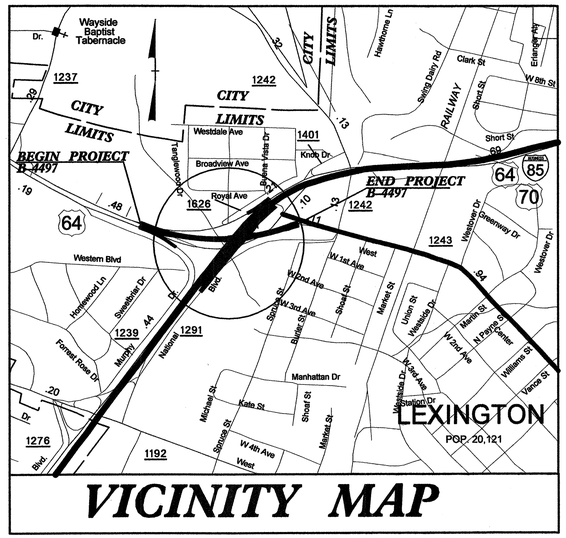
09/08/99

TIP PROJECT: B-4497

CONTRACT: C202951

STRUCTURES



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

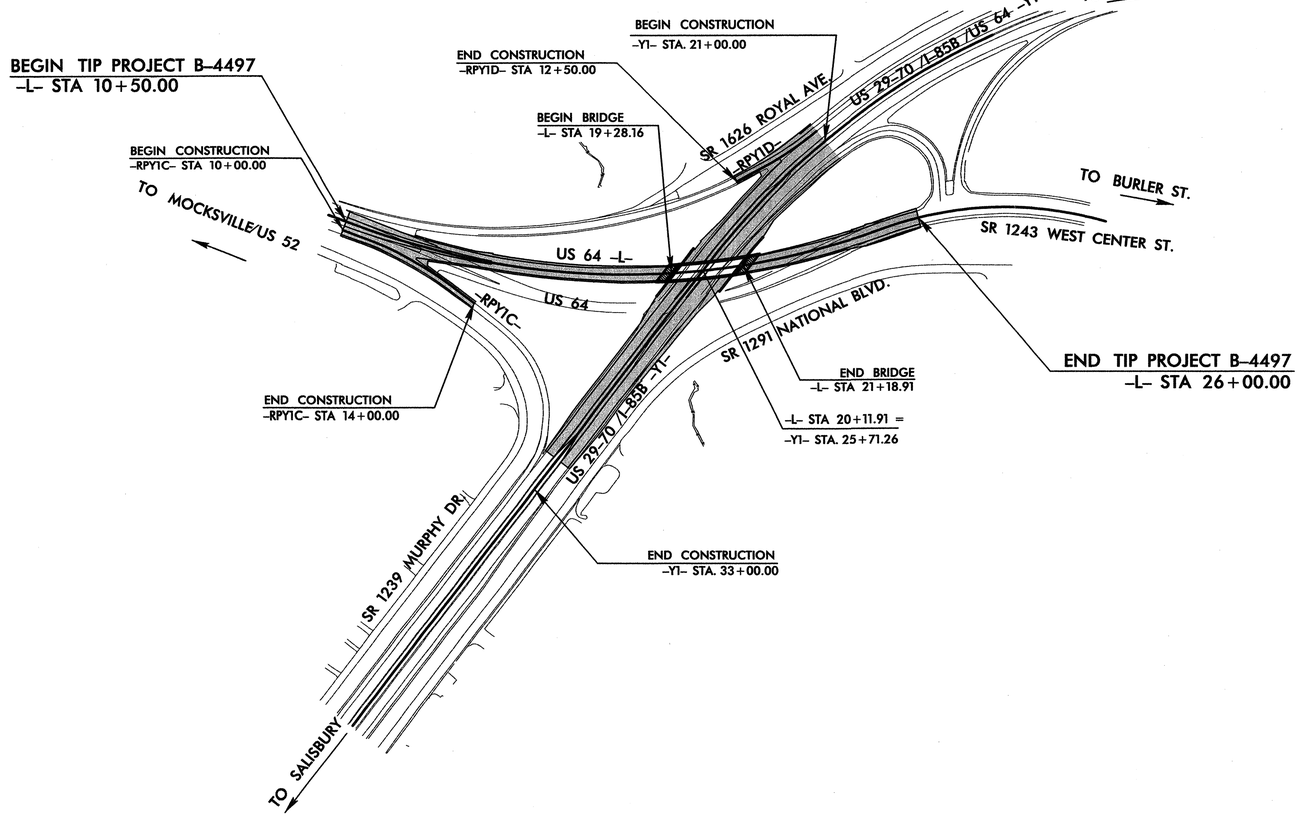
DAVIDSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4497		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38391.1.1	BRSTP-64(80)	P.E.
38391.2.1	BRSTP-64(80)	RW/UTIL

LOCATION: REPLACE BRIDGE 39 OVER US 29-70 / I-85BUS ON US 64

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURES, AND RETAINING WALLS.



DESIGN DATA

ADT 2012 = 22,040
ADT 2035 = 38,600
DHV = 10 %
D = 55 %
T = 17 % *
V = 50 MPH
ARTERIAL
* TTST 12 DUAL 5
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4497 = 0.258
LENGTH OF STRUCTURE TIP PROJECT B-4497 = 0.036
TOTAL LENGTH OF ROADWAY TIP PROJECT B-4497 = 0.294

Prepared In the Office of:
MULKEY ENGINEERS & CONSULTANTS
FOR THE NORTH CAROLINA DEPT. OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 1, 2011

LETTING DATE: NOVEMBER 20, 2012

L. KEVIN AUSTIN, PE
PROJECT ENGINEER

TIERRE R. PETERSON, PE
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 038352 ENGINEER TIERRE R. PETERSON
7/10/12

P.E.

SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.

STATE HIGHWAY DESIGN ENGINEER

7/3/2012
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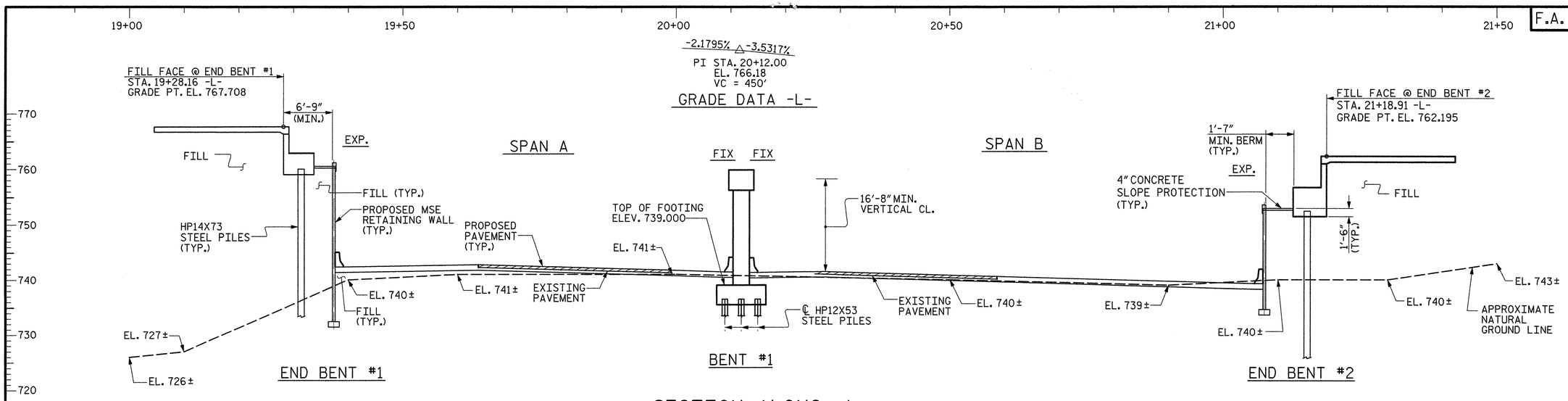
F.A. PROJ. NO. BRSTP-64(80)

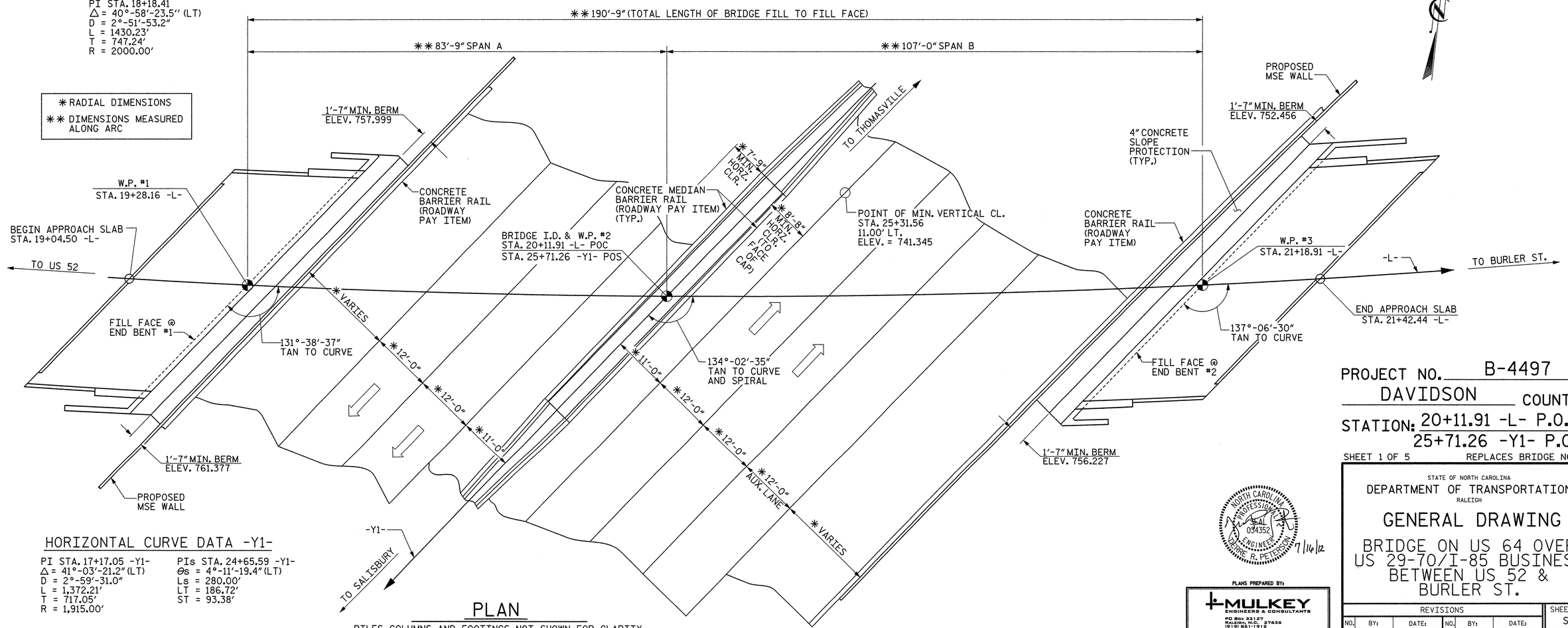


SECTION ALONG -L-

SECTION TAKEN AT RIGHT ANGLES TO BENTS AND END BENTS

HORIZONTAL CURVE DATA -L-

PI STA. 18+18.41
△ = 40°-58'-23.5" (LT)
D = 2°-51'-53.2"
L = 1430.23'
T = 747.24'
R = 2000.00'



HORIZONTAL CURVE DATA -Y1-

PI STA. 17+17.05 -Y1-
△ = 41°-03'-21.2" (LT)
D = 2°-59'-31.0"
L = 1,372.21'
T = 717.05'
R = 1,915.00'

PIs STA. 24+65.59 -Y1-
Θs = 4°-11'-19.4" (LT)
Ls = 280.00'
LT = 186.72'
ST = 93.38'

PLAN

PILES, COLUMNS AND FOOTINGS NOT SHOWN FOR CLARITY

DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

7/16/2012 1:46:05 PM R:\B4497_SD_00_01.dgn

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER JEROME R. PETERSON 7/16/12

PLANS PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1021

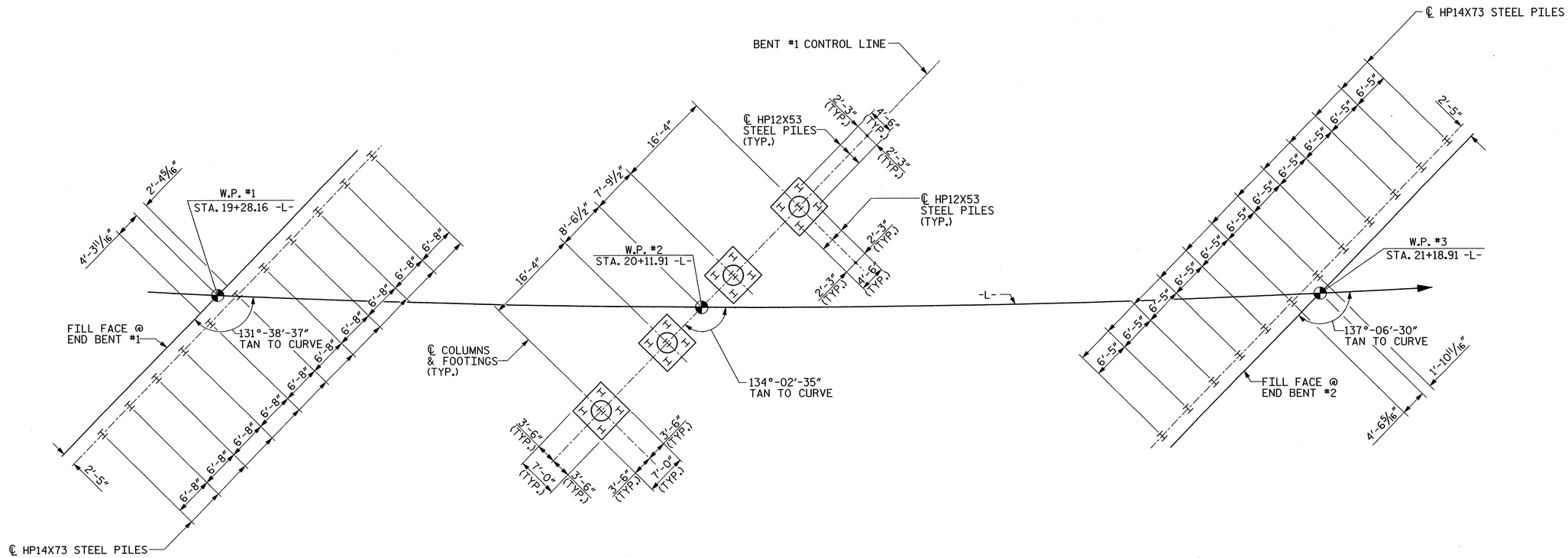
PROJECT NO. B-4497
DAVIDSON COUNTY
STATION: 20+11.91 -L- P.O.C.
25+71.26 -Y1- P.O.S.
SHEET 1 OF 5 REPLACES BRIDGE NO. 39

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 64 OVER US 29-70/I-85 BUSINESS BETWEEN US 52 & BURLER ST.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			34



END BENT #1 BENT #1 END BENT #2

FOUNDATION LAYOUT

ALL PILES AT END BENT #1 AND END BENT #2 ARE HP14X73.

ALL PILES AT BENT #1 ARE HP12X53.

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.

NOTES

FOR PILES, SEE SECTION 450 OF THE STANARD SPECIFICATIONS.

PILES AT END BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT #1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

PILES AT BENT #1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT BENT #1 TO A REQUIRED DRIVING RESISTANCE OF 175 TONS PER PILE.

PILES AT END BENT #2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT #2 TO A REQUIRED DRIVING RESISTANCE OF 192 TONS PER PILE.

OBSERVE A 3 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO WITHIN 2 FT. OF FINISHED GRADE BEFORE BEGINNING END BENT CONSTRUCTION AT END BENTS #1 &#2.

THE WAITNG PERIOD MAY BE REDUCED BY THE ENGINEER AFTER THE REVIEW AND ACCEPTANCE OF SETTLEMENT DATA THAT HAS BEEN OBTAINED BY EMBANKMENT MONITORING USING SURVEY HUBS. INSTALLATION AND MONITORING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.

DRAWN BY : W. B. ALLEN DATE : 2/12
CHECKED BY : T. R. PETERSON DATE : 3/12

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER TERRE R. PETERSON 7/10/12

PLANS PREPARED BY:

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(919) 851-1918 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1031

PROJECT NO. B-4497
DAVIDSON COUNTY
STATION: 20+11.91 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 64 OVER US 29-70/I-85 BUSINESS BETWEEN US 52 & BURLER ST.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			34

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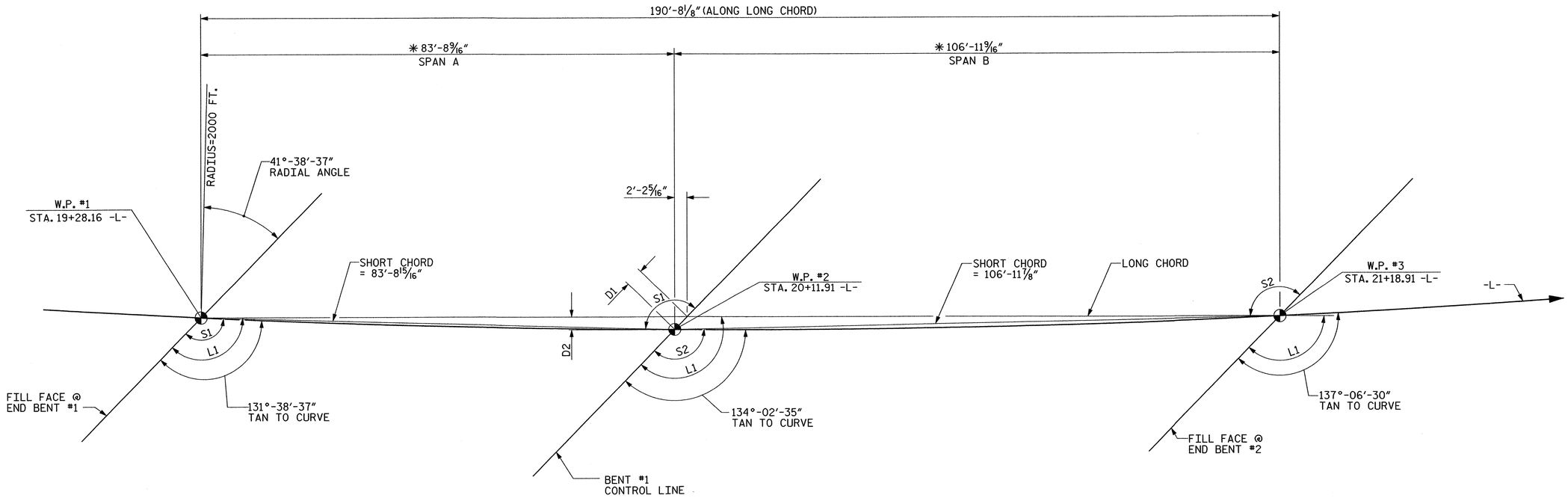

LONG CHORD LAYOUT

✳ ALONG LONG CHORD

ANGLES				OFFSETS	
LONG CHORD		SHORT CHORD			
L1	134°-22'-34"	S1	132°-50'-36"	D1	3'-1⅝"
		S2	135°-34'-32"	D2	2'-2⅞"

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 034392 ENGINEER TERRE R. PETERSON

7/10/12

PLANS PREPARED BY:

MULKEY
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PO Box 33157
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 64 OVER US 29-70/I-85 BUSINESS BETWEEN US 52 & BURLER ST.

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			34

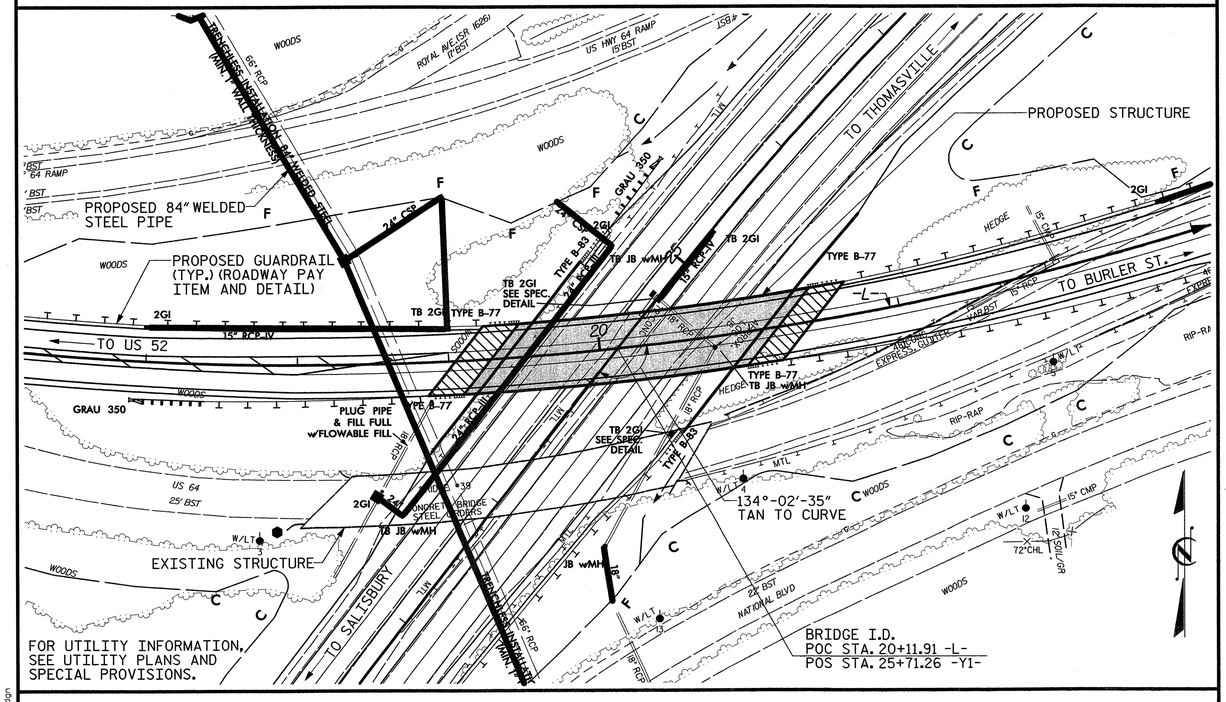
DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

7/3/2012 7:32:40 AM R:\Structures\B4497_SD_LC.dgn

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTESSED CONCRETE GIRDERS		HP12X53 STEEL PILES		HP14X73 STEEL PILES		CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	FEET	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			8,873	9,550		LUMP SUM			12	1102.02					418.75		LUMP SUM	LUMP SUM
END BENT #1					58.9		8161						11	755		19		
BENT #1		LUMP SUM			90.2		10217	1821			20	440						
END BENT #2					64.3		8839						12	800		25		
TOTAL	LUMP SUM	LUMP SUM	8,873	9,550	213.4	LUMP SUM	27,217	1821	12	1102.02	20	440	23	1555	418.75	44	LUMP SUM	LUMP SUM

BM #2: R/R SPIKE SET IN 30" POPLAR, -L- POC STA. 17+11.00, 34' RT. EL. 760.52'



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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

THE EXISTING STRUCTURE CONSISTING OF 4 SPANS (ONE AT 50', 2 AT 72.5', & ONE AT 50') OF REINFORCED CONCRETE DECK ON 5 LINES OF STEEL I-BEAMS WITH A CLEAR ROADWAY WIDTH OF 30'-0" ON END BENTS WITH REINFORCED CONCRETE CAPS ON STEEL PILES AND BENTS WITH REINFORCED CONCRETE CAPS AND COLUMNS ON PILE FOOTINGS AND LOCATED ADJACENT TO THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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 SHALL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE COST OF THE DECK SLAB.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 20+11.91 -L-.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON 7/10/12

PLANS PREPARED BY:

MULKEY
ENGINEERS & CONSULTANTS
PO Box 25127
Raleigh, N.C. 27636
(919) 851-1912
(919) 851-1915 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1021

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 64 OVER US 29-70/I-85 BUSINESS BEWTWEEN US 52 & BURLER ST.

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

DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

7/5/2012 11:36:06 AM R:\Structures\B4497_SD_00_02.dgn

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE											SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	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)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.15	--	1.75	0.678	1.56	A	EL	39.81	0.963	1.15	B	I	20.61	0.80	0.678	1.24	A	EL	39.81	
		HL-93 (OPERATING)	N/A		1.52	--	1.35	0.678	2.03	A	EL	39.81	0.963	1.52	B	I	20.61	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.58	56.88	1.75	0.678	2.07	A	EL	39.81	0.963	1.58	B	I	20.61	0.80	0.678	1.64	A	EL	39.81	
		HS-20 (OPERATING)	36.000		2.07	74.52	1.35	0.678	2.68	A	EL	39.81	0.963	2.07	B	I	20.61	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		3.73	50.36	1.40	0.678	5.86	A	EL	39.81	0.963	5.13	B	I	20.61	0.80	0.678	3.73	A	EL	39.81	
		SNGARBS2	20.000		2.76	55.20	1.40	0.678	4.34	A	EL	39.81	0.963	3.53	B	I	20.61	0.80	0.678	2.76	A	EL	39.81	
		SNAGRIS2	22.000		2.61	57.42	1.40	0.678	4.10	A	EL	39.81	0.963	3.24	B	I	20.61	0.80	0.678	2.61	A	EL	39.81	
		SNCOTTS3	27.250		1.86	50.69	1.40	0.678	2.92	A	EL	39.81	0.963	2.49	B	I	20.61	0.80	0.678	1.86	A	EL	39.81	
		SNAGGRS4	34.925		1.55	54.13	1.40	0.678	2.44	A	EL	39.81	0.963	2.00	B	I	20.61	0.80	0.678	1.55	A	EL	39.81	
		SNS5A	35.550		1.52	54.04	1.40	0.678	2.39	A	EL	39.81	0.963	2.00	B	I	20.61	0.80	0.678	1.52	A	EL	39.81	
		SNS6A	39.950		1.39	55.53	1.40	0.678	2.19	A	EL	39.81	0.963	1.80	B	I	20.61	0.80	0.678	1.39	A	EL	39.81	
		SNS7B	42.000		1.33	55.86	1.40	0.678	2.09	A	EL	39.81	0.963	1.74	B	I	20.61	0.80	0.678	1.33	A	EL	39.81	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.71	56.43	1.40	0.678	2.69	A	EL	39.81	0.963	2.17	B	I	20.61	0.80	0.678	1.71	A	EL	39.81	
		TNT4A	33.075		1.70	56.23	1.40	0.678	2.67	A	EL	39.81	0.963	2.14	B	I	20.61	0.80	0.678	1.70	A	EL	39.81	
		TNT6A	41.600		1.39	57.82	1.40	0.678	2.19	A	EL	39.81	0.963	1.83	B	I	20.61	0.80	0.678	1.39	A	EL	39.81	
		TNT7A	42.000		1.40	58.80	1.40	0.678	2.20	A	EL	39.81	0.963	1.79	B	I	20.61	0.80	0.678	1.40	A	EL	39.81	
		TNT7B	42.000		1.43	60.06	1.40	0.678	2.25	A	EL	39.81	0.963	1.72	B	I	20.61	0.80	0.678	1.43	A	EL	39.81	
		TNAGRIT4	43.000		1.38	59.34	1.40	0.678	2.17	A	EL	39.81	0.963	1.66	B	I	20.61	0.80	0.678	1.38	A	EL	39.81	
		TNAGT5A	45.000		1.30	58.50	1.40	0.678	2.05	A	EL	39.81	0.963	1.63	B	I	20.61	0.80	0.678	1.30	A	EL	39.81	
		TNAGT5B	45.000	⟨3⟩	1.28	57.60	1.40	0.678	2.02	A	EL	39.81	0.963	1.58	B	I	20.61	0.80	0.678	1.28	A	EL	39.81	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

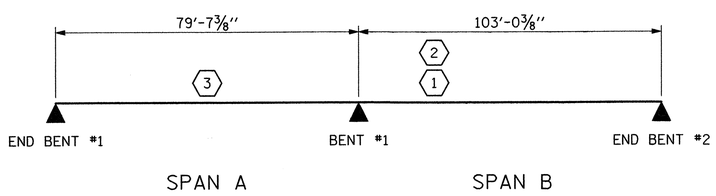
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. B-4497
DAVIDSON COUNTY
STATION: 20+11.91 -L-

SHEET 5 OF 5

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-5
1			3			TOTAL SHEETS
2			4			34

STD. NO. LRFR1

THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER TIERRE R. PETERSON 7/10/12

PLANS PREPARED BY:
MULKEY ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1912
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1031

ASSEMBLED BY : Z. H. BROWN	DATE : 4/4/12	REV. 11/12/08RR	MAA/GM
CHECKED BY : T. R. PETERSON	DATE : 4/5/12	REV. 10/1/11	MAA/GM
DRAWN BY : MAA 1/08			
CHECKED BY : GM/DI 2/08			

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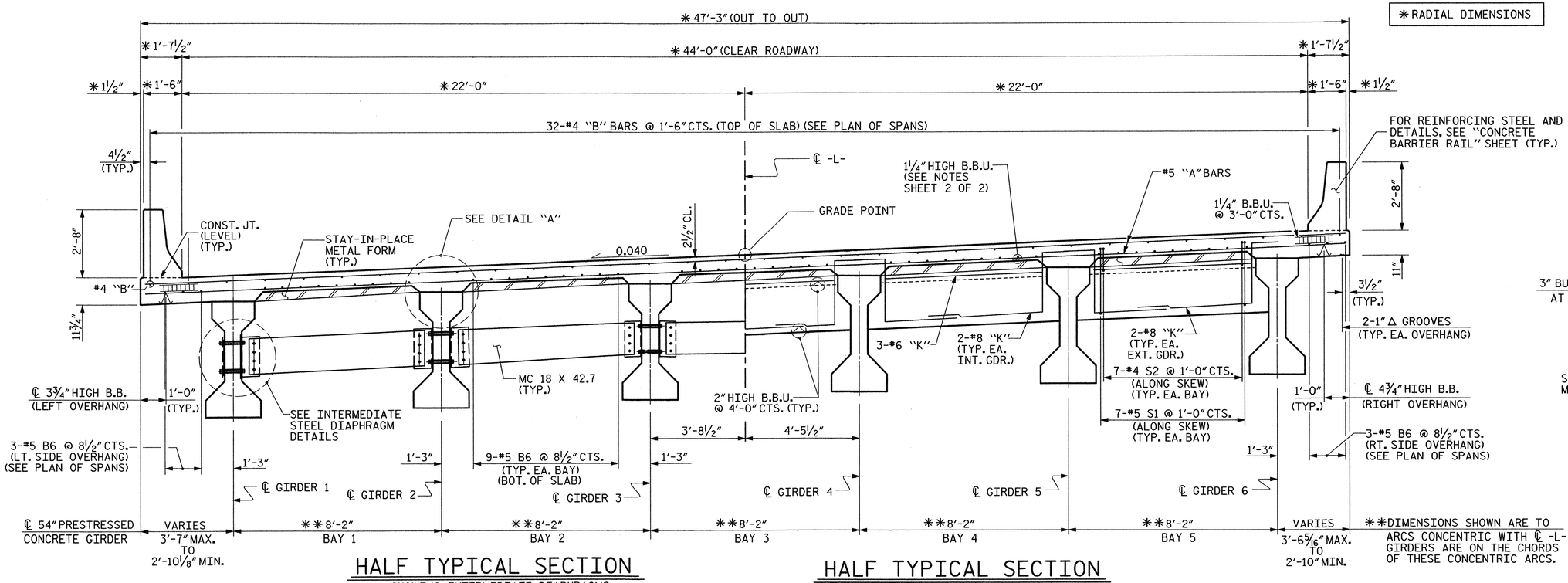
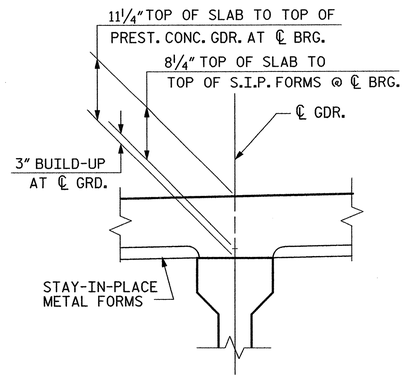
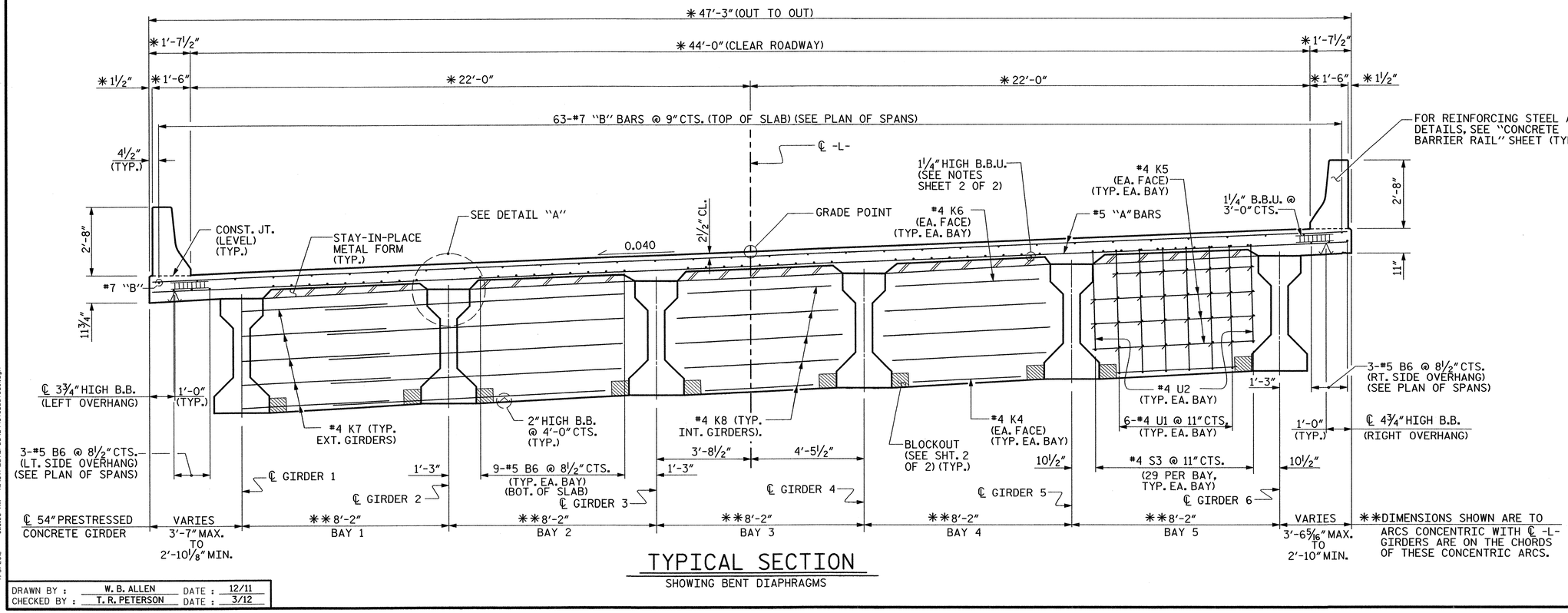


HALF TYPICAL SECTION
SHOWING INTERMEDIATE DIAPHRAGMS

HALF TYPICAL SECTION
SHOWING END BENT DIAPHRAGMS



DETAIL "A"



TYPICAL SECTION
SHOWING BENT DIAPHRAGMS

DRAWN BY : W. B. ALLEN DATE : 12/11
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NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER THERRE R. PETERSON 7/20/12

PLANS PREPARED BY:

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PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

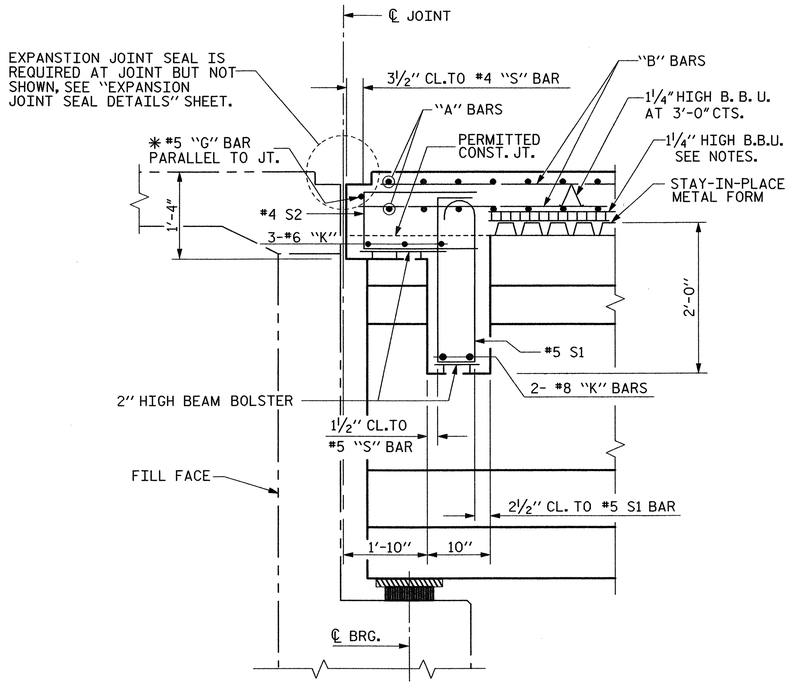
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

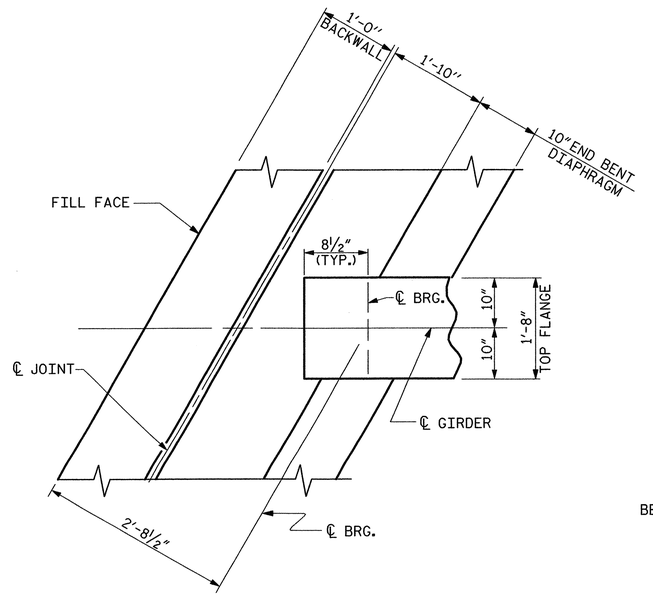
TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			34

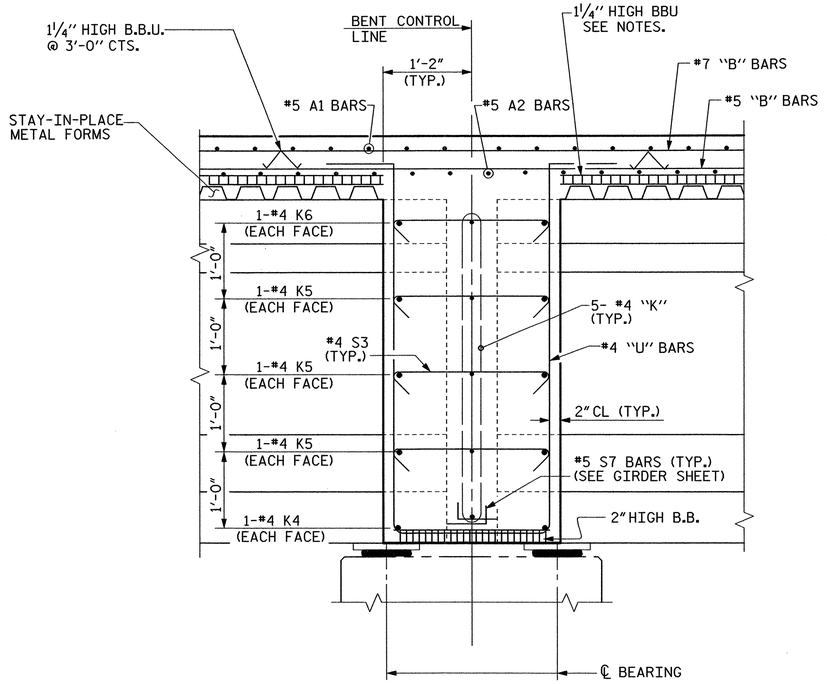


SECTION THRU END BENT DIAPHRAGMS

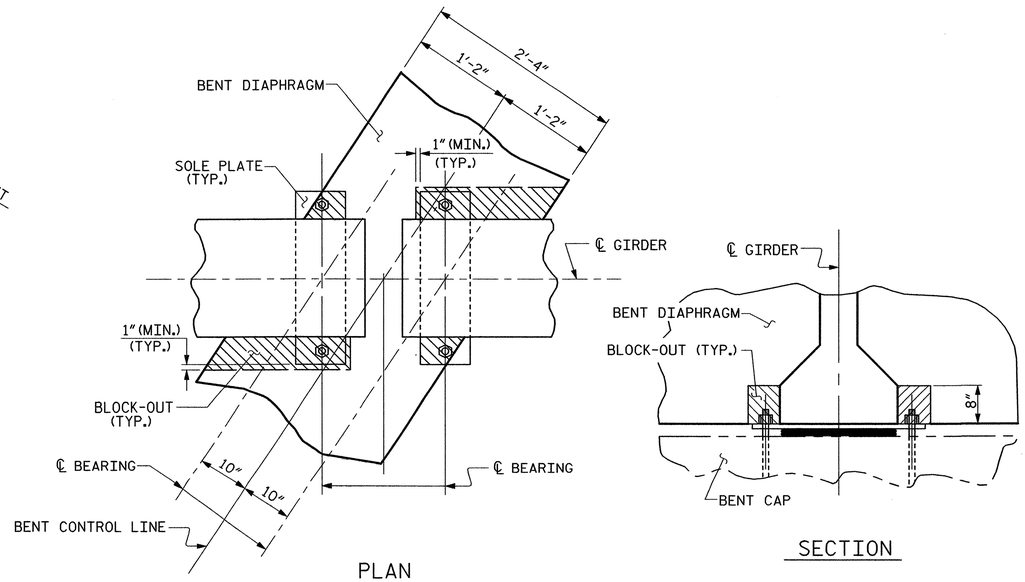
*#5 "G" BAR MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.



PLAN VIEW OF END BENT DIAPHRAGM



SECTION THRU BENT DIAPHRAGMS



PLAN

SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER (BBU) AT 4'-0" CENTERS 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 AS NECESSARY TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS AND DRAIN PIPES IN THE DECK.

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

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER THERRE R. PETERSON 7/10/12

PLANS PREPARED BY:

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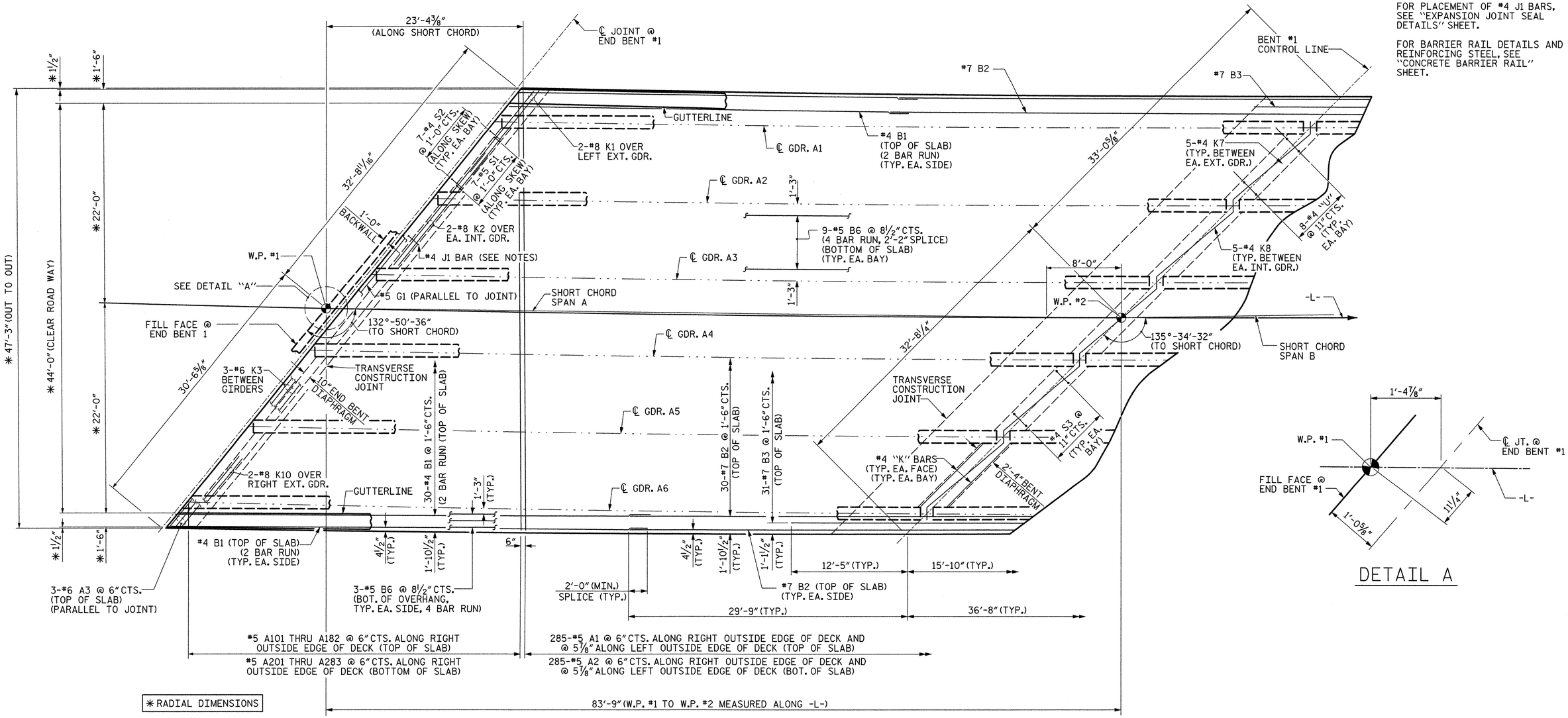
NOTES

FOR PLACEMENT OF #4 J1 BARS, SEE "EXPANSION JOINT SEAL DETAILS" SHEET.

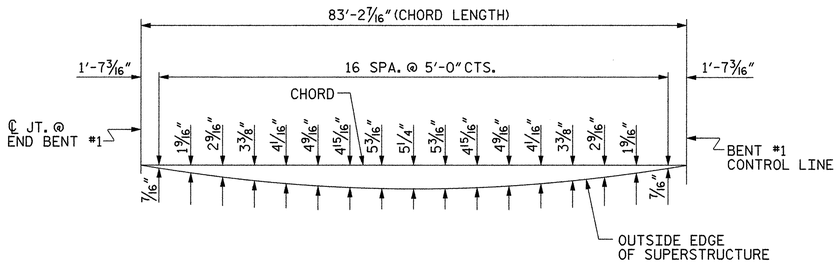
FOR BARRIER RAIL DETAILS AND REINFORCING STEEL, SEE "CONCRETE BARRIER RAIL" SHEET.



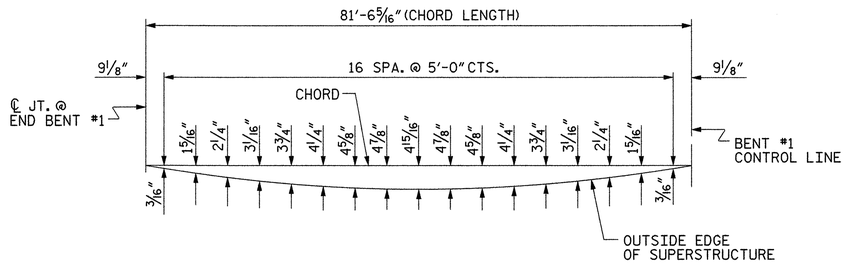
SPAN A

FOR POUR SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

DETAIL A



LEFT OUTSIDE EDGE



RIGHT OUTSIDE EDGE

ARC OFFSETS

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034352 TIERRE R. PETERSON 7/16/12

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1			3			TOTAL SHEETS
2			4			34

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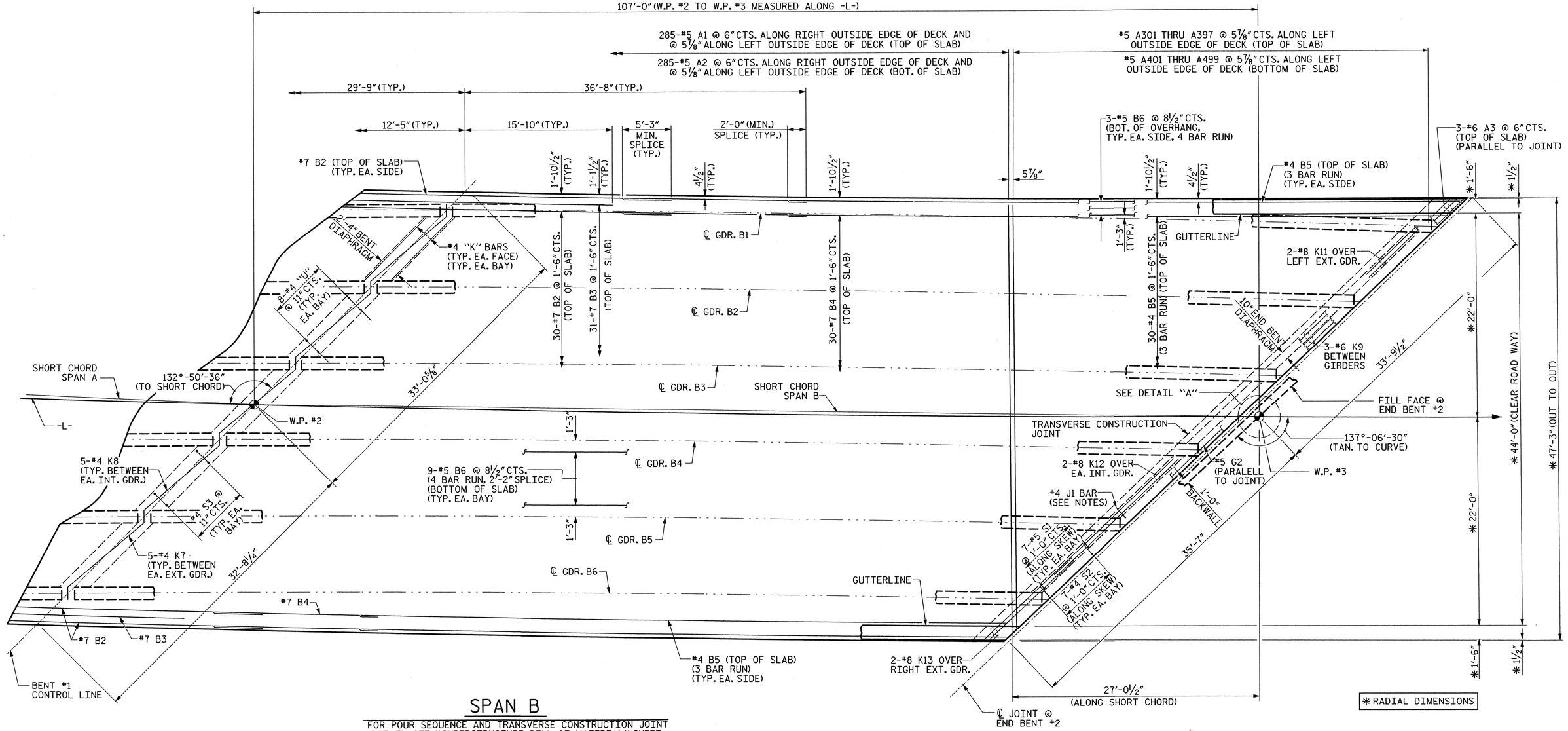
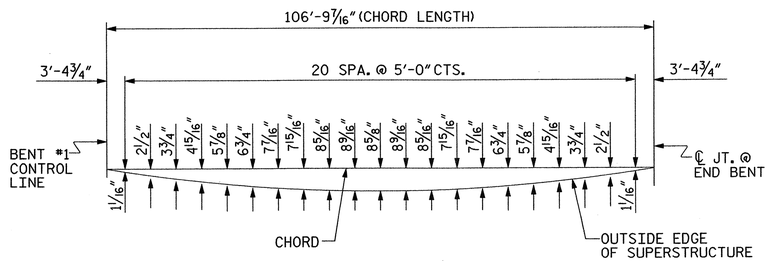


SPAN B

FOR POUR SEQUENCE AND TRANSVERSE CONSTRUCTION JOINT DETAIL, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



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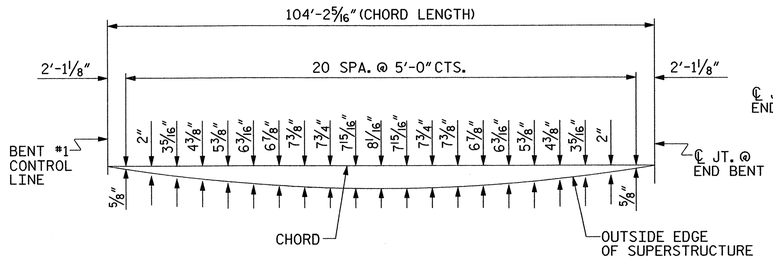
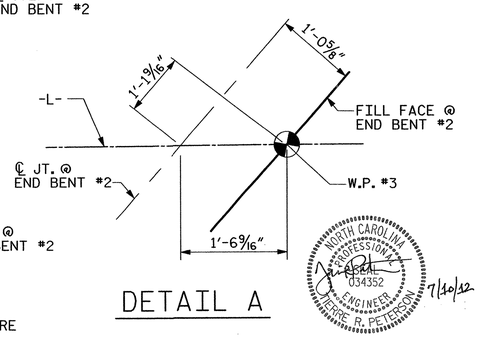


RIGHT OUTSIDE EDGE

ARC OFFSETS



DETAIL A

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034352 ENGINEER TERRENCE R. PETERSON 7/10/12

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1			3			TOTAL SHEETS
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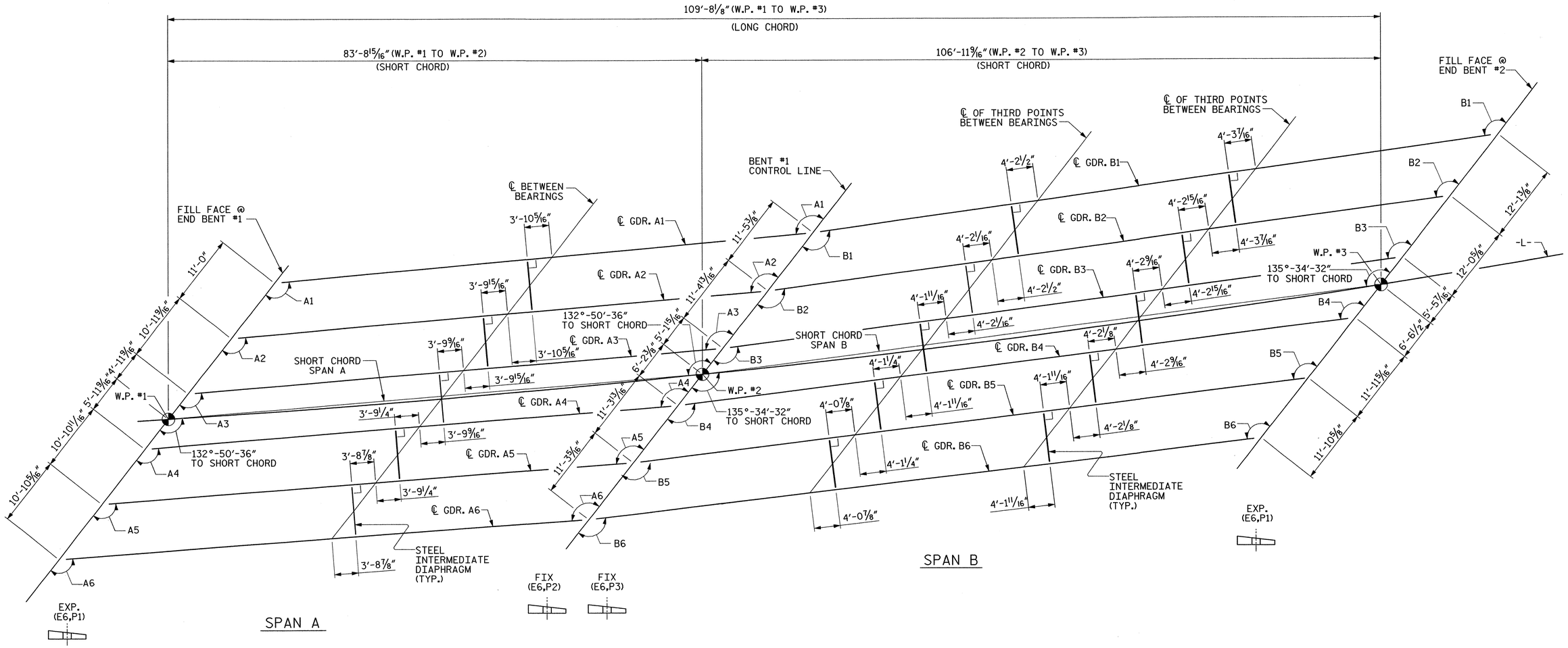

FRAMING PLAN

(END BENT DIAPHRAGMS AND BENT DIAPHRAGMS ARE NOT SHOWN)

GIRDER SKEW ANGLES				
GIRDER No.	SPAN A		SPAN B	
1	A1	133°-23'-03"	B1	136°-10'-17"
2	A2	133°-09'-43"	B2	135°-55'-35"
3	A3	132°-56'-33"	B3	135°-41'-04"
4	A4	132°-43'-31"	B4	135°-26'-44"
5	A5	132°-30'-38"	B5	135°-12'-34"
6	A6	132°-17'-55"	B6	134°-58'-35"

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER JERRE R. PETERSON 7/20/12

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STATE OF NORTH CAROLINA
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SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			34

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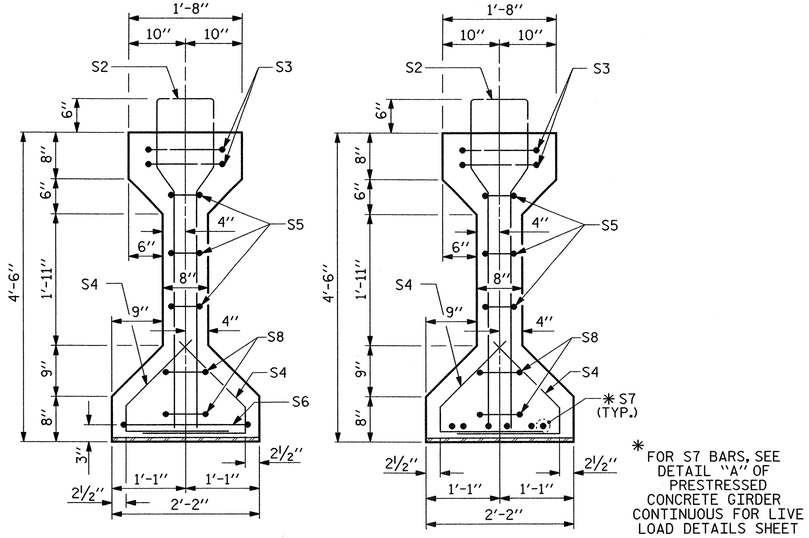
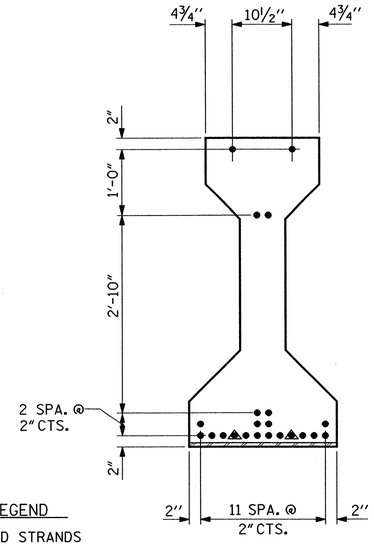


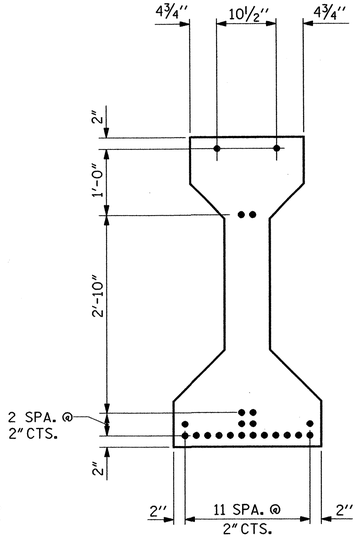
SECTION A-A

SECTION B-B

✱ FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



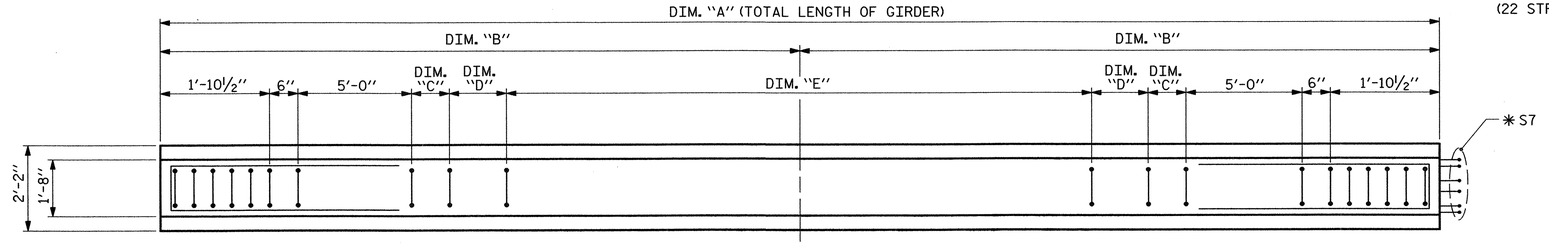
AT ℄ OF GIRDER

DEBONDING LEGEND

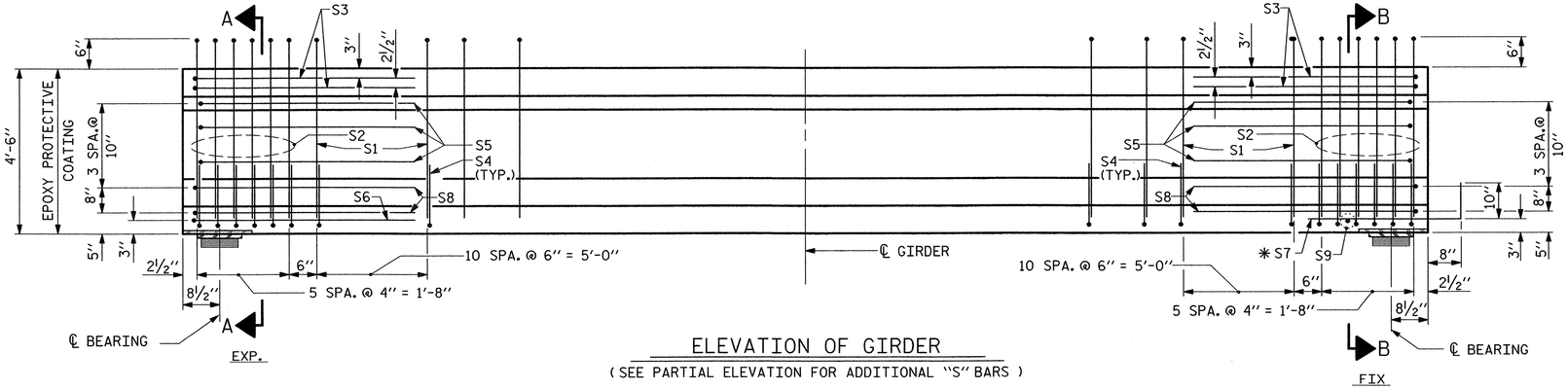
- ● FULLY BONDED STRANDS
- △ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(22 STRANDS)



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDER DIMENSIONS TABLE

SPAN A

GDR. No.	DIM. "A"	DIM. "B"	DIM. "C"	DIM. "D"	DIM. "E"
A1	81'-0⅜"	40'-6³⁄₁₆"	10¹¹⁄₁₆"	1'-6"	41 SPA. @ 1'-6" CTS.
A2	80'-8⅞"	40'-4⁷⁄₁₆"	8¹⁵⁄₁₆"	1'-6"	41 SPA. @ 1'-6" CTS.
A3	80'-5½"	40'-2¾"	7¼"	1'-6"	41 SPA. @ 1'-6" CTS.
A4	80'-2⅛"	40'-1¹⁄₁₆"	6"	1'-5⁹⁄₁₆"	41 SPA. @ 1'-6" CTS.
A5	79'-10⅞"	39'-11⁷⁄₁₆"	6"	1'-3¹⁵⁄₁₆"	41 SPA. @ 1'-6" CTS.
A6	79'-7¾"	39'-9⅞"	6"	1'-2⅜"	41 SPA. @ 1'-6" CTS.

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

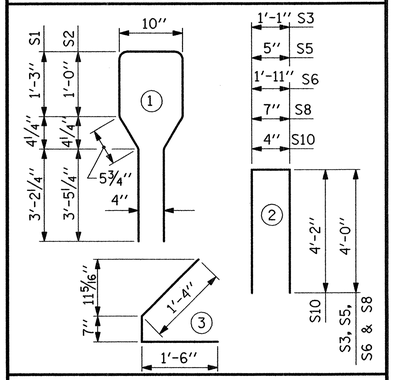
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	66	#4	1	10'-8"	470
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	68	#4	3	3'-5"	155
	S5	6	#4	2	8'-5"	34
	S6	1	#4	2	9'-11"	7
	✱S7	6	#5	STR	3'-8"	23
	S8	4	#4	2	8'-7"	23
	S9	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	14'-9"	49

✱ NOTE: S7 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 (LB.)	7000 PSI CONCRETE (C.Y.)	0.6" Ø L. R. STRANDS (No.)
EXTERIOR GIRDER	970	16.4	22
INTERIOR GIRDER	1014	16.4	22

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	SEE TABLE	481.96

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			34

THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON

7/10/12

PLANS PREPARED BY:

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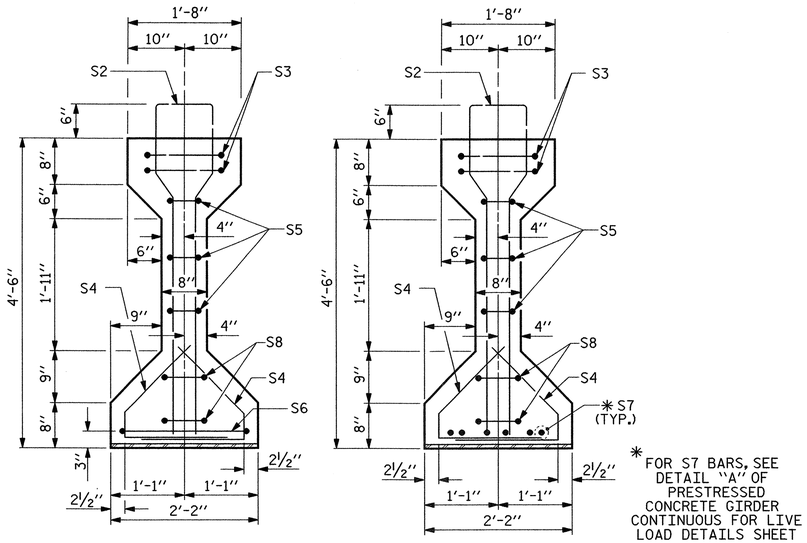


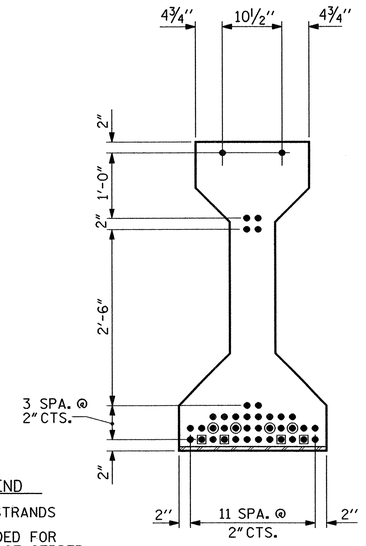
SECTION A-A

SECTION B-B

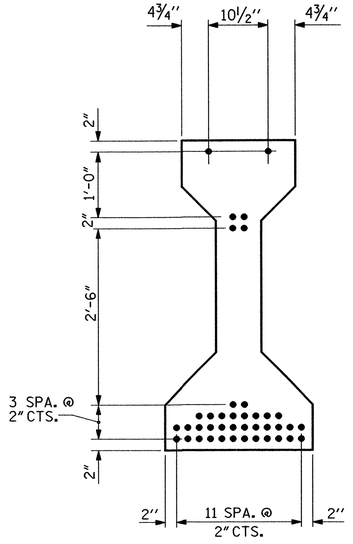
✱ FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◉ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- ◘ STRANDS DEBONDED FOR 20'-0" FROM END OF GIRDER



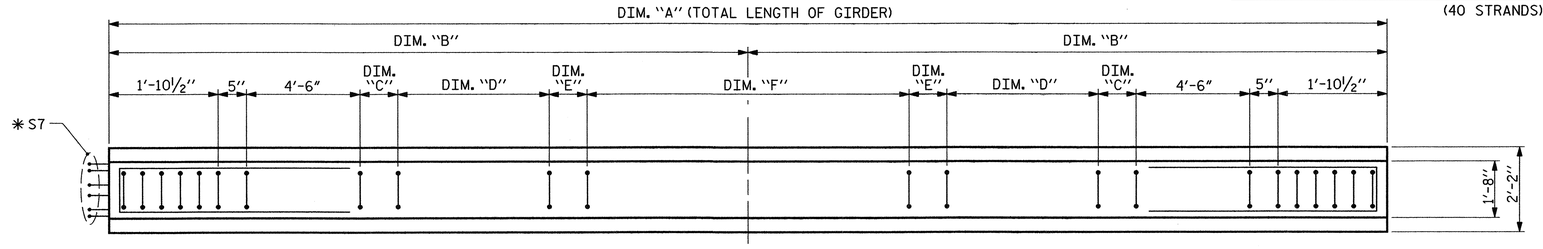
AT END OF GIRDER



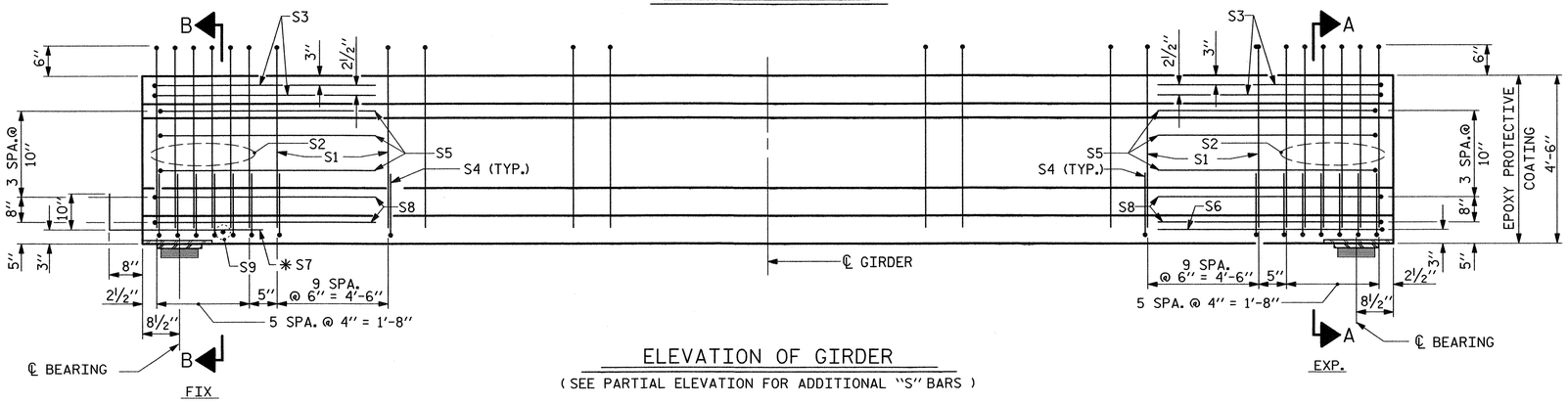
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(40 STRANDS)



PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDER DIMENSIONS TABLE

SPAN B

GDR. No.	DIM. "A"	DIM. "B"	DIM. "C"	DIM. "D"	DIM. "E"	DIM. "F"
B1	104'-5 3/8"	52'-2 11/16"	8 3/16"	4 SPA. @ 1'-0" CTS.	1'-0"	53 SPA. @ 1'-6" CTS.
B2	103'-11 7/8"	51'-11 5/16"	11 7/16"	5 SPA. @ 1'-0" CTS.	1'-0"	51 SPA. @ 1'-6" CTS.
B3	103'-6 1/2"	51'-9 1/4"	8 3/4"	5 SPA. @ 1'-0" CTS.	1'-0"	51 SPA. @ 1'-6" CTS.
B4	103'-1 3/8"	51'-6 11/16"	6 3/16"	5 SPA. @ 1'-0" CTS.	1'-0"	51 SPA. @ 1'-6" CTS.
B5	102'-8 1/4"	51'-4 1/8"	1'-0"	4 SPA. @ 1'-0" CTS.	1'-3 5/8"	51 SPA. @ 1'-6" CTS.
B6	102'-3 3/8"	51'-1 11/16"	1'-0"	4 SPA. @ 1'-0" CTS.	1'-1 3/16"	51 SPA. @ 1'-6" CTS.

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

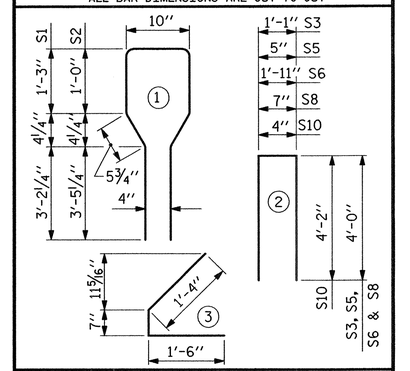
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
GIRDER 1 - 4	S1	84	#4	1	10'-8"	599
GIRDER 5 & 6	S1	82	#4	1	10'-8"	584
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	64	#4	3	3'-5"	146
	S5	6	#4	2	8'-5"	34
	S6	1	#4	2	9'-11"	7
	✱S7	6	#5	STR	3'-8"	23
	S8	4	#4	2	8'-7"	23
	S9	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S10	4	#5	2	8'-8"	36
INTERIOR GDR.	S10	8	#5	2	8'-8"	72
EXTERIOR GDR.	S11	10	#4	STR	7'-0"	47
INTERIOR GDR.	S12	10	#4	STR	15'-7"	104

✱ NOTE: S7 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 LB.	7000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GIRDER 1	1132	21.2	40
GIRDER 2 - 4	1225	21.1	40
GIRDER 5	1210	20.9	40
GIRDER 6	1117	20.8	40

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
6	SEE TABLE	620.06

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			34

STD. NO. PCG6

ASSEMBLED BY : W. B. ALLEN	DATE : 12/11		
CHECKED BY : T. R. PETERSON	DATE : 3/12		
DRAWN BY : ELR 8/91	REV. 10/17/00R	RWW/LES	
CHECKED BY : GRP 8/91	REV. 5/1/06R	TLA/GM	
	REV. 10/1/11	MAA/GM	

PLANS PREPARED BY:

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NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON

7/16/12

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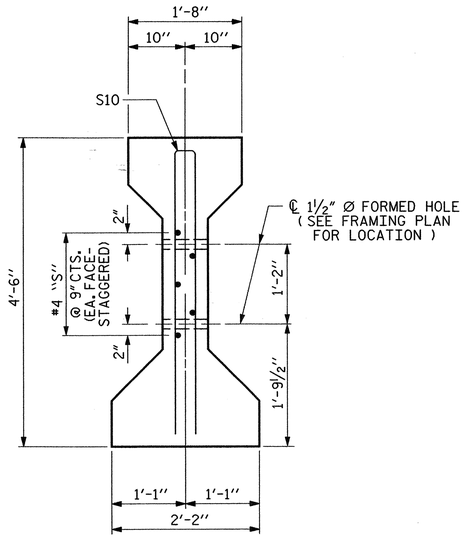
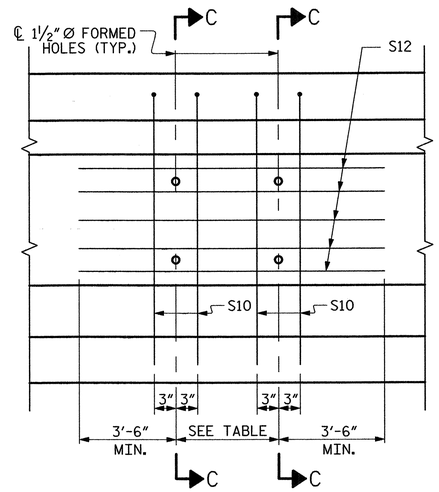
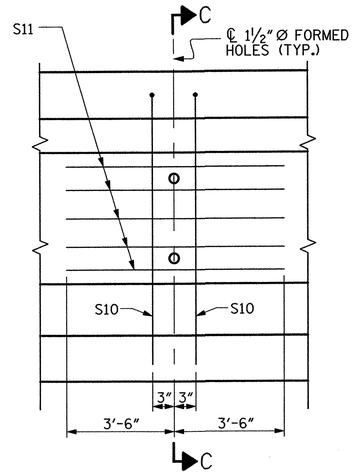


SECTION C-C

(S1 BARS NOT SHOWN)



INTERIOR GIRDER

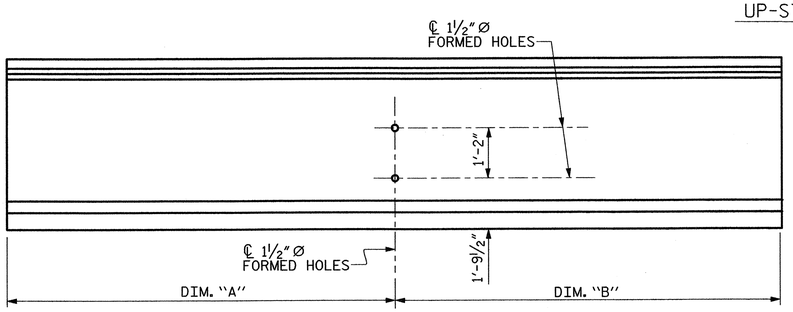


EXTERIOR GIRDER

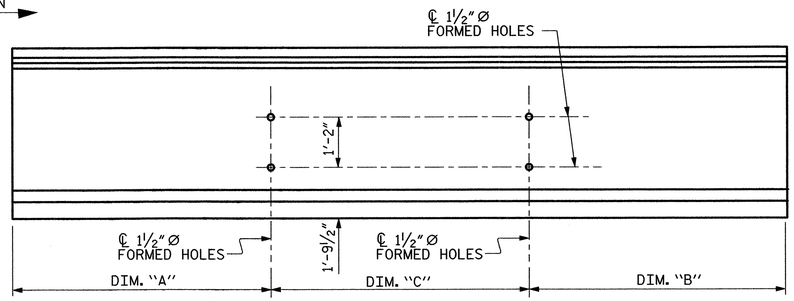
PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM
REINFORCING STEEL FOR GIRDER

UP-STATION

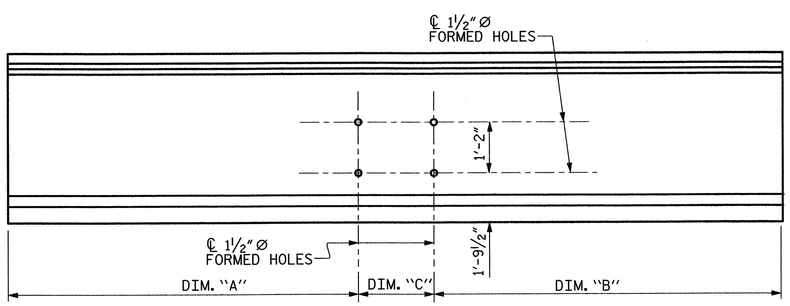


SPAN A



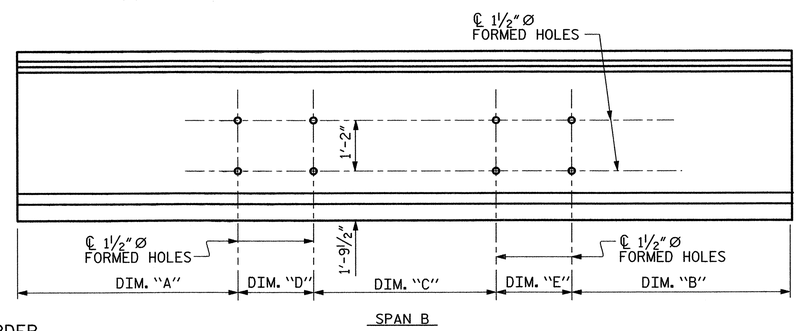
SPAN B

EXTERIOR GIRDER



END BENT #1

SPAN A



SPAN B

INTERIOR GIRDER

BENT 1

END BENT #2

BOLT HOLE PLACEMENT

BOLT HOLE PLACEMENT DIMENSIONS								
GDR. NO.	SPAN A			SPAN B				
	DIM. "A"	DIM. "B"	DIM. "C"	DIM. "A"	DIM. "B"	DIM. "C"	DIM. "D"	DIM. "E"
1	36'-7⅞"	44'-4½"	-	30'-10⅛"	39'-4"	34'-3¼"	-	-
2	36'-6½"	36'-6⅜"	7'-8⅜"	30'-8¹¹⁄₁₆"	30'-7⅜"	25'-8⅞"	8'-4⁹⁄₁₆"	8'-6⅜"
3	36'-5⅜"	36'-4¹³⁄₁₆"	7'-7½"	30'-7⅝"	30'-6¹⁄₁₆"	25'-7⅞"	8'-3¾"	8'-5½"
4	36'-3¹³⁄₁₆"	36'-3½"	7'-6¹³⁄₁₆"	30'-6"	30'-4¾"	25'-7"	8'-3"	8'-4⅝"
5	36'-2½"	36'-2¼"	7'-6⅛"	30'-4¹¹⁄₁₆"	30'-3½"	25'-6⅛"	8'-2⅛"	8'-3¹³⁄₁₆"
6	43'-6¾"	36'-1"	-	38'-4⅞"	30'-2¼"	33'-8¼"	-	-

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON
7/10/12

PLANS PREPARED BY:

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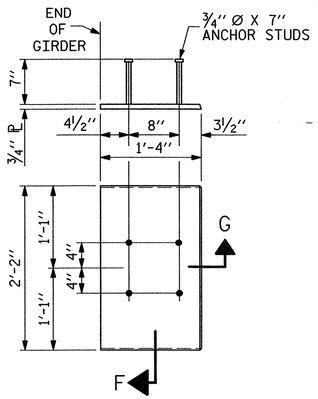
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			34

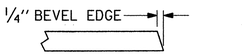
DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

7/3/2012 7:54:05 AM R:\Structures\B4497_S0_03_01.dgn

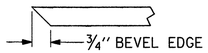


EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)

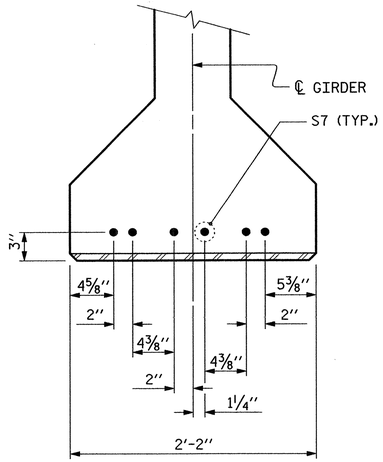


SECTION "G"



SECTION "F"

(SEE NOTES)



DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)

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 4500 PSI FOR GIRDERS IN SPAN A AND 5500 PSI FOR GIRDERS IN SPAN B.

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".

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN ½" OF THE THEORETICAL LOCATION SHOWN.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4500 lbs.

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" LOW RELAXATION	SPAN A GIRDER A1 - A6										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	.040	.068	.085	.095	.098	.095	.085	.068	.040	0.0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	.019	.038	.053	.062	.065	.062	.053	.038	.019	0.0
FINAL CAMBER ↑	0.0	1/4"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	1/4"	0.0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" LOW RELAXATION	SPAN B GIRDER B1 - B6																				
TWENTITH POINTS	0	.05	.1	.15	.2	.25	.3	.35	.4	.45	.5	.55	.6	.65	.7	.75	.8	.85	.9	.95	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	.056	.112	.155	.198	.224	.250	.266	.282	.287	.292	.287	.282	.266	.250	.224	.198	.155	.112	.056	0.0
✱DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	.026	.052	.078	.103	.124	.144	.157	.171	.176	.180	.177	.173	.160	.147	.127	.107	.081	.055	.027	0.0
FINAL CAMBER ↑	0.0	3/8"	3/4"	15/16"	1 1/8"	1 3/16"	1 1/4"	1 5/16"	1 3/8"	1 3/8"	1 3/8"	1 5/16"	1 5/16"	1 5/16"	1 1/4"	1 3/16"	1 1/8"	7/8"	11/16"	3/8"	0.0

✱INCLUDES FUTURE WEARING SURFACE

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

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			34

STD. NO. PCG9

PLANS PREPARED BY:

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NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER THERRE R PETERSON

7/10/12

ASSEMBLED BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

DRAWN BY : ELR 11/91
CHECKED BY : GRP 11/91

REV. 7/10/01RR LES/RDR
REV. 5/1/06 TLA/GM
REV. 10/1/11 MAA/GM

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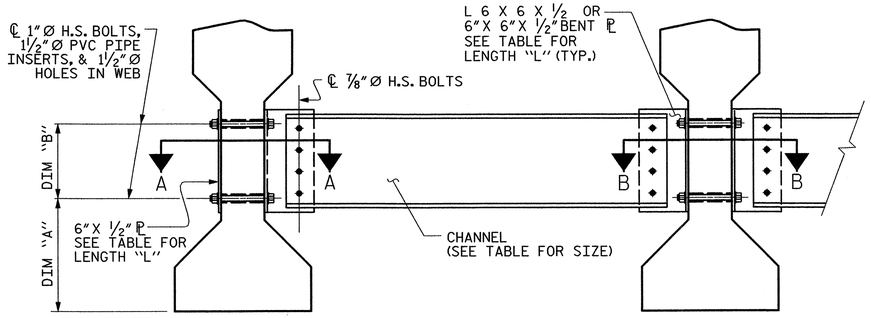
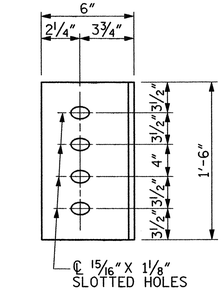
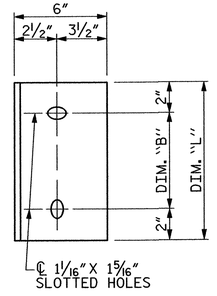


EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

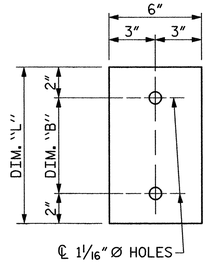
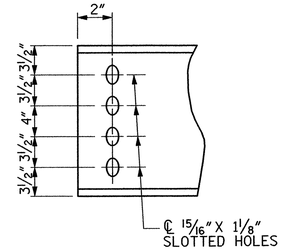
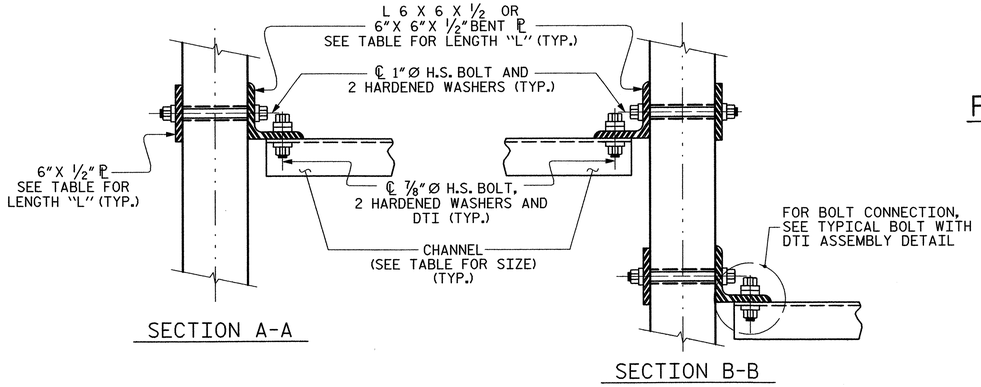


PLATE DETAILS



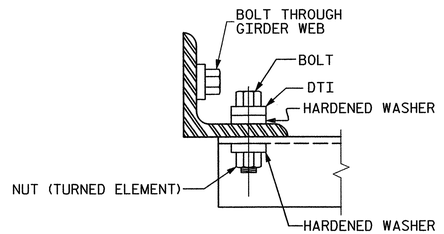
CHANNEL END



SECTION A-A SECTION B-B

CONNECTION DETAILS

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



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

TENSION ON THE ASTM A325 BOLTS THROUGH THE CHANNEL MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE PLATES, BENT PLATES, CHANNELS, AND ANGLES 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 PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

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

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON 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.

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, PLACE TEMPORARY STRUTS 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.

TABLE

GIRDER TYPE	CHANNEL SIZE	DIM "A"	DIM "B"	DIM "L"
IV	MC 18 x 42.7	1'-9½"	1'-2"	1'-6"

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
INTERMEDIATE
STEEL DIAPHRAGMS
FOR TYPE IV
PRESTRESSED CONCRETE
GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			34

THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON

7/10/12

PLANS PREPARED BY:

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NC LICENSE NO. C-1021

ASSEMBLED BY : W. B. ALLEN	DATE : 12/11	ADDED 10/21/05	
CHECKED BY : T. R. PETERSON	DATE : 3/12	REV. 5/1/06RRR	KMM/GM
DRAWN BY : TLA 6/05		REV. 10/1/11	MAA/GM
CHECKED BY : VC 6/05			

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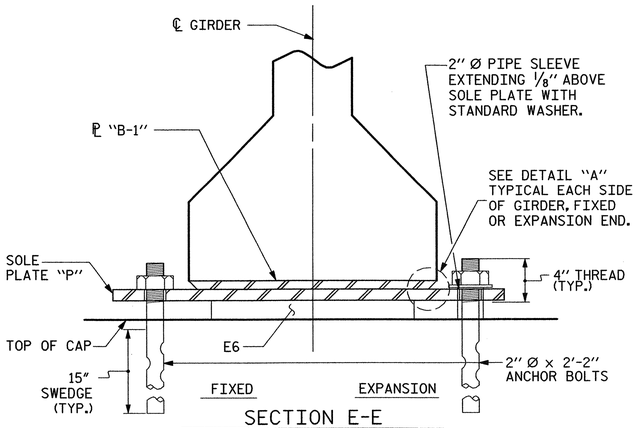
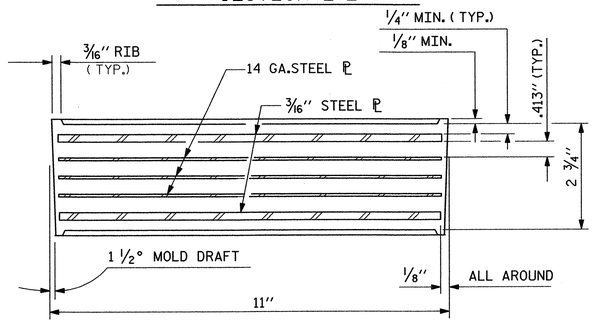
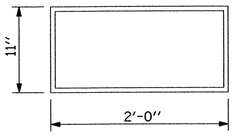
STD. NO. PCG10



SECTION E-E



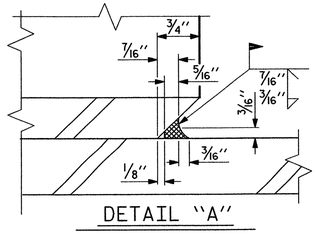
TYPICAL SECTION OF ELASTOMERIC BEARINGS



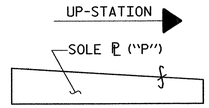
E6 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VII

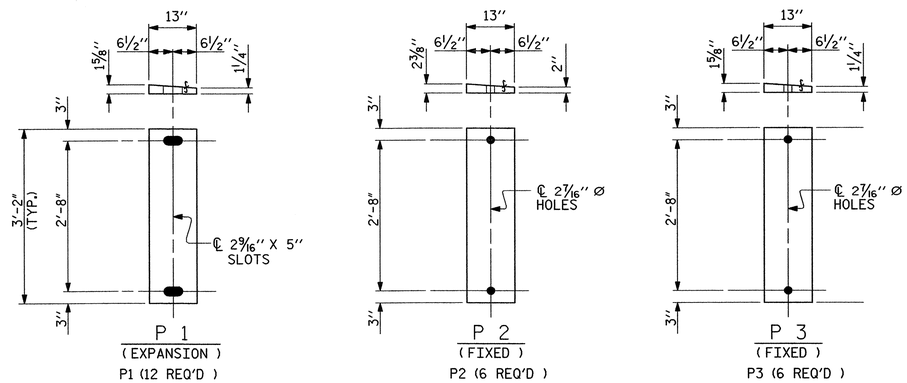


DETAIL "A"

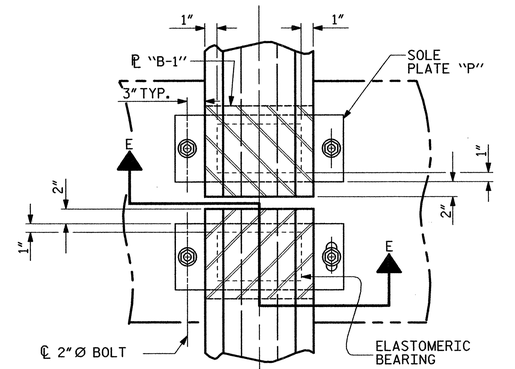


SOLE ℄ PLACEMENT DETAIL

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE VII	264 K



SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 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. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

PLANS PREPARED BY:

MULKEY
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NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER TERRY R. PETERSON

7/10/12

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-16
1			3			TOTAL SHEETS
2			4			34

STD. NO. EB4

ASSEMBLED BY : W. B. ALLEN	DATE : 2/12		
CHECKED BY : T. R. PETERSON	DATE : 3/12		
DRAWN BY : EEM 2/97	REV. 10/17/00	RWW/LES	
CHECKED BY : VAP 2/97	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

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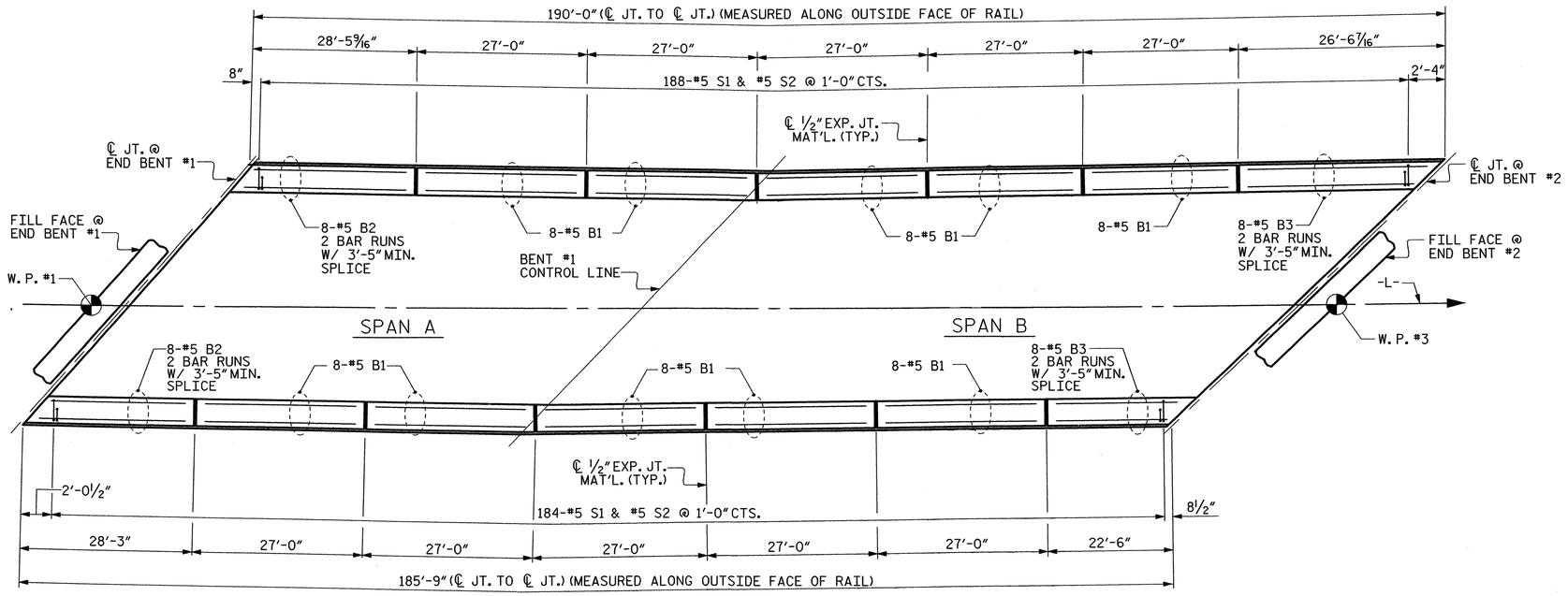
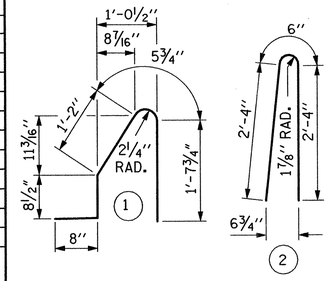


PLAN OF BARRIER RAIL

BILL OF MATERIAL					
FOR CONCRETE BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	80	#5	STR	26'-7"	2218
* B2	32	#5	STR	16'-3"	542
* B3	32	#5	STR	14'-7"	487
* S1	372	#5	1	4'-8"	1811
* S2	372	#5	2	5'-2"	2005
* EPOXY COATED REINFORCING STEEL					7063 LBS.
CLASS AA CONCRETE					37.6 CU. YDS.
CONCRETE BARRIER RAIL					
ON CONCRETE DECK SLAB					375.75 LIN. FT.
ON APPROACH SLAB					43.00 LIN. FT.
TOTAL					418.75 LIN. FT.

BAR TYPES



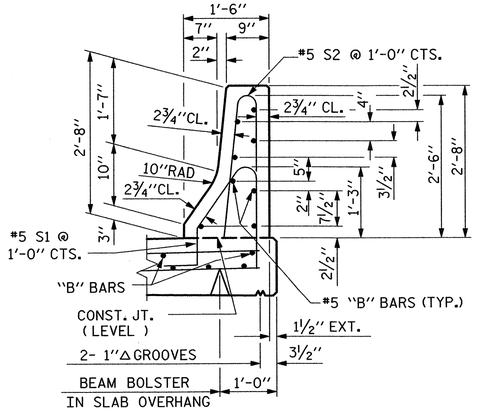
ALL BAR DIMENSIONS ARE OUT TO OUT

NOTES

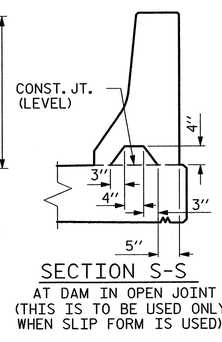
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

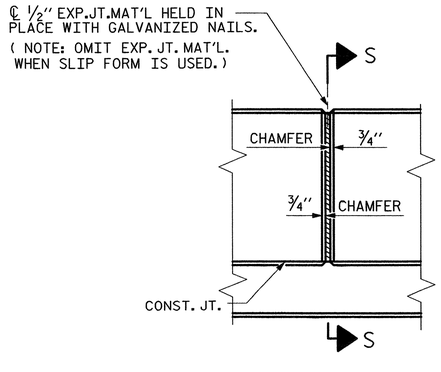
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



SECTION THRU RAIL



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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. B-4497
DAVIDSON COUNTY
STATION: 20+11.91 -L-

PLANS PREPARED BY:
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7/16/12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			34

STD. NO. CBR1

ASSEMBLED BY : W. B. ALLEN	DATE : 12/11		
CHECKED BY : T. R. PETERSON	DATE : 3/12		
DRAWN BY : ARB 5/87	REV. 5/7/03R	RWW/JTE	
CHECKED BY : SJD 9/87	REV. 5/1/06R	TLA/GM	
	REV. 10/1/11	MAA/GM	

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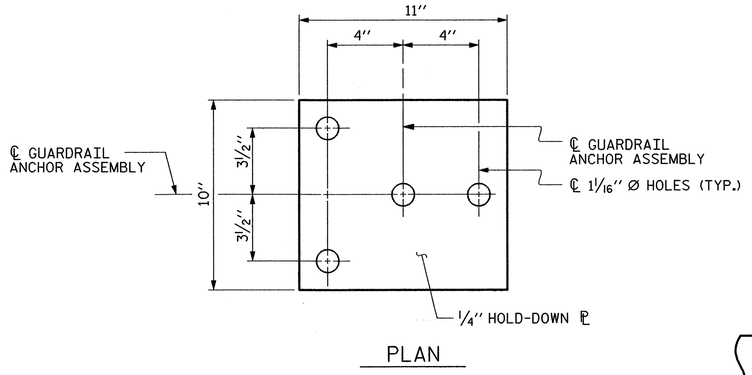
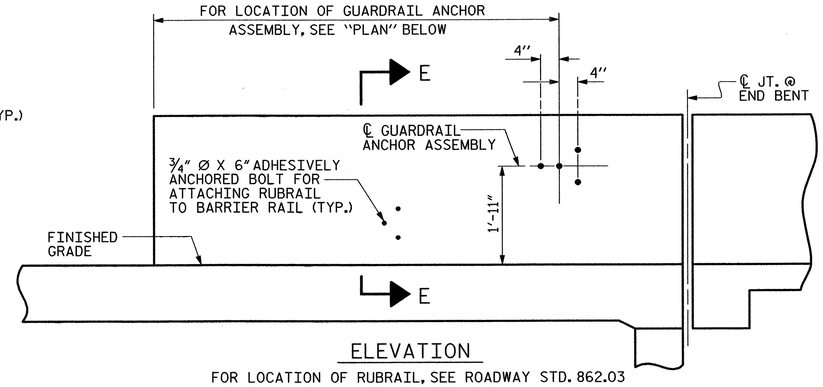
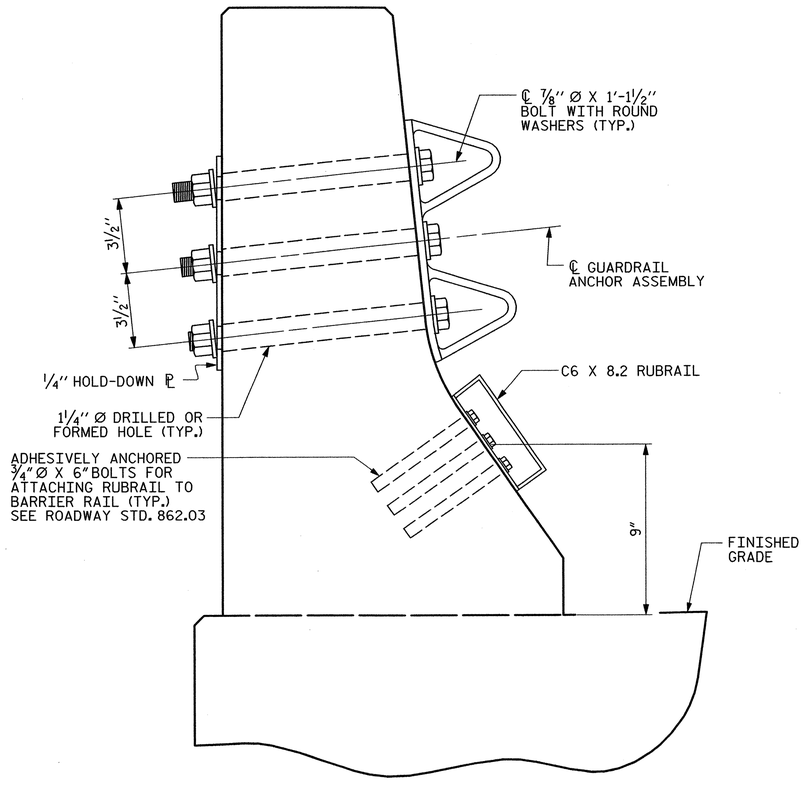


PLAN



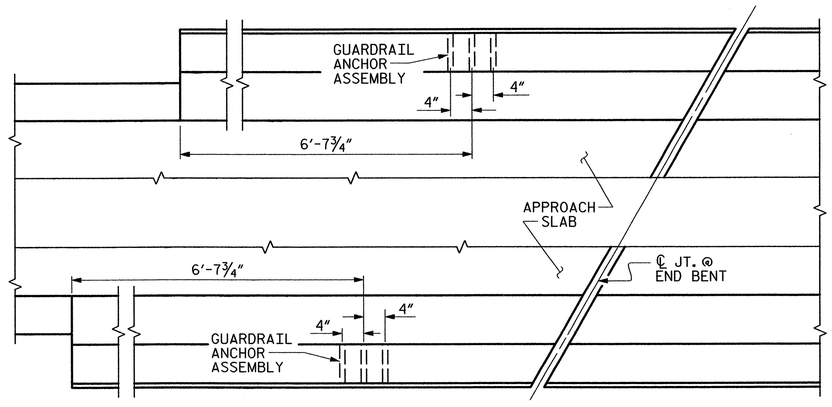
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

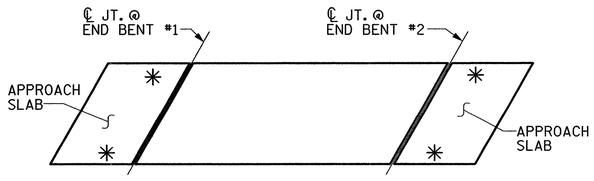
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼'' HOLD-DOWN PLATE AND 4 - ⅞'' Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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 ⅞'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

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

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1 ¼'' 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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾'' Ø X 6'' BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾'' Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

ASSEMBLED BY : W. B. ALLEN	DATE : 12/11		
CHECKED BY : T. R. PETERSON	DATE : 3/12		
DRAWN BY : TLA 5/06	ADDED 5/1/06RR KMM/GM		
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM		

PLANS PREPARED BY:

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NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON

7/10/12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			34

STD. NO. GRA2

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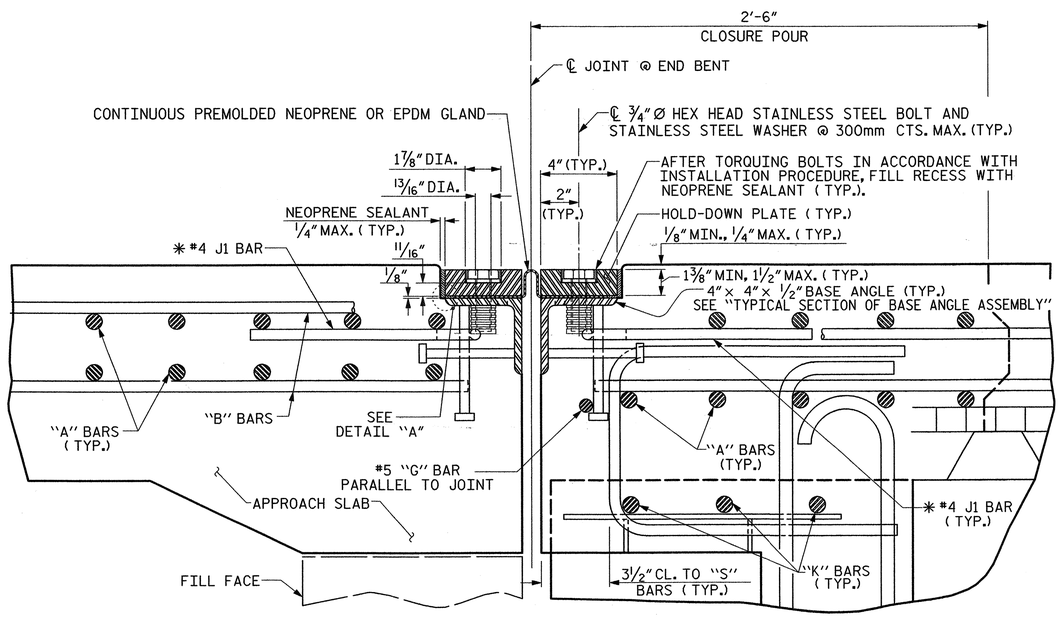


EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

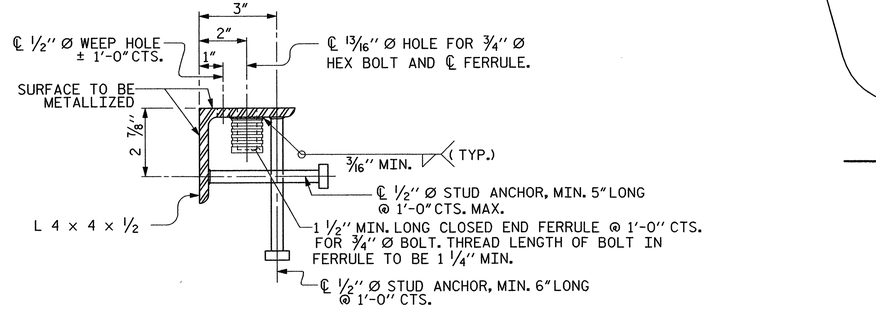
✱ THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

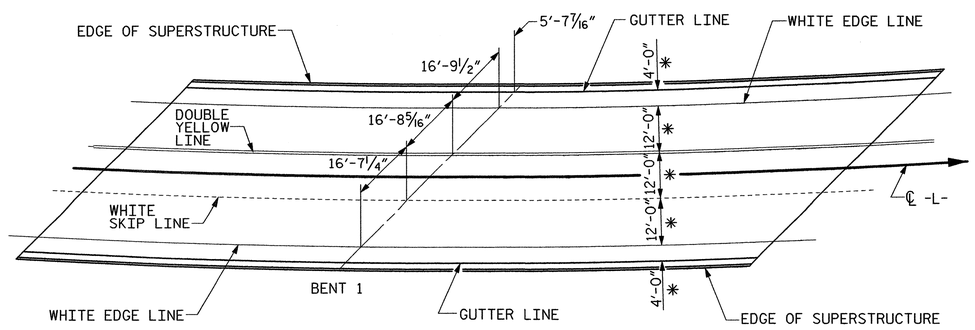
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE ¾" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X ½" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED ⅞" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL. ALL STUD ANCHORS SHALL CONFORM TO AASHTO M169, GRADES 1010 THRU 1020 OR APPROVED EQUAL. ALL CONCRETE INSERTS SHALL BE CLOSED END AND SHALL CONFORM TO AASHTO M169, GRADE 12L14. TENSILE CAPACITY SHALL BE 3000 LBS. MIN.
3. A PREMOLDED CORRUGATED OR NON-CORRUGATED GLAND SHALL BE USED FOR JOINTS SKEWED BETWEEN 50° THRU 130°. FOR JOINTS SKEWED LESS THAN 50° OR MORE THAN 130°, ONLY A CORRUGATED GLAND SHALL BE USED.
4. CLOSED END FERRULES AND STUD ANCHORS SHALL BE SHOP WELDED AND ALL HOLES SHALL BE SHOP DRILLED AS SHOWN ON PLANS. STUD ANCHORS SHALL BE ELECTRIC ARC END WELDED WITH COMPLETE FUSION.
5. SURFACES COMING IN CONTACT WITH NEOPRENE SHALL BE GROUND SMOOTH PRIOR TO METALLIZING.
6. UPON COMPLETION OF SHOP FABRICATION, THE HOLD DOWN PLATE AND BASE ANGLE ASSEMBLY, AS SHOWN IN THE " TYPICAL SECTION OF BASE ANGLE ASSEMBLY", SHALL BE METALLIZED. SEE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALLIZATION).
7. BASE ANGLE ASSEMBLY SHALL BE CONTINUOUS FOR THE LENGTH OF THE JOINT. AT CROWN BREAKS, THE ENDS OF THE BASE ANGLE ASSEMBLY SHALL BE CUT PARALLEL TO THE BRIDGE CENTERLINE FOR SKEWS LESS THAN 80° AND GREATER THAN 100°. FINISHED WELD SHALL BE GROUND SMOOTH AND COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
8. FIELD SPLICES OF HOLD-DOWN PLATES SHALL BE KEPT TO A MINIMUM. CONTRACTOR SHALL FURNISH DETAILED PLANS SHOWING PROPOSED SPLICE LOCATIONS FOR APPROVAL. HOLD-DOWN PLATES SHALL NOT EXCEED 20' LENGTHS UNLESS APPROVED BY THE ENGINEER.
9. NO ALTERNATE JOINT DETAILS SHALL BE PERMITTED IN LIEU OF THOSE SHOWN ON THESE PLANS.
10. THE CONTRACTOR MAY, AT HIS OPTION, USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF CONCRETE INSERTS FOR COVER PLATES. THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

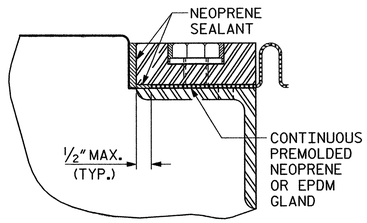


TYPICAL SECTION OF BASE ANGLE ASSEMBLY

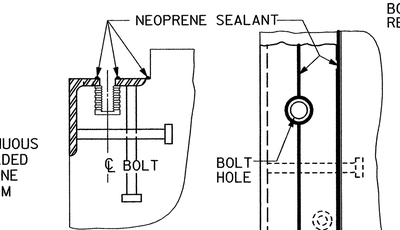


✱ DENOTES RADIAL DIMENSION

PAVEMENT MARKING ALIGNMENT

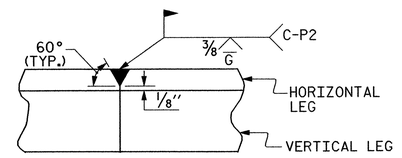


DETAIL "A"



CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
END BENT NO.	✱ SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	131°-38'-37"	11/16"	1⅜"	1¼"	1 1/16"
2	137°-06'-30"	⅞"	1 1/16"	1 5/16"	1⅛"

✱ SKEW ANGLES ARE TANGENT TO CURVE

PROJECT NO. B-4497
DAVIDSON COUNTY
STATION: 20+11.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			34

STD. NO. EJS1

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NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER TIERRE R. PETERSON

7/6/12

PLANS PREPARED BY:

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ASSEMBLED BY :	W. B. ALLEN	DATE :	12/11
CHECKED BY :	T. R. PETERSON	DATE :	3/12
DRAWN BY : REK	9/87	REV. 5/7/03R	RWW/JTE
CHECKED BY : CRK	10/87	REV. 5/1/06R	TLA/GM
		REV. 10/1/11	MAA/GM

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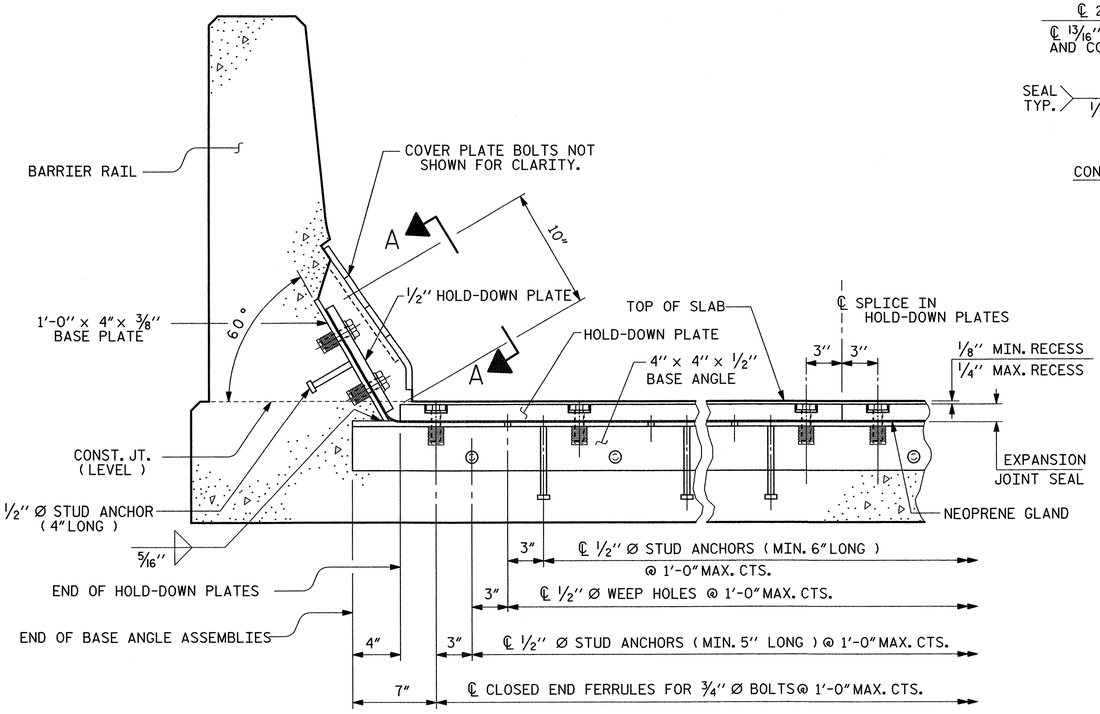
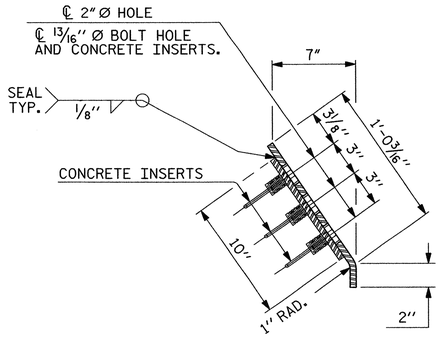
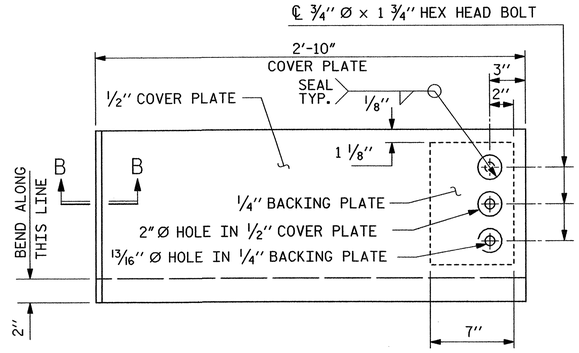


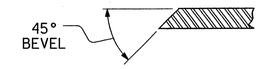
SECTION THRU RAIL NORMAL TO JOINT



END VIEW

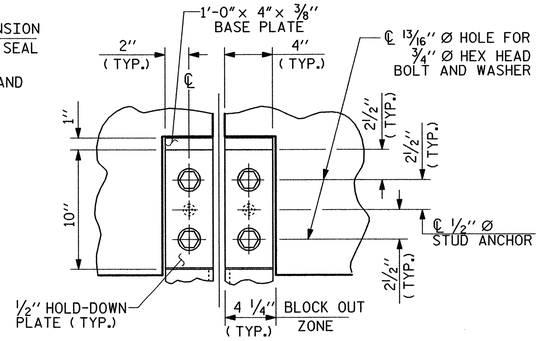


TYPE II - ELEVATION VIEW

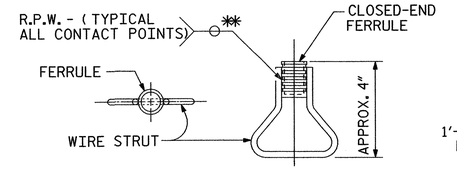


SECTION B - B

COVER PLATE DETAILS



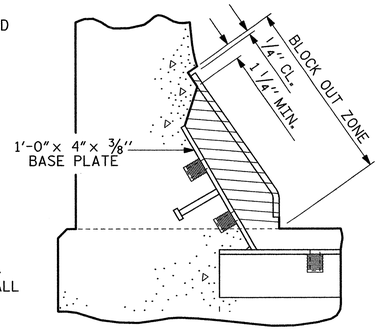
SECTION A - A



PLAN ELEVATION

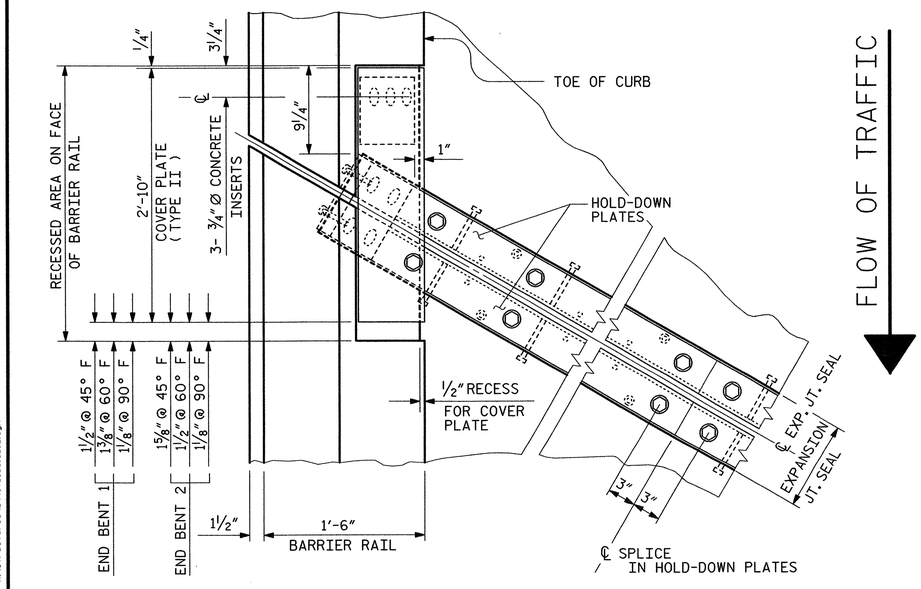
CONCRETE INSERT

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

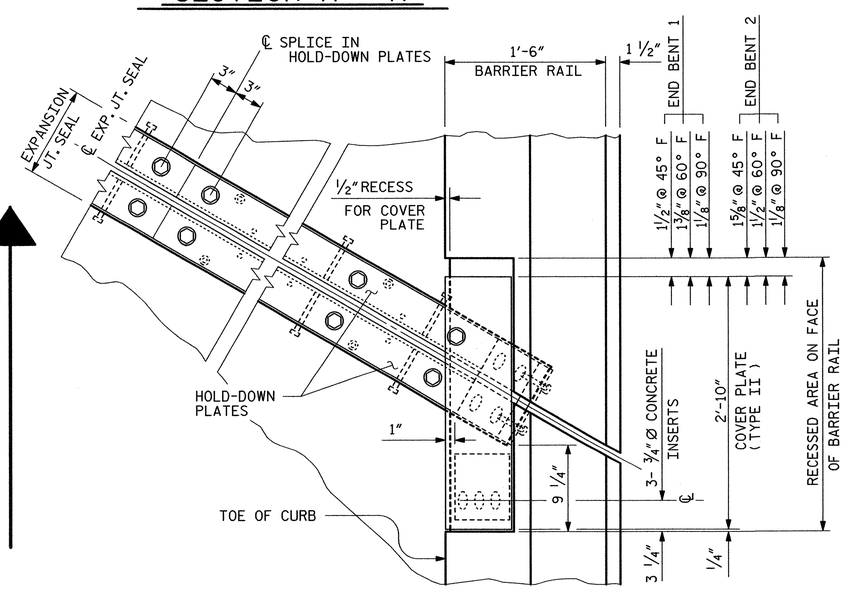


BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE

ASSEMBLED BY :	W. B. ALLEN	DATE :	1/12
CHECKED BY :	T. R. PETERSON	DATE :	3/12
DRAWN BY : REK 9/87	REV. 10/17/00		RWW/LES
CHECKED BY : CRK 10/87	REV. 5/1/06		TLA/GM
	REV. 10/1/11		MAA/GM

PLANS PREPARED BY:

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
RALEIGH, N.C. 27636
(919) 851-1815
(919) 851-1918 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1021

THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON
7/10/12

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			34

STD. NO. EJS2

7/3/2012 8:26:50 AM R:\Structures\B4497_SD_JS_02.dgn

BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	285	#5	STR	46′-11″	13946
A2	285	#5	STR	46′-11″	13946
✱ A3	6	#6	STR	17′-5″	157
✱ A101	1	#5	STR	46′-10″	49
✱ A102	1	#5	STR	46′-3″	48
✱ A103	1	#5	STR	45′-2″	47
✱ A104	1	#5	STR	44′-8″	47
✱ A105	1	#5	STR	44′-1″	46
✱ A106	1	#5	STR	43′-7″	45
✱ A107	1	#5	STR	43′-1″	45
✱ A108	1	#5	STR	42′-6″	44
✱ A109	1	#5	STR	42′-0″	44
✱ A110	1	#5	STR	41′-5″	43
✱ A111	1	#5	STR	40′-11″	43
✱ A112	1	#5	STR	40′-4″	42
✱ A113	1	#5	STR	39′-10″	42
✱ A114	1	#5	STR	39′-3″	41
✱ A115	1	#5	STR	38′-9″	40
✱ A116	1	#5	STR	38′-2″	40
✱ A117	1	#5	STR	37′-8″	39
✱ A118	1	#5	STR	37′-1″	39
✱ A119	1	#5	STR	36′-6″	38
✱ A120	1	#5	STR	36′-0″	38
✱ A121	1	#5	STR	35′-5″	37
✱ A122	1	#5	STR	34′-11″	36
✱ A123	1	#5	STR	34′-4″	36
✱ A124	1	#5	STR	33′-10″	35
✱ A125	1	#5	STR	33′-3″	35
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A458	1	#5	STR	20′-1″	21
A459	1	#5	STR	19′-8″	21
A460	1	#5	STR	19′-2″	20
A461	1	#5	STR	18′-9″	20
A462	1	#5	STR	18′-3″	19
A463	1	#5	STR	17′-10″	19
A464	1	#5	STR	17′-5″	18
A465	1	#5	STR	16′-11″	18
A466	1	#5	STR	16′-6″	17
A467	1	#5	STR	16′-0″	17
A468	1	#5	STR	15′-7″	16
A469	1	#5	STR	15′-1″	16
A470	1	#5	STR	14′-8″	15
A471	1	#5	STR	14′-2″	15
A472	1	#5	STR	13′-9″	14
A473	1	#5	STR	13′-3″	14
A474	1	#5	STR	12′-10″	13
A475	1	#5	STR	12′-4″	13
A476	1	#5	STR	11′-11″	12
A477	1	#5	STR	11′-6″	12
A478	1	#5	STR	11′-0″	11
A479	1	#5	STR	10′-7″	11
A480	1	#5	STR	10′-1″	11
A481	1	#5	STR	9′-8″	10
A482	1	#5	STR	9′-2″	10
A483	1	#5	STR	8′-9″	9
A484	1	#5	STR	8′-4″	9
A485	1	#5	STR	7′-10″	8
A486	1	#5	STR	7′-5″	8
A487	1	#5	STR	6′-11″	7
A488	1	#5	STR	6′-6″	7
A489	1	#5	STR	6′-1″	6
A490	1	#5	STR	5′-7″	6
A491	1	#5	STR	5′-2″	5
A492	1	#5	STR	4′-9″	5
A493	1	#5	STR	4′-3″	4
A494	1	#5	STR	3′-10″	4
A495	1	#5	STR	3′-4″	3
A496	1	#5	STR	2′-11″	3
A497	1	#5	STR	2′-6″	3
A498	1	#5	STR	2′-0″	2
A499	1	#5	STR	1′-7″	2
✱ B1	64	#4	STR	28′-10″	1233
✱ B2	32	#7	STR	51′-0″	3336
✱ B3	31	#7	STR	28′-3″	1790
✱ B4	32	#7	STR	20′-8″	1352
✱ B5	96	#4	STR	25′-5″	1630
B6	204	#5	STR	49′-0″	10426
✱ G1	2	#5	STR	32′-9″	68
✱ G2	2	#5	STR	35′-9″	75
✱ J1	125	#4	9	1′-5″	118
✱ K1	2	#8	1	15′-7″	83
✱ K2	8	#8	2	22′-3″	475
✱ K3	15	#6	STR	8′-1″	182
K4	10	#4	STR	7′-2″	48
K5	30	#4	STR	8′-7″	172
K6	10	#4	STR	8′-4″	56
K7	10	#4	3	7′-2″	48
K8	20	#4	4	14′-0″	187
✱ K9	15	#6	STR	8′-11″	201
✱ K10	2	#8	1	14′-9″	79
✱ K11	2	#8	1	17′-0″	91
✱ K12	8	#8	2	24′-3″	518
✱ K13	2	#8	1	16′-1″	86
✱ S1	70	#5	5	5′-9″	420
✱ S2	70	#4	6	5′-1″	238
S3	145	#4	7	2′-9″	266
U1	30	#4	8	15′-6″	311
U2	10	#4	8	13′-6″	90

REINFORCING STEEL LBS. 30125

✱ EPOXY COATED REINFORCING STEEL LBS. 30603

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″			

NORTH CAROLINA PROFESSIONAL SEAL 034552 ENGINEER PIERRE R. PETERSON 7/10/12

PLANS PREPARED BY:

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NC LICENSE NO. C-1031

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

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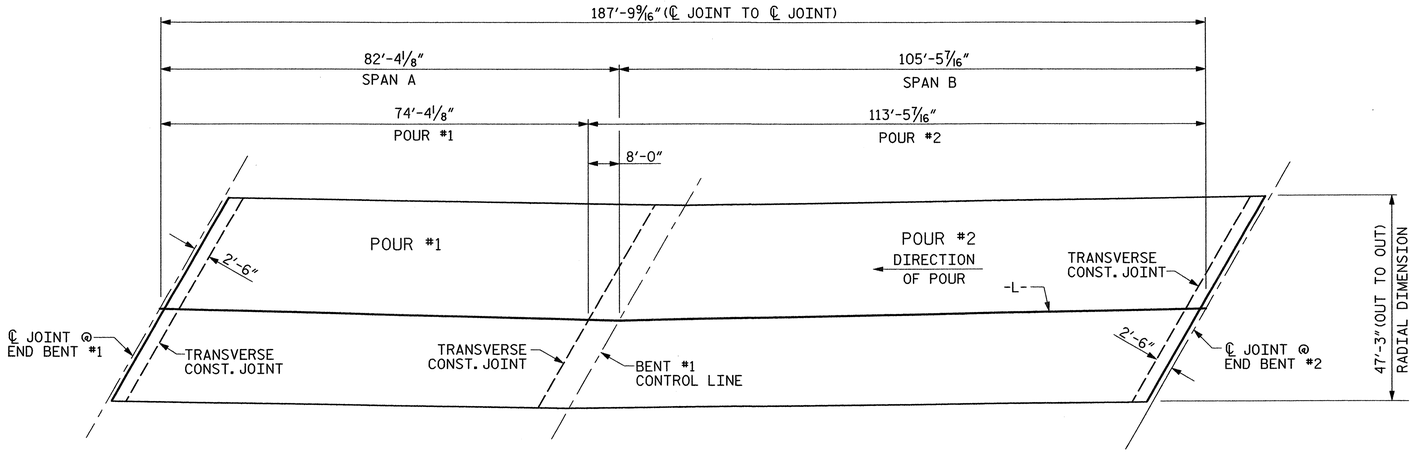
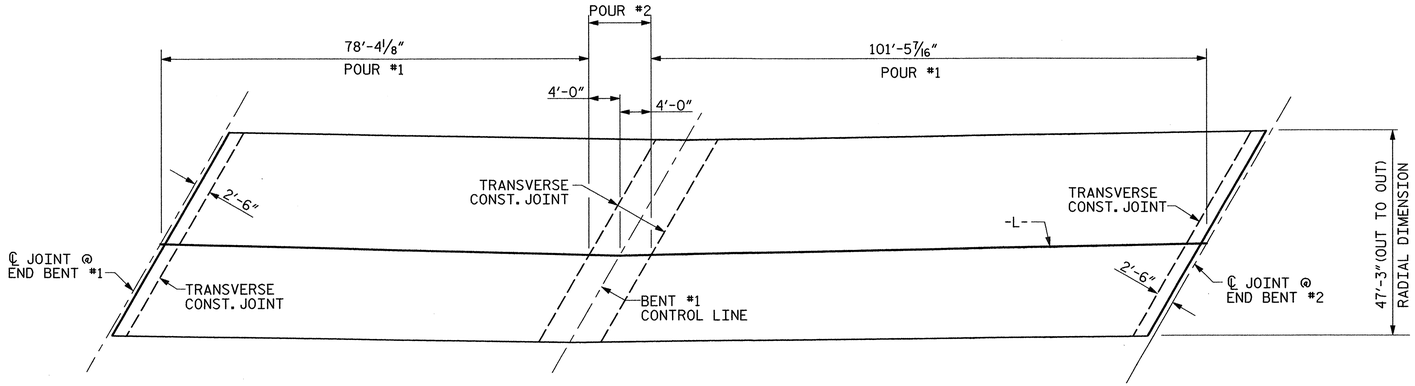


POURING SEQUENCE AND LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

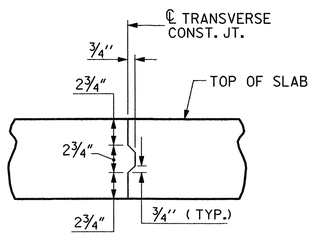
(SQ. FT. = 8,873)

ALL DIMENSIONS ARE MEASURED ALONG -L- UNLESS OTHERWISE NOTED.



OPTIONAL POURING SEQUENCE

POUR #2 CANNOT BE STARTED UNTIL BOTH ADJACENT POURS LABELED POUR #1 REACH A MINIMUM OF 3000 PSI.
ALL DIMENSIONS ARE MEASURED ALONG -L-.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

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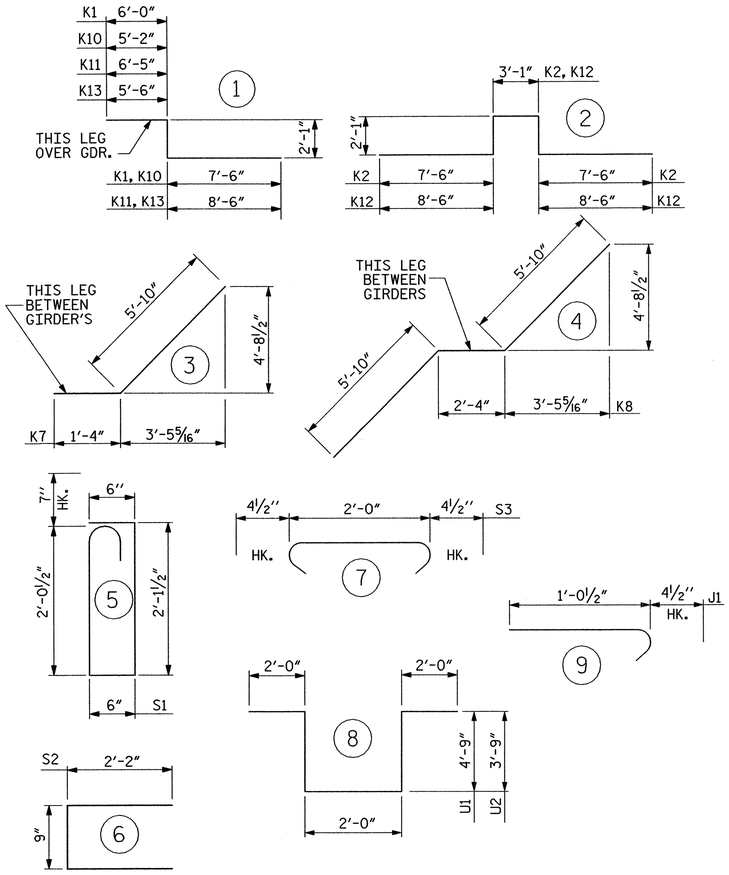
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
POUR 1	111.5		
POUR 2	189.0		
** TOTALS	300.5	30125	30603

** QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED.

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,916	SQ.FT.
BRIDGE DECK	7,634	SQ.FT.
TOTAL	9,550	SQ.FT.

PROJECT NO. B-4497
DAVIDSON COUNTY
STATION: 20+11.91 -L-

SHEET 2 OF 2

NORTH CAROLINA REGISTERED SEAL 034352 ENGINEER THERRE R. PETERSON
7/10/12

PLANS PREPARED BY:
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NC LICENSE NO. C-1021

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			34

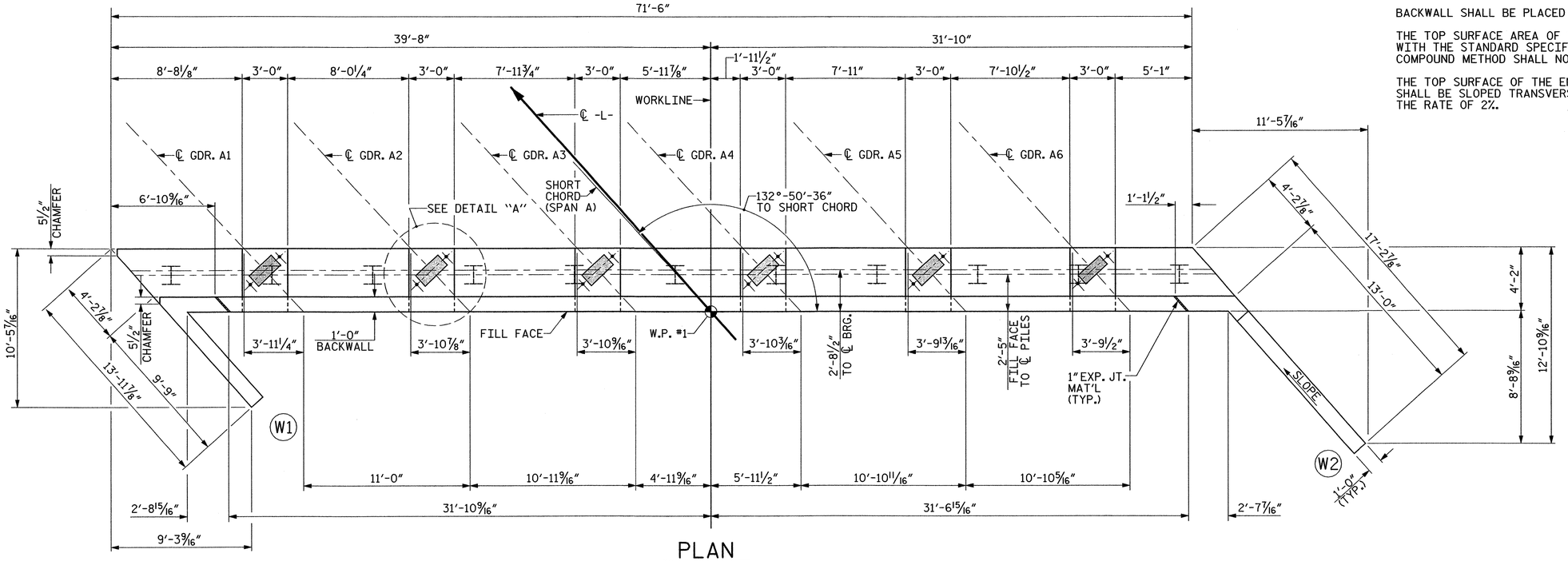
NOTES

STIRRUPS AND U2 BARS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

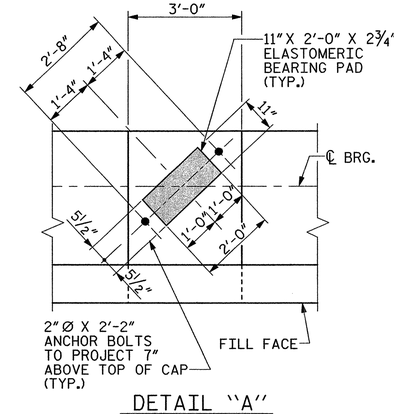
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

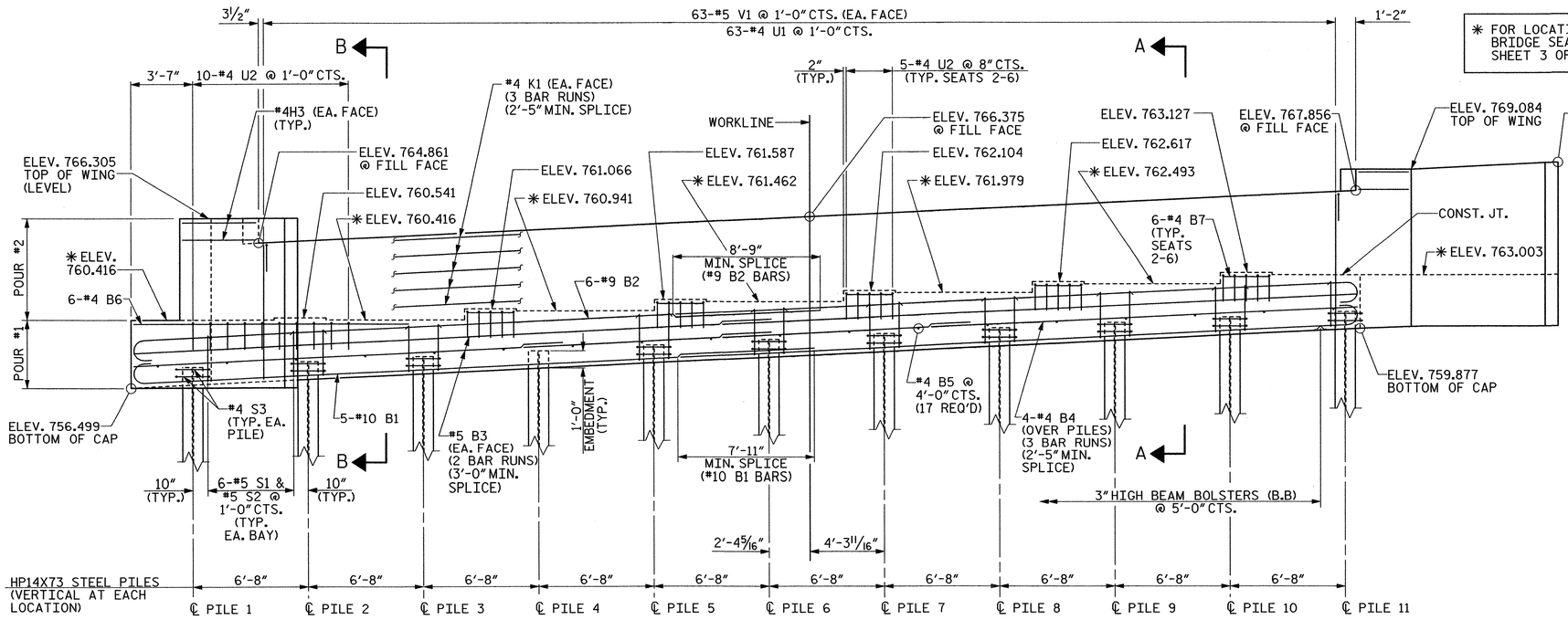
THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.



PLAN



DETAIL "A"
(TYP. EACH GIRDER)



ELEVATION

✱ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS. SEE SECTION A-A SHEET 3 OF 3.

PILE NO.	PILE ELEVATIONS
1	757.696
2	758.013
3	758.330
4	758.646
5	758.963
6	759.280
7	759.597
8	759.914
9	760.230
10	760.547
11	760.864

PILE ELEVATIONS @ MIN. 1'-0" EMBEDMENT RIGHT SIDE OF PILE FOR PILES IN THE CAP.

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER THERRE R. PETERSON 7/10/12

PLANS PREPARED BY:

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NC LICENSE NO. C-1021

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

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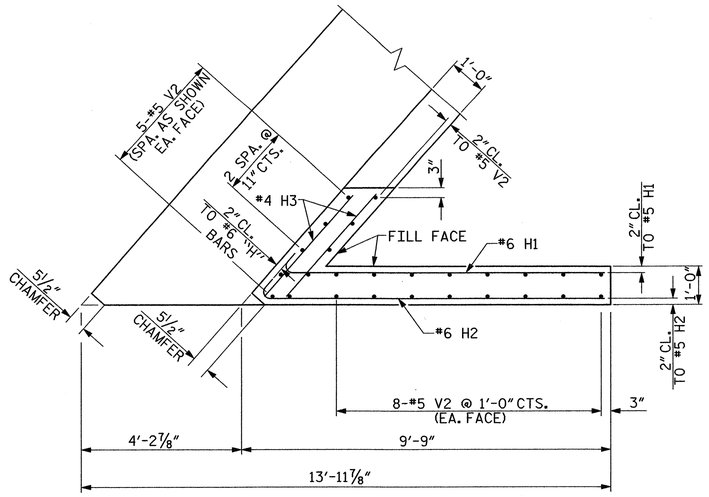
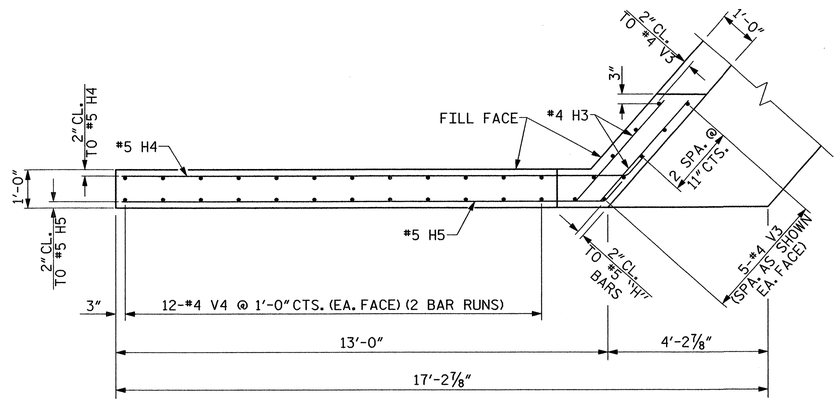
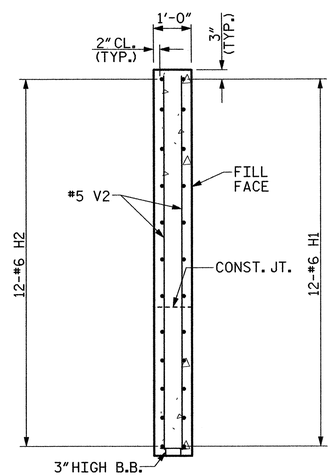


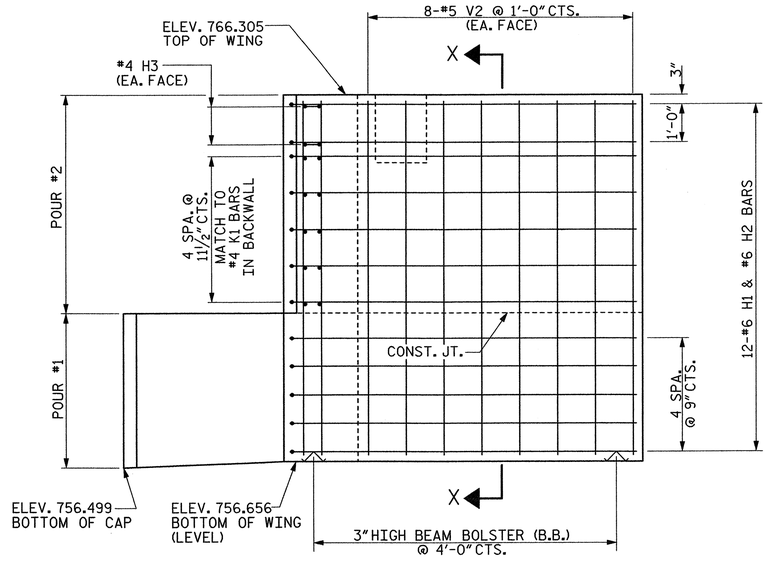
PLAN OF LEFT WING - W1



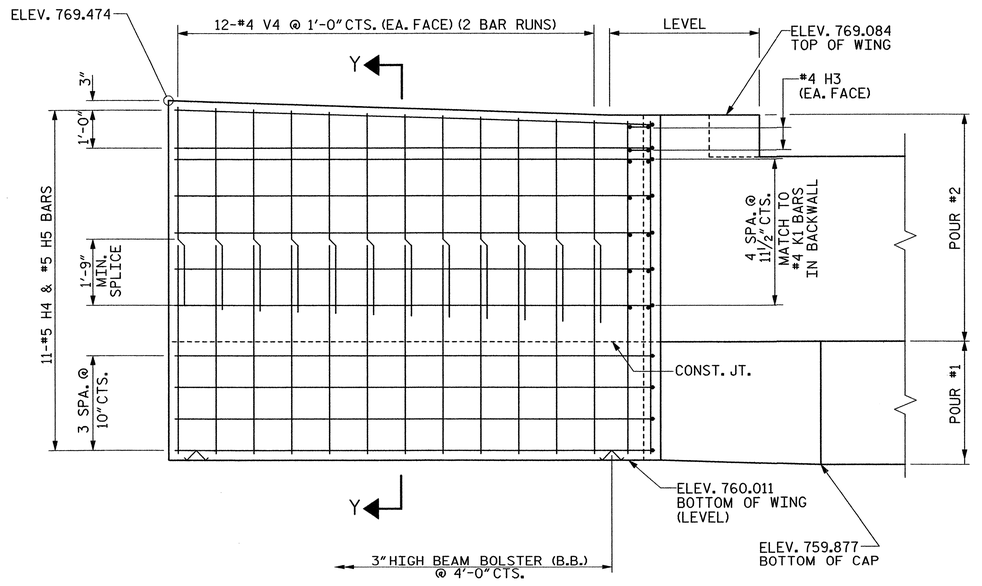
PLAN OF RIGHT WING - W2



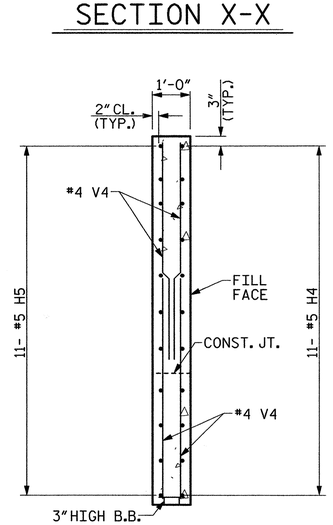
SECTION X-X



ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2



SECTION Y-Y

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034352 ENGINEER HERBERT R. PETERSON 7/10/12

PLANS PREPARED BY:

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NC LICENSE NO. C-1081

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

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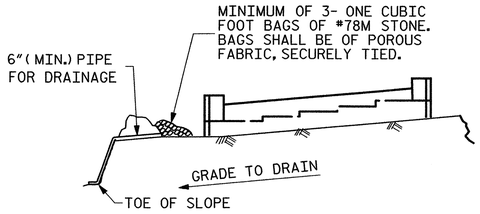
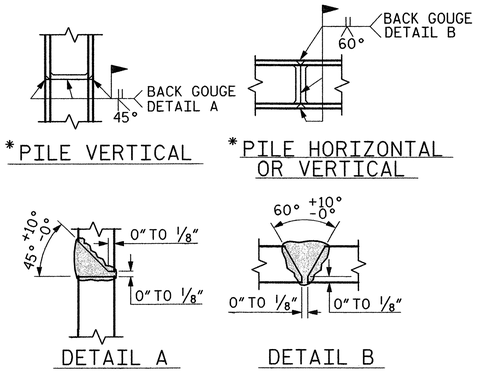


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

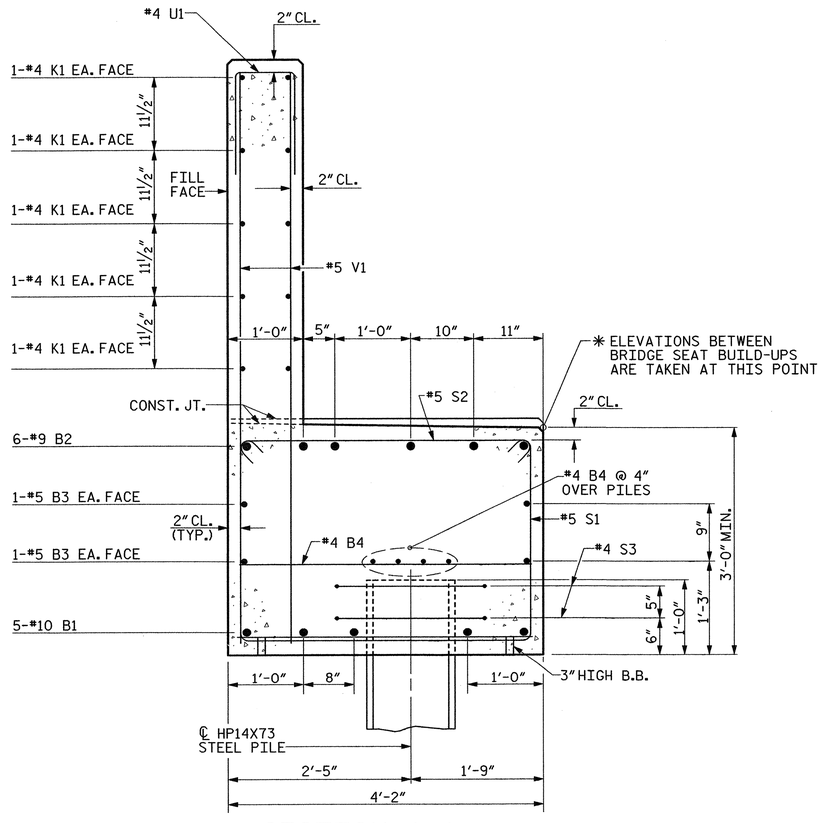
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

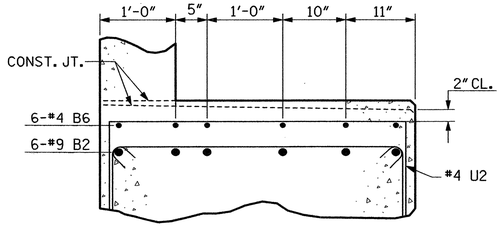


PILE SPLICE DETAILS

*POSITION OF PILE DURING WELDING.

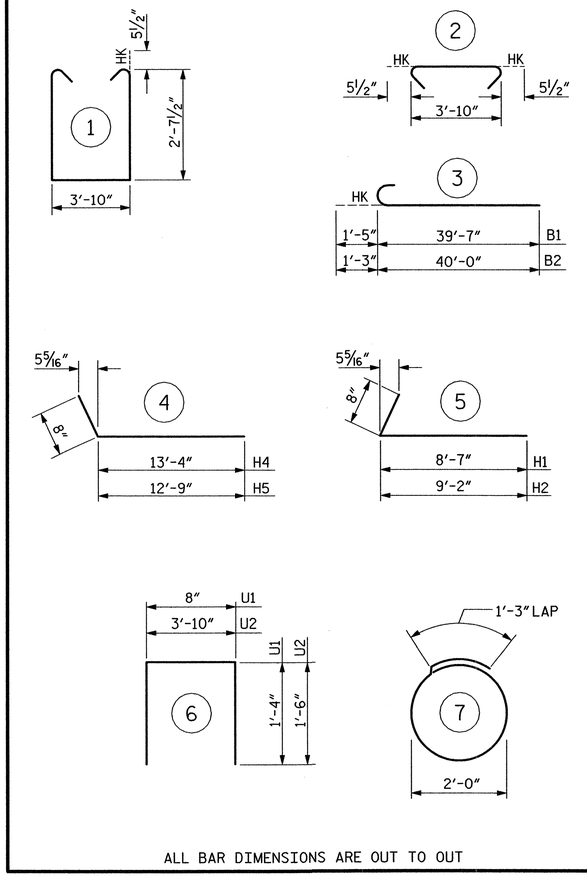


SECTION A-A



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	10	#10	3	41'-0"	1764
B2	12	#9	3	41'-3"	1683
B3	8	#5	STR	37'-1"	309
B4	12	#4	STR	25'-4"	203
B5	17	#4	STR	3'-10"	44
B6	6	#4	STR	12'-9"	51
B7	30	#4	STR	2'-8"	53
H1	12	#6	5	9'-3"	167
H2	12	#6	5	9'-10"	177
H3	8	#4	STR	3'-6"	19
H4	11	#5	4	14'-0"	161
H5	11	#5	4	13'-5"	154
K1	30	#4	STR	25'-4"	508
S1	60	#5	1	10'-0"	626
S2	60	#5	2	4'-9"	297
S3	22	#4	7	7'-7"	111
U1	63	#4	6	3'-4"	140
U2	35	#4	6	6'-10"	160
V1	126	#5	STR	7'-8"	1008
V2	26	#5	STR	9'-3"	251
V3	10	#5	STR	9'-2"	96
V4	48	#4	STR	5'-7"	179

TOTAL REINFORCING STEEL	8161 lbs.
CLASS "A" CONCRETE - CU. YARDS	
POUR 1 - CAP & LOWER WINGS	41.5 cu. yds.
POUR 2 - UPPER WINGS & BACKWALL	17.4 cu. yds.
TOTAL	58.9 cu. yds.
HP14X73 STEEL PILES	
11 PILES REQUIRED - LIN. FEET	755

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER TIERRE R. PETERSON

PLANS PREPARED BY:

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NC LICENSE NO. C-1031

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

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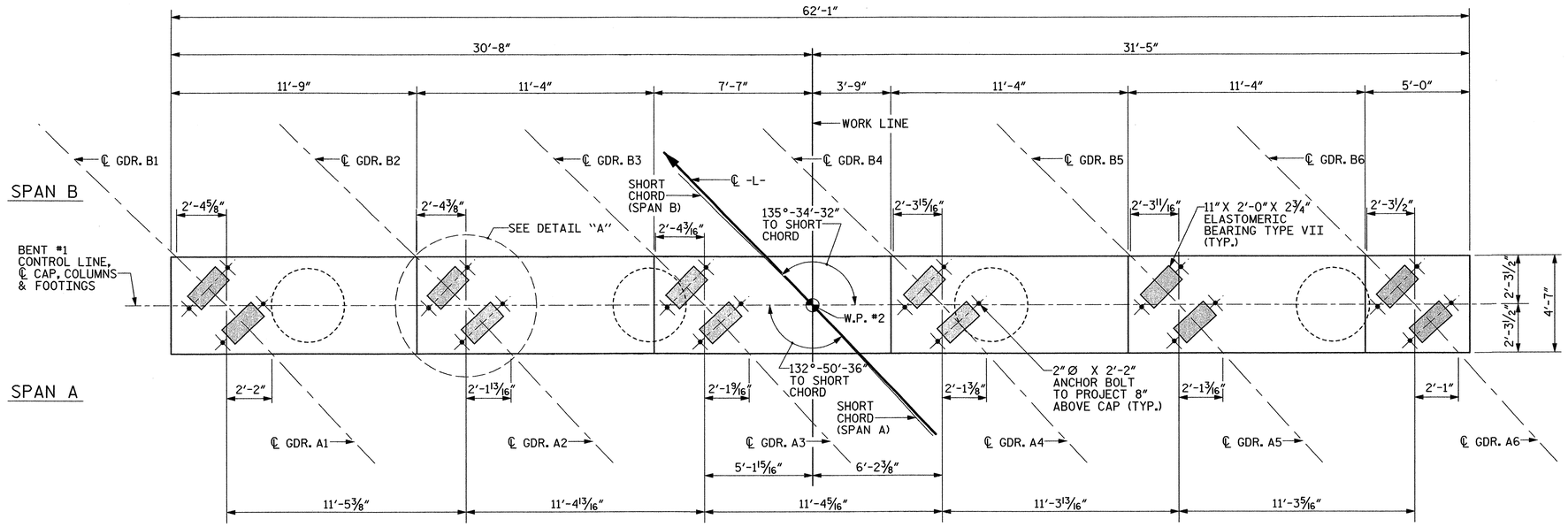
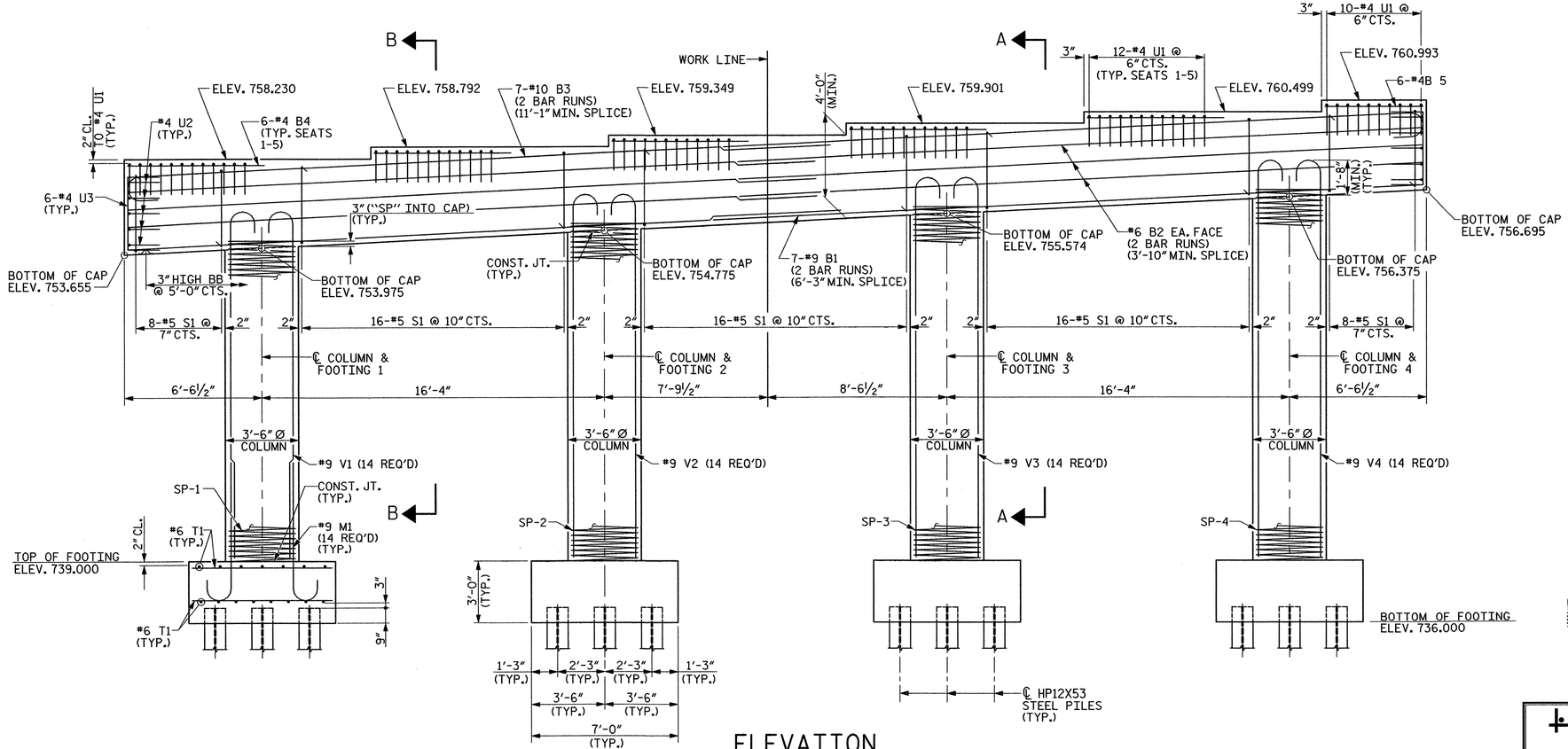


PLAN



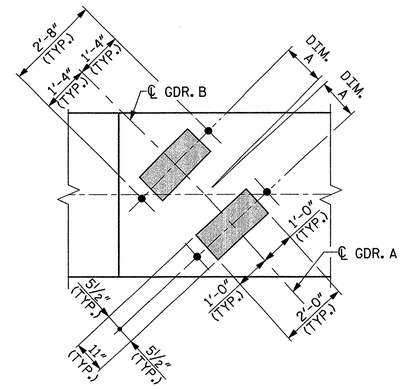
ELEVATION

NOTE: REINFORCING STEEL IN FOOTINGS ("T" & "M" BARS) TYPICAL

NOTES

STIRRUPS AND "U" BARS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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



DETAIL 'A'
(TYPICAL EACH GIRDER)

SPAN A		SPAN B	
GIRDER NO.	DIM. A	GIRDER NO.	DIM. A
GDR. A1	1'-1¾"	GDR. B1	1'-2⁷⁄₁₆"
GDR. A2	1'-1¹¹⁄₁₆"	GDR. B2	1'-2⅜"
GDR. A3	1'-1¹¹⁄₁₆"	GDR. B3	1'-2⅝"
GDR. A4	1'-1⅝"	GDR. B4	1'-2¼"
GDR. A5	1'-1⁹⁄₁₆"	GDR. B5	1'-2³⁄₁₆"
GDR. A6	1'-1½"	GDR. B6	1'-2⅛"

DIM. A MEASURED ALONG ℄ GIRDER

INVERT ALTERNATE #5 S1 STIRRUPS

PROJECT NO. B-4497
DAVIDSON COUNTY
STATION: 20+11.91 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER TIERRE R. PETERSON 7/10/12

PLANS PREPARED BY:
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 2/12
CHECKED BY : T. R. PETERSON DATE : 4/12

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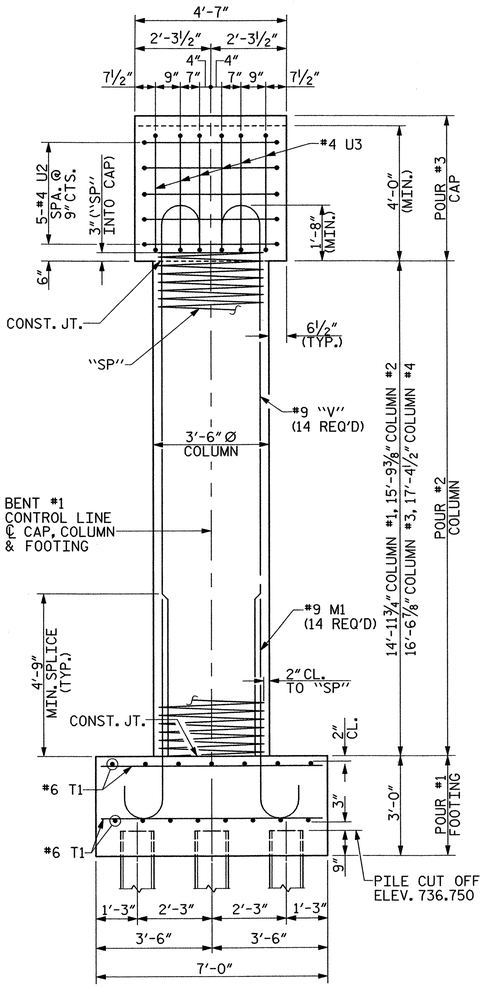
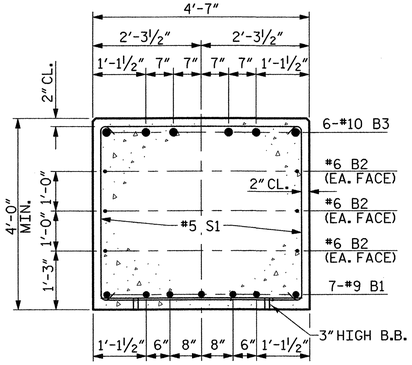
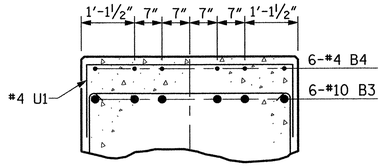


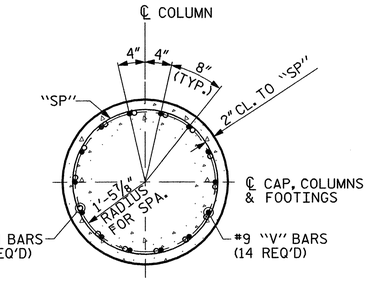
END ELEVATION



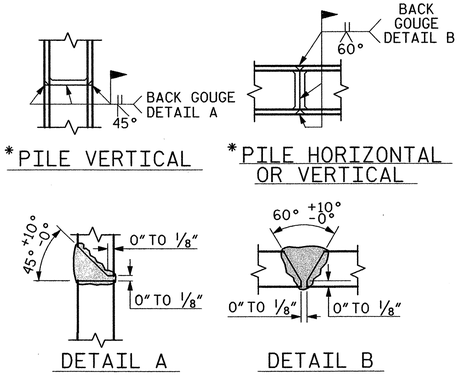
SECTION A-A



SECTION B-B



SECTION THRU COLUMN



*PILE VERTICAL

*PILE HORIZONTAL OR VERTICAL

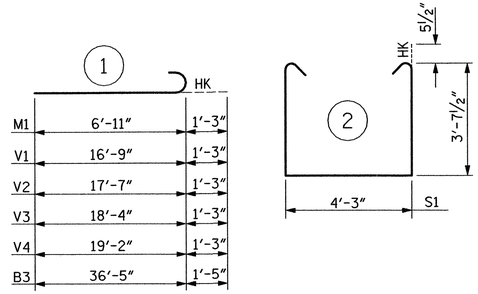
DETAIL A

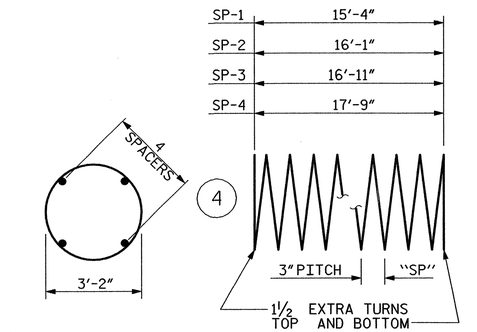
DETAIL B

PILE SPLICE DETAILS

*POSITION OF PILE DURING WELDING.

BAR TYPES





ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT #1

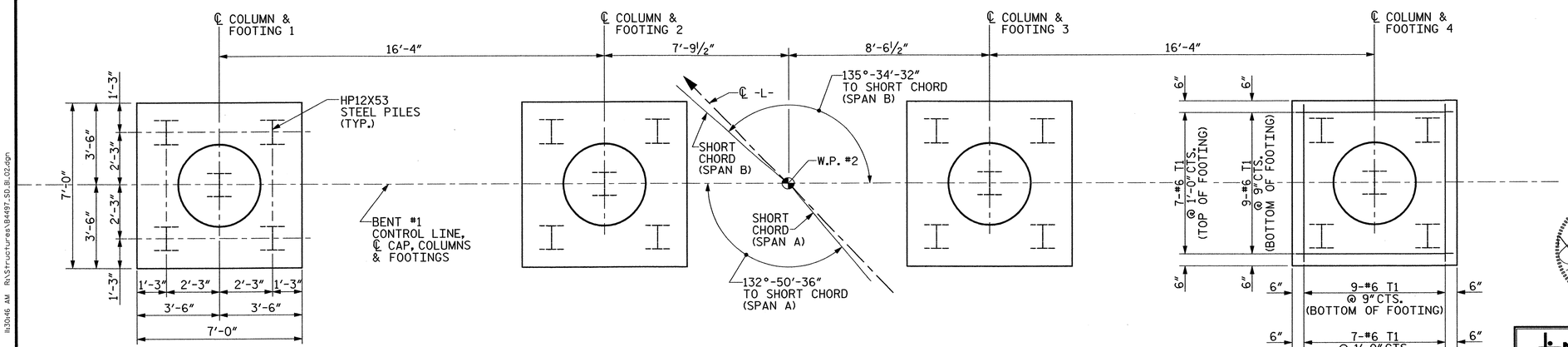
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	#9	STR	34'-1"	1622
B2	12	#6	STR	32'-10"	592
B3	12	#10	1	37'-10"	1954
B4	30	#4	STR	6'-6"	130
B5	6	#4	STR	4'-8"	19
M1	36	#9	1	8'-2"	1000
S1	64	#5	2	12'-5"	829
T1	128	#6	STR	6'-8"	1282
U1	70	#4	3	7'-3"	339
U2	10	#4	3	7'-1"	47
U3	12	#4	3	6'-6"	52
V1	9	#9	1	18'-0"	551
V2	9	#9	1	18'-10"	576
V3	9	#9	1	19'-7"	599
V4	9	#9	1	20'-5"	625
TOTAL REINFORCING STEEL					10217 lbs.
SP-1	1	**	4	637'-4"	426
SP-2	1	**	4	666'-9"	445
SP-3	1	**	4	696'-2"	465
SP-4	1	**	4	725'-7"	485
SPIRAL COLUMN REINFORCING STEEL (SP)					1821 lbs.

CLASS "A" CONCRETE - CU. YARDS

POUR 1 - FOOTINGS	21.8 cu. yds.
POUR 2 - COLUMNS	23.1 cu. yds.
POUR 3 - CAP	45.3 cu. yds.
TOTAL	90.2 cu. yds.

HP12X53 STEEL PILES
20 PILES REQUIRED - LIN. FEET 440

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



PLAN OF FOOTINGS

DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR EACH FOOTING

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER THERESE R. PETERSON 7/10/12

PLANS PREPARED BY:

MULKEY ENGINEERS & CONSULTANTS
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(919) 851-1918 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1021

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -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-27
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 2/12
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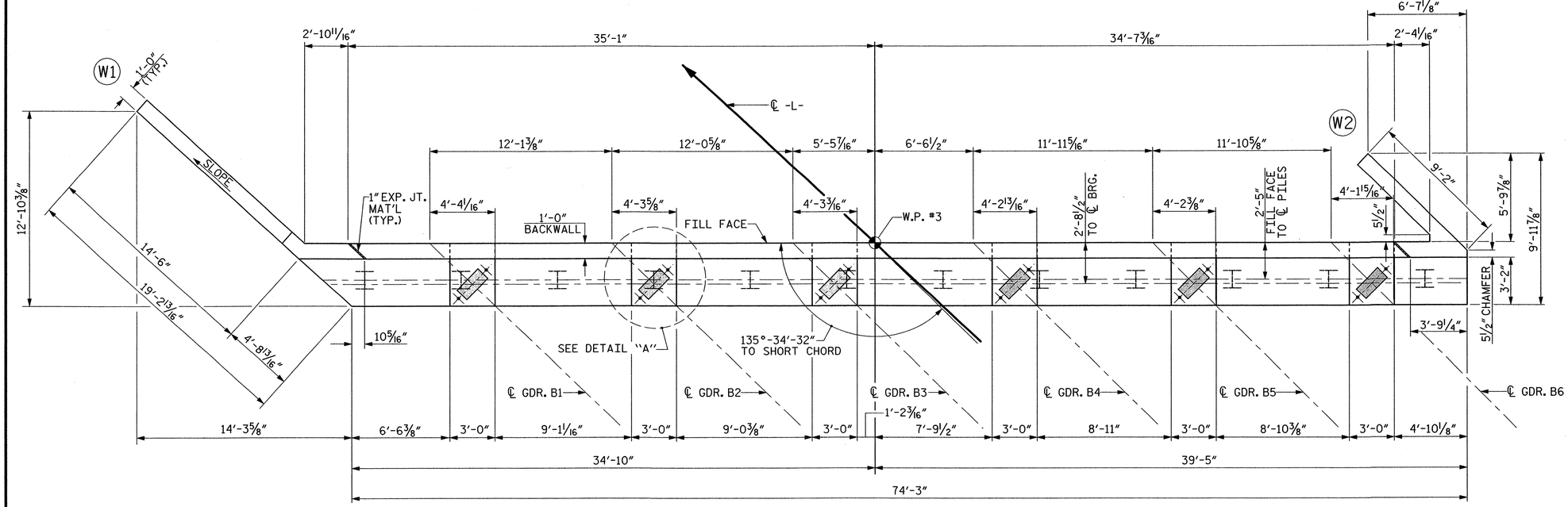
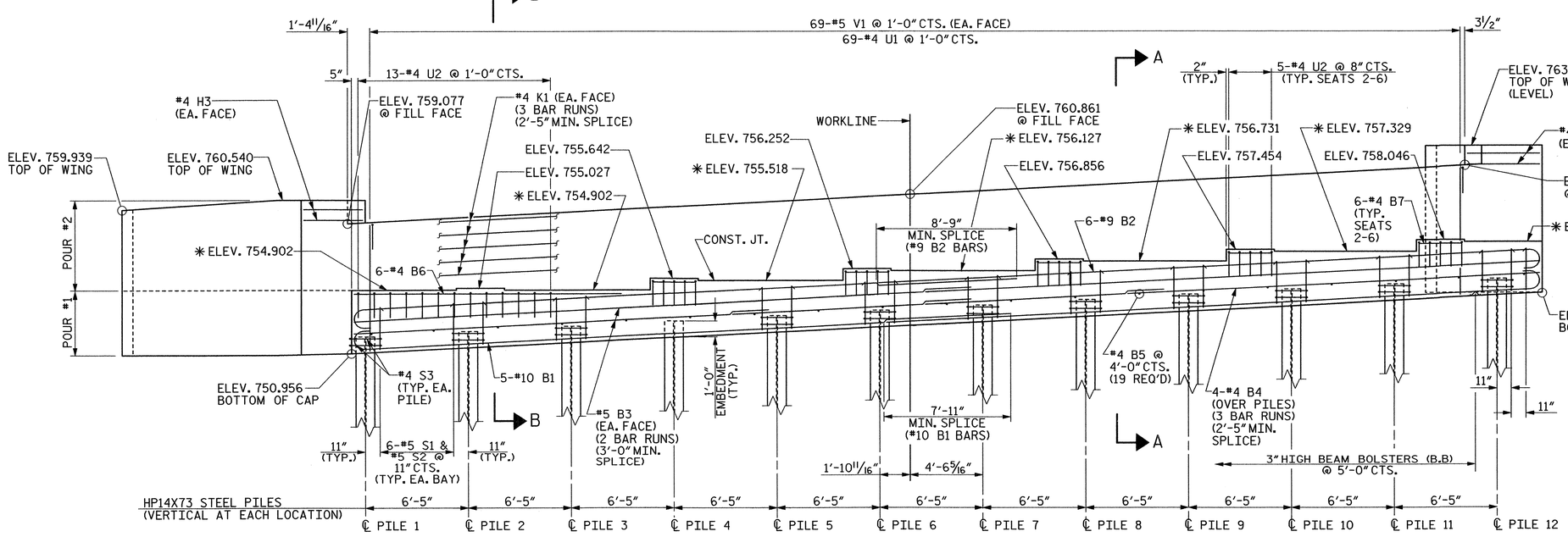


PLAN



ELEVATION

PILE NO.	PILE ELEVATIONS	PILE NO.	PILE ELEVATIONS
1	752.000	7	753.955
2	752.326	8	754.281
3	752.651	9	754.607
4	752.977	10	754.933
5	753.303	11	755.259
6	753.629	12	755.584

PILE ELEVATIONS @ MIN. 1'-0" EMBEDMENT RIGHT SIDE OF PILE FOR PILES IN THE CAP.

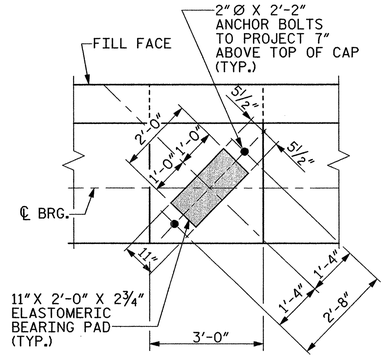
NOTES

STIRRUPS AND U2 BARS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE AREA OF THE END BENT CAP 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%.



DETAIL "A"
(TYP. EACH GIRDER)

* FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS. SEE SECTION A-A SHEET 3 OF 3.

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			34

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER THERESE R. PETERSON 7/10/12

PLANS PREPARED BY:

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DRAWN BY : W. B. ALLEN DATE : 12/11
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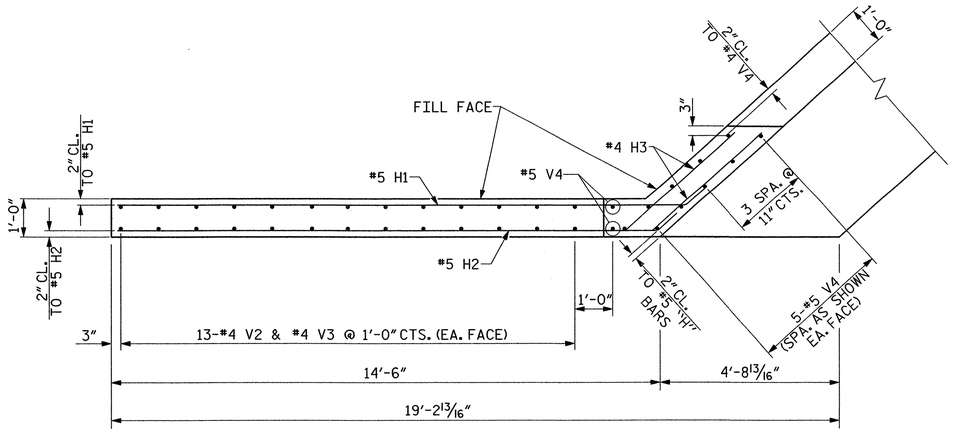
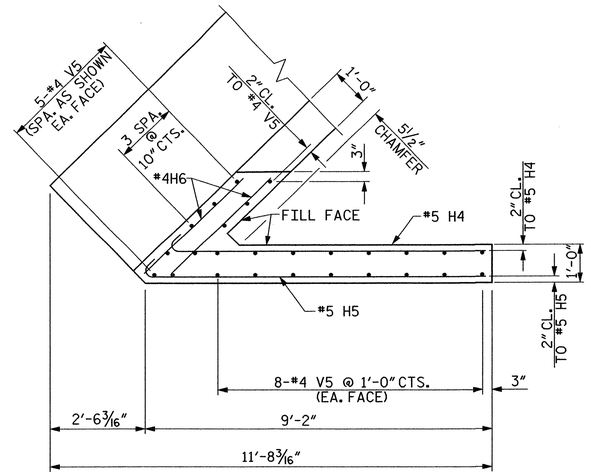
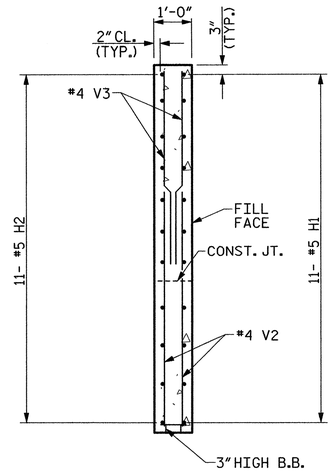
7/3/2012 9:09:53 AM R:\Structures\B4497_SD_E2.dgn



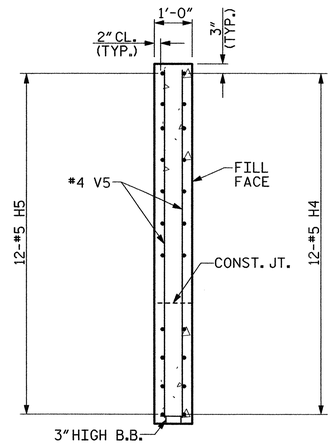
PLAN OF LEFT WING - W1



PLAN OF RIGHT WING - W2



SECTION X-X



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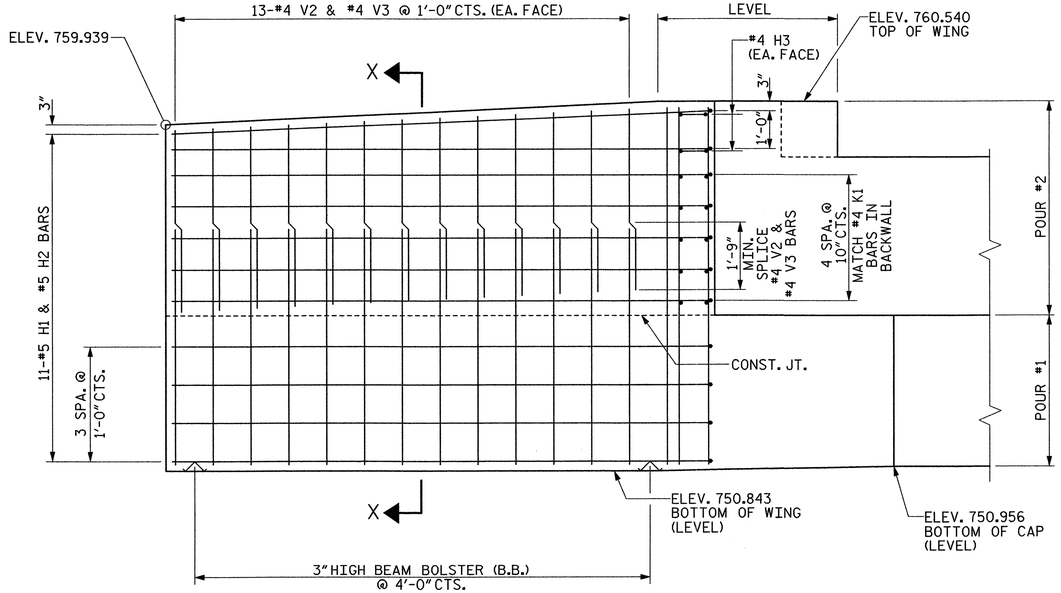
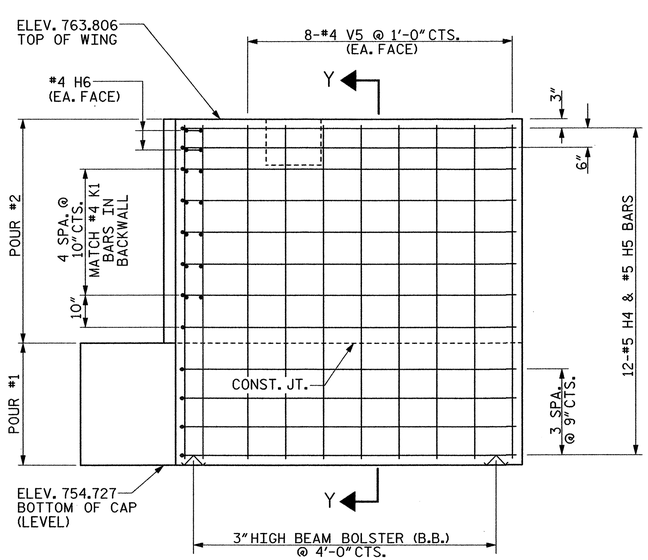


ELEVATION OF LEFT WING - W1



ELEVATION OF RIGHT WING - W2

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER TIERRE R. PETERSON

7/6/12

PLANS PREPARED BY:

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WWW.MULKEYINC.COM
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 2 OF 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 12/11
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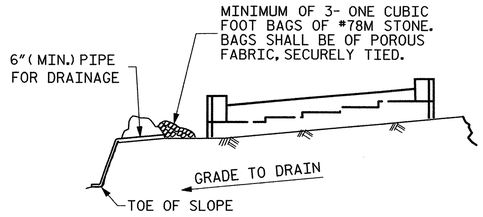
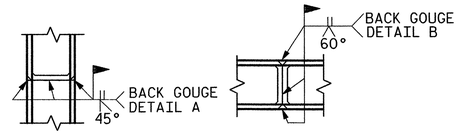


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

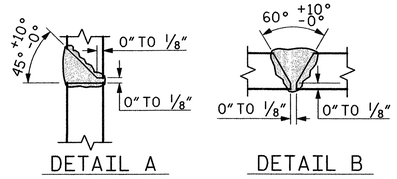
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



*PILE VERTICAL

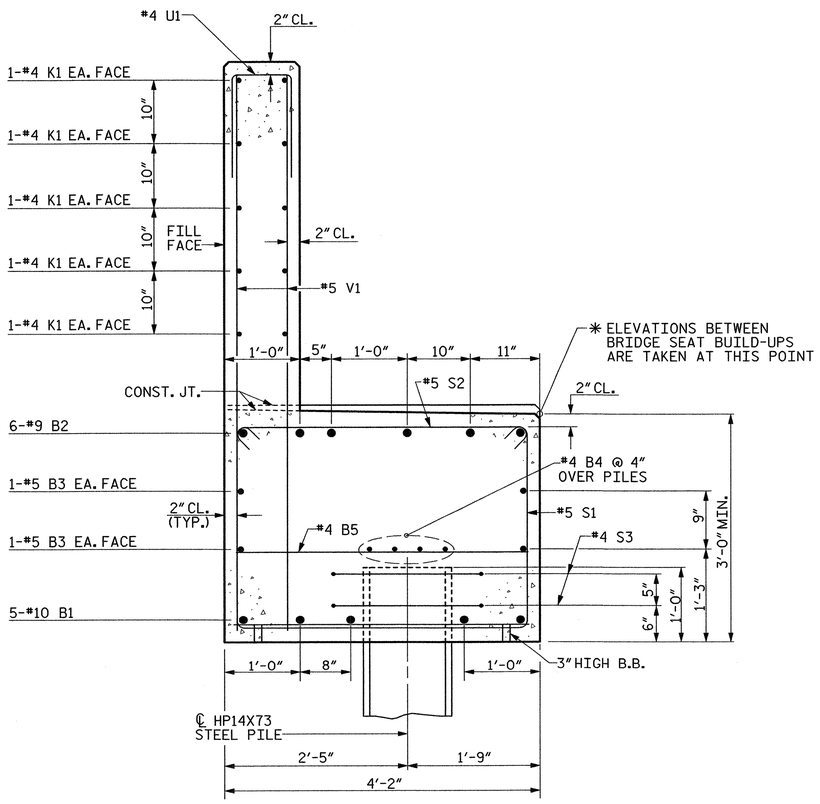
*PILE HORIZONTAL OR VERTICAL



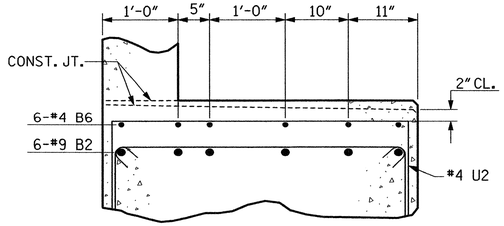
DETAIL A DETAIL B

PILE SPLICE DETAILS

*POSITION OF PILE DURING WELDING.

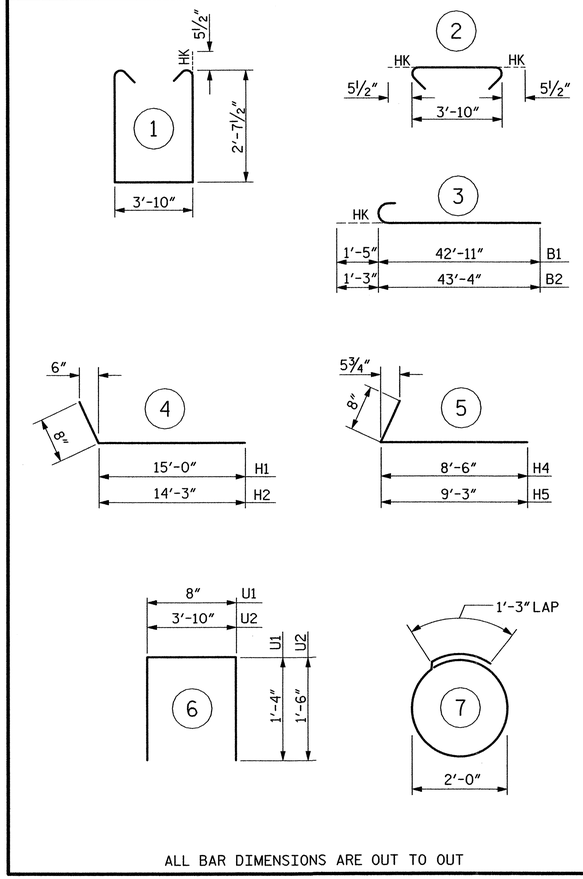


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#10	3	44'-4"	1908
B2	12	#9	3	44'-7"	1819
B3	8	#5	STR	40'-5"	337
B4	12	#4	STR	27'-7"	221
B5	19	#4	STR	3'-10"	49
B6	6	#4	STR	17'-3"	69
B7	30	#4	STR	2'-8"	53
H1	11	#5	4	15'-8"	180
H2	11	#5	4	14'-11"	171
H3	4	#4	STR	3'-10"	10
H4	12	#5	5	9'-2"	115
H5	12	#5	5	9'-10"	123
H6	4	#4	STR	3'-7"	10
K1	30	#4	STR	27'-7"	553
S1	66	#5	1	10'-0"	688
S2	66	#5	2	4'-9"	327
S3	24	#4	7	7'-7"	122
U1	69	#4	6	3'-4"	154
U2	38	#4	6	6'-10"	173
V1	138	#5	STR	7'-8"	1103
V2	26	#5	STR	6'-5"	174
V3	26	#5	STR	4'-9"	129
V4	12	#5	STR	9'-3"	116
V5	26	#5	STR	8'-8"	235

TOTAL REINFORCING STEEL	8839 lbs.
CLASS "A" CONCRETE - CU. YARDS	
POUR 1 - CAP & LOWER WINGS	45.4 cu. yds.
POUR 2 - UPPER WINGS & BACKWALL	18.9 cu. yds.
TOTAL	64.3 cu. yds.
HP14X73 STEEL PILES	
12 PILES REQUIRED - LIN. FEET	800

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON 7/10/12

PLANS PREPARED BY:

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PO Box 32127
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NC LICENSE NO. C-1031

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 12/11
CHECKED BY : T. R. PETERSON DATE : 3/12

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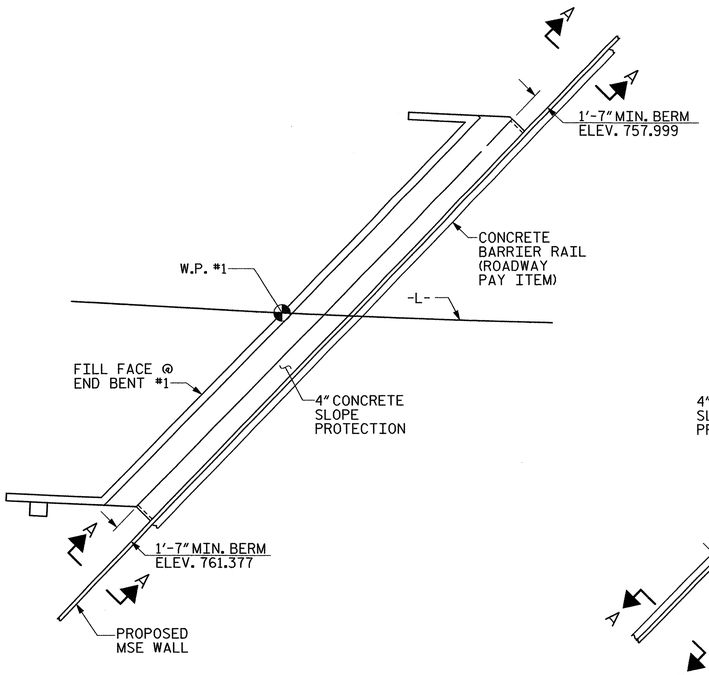
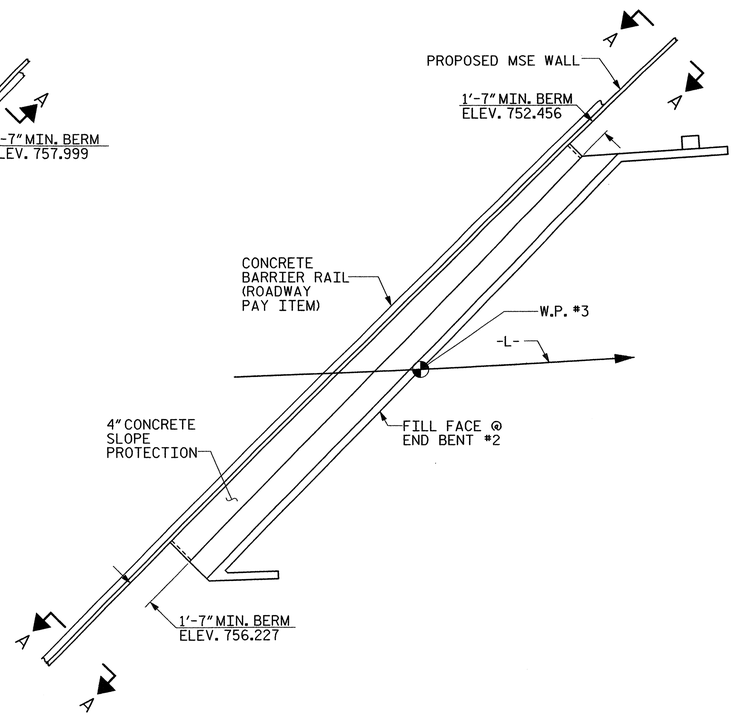




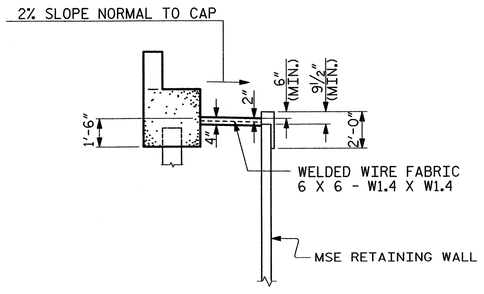
PLAN

NOTES

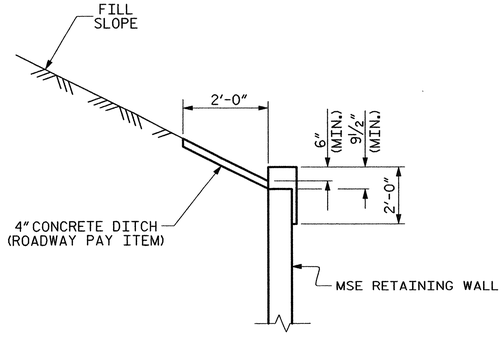
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

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 FINISHED TO THE SATISFACTION OF THE ENGINEER. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 20" WIDE. THE COST OF THE WELDED WIRE FABRIC SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

BRIDGE @ STA. 20+11.91 -L-	4" SLOPE PROTECTION	WELDED WIRE FABRIC 20 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT #1	19	71
END BENT #2	25	74

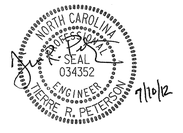


SECTION ALONG ℄ ROADWAY



SECTION A-A

PROJECT NO. B-4497
DAVIDSON COUNTY
STATION: 20+11.91 -L-



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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 12/11
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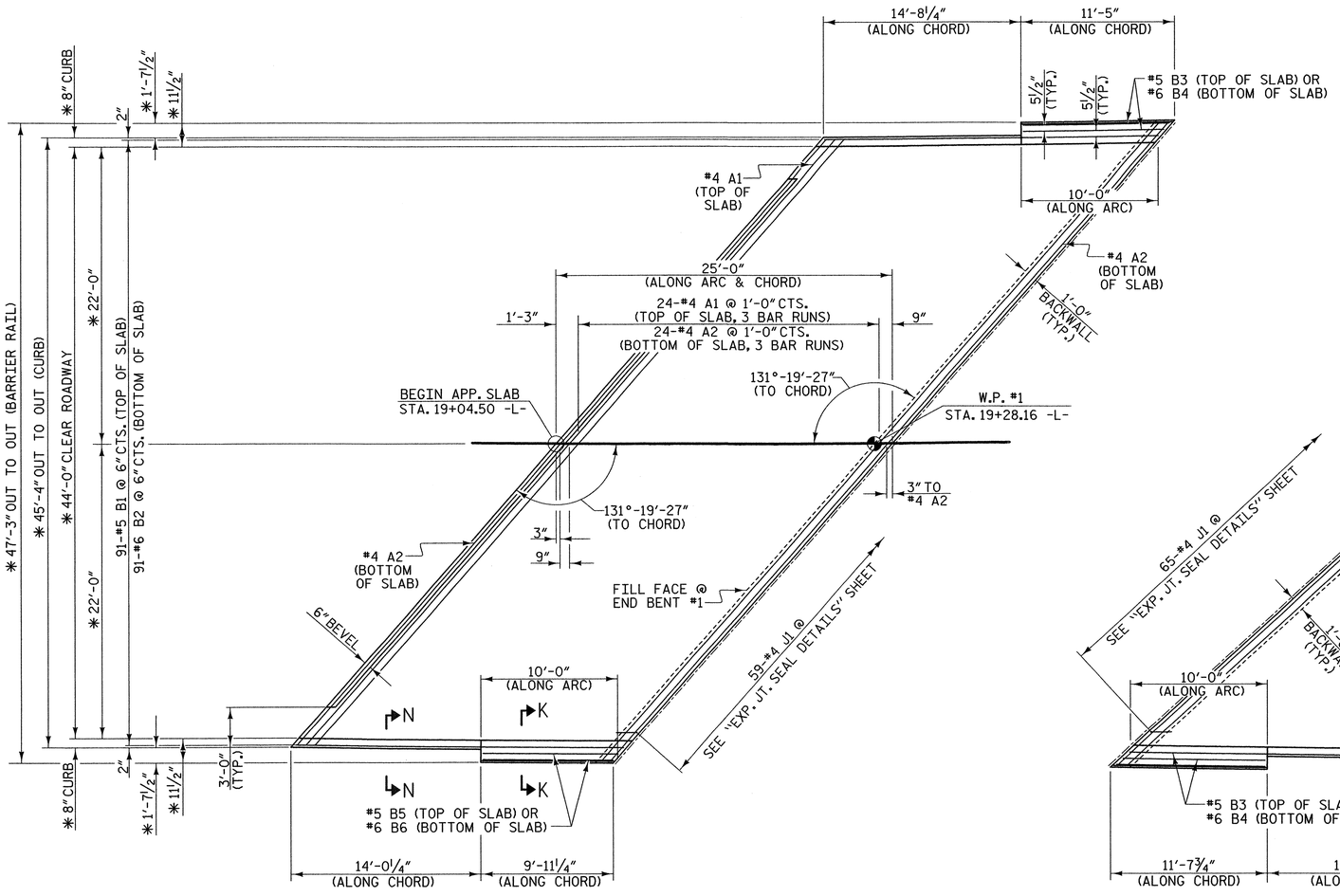
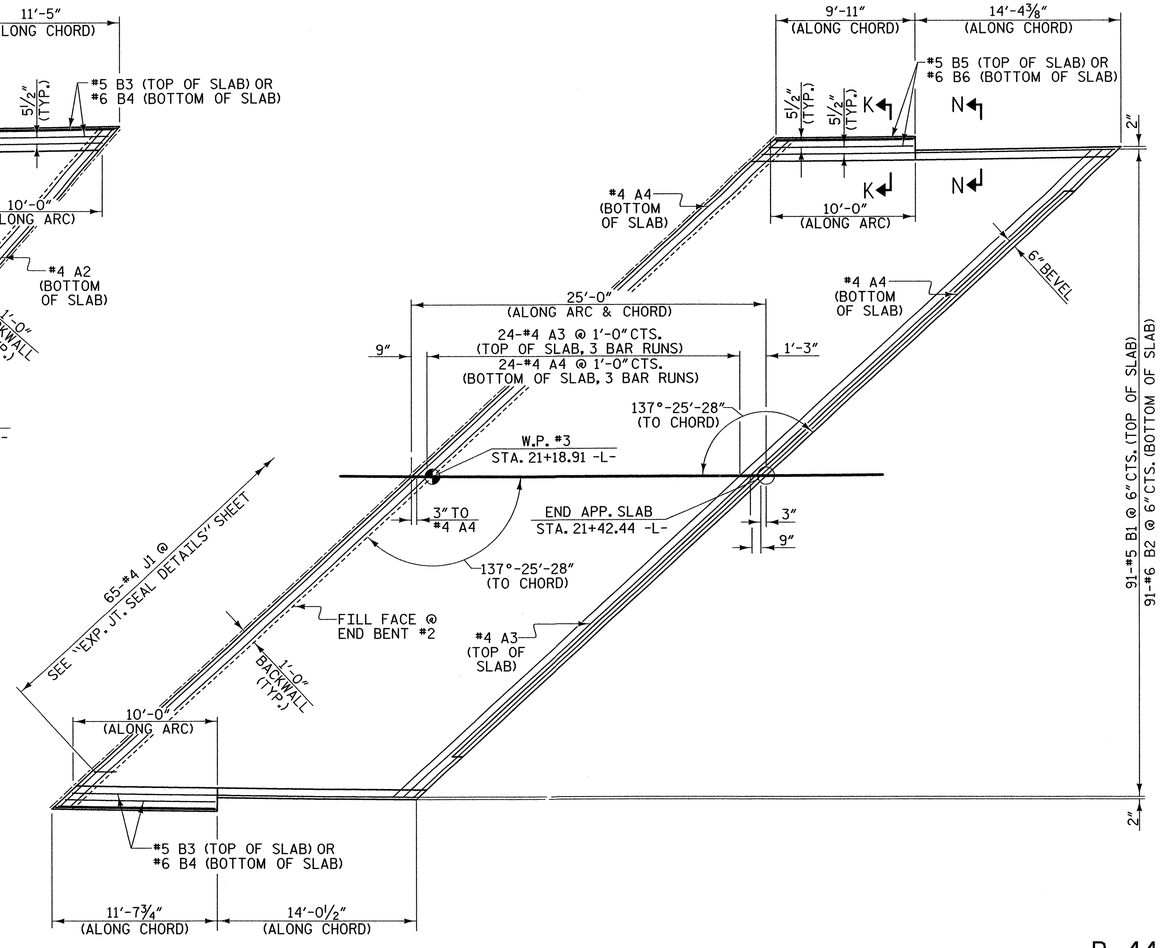


PLAN @ END BENT #1



PLAN @ END BENT #2

*RADIAL DIMENSION

NOTE: ARC OFFSETS ARE NEGLIGIBLE, THEREFORE NOT SHOWN.

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF BRIDGE APPROACH SLAB

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER TIMOTHY R. PETERSON 7/16/12

PLANS PREPARED BY:

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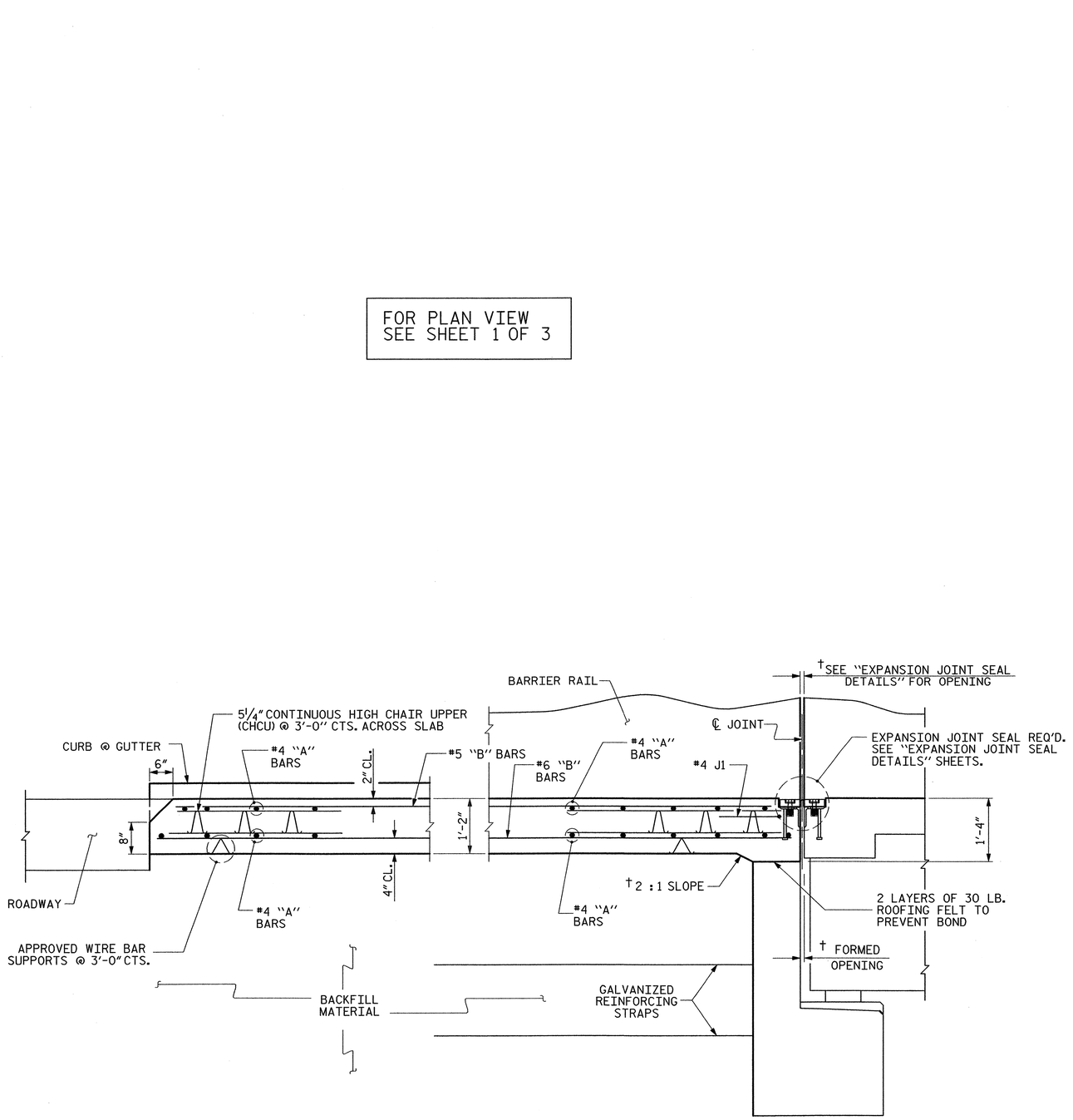
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			34

DRAWN BY : W. B. ALLEN DATE : 1/12
CHECKED BY : T. R. PETERSON DATE : 3/12

7/3/2012 9:15:33 AM R:\Structures\B4497_SD_AS_01.dgn

FOR PLAN VIEW
SEE SHEET 1 OF 3



† NORMAL TO END BENT

SECTION THRU SLAB

NOTES

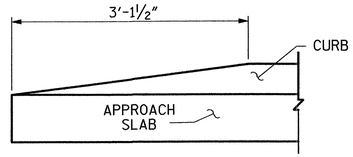
APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

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

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

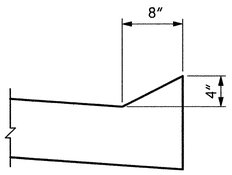
FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

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

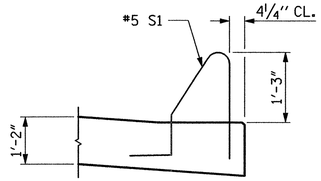


END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS



SECTION N-N



SECTION K-K

BILL OF MATERIAL

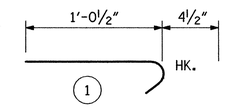
APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	75	#4	STR	21'-5"	1073
A2	78	#4	STR	21'-3"	1107
✳B1	91	#5	STR	23'-1"	2191
B2	91	#6	STR	24'-4"	3326
✳B3	2	#5	STR	10'-5"	22
B4	2	#6	STR	10'-5"	31
✳B5	2	#5	STR	9'-7"	20
B6	2	#6	STR	9'-7"	29
✳J1	59	#4	1	1'-5"	56
REINFORCING STEEL ✳✳ LBS.					4493
✳EPOXY COATED REINFORCING STEEL ✳✳ LBS.					3362
CLASS AA CONCRETE ✳✳ C. Y.					50.1

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A3	75	#4	STR	23'-8"	1186
A4	78	#4	STR	23'-6"	1224
✳B1	91	#5	STR	23'-1"	2191
B2	91	#6	STR	24'-4"	3326
✳B3	2	#5	STR	10'-5"	22
B4	2	#6	STR	10'-5"	31
✳B5	2	#5	STR	9'-7"	20
B6	2	#6	STR	9'-7"	29
✳J1	65	#4	1	1'-5"	62
REINFORCING STEEL ✳✳ LBS.					4610
✳EPOXY COATED REINFORCING STEEL ✳✳ LBS.					3481
CLASS AA CONCRETE ✳✳ C. Y.					50.1

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED. SEE SHEET 3 OF 3.

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 2 OF 3

ASSEMBLED BY : W. B. ALLEN	DATE : 12/11
CHECKED BY : T. R. PETERSON	DATE : 3/12
DRAWN BY : EEM 3/95	REV. 5/7/03R RWW/JTE
CHECKED BY : VAP 3/95	REV. 5/1/06RR KMM/GM
	REV. 10/1/11 MAA/GM

PLANS PREPARED BY:
MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, N.C. 27636
(919) 851-1912
(919) 851-1912 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1021

THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

NORTH CAROLINA PROFESSIONAL SEAL 034352 ENGINEER PIERRE R. PETERSON

7/10/12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			34

STD. NO. BAS2

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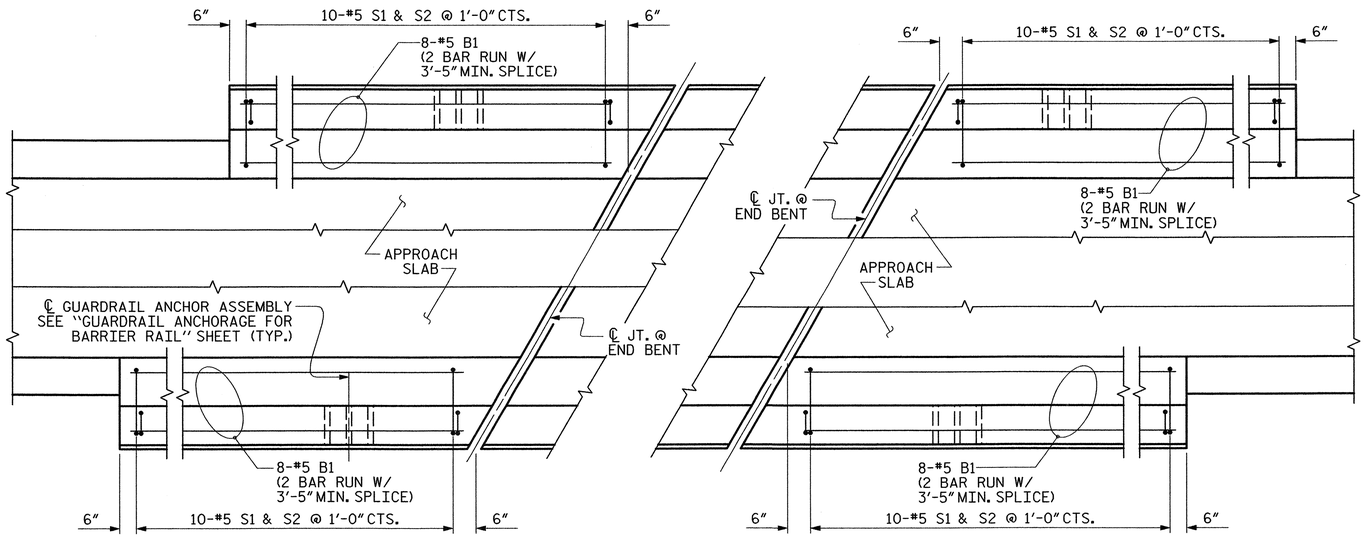


PLAN OF BARRIER RAIL

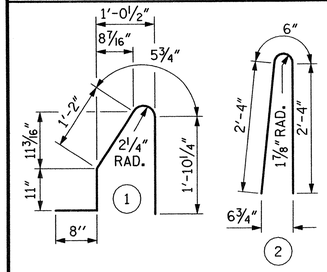
NOTES

THE COST OF THE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "CONCRETE BARRIER RAIL".

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES



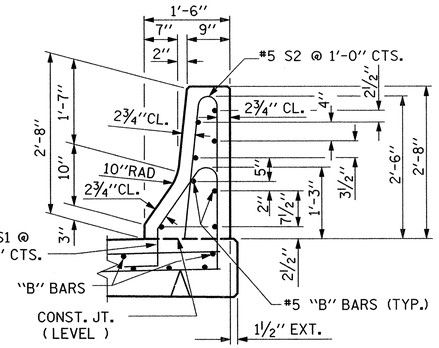
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

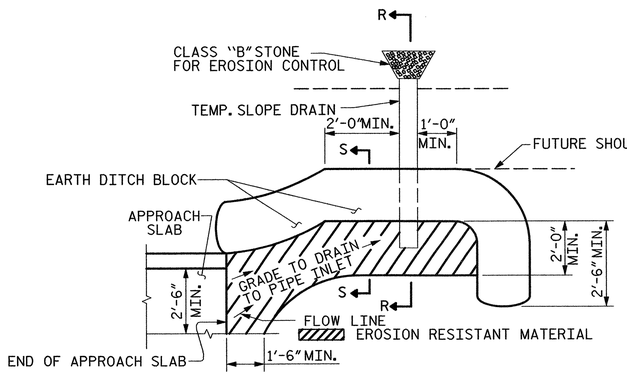
BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	64	#5	STR	7'-3"	484
✳S1	40	#5	1	5'-1"	212
✳S2	40	#5	2	5'-2"	216

✳EPOXY COATED REINFORCING STEEL	LBS.	912
CLASS AA CONCRETE	C. Y.	4.4
CONCRETE BARRIER RAIL	43.00	LIN. FT.

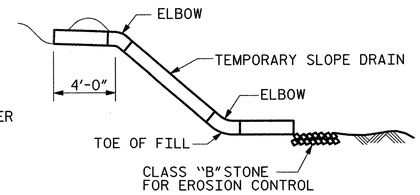


SECTION THRU RAIL

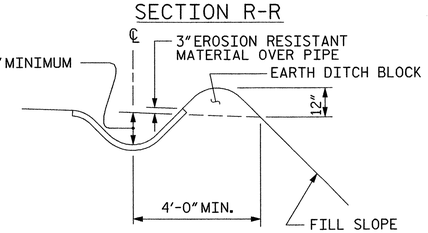


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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.

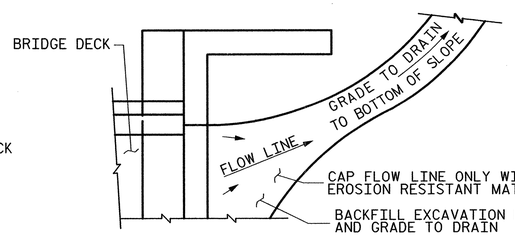
PLAN VIEW



SECTION R-R



SECTION S-S



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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-4497

DAVIDSON COUNTY

STATION: 20+11.91 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			34

THIS STANDARD DRAWING REVIEWED & ADOPTED FOR USE AT THE REFERENCED LOCATION BY THE UNDERSIGNED:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 034352 TERRIE R. PETERSON

7/10/12

PLANS PREPARED BY:

MULKEY
ENGINEERS & CONSULTANTS
PO Box 33127
Raleigh, N.C. 27636
(919) 851-1212
(919) 851-1213 (FAX)
WWW.MULKEYINC.COM
NC LICENSE NO. C-1031

ASSEMBLED BY :	W. B. ALLEN	DATE :	1/12
CHECKED BY :	T. R. PETERSON	DATE :	3/12
DRAWN BY : FCJ	11/88	REV. 5/7/03	RWW/JTE
CHECKED BY : ARB	11/88	REV. 5/1/06RRR	MAA/KMM
		REV. 10/1/11	MAA/GM

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STD. NO. BAS4

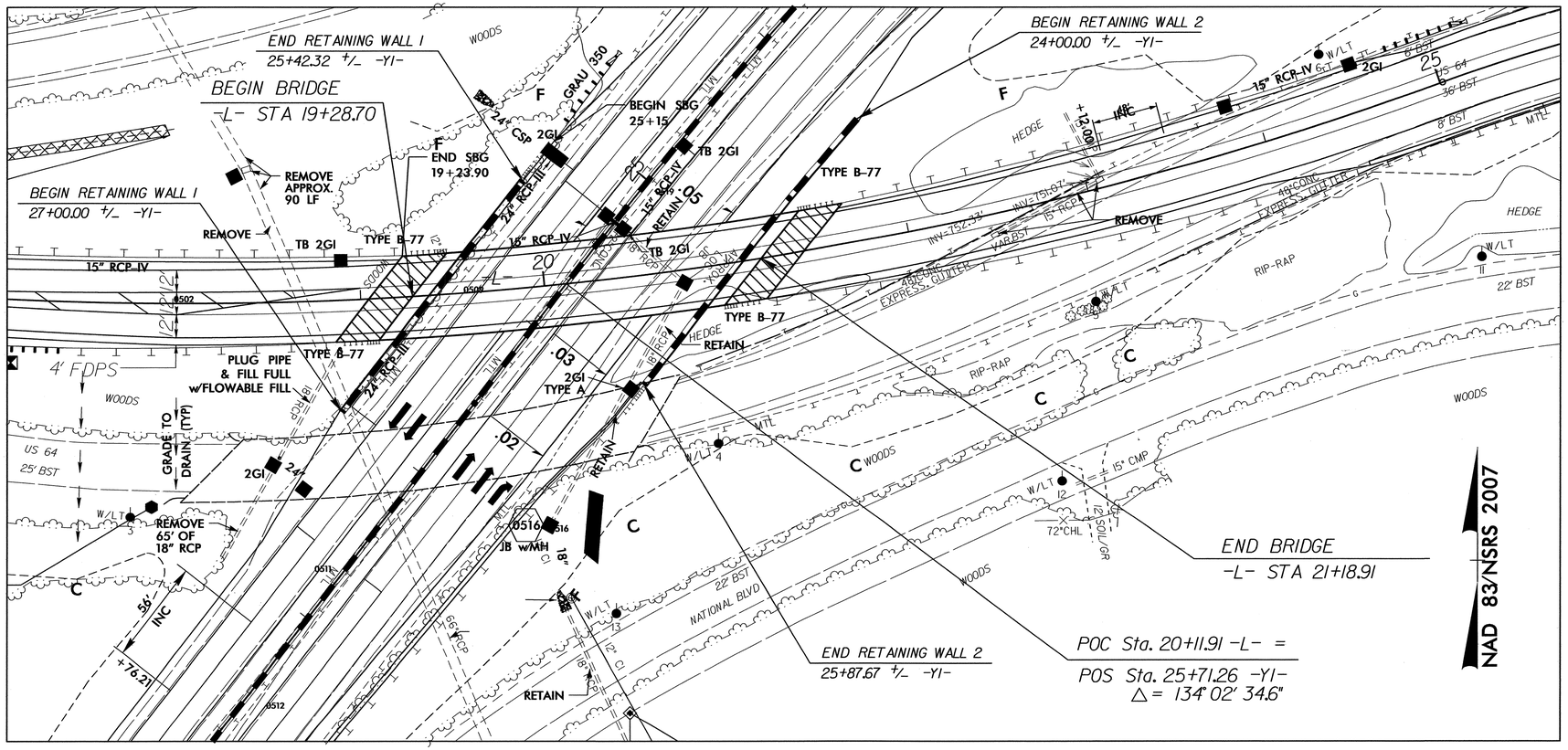
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER ELAINE C CLARK

SIGNATURE 9/27/12 DATE

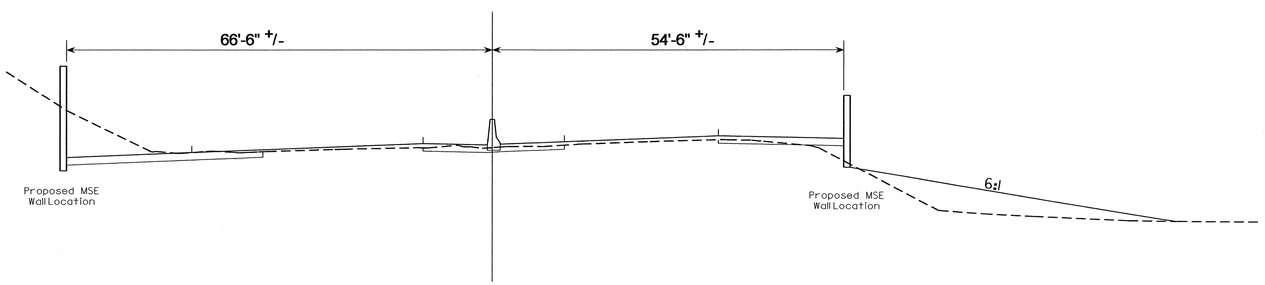
ENGINEER

SIGNATURE DATE



LOCATION SKETCH

-Y1-
STA. 25+50.00



TYPICAL SECTION

TOTAL STRUCTURE QUANTITIES

MSE RETAINING WALL @ END BENT #1	2353 SQ. FT.
MSE RETAINING WALL @ END BENT #2	2408 SQ. FT.

PREPARED BY: EJS	DATE: 8/12
REVIEWED BY: SCC	DATE: 8/12

PROJECT NO.: B-4497

DAVIDSON *COUNTY*

STATION: 25+42.32-Y1- TO 27+00.00-Y1-
24+00.00-Y1- TO 25+87.67-Y1-

SHEET 1 OF 4

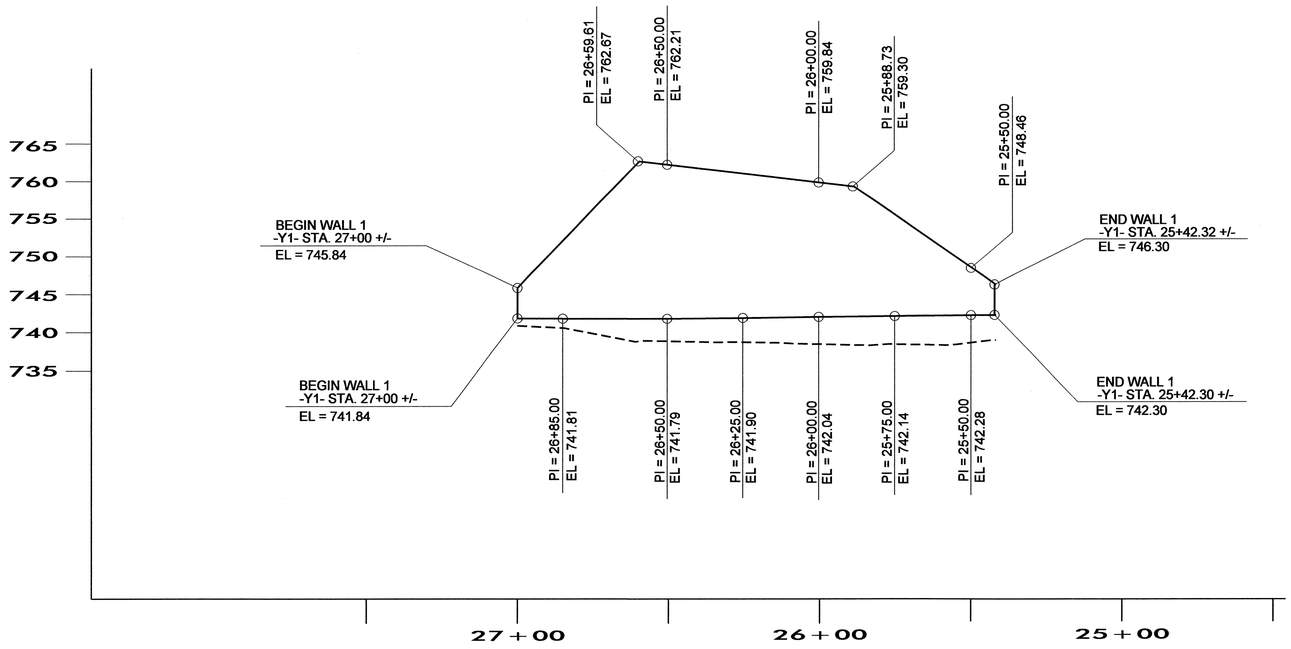
GEOTECHNICAL ENGINEERING UNIT

☐ *EASTERN REGIONAL OFFICE*
☒ *WESTERN REGIONAL OFFICE*
☐ *CONTRACT OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

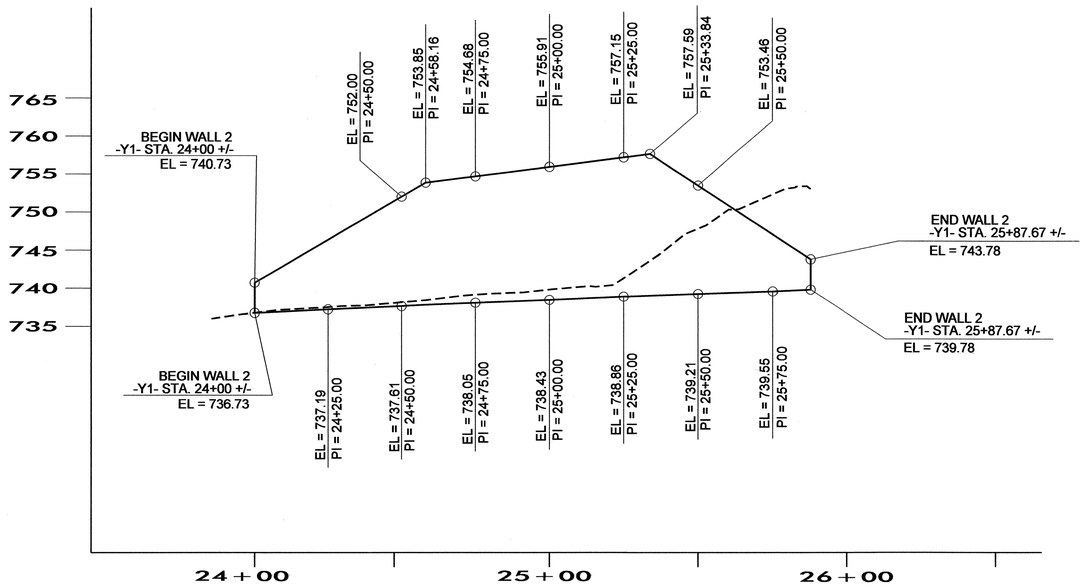
MSE
RETAINING WALL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W3-1
1	-	-	3	-	-	TOTAL SHEETS
2	-	-	4	-	-	4



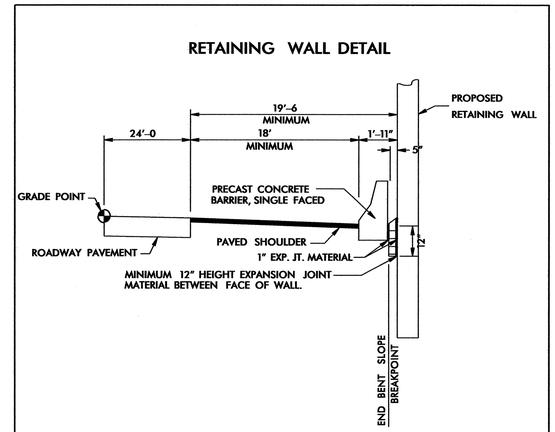
WALL ENVELOPE - END BENT #1

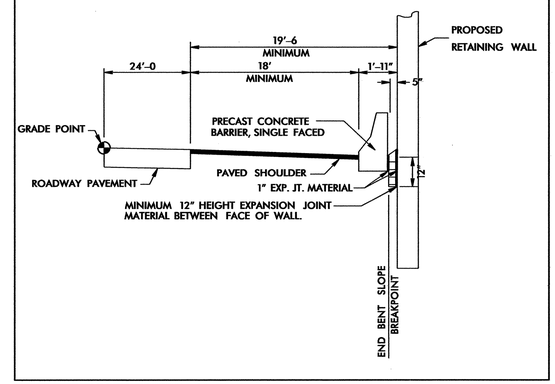
LOOKING AT FRONT FACE OF WALL



WALL ENVELOPE - END BENT #2

LOOKING AT FRONT FACE OF WALL





GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK

SIGNATURE 9/24/12 DATE

ENGINEER

SIGNATURE DATE

PREPARED BY: EJS	DATE: 8/12
REVIEWED BY: SCC	DATE: 8/12

PROJECT NO.: B-4497

DAVIDSON *COUNTY*

STATION: 25+42.32-Y1- TO 27+00.00-Y1-

24+00.00-Y1- TO 25+87.67-Y1-

SHEET 2 OF 4

GEOTECHNICAL ENGINEERING UNIT

☐ *EASTERN REGIONAL OFFICE*

☒ *WESTERN REGIONAL OFFICE*

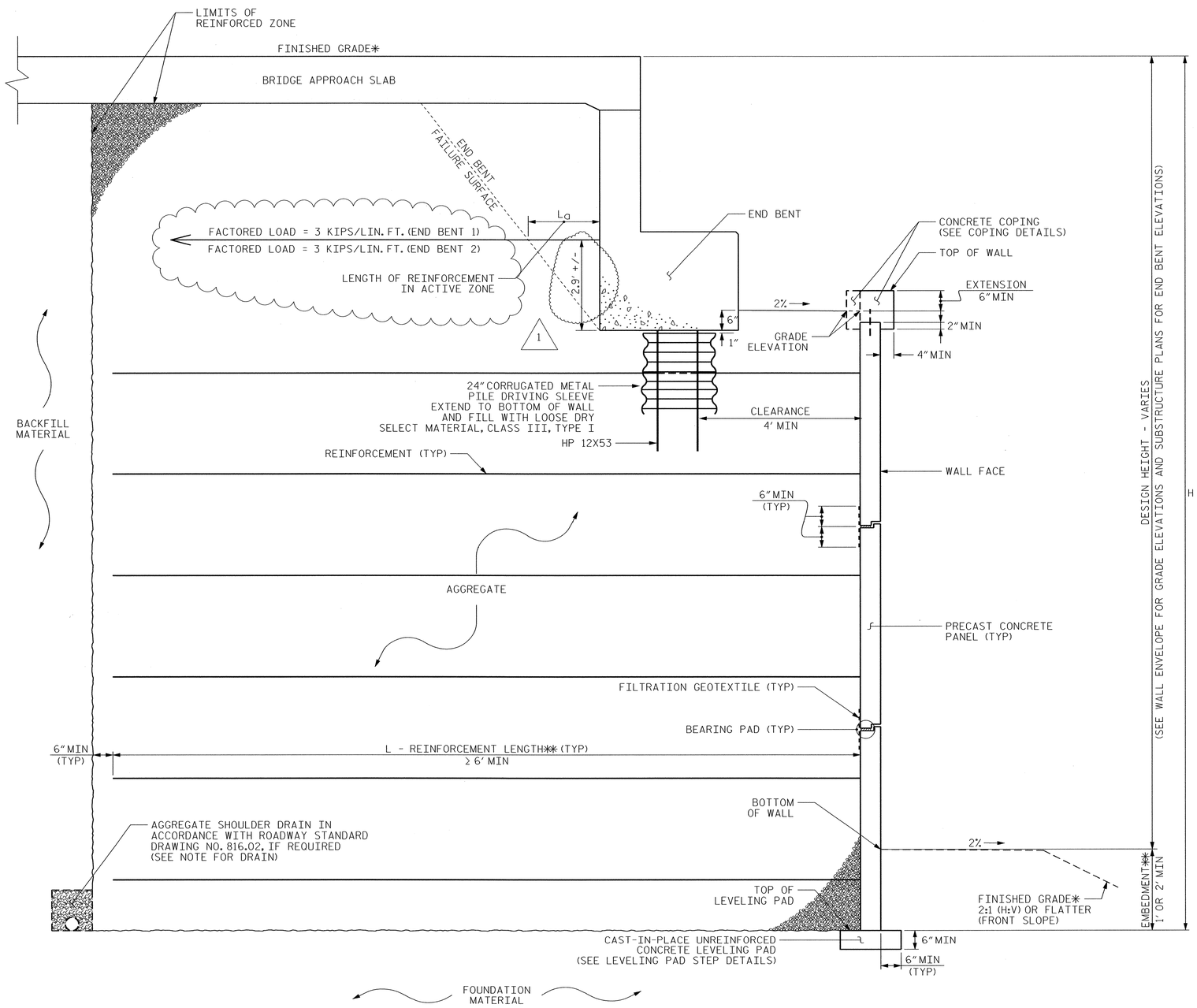
☐ *CONTRACT OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE
RETAINING WALLS

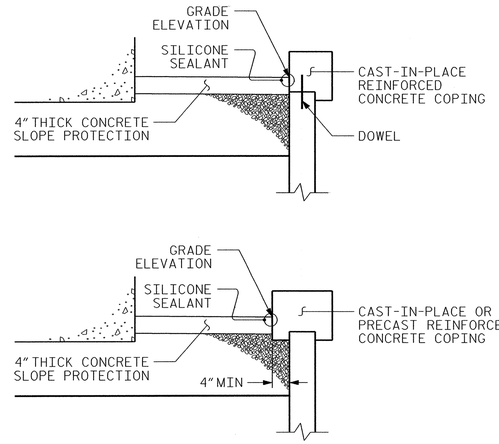
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-2
1			3			TOTAL SHEETS
2			4			4

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK — SIGNATURE 11/3/12 DATE	SIGNATURE DATE



MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
**SEE MSE RETAINING WALLS PROVISION FOR EMBEDMENT AND REINFORCEMENT LENGTH REQUIREMENTS.



COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

PREPARED BY: EJS	DATE: 8/12
REVIEWED BY: SCC	DATE: 8/12

PROJECT NO.: B-4497

DAVIDSON ***COUNTY***

STATION: 25+42.32-Y1- TO 27+00.00-Y1-
24+00.00-Y1- TO 25+87.67-Y1-

SHEET 3 OF 4

GEOTECHNICAL ENGINEERING UNIT

☐ ***EASTERN REGIONAL OFFICE***
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☐ ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-3
1	SCC	11-7-12	3			TOTAL SHEETS
2			4			4

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 29869 ENGINEER SHANE C CLARK SIGNATURE 11/7/12 DATE	SIGNATURE DATE

NOTES:

FOR MECHANICALLY STABILIZED EARTH (MSE) RETAINING WALLS, SEE MECHANICALLY STABILIZED EARTH RETAINING WALLS PROVISION.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALLS AT END BENT 1 AND 2.

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALLS AT END BENT 1 AND 2.

A SMOOTH ARCHITECTURAL FINISH IS REQUIRED FOR PRECAST CONCRETE PANELS FOR RETAINING WALLS AT END BENT 1 AND 2.

A DRAIN MAY BE REQUIRED FOR RETAINING WALLS AT END BENT 1 AND 2.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALLS AT END BENT 1 AND 2, SURVEY WALL LOCATIONS AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO. FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 4900 LB/SF
4) MINIMUM REINFORCEMENT LENGTH (L) = 1 * H
5) MINIMUM EMBEDMENT ELEVATION = 2 FT. BELOW FINISHED GRADE
6) AGGREGATE PARAMETERS:

AGGREGATE TYPE*	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
COARSE	110	38	0
FINE	125	34	0
*SEE MSE RETAINING WALLS PROVISION FOR COARSE AND FINE AGGREGATE MATERIAL REQUIREMENTS.			

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	28	50

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 LOCATED AT STATION 19+28.70 -L- AND END BENT No. 2 LOCATED AT STATION 21+16.14 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3"BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 19+28.70 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO. 2 LOCATED AT STATION 21+16.14 -L- WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

DESIGN RETAINING WALLS AT END BENT 1 AND 2 FOR VERTICAL PIPES (PILE DRIVING SLEEVES) EXTENDING THROUGH THE WALL REINFORCED ZONE AT THE PILE LOCATIONS SHOWN ON THE FOUNDATION PLANS. VERIFY PILE SLEEVE LOCATIONS AND ELEVATIONS BEFORE BEGINNING THE MSE WALL DESIGN AND CONSTRUCTION.

PILE DRIVING SLEEVES FOR END BENTS 1 AND 2 SHALL BE INSTALLED DURING CONSTRUCTION OF THE WALL. THE SLEEVES ARE TO REMAIN PLUMB DURING WALL CONSTRUCION

AFTER PILES HAVE BEEN DRIVEN, FILL PILES DRIVING SLEEVES AT END BENT 1 AND 2 WITH DRY SELECT MATERIAL, CLASS III, TYPE I, BEFORE CONSTRUCTION OF THE END BENT CAP BEGINS.

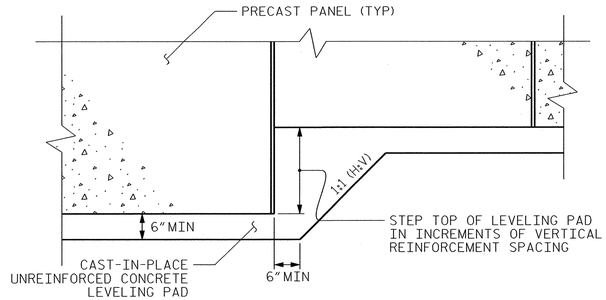
DESIGN RETAINING WALLS AT END BENT 1 AND 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

1

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALLS AT END BENT 1 AND 2.

DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALLS AT END BENT 1 AND 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

"TEMPORARY SHORING" MAY REQUIRED FOR RETAINING WALLS AT END BENT 1 AND 2 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY, STRUCTURE or TRAFFIC CONTROL PLANS.



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PREPARED BY: EJS	DATE: 8/12
REVIEWED BY: SCC	DATE: 8/12

PROJECT NO.: B-4497
DAVIDSON ***COUNTY***
STATION: 25+42.32-Y1- TO 27+00.00-Y1-
24+00.00-Y1- TO 25+87.67-Y1-

SHEET 4 OF 4

GEOTECHNICAL ENGINEERING UNIT

☐ ***EASTERN REGIONAL OFFICE***
☒ ***WESTERN REGIONAL OFFICE***
☐ ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-4
1	SCC	11-7-12	3			TOTAL SHEETS
2			4			4

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

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

ENGLISH

JANUARY, 1990

STD. NO. SN