TIP PROJECT: B-4640

CONTRACT: C202780

STRUCTURE

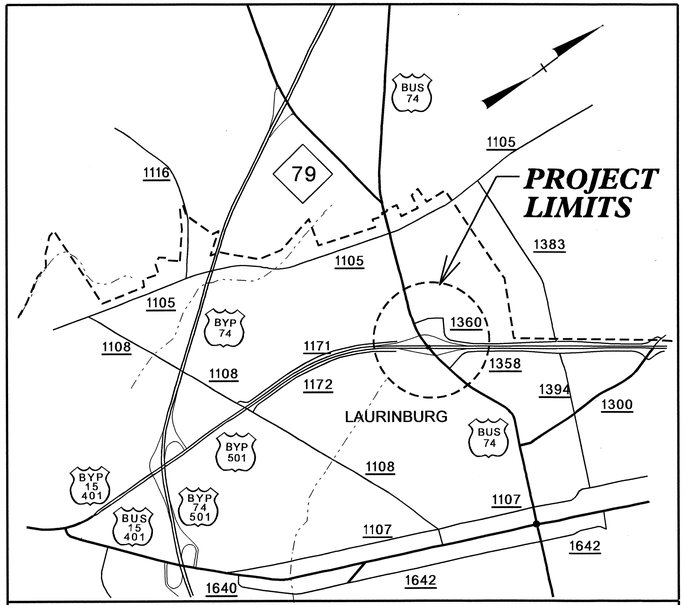
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4640		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
38450.1.1	BRNHS-15(19)	P.E.
38450.2.1	BRNHS-15(19)	UTIL. & R/W
38450.3.1	BRNHS-15(19)	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
SCOTLAND COUNTY

LOCATION: BRIDGE NO. 39 OVER US 74 BUSINESS AND NC 79 ON US 15-401-501

TYPE OF WORK: GRADING, DRAINAGE, PAVING & STRUCTURE

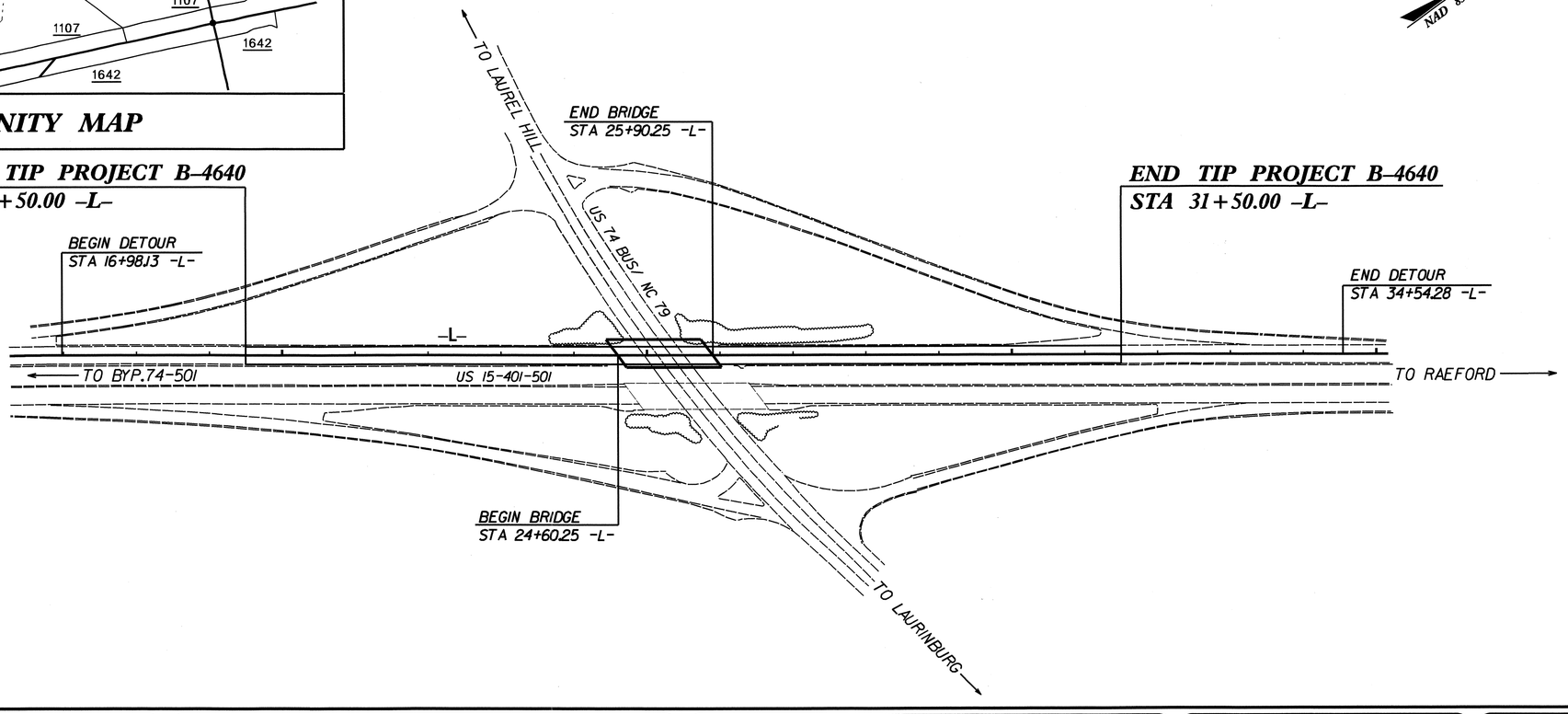


VICINITY MAP

NAD 83

BEGIN TIP PROJECT B-4640
STA 19+50.00 -L-

END TIP PROJECT B-4640
STA 31+50.00 -L-



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2012	=	8044
ADT 2032	=	13884
DHV	=	10 %
D	=	100 %
T	=	9 % *
V	=	60 MPH
CLASSIFICATION	=	ARTERIAL
* TTST 6%		DUAL 3%

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-4640	= 0.202 MILES
LENGTH OF STRUCTURE TIP PROJECT B-4640	= 0.025 MILES
TOTAL LENGTH OF TIP PROJECT B-4640	= 0.227 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE :

FEBRUARY 21, 2012

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

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

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

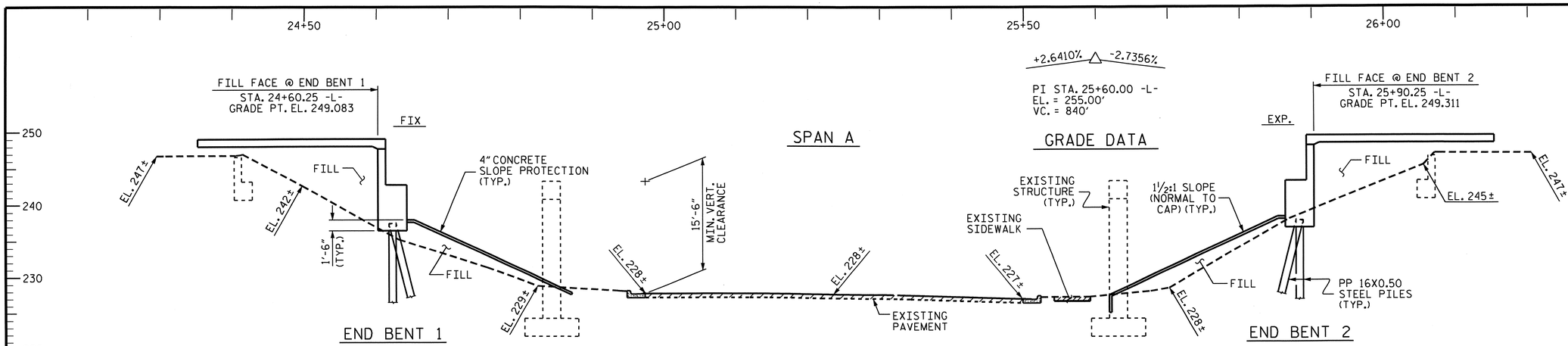
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

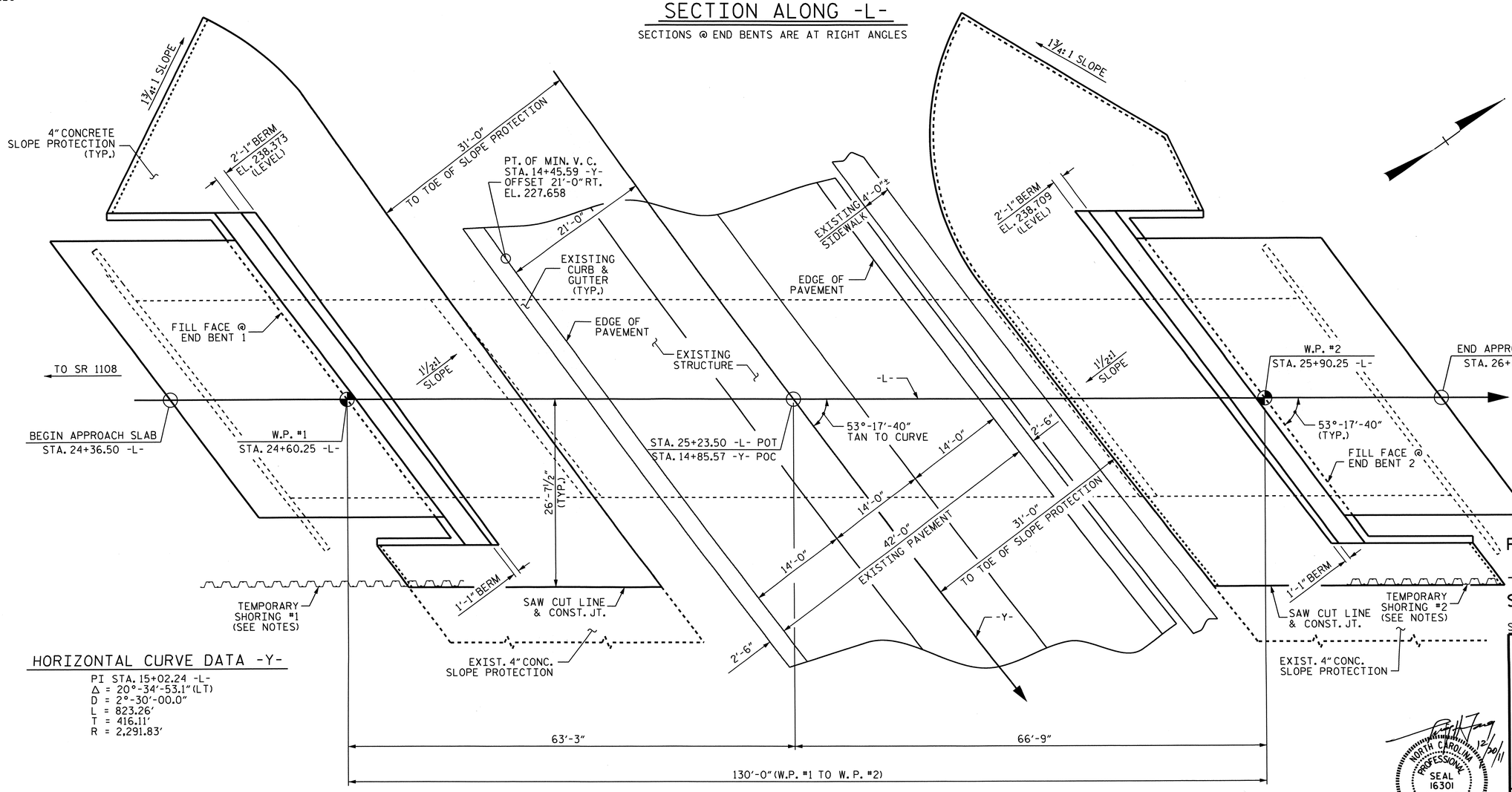
APPROVED
DIVISION ADMINISTRATOR *DATE*

F.A. PROJECT BRNHS-15(19)



SECTION ALONG -L-

SECTIONS @ END BENTS ARE AT RIGHT ANGLES



HORIZONTAL CURVE DATA -Y-

PI STA. 15+02.24 -L-
Δ = 20°-34'-53.1" (LT)
D = 2°-30'-00.0"
L = 823.26'
T = 416.11'
R = 2,291.83'

PLAN

(FOR CLARITY, PILES NOT SHOWN IN PLAN VIEW)

DRAWN BY : E.C. LOCKLEAR DATE : 4-3-09
CHECKED BY : T. H. FANG DATE : 4-21-09

20-DEC-2011 15:32
K:\TIPProjects-B\B4640\Structures\FinalPlans\B4640_sd_GD.dgn
ttfang

PROJECT NO. B-4640
SCOTLAND COUNTY
STATION: 25+23.50 -L- POT
14+85.57 -Y- POC
SHEET 1 OF 3
REPLACES BRIDGE #39

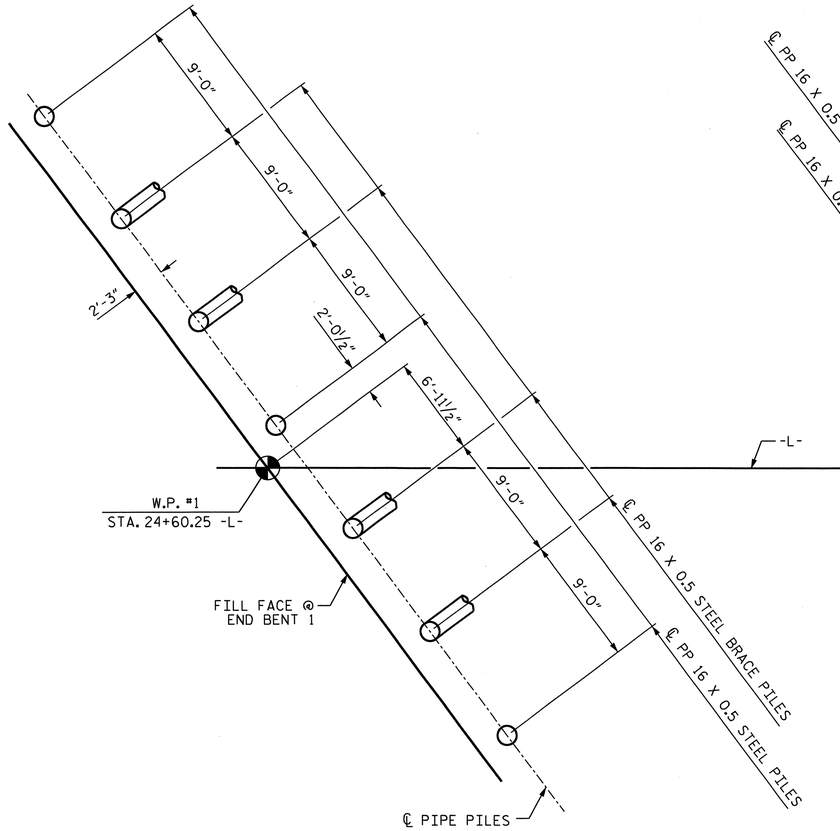
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

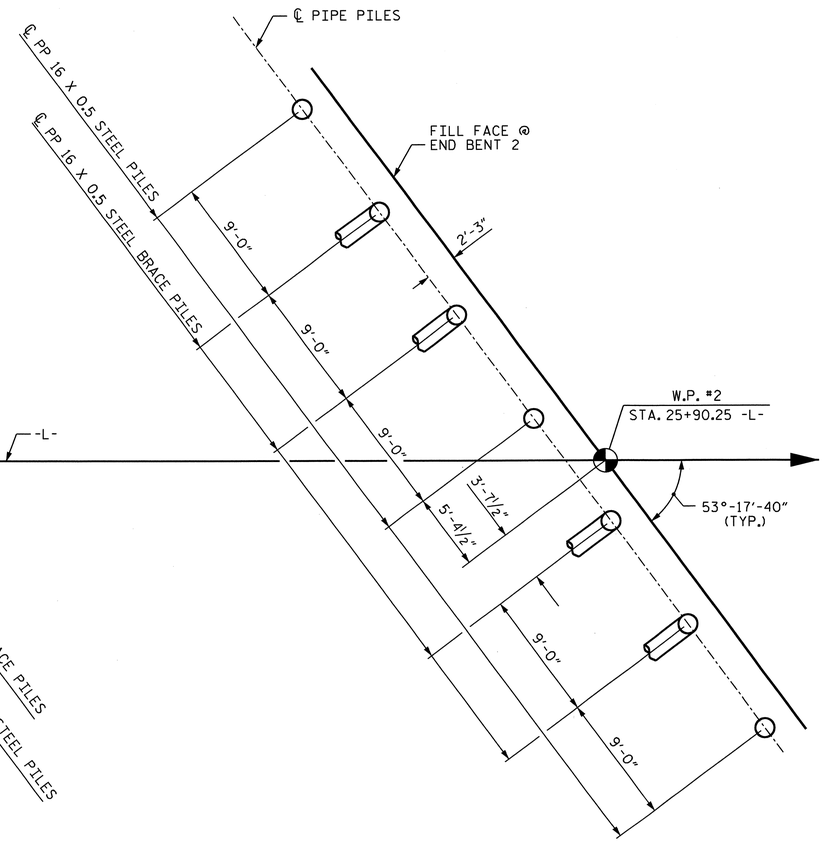
FOR BRIDGE ON US 15-401-501 OVER US 74 BUS. AND NC 79 BETWEEN SR 1108 & SR 1383

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILUNG FANG
12/20/11

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



END BENT 1



END BENT 2

-L-

FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE)

NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENTS 1 AND 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 130 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE.

TESTING PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PIPE PILE PLATES ARE REQUIRED FOR PIPE PILES AT END BENTS 1 AND 2. USE PIPE PILE PLATES WITH A DIAMETER EQUAL TO THE PIPE PILE DIAMETER. FOR STEEL PIPE PILE PLATES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
12/20/11

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 15-401-501 OVER US 74 BUS. AND NC 79 BETWEEN SR 1108 & SR 1383

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

DRAWN BY : E.C. LOCKLEAR DATE : 11-23-09
CHECKED BY : T. H. FANG DATE : 10-3-11

20-DEC-2011 11:19
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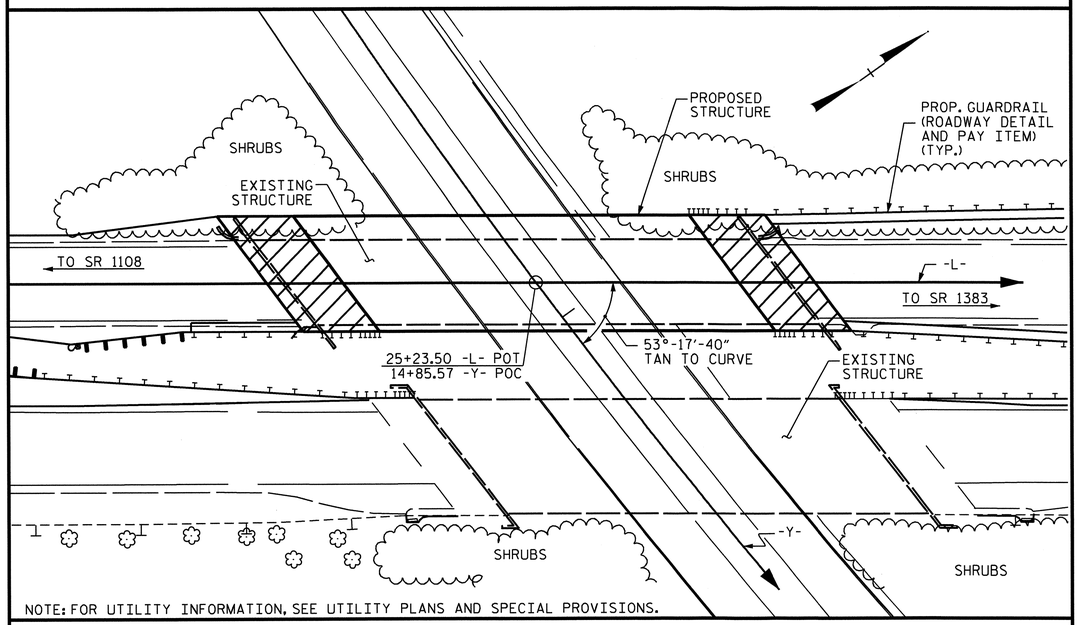
ttfang

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	STRUCTURAL STEEL	PP 16 X 0.50 STEEL PILES		PIPE PILE PLATES	PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	EACH	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	APPROX.LBS.	NO.	LIN.FT.	EACH	EACH	LIN.FT.	S.Y.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			5,253	6,056				159,750					296.94			
END BENT 1					72.5		8,644		7	315	7	7		230		
END BENT 2					71.7		8,586		7	385	7	7		245		
TOTAL	LUMP SUM	1	5,253	6,056	144.2	LUMP SUM	17,230	159,750	14	700	14	14	296.94	475	LUMP SUM	LUMP SUM

BM #2: R.R. SPIKE IN BASE OF POWER POLE, 401.22' LEFT OF STA. 22+54.11 -L-, EL. 228.45



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 BRIDGE DESIGN SPECIFICATIONS.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

IN AS MUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 25+23.50 -L-".

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS 1 @ 42'-4", 1 @ 79'-0" & 1 @ 45'-8", OF REINFORCING CONCRETE DECK ON I-BEAMS WITH CLEAR ROADWAY WIDTH 28.1 FT.; END BENTS: RC CAPS ON TIMBER PILES, INTERIOR BENTS: RC POSTS AND BEAM ON PILE FOOTINGS, AND LOCATED AT SITE OF PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

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

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.

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

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSILING FANG

12/22/11

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 15-401-501 OVER US 74 BUS. / NC 79 BETWEEN SR 1108 & SR 1383

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

DRAWN BY : E.C. LOCKLEAR DATE : 4-6-10
CHECKED BY : T. H. FANG DATE : 4-21-10

22-DEC-2011 16:49
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tfang

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	(1)	1.13	--	1.75	0.877	1.68	A	E	62.09	1.178	1.13	A	I	0.00	1.30	0.877	1.74	A	E	62.09	
		HL-93 (OPERATING)	N/A	--	1.47	--	1.35	0.877	2.18	A	E	62.09	1.178	1.47	A	I	0.00	1.00	0.877	2.26	A	E	62.09	
		HS-20 (INVENTORY)	36.00	(2)	1.41	50.88	1.75	0.877	2.14	A	E	62.09	1.178	1.41	A	I	0.00	1.30	0.877	2.21	A	E	62.09	
		HS-20 (OPERATING)	36.00	--	1.83	65.96	1.35	0.877	2.78	A	E	62.09	1.178	1.83	A	I	0.00	1.00	0.877	2.87	A	E	62.09	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	4.45	60.03	1.40	0.877	6.51	A	E	62.09	1.178	4.45	A	I	0.00	1.30	0.877	5.39	A	E	62.09	
		SNGARBS2	20.000	--	3.08	61.66	1.40	0.877	4.65	A	E	62.09	1.178	3.08	A	I	0.00	1.30	0.877	3.83	A	E	93.14	
		SNAGRIS2	22.000	--	2.83	62.34	1.40	0.877	4.32	A	E	62.09	1.178	2.83	A	I	0.00	1.30	0.877	3.54	A	E	93.14	
		SNCOTTS3	27.250	--	2.21	60.10	1.40	0.877	3.24	A	E	62.09	1.178	2.21	A	I	0.00	1.30	0.877	2.67	A	E	62.09	
		SNAGGRS4	34.925	--	1.78	62.12	1.40	0.877	2.62	A	E	62.09	1.178	1.78	A	I	0.00	1.30	0.877	2.17	A	E	62.09	
		SNS5A	35.550	--	1.78	63.23	1.40	0.877	2.57	A	E	62.09	1.178	1.78	A	I	0.00	1.30	0.877	2.12	A	E	62.09	
		SNS6A	39.950	--	1.60	63.95	1.40	0.877	2.32	A	E	62.09	1.178	1.60	A	I	0.00	1.30	0.877	1.92	A	E	62.09	
		SNS7B	42.000	--	1.54	64.74	1.40	0.877	2.22	A	E	62.09	1.178	1.54	A	I	0.00	1.30	0.877	1.83	A	E	62.09	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.92	63.39	1.40	0.877	2.82	A	E	62.09	1.178	1.92	A	I	0.00	1.30	0.877	2.34	A	E	62.09	
		TNT4A	33.075	--	1.90	62.75	1.40	0.877	2.83	A	E	62.09	1.178	1.90	A	I	0.00	1.30	0.877	2.34	A	E	62.09	
		TNT6A	41.600	--	1.60	66.59	1.40	0.877	2.29	A	E	62.09	1.178	1.60	A	I	0.00	1.30	0.877	1.89	A	E	62.09	
		TNT7A	42.000	--	1.58	66.23	1.40	0.877	2.28	A	E	62.09	1.178	1.58	A	I	0.00	1.30	0.877	1.89	A	E	62.09	
		TNT7B	42.000	--	1.53	64.24	1.40	0.877	2.32	A	E	62.09	1.178	1.53	A	I	0.00	1.30	0.877	1.92	A	E	62.09	
		TNAGRIT4	43.000	--	1.48	63.73	1.40	0.877	2.23	A	E	62.09	1.178	1.48	A	I	0.00	1.30	0.877	1.85	A	E	62.09	
		TNAGT5A	45.000	--	1.45	65.10	1.40	0.877	2.12	A	E	62.09	1.178	1.45	A	I	0.00	1.30	0.877	1.75	A	E	62.09	
		TNAGT5B	45.000	(3)	1.41	63.50	1.40	0.877	2.11	A	E	62.09	1.178	1.41	A	I	0.00	1.30	0.877	1.74	A	E	62.09	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75	--	--																			

LOAD FACTORS:

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

NOTES:

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

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93) **

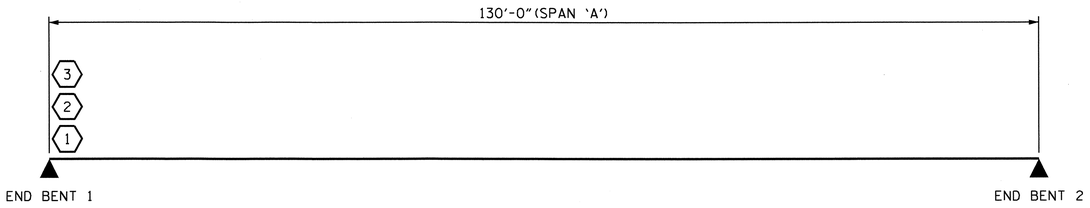
(2) DESIGN LOAD RATING (HS-20) **

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

11/15/2011

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR STEEL GIRDERS

(NON-INTERSTATE TRAFFIC)

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

STD. NO. LRFR3

ASSEMBLED BY : P. K. NEWTON	DATE : 6/4/2010
CHECKED BY : S. F. DOMBROWSKI	DATE : 7/12/2010
DRAWN BY : MAA 1/08	REV. 11/12/08RR MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11 MAA/GM

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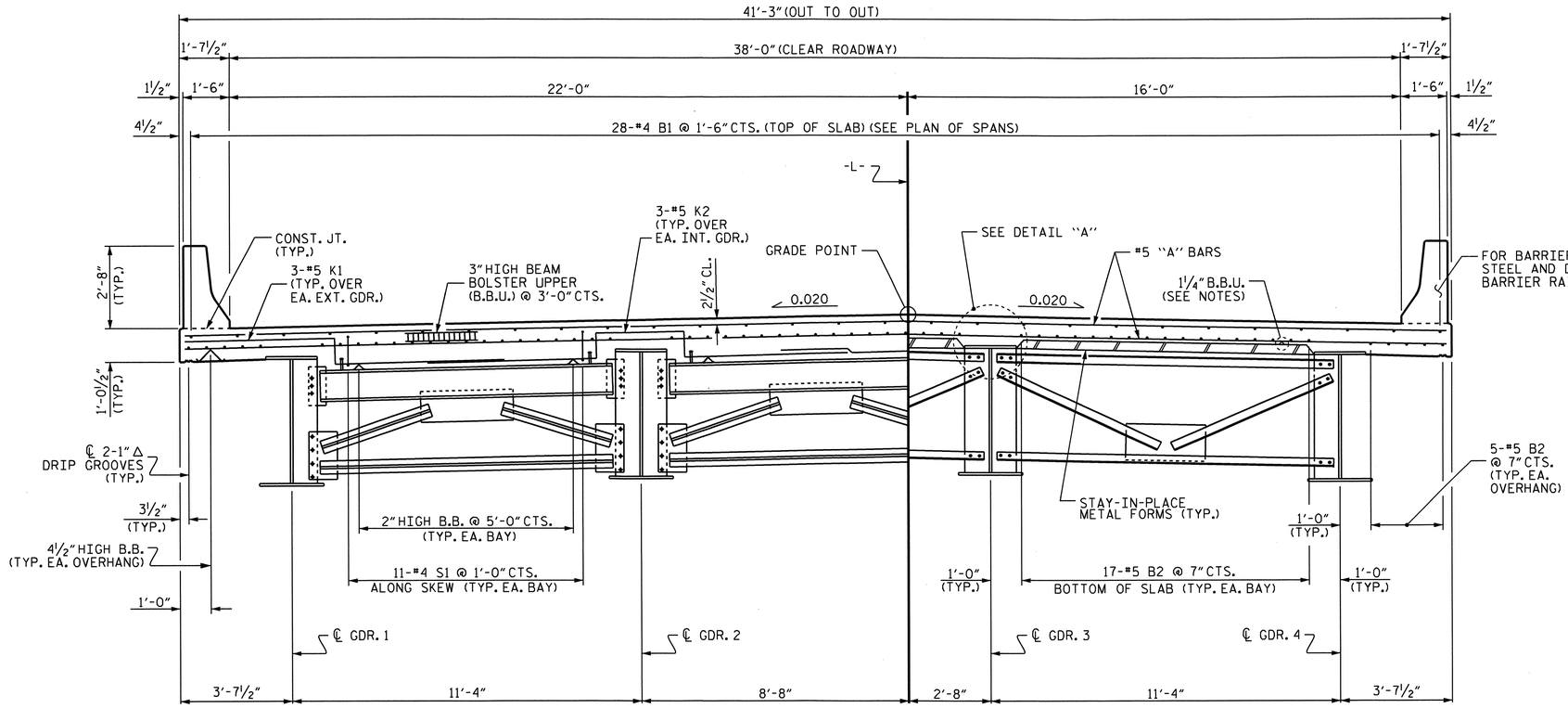
sbwilliams



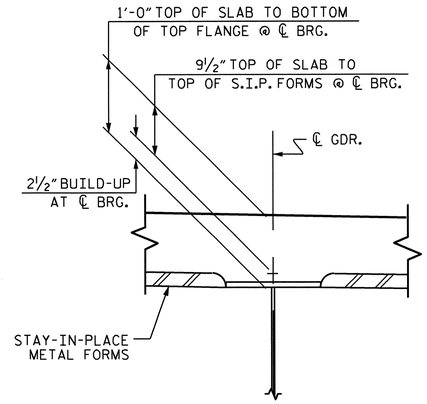
PARTIAL TYPICAL SECTION
(SHOWING END BENT DIAPHRAGMS)

PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

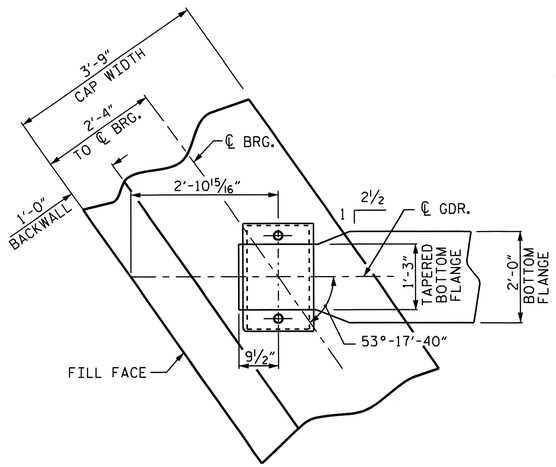
NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE STAY-IN-PLACE METAL 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.

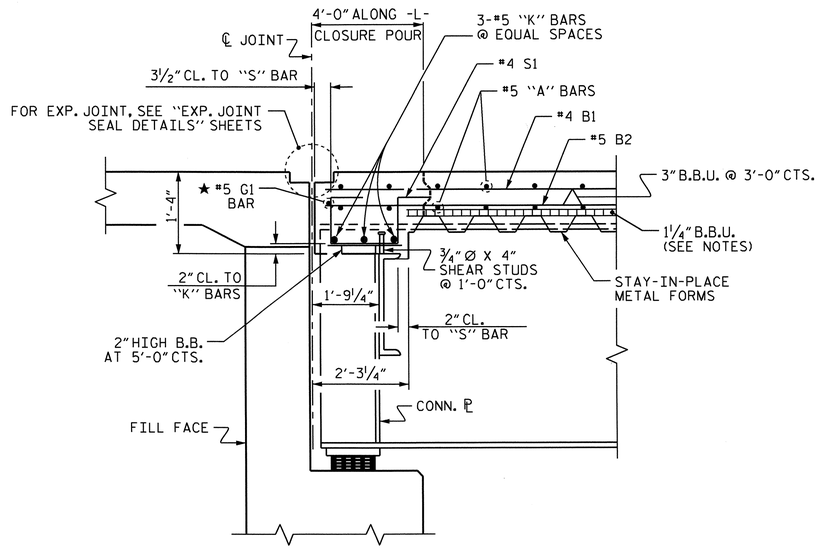
THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN STAY-IN-PLACE METAL FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE STAY-IN-PLACE METAL FORM WORKING DRAWINGS.



DETAIL "A"



PLAN OF GIRDER @ END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION @ END BENT

★ #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY TO CLEAR DIAPHRAGM AND REINFORCING STEEL.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
12/20/11

PROJECT NO. B-4640
SCOTLAND COUNTY
STATION: 25+23.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : E.C. LOCKLEAR DATE : 4-6-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

20-DEC-2011 12:06
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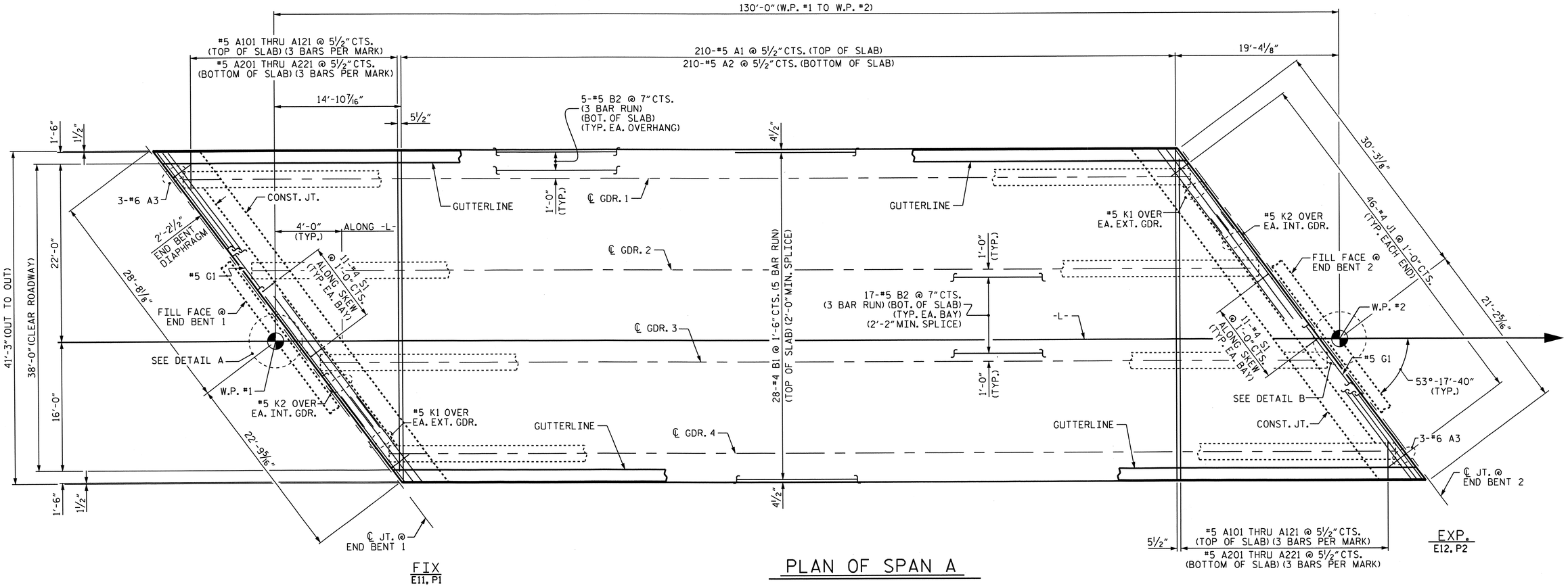
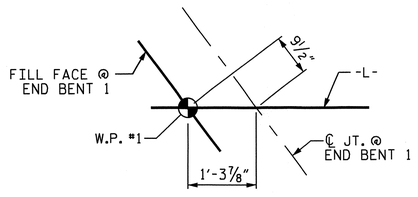
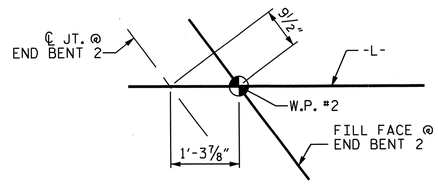
ttfang



PLAN OF SPAN A



DETAIL A



DETAIL B

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

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			25

DRAWN BY : E.C. LOCKLEAR DATE : 8-24-09
CHECKED BY : O.T. NGUYEN DATE : 7-10

20-DEC-2011 12:35
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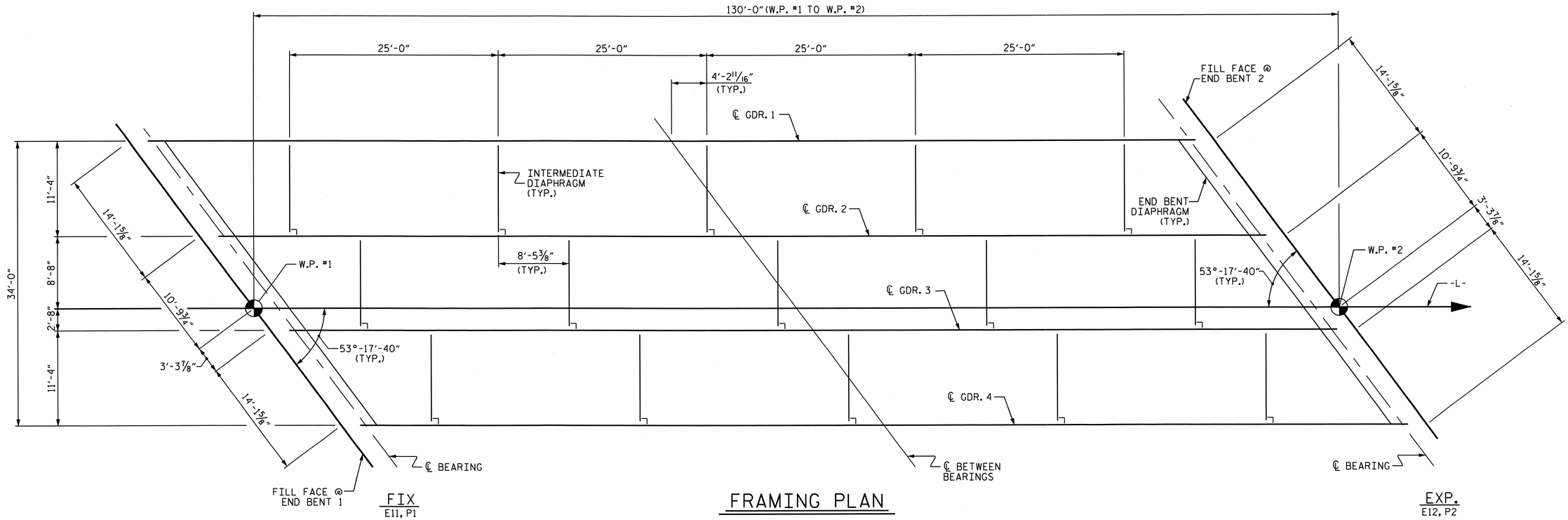
tfang



DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																				
	GIRDERS 1 & 4																				
TWENTIETH POINTS	BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.017	0.034	0.049	0.063	0.075	0.084	0.092	0.097	0.101	0.102	0.101	0.097	0.092	0.084	0.075	0.063	0.049	0.034	0.017	0
* DEFLECTION DUE TO WEIGHT OF SLAB	0	0.093	0.170	0.242	0.306	0.362	0.407	0.442	0.467	0.483	0.488	0.483	0.467	0.442	0.407	0.362	0.306	0.242	0.170	0.093	0
DEFLECTION DUE TO WEIGHT OF RAIL	0	0.006	0.011	0.016	0.021	0.025	0.028	0.030	0.032	0.033	0.034	0.033	0.032	0.030	0.028	0.025	0.021	0.016	0.011	0.006	0
TOTAL DEAD LOAD DEFLECTION	0	0.116	0.214	0.306	0.390	0.461	0.519	0.564	0.597	0.617	0.623	0.617	0.597	0.564	0.519	0.461	0.390	0.306	0.214	0.116	0
VERTICAL CURVE ORDINATE	0	0.023	0.044	0.063	0.079	0.093	0.104	0.112	0.118	0.122	0.123	0.122	0.118	0.112	0.104	0.093	0.079	0.063	0.044	0.023	0
REQUIRED CAMBER	0	1 11/16"	3 1/8"	4 7/16"	5 5/8"	6 5/8"	7 1/2"	8 1/8"	8 9/16"	8 7/8"	8 15/16"	8 7/8"	8 9/16"	8 1/8"	7 1/2"	6 5/8"	5 5/8"	4 7/16"	3 1/8"	1 11/16"	0
	GIRDERS 2 & 3																				
TWENTIETH POINTS	BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER	0	0.017	0.034	0.049	0.063	0.075	0.084	0.092	0.097	0.101	0.102	0.101	0.097	0.092	0.084	0.075	0.063	0.049	0.034	0.017	0
DEFLECTION DUE TO WEIGHT OF SLAB	0	0.090	0.164	0.233	0.295	0.348	0.391	0.425	0.449	0.464	0.469	0.464	0.449	0.425	0.391	0.348	0.295	0.233	0.164	0.090	0
DEFLECTION DUE TO WEIGHT OF RAIL	0	0.006	0.011	0.016	0.021	0.025	0.028	0.030	0.032	0.033	0.034	0.033	0.032	0.030	0.028	0.025	0.021	0.016	0.011	0.006	0
TOTAL DEAD LOAD DEFLECTION	0	0.113	0.208	0.297	0.378	0.447	0.503	0.547	0.579	0.598	0.605	0.598	0.579	0.547	0.503	0.447	0.378	0.297	0.208	0.113	0
VERTICAL CURVE ORDINATE	0	0.023	0.044	0.063	0.079	0.093	0.104	0.112	0.118	0.122	0.123	0.122	0.118	0.112	0.104	0.093	0.079	0.063	0.044	0.023	0
REQUIRED CAMBER	0	1 5/8"	3"	4 5/16"	5 1/2"	6 1/2"	7 5/16"	7 15/16"	8 3/8"	8 5/8"	8 3/4"	8 5/8"	8 3/8"	7 15/16"	7 5/16"	6 1/2"	5 1/2"	4 5/16"	3"	1 5/8"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " REQUIRED CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER T.NG HSIANG
11/14/11

PROJECT NO. B-4640
SCOTLAND COUNTY
STATION: 25+23.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
FRAMING PLAN & DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : E.C. LOCKLEAR DATE : 12-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

14-NOV-2011 10:02
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sbwilliams

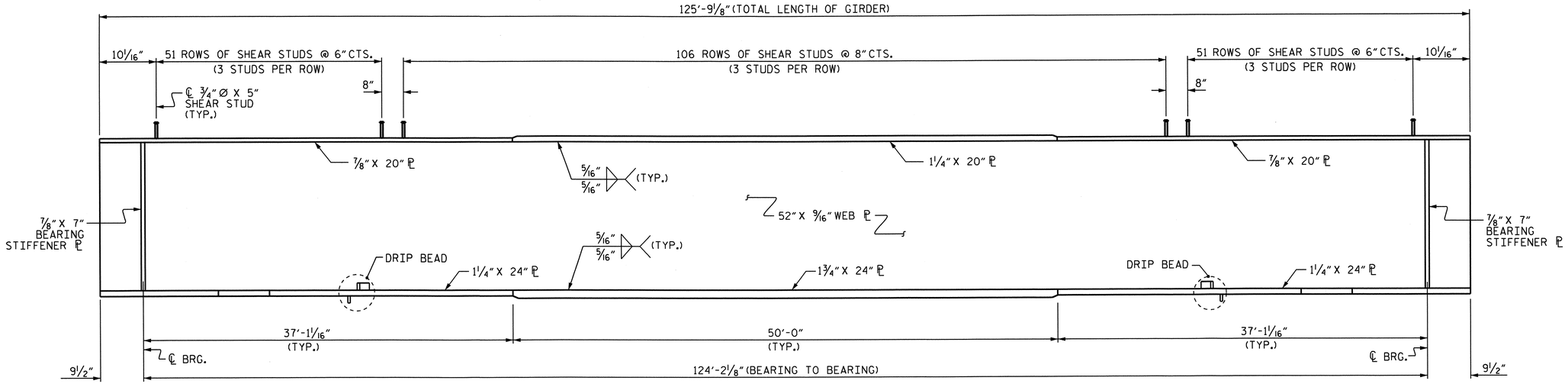
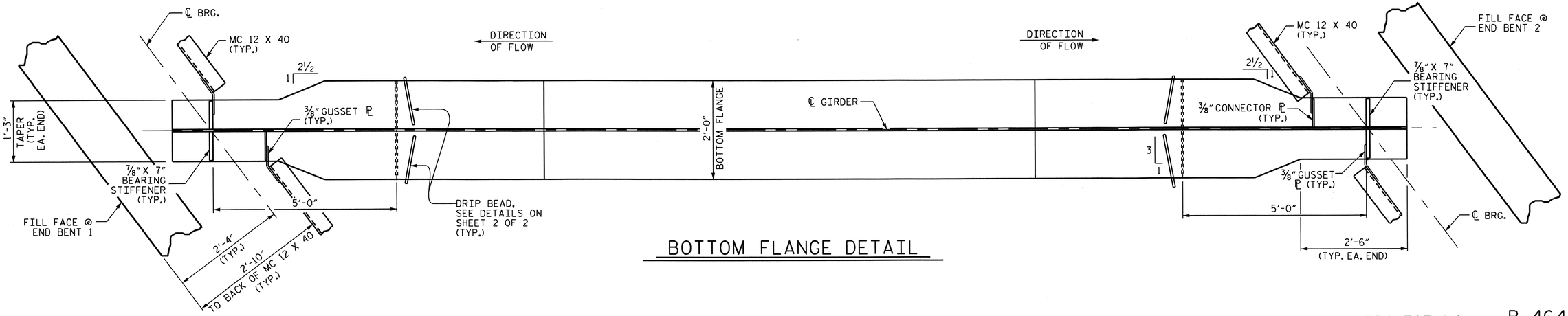
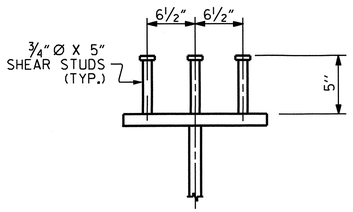


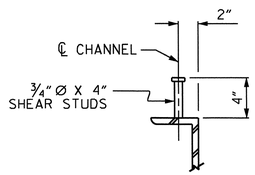
PLATE GIRDER ELEVATION



BOTTOM FLANGE DETAIL

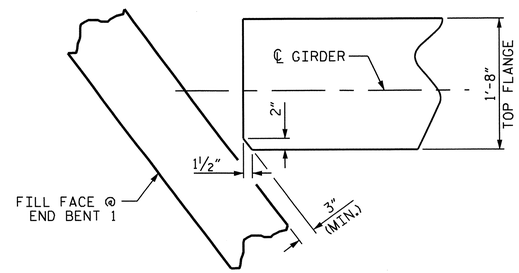


@ END EACH GIRDER



@ END BENT DIAPHRAGM

SHEAR STUD DETAILS



TOP FLANGE CLIP DETAILS
(END BENT 2 SIMILAR)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER THU H. TANG
12/21/11

PROJECT NO. B-4640
SCOTLAND COUNTY
STATION: 25+23.50 -L-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : P. K. NEWTON DATE : 4/8/10
CHECKED BY : Q.T. NGUYEN DATE : 8/2/10

21-DEC-2011 14:49
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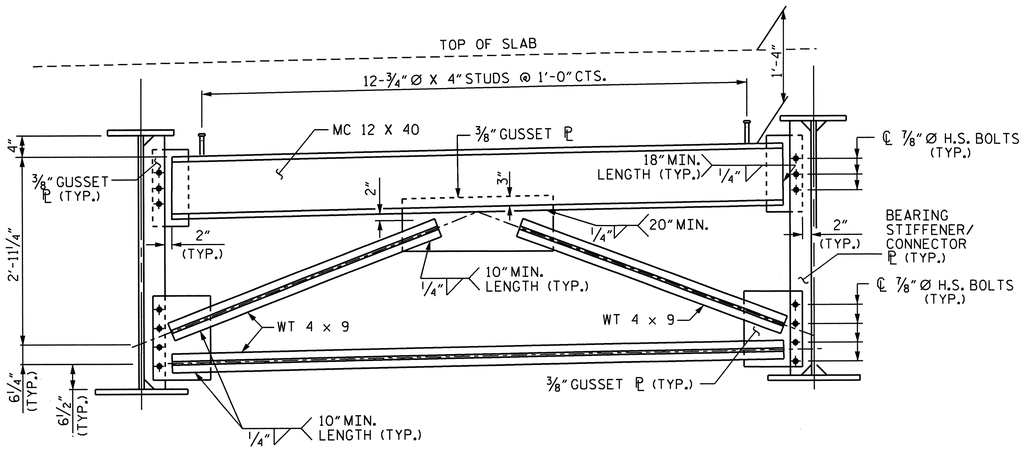
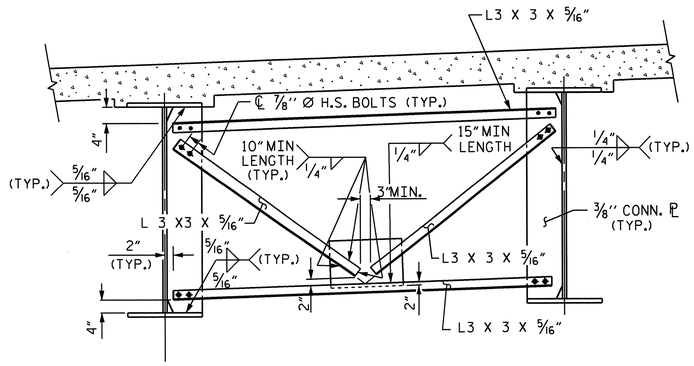
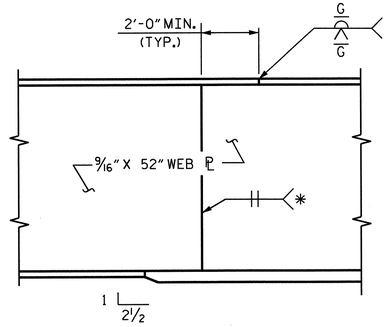
ttfang



END BENT DIAPHRAGM

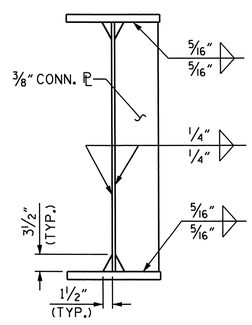


TYPICAL INTERMEDIATE DIAPHRAGM

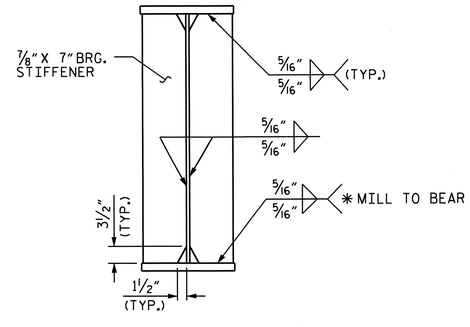


TYPICAL FLANGE AND WEB BUTT JOINT

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS



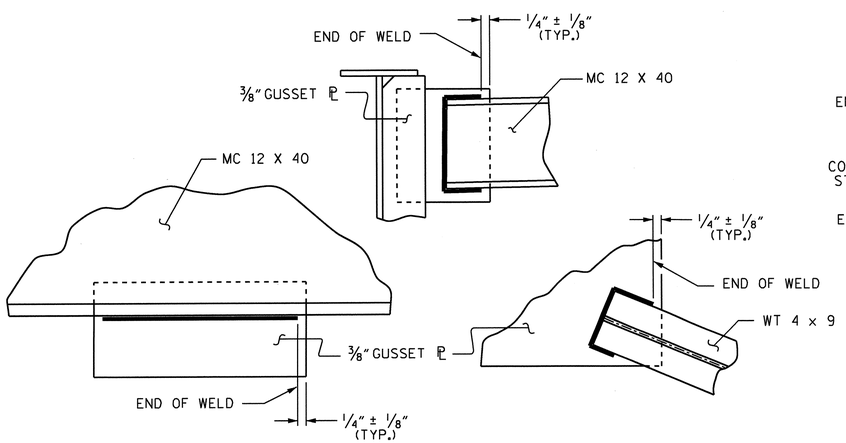
CONNECTOR PLATE DETAILS



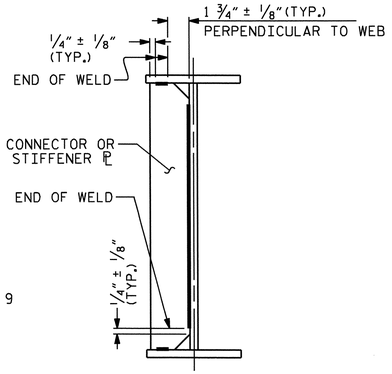
BEARING STIFFENER

NOTE: DO NOT CLIP PLATE AT TOP OUTSIDE CORNER OF STIFFENER PLATE.

* WELD TO BOTTOM FLANGE IS ONLY REQUIRED WHEN BEARING STIFFENER IS ALSO CONNECTOR PLATE

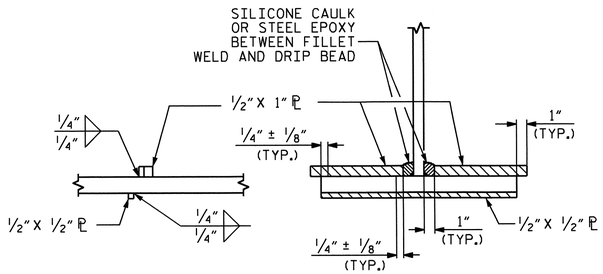


TYPICAL GUSSET PLATE CONNECTIONS



TYPICAL STIFFENER OR CONNECTOR PL CONNECTIONS

WELD TERMINATION DETAILS



SIDE VIEW SECTION

DRIP BEAD DETAILS

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION. KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL, UNLESS OTHERWISE NOTED.

ALL FIELD CONNECTIONS TO BE 7/8" DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES FOR ALL GIRDERS. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE TO AVOID INTERFERENCE WITH THE ANCHOR BOLT.

END OF GIRDERS SHALL BE PLUMB.

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : HARISH SHAH DATE : 12-09
CHECKED BY : QT NGUYEN DATE : 8-02-10

21-DEC-2011 14:56
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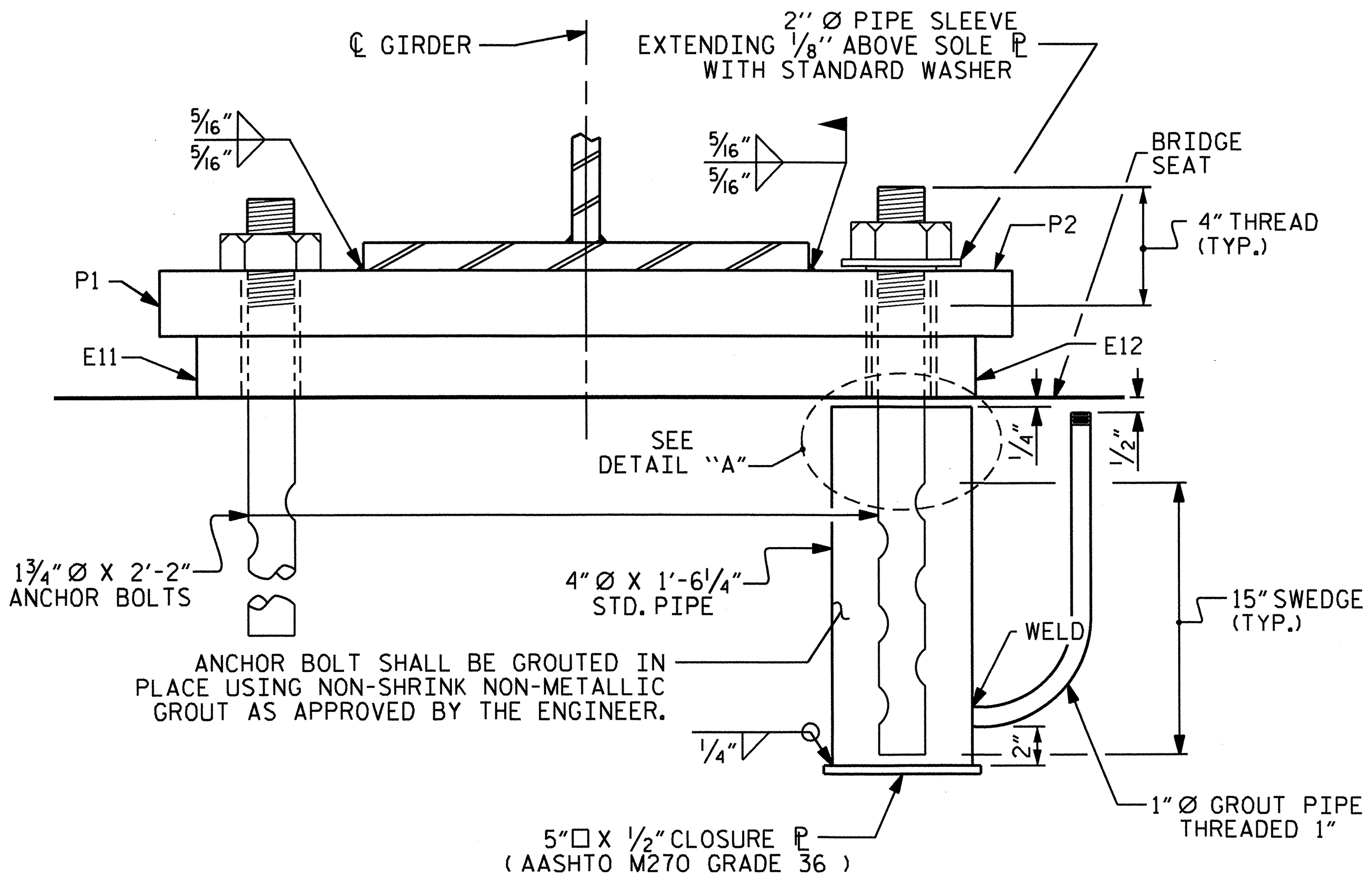
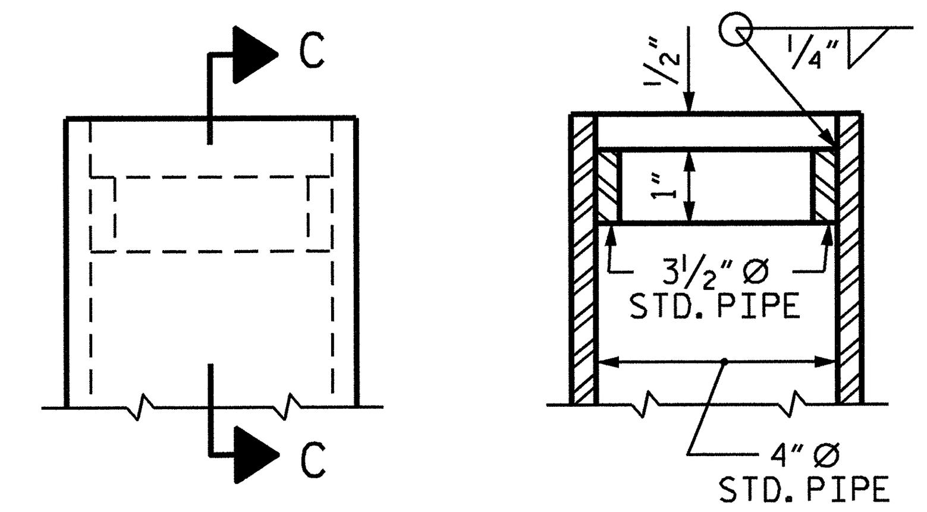
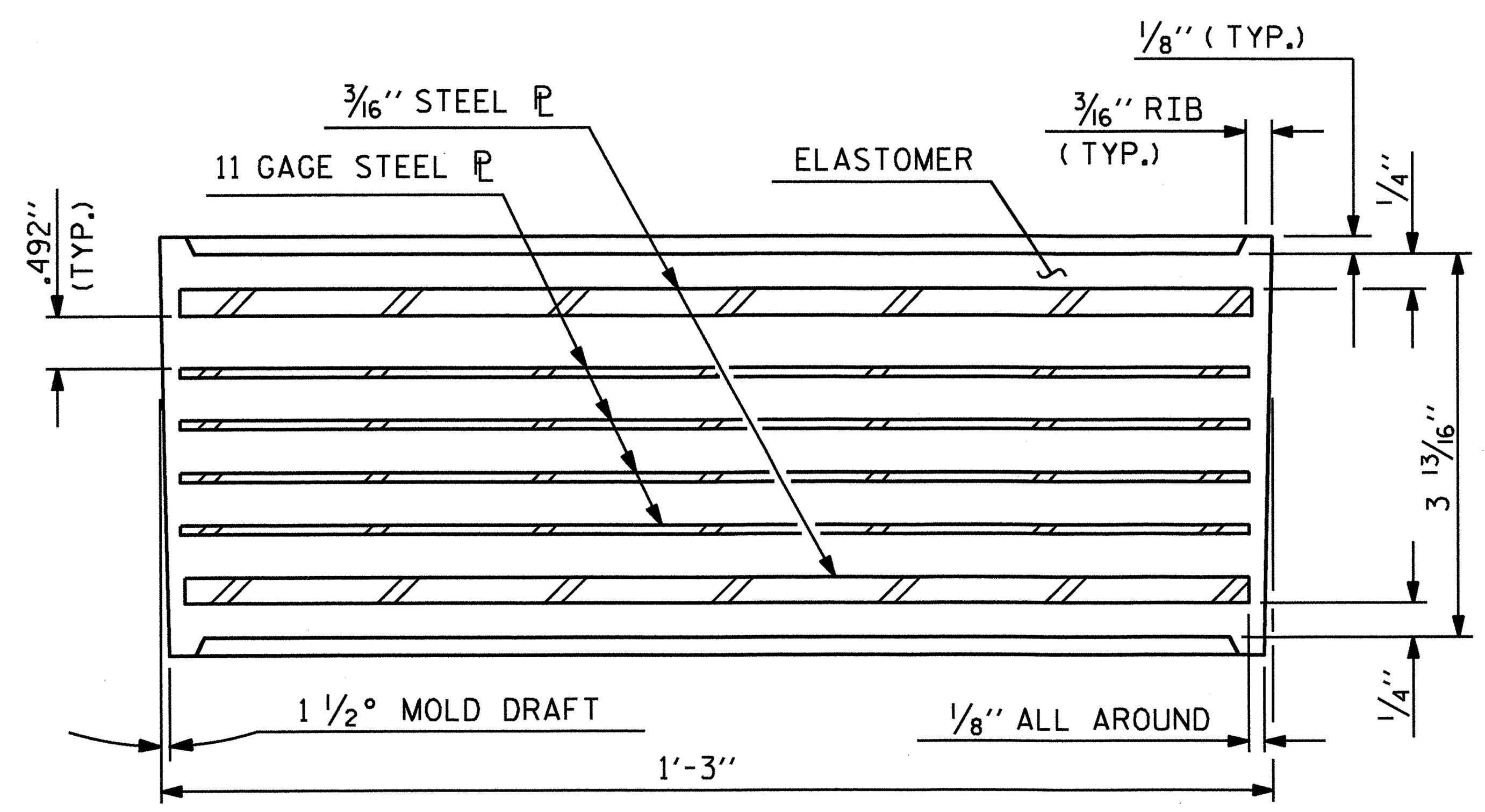
tfang



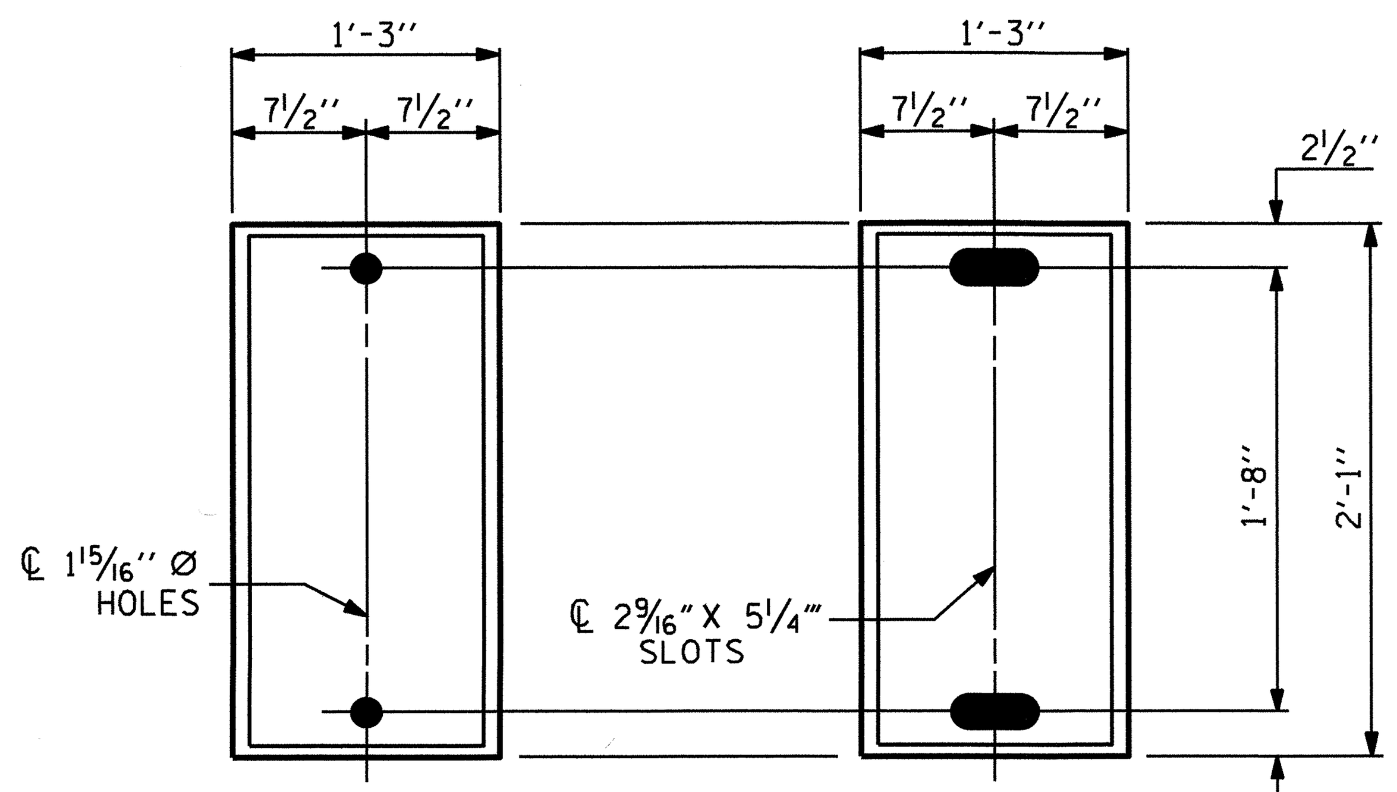
END VIEW



DETAIL "A"



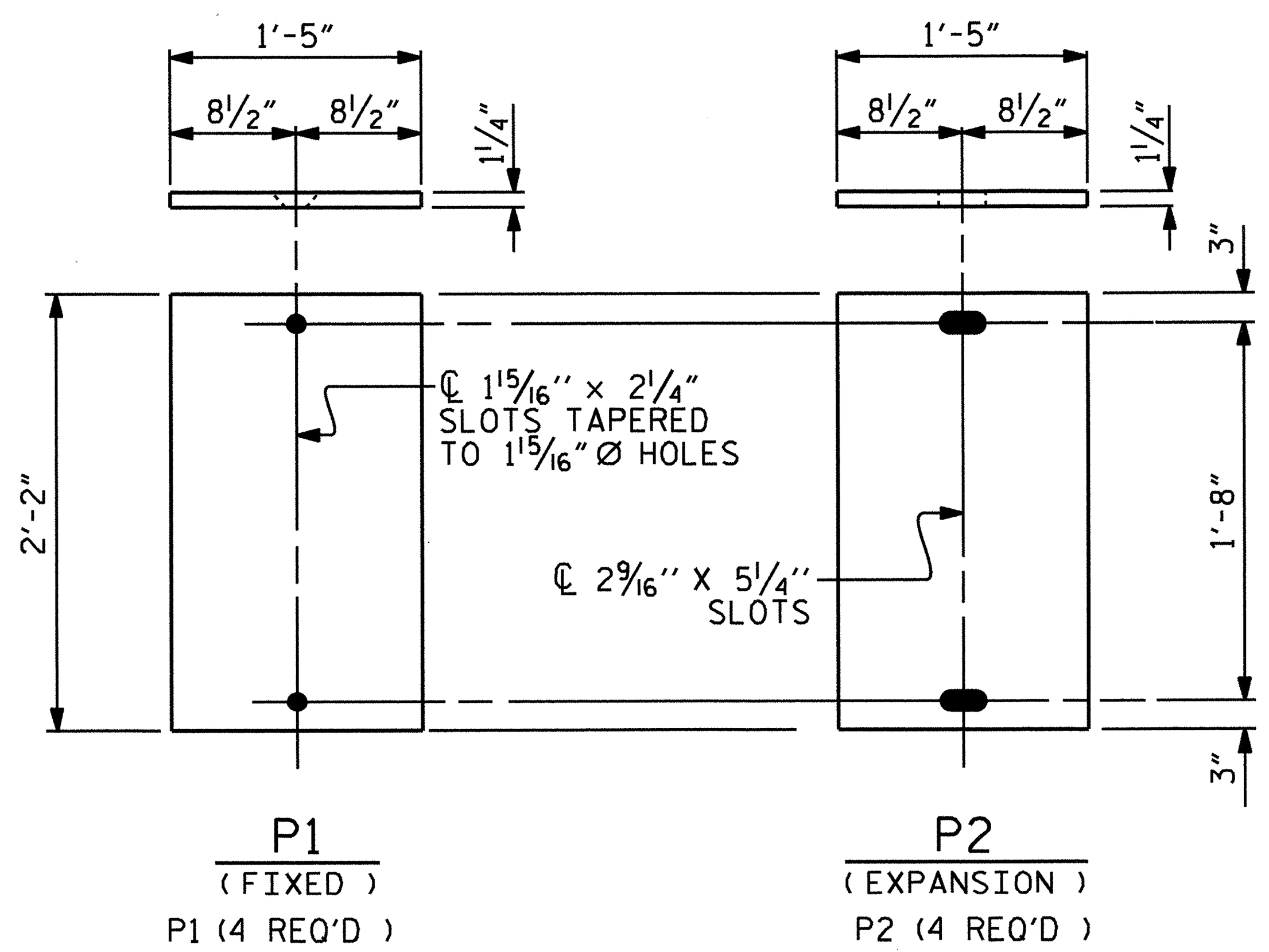
TYPICAL SECTION OF ELASTOMERIC BEARING



PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS



SOLE PLATE DETAILS ("P")

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

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

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, 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.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE CLOSURE PLATE, GROUT PIPE AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F.
2. AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.
3. THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

—LOAD RATINGS—

	MAX.D.L.+ L.L.
TYPE VI	262 K

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

(STEEL SUPERSTRUCTURE)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
12/20/11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			25

STD. NO. EB2

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 11-24-09
CHECKED BY : O.T. NGUYEN	DATE : 7-10

DRAWN BY : EEM 10/95	REV. 10/17/00	RWW/LES
CHECKED BY : PEK 10/95	REV. 7/10/01	LES/RDR
	REV. 5/1/06	TLA/GM

20-DEC-2011 14:18
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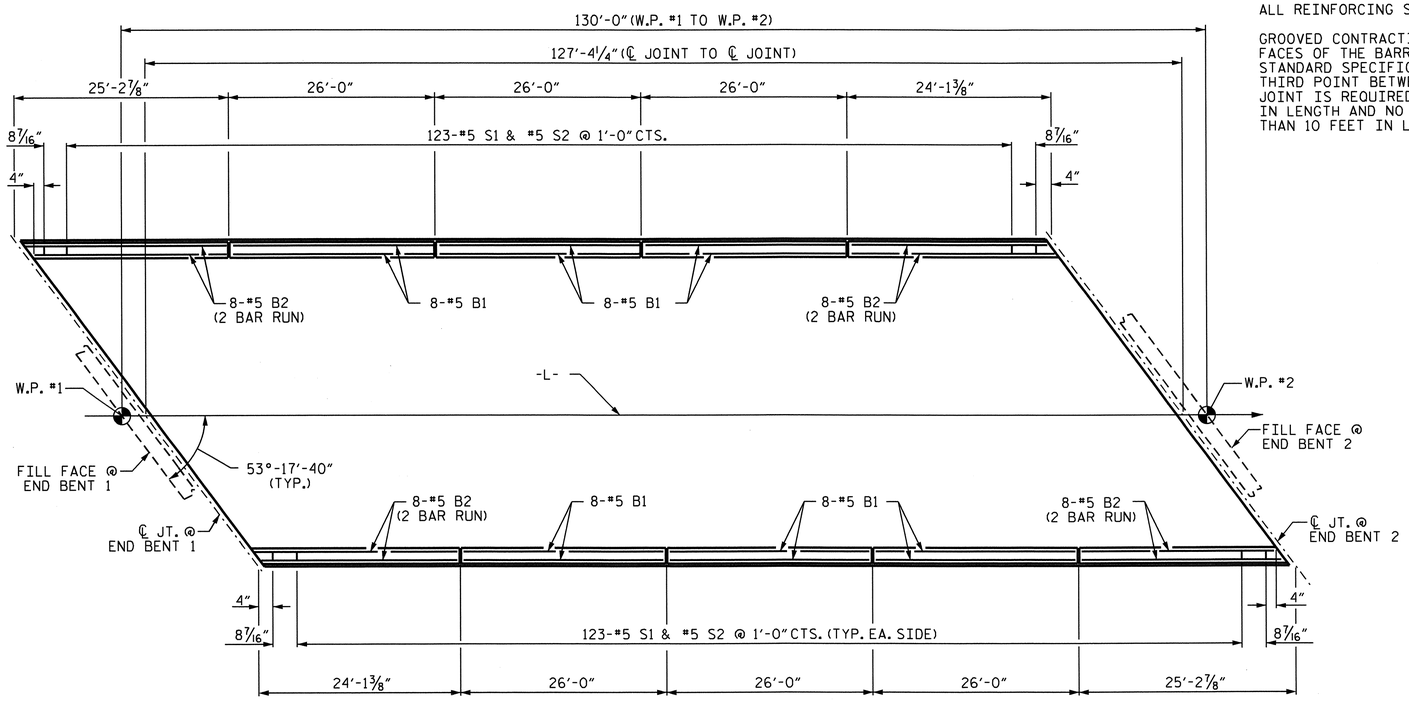
tfang



PLAN OF BARRIER RAIL

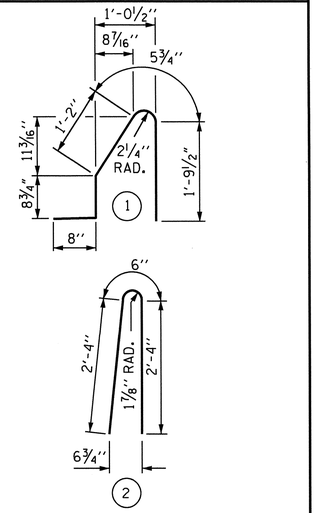
NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

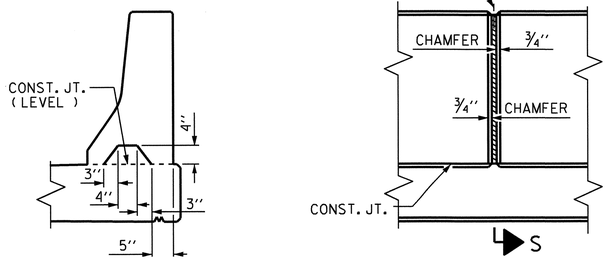
BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	48	#5	STR	25'-7"	1281
✱ B2	64	#5	STR	14'-2"	946
✱ S1	246	#5	1	4'-9"	1219
✱ S2	246	#5	2	5'-2"	1326

✱ EPOXY COATED REINFORCING STEEL	4,772 LBS.
CLASS AA CONCRETE	25.5 CU. YDS.
CONCRETE BARRIER RAIL	
DECK	254.70 LIN. FT.
✱✱ 2 APPROACH SLABS	42.24 LIN. FT.
TOTAL	296.94 LIN. FT.

✱✱ SEE APPROACH SLAB SHEETS FOR ADDITIONAL BARRIER RAIL DETAILS

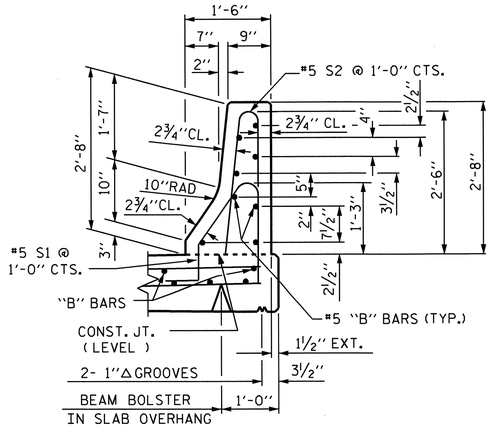


SECTION S-S

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

ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS



SECTION THRU RAIL

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			25

STD. NO. CBR1

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 11-30-09		
CHECKED BY : O.T. NGUYEN	DATE : 7-10		
DRAWN BY : ARB 5/87	REV. 5/7/03R	RWW/JTE	
CHECKED BY : SJD 9/87	REV. 5/1/06R	TLA/GM	
	REV. 10/1/11	MAA/GM	

20-DEC-2011 14:30
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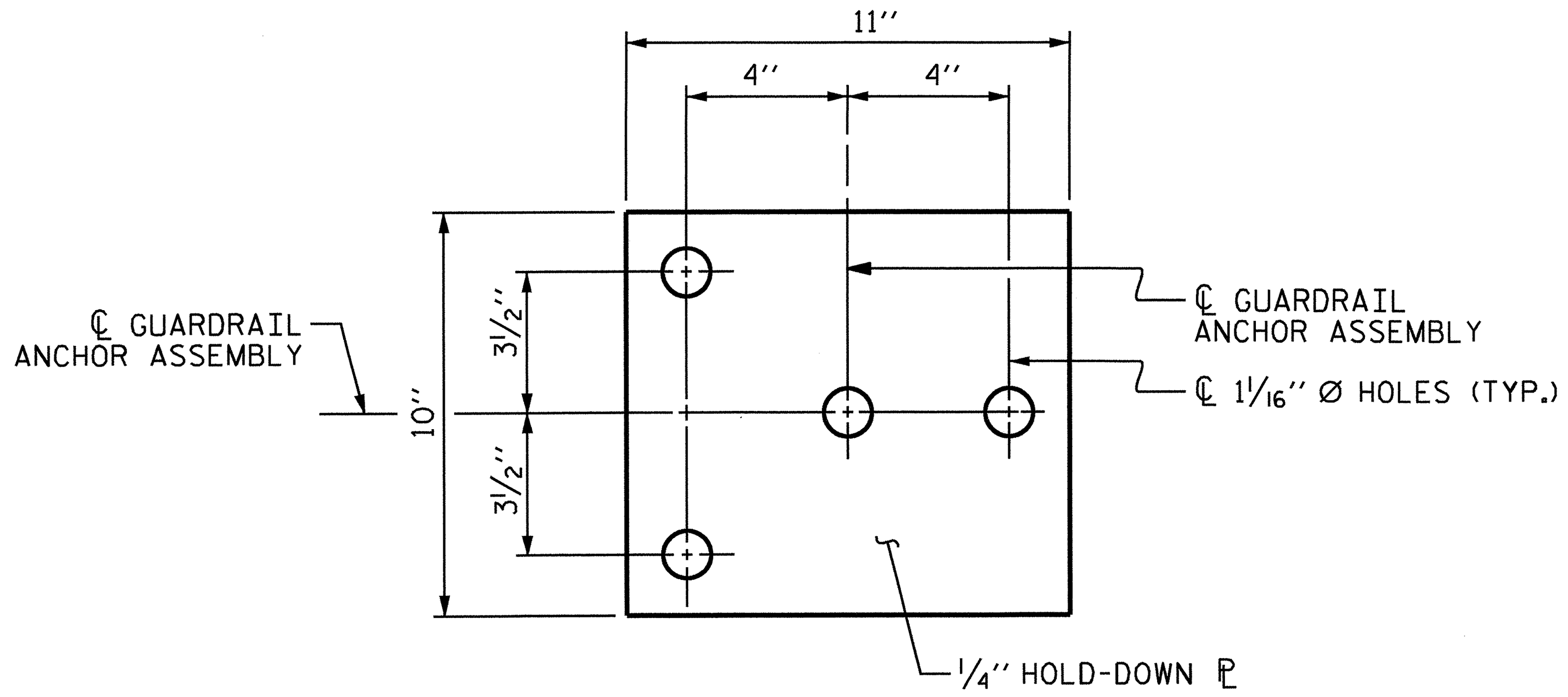
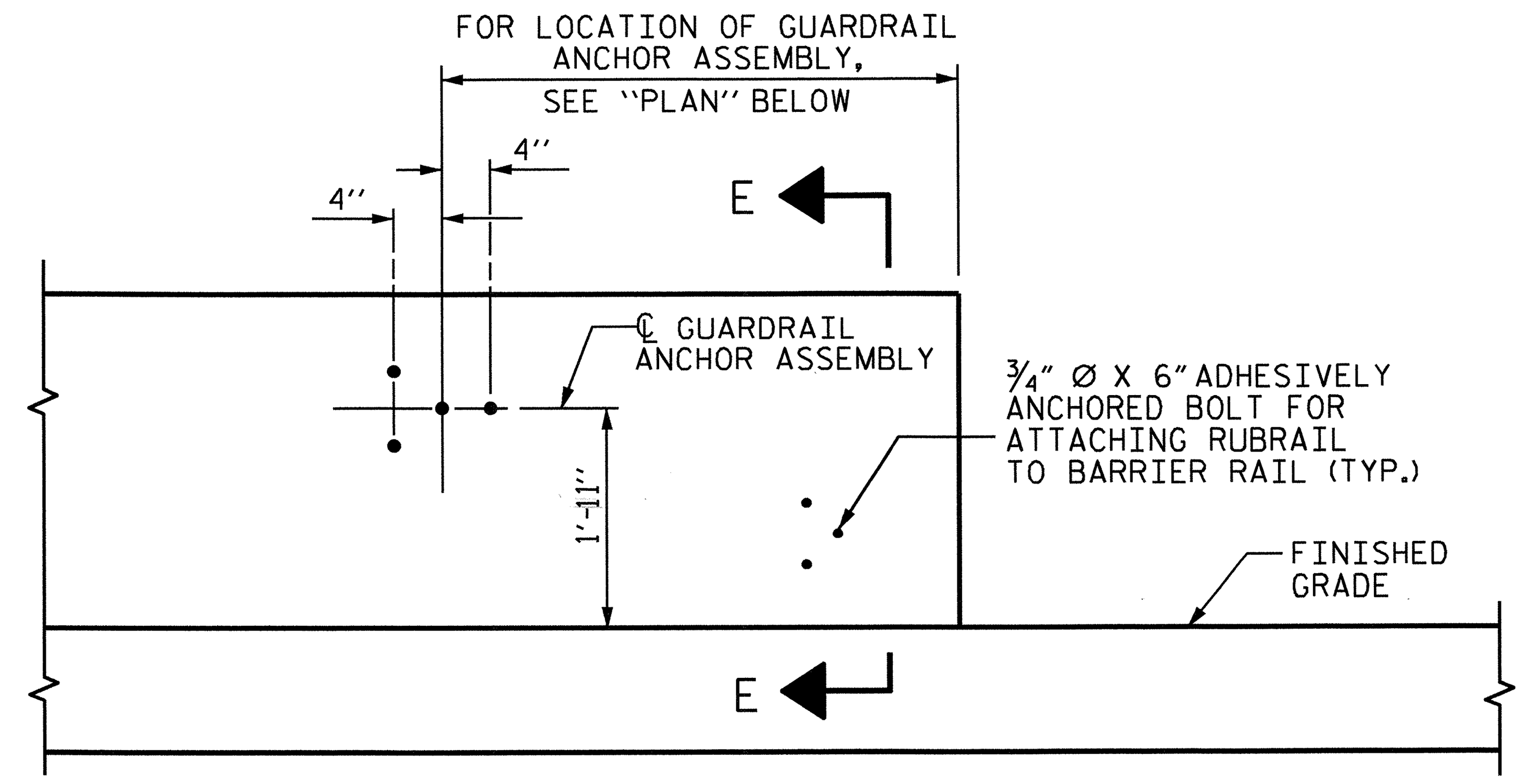
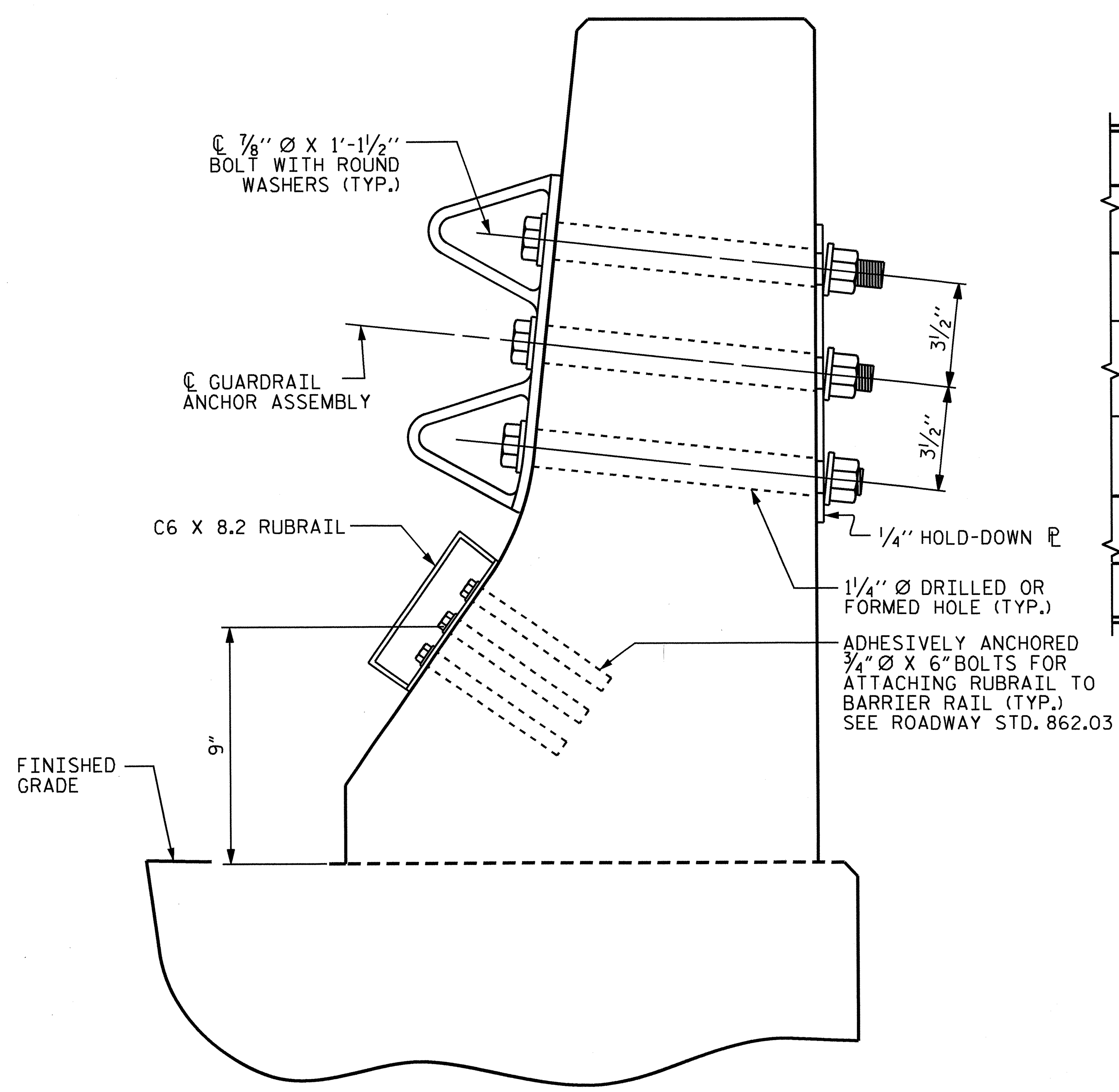


PLAN



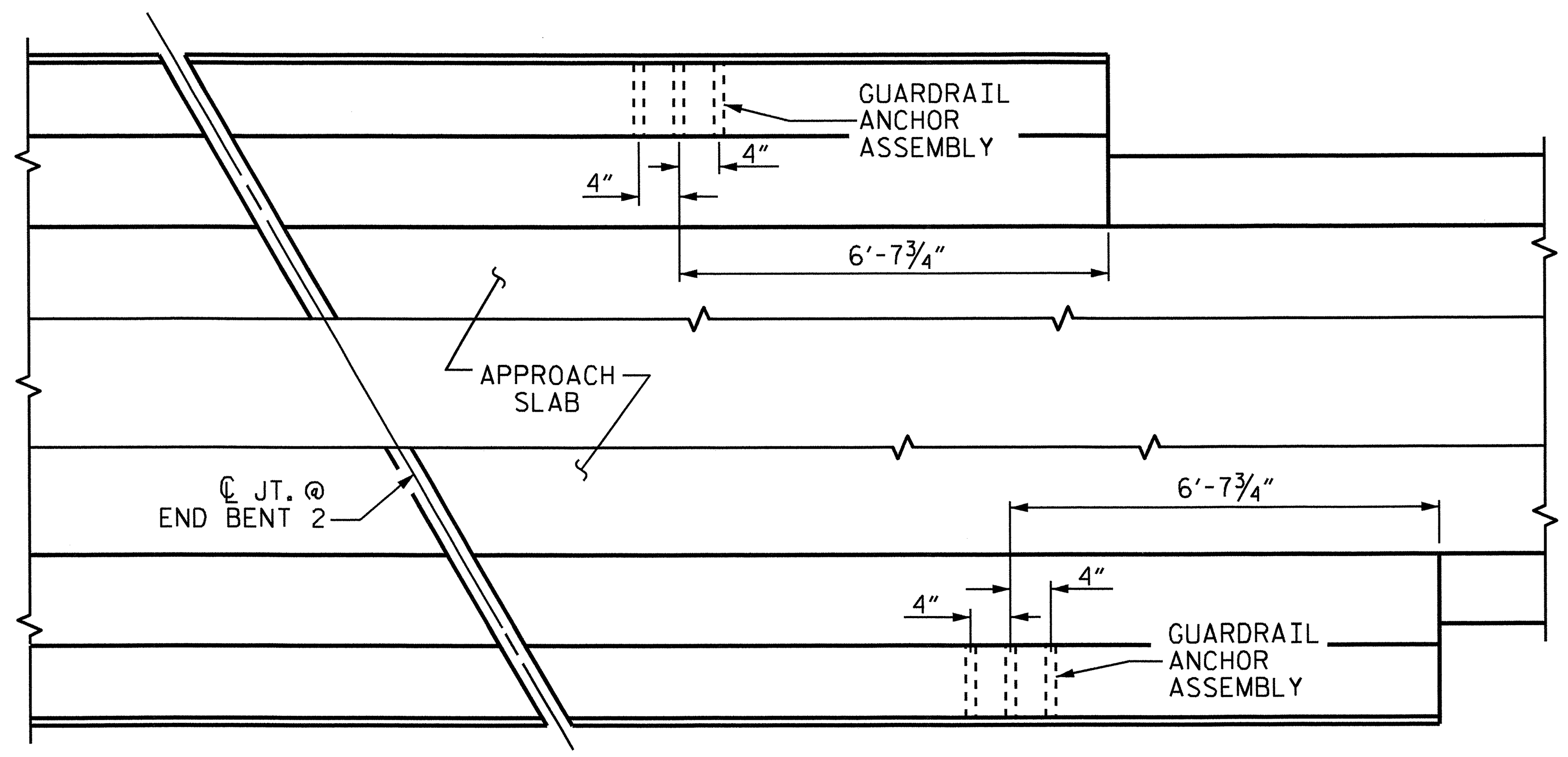
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 2 SHOWN, END BENT 1 SIMILAR

NOTES

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

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

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

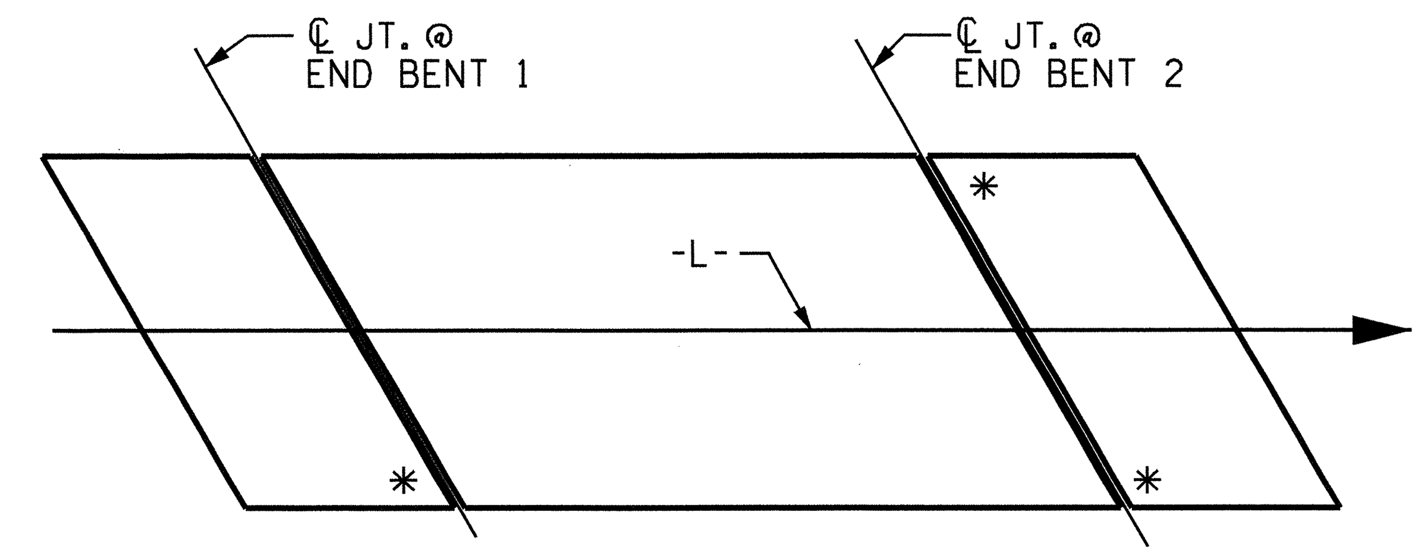
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

THE 1 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.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SKETCH SHOWING POINTS OF ATTACHMENTS

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG

11/14/11

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			S-12
1			3					TOTAL SHEETS
2			4					25

(SHT 3a) STD. NO. GRA2

ASSEMBLED BY : E.C. LOCKLEAR DATE : 11-30-08
CHECKED BY : O.T. NGUYEN DATE : 7-10

DRAWN BY : TLA 5/06
CHECKED BY : GM 5/06
ADDED 5/1/06R KMM/GM

14-NOV-2011 10:03
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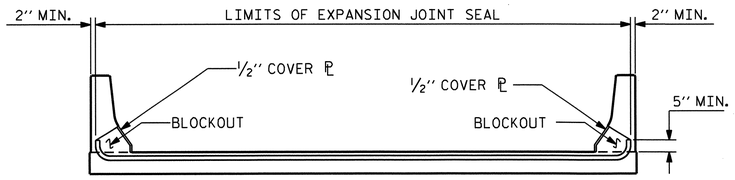
sbwilliams

MOVEMENT AND SETTING AT EXPANSION JOINT					
END BENT	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
1	53°-17'-40"	0"	1½"	1½"	1½"
2	53°-17'-40"	⅞"	1 11/16"	1½"	1 3/16"

TOTAL MOVEMENT IS CALCULATED ALONG THE CENTERLINE OF ROADWAY.
JOINT OPENINGS ARE MEASURED PERPENDICULAR TO THE JOINT.



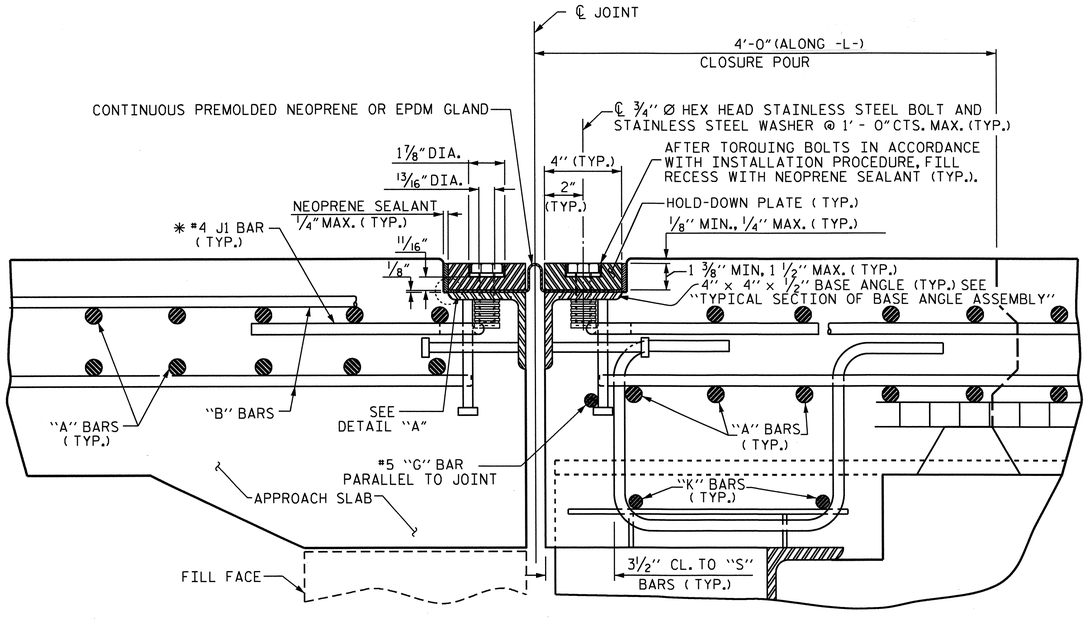
SKETCH SHOWING LIMITS OF EXPANSION JOINT SEAL

INSTALLATION PROCEDURE

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

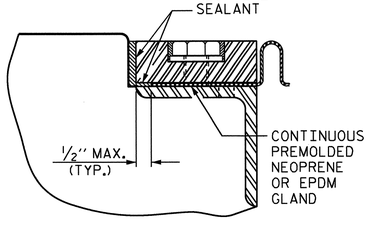
GENERAL NOTES

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

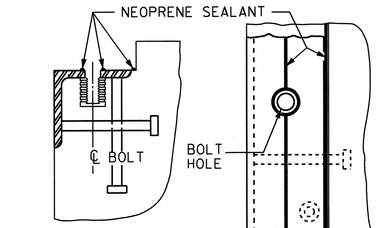


EXPANSION JOINT DETAILS

* 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.



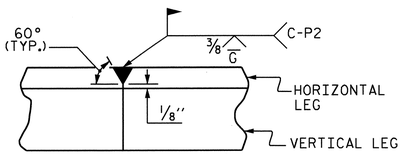
DETAIL "A"



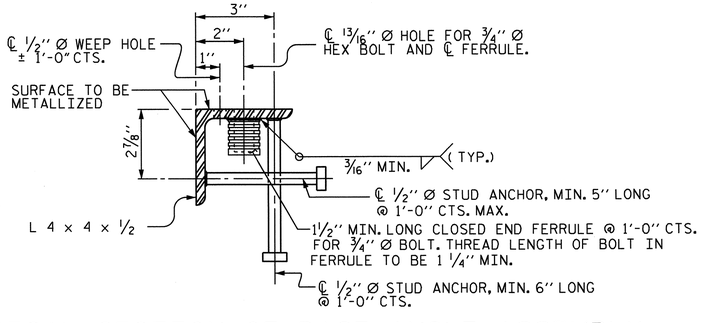
CROSS SECTION

PLAN VIEW

INSTALLATION SKETCH



DETAIL- FIELD WELD SPLICE OF BASE ANGLE



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. B-4640
SCOTLAND COUNTY
STATION: 25+23.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

EXPANSION JOINT SEAL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG FANG
12/20/11

ASSEMBLED BY : Q. T. NGUYEN	DATE : 10/3/11
CHECKED BY : T. H. FANG	DATE : 10/10/11
DRAWN BY : REK 9/87	REV. 5/7/03R RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			25

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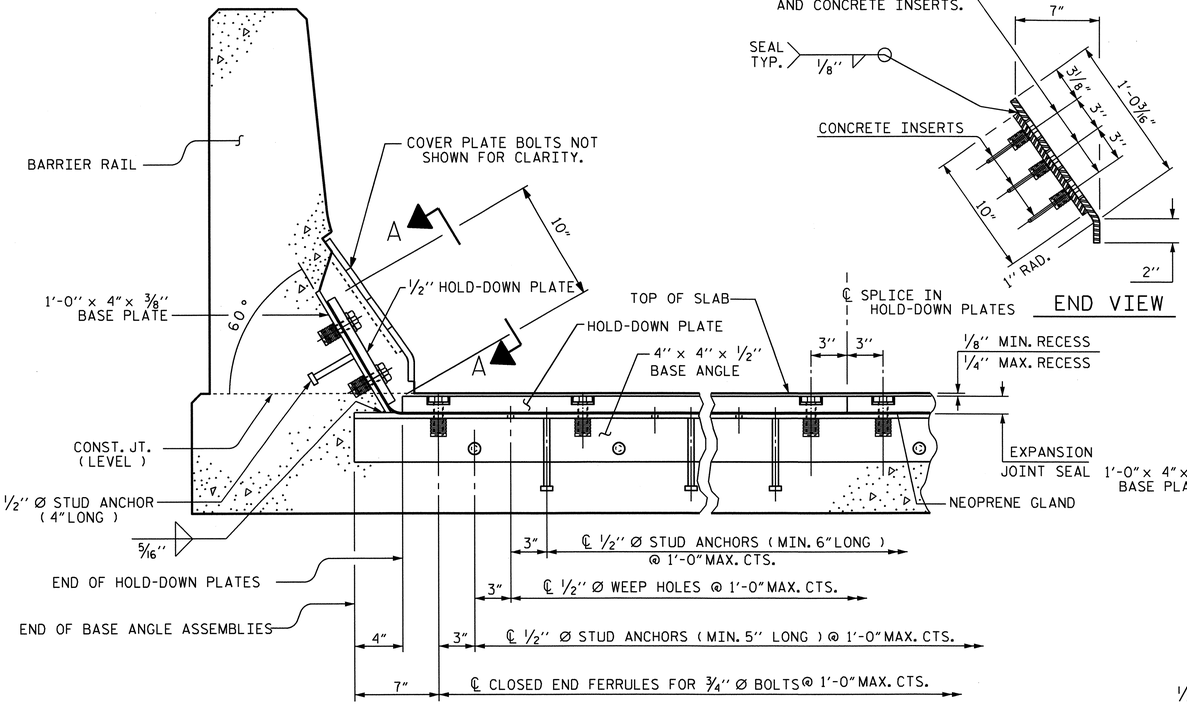
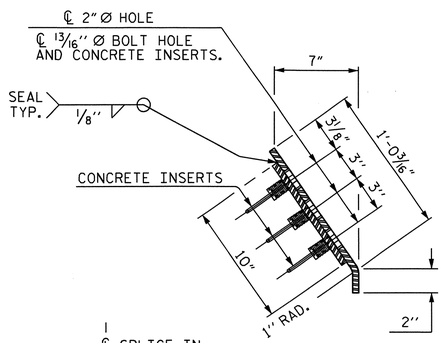
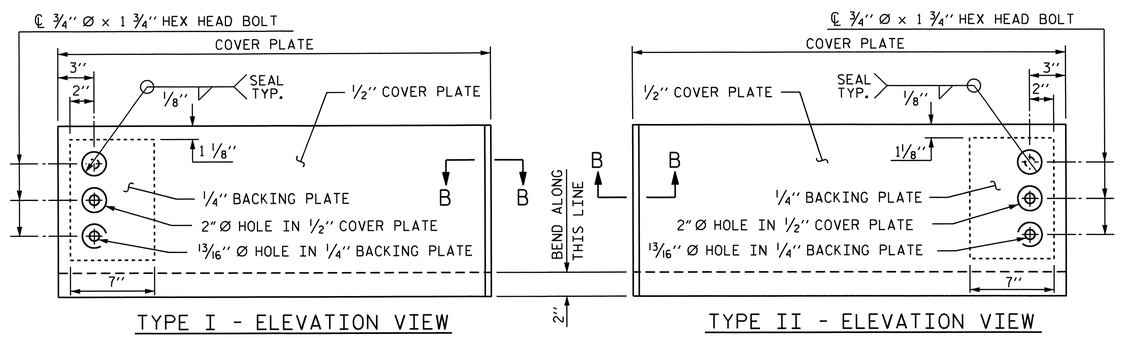
STD. NO. EJS1



SECTION THRU RAIL NORMAL TO JOINT



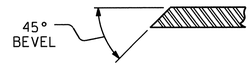
END VIEW



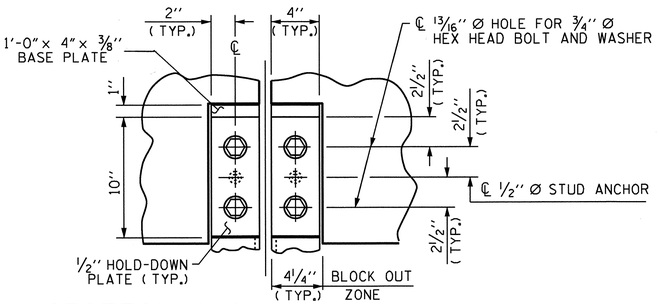
TYPE I - ELEVATION VIEW

TYPE II - ELEVATION VIEW

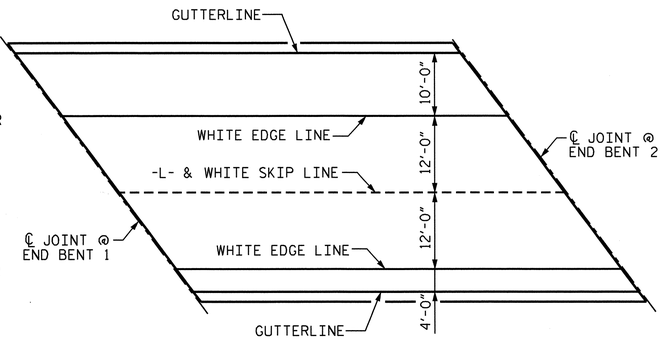
COVER PLATE DETAILS



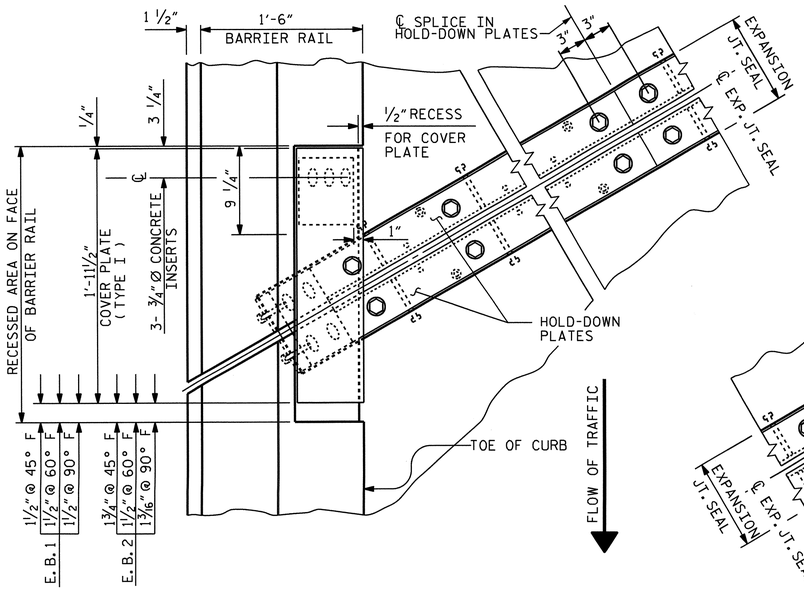
SECTION B-B



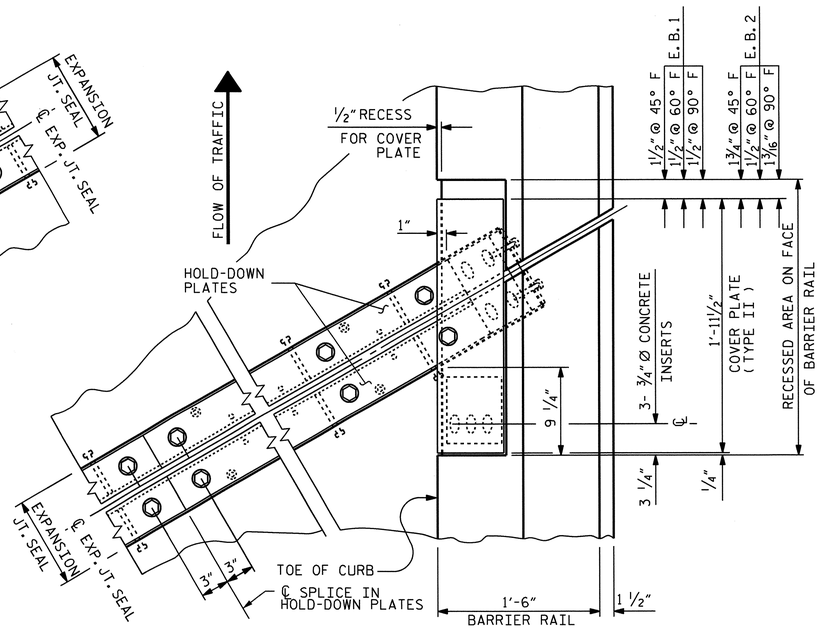
SECTION A-A



PAVEMENT MARKING ALIGNMENT

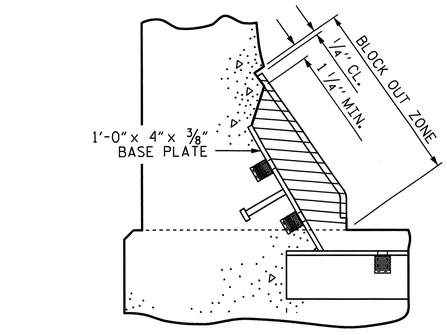


LEFT SIDE



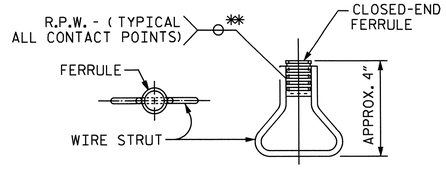
RIGHT SIDE

PLAN OF EXPANSION JOINT SEAL



BLOCK OUT DETAIL

SEE "SECTION A-A" FOR OTHER DETAILS.



PLAN ELEVATION

CONCRETE INSERT

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

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TAHG HSING FANG
11/14/11

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

EXPANSION JOINT SEAL DETAILS FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			25

STD. NO. EJS2

ASSEMBLED BY :	O. T. NGUYEN	DATE :	10/03/11
CHECKED BY :	T. H. FANG	DATE :	10/10/11
DRAWN BY : REK 9/87	REV. 7/17/98	RWW/LES	
CHECKED BY : CRK 10/87	REV. 10/17/00	RWW/LES	
	REV. 5/1/06	TLA/GM	

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sbwilliams

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"			

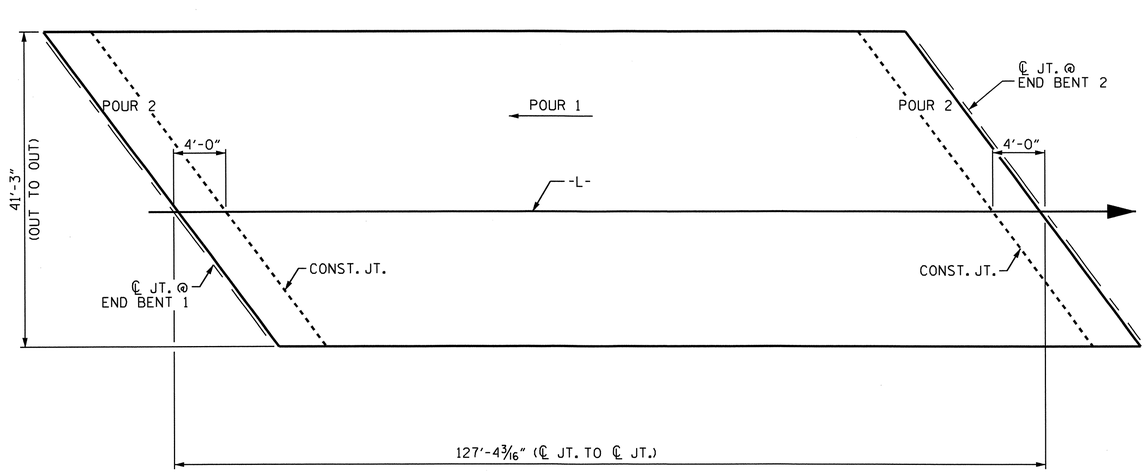
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	✳EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPAN A		20,057	15,231
POUR 1	189.3		
POUR 2	15.2		
TOTALS ✳✳	204.5	20,057	15,231

✳✳QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	1,648	SQ.FT.
BRIDGE DECK	4,408	SQ.FT.
TOTAL	6,056	SQ.FT.

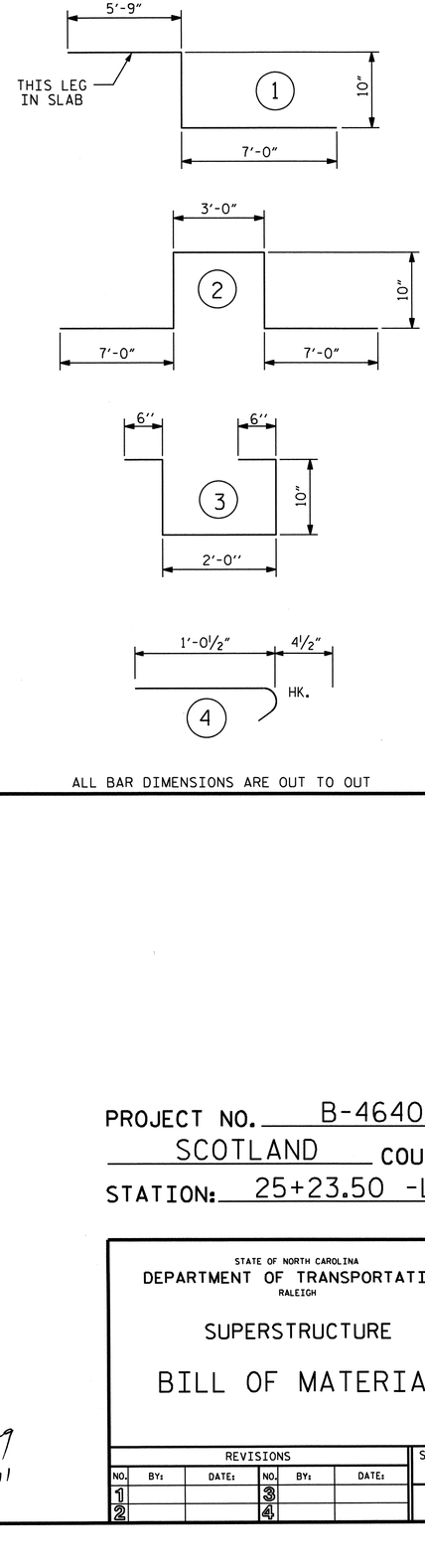


LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ.FT. = 5,253)

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	210	5	STR	40'-11"	8962
A2	210	5	STR	40'-11"	8962
✳ A3	6	6	STR	19'-3"	173
✳ A101	6	5	STR	38'-9"	242
✳ A102	6	5	STR	36'-11"	231
✳ A103	6	5	STR	35'-1"	220
✳ A104	6	5	STR	33'-3"	208
✳ A105	6	5	STR	31'-5"	197
✳ A106	6	5	STR	29'-7"	185
✳ A107	6	5	STR	27'-9"	174
✳ A108	6	5	STR	25'-11"	162
✳ A109	6	5	STR	24'-1"	151
✳ A110	6	5	STR	22'-2"	139
✳ A111	6	5	STR	20'-4"	127
✳ A112	6	5	STR	18'-6"	116
✳ A113	6	5	STR	16'-8"	104
✳ A114	6	5	STR	14'-10"	93
✳ A115	6	5	STR	13'-0"	81
✳ A116	6	5	STR	11'-2"	70
✳ A117	6	5	STR	8'-3"	52
✳ A118	6	5	STR	7'-5"	46
✳ A119	6	5	STR	5'-7"	35
✳ A120	6	5	STR	3'-9"	23
✳ A121	6	5	STR	1'-11"	12
A201	6	5	STR	39'-4"	246
A202	6	5	STR	37'-6"	235
A203	6	5	STR	35'-8"	223
A204	6	5	STR	33'-10"	212
A205	6	5	STR	32'-0"	200
A206	6	5	STR	30'-2"	189
A207	6	5	STR	28'-4"	177
A208	6	5	STR	26'-6"	166
A209	6	5	STR	24'-8"	154
A210	6	5	STR	22'-9"	142
A211	6	5	STR	20'-11"	131
A212	6	5	STR	19'-1"	119
A213	6	5	STR	17'-3"	108
A214	6	5	STR	15'-5"	96
A215	6	5	STR	13'-7"	85
A216	6	5	STR	11'-9"	74
A217	6	5	STR	8'-10"	55
A218	6	5	STR	8'-0"	50
A219	6	5	STR	6'-2"	39
A220	6	5	STR	4'-4"	27
A221	6	5	STR	2'-6"	16
✳ B1	140	4	STR	26'-10"	2509
B2	183	5	STR	43'-9"	8350
✳ G1	2	5	STR	51'-1"	107
✳ J1	92	4	4	1'-5"	87
✳ K1	12	5	1	13'-7"	170
✳ K2	12	5	2	18'-8"	234
✳ S1	66	5	3	4'-8"	321
REINFORCING STEEL				LBS.	20,057
✳ EPOXY COATED REINFORCING STEEL				LBS.	15,231

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER YING HSIUNG FANG

12/21/11

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : E.C. LOCKLEAR DATE : 4-8-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

21-DEC-2011 14:58
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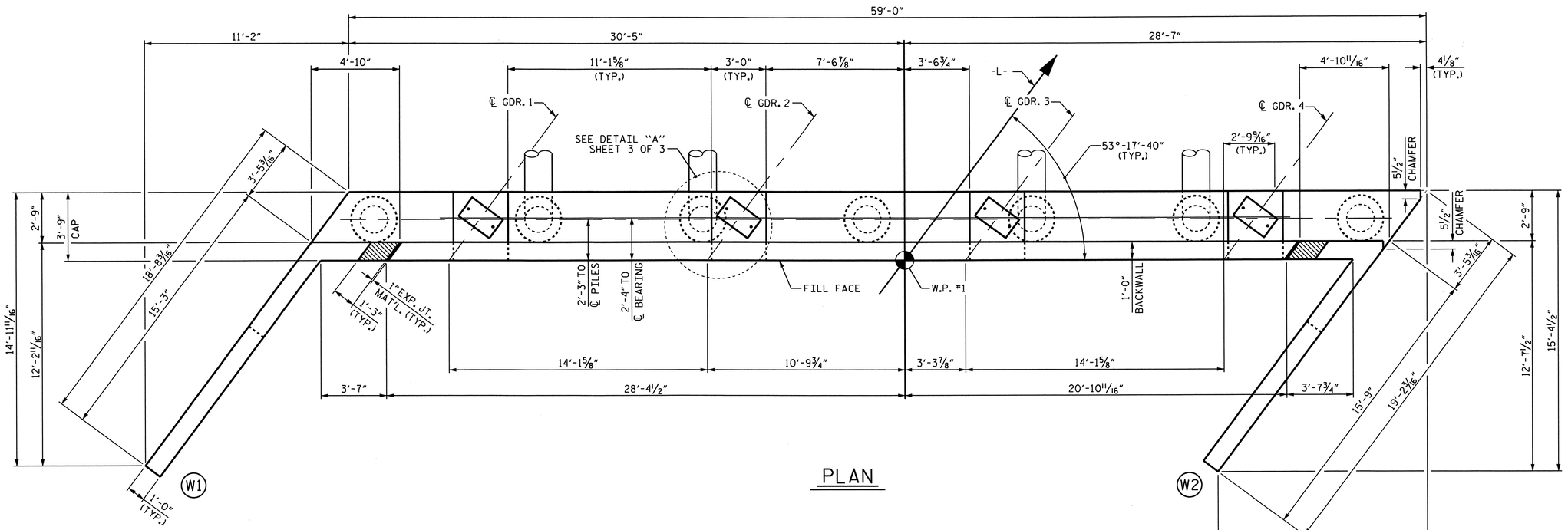
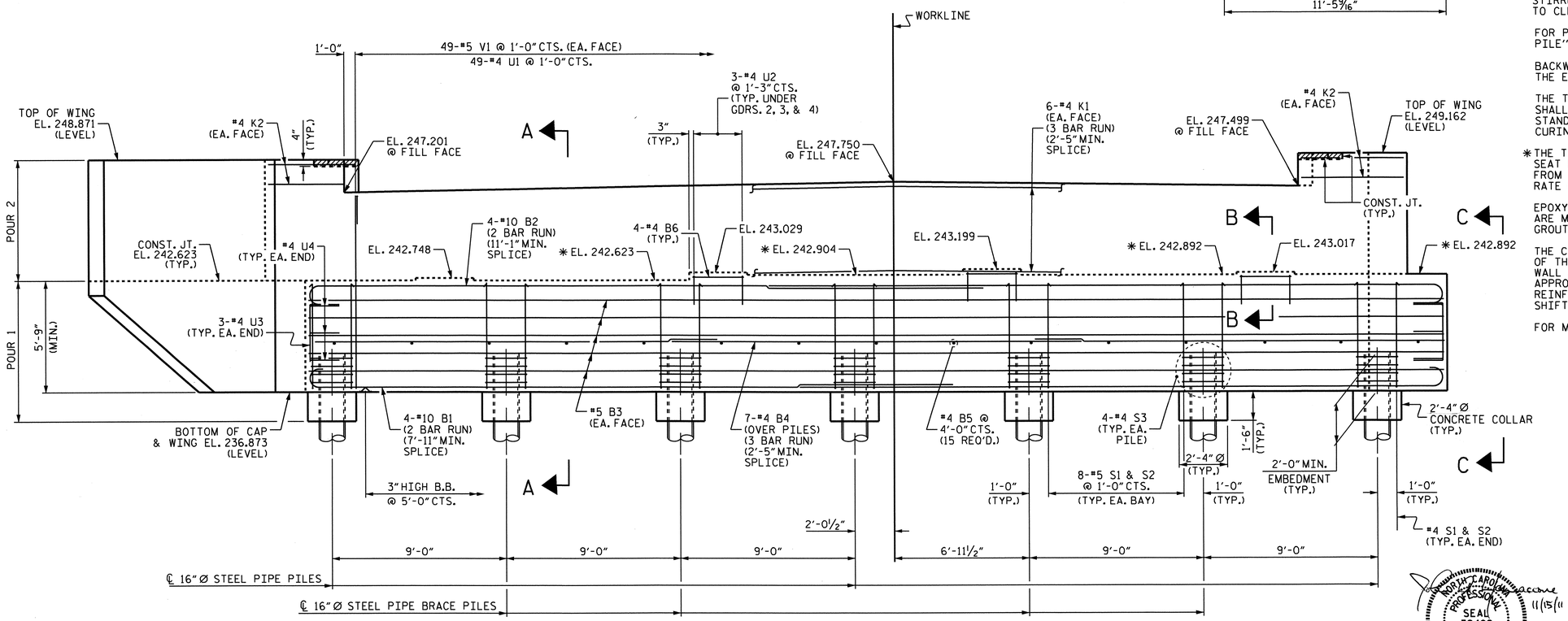
tfang



PLAN



ELEVATION

RIGHT WING NOT SHOWN FOR CLARITY.

NOTES

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

FOR PILE SPLICE DETAILS, SEE "16 INCH STEEL PIPE PILE" SHEET.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

* 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%.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

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

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 32492 ENGINEER JOHN A. YANNACCONE 11/15/11

DRAWN BY : E.C. LOCKLEAR DATE : 12-4-09
CHECKED BY : J.A. YANNACCONE DATE : 7/26/11

14-NOV-2011 10:03
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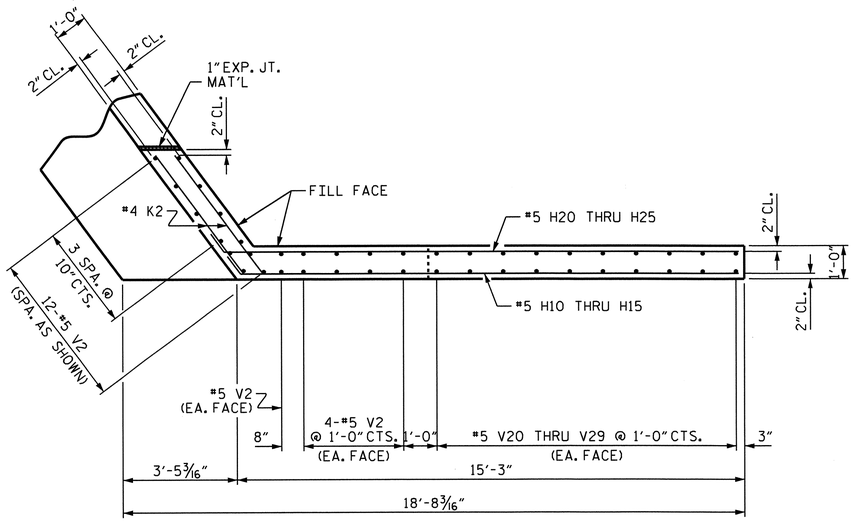
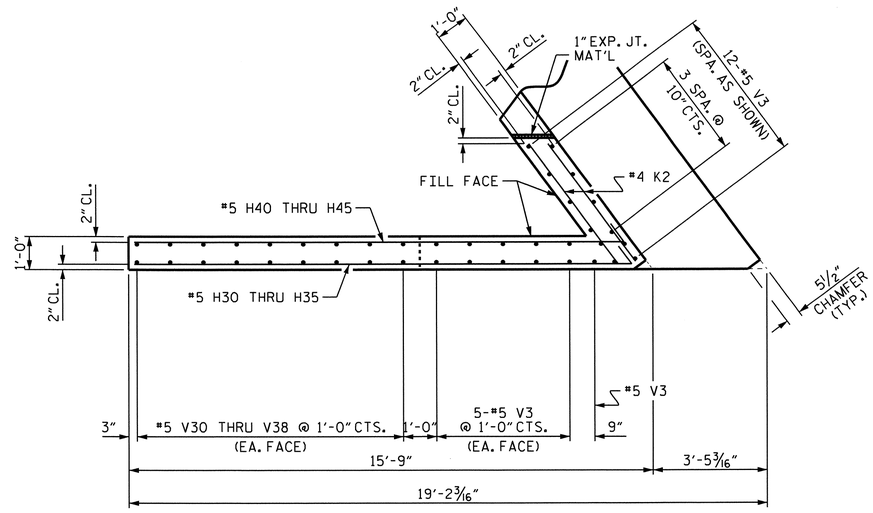
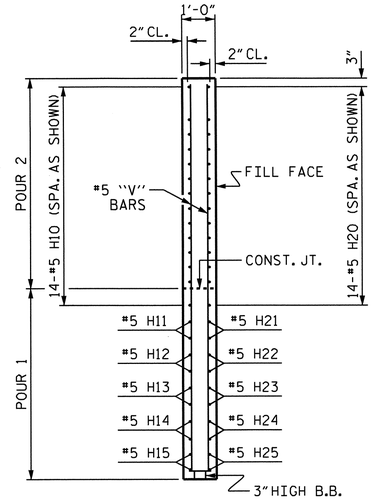
sbwilliams



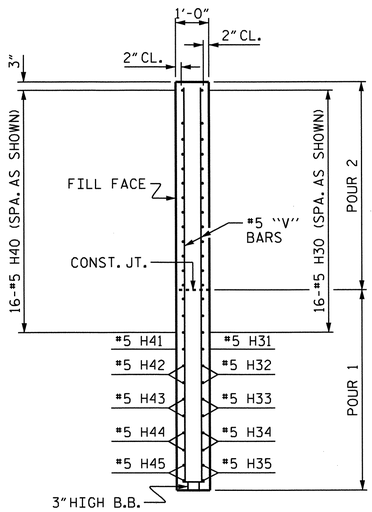
PLAN OF WING (W1)



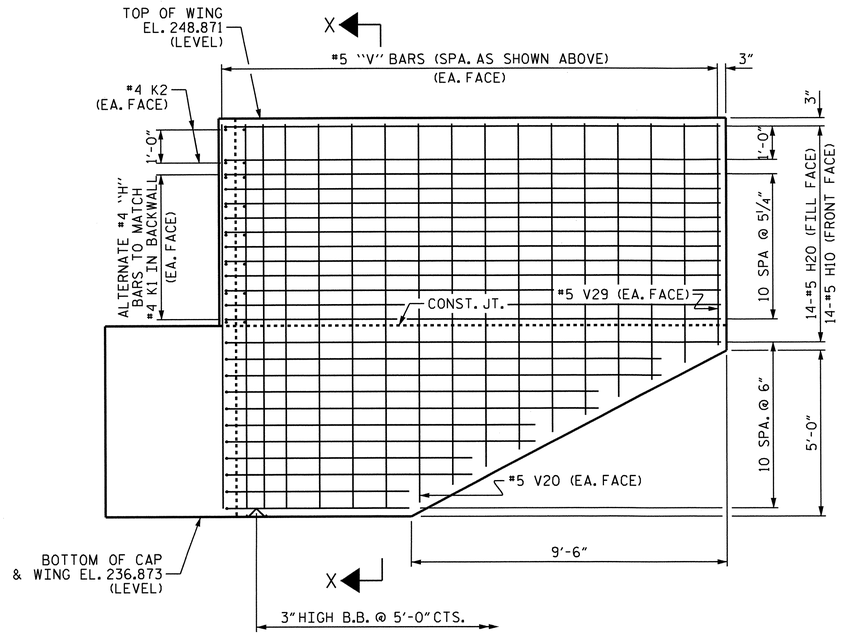
PLAN OF WING (W2)



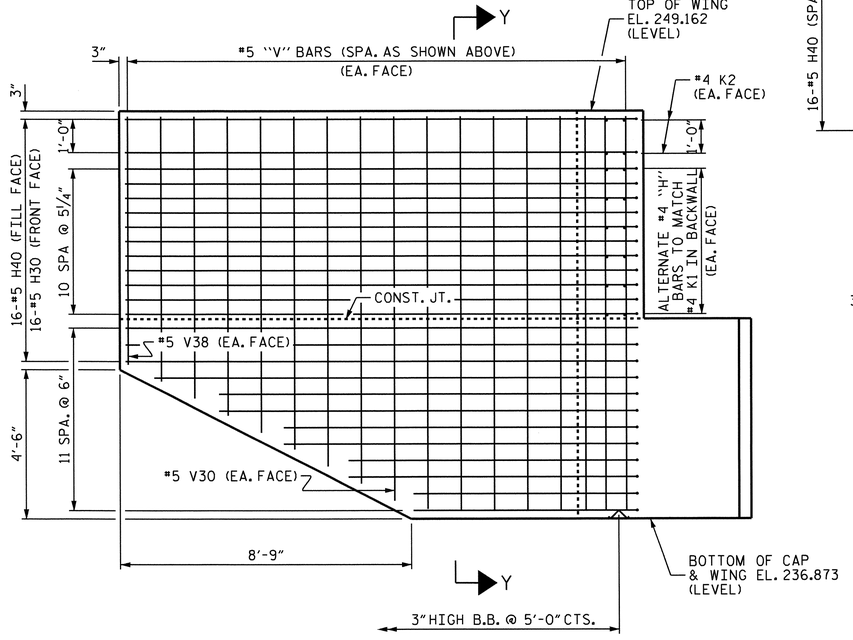
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

NORTH CAROLINA PROFESSIONAL SEAL 32492 ENGINEER JOHN A. YANNACCONE
accone 12/20/11

PROJECT NO. B-4640
SCOTLAND COUNTY
STATION: 25+23.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : E.C. LOCKLEAR DATE : 12-8-09
CHECKED BY : J.A. YANNACCONE DATE : 7/26/11

20-DEC-2011 15:42
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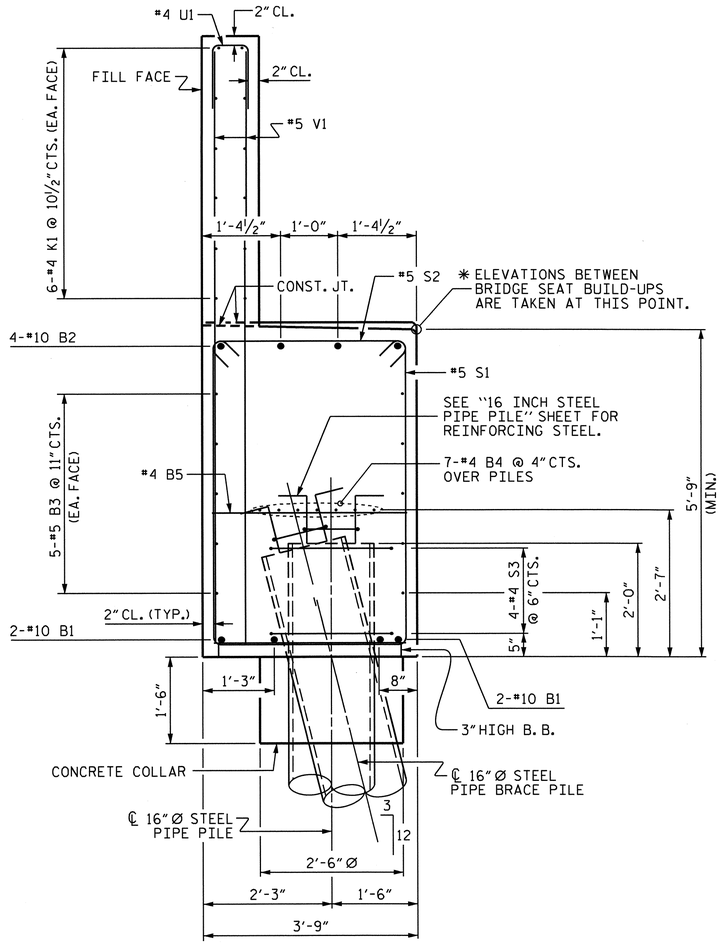
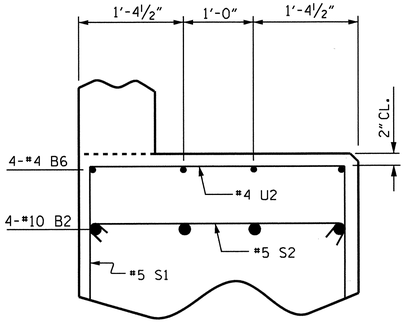
tfang

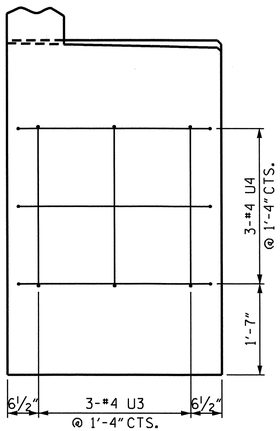


SECTION A-A



PARTIAL SECTION B-B

(#5 V1 BARS NOT SHOWN FOR CLARITY)



VIEW C-C

(TYP. EA. END)

BILL OF MATERIAL

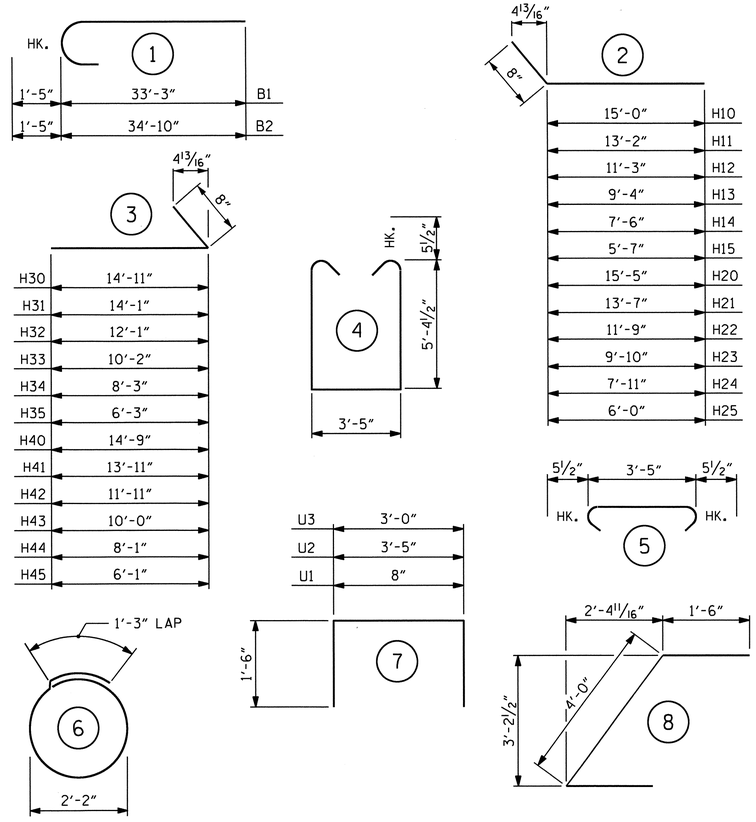
END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	34'-8"	1193
B2	8	#10	1	36'-3"	1248
B3	10	#5	STR	58'-6"	610
B4	21	#4	STR	21'-2"	297
B5	15	#4	STR	3'-5"	34
B6	12	#4	STR	2'-8"	21
H10	14	#5	2	15'-8"	229
H11	2	#5	2	13'-10"	29
H12	2	#5	2	11'-11"	25
H13	2	#5	2	10'-0"	21
H14	2	#5	2	8'-2"	17
H15	2	#5	2	6'-3"	13
H20	14	#5	2	16'-1"	235
H21	2	#5	2	14'-3"	30
H22	2	#5	2	12'-5"	26
H23	2	#5	2	10'-6"	22
H24	2	#5	2	8'-7"	18
H25	2	#5	2	6'-8"	14
H30	16	#5	3	15'-7"	260
H31	1	#5	3	14'-9"	15
H32	2	#5	3	12'-9"	27
H33	2	#5	3	10'-10"	23
H34	2	#5	3	8'-11"	19
H35	2	#5	3	6'-11"	14
H40	16	#5	3	15'-5"	257
H41	1	#5	3	14'-7"	15
H42	2	#5	3	12'-7"	26
H43	2	#5	3	10'-8"	22
H44	2	#5	3	8'-9"	18
H45	2	#5	3	6'-9"	14
K1	36	#4	STR	21'-2"	509
K2	8	#4	STR	4'-4"	23
S1	50	#5	4	15'-1"	787
S2	50	#5	5	4'-4"	226
S3	28	#4	6	8'-1"	151

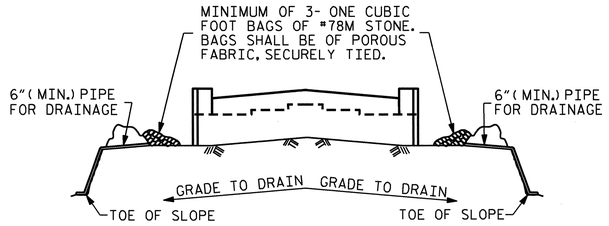
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
U1	49	#4	7	3'-8"	120
U2	9	#4	7	6'-5"	39
U3	6	#4	7	6'-0"	24
U4	6	#4	8	7'-0"	28
V1	98	#5	STR	10'-0"	1022
V2	22	#5	STR	11'-8"	268
V3	23	#5	STR	11'-11"	286
V20	2	#5	STR	11'-6"	24
V21	2	#5	STR	10'-11"	23
V22	2	#5	STR	10'-5"	22
V23	2	#5	STR	9'-11"	21
V24	2	#5	STR	9'-4"	19
V25	2	#5	STR	8'-10"	18
V26	2	#5	STR	8'-4"	17
V27	2	#5	STR	7'-9"	16
V28	2	#5	STR	7'-3"	15
V29	2	#5	STR	6'-9"	14
V30	2	#5	STR	11'-7"	24
V31	2	#5	STR	11'-1"	23
V32	2	#5	STR	10'-7"	22
V33	2	#5	STR	10'-1"	21
V34	2	#5	STR	9'-7"	20
V35	2	#5	STR	9'-1"	19
V36	2	#5	STR	8'-6"	18
V37	2	#5	STR	8'-0"	17
V38	2	#5	STR	7'-6"	16

REINFORCING STEEL	LBS	8,644
CLASS A CONRETE		
POUR #1: CAP & LOWER PART OF WINGS	CY	55.0
POUR #2: BACKWALL & UPPER PART OF WINGS	CY	17.5
TOTAL CLASS A CONCRETE	CY	72.5
PP 16 X 0.5 STEEL PILES NO. 7		315 LN. FT.
PIPE PILE PLATES		7 EA.
PILE REDRIVES		7 EA.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

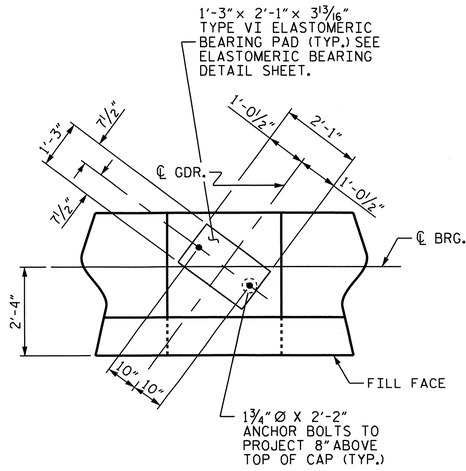


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

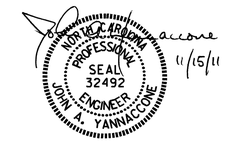
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

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

TEMPORARY DRAINAGE AT END BENT



DETAIL "A"



PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : E.C. LOCKLEAR DATE : 12-8-09
CHECKED BY : J.A. YANNACCONE DATE : 7/26/11

14-NOV-2011 10:03
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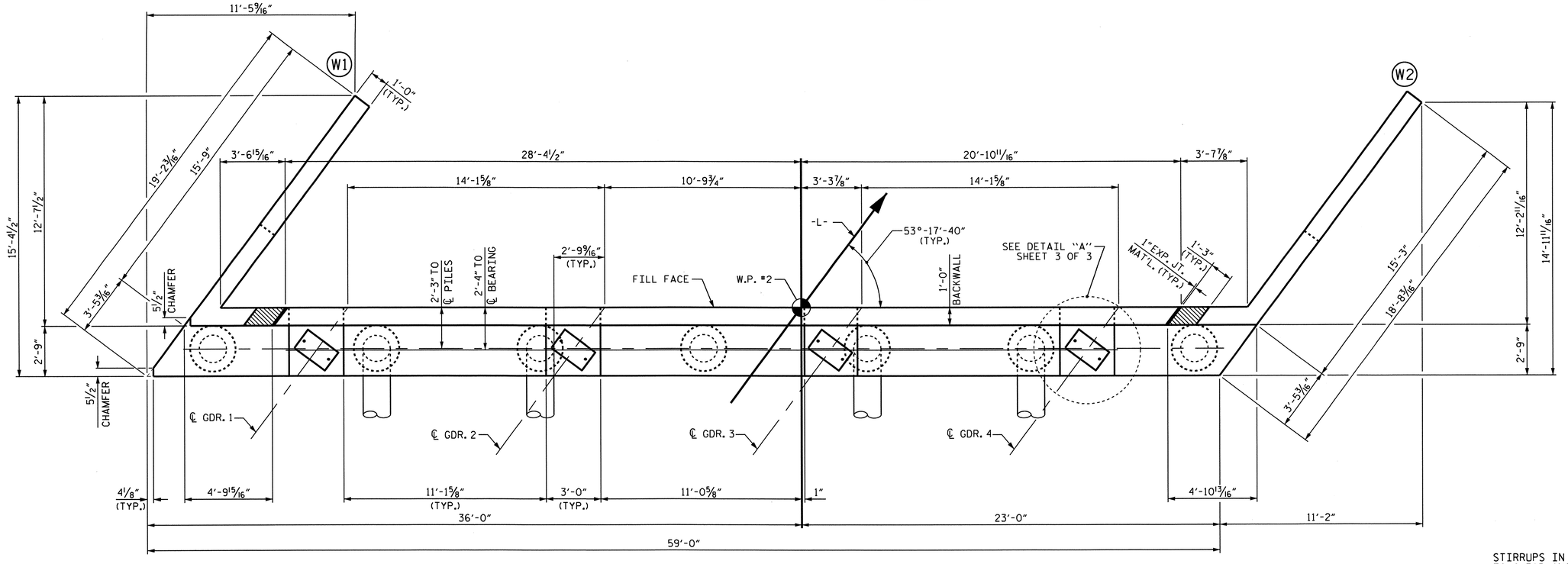
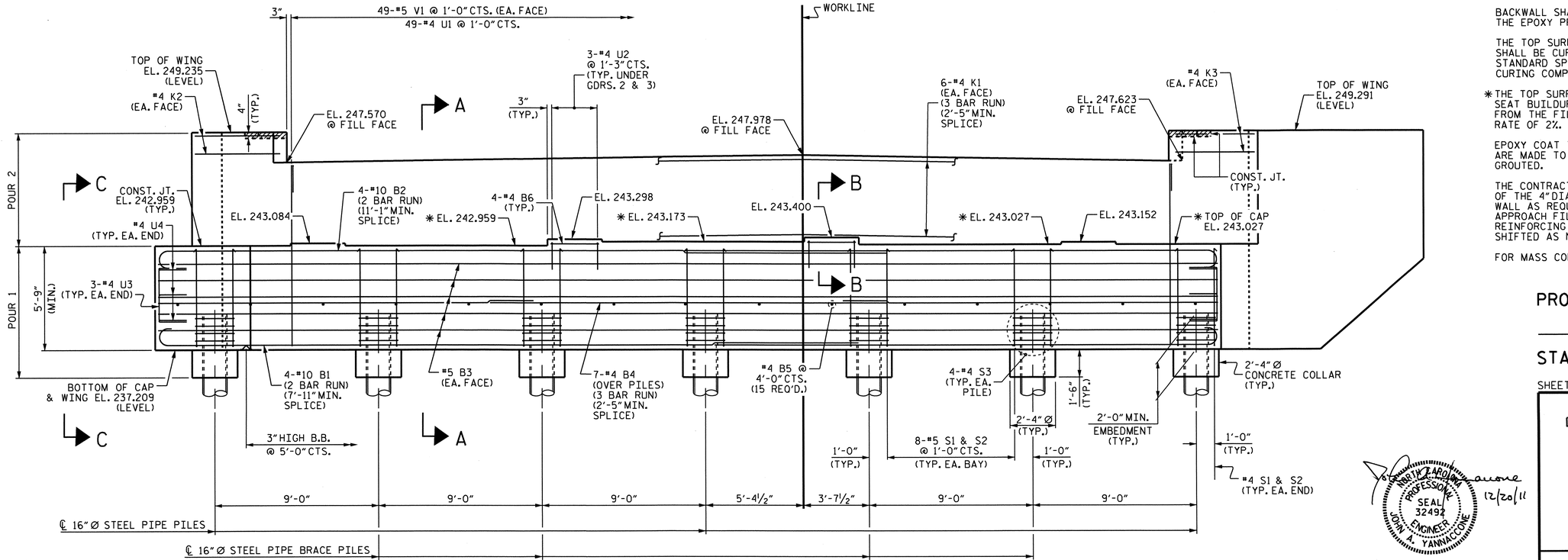
sbwilliams



PLAN



ELEVATION

LEFT WING NOT SHOWN FOR CLARITY.

NOTES

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

FOR PILE SPLICE DETAILS, SEE "16 INCH STEEL PIPE PILE" SHEET.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

✱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%.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

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

FOR MASS CONCRETE, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			25

NORTH CAROLINA PROFESSIONAL SEAL 32492 ENGINEER JOHN A. YANNACCONE
12/20/11

DRAWN BY : J.A. YANNACCONE DATE : 7/14/11
CHECKED BY : T. H. FANG DATE : 10/14/11

20-DEC-2011 15:50
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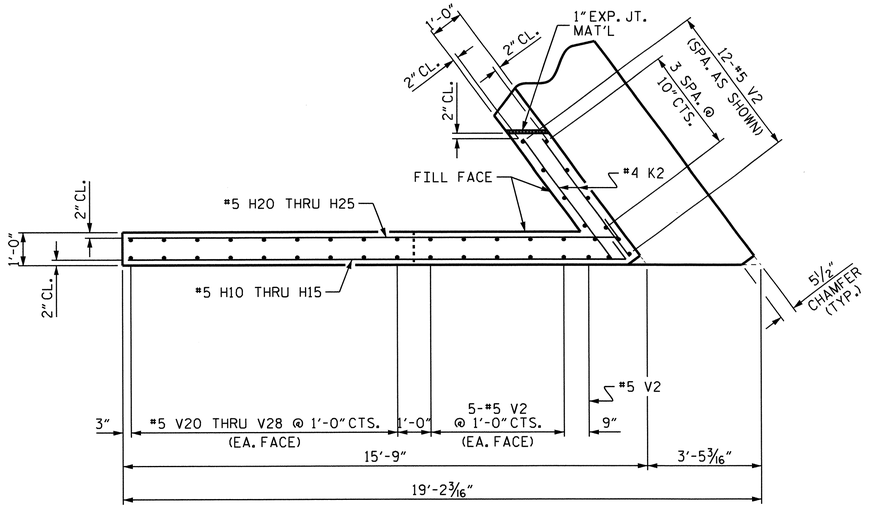
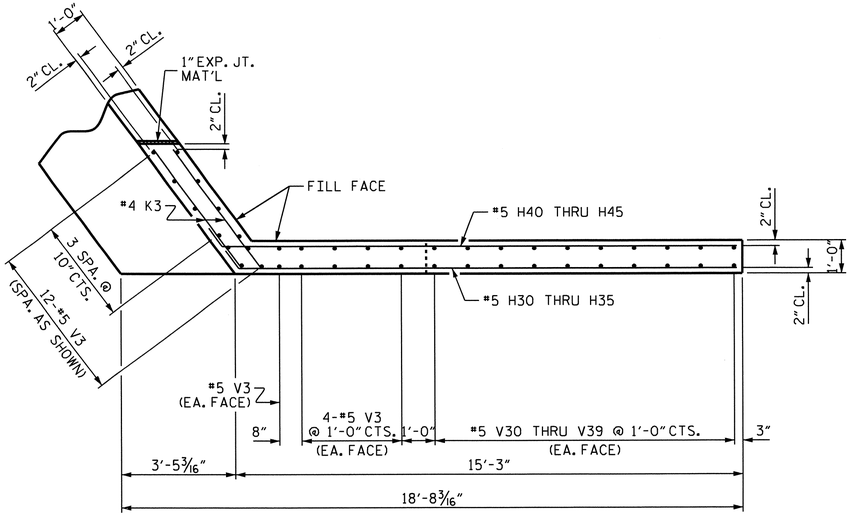
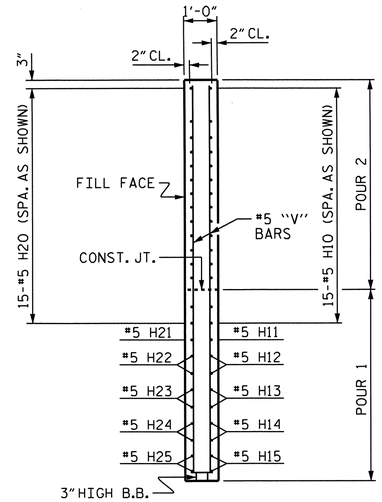
ttfang



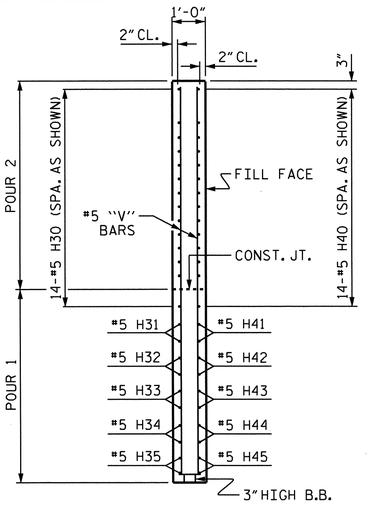
PLAN OF WING (W1)



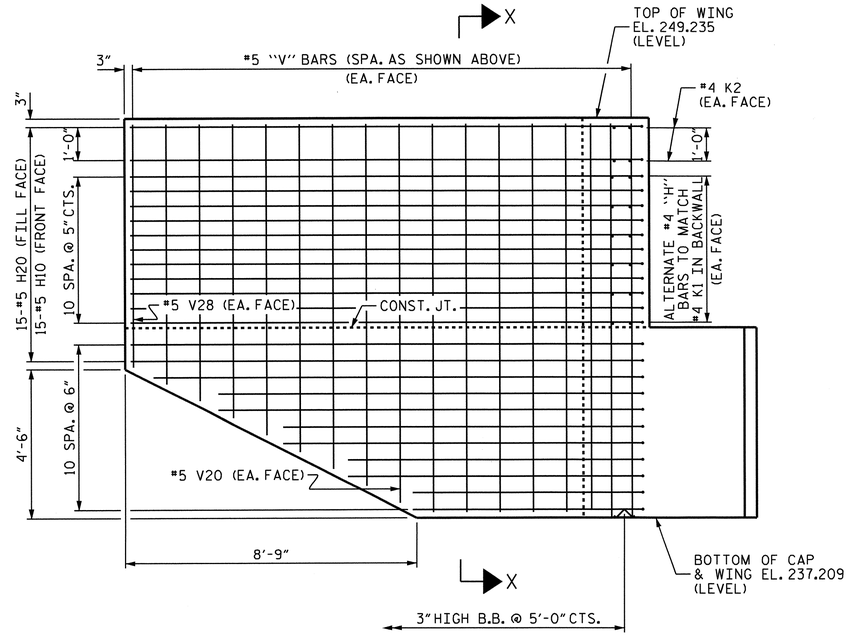
PLAN OF WING (W2)



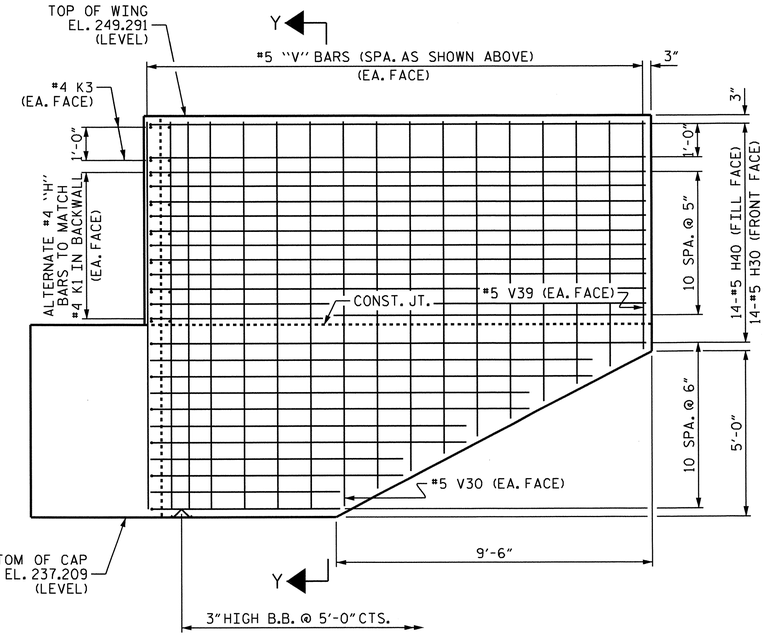
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W1)



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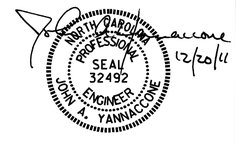

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : J.A. YANNACCONE DATE : 4/18/11
CHECKED BY : T. H. FANG DATE : 10/14/11

20-DEC-2011 15:51
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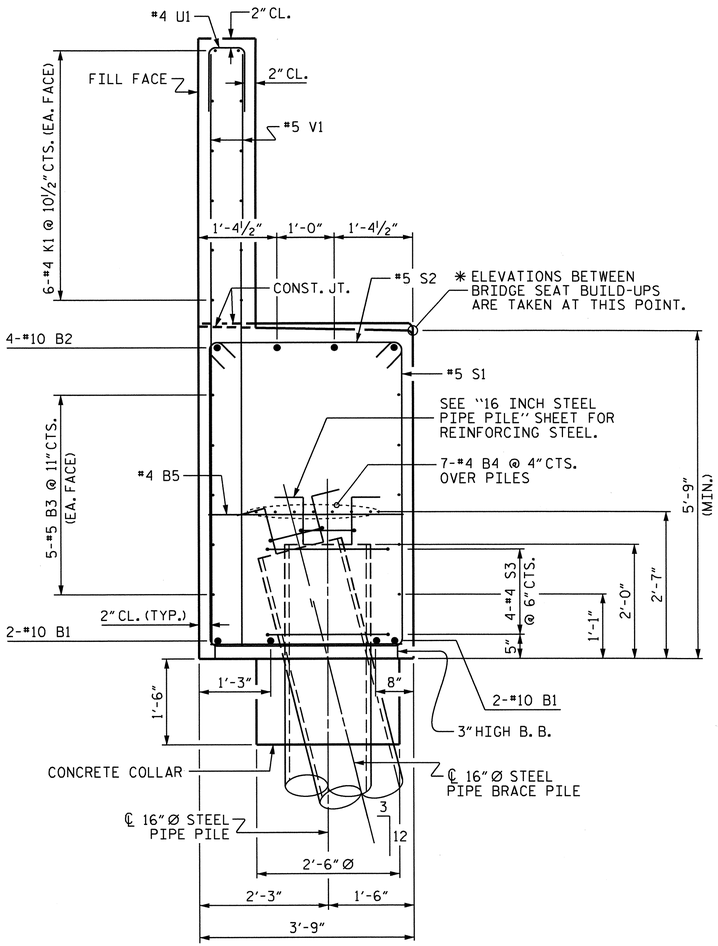
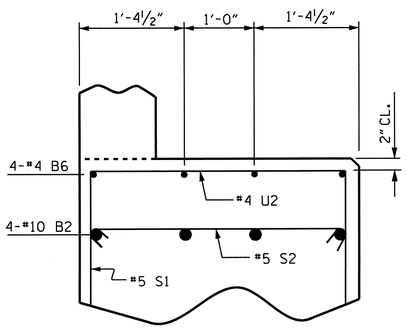
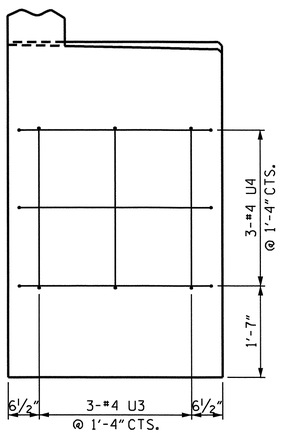


SECTION A-A



PARTIAL SECTION B-B

(#5 V1 BARS NOT SHOWN FOR CLARITY)



VIEW C-C

(TYP. EA. END)

BILL OF MATERIAL

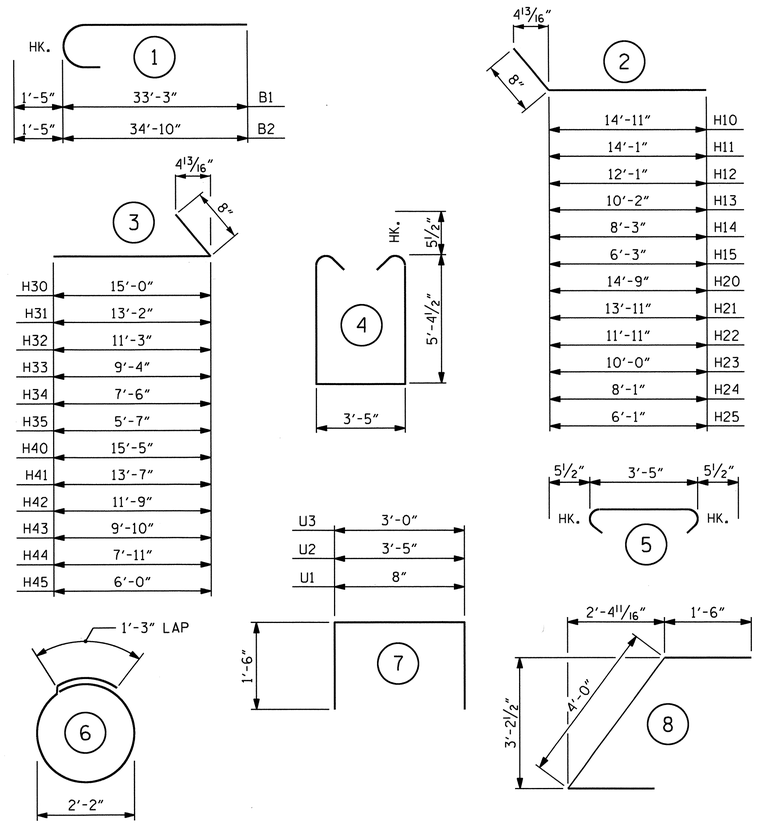
END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	34'-8"	1193
B2	8	#10	1	36'-3"	1248
B3	10	#5	STR	58'-6"	610
B4	21	#4	STR	21'-2"	297
B5	15	#4	STR	3'-5"	34
B6	8	#4	STR	2'-8"	14
H10	15	#5	2	15'-7"	244
H11	1	#5	2	14'-9"	15
H12	2	#5	2	12'-9"	27
H13	2	#5	2	10'-10"	23
H14	2	#5	2	8'-11"	19
H15	2	#5	2	6'-11"	14
H20	15	#5	2	15'-5"	241
H21	2	#5	2	14'-7"	15
H22	2	#5	2	12'-7"	26
H23	2	#5	2	10'-8"	22
H24	2	#5	2	8'-9"	18
H25	2	#5	2	6'-9"	14
H30	16	#5	2	15'-8"	229
H31	2	#5	2	13'-10"	29
H32	2	#5	2	11'-11"	25
H33	2	#5	2	10'-0"	21
H34	2	#5	2	8'-2"	17
H35	2	#5	2	6'-3"	13
H40	16	#5	2	16'-1"	235
H41	2	#5	2	14'-3"	30
H42	2	#5	2	12'-5"	26
H43	2	#5	2	10'-6"	22
H44	2	#5	2	8'-7"	18
H45	2	#5	2	6'-8"	14
K1	36	#4	STR	21'-2"	509
K2	4	#4	STR	4'-1"	11
K3	4	#4	STR	4'-5"	12
S1	50	#5	4	15'-1"	787
S2	50	#5	5	4'-4"	226
S3	28	#4	6	8'-1"	151

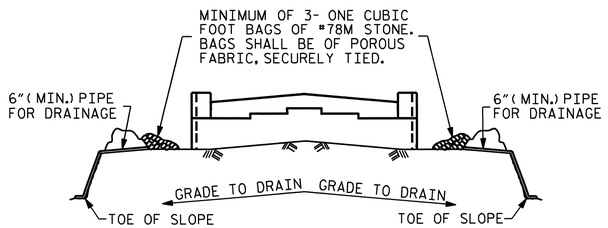
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
U1	49	#4	7	3'-8"	120
U2	6	#4	7	6'-5"	26
U3	6	#4	7	6'-0"	24
U4	6	#4	8	7'-0"	28
V1	98	#5	STR	10'-0"	1022
V2	23	#5	STR	11'-8"	280
V3	22	#5	STR	11'-9"	270
V20	2	#5	STR	11'-4"	24
V21	2	#5	STR	10'-10"	23
V22	2	#5	STR	10'-4"	22
V23	2	#5	STR	9'-10"	21
V24	2	#5	STR	9'-4"	19
V25	2	#5	STR	8'-9"	18
V26	2	#5	STR	8'-3"	17
V27	2	#5	STR	7'-9"	16
V28	2	#5	STR	7'-3"	15
V30	2	#5	STR	11'-6"	24
V31	2	#5	STR	11'-0"	23
V32	2	#5	STR	10'-6"	22
V33	2	#5	STR	10'-0"	21
V34	2	#5	STR	9'-5"	20
V35	2	#5	STR	8'-11"	19
V36	2	#5	STR	8'-5"	18
V37	2	#5	STR	7'-10"	16
V38	2	#5	STR	7'-4"	15
V39	2	#5	STR	6'-10"	14

REINFORCING STEEL	LBS	8,586
CLASS A CONRETE		
POUR #1: CAP & LOWER PART OF WINGS	CY	54.1
POUR #2: BACKWALL & UPPER PART OF WINGS	CY	17.6
TOTAL CLASS A CONCRETE	CY	71.7
PP 16 X 0.5 STEEL PILES NO. 7		385 LN. FT.
PIPE PILE PLATES		7 EA.
PILE REDRIVES		7 EA.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

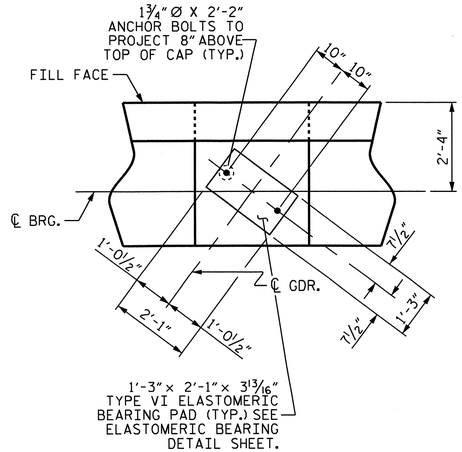


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

NORTH CAROLINA PROFESSIONAL SEAL 32492 ENGINEER JOHN A. YANNACCONE

4/15/11

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			25

DRAWN BY : J.A. YANNACCONE DATE : 7/26/11
CHECKED BY : T. H. FANG DATE : 10/14/11

14-NOV-2011 10:03
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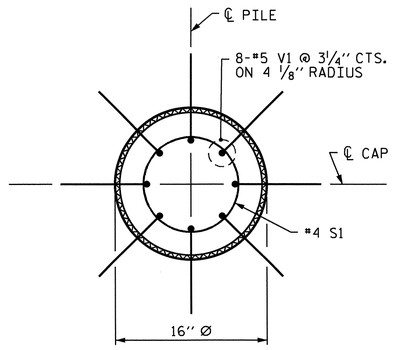
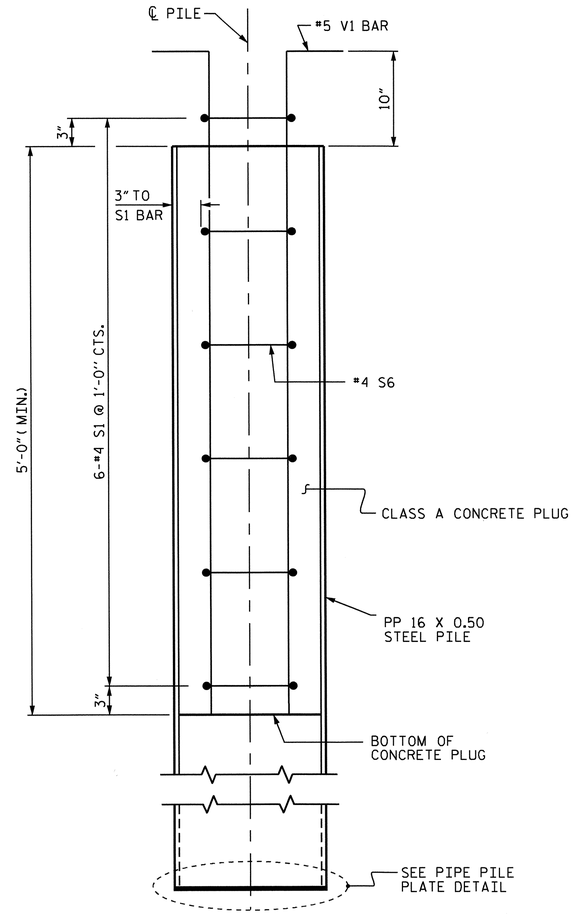
sbwilliams



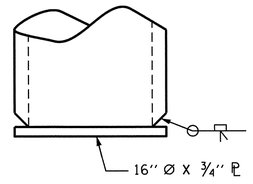
PLAN



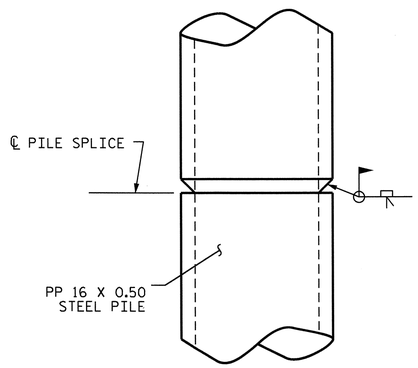
ELEVATION

PP 16 X 0.50 STEEL PILE

(CLOSED END)



PIPE PILE PLATE DETAIL



PIPE PILE SPLICE DETAIL

NOTES

PIPE PILES SHALL BE IN ACCORDANCE WITH SECTION 1084 OF THE STANDARD SPECIFICATIONS.

PIPE PILE PLATES SHALL BE IN ACCORDANCE WITH SECTION 450 OF THE STANDARD SPECIFICATIONS.

REMOVE AND REPLACE OR REPAIR TO THE SATISFACTION OF THE ENGINEER PILES THAT ARE DAMAGED, DEFORMED OR COLLAPSED DURING INSTALLATION OR DRIVING.

PILE SPLICES SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND AWS D1.1.

FOR CLOSED END PIPE PILES, REMOVE ALL SOIL AND WATER FROM INSIDE THE PILES JUST PRIOR TO PLACING REINFORCING STEEL AND CONCRETE FOR THE CONCRETE PLUG.

FORM THE CONCRETE PLUG SUCH THAT THE REINFORCING STEEL OR CONCRETE DOES NOT MOVE AND THE CLEARANCE FROM THE REINFORCING STEEL TO THE INSIDE OF THE PILE IS MAINTAINED AFTER CONCRETE PLACEMENT. DO NOT PLACE CONCRETE IN THE BENT CAP UNTIL THE CONCRETE PLUG HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI.

THE REINFORCING STEEL, CLASS A CONCRETE ARE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR PP 16 X 0.50 STEEL PILES.

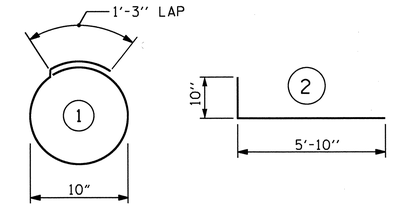
BILL OF MATERIAL FOR ONE PP 16 X 0.50 STEEL PILE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
S6	6	#4	1	3'-11"	16
V1	8	#5	2	6'-8"	56
REINFORCING STEEL =					72 lbs

CLASS A CONCRETE

5'-0" MINIMUM PLUG 0.2 CY

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

16" STEEL PIPE PILE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			25

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 12-8-09
CHECKED BY : O.T. NGUYEN	DATE : 7-10
DRAWN BY : TLA 8/05	ADDED 10/1/05
CHECKED BY : GM 9/05	REV. 5/1/06R MAA/KMM

14-NOV-2011 10:03
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sbwilliams

STD. NO. SPP2

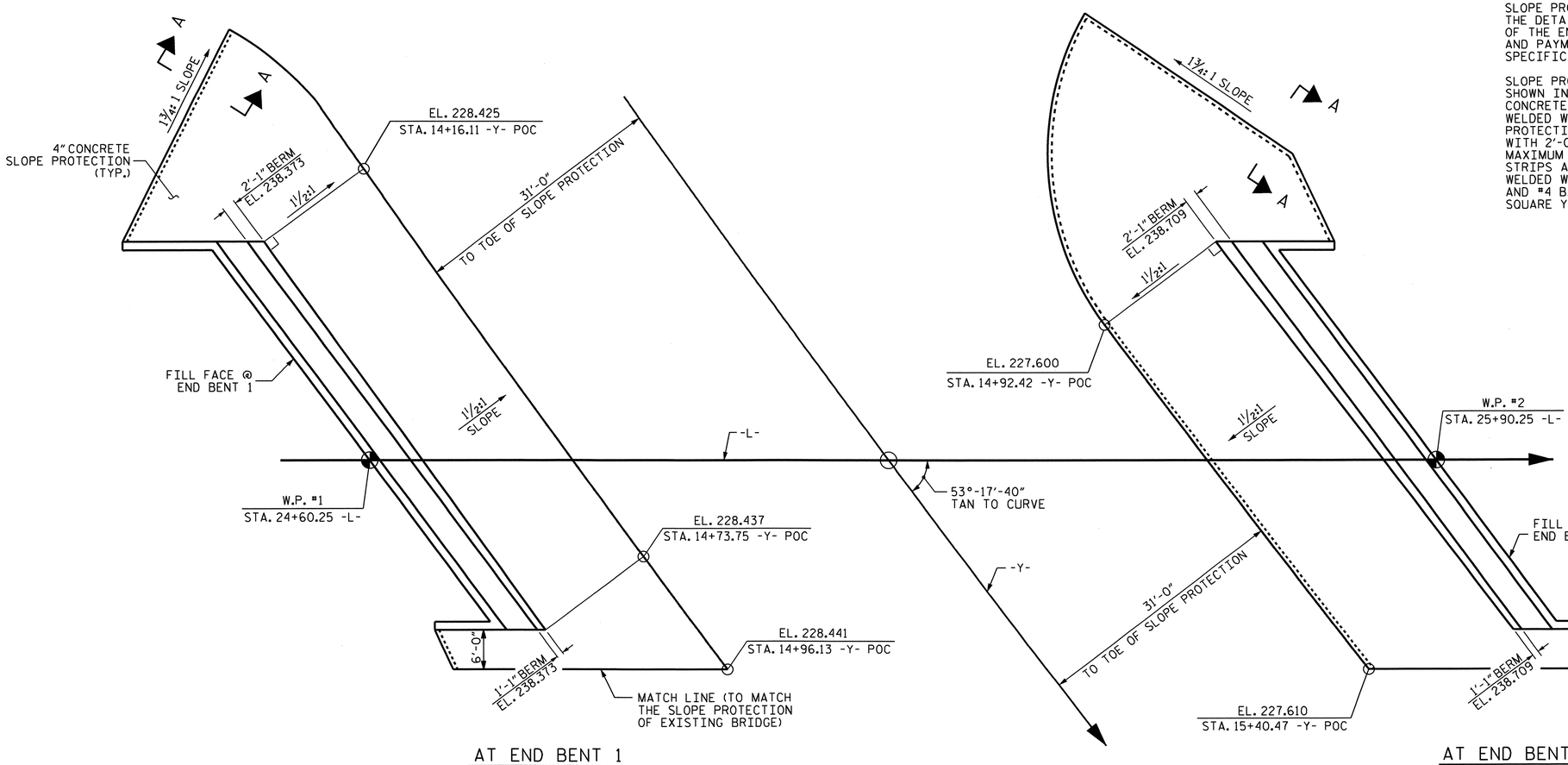
GENERAL NOTES

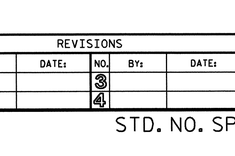
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.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

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

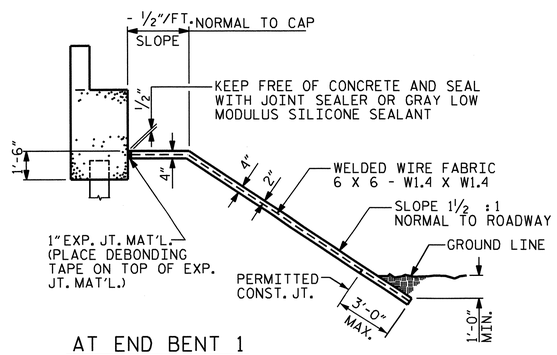
BRIDGE @ STA. 25+23.50 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	230	465
END BENT 2	245	500

* QUANTITY SHOWN IS BASED ON 5' POURS.

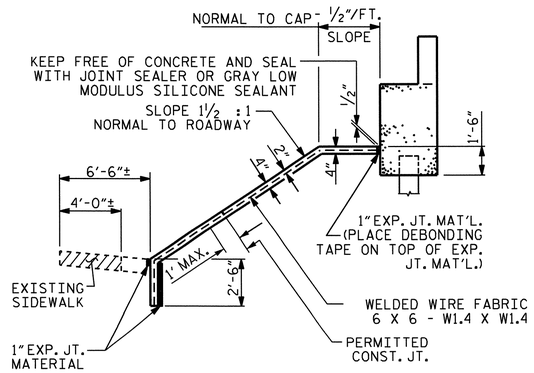




SECTION A-A

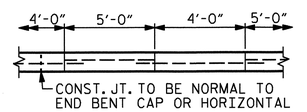


AT END BENT 1



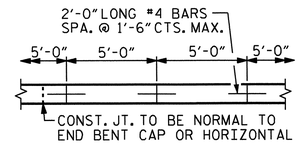
AT END BENT 2

SECTION ALONG ℄ ROADWAY



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

OPTIONAL POURING DETAIL



STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER T.H. FANG
11/14/11

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			25

ASSEMBLED BY : HARISH SHAH		DATE : 1-13-10	
CHECKED BY : T. H. FANG		DATE : 10-19-11	
DRAWN BY : ELR 5/92	REV. 7/10/01	LES/RDR	
CHECKED BY : GRP 6/92	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06	TLA/GM	

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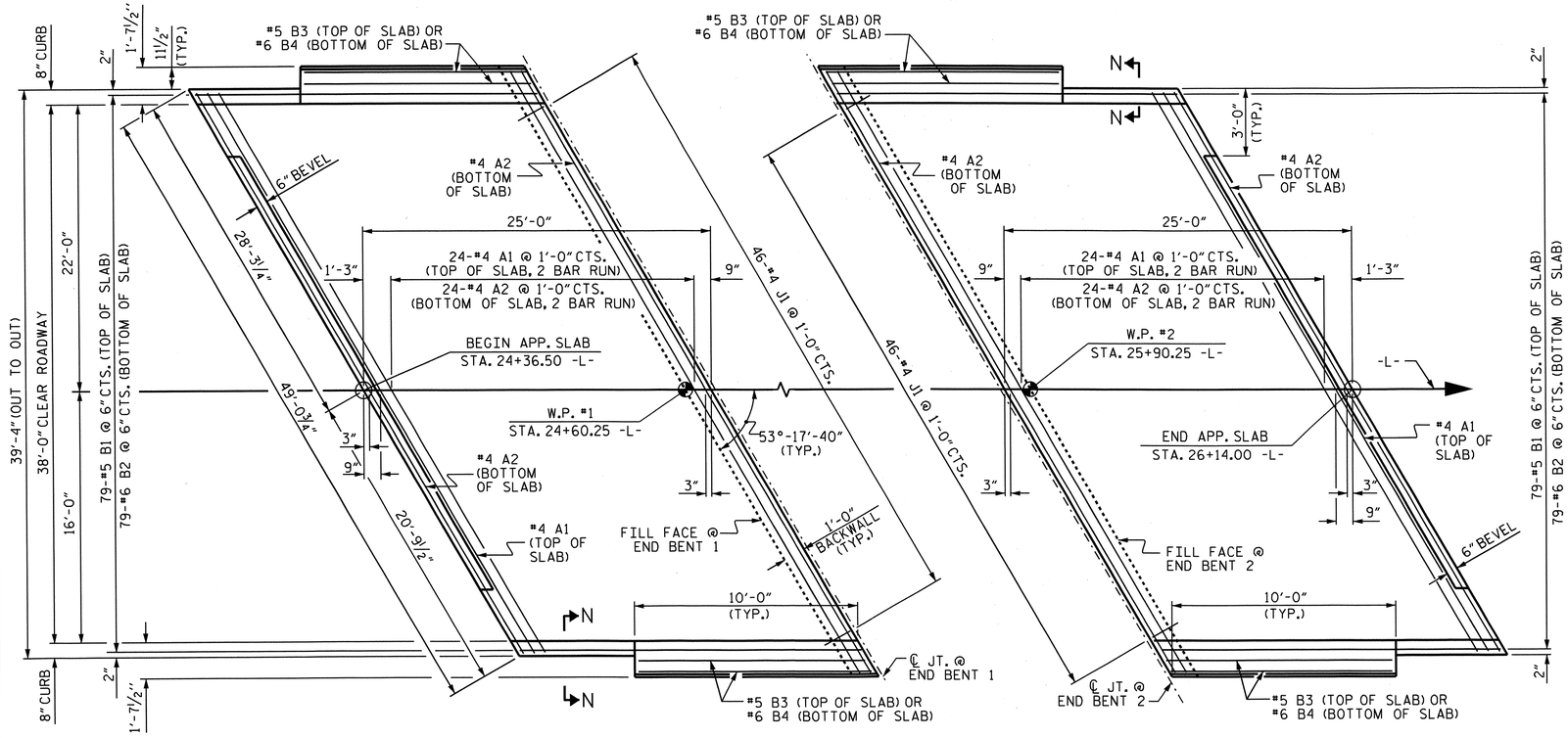
sbwilliams

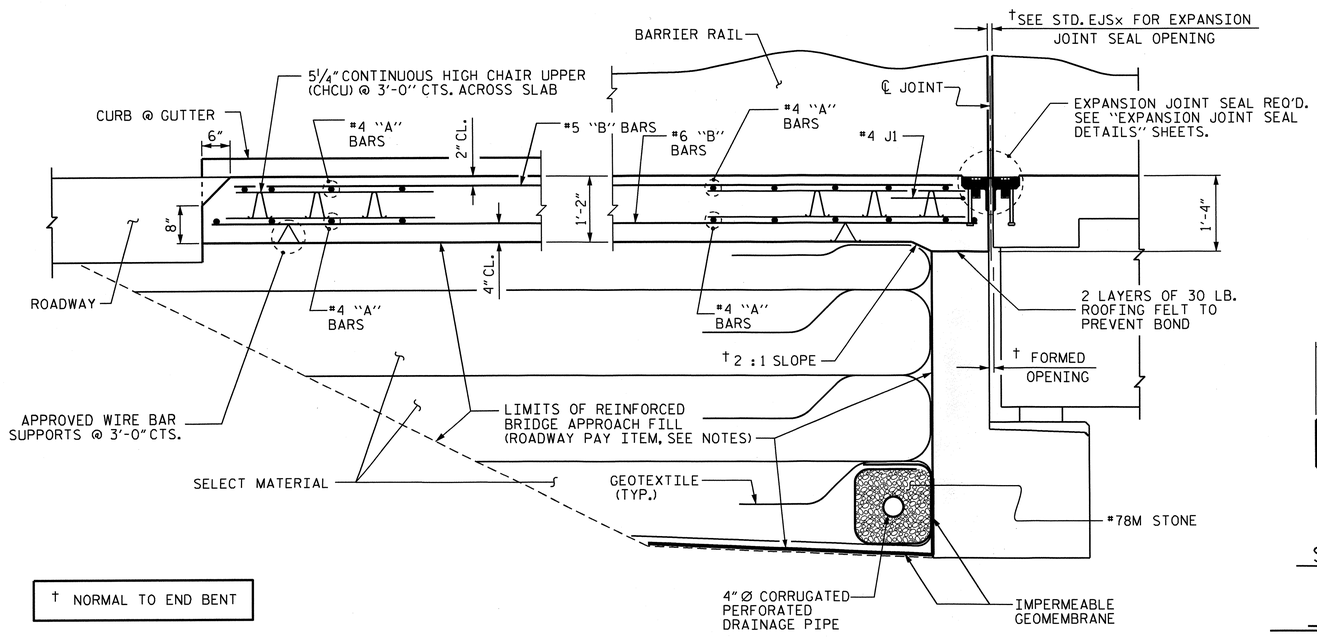
STD. NO. SP1



AT END BENT 1 — AT END BENT 2

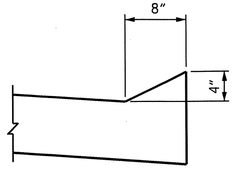
PLAN

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

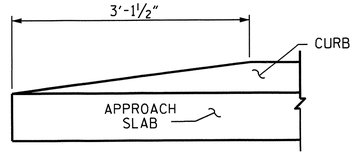


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

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

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

THE CONCRETE BARRIER RAILS ON THE APPROACH SLABS SHALL BE INCLUDED IN THE LINEAR FOOT COST OF CONCRETE BARRIER RAIL FOR THE SUPERSTRUCTURE. FOR QUANTITIES AND DETAILS, SEE SHEET 2 OF 2.

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

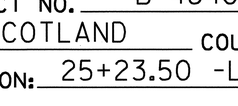
FOR EXPANSION JOINT SEALS, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱A1	50	#4	STR	26'-6"	885
A2	52	#4	STR	26'-4"	915
✱B1	79	#5	STR	23'-8"	1936
B2	79	#6	STR	24'-7"	2917
✱B3	4	#5	STR	9'-8"	40
B4	4	#6	STR	9'-8"	58
✱J1	46	#4	1	1'-5"	44
REINFORCING STEEL				LBS.	3890
✱EPOXY COATED REINFORCING STEEL				LBS.	2905
CLASS AA CONCRETE				C.Y.	43.7

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE CHART

BAR	SIZE	SPLICE
✱A1	#4	2'-0"
A2	#4	1'-9"

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG PENG
12/20/11

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			25

ASSEMBLED BY : HARISH SHAH DATE : 1-12-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

DRAWN BY : EEM 3/95
CHECKED BY : VAP 3/95

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

20-DEC-2011 08:45
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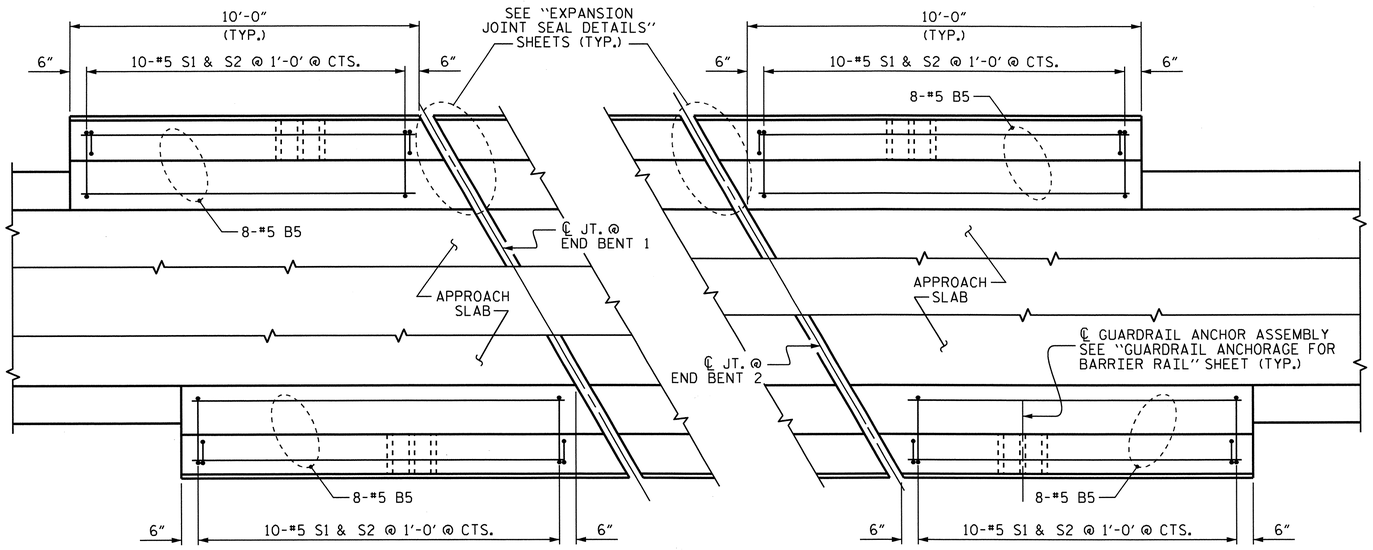
ttang

STD. NO. BAS2 (SHT 3a)



AT END BENT 1 AT END BENT 2

PLAN OF BARRIER RAIL

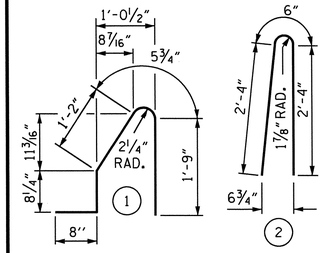
FOR EXPANSION JOINT SEAL, SEE "EXPANSION JOINT SEAL DETAILS" SHEET

NOTES

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

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES



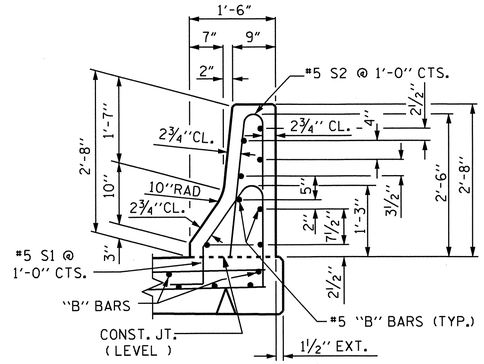
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

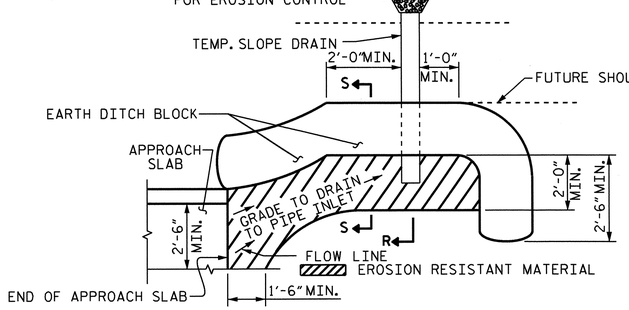
BARRIER RAILS ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B5	32	#5	STR	9'-8"	323
✱S1	40	#5	1	4'-9"	198
✱S2	40	#5	2	5'-2"	216
✱EPOXY COATED REINFORCING STEEL				LBS.	737
CLASS AA CONCRETE				C.Y.	4.3
CONCRETE BARRIER RAIL				42.24	LIN.FT.

✱✱ PAYMENT FOR CONCRETE BARRIER RAIL TO BE INCLUDED IN THE LINEAR FT. QUANTITY ON "CONCRETE BARRIER RAIL" SHEET.

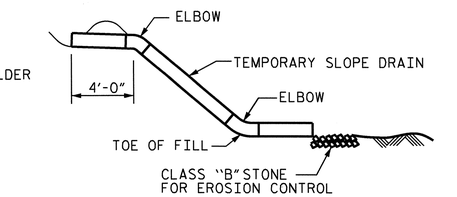


SECTION THRU RAIL

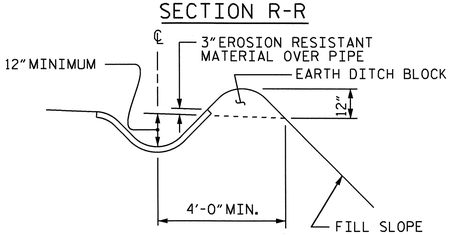


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



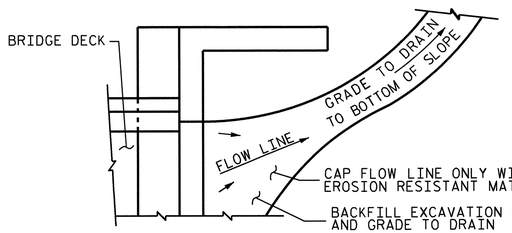
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. B-4640

SCOTLAND COUNTY

STATION: 25+23.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

ASSEMBLED BY : HARISH SHAH	DATE : 1-13-10
CHECKED BY : QT NGUYEN	DATE : 07-10

DRAWN BY : FCJ 11/88	REV. 10/17/00 RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03 RWW/JTE
	REV. 5/1/06R MAA/KMM

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

STD. NO. BAS10

14-NOV-2011 10:03
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sbwilliams

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

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

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