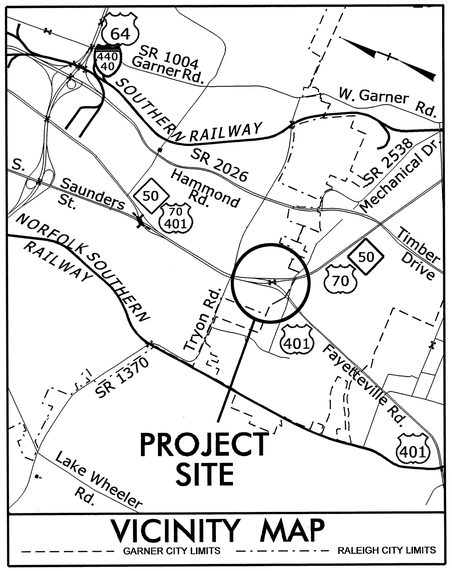
TIP NO: B-4946

CONTRACT: C203091



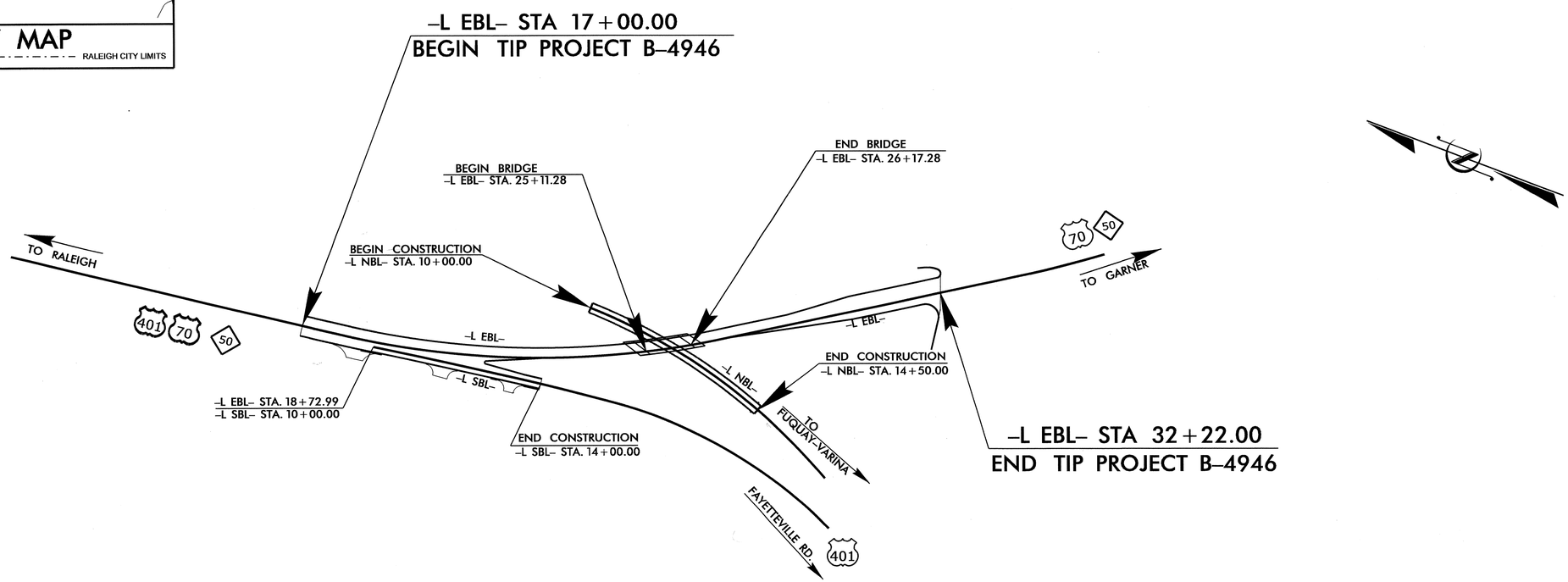
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4946		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
39978.1.1	BRSTP-0070(103)	PE
39978.2.1	BRSTP-0070(103)	R/W & UTILITIES
39978.3.1	BRSTP-0070(103)	CONST.

LOCATION: ***BRIDGE NO. 251 OVER US 401 ON US 70 /NC 50***

TYPE OF WORK: ***GRADING, DRAINAGE, PAVING, GUARDRAIL, SIGNALS, AND STRUCTURE***



STRUCTURE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2013 = 14,156
ADT 2033 = 18,678
DHV = 10%
D = 60%
T = 4% *
* (TTST 1% DUAL 3%)
V = 50 MPH
CLASS = ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4946: 0.268 MILES

LENGTH STRUCTURE TIP PROJECT B-4946: 0.020 MILES

TOTAL LENGTH OF TIP PROJECT B-4946: 0.288 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE :

APRIL 16, 2013

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

K. W. ALFORD, P.E.
PROJECT DESIGN ENGINEER

STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

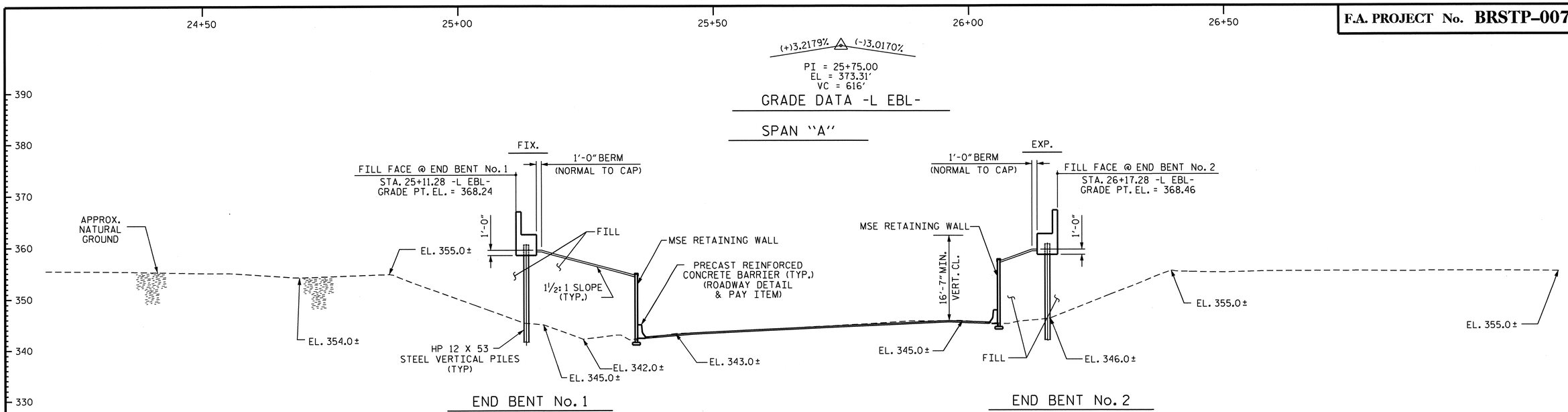
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

F.A. PROJECT No. BRSTP-0070 (103)

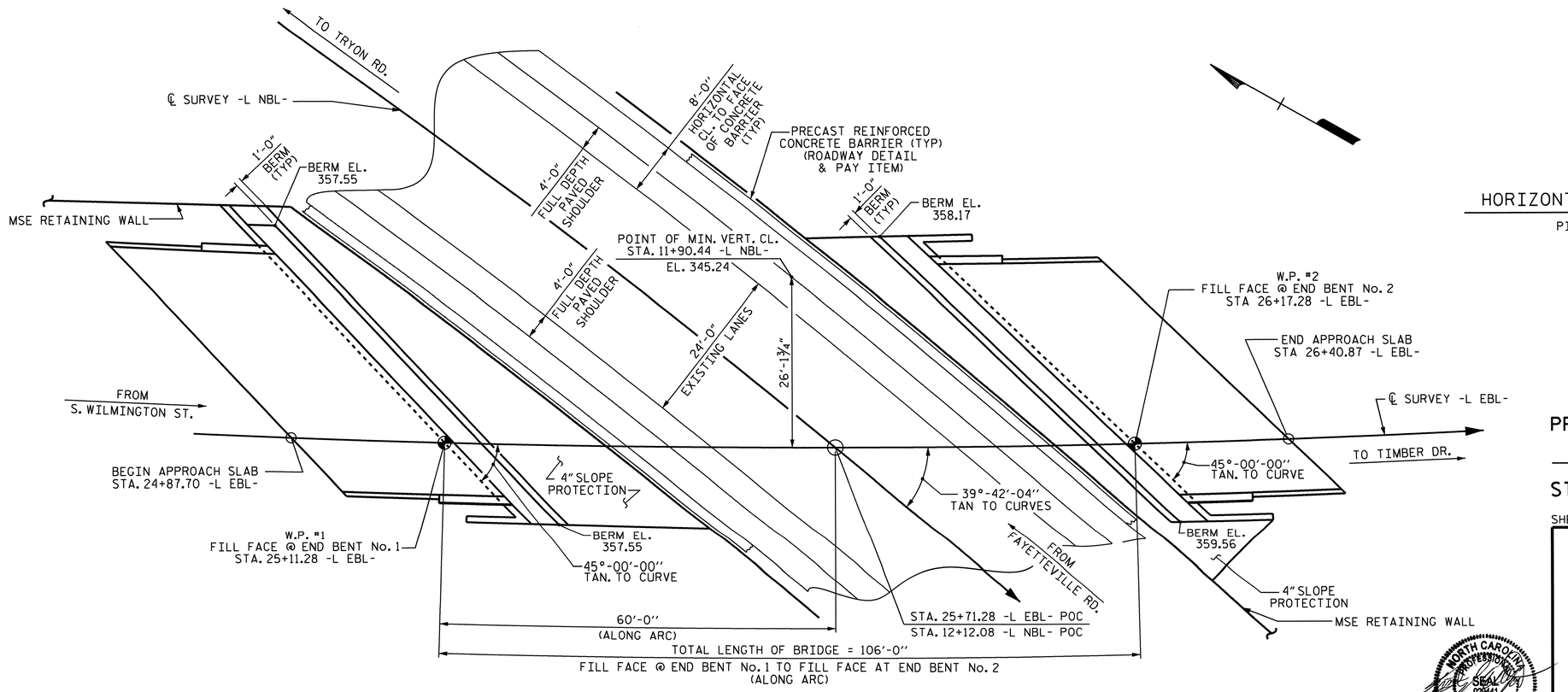


GRADE DATA -L EBL-

SPAN "A"

SECTION ALONG ℄ SURVEY -L EBL-

(SECTIONS AT END BENTS ARE AT RIGHT ANGLES)



PLAN

(PILES NOT SHOWN IN PLAN VIEW FOR CLARITY)
(TEMPORARY SHORING NOT SHOWN FOR CLARITY. SEE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS.)

HORIZONTAL CURVE DATA -L EBL-

PI STA. = 22+85.89 -L EBL-
Δ = 23°-19'-46.4" (LT.)
D = 2°-51'-53.2"
L = 814.35'
T = 412.90'
R = 2,000.00'

NORTH CAROLINA PROFESSIONAL SEAL 022205 ENGINEER JOSEPH MARTHUR BAILEY
2/20/13

NORTH CAROLINA PROFESSIONAL SEAL 024441 ENGINEER KIMBERLY W. ALFORD

PROJECT NO. B-4946
WAKE COUNTY
STATION: 25+71.28 -L EBL-

SHEET 1 OF 3 REPLACES BRIDGE No. 251

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON US 70/NC 50
OVER US 401 BETWEEN TRYON RD.
AND TIMBER DR.

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

DRAWN BY : K.W. ALFORD DATE : 8/12
CHECKED BY : J.L. LAMBERT DATE : 9/12
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

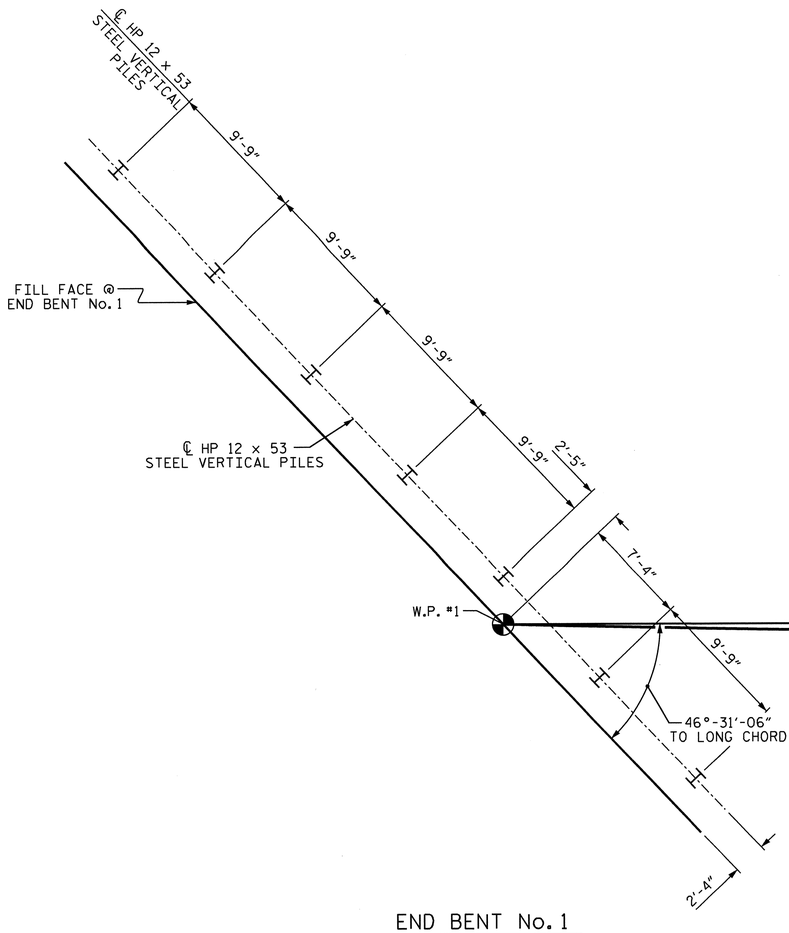
19-FEB-2013 10:12
V:\Structures\Plans\Gen_draw\B-4946_SD_GD.dgn
kalford

NOTES:

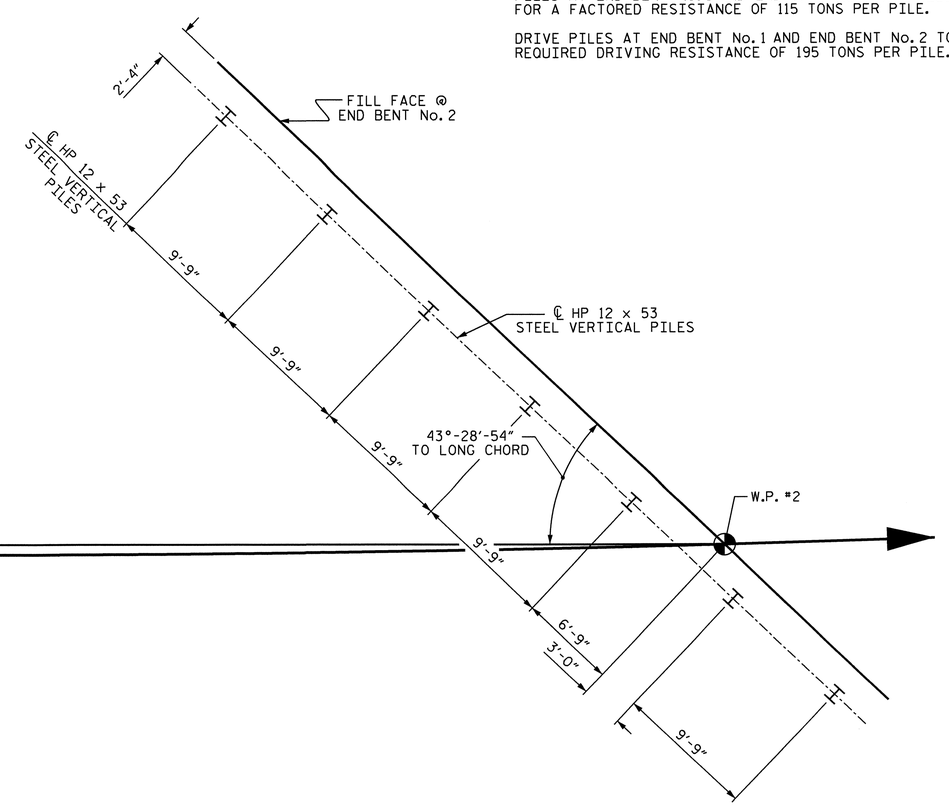
FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT No. 1 AND END BENT No. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 115 TONS PER PILE.

DRIVE PILES AT END BENT No. 1 AND END BENT No. 2 TO A REQUIRED DRIVING RESISTANCE OF 195 TONS PER PILE.



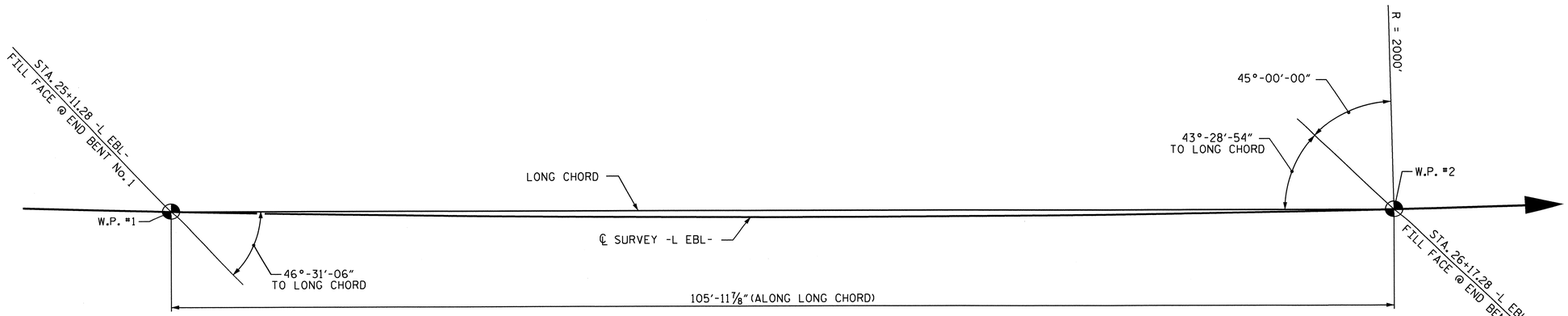
END BENT No. 1



END BENT No. 2

FOUNDATION LAYOUT

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



LONG CHORD LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 19061 ENGINEER KRISTY W. ALFORD

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 70/NC 50 OVER US 401 BETWEEN TRYON RD. AND TIMBER DR.

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

DRAWN BY : K.W. ALFORD DATE : 9/12
CHECKED BY : J.L. LAMBERT DATE : 9/12
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:12
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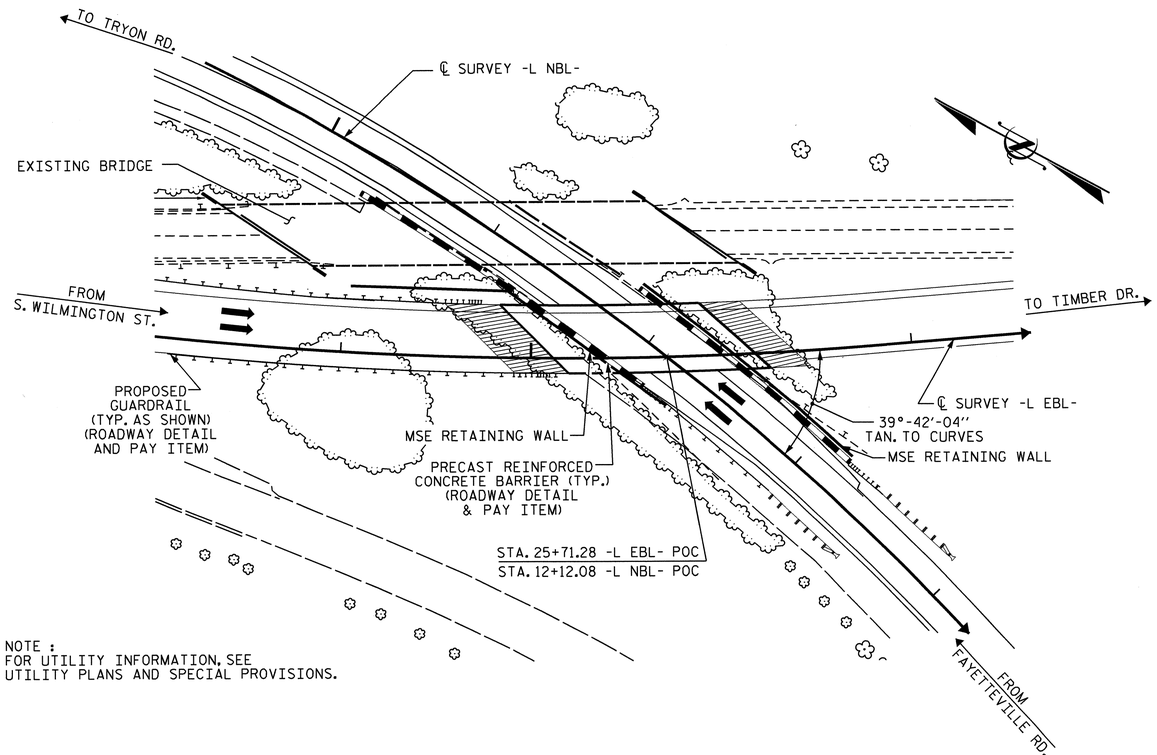
Ralford

BM #4 RR SPIKE IN 26"PINE 237.27' RT -L EBL- STA 24+22 ELEV.= 360.20'



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

LOCATION SKETCH

NOTES:

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

THE ELEVATION AND CLEARANCE SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

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

ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE PAVEMENT MARKING PLANS AND SHALL PROVIDE FOR BICYCLES.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. AND COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 25-71.28 -L EBL-".

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

THE EXISITING STRUCTURE, CONSISTING OF 5 SPANS: 1 @ 42', 1 @ 43', 1 @ 71', AND 2 @ 35', WITH A CLEAR ROADWAY OF 28.3' AND REINFORCED CONRETE DECK GIRDERS AND REINFORCED CONRETE DECK ON STEEL I-GIRDERS ON REINFORCED CONCRETE CAP WITH TIMBER PILE END BENTS AND REINFORCED CONCRETE POST AND BEAM COLUMNS ON PILE FOOTINGS AND LOCATED NORTH OF THE PROPOSED BRIDGE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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 THE 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.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		TWO BAR METAL RAIL	1'-3"X 2'-6" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE		3954	4879				5	497.72			239.57	256.93			
END BENT 1				60.3		7616			7	385			84		
END BENT 2				62.9		8098			7	350			65		
TOTAL	LUMP SUM	3954	4879	123.2	LUMP SUM	15714	5	497.72	14	735	239.57	256.93	149	LUMP SUM	LUMP SUM

PROJECT NO. B-4946
WAKE COUNTY
STATION: 25+71.28 -L EBL-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON US 70/NC 50
OVER US 401 BETWEEN TRYON RD.
AND TIMBER DR.

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

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KARISTY W. ALFORD

DRAWN BY : K.W. ALFORD DATE : 9/12
CHECKED BY : J.L. LAMBERT DATE : 9/12
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:12
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kalford

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					
								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	1.001	--	1.75	0.737	1.60	A	EL	48.609	0.935	2.78	A	EL	38.887	0.80	0.669	1.00	A	ER	49.517
		HL-93(Opr)	N/A	--	2.076	--	1.35	0.737	2.08	A	EL	48.609	0.935	3.61	A	EL	38.887	N/A	--	--	--	--	--
		HS-20(Inv)	36.000	2	1.384	49.839	1.75	0.737	2.26	A	EL	48.609	0.935	3.39	A	EL	38.887	0.80	0.669	1.38	A	ER	49.517
		HS-20(Opr)	36.000	--	2.935	105.660	1.35	0.737	2.93	A	EL	48.609	0.935	4.40	A	EL	38.887	N/A	--	--	--	--	--
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.284	44.332	1.4	0.737	6.70	A	EL	48.609	0.935	9.95	A	EL	38.887	0.80	0.669	3.28	A	ER	49.517
		SNGARBS2	20.000	--	2.378	47.557	1.4	0.737	4.86	A	EL	48.609	0.935	7.12	A	EL	38.887	0.80	0.669	2.38	A	ER	49.517
		SNAGRIS2	22.000	--	2.224	48.927	1.4	0.737	4.54	A	EL	48.609	0.935	6.63	A	EL	38.887	0.80	0.669	2.22	A	ER	49.517
		SNCOTTS3	27.250	--	1.632	44.475	1.4	0.737	3.33	A	EL	48.609	0.935	4.97	A	EL	38.887	0.80	0.669	1.63	A	ER	49.517
		SNAGGRS4	34.925	--	1.337	46.702	1.4	0.737	2.73	A	EL	48.609	0.935	4.16	A	EL	38.887	0.80	0.669	1.34	A	ER	49.517
		SNS5A	35.550	--	1.309	46.550	1.4	0.737	2.67	A	EL	48.609	0.935	4.23	A	EL	38.887	0.80	0.669	1.31	A	ER	49.517
		SNS6A	39.950	--	1.191	47.561	1.4	0.737	2.43	A	EL	48.609	0.935	3.87	A	EL	38.887	0.80	0.669	1.19	A	ER	49.517
		SNS7B	42.000	--	1.133	47.600	1.4	0.737	2.31	A	EL	48.609	0.935	3.82	A	EL	38.887	0.80	0.669	1.13	A	ER	49.517
	TTST	TNAGRIT3	33.000	--	1.449	47.803	1.4	0.737	2.96	A	EL	48.609	0.935	4.60	A	EL	38.887	0.80	0.669	1.45	A	ER	49.517
		TNT4A	33.075	--	1.452	48.026	1.4	0.737	2.97	A	EL	48.609	0.935	4.47	A	EL	38.887	0.80	0.669	1.45	A	ER	49.517
		TNT6A	41.600	--	1.177	48.966	1.4	0.737	2.41	A	EL	48.609	0.935	4.10	A	EL	38.887	0.80	0.669	1.18	A	ER	49.517
		TNT7A	42.000	--	1.178	49.459	1.4	0.737	2.41	A	EL	48.609	0.935	4.02	A	EL	38.887	0.80	0.669	1.18	A	ER	49.517
		TNT7B	42.000	--	1.205	50.620	1.4	0.737	2.46	A	EL	48.609	0.935	3.72	A	EL	38.887	0.80	0.669	1.21	A	ER	49.517
		TNAGRIT4	43.000	--	1.156	49.716	1.4	0.737	2.36	A	EL	48.609	0.935	3.60	A	EL	38.887	0.80	0.669	1.16	A	ER	49.517
		TNAGT5A	45.000	--	1.095	49.262	1.4	0.737	2.24	A	EL	48.609	0.935	3.59	A	EL	38.887	0.80	0.669	1.09	A	ER	49.517
		TNAGT5B	45.000	3	1.086	48.851	1.4	0.737	2.22	A	EL	48.609	0.935	3.42	A	EL	38.887	0.80	0.669	1.09	A	ER	49.517

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.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

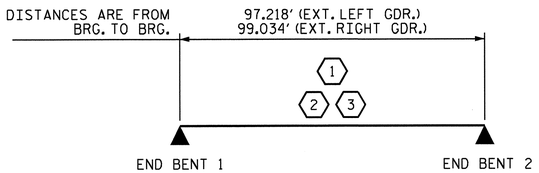
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨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-4946

WAKE

STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 025441 ENGINEER KRISTY W. ALFORD

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S-4

TOTAL SHEETS 31

STD. NO. LRFR1

ASSEMBLED BY : T. M. GARRISON DATE : 1/20/11
CHECKED BY : M.K. TOM DATE : 4/14/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

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

REV. 11/12/08R MAA/GM

19-FEB-2013 10:11
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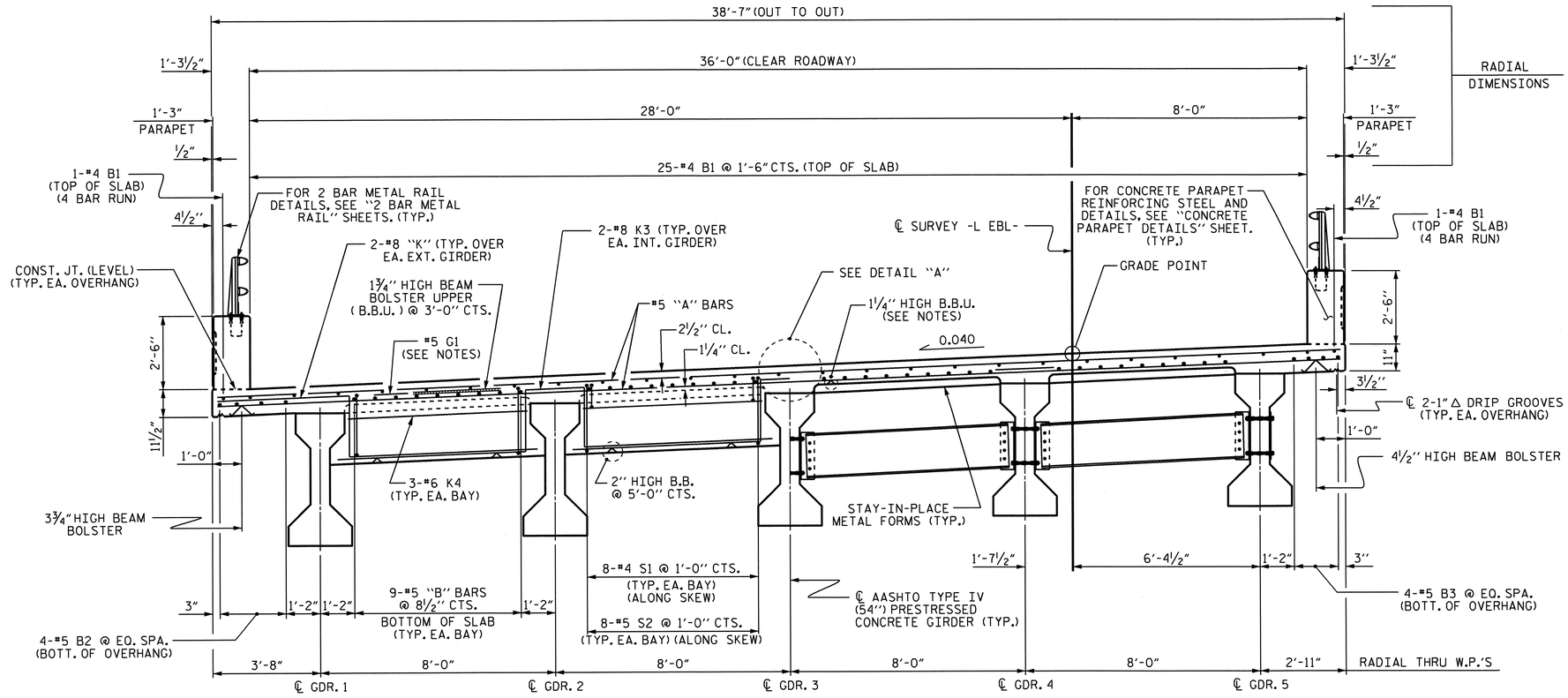
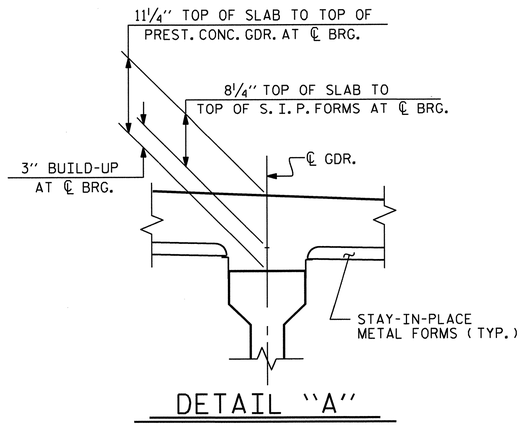
kalford



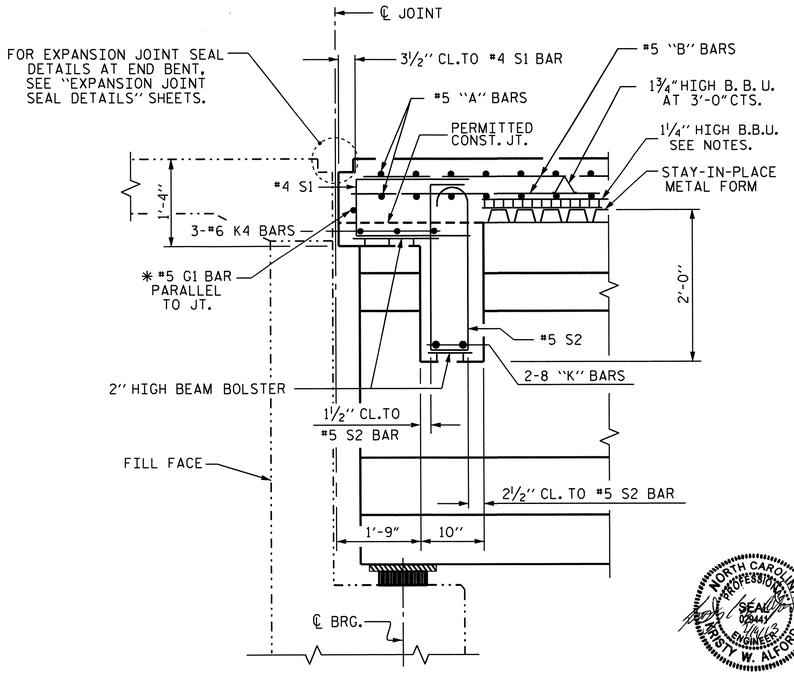
HALF-SECTION
SHOWING END BENT DIAPHRAGMS

HALF-SECTION
SHOWING INTERMEDIATE DIAPHRAGM

TYPICAL SECTION



DETAIL "A"



SECTION @ END BENT

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.

#5 G1 BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND STIRRUPS.

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

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D. G. ELY DATE : 03/11
CHECKED BY : M. K. TOM DATE : 05/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:11
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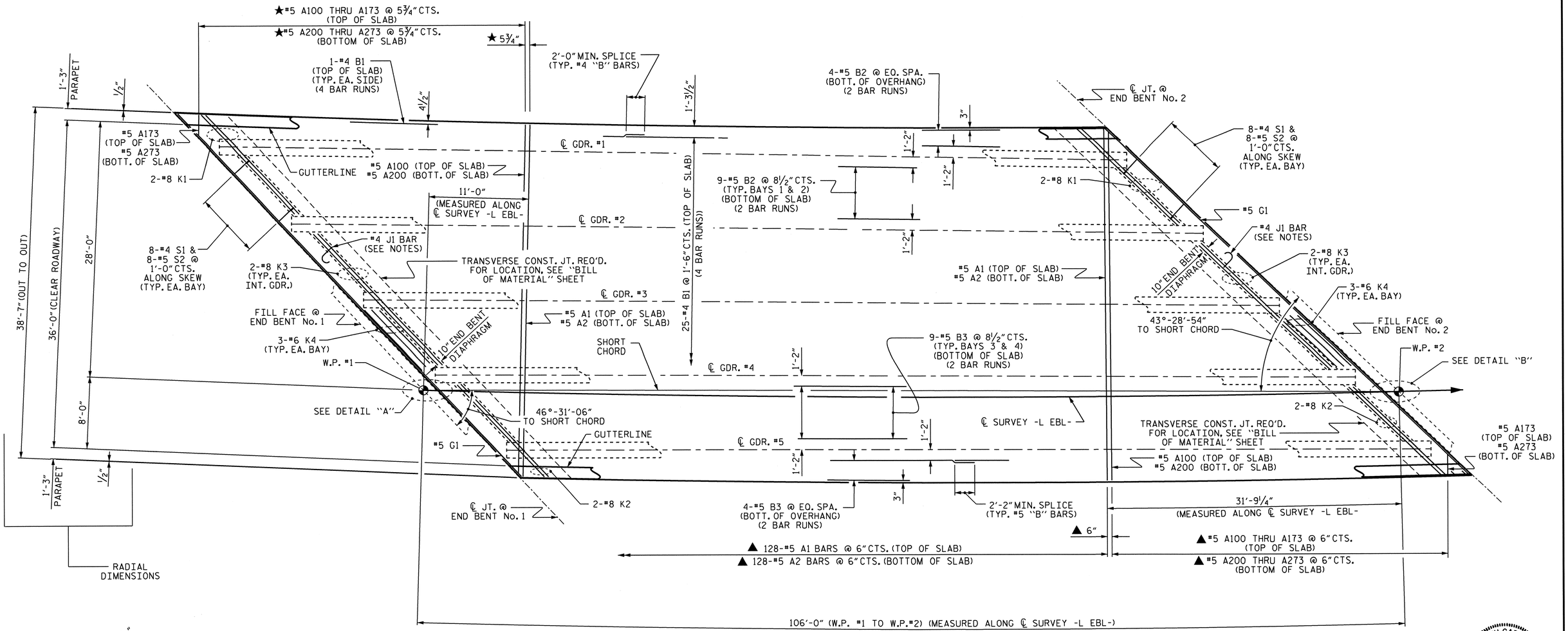
kalford



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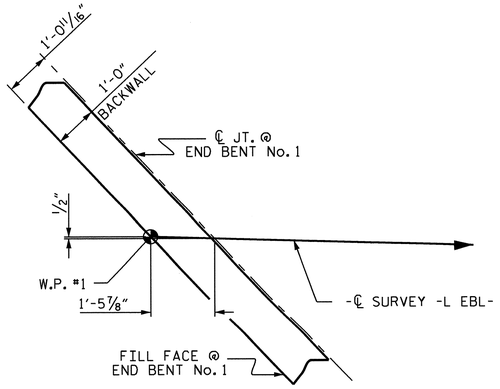


DETAIL "A"

NOTES

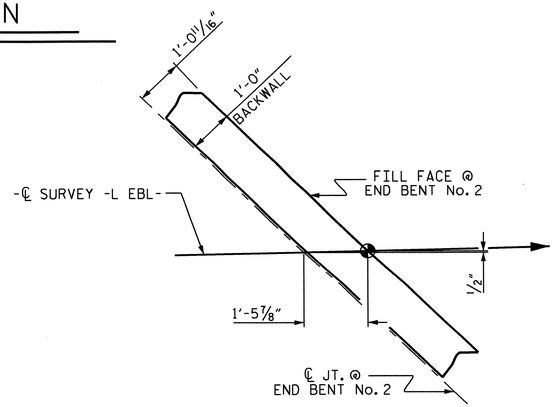
FOR PARAPET REINFORCING STEEL, SEE "CONCRETE PARAPET DETAILS" SHEET.

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

FOR PLACEMENT OF #4 J1 BAR, SEE "EXPANSION JOINT SEAL DETAILS" SHEETS.

★ THESE #5 "A" BARS ARE TO BE PLACED RADIALLY. DIMENSIONS SHOWN ARE MEASURED ALONG LEFT OUTSIDE EDGE OF SUPERSTRUCTURE.

▲ THESE #5 "A" BARS ARE TO BE PLACED RADIALLY. DIMENSIONS SHOWN ARE MEASURED ALONG RIGHT OUTSIDE EDGE OF SUPERSTRUCTURE.



DETAIL "B"

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D.G. ELY DATE : 04/11
CHECKED BY : M.K. TOM DATE : 05/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:10
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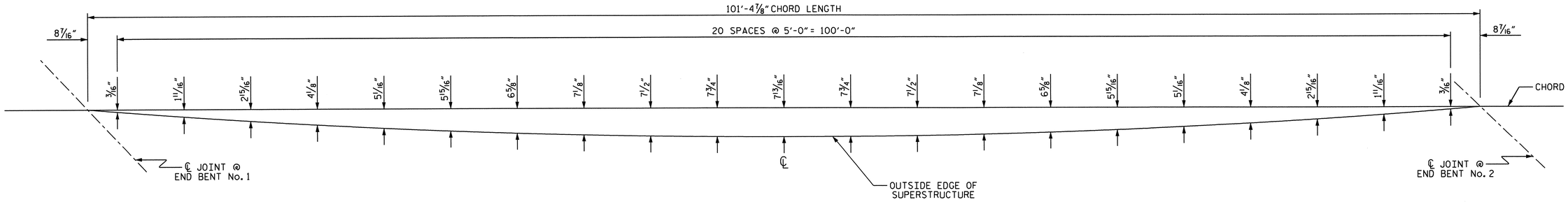
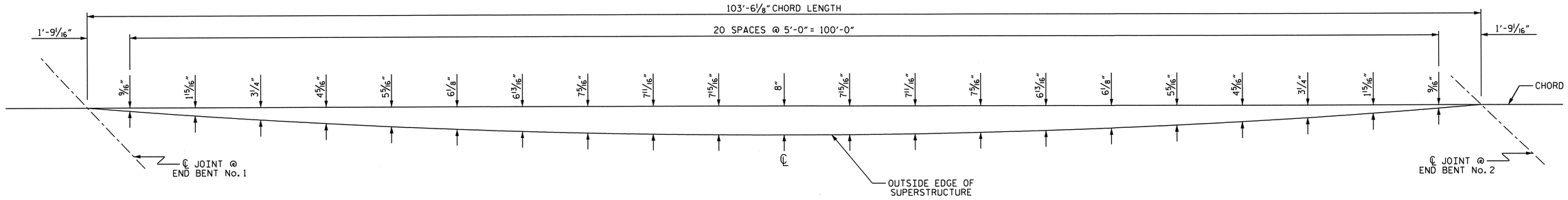


OUTSIDE LEFT OVERHANG ARC OFFSETS



OUTSIDE RIGHT OVERHANG ARC OFFSETS

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

ARC OFFSETS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029441 TIMOTHY W. ALFORD 2/19/13

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D.G. ELY DATE : 05/11
CHECKED BY : M.K. TOM DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

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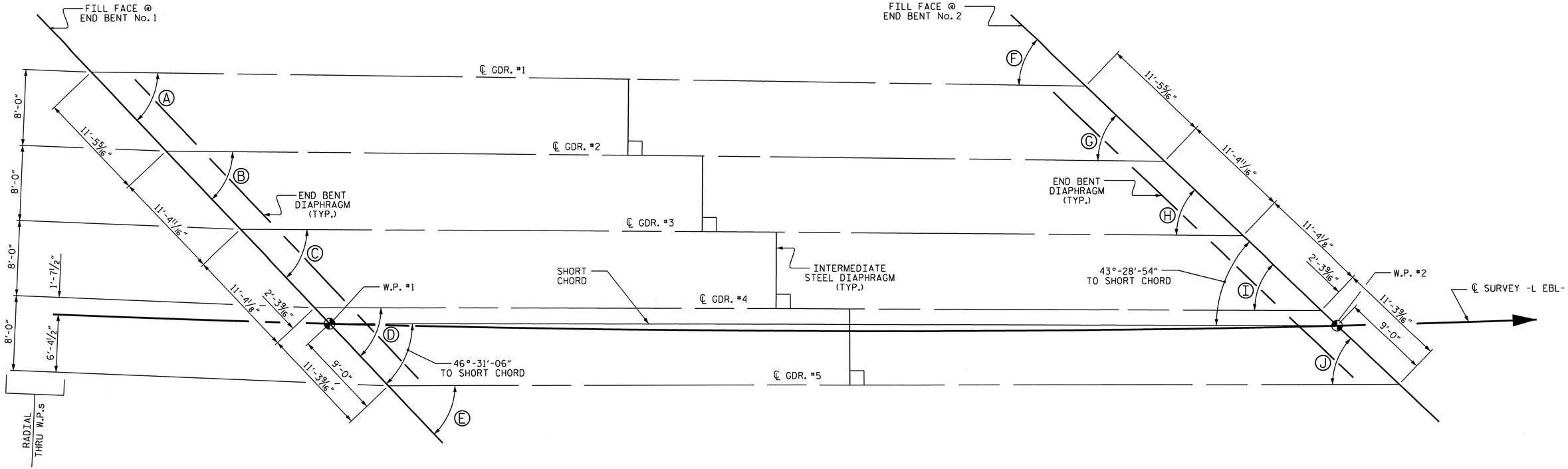

FIXED
E1, P1

EXPANSION
E1, P2

ANGLES

Ⓐ	45°-46'-11"	Ⓕ	42°-43'-59"
Ⓑ	46°-00'-24"	Ⓖ	42°-58'-12"
Ⓒ	46°-14'-26"	Ⓗ	43°-12'-14"
Ⓓ	46°-28'-18"	Ⓘ	43°-26'-06"
Ⓔ	46°-42'-00"	Ⓙ	43°-39'-48"

GIRDER LAYOUT

NOTE:

FOR INTERMEDIATE STEEL DIAPHRAGM DETAILS SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR PRESTRESSED CONCRETE GIRDERS" SHEET.

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D.G. ELY DATE : 05/11
CHECKED BY : M.K. TOM DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

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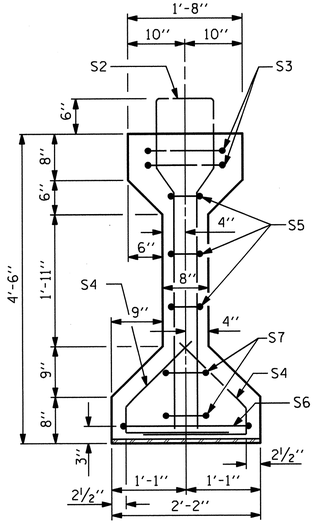
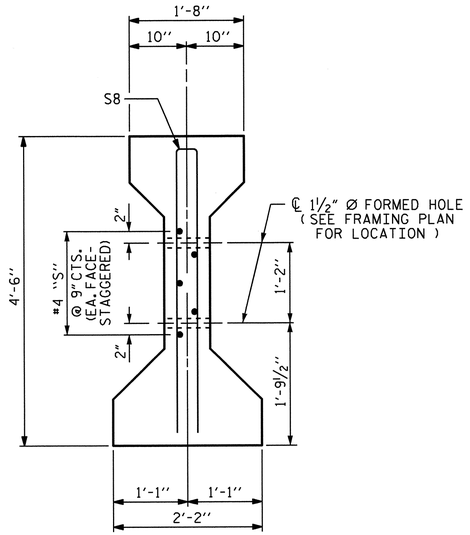
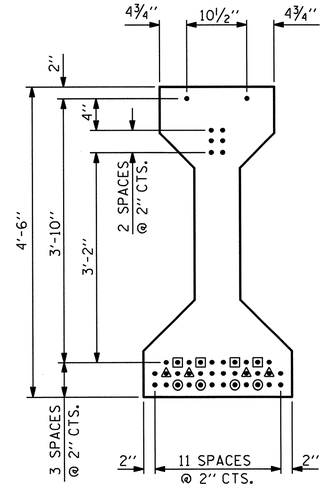


SECTION A-A



SECTION C-C

(S1 BARS NOT SHOWN)



0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◭ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER

GIRDERS REQUIRED

NUMBER	LENGTH
GIRDER #1	98'-7⅝"
GIRDER #2	99'-1⅛"
GIRDER #3	99'-6½"
GIRDER #4	100'-0"
GIRDER #5	100'-5⅜"
TOTAL LENGTH	497.72'

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
GIRDER #1	2058	20.0	42
GIRDER #2	2103	20.1	42
GIRDER #3	2124	20.2	42
GIRDER #4	2117	20.3	42
GIRDER #5	2108	20.4	42

0.6" Ø L. R. GRADE 270 STRANDS

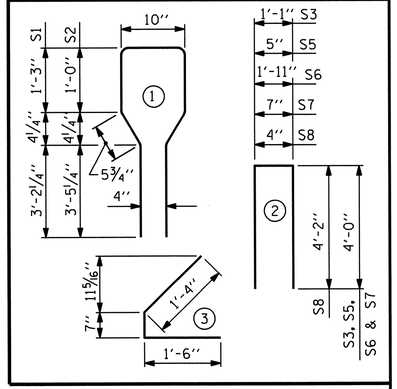
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

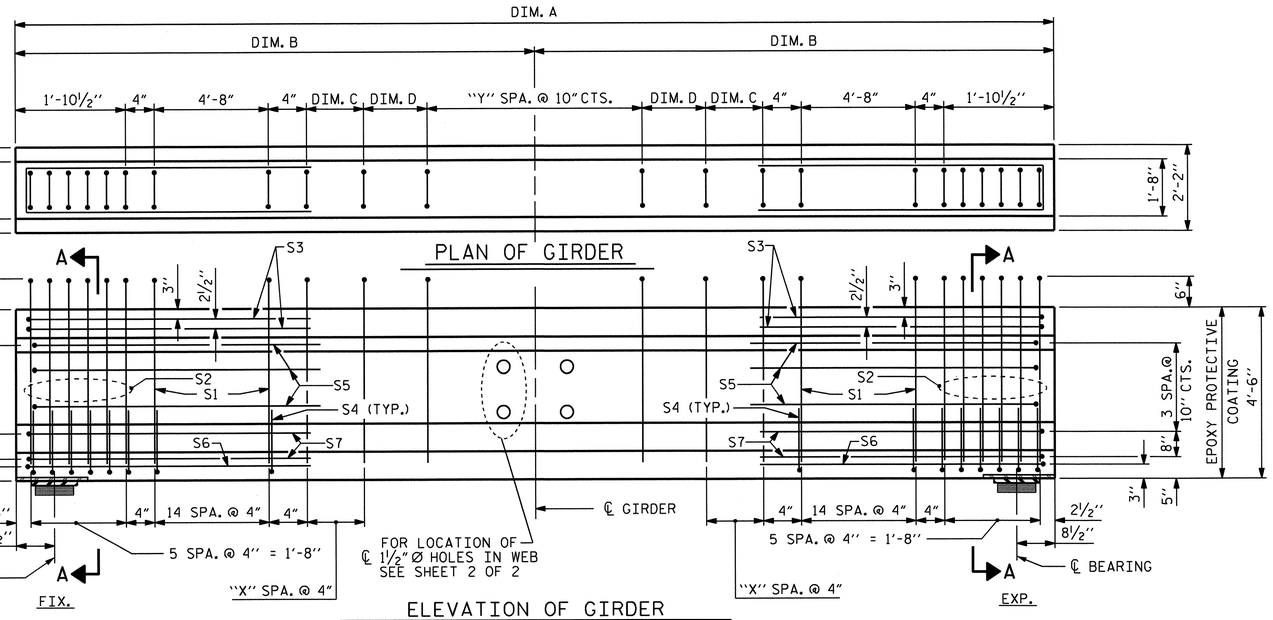
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
GIRDERS #1 & #2	S1	216	#4	1	10'-8"	1539
GIRDER #3	S1	219	#4	1	10'-8"	1560
GIRDER #4	S1	218	#4	1	10'-8"	1553
GIRDER #5	S1	223	#4	1	10'-8"	1589
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	84	#4	3	3'-5"	192
	S5	6	#4	2	8'-5"	34
	S6	2	#4	2	9'-11"	13
	S7	4	#4	2	8'-7"	23
GIRDERS #1 & 5	S8	2	#5	2	8'-8"	18
GIRDERS #2, #3, & 4	S8	4	#5	2	8'-8"	36
GIRDERS #1 & 5	S9	5	#4	STR	7'-0"	23
GIRDERS #2, #3, & 4	S10	5	#4	STR	15'-0"	50

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT





ELEVATION OF GIRDER

(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

GIRDER #	BRG. TO BRG.	DIM. A	DIM. B	"X" SPACES	"Y" SPACES	DIM. C	DIM. D
1	97'-2⅝"	98'-7⅝"	49'-3 13/16"	69	45	23'-0"	4 5/16"
2	97'-8⅛"	99'-1⅛"	49'-6 9/16"	69	45	23'-0"	7 1/16"
3	98'-1½"	99'-6½"	49'-9¼"	71	44	23'-8"	6¾"
4	98'-7"	100'-0"	50'-0"	70	45	23'-4"	8½"
5	99'-0⅜"	100'-5⅜"	50'-2 11/16"	73	44	24'-4"	4 3/16"

PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS #2, #3, & #4

PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR GIRDERS #1 & #5.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029441 KRISTY W. ALFORD

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			31

STD. NO. PCG6

ASSEMBLED BY : D. G. ELY		DATE : 05/11
CHECKED BY : M. K. TOM		DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E.		DATE : 1-8-13
DRAWN BY : ELR 8/91	REV. 10/17/00R	RWW/LES
CHECKED BY : GRP 8/91	REV. 5/1/06R	TLA/GM
	REV. 10/1/11	MAA/GM

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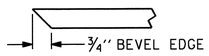
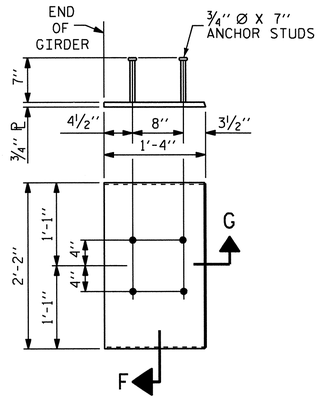
SECTION "G"



SECTION "F"

(SEE NOTES)



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

(2 REQ'D PER GIRDER)

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL SHALL BE GRADE 60.

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

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

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

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

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6500 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.

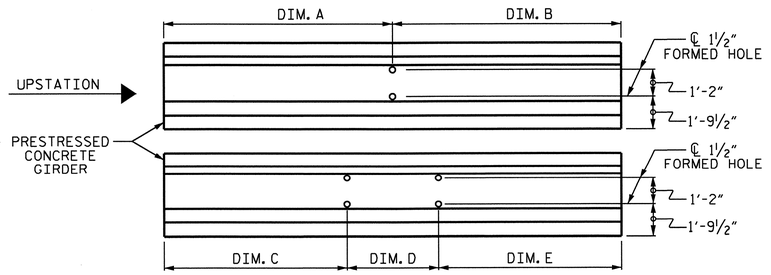
DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6" Ø LOW RELAXATION	GIRDER 1											GIRDERS 2 THRU 4											GIRDER 5										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	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	0.080	0.151	0.207	0.242	0.255	0.242	0.207	0.151	0.080	0	0	0.080	0.152	0.208	0.244	0.256	0.244	0.208	0.152	0.080	0	0	0.081	0.152	0.208	0.244	0.256	0.244	0.208	0.152	0.081	0
* DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.040	0.075	0.102	0.120	0.126	0.120	0.102	0.075	0.040	0	0	0.044	0.083	0.114	0.133	0.140	0.133	0.114	0.083	0.044	0	0	0.044	.0084	0.115	0.134	0.141	0.134	0.115	0.084	0.044	0
FINAL CAMBER ↑	0	1/2"	15/16"	1 1/4"	1 1/2"	1 3/16"	1 1/2"	1 1/4"	15/16"	1/2"	0	0	7/16"	13/16"	1 1/8"	1 5/16"	1 3/8"	1 5/16"	1 1/8"	13/16"	7/16"	0	0	7/16"	13/16"	1 1/8"	1 5/16"	1 3/8"	1 5/16"	1 1/8"	13/16"	7/16"	0

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

DIAPHRAGM FORMED HOLE PLACEMENT TABLE

GIRDER	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E
GDR. #1	53'-7 11/16"	44'-11 15/16"	———	———	———
GDR. #2	———	———	45'-8 1/2"	7'-10 3/8"	45'-6 1/4"
GDR. #3	———	———	45'-8 1/2"	7'-9 5/8"	46'-0 3/8"
GDR. #4	———	———	45'-8 1/2"	7'-8 7/8"	46'-6 5/8"
GDR. #5	45'-8 1/2"	54'-8 7/8"	———	———	———



ELEVATION

FORMED HOLES FOR DIAPHRAGM DETAIL

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28-L EBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			31

STD. NO. PCG9

ASSEMBLED BY : D. G. ELY — DATE : 05/11
CHECKED BY : M. K. TOM — DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. — DATE : 1-8-13

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

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

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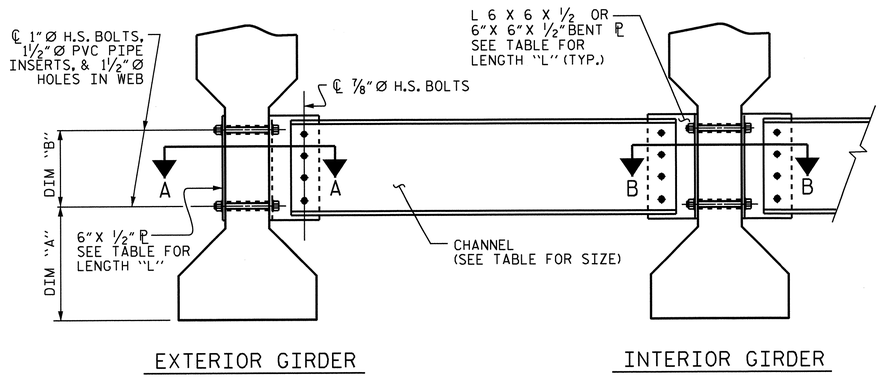
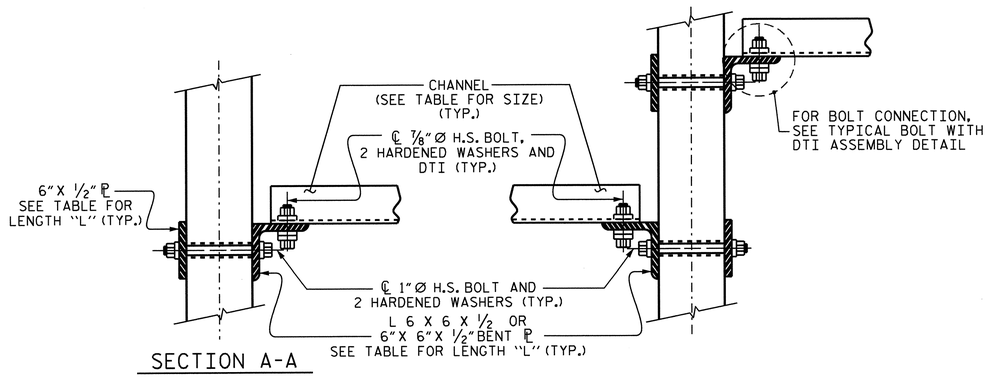


EXTERIOR GIRDER

INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM

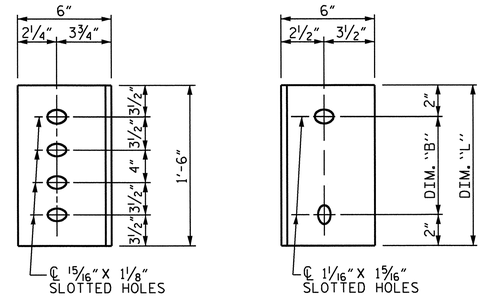
(TYPE IV GIRDER SHOWN)



SECTION A-A

SECTION B-B

CONNECTION DETAILS



DIAPHRAGM FACE

(TYPE IV GDR.)

WEB FACE

CONNECTOR PLATE DETAILS

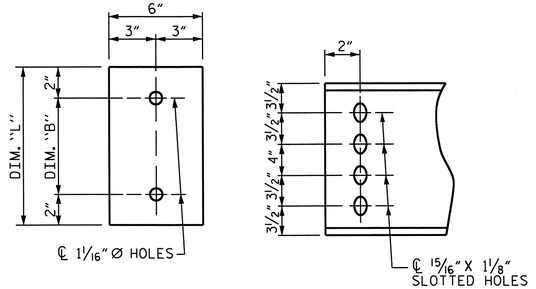


PLATE DETAILS

CHANNEL END

(TYPE IV GDR.)

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

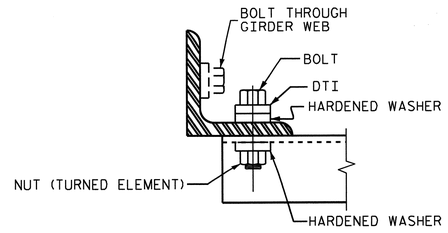
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

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

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

TABLE

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



BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			31

STD. NO. PCG10 (SHT 1)

ASSEMBLED BY : D. C. ELY		DATE : 05/11
CHECKED BY : M. K. TOM		DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E.		DATE : 1-8-13
DRAWN BY : TLA 6/05	ADDED 10/21/05	
CHECKED BY : VC 6/05	REV. 5/1/06RRR KMM/GM	
	REV. 10/1/11 MAA/GM	

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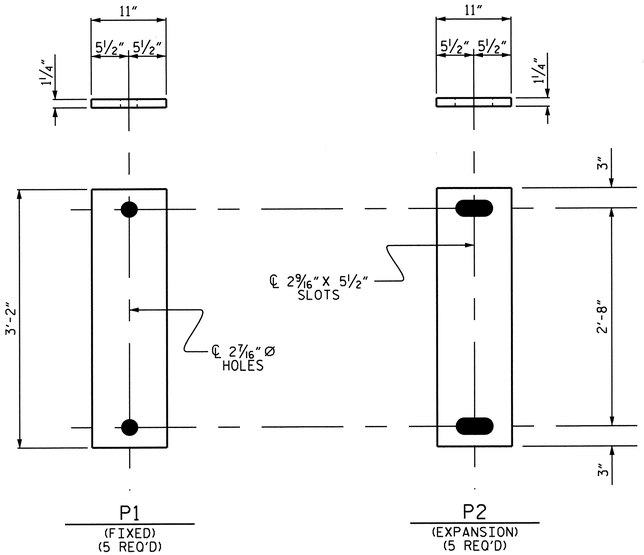
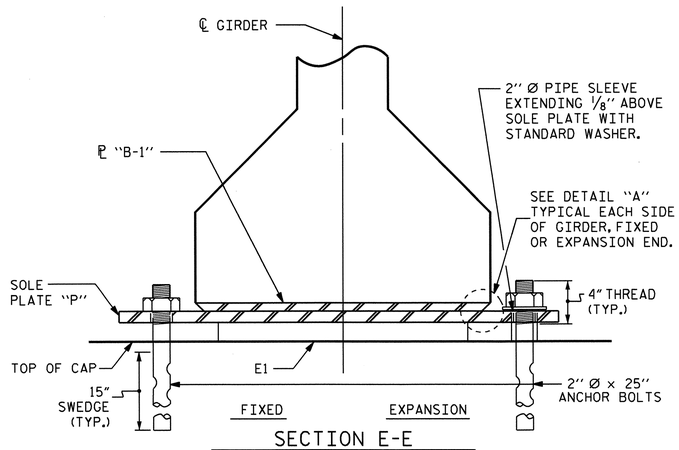
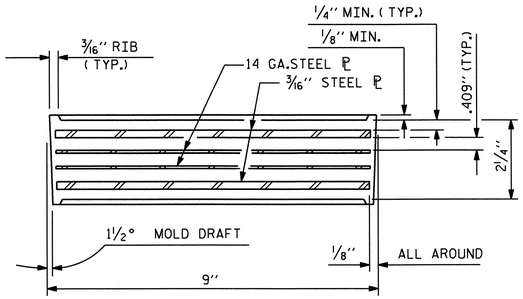


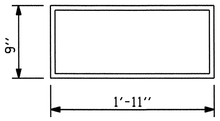
SOLE PLATE DETAILS ("P")



SECTION E-E



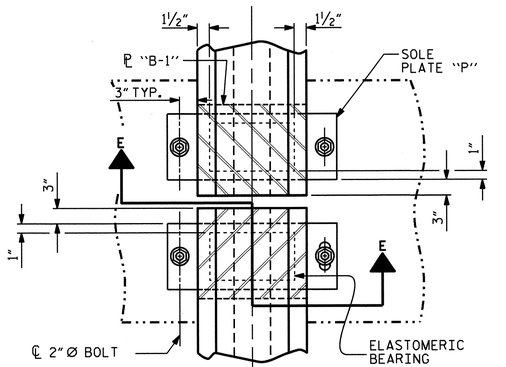
TYPICAL SECTION OF ELASTOMERIC BEARINGS



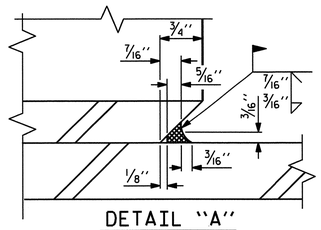
E1 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V



TYPICAL HALF-PLAN (FIXED END) | TYPICAL HALF-PLAN (EXPANSION END)



DETAIL "A"

NOTES

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

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

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

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

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

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

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE V	365 k

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28-L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029441 KRISTY W. ALFORD 1/9/13

ASSEMBLED BY : D. G. ELY	DATE : 05/11
CHECKED BY : M. K. TOM	DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E.	DATE : 1-8-13
DRAWN BY : EEM 2/97	REV. 5/1/06 TLA/GM
CHECKED BY : VAP 2/97	REV. 10/1/11 MAA/GM
	REV. 10/24/12 AAC/MAA

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			31

STD. NO. EB4 (SHT 1)

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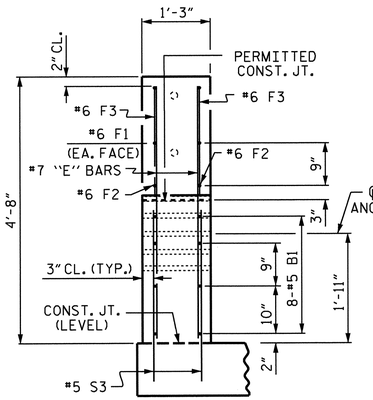
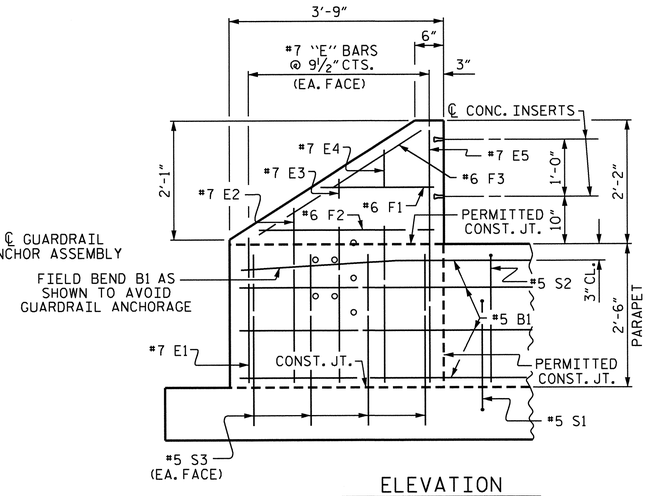
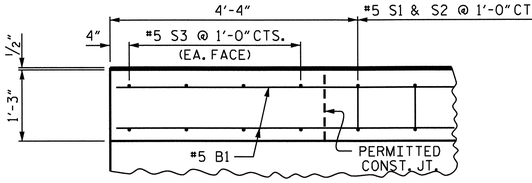


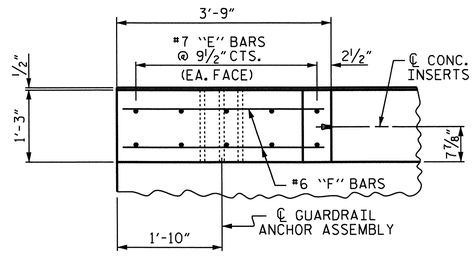
END VIEW



ELEVATION



PLAN OF PARAPET



PLAN OF END POST

NOTES

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

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

THE #5 S1 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.

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

BILL OF MATERIAL

FOR CONCRETE PARAPET & END POST ONLY

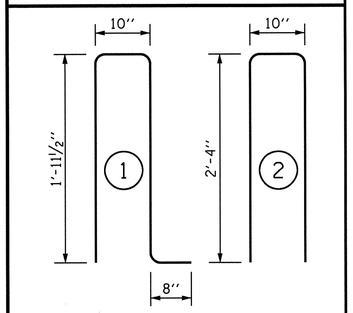
BAR	No.	SIZE	TYPE	LENGTH	WEIGHT
✱B1	64	#5	STR.	8'-6"	567
✱B2	32	#5	STR.	14'-9"	492
✱B3	32	#5	STR.	24'-7"	820
✱B4	32	#5	STR.	15'-4"	512
✱E1	8	#7	STR.	2'-9"	45
✱E2	8	#7	STR.	3'-1"	50
✱E3	8	#7	STR.	3'-6"	57
✱E4	8	#7	STR.	3'-10"	63
✱E5	8	#7	STR.	4'-2"	68
✱F1	8	#6	STR.	2'-4"	28
✱F2	8	#6	STR.	3'-0"	36
✱F3	8	#6	STR.	3'-4"	40
✱S1	236	#5	1	5'-5"	1333
✱S2	236	#5	2	5'-6"	1354
✱S3	32	#5	STR.	3'-0"	100

✱EPOXY COATED REINFORCING STEEL 5,565 LBS.

CLASS AA CONCRETE	28.8 C.Y.
CONCRETE PARAPET	256.93 LIN. FT.

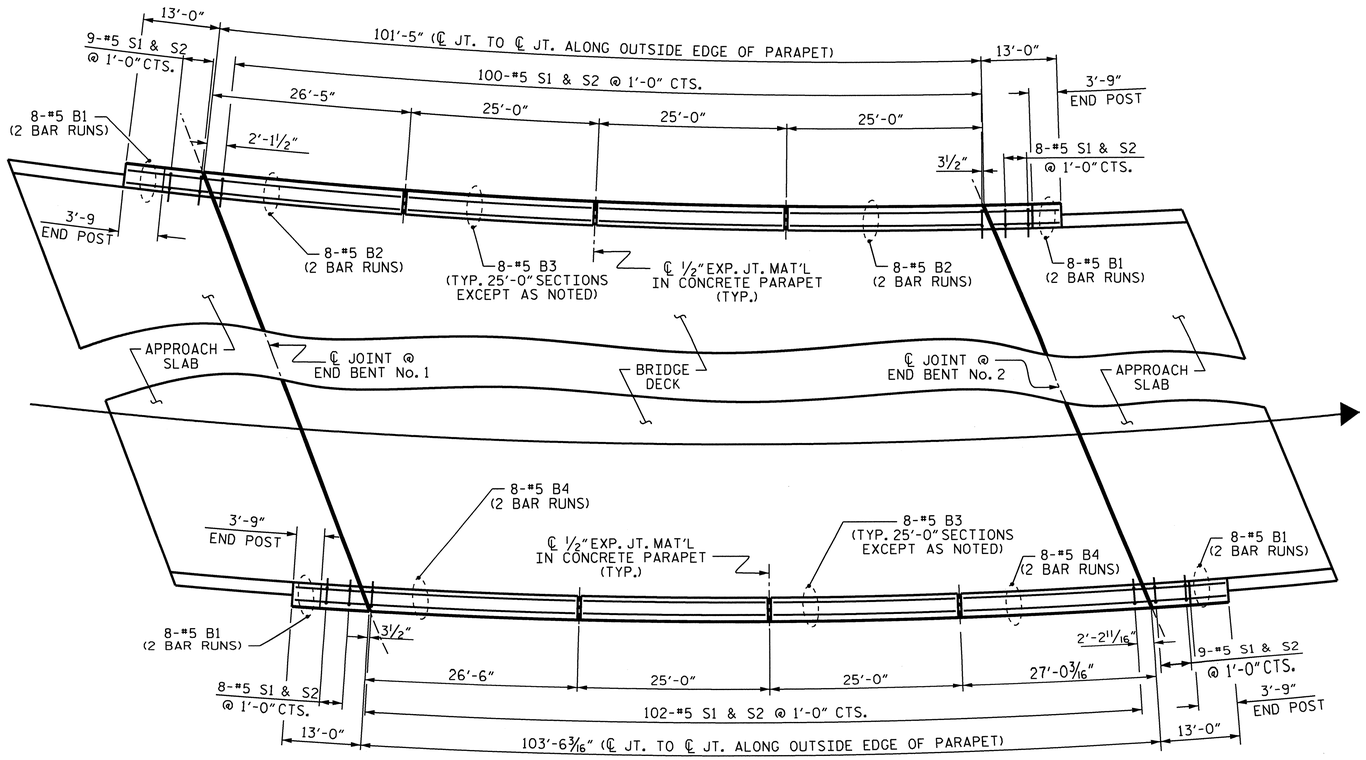
✱THESE BARS ARE EPOXY COATED

BAR TYPE



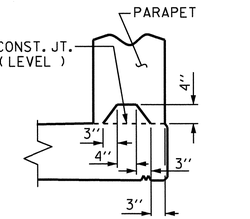
BAR DIMENSIONS ARE OUT TO OUT

PARAPET AND END POST FOR TWO BAR RAIL



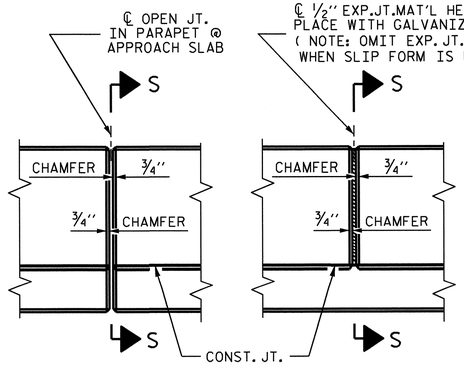
PLAN OF PARAPET

ALL DIMENSIONS ARE TAKEN ALONG THE ARC AT THE BACK FACE OF PARAPET (RECESSED PANELS NOT SHOWN FOR CLARITY. SEE SHEET 2 OF 2 FOR RECESSED PANEL DETAILS.)



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029441 KRISTY W. ALFORD

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE PARAPET DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D. G. ELY DATE : 05/11
CHECKED BY : M. K. TOM DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

25-FEB-2013 08:19
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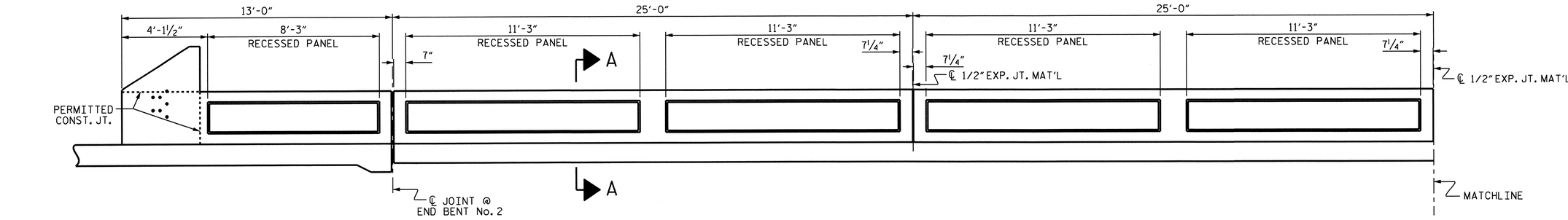
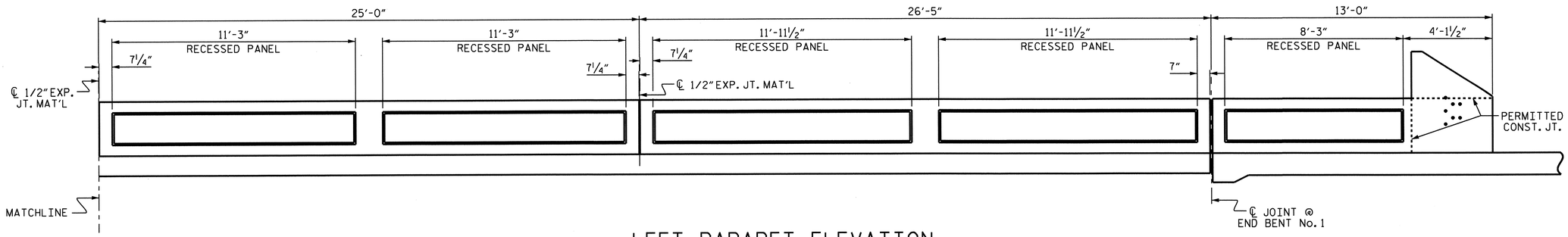
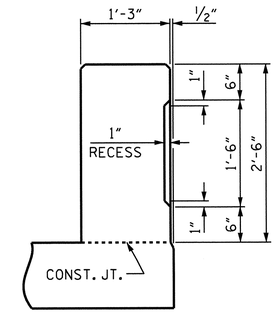
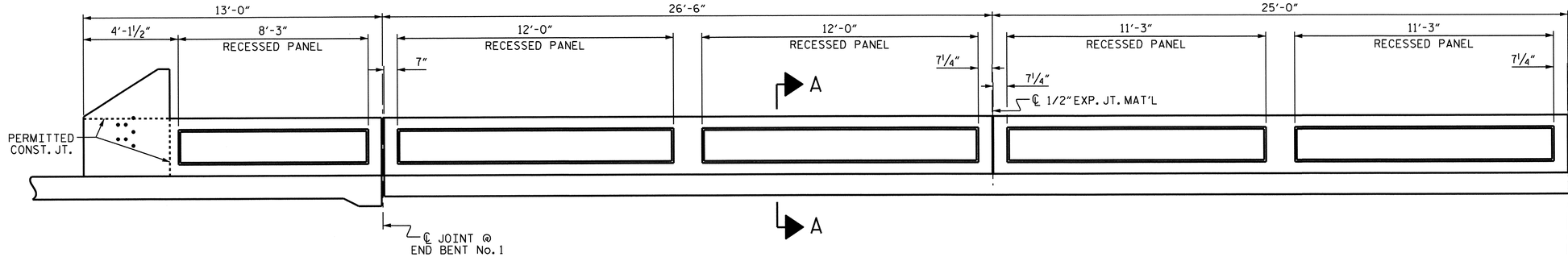


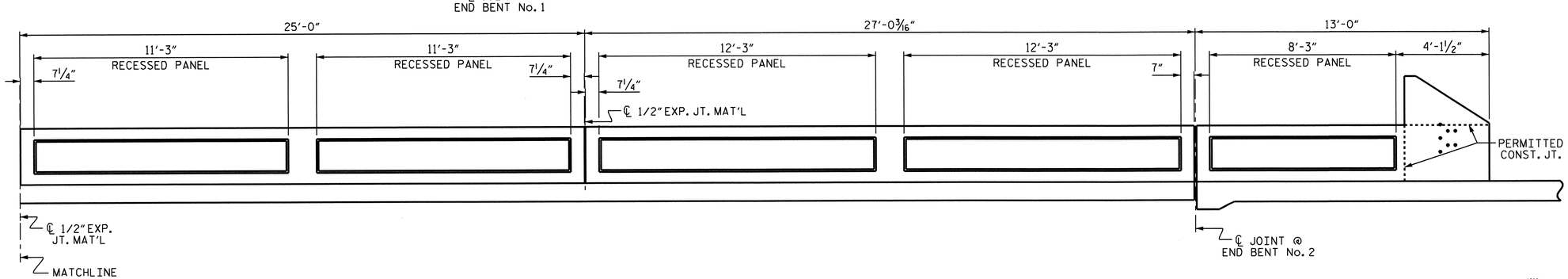


LEFT PARAPET ELEVATION



SECTION A-A





RIGHT PARAPET ELEVATION

REINFORCING STEEL IN PARAPET NOT SHOWN FOR CLARITY. FOR REINFORCING STEEL IN PARAPET, SEE SHEET 1 OF 2.
DIMENSIONS SHOWN ARE TO THE OUTSIDE EDGE OF THE PARAPET.

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE PARAPET RECESSED PANEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			31

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023447 KEITH W. ALFORD

DRAWN BY : K.W. ALFORD DATE : 2/15/13
CHECKED BY : A.C. OUTLAW DATE : 2/18/13
DESIGN ENGINEER OF RECORD: K.W. ALFORD DATE : 2/15/13

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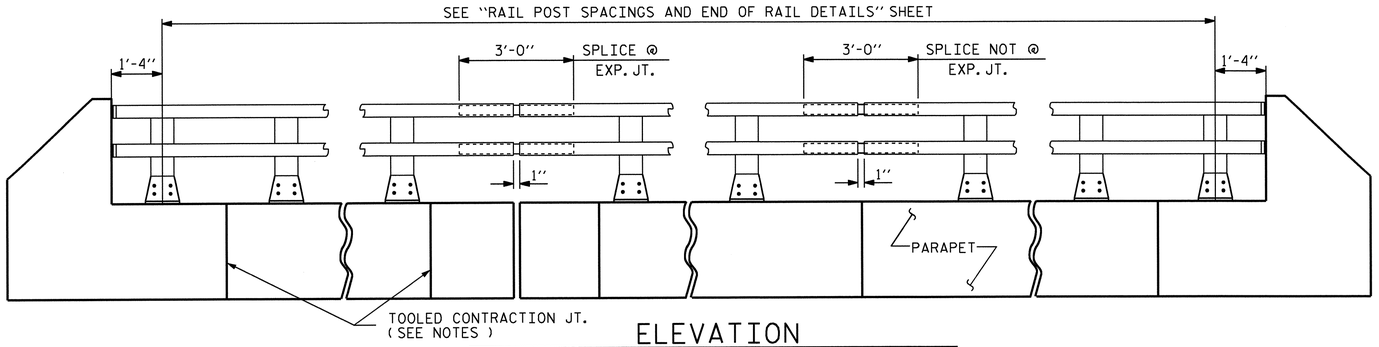
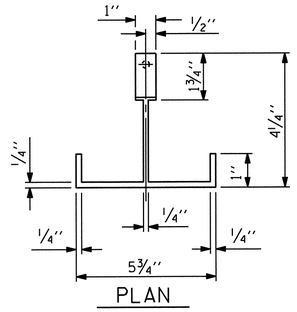
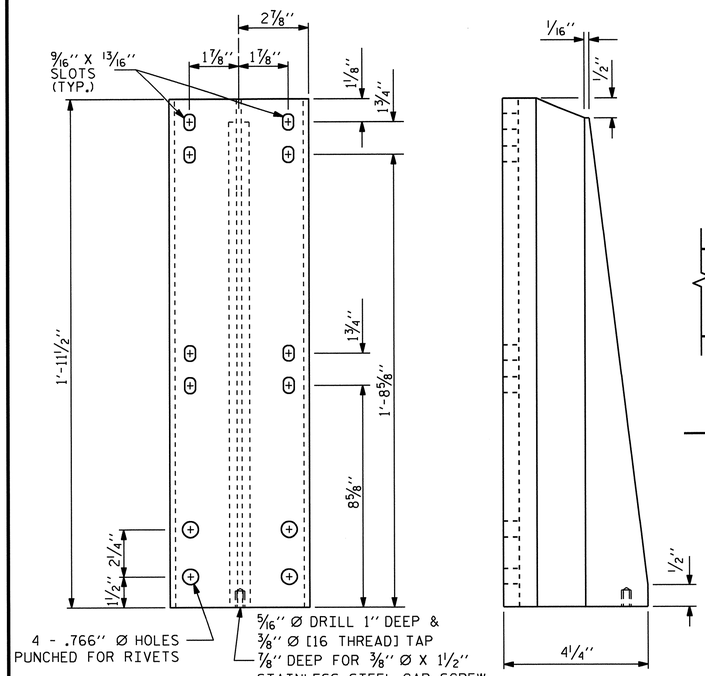


ELEVATION

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



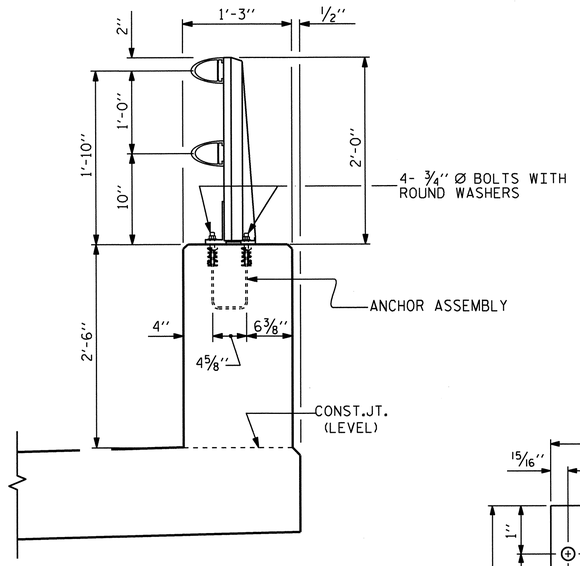
PLAN



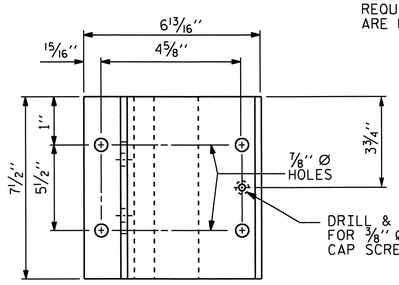
FRONT ELEVATION

SIDE ELEVATION

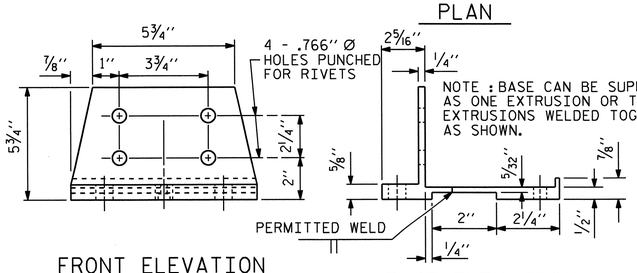
DETAILS OF POST



SECTION THRU PARAPET AND RAIL



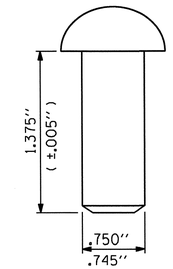
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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.

ANODIZING

ALUMINUM FOR POSTS, BASES, RAILS, EXPANSION BARS, RIVETS, CAPS, AND SHIMS SHALL BE ANODIZED. THE CONTRACTOR SHALL SUBMIT THREE (3) SETS OF ASTM B-21 6061-T6 ALUMINUM SAMPLES ANODIZED MEDIUM BROWN, DARK BROWN, AND EXTRA DARK BROWN TO THE ENGINEER. THE ENGINEER SHALL SELECT THE COLOR FROM THE SAMPLES FURNISHED BY THE CONTRACTOR.

ANY DAMAGE TO THE ANODIZED SURFACE OF THE RAIL OR COMPONENTS DURING THE CONSTRUCTION SHALL BE REPAIRED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS AT THE DIRECTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.

AFTER A SHADE OF BROWN HAS BEEN SELECTED FOR THE RAILING, THE CONTRACTOR SHALL SUBMIT A SAMPLE OF COMPATIBLE EXTERIOR ACRYLIC HOUSE PAINT TO THE ENGINEER. THIS PAINT SHALL MATCH THE ANODIZED RAIL COLOR AS CLOSELY AS POSSIBLE. AFTER ERECTION OF THE ANODIZED ALUMINUM RAILING, ALL EXPOSED ANCHOR BOLTS, NUTS, WASHERS, MACHINE SCREWS, CAP SCREWS, BOLTS, ATTACHMENT BRACKETS, HOLD-DOWN PLATES, AND BUILT UP ANGLES SHALL BE COATED WITH TWO COATS OF THIS PAINT.

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 239.57 LIN. FT.

ASSEMBLED BY : D. G. ELY — DATE : 05/11
CHECKED BY : M. K. TOM — DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. — DATE : 1-8-13

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

REVISIONS		
REV. 5/7/03R	RWW/JTE	
REV. 5/1/06	TLA/GM	
REV. 10/1/11	MAA/GM	

PROJECT NO. B-4946
WAKE COUNTY
STATION: 25+71.28-L EBL-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			31

STD. NO. BMR3

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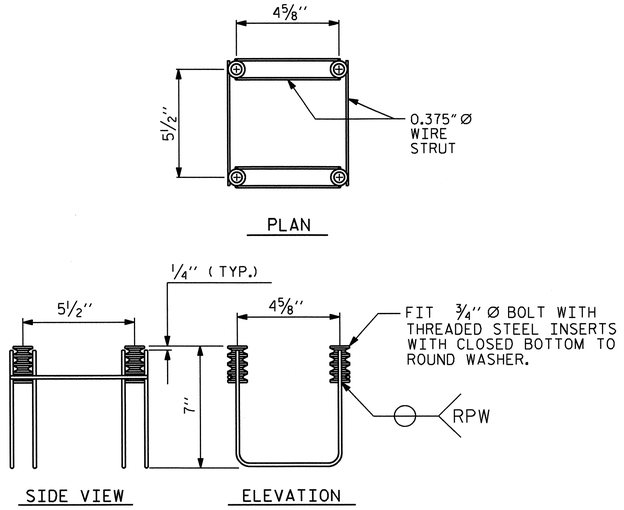


4-BOLT METAL RAIL ANCHOR ASSEMBLY

(44 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.

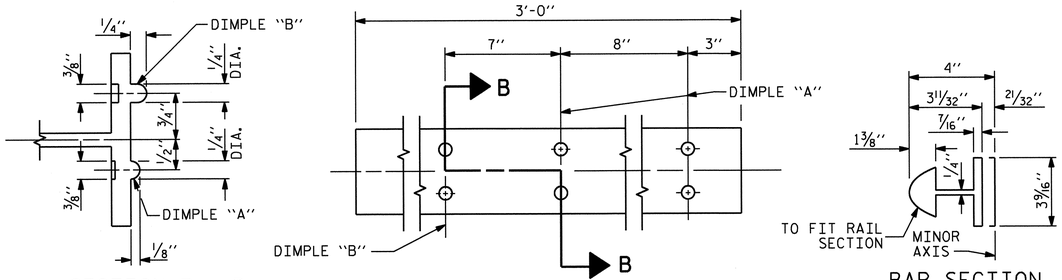
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

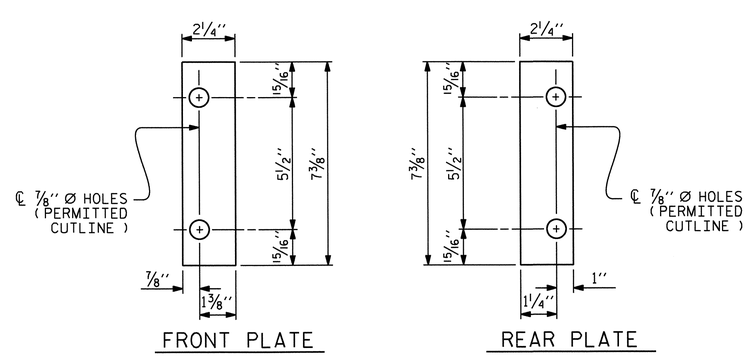
E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

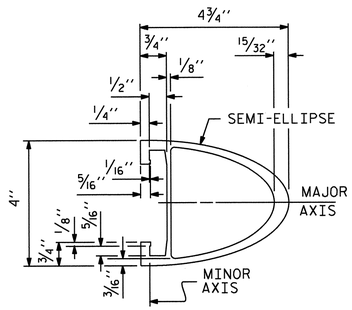
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

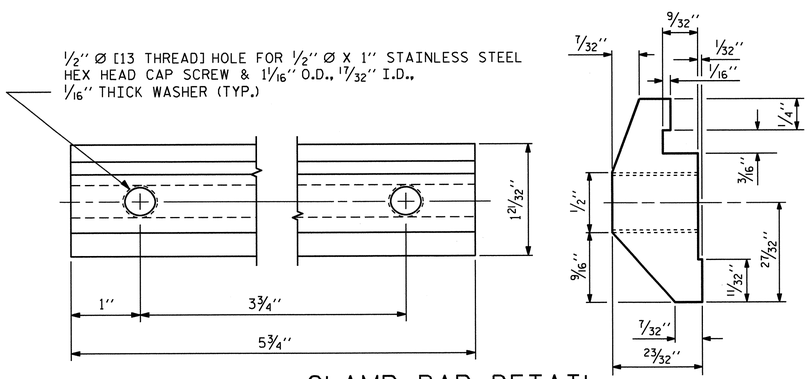
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾"Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

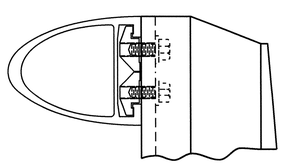
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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

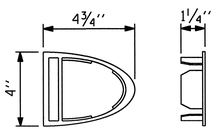












PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28-L EBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

ASSEMBLED BY : D. G. ELY		DATE : 05/11			
CHECKED BY : M. K. TOM		DATE : 06/11			
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			

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			31

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

STD. NO. BMR4

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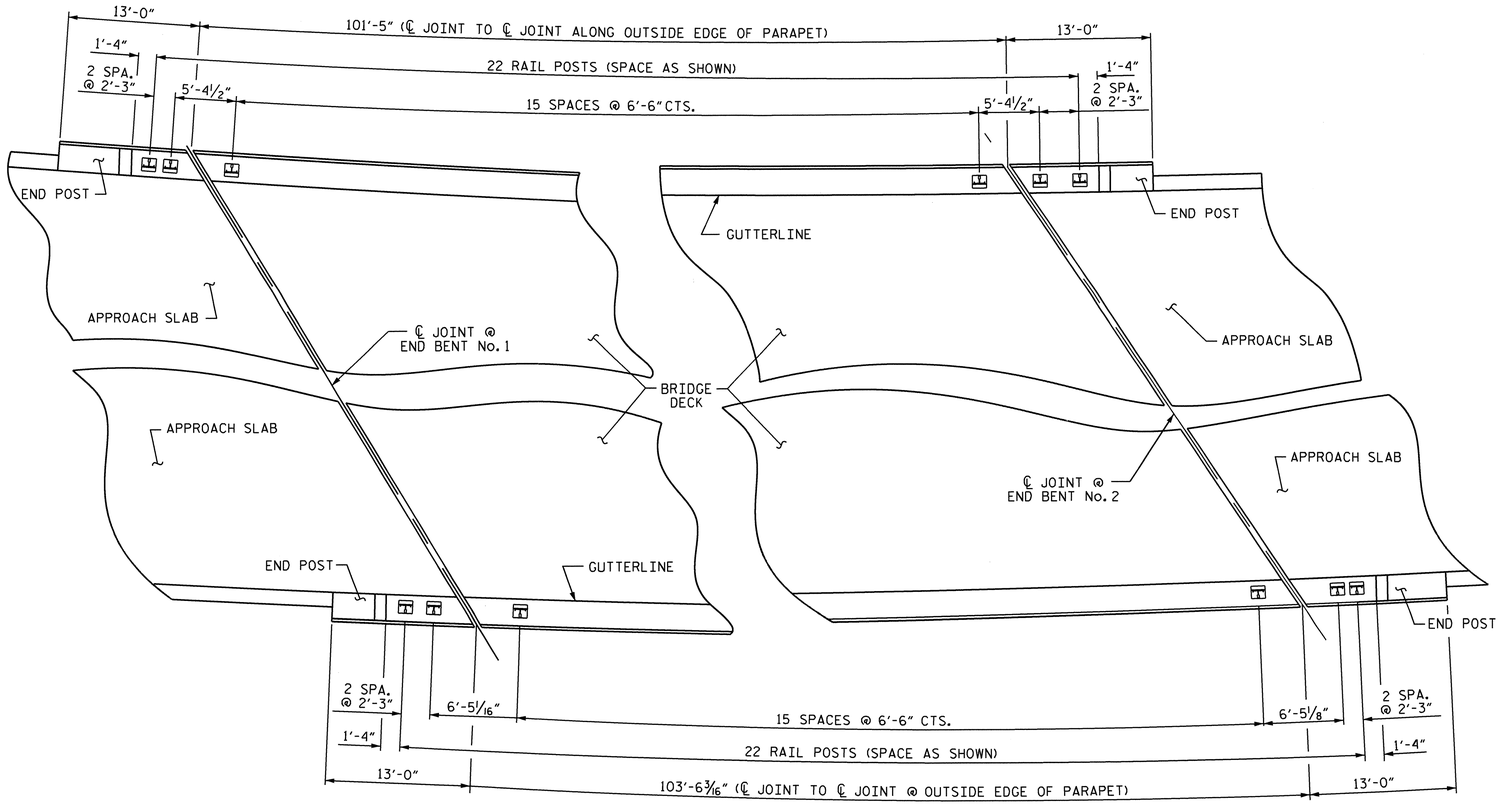
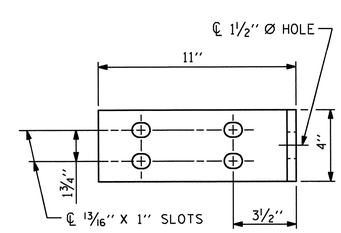
kalford

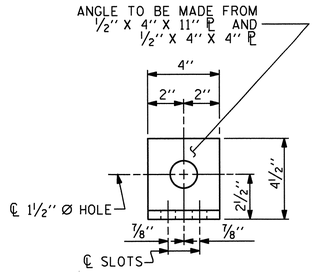


PLAN OF RAIL POST SPACINGS

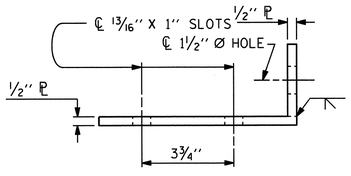
ALL DIMENSIONS ARE TAKEN ALONG THE ARC OF THE OUTSIDE EDGE OF PARAPET



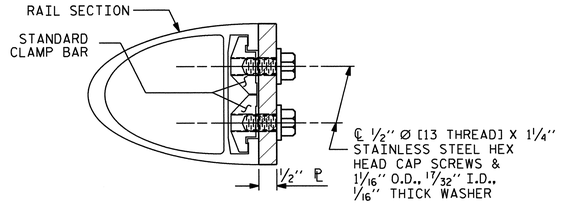
ELEVATION



END VIEW

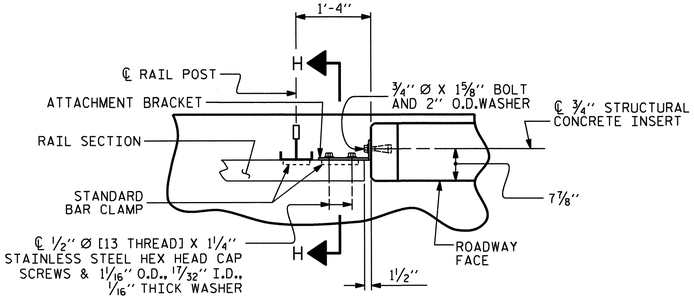


TOP VIEW



SECTION H-H

DETAILS FOR ATTACHING METAL RAIL TO END POST



PLAN - RAIL AND END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

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

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

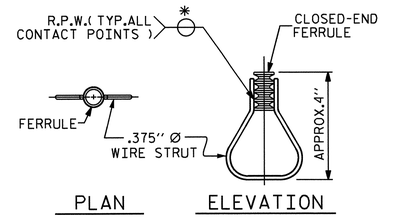
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

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

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



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			31

STD. NO. BMR2

ASSEMBLED BY : D. G. ELY	DATE : 05/11
CHECKED BY : M. K. TOM	DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E.	DATE : 1-8-13
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

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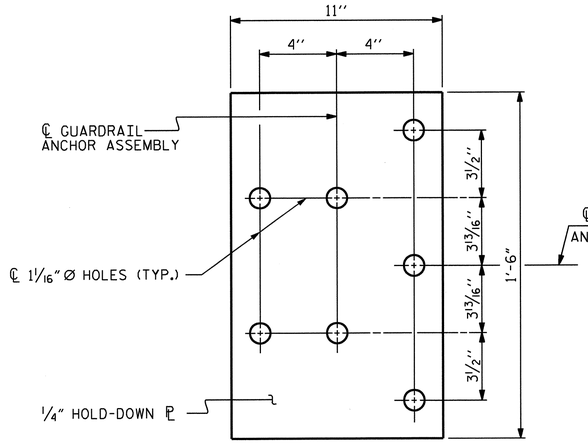
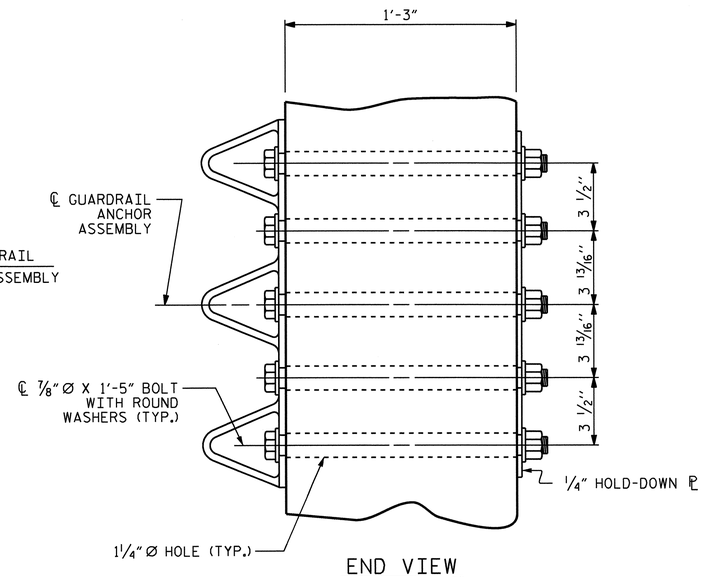


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4'' HOLD DOWN PLATE AND 7 - 7/8'' Ø BOLTS WITH NUTS AND WASHERS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

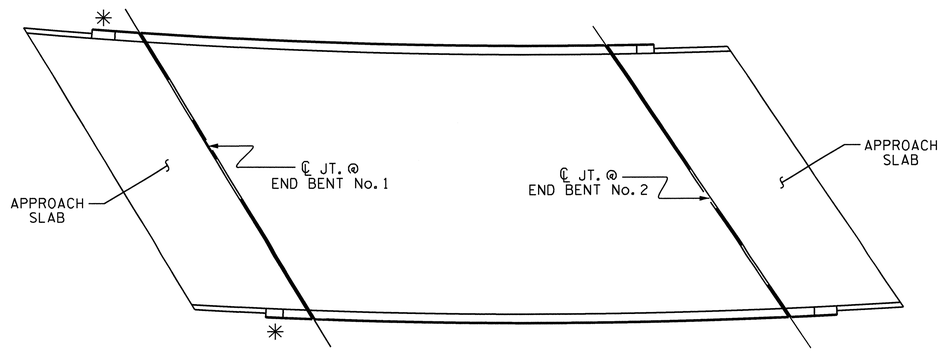
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

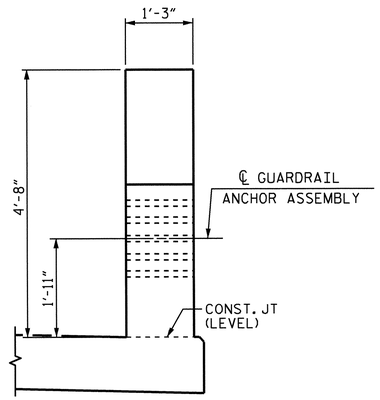
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

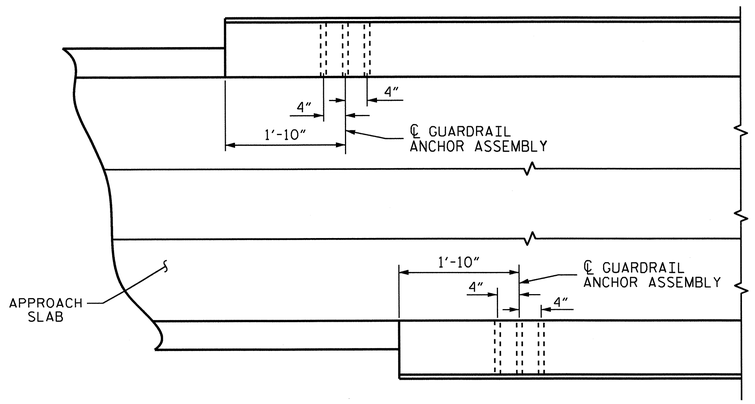


SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28-L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 024441 ENGINEER TIMOTHY W. ALFORD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			31

ASSEMBLED BY : D. G. ELY	DATE : 05-11
CHECKED BY : M. K. TOM	DATE : 06/11
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

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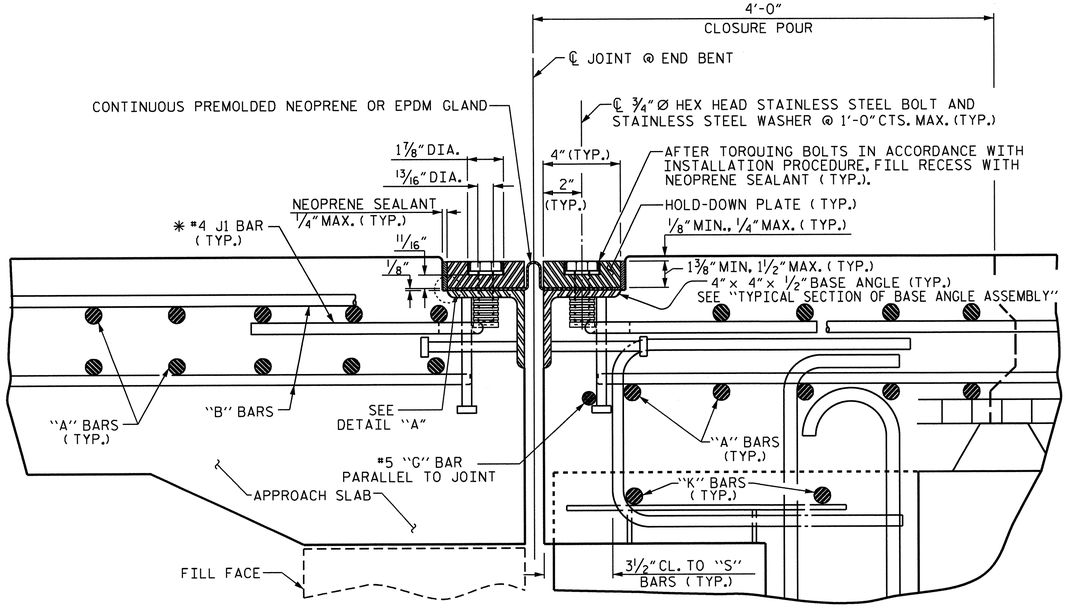
kalford

(SHT 6) STD. NO. GRA3



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

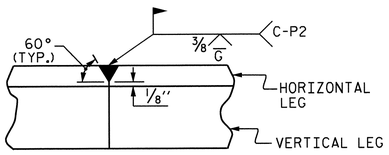
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

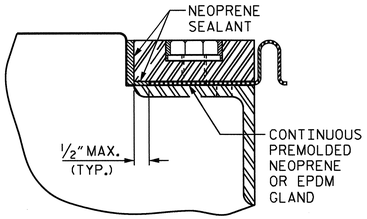
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO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

GENERAL NOTES

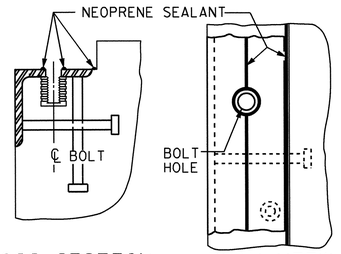
1. FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.
2. ALL PLATES AND ANGLES SHALL CONFORM TO AASHTO M270 GRADE 36 STEEL OR APPROVED EQUAL. ALL HOLD-DOWN BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL CONFORM TO ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS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



DETAIL- FIELD WELD SPLICE OF BASE ANGLE



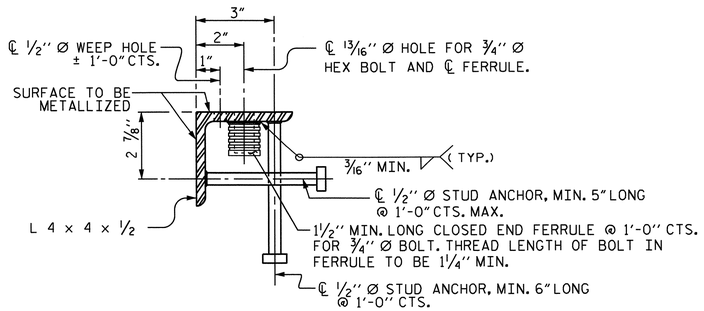
DETAIL "A"



CROSS SECTION PLAN VIEW

INSTALLATION SKETCH

MOVEMENT AND SETTING AT JOINT					
LOCATION	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END BENT No. 1	45°-00'-00"	———	———	1 5/16"	———
END BENT No. 2	45°-00'-00"	⅞"	1 1/16"	1 5/16"	1⅛"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. B-4946
WAKE COUNTY
STATION: 25+71.28 -L EBL-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

EXPANSION JOINT SEAL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			31

ASSEMBLED BY : D. G. ELY DATE : 05/11
CHECKED BY : M. K. TOM DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

DRAWN BY : REK 9/87
CHECKED BY : CRK 10/87

REV. 5/7/03R RWW/JTE
REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM

19-FEB-2013 10:05
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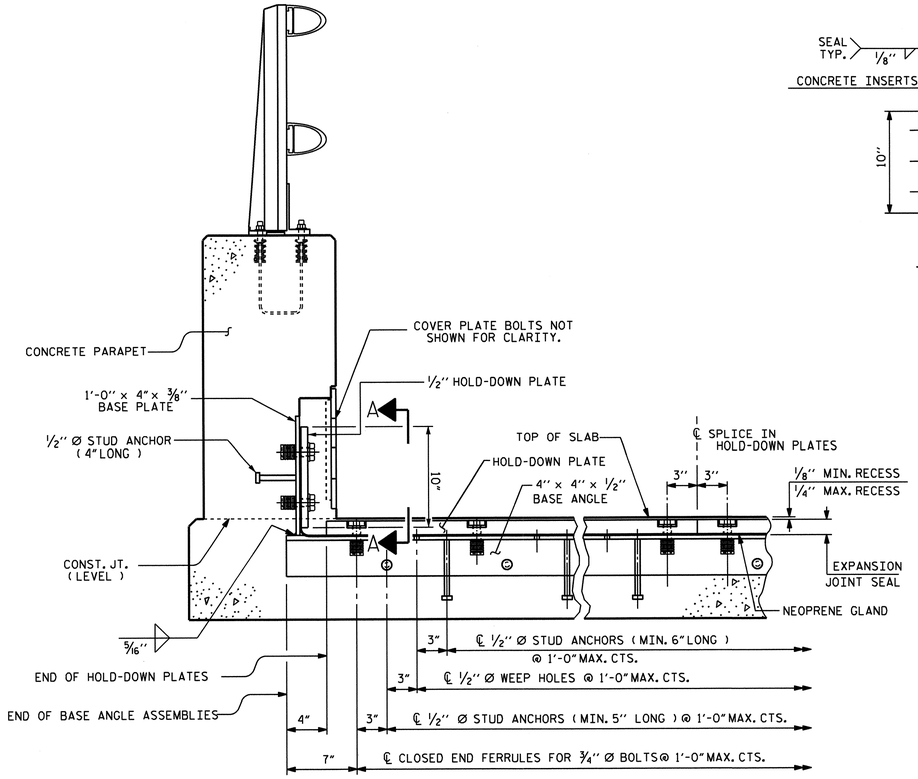
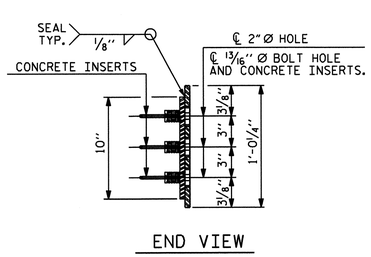
kalford

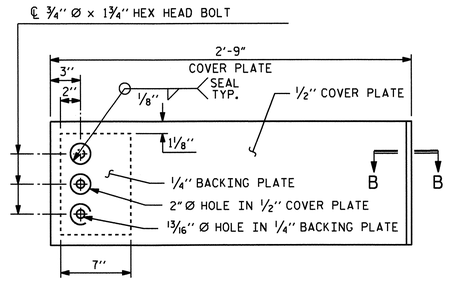
STD. NO. EJS1 (SHT 2)



SECTION THRU RAIL NORMAL TO JOINT

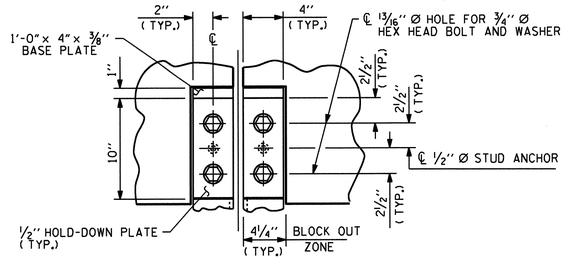


END VIEW

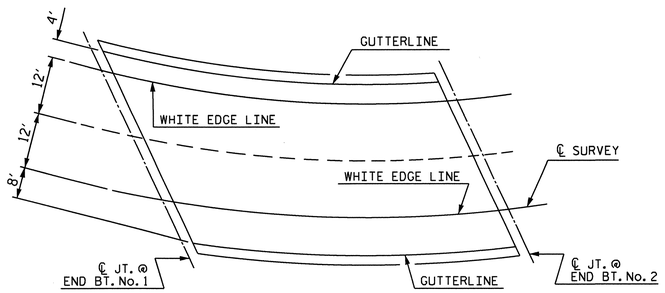


TYPE I - ELEVATION VIEW

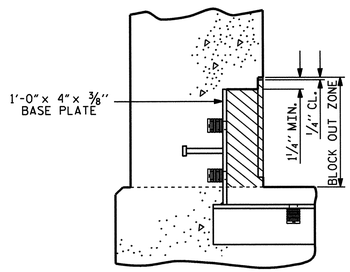
COVER PLATE DETAILS



SECTION A - A

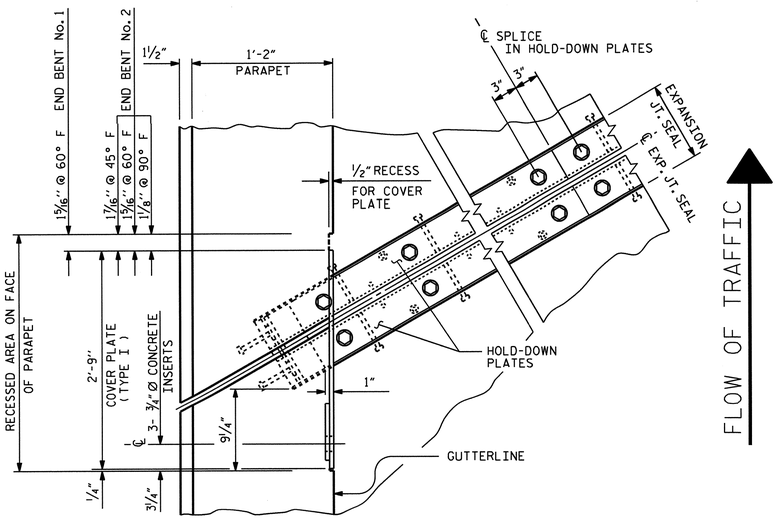


PAVEMENT MARKING ALIGNMENT



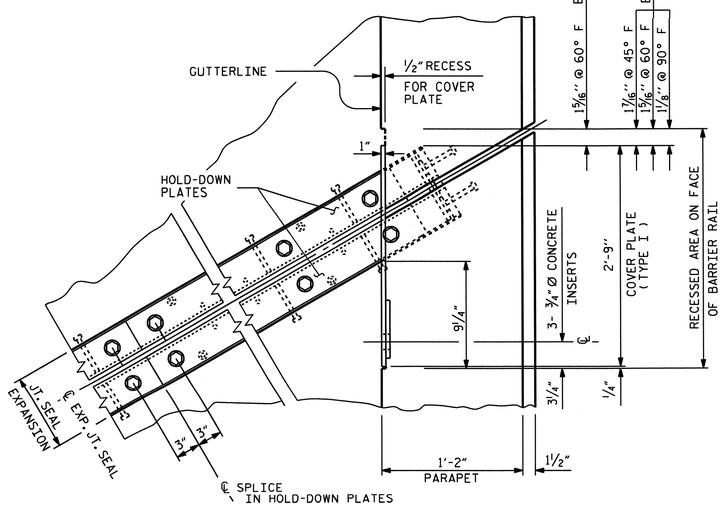
BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.

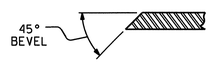


PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

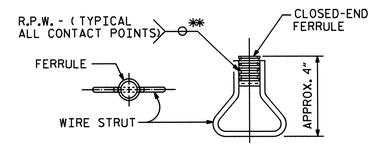
FLOW OF TRAFFIC



PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



SECTION B - B



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

EXPANSION JOINT SEAL DETAILS FOR CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			31

STD. NO. EJS2

ASSEMBLED BY : T. M. GARRISON		DATE : 05/11
CHECKED BY : M. K. TOM		DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E.		DATE : 1-8-13
DRAWN BY : REK 9/87	REV. 10/17/00	RWW/LES
CHECKED BY : CRK 10/87	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MMA/GM

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

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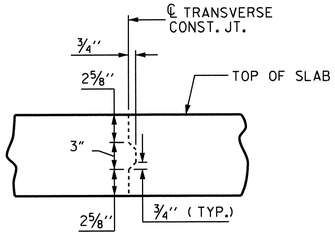
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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"			

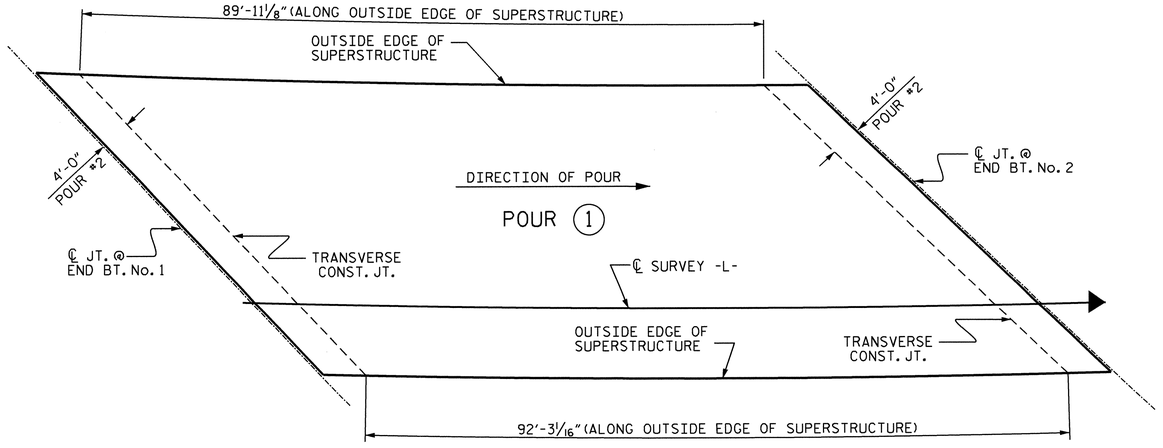
GROOVING BRIDGE FLOORS

APPROACH SLABS	1549 SQ.FT.
BRIDGE DECK	3330 SQ.FT.
TOTAL	4879 SQ.FT.



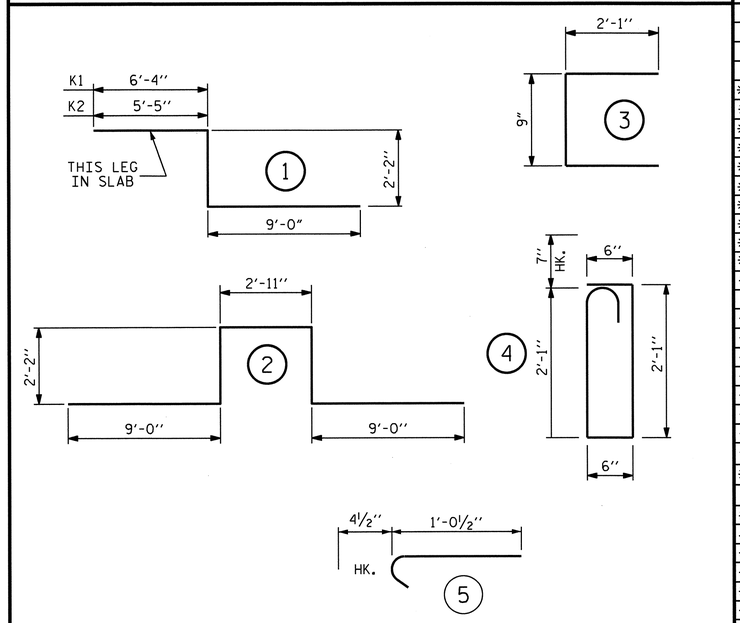
TRANSVERSE CONSTRUCTION JOINT DETAIL

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



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 3954)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPAN "A"	125.3	12,994	12,290
TOTALS**	125.3	12,994	12,290

**QUANTITIES FOR PARAPET AND END POSTS ARE NOT INCLUDED

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	128	#5	STR	38'-3"	5107	* A155	2	#5	STR	11'-1"	23	A238	2	#5	STR	19'-3"	40
A2	128	#5	STR	38'-3"	5107	* A156	2	#5	STR	10'-7"	22	A239	2	#5	STR	18'-10"	39
						* A157	2	#5	STR	10'-1"	21	A240	2	#5	STR	18'-4"	38
* A100	2	#5	STR	37'-10"	79	* A158	2	#5	STR	9'-7"	20	A241	2	#5	STR	17'-10"	37
* A101	2	#5	STR	37'-4"	78	* A159	2	#5	STR	9'-2"	19	A242	2	#5	STR	17'-4"	36
* A102	2	#5	STR	36'-10"	77	* A160	2	#5	STR	8'-8"	18	A243	2	#5	STR	16'-11"	35
* A103	2	#5	STR	36'-4"	76	* A161	2	#5	STR	8'-2"	17	A244	2	#5	STR	16'-5"	34
* A104	2	#5	STR	35'-10"	75	* A162	2	#5	STR	7'-8"	16	A245	2	#5	STR	15'-11"	33
* A105	2	#5	STR	35'-4"	74	* A163	2	#5	STR	7'-2"	15	A246	2	#5	STR	15'-5"	32
* A106	2	#5	STR	34'-10"	73	* A164	2	#5	STR	6'-8"	14	A247	2	#5	STR	15'-0"	31
* A107	2	#5	STR	34'-4"	72	* A165	2	#5	STR	6'-2"	13	A248	2	#5	STR	14'-6"	30
* A108	2	#5	STR	33'-10"	71	* A166	2	#5	STR	5'-8"	12	A249	2	#5	STR	14'-0"	29
* A109	2	#5	STR	33'-4"	70	* A167	2	#5	STR	5'-2"	11	A250	2	#5	STR	13'-7"	28
* A110	2	#5	STR	32'-10"	68	* A168	2	#5	STR	4'-8"	10	A251	2	#5	STR	13'-1"	27
* A111	2	#5	STR	32'-5"	68	* A169	2	#5	STR	4'-2"	9	A252	2	#5	STR	12'-7"	26
* A112	2	#5	STR	31'-11"	67	* A170	2	#5	STR	3'-8"	8	A253	2	#5	STR	12'-1"	25
* A113	2	#5	STR	31'-5"	66	* A171	2	#5	STR	3'-2"	7	A254	2	#5	STR	11'-7"	24
* A114	2	#5	STR	30'-11"	64	* A172	2	#5	STR	2'-8"	6	A255	2	#5	STR	11'-1"	23
* A115	2	#5	STR	30'-5"	63	* A173	2	#5	STR	2'-2"	5	A256	2	#5	STR	10'-7"	22
* A116	2	#5	STR	29'-11"	62							A257	2	#5	STR	10'-1"	21
* A117	2	#5	STR	29'-5"	61	A200	2	#5	STR	37'-10"	79	A258	2	#5	STR	9'-7"	20
* A118	2	#5	STR	29'-0"	60	A201	2	#5	STR	37'-4"	78	A259	2	#5	STR	9'-2"	19
* A119	2	#5	STR	28'-6"	59	A202	2	#5	STR	36'-10"	77	A260	2	#5	STR	8'-8"	18
* A120	2	#5	STR	28'-0"	58	A203	2	#5	STR	36'-4"	76	A261	2	#5	STR	8'-2"	17
* A121	2	#5	STR	27'-6"	57	A204	2	#5	STR	35'-10"	75	A262	2	#5	STR	7'-8"	16
* A122	2	#5	STR	27'-0"	56	A205	2	#5	STR	35'-4"	74	A263	2	#5	STR	7'-2"	15
* A123	2	#5	STR	26'-6"	55	A206	2	#5	STR	34'-10"	73	A264	2	#5	STR	6'-8"	14
* A124	2	#5	STR	26'-1"	54	A207	2	#5	STR	34'-4"	72	A265	2	#5	STR	6'-2"	13
* A125	2	#5	STR	25'-7"	53	A208	2	#5	STR	33'-10"	71	A266	2	#5	STR	5'-8"	12
* A126	2	#5	STR	25'-1"	52	A209	2	#5	STR	33'-4"	70	A267	2	#5	STR	5'-2"	11
* A127	2	#5	STR	24'-7"	51	A210	2	#5	STR	32'-10"	68	A268	2	#5	STR	4'-8"	10
* A128	2	#5	STR	24'-1"	50	A211	2	#5	STR	32'-5"	68	A269	2	#5	STR	4'-2"	9
* A129	2	#5	STR	23'-7"	49	A212	2	#5	STR	31'-11"	67	A270	2	#5	STR	3'-8"	8
* A130	2	#5	STR	23'-2"	48	A213	2	#5	STR	31'-5"	66	A271	2	#5	STR	3'-2"	7
* A131	2	#5	STR	22'-8"	47	A214	2	#5	STR	30'-11"	64	A272	2	#5	STR	2'-8"	6
* A132	2	#5	STR	22'-2"	46	A215	2	#5	STR	30'-5"	63	A273	2	#5	STR	2'-2"	5
* A133	2	#5	STR	21'-8"	45	A216	2	#5	STR	29'-11"	62						
* A134	2	#5	STR	21'-3"	44	A217	2	#5	STR	29'-5"	61	* B1	108	#4	STR	27'-3"	1966
* A135	2	#5	STR	20'-9"	43	A218	2	#5	STR	29'-0"	60	B2	44	#5	STR	52'-1"	2390
* A136	2	#5	STR	20'-3"	42	A219	2	#5	STR	28'-6"	59	B3	44	#5	STR	52'-7"	2413
* A137	2	#5	STR	19'-9"	41	A220	2	#5	STR	28'-0"	58						
* A138	2	#5	STR	19'-3"	40	A221	2	#5	STR	27'-6"	57	* G1	2	#5	STR	54'-3"	113
* A139	2	#5	STR	18'-10"	39	A222	2	#5	STR	27'-0"	56						
* A140	2	#5	STR	18'-4"	38	A223	2	#5	STR	26'-6"	55	* J1	106	#4	5	1'-5"	100
* A141	2	#5	STR	17'-10"	37	A224	2	#5	STR	26'-1"	54						
* A142	2	#5	STR	17'-4"	36	A225	2	#5	STR	25'-7"	53	* K1	4	#8	1	17'-6"	187
* A143	2	#5	STR	16'-11"	35	A226	2	#5	STR	25'-1"	52	* K2	4	#8	1	16'-7"	177
* A144	2	#5	STR	16'-5"	34	A227	2	#5	STR	24'-7"	51	* K3	12	#8	2	25'-3"	809
* A145	2	#5	STR	15'-11"	33	A228	2	#5	STR	24'-1"	50	* K4	12	#6	STR	8'-6"	153
* A146	2	#5	STR	15'-5"	32	A229	2	#5	STR	23'-7"	49						
* A147	2	#5	STR	15'-0"	31	A230	2	#5	STR	23'-2"	48	* S1	64	#4	3	4'-11"	210
* A148	2	#5	STR	14'-6"	30	A231	2	#5	STR	22'-8"	47	* S2	64	#5	4	5'-9"	384
* A149	2	#5	STR	14'-0"	29	A232	2	#5	STR	22'-2"	46						
* A150	2	#5	STR	13'-7"	28	A233	2	#5	STR	21'-8"	45						
* A151	2	#5	STR	13'-1"	27	A234	2	#5	STR	21'-3"	44						
* A152	2	#5	STR	12'-7"	26	A235	2	#5	STR	20'-9"	43						
* A153	2	#5	STR	12'-1"	25	A236	2	#5	STR	20'-3"	42						
* A154	2	#5	STR	11'-7"	24	A237	2	#5	STR	19'-9"	41						

REINFORCING STEEL = 12,994 LBS
* EPOXY COATED REINF. STEEL= 12,290 LBS

CLASS AA CONCRETE BREAKDOWN

POUR #1	106.4 CU. YDS.
POUR #2	18.9 CU. YDS.
TOTAL	125.3 CU. YDS.

PROJECT NO. B-4946
WAKE COUNTY
STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D.G. ELY DATE : 05-11
CHECKED BY : M. K. TOM DATE : 06-11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:04
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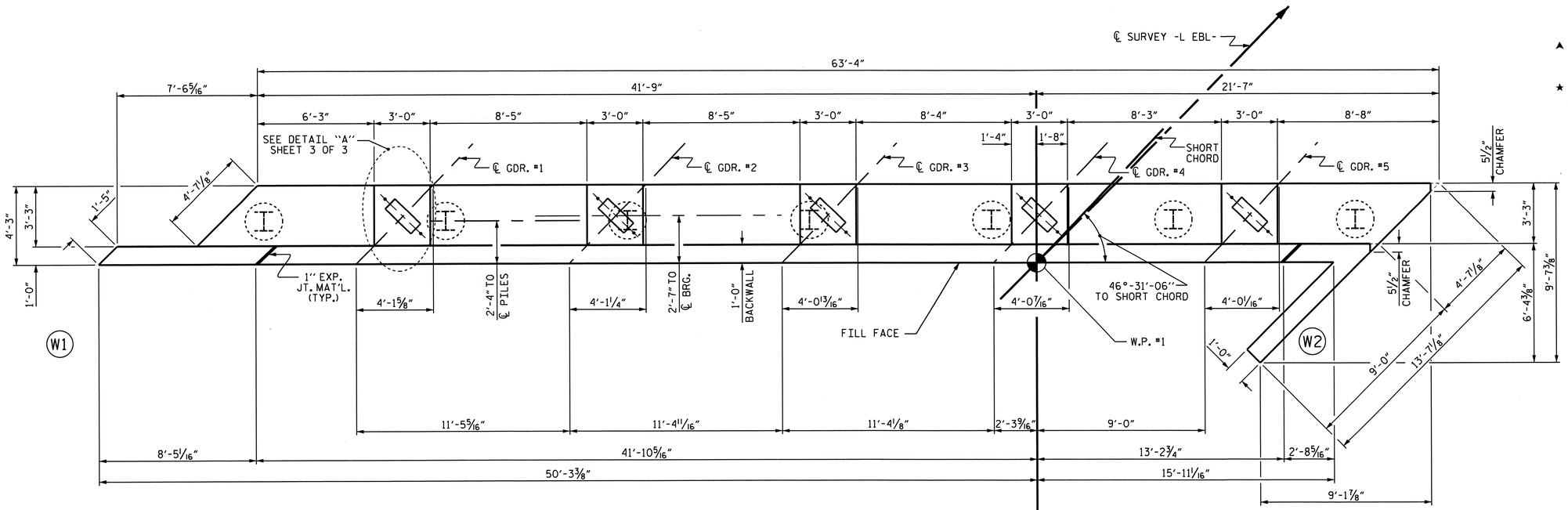
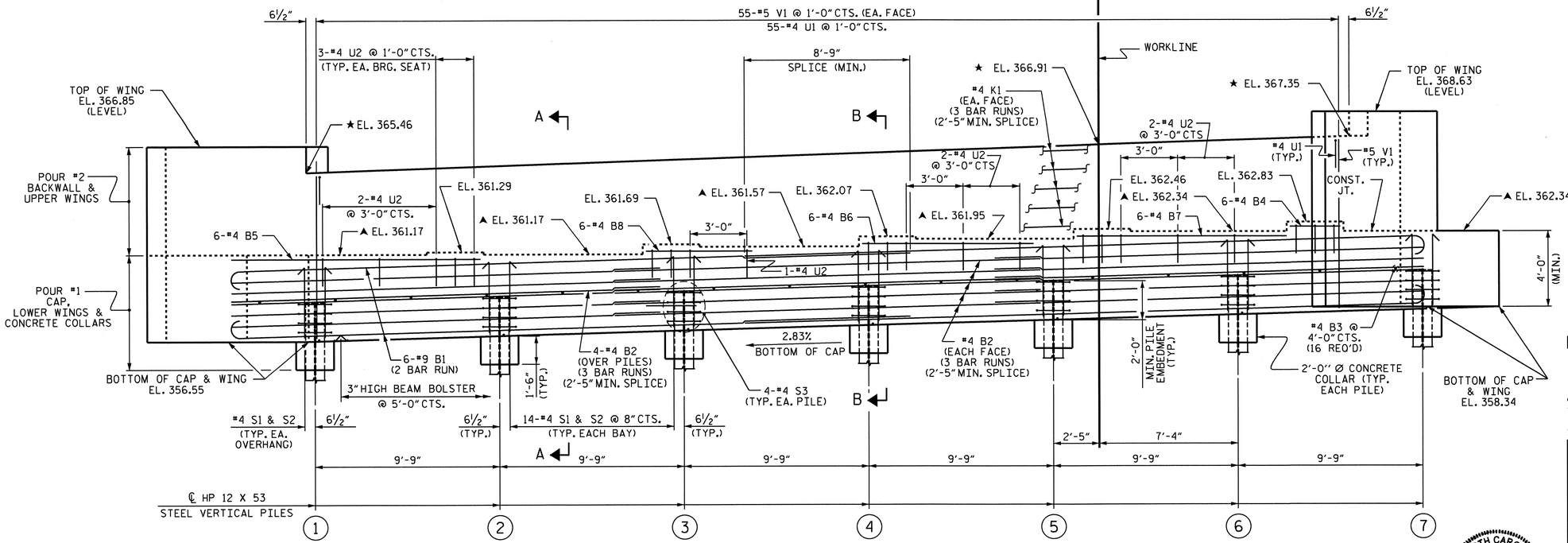


PLAN



ELEVATION

NOTES

▲ FOR LOCATION OF ELEVATION BETWEEN BUILDUPS, SEE SECTION A-A, ON SHEET 3 OF 3.

★ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

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

TOP OF PILE ELEVATIONS

1	EL. 358.63
2	EL. 358.90
3	EL. 359.17
4	EL. 359.45
5	EL. 359.72
6	EL. 359.99
7	EL. 360.27

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 1 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-22
1			3			TOTAL SHEETS
2			4			31

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTI W. ALFORD

DRAWN BY : D. G. ELY DATE : 06/2011
CHECKED BY : N. PIERCE DATE : 07/2011
DESIGN ENGINEER OF RECORD: P.K. NEWTON, P.E. DATE : 1/2013

19-FEB-2013 10:04
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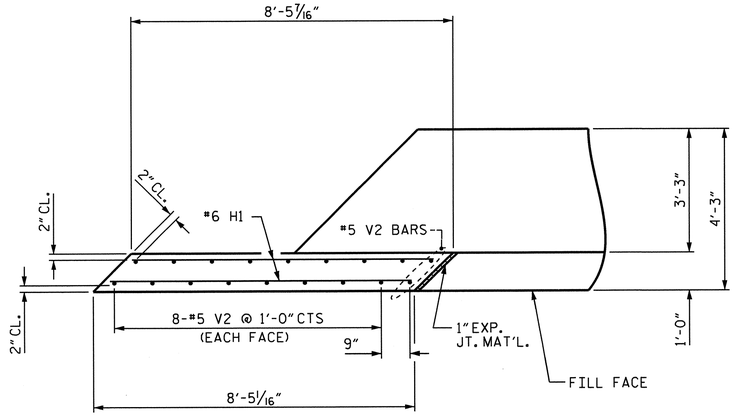
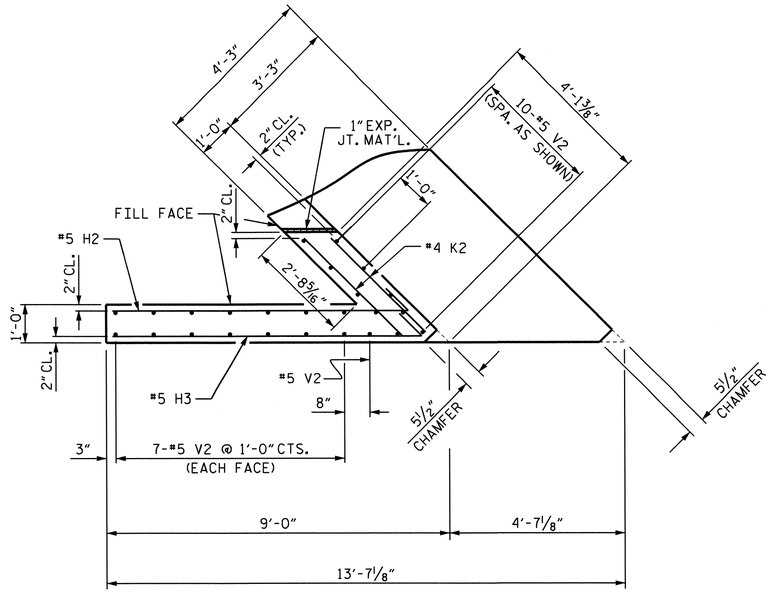
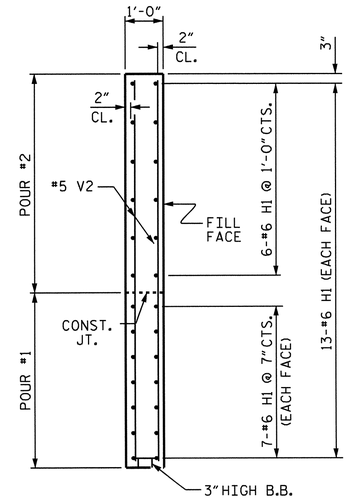


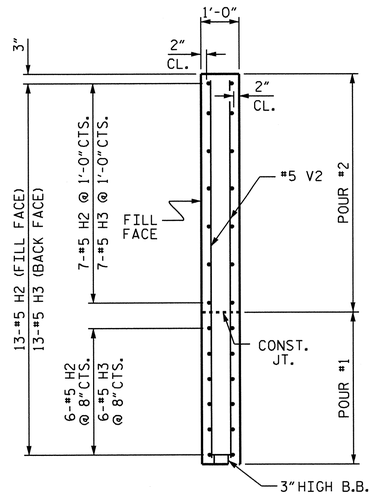
PLAN OF WING (W1)



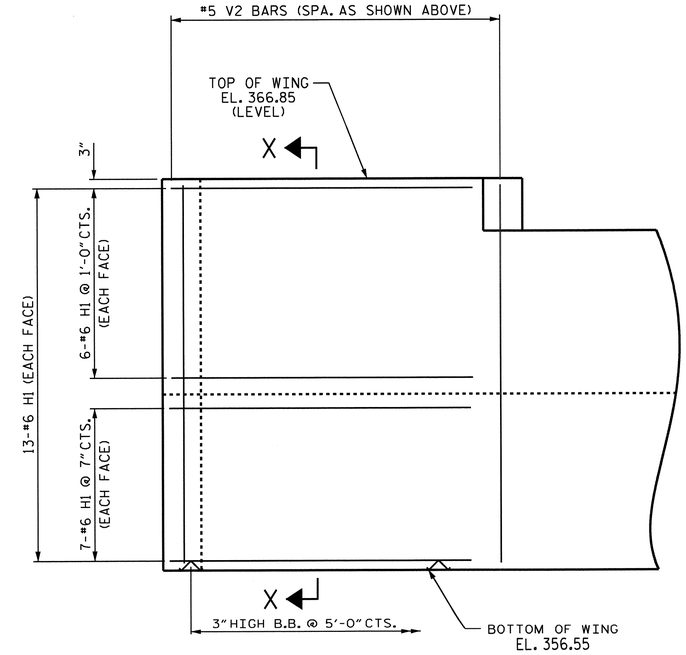
PLAN OF WING (W2)



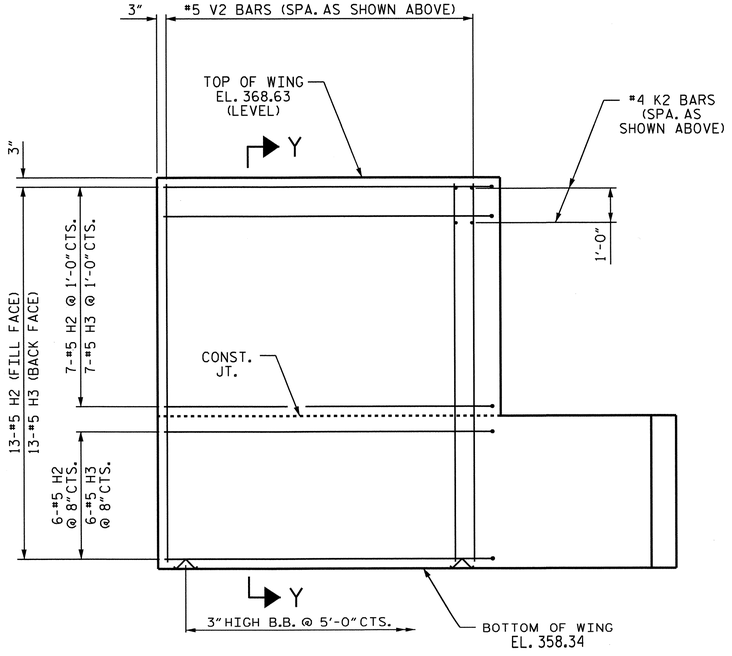
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

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-23
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D. G. ELY DATE : 06/2011
CHECKED BY : N. PIERCE DATE : 07/2011
DESIGN ENGINEER OF RECORD: P.K. NEWTON, P.E. DATE : 1-7-13

19-FEB-2013 10:03
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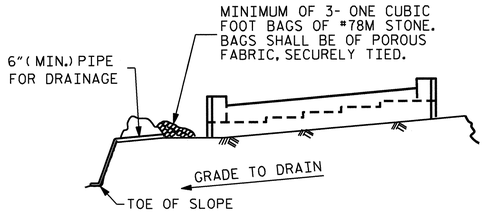
kalford

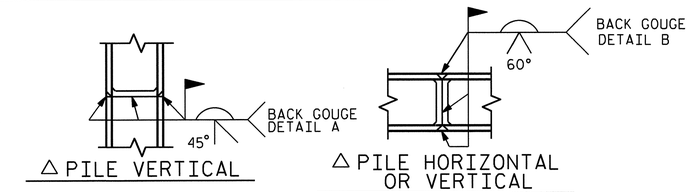


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

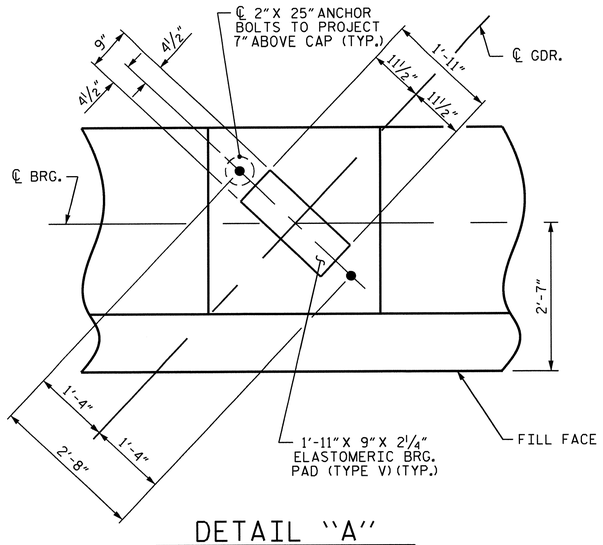
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



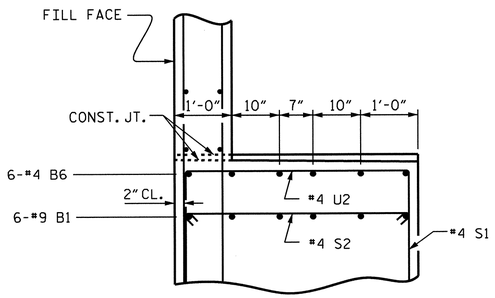
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

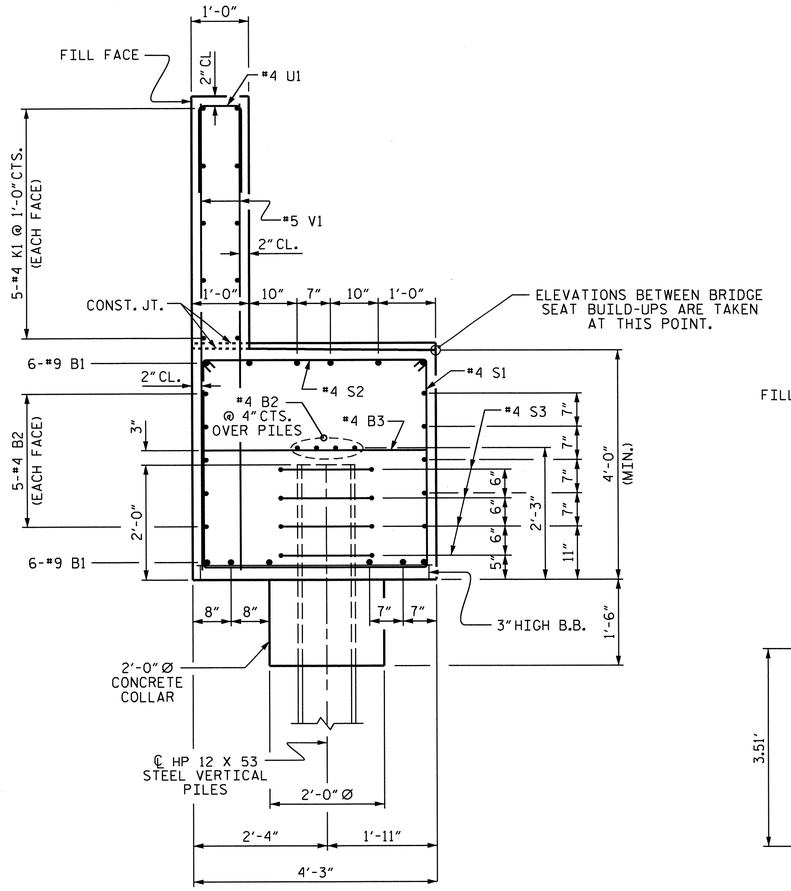


DETAIL "A"

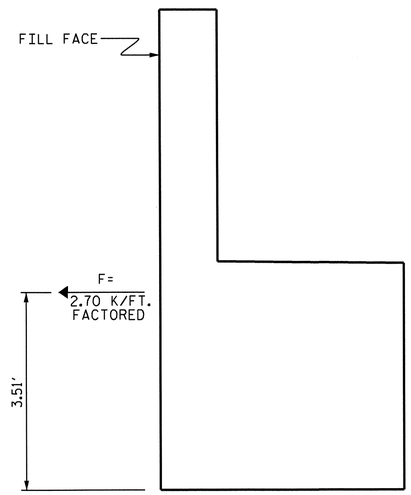
(TYP. EACH GIRDER)



SECTION B-B



SECTION A-A

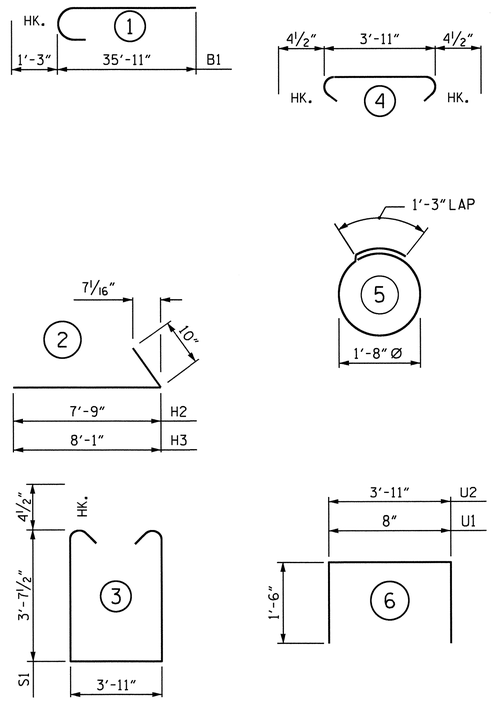


CAP

TIEBACK DETAILS

(DETAIL SHOWING TIEBACK RESTRAINT FOR END BENT No. 1)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#9	1	37'-2"	3033
B2	42	#4	STR	22'-8"	636
B3	16	#4	STR	3'-11"	42
B4	6	#4	STR	2'-8"	11
B5	6	#4	STR	13'-2"	53
B6	6	#4	STR	9'-1"	36
B7	6	#4	STR	11'-0"	44
B8	6	#4	STR	7'-4"	29
H1	26	#6	STR	7'-11"	309
H2	13	#5	2	8'-7"	116
H3	13	#5	2	8'-11"	121
K1	30	#4	STR	22'-8"	454
K2	4	#4	STR	3'-6"	9
S1	86	#4	3	11'-11"	685
S2	86	#4	4	4'-8"	268
S3	28	#4	5	6'-6"	122
U1	55	#4	6	3'-8"	135
U2	22	#4	6	6'-11"	102
V1	110	#5	STR	8'-5"	966
V2	43	#5	STR	9'-11"	445

REINFORCING STEEL	7616 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 (CAP, LOWER WINGS & CONCRETE COLLARS)	46.5 C.Y.
POUR #2 (BACKWALL & UPPER WINGS)	13.8 C.Y.
TOTAL CLASS A CONCRETE	60.3 C.Y.
HP 12 X 53 STEEL VERTICAL PILES	
No. = 7	385 LIN FT.

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D. G. ELY DATE : 06/2011
CHECKED BY : N. PIERCE DATE : 07/2011
DESIGN ENGINEER OF RECORD: P.K. NEWTON, P.E. DATE : 01/2013

19-FEB-2013 10:03
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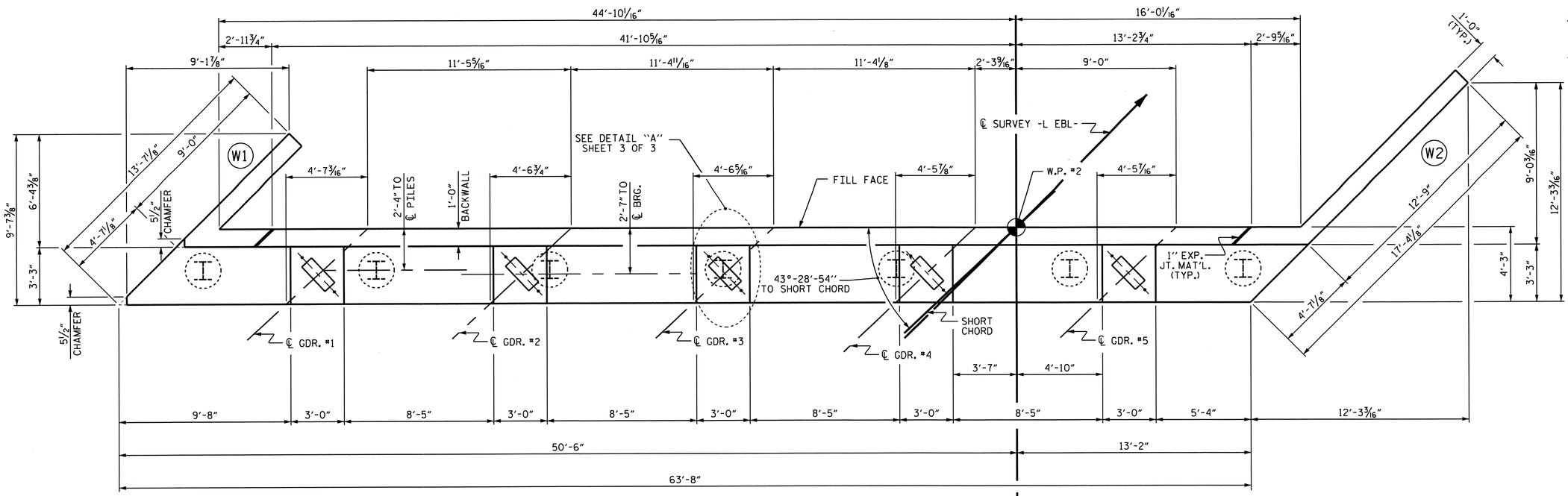
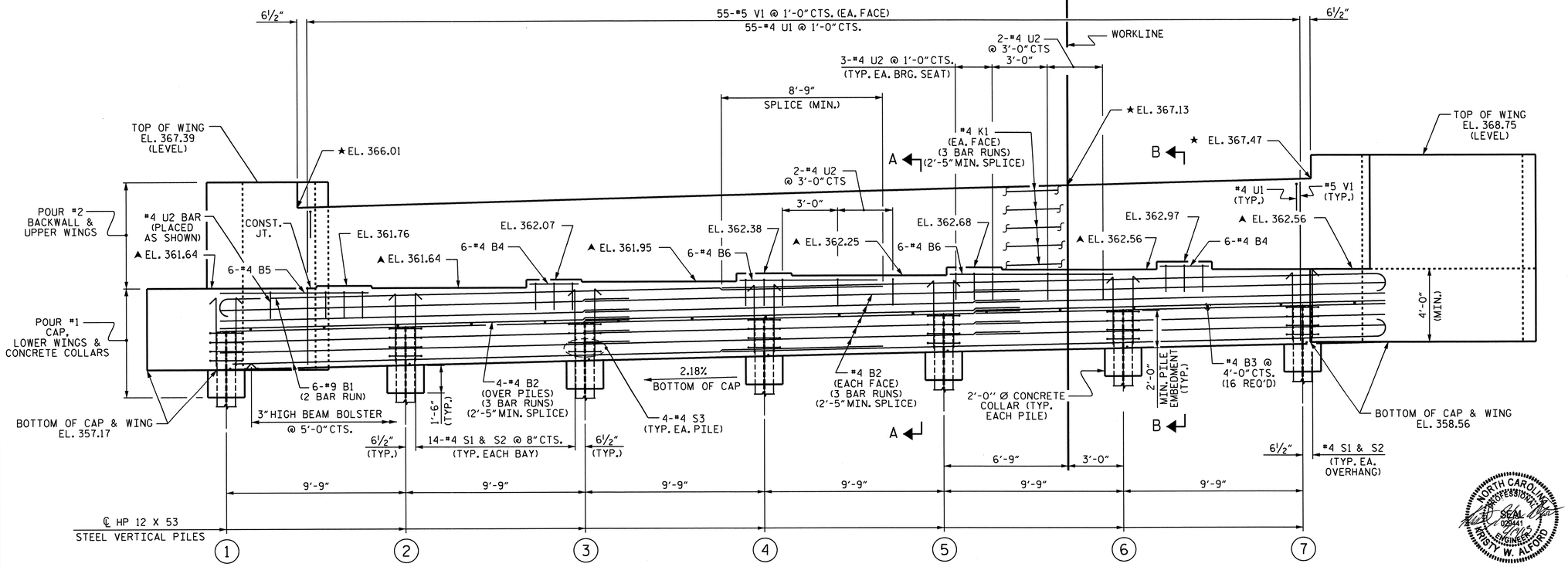
kalford



PLAN



ELEVATION

NOTES

▲ FOR LOCATION OF ELEVATION BETWEEN BUILDUPS, SEE SECTION A-A, ON SHEET 3 OF 3.

★ THIS ELEVATION TAKEN ON FILL FACE OF BACKWALL.

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

FOR PILE SPLICE DETAILS, SEE SHEET 3 OF 3.

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

TOP OF PILE ELEVATIONS

1	EL. 359.24
2	EL. 359.46
3	EL. 359.67
4	EL. 359.88
5	EL. 360.10
6	EL. 360.31
7	EL. 360.52

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 1 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-25
1			3			TOTAL SHEETS
2			4			31

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER TIMOTHY W. ALFORD

DRAWN BY : D. G. ELY DATE : 06/2011
CHECKED BY : N. PIERCE DATE : 07/2011
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:03
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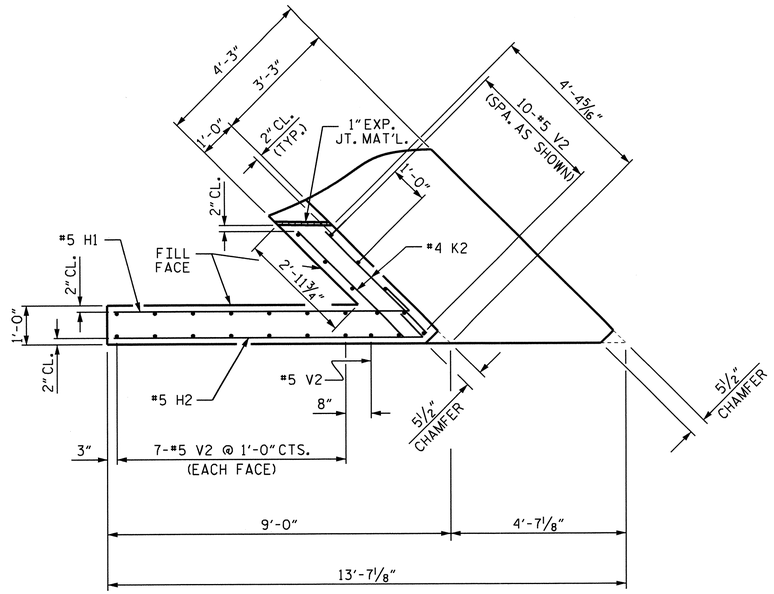
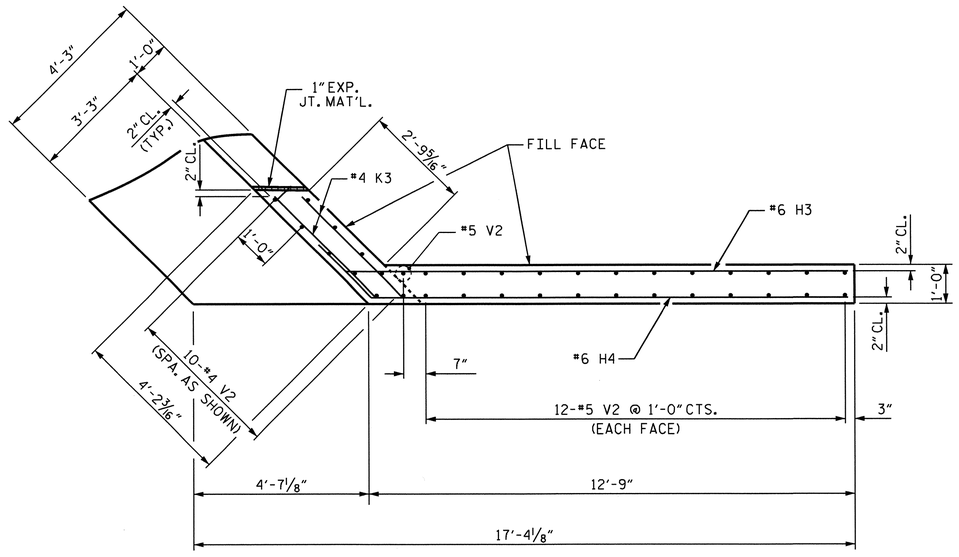
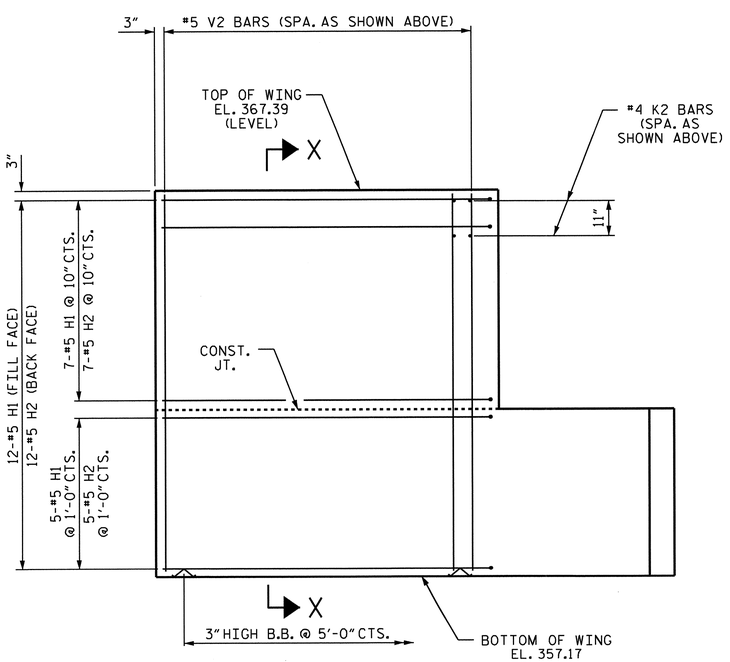
kalford



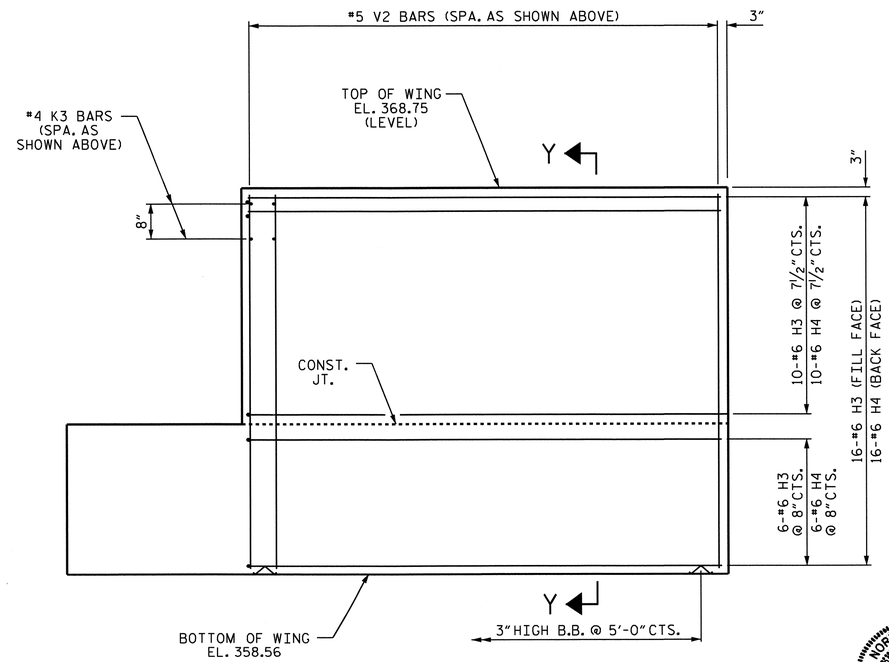
PLAN OF WING (W1)



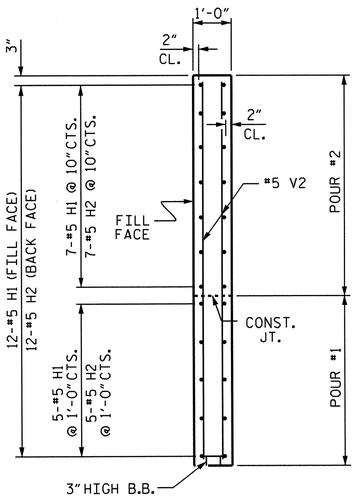
PLAN OF WING (W2)



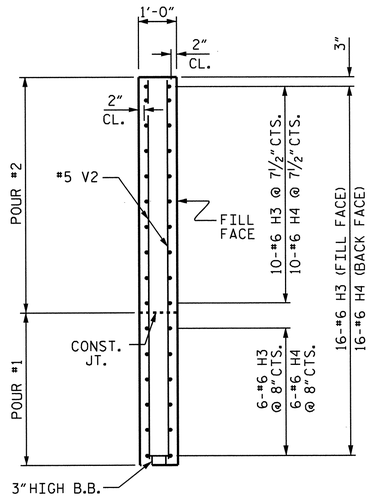
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X



SECTION Y-Y

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

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-26
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D. G. ELY DATE : 06/2011
CHECKED BY : N. PIERCE DATE : 07/2011
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:02
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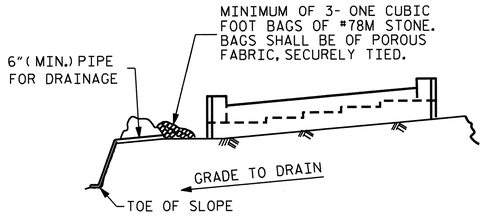
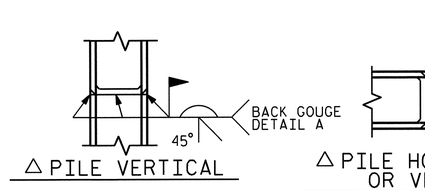


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

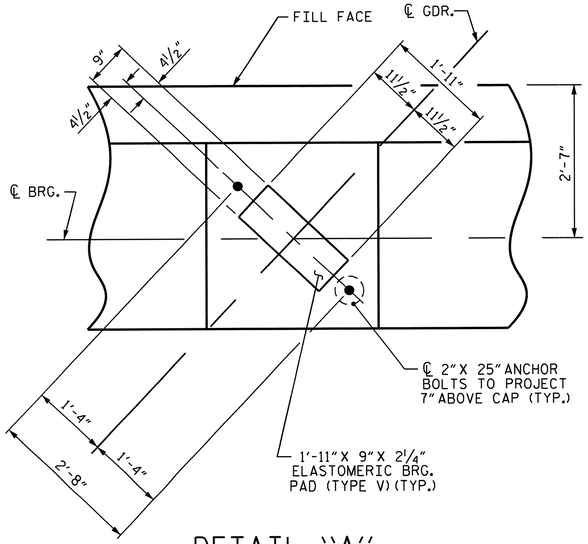
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



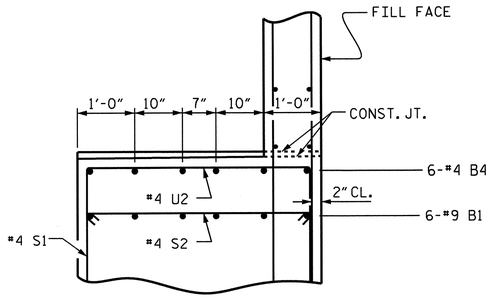
△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

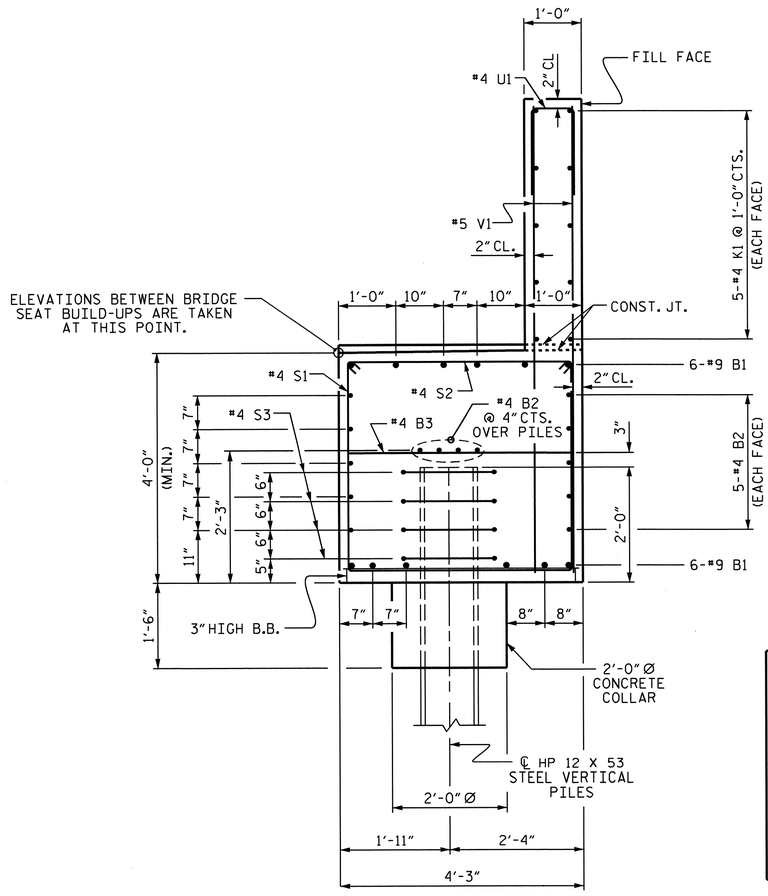


DETAIL "A"

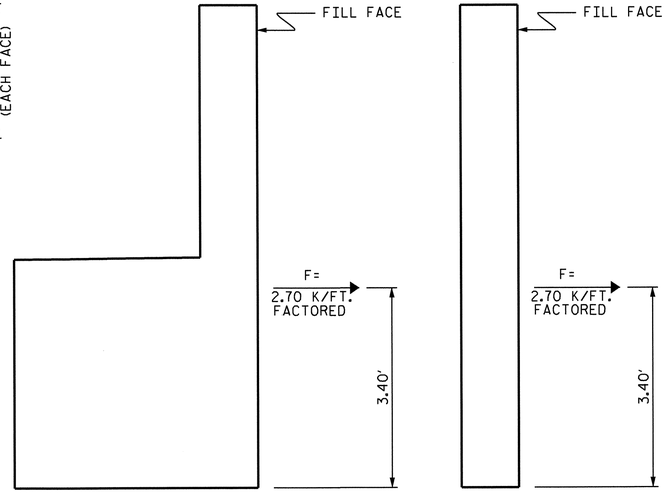
(TYP. EACH GIRDER)



SECTION B-B



SECTION A-A



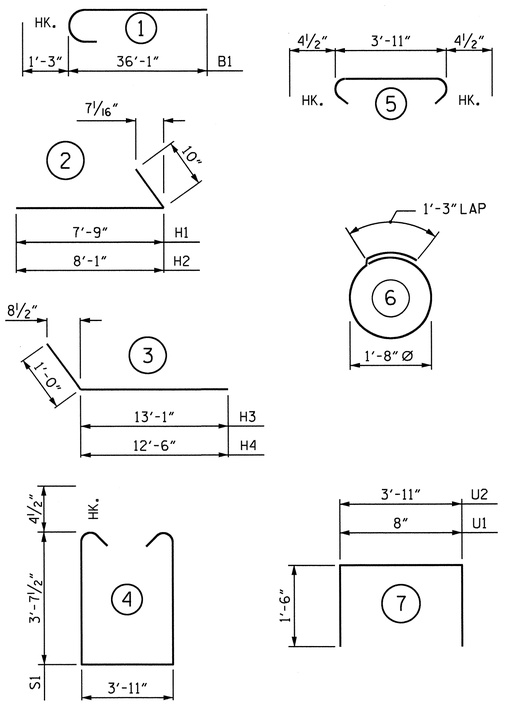
CAP

WING 2

TIEBACK DETAILS

(DETAIL SHOWING TIEBACK RESTRAINT FOR END BENT No. 2)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

END BENT No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	24	#9	1	37'-4"	3046
B2	42	#4	STR	22'-9"	638
B3	16	#4	STR	3'-11"	42
B4	12	#4	STR	2'-8"	21
B5	6	#4	STR	12'-4"	49
B6	12	#4	STR	9'-0"	72
H1	12	#5	2	8'-7"	107
H2	12	#5	2	8'-11"	112
H3	16	#6	3	14'-1"	338
H4	16	#6	3	13'-6"	324
K1	30	#4	STR	22'-9"	456
K2	4	#4	STR	3'-9"	10
K3	4	#4	STR	3'-10"	10
S1	86	#4	4	11'-11"	685
S2	86	#4	5	4'-8"	268
S3	28	#4	6	6'-6"	122
U1	55	#4	7	3'-8"	135
U2	20	#4	7	6'-11"	92
V1	110	#5	STR	8'-4"	956
V2	60	#5	STR	9'-10"	615

REINFORCING STEEL	8098 LBS.
CLASS A CONCRETE BREAKDOWN	
POUR #1 (CAP, LOWER WINGS & CONCRETE COLLARS)	47.5 C.Y.
POUR #2 (BACKWALL & UPPER WINGS)	15.4 C.Y.
TOTAL CLASS A CONCRETE	62.9 C.Y.
HP 12 X 53 STEEL VERTICAL PILES	
No. = 7	350 LIN FT.

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

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-27
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : D. G. ELY DATE : 06/2011
CHECKED BY : N. PIERCE DATE : 07/2011
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

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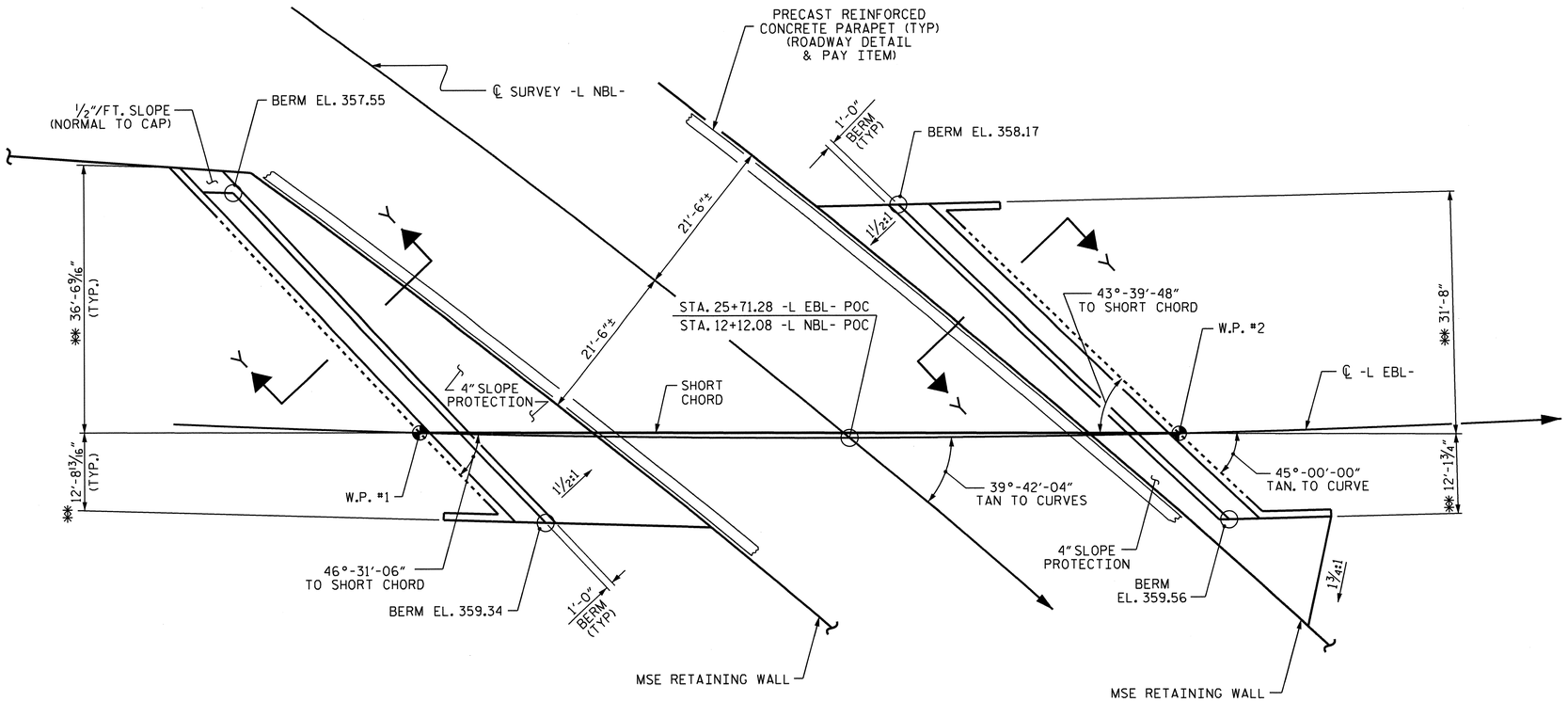
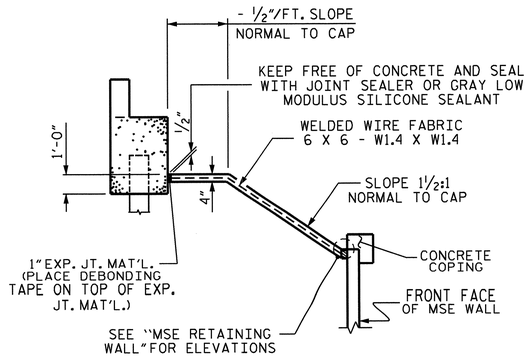


END BENT No. 1

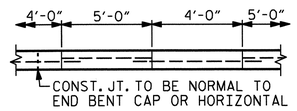
END BENT No. 2

PLAN

✱✱ PERPENDICULAR TO SHORT CHORD

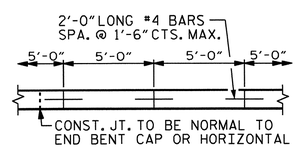


SECTION Y-Y



POUR A 4'-0" STRIP FIRST.

OPTIONAL POURING DETAIL



POURING DETAIL

GENERAL NOTES

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

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

BRIDGE @ STATION 25+71.28 -L EBL-	4" INCH SLOPE PROTECTION	✱ WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT No. 1	84	152
END BENT No. 2	65	117

✱ QUANTITY SHOWN IS BASED ON 5' POURS.

ASSEMBLED BY : J. L. LAMBERT	DATE : 8/12		
CHECKED BY : S. H. SOCKWELL	DATE : 8/12		
DESIGN ENGINEER OF RECORD: P.K. NEWTON, P.E.	DATE : 8/12		
DRAWN BY : ELR 5/92	REV. 7/10/01	LES/RDR
CHECKED BY : GRP 6/92	REV. 5/7/03	RWW/JTE
	REV. 5/1/06	TLA/GM

19-FEB-2013 10:02
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kalford

PROJECT NO. B-4946

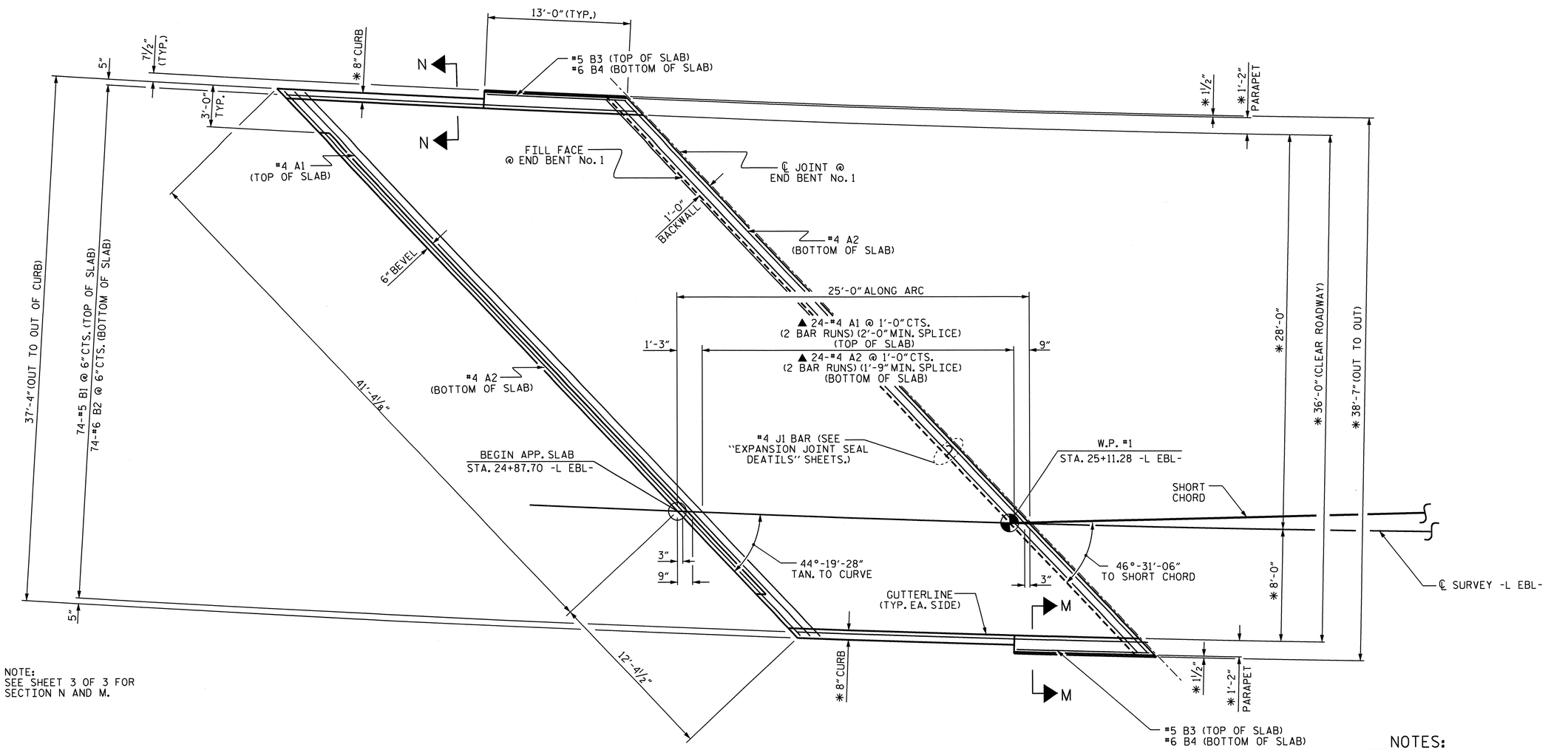
WAKE COUNTY

STATION: 25+71.28 -L EBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			31



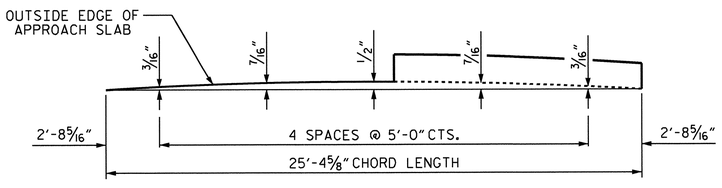
NOTE:
SEE SHEET 3 OF 3 FOR SECTION N AND M.

PLAN @ END BENT No. 1

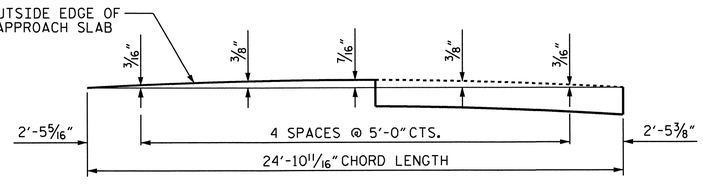
NOTES:

* MEASURED RADIALLY

▲ "A" BARS ARE PLACED PARALLEL TO FILL FACE



LEFT SIDE



RIGHT SIDE

ARC OFFSETS @ END BENT No. 1

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

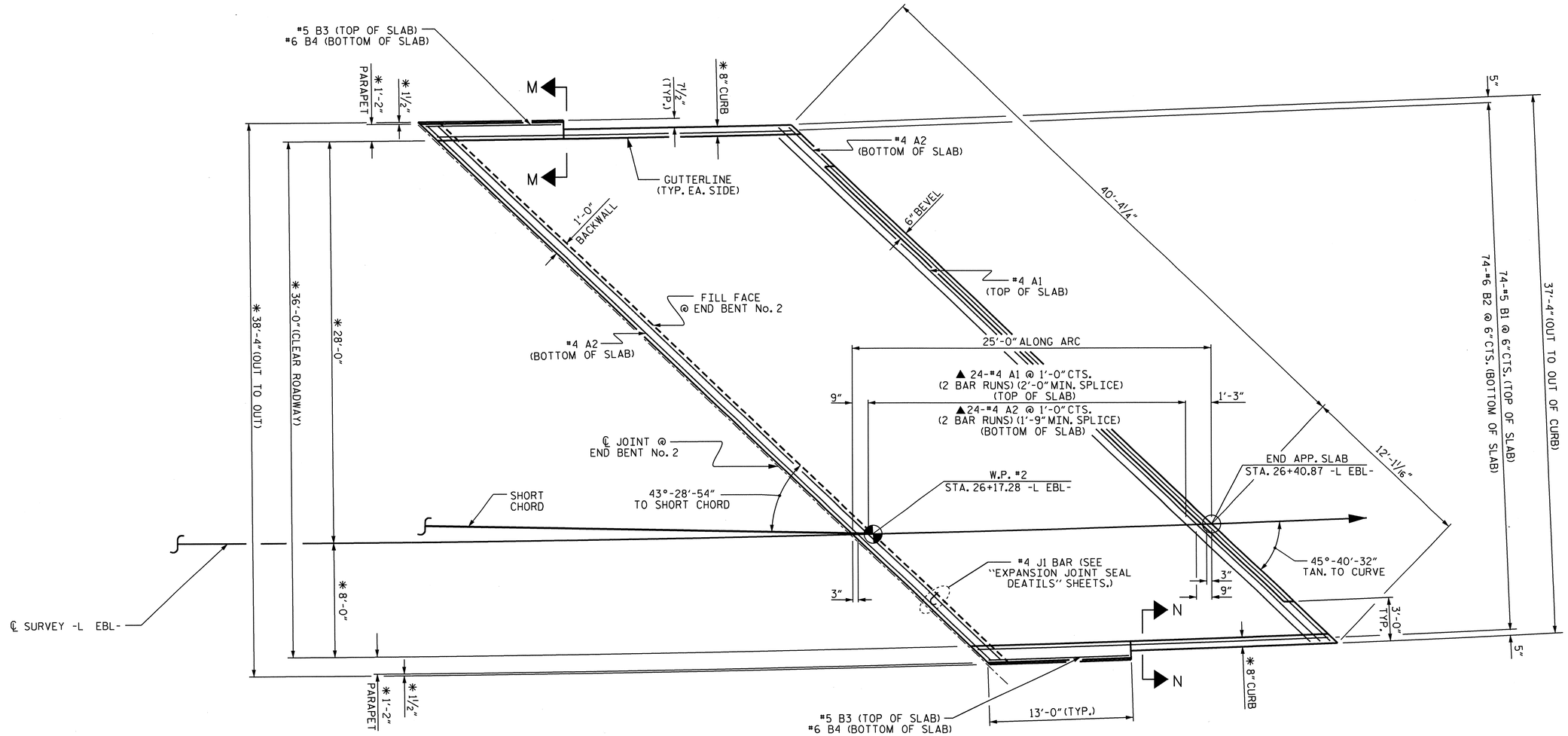
END BENT No. 1 BRIDGE APPROACH SLAB AND ARC OFFSETS

NORTH CAROLINA PROFESSIONAL SEAL 029441 ENGINEER KRISTY W. ALFORD

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			31

DRAWN BY : A.V. ROYAL DATE : 06/11
CHECKED BY : D. G. ELY DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:01
V:\Structures\Plans\Misc.draw\B-4946_SD_AS.dgn
kaford

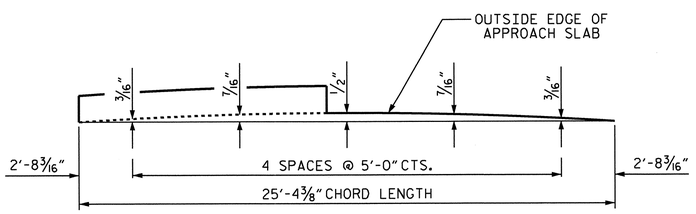


NOTES:
* MEASURED RADIALLY

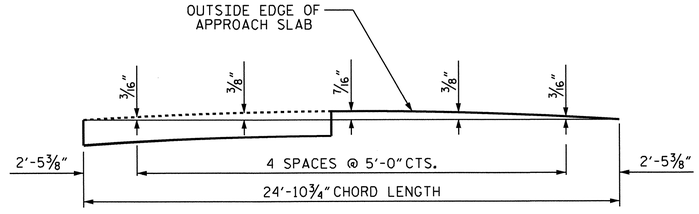
▲ "A" BARS ARE PLACED PARALLEL TO FILL FACE

PLAN @ END BENT No. 2

NOTE:
SEE SHEET 3 OF 3 FOR SECTION N AND M



LEFT SIDE



RIGHT SIDE

ARC OFFSETS @ END BENT No. 2

PROJECT NO. B-4946
WAKE COUNTY
STATION: 25+71.28 -L EBL-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

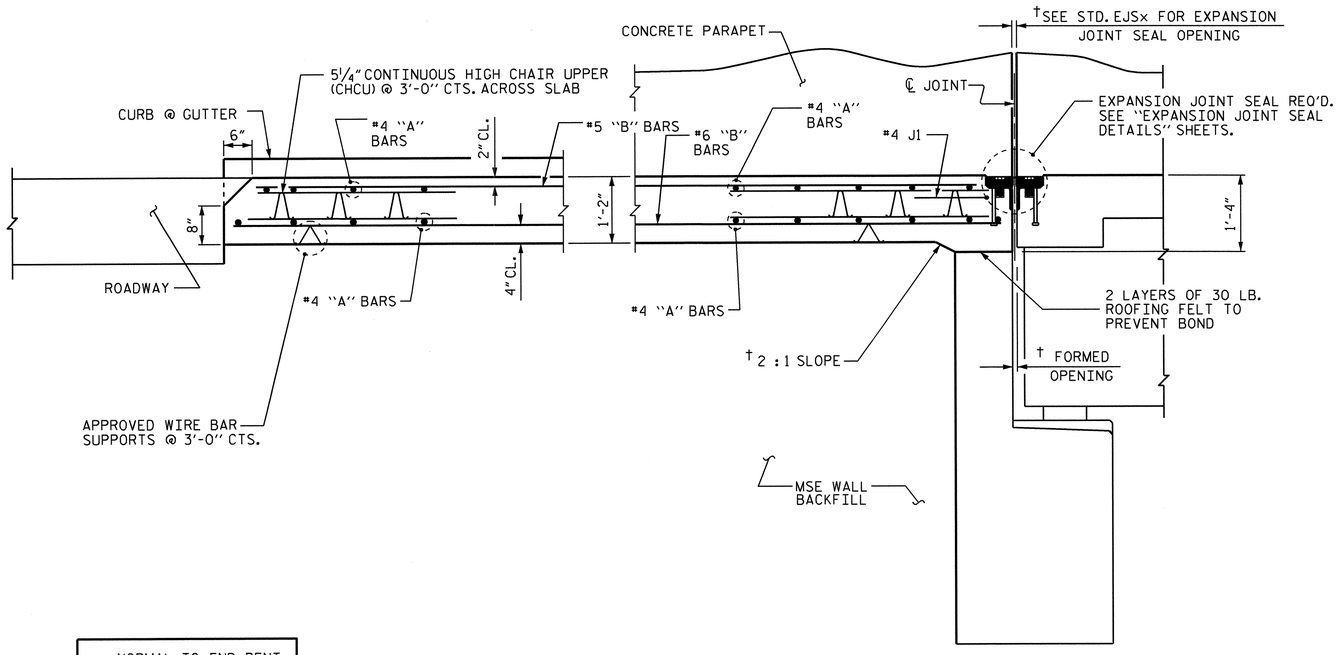
END BENT No. 2 BRIDGE APPROACH SLAB AND ARC OFFSETS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			S-31

NORTH CAROLINA PROFESSIONAL SEAL 032441 ENGINEER KRISTY W. ALFORD

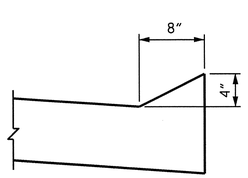
DRAWN BY : A.V. ROYAL DATE : 06/11
CHECKED BY : D. G. ELY DATE : 06/11
DESIGN ENGINEER OF RECORD: T.M. GARRISON, P.E. DATE : 1-8-13

19-FEB-2013 10:01
V:\Structures\Plans\Misc_draw\B-4946_SD_AS.dgn
kalford

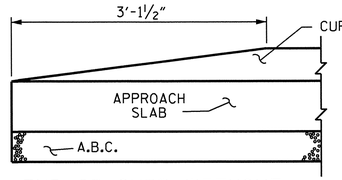


NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

NOTES

FOR MSE WALL BACKFILL, SEE SHEET W-2.

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

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

FOR TWO BAR METAL RAIL QUANTITIES AND DETAILS, SEE "2 BAR METAL RAIL" SHEET.

FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET.

FOR PARAPET AND END POST DETAILS, SEE "CONCRETE PARAPET AND END POST" SHEET.

FOR REINFORCING STEEL IN PARAPET QUANTITIES AND DETAILS, SEE "CONCRETE PARAPET DETAILS" SHEET.

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

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

APPROACH SLAB AT EB No. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	50	#4	STR	28'-5"	949
A2	52	#4	STR	28'-4"	984
✳ B1	74	#5	STR	23'-10"	1840
B2	74	#6	STR	24'-8"	2742
✳ B3	8	#5	STR	8'-1"	67
B4	8	#6	STR	8'-1"	97
✳ J1	53	#4	1	1'-5"	50

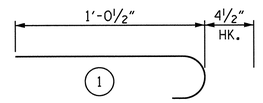
REINFORCING STEEL	=	3823 LBS
✳ EPOXY COATED REINFORCING STEEL	=	2906 LBS
CLASS AA CONCRETE	=	41.3 C.Y.

APPROACH SLAB AT EB No. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	50	#4	STR	28'-5"	949
A2	52	#4	STR	28'-4"	984
✳ B1	74	#5	STR	23'-10"	1840
B2	74	#6	STR	24'-8"	2742
✳ B3	8	#5	STR	8'-1"	67
B4	8	#6	STR	8'-1"	97
✳ J1	53	#4	1	1'-5"	50

REINFORCING STEEL	=	3823 LBS
✳ EPOXY COATED REINFORCING STEEL	=	2906 LBS
CLASS AA CONCRETE	=	41.3 C.Y.

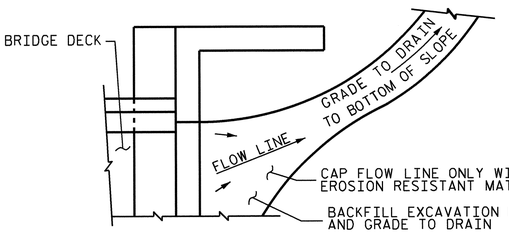
BAR TYPES



ALL BAR DIMENSION ARE OUT TO OUT

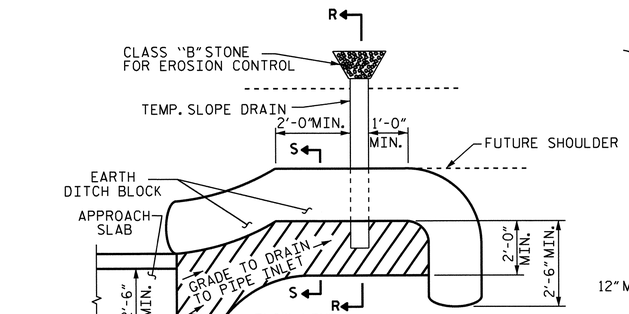
THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

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



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

TEMPORARY DRAINAGE DETAIL



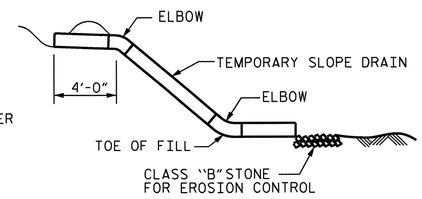
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW

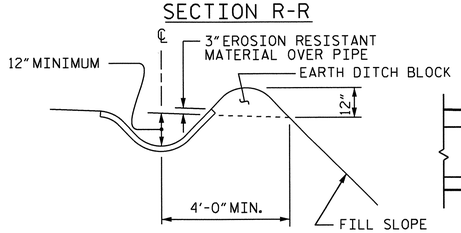
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

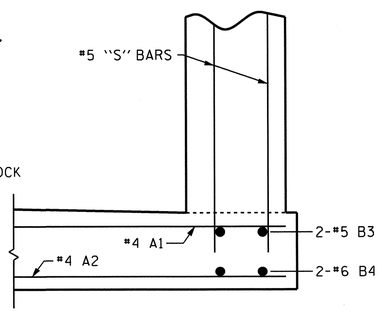
CURB DETAILS



SECTION R-R



SECTION S-S



SECTION M-M

PROJECT NO. B-4946

WAKE COUNTY

STATION: 25+71.28 -L EBL-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT WITH CONCRETE PARAPET

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

ASSEMBLED BY : A. V. ROYAL	DATE : 06/11		
CHECKED BY : D. G. ELY	DATE : 06/11		
DRAWN BY : LES 8/01	REV. 5/7/03R	RWW/JTE	
CHECKED BY : RDR 8/01	REV. 5/1/06RR	KMM/GM	
	REV. 10/1/11	MAA/GM	

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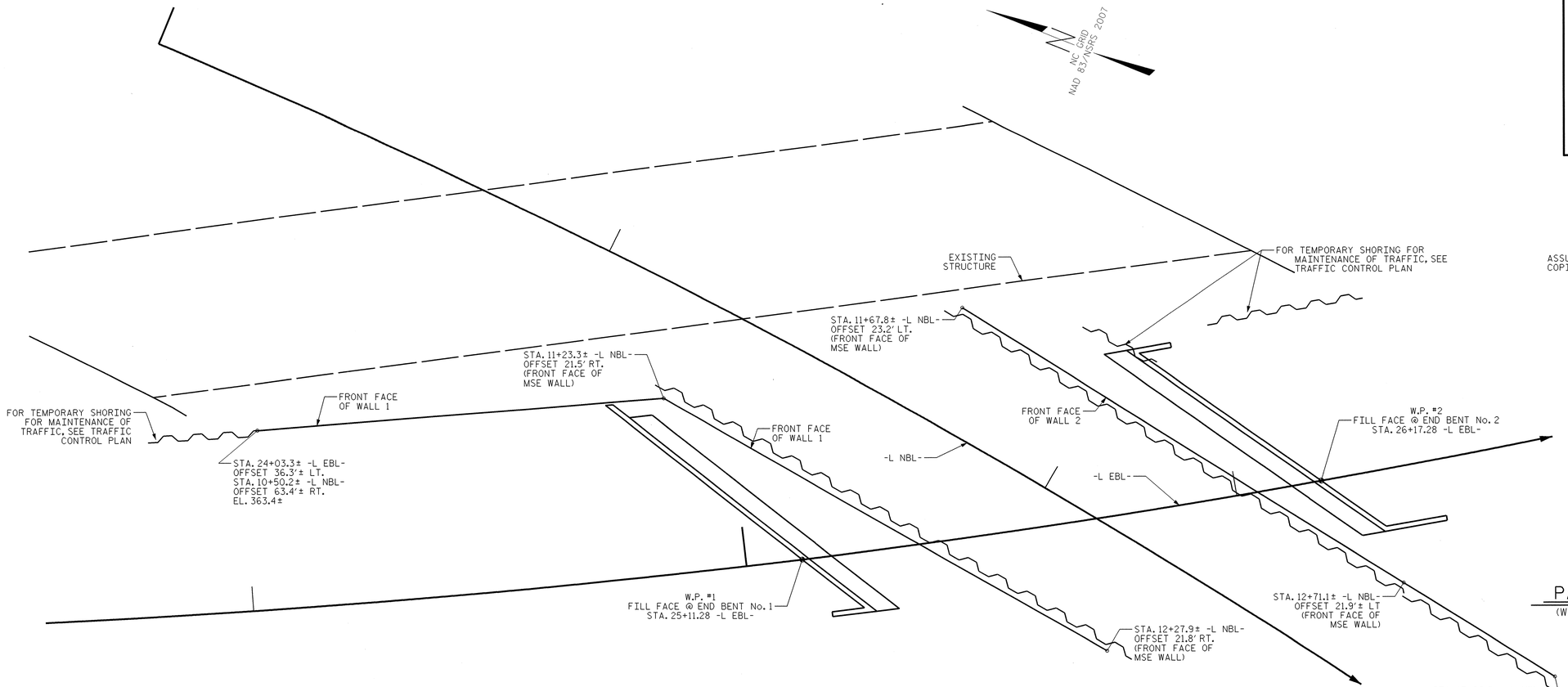
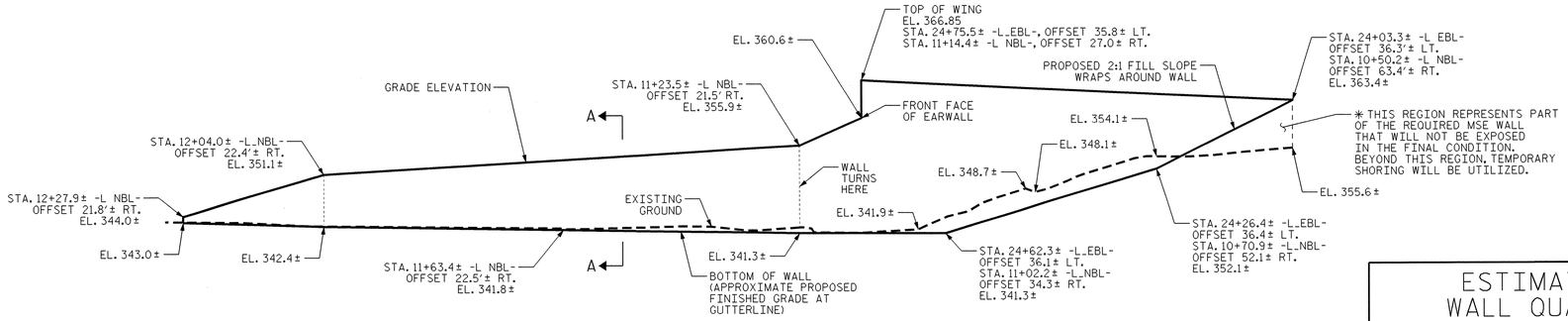
kalford

STD. NO. BAS2 (SHT 4a)

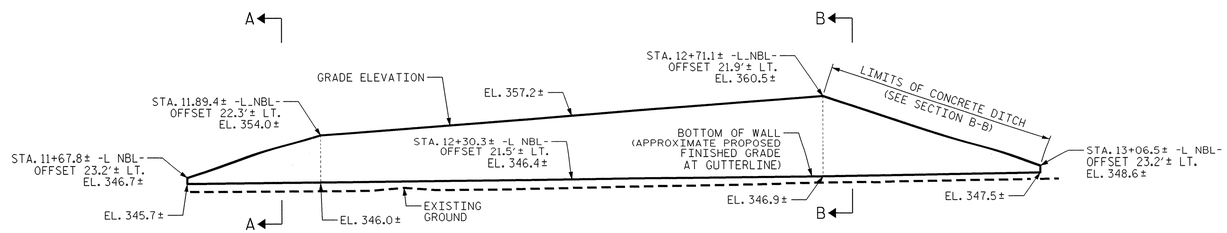
GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG 2-4-2013	
SIGNATURE DATE	SIGNATURE DATE



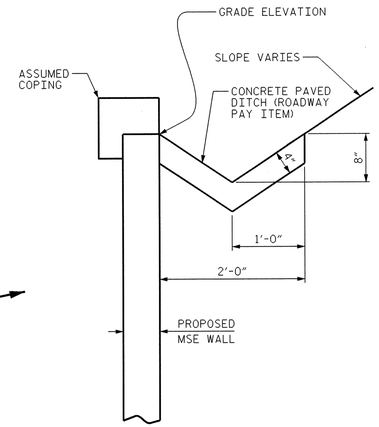
MSE RETAINING WALL NO. 1 AND NO. 2 - PLAN VIEW (NTS)



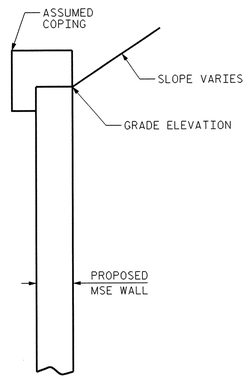
MSE RETAINING WALL NO. 1 ENVELOPE (NTS)



MSE RETAINING WALL NO. 2 ENVELOPE (NTS)



PART SECTION B-B
(WITH CONCRETE PAVED DITCH)



PART SECTION A-A
(WITHOUT CONCRETE PAVED DITCH)

ESTIMATED MSE WALL QUANTITIES
(SQUARE FEET)

MSE RETAINING WALL NO. 1	2465 SF
MSE RETAINING WALL NO. 2	1335 SF

* ADDITIONAL 75 SF ± MSE WALL WILL BE BURIED AND NOT BE MEASURED FOR PAYMENT. SEE MSE WALL NO. 1 ENVELOPE FOR LOCATIONS.

PROJECT NO.: B-4946

WAKE ***COUNTY***

STATION: VARIES

SHEET 1 OF 3

PREPARED BY: S. ZHANG	DATE: 01/2013
REVIEWED BY: J. BATTS	DATE: 01/2013

GEOTECHNICAL ENGINEERING UNIT

- [X] ***EASTERN REGIONAL OFFICE***
- [ ] ***WESTERN REGIONAL OFFICE***
- [ ] ***CONTRACT OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL NO. 1 & 2 LOCATIONS AND WALL ENVELOPES

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

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG	
2-27-2013	
SIGNATURE DATE	SIGNATURE DATE

NOTES:

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

FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.

FOR SINGLE FACED PRECAST CONCRETE BARRIER, SEE ROADWAY PLANS AND SECTION 857 OF THE STANDARD SPECIFICATIONS.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS THAT MEET SECTION 1077 OF THE STANDARD SPECIFICATIONS FOR RETAINING WALL NO. 1 & NO. 2.

USE RECTANGULAR PANELS WITH A TEXTURE DIMENSIONED ON THE FRONT FACE OF THE PANELS AS SHOWN ON THE PLANS FOR RETAINING WALLS NO 1 & NO. 2. ANY DEVIATION OF THE SURFACE DETAIL DIMENSIONS AS SHOWN ON THE PLANS SHALL BE APPROVED BY THE ENGINEER.

CAST-IN-PLACE REINFORCED CONCRETE COPING IS REQUIRED FOR RETAINING WALL NO. 1 & NO. 2.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 1 & NO. 2.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1 & NO. 2, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

DESIGN RETAINING WALL NO._FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 7000 LB/SF
4) MINIMUM REINFORCEMENT LENGTH (L) TO WALL HEIGHT (H) RATIO = 0.8
5) AGGREGATE PARAMETERS:

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

6) IN-SITU ASSUMED MATERIAL PARAMETERS:

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

DESIGN RETAINING WALL NO. 1 & 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 AND NO. 2 LOCATED AT STATION 25+11.28 -L EBL- AND 26+40.87 -L EBL-, RESPECTIVELY. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

DESIGN REINFORCEMENT CONNECTED TO LEFT SIDE WING WALL AT END BENT NO. 1 AND RIGHT SIDE WING WALL AT END BENT NO. 2 FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_a) SHOWN. CAST REINFORCEMENT CONNECTORS INTO WING WALLS AND MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN WING WALL.

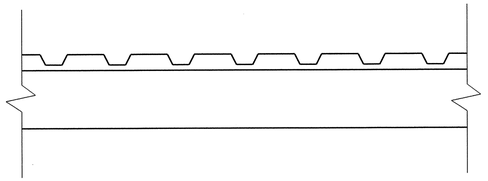
EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 AND NO. 2.

FOUNDATIONS FOR END BENT NO. 1 & NO. 2 LOCATED AT STA. 25+11.28 -L EBL- AND 26+40.87 -L EBL-, RESPECTIVELY WILL INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1 AND NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

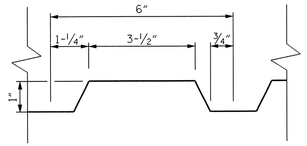
DO NOT PLACE LEVELING PAD CONCRETE, AGGREGATE OR REINFORCEMENT FOR RETAINING WALL NO. 1 AND NO. 2 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

"TEMPORARY SHORING" IS REQUIRED FOR RETAINING WALL NO. 1 AND NO. 2 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE TRAFFIC CONTROL PLANS.

AT THE CONTRACTOR'S OPTION, "TEMPORARY SHORING FOR WALL CONSTRUCTION" MAY BE USED TO CONSTRUCT RETAINING WALL NO. 1 AND NO. 2. SEE MSE RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.

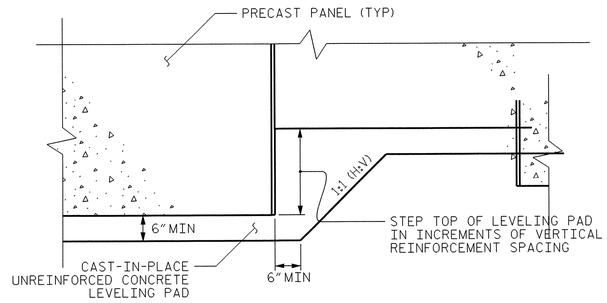


PLAN VIEW (NTS)



SURFACE DETAILS

WALL PANEL FINISH DETAILS



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PREPARED BY: S. ZHANG	DATE: 02/2013
REVIEWED BY: J. BATTS	DATE: 02/2013

PROJECT NO.: B-4946
WAKE ***COUNTY***
STATION: VARIES
SHEET 2 OF 3

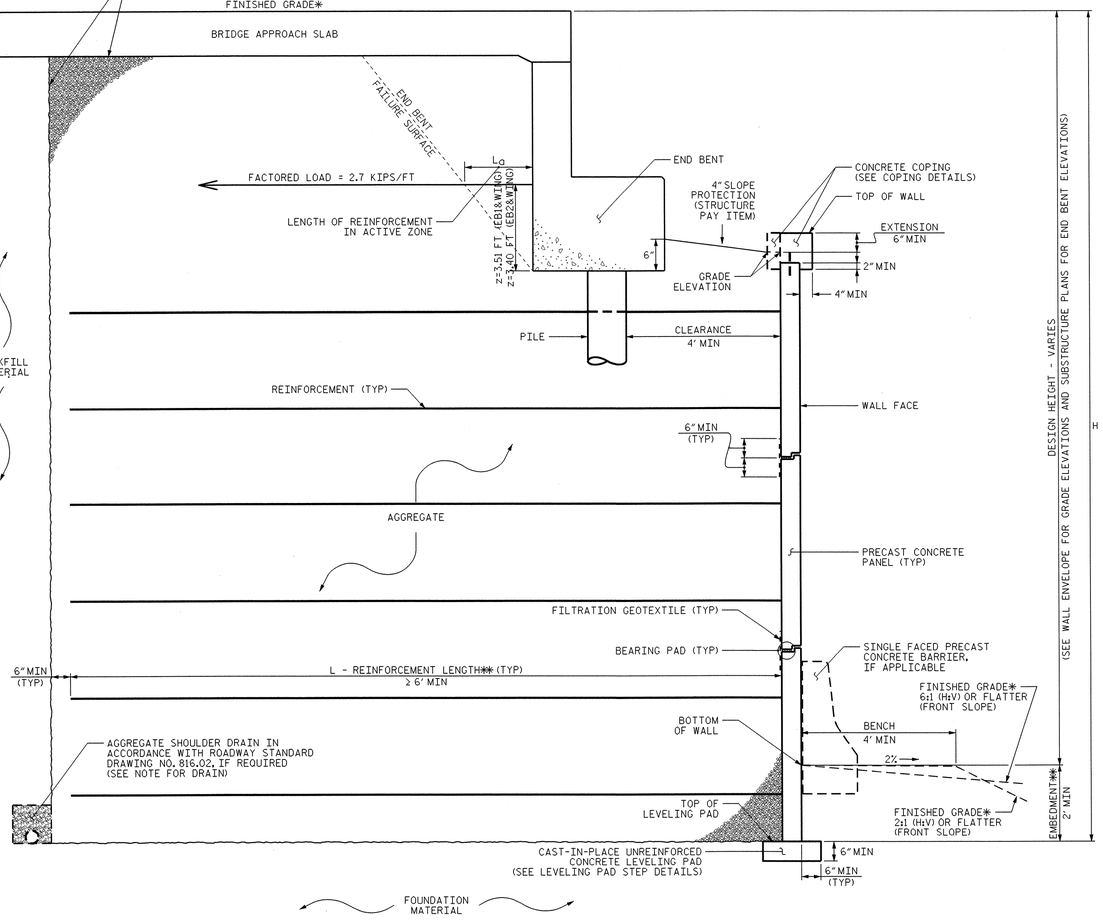
GEOTECHNICAL ENGINEERING UNIT
[X] ***EASTERN REGIONAL OFFICE***
[ ] ***WESTERN REGIONAL OFFICE***
[ ] ***CONTRACT OFFICE***
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL NO. 1 & 2
NOTES AND DETAILS

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

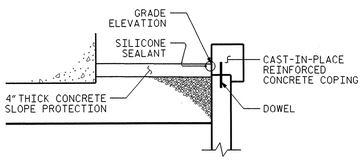
GEJ266087 2/27/2013 B-4946_Geo_Rwall szhang2 RD-Oce860-34

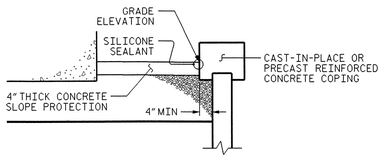
GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER SHIHAI ZHANG 2-4-2013	
SIGNATURE DATE	SIGNATURE DATE



MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

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

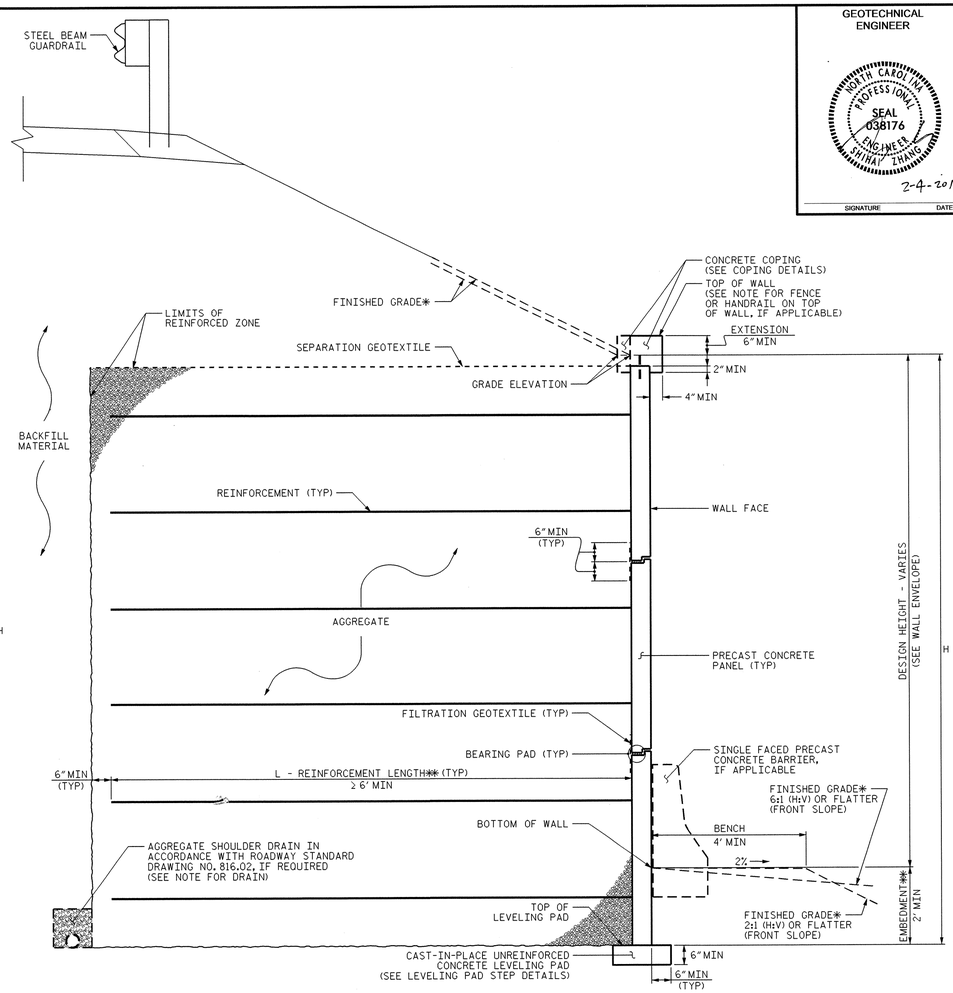




COPING DETAILS

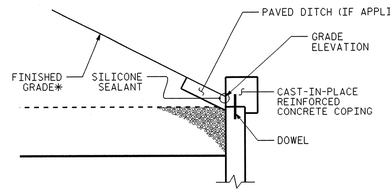
AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.

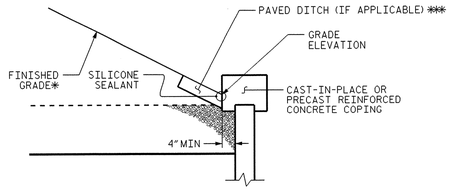
PREPARED BY: S. ZHANG	DATE: 01/2013
REVIEWED BY: J. BATTS	DATE: 01/2013



MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

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





COPING DETAILS

AT THE CONTRACTOR'S OPTION, CONNECT COPING TO PANELS WITH DOWELS OR EXTEND COPING DOWN BACK OF PANELS.
*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.
***SEE "MSE RETAINING WALL NO. 1 & 2 LOCATIONS AND WALL ENVELOPES" PLAN SHEET FOR DITCH DETAILS.

PROJECT NO.: B-4946
WAKE ***COUNTY***
STATION: VARIES
SHEET 3 OF 3

GEOTECHNICAL ENGINEERING UNIT
[X] ***EASTERN REGIONAL OFFICE***
[ ] ***WESTERN REGIONAL OFFICE***
[ ] ***CONTRACT OFFICE***
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

MSE RETAINING WALL NO. 1 & 2 TYPICAL DETAILS

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

GEJ266087 2/4/2013 B-4946_Geo_Rwall2 szhang2 RD-Oce860-34

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

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