2'-9"	3'-4"	3'-7"	3'-11"	4'-3"	6000
	50							2'-2"	2'-6"	3'-5"	4000
		2'-1"	2'-4"	2'-8"	3'-0"	3'-4"	3'-7"	3'-11"	4'-3"	5'-2"	6000
14	30								2'-3"	3'-1"	4000
						2'-0"	2'-6"	3'-1"	3'-8"	4'-8"	6000
	40								2'-3"	3'-1"	4000
					2'-0"	2'-7"	3'-0"	3'-3"	3'-6"	3'-10"	6000
	50								2'-3"	3'-1"	4000
			2'-2"	2'-5"	2'-8"	3'-0"	3'-3"	3'-6"	3'-10"	4'-8"	6000
16	30								2'-0"	2'-9"	4000
							2'-4"	2'-10"	3'-5"	4'-3"	6000
	40								2'-0"	2'-9"	4000
						2'-5"	2'-8"	2'-11"	3'-3"	3'-6"	6000
	50								2'-0"	2'-9"	4000
				2'-2"	2'-5"	2'-8"	2'-11"	3'-3"	3'-6"	4'-3"	6000

DEFINITIONS

SLPB = SCREED LOAD PER BRACKET (R x W)
R = SCREED LOAD FACTOR, OBTAINED FROM TABLE 2
W = WHEEL LOAD
S = BRACKET SPACING
T = AVERAGE SLAB THICKNESS
SWL = SAFE WORKING LOAD
K = DIMENSION DEFINED ON "BRIDGE OVERHANG BRACKET SUMMARY" ON SHEET 2
L = OVERHANG MEASURED FROM EDGE OF TOP FLANGE TO EDGE OF SUPERSTRUCTURE

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK
AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO
Chang-Chuan Victor Chao
5-9-2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

09-MAY-2011 10:04
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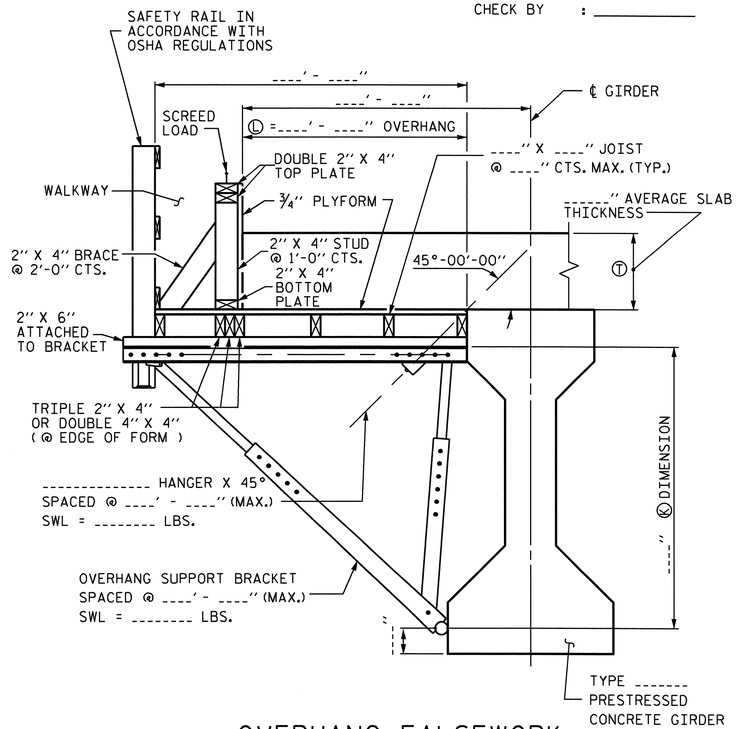
ttfang

OF1

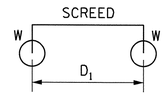
BRIDGE OVERHANG BRACKET SUMMARY

TOTAL SCREED WEIGHT = _____ LBS.
NUMBER OF SCREED WHEELS = _____
SCREED WHEEL LOAD (W) = _____LBS.
SCREED LOAD PER BRACKET = _____ LBS.

PROJECT No. : _____
COUNTY : _____
STATION : _____
DESCRIPTION : _____
DATE : _____
DESIGN BY : _____
CHECK BY : _____

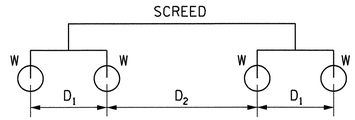


OVERHANG FALSEWORK



4-WHEEL MACHINE

4 WHEEL MACHINE	
S/D1	R
<= 1.0	1.00
1.1	1.09
1.2	1.17
1.3	1.23
1.4	1.29
1.5	1.33
1.6	1.38
1.7	1.41
1.8	1.44
1.9	1.47
2.0	1.50
2.2	1.55
2.4	1.58
2.6	1.62
2.8	1.64
3.0	1.67
3.5	1.71
4.0	1.75



8-WHEEL MACHINE

TABLE 2: SCREED LOAD FACTOR "R"

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																		
		S/D2																		
S/D1		<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
	<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.58	1.62	1.64	1.67	1.71	1.75
	1.1	1.09	1.18	1.26	1.32	1.38	1.42	1.47	1.50	1.54	1.56	1.59	1.64	1.67	1.71	1.73	1.76	1.81	1.84
	1.2	1.17	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92
	1.3	1.23	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.68	1.70	1.73	1.78	1.81	1.85	1.87	1.90	1.95	1.98
	1.4	1.29	1.38	1.45	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
	1.5	1.33	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92	1.95	1.98	2.00	2.10	2.17
	1.6	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.85	1.88	1.92	1.96	1.99	2.04	2.08	2.18	2.25
	1.7	1.41	1.50	1.58	1.64	1.70	1.75	1.79	1.82	1.86	1.89	1.91	1.96	2.00	2.05	2.11	2.16	2.25	2.32
	1.8	1.44	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.99	2.06	2.12	2.17	2.22	2.32	2.39
	1.9	1.47	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.04	2.11	2.18	2.23	2.28	2.38	2.45
	2.0	1.50	1.59	1.67	1.73	1.79	1.83	1.88	1.91	1.94	1.97	2.00	2.09	2.17	2.23	2.29	2.33	2.43	2.50
	2.2	1.55	1.64	1.71	1.78	1.83	1.88	1.92	1.96	1.99	2.04	2.09	2.18	2.26	2.32	2.38	2.42	2.52	2.59
	2.4	1.58	1.67	1.75	1.81	1.87	1.92	1.96	2.00	2.06	2.11	2.17	2.26	2.33	2.40	2.45	2.50	2.60	2.67
	2.6	1.62	1.71	1.78	1.85	1.90	1.95	1.99	2.05	2.12	2.18	2.23	2.32	2.40	2.46	2.52	2.56	2.66	2.73
	2.8	1.64	1.73	1.81	1.87	1.93	1.98	2.04	2.11	2.17	2.23	2.29	2.38	2.45	2.52	2.57	2.62	2.71	2.79
	3.0	1.67	1.76	1.83	1.90	1.95	2.00	2.08	2.16	2.22	2.28	2.33	2.42	2.50	2.56	2.62	2.67	2.76	2.83
	3.5	1.71	1.81	1.88	1.95	2.00	2.10	2.18	2.25	2.32	2.38	2.43	2.52	2.60	2.66	2.71	2.76	2.86	2.93
	4.0	1.75	1.84	1.92	1.98	2.07	2.17	2.25	2.32	2.39	2.45	2.50	2.59	2.67	2.73	2.79	2.83	2.93	3.00

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

AVG. SLAB THICKNESS Ⓣ (IN)	LUMBER JOIST SIZE (IN X IN)	JOIST SPACINGS			
		15 IN	12 IN	10 IN	8 IN
		THE ALLOWABLE SPAN LENGTH OF JOISTS			
10	2 X 4	———	4' - 6"	4' - 9"	5' - 0"
	4 X 4	5' - 9"	6' - 3"	6' - 6"	6' - 7"
12	2 X 4	———	4' - 3"	4' - 9"	5' - 0"
	4 X 4	5' - 3"	6' - 0"	6' - 3"	6' - 5"
14	2 X 4	———	4' - 0"	4' - 6"	5' - 0"
	4 X 4	———	5' - 6"	6' - 0"	6' - 4"
16	2 X 4	———	4' - 0"	4' - 3"	4' - 9"
	4 X 4	———	5' - 3"	5' - 9"	6' - 3"

NOTES

DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

SUBMITTALS UTILIZING THE INSTRUCTIONS AND PROCEDURES DESCRIBED ON SHEET 1 OF 3 SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE SPECIFICATIONS AND SPECIAL PROVISIONS, EXCEPT THAT CALCULATIONS FOR OVERHANG FALSEWORK NEED NOT BE SEALED BY A REGISTERED ENGINEER.

FOR OVERHANG FALSEWORK BRACING DESIGN, SEE SHEET 3 OF 3.

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK
AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
5-9-2011

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			32

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

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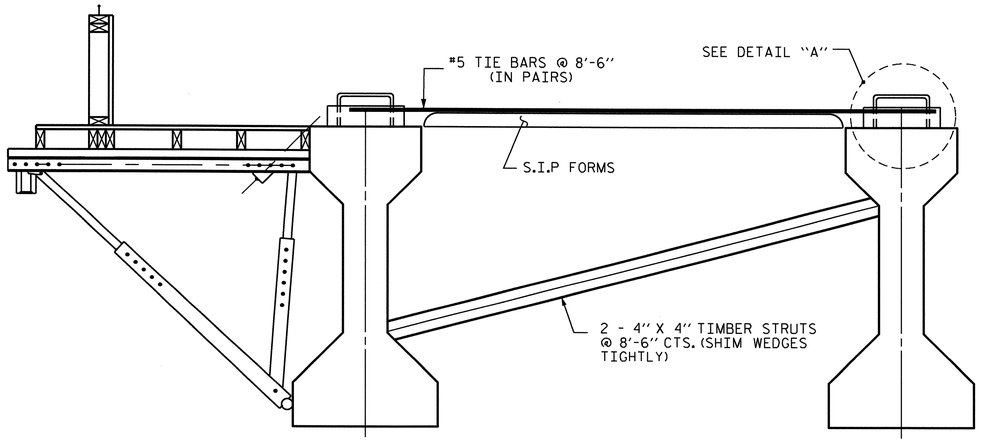
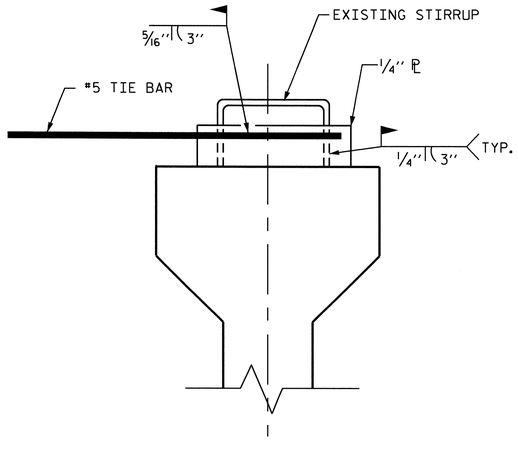


EXTERIOR GIRDER

INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



DETAIL "A"

NOTES:

EACH #5 TIE BAR SHALL BE WELDED TO ONE STIRRUP LOOP AS SHOWN IN DETAIL "A". #5 TIE BARS SHALL BE WELDED TO TWO ADJACENT STIRRUPS OF THE EXTERIOR GIRDER AND THE ADJACENT INTERIOR GIRDER BETWEEN PERMANENT DIAPHRAGMS. WELD STEEL PLATES IN BETWEEN THE TIE BARS AND THE STIRRUP LOOP. WELDING TWO TIE BARS TO THE SAME STIRRUP LOOP SHALL NOT BE PERMITTED.

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 8'-6" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

INSTALL TIE BARS AND TIMBER STRUTS PRIOR TO PLACEMENT OF CONCRETE OR SCREED WEIGHT ONTO THE OVERHANG FALSEWORK.

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
5-9-2011

ASSEMBLED BY:	DATE:
CHECKED BY:	DATE:
DRAWN BY: R. WRIGHT 06/04	REV.
CHECKED BY: C. V. CHAO 06/04	

09-MAY-2011 10:05
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PROJECT NO. B-4499

DAVIDSON COUNTY

STATION: 21+88.20 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK
AASHTO TYPES
III, IV, V, AND VI

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			32

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (W) RGW REV. 5-7-03 RWW (W) JTE
REV. 8-16-99 RWW (W) LES REV. 5-1-06 TLA (W) GM

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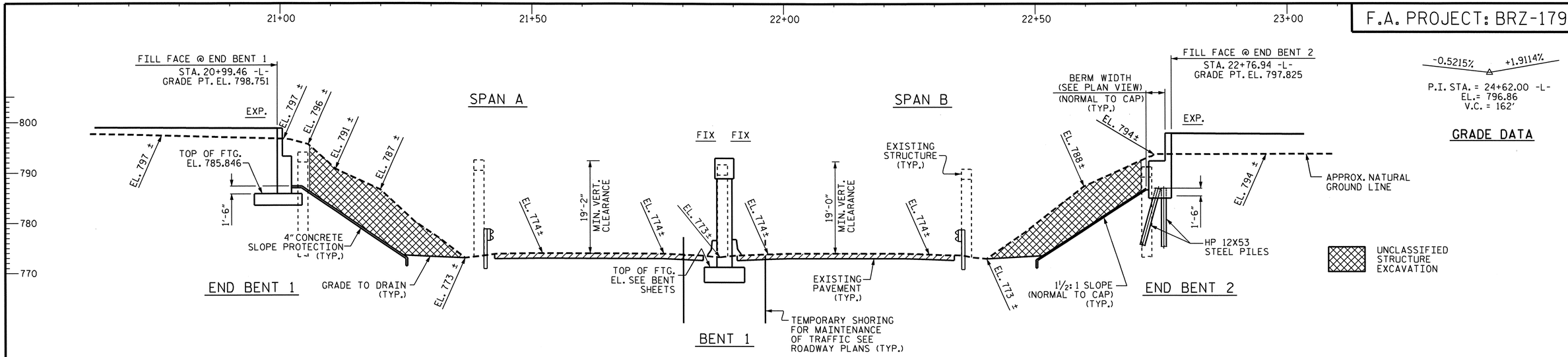
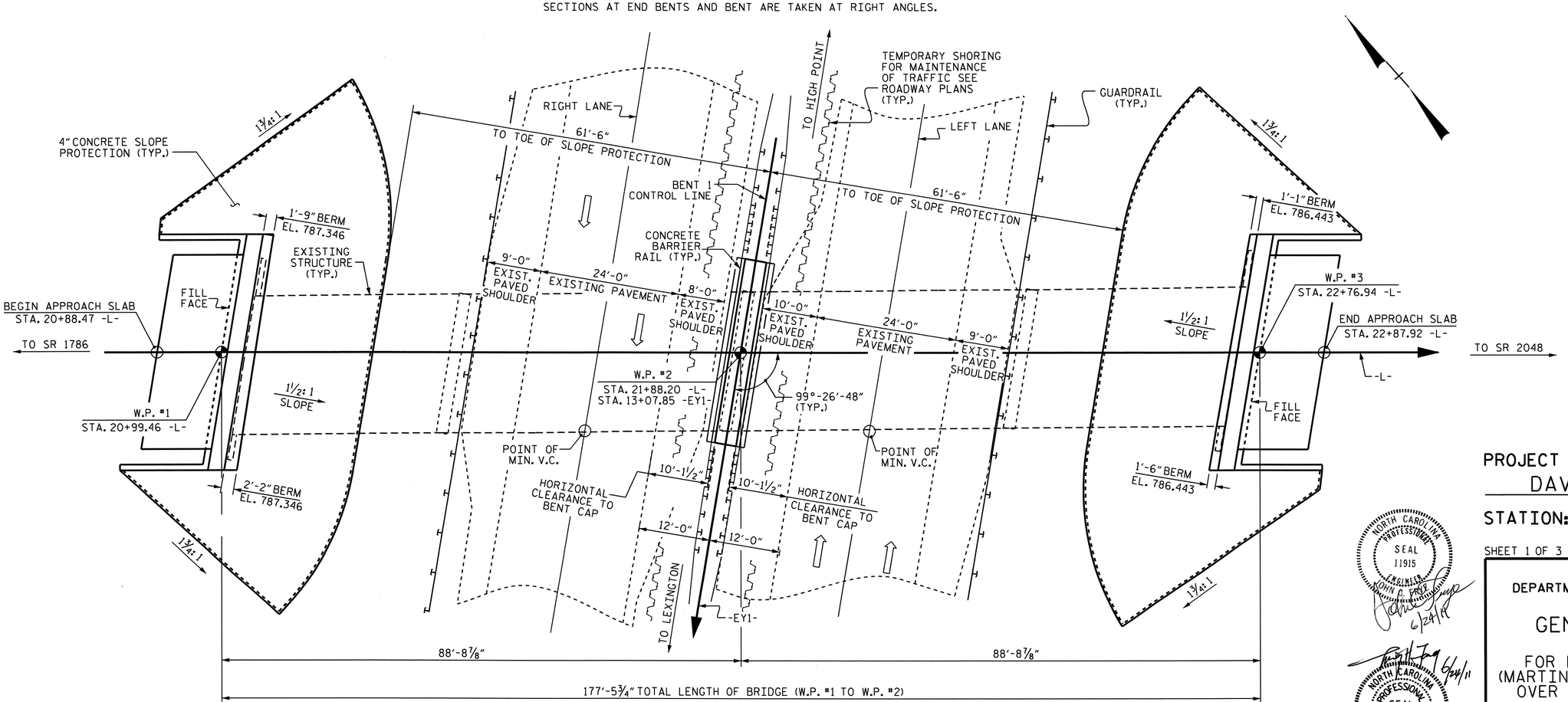
F.A. PROJECT: BRZ-1792 (2)



SECTION ALONG -L-

SECTIONS AT END BENTS AND BENT ARE TAKEN AT RIGHT ANGLES.



PLAN

FOUNDATIONS NOT SHOWN FOR CLARITY

DRAWN BY : S. DOMBROWSKI DATE : 10/30/08
CHECKED BY : T. H. FANG DATE : 2/09/09

24-JUN-2011 10:27
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tfang

NORTH CAROLINA PROFESSIONAL SEAL 11915 ENGINEER JOHN C. GRUP
6/24/11

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
6/24/11

PROJECT NO. B-4499
DAVIDSON COUNTY
STATION: 21+88.20 -L-
13+07.85 -EY1-
SHEET 1 OF 3 REPLACES BRIDGE #158

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1792
(MARTIN LUTHER KING JR. DR.)
OVER US-29/70/I-85 BUS.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			32