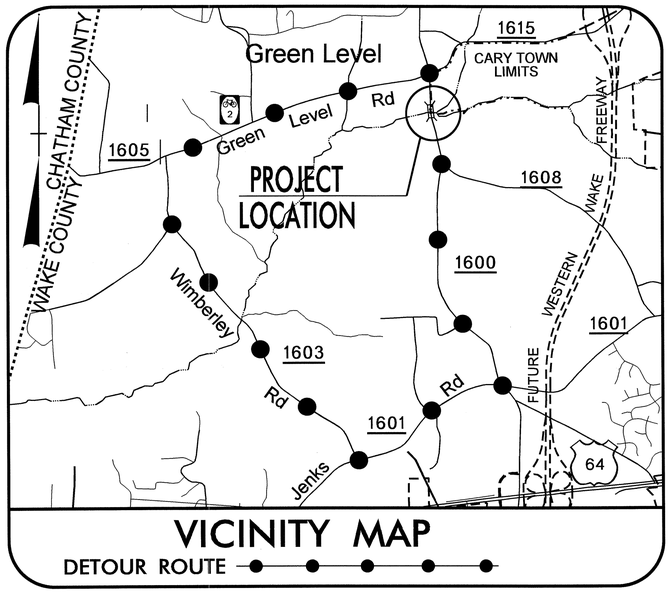
TIP PROJECT: B-4697

CONTRACT: C202813



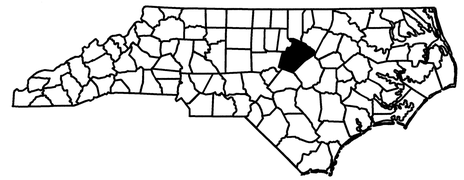
STRUCTURE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4697		

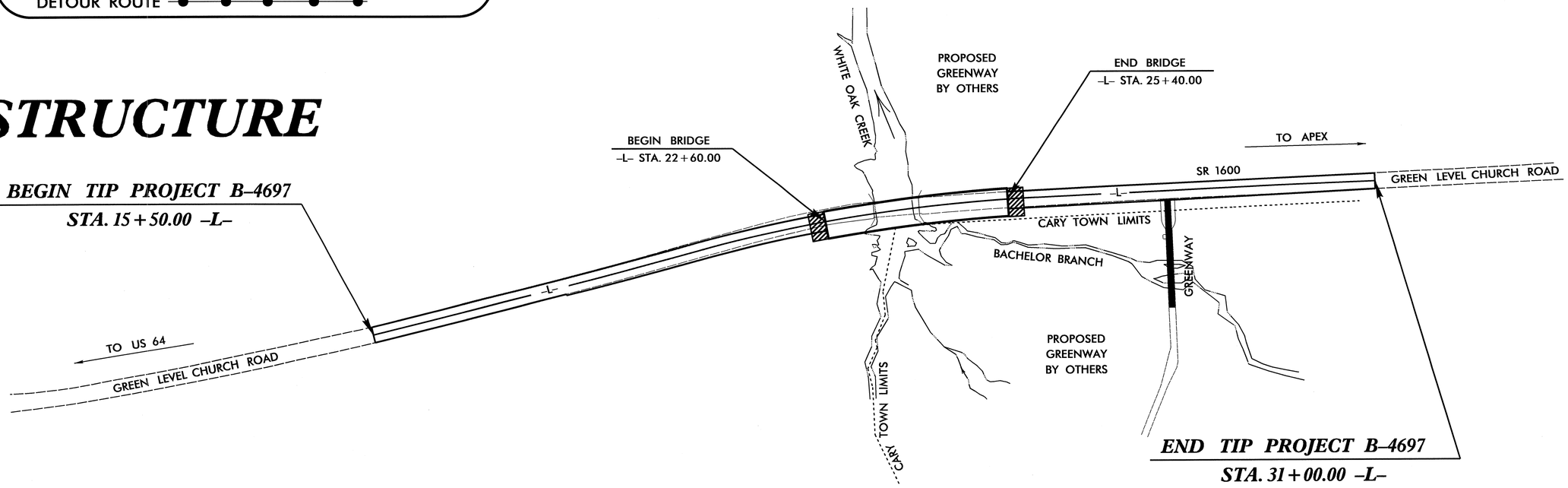
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38474.1.1	BRZ-1600(9)	PE
38474.2.1	BRZ-1600(9)	ROW, UTIL
38474.3.1	BRZ-1600(9)	CONST.



LOCATION: BRIDGE NO. 55 OVER WHITE OAK CREEK ON SR 1600 (GREEN LEVEL CHURCH RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE BOARDWALK AND STRUCTURE

NAD 83/95



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2012 = 7,900
ADT 2035 = 22,000
DHV = 8 %
D = 60 %
T = 5 % *
V = 50 MPH
* TTST = 2% DUAL 3%
FUNC CLASS = LOCAL
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4697 = 0.241 MILES

LENGTH STRUCTURE TIP PROJECT B-4697 = 0.053 MILES

TOTAL LENGTH TIP PROJECT B-4697 = 0.294 MILES

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

2012 STANDARD SPECIFICATIONS

LETTING DATE:
APRIL 17, 2012

J. M. BAILEY, P.E.
PROJECT ENGINEER

D. R. CALHOUN, P.E.
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

10-JAN-2012 13:42
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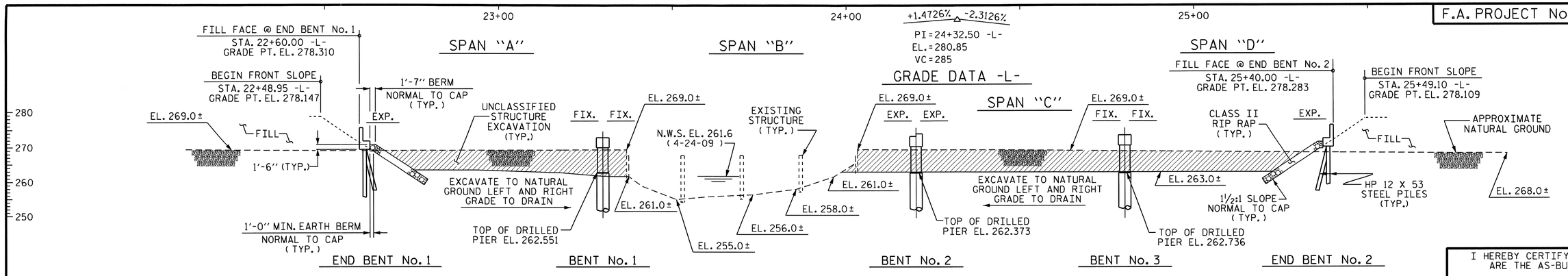
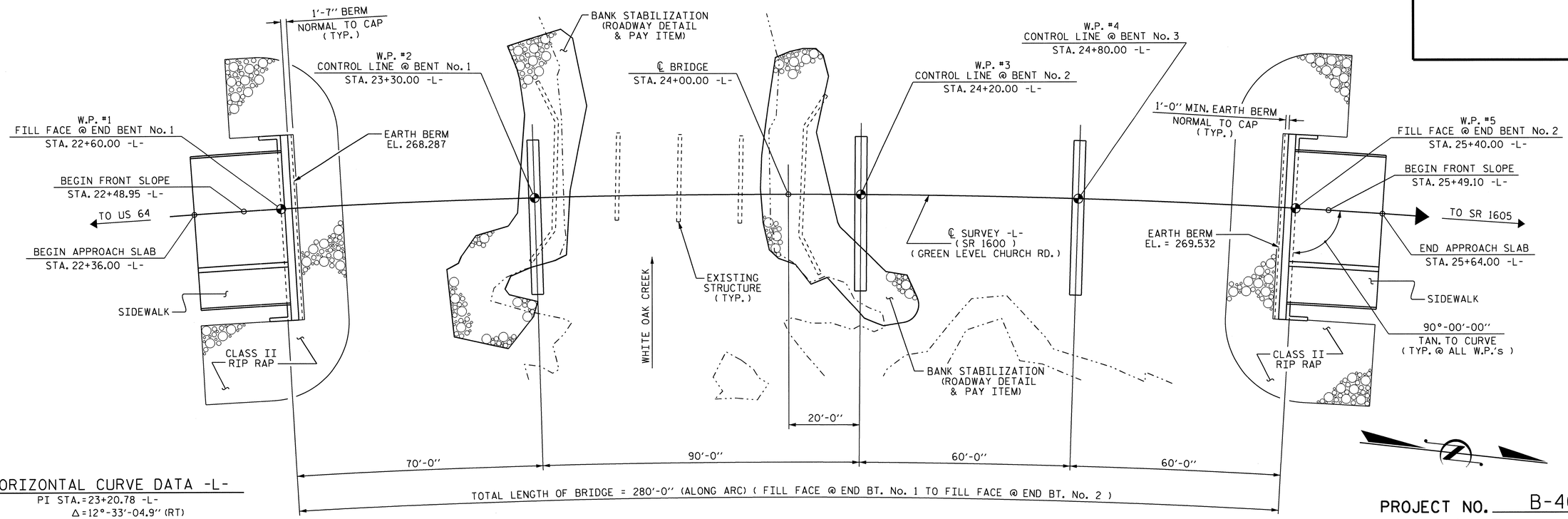
F.A. PROJECT No. BRZ-1600(9)



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

SECTION ALONG ℄ SURVEY -L-

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



PLAN

(PILES AND DRILLED PIERS NOT SHOWN IN PLAN VIEW FOR CLARITY)

HORIZONTAL CURVE DATA -L-

PI STA.=23+20.78 -L-
Δ=12°-33'-04.9" (RT)
D=2°-23'-14.4"
L=525.75
T=263.93
R=2400.00

HYDROGRAPHIC DATA

DESIGN DISCHARGE	= 2100 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YR
DESIGN HIGH WATER ELEVATION	= 267.2
DRAINAGE AREA	= 7.0 SQ. MI.
BASE DISCHARGE (Q100)	= 3380 CFS
BASE HIGH WATER ELEVATION	= 268.5

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	= 4980± CFS
FREQUENCY OF OVERTOPPING FLOOD	= 500± YR
OVERTOPPING FLOOD ELEVATION	= 269.0

OVERTOPPING ELEVATION REPRESENTS HIGH SIDE EDGE OF ROADWAY AT SAG STA. 30+46.50 -L-

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE No. 55

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1600 (GREEN LEVEL CHURCH RD) OVER WHITE OAK CREEK BETWEEN US 64 AND SR 1605

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

DRAWN BY : A. V. ROYAL DATE : 8/11
CHECKED BY : S. B. WILLIAMS DATE : 9/11

20-FEB-2012 15:05
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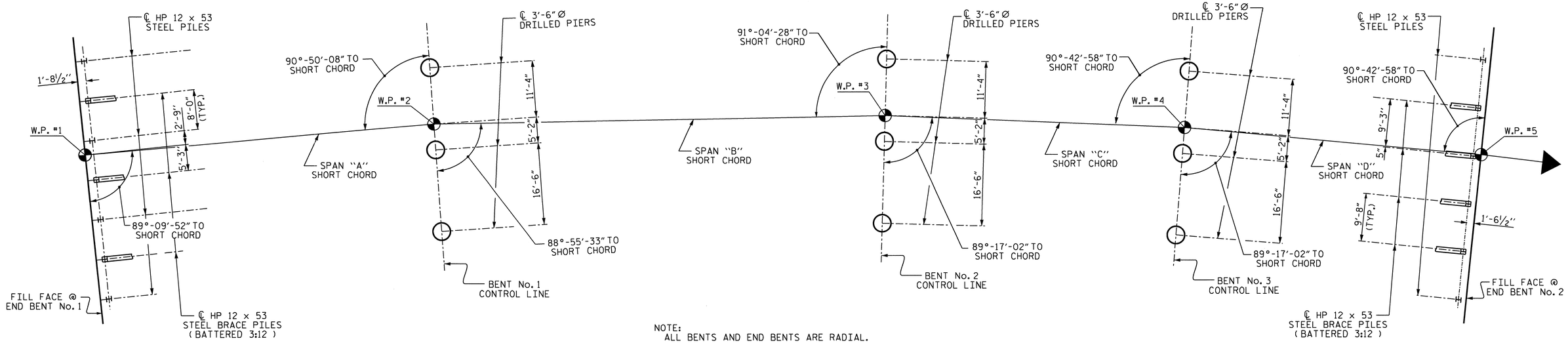
wparker



NOTE:
ALL BENTS AND END BENTS ARE RADIAL.

FOUNDATION LAYOUT

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

NOTES:

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND ROADBED SCARIFIED TO A MINIMUM DEPTH OF 2'-0".

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No. 1 AND END BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT No. 1, AND END BENT No. 2 TO A REQUIRED RESISTANCE OF 180 TONS PER PILE.

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

DRILLED PIERS AT BENT No. 1, BENT No. 2, AND BENT No. 3 ARE DESIGNED FOR A FACTORED RESISTANCE OF 505 TONS PER PIER, 445 TONS PER PIER AND 375 TONS PER PIER RESPECTIVELY. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 100 TSF, 100 TSF AND 80 TSF RESPECTIVELY.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT No. 1 AND BENT No. 2. IF REQUIRED DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 247.7 FT. AND 245.6 FT. RESPECTIVELY, WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

INSTALL DRILLED PIERS AT BENT No. 1 AND BENT No. 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 240.0 FT. AND 236.0 FT, RESPECTIVELY, AND SATISFY THE REQUIRED TIP RESISTANCE.

INSTALL DRILLED PIERS AT BENT No. 3 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 235.0 FT. (LT.), 234.0 FT. (CTR.), AND 233.0 FT. (RT.), RESPECTIVELY, AND SATISFY THE REQUIRED TIP RESISTANCE.

THE SCOUR CRITICAL ELEVATION FOR BENT No. 1, BENT No. 2, AND BENT No. 3 ARE ELEVATION 248.0 FT, 248.0 FT AND 256.0 FT, RESPECTIVELY. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

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

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 1 SPAN @ 17'-9", 2 SPANS @ 17'-0", AND 1 SPAN @ 17'-9" WITH A CLEAR ROADWAY WIDTH OF 24.0 FT. WITH A REINFORCED CONCRETE FLOOR WITH ASPHALT WEARING SURFACE OF 2.25" ON TIMBER JOISTS ON TIMBER CAPS ON TIMBER PILES LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 40 FT. LEFT AND 30 FT. RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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

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

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.

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.

ALL GIRDERS HAVE BEEN DESIGNED FOR TRAFFIC LOADS INCLUDING GIRDERS ADJACENT TO THE SIDEWALK SECTION.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS FOR BENT No. 2 AND BENT No. 3 IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

THE CONTRACTOR MAY CHOOSE TO UTILIZE THE STANDARD OVERHANG FALSEWORK BRACING SYSTEM, SEE "STANDARD OVERHANG FALSEWORK" SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

DRAWN BY : A. V. ROYAL DATE : 9/11
CHECKED BY : S. B. WILLIAMS DATE : 9/11

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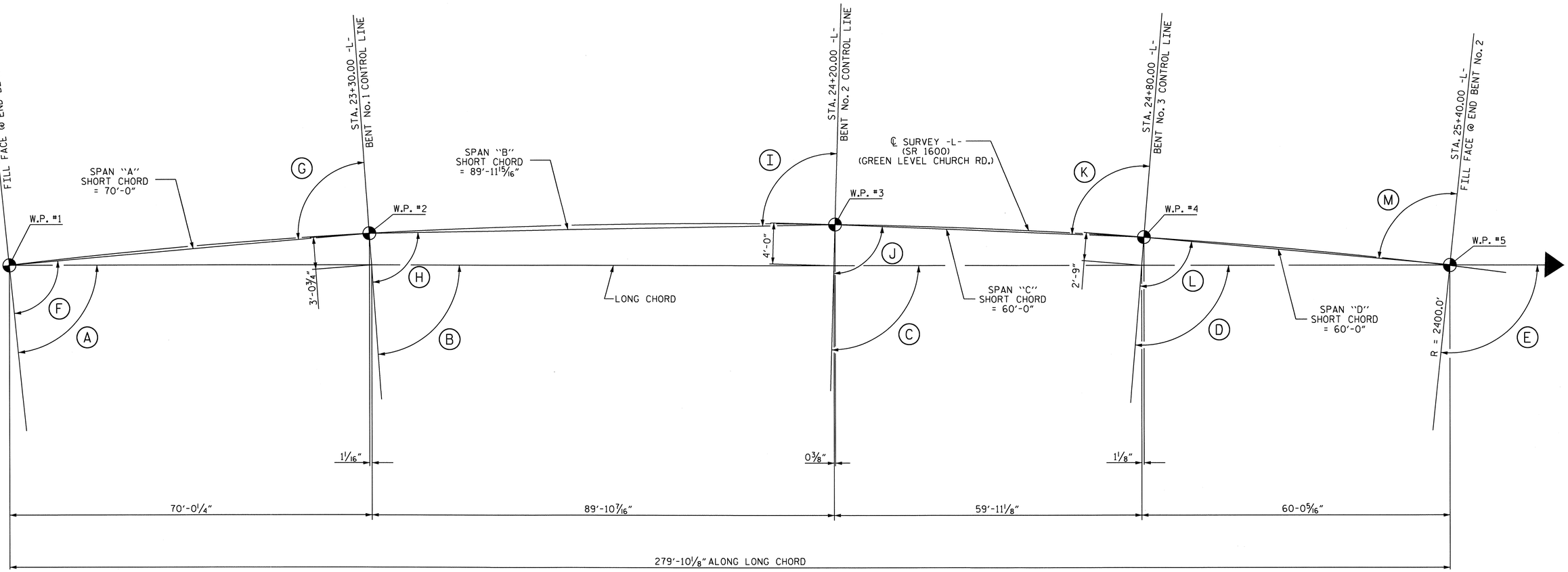
PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON SR 1600 (GREEN LEVEL CHURCH RD) OVER WHITE OAK CREEK BETWEEN US 64 AND SR 1605

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			65



LONG CHORD LAYOUT

ALL BENTS & END BENTS ARE RADIAL TO ℄ SURVEY -L-

HORIZONTAL CURVE DATA -L-

PI STA.=23+20.78 -L-
Δ=12°-33'-04.9" (RT)
D=2°-23'-14.4"
L=525.75
T=263.93
R=2400.00

ANGLES

(A)	86°-39'-28"	(H)	88°-55'-33"
(B)	88°-19'-44"	(I)	91°-04'-28"
(C)	90°-28'-39"	(J)	89°-17'-02"
(D)	91°-54'-36"	(K)	90°-42'-58"
(E)	93°-20'-32"	(L)	89°-17'-02"
(F)	89°-09'-52"	(M)	90°-42'-58"
(G)	90°-50'-08"		

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1600 (GREEN LEVEL CHURCH RD) OVER WHITE OAK CREEK BETWEEN US 64 AND SR 1605

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : A. V. ROYAL DATE : 9/11
CHECKED BY : S. B. WILLIAMS DATE : 9/11

10-JAN-2012 13:41
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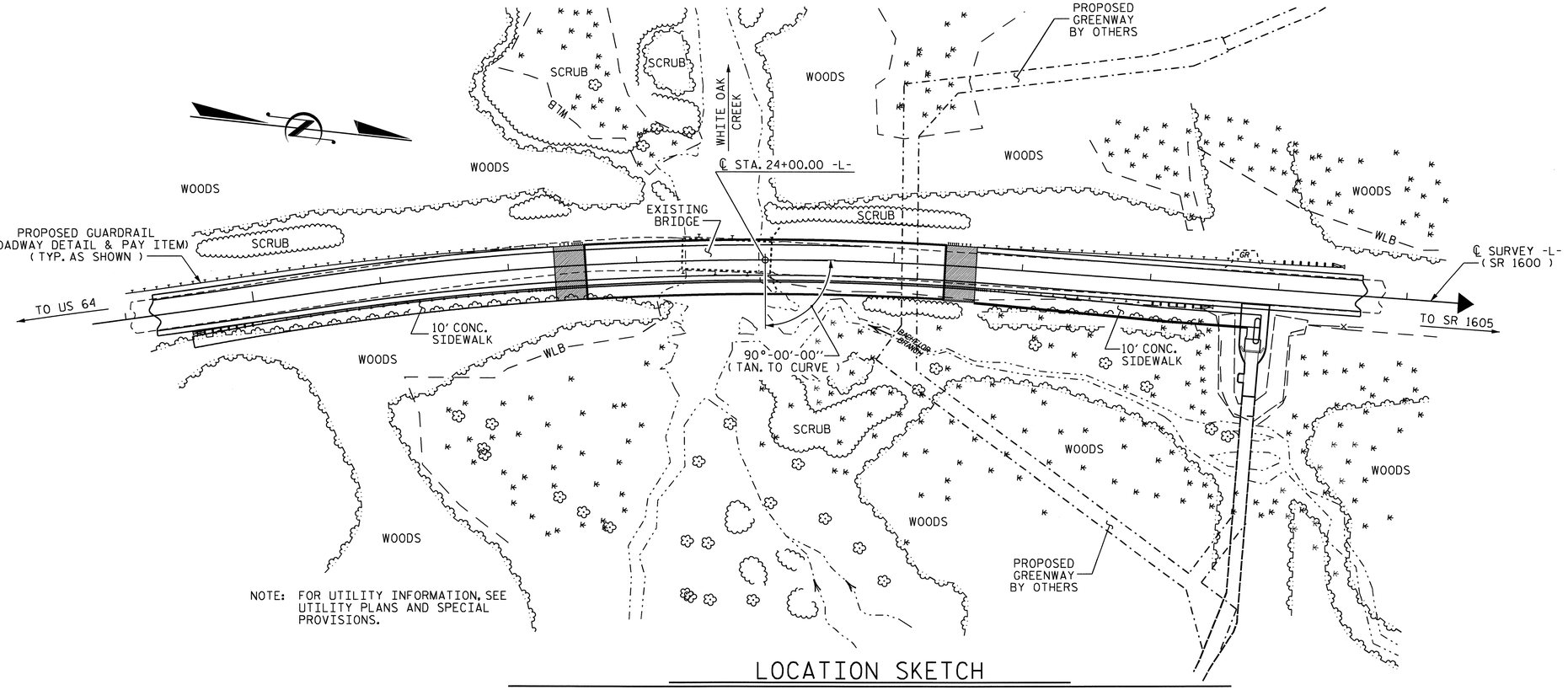
BM #88: R.R. SPIKE IN 10'' MAPLE, 367.02' RT. OF STA. 22+15.57 -L-, EL. 265.07



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

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	3'-6" Ø DRILLED PIERS IN SOIL	3'-6" Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	45" PRESTRESSED CONCRETE GIRDERS		54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES	
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.
SUPERSTRUCTURE								12,502	9,342					10	586.60	10	786.59		
END BENT No. 1										38.2		5,743						7	140
BENT No. 1		52.0	17.0	48.0						30.1		9,467	1,921						
BENT No. 2		54.5	25.0	54.0						31.5		10,353	2,160						
BENT No. 3		62.0	28.0							30.5		10,386	2,392						
END BENT No. 2										30.5		5,429						6	180
TOTAL	LUMP SUM	168.5	70.0	102.0	1	1	LUMP SUM	12,502	9,342	160.8	LUMP SUM	41,378	6,473	10	586.60	10	786.59	13	320

TOTAL BILL OF MATERIAL

	TWO BAR METAL RAIL	1'-2"X 2'-6" CONCRETE PARAPET	1'-4"X 3'-0" CONCRETE PARAPET	1'-2"X 3'-0" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	DOUBLE FACED TWO BAR METAL RAIL
	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	TON	SQ. YDS.	LUMP SUM	LUMP SUM	LIN. FT.
SUPERSTRUCTURE	539.44	279.92	326.13	274.69			LUMP SUM	LUMP SUM	318.63
END BENT No. 1					350	390			
BENT No. 1									
BENT No. 2									
BENT No. 3									
END BENT No. 2					375	420			
TOTAL	539.44	279.92	326.13	274.69	725	810	LUMP SUM	LUMP SUM	318.63

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1600 (GREEN LEVEL CHURCH RD) OVER WHITE OAK CREEK BETWEEN US 64 AND SR 1605

NORTH CAROLINA PROFESSIONAL SEAL 23390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : A. V. ROYAL DATE : 8/11
CHECKED BY : S. B. WILLIAMS DATE : 9/11

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.016	--	1.75	0.824	1.41	A	EL	33.645	0.937	1.66	A	I	26.802	0.80	0.937	1.02	B	I	44.062	
		HL-93(Opr)	N/A	--	1.827	--	1.35	0.824	1.83	A	EL	33.645	0.937	2.15	A	I	26.802	N/A	--	--	--	--	--	
		HS-20(Inv)	36.000	2	1.328	47.819	1.75	0.824	1.78	C	EL	29.178	0.937	1.95	A	I	26.802	0.80	0.792	1.33	C	I	29.057	
		HS-20(Opr)	36.000	--	2.31	83.153	1.35	0.824	2.31	C	EL	29.178	0.937	2.53	A	I	26.802	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.848	38.45	1.4	0.824	4.78	C	EL	29.178	0.937	5.33	A	I	26.802	0.80	0.792	2.85	C	I	29.057	
		SNGARBS2	20.000	--	2.185	43.705	1.4	0.824	3.67	C	EL	29.178	0.937	3.93	A	I	26.802	0.80	0.792	2.19	C	I	29.057	
		SNAGRIS2	22.000	--	2.097	46.133	1.4	0.824	3.52	C	EL	29.178	0.937	3.71	A	I	26.802	0.80	0.792	2.10	C	I	29.057	
		SNCOTTS3	27.250	--	1.419	38.67	1.4	0.824	2.38	C	EL	29.178	0.937	2.68	A	I	26.802	0.80	0.792	1.42	C	I	29.057	
		SNAGGRS4	34.925	--	1.21	42.251	1.4	0.824	2.03	C	EL	29.178	0.937	2.32	A	I	26.802	0.80	0.792	1.21	C	I	29.057	
		SNS5A	35.550	--	1.181	41.998	1.4	0.824	1.98	C	EL	29.178	0.937	2.41	A	I	26.802	0.80	0.792	1.18	C	I	29.057	
		SNS6A	39.950	--	1.094	43.712	1.4	0.824	1.84	C	EL	29.178	0.937	2.24	A	I	26.802	0.80	0.792	1.09	C	I	29.057	
		SNS7B	42.000	--	1.042	43.779	1.4	0.824	1.75	C	EL	29.178	0.937	2.26	A	I	26.802	0.80	0.792	1.04	C	I	29.057	
	TTST	TNAGRIT3	33.000	--	1.337	44.132	1.4	0.824	2.24	C	EL	29.178	0.937	2.63	A	I	26.802	0.80	0.792	1.34	C	I	29.057	
		TNT4A	33.075	--	1.346	44.522	1.4	0.824	2.26	C	EL	29.178	0.937	2.52	A	I	26.802	0.80	0.792	1.35	C	I	29.057	
		TNT6A	41.600	--	1.111	46.203	1.4	0.824	1.86	C	EL	29.178	0.937	2.53	A	I	26.802	0.80	0.792	1.11	C	I	29.057	
		TNT7A	42.000	--	1.122	47.109	1.4	0.824	1.88	C	EL	29.178	0.937	2.41	A	I	26.802	0.80	0.792	1.12	C	I	29.057	
		TNT7B	42.000	--	1.171	49.201	1.4	0.824	1.96	C	EL	29.178	0.937	2.17	A	I	26.802	0.80	0.792	1.17	C	I	29.057	
		TNAGRIT4	43.000	--	1.107	47.588	1.4	0.824	1.86	C	EL	29.178	0.937	2.08	A	I	26.802	0.80	0.792	1.11	C	I	29.057	
		TNAGT5A	45.000	--	1.039	46.745	1.4	0.824	1.74	C	EL	29.178	0.937	2.14	A	I	26.802	0.80	0.792	1.04	C	I	29.057	
		TNAGT5B	45.000	3	1.022	45.994	1.4	0.824	1.71	C	EL	29.178	0.937	1.97	A	I	26.802	0.80	0.792	1.02	C	I	29.057	

LOAD FACTORS:

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

NOTES:

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

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

ALL GIRDERS ON THIS STRUCTURE HAVE BEEN DESIGNED FOR TRAFFIC LOADS, INCLUDING GIRDERS ADJACENT TO THE SIDEWALK SECTION.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

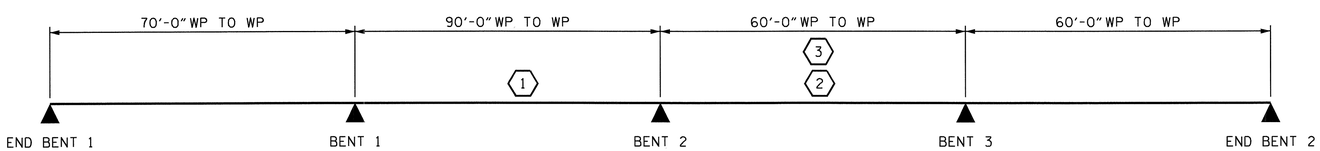
(2) DESIGN LOAD RATING (HS-20)

(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-4697

WAKE COUNTY

STATION: 24+00.00-L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			65

STD. NO. LRFR1

ASSEMBLED BY : T.L.CLELLAND	DATE : 12/17/10
CHECKED BY : T.M.GARRISON	DATE : 12/21/10
DRAWN BY : MAA 1/08	REV. 11/12/08R MAA/GM
CHECKED BY : GM/DI 2/08	

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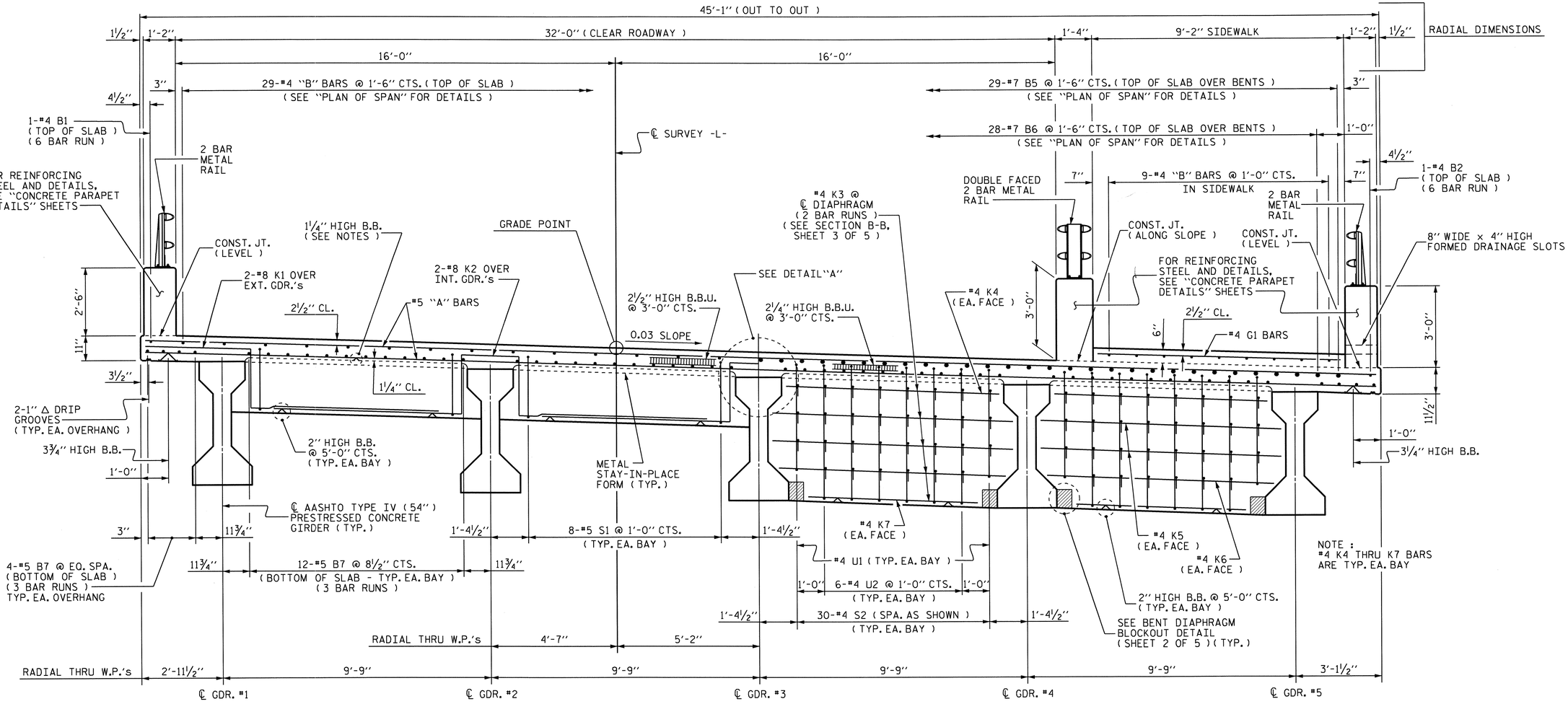
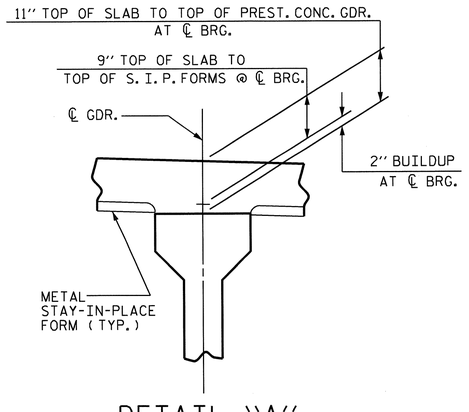


HALF-SECTION @ END BENT No. 1 & BENT No. 2

HALF-SECTION @ BENT No. 1

TYPICAL SECTION

(SPANS "A-B")



DETAIL "A"

(TYPICAL ALL SPANS)

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 2-10-11
CHECKED BY : D.G. ELY DATE : 7-12-11

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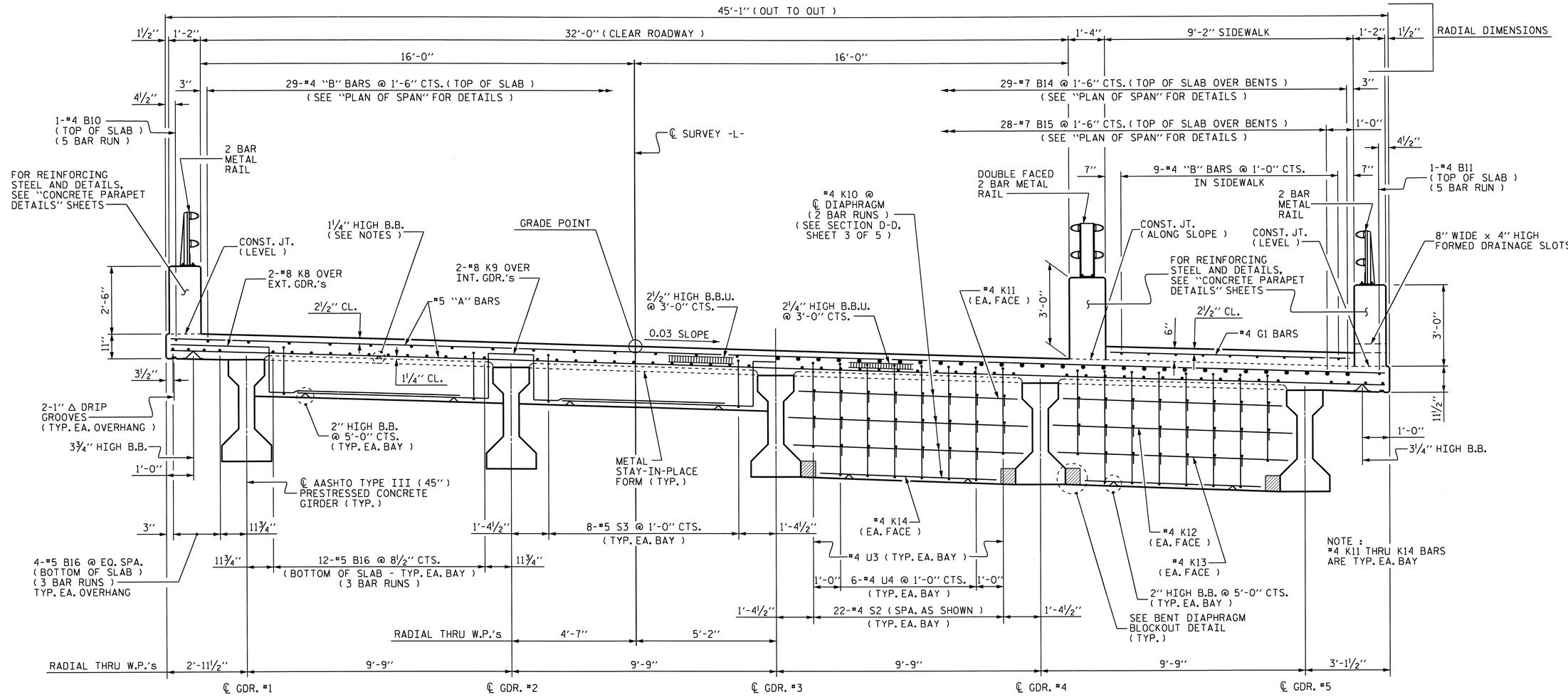
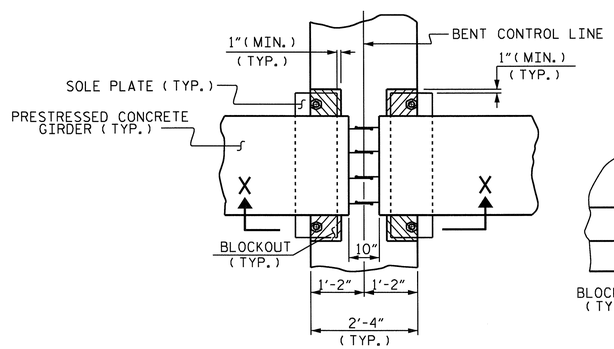


HALF-SECTION @ BENT No. 2 & END BENT No. 2

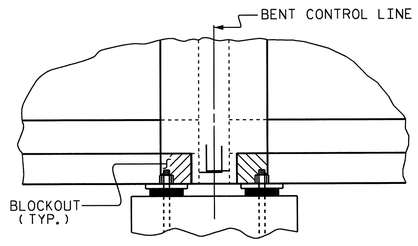
HALF-SECTION @ BENT No. 3

TYPICAL SECTION

(SPANS "C-D")

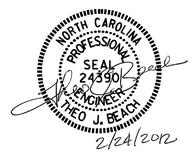


PLAN VIEW



SECTION X-X

BENT DIAPHRAGM BLOCKOUT DETAIL



PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 2-10-11
CHECKED BY : D.G. ELY DATE : 7-12-11

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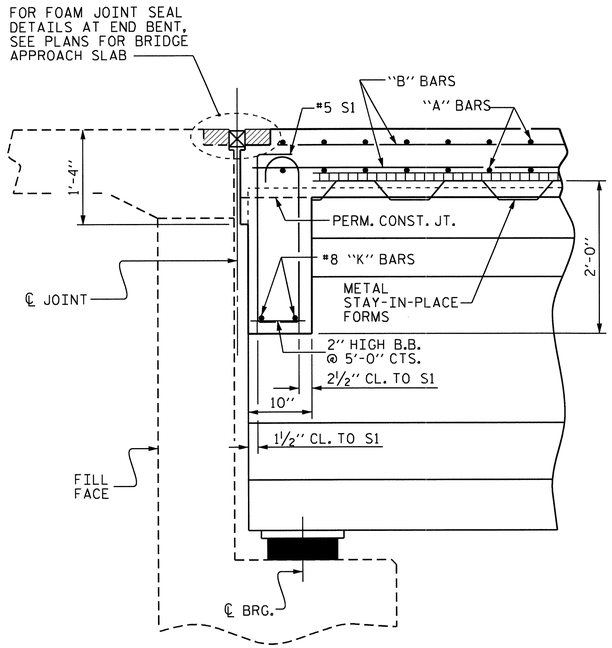
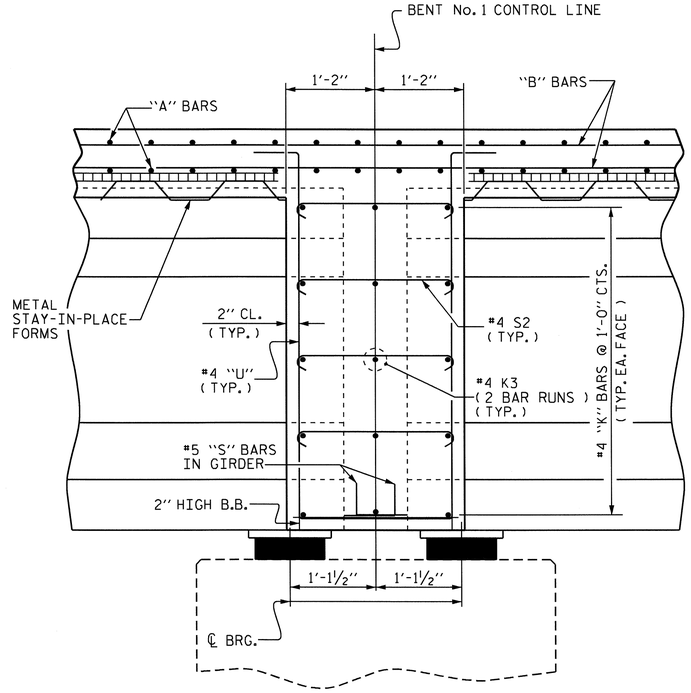
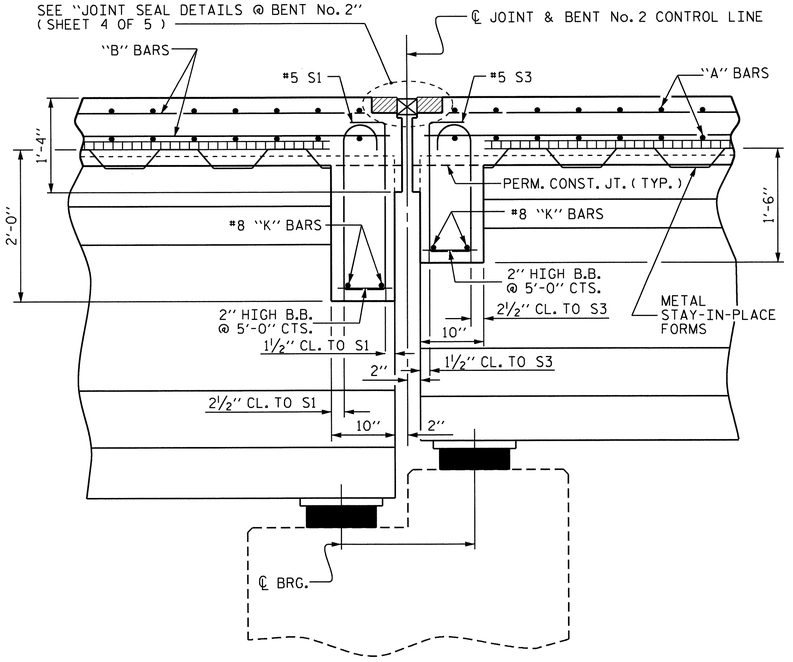


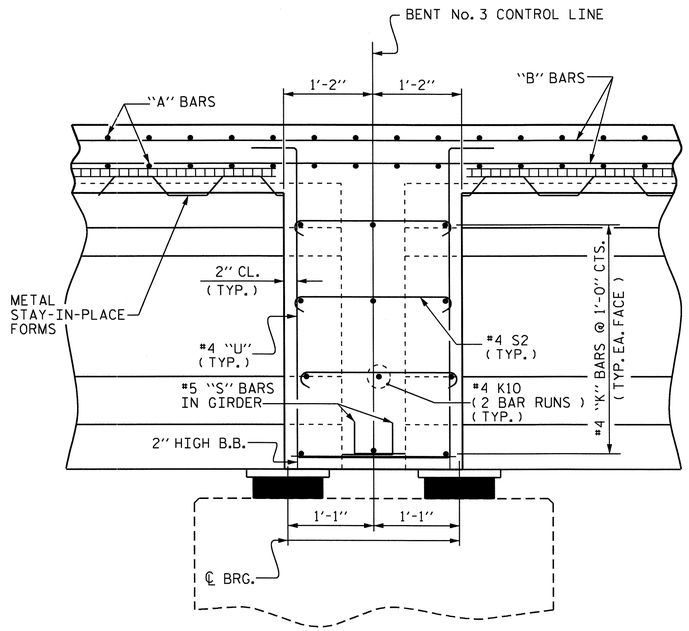
SECTION A-A



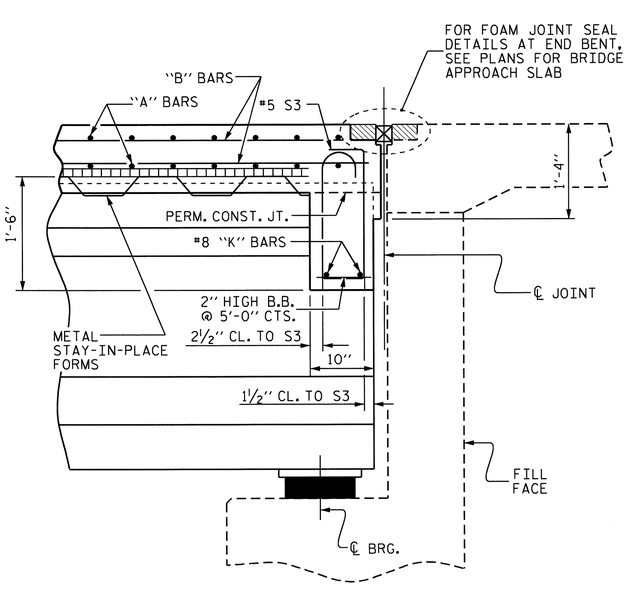
SECTION B-B



SECTION C-C



SECTION D-D



SECTION E-E

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-
SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 2-10-11
CHECKED BY : D.G. ELY DATE : 7-12-11

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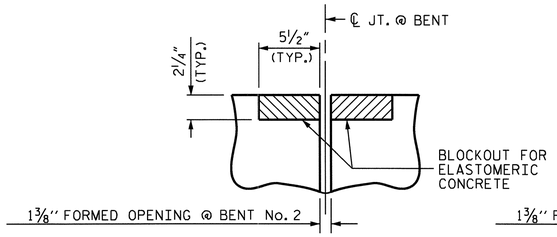
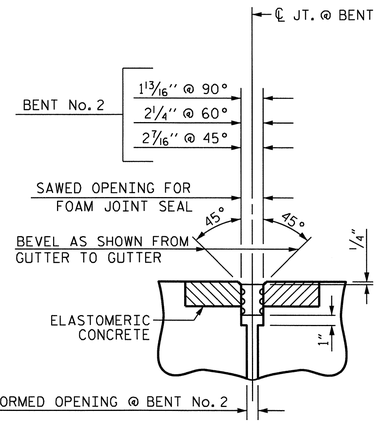


SECTION Z-Z

FOAM JOINT SEAL

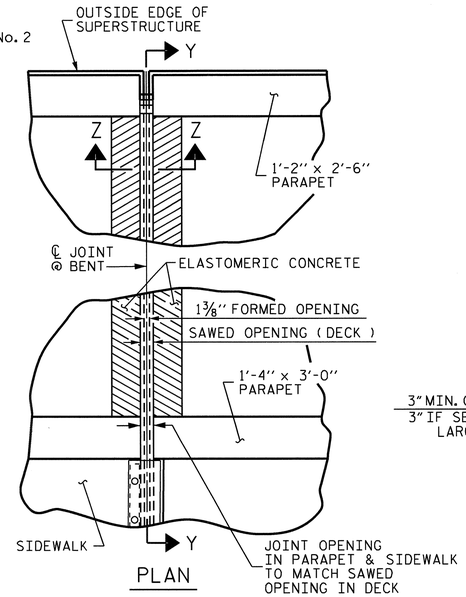
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION Z-Z

FOAM JOINT SEAL

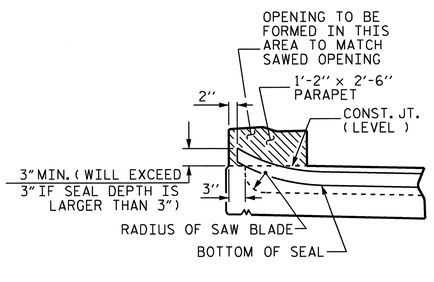
(EXP.)

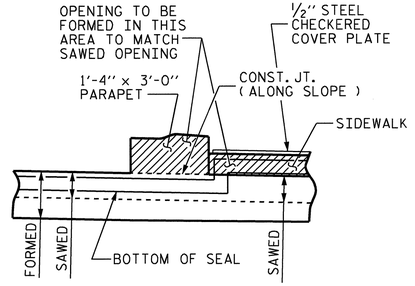


PLAN

ELASTOMERIC CONCRETE	
LOCATION	ELASTOMERIC CONCRETE * (CU. FT.)
BENT No. 2	5.5

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

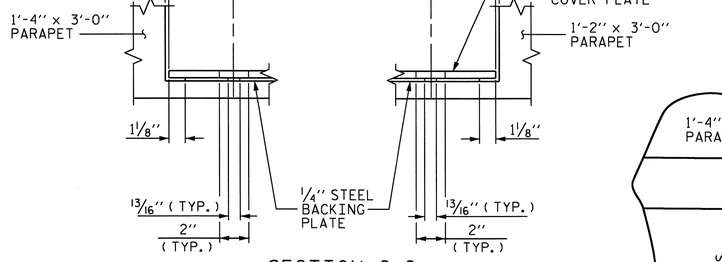




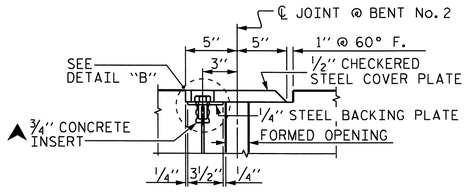
SECTION Y-Y

JOINT SEAL DETAILS @ BENT No. 2

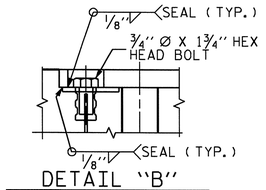
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND SIDEWALK



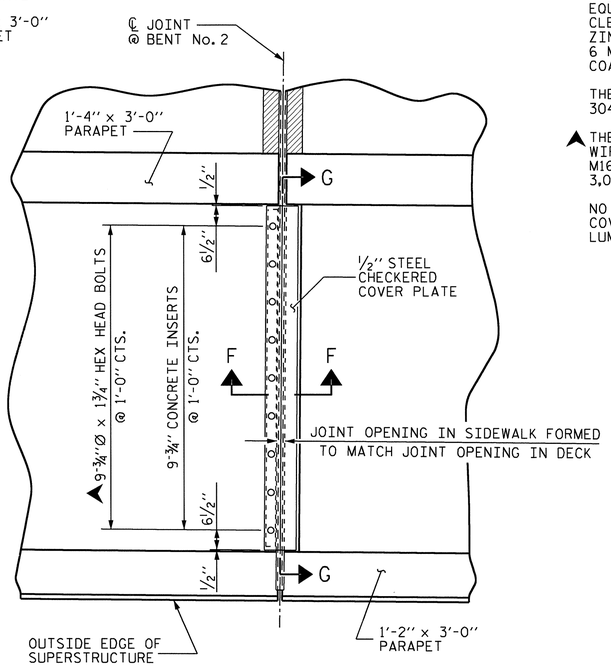
SECTION G-G



SECTION F-F



DETAIL "B"



PLAN

SIDEWALK COVER PLATE DETAILS @ BENT No. 2

NOTES FOR SIDEWALK COVER PLATES

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALLY BLAST CLEANED AND COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE ¾" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

▲ THE ¾" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3,000 LBS.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 2-15-11
CHECKED BY : D.G. ELY DATE : 7-7-11

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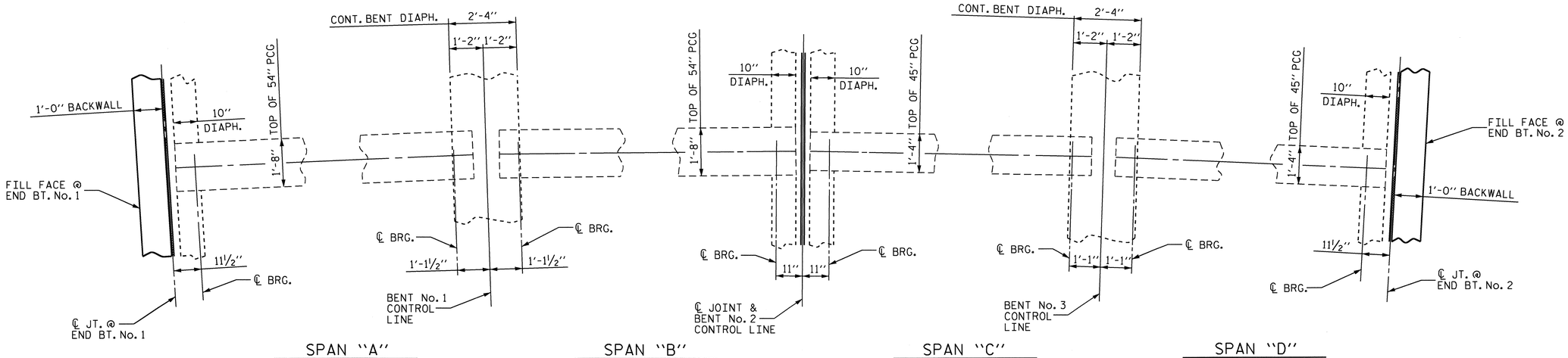

PLAN OF DIAPHRAGMS

NOTES :

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

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

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPETS, END POSTS AND SIDEWALK.

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

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

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

ALL REINFORCING STEEL IN PARAPETS SHALL BE EPOXY COATED.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2½" AT END BENTS. FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2 13/16" AT BENT No. 2. FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR INTERMEDIATE DIAPHRAGMS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III & IV PRESTRESSED CONCRETE GIRDERS" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 24890 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 2-16-11
CHECKED BY : D.G. ELY DATE : 7-7-11

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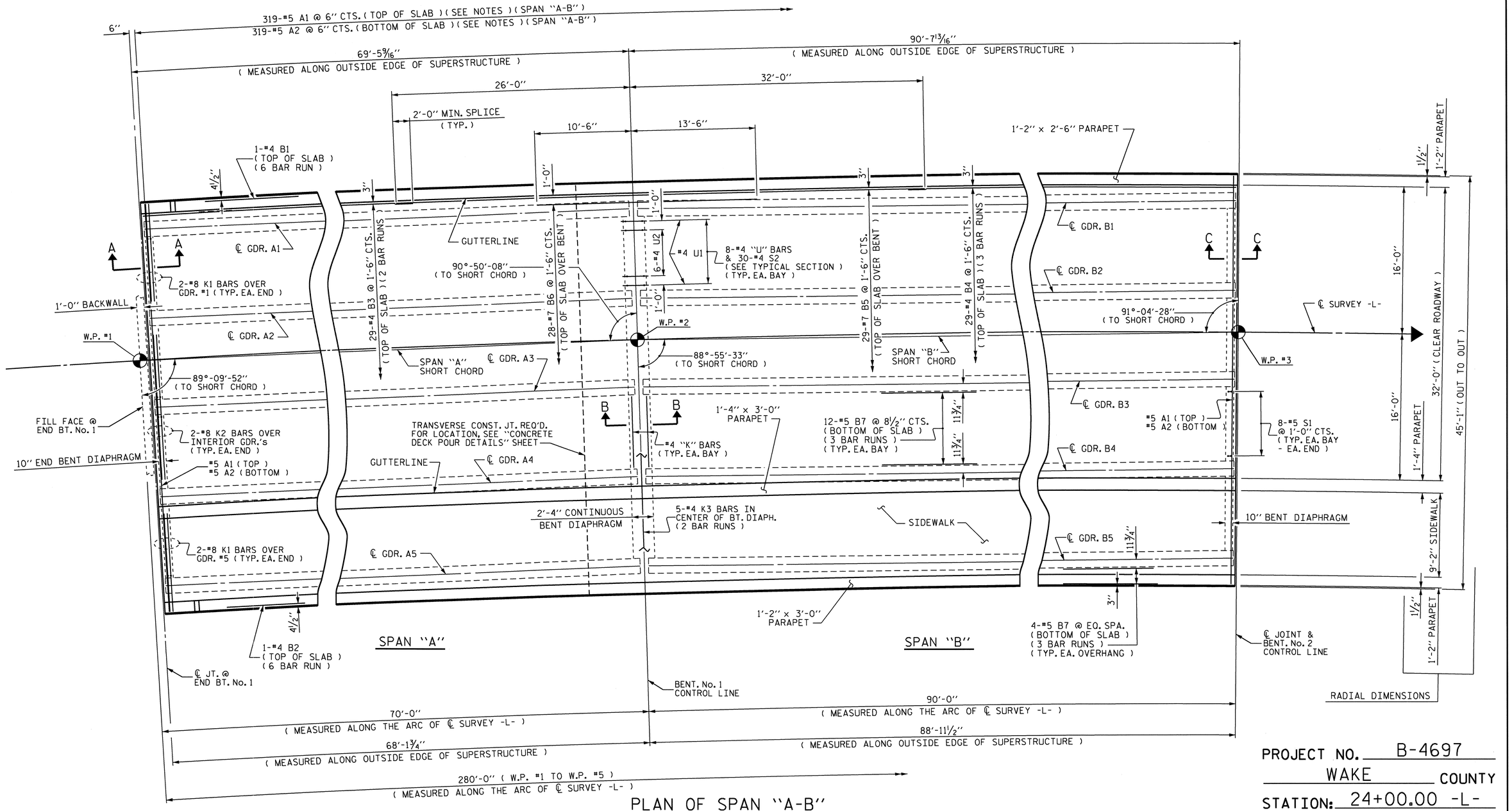

PLAN OF SPAN "A-B"

NOTES :

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS. FOR DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR PRESTRESSED CONCRETE GIRDERS" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTIONS", SHEET 3 OF 5.

FOR PARAPET DETAILS AND REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEETS.

THE 1'-4" x 3'-0" PARAPET CONTINUES ON THE APPROACH SLABS, BUT IS NOT SHOWN. FOR DETAILS OF THE 1'-4" x 3'-0" PARAPET ON APPROACH SLABS, SEE "PARAPET DETAILS" SHEETS.

THE #5 "A" BARS SHALL BE SPACED ALONG THE LEFT OUTSIDE EDGE OF SUPERSTRUCTURE AND BE PLACED RADIALLY.

FOR LOCATION OF FORMED DRAINAGE SLOTS IN RIGHT EXTERIOR PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.

FOR REINFORCING STEEL AND DETAILS OF SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 24330 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN "A-B"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 3-16-11
CHECKED BY : D.G. ELY DATE : 7-12-11

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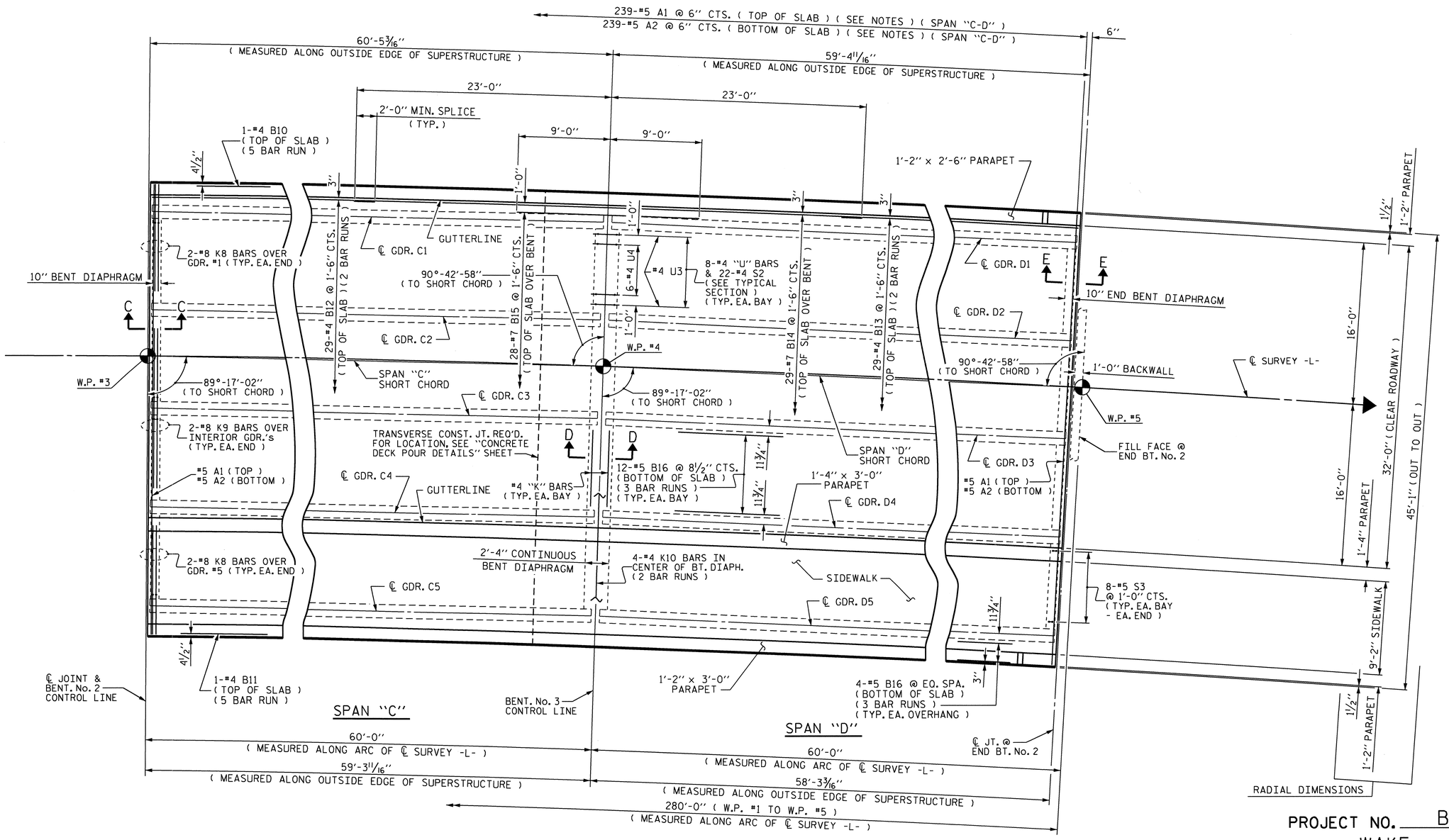

PLAN OF SPAN "C-D"

NOTES :

FOR LOCATION OF INTERMEDIATE DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS. FOR DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR PRESTRESSED CONCRETE GIRDERS" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTIONS", SHEET 3 OF 5.

FOR PARAPET DETAILS AND REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEETS.

THE 1'-4" x 3'-0" PARAPET CONTINUES ON THE APPROACH SLABS, BUT IS NOT SHOWN. FOR DETAILS OF THE 1'-4" x 3'-0" PARAPET ON APPROACH SLABS, SEE "PARAPET DETAILS" SHEETS.

THE #5 "A" BARS SHALL BE SPACED ALONG THE LEFT OUTSIDE EDGE OF SUPERSTRUCTURE AND BE PLACED RADIALLY.

FOR LOCATION OF FORMED DRAINAGE SLOTS IN RIGHT EXTERIOR PARAPET, SEE "CONCRETE PARAPET DETAILS" SHEETS.

FOR REINFORCING STEEL AND DETAILS OF SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN "C-D"

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 3-23-11
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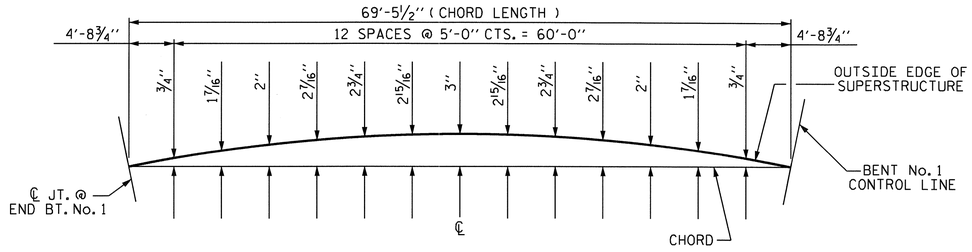
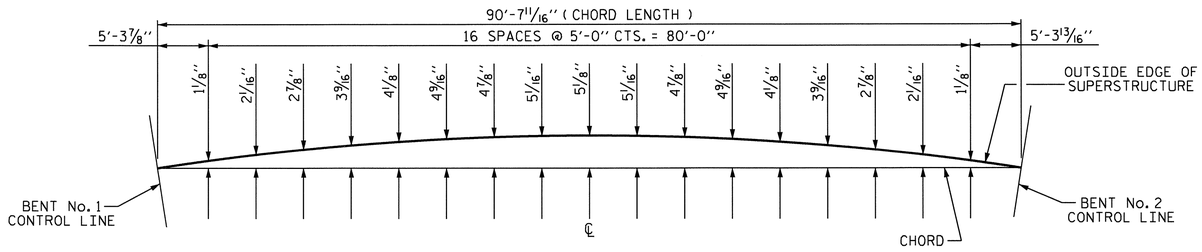
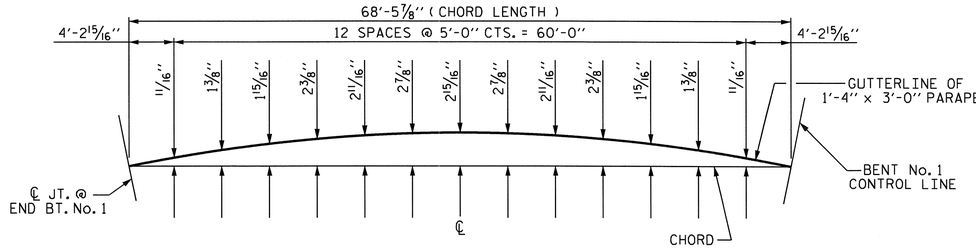


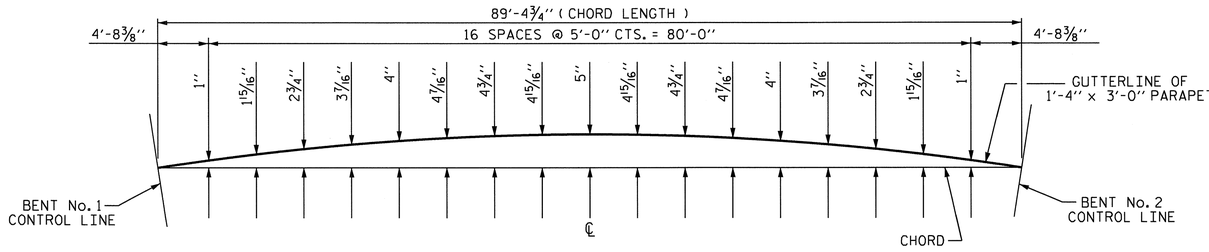
LEFT SIDE



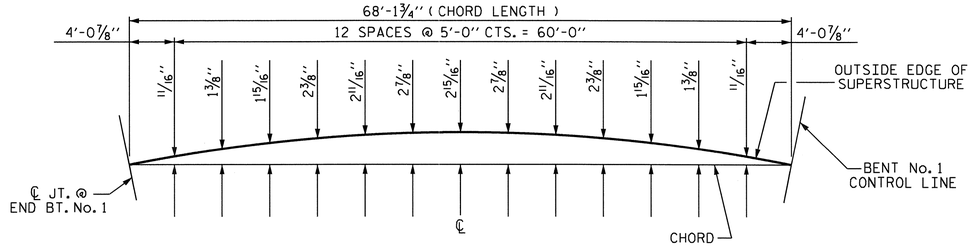
LEFT SIDE



MIDDLE PARAPET

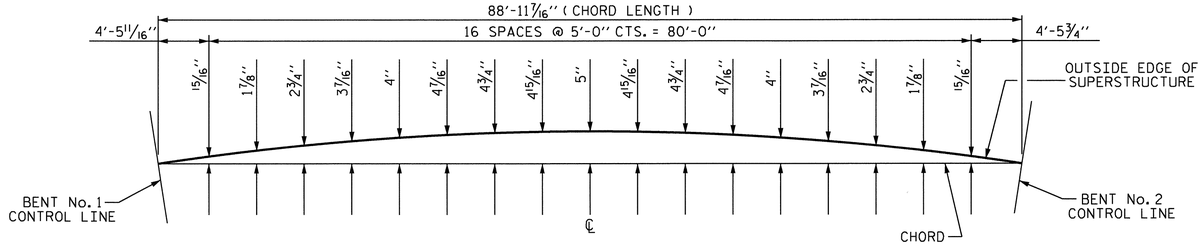


MIDDLE PARAPET



RIGHT SIDE

SPAN ''A'' ARC OFFSETS



RIGHT SIDE

SPAN ''B'' ARC OFFSETS

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 4-12-11
CHECKED BY : D.G. ELY DATE : 7-15-11

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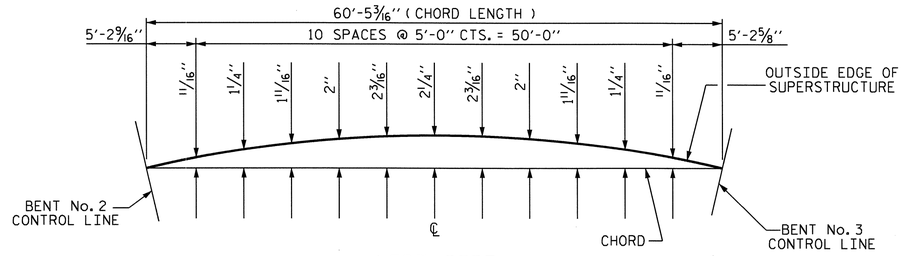

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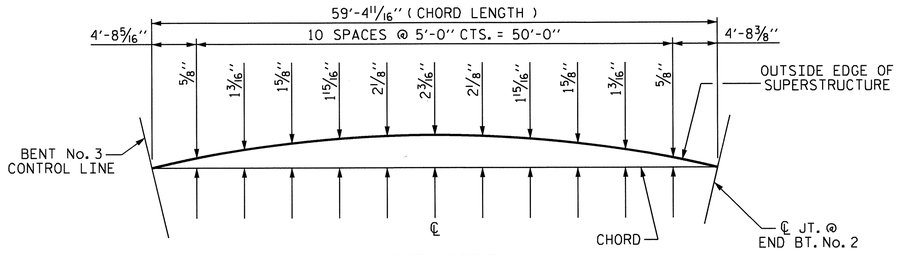

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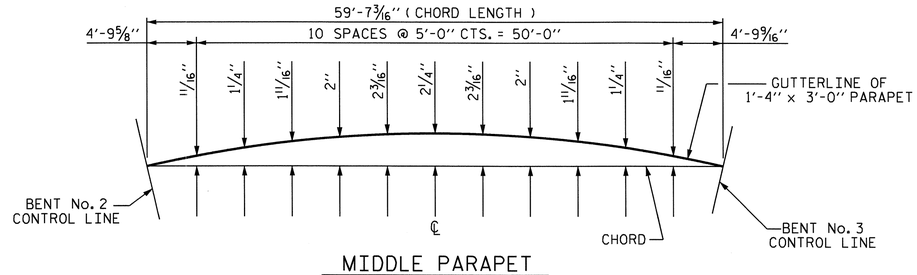
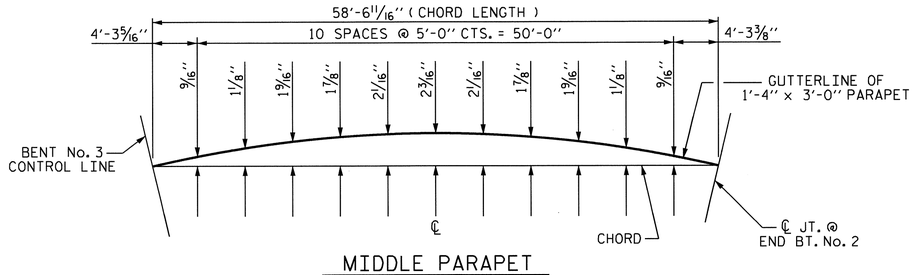
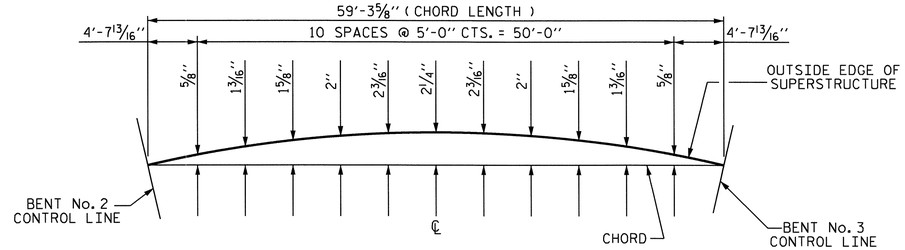


MIDDLE PARAPET

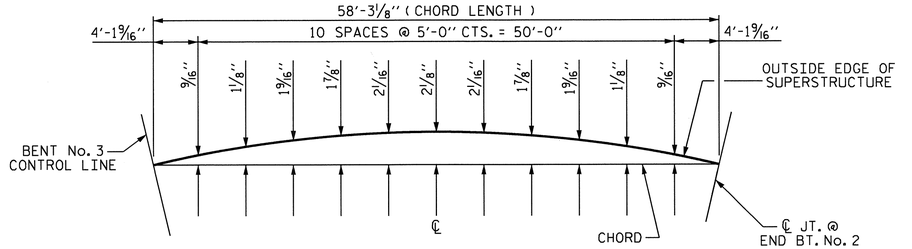


MIDDLE PARAPET



RIGHT SIDE

SPAN "C" ARC OFFSETS



RIGHT SIDE

SPAN "D" ARC OFFSETS

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			65

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CHECKED BY : D.G. ELY DATE : 7-15-11

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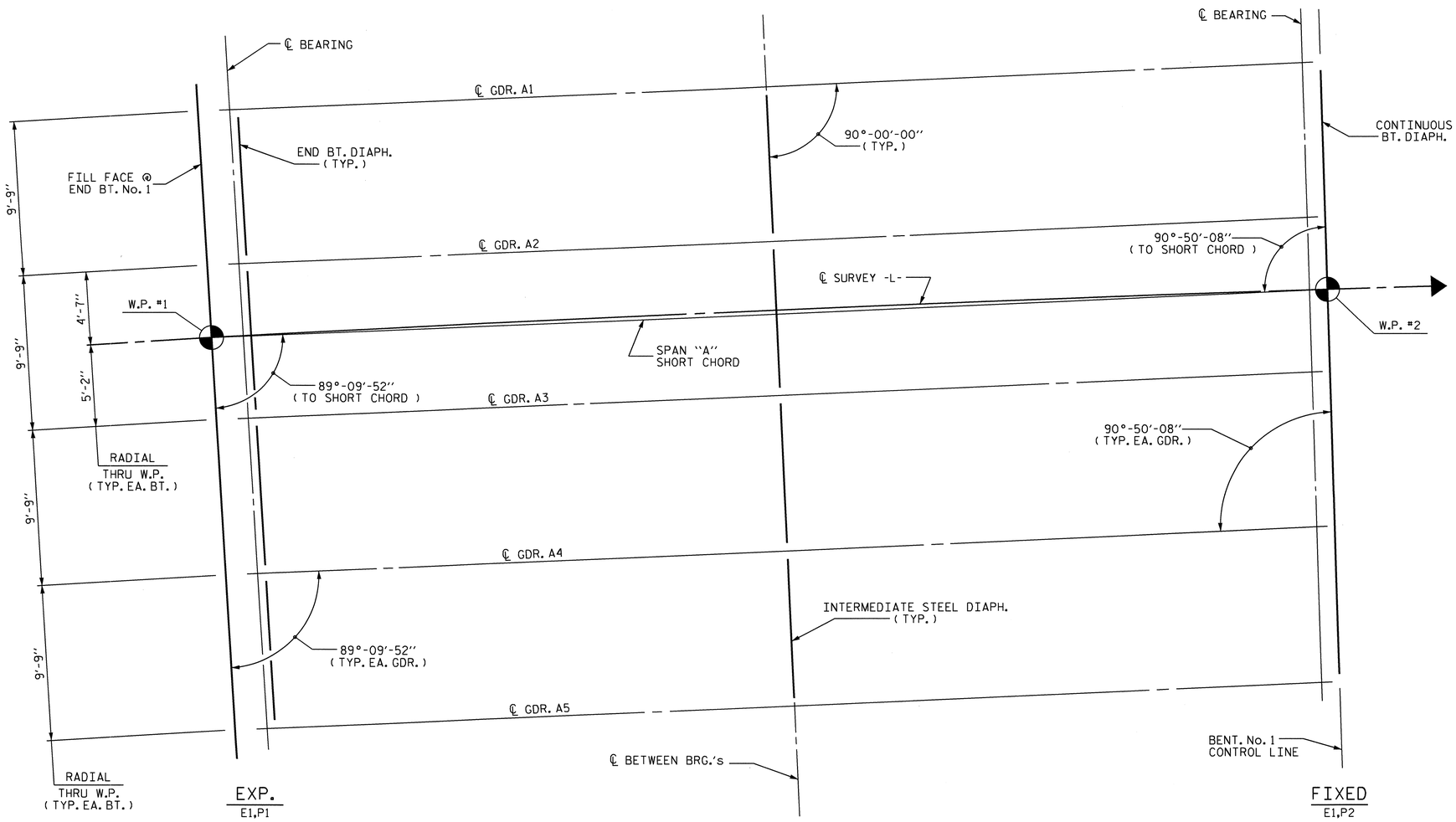

SPAN ''A'' GIRDER LAYOUT

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

SPAN ''A''

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/29/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			65

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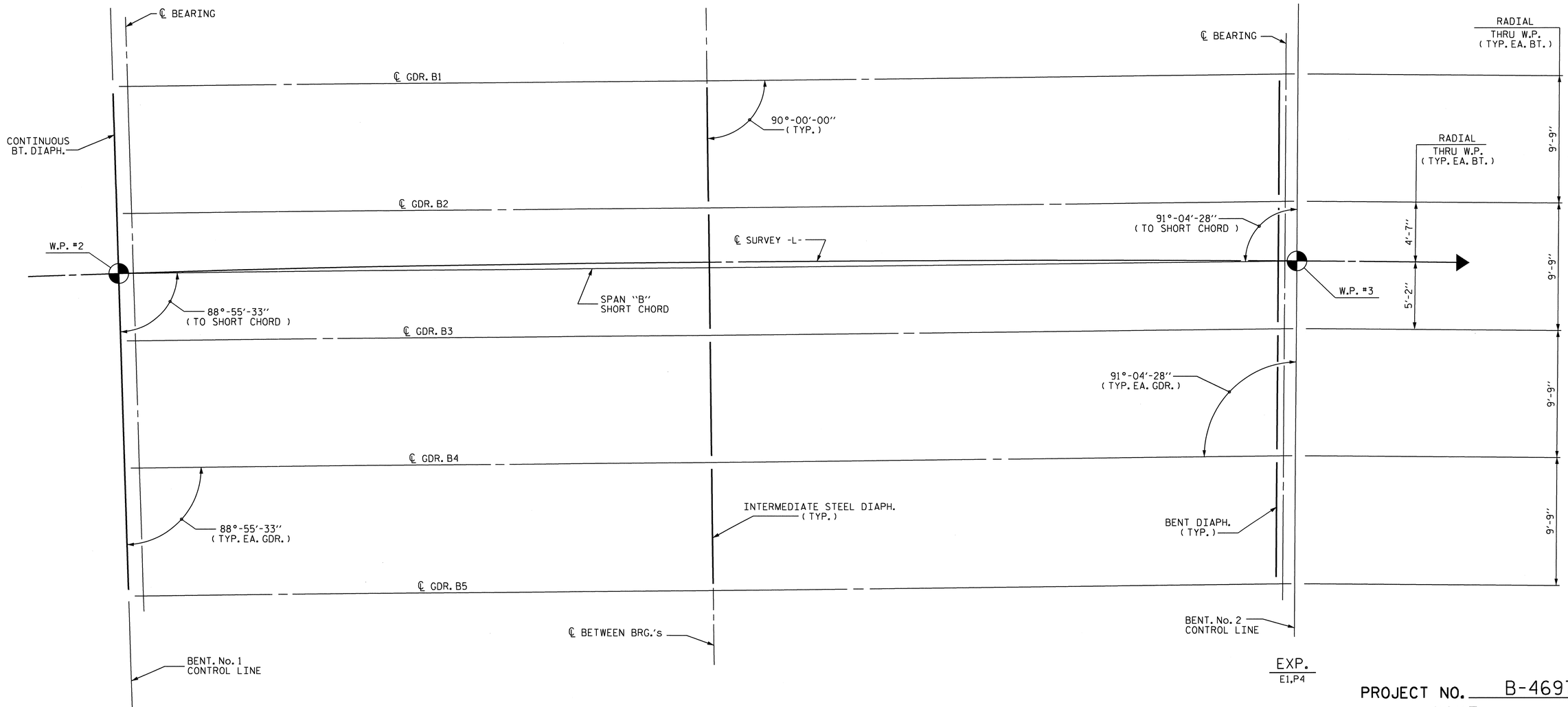

SPAN "B" GIRDER LAYOUT

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

SPAN "B"

NORTH CAROLINA PROFESSIONAL SEAL 24330 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 4-5-11
CHECKED BY : D.G. ELY DATE : 7-15-11

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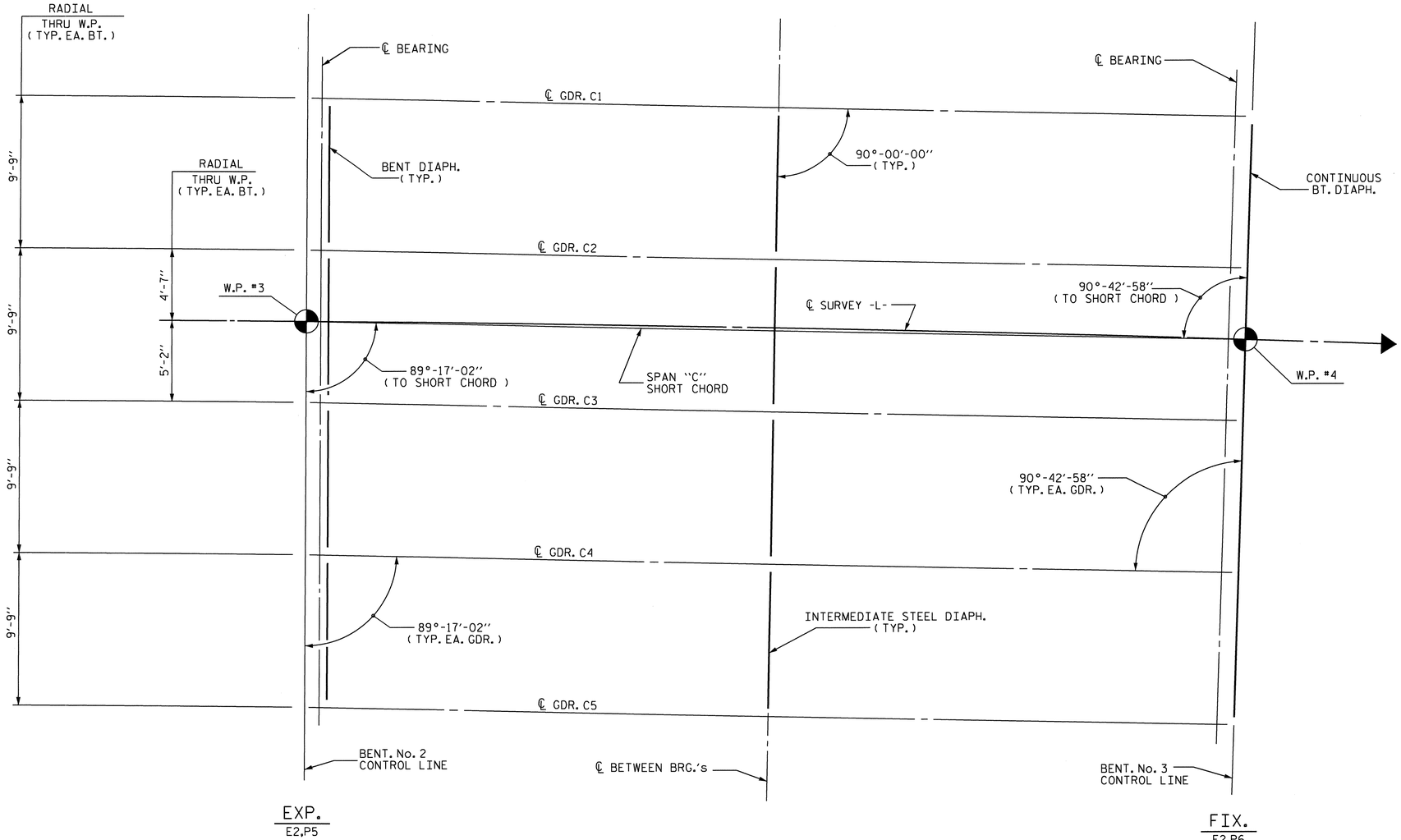

SPAN "C" GIRDER LAYOUT

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

SPAN "C"

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH

2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 4-5-11
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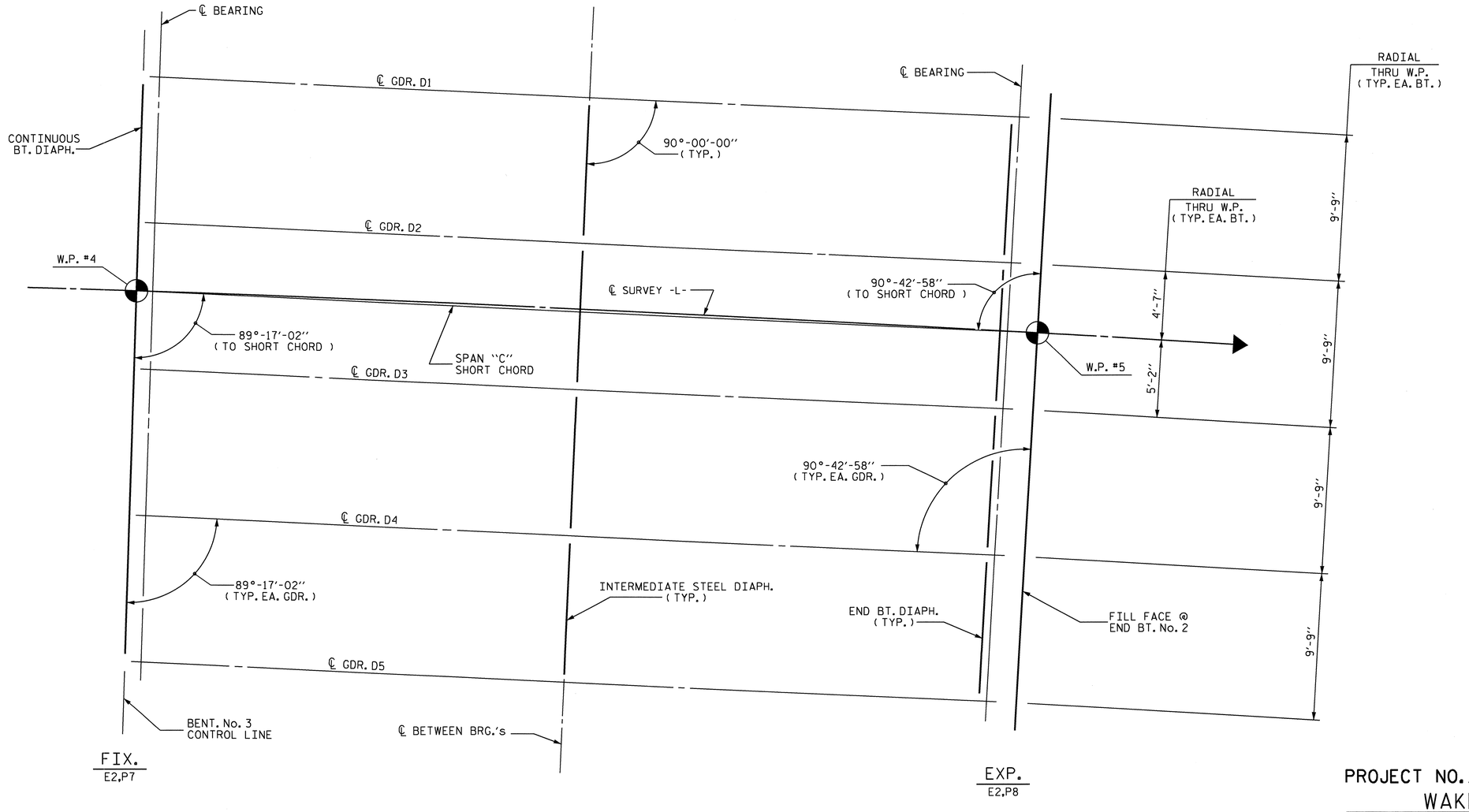

SPAN "D" GIRDER LAYOUT

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

SPAN "D"

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			65

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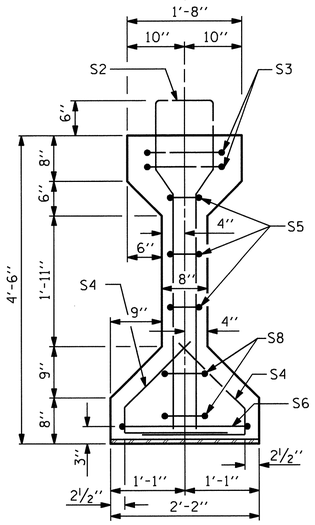
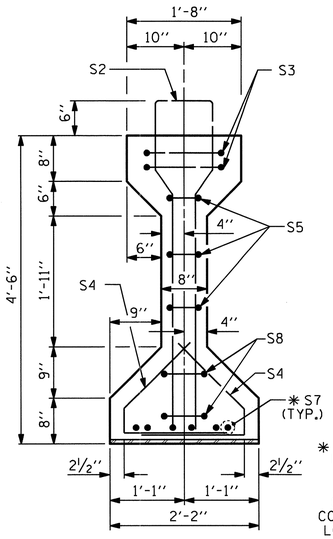
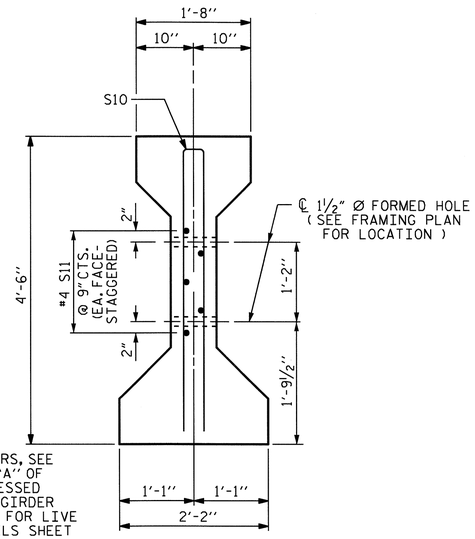


SECTION A-A



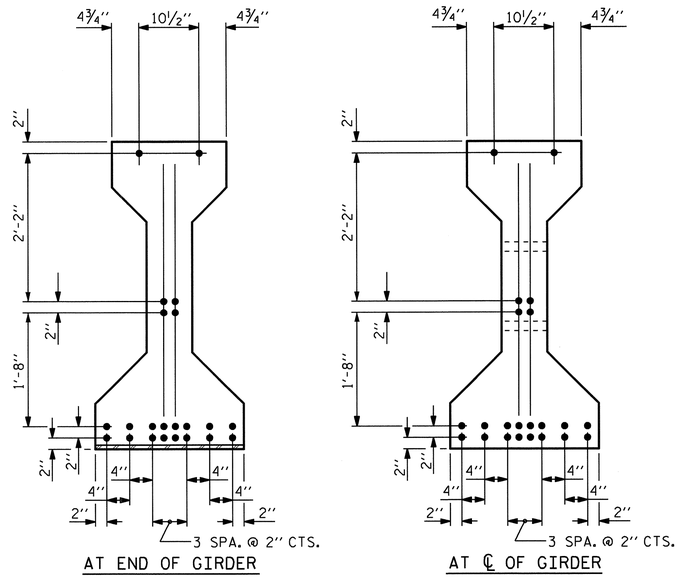
SECTION B-B



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

SECTION C-C

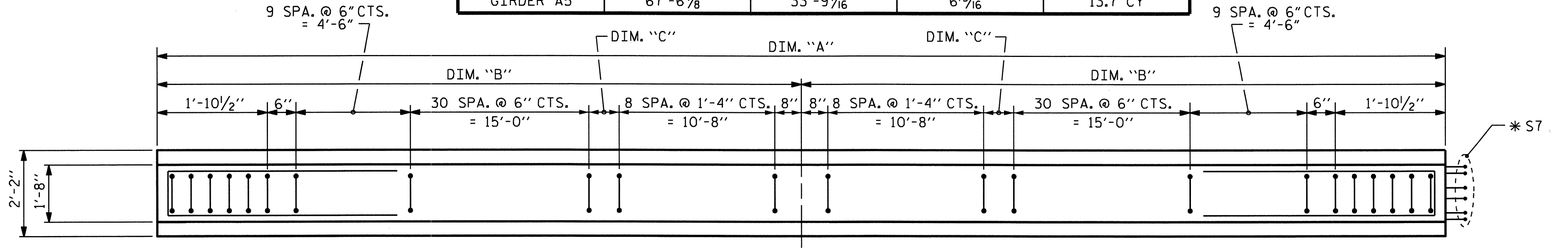
(S1 BARS NOT SHOWN)



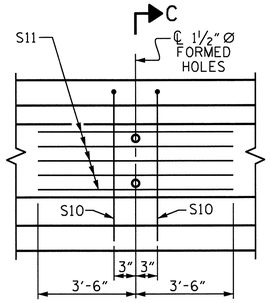
0.6" Ø LOW RELAXATION STRAND LAYOUT

TABLE A

GIRDER No.	DIM. "A"	DIM. "B"	DIM. "C"	CONCRETE REQ'D
GIRDER A1	68'-8½"	34'-4¼"	1'-1¾"	13.9 CY
GIRDER A2	68'-5⅛"	34'-2⁹⁄₁₆"	1'-0⅛"	13.9 CY
GIRDER A3	68'-1⅝"	34'-0¹³⁄₁₆"	10⁵⁄₁₆"	13.8 CY
GIRDER A4	67'-10¼"	33'-11⅛"	8⅝"	13.8 CY
GIRDER A5	67'-6⅞"	33'-9⁹⁄₁₆"	6¹⁵⁄₁₆"	13.7 CY

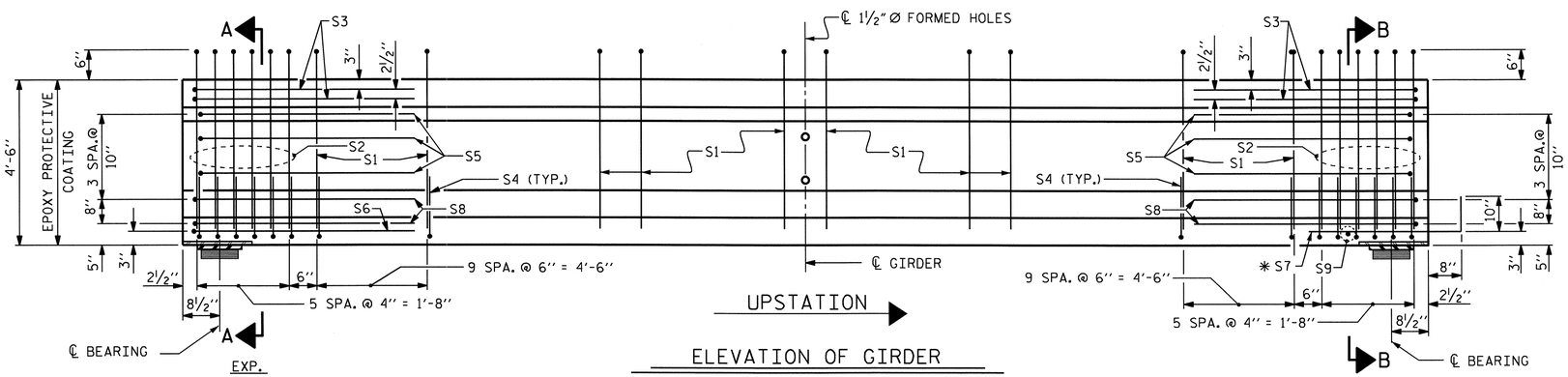


PLAN OF GIRDER



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

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

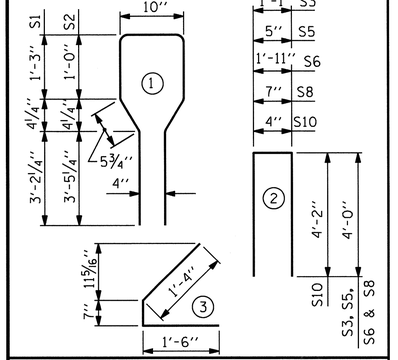
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	98	#4	1	10'-8"	698
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
S10	2	#5	2	8'-8"	18
S11	5	#4	STR	7'-0"	23

✱ 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

SPAN "A"	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GIRDERS A1-A5	1,189	✱✱	22

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 GIRDERS	✱✱	340.70'

✱✱ SEE TABLE A

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 24890 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			65

ASSEMBLED BY : MIKE BRITT	DATE : 6-30-11	
CHECKED BY : D.G. ELY	DATE : 7-17-11	
DRAWN BY : ELR 8/91	REV. 7/17/98	RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R	RWW/LES
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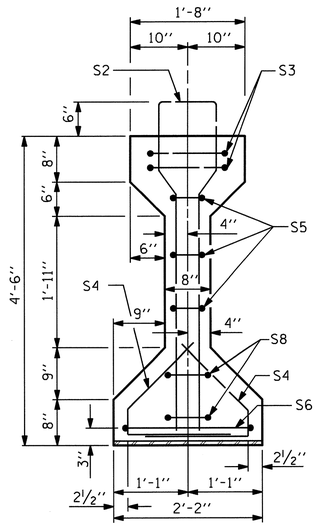
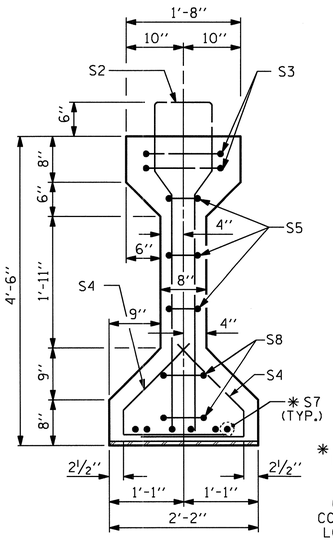
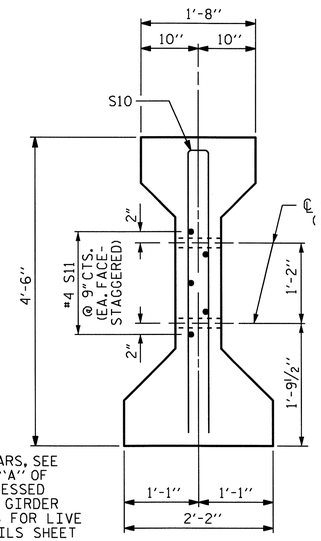
STD. NO. PCG6



SECTION A-A



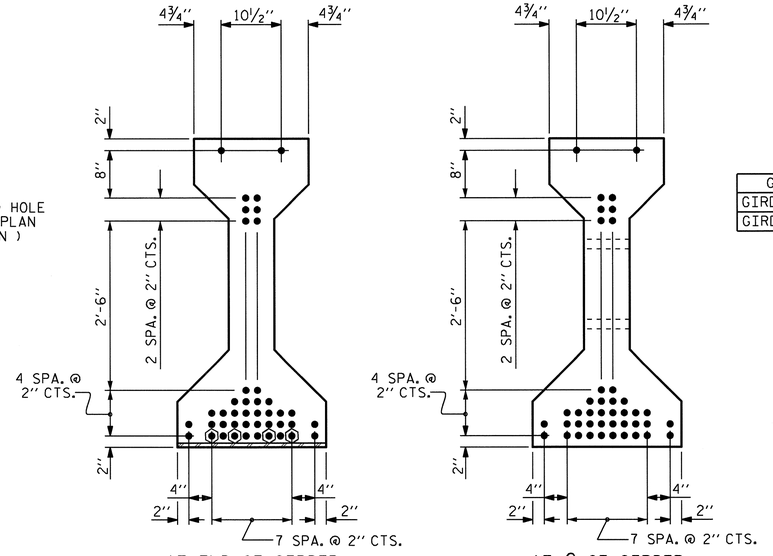
SECTION B-B



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

SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER

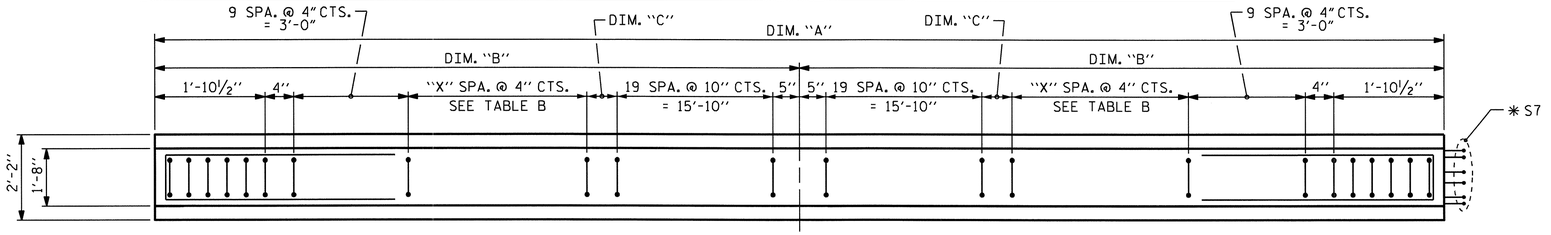
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

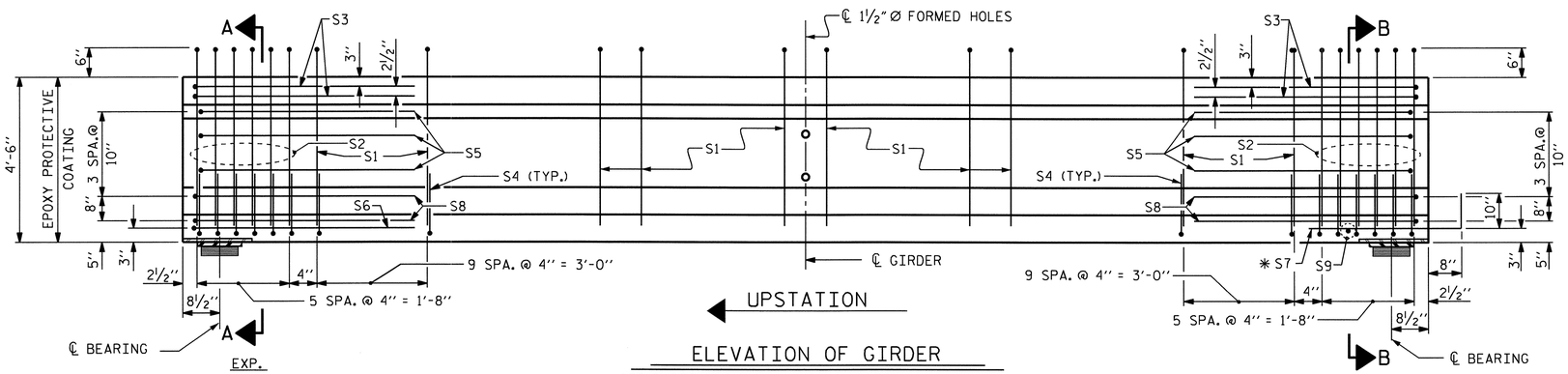
⬢ STRANDS TO BE DEBONDED FOR 12'-0" FROM END OF GIRDER

TABLE B

GIRDER No.	"X"	DIM. "A"	DIM. "B"	DIM. "C"	CONCRETE REQ'D	REINFORCING STEEL REQ'D
GIRDER B1	69 SPACES	89'-10 7/8"	44'-11 7/16"	5 5/16"	18.2 CY	1,902 LBS.
GIRDER B2	68 SPACES	89'-6 1/2"	44'-9 1/4"	7 3/4"	18.2 CY	1,888 LBS.
GIRDER B3	68 SPACES	89'-2 1/8"	44'-7 1/16"	5 9/16"	18.1 CY	1,888 LBS.
GIRDER B4	67 SPACES	88'-9 3/4"	44'-4 7/8"	7 3/8"	18.0 CY	1,873 LBS.
GIRDER B5	67 SPACES	88'-5 3/8"	44'-2 11/16"	5 3/16"	17.9 CY	1,873 LBS.



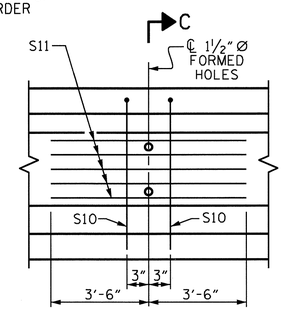
PLAN OF GIRDER



UPSTATION

ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS

NOTE :
CONTRACTORS ATTENTION IS CALLED TO THE FACT THAT SPAN "B" GIRDERS REQUIRE 7500 PSI CONCRETE

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

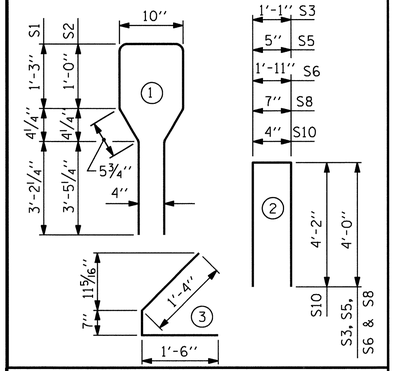
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
GIRDER B1	S1	198	#4	1	10'-8"	1411
GIRDER B2 & B3	S1	196	#4	1	10'-8"	1397
GIRDER B4 & B5	S1	194	#4	1	10'-8"	1382
	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
	S10	2	#5	2	8'-8"	18
	S11	5	#4	STR	7'-0"	23

✱ 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

SPAN "B"	REINFORCING STEEL LB.	7500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDERS B1-B5	✱✱	✱✱	42

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 GIRDERS	✱✱	445.89'

✱✱ SEE TABLE B

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

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

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			65

STD. NO. PCG6

ASSEMBLED BY : MIKE BRITT	DATE : 6-30-11
CHECKED BY : D.G. ELY	DATE : 7-17-11
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
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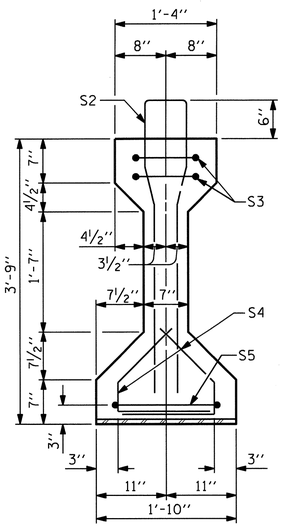
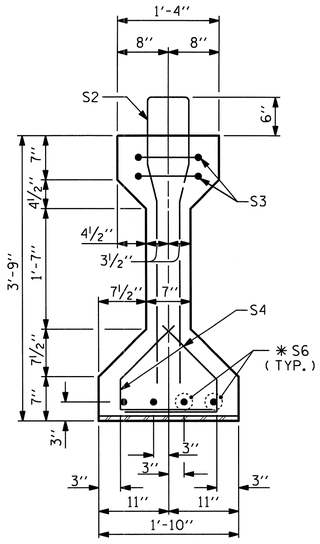
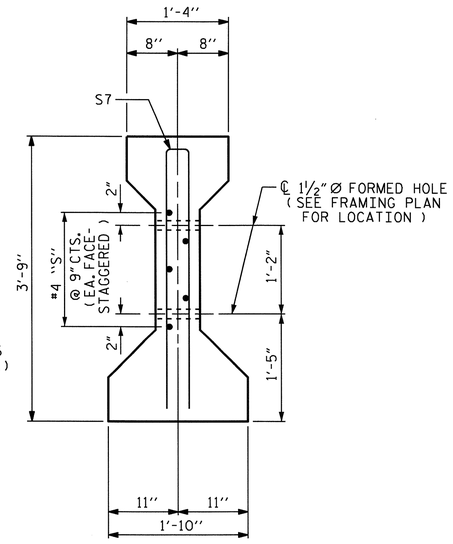


SECTION A-A

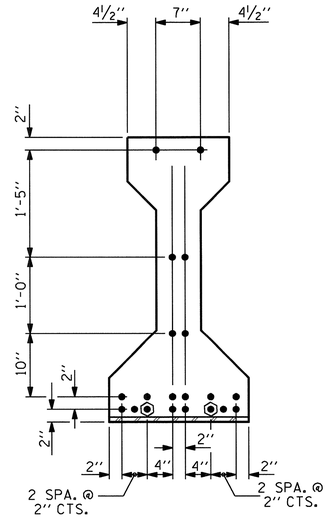


SECTION B-B

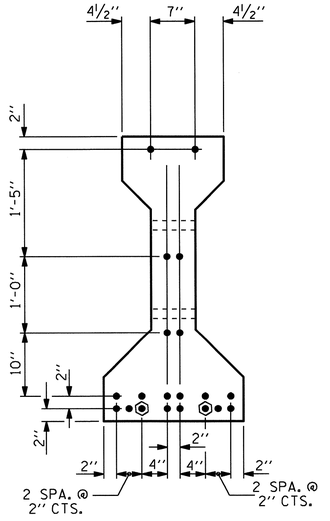


SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER



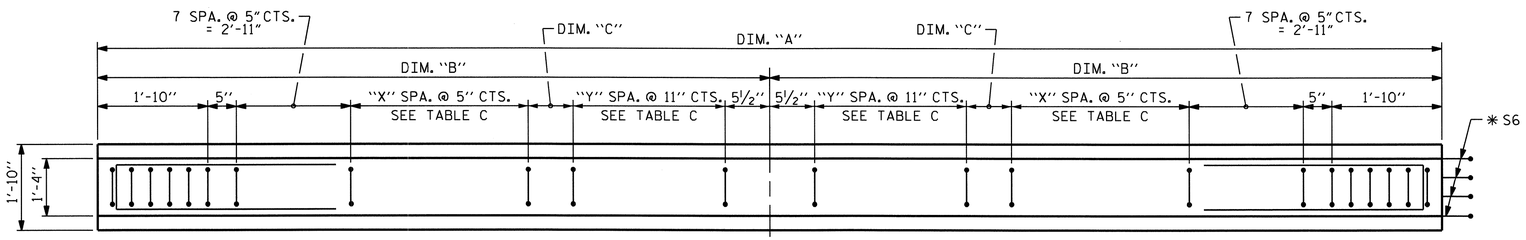
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

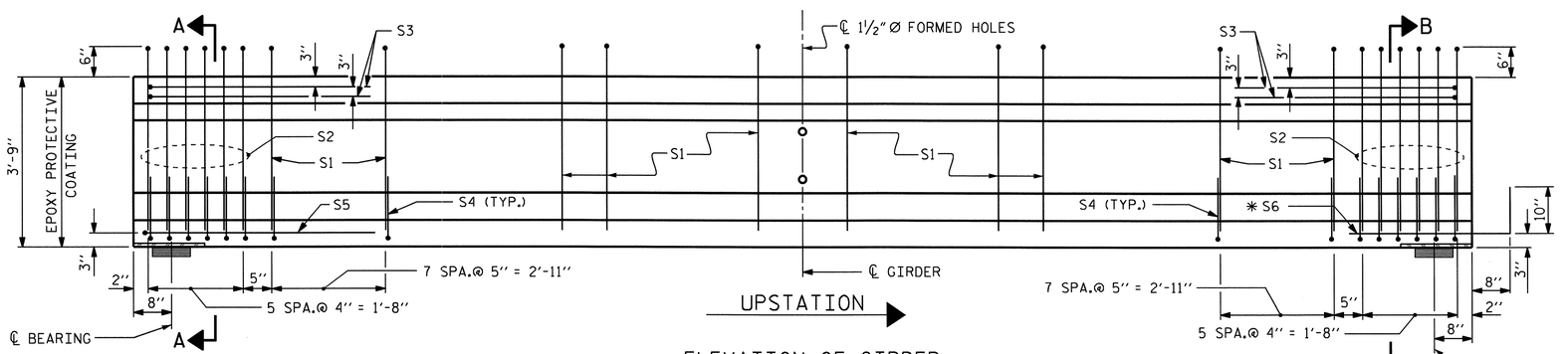
⬢ STRANDS TO BE DEBONDED FOR 12'-0" FROM END OF GIRDER

TABLE C

GIRDER No.	"X"	"Y"	DIM. "A"	DIM. "B"	DIM. "C"	CONCRETE REQ'D
GIRDER C1	32 SPACES	11 SPACES	59'-8¼"	29'-10⅛"	9⅝"	8.6 CY
GIRDER C2	32 SPACES	11 SPACES	59'-5⅜"	29'-8¹¹⁄₁₆"	8³⁄₁₆"	8.6 CY
GIRDER C3	32 SPACES	11 SPACES	59'-2⅜"	29'-7³⁄₁₆"	6¹¹⁄₁₆"	8.5 CY
GIRDER C4	32 SPACES	11 SPACES	58'-11½"	29'-5¾"	5¼"	8.5 CY
GIRDER C5	33 SPACES	10 SPACES	58'-8⅝"	29'-4⁵⁄₁₆"	9¹³⁄₁₆"	8.4 CY



PLAN OF GIRDER



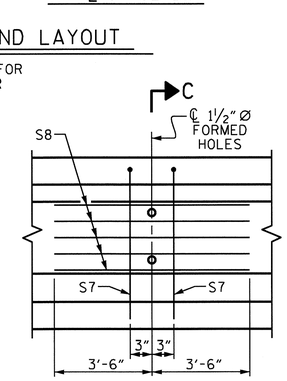
EXP.

UPSTATION

ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

FIX



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

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

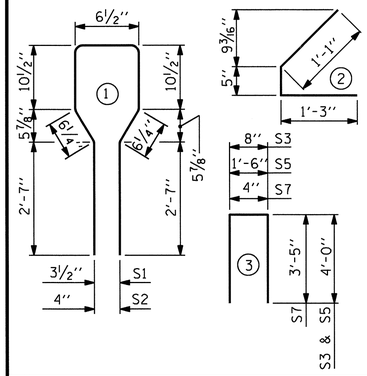
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	104	#4	1	8'-6"	591
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
S5	1	#4	3	9'-6"	6
✱S6	4	#5	STR	3'-8"	15
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

SPAN "C"	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L. R. STRANDS No.
GIRDERS C1-C5	929	✱✱	20

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 GIRDERS	✱✱	296.01'

✱✱SEE TABLE C

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN "C"

NORTH CAROLINA PROFESSIONAL SEAL 24890 ENGINEER THEO J. BEACH
2/24/2012

ASSEMBLED BY : MIKE BRITT	DATE : 7-6-11
CHECKED BY : D.G. ELY	DATE : 7-17-11
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06R TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			65

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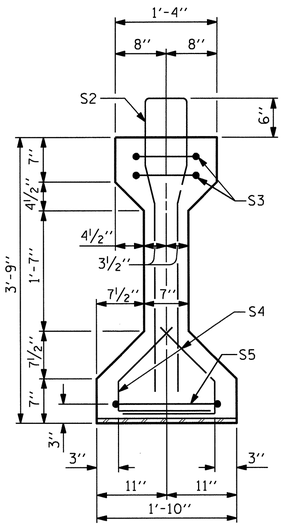
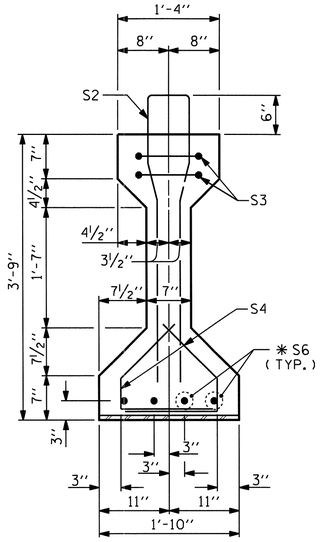
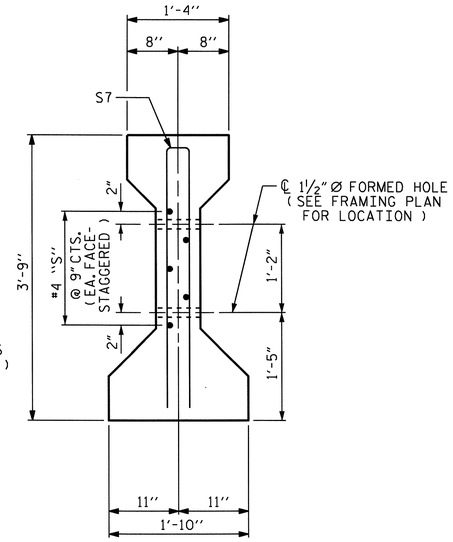
STD. NO. PCG5



SECTION A-A

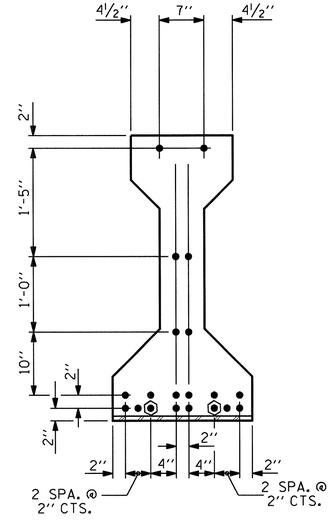


SECTION B-B

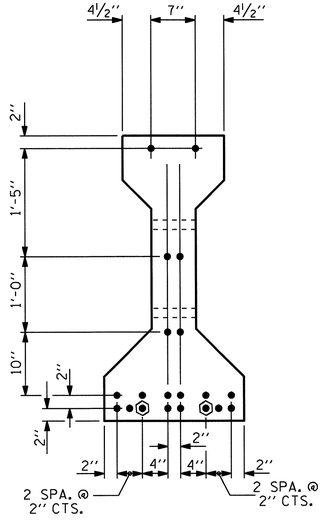


SECTION C-C

(S1 BARS NOT SHOWN)



AT END OF GIRDER



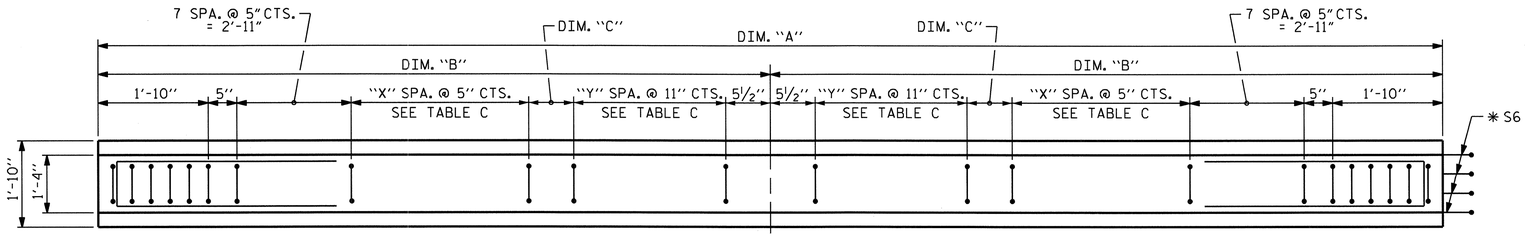
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

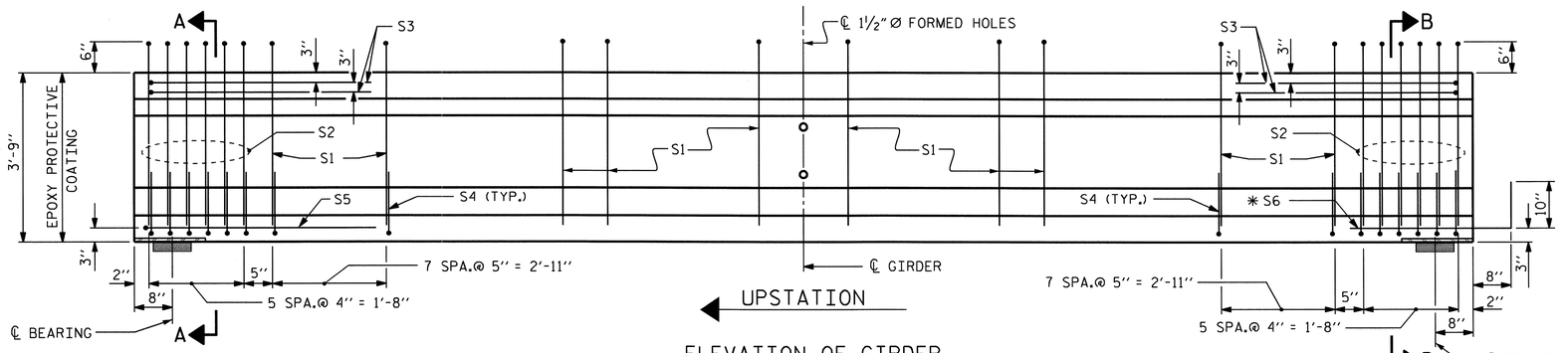
⬢ STRANDS TO BE DEBONDED FOR 12'-0" FROM END OF GIRDER

TABLE D

GIRDER No.	"X"	"Y"	DIM. "A"	DIM. "B"	DIM. "C"	CONCRETE REQ'D
GIRDER D1	31 SPACES	11 SPACES	58'-7¼"	29'-3⅝"	8⅛"	8.4 CY
GIRDER D2	31 SPACES	11 SPACES	58'-4⅜"	29'-2⅜"	6¹¹⁄₁₆"	8.4 CY
GIRDER D3	31 SPACES	11 SPACES	58'-1⅜"	29'-0¹¹⁄₁₆"	5⅜"	8.4 CY
GIRDER D4	32 SPACES	10 SPACES	57'-10½"	28'-11¼"	9¾"	8.3 CY
GIRDER D5	32 SPACES	10 SPACES	57'-7⅝"	28'-9¹³⁄₁₆"	8⅝"	8.3 CY

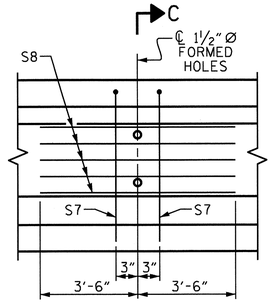


PLAN OF GIRDER



ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS

0.6" Ø L. R. GRADE 270 STRANDS

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

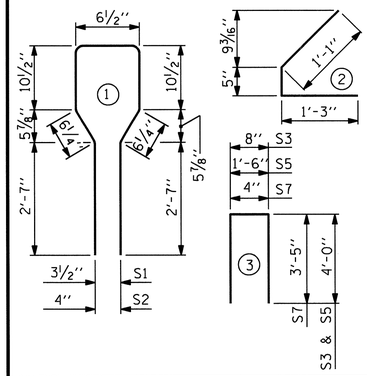
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	102	#4	1	8'-6"	579
S2	12	#6	1	8'-6"	153
S3	4	#4	3	8'-8"	23
S4	56	#4	2	2'-9"	103
S5	1	#4	3	9'-6"	6
✱S6	4	#5	STR	3'-8"	15
S7	2	#5	3	7'-2"	15
S8	5	#4	STR	7'-0"	23

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

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT



QUANTITIES FOR ONE GIRDER

SPAN "D"	REINFORCING STEEL LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
GIRDERS D1-D5	917	✱✱	20

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
5 GIRDERS	✱✱	290.59'

✱✱SEE TABLE D

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE III
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
SPAN "D"

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER STEVEN J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			65

ASSEMBLED BY : MIKE BRITT	DATE : 7-6-11
CHECKED BY : D.G. ELY	DATE : 7-17-11
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06R TLA/GM

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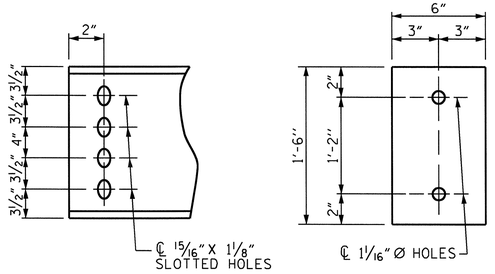
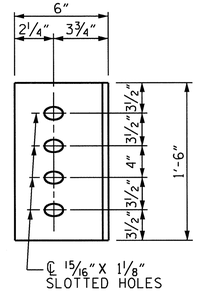
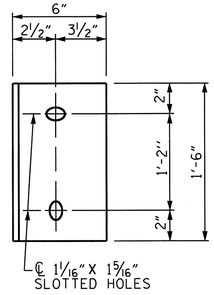


CHANNEL END

PLATE DETAILS



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

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 1/4 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.

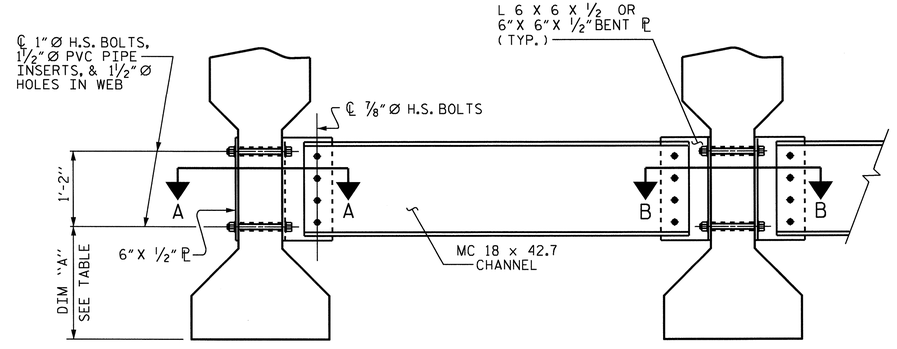
FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

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.



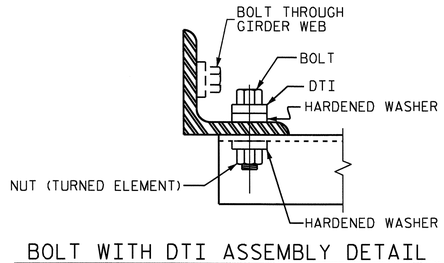
EXTERIOR GIRDER

INTERIOR GIRDER

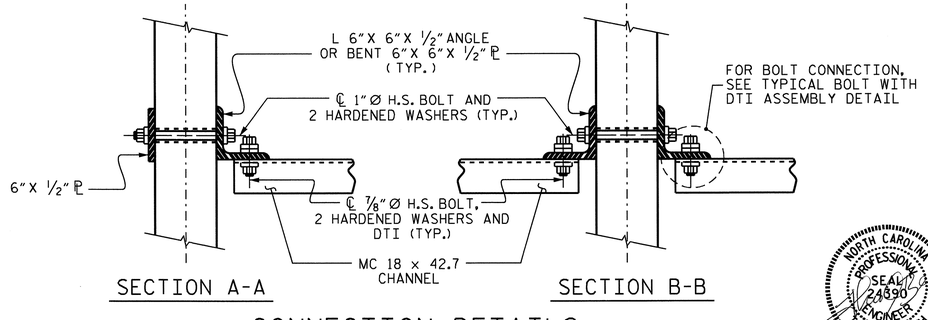
PART SECTION AT INTERMEDIATE DIAPHRAGM

TABLE

GIRDER TYPE	SPAN LOCATION	DIM "A"
IV	SPANS "A" & "B"	1'-9½"
III	SPANS "C" & "D"	1'-5"



BOLT WITH DTI ASSEMBLY DETAIL



SECTION A-A

SECTION B-B

CONNECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 24890 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE III & IV PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			65

ASSEMBLED BY : MIKE BRITT	DATE : 4-6-11
CHECKED BY : D.G. ELY	DATE : 7-17-11
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RR KMM/GM
	REV. 10/1/11 MAA/GM

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STD. NO. PCG10

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.

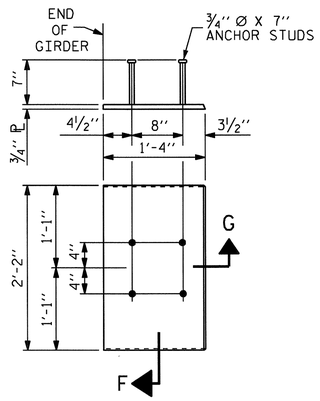
FOR SPANS "A", "C" & "D", THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

FOR SPAN "B", THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

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

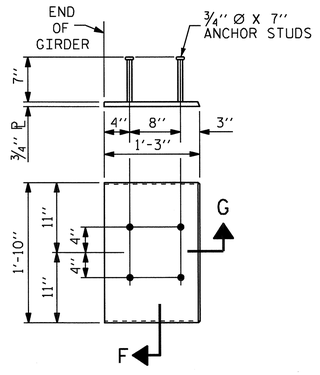
THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF 1/4".

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.



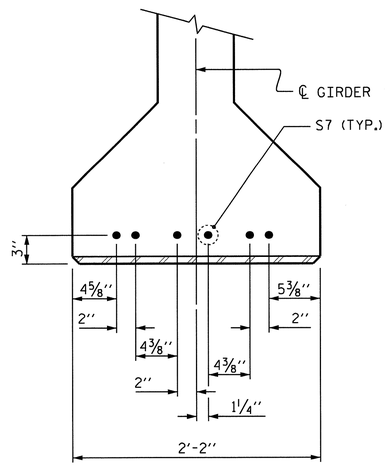
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER - SPANS "A" & "B")



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

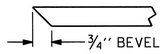
(2 REQ'D PER GIRDER - SPANS "C" & "D")



DETAIL "A"

(FOR AASHTO TYPE IV GIRDERS)

SECTION "G"



SECTION "F"

(SEE NOTES)

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			65

ASSEMBLED BY : MIKE BRITT	DATE : 4-6-11
CHECKED BY : D.G. ELY	DATE : 7-19-11
DRAWN BY : ELR 11/91	REV. 7/10/01RR LES/RDR
CHECKED BY : GRP 11/91	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

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STD. NO. PCG9

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "A"																						
	GIRDER A1											GIRDERS A2 THRU A4											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.033	0.062	0.085	0.100	0.105	0.100	0.085	0.062	0.033	0	0	0.033	0.062	0.085	0.099	0.104	0.099	0.085	0.062	0.033	0	
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.015	0.028	0.039	0.046	0.048	0.046	0.039	0.028	0.015	0	0	0.017	0.032	0.044	0.051	0.054	0.051	0.044	0.032	0.017	0	
FINAL CAMBER ↑	0	3/16"	7/16"	9/16"	5/8"	11/16"	5/8"	9/16"	7/16"	3/16"	0	0	3/16"	3/8"	1/2"	9/16"	5/8"	9/16"	1/2"	3/8"	3/16"	0	

0.6" Ø LOW RELAXATION	GIRDER A5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.032	0.061	0.084	0.098	0.103	0.098	0.084	0.061	0.032	0
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.014	0.026	0.036	0.042	0.044	0.042	0.036	0.026	0.014	0
FINAL CAMBER ↑	0	3/16"	7/16"	9/16"	11/16"	11/16"	11/16"	9/16"	7/16"	3/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "B"																						
	GIRDER B1											GIRDERS B2 THRU B4											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.081	0.153	0.210	0.246	0.258	0.246	0.210	0.153	0.081	0	0	0.081	0.153	0.209	0.245	0.257	0.245	0.209	0.153	0.081	0	
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.037	0.070	0.096	0.113	0.118	0.113	0.096	0.070	0.037	0	0	0.041	0.078	0.107	0.126	0.132	0.126	0.107	0.078	0.041	0	
FINAL CAMBER ↑	0	1/2"	1"	1 3/8"	1 5/8"	1 11/16"	1 5/8"	1 3/8"	1"	1/2"	0	0	1/2"	7/8"	1 1/4"	1 7/16"	1 1/2"	1 7/16"	1 1/4"	7/8"	1/2"	0	

0.6" Ø LOW RELAXATION	GIRDER B5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.080	0.151	0.207	0.242	0.254	0.242	0.207	0.151	0.080	0
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.034	0.065	0.089	0.104	0.109	0.104	0.089	0.065	0.034	0
FINAL CAMBER ↑	0	9/16"	1 1/16"	1 7/16"	1 5/8"	1 3/4"	1 5/8"	1 7/16"	1 1/16"	9/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "C"																						
	GIRDER C1											GIRDERS C2 THRU C4											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.039	0.074	0.101	0.118	0.124	0.118	0.101	0.074	0.039	0	0	0.039	0.073	0.100	0.117	0.123	0.117	0.100	0.073	0.039	0	
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.017	0.032	0.044	0.052	0.054	0.052	0.044	0.032	0.017	0	0	0.019	0.036	0.050	0.058	0.061	0.058	0.050	0.036	0.019	0	
FINAL CAMBER ↑	0	1/4"	1/2"	11/16"	13/16"	13/16"	13/16"	11/16"	1/2"	1/4"	0	0	1/4"	7/16"	5/8"	11/16"	3/4"	11/16"	5/8"	7/16"	1/4"	0	

0.6" Ø LOW RELAXATION	GIRDER C5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.038	0.072	0.099	0.116	0.121	0.116	0.099	0.072	0.038	0
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.016	0.030	0.041	0.048	0.050	0.048	0.041	0.030	0.016	0
FINAL CAMBER ↑	0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	SPAN "D"																						
	GIRDER D1											GIRDERS D2 THRU D4											
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.038	0.072	0.099	0.115	0.121	0.115	0.099	0.072	0.038	0	0	0.038	0.072	0.098	0.115	0.121	0.115	0.098	0.072	0.038	0	
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.016	0.030	0.041	0.048	0.050	0.048	0.041	0.030	0.016	0	0	0.018	0.034	0.046	0.054	0.057	0.054	0.046	0.034	0.018	0	
FINAL CAMBER ↑	0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	0	0	1/4"	7/16"	5/8"	3/4"	3/4"	3/4"	5/8"	7/16"	1/4"	0	

0.6" Ø LOW RELAXATION	GIRDER D5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.037	0.070	0.096	0.113	0.119	0.113	0.096	0.070	0.037	0
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.015	0.027	0.038	0.044	0.046	0.044	0.038	0.027	0.015	0
FINAL CAMBER ↑	0	1/4"	1/2"	11/16"	13/16"	7/8"	13/16"	11/16"	1/2"	1/4"	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-4697
WAKE COUNTY
STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 7-7-11
CHECKED BY : D.G. ELY DATE : 7-19-11

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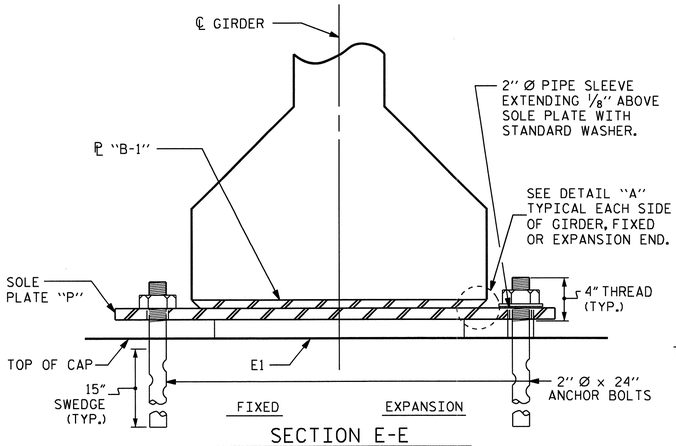

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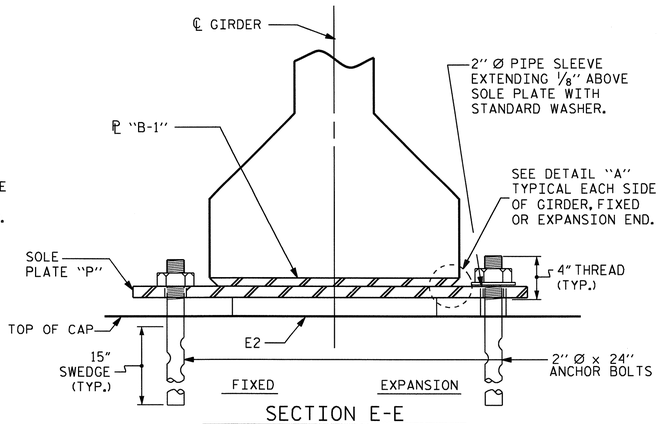

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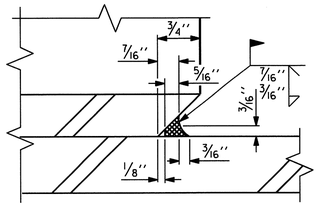
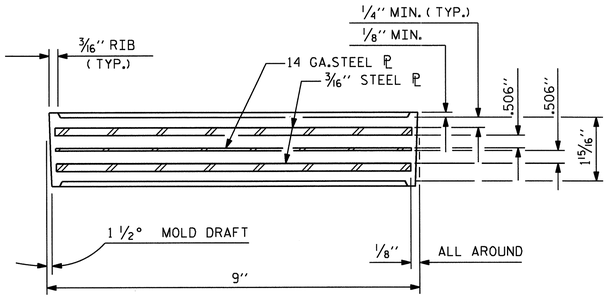
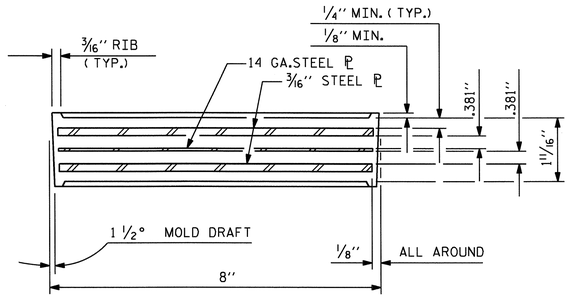


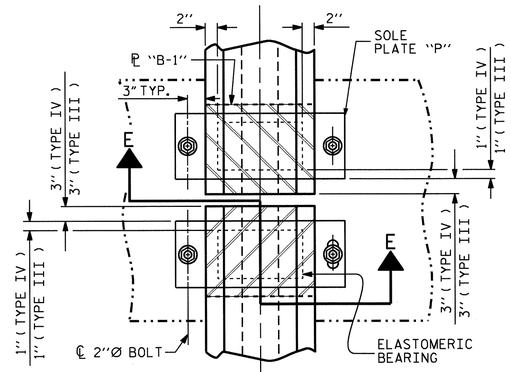
DETAIL "A"



TYPICAL SECTION OF ELASTOMERIC BEARINGS



TYPICAL SECTION OF ELASTOMERIC BEARINGS



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.

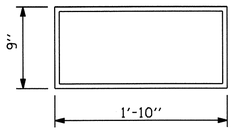
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLT, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

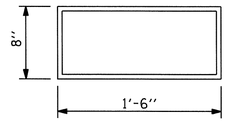
LOAD RATINGS	
	MAX.D.L.+L.L.
45"PCG -TYPE III	180 K
54"PCG -TYPE IV	248 K



E1 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

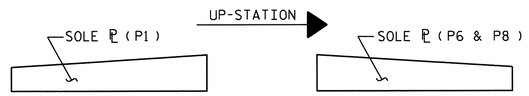
TYPE IV



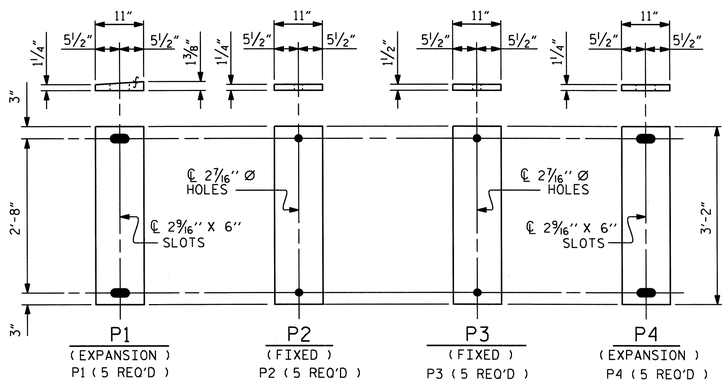
E2 (20 REQ'D)

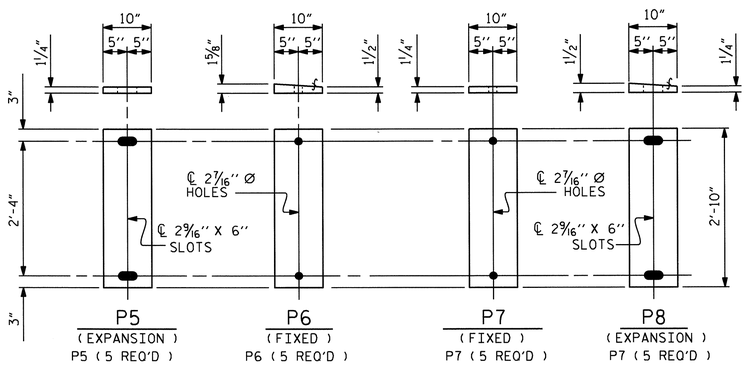
PLAN VIEW OF ELASTOMERIC BEARING

TYPE III



SOLE ℄ PLACEMENT DETAIL





SOLE PLATE DETAILS ("P")

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			65

STD. NO. EB3

ASSEMBLED BY : MIKE BRITT	DATE : 4-13-11	
CHECKED BY : D.G. ELY	DATE : 7-15-11	
DRAWN BY : WJH 8/89	REV. 7/10/01	RWW/LES
CHECKED BY : CRK 8/89	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

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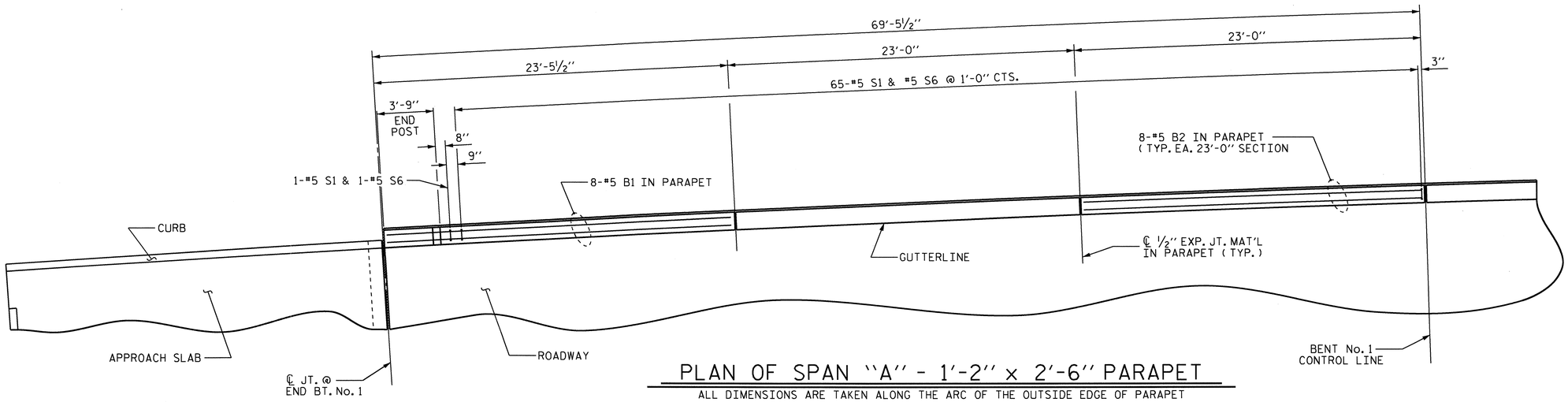
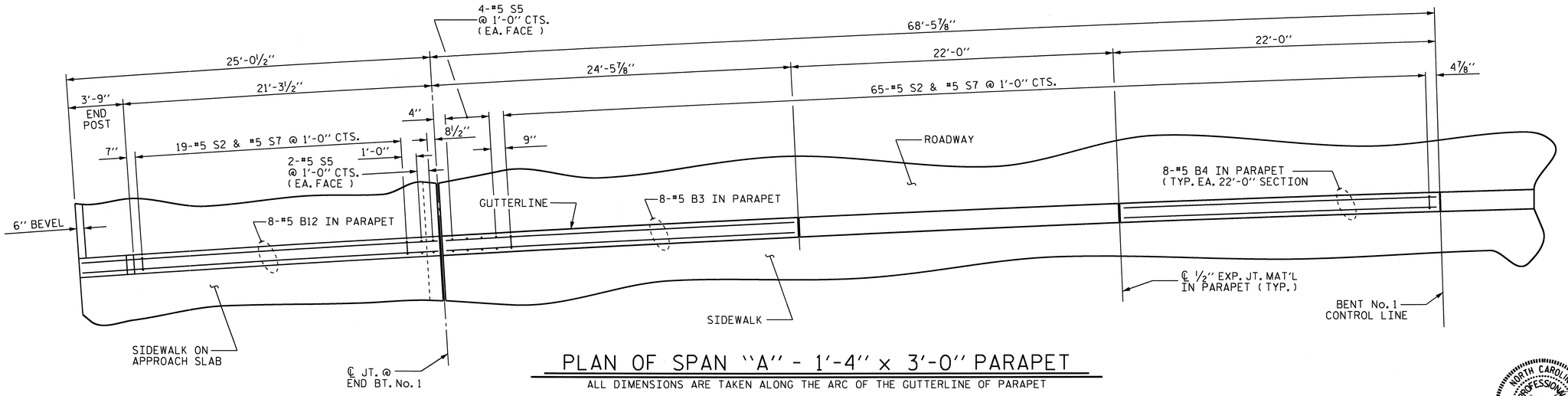


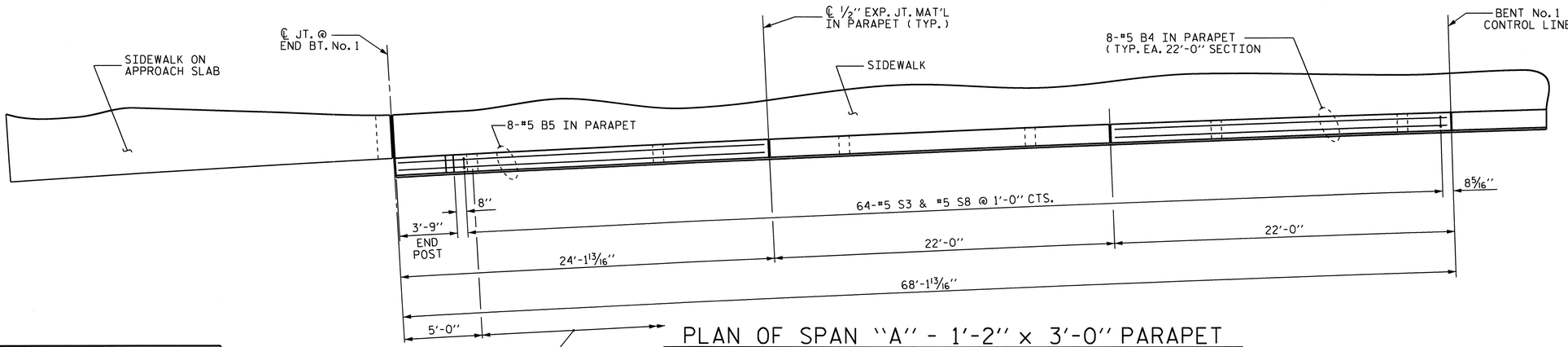
PLAN OF SPAN ''A'' - 1'-2'' x 2'-6'' PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF PARAPET



PLAN OF SPAN ''A'' - 1'-4'' x 3'-0'' PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE GUTTERLINE OF PARAPET



PLAN OF SPAN ''A'' - 1'-2'' x 3'-0'' PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 24890 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET DETAILS
(SPAN ''A'')

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 4-28-11
CHECKED BY : D.G. ELY DATE : 7-20-11

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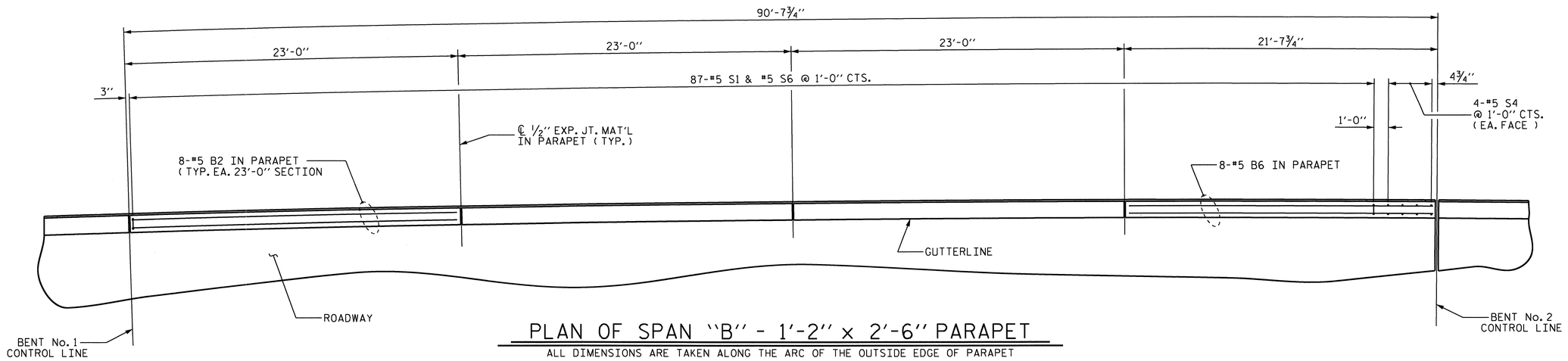

PLAN OF SPAN ''B'' - 1'-2'' x 2'-6'' PARAPET

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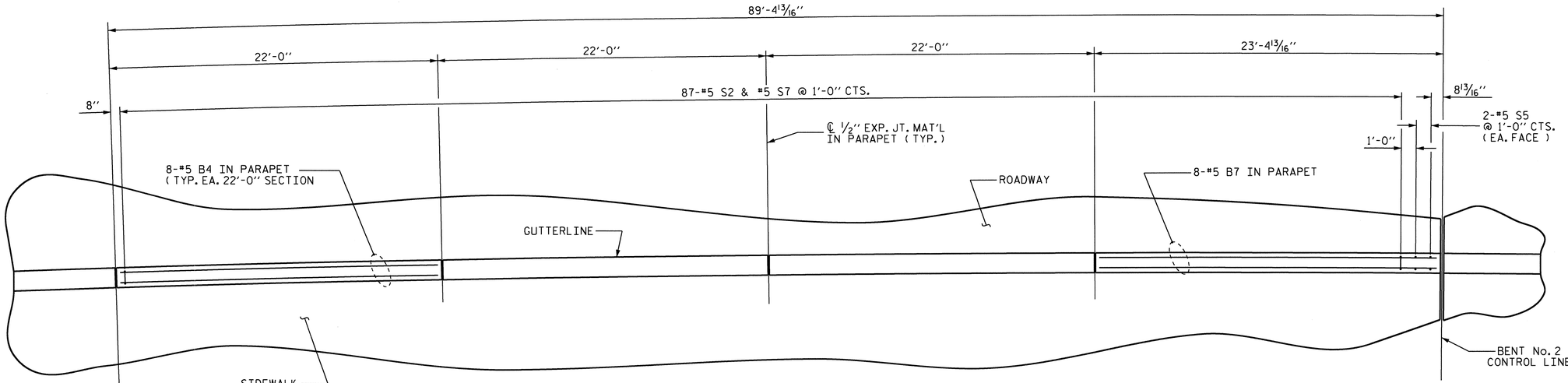
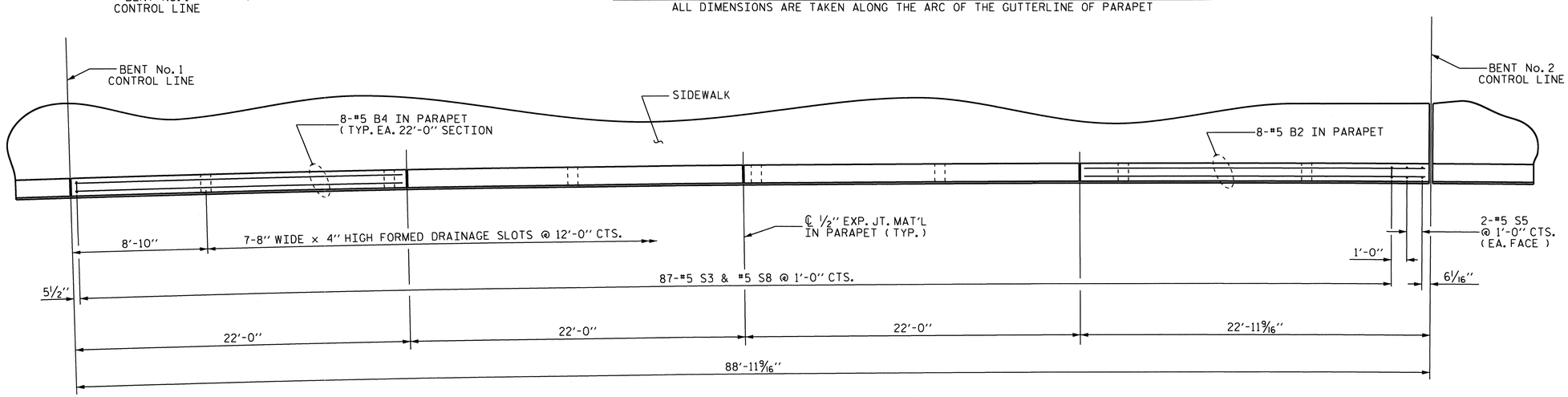


PLAN OF SPAN ''B'' - 1'-4'' x 3'-0'' PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE GUTTERLINE OF PARAPET



PLAN OF SPAN ''B'' - 1'-2'' x 3'-0'' PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET DETAILS
(SPAN ''B'')

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 5-3-11
CHECKED BY : D.G. ELY DATE : 7-20-11

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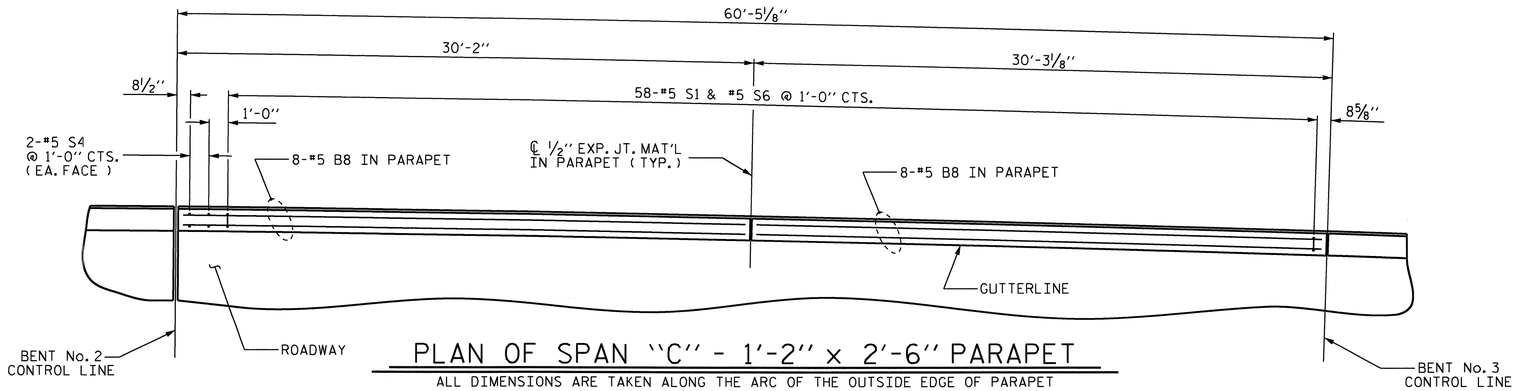
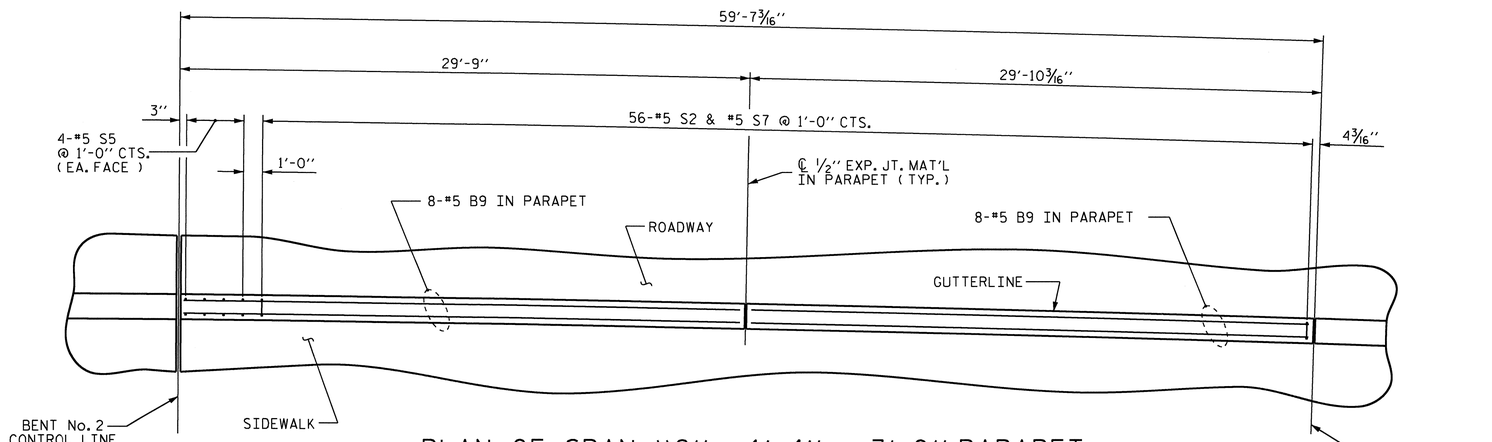


PLAN OF SPAN "C" - 1'-2" x 2'-6" PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF PARAPET



PLAN OF SPAN "C" - 1'-4" x 3'-0" PARAPET

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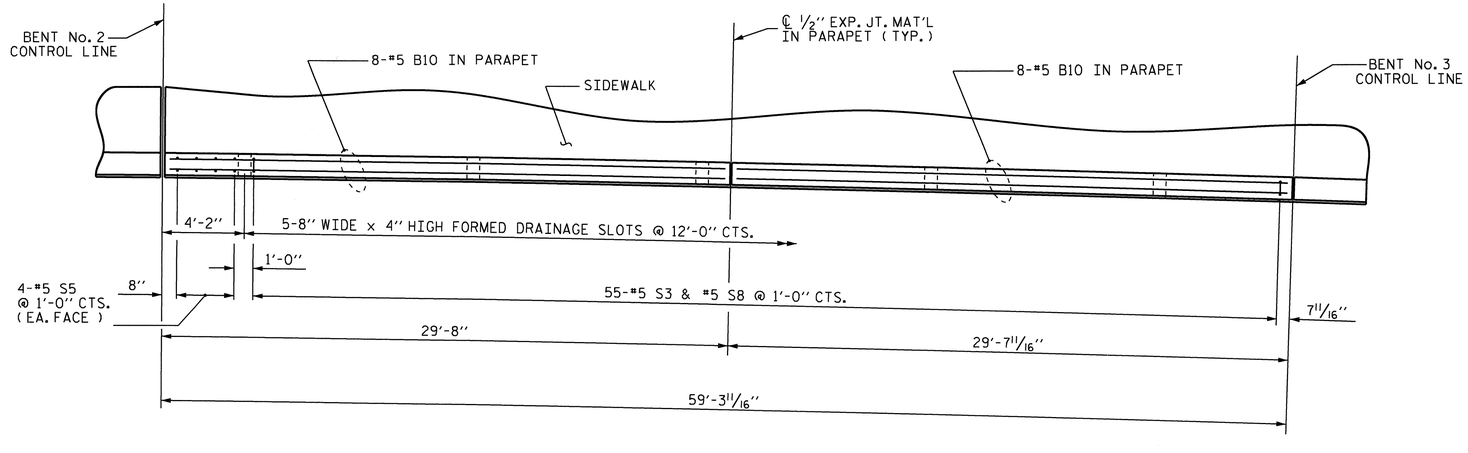
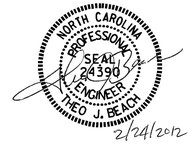


PLAN OF SPAN "C" - 1'-2" x 3'-0" PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF PARAPET



PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 3 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET DETAILS
(SPAN "C")

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 5-4-11
CHECKED BY : D.G. ELY DATE : 7-20-11

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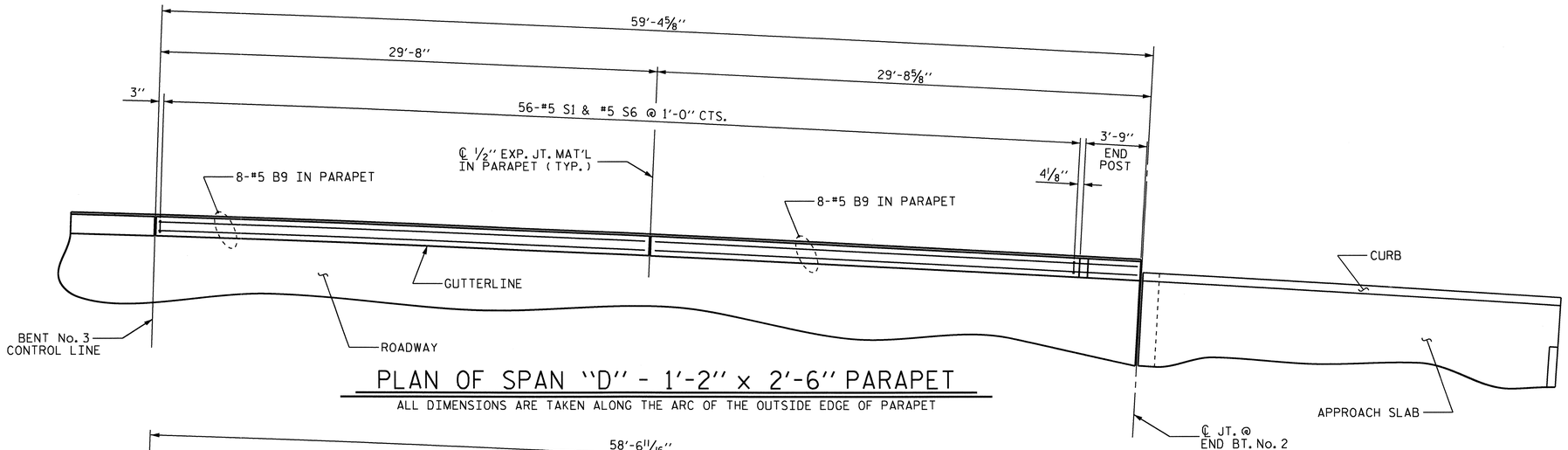

PLAN OF SPAN ''D'' - 1'-2'' x 2'-6'' PARAPET

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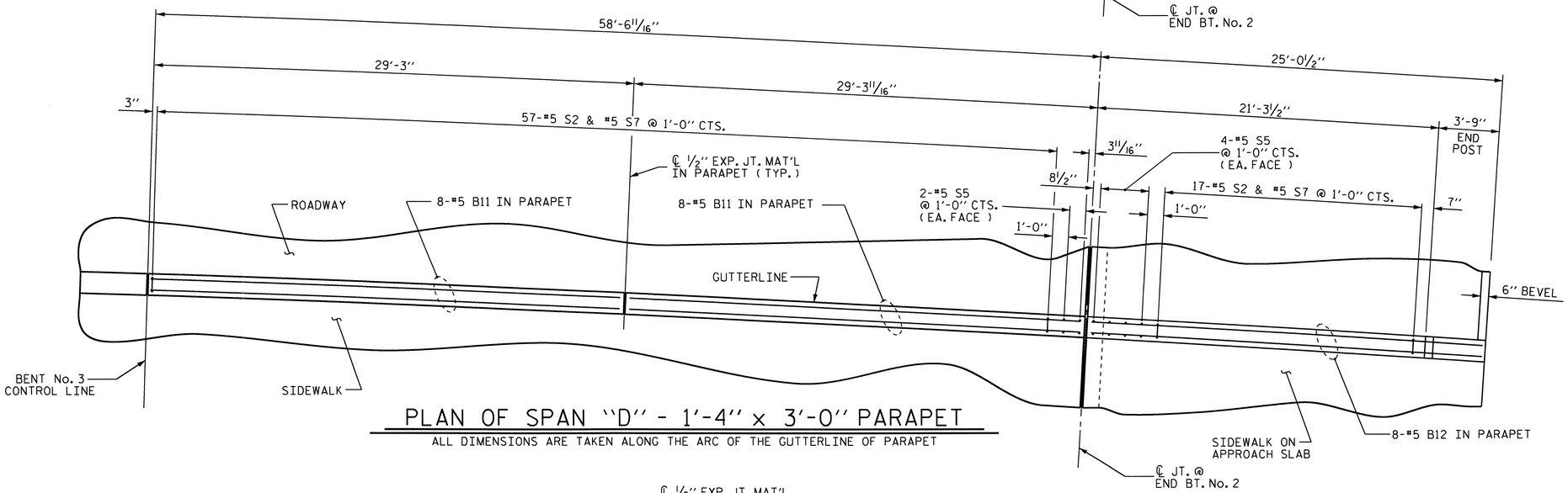
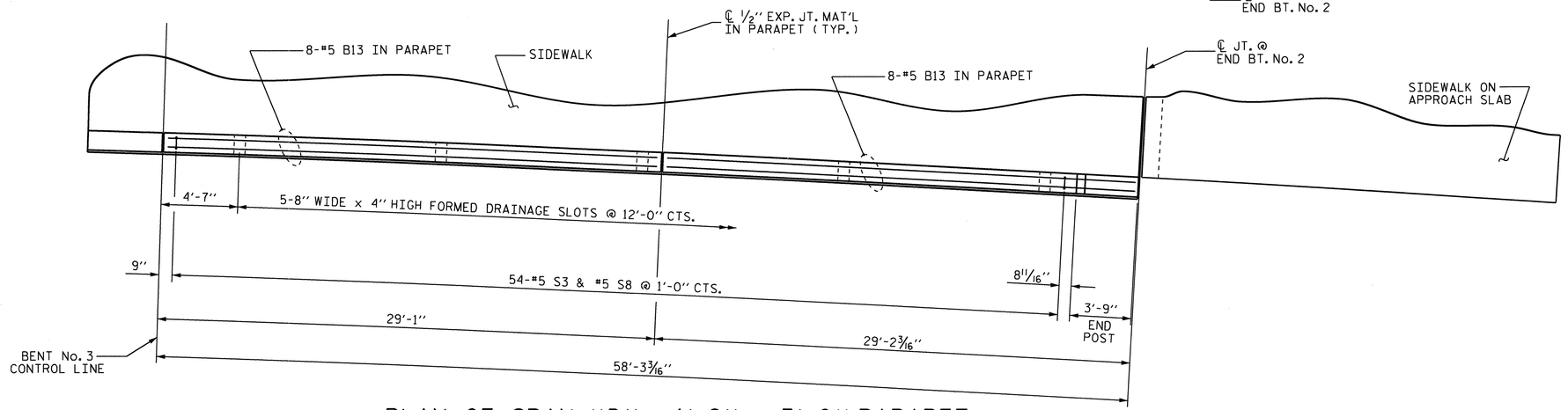


PLAN OF SPAN ''D'' - 1'-4'' x 3'-0'' PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE GUTTERLINE OF PARAPET



PLAN OF SPAN ''D'' - 1'-2'' x 3'-0'' PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 4 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET DETAILS
(SPAN ''D'')

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 5-5-11
CHECKED BY : D.G. ELY DATE : 7-20-11

10-JAN-2012 13:28
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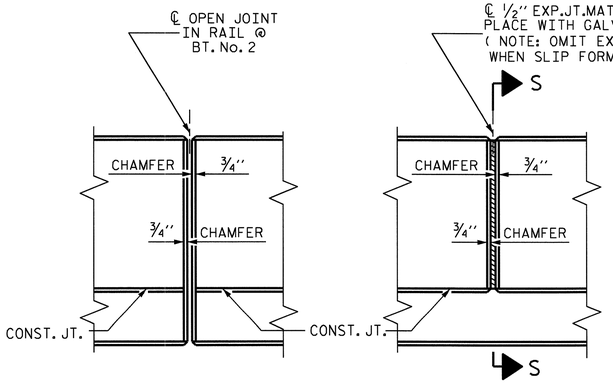
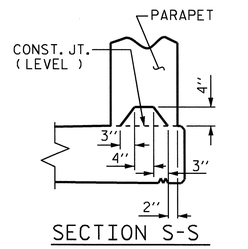
dely



ELEVATION AT EXPANSION JOINTS



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

NOTES (FOR 1'-2" x 2'-6" PARAPET)

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

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

THE #5 S1 & #5 S6 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE ½" EXPANSION JOINT MATERIAL IN PARAPET.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF PARAPET.

THE #5 S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. LEVEL TWO FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE #5 S4 BAR IS 18.6 KIPS.

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

BILL OF MATERIAL

FOR 1'-2" x 2'-6" CONCRETE PARAPET & END POST ONLY

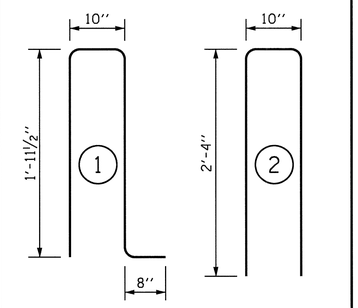
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
✱B1	8	#5	STR.	23'-1"	193
✱B2	40	#5	STR.	22'-7"	942
✱B6	8	#5	STR.	21'-3"	177
✱B8	16	#5	STR.	29'-9"	496
✱B9	16	#5	STR.	29'-4"	490
✱E1	4	#7	STR.	2'-6"	20
✱E2	4	#7	STR.	3'-0"	25
✱E3	4	#7	STR.	3'-6"	29
✱E4	4	#7	STR.	4'-0"	33
✱E5	4	#7	STR.	4'-4"	35
✱F1	4	#6	STR.	1'-10"	11
✱F2	4	#6	STR.	3'-0"	18
✱F3	4	#6	STR.	3'-6"	21
✱S1	268	#5	1	5'-5"	1514
✱S4	28	#5	STR.	3'-0"	88
✱S6	268	#5	2	5'-6"	1537

✱ EPOXY COATED REINFORCING STEEL 5,629 LBS.

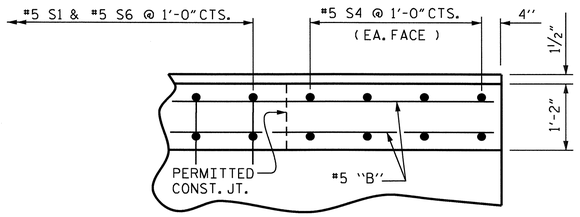
CLASS AA CONCRETE	30.6 C.Y.
CONCRETE PARAPET	279.92 L.F.

✱ THESE BARS ARE EPOXY COATED

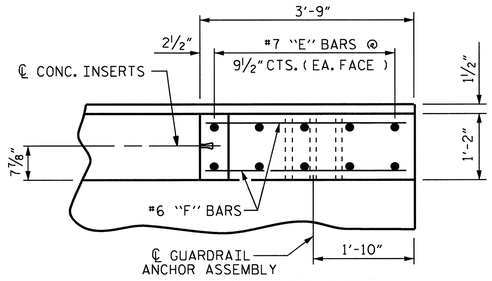
BAR TYPES



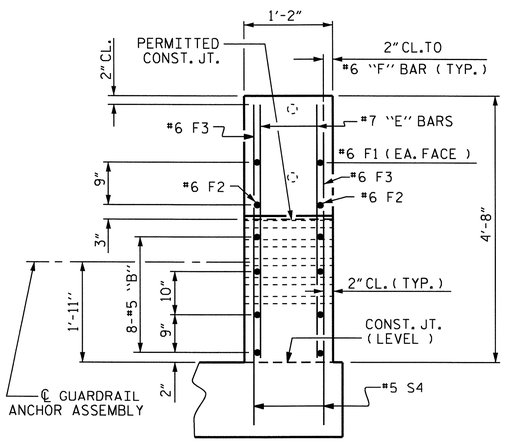
BAR DIMENSIONS ARE OUT TO OUT



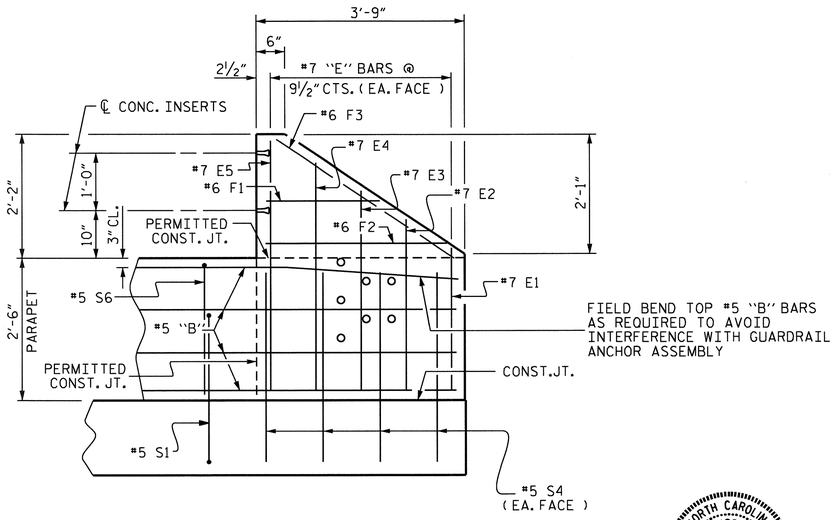
PLAN OF PARAPET



PLAN OF END POST



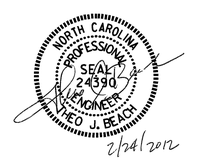
END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

(SPAN "D" SHOWN, SPAN "A" SIMILAR)



PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 5 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET DETAILS
(1'-2" x 2'-6" PARAPET)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 5-11-11
CHECKED BY : D.G. ELY DATE : 7-19-11

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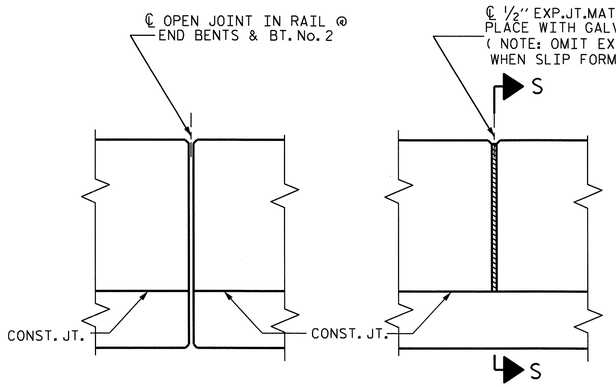
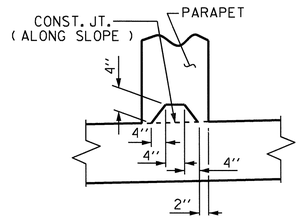


ELEVATION AT EXPANSION JOINTS



SECTION S-S

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

NOTES (FOR 1'-4" x 3'-0" PARAPET)

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

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

THE #5 S2 & #5 S7 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE ½" EXPANSION JOINT MATERIAL IN PARAPET.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS FOR DOUBLE FACED TWO BAR METAL RAIL" SHEET.

FOR DETAILS OF GUARDRAIL ANCHOR ASSEMBLIES, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF PARAPET.

THE #5 S5 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. LEVEL TWO FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE #5 S5 BAR IS 18.6 KIPS.

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

BILL OF MATERIAL

FOR 1'-4" x 3'-0" CONCRETE PARAPET & END POST ONLY

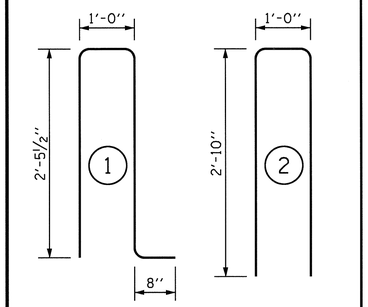
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
✳ B3	8	#5	STR.	24'-0"	200
✳ B4	40	#5	STR.	21'-8"	904
✳ B7	8	#5	STR.	23'-0"	192
✳ B9	16	#5	STR.	29'-4"	490
✳ B11	16	#5	STR.	28'-11"	483
✳ B12	16	#5	STR.	24'-7"	210
✳ E6	4	#7	STR.	3'-0"	25
✳ E7	4	#7	STR.	3'-6"	29
✳ E8	4	#7	STR.	4'-0"	33
✳ E9	4	#7	STR.	4'-6"	37
✳ E10	4	#7	STR.	4'-10"	40
✳ F1	4	#6	STR.	1'-10"	11
✳ F2	4	#6	STR.	3'-0"	18
✳ F3	4	#6	STR.	3'-6"	21
✳ S2	301	#5	1	6'-7"	2067
✳ S5	52	#5	STR.	3'-6"	190
✳ S7	301	#5	2	6'-8"	2093

✳ EPOXY COATED REINFORCING STEEL 7,248 LBS.

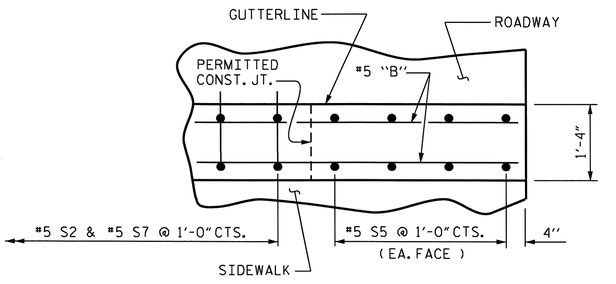
CLASS AA CONCRETE	48.8 C.Y.
CONCRETE PARAPET	326.13 L.F.

✳ THESE BARS ARE EPOXY COATED

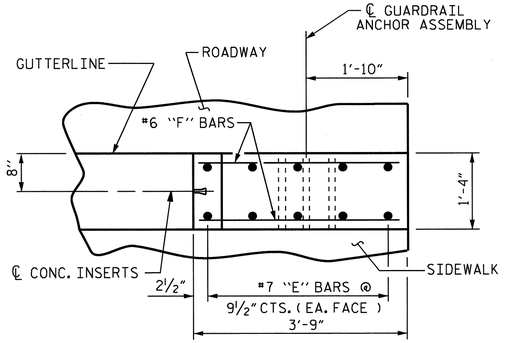
BAR TYPES



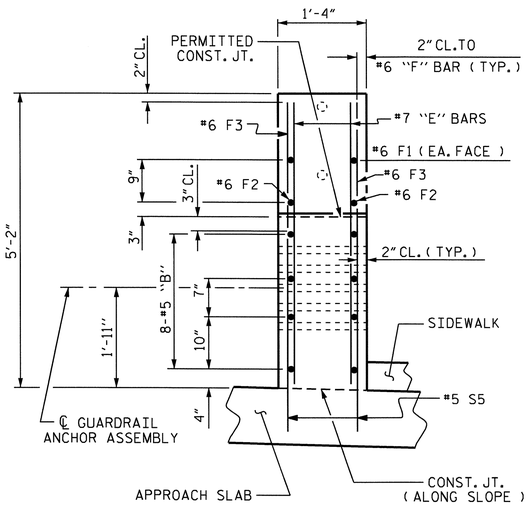
BAR DIMENSIONS ARE OUT TO OUT



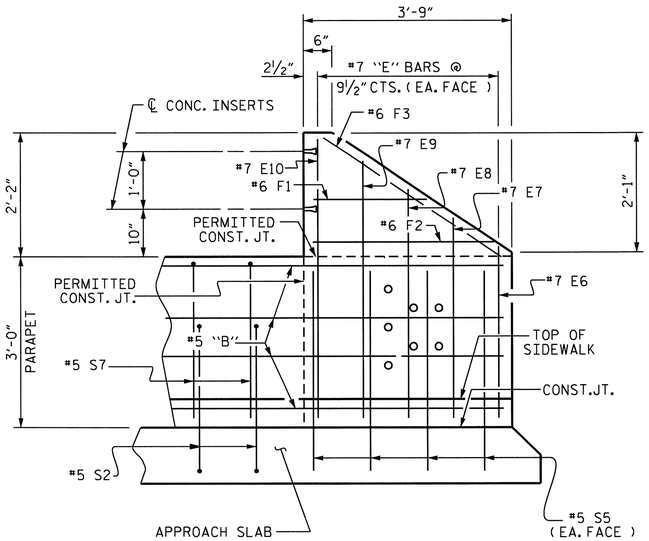
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR DOUBLE FACED TWO BAR RAIL

(APPROACH SLAB 2 SHOWN, APPROACH SLAB 1 SIMILAR)

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER STEVEN J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 6 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET DETAILS
(1'-4" x 3'-0" PARAPET)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 5-12-11
CHECKED BY : D.G. ELY DATE : 7-20-11

10-JAN-2012 13:27
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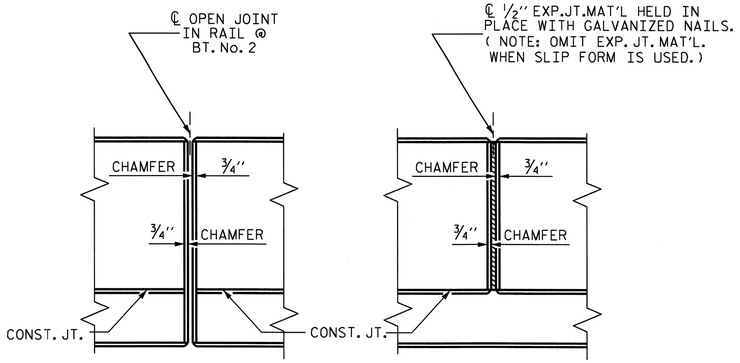
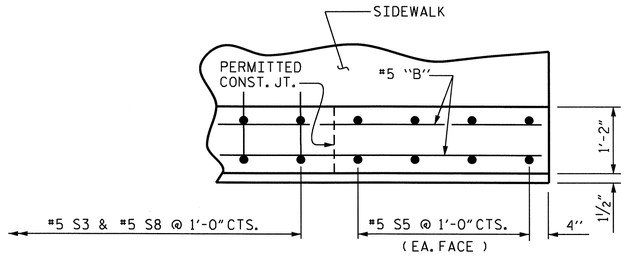
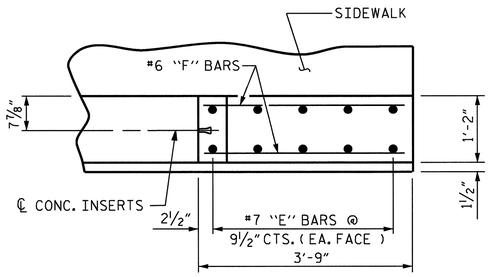


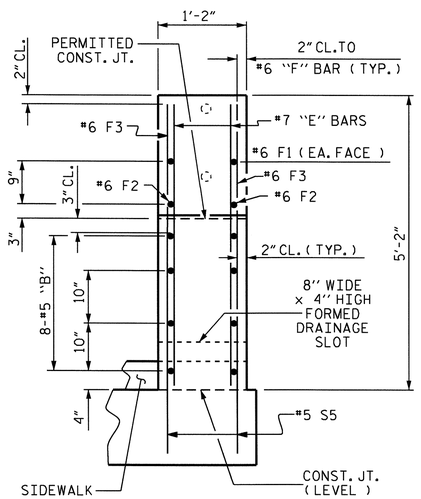
ELEVATION AT EXPANSION JOINTS



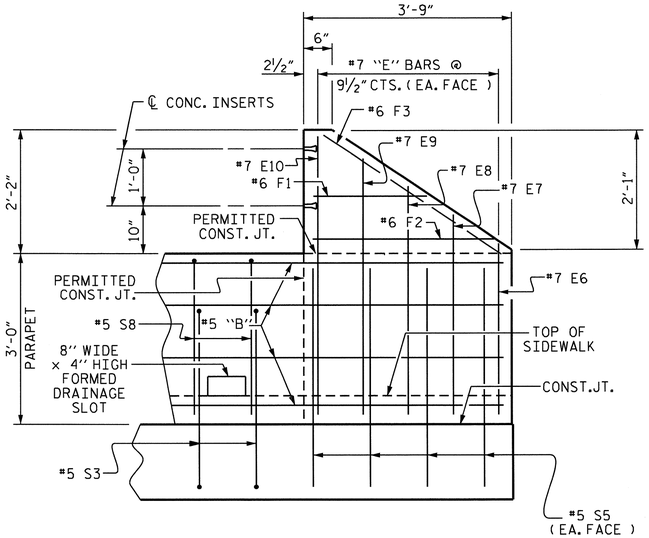
PLAN OF PARAPET



PLAN OF END POST



END VIEW



ELEVATION

PARAPET AND END POST FOR TWO BAR RAIL

(SPAN "D" SHOWN, SPAN "A" SIMILAR)

NOTES (FOR 1'-2" x 3'-0" PARAPET)

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

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

THE #5 S3 & #5 S8 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN PARAPET.

FOR DETAILS OF CONCRETE INSERTS IN END POSTS, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET.

WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF PARAPET.

THE #5 S5 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. LEVEL TWO FIELD TESTING IS REQUIRED AND THE YIELD LOAD OF THE #5 S5 BAR IS 18.6 KIPS.

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

NO GUARDRAIL ANCHORAGE IS REQUIRED FOR THE 1'-2" x 3'-0" PARAPET.

THE 8" WIDE x 4" HIGH FORMED DRAINAGE SLOTS MAY BE SHIFTED SLIGHTLY IN ORDER TO CLEAR THE #5 S3 & #5 S8 BARS IN THE PARAPET.

BILL OF MATERIAL

FOR 1'-2" x 3'-0" CONCRETE PARAPET & END POST ONLY

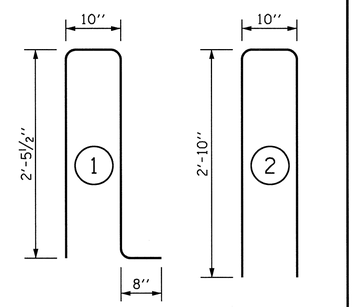
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* B2	8	#5	STR.	22'-7"	188
* B4	40	#5	STR.	21'-8"	904
* B5	8	#5	STR.	23'-9"	198
* B10	16	#5	STR.	29'-3"	488
* B13	16	#5	STR.	28'-9"	480
* E6	4	#7	STR.	3'-0"	25
* E7	4	#7	STR.	3'-6"	29
* E8	4	#7	STR.	4'-0"	33
* E9	4	#7	STR.	4'-6"	37
* E10	4	#7	STR.	4'-10"	40
* F1	4	#6	STR.	1'-10"	11
* F2	4	#6	STR.	3'-0"	18
* F3	4	#6	STR.	3'-6"	21
* S3	260	#5	1	6'-5"	1740
* S5	28	#5	STR.	3'-6"	102
* S8	260	#5	2	6'-6"	1763

* EPOXY COATED REINFORCING STEEL 6,077 LBS.

CLASS AA CONCRETE	36.0 C.Y.
CONCRETE PARAPET	274.69 L.F.

* THESE BARS ARE EPOXY COATED

BAR TYPES



BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 7 OF 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET DETAILS
(1'-2" x 3'-0" PARAPET)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 24090 ENGINEER THEO J. BEACH
2/24/2012

DRAWN BY : MIKE BRITT DATE : 5-11-11
CHECKED BY : D.G. ELY DATE : 7-20-11

10-JAN-2012 13:26
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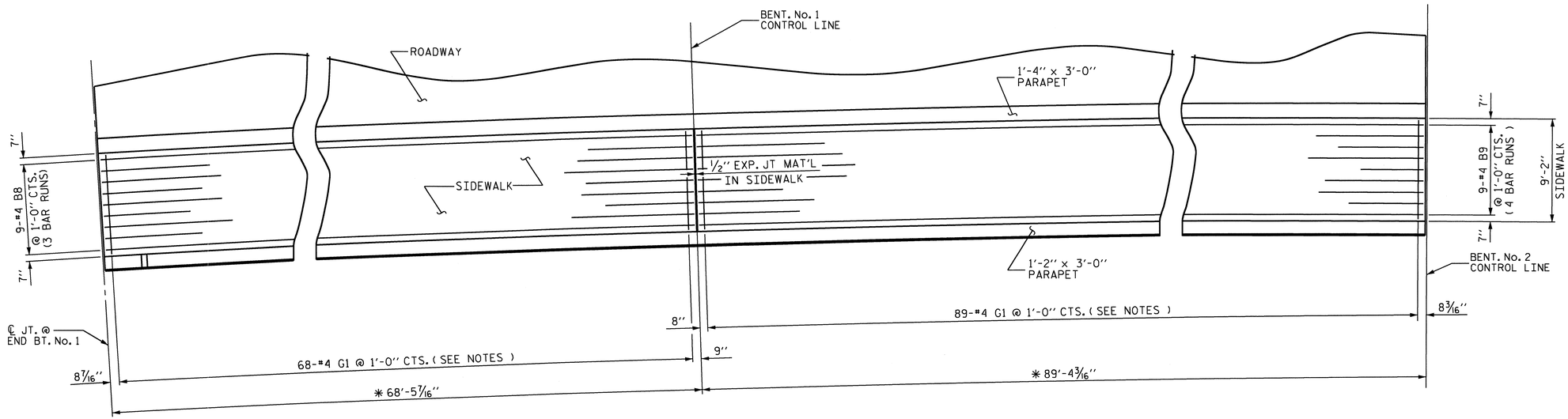
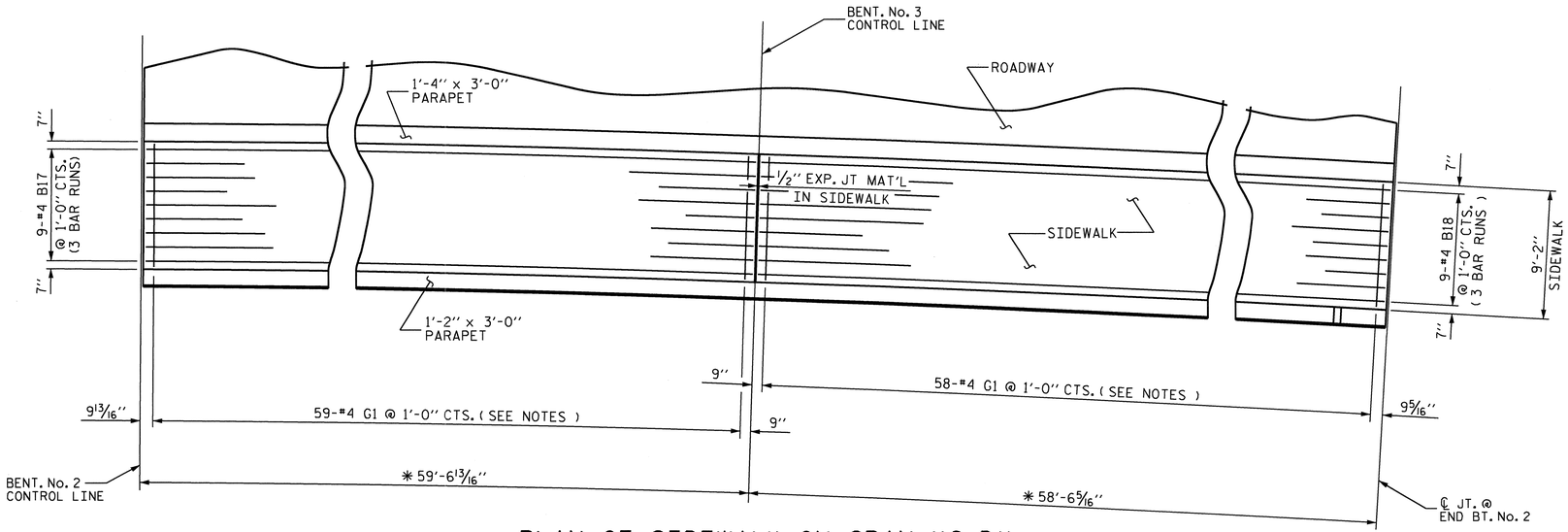


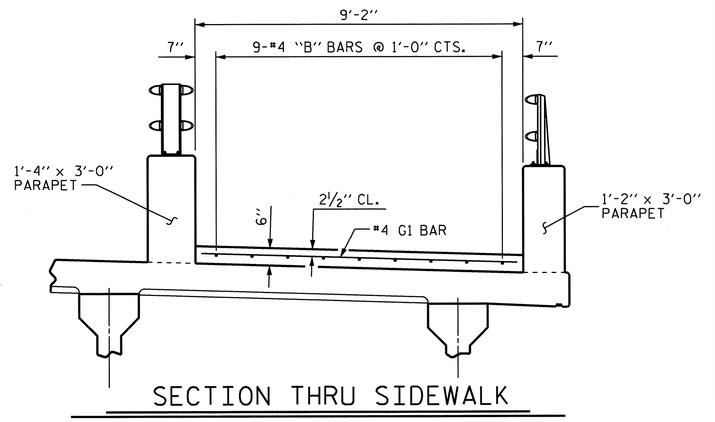
PLAN OF SIDEWALK ON SPAN ''A-B''

* NOTE :
THESE DIMENSIONS ARE TAKEN
ALONG THE ARC OF THE SIDEWALK
FACE OF THE 1'-4'' x 3'-0'' PARAPET



PLAN OF SIDEWALK ON SPAN ''C-D''

* NOTE :
THESE DIMENSIONS ARE TAKEN
ALONG THE ARC OF THE SIDEWALK
FACE OF THE 1'-4'' x 3'-0'' PARAPET



SECTION THRU SIDEWALK

NOTES :

FOR PARAPET DETAILS AND REINFORCING STEEL, SEE ''CONCRETE PARAPET DETAILS'' SHEETS.

THE #4 G1 BARS SHALL BE SPACED ALONG THE SIDEWALK FACE OF THE 1'-4'' x 3'-0'' PARAPET AND BE PLACED RADIALLY.

ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

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

FOR SIDEWALK REINFORCEMENT AND CONCRETE QUANTITIES, SEE ''CONCRETE DECK POUR DETAILS'' AND ''SUPERSTRUCTURE BILL OF MATERIAL'' SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 5-17-11
CHECKED BY : D.G. ELY DATE : 7-11-11

10-JAN-2012 13:26
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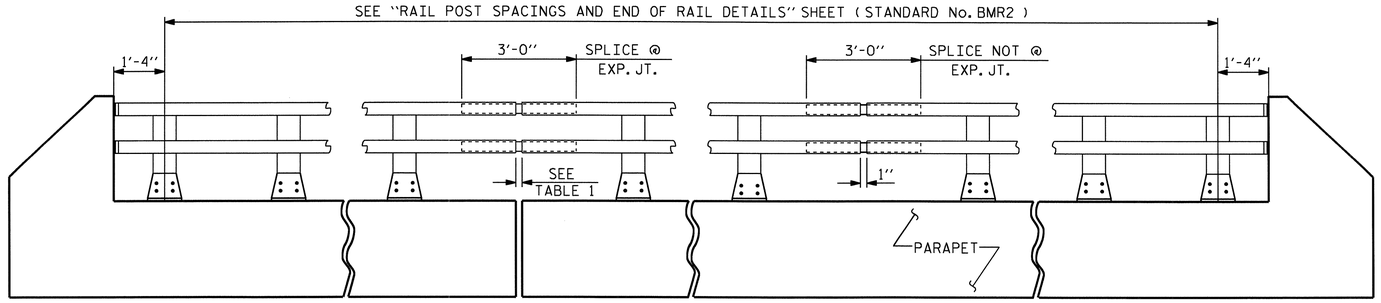
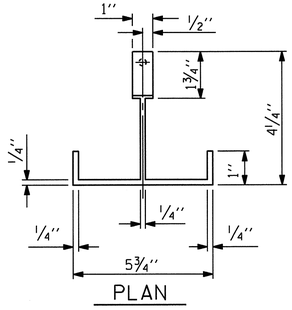


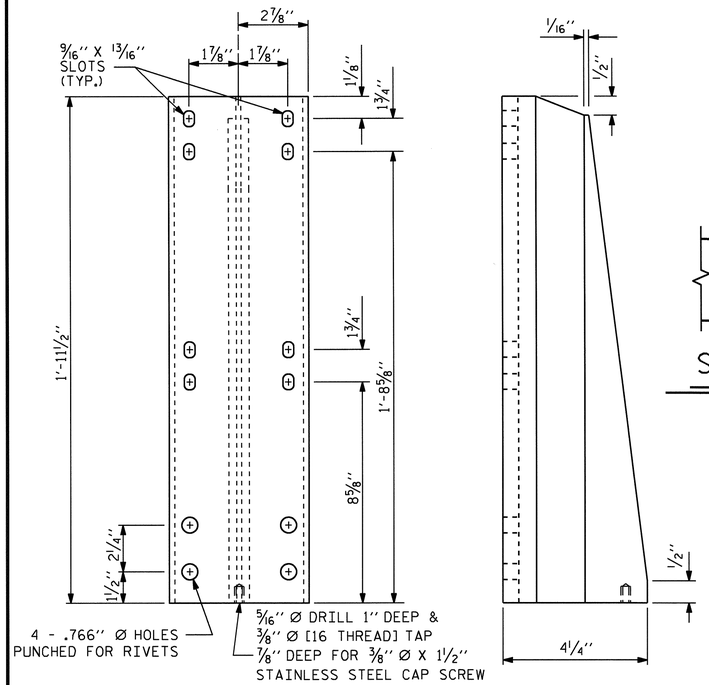
ELEVATION

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

TABLE 1	
℄ EXP. JT. @	RAIL OPENING
BENT No. 2	2 7/16"

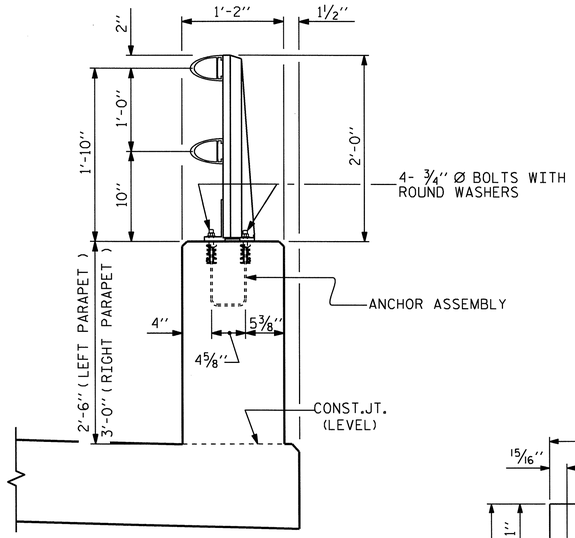


PLAN

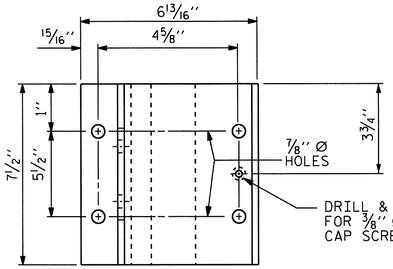


FRONT ELEVATION SIDE ELEVATION

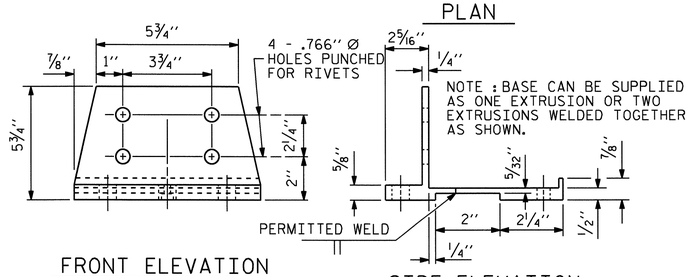
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

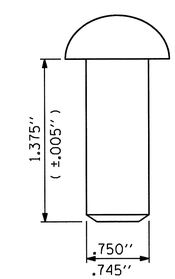


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

ALUMINUM RAILS

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

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

PAY LENGTH = 539.44 LIN FT.

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 24890 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			65

STD. NO. BMR3

ASSEMBLED BY : MIKE BRITT		DATE : 5-18-11
CHECKED BY : D.G. ELY		DATE : 7-21-11
DRAWN BY : EEM 6/94	REV. 5/7/03R	RWW/JTE
CHECKED BY : RGW 6/94	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

10-JAN-2012 13:25
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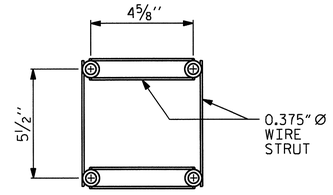
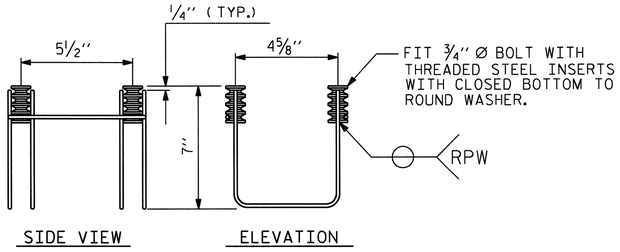


PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(89 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR ¾'' FERRULES.

B. 4 - ¾'' Ø X 2½'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ¾'' Ø X 2½'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

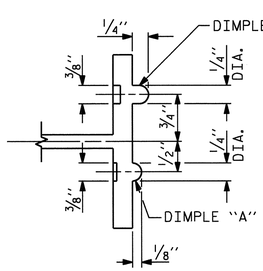
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

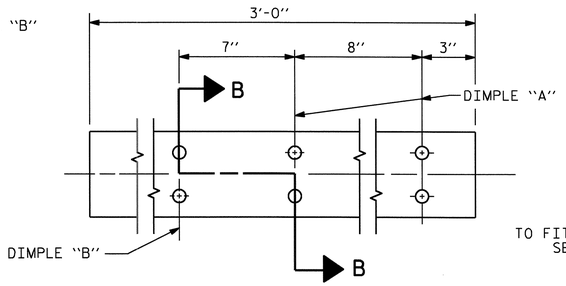
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

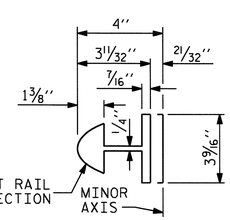
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

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



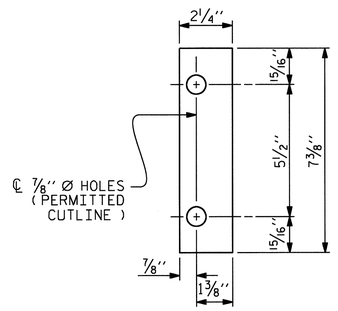
SECTION B - B



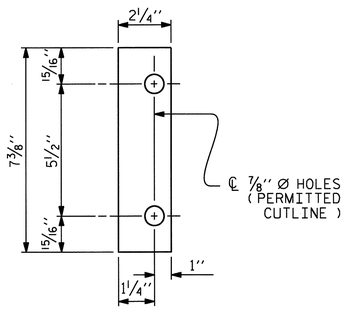


BAR SECTION

EXPANSION BAR DETAILS



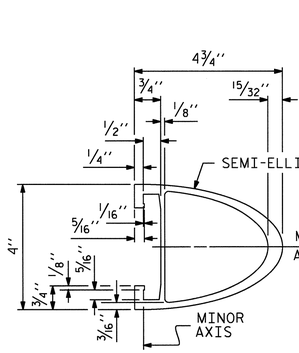
FRONT PLATE



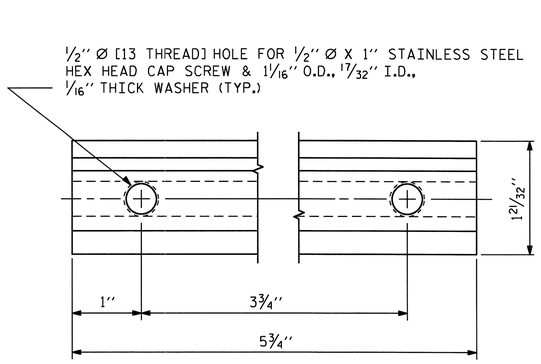
REAR PLATE

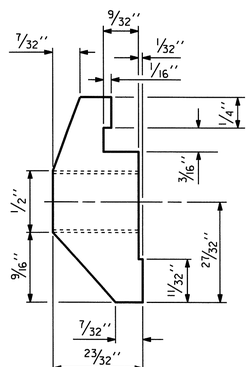
SHIM DETAILS

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



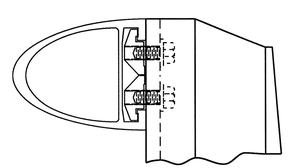
RAIL SECTION



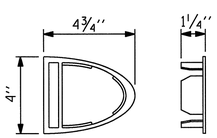


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			65

STD. NO. BMR4

ASSEMBLED BY : MIKE BRITT	DATE : 5-18-11
CHECKED BY : D.G. ELY	DATE : 7-21-11
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

10-JAN-2012 13:24
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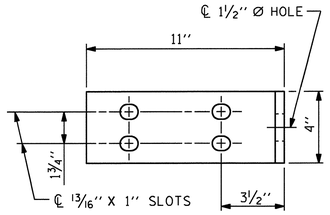
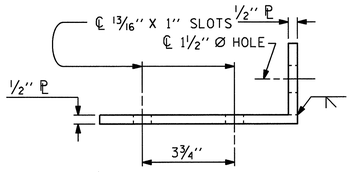
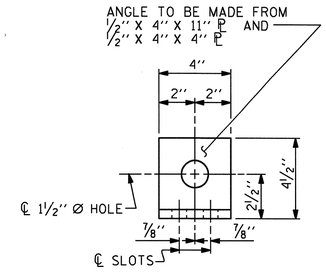


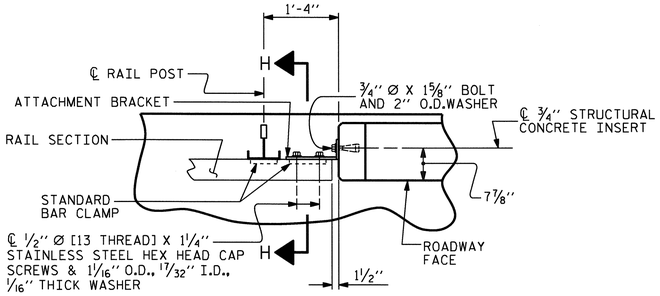
ELEVATION



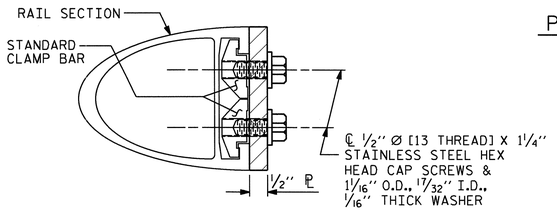
TOP VIEW



END VIEW

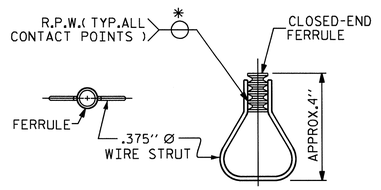


PLAN - RAIL AND END POST



SECTION H-H

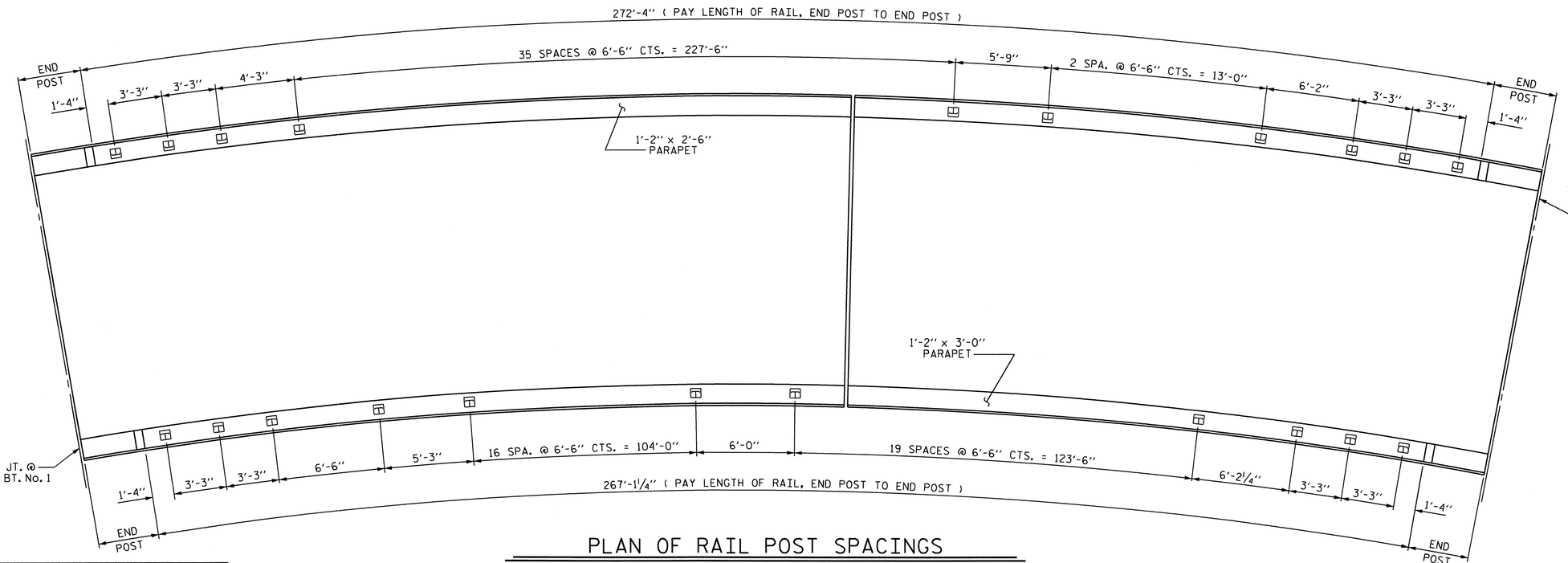
DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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



PLAN OF RAIL POST SPACINGS

(DIMENSIONS ARE MEASURED ALONG THE ARC OF THE OUTSIDE FACE OF PARAPET)

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

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

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

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

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

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

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

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

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			65

STD. NO. BMR2

ASSEMBLED BY : MIKE BRITT		DATE : 5-18-11
CHECKED BY : D.G. ELY		DATE : 7-21-11
DRAWN BY : FCJ 1/88	REV. 5/7/03	RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

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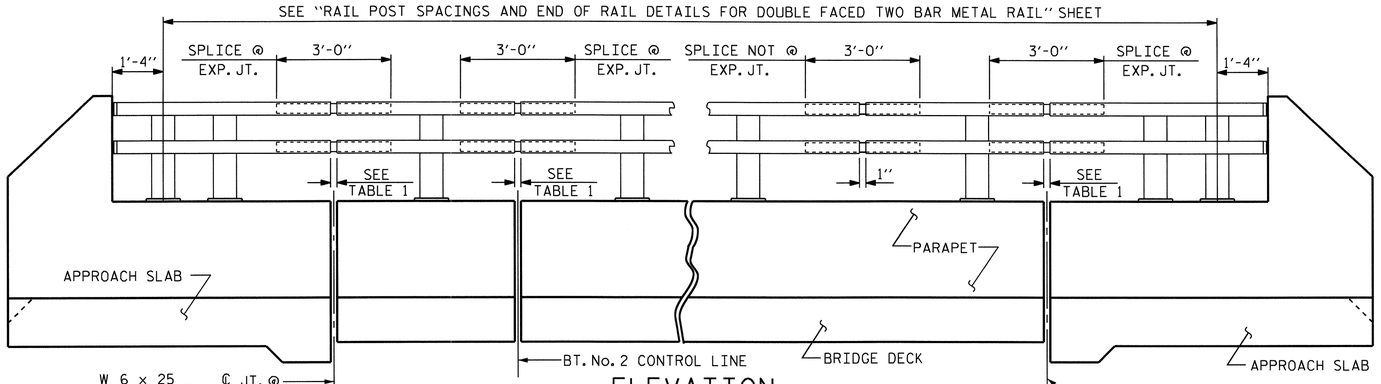
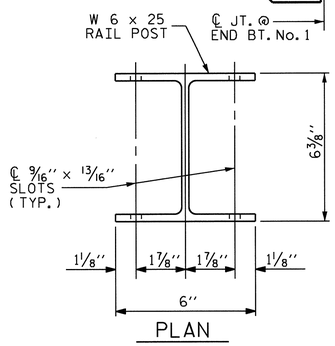


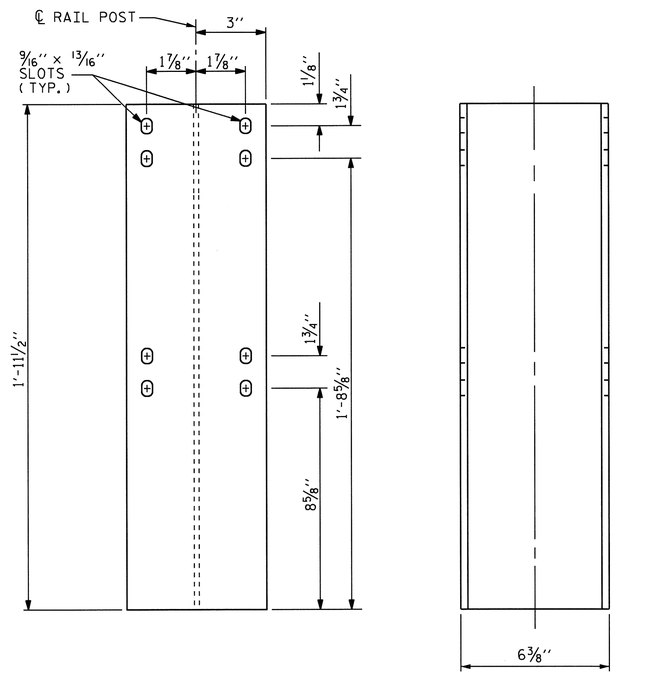
ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "RAIL POST SPACING AND END OF RAIL DETAILS FOR DOUBLE FACED 2 BAR METAL RAIL" SHEET.

TABLE 1	
℄ EXP. JT. @	RAIL OPENING
END BENT No. 1	2 1/8"
BENT No. 2	2 7/16"
END BENT No. 2	2 1/16"

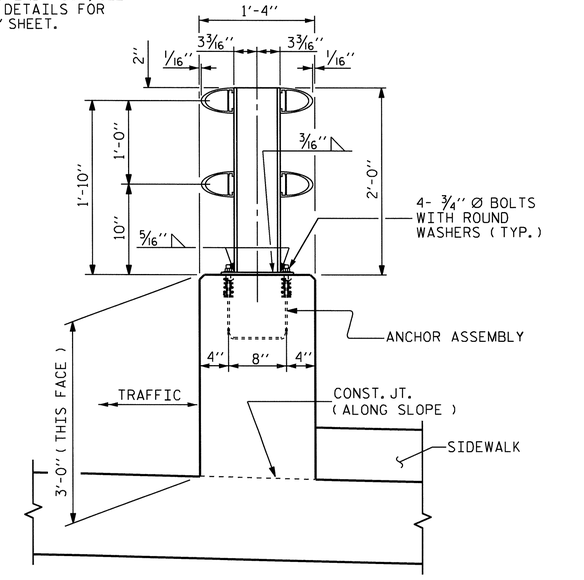


PLAN

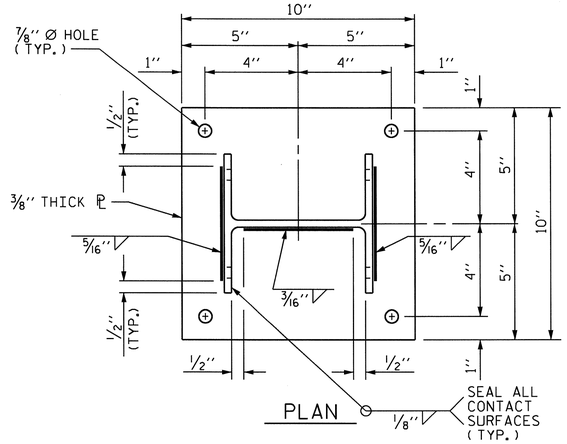


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST



SECTION THRU PARAPET AND RAIL



PLAN

POST BASE DETAILS

NOTES

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

ALUMINUM RAILS

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

GENERAL NOTES

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET 3 OF 3.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

ALL POST OR BASE PLATE SURFACES RECEIVING A SEAL WELD SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

FOR DOUBLE FACED TWO BAR METAL RAIL, SEE SPECIAL PROVISIONS.

PAY LENGTH = 318.63 LIN FT.

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DOUBLE FACED 2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 5-24-11
CHECKED BY : D.G. ELY DATE : 7-21-11

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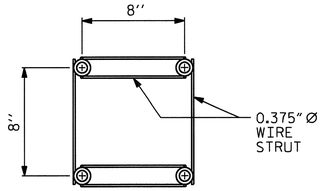
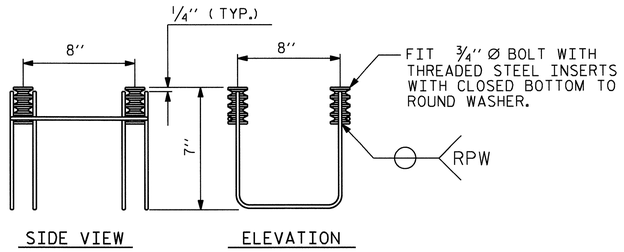


PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(53 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

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

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

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

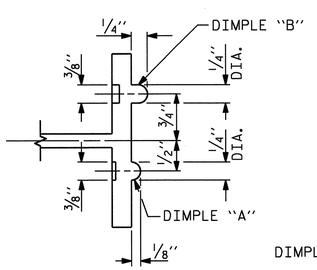
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

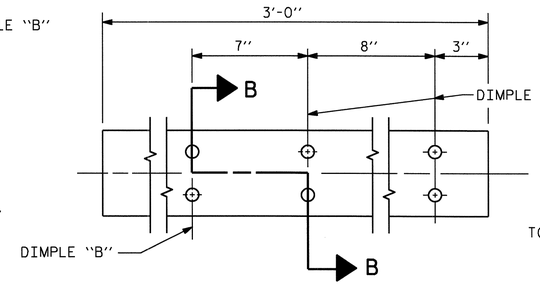
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

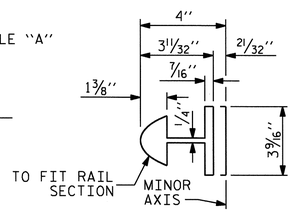
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4"Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

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



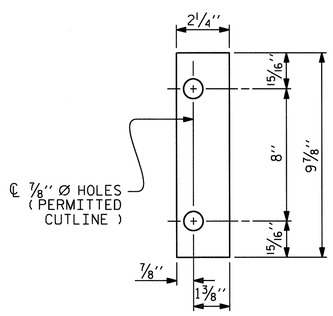
SECTION B - B



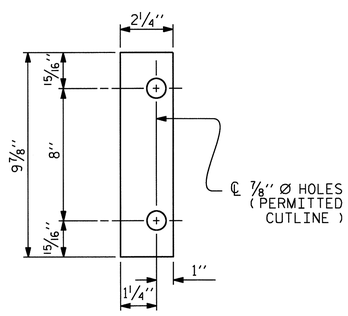


BAR SECTION

EXPANSION BAR DETAILS



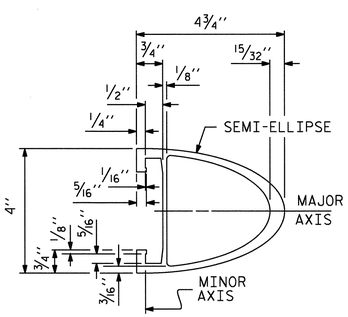
FRONT PLATE



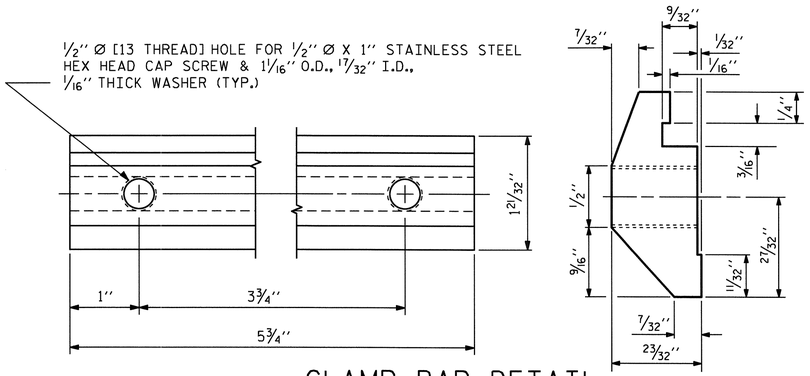
REAR PLATE

SHIM DETAILS

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

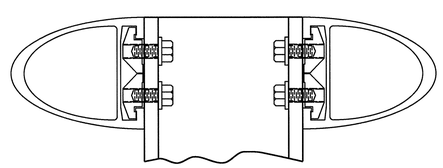


RAIL SECTION

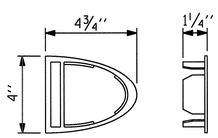


CLAMP BAR DETAIL

(8 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DOUBLE FACED
2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			65

DRAWEN BY : MIKE BRITT DATE : 5-25-11
CHECKED BY : D.G. ELY DATE : 7-21-11

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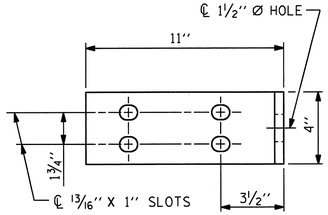
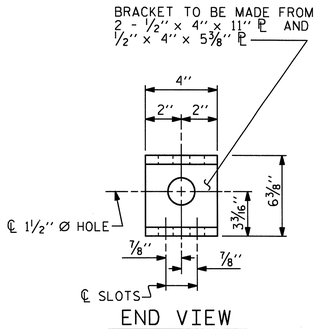
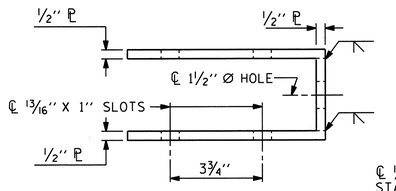


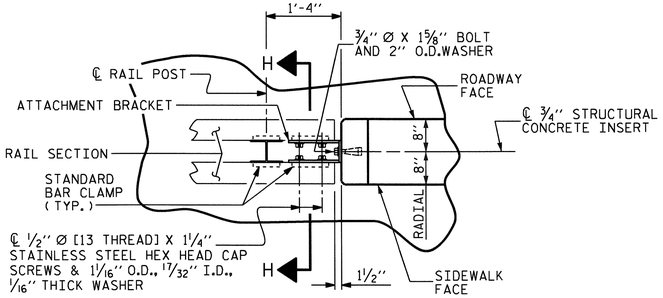
ELEVATION



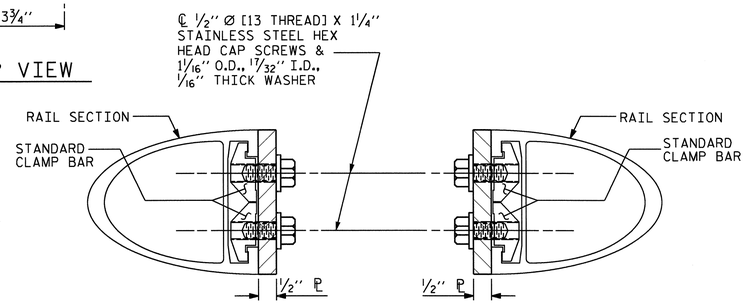
END VIEW



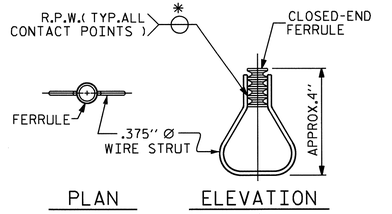
TOP VIEW



PLAN - RAIL AND END POST



SECTION H-H



STRUCTURAL CONCRETE INSERT

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

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

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

D. STANDARD CLAMP BARS (SEE SHEET 2 OF 3).

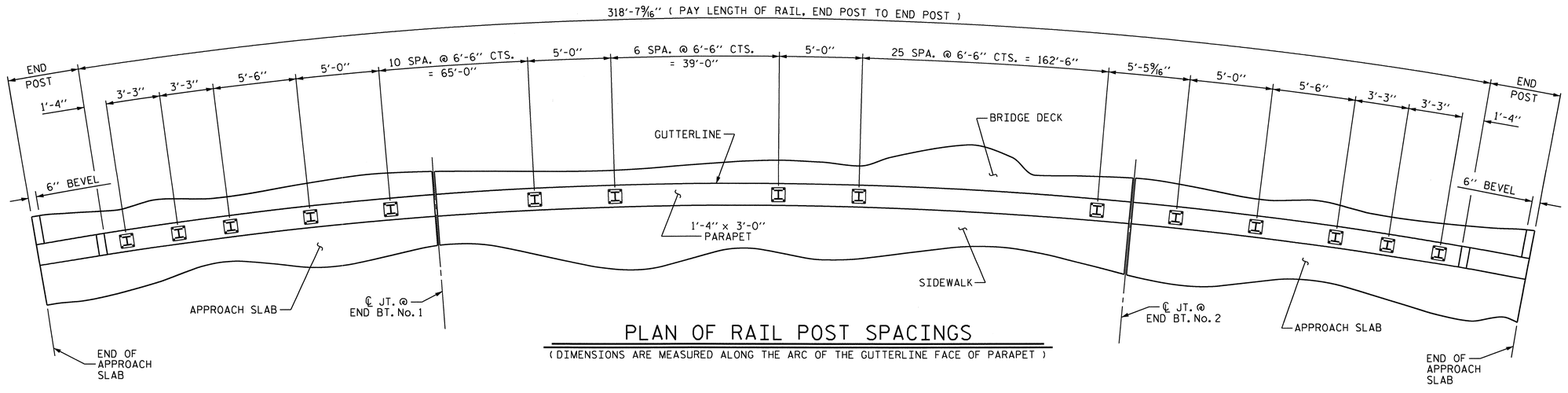
E. ½'' Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

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

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



PLAN OF RAIL POST SPACINGS

(DIMENSIONS ARE MEASURED ALONG THE ARC OF THE GUTTERLINE FACE OF PARAPET)

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR DOUBLE FACED TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT	DATE : 5-23-11
CHECKED BY : D.G. ELY	DATE : 7-21-11

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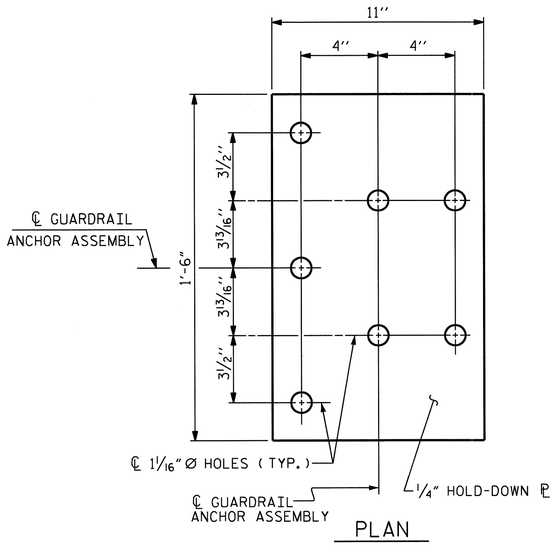
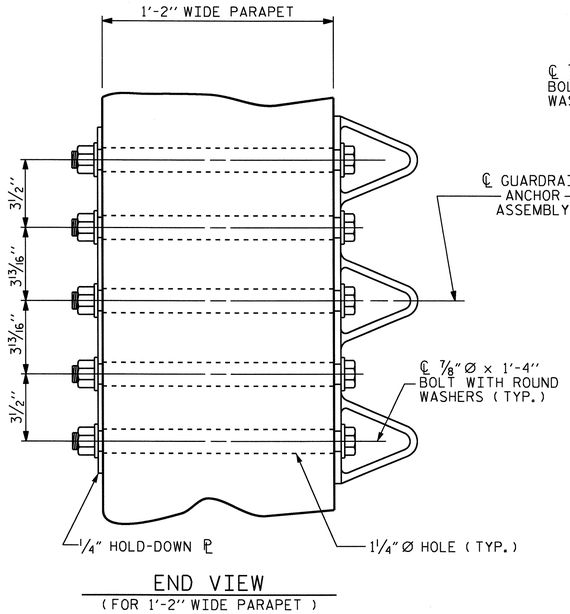
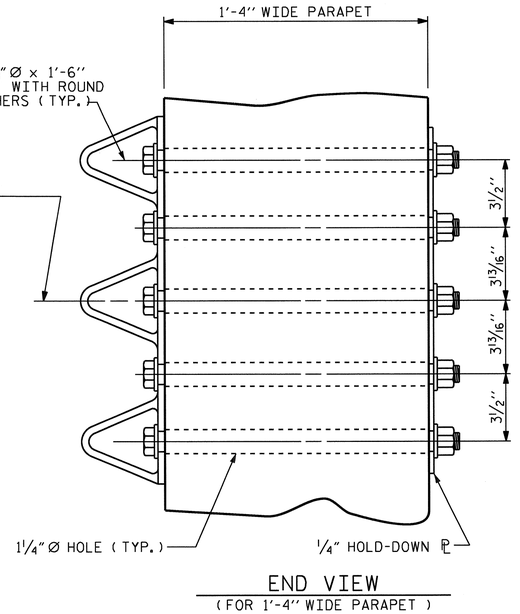


PLAN



END VIEW
(FOR 1'-2'' WIDE PARAPET)



END VIEW
(FOR 1'-4'' WIDE PARAPET)

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼'' HOLD DOWN PLATE AND 7 - ⅞'' Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 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.

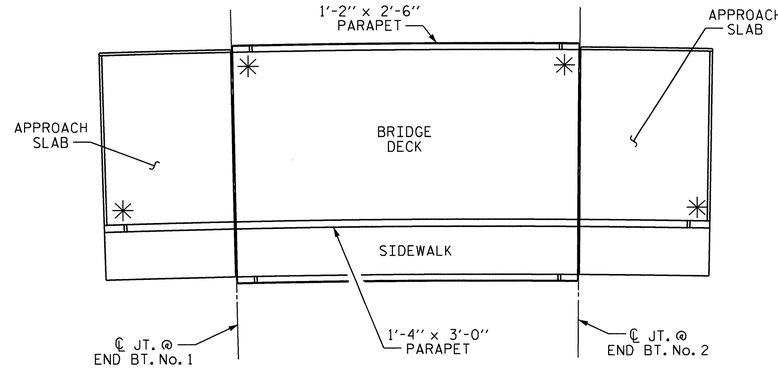
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

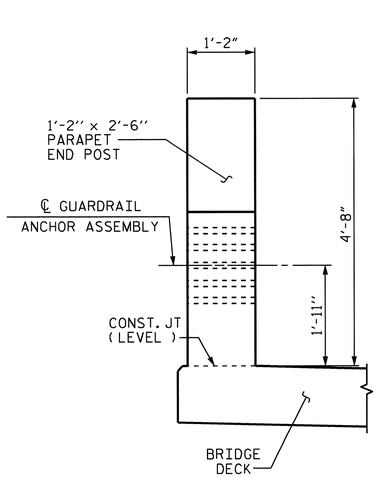
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

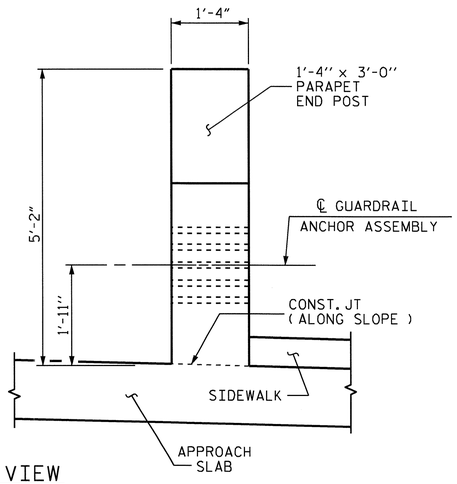
THE 1¼'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



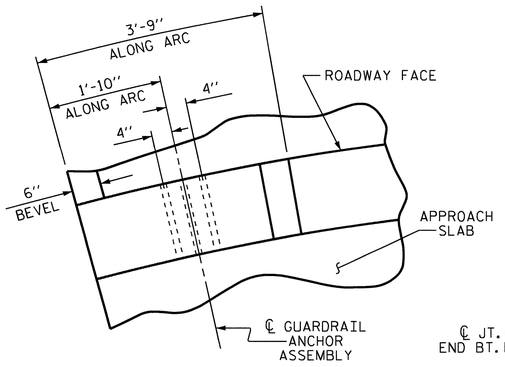
SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT

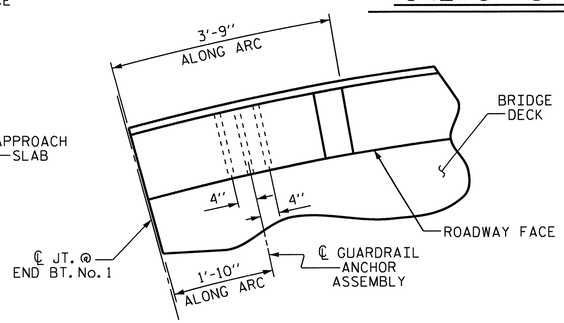




END VIEW



PLAN OF 1'-4'' WIDE PARAPET
(SIMILAR EACH END)



PLAN OF 1'-2'' WIDE PARAPET
(SIMILAR EACH END)

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			65

STD. NO. GRA3

ASSEMBLED BY : MIKE BRITT	DATE : 5-25-11
CHECKED BY : D.G. ELY	DATE : 7-21-11
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/1/11 MAA/GM
	REV. 12/5/11 MAA/GM

10-JAN-2012 13:21
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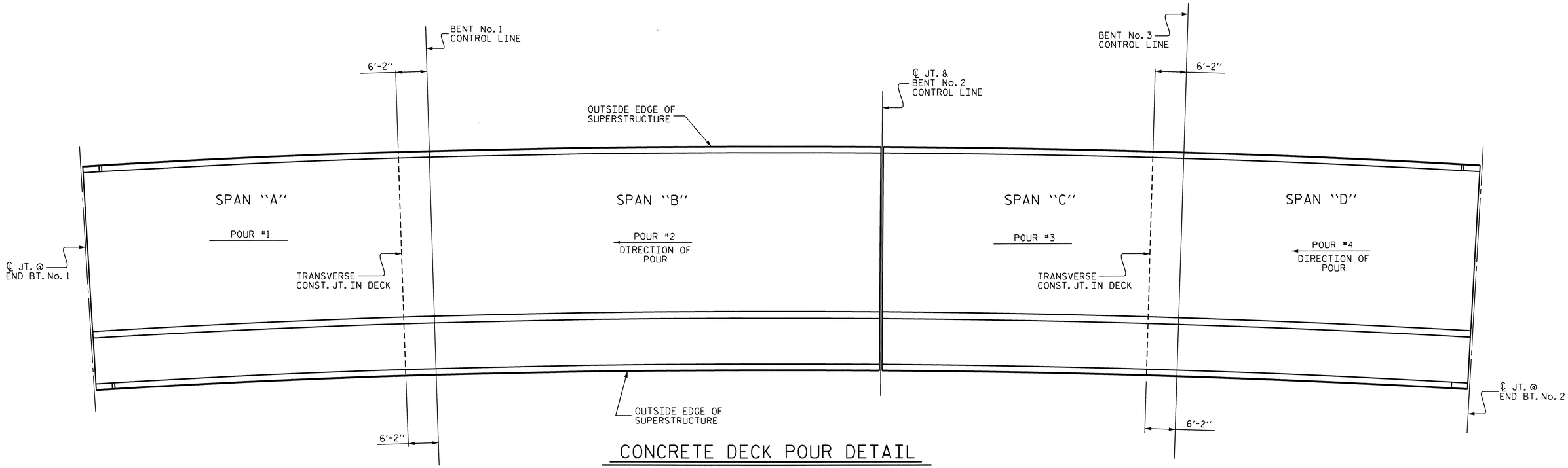
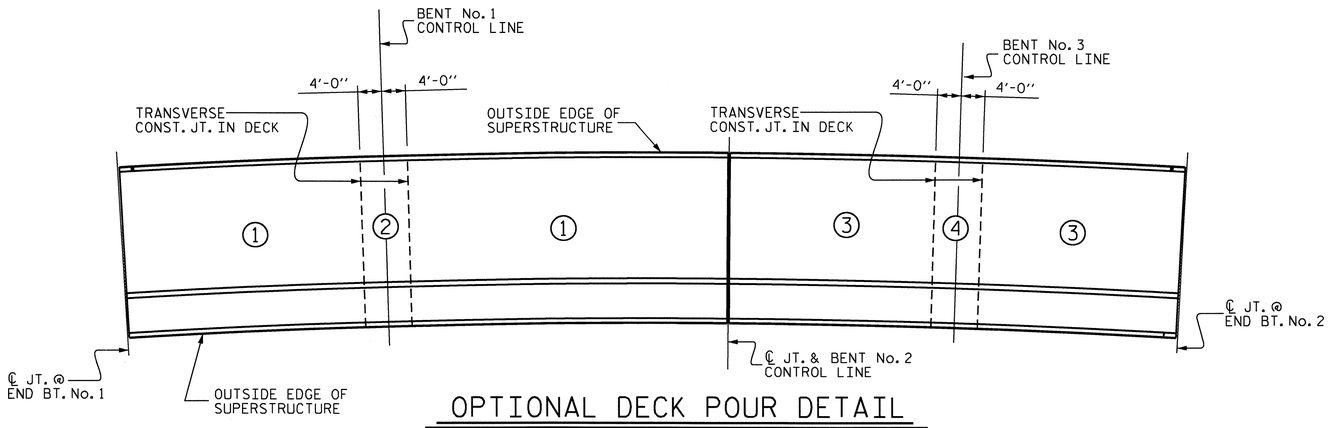


CONCRETE DECK POUR DETAIL

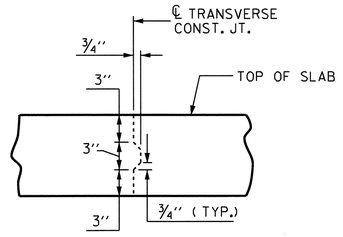
NOTE: ALL DIMENSIONS ARE MEASURED ALONG THE ARC OF OUTSIDE EDGE OF SUPERSTRUCTURE

CLASS AA CONCRETE BREAKDOWN	
POUR #1 (SPAN "A-B")	91.8 CU. YDS.
POUR #2 (SPAN "A-B")	153.7 CU. YDS.
SIDEWALK (SPAN "A-B")	26.7 CU. YDS.
TOTAL	272.2 CU. YDS.
POUR #3 (SPAN "C-D")	78.3 CU. YDS.
POUR #4 (SPAN "C-D")	106.7 CU. YDS.
SIDEWALK (SPAN "C-D")	20.0 CU. YDS.
TOTAL	205.0 CU. YDS.



OPTIONAL DECK POUR DETAIL

POUR ② OR ④ SHALL NOT BE STARTED UNTIL BOTH ADJACENT POURS ① OR ③ REACH A MINIMUM OF 3,000 PSI



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE DECK POUR DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : MIKE BRITT DATE : 6-15-11
CHECKED BY : D.G. ELY DATE : 7-14-11

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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"			

BILL OF MATERIAL

SPAN "A-B"

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* A1	319	#5	STR.	44'-9"	14889
A2	319	#5	STR.	44'-9"	14889
* B1	6	#4	STR.	28'-3"	113
* B2	6	#4	STR.	27'-9"	111
* B3	58	#4	STR.	23'-7"	914
* B4	87	#4	STR.	21'-6"	1249
* B5	29	#7	STR.	58'-0"	3438
* B6	28	#7	STR.	24'-0"	1374
B7	168	#5	STR.	54'-8"	9579
* B8	27	#4	STR.	24'-0"	433
* B9	36	#4	STR.	23'-9"	571
* G1	157	#4	STR.	8'-10"	926
* K1	8	#8	1	13'-1"	279
* K2	12	#8	2	20'-11"	670
K3	10	#4	STR.	20'-6"	137
K4	8	#4	STR.	7'-9"	41
K5	16	#4	STR.	8'-9"	94
K6	8	#4	STR.	8'-3"	44
K7	8	#4	STR.	6'-2"	33
* S1	64	#5	3	5'-11"	395
S2	120	#4	5	2'-9"	220
* U1	8	#4	4	12'-6"	67
* U2	24	#4	4	14'-6"	232

REINFORCING STEEL 25,037 LBS.

* EPOXY COATED REINFORCING STEEL 25,661 LBS.

SPAN "C-D"

BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
* A1	239	#5	STR.	44'-9"	11155
A2	239	#5	STR.	44'-9"	11155
* B10	5	#4	STR.	25'-6"	85
* B11	5	#4	STR.	25'-0"	84
* B12	58	#4	STR.	20'-7"	797
* B13	58	#4	STR.	20'-1"	778
* B14	29	#7	STR.	46'-0"	2727
* B15	28	#7	STR.	18'-0"	1030
B16	168	#5	STR.	41'-3"	7228
* B17	27	#4	STR.	21'-0"	379
* B18	27	#4	STR.	20'-8"	373
* G1	117	#4	STR.	8'-10"	690
* K8	8	#8	1	12'-7"	269
* K9	12	#8	2	19'-11"	638
K10	8	#4	STR.	20'-6"	110
K11	8	#4	STR.	8'-1"	43
K12	8	#4	STR.	8'-10"	47
K13	8	#4	STR.	8'-5"	45
K14	8	#4	STR.	6'-6"	35
S2	88	#4	5	2'-9"	162
* S3	64	#5	3	4'-11"	328
* U3	8	#4	4	11'-0"	59
* U4	24	#4	4	13'-0"	208

REINFORCING STEEL 18,825 LBS.

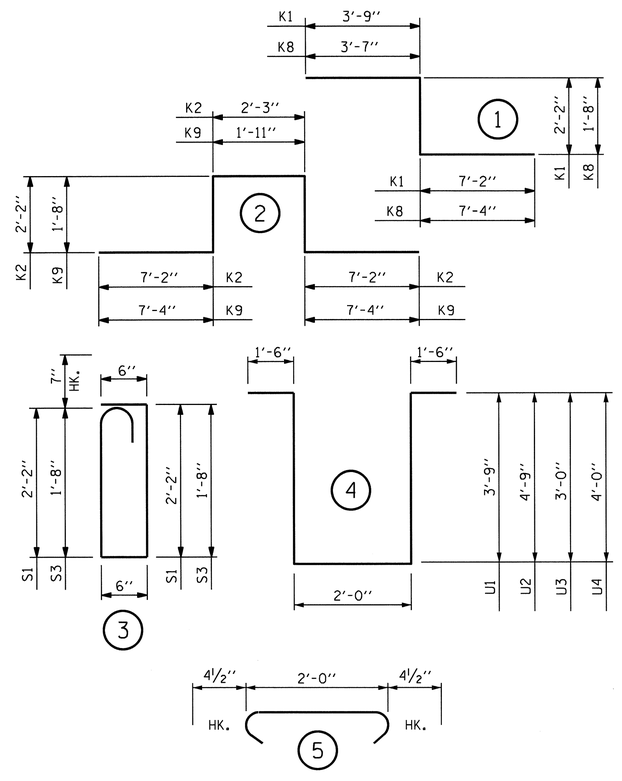
* EPOXY COATED REINFORCING STEEL 19,600 LBS.

NOTE: BILL OF MATERIAL INCLUDES SIDEWALK REINFORCING STEEL

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,375 SQ.FT.
BRIDGE DECK	7,967 SQ.FT.
TOTAL	9,342 SQ.FT.

BAR TYPES



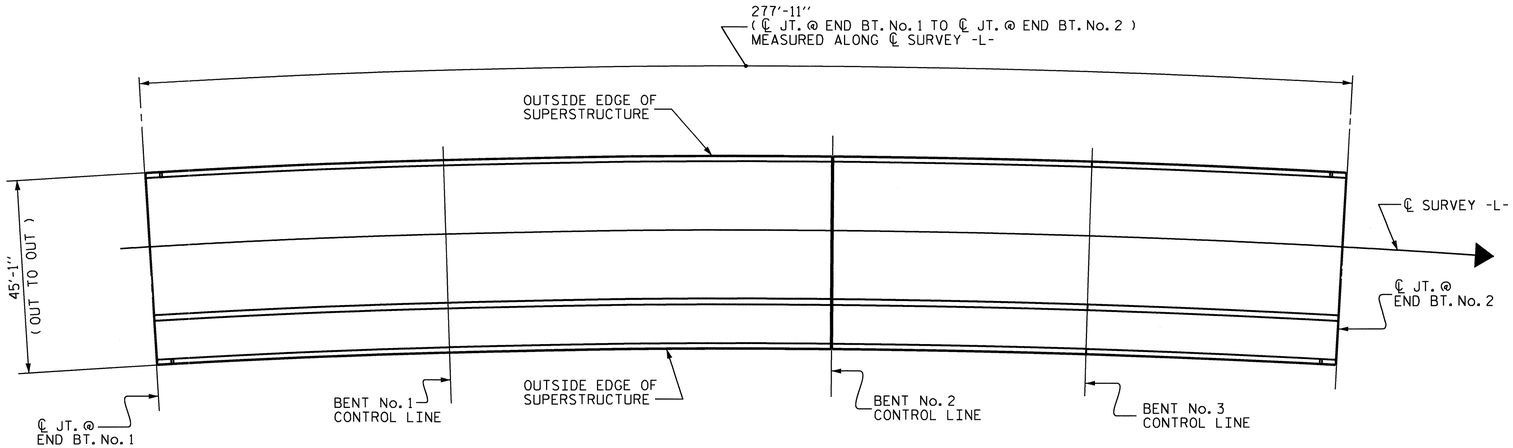
ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
SPAN	(CU. YDS.)	(LBS.)	(LBS.)
"A-B"	272.2	25,037	25,661
"C-D"	205.0	18,825	19,600
TOTALS**	477.2	43,862	45,261

**QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED, SIDEWALK IS INCLUDED.

NOTE :
FOR CLASS AA CONCRETE BREAKDOWN, SEE "CONCRETE DECK POUR DETAILS" SHEET



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB
(SQ. FT. = 12,529)

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SUPERSTRUCTURE BILL OF MATERIAL

OCTOBER 1987

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 21390 ENGINEER THEO J. BEACH
2/24/2012

ASSEMBLED BY : MIKE BRITT	DATE : 6-8-11
CHECKED BY : D.G. ELY	DATE : 7-14-11
DRAWN BY : JMB 5/87	REV. 6/1/94 EEM/GRP
CHECKED BY : SJD 9/87	REV. 8/16/99 RWW/LES

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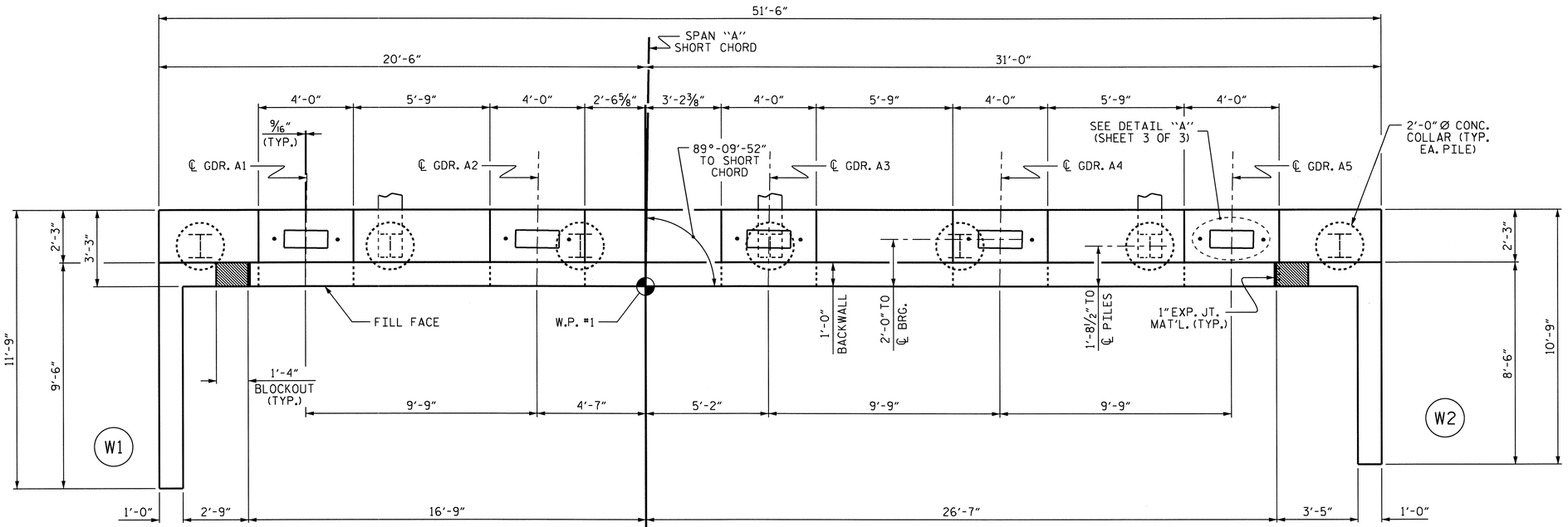
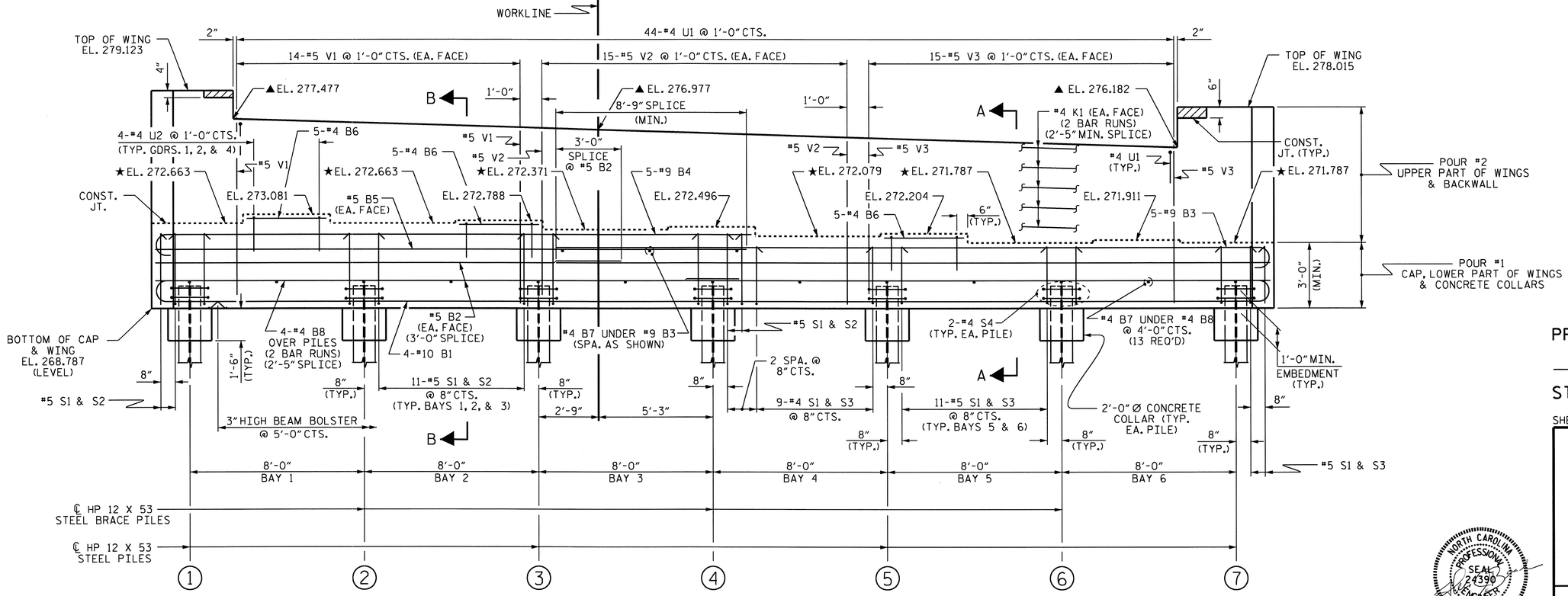
STD. NO. BOM2



PLAN



ELEVATION

NOTES

★ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL, PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

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

#5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : T. N. CARROLL DATE : 07-2011
CHECKED BY : D. G. ELY DATE : 08-2011

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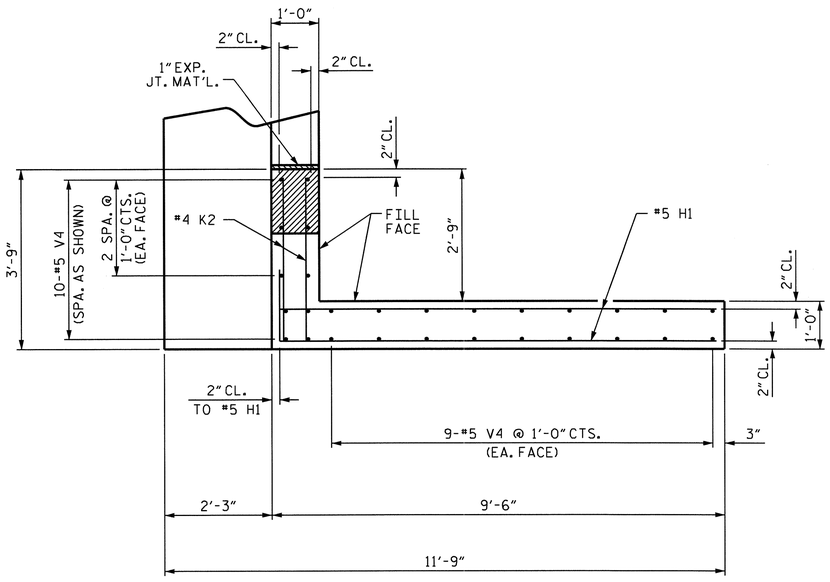
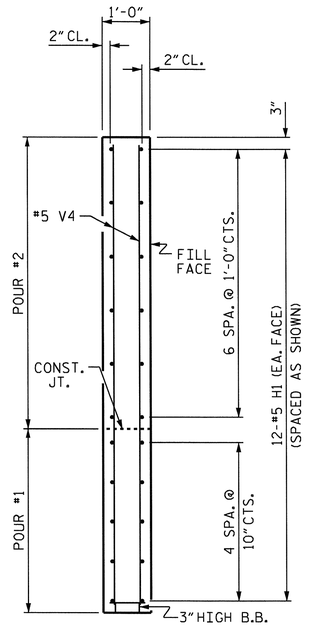
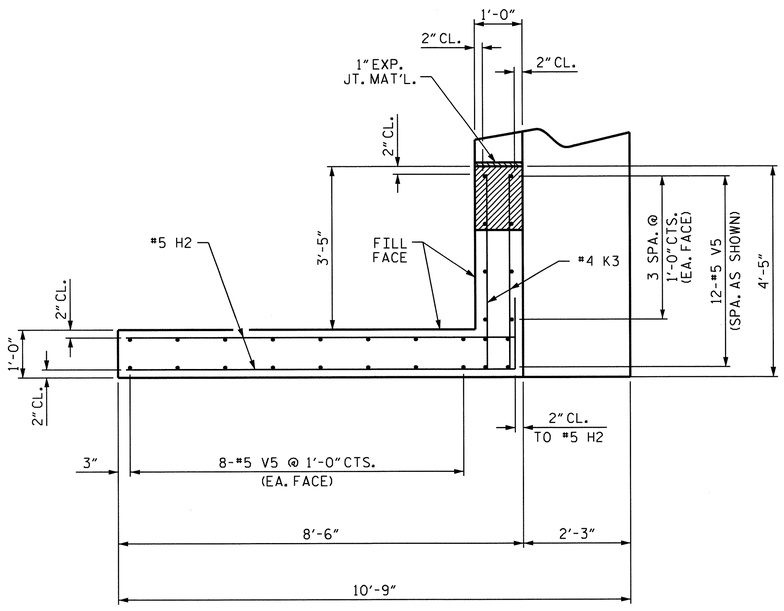
wparker



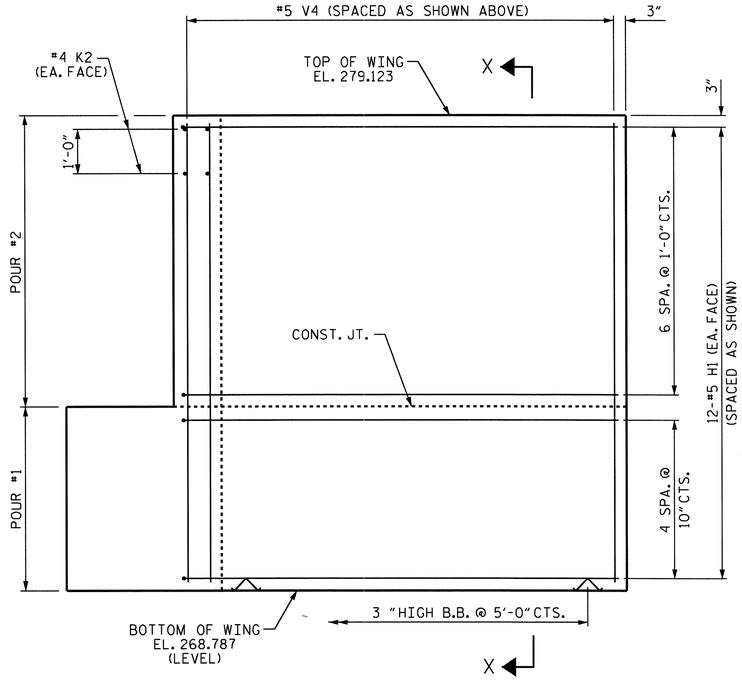
PLAN OF WING (W1)



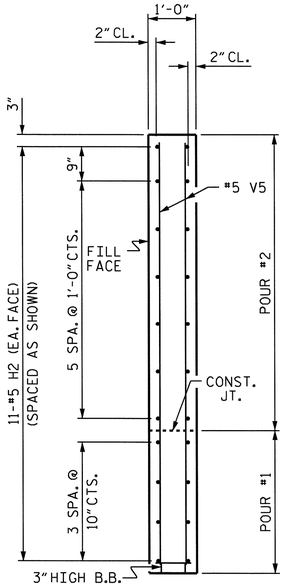
SECTION X-X



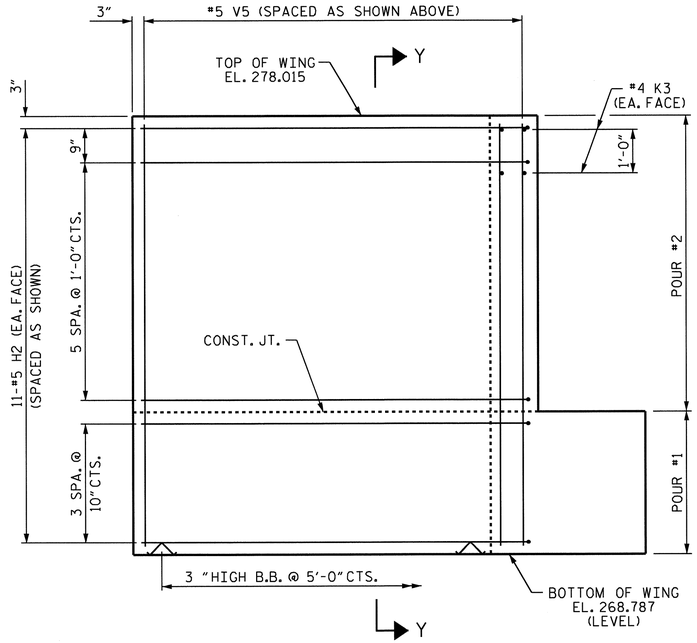
PLAN OF WING (W2)



ELEVATION OF WING (W1)



SECTION Y-Y



ELEVATION OF WING (W2)

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : T. N. CARROLL DATE : 07-2011
CHECKED BY : D. G. ELY DATE : 08-2011

10-JAN-2012 13:19
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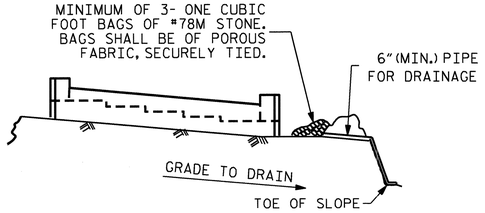
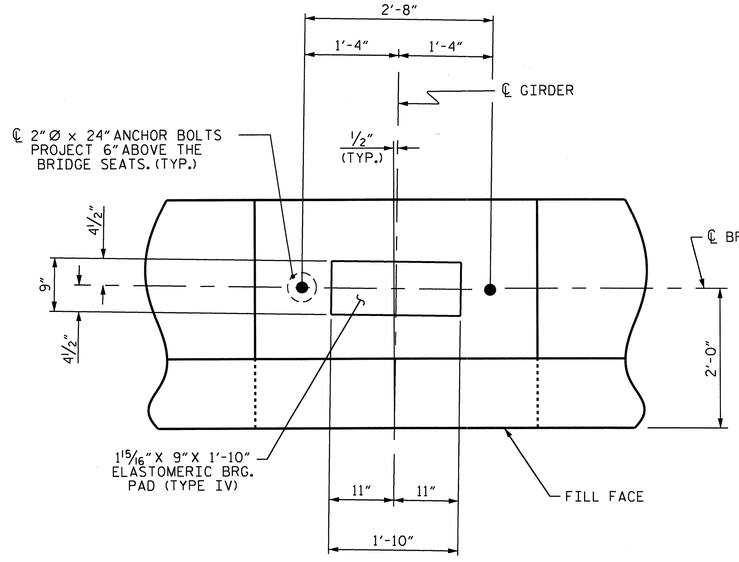


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

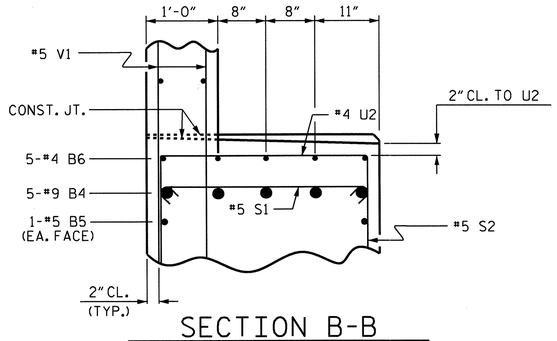
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

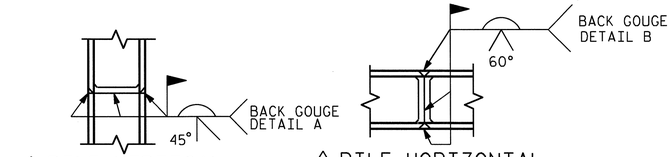


DETAIL "A"

(TYP. EACH GIRDER)

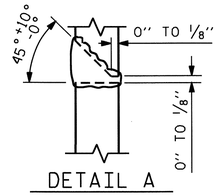


SECTION B-B

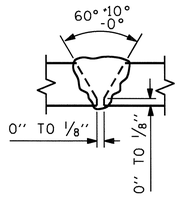


△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



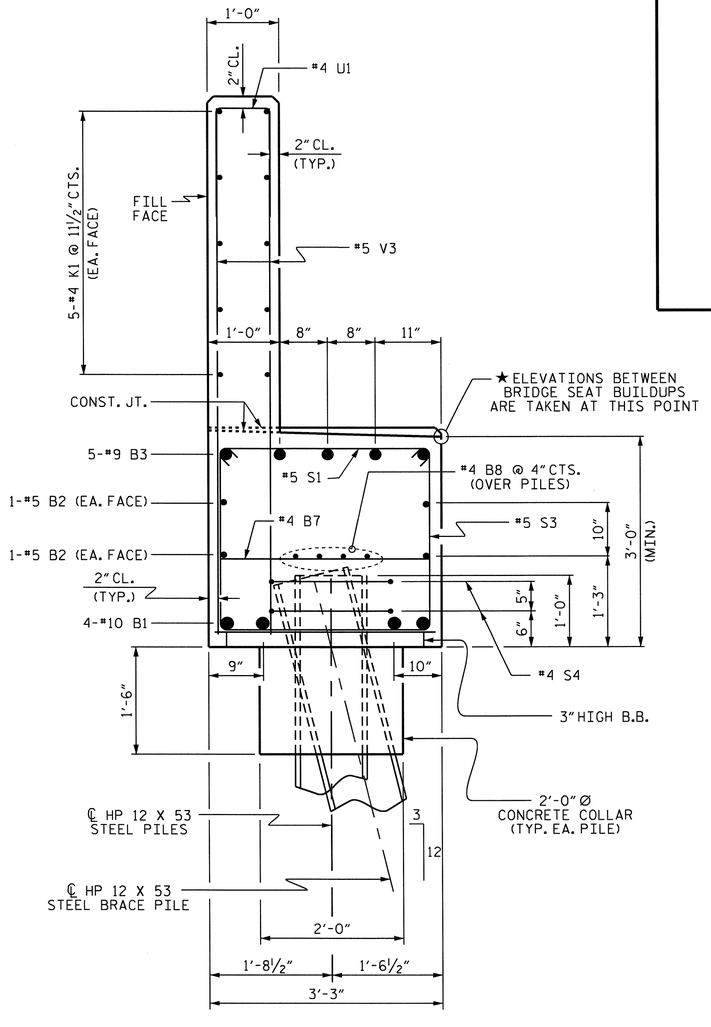
DETAIL A



DETAIL B

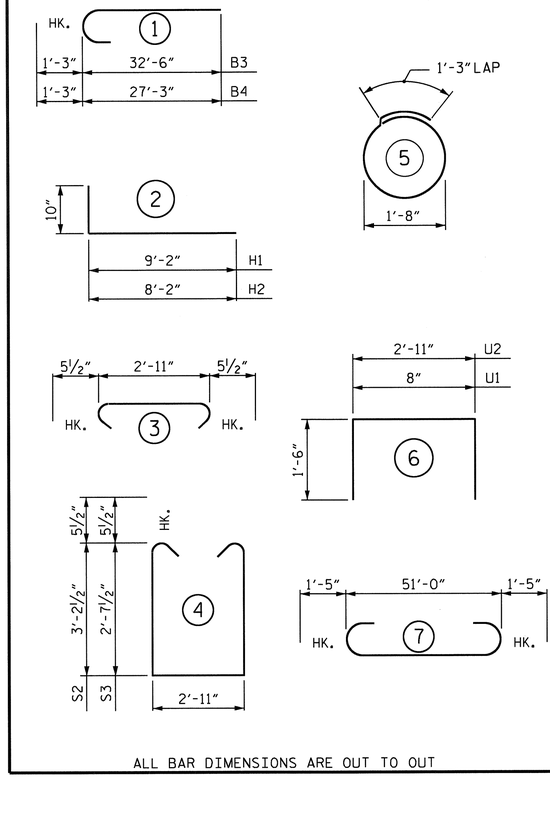
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	7	53'-10"	927
B2	8	#5	STR	27'-1"	226
B3	5	#9	1	33'-9"	574
B4	5	#9	1	28'-6"	485
B5	2	#5	STR	21'-8"	45
B6	15	#4	STR	3'-8"	37
B7	16	#4	STR	2'-11"	31
B8	8	#4	STR	26'-10"	143
H1	24	#5	2	10'-0"	250
H2	22	#5	2	9'-0"	207
K1	20	#4	STR	26'-10"	358
K2	4	#4	STR	3'-5"	9
K3	4	#4	STR	4'-1"	11
S1	70	#5	3	3'-10"	280
S2	37	#5	4	10'-3"	396
S3	33	#5	4	9'-1"	313
S4	14	#4	5	6'-6"	61
U1	44	#4	6	3'-8"	108
U2	12	#4	6	5'-11"	47
V1	28	#5	STR	7'-11"	231
V2	30	#5	STR	7'-6"	235
V3	30	#5	STR	7'-0"	219
V4	28	#5	STR	10'-0"	292
V5	28	#5	STR	8'-10"	258

REINFORCING STEEL	5743 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 (CAP, LOWER WINGS & CONCRETE COLLARS)	25.2 C.Y.
POUR #2 (BACKWALL & UPPER WINGS)	13.0 C.Y.
TOTAL CLASS A CONCRETE	38.2 C.Y.
HP 12 X 53 STEEL PILES	
No. = 7	140 LIN FT.

DRAWN BY : T. N. CARROLL DATE : 07/2011
CHECKED BY : D. G. ELY DATE : 08/2011

10-JAN-2012 13:19
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PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			65

NOTES:

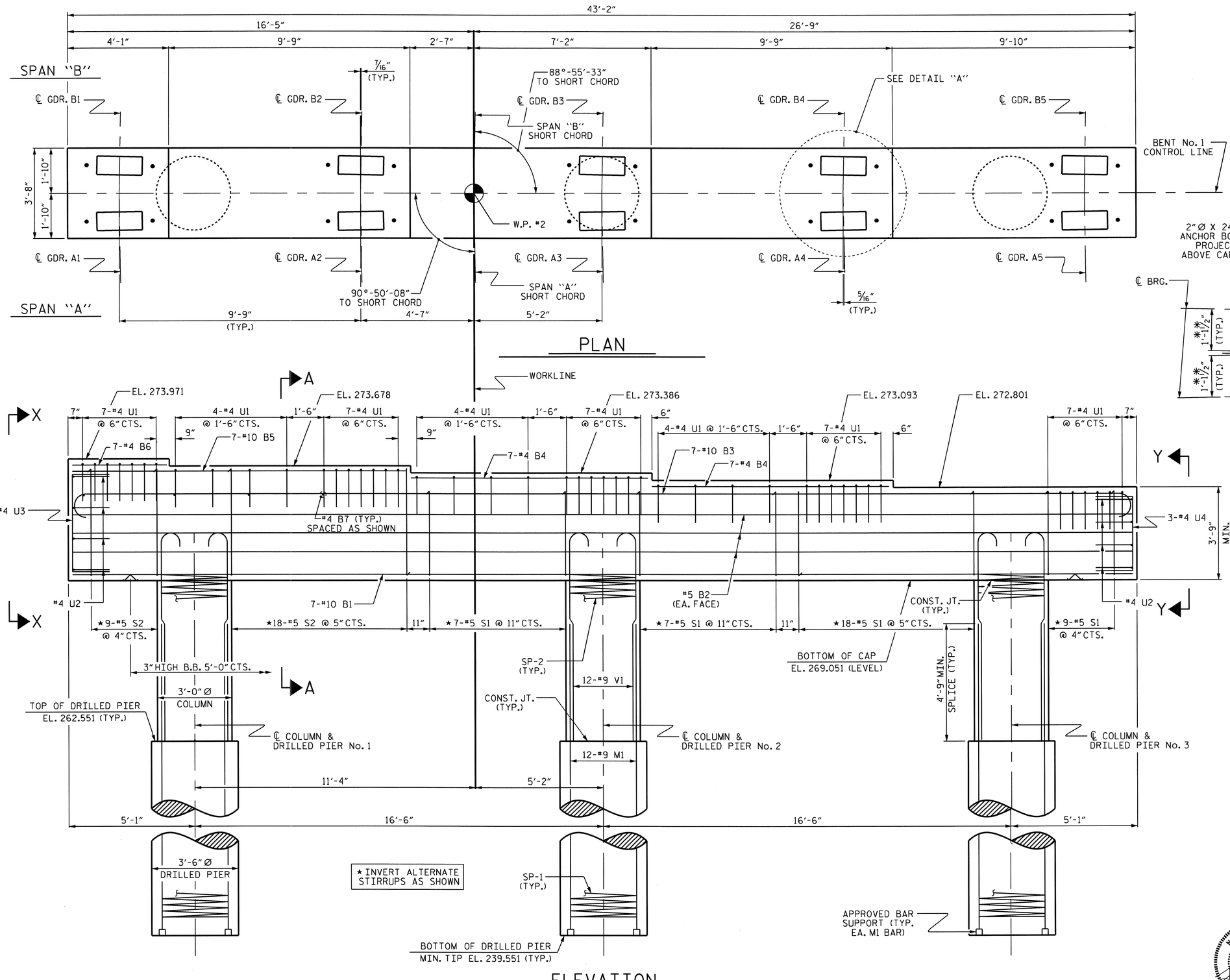
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS & PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

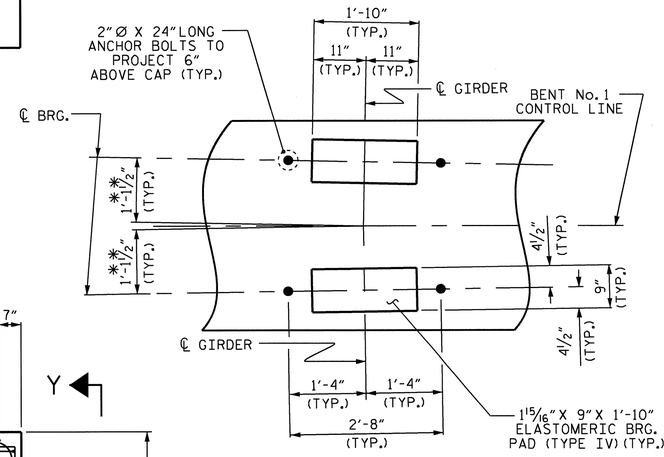
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL.



PLAN

ELEVATION

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



DETAIL "A"

** MEASURED ALONG ℄ GIRDER (TYP. EA. GIRDER)

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : M.L. BROWN DATE : 5-2011
CHECKED BY : S.B. WILLIAMS DATE : 5-2011

10-JAN-2012 13:18
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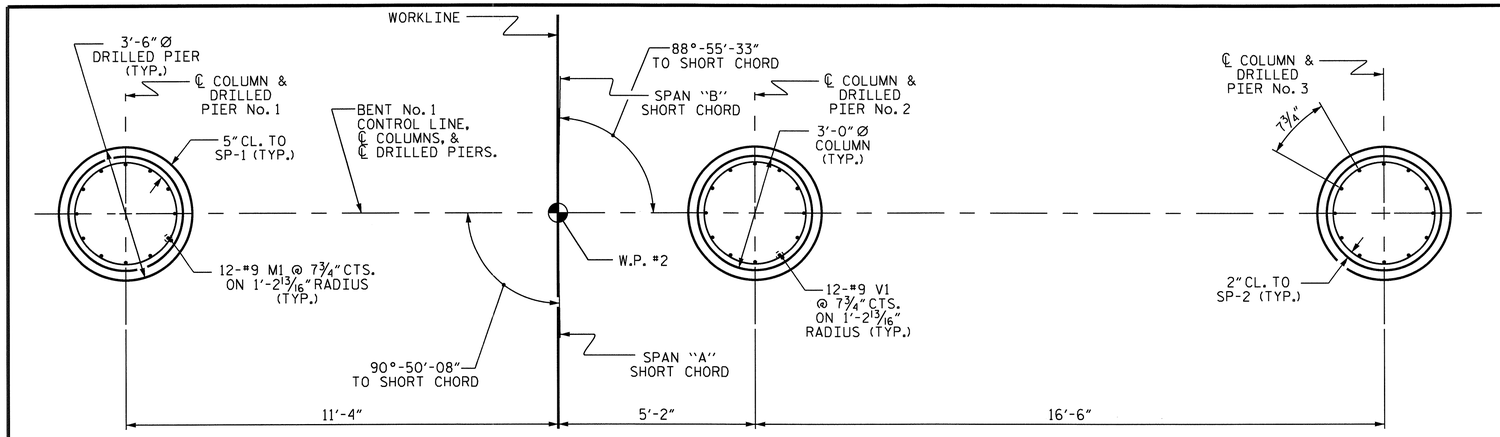
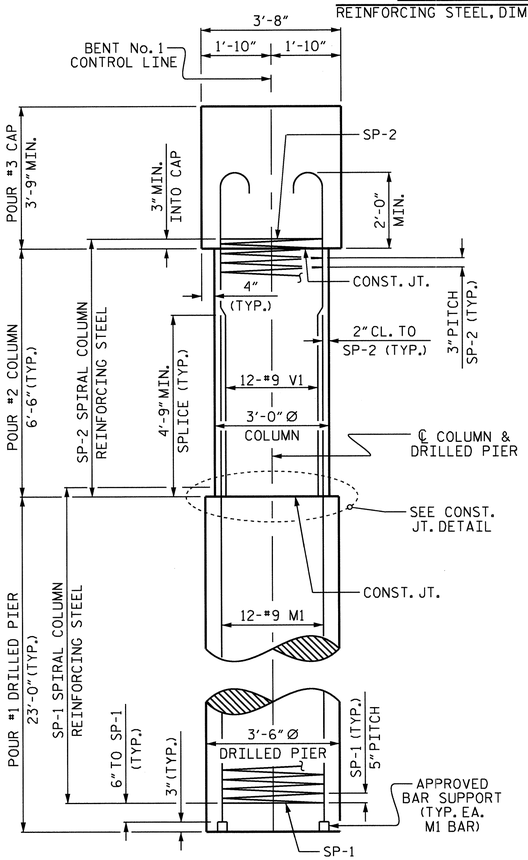


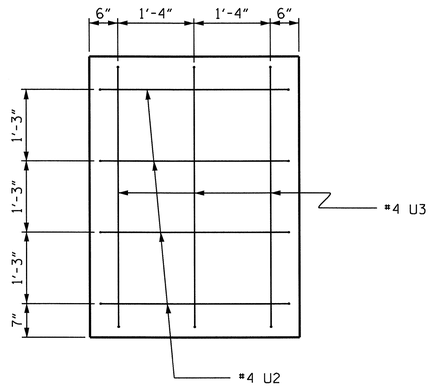
PLAN OF DRILLED PIERS & COLUMNS

REINFORCING STEEL, DIMENSIONS & DETAILS ARE TYPICAL FOR EACH DRILLED PIER & COLUMN.

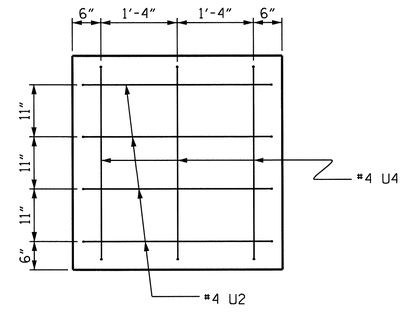


END ELEVATION

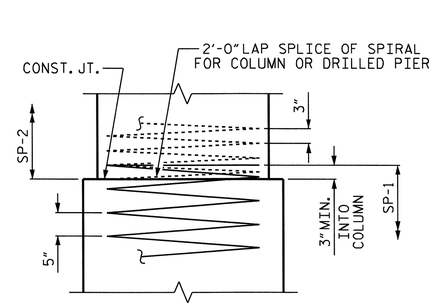
REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER UNLESS OTHERWISE NOTED.



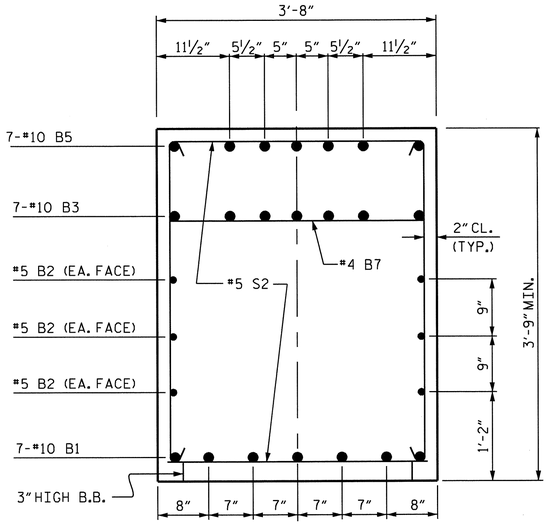
VIEW X-X



VIEW Y-Y

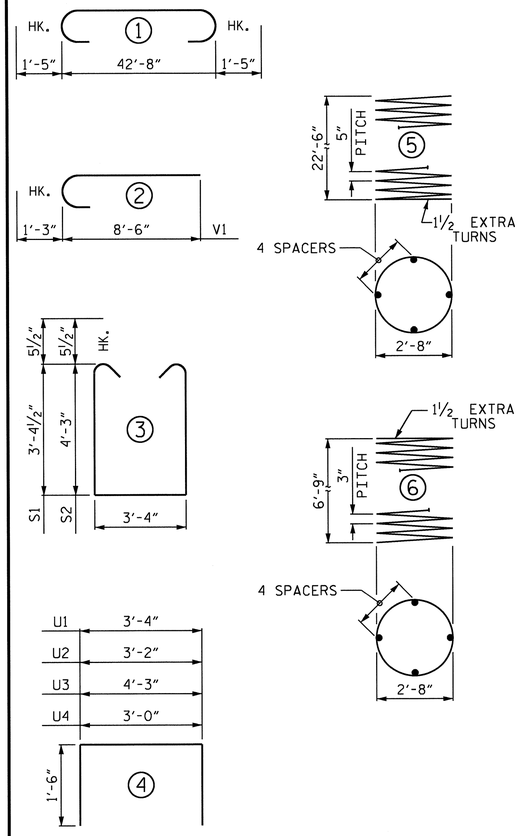


CONSTRUCTION JOINT DETAIL



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	STR	42'-10"	1290
B2	6	#5	STR	42'-10"	268
B3	7	#10	1	45'-6"	1371
B4	14	#4	STR	9'-7"	90
B5	7	#10	STR	13'-6"	407
B6	7	#4	STR	3'-9"	18
B7	4	#4	STR	3'-4"	9
M1	36	#9	STR	30'-6"	3733
S1	41	#5	3	11'-0"	470
S2	27	#5	3	12'-9"	359
U1	47	#4	4	6'-4"	199
U2	8	#4	4	6'-2"	33
U3	3	#4	4	7'-3"	15
U4	3	#4	4	6'-0"	12
V1	36	#9	2	9'-9"	1193
REINFORCING STEEL					9467 LBS.

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	3	*	5	460'-7"	1441
SP-2	3	**	6	239'-3"	480
SPIRAL COLUMN REINFORCING STEEL					1,921 LBS.

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

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

CLASS A CONCRETE	
POUR #2 (COLUMNS)	5.1 C.Y.
POUR #3 (CAP)	25.0 C.Y.
TOTAL	30.1 C.Y.

DRILLED PIERS:	
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	24.6 C.Y.
3'-6"Ø DRILLED PIER NOT IN SOIL	17.0 LIN. FT.
3'-6"Ø DRILLED PIER IN SOIL	52.0 LIN. FT.
PERMANENT STEEL CASING FOR 3'-6"Ø DRILLED PIER	48.0 LIN. FT.
CSL TUBES	294.0 LIN. FT.

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 24590 ENGINEER THEO J. BEACH
2/24/2012

DRAWN BY : M.L. BROWN DATE : 5-2011
CHECKED BY : S.B. WILLIAMS DATE : 5-2011

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dely

NOTES:

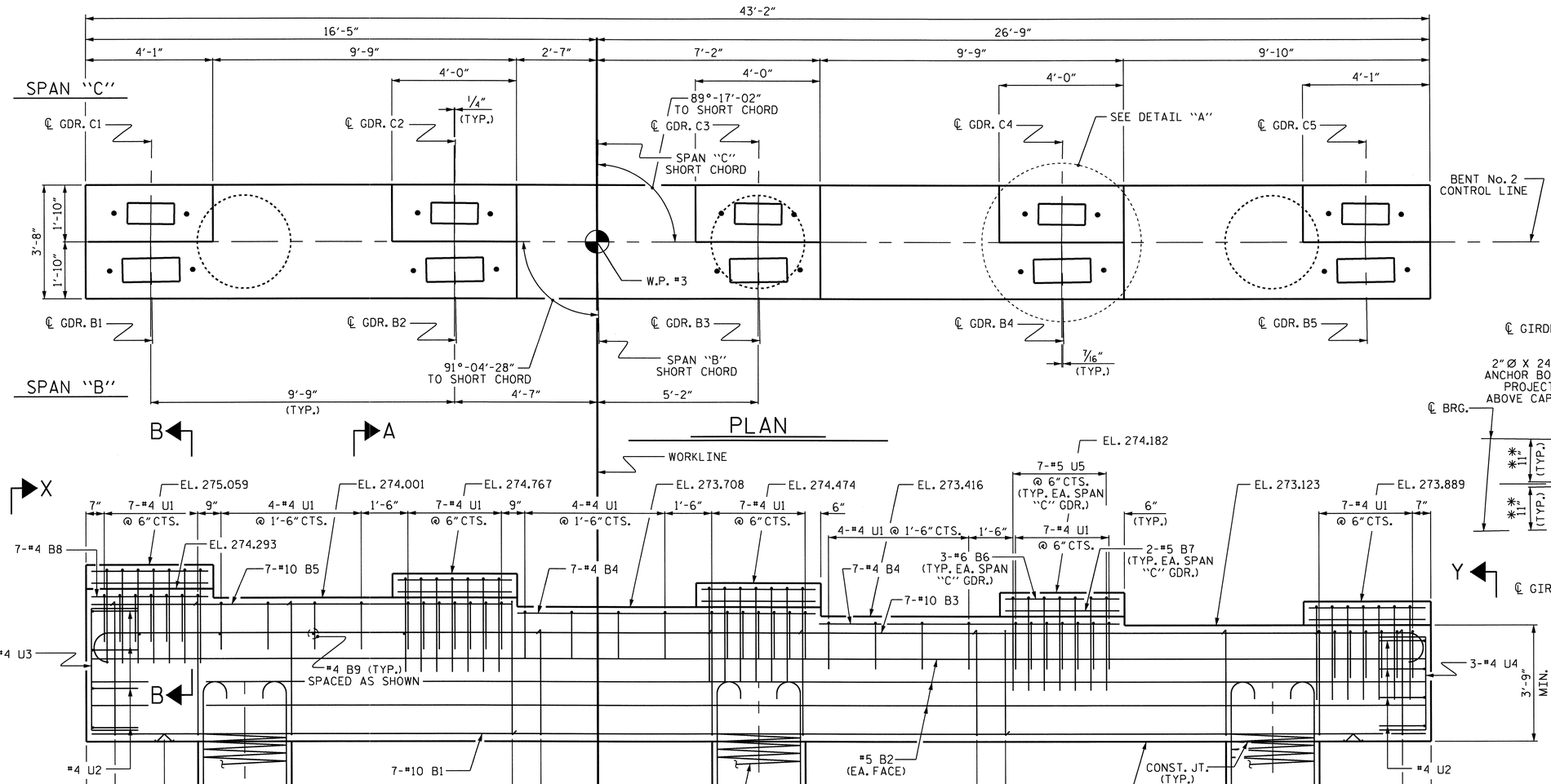
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS & PERMANENT STEEL CASING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

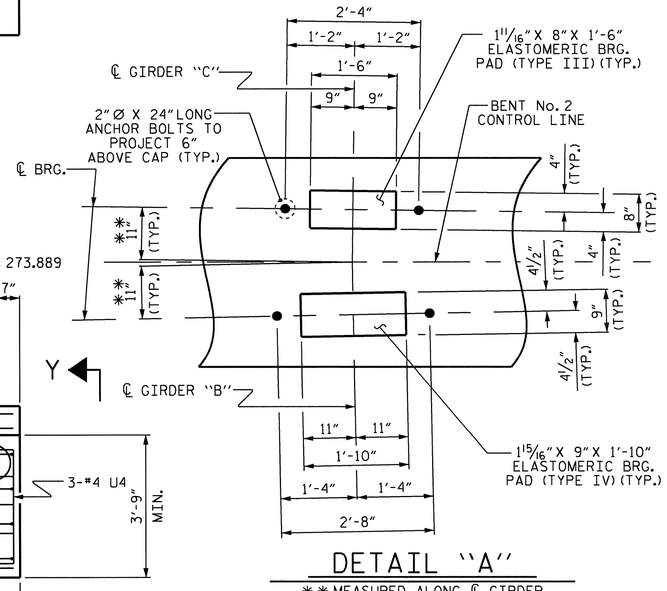
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIER IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

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



ELEVATION

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



DETAIL "A"

** MEASURED ALONG ℄ GIRDER (TYP. EA. GIRDER)

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 24890 ENGINEER LEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : M.L. BROWN DATE : 5-2011
CHECKED BY : S.B. WILLIAMS DATE : 5-2011

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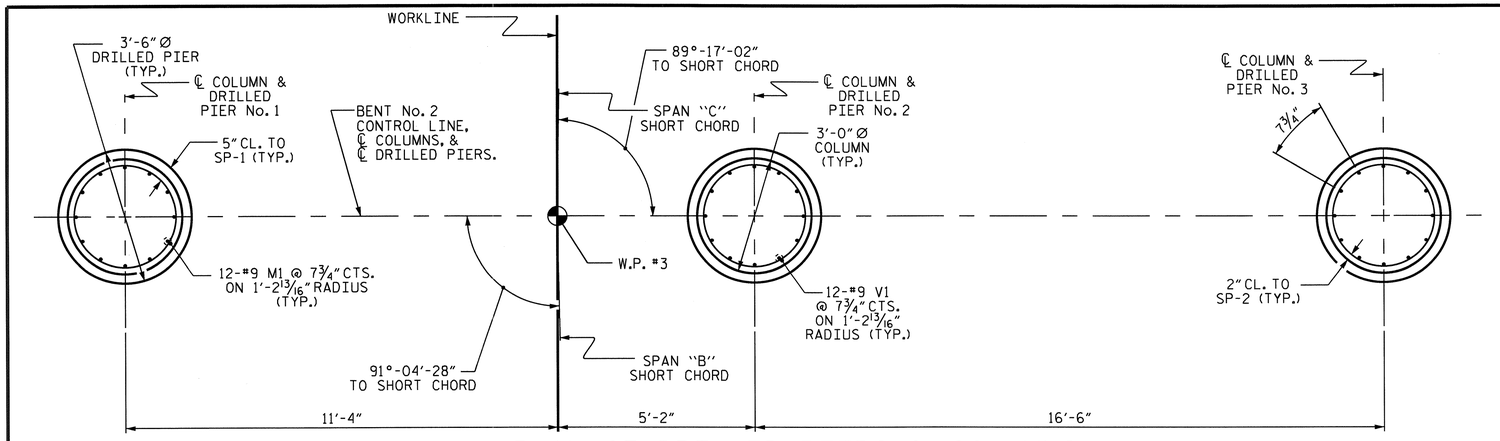
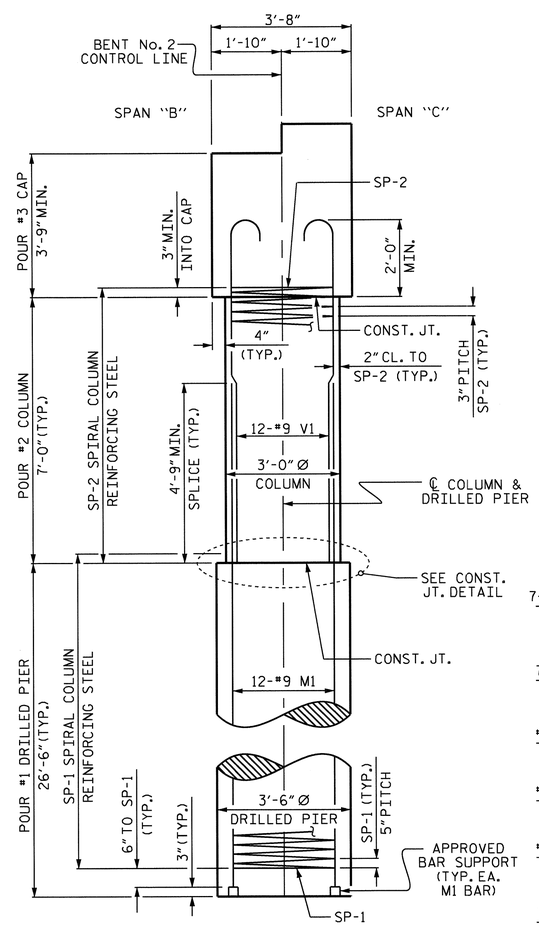


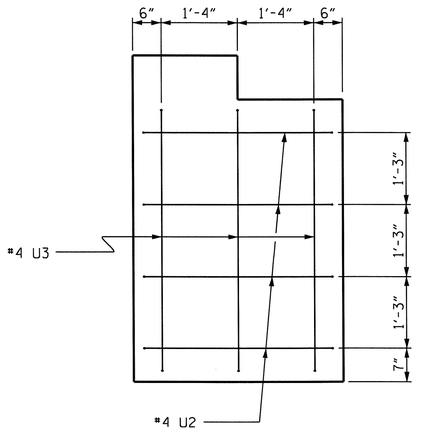
PLAN OF DRILLED PIERS & COLUMNS

REINFORCING STEEL, DIMENSIONS & DETAILS ARE TYPICAL FOR EACH DRILLED PIER & COLUMN.

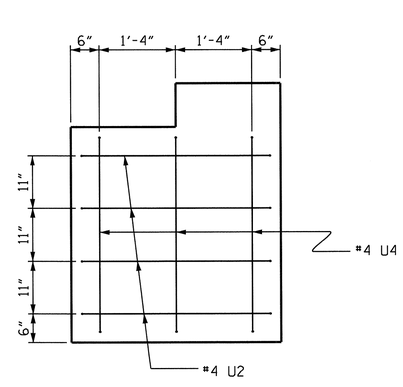


RIGHT END ELEVATION

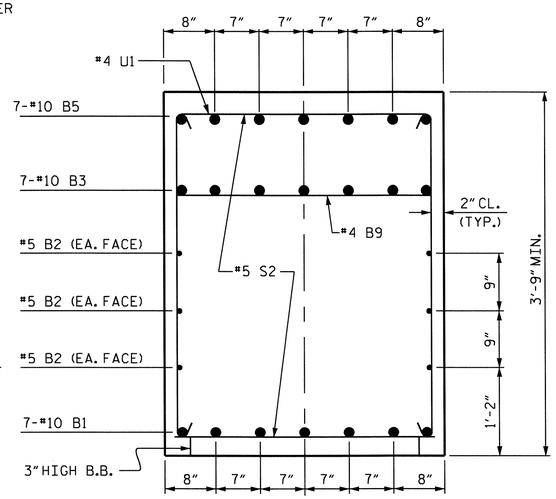
REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER UNLESS OTHERWISE NOTED.



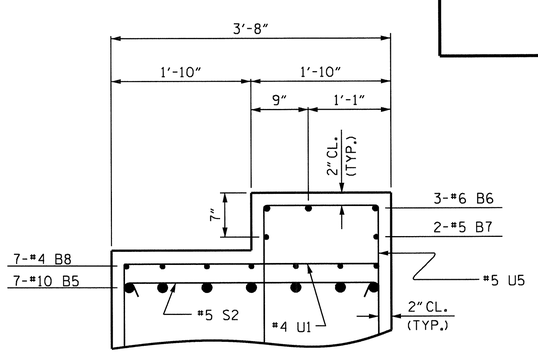
VIEW X-X



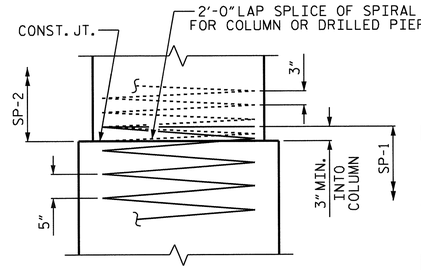
VIEW Y-Y



SECTION A-A

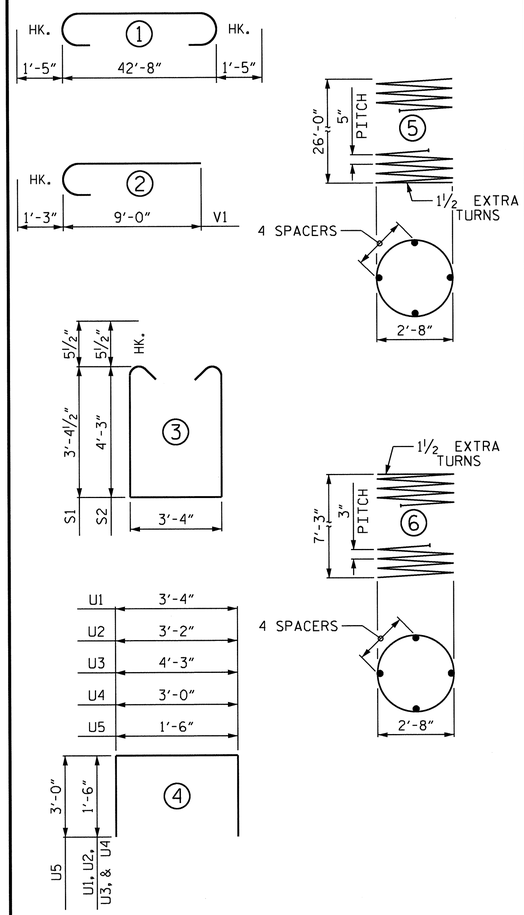


SECTION B-B



CONSTRUCTION JOINT DETAIL

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	STR	42'-10"	1290
B2	6	#5	STR	42'-10"	268
B3	7	#10	1	45'-6"	1371
B4	14	#4	STR	9'-7"	90
B5	7	#10	STR	13'-6"	407
B6	15	#6	STR	3'-8"	83
B7	10	#5	STR	3'-8"	38
B8	7	#4	STR	3'-9"	18
B9	4	#4	STR	3'-4"	9
M1	36	#9	STR	34'-0"	4162
S1	41	#5	3	11'-0"	470
S2	27	#5	3	12'-9"	359
U1	47	#4	4	6'-4"	199
U2	8	#4	4	6'-2"	33
U3	3	#4	4	7'-3"	15
U4	3	#4	4	6'-0"	12
U5	35	#5	4	7'-6"	274
V1	36	#9	2	10'-3"	1255

REINFORCING STEEL 10353 LBS.

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	3	*	5	526'-4"	1647
SP-2	3	**	6	255'-9"	513

SPIRAL COLUMN REINFORCING STEEL 2,160 LBS.

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

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

CLASS A CONCRETE	
POUR #2 (COLUMNS)	5.5 C.Y.
POUR #3 (CAP)	26.0 C.Y.
TOTAL	31.5 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	28.3 C.Y.
3'-6" Ø DRILLED PIER NOT IN SOIL	25.0 LIN. FT.
3'-6" Ø DRILLED PIER IN SOIL	54.5 LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER	54.0 LIN. FT.
CSL TUBES	336.0 LIN. FT.

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER MEG J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : M.L. BROWN DATE : 5-2011
CHECKED BY : S.B. WILLIAMS DATE : 5-2011

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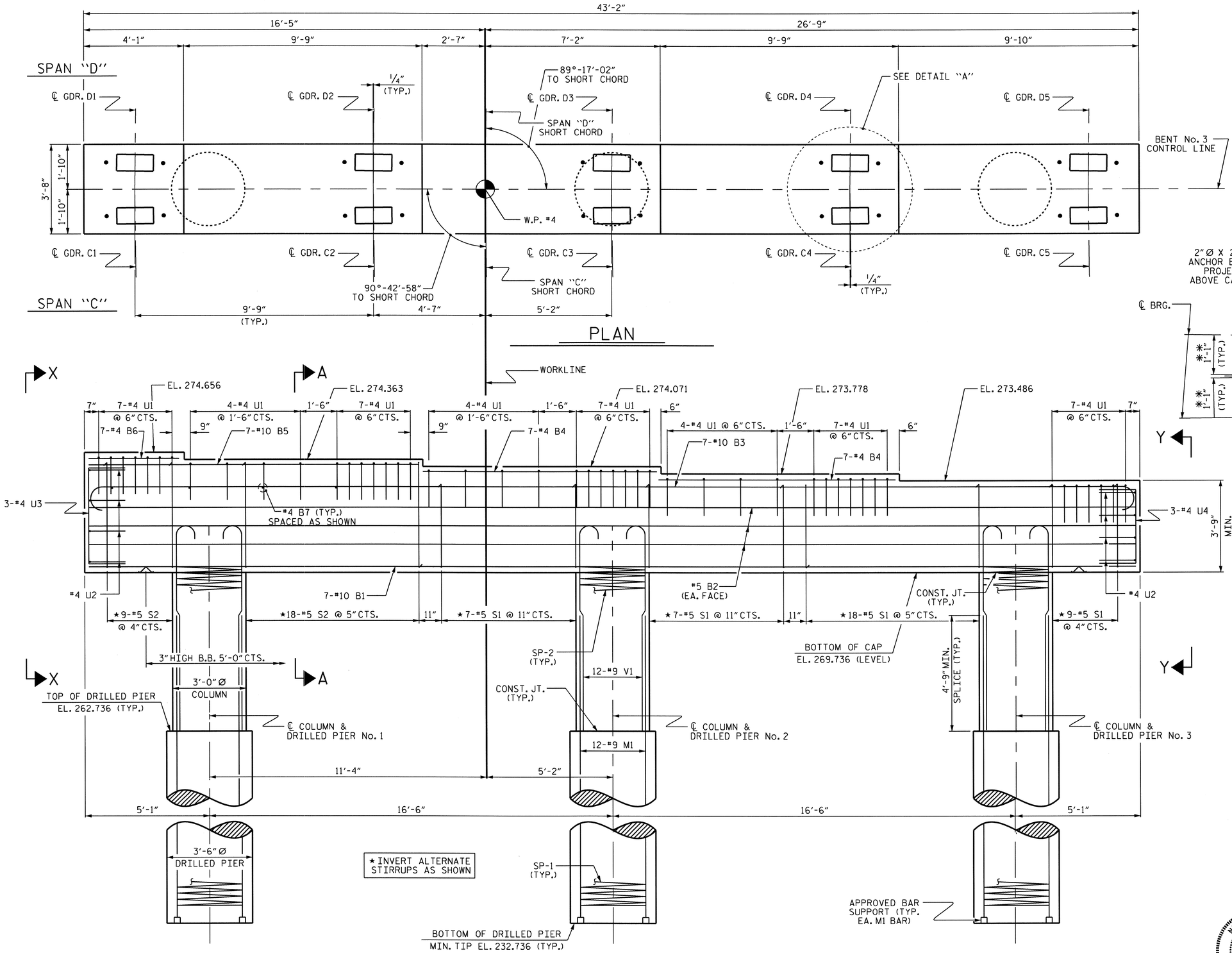


NOTES:

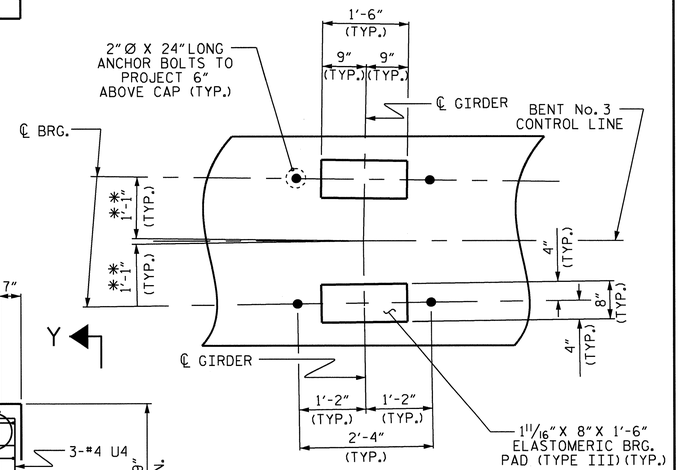
STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

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

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



DETAIL "A"

** MEASURED ALONG ℄ GIRDER (TYP. EA. GIRDER)

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 24380 ENGINEER THEO J. BEACH
2/24/2012

DRAWN BY : M.L. BROWN DATE : 5-2011
CHECKED BY : S.B. WILLIAMS DATE : 5-2011

10-JAN-2012 13:16
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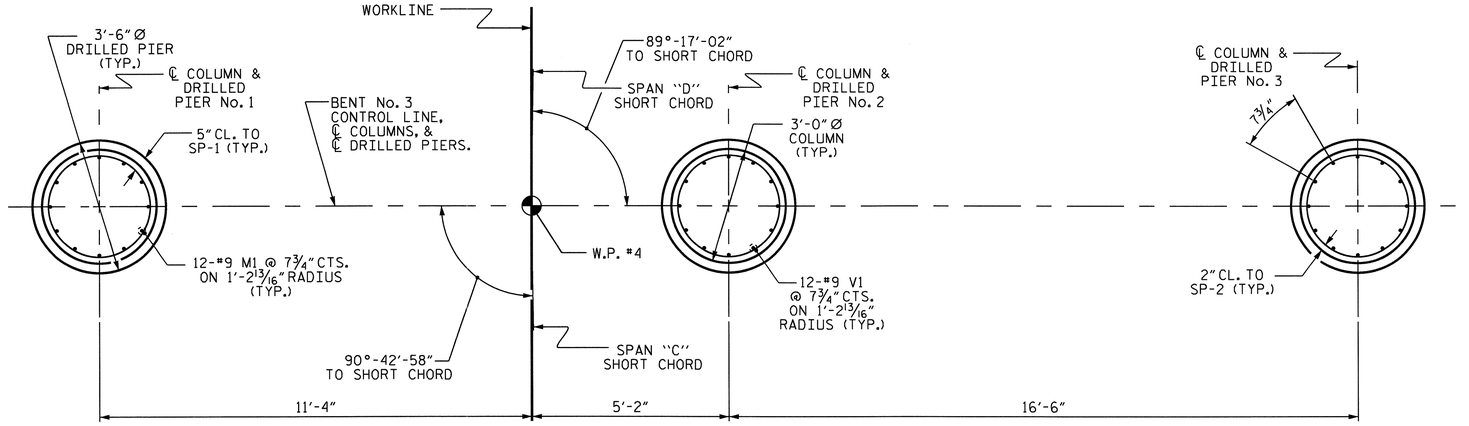
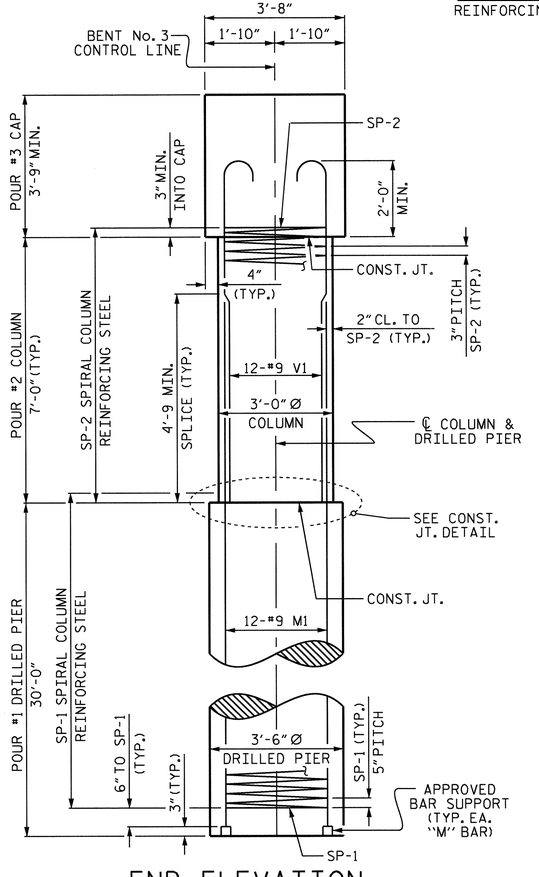


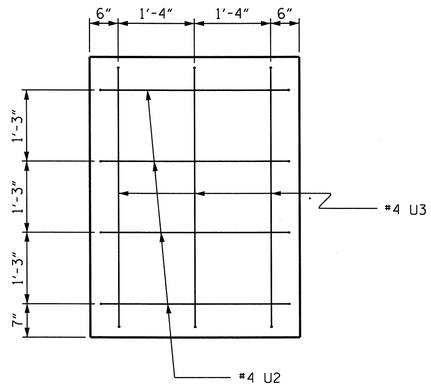
PLAN OF DRILLED PIERS & COLUMNS

REINFORCING STEEL, DIMENSIONS & DETAILS ARE TYPICAL FOR EACH DRILLED PIER & COLUMN.

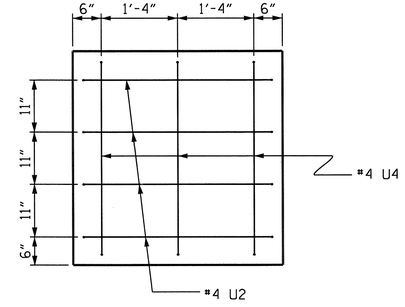


END ELEVATION

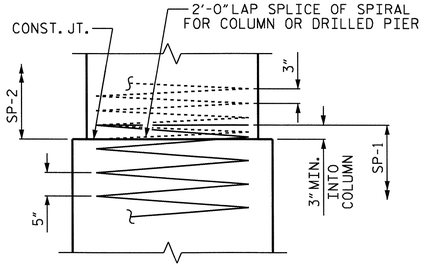
REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND DRILLED PIER UNLESS OTHERWISE NOTED.



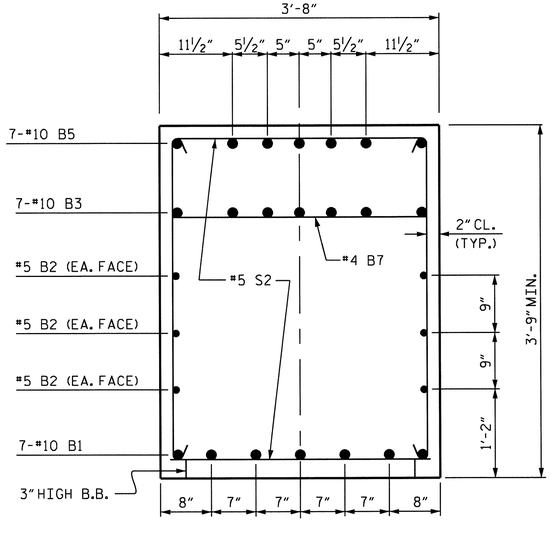
VIEW X-X



VIEW Y-Y

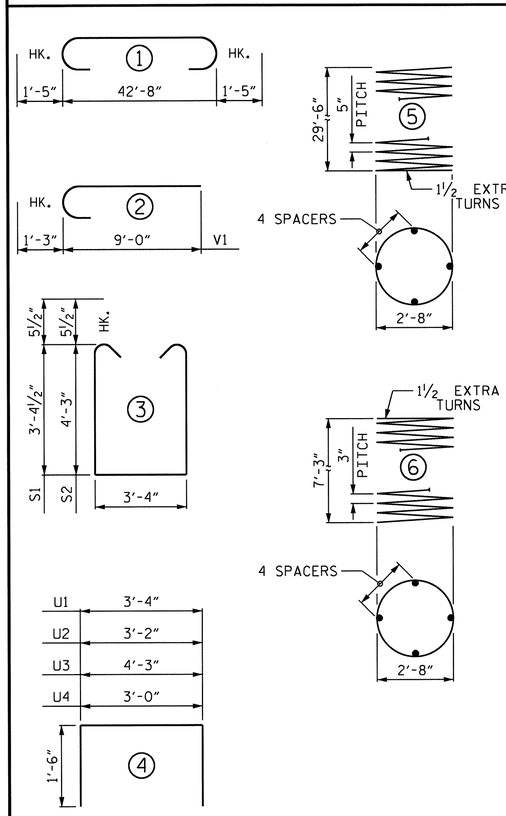


CONSTRUCTION JOINT DETAIL



SECTION A-A

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT No. 3

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	STR	42'-10"	1290
B2	6	#5	STR	42'-10"	268
B3	7	#10	1	45'-6"	1371
B4	14	#4	STR	9'-7"	90
B5	7	#10	STR	13'-6"	407
B6	7	#4	STR	3'-9"	18
B7	4	#4	STR	3'-4"	9
M1	36	#9	STR	37'-6"	4590
S1	41	#5	3	11'-0"	470
S2	27	#5	3	12'-9"	359
U1	47	#4	4	6'-4"	199
U2	8	#4	4	6'-2"	33
U3	3	#4	4	7'-3"	15
U4	3	#4	4	6'-0"	12
V1	36	#9	2	10'-3"	1255

REINFORCING STEEL 10386 LBS.

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	3	*	5	600'-5"	1879
SP-2	3	**	6	255'-9"	513

SPIRAL COLUMN REINFORCING STEEL 2,392 LBS.

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

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

CLASS A CONCRETE	
POUR #2 (COLUMNS)	5.5 C.Y.
POUR #3 (CAP)	25.0 C.Y.
TOTAL	30.5 C.Y.

DRILLED PIERS:

DRILLED PIER CONCRETE

POUR #1 (DRILLED PIERS) 32.1 C.Y.

3'-6"Ø DRILLED PIER NOT IN SOIL 28.0 LIN. FT.

3'-6"Ø DRILLED PIER IN SOIL 62.0 LIN. FT.

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 3

NORTH CAROLINA PROFESSIONAL SEAL 24890 ENGINEER THEO J. BEACH
2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : M.L. BROWN DATE : 5-2011
CHECKED BY : S.B. WILLIAMS DATE : 5-2011

10-JAN-2012 13:15
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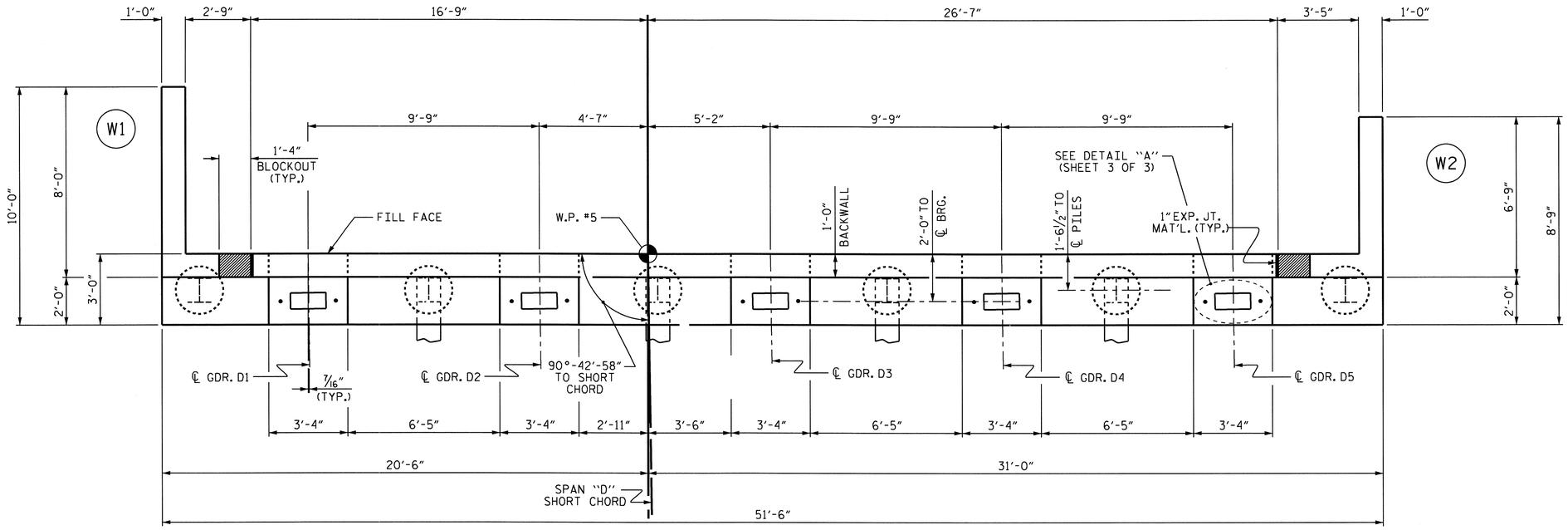
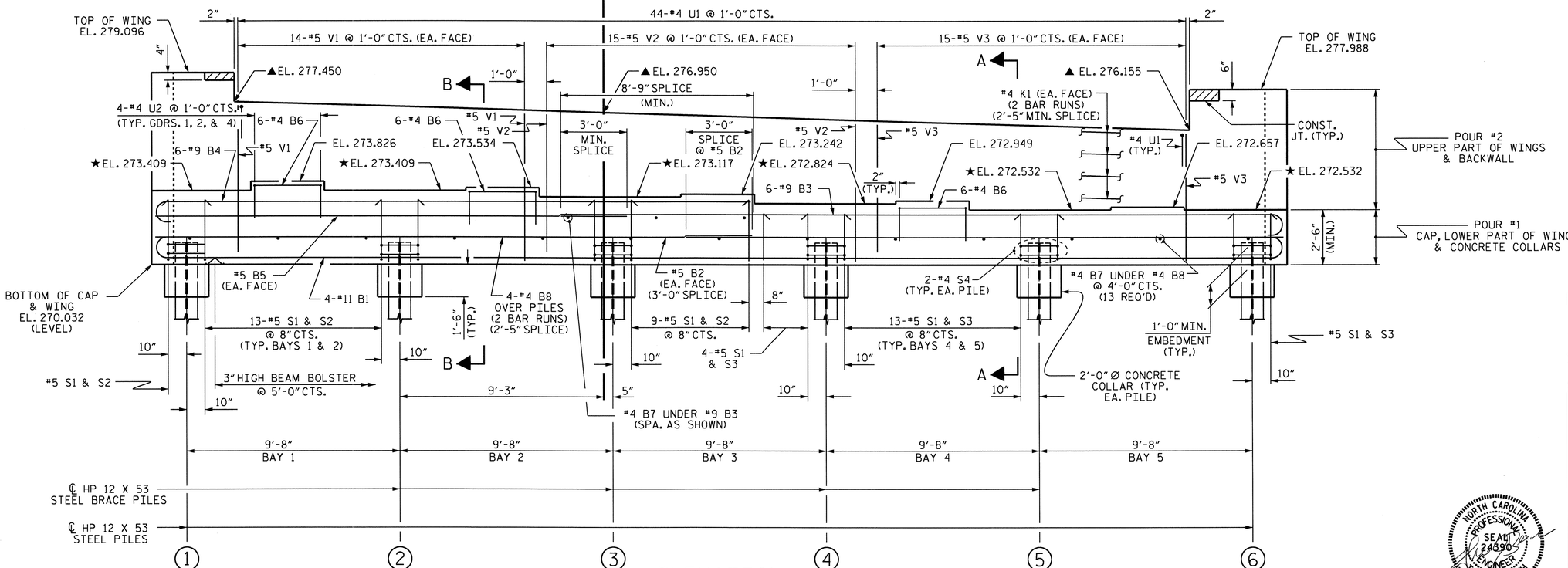


PLAN



ELEVATION

NOTES

★ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILDUPS, SEE SECTION A-A ON SHEET 3 OF 3.

▲ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL, PARAPET AND END POST ARE CAST IF SLIP FORMING IS USED.

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

#5 "V" BARS IN BACKWALL SHALL BE PLACED 2" CLEAR FROM TOP OF BACKWALL.

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH 2/24/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : T. N. CARROLL DATE : 07-2011
CHECKED BY : D. G. ELY DATE : 08-2011

10-JAN-2012 13:15
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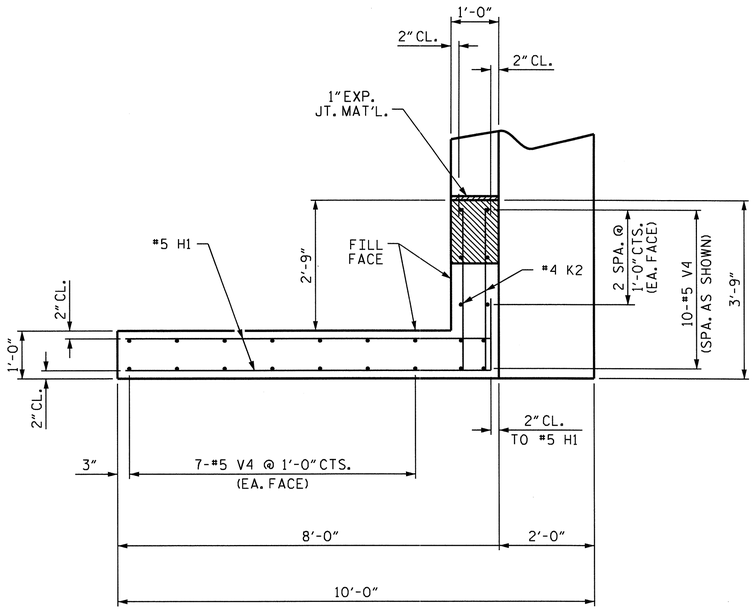
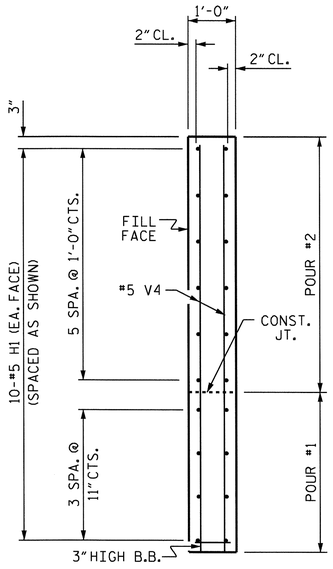
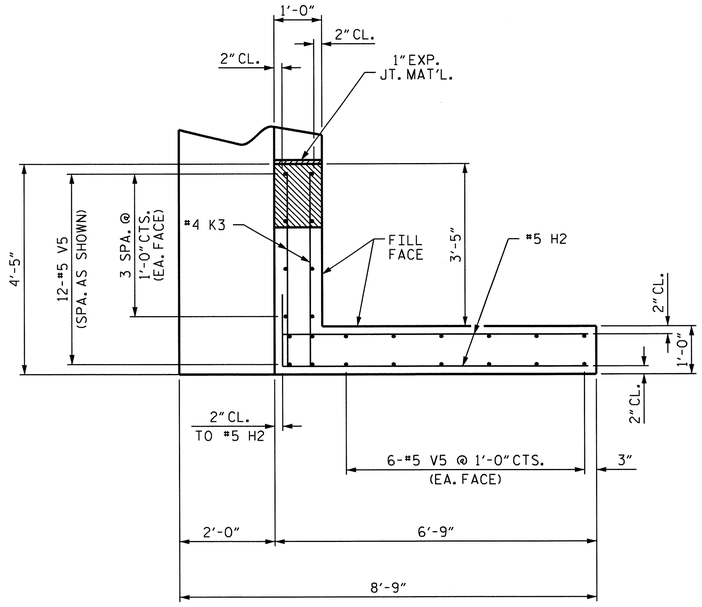


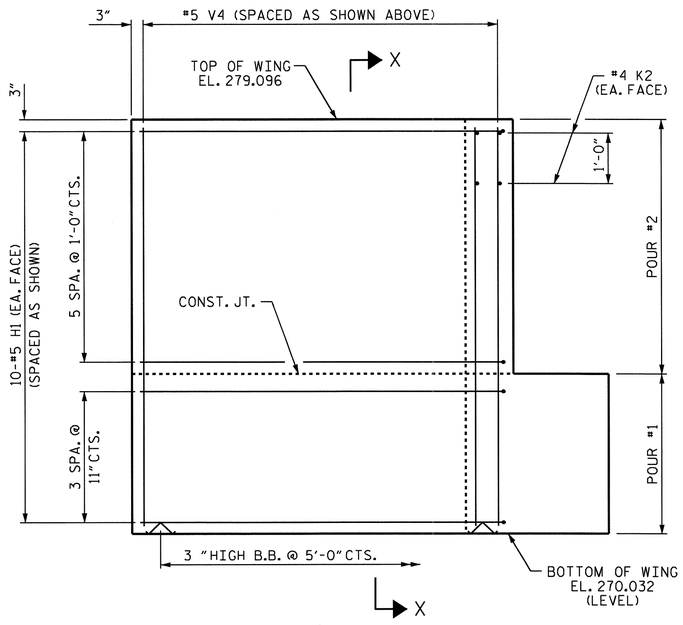
PLAN OF WING W1



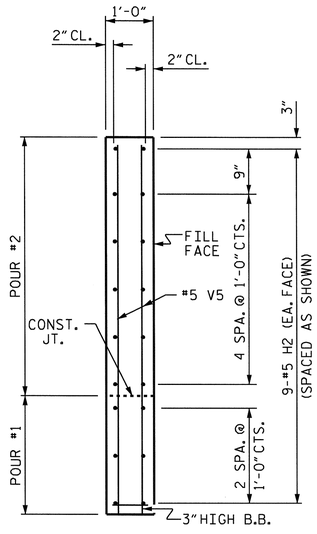
SECTION X-X



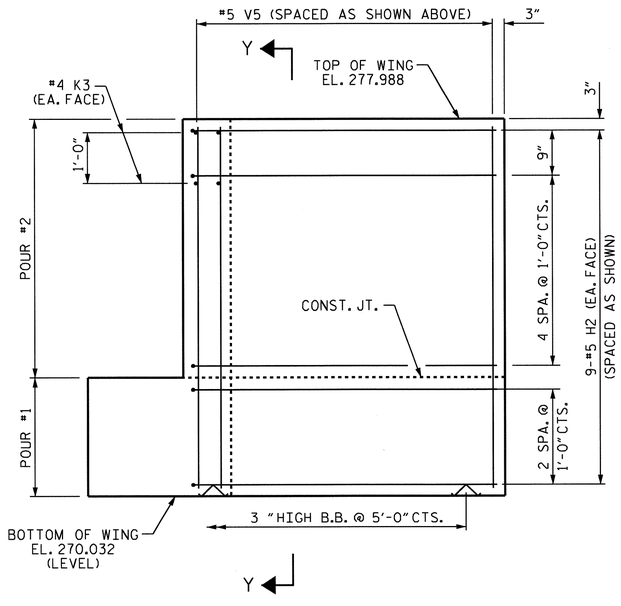
PLAN OF WING W2



ELEVATION OF WING W1



SECTION Y-Y



ELEVATION OF WING W2

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH

1/24/2012

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : T. N. CARROLL DATE : 07-2011
CHECKED BY : D. G. ELY DATE : 08-2011

10-JAN-2012 13:14
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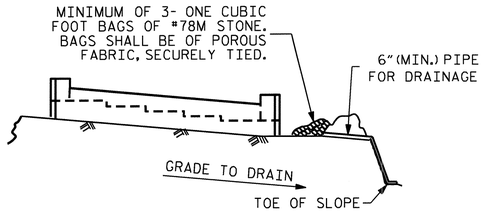
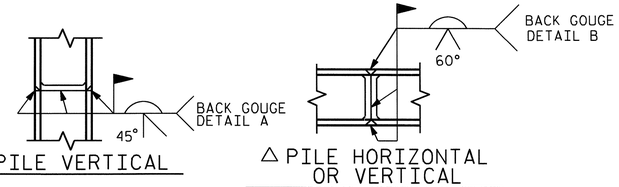


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

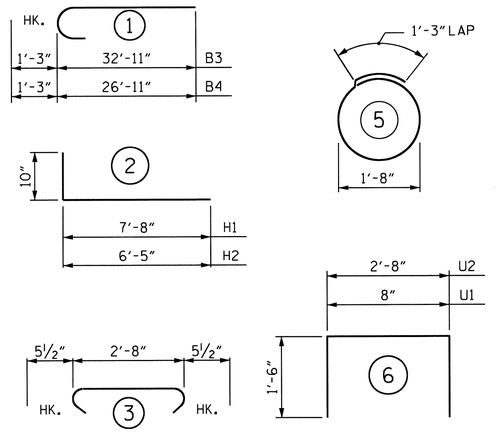
TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



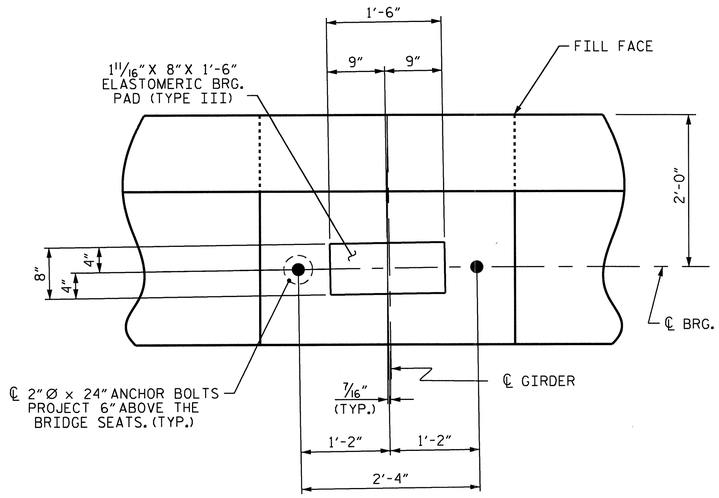
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT No. 2

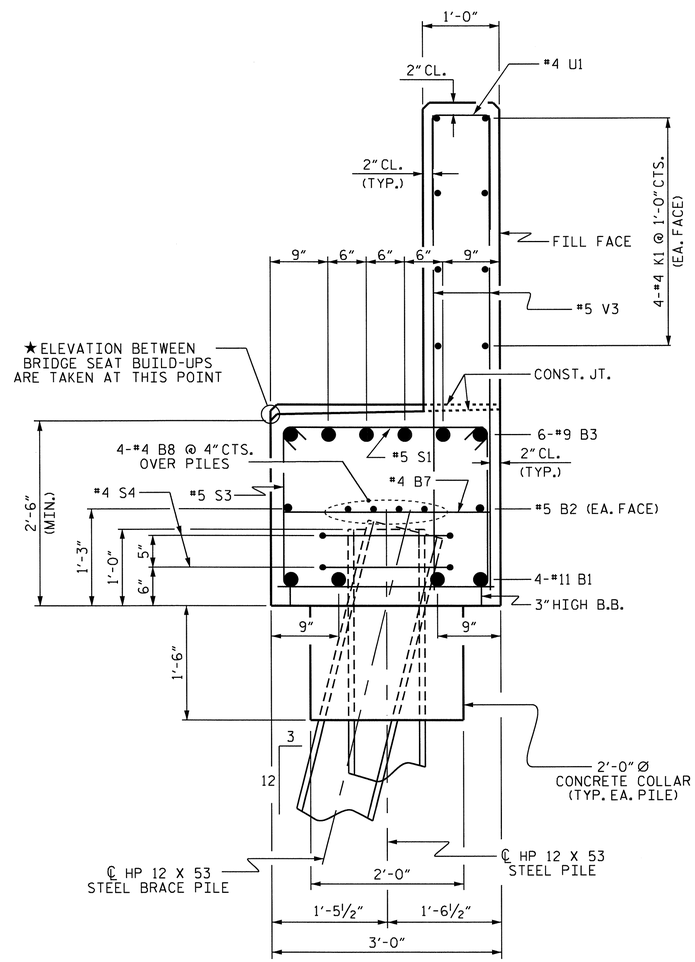
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#11	7	54'-2"	1151
B2	4	#5	STR	27'-1"	113
B3	6	#9	1	34'-2"	697
B4	6	#9	1	28'-2"	575
B5	2	#5	STR	21'-3"	44
B6	18	#4	STR	3'-0"	36
B7	16	#4	STR	2'-8"	29
B8	8	#4	STR	26'-10"	143
H1	20	#5	2	8'-6"	177
H2	18	#5	2	7'-3"	136
K1	16	#4	STR	26'-10"	287
K2	4	#4	STR	3'-5"	9
K3	4	#4	STR	4'-1"	11
S1	67	#5	3	3'-7"	250
S2	36	#5	4	9'-0"	338
S3	31	#5	4	7'-10"	253
S4	12	#4	5	6'-6"	52
U1	44	#4	6	3'-8"	108
U2	12	#4	6	5'-8"	45
V1	28	#5	STR	6'-8"	195
V2	30	#5	STR	6'-2"	193
V3	30	#5	STR	5'-9"	180
V4	24	#5	STR	8'-8"	217
V5	24	#5	STR	7'-7"	190

REINFORCING STEEL	5429 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 (CAP, LOWER WINGS & CONCRETE COLLARS)	20.0 C.Y.
POUR #2 (BACKWALL & UPPER WINGS)	10.5 C.Y.
TOTAL CLASS A CONCRETE	30.5 C.Y.
HP 12 X 53 STEEL PILES	
No. = 6	180 LIN FT.

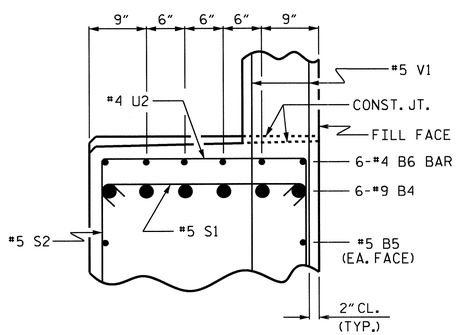


DETAIL "A"

(TYP. EACH GIRDER)



SECTION A-A



SECTION B-B

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER THEO J. BEACH
2/24/2012

DRAWN BY : T. N. CARROLL DATE : 07/2011
CHECKED BY : D. G. ELY DATE : 08/2011

20-FEB-2012 15:50
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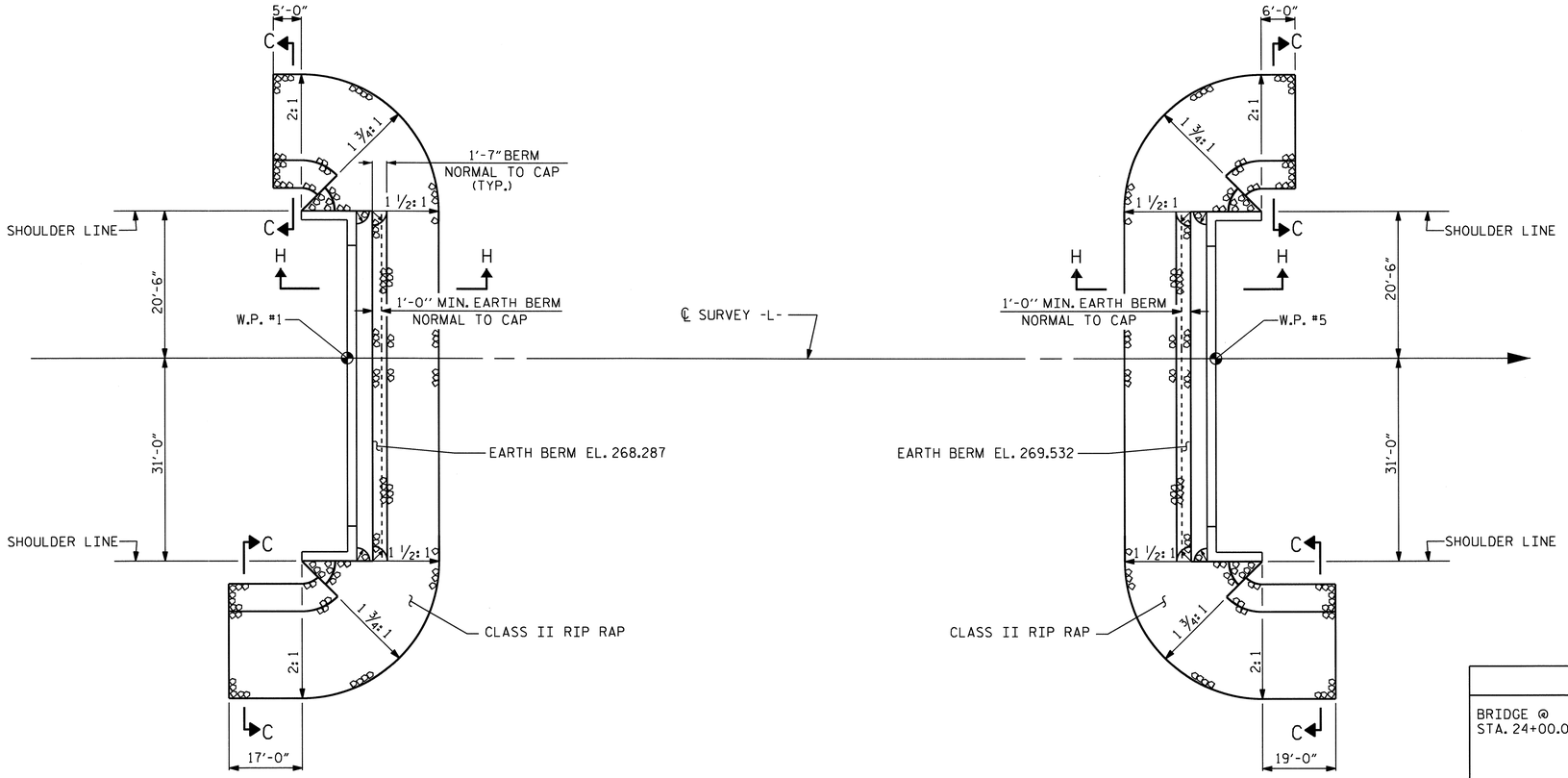


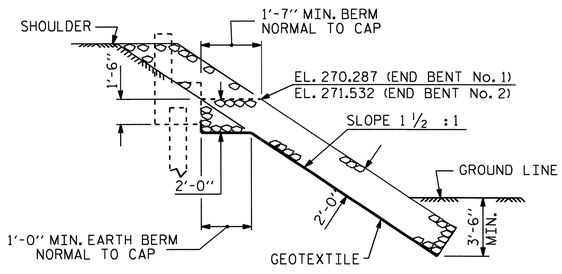
END BENT No. 1

END BENT No. 2

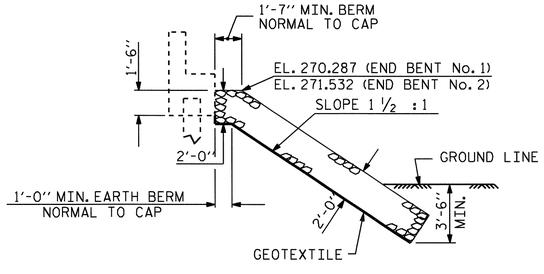
ESTIMATED QUANTITIES

BRIDGE @ STA. 24+00.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	350	390
END BENT 2	375	420

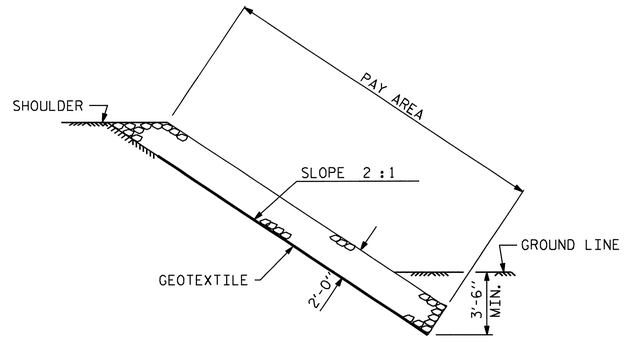
PLAN



SECTION H-H



℄ SECTION
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RIP RAP DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 23390 ENGINEER THEO J. BEACH
2/24/2012

ASSEMBLED BY : S. B. WILLIAMS	DATE : 7-11
CHECKED BY : M. L. BROWN	DATE : 7-11
DRAWN BY : FCJ 2/88	REV. 8/16/99 RWW/LES
CHECKED BY : ARB 8/88	REV. 10/17/00 RWW/LES
	REV. 5/1/06R TLA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			65

20-FEB-2012 15:53
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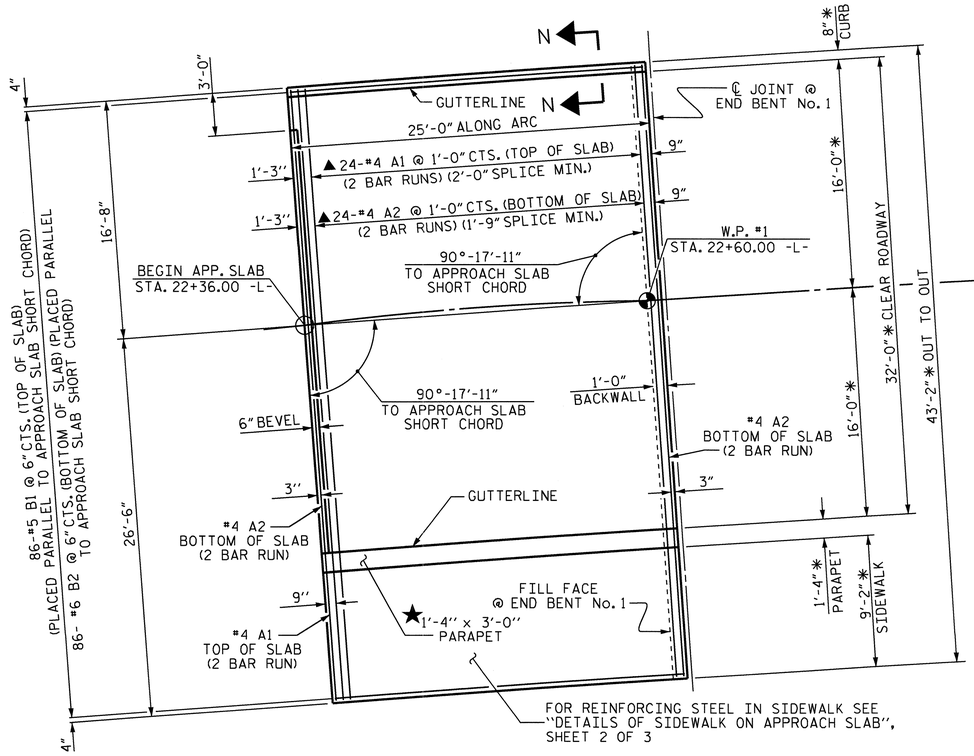
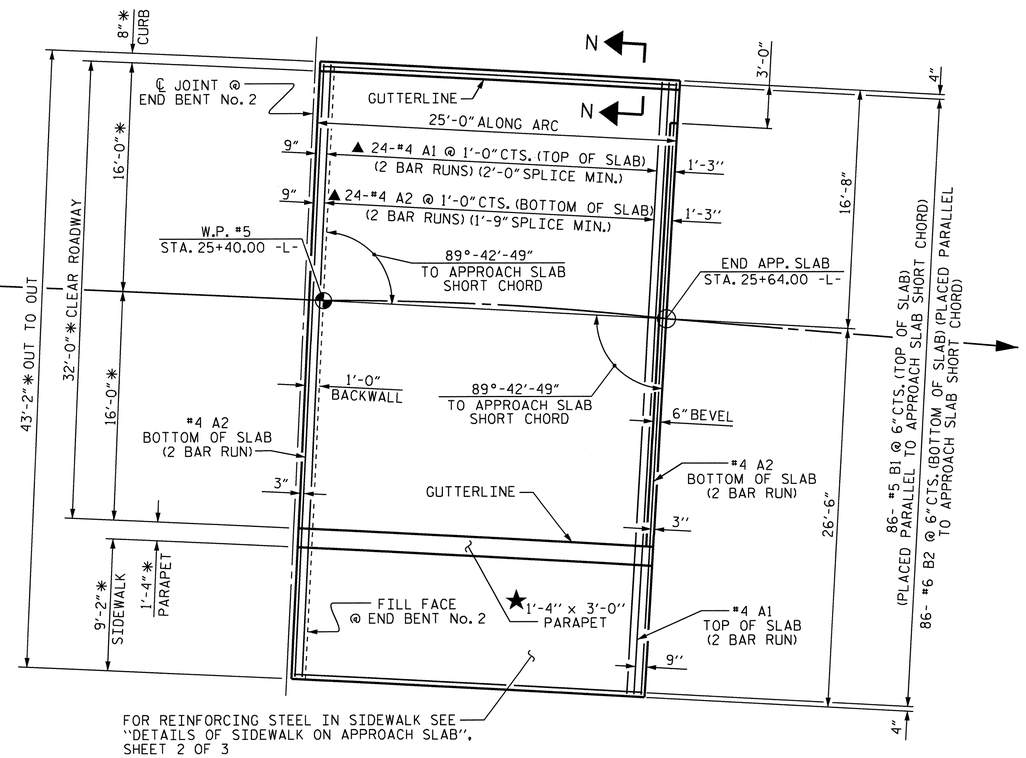
SKEW 90°

STD. NO. RR2





★ FOR ADDITIONAL REINFORCING STEEL IN APPROACH SLAB AND 1'-4" x 3'-0" PARAPET, SEE "SUPERSTRUCTURE CONCRETE PARAPET DETAILS" SHEETS.

PLAN @ END BENT No. 1

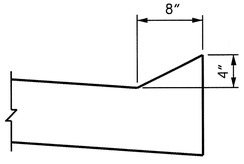
PLAN @ END BENT No. 2

PLAN OF APPROACH SLABS

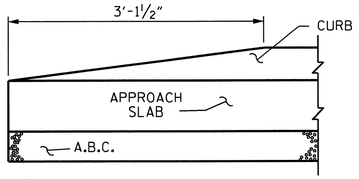
NOTES:

* MEASURED RADIALLY

▲ "A" BARS ARE SPACED ALONG APPROACH SLAB CHORD AND PLACED PARALLEL TO FILL FACE

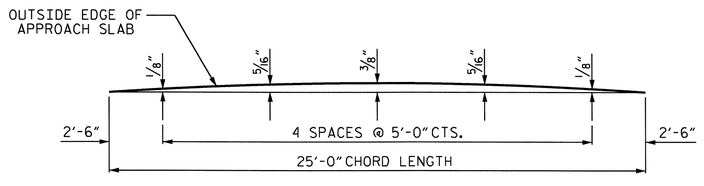


SECTION N-N

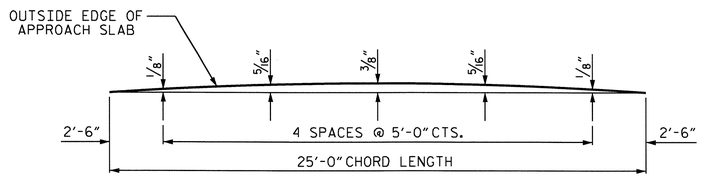


END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

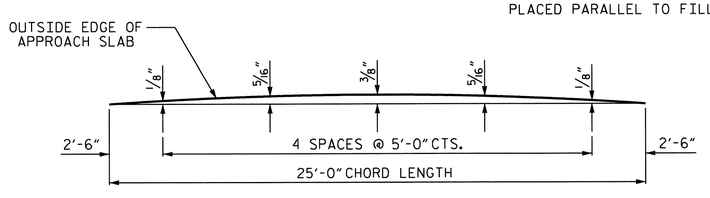


LEFT SIDE

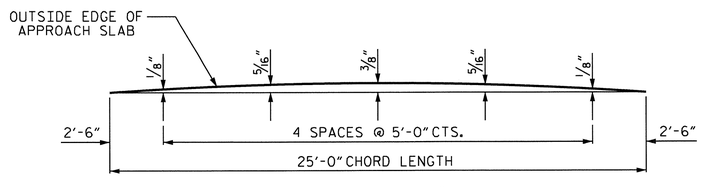


RIGHT SIDE

ARC OFFSETS @ END BENT No. 1



LEFT SIDE



RIGHT SIDE

ARC OFFSETS @ END BENT No. 2

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB AND ARC OFFSETS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			65

DRAWN BY : A. V. ROYAL DATE : 05/11
CHECKED BY : M. L. BROWN DATE : 06/11

10-JAN-2012 13:12
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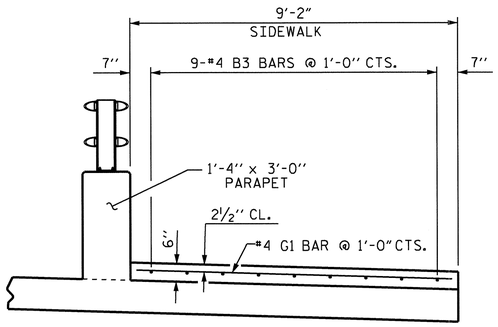
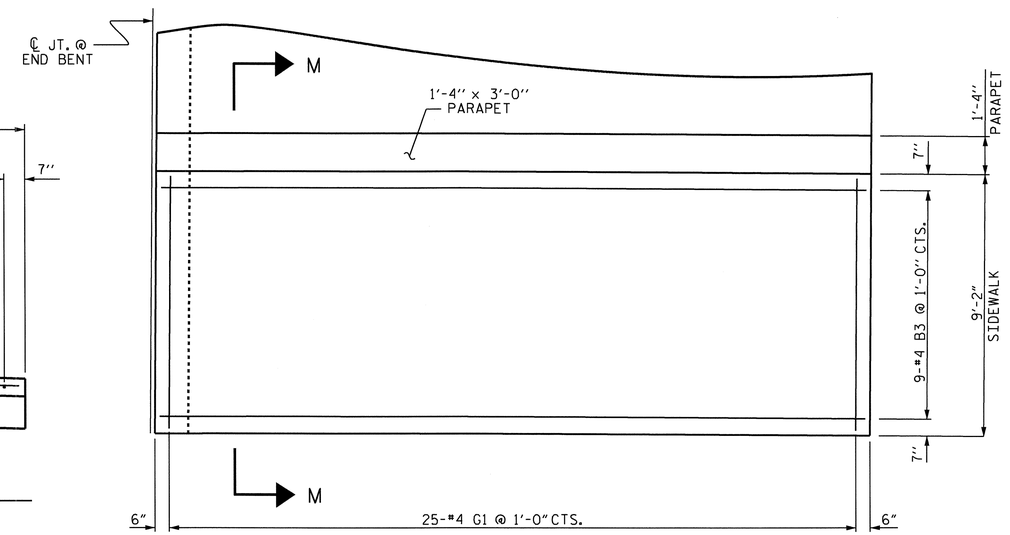


SECTION M-M



PLAN

DETAILS OF SIDEWALK ON APPROACH SLAB

END BENT No. 2 SHOWN, END BENT No. 1 SIMILAR

THE #4 G1 BARS SHALL BE SPACED ALONG THE SIDEWALK FACE OF THE 1'-4" x 3'-0" PARAPET AND BE PLACED RADIALLY.

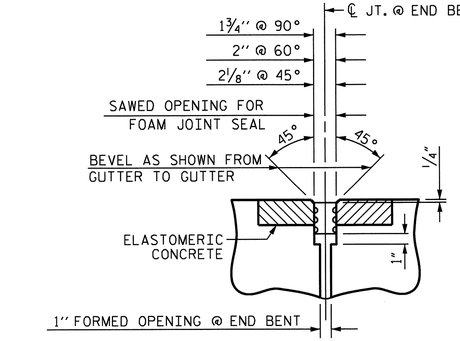
ALL REINFORCING STEEL IN SIDEWALK SHALL BE EPOXY COATED.

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

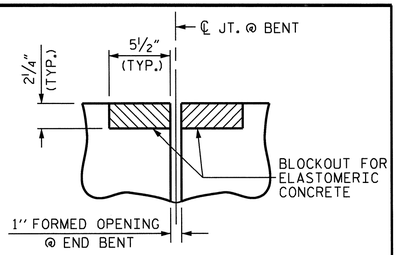
FOR PARAPET DETAILS AND REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEETS.

ELASTOMERIC CONCRETE	
LOCATION	ELASTOMERIC CONCRETE * (CU. FT.)
END BENT No. 1	5.5
END BENT No. 2	5.5

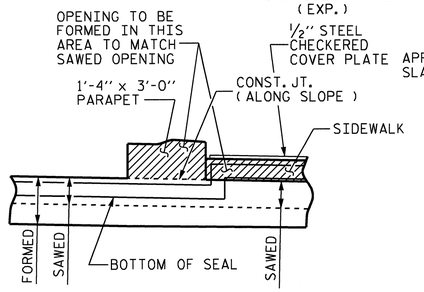
* BASED ON THE MINIMUM BLOCKOUT SHOWN.



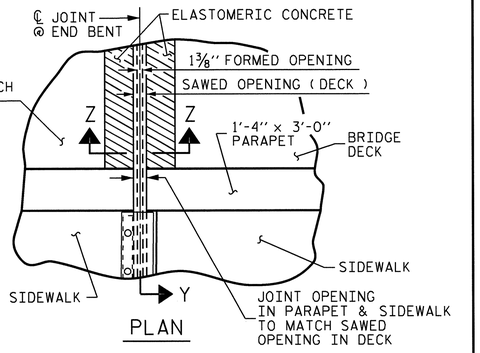
SECTION Z-Z
FOAM JOINT SEAL (EXP.)



SECTION Z-Z
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



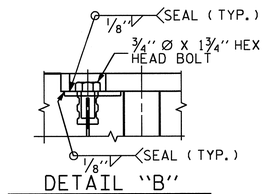
SECTION Y-Y



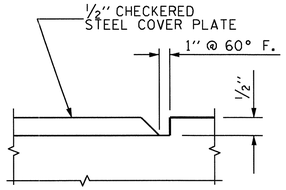
PLAN

JOINT SEAL DETAILS @ END BENT

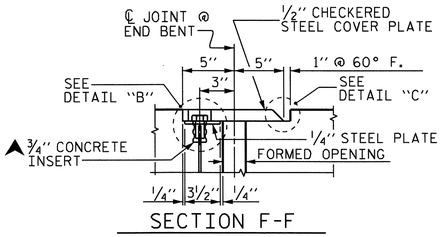
THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET AND SIDEWALK



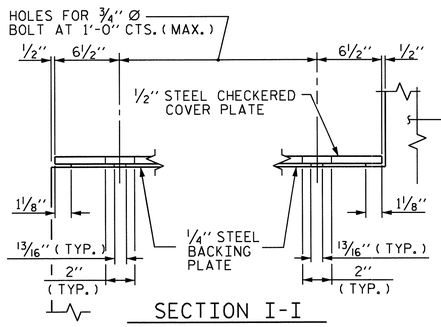
DETAIL "B"



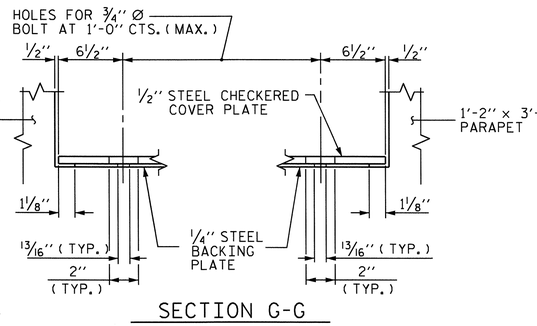
DETAIL "C"



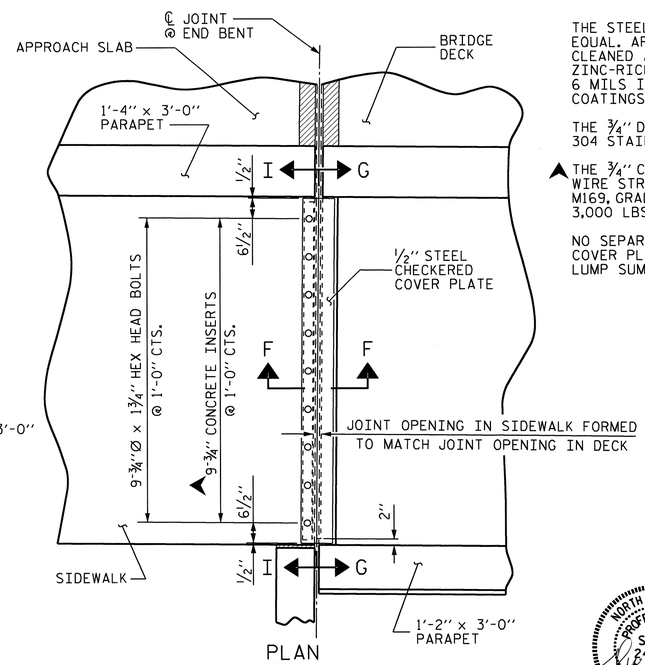
SECTION F-F



SECTION I-I



SECTION G-G



PLAN

NOTES FOR SIDEWALK COVER PLATES

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERCIALLY BLAST CLEANED AND COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT, GALVANIZED OR METALLIZED TO A MINIMUM THICKNESS OF 6 MILS IN ACCORDANCE WITH STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE ¾" DIAMETER HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

▲ THE ¾" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3,000 LBS.

NO SEPARATE PAYMENT WILL BE MADE FOR FURNISHING AND INSTALLING THE COVER PLATE. THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE FOR "FOAM JOINT SEALS".

SIDEWALK COVER PLATE DETAILS @ END BENT

PLAN VIEW @ END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 2 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-58
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 24390 ENGINEER JAMES J. BEACH
2/24/2012

DRAWN BY : A. V. ROYAL DATE : 05/11
CHECKED BY : M. L. BROWN DATE : 06/11

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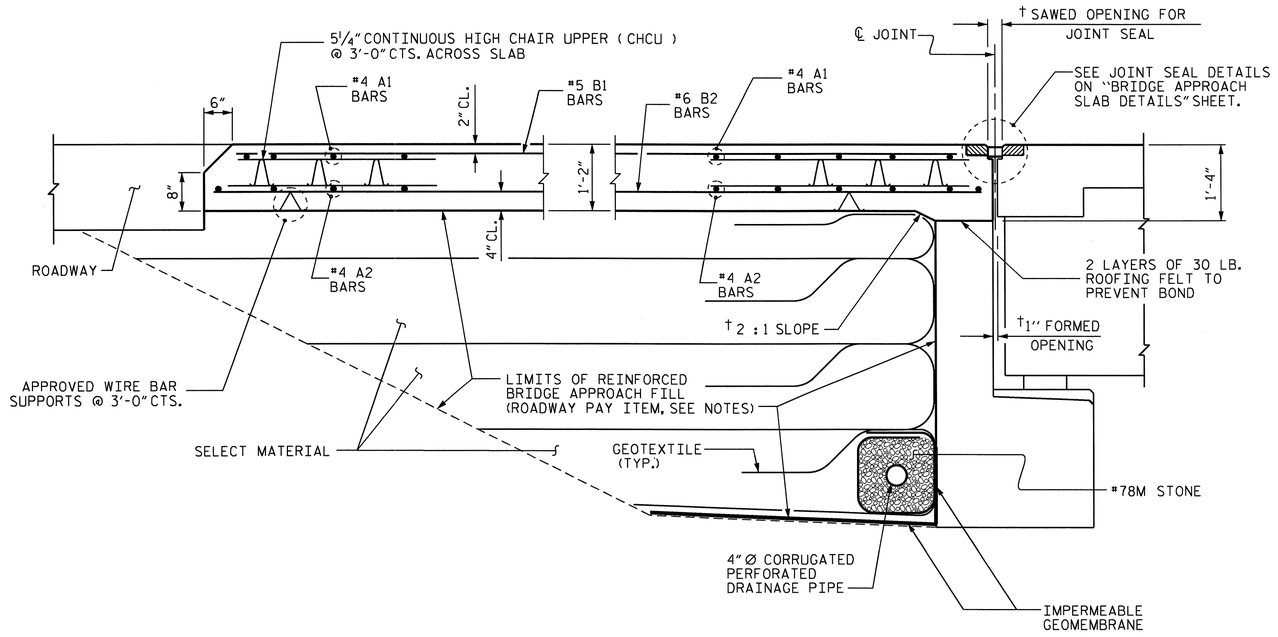


SECTION THRU SLAB

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING 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.

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

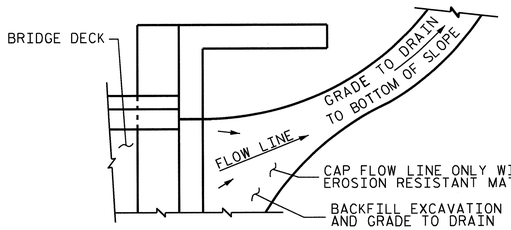
FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

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

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

FOR ADDITIONAL REINFORCING STEEL IN APPROACH SLAB AND 1'-4" x 3'-0" PARAPET, SEE "SUPERSTRUCTURE CONCRETE PARAPET DETAILS" SHEET.

PAYMENT FOR 1'-4" x 3'-0" PARAPET ON THE APPROACH SLABS IS INCLUDED PAY ITEM FOR 1'-4" x 3'-0" PARAPET.



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

TEMPORARY DRAINAGE DETAIL

BILL OF MATERIAL
APPROACH SLAB AT EB No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	50	#4	STR	22'-5"	749
A2	52	#4	STR	22'-4"	776
✱ B1	86	#5	STR	23'-9"	2130
B2	86	#6	STR	24'-8"	3186
✱ B3	9	#4	STR	24'-8"	148
✱ G1	25	#4	STR	8'-10"	148
REINFORCING STEEL					3962 LBS.
✱ EPOXY COATED REINFORCING STEEL					3175 LBS.

CLASS AA CONCRETE	
POUR #1 (SLAB & CURB)	46.9 C. Y.
POUR #2 (SIDEWALK)	4.2 C. Y.
TOTAL	51.1 C. Y.

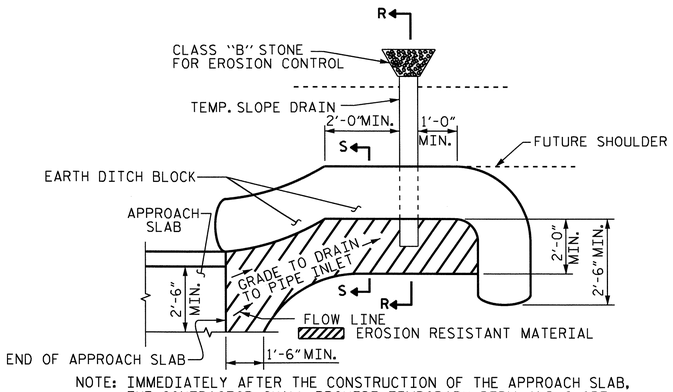
BILL OF MATERIAL
APPROACH SLAB AT EB No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	50	#4	STR	22'-5"	749
A2	52	#4	STR	22'-4"	776
✱ B1	86	#5	STR	23'-9"	2130
B2	86	#6	STR	24'-8"	3186
✱ B3	9	#4	STR	24'-8"	149
✱ G1	25	#4	STR	8'-10"	148
REINFORCING STEEL					3962 LBS.
✱ EPOXY COATED REINFORCING STEEL					3175 LBS.

CLASS AA CONCRETE	
POUR #1 (SLAB & CURB)	46.9 C. Y.
POUR #2 (SIDEWALK)	4.2 C. Y.
TOTAL	51.1 C. Y.

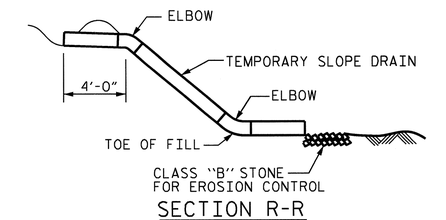
SPLICE LENGTHS

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

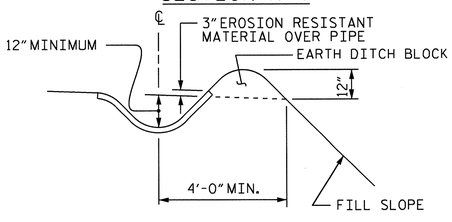


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 3 OF 3

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-59
1			3			TOTAL SHEETS
2			4			65

ASSEMBLED BY : A. V. ROYAL	DATE : 05/11		
CHECKED BY : M. L. BROWN	DATE : 06/11		
DRAWN BY : EEM 3/95	REV. 7/10/01	LES/RDR	
CHECKED BY : VAP 3/95	REV. 5/7/03R	RWW/JTE	
	REV. 5/1/06R	KMM/GM	

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STD. NO. BAS4 (SHT 6)

OVERHANG BRACKET CALCULATION INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

DEFINITIONS

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

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK AASHTO TYPES III, IV, V, AND VI (SPANS A & B)

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHARNG-CHUAN VICTOR CHAO

Charng-Chuan Victor Chao
1/11/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			65

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

11-JAN-2012 09:18
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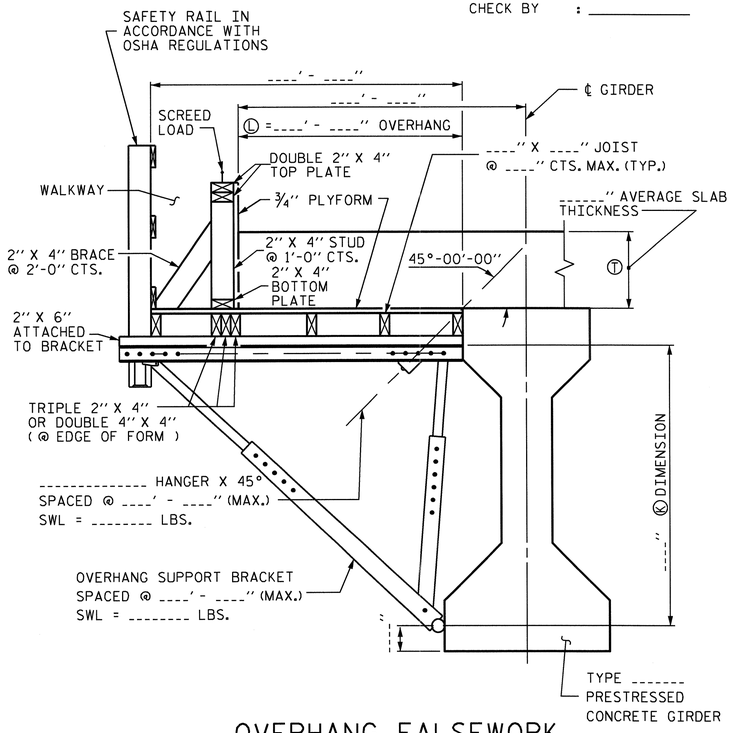
vchao

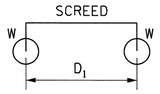
BRIDGE OVERHANG BRACKET SUMMARY

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

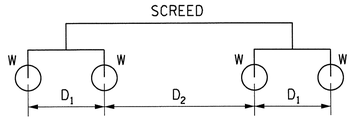
PROJECT No. : _____
COUNTY : _____
STATION : _____
DESCRIPTION : _____
DATE : _____
DESIGN BY : _____
CHECK BY : _____



OVERHANG FALSEWORK



4-WHEEL MACHINE



8-WHEEL MACHINE

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

TABLE 2: SCREED LOAD FACTOR "R"

		THE SCREED LOAD FACTOR R (FOR 8 WHEEL MACHINE)																		
		S/D_2																		
S/D_1		<= 1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.2	2.4	2.6	2.8	3.0	3.5	4.0
	<= 1.0	1.00	1.09	1.17	1.23	1.29	1.33	1.38	1.41	1.44	1.47	1.50	1.55	1.58	1.62	1.64	1.67	1.71	1.75
	1.1	1.09	1.18	1.26	1.32	1.38	1.42	1.47	1.50	1.54	1.56	1.59	1.64	1.67	1.71	1.73	1.76	1.81	1.84
	1.2	1.17	1.26	1.33	1.40	1.45	1.50	1.54	1.58	1.61	1.64	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92
	1.3	1.23	1.32	1.40	1.46	1.52	1.56	1.61	1.64	1.68	1.70	1.73	1.78	1.81	1.85	1.87	1.90	1.95	1.98
	1.4	1.29	1.38	1.45	1.52	1.57	1.62	1.66	1.70	1.73	1.76	1.79	1.83	1.87	1.90	1.93	1.95	2.00	2.07
	1.5	1.33	1.42	1.50	1.56	1.62	1.67	1.71	1.75	1.78	1.81	1.83	1.88	1.92	1.95	1.98	2.00	2.10	2.17
	1.6	1.38	1.47	1.54	1.61	1.66	1.71	1.75	1.79	1.82	1.85	1.88	1.92	1.96	1.99	2.04	2.08	2.18	2.25
	1.7	1.41	1.50	1.58	1.64	1.70	1.75	1.79	1.82	1.86	1.89	1.91	1.96	2.00	2.05	2.11	2.16	2.25	2.32
	1.8	1.44	1.54	1.61	1.68	1.73	1.78	1.82	1.86	1.89	1.92	1.94	1.99	2.06	2.12	2.17	2.22	2.32	2.39
	1.9	1.47	1.56	1.64	1.70	1.76	1.81	1.85	1.89	1.92	1.95	1.97	2.04	2.11	2.18	2.23	2.28	2.38	2.45
	2.0	1.50	1.59	1.67	1.73	1.79	1.83	1.88	1.91	1.94	1.97	2.00	2.09	2.17	2.23	2.29	2.33	2.43	2.50
	2.2	1.55	1.64	1.71	1.78	1.83	1.88	1.92	1.96	1.99	2.04	2.09	2.18	2.26	2.32	2.38	2.42	2.52	2.59
	2.4	1.58	1.67	1.75	1.81	1.87	1.92	1.96	2.00	2.06	2.11	2.17	2.26	2.33	2.40	2.45	2.50	2.60	2.67
	2.6	1.62	1.71	1.78	1.85	1.90	1.95	1.99	2.05	2.12	2.18	2.23	2.32	2.40	2.46	2.52	2.56	2.66	2.73
	2.8	1.64	1.73	1.81	1.87	1.93	1.98	2.04	2.11	2.17	2.23	2.29	2.38	2.45	2.52	2.57	2.62	2.71	2.79
	3.0	1.67	1.76	1.83	1.90	1.95	2.00	2.08	2.16	2.22	2.28	2.33	2.42	2.50	2.56	2.62	2.67	2.76	2.83
	3.5	1.71	1.81	1.88	1.95	2.00	2.10	2.18	2.25	2.32	2.38	2.43	2.52	2.60	2.66	2.71	2.76	2.86	2.93
	4.0	1.75	1.84	1.92	1.98	2.07	2.17	2.25	2.32	2.39	2.45	2.50	2.59	2.67	2.73	2.79	2.83	2.93	3.00

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

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

NOTES

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

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

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

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

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

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

11-JAN-2012 09:19
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vchao

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHARNG-CHUAN VICTOR CHAO

Charng-Chuan Victor Chao
1/11/2012

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

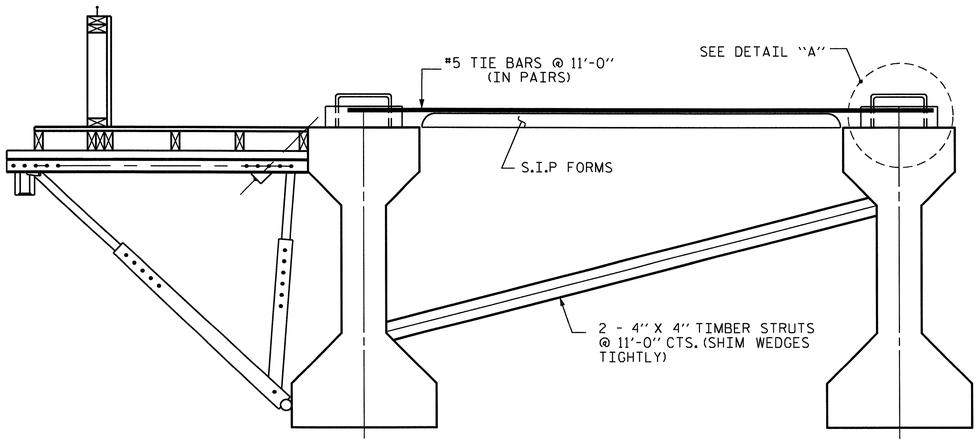
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK AASHTO TYPES III, IV, V, AND VI (SPANS A & B)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			65

0F2



EXTERIOR GIRDER INTERIOR GIRDER

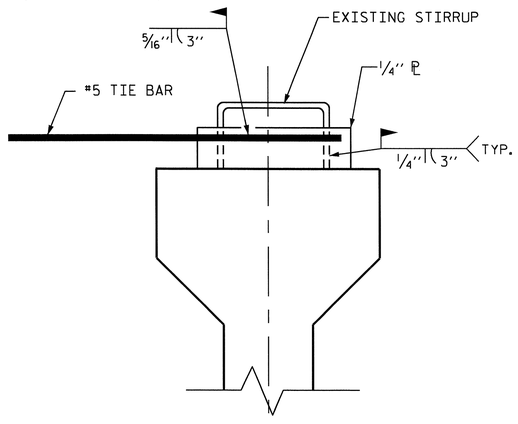
DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM

NOTES:

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

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 11'-0" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

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



DETAIL "A"

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK AASHTO TYPES III, IV, V, AND VI (SPANS A & B)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHARNG-CHUAN VICTOR CHAO

Charng-Chuan Victor Chao
1/11/2012

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

11-JAN-2012 09:20
C:\OLDFILESD\wdlr\victor\OverhangFalsework\TIEBAR&STRUT\B-4697_TYPE_III &IV\B-4697_TYPE_IV\B4697SPANSA&BOverHangSheets.dgn
vchao

OVERHANG BRACKET CALCULATION INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

DEFINITIONS

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

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK AASHTO TYPES III, IV, V, AND VI (SPANS C & D)

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
1/11/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			65

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

11-JAN-2012 09:12
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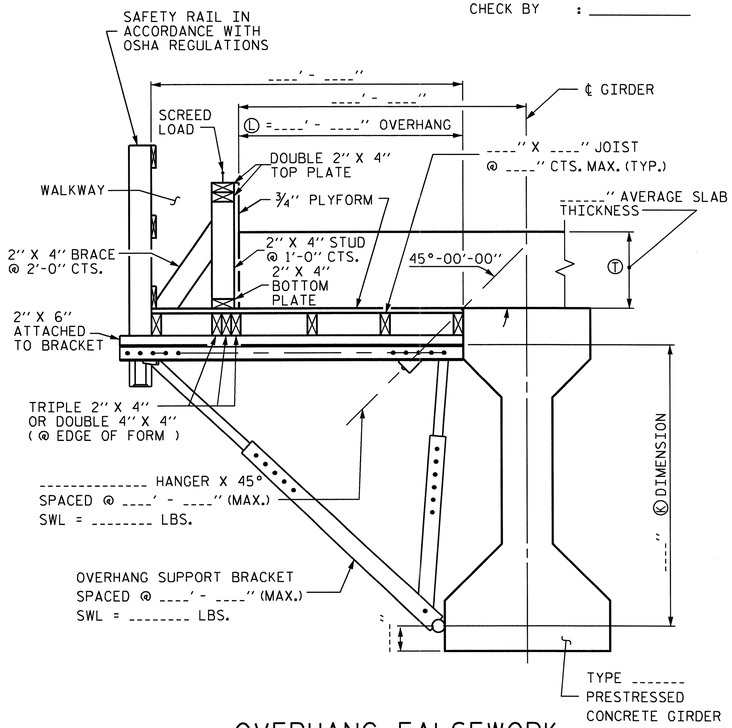
vchao

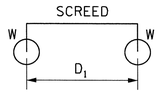
BRIDGE OVERHANG BRACKET SUMMARY

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

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

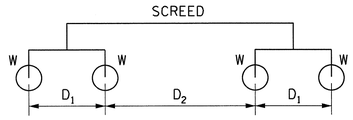


OVERHANG FALSEWORK



4-WHEEL MACHINE

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



8-WHEEL MACHINE

TABLE 2: SCREED LOAD FACTOR "R"

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

NOTES

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

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

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

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

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

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

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

PROJECT NO. B-4697
WAKE COUNTY
STATION: 24+00.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK AASHTO TYPES III, IV, V, AND VI (SPANS C & D)

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
1/11/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			65

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

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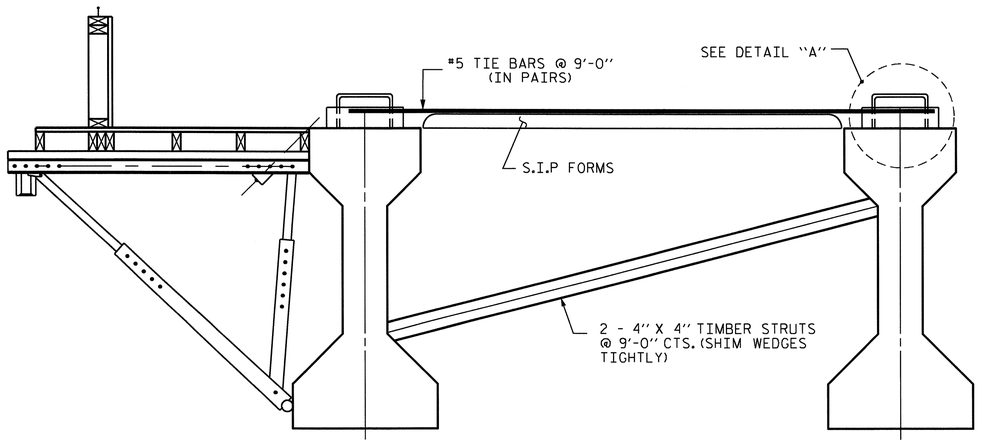


EXTERIOR GIRDER

INTERIOR GIRDER

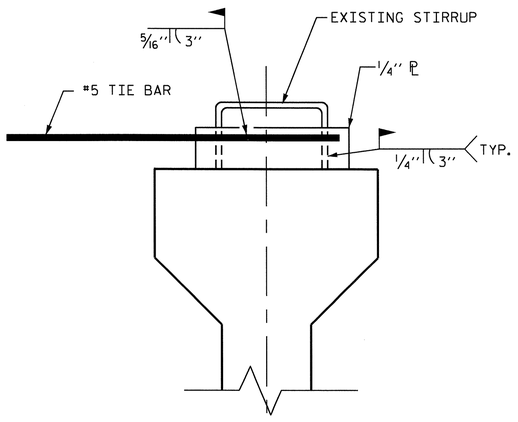
DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM

NOTES:

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

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 9'-0" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

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



DETAIL "A"

PROJECT NO. B-4697

WAKE COUNTY

STATION: 24+00.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK AASHTO TYPES III, IV, V, AND VI (SPANS C & D)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			65

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHIANG-CHUAN VICTOR CHAO

Chiang-Chuan Victor Chao
1/11/2012

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

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vchao

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

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

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