TIP PROJECT: U-2551

CONTRACT: C202815

STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2551		

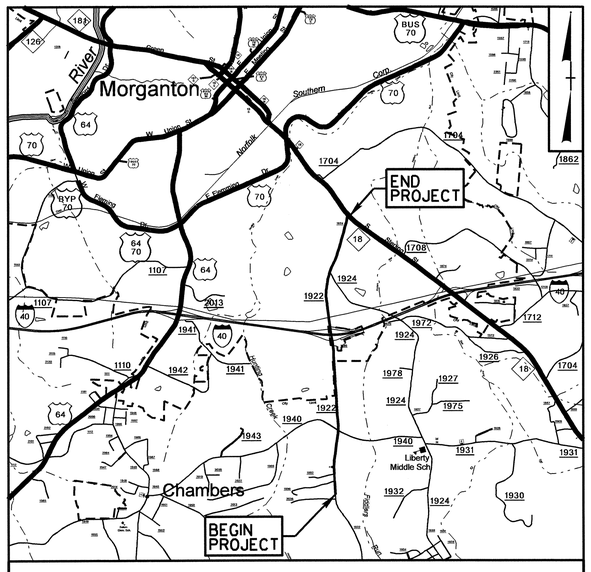
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34832.1.1	STP-1922 (1)	P.E.
34832.2.2	STP-1922 (1)	UTIL & R/W
34832.3.1	STP-1922 (1)	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

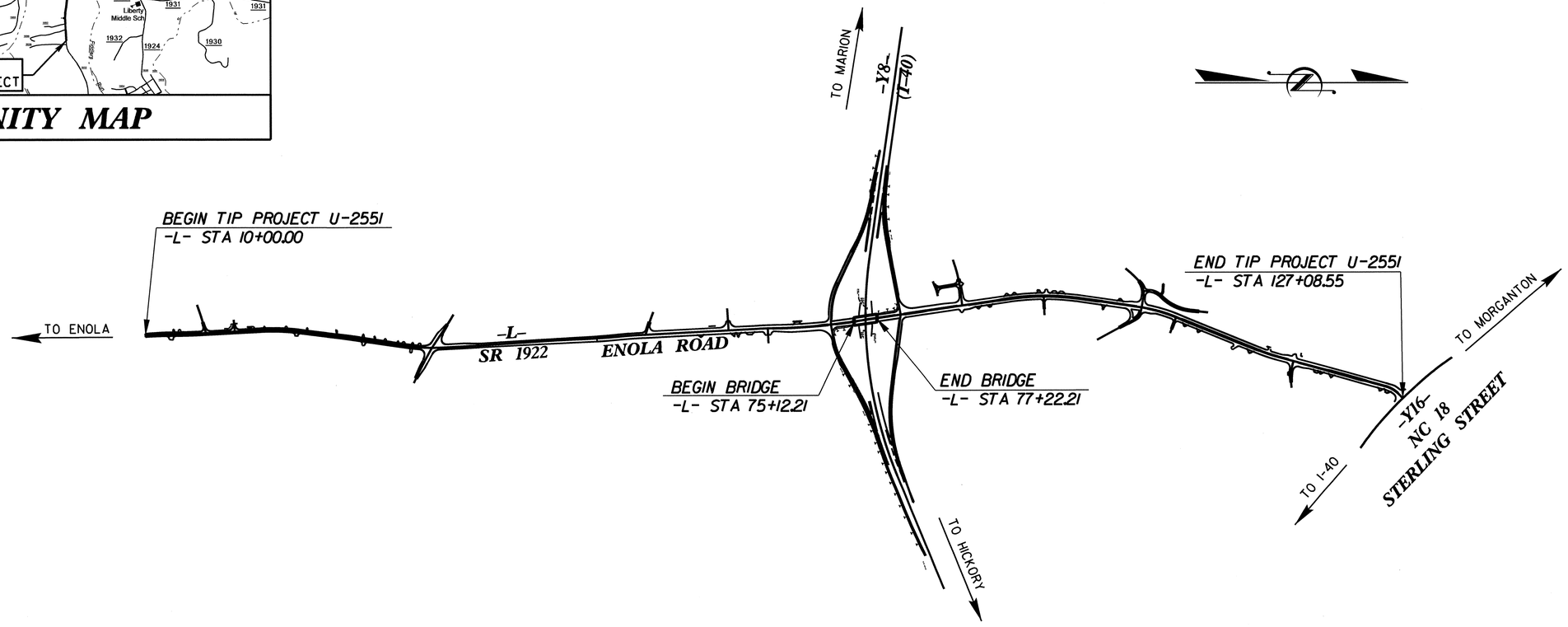
BURKE COUNTY

LOCATION: *MORGANTON–SR 1922 (ENOLA RD)/SR 1924 (OLD NC 18) FROM SR 2026 (ARNOLD DRIVE) TO NC 18 (SOUTH STERLING STREET)*

TYPE OF WORK: *WIDENING, GRADING, PAVING, DRAINAGE, STRUCTURE, RETAINING WALL, AND SIGNALS*



VICINITY MAP



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2012 = 15364 VPD
ADT 2032 = 22504 VPD
DHV = 9 %
D = 60 %
T = 7 % *
V = 40 MPH
* TTST 3% DUAL 4%
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2551 = 2.178 MI

LENGTH STRUCTURE TIP PROJECT U-2551 = 0.040 MI

TOTAL LENGTH TIP PROJECT U-2551 = 2.218 MI

Prepared In the Office of:

DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

LETTING DATE :

APRIL 17, 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

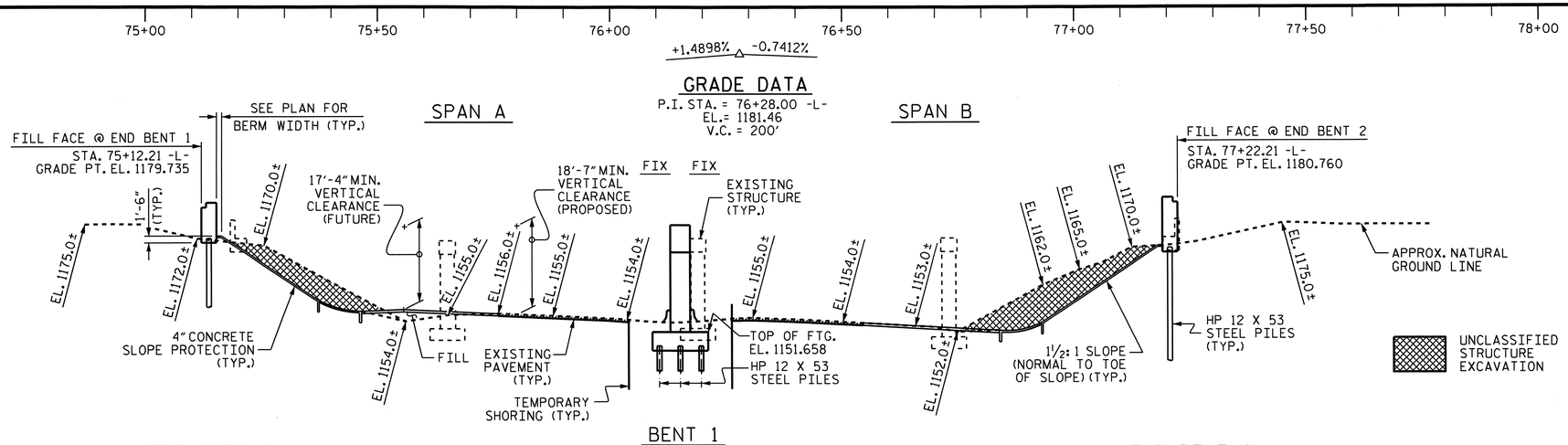
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

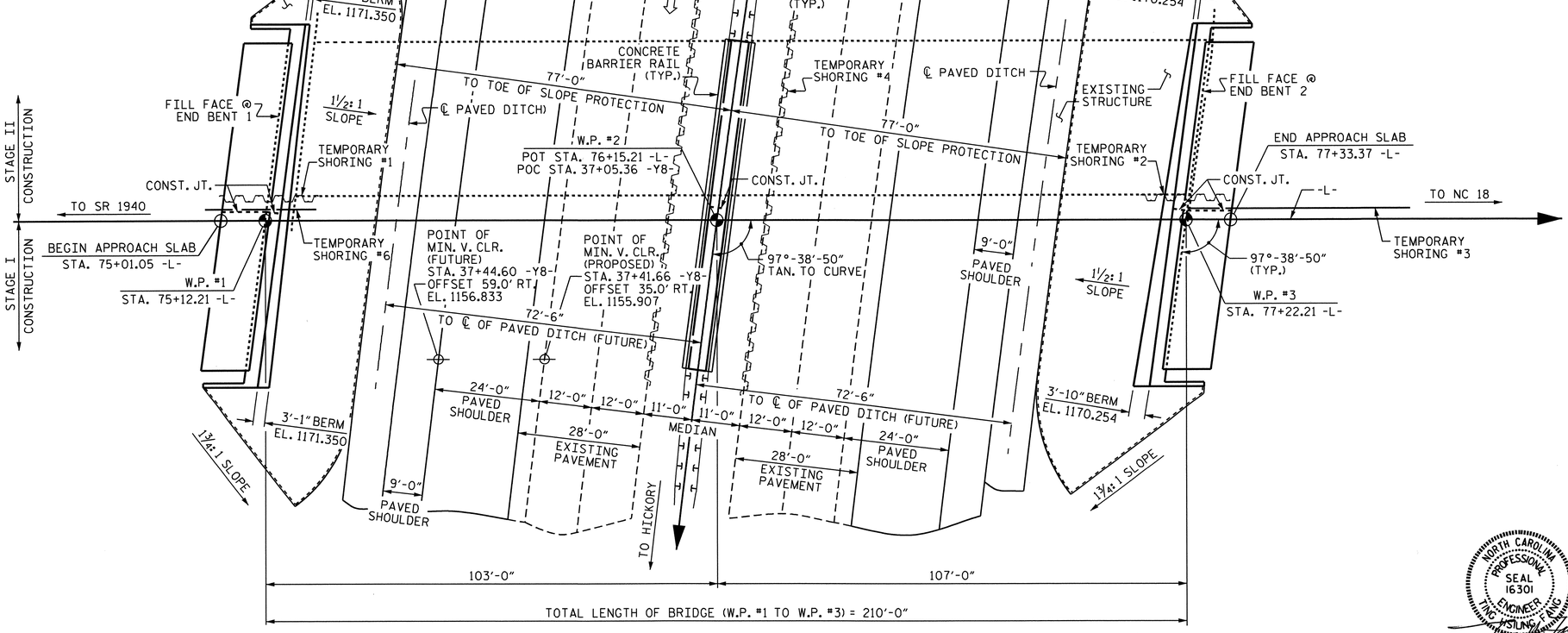
APPROVED
DIVISION ADMINISTRATOR *DATE*

F.A. PROJECT: STP-1922 (1)



SECTION ALONG -L-

SECTIONS AT END BENTS AND BENT ARE AT RIGHT ANGLES.



PLAN

PILES & FOOTINGS NOT SHOWN FOR CLARITY.

HORIZONTAL CURVE DATA -Y8-

PI STA. 41+71.68 -Y8-
Δ = 30°-32'-47.4" (LT)
D = 1°-29'-59.8"
L = 2036.49'
T = 1043.07'
R = 3819.83'

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L- POT
37+05.36 -Y8- POC

SHEET 1 OF 3 REPLACES BRIDGE #134

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON SR 1922 (ENOLA RD.) OVER I-40 BETWEEN SR 1940 & NC 18

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

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-YU HSIUNG FANG
2/22/12

DRAWN BY : E.C. LOCKLEAR DATE : 7-24-09
CHECKED BY : T. H. FANG DATE : 9-24-09

22-FEB-2012 11:03
R:\Structures\Final Plans\u2551_sd_gd.dgn
wparker

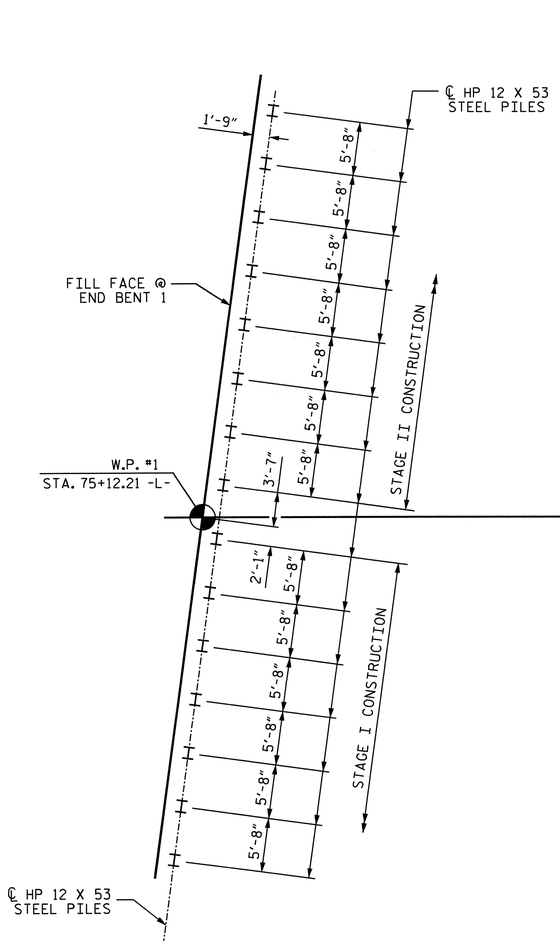
NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

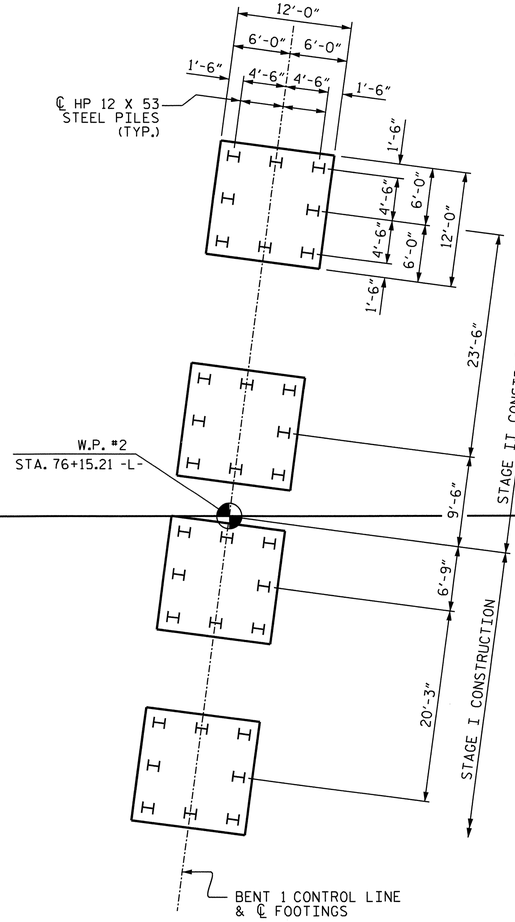
PILES AT END BENTS 1 & 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 167 TONS PER PILE.

PILES AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE. DRIVE PILES TO A REQUIRED DRIVING RESISTANCE OF 183 TONS PER PILE.

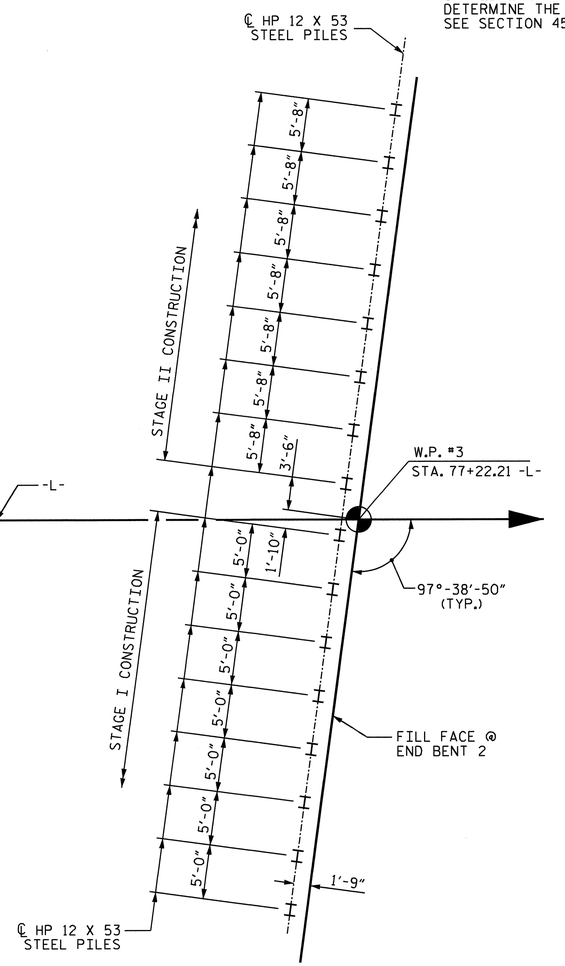
TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.



END BENT 1
(INTEGRAL)



BENT 1



END BENT 2
(INTEGRAL)

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE. ORIENT PILES AS SHOWN. FOOTING DIMENSIONS ARE TYPICAL AT BENT 1.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG FANG

2/22/12

DRAWN BY : OT NGUYEN DATE : 9-24-10
CHECKED BY : T. H. FANG DATE : 12-23-11

22-FEB-2012 11:03
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wparker

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

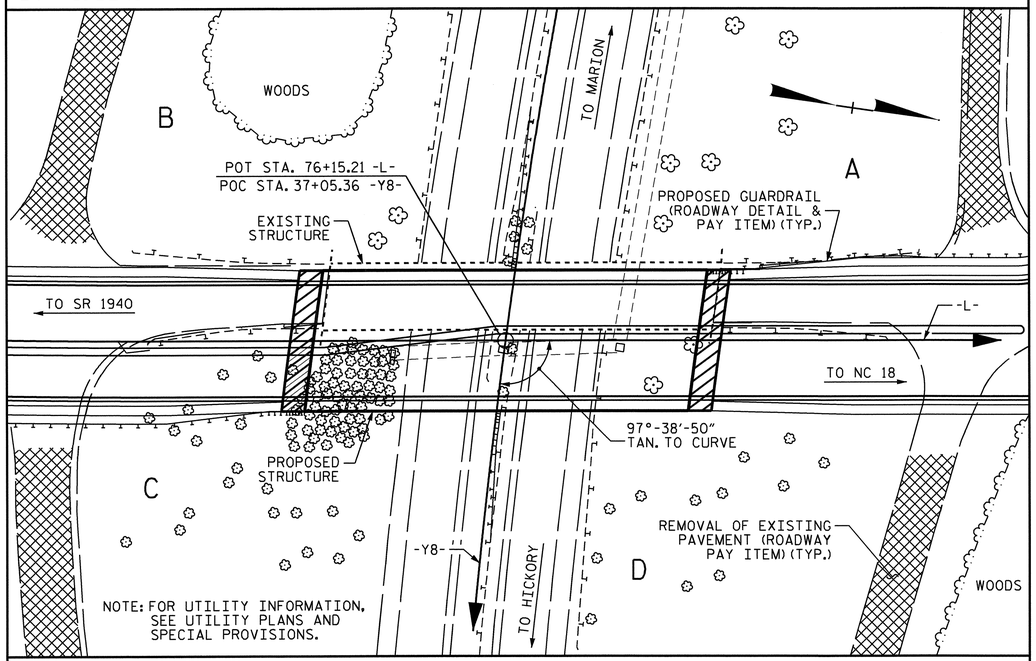
GENERAL DRAWING FOR BRIDGE ON SR 1922 (ENOLA RD.) OVER I-40 BETWEEN SR 1940 & NC 18

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

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	PDA TESTING	UNCLASSFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		PILE REDRIVES	TWO BAR METAL RAIL	1'-5" x 2'-6" CONCRETE PARAPET	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	ARCHITECTURAL CONCRETE SURFACE TREATMENT
	LUMP SUM	LUMP SUM	EACH	LUMP SUM	SQ. FT.	SQ. FT.	CU. YDS	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	SQ. FT.
SUPERSTRUCTURE					16,152	13,057					22	2,277.46				449.29	464.64		LUMP SUM	2,989
END BENT 1			1	LUMP SUM			45.4		5,766				15	675	15			350		540
BENT 1		LUMP SUM	1				205.9		19,476	1864			32	1440	32					2,146
END BENT 2			1	LUMP SUM			70.8		6,653				16	720	16			435		795
TOTAL	LUMP SUM	LUMP SUM	3	LUMP SUM	16,152	13,057	322.1	LUMP SUM	31,895	1864	22	2,277.46	63	2,835	63	449.29	464.64	785	LUMP SUM	6,470

BM #3: BENCH TIE MARKER IN 24" PINE STA 77+53.00 -L-, 99.000' RIGHT, EL. 1169.09



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF 4 REINFORCED CONCRETE DECK GIRDER SPANS (43'-6", 53'-11", 54'-0" AND 53'-11½"); 28'-0" CLEAR ROADWAY; END BENT CONSISTING OF RC CAPS ON PPC PILES, INTERIOR BENTS CONSISTING OF 3 COLUMN RC POST & BEAM BENT ON PPC PILE FOOTING, AND LOCATED AT THE PROPOSED STRUCTURE SITE 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.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 75 FT. LEFT OF CENTERLINE ROADWAY AND 50 FT. RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

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

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING FOR BRIDGE ON SR 1922 (ENOLA RD.) OVER I-40 BETWEEN SR 1940 & NC 18

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG FANG

2/29/12

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

DRAWN BY : E.C. LOCKLEAR DATE : 10/08
CHECKED BY : T.H. FANG DATE : 11/08

29-FEB-2012 09:50
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tfang

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.005	--	1.75	0.668	1.65	A	EL	50.055	0.764	1.21	B	I	20.822	0.80	0.668	1.00	A	EL	50.055	
		HL-93 (OPERATING)	N/A	--	1.649	--	1.35	0.668	2.14	A	EL	50.055	0.764	1.57	B	I	20.822	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.403	50.514	1.75	0.668	2.30	A	EL	50.055	0.764	1.58	B	I	20.822	0.80	0.668	1.40	A	EL	50.055	
		HS-20 (OPERATING)	36.000	--	2.165	77.934	1.35	0.668	2.98	A	EL	50.055	0.764	2.05	B	I	20.822	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500	--	3.333	44.996	1.40	0.668	6.83	A	EL	50.055	0.764	4.82	B	I	20.822	0.80	0.668	3.33	A	EL	50.055	
		SNGARBS2	20.000	--	2.411	48.229	1.40	0.668	4.94	A	EL	50.055	0.764	3.39	B	I	20.822	0.80	0.668	2.41	A	EL	50.055	
		SNAGRIS2	22.000	--	2.255	49.602	1.40	0.668	4.62	A	EL	50.055	0.764	3.13	B	I	20.822	0.80	0.668	2.25	A	EL	50.055	
		SNCOTTS3	27.250	--	1.656	45.139	1.40	0.668	3.40	A	EL	50.055	0.764	2.40	B	I	20.822	0.80	0.668	1.66	A	EL	50.055	
		SNAGGRS4	34.925	--	1.356	47.372	1.40	0.668	2.78	A	EL	50.055	0.764	1.97	B	I	20.822	0.80	0.668	1.36	A	EL	50.055	
		SNS5A	35.550	--	1.328	47.220	1.40	0.668	2.72	A	EL	50.055	0.764	1.98	B	I	20.822	0.80	0.668	1.33	A	EL	50.055	
		SNS6A	39.950	--	1.207	48.233	1.40	0.668	2.47	A	EL	50.055	0.764	1.79	B	I	20.822	0.80	0.668	1.21	A	EL	50.055	
		SNS7B	42.000	--	1.149	48.272	1.40	0.668	2.36	A	EL	50.055	0.764	1.75	B	I	20.822	0.80	0.668	1.15	A	EL	50.055	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000	--	1.469	48.476	1.40	0.668	3.01	A	EL	50.055	0.764	2.14	B	I	20.822	0.80	0.668	1.47	A	EL	50.055	
		TNT4A	33.075	--	1.472	48.699	1.40	0.668	3.02	A	EL	50.055	0.764	2.10	B	I	20.822	0.80	0.668	1.47	A	EL	50.055	
		TNT6A	41.600	--	1.193	49.641	1.40	0.668	2.45	A	EL	50.055	0.764	1.83	B	I	20.822	0.80	0.668	1.19	A	EL	50.055	
		TNT7A	42.000	--	1.194	50.134	1.40	0.668	2.45	A	EL	50.055	0.764	1.80	B	I	20.822	0.80	0.668	1.19	A	EL	50.055	
		TNT7B	42.000	--	1.221	51.295	1.40	0.668	2.50	A	EL	50.055	0.764	1.72	B	I	20.822	0.80	0.668	1.22	A	EL	50.055	
		TNAGRIT4	43.000	--	1.172	50.391	1.40	0.668	2.40	A	EL	50.055	0.764	1.66	B	I	20.822	0.80	0.668	1.17	A	EL	50.055	
		TNAGT5A	45.000	--	1.110	49.937	1.40	0.668	2.27	A	EL	50.055	0.764	1.64	B	I	20.822	0.80	0.668	1.11	A	EL	50.055	
		TNAGT5B	45.000	3	1.101	49.525	1.40	0.668	2.26	A	EL	50.055	0.764	1.58	B	I	20.822	0.80	0.668	1.10	A	EL	50.055	

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

1.
2.
3.
4.

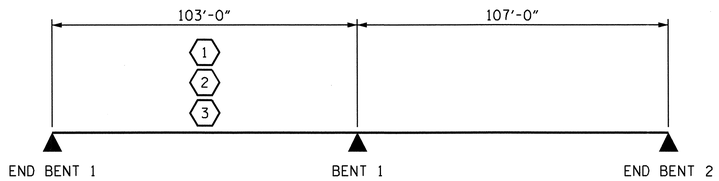
(#) CONTROLLING LOAD RATING

1. DESIGN LOAD RATING (HL-93)
2. DESIGN LOAD RATING (HS-20)
3. LEGAL LOAD RATING **

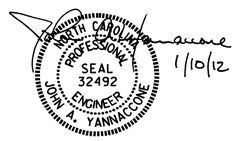
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY



1/10/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

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

SHEET NO. S-4
TOTAL SHEETS 47

STD. NO. LRFR1

ASSEMBLED BY : J.A. YANNACCONE DATE : 1/5/12 CHECKED BY : T. H. FANG DATE : 1/6/12	
DRAWN BY : MAA 1/08 CHECKED BY : GM/DI 2/08	REV. 11/12/08R MAA/GM

09-JAN-2012 16:44
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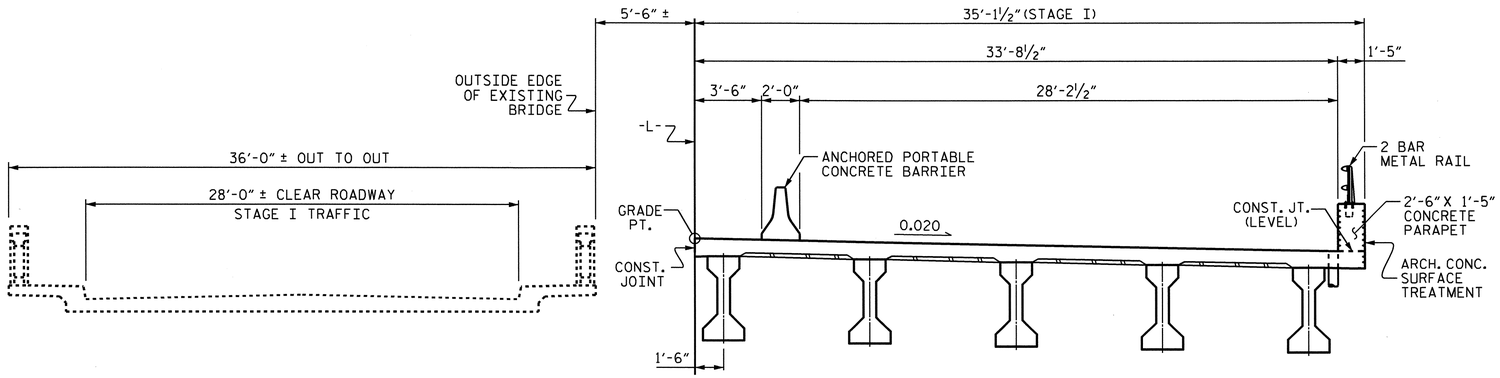
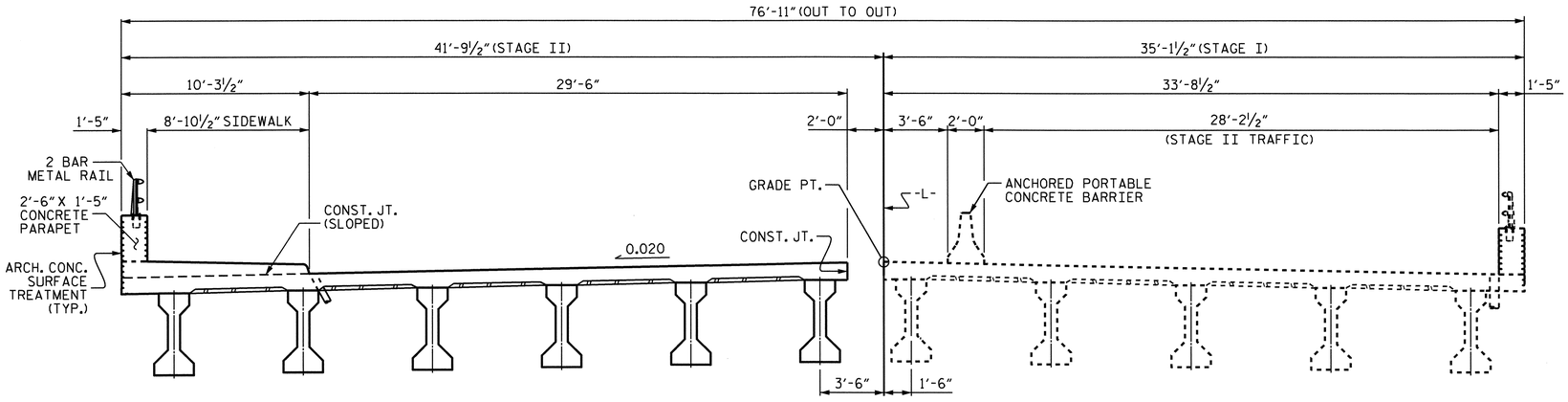
JAYannaccone



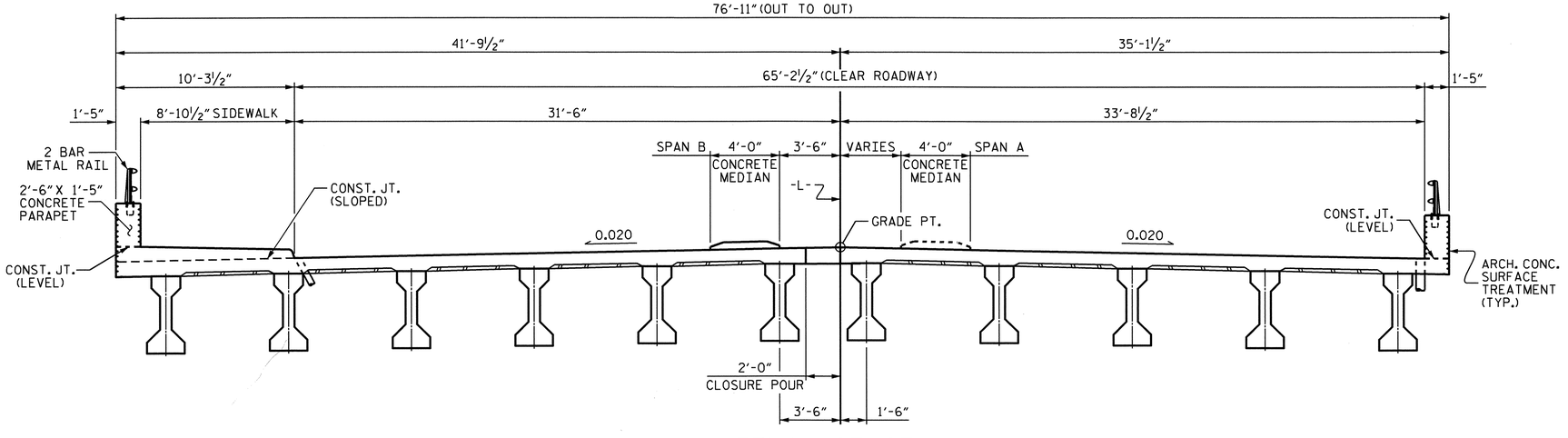
STAGE I CONSTRUCTION

CONSTRUCT RIGHT SIDE OF PROPOSED BRIDGE
MAINTAIN TRAFFIC ON EXISTING STRUCTURE



STAGE II CONSTRUCTION

MOVE TRAFFIC ONTO NEW BRIDGE, REMOVE EXISTING BRIDGE, CONSTRUCT LEFT SIDE OF PROPOSED BRIDGE.



FINAL STAGE

CONSTRUCT THE CLOSURE POUR &
CONCRETE MEDIAN OF PROPOSED BRIDGE

NOTE

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMIT OF THE ANCHORED PORTABLE CONCRETE BARRIER.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER HSING FANG
2/20/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : E.C. LOCKLEAR DATE : 7-27-09
CHECKED BY : T. H. FANG DATE : 9-27-09

20-FEB-2012 17:48
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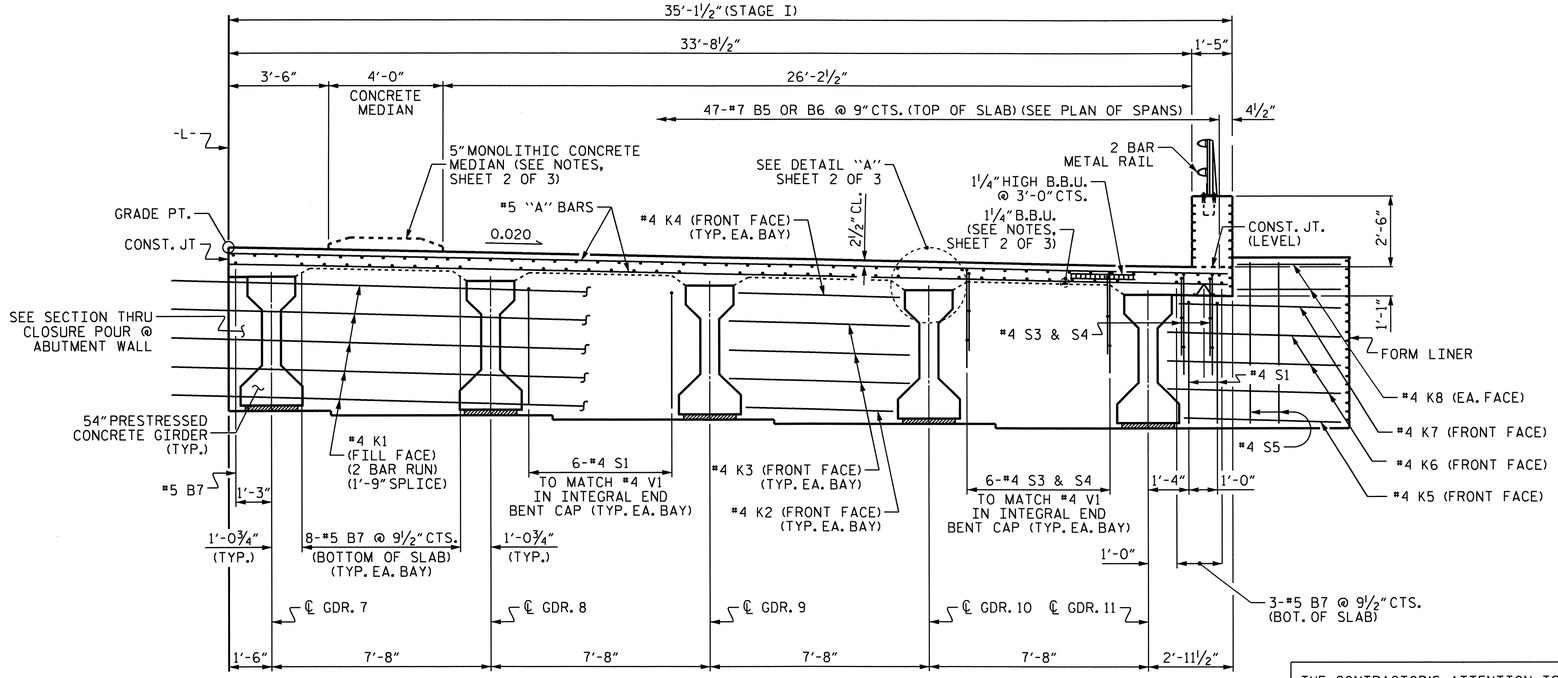
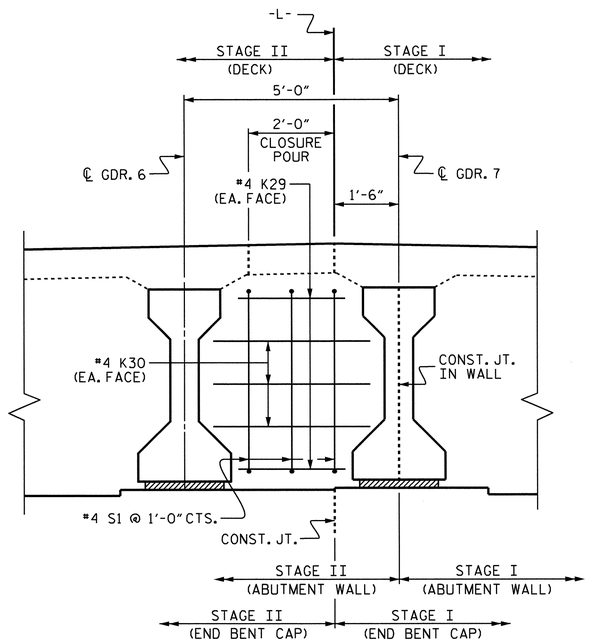
tfang



TYPICAL SECTION - STAGE I

SHOWING ABUTMENT WALL AT END BENT.
APPROACH SLAB BLOCKOUT & SIP FORMS NOT SHOWN FOR CLARITY.

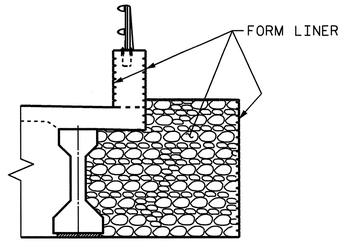
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE STAGE II SCREED RAIL SHALL NOT BE SUPPORTED ON THE DECK OF STAGE I DURING THE CONSTRUCTION OF STAGE II.



SECTION THRU CLOSURE POUR @ ABUTMENT WALL

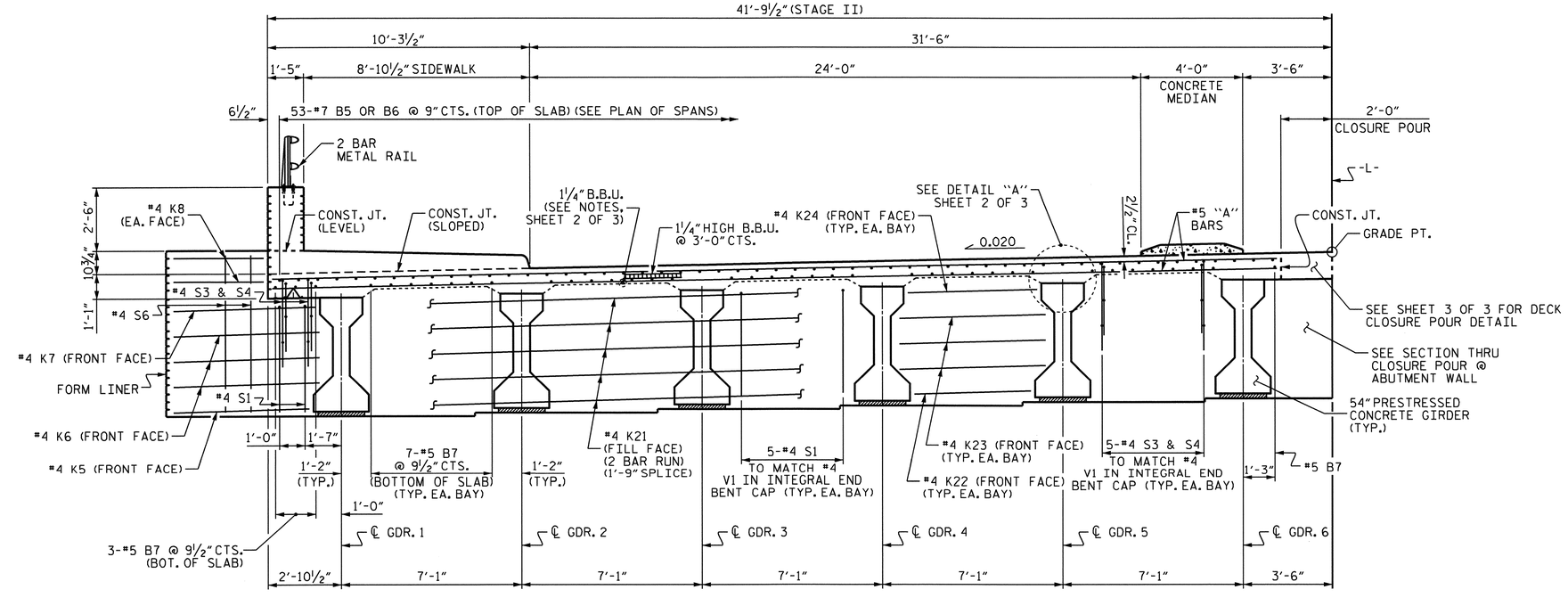
#4 K1, K21, S3 & S4 NOT SHOWN FOR CLARITY.

CAST ABUTMENT WALLS BETWEEN GIRDERS 6 & 7 WITH STAGE II CONSTRUCTION, SEE "POUR SEQUENCE" DETAILS.



LIMITS OF ARCHITECTURAL CONCRETE SURFACE TREATMENT ON ABUTMENT WALL

STAGE I SHOWN. STAGE II SIMILAR.



TYPICAL SECTION - STAGE II

SHOWING ABUTMENT WALL AT END BENT.
APPROACH SLAB BLOCKOUT & SIP FORMS NOT SHOWN FOR CLARITY.

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

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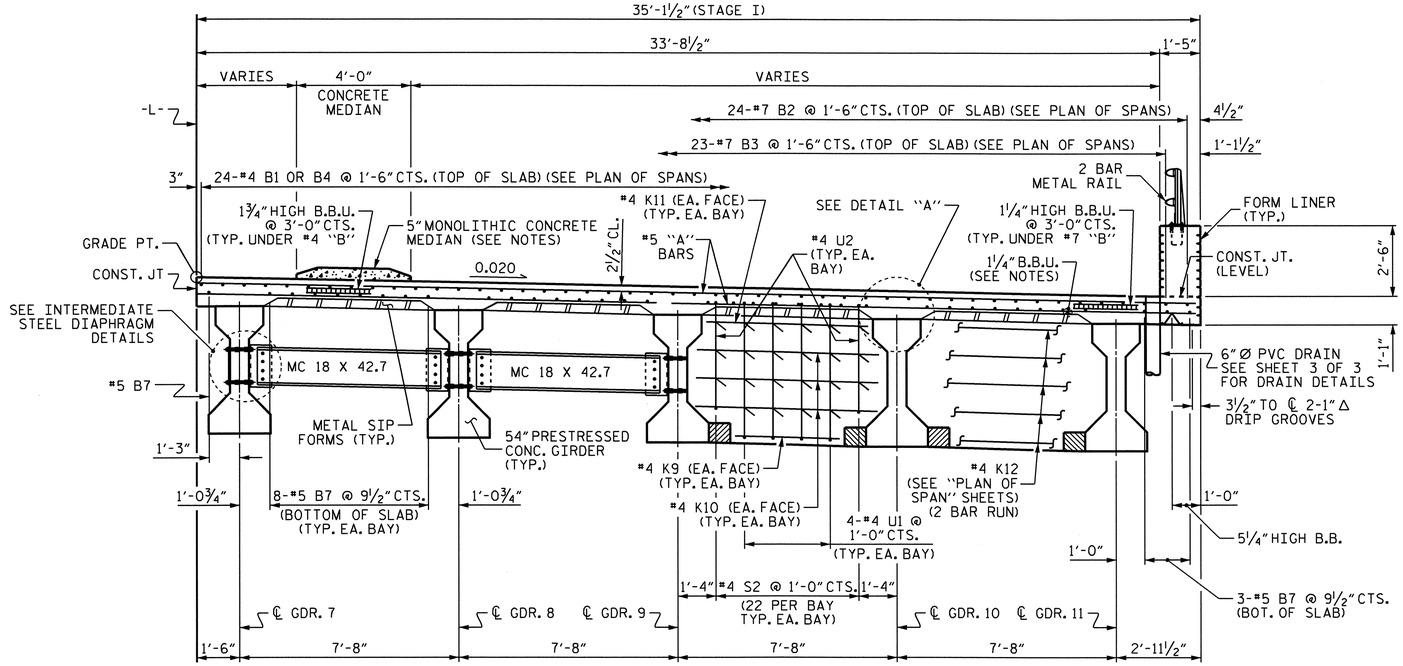
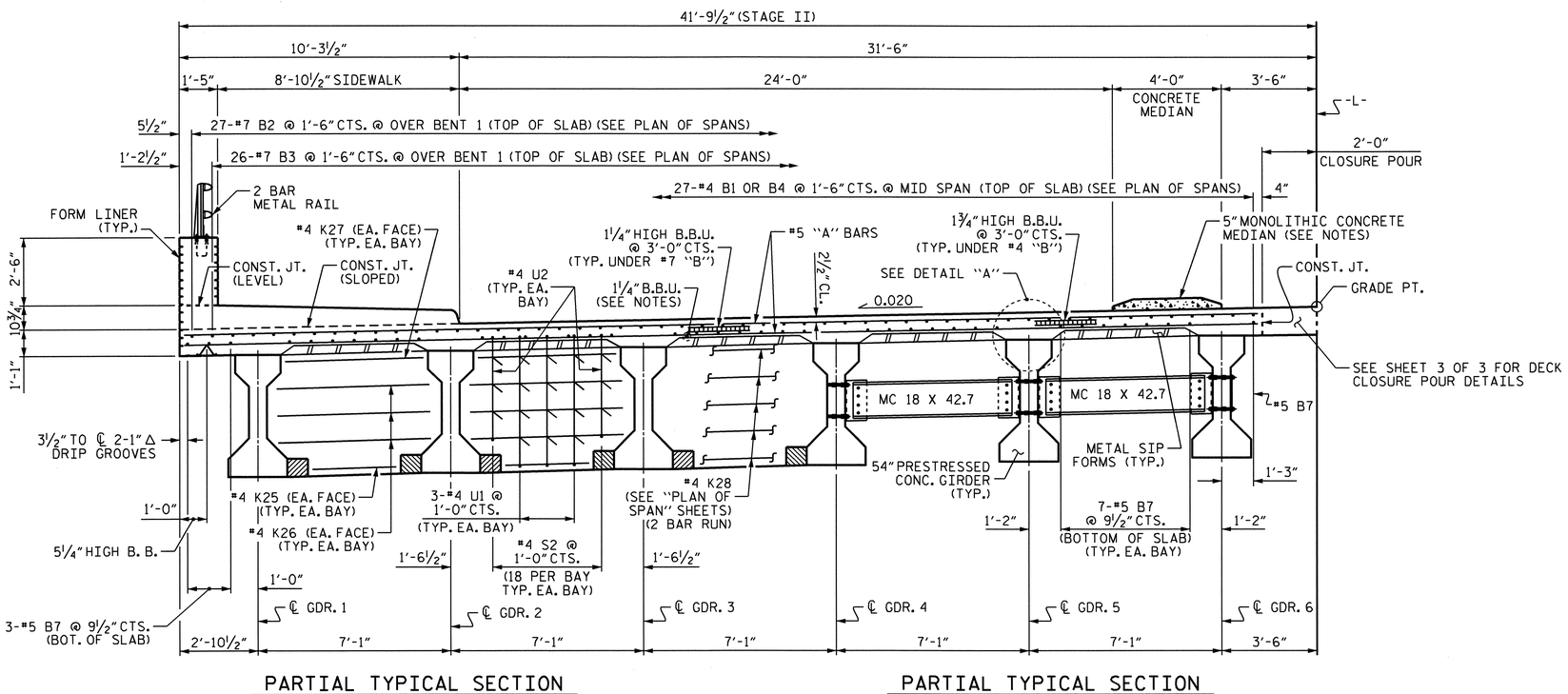


PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

PARTIAL TYPICAL SECTION
(SHOWING BENT DIAPHRAGMS)

TYPICAL SECTION - STAGE I



PARTIAL TYPICAL SECTION
(SHOWING BENT DIAPHRAGMS)

PARTIAL TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS)

TYPICAL SECTION - STAGE II

DECK DRAINS NOT SHOWN FOR CLARITY.

NOTES

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

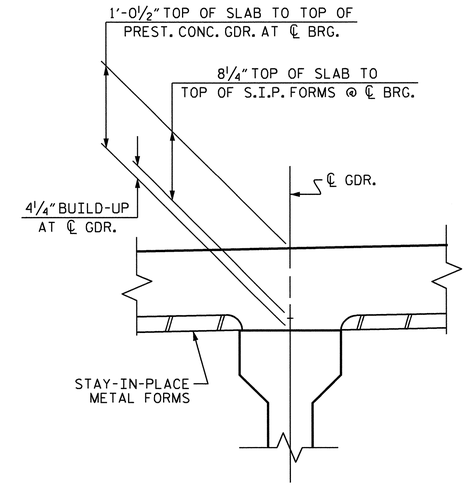
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

FOR WING ELEVATIONS AND DETAILS, SEE "PLAN OF SPANS DETAILS" SHEETS.

FOR 5" MONOLITHIC CONCRETE MEDIAN REINFORCING STEEL AND DETAILS, SEE "CONCRETE MEDIAN" SHEET.

FOR SECTION THROUGH SIDEWALK AND DETAILS, SEE "SIDEWALK DETAILS" SHEET.



DETAIL "A"

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			47

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
2/20/12

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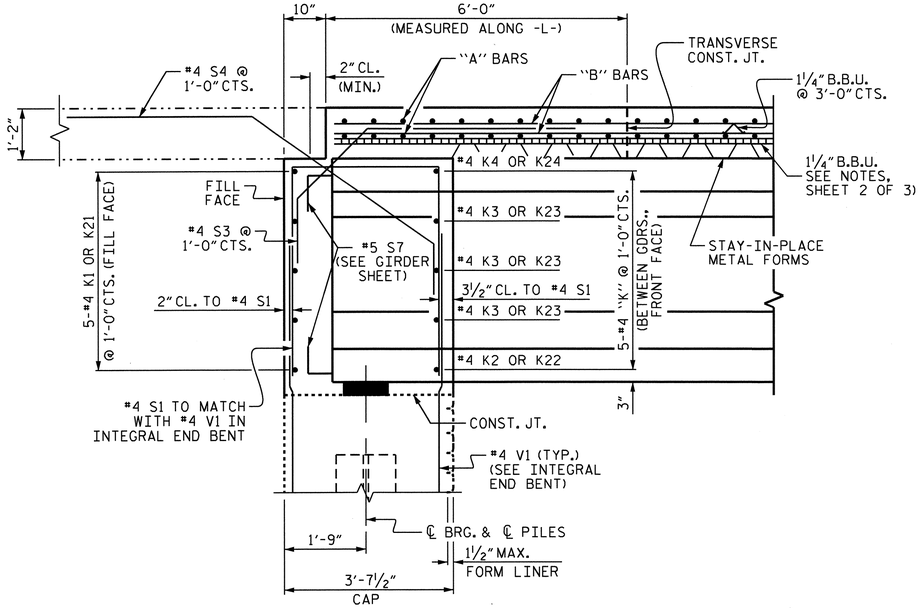
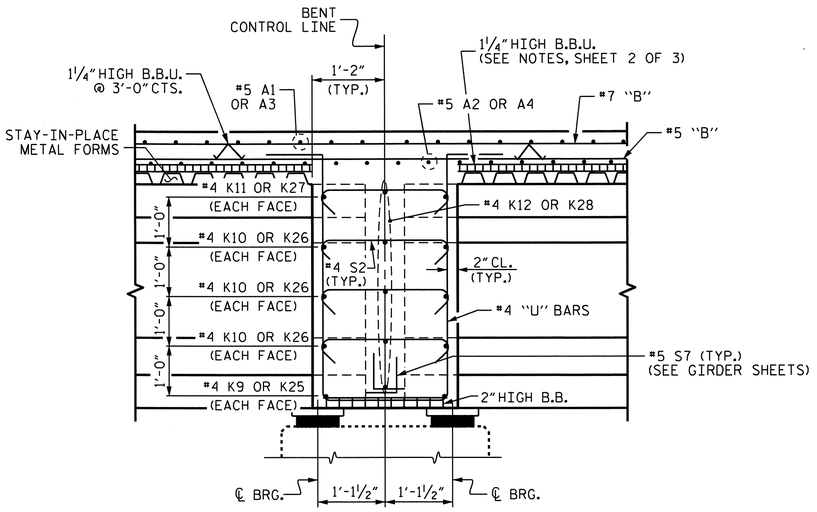
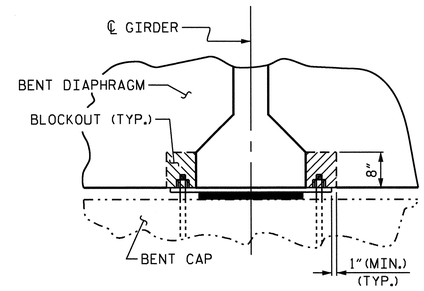


SECTION THRU INTEGRAL END BENT

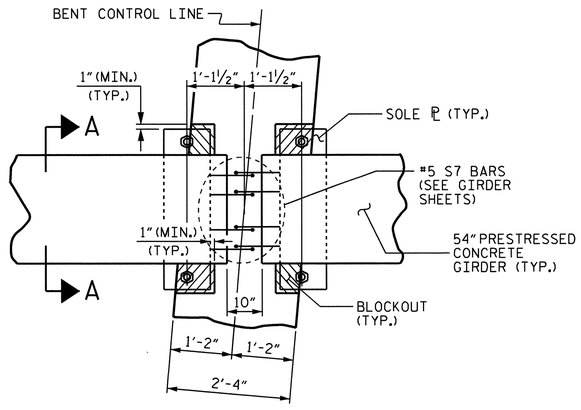


SECTION THRU BENT

NO BENT DIAPHRAGM REQUIRED IN THE CLOSURE-POUR BAY.

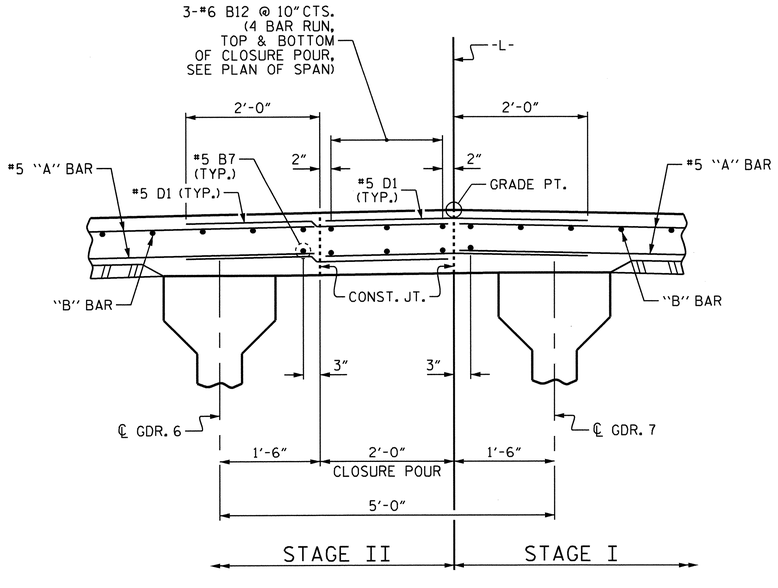


SECTION A-A



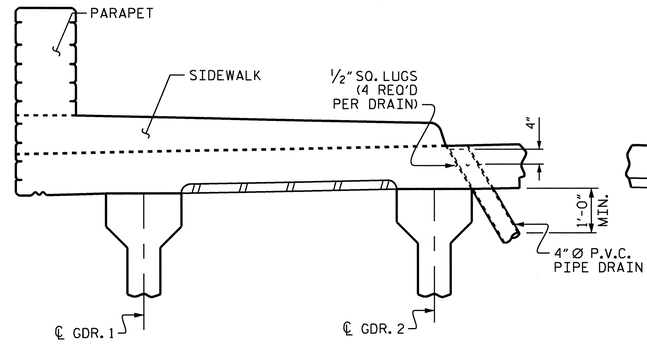
PLAN

BENT DIAPHRAGM BLOCK-OUT DETAIL

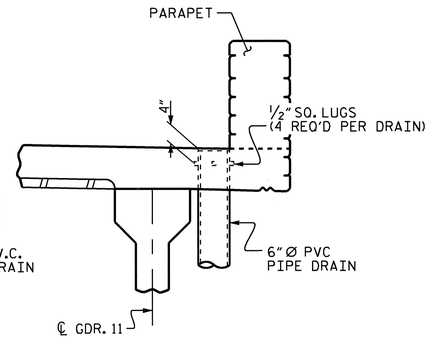


DECK CLOSURE POUR DETAIL

#5 D1 DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP AND BOTTOM REINFORCING STEEL AND EXTEND 1'-9" INTO CLOSURE POUR.



AT SIDEWALK



AT PARAPET

DRAIN DETAILS

TOP OF FLOOR DRAIN TO BE SET ⅜" BELOW SURFACE OF SLAB.

4 - ½" SQUARE LUGS TO BE GLUED TO THE PVC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

THE 4" Ø & 6" Ø PVC PIPES AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.

COUPLING IN DRAIN PIPE WILL BE PERMITTED AS APPROVED BY THE ENGINEER.

SEE PLAN OF SPANS FOR LOCATION OF 4" Ø & 6" Ø PVC PIPE DRAINS.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG FANG
2/20/12

PROJECT NO. U-2551

BURKE COUNTY

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SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

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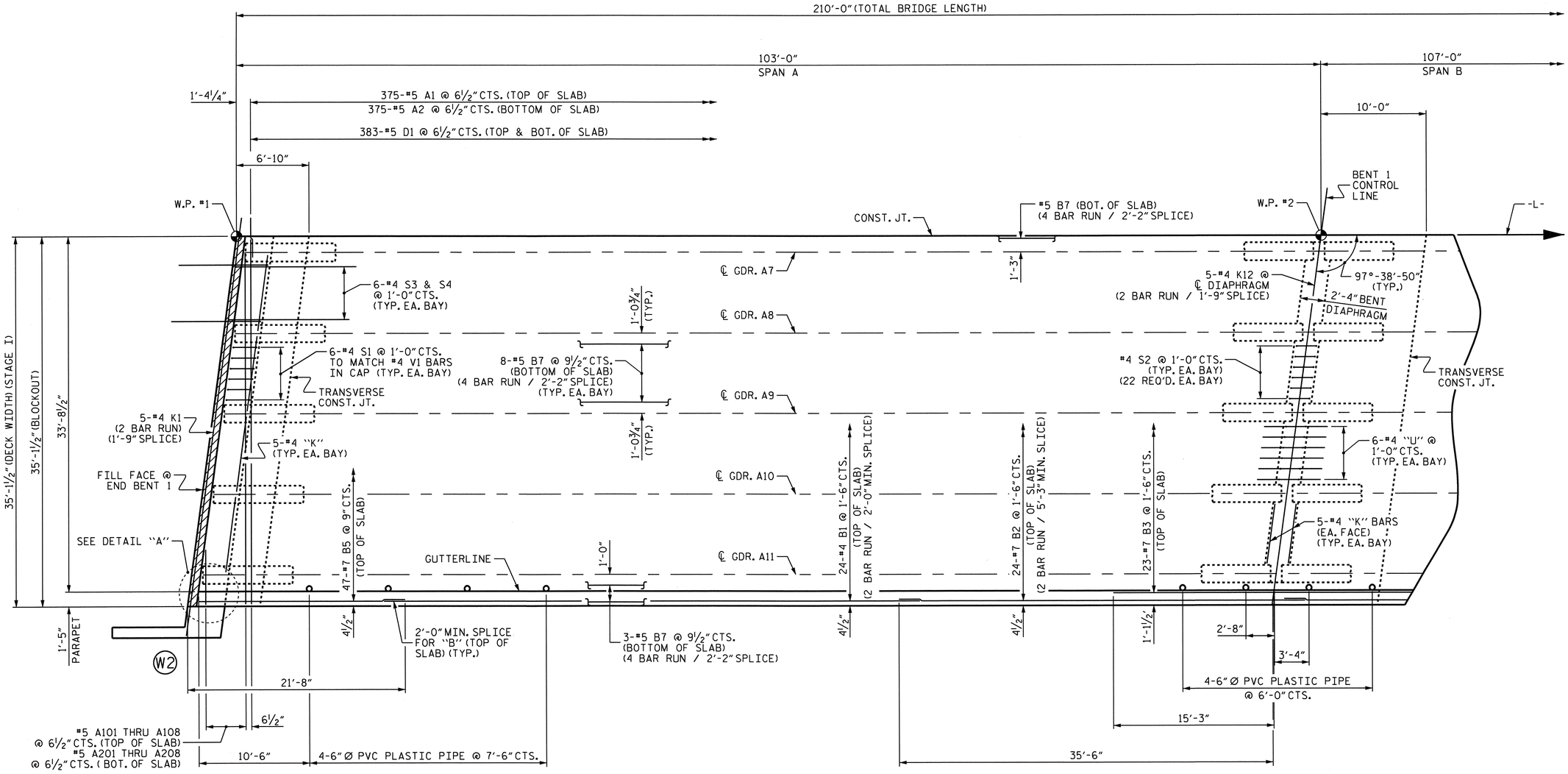
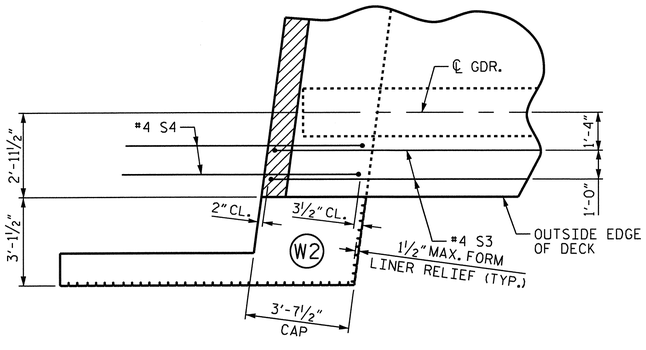


SPAN A

CONCRETE MEDIAN & FORM LINER ON PARAPET NOT SHOWN FOR CLARITY.



DETAIL "A"

#4 S5 NOT SHOWN FOR CLARITY.
W2 SHOWN, W4 SIMILAR.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPAN A
STAGE I

NORTH CAROLINA PROFESSIONAL SEAL 32492 ENGINEER JOHN A. YANNACCONE
2/24/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
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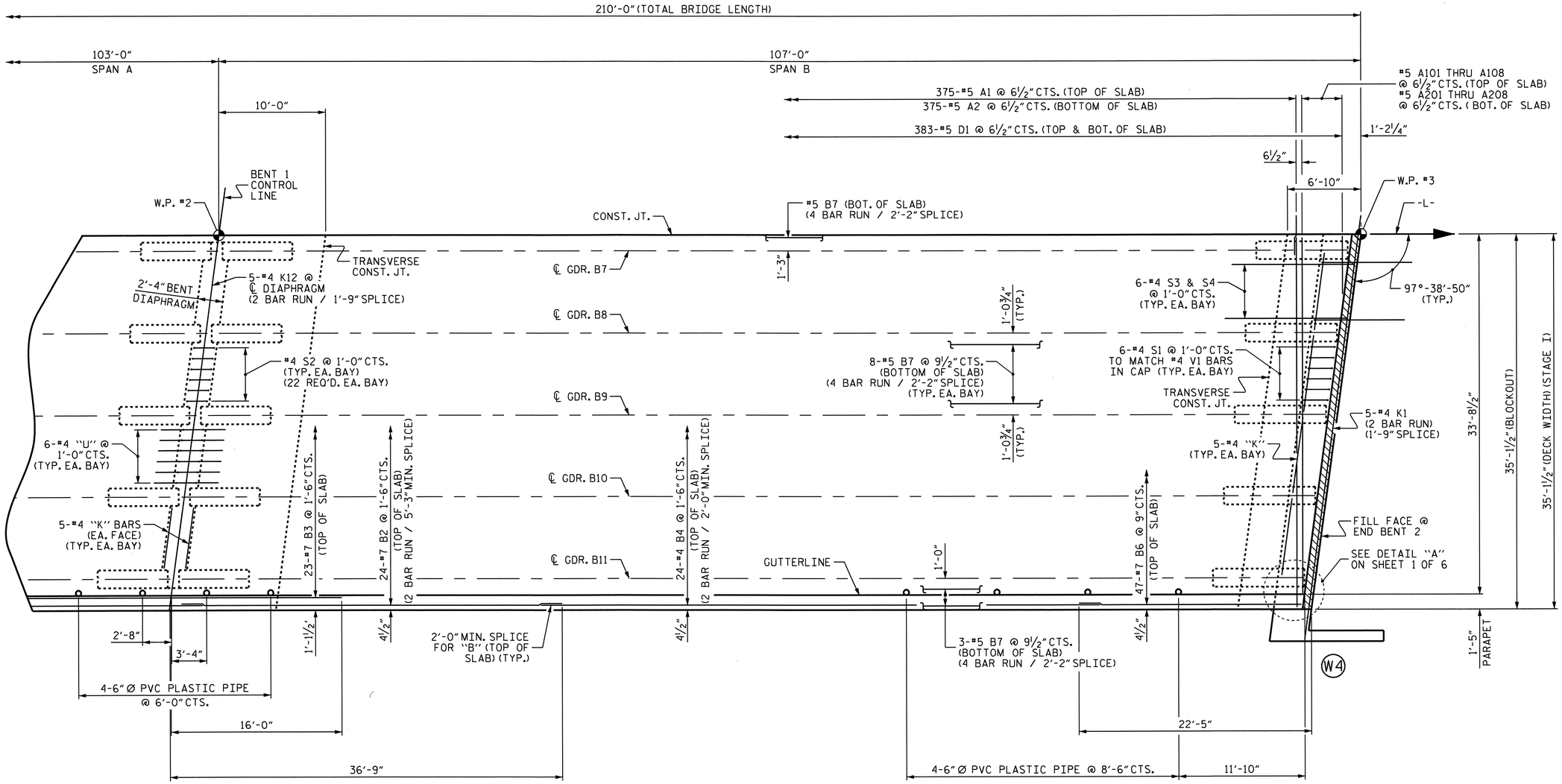

SPAN B

FORM LINER ON PARAPET NOT SHOWN FOR CLARITY.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 2 OF 6

NORTH CAROLINA PROFESSIONAL SEAL 32482 ENGINEER JOHN A. YANNACCONE

2/24/12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPAN B
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			47

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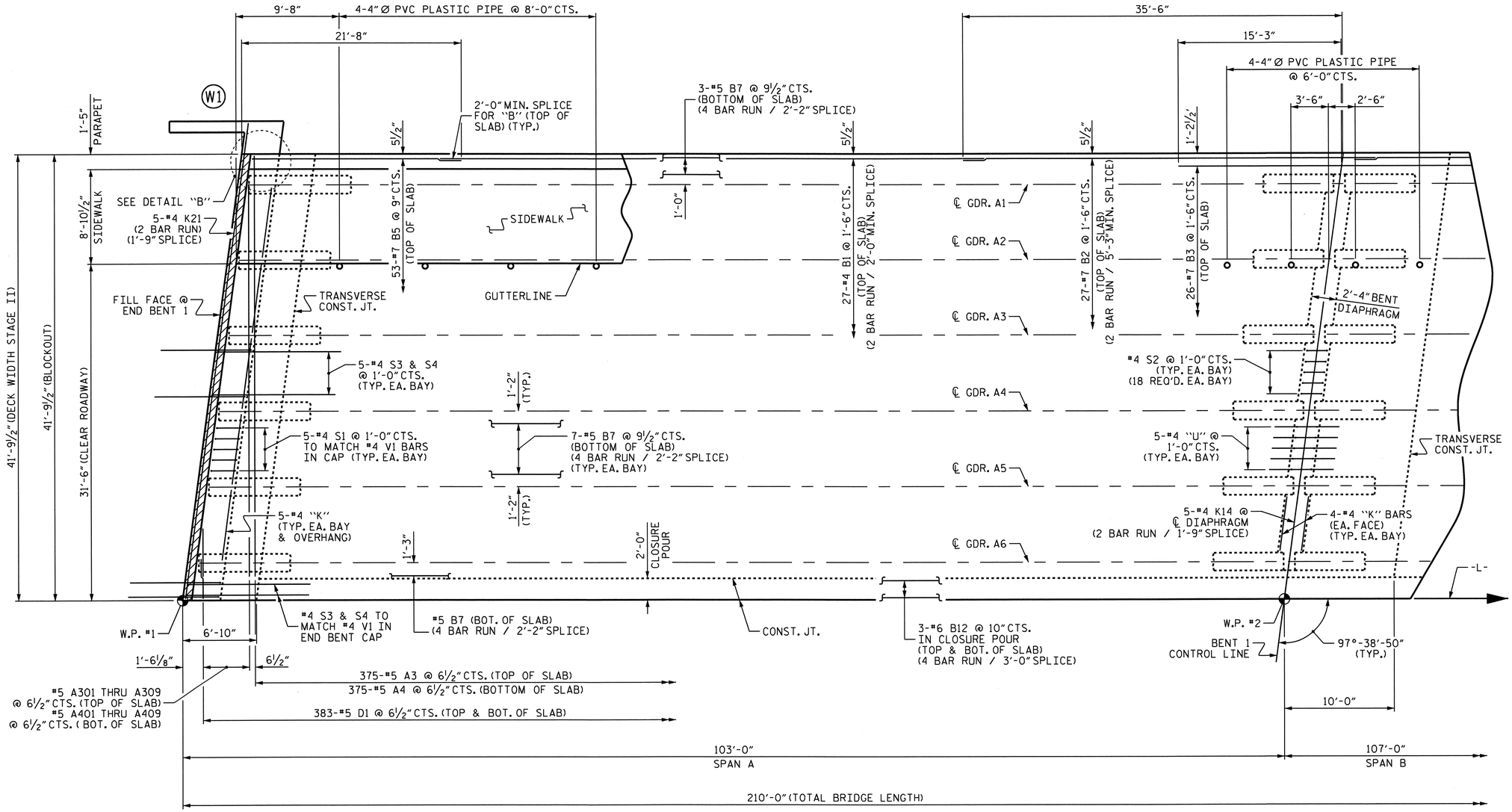
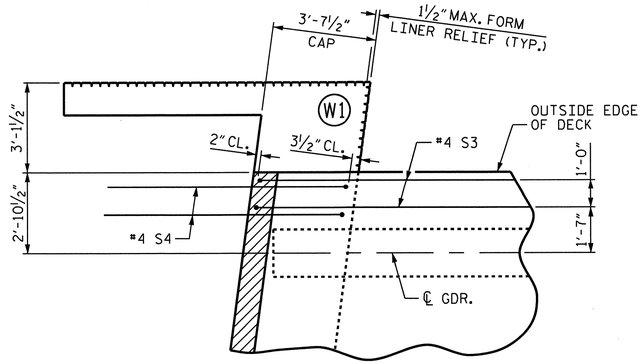


SPAN A

CONCRETE MEDIAN & FORM LINER ON PARAPET NOT SHOWN FOR CLARITY.



DETAIL "B"

#4 S5 NOT SHOWN FOR CLARITY.
W1 SHOWN, W3 SIMILAR.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPAN A
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			47

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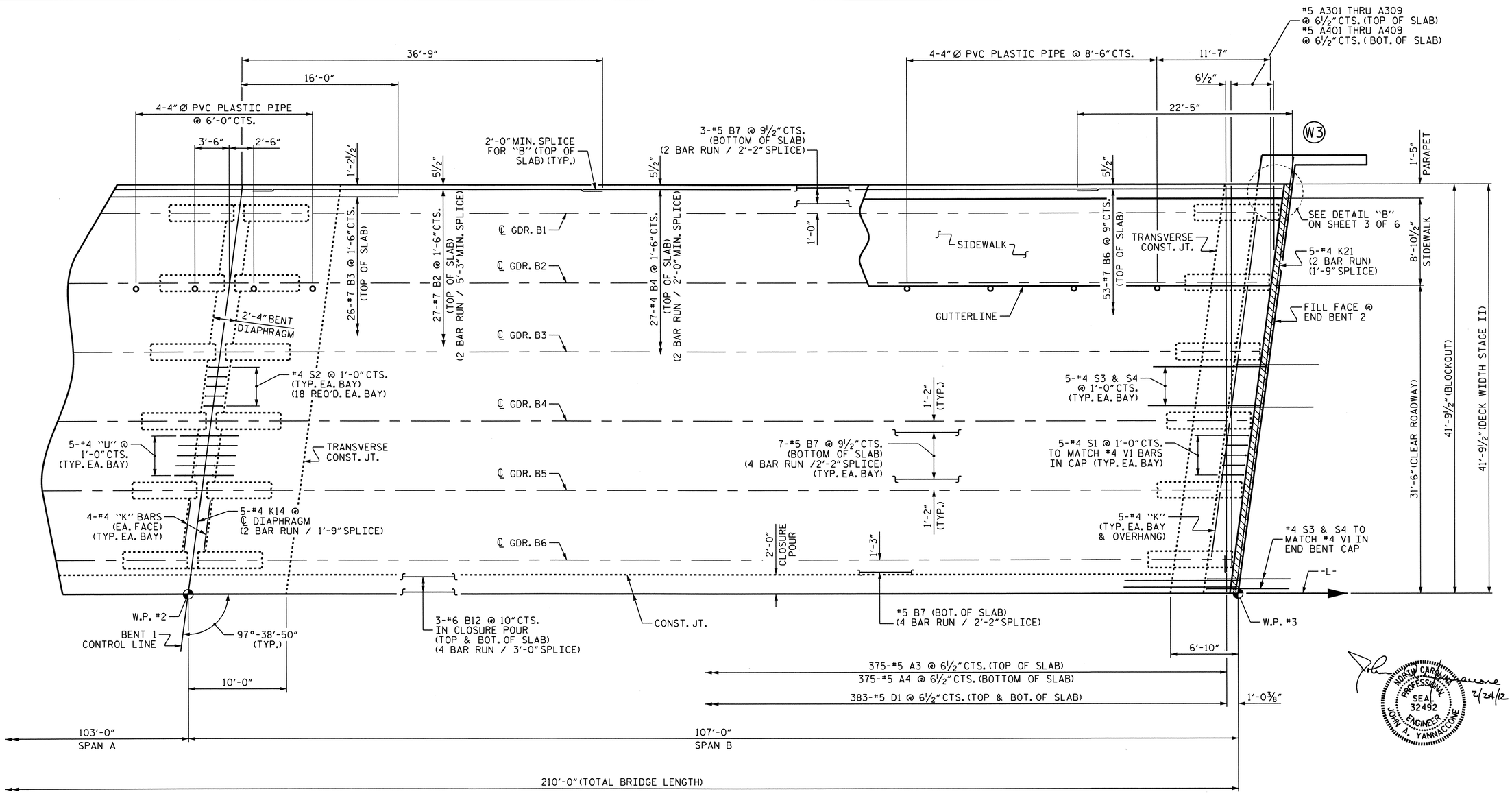

NORTH CAROLINA PROFESSIONAL SEAL 32492 ENGINEER JOHN A. YANNACCONE 2/24/12

SPAN B

CONCRETE MEDIAN & FORM LINER ON PARAPET NOT SHOWN FOR CLARITY.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS
SPAN B
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			47

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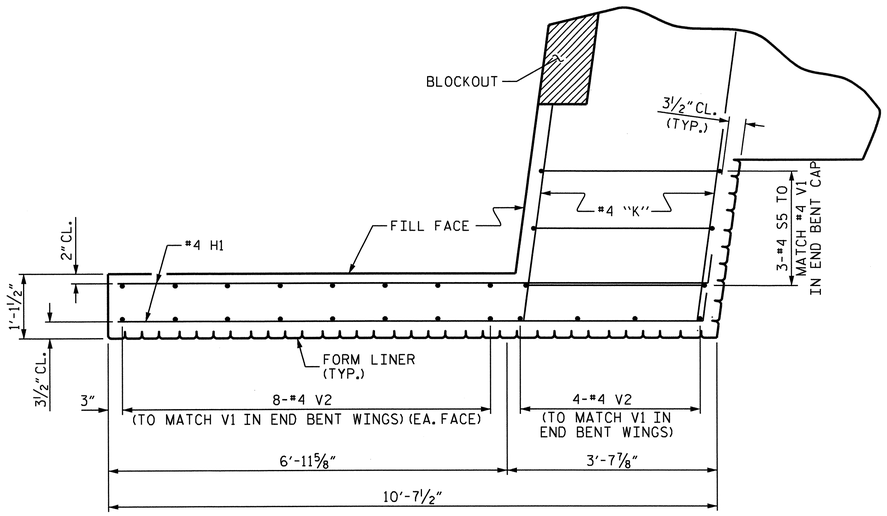
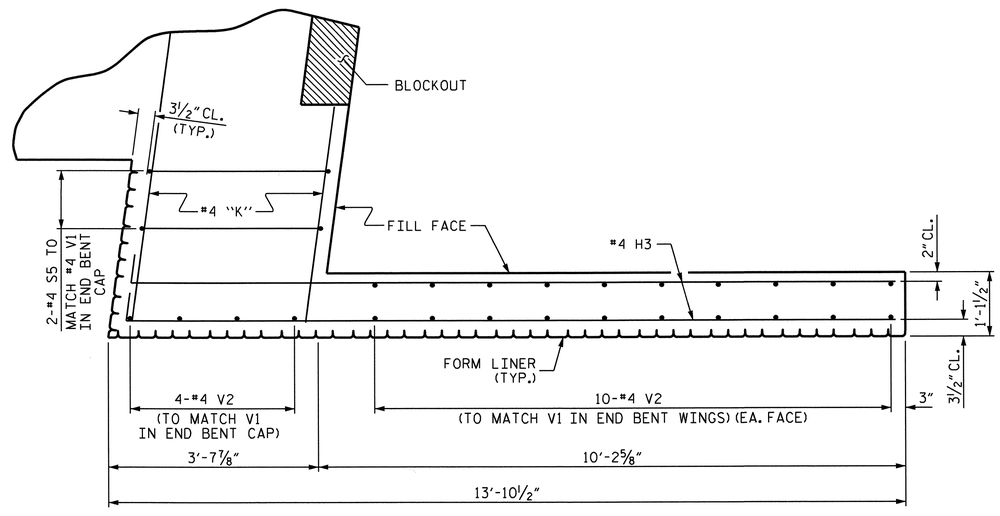
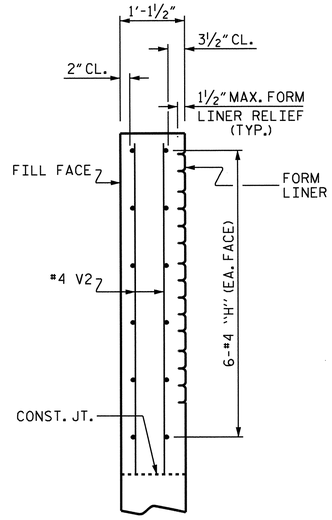


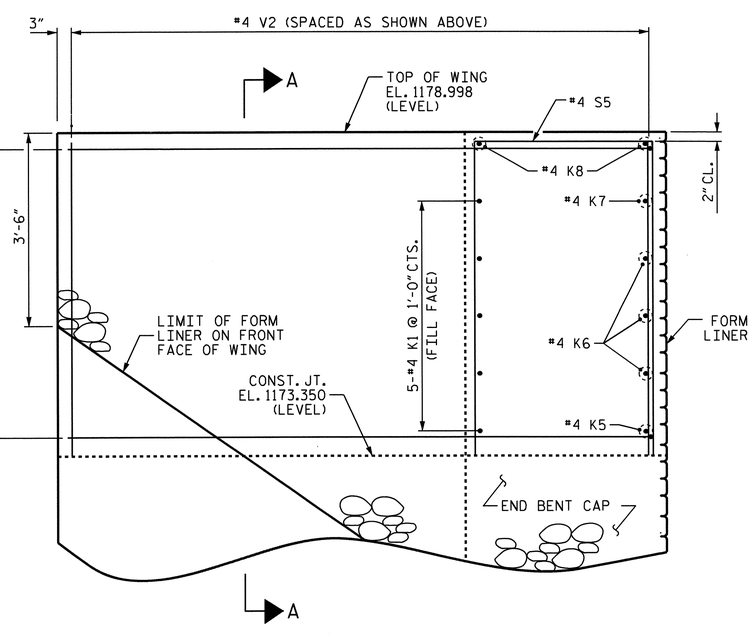
PLAN OF WING W2
AT END BENT 1



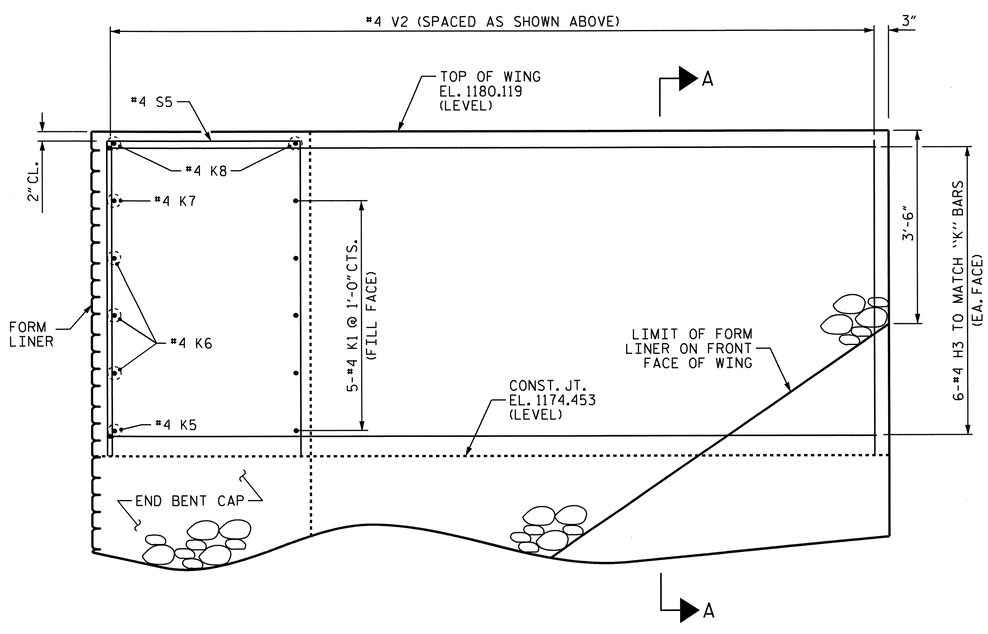
PLAN OF WING W4
AT END BENT 2



SECTION A-A



ELEVATION OF WING W2
AT END BENT 1



ELEVATION OF WING W4
AT END BENT 2

ABUTMENT WINGS
FOR END BENT REINFORCING STEEL AND DETAILS, SEE "SUBSTRUCTURE END BENTS 1 & 2" SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 32492 ENGINEER JOHN A. YANNACCONE
2/24/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN DETAILS
STAGE I

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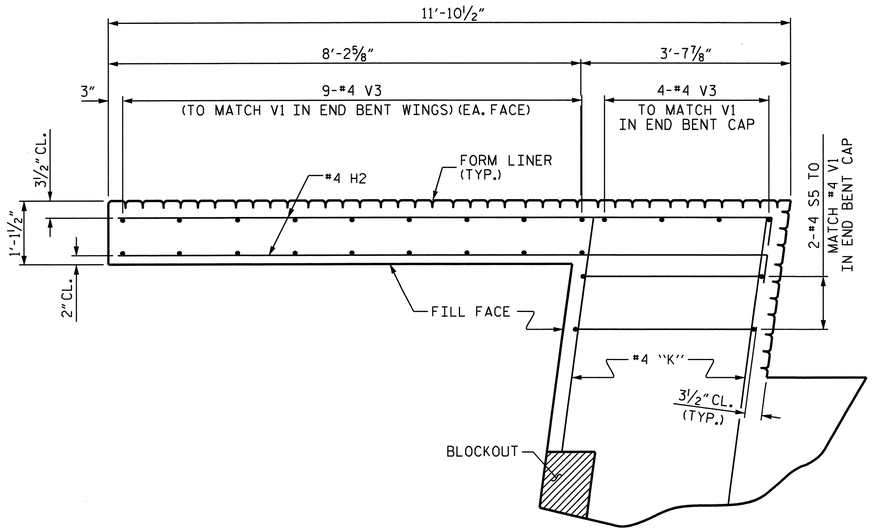
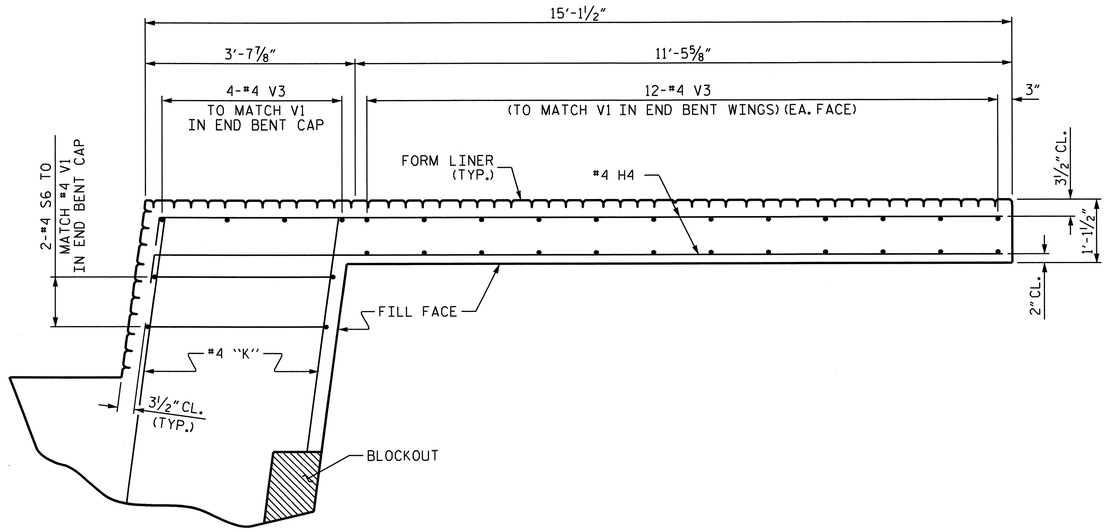
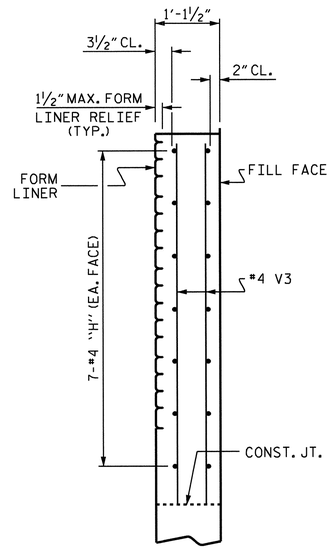


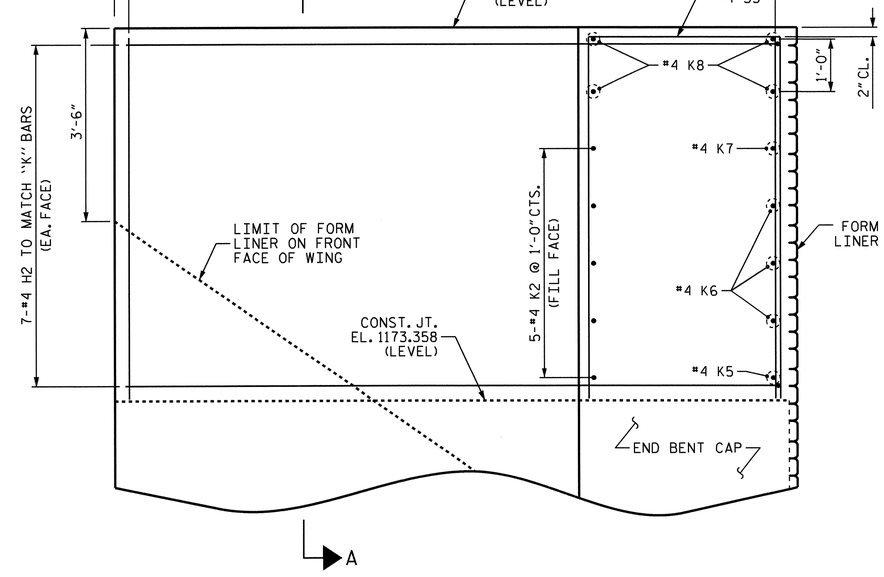
PLAN OF WING (W1)
AT END BENT 1



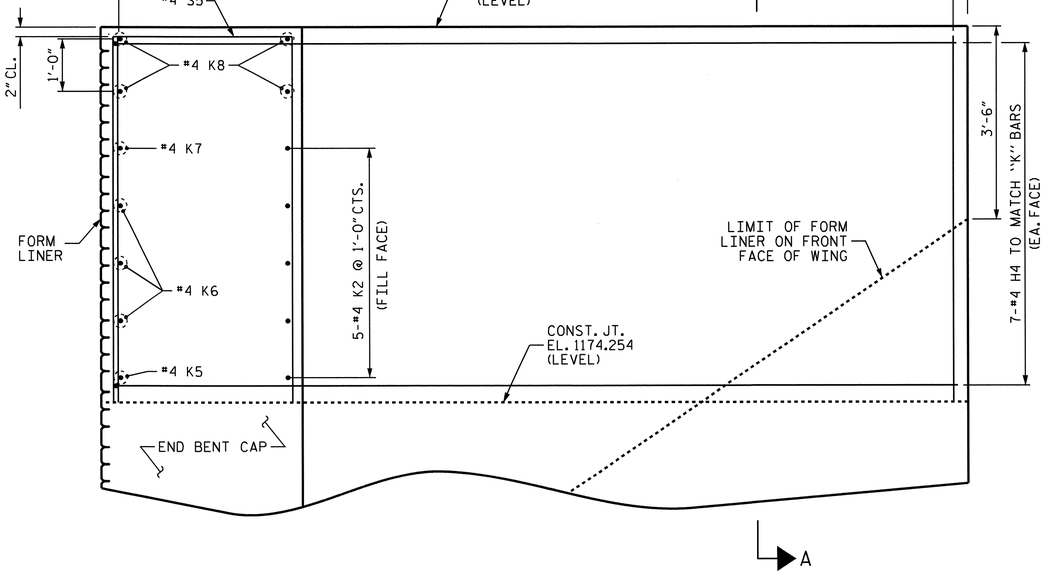
PLAN OF WING (W3)
AT END BENT 2



SECTION A-A



ELEVATION OF WING (W1)
AT END BENT 1



ELEVATION OF WING (W3)
AT END BENT 2

ABUTMENT WINGS

FOR END BENT REINFORCING STEEL AND DETAILS, SEE "SUBSTRUCTURE END BENTS 1 & 2" SHEETS.

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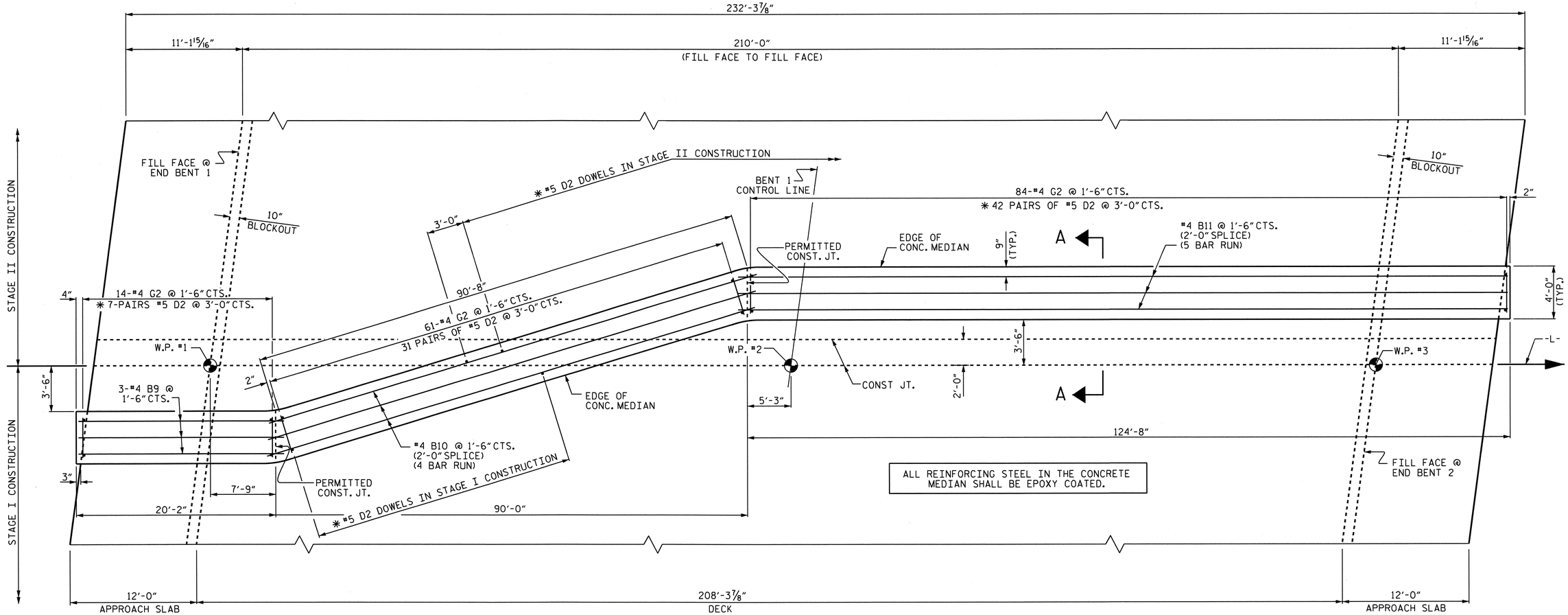
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 32492 JOHN A. YANNACCONE
2/24/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

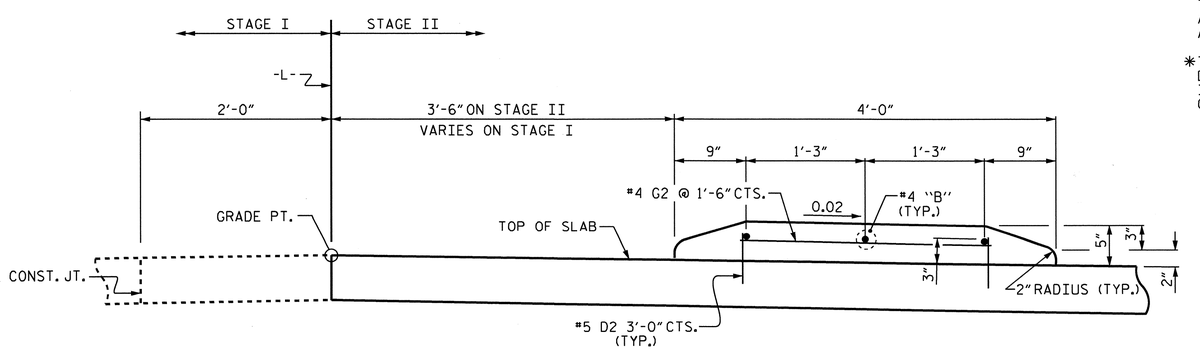
SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
PLAN OF SPAN DETAILS
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			47



PLAN



SECTION A-A

NOTES:

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

THE CONCRETE MEDIAN ON THE BRIDGE EXTENDING TO THE END OF THE APPROACH SLABS IS INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL AND PAID FOR AS PART OF THE REINFORCED CONCRETE DECK PAY ITEM.

*THE #5 D2 DOWELS IN THE AREA OF STAGE I CONSTRUCTION SHALL BE DRILLED AND GROUTED INTO DECK AND APPROACH SLAB. #5 D2 DOWELS IN THE AREA OF STAGE II CONSTRUCTION MAY BE PUSHED INTO GREEN CONCRETE AFTER DECK OR APPROACH SLAB HAS BEEN SCREEDED OFF.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+25.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE MEDIAN

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

1/10/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
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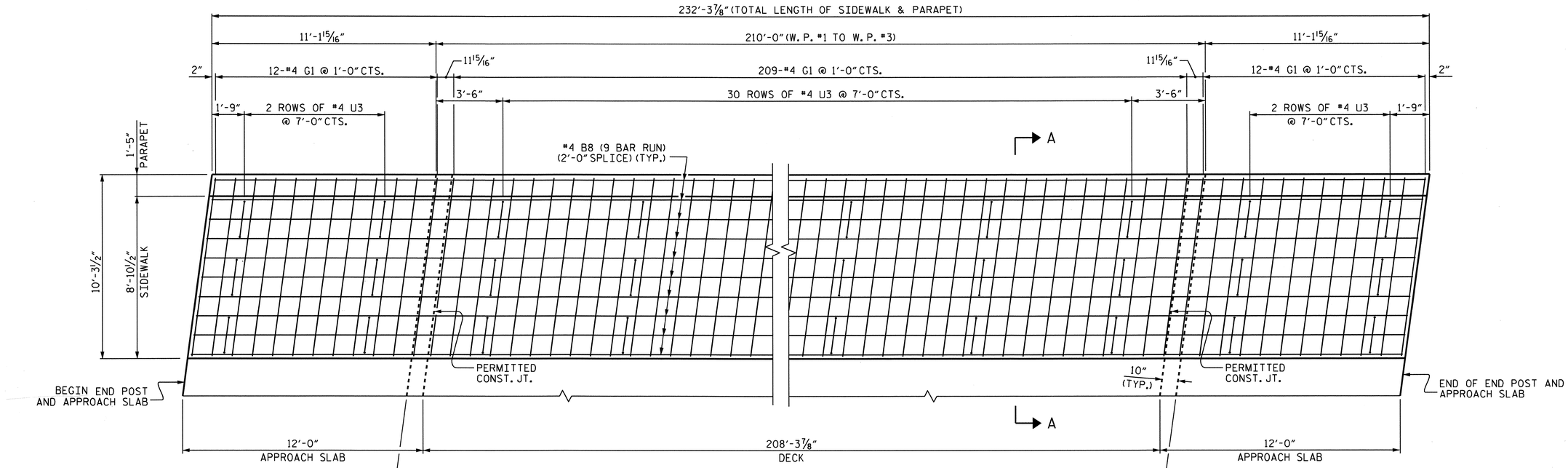
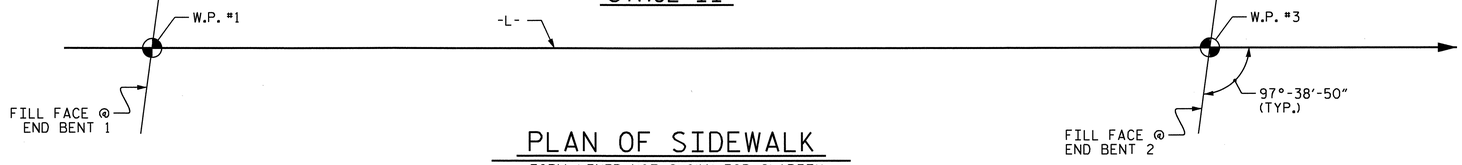
tfang

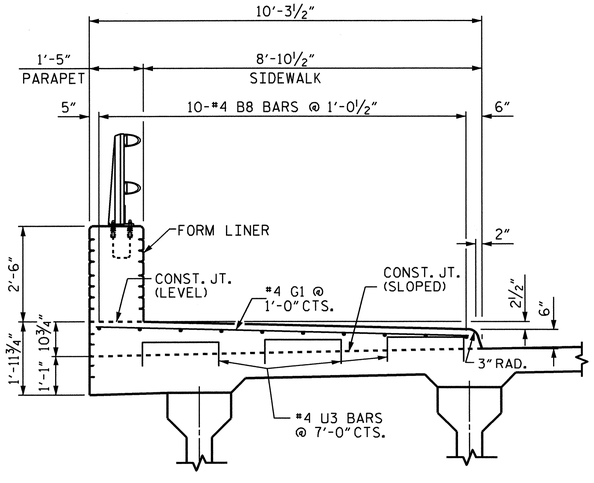


STAGE II



PLAN OF SIDEWALK

FORM LINER NOT SHOWN FOR CLARITY.



SECTION A-A

NOTES FOR SIDEWALKS AND CONCRETE MEDIAN:

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

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

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

FOR REINFORCING IN PARAPET, SEE "RAIL POST SPACINGS & END POST DETAILS" SHEET.

SIDEWALKS ON THE BRIDGE EXTENDING TO THE END OF THE APPROACH SLABS ARE INCLUDED IN THE SUPERSTRUCTURE BILL OF MATERIAL AND PAID FOR AS PART OF THE REINFORCED CONCRETE DECK PAY ITEM.

THE #4 U3 DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER DECK OR APPROACH SLAB HAS BEEN SCREEDED OFF, EXCEPT AS NOTED.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSUING FANG
1/9/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK DETAILS

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 2-23-10
CHECKED BY : Q.T. NGUYEN DATE : 7-10

09-JAN-2012 16:44
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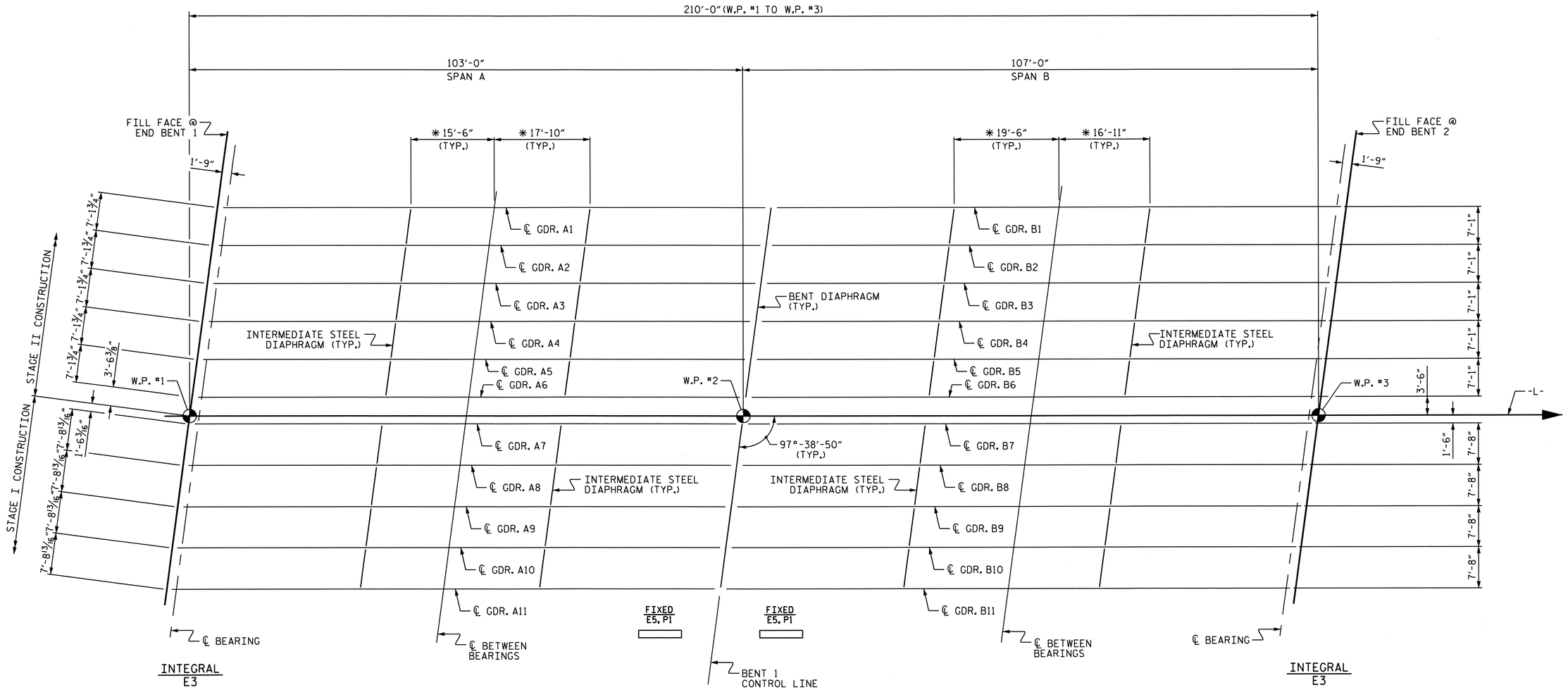
JAYannaccone



SPAN A

SPAN B

FRAMING PLAN

*DIMENSIONS MEASURING INTERMEDIATE DIAPHRAGMS ARE SHOWN TO ℄ BETWEEN BEARINGS.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

NORTH CAROLINA PROFESSIONAL SEAL 32492 ENGINEER JOHN A. YANNACCONE

2/24/12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : E.C. LOCKLEAR DATE : 4-15-10
CHECKED BY : Q.T. NGUYEN DATE : 7-10

22-FEB-2012 11:41
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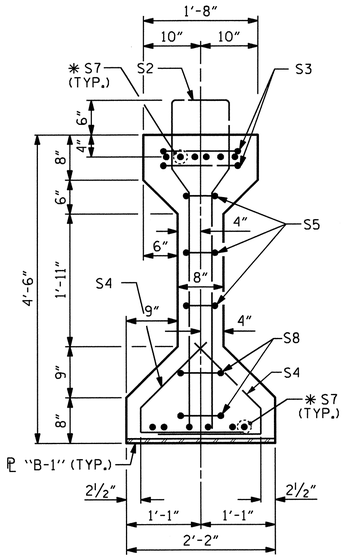
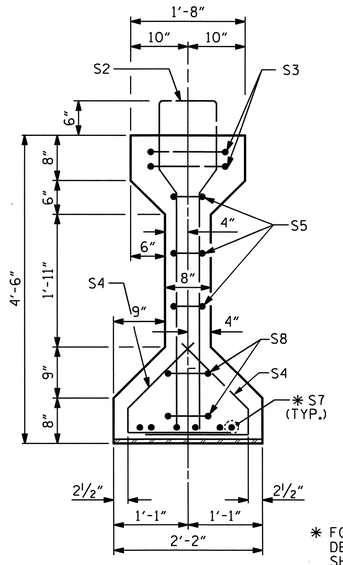
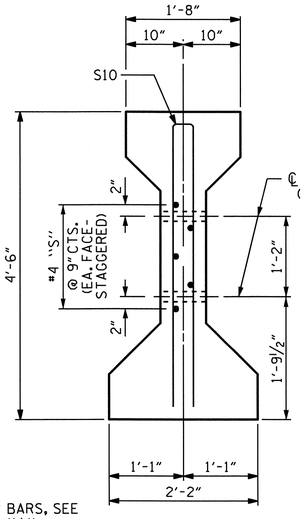


SECTION A-A

FOR EMBEDDED ℄ "B-1" DETAILS SEE SHEET 4 OF 4



SECTION B-B



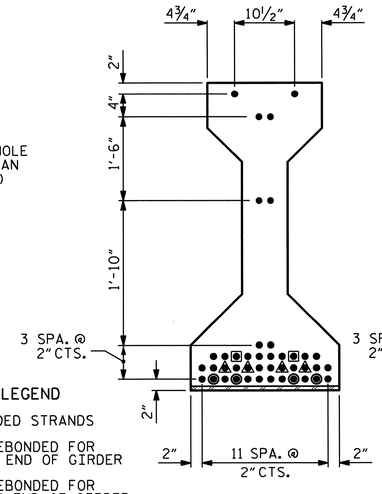
✱ FOR S7 BARS, SEE DETAIL "A" SHEET 4 OF 4.

SECTION C-C

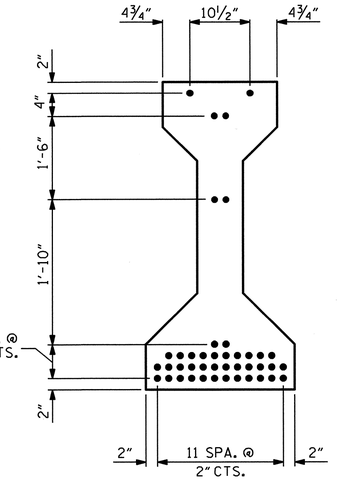
(S1 BARS NOT SHOWN)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- △ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



AT END OF GIRDER



AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

(42 STRANDS, ALL STRAIGHT, 10 DEBONDED STRANDS)

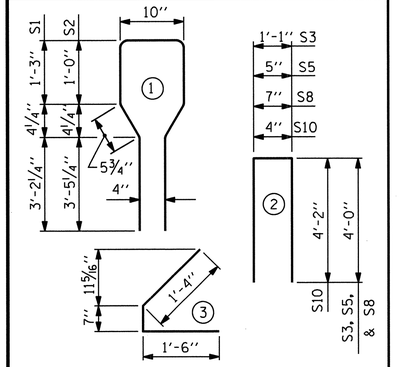
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	76	#4	1	10'-8"	542
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	96	#4	3	3'-5"	219
S5	6	#4	2	8'-5"	34
✱ S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	4	#5	2	8'-8"	36
S11	10	#4	STR	7'-0"	47
S12	1	#3	STR	1'-4"	1

S7 BARS SHALL BE BENT BEFORESHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



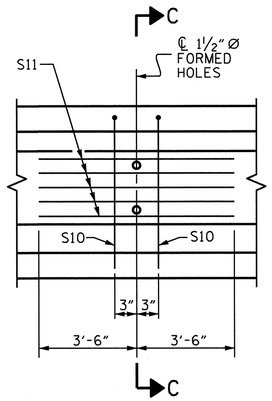
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	8000 PSI CONCRETE	0.6" Ø L. R. STRANDS
	LB.	C.Y.	No.
	1188	20.6	42

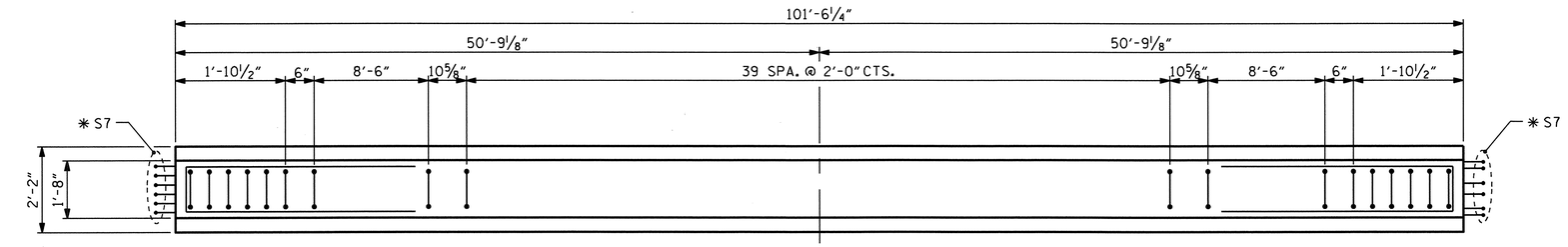
GIRDERS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
STAGE I	5	101.52	507.60
STAGE II	6	101.52	609.13
TOTAL	11	-	1116.73

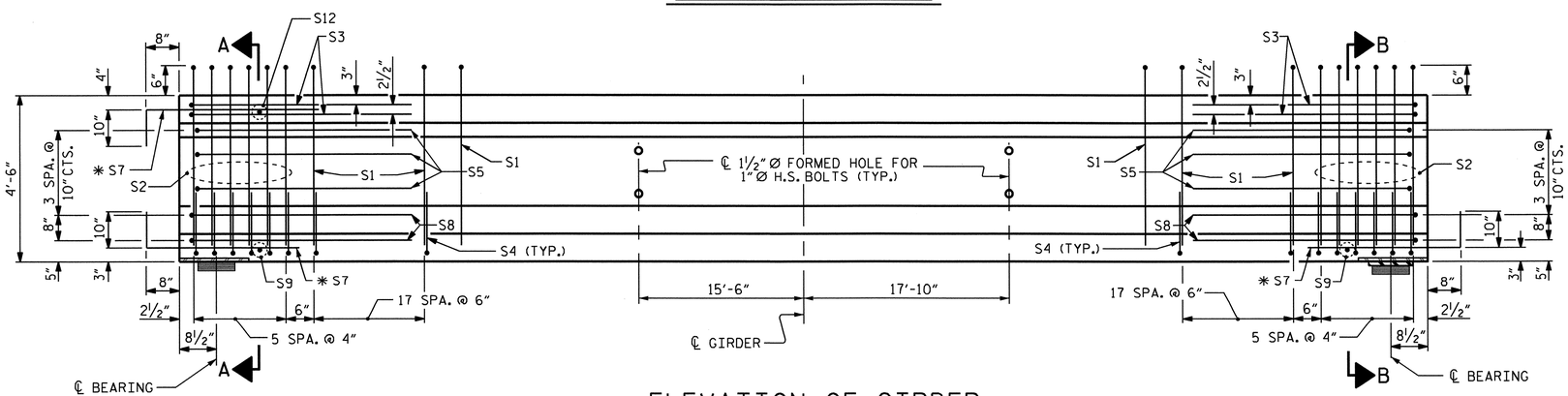


PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS.



PLAN OF GIRDER



ELEVATION OF GIRDER

INTEGRAL END BENT

FIX

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			47

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

1/9/12

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 4-16-10
CHECKED BY : Q.T. NGUYEN	DATE : 7-10
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06R TLA/GM

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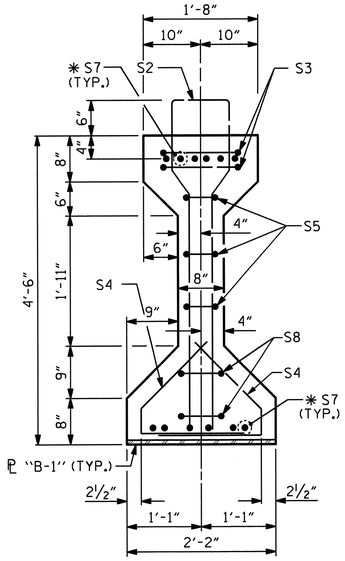
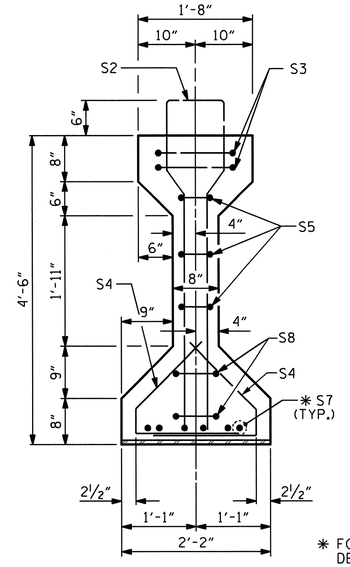
JAYannaccone

STD. NO. PCG6 (Sht. 2)



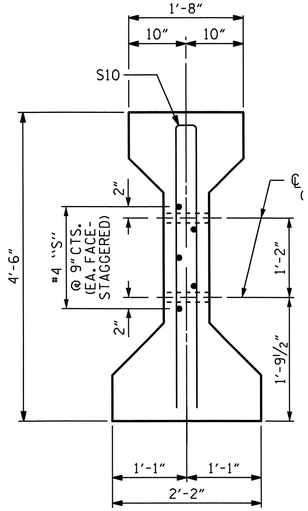
SECTION A-A

FOR EMBEDDED ℄ "B-1" DETAILS, SEE SHEET 4 OF 4



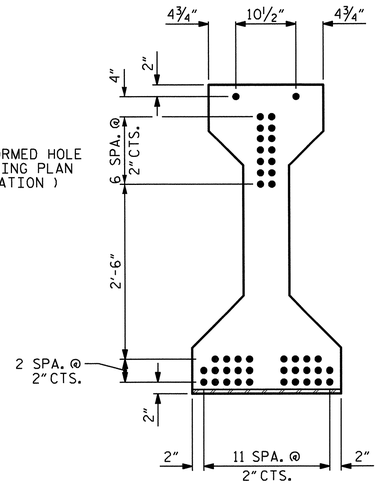
SECTION B-B

* FOR S7 BARS, SEE DETAIL "A" SHEET 4 OF 4.

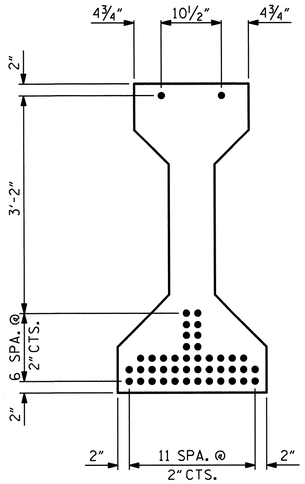


SECTION C-C

(S1 BARS NOT SHOWN)

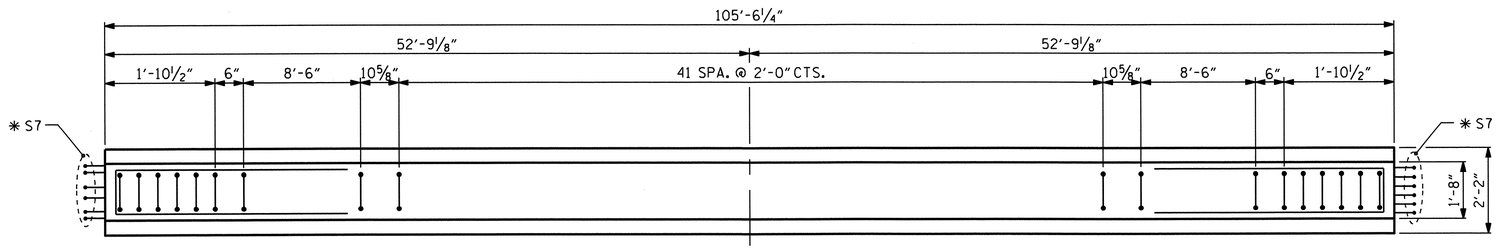


AT END OF GIRDER

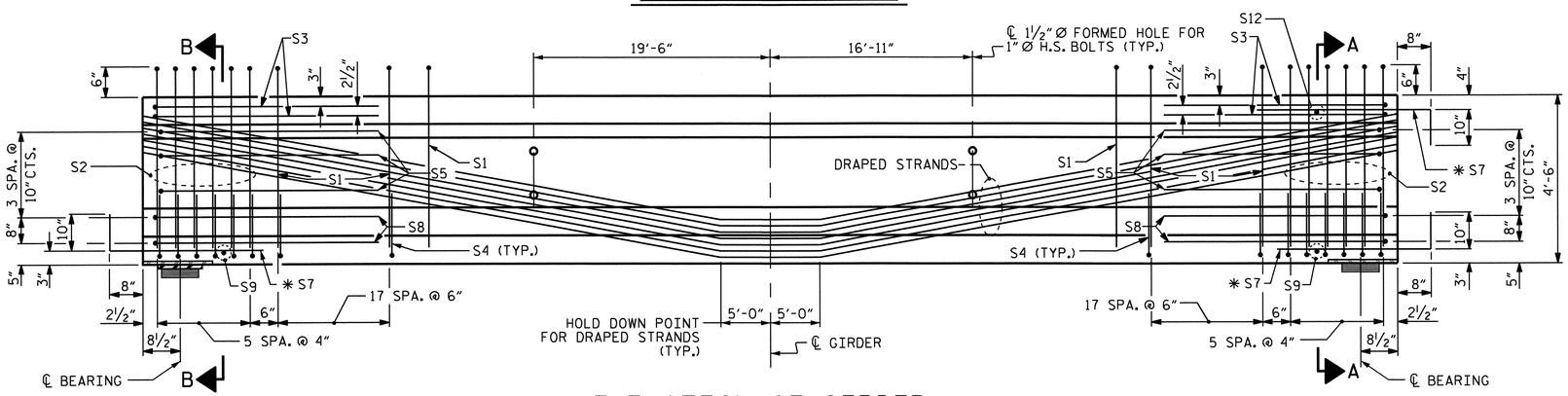


AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

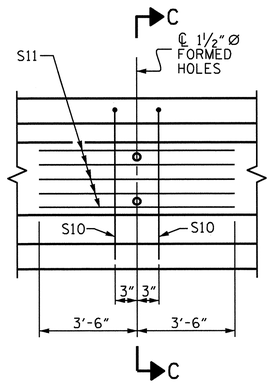


PLAN OF GIRDER



ELEVATION OF GIRDER

INTEGRAL END BENT



PARTIAL ELEVATION

SHOWING INTERMEDIATE DIAPHRAGM REINFORCING STEEL FOR ALL GIRDERS.

0.6" Ø L. R. GRADE 270 STRANDS

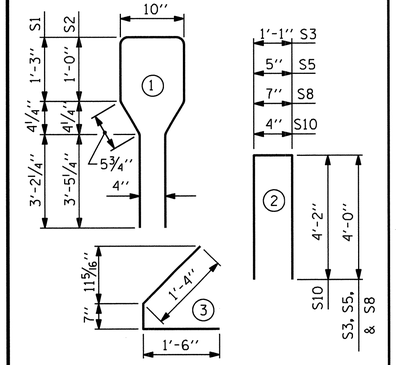
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	78	#4	1	10'-8"	556
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	96	#4	3	3'-5"	219
S5	6	#4	2	8'-5"	34
* S7	18	#5	STR	3'-8"	69
S8	4	#4	2	8'-7"	23
S9	2	#3	STR	1'-10"	1
S10	4	#5	2	8'-8"	36
S11	10	#4	STR	7'-0"	47
S12	1	#3	STR	1'-4"	1

S7 BARS SHALL BE BENT BEFORESHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL LB.	7500 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
	1202	21.4	44

GIRDERS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
STAGE I	5	105.52	527.60
STAGE II	6	105.52	633.12
TOTAL	11	-	1160.72

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

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

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

2/22/12

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 4-16-10
CHECKED BY : O.T. NGUYEN	DATE : 7-10
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06R TLA/GM

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

SHEET NO. S-19

TOTAL SHEETS 47

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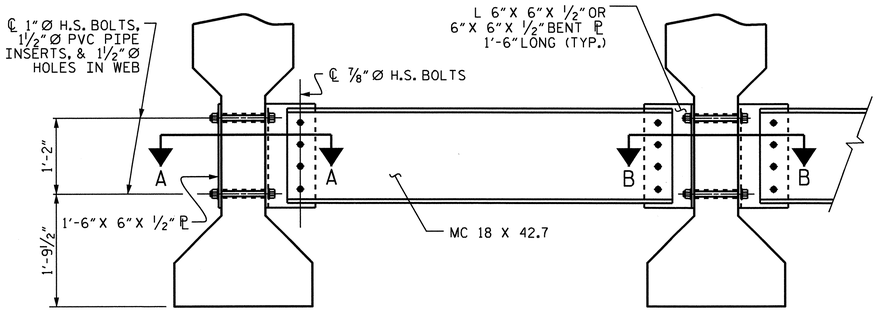
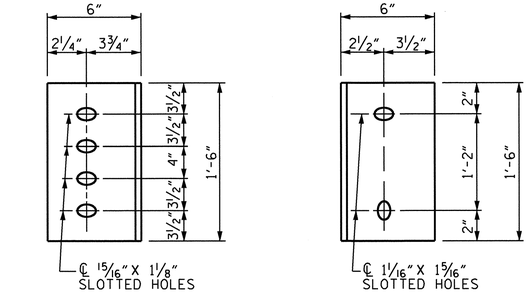
STD. NO. PCG6



EXTERIOR GIRDER INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



DIAPHRAGM FACE WEB FACE

CONNECTOR PLATE DETAILS

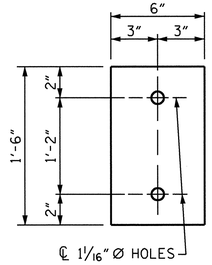
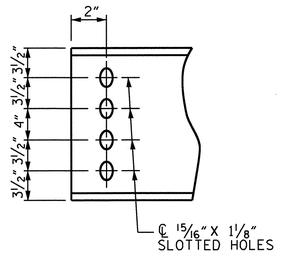
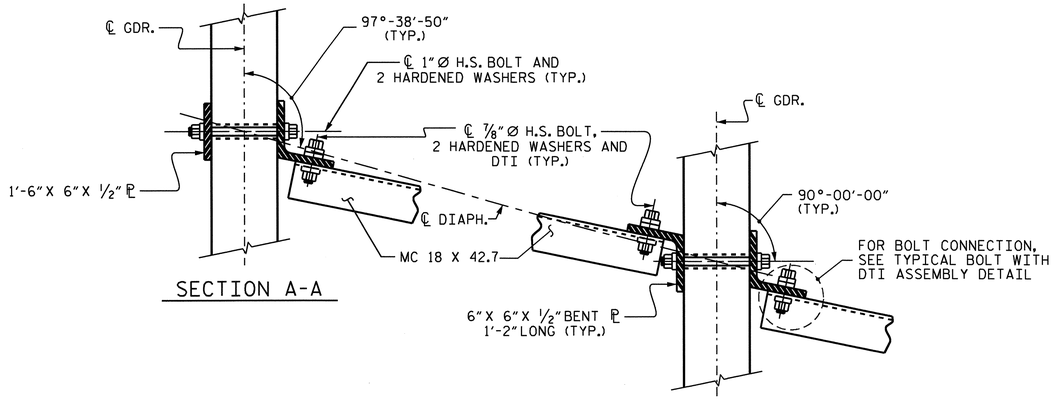


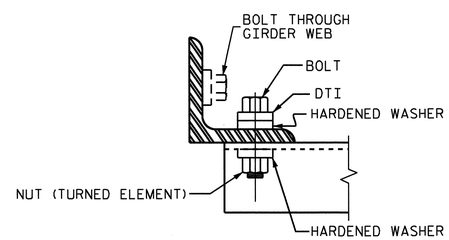
PLATE DETAILS



CHANNEL END



CONNECTION DETAILS



BOLT WITH DTI ASSEMBLY DETAIL

STRUCTURAL STEEL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
1/9/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			47

STD. NO. PCG10

ASSEMBLED BY : HARISH SHAH	DATE : 10-10
CHECKED BY : Q.T. NGUYEN	DATE : 10-10
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06RR KMM/GM

09-JAN-2012 16:44
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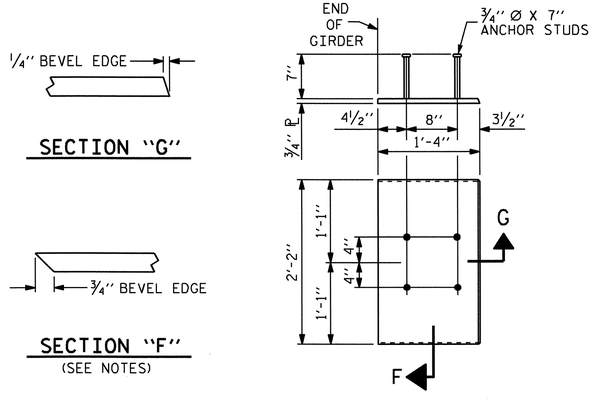
JAYannaccone

DEAD LOAD DEFLECTION TABLE

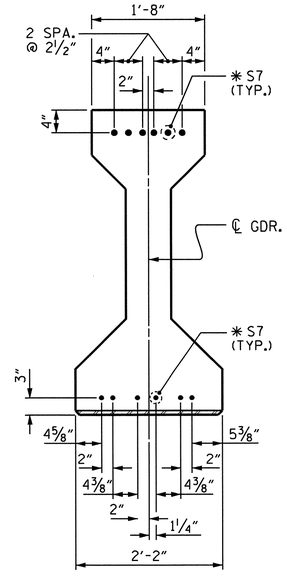
0.6"Ø LOW RELAXATION	SPAN A											SPAN B										
	GIRDER 1											GIRDER 1										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.116	0.220	0.301	0.352	0.370	0.352	0.301	0.220	0.116	0.000	0.000	0.121	0.229	0.314	0.368	0.386	0.368	0.314	0.229	0.121	0.000
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.051	0.097	0.133	0.156	0.163	0.156	0.133	0.097	0.051	0.000	0.000	0.062	0.117	0.160	0.187	0.197	0.187	0.160	0.117	0.062	0.000
FINAL CAMBER ↑	0.000	3/4"	1 1/2"	2"	2 3/8"	2 1/2"	2 3/8"	2"	1 1/2"	3/4"	0.000	0.000	11/16"	1 3/8"	1 7/8"	2 3/16"	2 1/4"	2 3/16"	1 7/8"	1 3/8"	11/16"	0.000
	GIRDERS 2 & 3											GIRDERS 2 & 3										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.116	0.220	0.301	0.352	0.370	0.352	0.301	0.220	0.116	0.000	0.000	0.121	0.229	0.314	0.368	0.386	0.368	0.314	0.229	0.121	0.000
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.052	0.099	0.135	0.159	0.167	0.159	0.135	0.099	0.052	0.000	0.000	0.063	0.119	0.163	0.191	0.201	0.191	0.163	0.119	0.063	0.000
FINAL CAMBER ↑	0.000	3/4"	1 7/16"	2"	2 5/16"	2 7/16"	2 5/16"	2"	1 7/16"	3/4"	0.000	0.000	11/16"	1 5/16"	1 13/16"	2 1/8"	2 1/4"	2 1/8"	1 13/16"	1 5/16"	11/16"	0.000
	GIRDERS 4 & 5											GIRDERS 4 & 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
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.116	0.220	0.301	0.352	0.370	0.352	0.301	0.220	0.116	0.000	0.000	0.121	0.229	0.314	0.368	0.386	0.368	0.314	0.229	0.121	0.000
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.043	0.082	0.112	0.131	0.138	0.131	0.112	0.082	0.043	0.000	0.000	0.052	0.099	0.135	0.158	0.166	0.158	0.135	0.099	0.052	0.000
FINAL CAMBER ↑	0.000	7/8"	1 5/8"	2 1/4"	2 5/8"	2 13/16"	2 5/8"	2 1/4"	1 5/8"	7/8"	0.000	0.000	13/16"	1 9/16"	2 1/8"	2 1/2"	2 5/8"	2 1/2"	2 1/8"	1 9/16"	13/16"	0.000
	GIRDER 6											GIRDER 6										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.116	0.220	0.301	0.352	0.370	0.352	0.301	0.220	0.116	0.000	0.000	0.121	0.229	0.314	0.368	0.386	0.368	0.314	0.229	0.121	0.000
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.036	0.068	0.092	0.108	0.114	0.108	0.092	0.068	0.036	0.000	0.000	0.043	0.081	0.111	0.131	0.137	0.131	0.111	0.081	0.043	0.000
FINAL CAMBER ↑	0.000	15/16"	1 13/16"	2 1/2"	2 15/16"	3 1/16"	2 15/16"	2 1/2"	1 13/16"	15/16"	0.000	0.000	15/16"	1 3/4"	2 7/16"	2 7/8"	3"	2 7/8"	2 7/16"	1 3/4"	15/16"	0.000
	GIRDER 7											GIRDER 7										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.116	0.220	0.301	0.352	0.370	0.352	0.301	0.220	0.116	0.000	0.000	0.121	0.229	0.314	0.368	0.386	0.368	0.314	0.229	0.121	0.000
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.037	0.070	0.096	0.113	0.118	0.113	0.096	0.070	0.037	0.000	0.000	0.045	0.085	0.116	0.136	0.143	0.136	0.116	0.085	0.045	0.000
FINAL CAMBER ↑	0.000	15/16"	1 13/16"	2 7/16"	2 7/8"	3"	2 7/8"	2 7/16"	1 13/16"	15/16"	0.000	0.000	15/16"	1 3/4"	2 3/8"	2 3/4"	2 15/16"	2 3/4"	2 3/8"	1 3/4"	15/16"	0.000
	GIRDERS 8 & 11											GIRDERS 8 & 11										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.116	0.220	0.301	0.352	0.370	0.352	0.301	0.220	0.116	0.000	0.000	0.121	0.229	0.314	0.368	0.386	0.368	0.314	0.229	0.121	0.000
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.046	0.087	0.120	0.140	0.147	0.140	0.120	0.087	0.046	0.000	0.000	0.056	0.106	0.144	0.169	0.178	0.169	0.144	0.106	0.056	0.000
FINAL CAMBER ↑	0.000	13/16"	1 9/16"	2 3/16"	2 9/16"	2 11/16"	2 9/16"	2 3/16"	1 9/16"	13/16"	0.000	0.000	13/16"	1 1/2"	2 1/16"	2 3/8"	2 1/2"	2 3/8"	2 1/16"	1 1/2"	13/16"	0.000
	GIRDERS 9 & 10											GIRDERS 9 & 10										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.116	0.220	0.301	0.352	0.370	0.352	0.301	0.220	0.116	0.000	0.000	0.121	0.229	0.314	0.368	0.386	0.368	0.314	0.229	0.121	0.000
✱ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.000	0.049	0.092	0.126	0.147	0.155	0.147	0.126	0.092	0.049	0.000	0.000	0.059	0.111	0.152	0.178	0.186	0.178	0.152	0.111	0.059	0.000
FINAL CAMBER ↑	0.000	13/16"	1 9/16"	2 1/8"	2 7/16"	2 9/16"	2 7/16"	2 1/8"	1 9/16"	13/16"	0.000	0.000	3/4"	1 7/16"	1 15/16"	2 1/4"	2 3/8"	2 1/4"	1 15/16"	1 7/16"	3/4"	0.000

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



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



DETAIL "A"

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. IN SPAN A AND 6300 PSI IN SPAN B.

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

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

WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

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

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
1/10/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 4 OF 4

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-21
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : E.C. LOCKLEAR	DATE : 4-19-10
CHECKED BY : O.T. NGUYEN	DATE : 7-10
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

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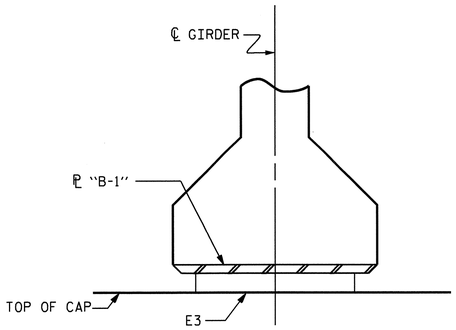
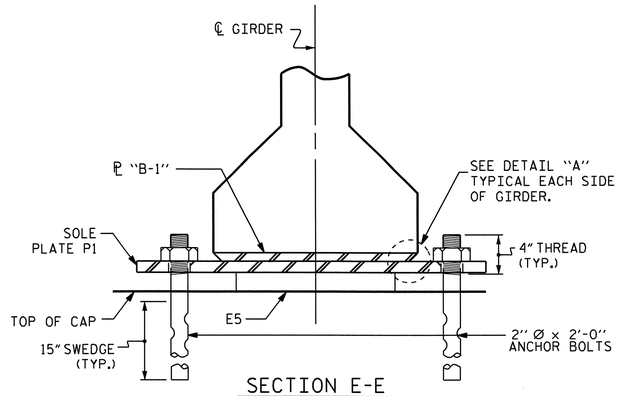
ttfang

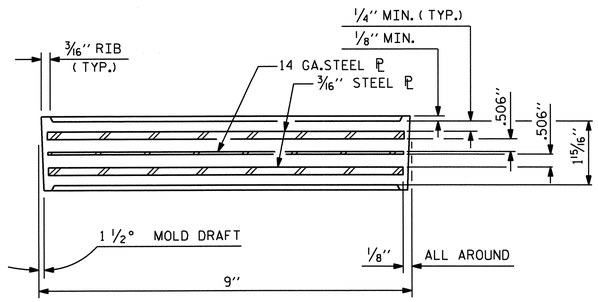
STD. NO. PCG9



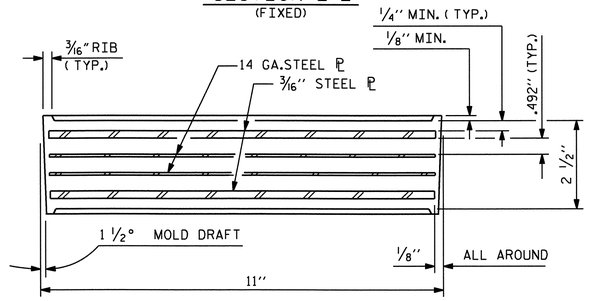
SECTION F-F
(AT INTEGRAL END BENT)



SECTION E-E
(FIXED)



TYPICAL SECTION OF ELASTOMERIC BEARINGS

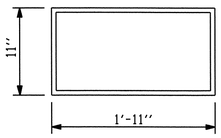


TYPICAL SECTION OF ELASTOMERIC BEARINGS

E3 (22 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

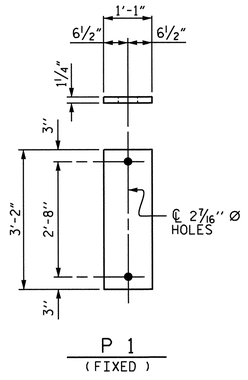
TYPE IV



E5 (22 REQ'D)

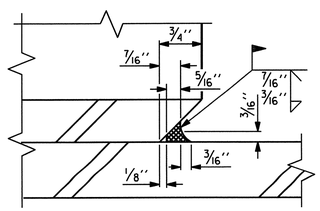
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI

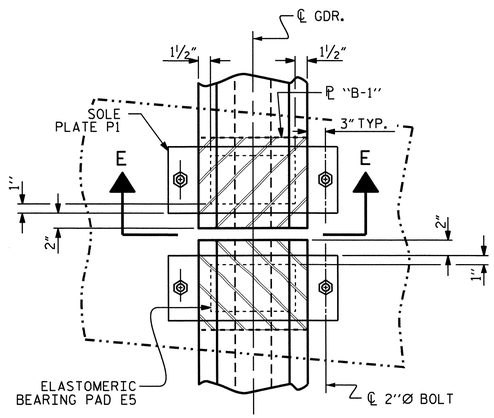


P 1
(FIXED)
(22 REQ'D)

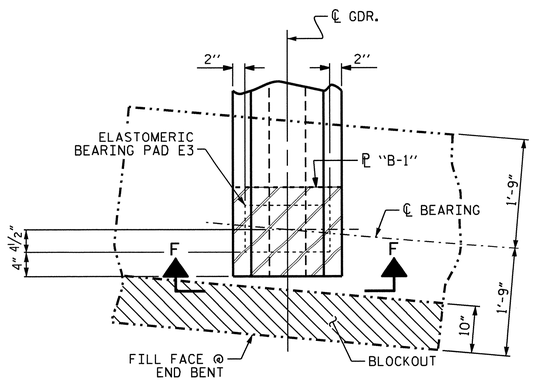
SOLE PLATE DETAILS



DETAIL "A"



TYPICAL PLAN @ BENT



TYPICAL PLAN @ END BENT
(INTEGRAL)

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.

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.

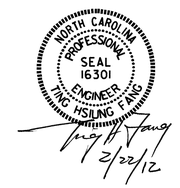
SOLE PLATE "P", BOLTS, NUTS, AND WASHERS SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

— LOAD RATINGS —

	MAX.D.L.+L.L.
54"PCG -TYPE IV	137 K
TYPE VI	211 K



PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
ELASTOMERIC BEARING DETAILS
PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

ASSEMBLED BY : H. B. SHAH	DATE : 11-08
CHECKED BY : T. H. FANG	DATE : 11-08
DRAWN BY : WJH 8/89	REV. 7/10/01 RWW/LES
CHECKED BY : CRK 8/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			47

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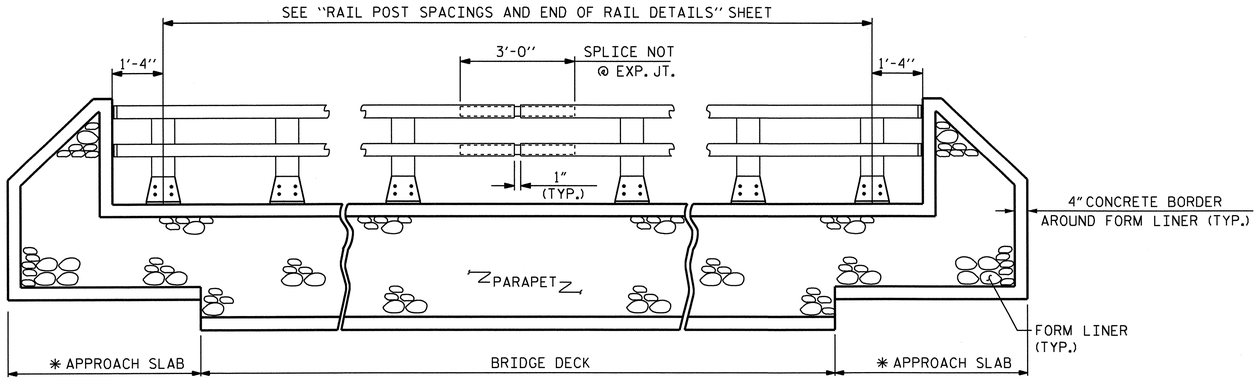
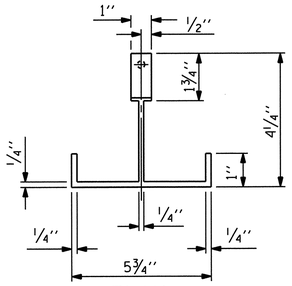


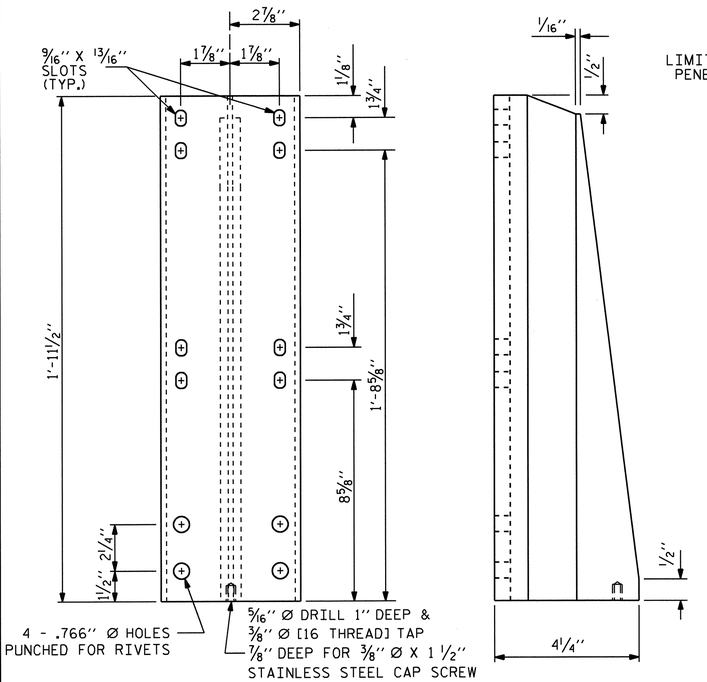
ELEVATION

FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR4, ON SHEET S-24.

* FOR LIMIT OF FORM LINER, SEE SECTIONS N-N & T-T ON "BRIDGE APPROACH SLAB" SHEET S-43.

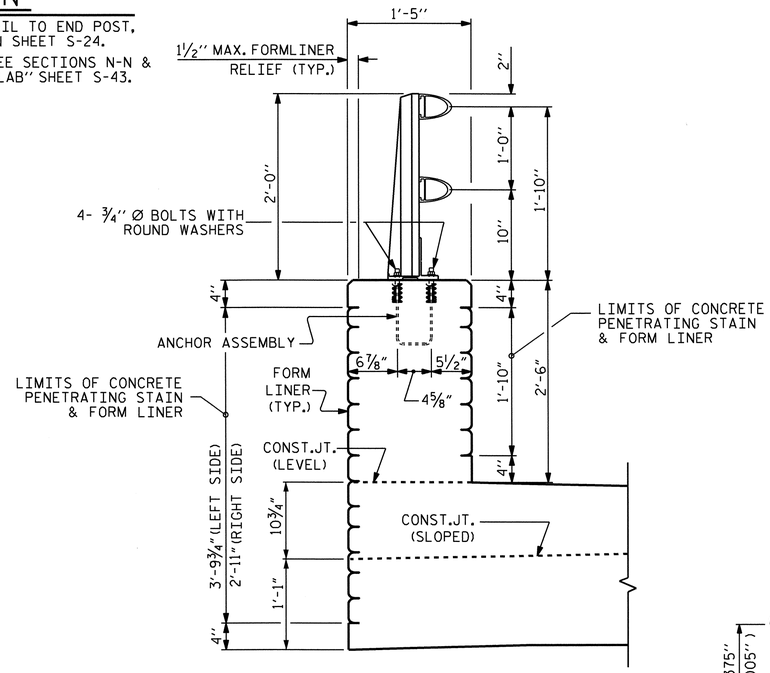


PLAN



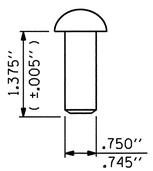
FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

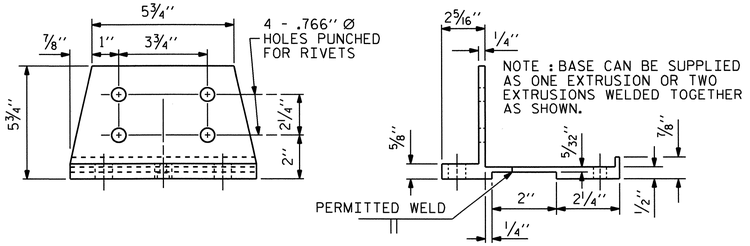


SECTION THRU PARAPET

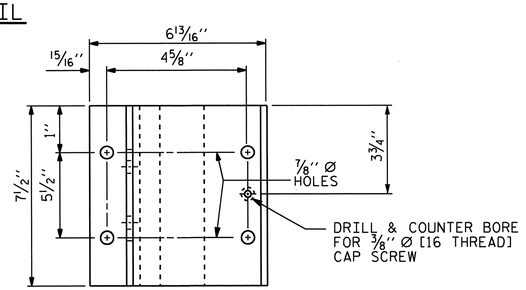
LEFT SIDE SHOWN WITH SIDEWALK, RIGHT SIDE SIMILAR OMIT SIDEWALK



RIVET DETAIL



FRONT ELEVATION SIDE ELEVATION



PLAN

POST BASE DETAILS

NOTES

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

ALUMINUM RAILS

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

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE SHEET 3 OF 4.

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 IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 449.29 LIN. FT.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

2/23/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			47

STD. NO. BMR3

ASSEMBLED BY : HARISH SHAH	DATE : 2-23-10	
CHECKED BY : O.T. NGUYEN	DATE : 7-10	
DRAWN BY : EEM 6/94	REV. 5/7/03R	RWW/JTE
CHECKED BY : RGW 6/94	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

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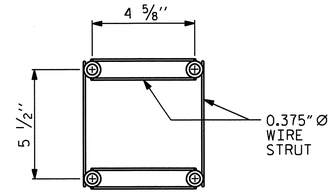
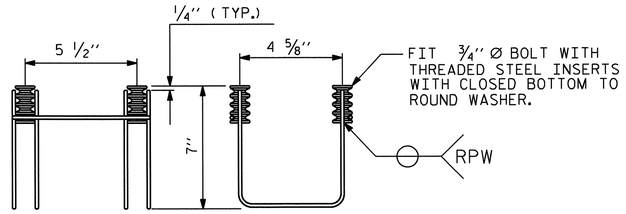
tfang



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(76 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

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

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

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

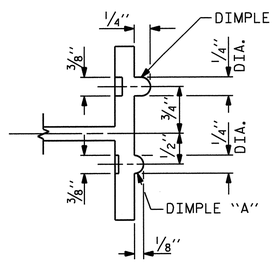
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

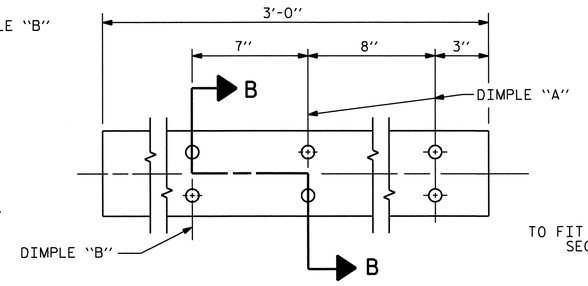
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

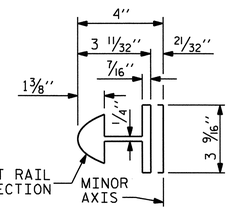
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



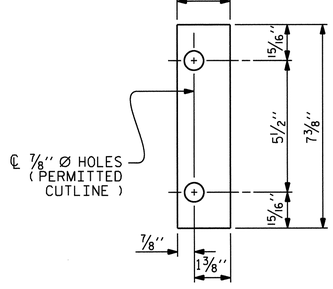
SECTION B-B



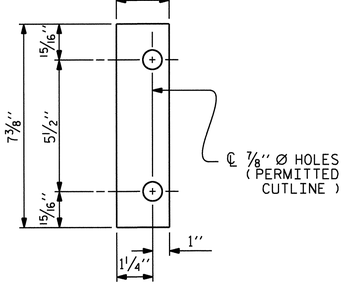
EXPANSION BAR DETAILS



BAR SECTION



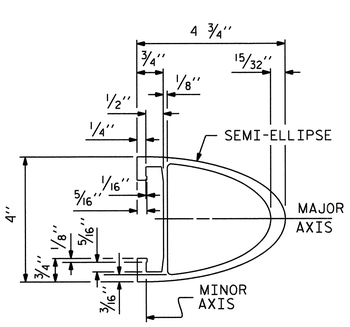
FRONT PLATE



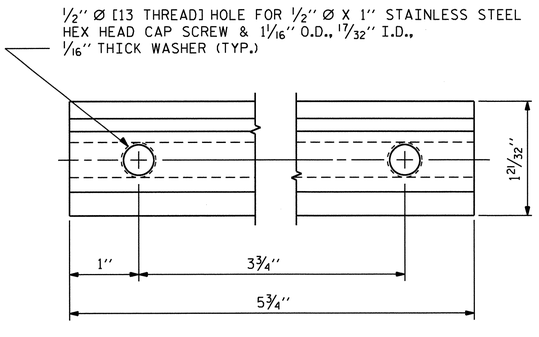
REAR PLATE

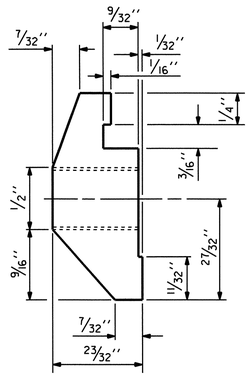
SHIM DETAILS

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



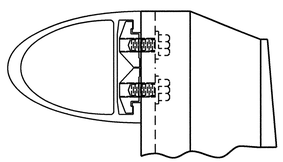
RAIL SECTION



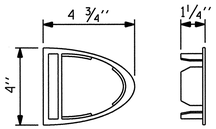


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : HARISH SHAH	DATE : 2-23-10	
CHECKED BY : O.T. NGUYEN	DATE : 7-10	
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

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG LIANG
2/22/12

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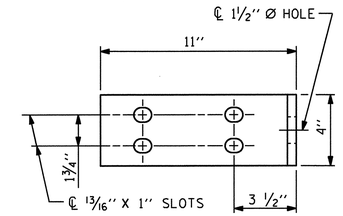
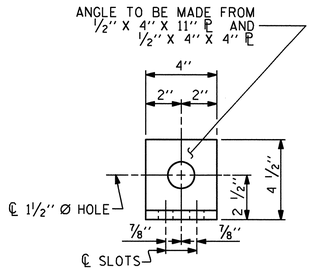
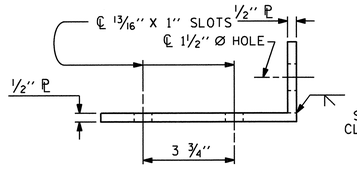
STD. NO. BMR4



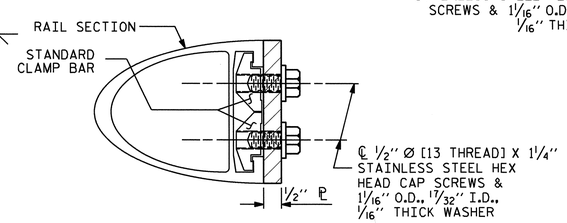
ELEVATION



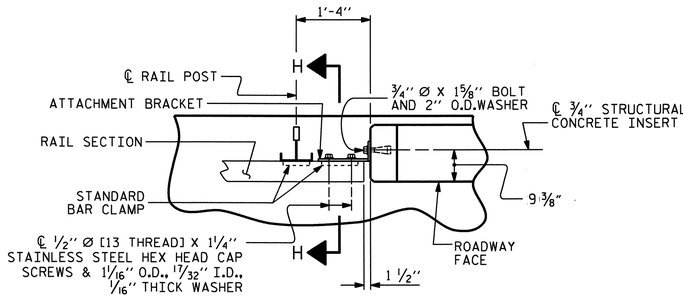
END VIEW (FIX)



TOP VIEW



SECTION H-H (FIX)



PLAN - RAIL AND END POST

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

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

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

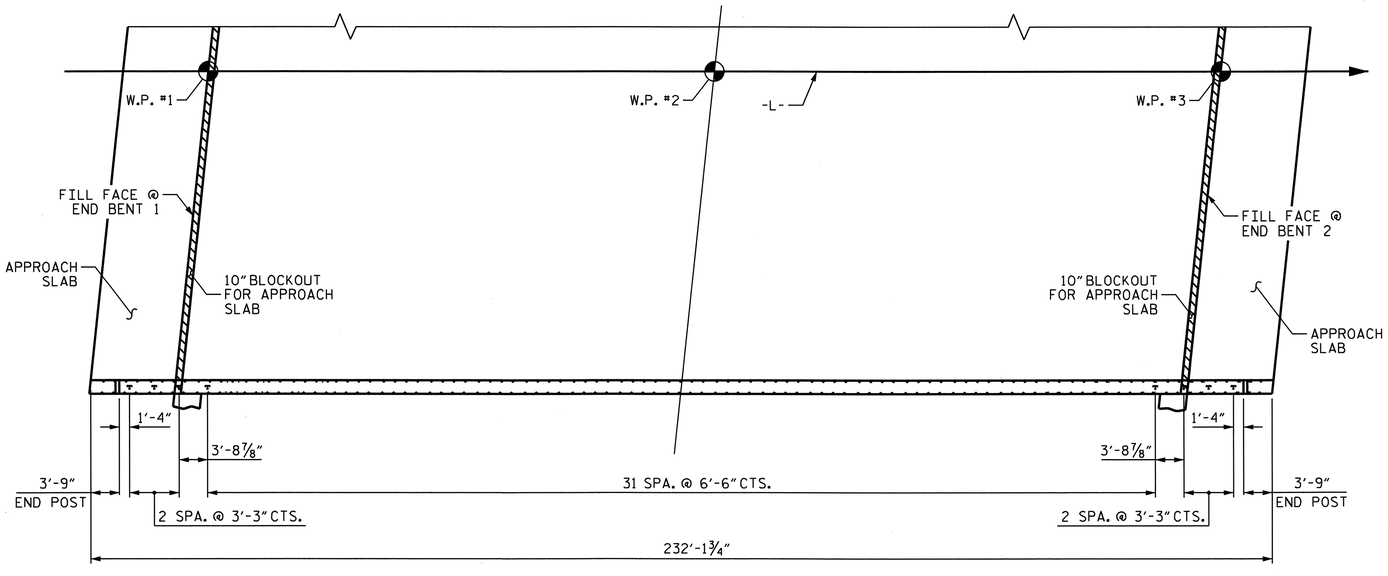
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

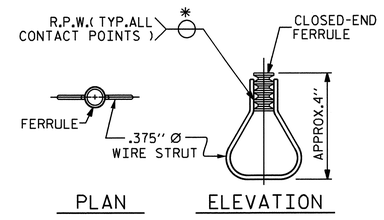
THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN OF RAIL POST SPACING

(TYPICAL EACH SIDE)



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

RAIL POST SPACINGS AND END OF RAIL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			47

T. H. Fang 1/9/12

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

DRAWN BY : J.A. YANNACCONE DATE : 11/29/11
CHECKED BY : T. H. FANG DATE : 1/4/12

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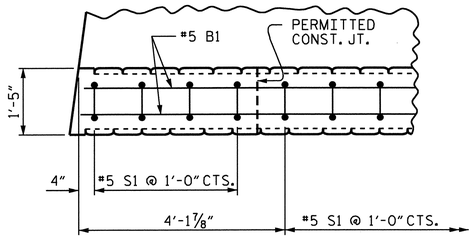
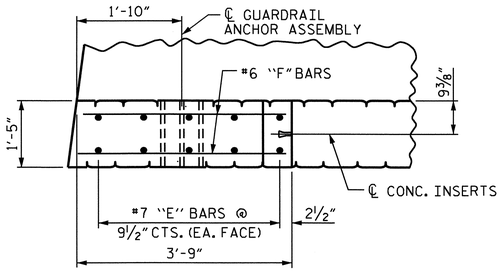
JAYannaccone



PLAN OF PARAPET



PLAN OF END POST

NOTES

ALL REINFORCING STEEL IN PARAPETS AND END POSTS SHALL BE EXPOXY COATED.

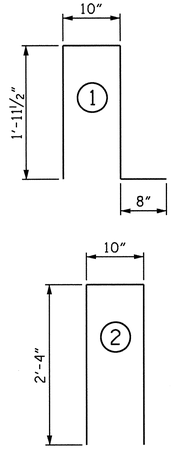
FOR DETAIL OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAIL" SHEET.

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

THE COST OF THE FORM LINERS AND SPECIAL SURFACE FINISH ARE INCLUDED IN THE LUMP SUM PRICE BID FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT.

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

BAR TYPE



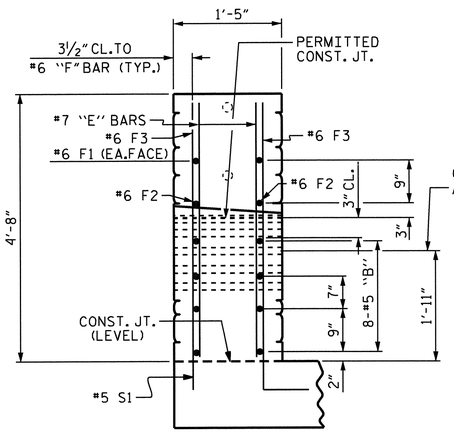
BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

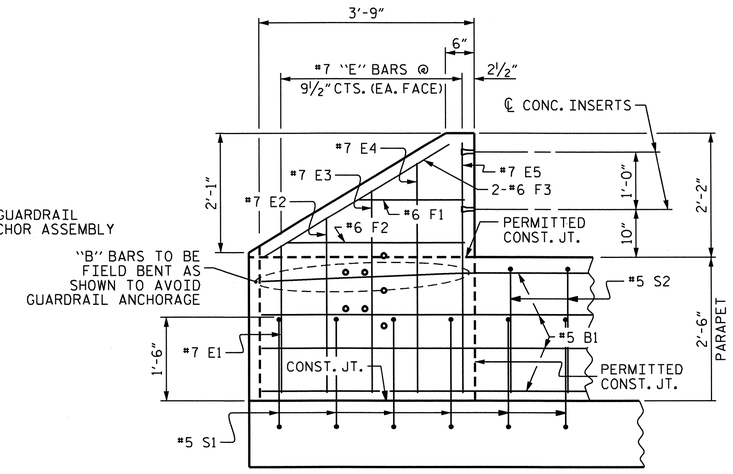
FOR 2 PARAPETS AND 4 END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B1	64	#5	STR	28'-1"	1875
✱B2	64	#5	STR	29'-1"	1941
✱E1	8	#7	STR	2'-6"	41
✱E2	8	#7	STR	3'-0"	49
✱E3	8	#7	STR	3'-6"	57
✱E4	8	#7	STR	4'-0"	65
✱E5	8	#7	STR	4'-4"	71
✱F1	8	#6	STR	1'-10"	22
✱F2	8	#6	STR	3'-0"	36
✱F3	8	#6	STR	3'-7"	43
✱S1	466	#5	1	5'-5"	2633
✱S2	450	#5	2	5'-6"	2581

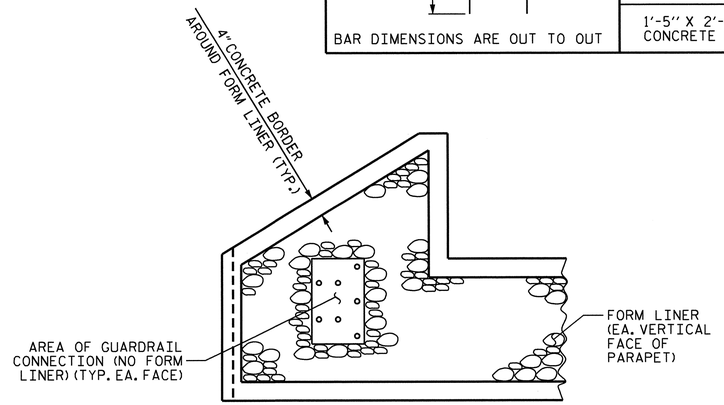
✱EPOXY COATED REINFORCING STEEL	9414 LBS.
CLASS AA CONCRETE	62.0 CU. YDS.
1'-5" X 2'-6" CONCRETE PARAPET	464.64 LIN. FT.



END VIEW



ELEVATION

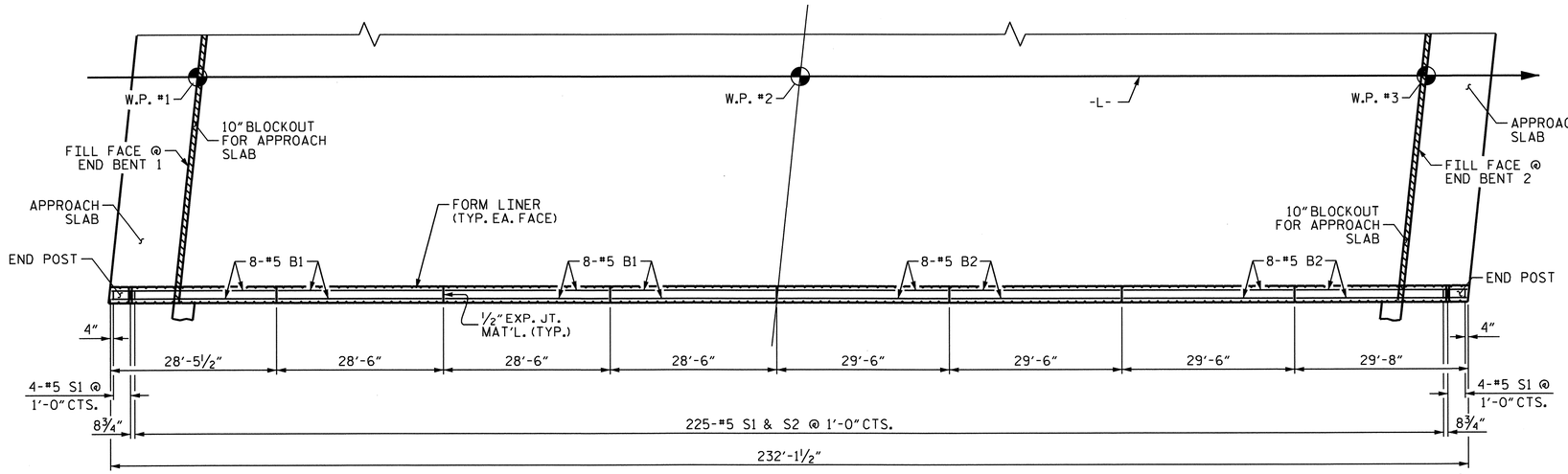


FORM LINER DETAIL

FOR LOCATION OF GUARDRAIL CONNECTION AND AREA WITH NO FORM LINER SEE "GUARDRAIL ANCHORAGE DETAILS" SHEET

PARAPET AND END POST FOR TWO BAR RAIL

SIDEWALK NOT SHOWN FOR CLARITY.



PLAN OF PARAPET

(TYPICAL EACH SIDE)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
2/22/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TWO BAR METAL RAIL POST SPACINGS & END POST DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : J.A. YANNACCONE DATE : 11/30/11
CHECKED BY : T. H. FANG DATE : 1/5/12

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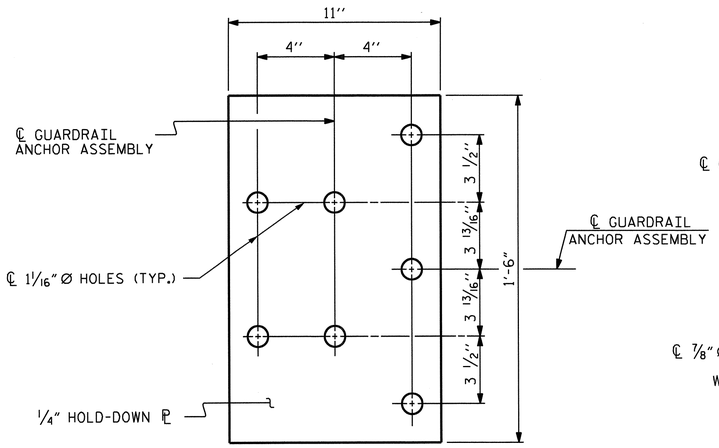
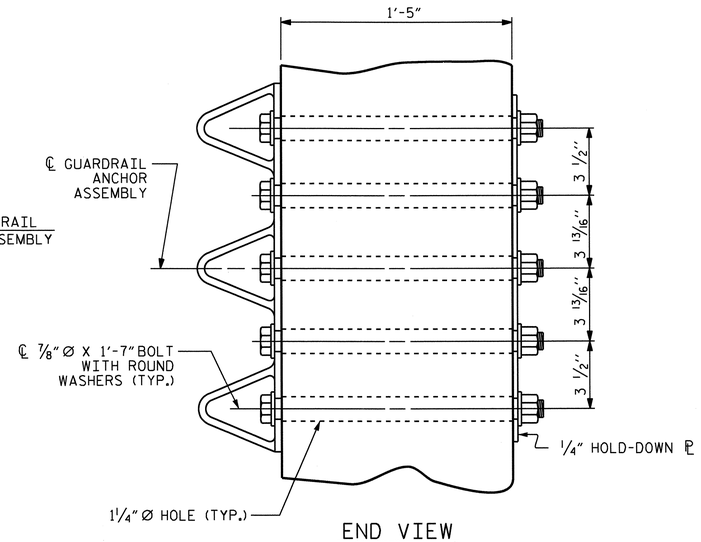


PLAN



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.

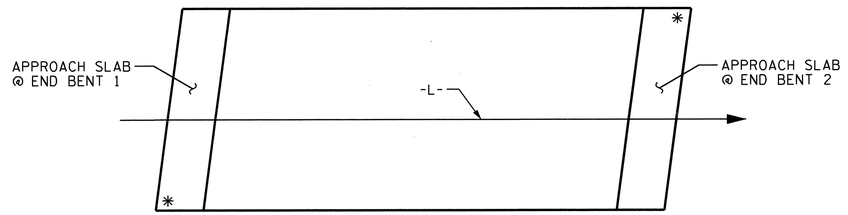
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

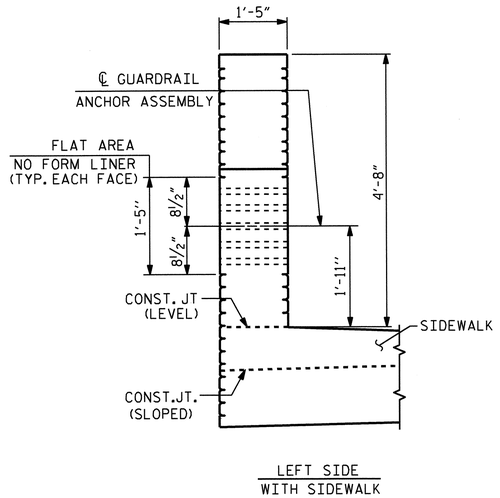
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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.

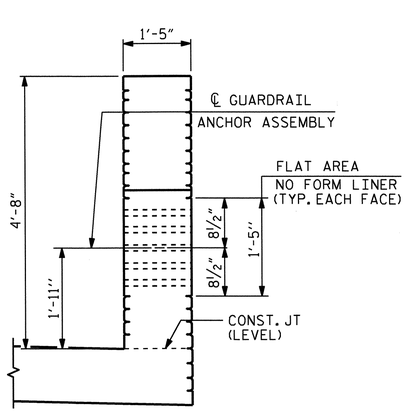


SKETCH SHOWING POINTS OF ATTACHMENT

*LOCATION OF GUARDRAIL ATTACHMENT

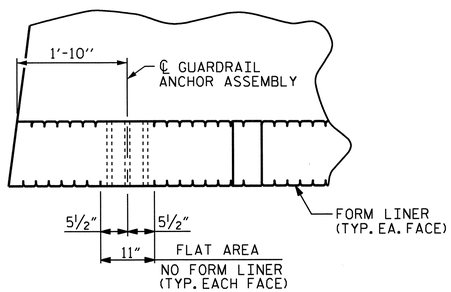


LEFT SIDE WITH SIDEWALK



RIGHT SIDE

END VIEW



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

ASSEMBLED BY : J.A.YANNACCONE	DATE : 12/2/11
CHECKED BY : T. H. FANG	DATE : 1/4/12

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			47

STD. NO. GRA3

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIUNG FANG
2/22/12

23-FEB-2012 14:38
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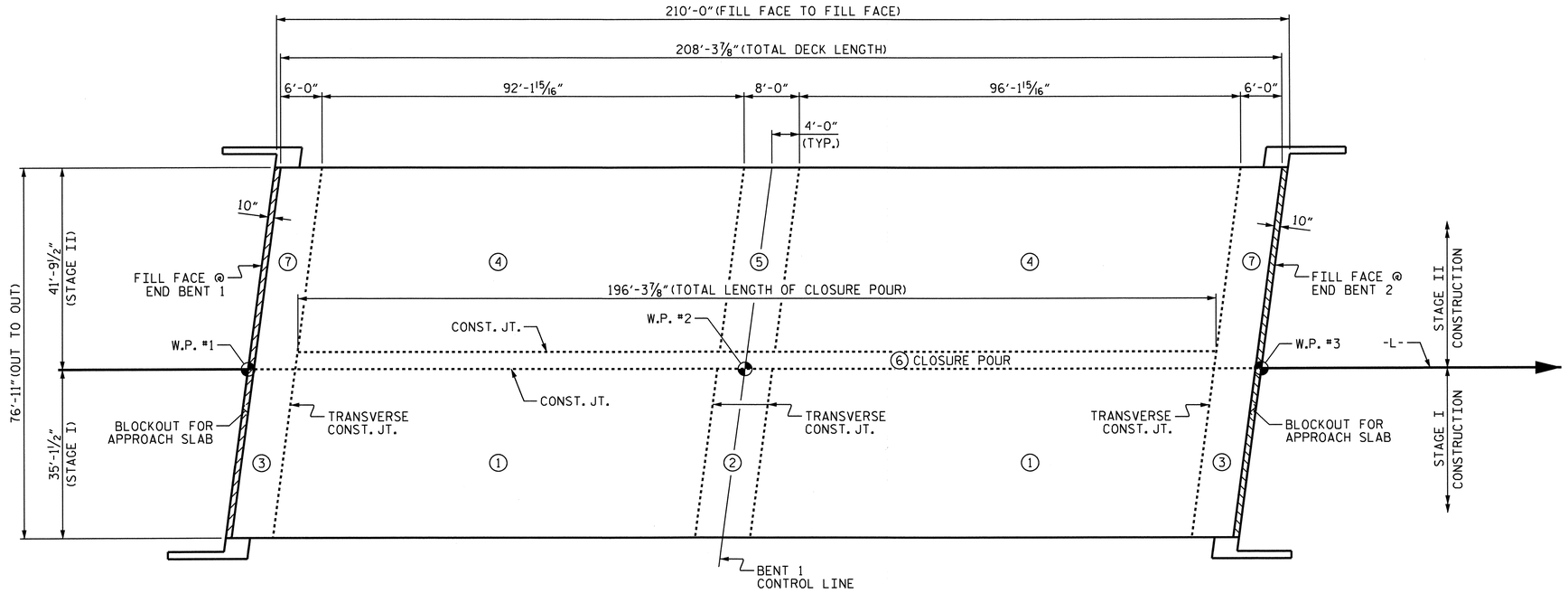
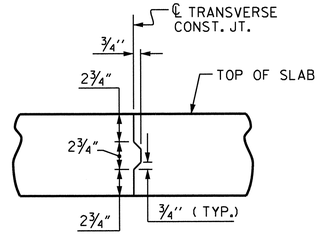
ttfang



OPTIONAL POURING SEQUENCE

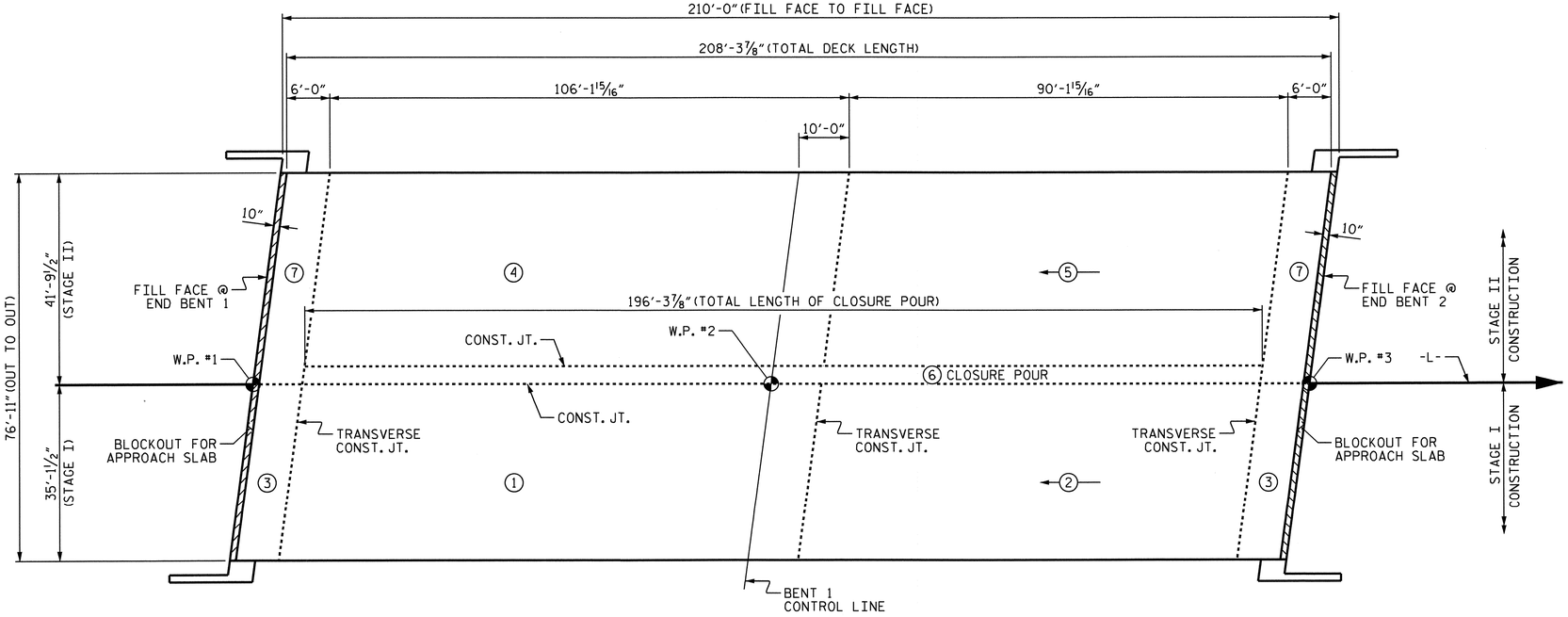
POUR 2 OR 5 CANNOT BE STARTED UNTIL BOTH ADJACENT POUR 1 OR 4 REACH A MINIMUM OF 3000 PSI RESPECTIVELY.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE STAGE II SCREED RAIL SHALL NOT BE SUPPORTED ON THE DECK OF STAGE I DURING THE CONSTRUCTION OF STAGE II.



TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POURING SEQUENCE

←(#)— = INDICATES POUR NUMBER AND DIRECTION OF POUR

THE UPPER PORTION OF THE WING SHALL BE POURED WITH THE SUPERSTRUCTURE.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

POUR SEQUENCE

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-HSIANG FANG

2/22/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : E.C. LOCKLEAR DATE : 4-21-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

22-FEB-2012 10:59
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wparker

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"			

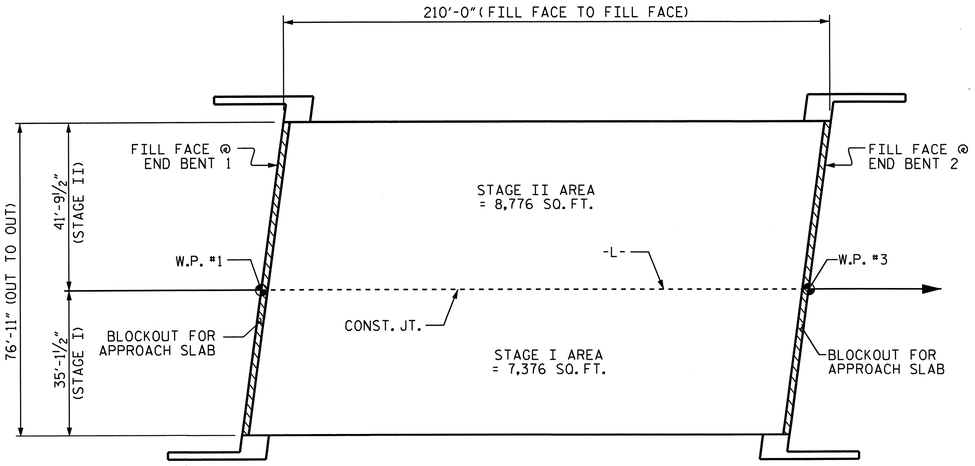
GROOVING BRIDGE FLOORS

STAGE I		
APPROACH SLABS	633	SQ.FT.
BRIDGE DECK	6,437	SQ.FT.
TOTAL	7,070	SQ.FT.
STAGE II		
APPROACH SLABS	577	SQ.FT.
BRIDGE DECK	5,410	SQ.FT.
TOTAL	5,987	SQ.FT.
TOTAL		
APPROACH SLABS	1,210	SQ.FT.
BRIDGE DECK	11,847	SQ.FT.
TOTAL	13,057	SQ.FT.

SUPERSTRUCTURE BILL OF MATERIAL

		CLASS AA CONCRETE (CU. YD.)				REINFORCING STEEL (LBS)	EPOXY COATED REINFORCING STEEL (LBS)
STAGE I	POUR NO.	#1	#2	#3	TOTAL		
	DECK	130.9	101.4	75.5	307.8	23,682	28,995
STAGE II	POUR NO.	#4	#5	#7	TOTAL		
	DECK	145.6	112.2	95.5	353.3	26,540	38,553
	SIDEWALK				45.5		
	CONC. MEDIAN				12.9		
	CLOSURE POUR				15.8		
	TOTALS **				735.3	50,222	67,548

** QUANTITIES INCLUDED WITH SPAN TOTALS



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ.FT. = 16,152)

REINFORCING STEEL

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	375	#5	STR	34'-9"	13592
A2	375	#5	STR	34'-9"	13592
* A101	2	#5	STR	33'-3"	69
* A102	2	#5	STR	29'-3"	61
* A103	2	#5	STR	25'-2"	52
* A104	2	#5	STR	21'-2"	44
* A105	2	#5	STR	17'-1"	36
* A106	2	#5	STR	13'-1"	27
* A107	2	#5	STR	9'-0"	19
* A108	2	#5	STR	5'-0"	10
A201	2	#5	STR	33'-3"	69
A202	2	#5	STR	29'-3"	61
A203	2	#5	STR	25'-2"	52
A204	2	#5	STR	21'-2"	44
A205	2	#5	STR	17'-1"	36
A206	2	#5	STR	13'-1"	27
A207	2	#5	STR	9'-0"	19
A208	2	#5	STR	5'-0"	10
* B1	48	#4	STR	26'-1"	836
* B2	48	#7	STR	39'-3"	3851
* B3	23	#7	STR	31'-3"	1469
* B4	48	#4	STR	27'-0"	866
* B5	47	#7	STR	20'-8"	1985
* B6	47	#7	STR	21'-5"	2057
B7	144	#5	STR	53'-8"	8060
* D1	766	#5	STR	3'-9"	2996
H1	12	#4	5	10'-10"	87
H3	12	#4	6	13'-11"	112
K1	20	#4	STR	21'-1"	282
K2	8	#4	STR	5'-3"	28
K3	24	#4	STR	6'-4"	102
K4	8	#4	STR	5'-9"	31
K5	2	#4	STR	4'-6"	6
K6	6	#4	STR	5'-3"	21
K7	2	#4	STR	4'-10"	6
K8	8	#4	STR	2'-8"	14
K9	8	#4	STR	4'-0"	21
K10	24	#4	STR	6'-4"	102
K11	8	#4	STR	5'-9"	31
K12	10	#4	STR	16'-7"	111
S1	52	#4	3	11'-8"	405
S2	88	#4	2	2'-9"	162
* S3	52	#4	4	11'-11"	414
* S4	52	#4	4	10'-5"	362
S5	4	#4	3	13'-10"	37
* U1	16	#4	1	16'-2"	173
* U2	8	#4	1	14'-2"	76
V2	44	#4	STR	5'-3"	154

REINFORCING STEEL = 23,682 LBS

* EPOXY COATED REINF. STEEL= 28,995 LBS

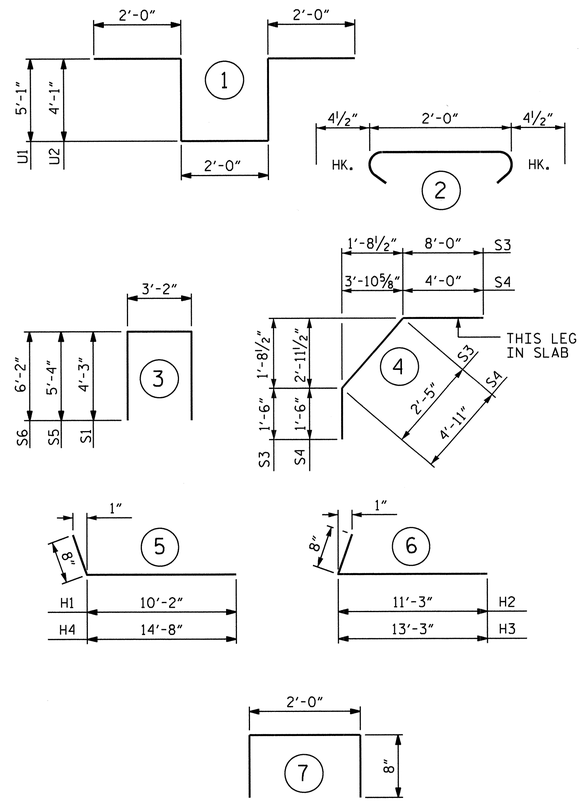
STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A3	375	#5	STR	39'-6"	15449
A4	375	#5	STR	39'-6"	15449
* A301	2	#5	STR	35'-7"	74
* A302	2	#5	STR	31'-6"	66
* A303	2	#5	STR	27'-6"	57
* A304	2	#5	STR	23'-6"	49
* A305	2	#5	STR	19'-5"	41
* A306	2	#5	STR	15'-5"	32
* A307	2	#5	STR	11'-4"	24
* A308	2	#5	STR	7'-4"	15
* A309	2	#5	STR	3'-4"	7
A401	2	#5	STR	35'-7"	74
A402	2	#5	STR	31'-6"	66
A403	2	#5	STR	27'-6"	57
A404	2	#5	STR	23'-6"	49
A405	2	#5	STR	19'-5"	41
A406	2	#5	STR	15'-5"	32
A407	2	#5	STR	11'-4"	24
A408	2	#5	STR	7'-4"	15
A409	2	#5	STR	3'-4"	7
* B1	54	#4	STR	26'-1"	941
* B2	54	#7	STR	39'-3"	4332
* B3	26	#7	STR	31'-3"	1661
* B4	54	#4	STR	27'-0"	974
* B5	53	#7	STR	20'-8"	2239
* B6	53	#7	STR	21'-5"	2320
B7	156	#5	STR	53'-8"	8732
* B8	90	#4	STR	27'-7"	1658
* B9	3	#4	STR	22'-2"	44
* B10	12	#4	STR	24'-2"	194
* B11	15	#4	STR	26'-6"	266
* B12	24	#6	STR	54'-3"	1956
* D1	766	#5	STR	3'-9"	2996
* D2	160	#5	STR	0'-7"	97
* G1	233	#4	STR	9'-8"	1505
* G2	159	#4	STR	2'-6"	266
H2	14	#4	5	11'-11"	111
H4	14	#4	6	15'-4"	143
K5	2	#4	STR	4'-6"	6
K6	6	#4	STR	5'-3"	21
K7	2	#4	STR	4'-10"	6
K8	8	#4	STR	2'-8"	14
K21	20	#4	STR	23'-4"	312
K22	10	#4	STR	4'-7"	31
K23	30	#4	STR	5'-10"	117
K24	10	#4	STR	5'-1"	34
K25	10	#4	STR	3'-5"	23
K26	30	#4	STR	5'-10"	117
K27	10	#4	STR	5'-1"	34
K28	10	#4	STR	18'-11"	126
K29	4	#4	STR	2'-7"	7
K30	6	#4	STR	3'-9"	15
S1	60	#4	3	11'-8"	468
S2	90	#4	2	2'-9"	165
* S3	54	#4	4	11'-11"	430
* S4	54	#4	4	10'-5"	376
S6	4	#4	3	15'-6"	41
* U1	15	#4	1	16'-2"	162
* U2	10	#4	1	14'-2"	95
* U3	102	#4	7	3'-4"	227
V3	50	#4	STR	6'-1"	203

REINFORCING STEEL = 26,540 LBS

* EPOXY COATED REINF. STEEL= 38,553 LBS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING-FANG HSU
2/23/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			47

STD. NO. BOM1

ASSEMBLED BY : E. C. LOCHLEAR	DATE : 04-10		
CHECKED BY : O.T. NGUYEN	DATE : 07-10		
DRAWN BY : JMB 5/87	REV. 6/1/94	EEM/GRP	
CHECKED BY : SJD 9/87	REV. 8/16/99	RWW/LES	
	REV. 5/1/06	TLA/GM	

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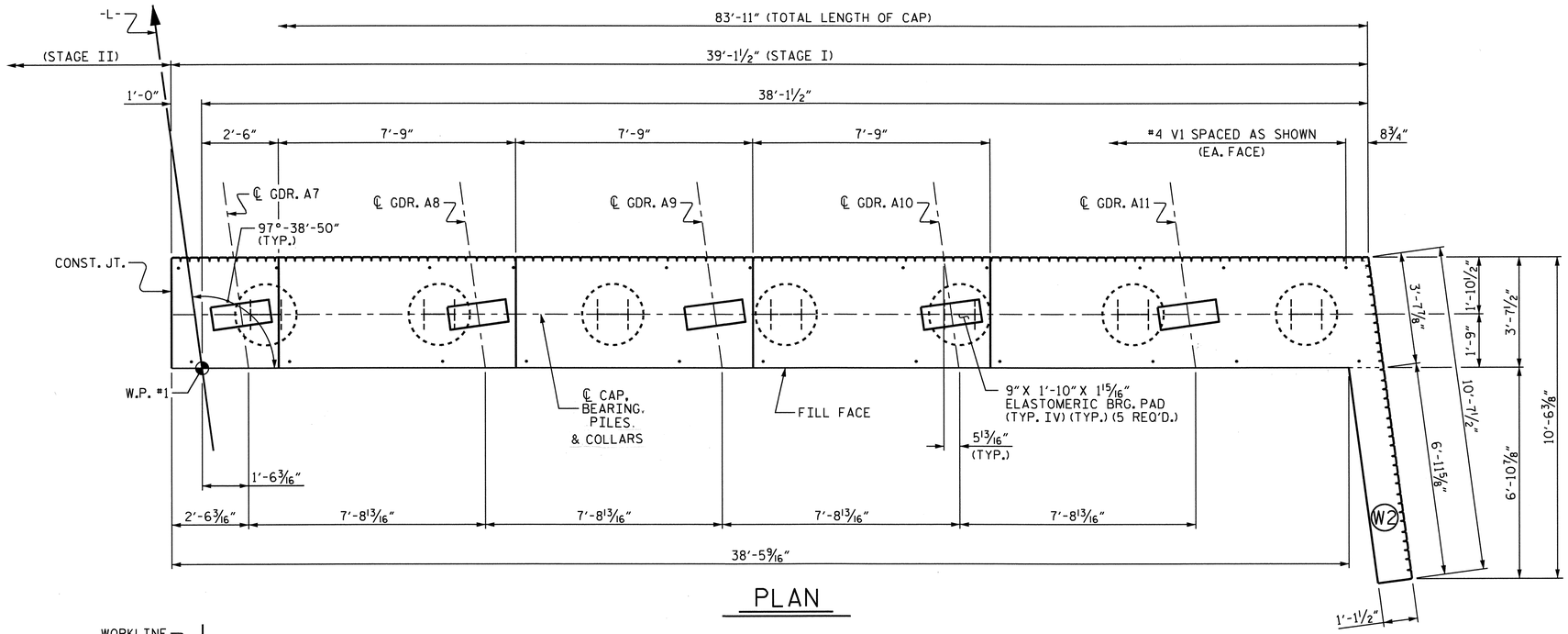
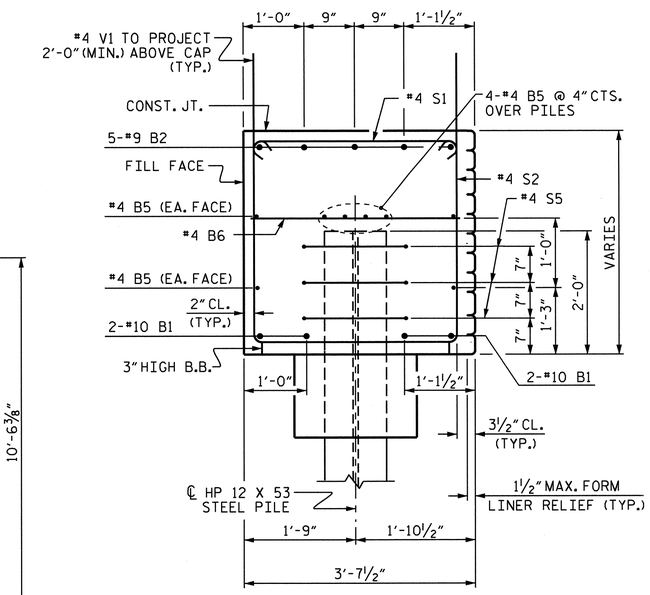
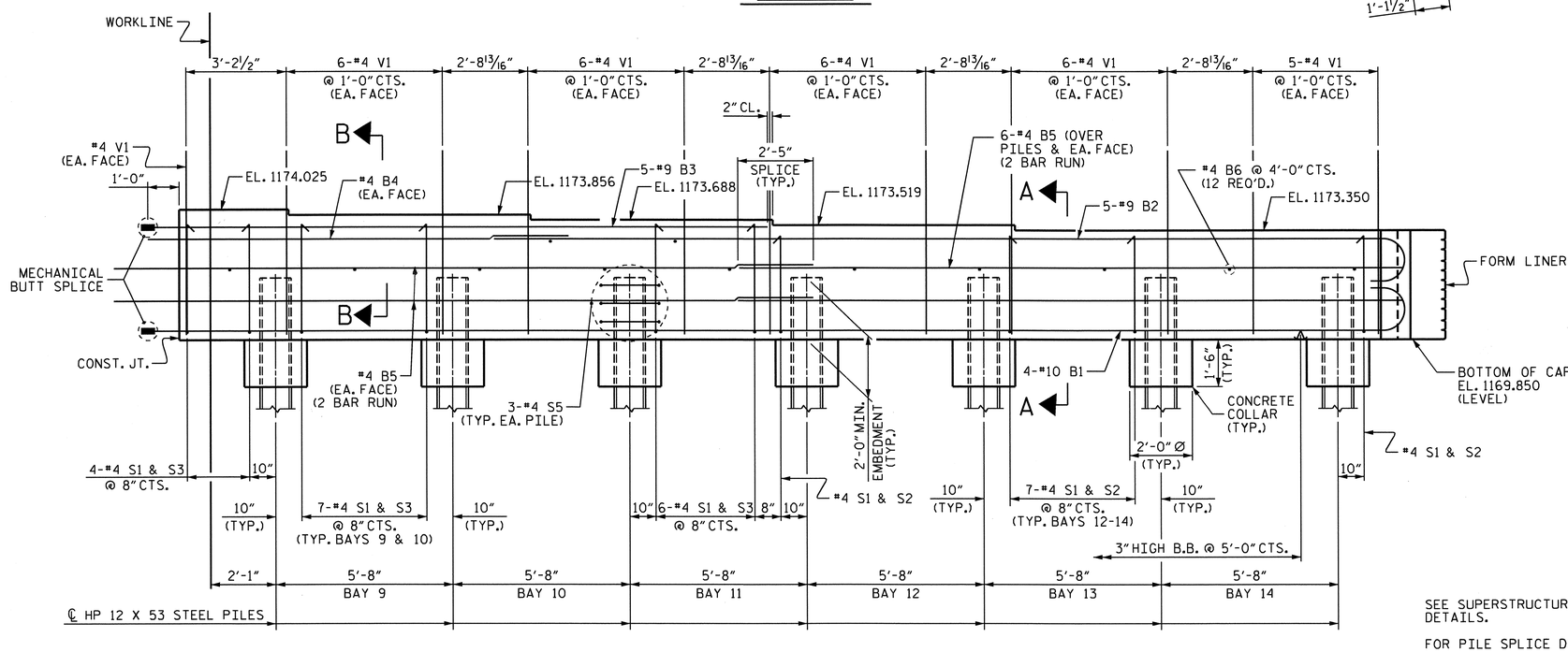


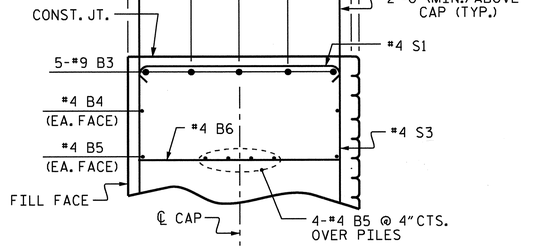
PLAN



SECTION A-A



ELEVATION



PARTIAL SECTION B-B

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
1/9/12

NOTES

SEE SUPERSTRUCTURE SHEETS FOR THE ABUTMENT DETAILS.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

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

THE COST OF THE FORM LINERS AND SPECIAL SURFACE FINISH ARE INCLUDED IN THE LUMP SUM PRICE BID FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT.

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 1 (INTEGRAL)
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 4-22-10
CHECKED BY : Q.T. NGUYEN DATE : 7-10

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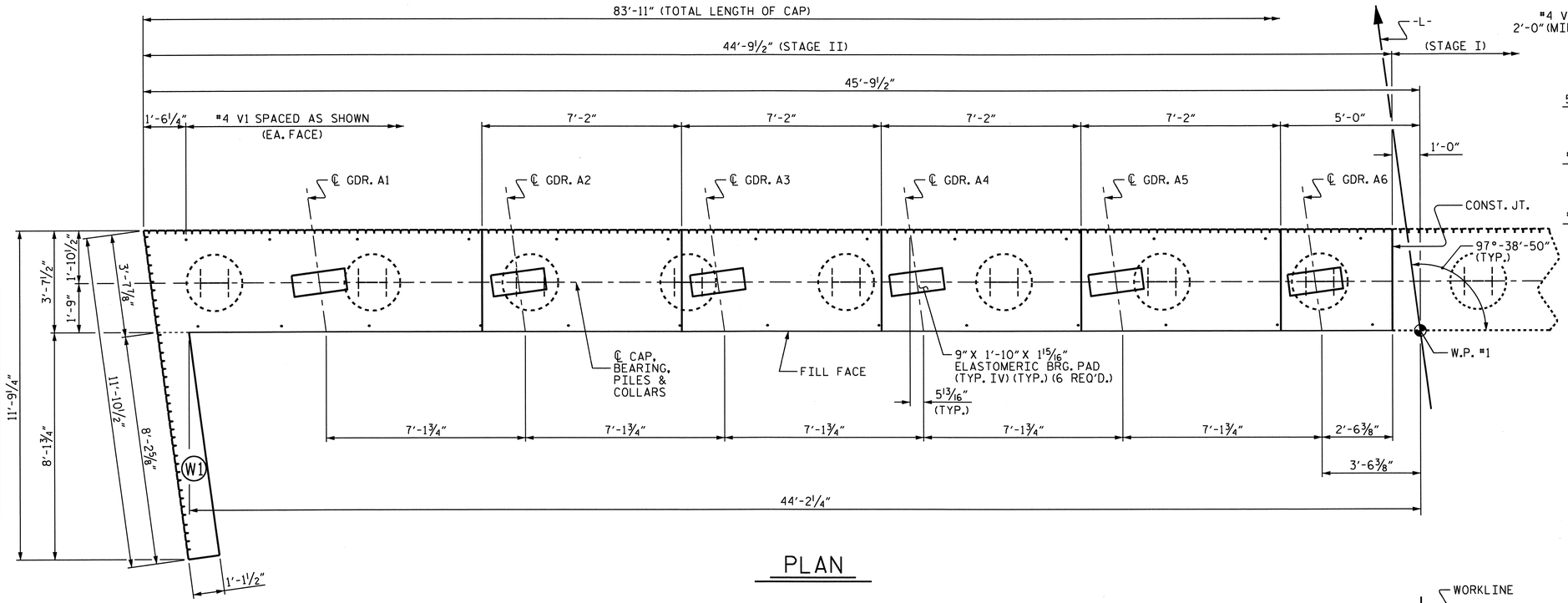
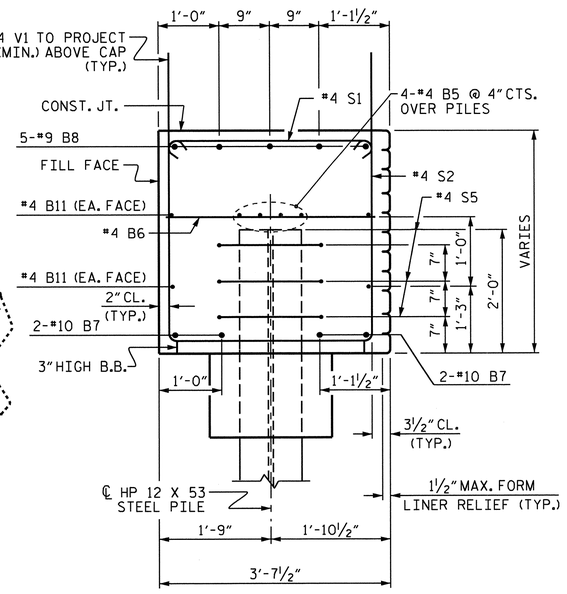
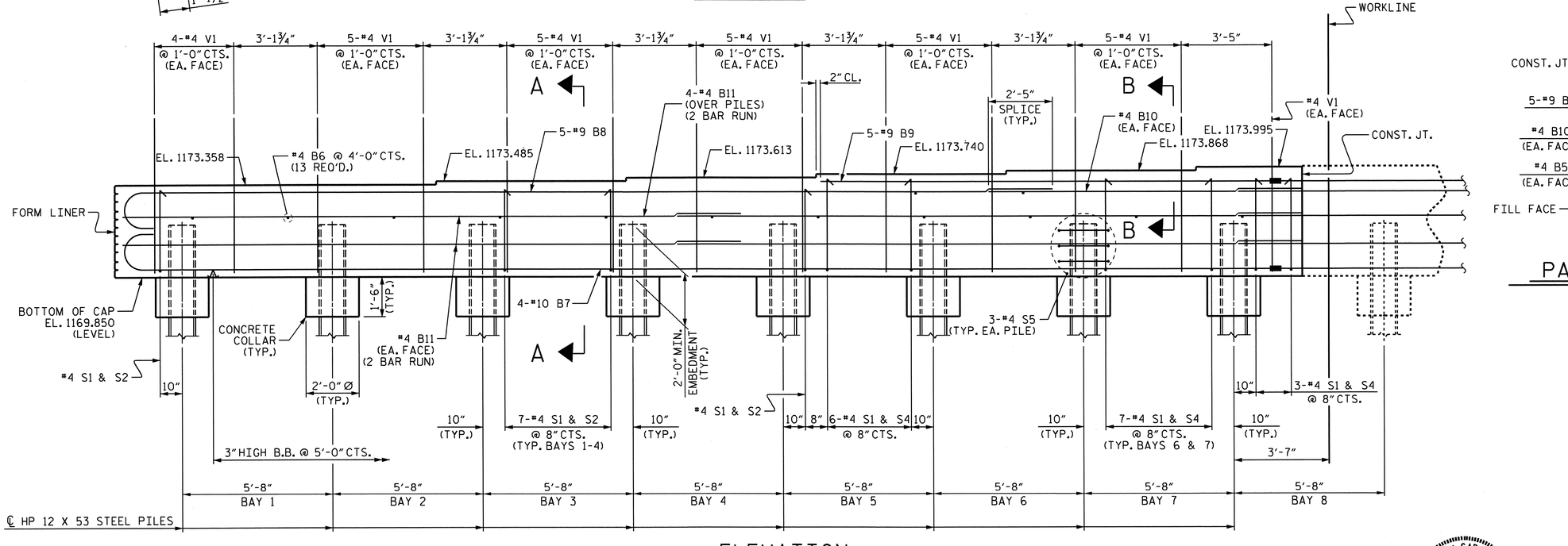
JAYannaccone



PLAN



SECTION A-A



ELEVATION

WING WALL NOT SHOWN FOR CLARITY.

PARTIAL SECTION B-B

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 (INTEGRAL) STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			47

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSING FANG

2/23/12

DRAWN BY : HARISH SHAH DATE : 4-22-10
CHECKED BY : Q.T. NGUYEN DATE : 7-10

23-FEB-2012 09:41
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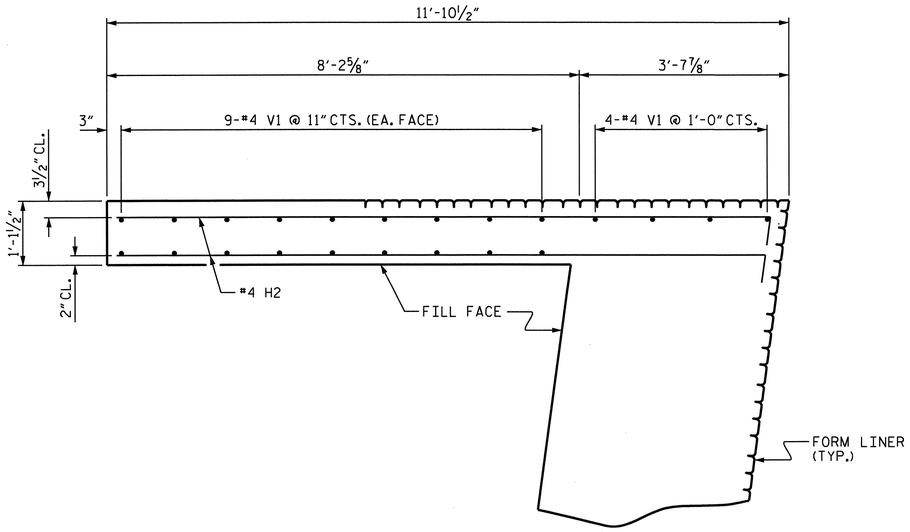
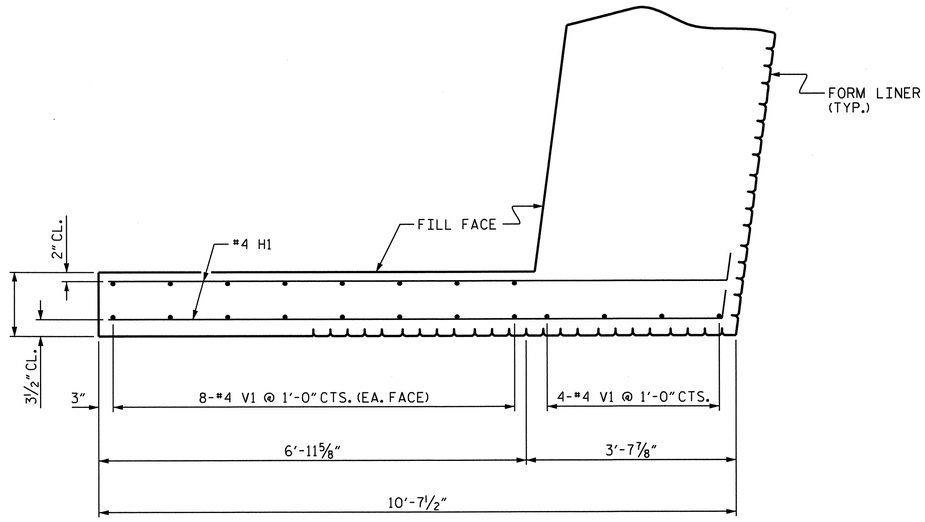
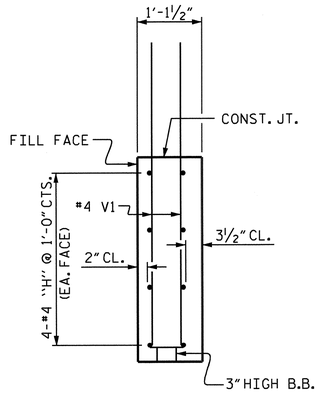
tfang



PLAN OF WING (W1)
(STAGE II)



PLAN OF WING (W2)
(STAGE I)



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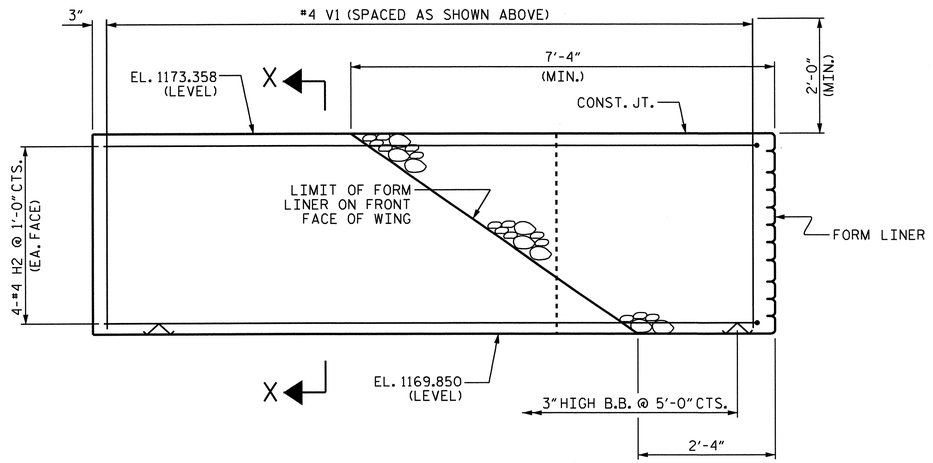
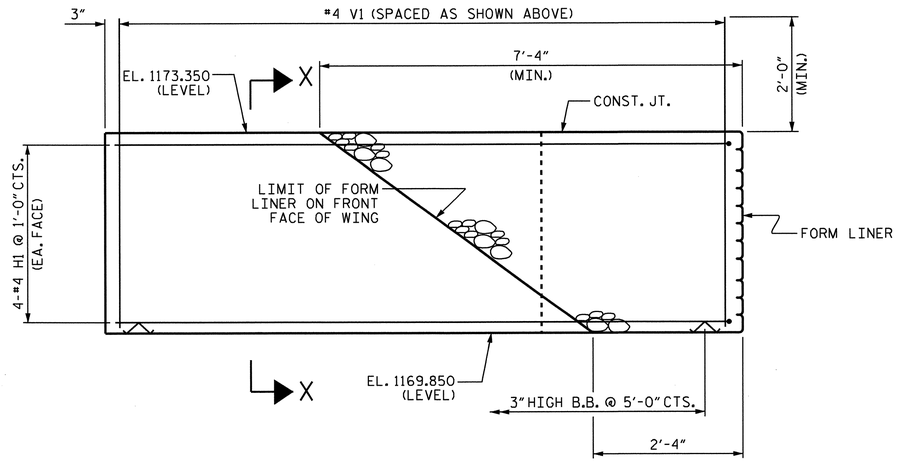


ELEVATION OF WING (W1)
(STAGE II)



ELEVATION OF WING (W2)
(STAGE I)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER HSHONG FANG
2/23/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 4-22-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

23-FEB-2012 11:29
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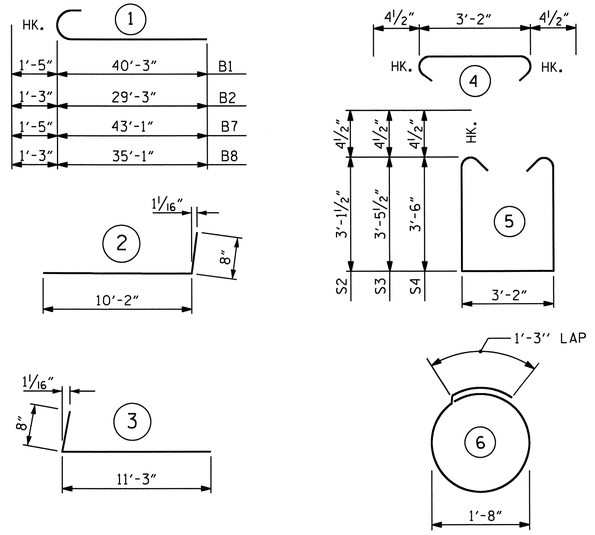
tfang

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	41'-8"	717
B2	5	#9	1	30'-6"	519
B3	5	#9	STR	19'-10"	337
B4	2	#4	STR	14'-11"	20
B5	16	#4	STR	22'-1"	236
B6	12	#4	STR	3'-2"	25
H1	8	#4	2	10'-10"	58
S1	47	#4	4	3'-11"	123
S2	23	#4	5	10'-2"	156
S3	24	#4	5	10'-8"	174
S5	21	#4	6	6'-6"	91
V1	80	#4	STR	6'-1"	325

REINFORCING STEEL = 2781 LBS

CLASS A CONCRETE:
CAP, LOWER WINGS, & COLLARS 21.2 C.Y.

HP 12 X 53 STEEL PILES
NO. 7 LIN. FT. 315
PILE REDRIVES 7 EA.

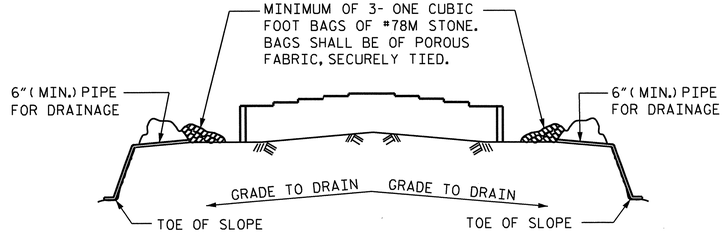
STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B6	13	#4	STR	3'-2"	27
B7	4	#10	1	44'-6"	766
B8	5	#9	1	36'-4"	618
B9	5	#9	STR	17'-4"	295
B10	2	#4	STR	11'-10"	16
B11	16	#4	STR	23'-6"	251
H2	8	#4	3	11'-11"	64
S1	53	#4	4	3'-11"	139
S2	30	#4	5	10'-2"	204
S4	23	#4	5	10'-11"	168
S5	24	#4	6	6'-6"	104
V1	82	#4	STR	6'-1"	333

REINFORCING STEEL = 2985 LBS

CLASS A CONCRETE:
CAP, LOWER WINGS, & COLLARS 24.2 C.Y.

HP 12 X 53 STEEL PILES
NO. 8 LIN. FT. 360
PILE REDRIVES 8 EA.

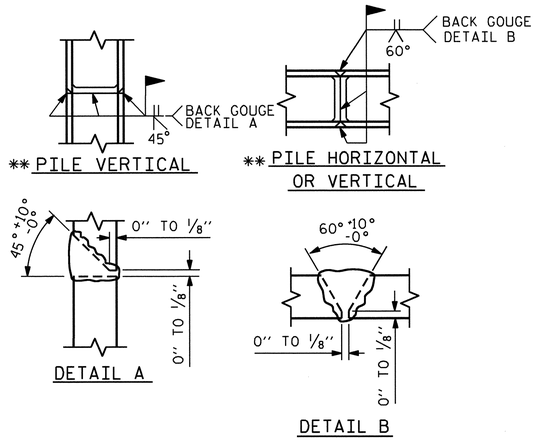


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG YANG
2/23/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1
(INTEGRAL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 4-23-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

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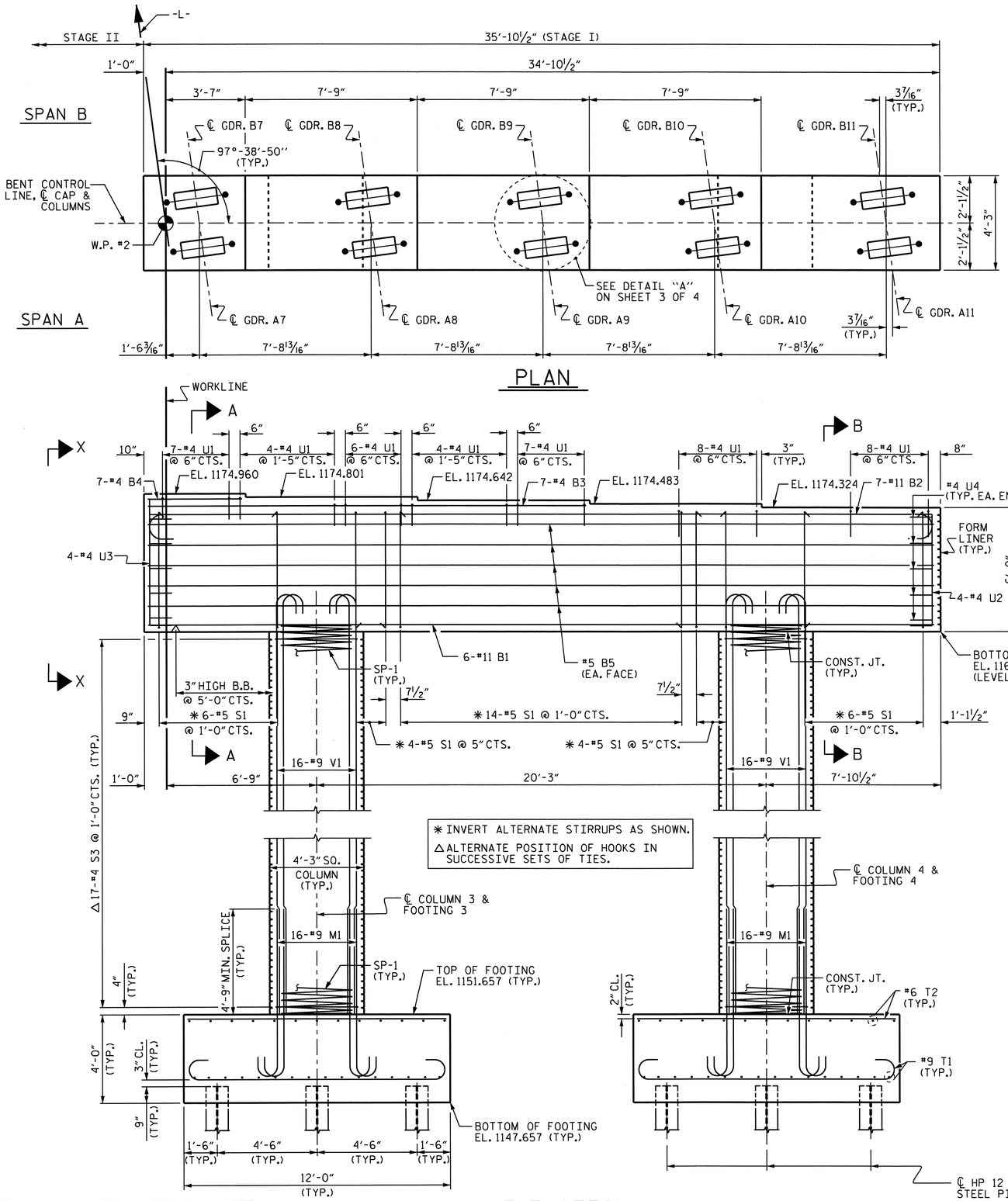
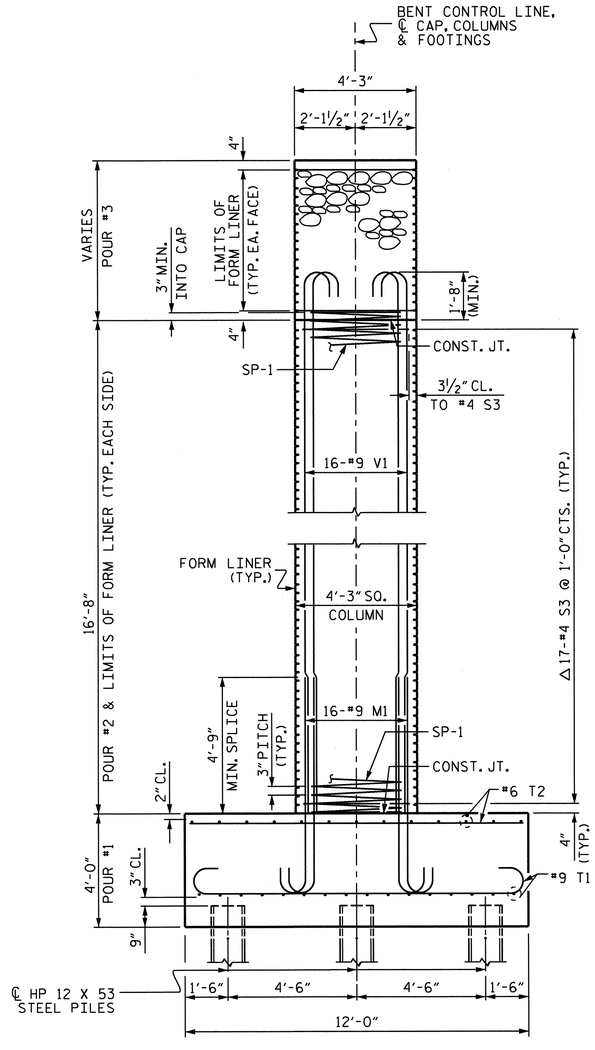
tfang



PLAN

ELEVATION



END ELEVATION

NOTES

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

HOOKS ON M1 & V1 BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

THE COST OF THE FORM LINERS AND SPECIAL SURFACE FINISH ARE INCLUDED IN THE LUMP SUM PRICE BID FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT.

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 21545 ENGINEER STEVEN R. WANCE
02/23/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 6-01-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

23-FEB-2012 12:21
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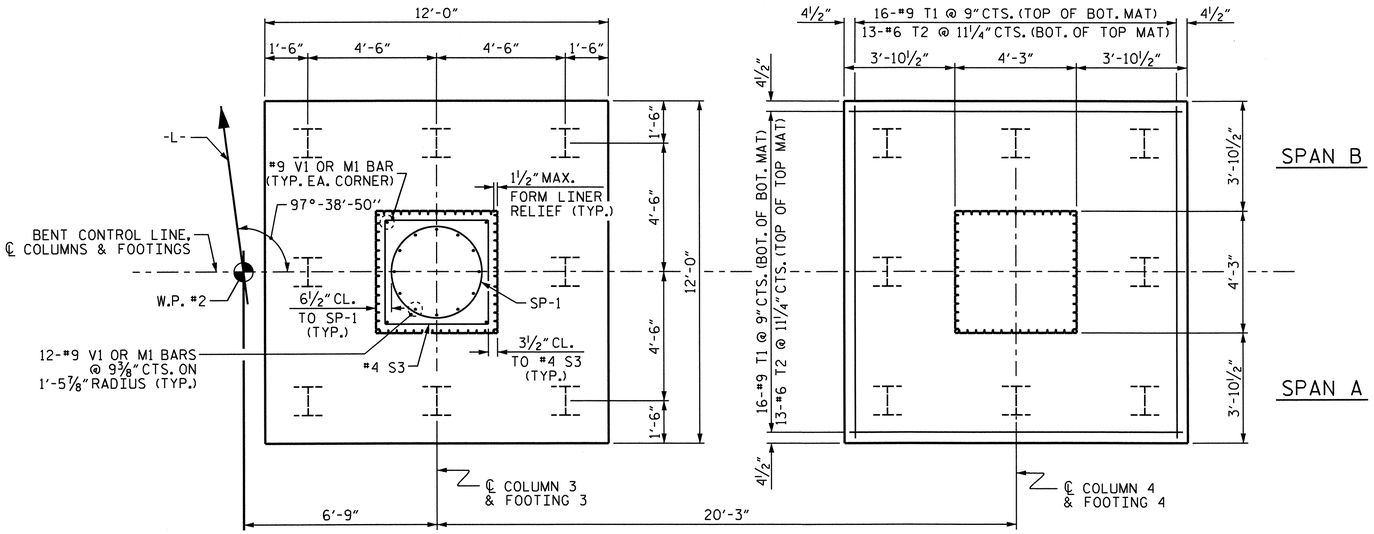


PLAN OF FOOTINGS AND COLUMNS

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

BILL OF MATERIAL

STAGE I

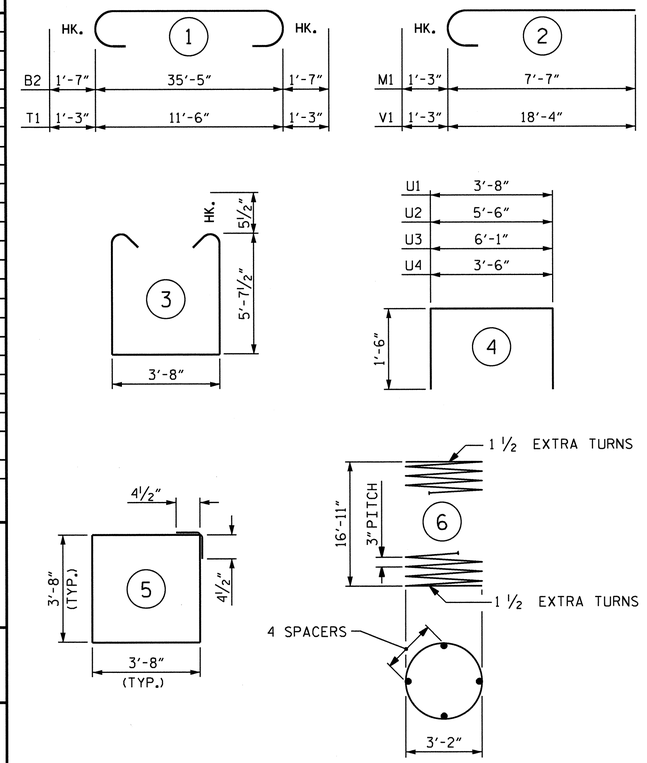
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	#11	STR	35'-5"	1129
B2	7	#11	1	38'-7"	1435
B3	7	#4	STR	19'-9"	92
B4	7	#4	STR	4'-3"	20
B5	10	#5	STR	35'-5"	369
M1	32	#9	2	8'-10"	961
S1	34	#5	3	15'-10"	561
S3	34	#4	5	15'-5"	350
T1	32	#9	1	14'-0"	1523
T2	26	#6	STR	11'-6"	449
U1	44	#4	4	6'-8"	196
U2	4	#4	4	8'-6"	23
U3	4	#4	4	9'-1"	24
U4	10	#4	4	6'-6"	43
V1	32	#9	2	19'-7"	2131
REINFORCING STEEL				LBS.	9306
SP-1	2	*	6	697'-4"	932
SPIRAL COLUMN REINFORCING STEEL				LBS.	932

CLASS A CONCRETE		
POUR #1 - FOOTINGS	CU. YDS.	42.7
POUR #2 - COLUMNS	CU. YDS.	22.3
POUR #3 - CAP	CU. YDS.	35.5
TOTAL	CU. YDS.	100.5

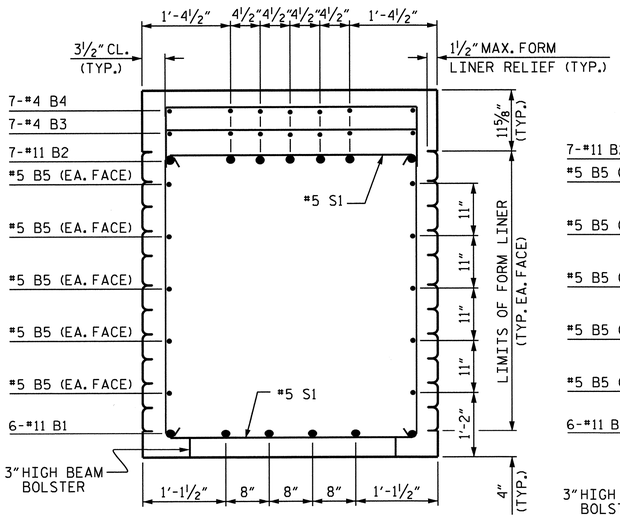
HP 12 X 53 STEEL PILES		
NUMBER = 16	LIN. FT. =	720
PILE REDRIVES		16 EA.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

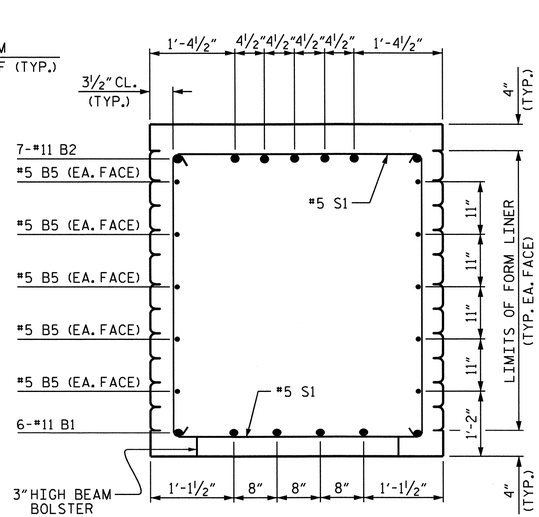
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



SECTION A-A



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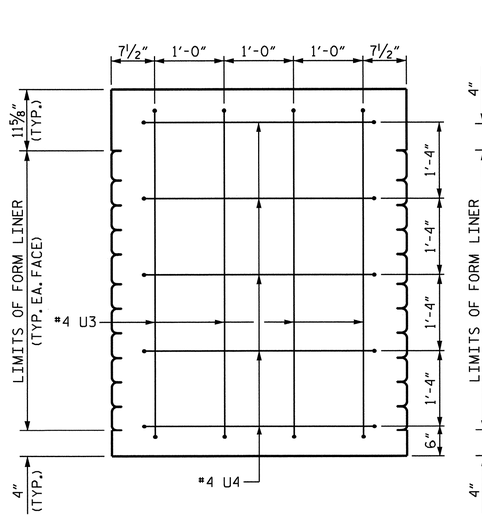
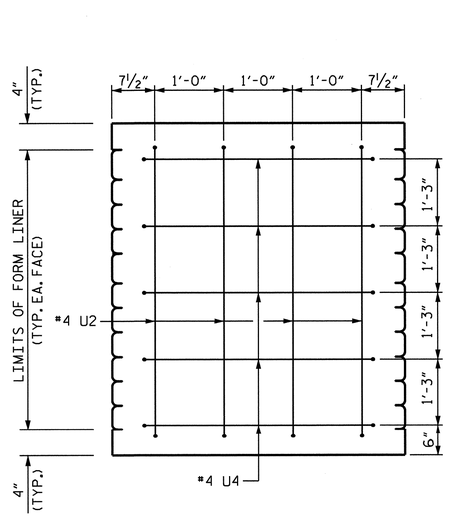


VIEW X-X



VIEW Y-Y

NORTH CAROLINA PROFESSIONAL SEAL 21545 ENGINEER STEVEN L. WANCE
02/23/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 6-01-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

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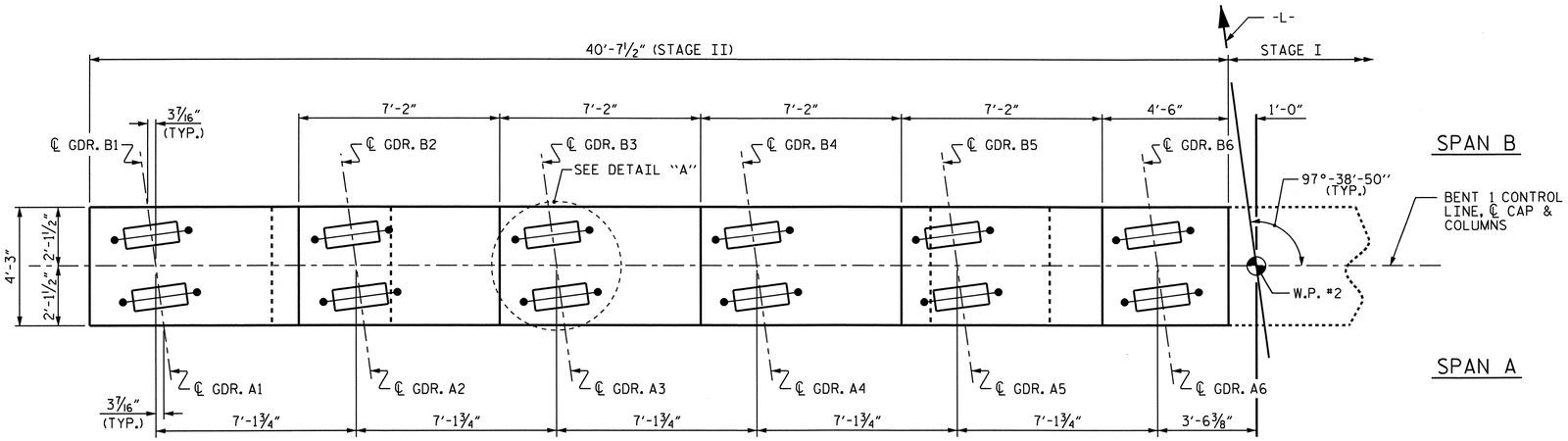
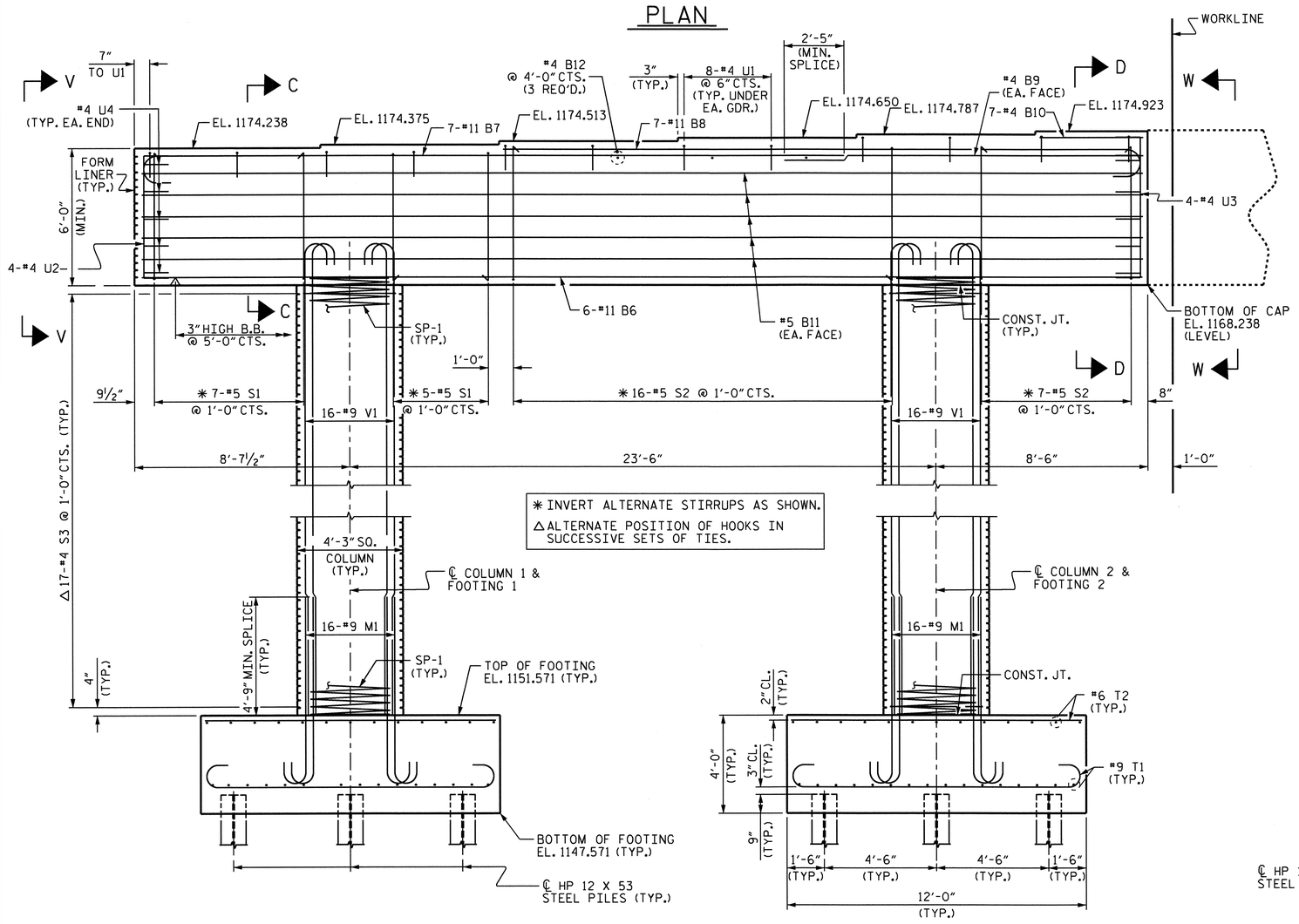
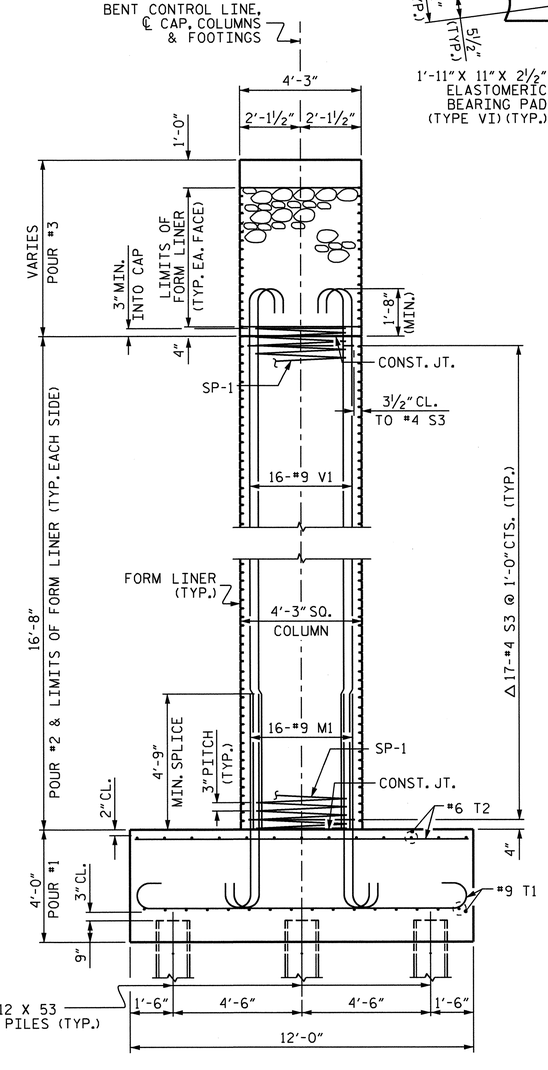


PLAN



ELEVATION



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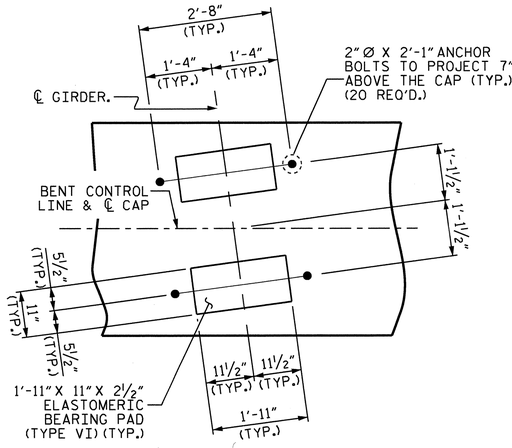

DETAIL "A"
(TYP. EA. GDR.)

FOR NOTES, SEE SHEET 1 OF 4.

NORTH CAROLINA PROFESSIONAL SEAL 21545 ENGINEER STEVEN T. WANCE
02/23/12

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT 1
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 5-27-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

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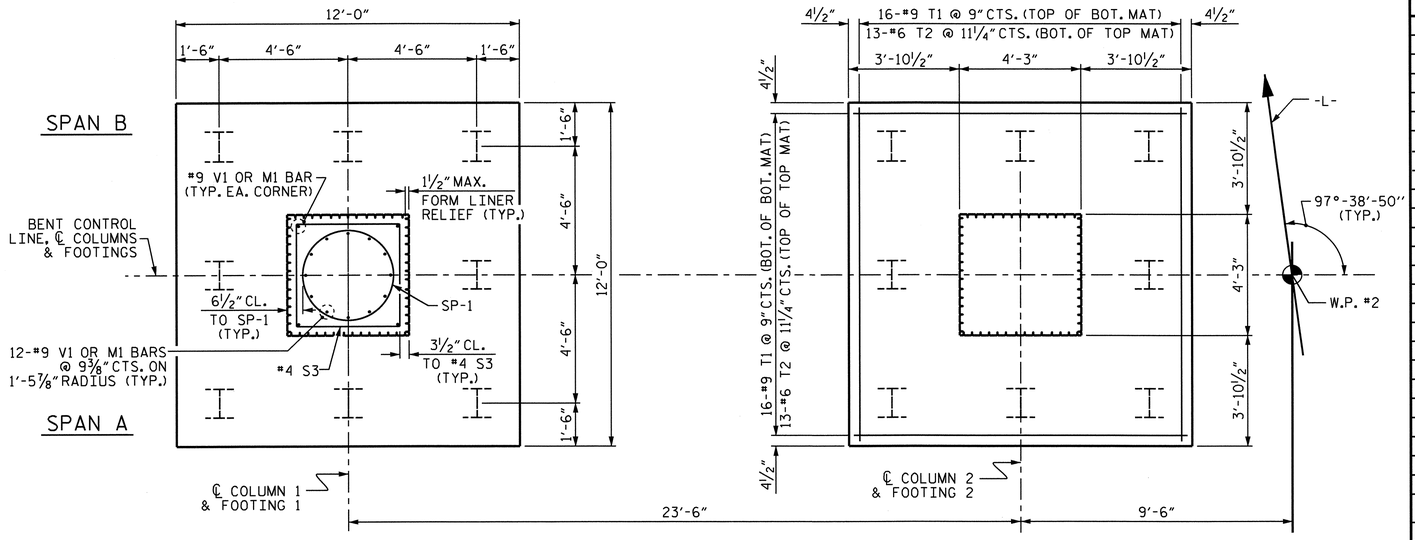


PLAN OF FOOTINGS AND COLUMNS

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

BILL OF MATERIAL

STAGE II

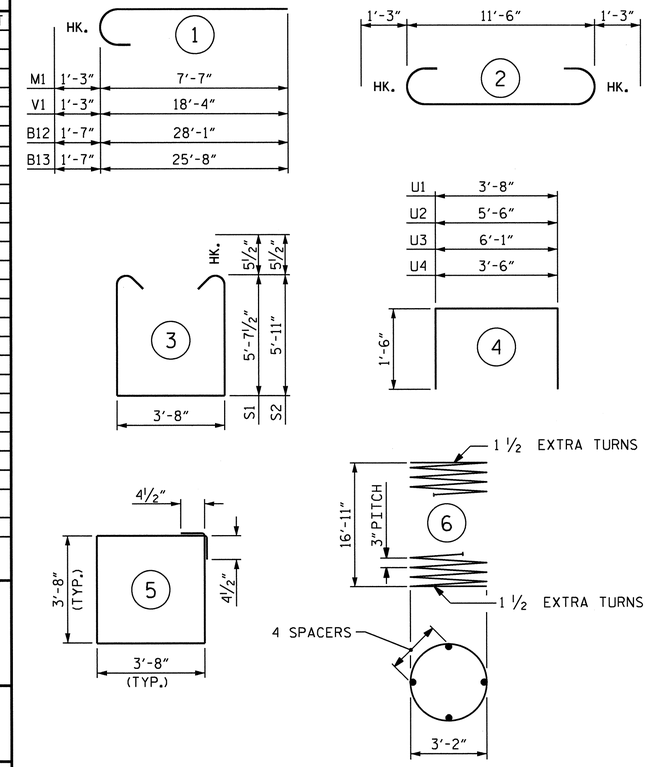
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B6	6	#11	STR	40'-2"	1280
B7	7	#11	1	29'-8"	1103
B8	7	#11	1	27'-3"	1013
B9	2	#4	STR	14'-6"	19
B10	7	#4	STR	4'-2"	19
B11	10	#5	STR	40'-2"	419
B12	3	#4	STR	3'-8"	7
M1	32	#9	1	8'-10"	961
S1	12	#5	3	15'-10"	198
S2	23	#5	3	16'-5"	394
S3	34	#4	5	15'-5"	350
T1	32	#9	2	14'-0"	1523
T2	26	#6	STR	11'-6"	449
U1	48	#4	4	6'-8"	214
U2	4	#4	4	8'-6"	23
U3	4	#4	4	9'-1"	24
U4	10	#4	4	6'-6"	43
V1	32	#9	1	19'-7"	2131
REINFORCING STEEL				LBS.	10,170
SP-1	2	*	5	697'-4"	932
SPIRAL COLUMN REINFORCING STEEL				LBS.	932

CLASS A CONCRETE		
POUR #1 - FOOTINGS	CU. YDS.	42.7
POUR #2 - COLUMNS	CU. YDS.	22.3
POUR #3 - CAP	CU. YDS.	40.4
TOTAL	CU. YDS.	105.4

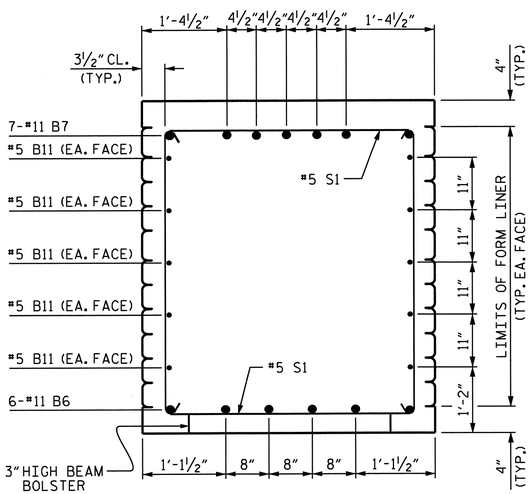
HP 12 X 53 STEEL PILES		
NUMBER = 16	LIN. FT. =	720
PILE REDRIVES		16 EA.

* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

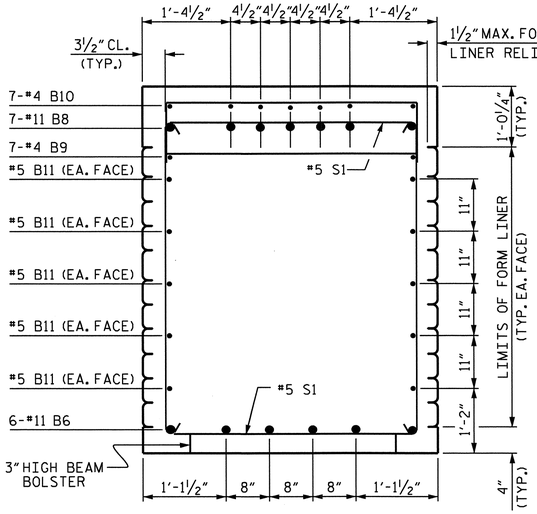
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



SECTION C-C



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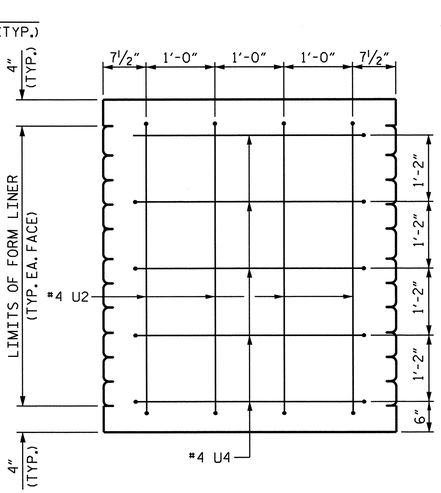
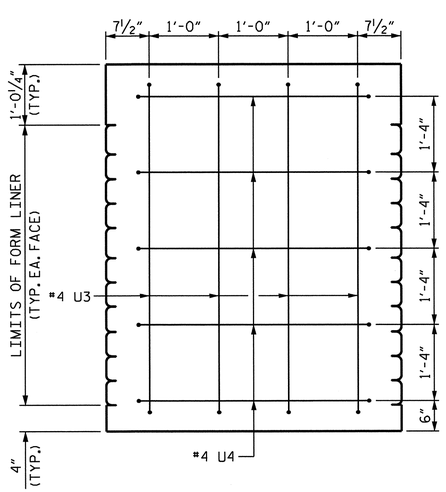
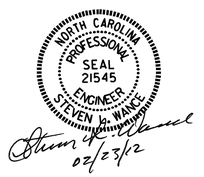


VIEW V-V



VIEW W-W



PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 5-28-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

23-FEB-2012 12:21
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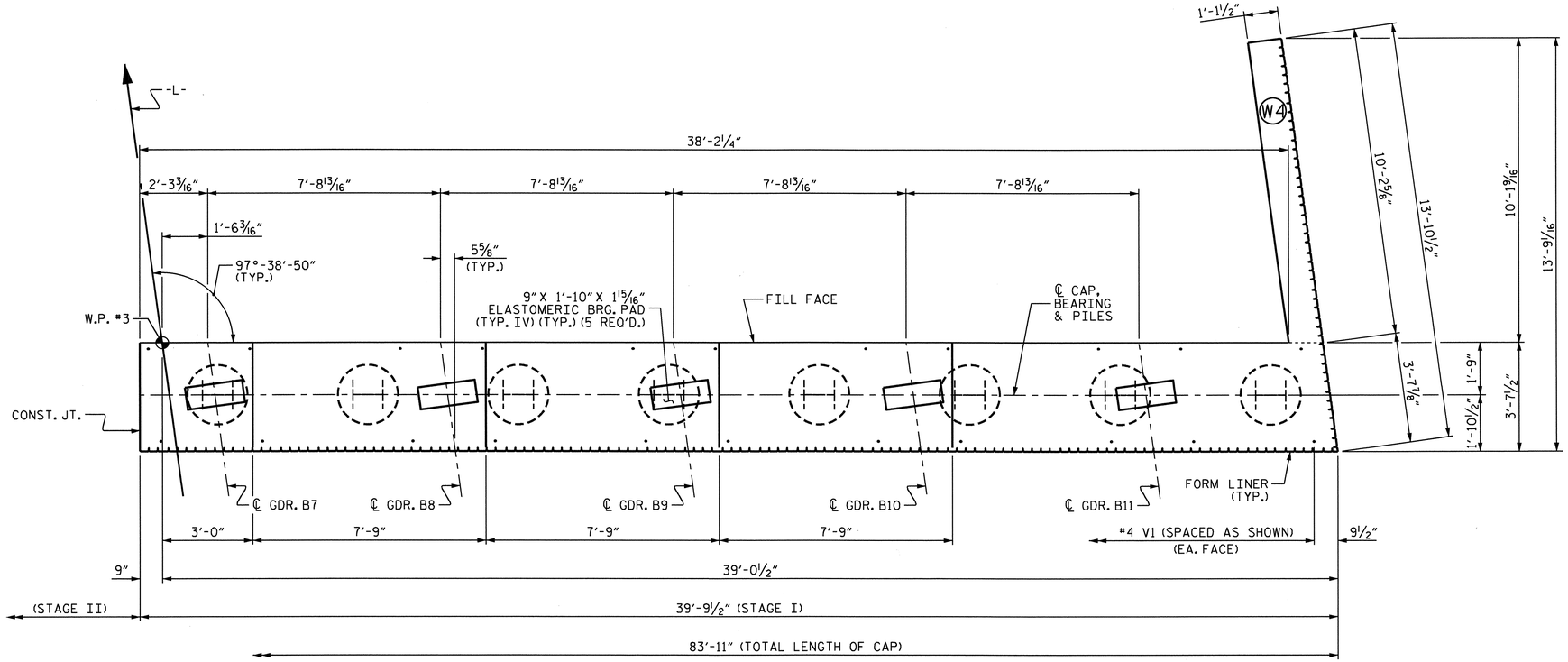
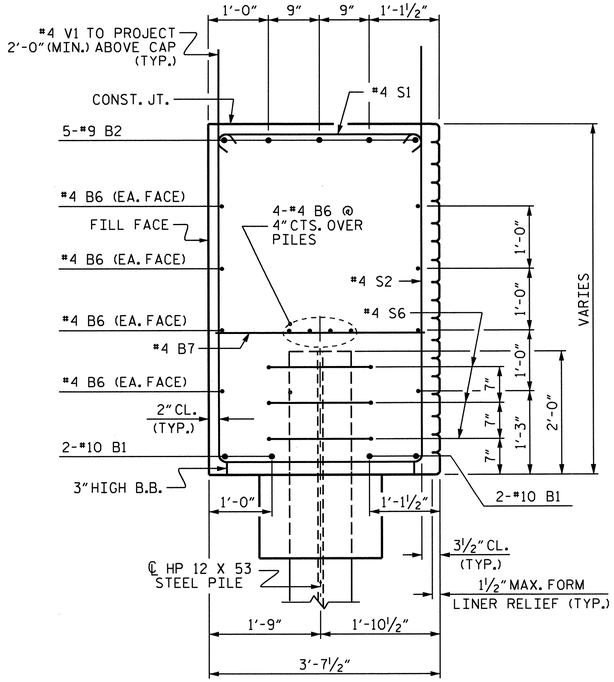
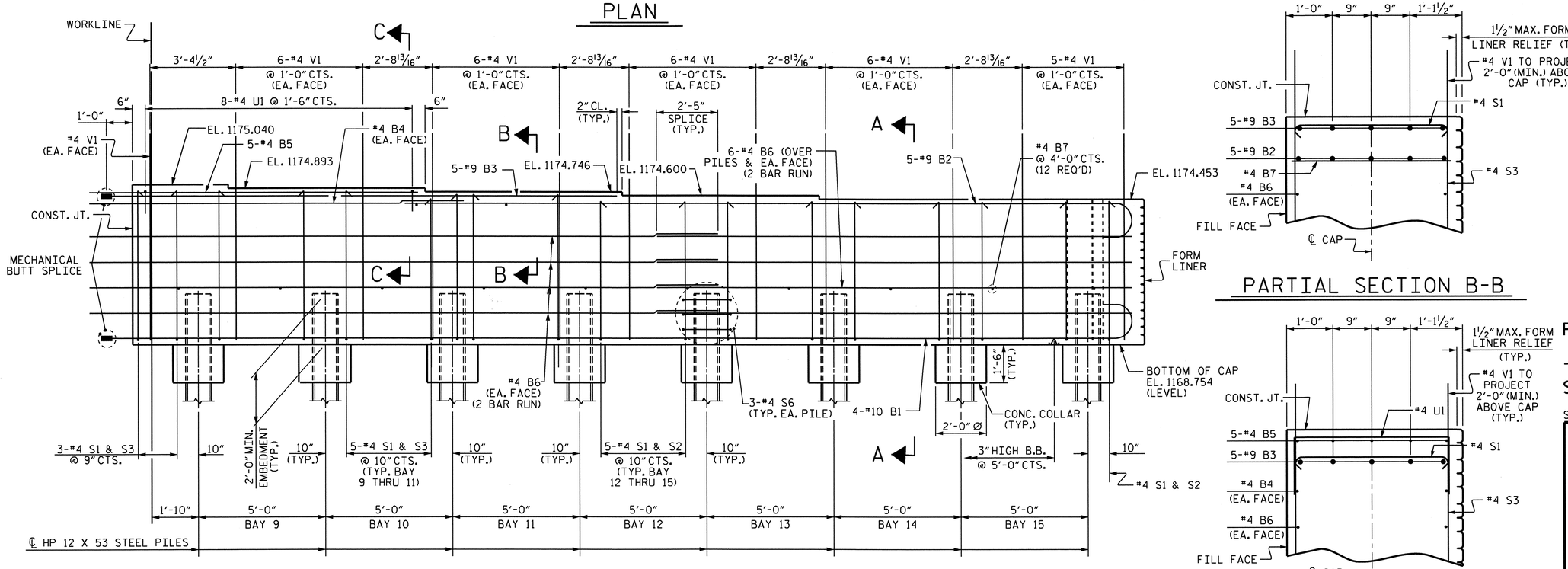


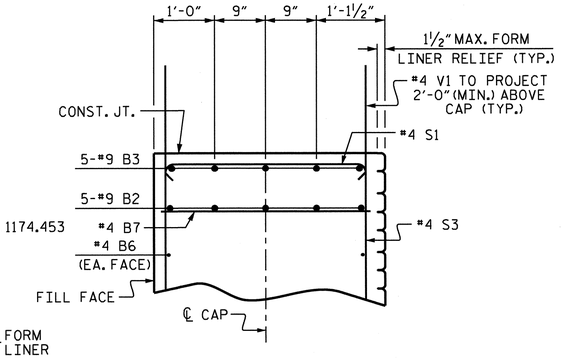
PLAN



SECTION A-A



ELEVATION



PARTIAL SECTION B-B

PARTIAL SECTION C-C

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TAO-HSILING FANG

1/9/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT 2 (INTEGRAL)
STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 4-28-10
CHECKED BY : Q.T. NGUYEN DATE : 7-10

09-JAN-2012 16:43
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JAYannaccone

NOTES

SEE SUPERSTRUCTURE SHEETS FOR THE ABUTMENT DETAILS.

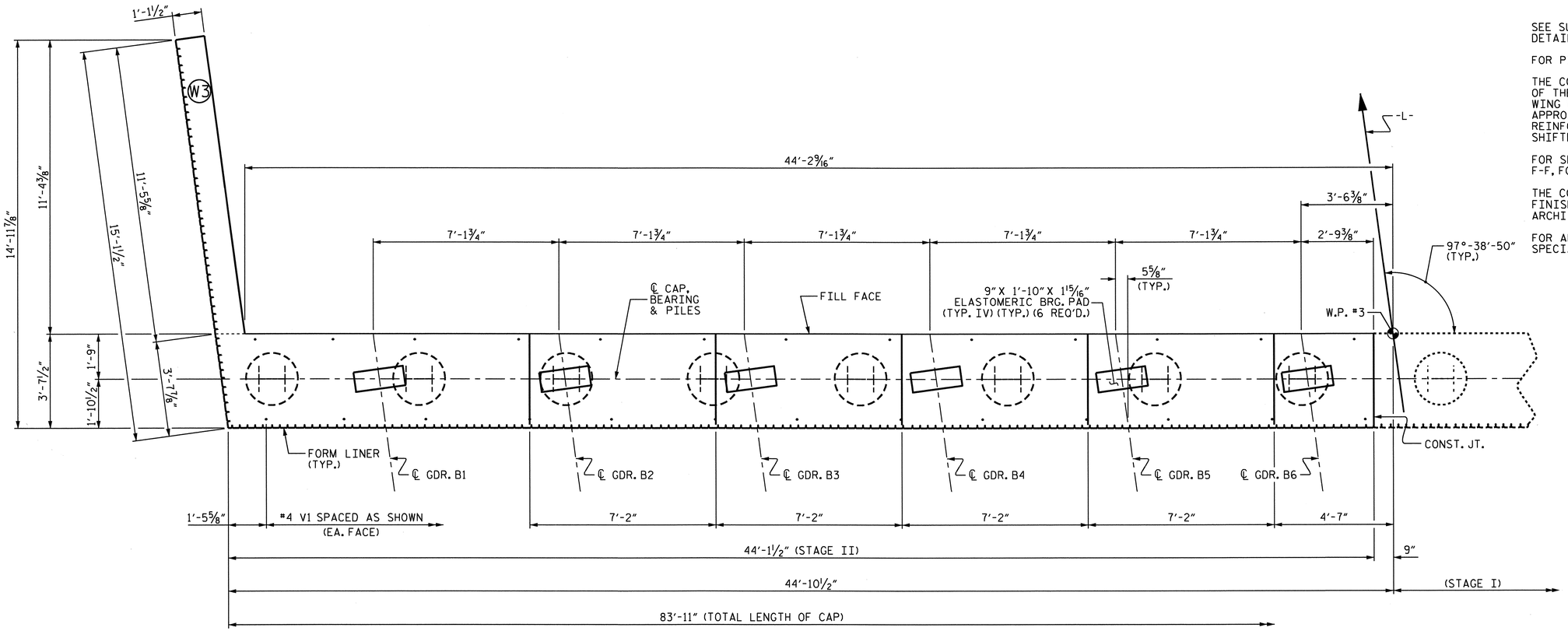
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

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.

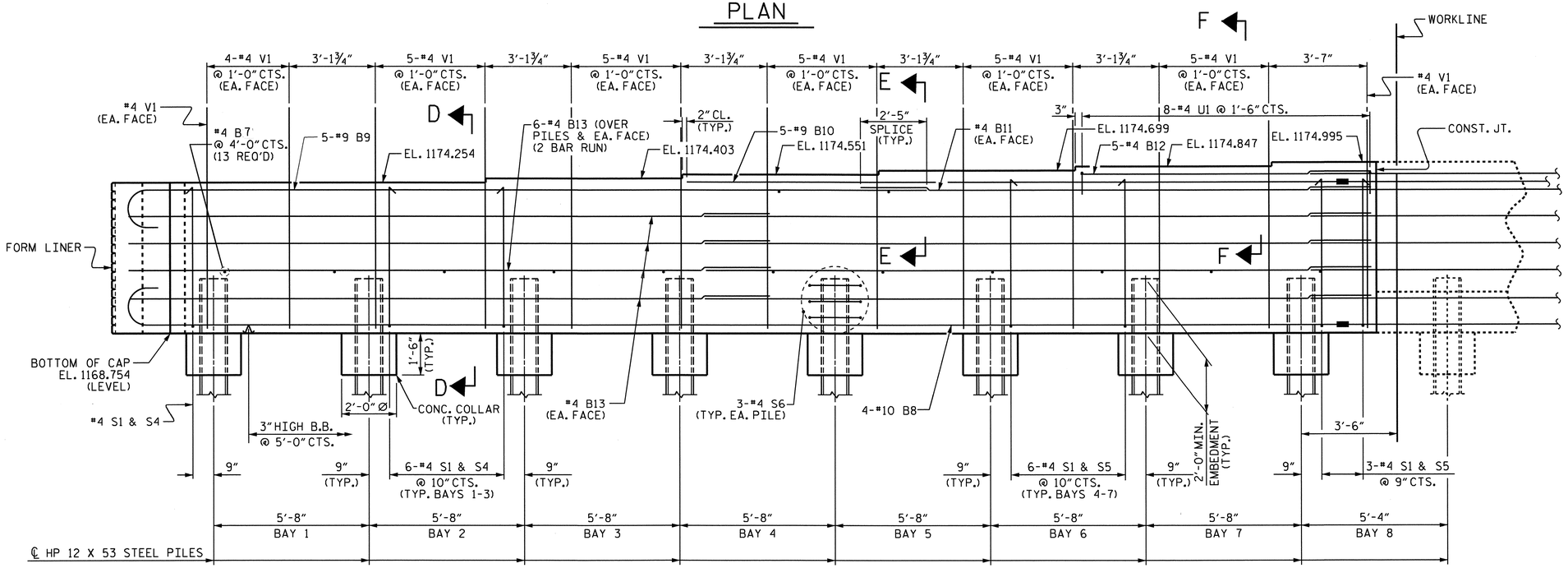
FOR SECTION D-D, AND PARTIAL SECTION E-E AND F-F, FOR STAGE II, SEE SHEET 4 OF 4.

THE COST OF THE FORM LINERS AND SPECIAL SURFACE FINISH ARE INCLUDED IN THE LUMP SUM PRICE BID FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT.

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.



PLAN



ELEVATION

WING WALL NOT SHOWN FOR CLARITY.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER JING HSIUNG FANG
1/9/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 (INTEGRAL)
STAGE II

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 4-26-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

09-JAN-2012 16:43
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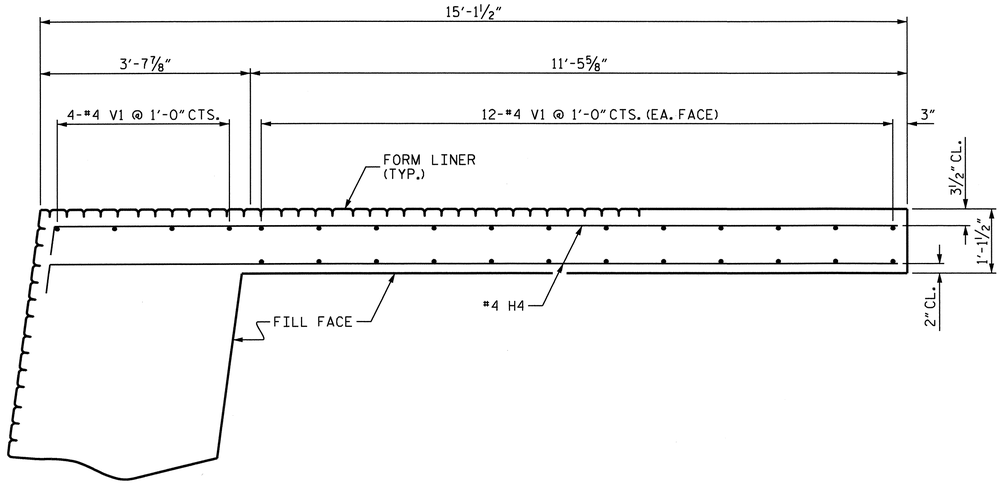
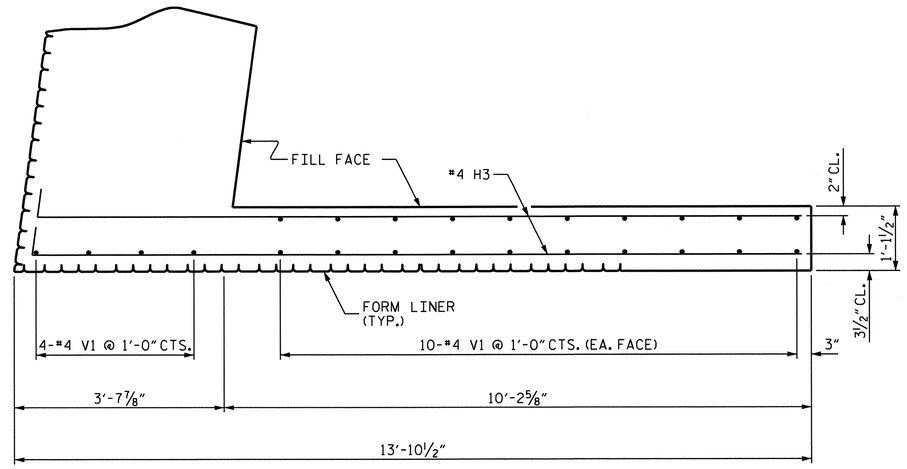
JAYannaccone



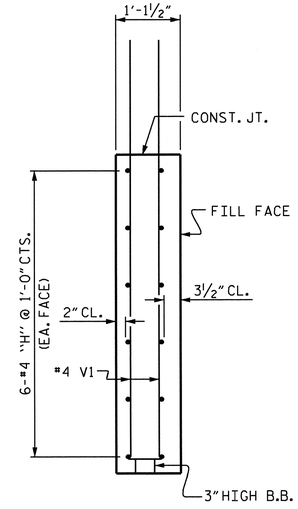
PLAN OF WING W3

(STAGE II)

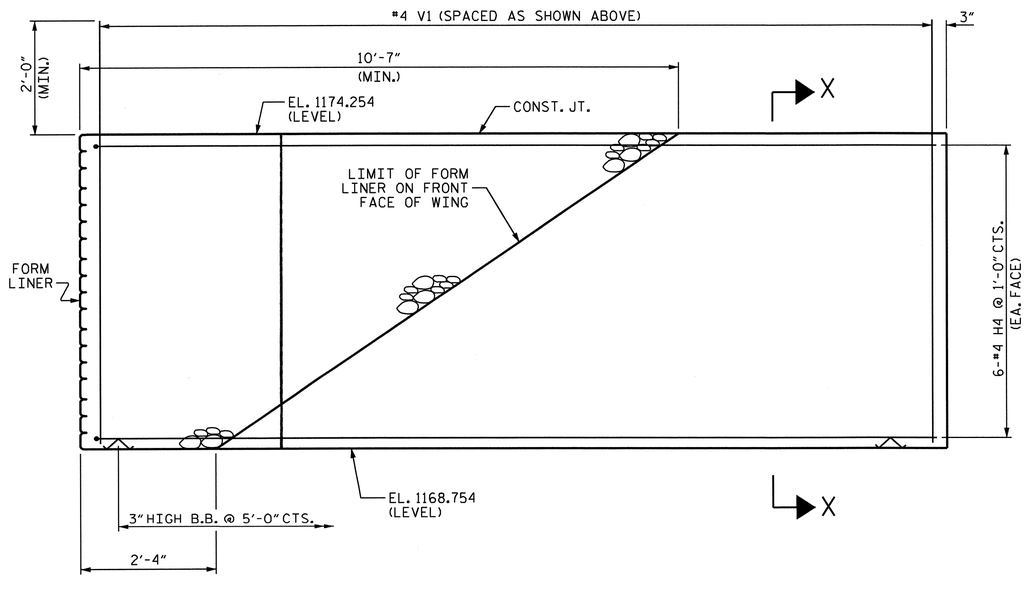


PLAN OF WING W4

(STAGE I)

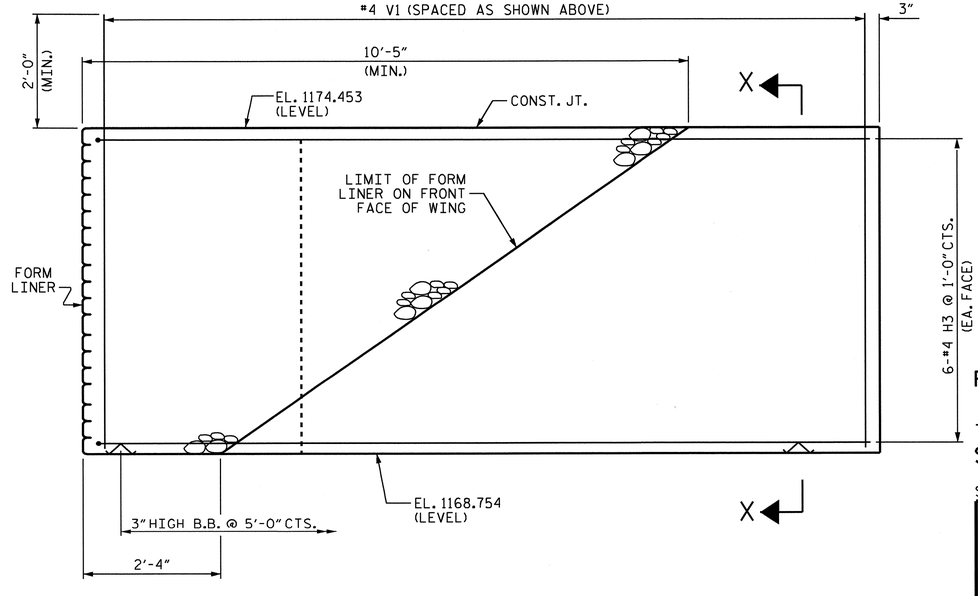


SECTION X-X



ELEVATION OF WING W3

(STAGE II)



ELEVATION OF WING W4

(STAGE I)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIANG FANG
2/23/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 4-28-10
CHECKED BY : O.T. NGUYEN DATE : 7-10

23-FEB-2012 11:41
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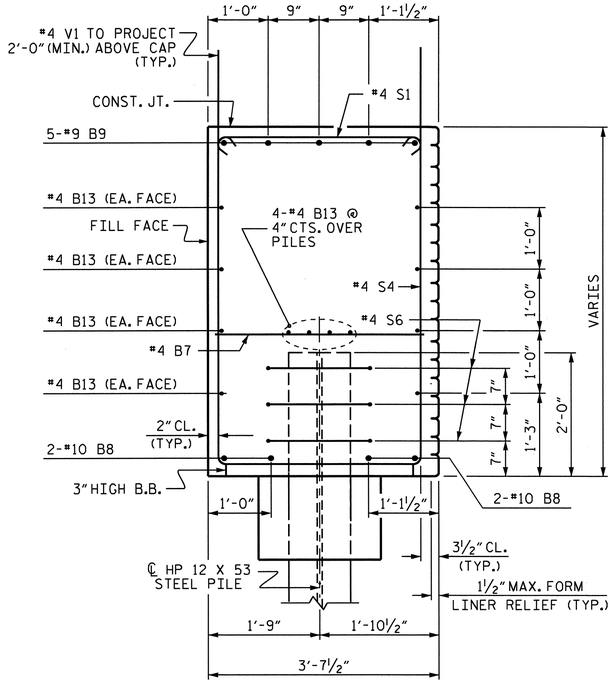
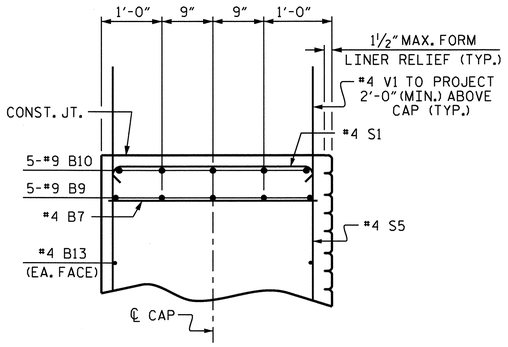
tfang



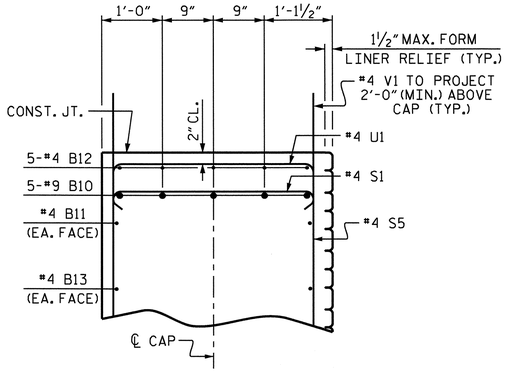
SECTION D-D

(STAGE II)



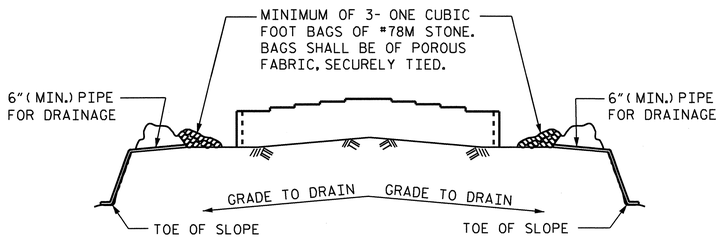
PARTIAL SECTION E-E

(STAGE II)



PARTIAL SECTION F-F

(STAGE II)

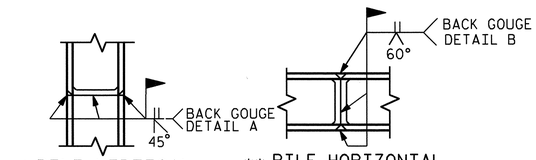


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

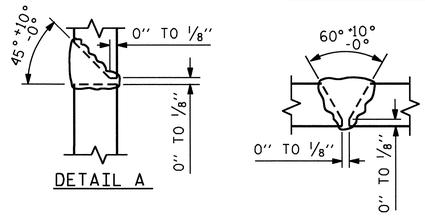
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



** PILE VERTICAL

** PILE HORIZONTAL OR VERTICAL



DETAIL A

DETAIL B

** POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BILL OF MATERIAL

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	41'-11"	721
B2	5	#9	1	30'-0"	510
B3	5	#9	STR	20'-1"	341
B4	2	#4	STR	15'-7"	21
B5	5	#4	STR	13'-11"	46
B6	24	#4	STR	22'-2"	355
B7	12	#4	STR	3'-2"	25
H3	12	#4	2	13'-11"	112
S1	39	#4	4	3'-11"	102
S2	21	#4	5	14'-6"	203
S3	18	#4	5	15'-1"	181
S6	24	#4	6	6'-6"	104
U1	8	#4	7	6'-2"	33
V1	84	#4	STR	8'-2"	458

REINFORCING STEEL = 3212 LBS

CLASS A CONCRETE:
CAP, LOWER WINGS, & COLLARS 33.8 C.Y.

HP 12 X 53 STEEL PILES
NO. 8 LIN. FT. 360
PILE REDRIVES 8 EA.

STAGE II

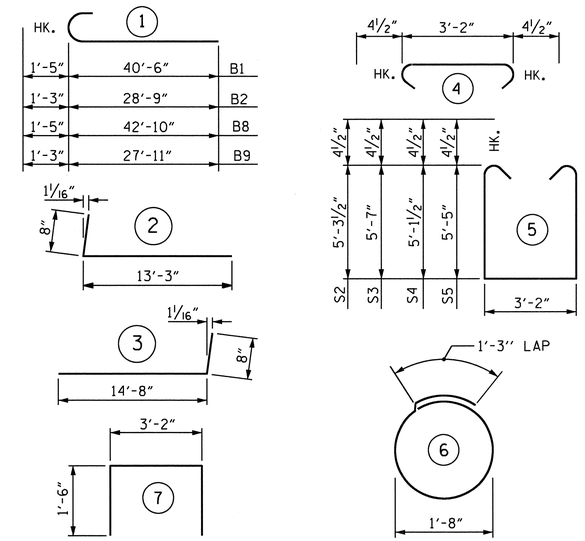
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B7	13	#4	STR	3'-2"	27
B8	4	#10	1	44'-3"	762
B9	5	#9	1	29'-2"	496
B10	5	#9	STR	24'-2"	411
B11	2	#4	STR	21'-3"	28
B12	5	#4	STR	10'-10"	36
B13	24	#4	STR	23'-5"	375
H4	12	#4	3	15'-4"	123
S1	46	#4	4	3'-11"	120
S4	19	#4	5	14'-2"	180
S5	27	#4	5	14'-9"	266
S6	24	#4	6	6'-6"	104
U1	8	#4	7	6'-2"	33
V1	88	#4	STR	8'-2"	480

REINFORCING STEEL = 3441 LBS

CLASS A CONCRETE:
CAP, LOWER WINGS, & COLLARS 37.0 C.Y.

HP 12 X 53 STEEL PILES
NO. 8 LIN. FT. 360
PILE REDRIVES 8 EA.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2
(INTEGRAL)

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

2/23/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			47

DRAWN BY : HARISH SHAH DATE : 4-23-10
CHECKED BY : Q.T. NGUYEN DATE : 7-10

23-FEB-2012 10:50
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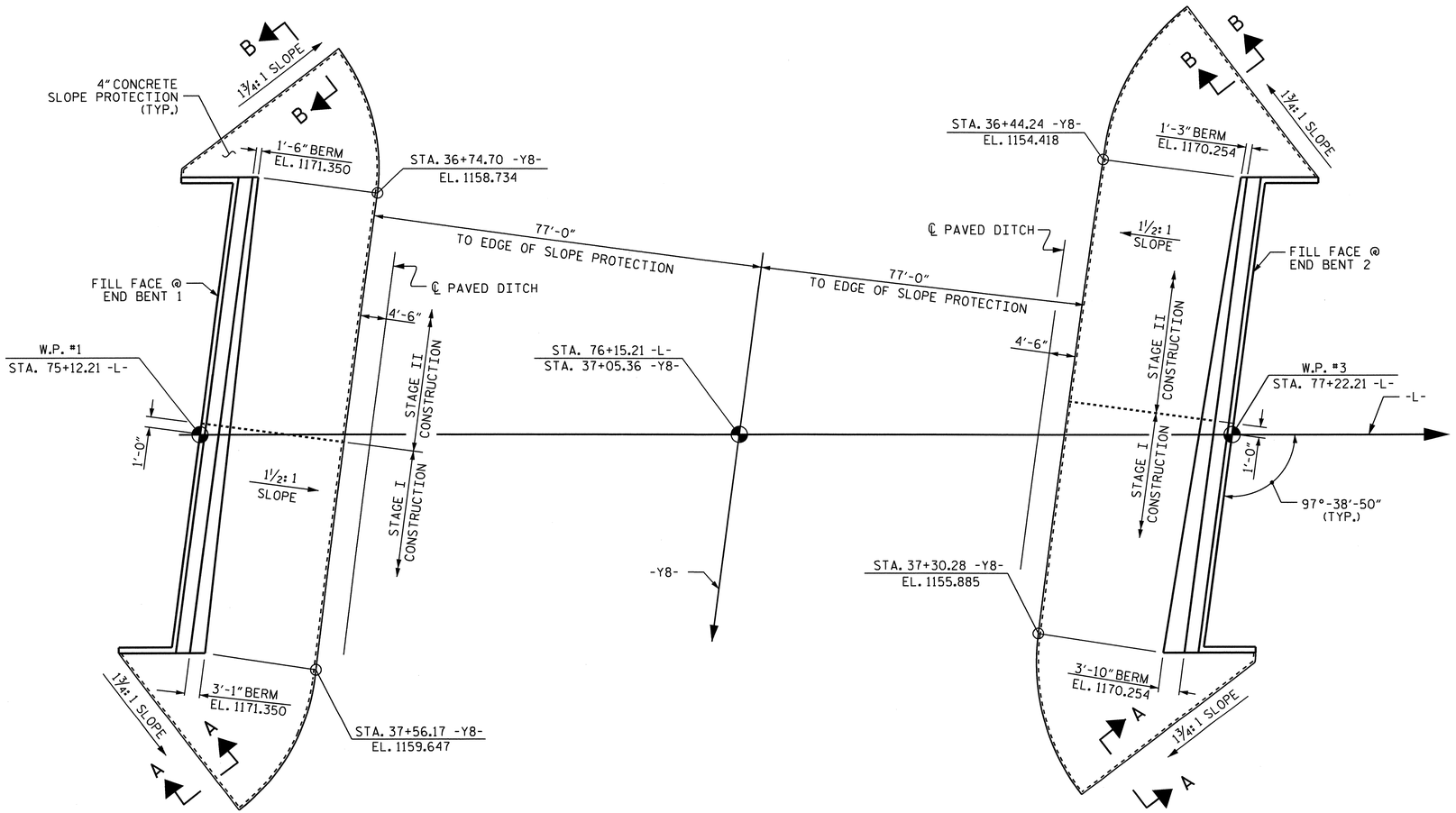
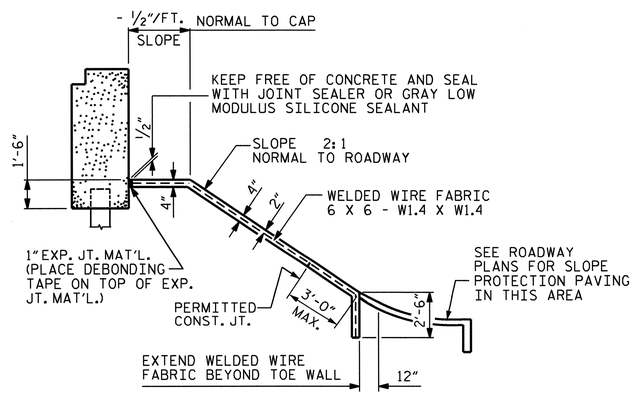


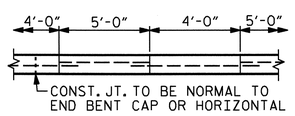
@ END BENT 1

PLAN

@ END BENT 2

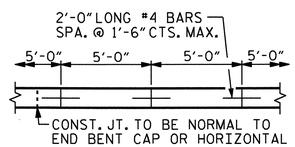


SECTION ALONG ℄ ROADWAY



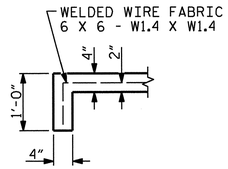
POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

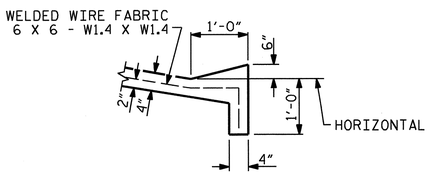


STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



SECTION A-A



SECTION B-B

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.

ESTIMATED QUANTITIES

BRIDGE @ STA. 76+15.21 -L-	4" INCH SLOPE PROTECTION			✳ WELDED WIRE FABRIC 60 INCHES WIDE		
	SQUARE YARDS			APPROX. L.F.		
	STAGE I	STAGE II	TOTAL	STAGE I	STAGE II	TOTAL
END BENT 1	160	190	350	320	380	700
END BENT 2	200	235	435	405	470	875
TOTAL			785			1575

✳ QUANTITY SHOWN IS BASED ON 5' POURS.

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG
1/10/12

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			47

ASSEMBLED BY : HARISH SHAH		DATE : 01-28-10	
CHECKED BY : Q.T. NGUYEN		DATE : 7-10	
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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STD. NO. SP1 (SHT 6)

SPLICE CHART		
BAR	SIZE	SPLICE
✱ A1	#4	2′-0″
A2	#4	1′-9″

BILL OF MATERIAL

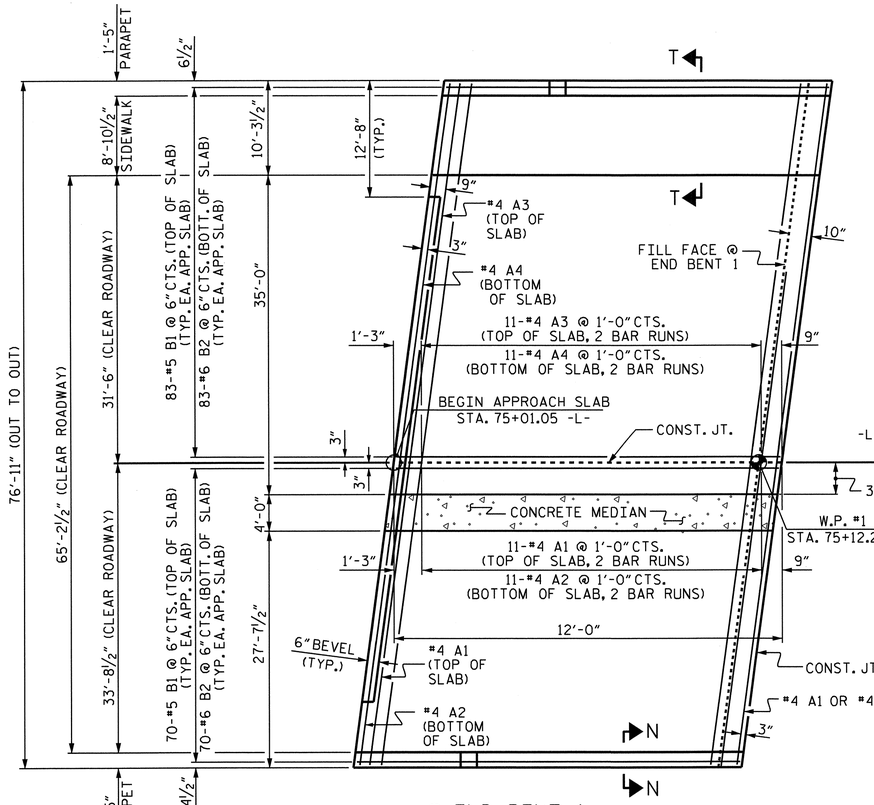
FOR ONE APPROACH SLAB (2 REQ'D)

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	26	#4	STR	19′-9″	343
A2	26	#4	STR	19′-6″	339
✱ B1	70	#5	STR	11′-2″	815
B2	70	#6	STR	11′-8″	1227
REINFORCING STEEL				LBS.	1566
✱ EPOXY COATED REINFORCING STEEL				LBS.	1158
CLASS AA CONCRETE				C. Y.	18.2

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A3	26	#4	STR	21′-11″	381
A4	26	#4	STR	21′-10″	379
✱ B1	83	#5	STR	11′-2″	967
B2	83	#6	STR	11′-8″	1454
REINFORCING STEEL				LBS.	1834
✱ EPOXY COATED REINFORCING STEEL				LBS.	1347
CLASS AA CONCRETE				C. Y.	21.6



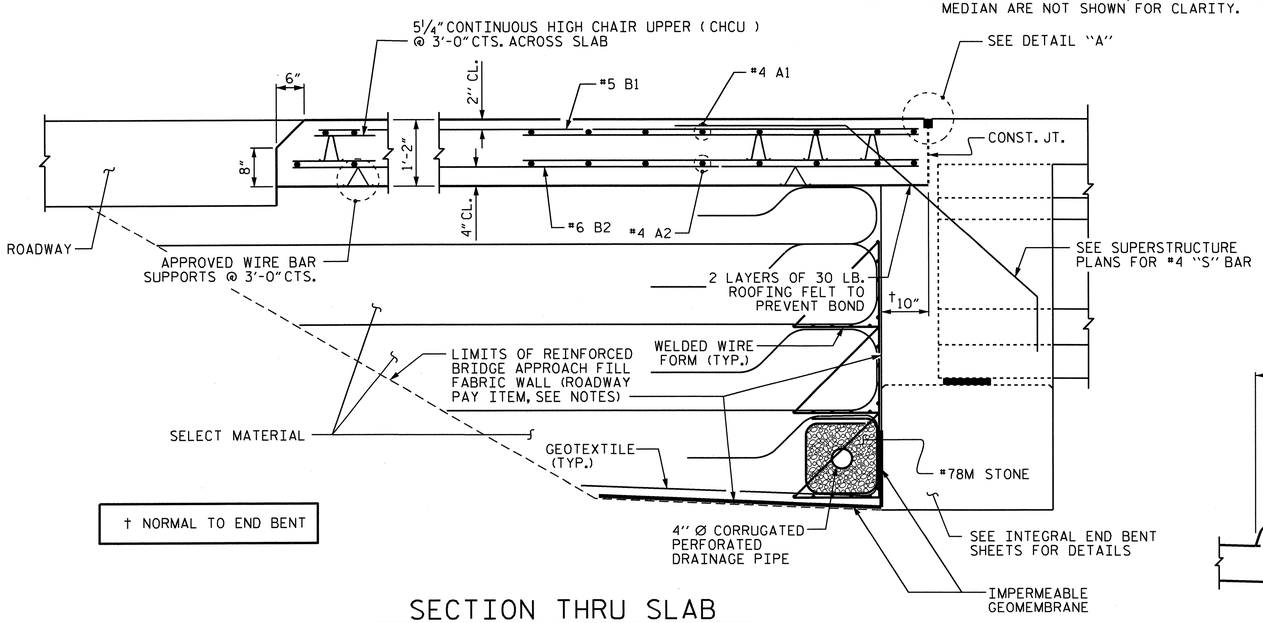
@ END BENT 1

@ END BENT 2

PLAN

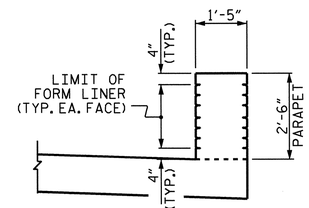
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS. REINFORCING STEELS IN SIDEWALK, PARAPETS AND CONCRETE MEDIAN ARE NOT SHOWN FOR CLARITY.

EXTEND #4 A1 TOP BARS 2′-2″ BEYOND CONSTRUCTION JOINT FOR 2′-0″ SPLICE.
EXTEND #4 A2 BOTTOM BARS 1′-11″ BEYOND CONSTRUCTION JOINT FOR 1′-9″ SPLICE.

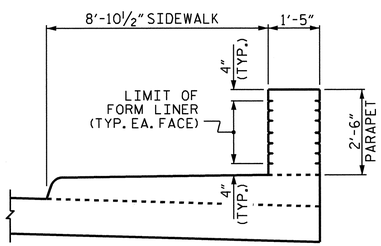


† NORMAL TO END BENT

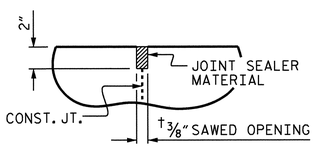
SECTION THRU SLAB



SECTION N-N



SECTION T-T



DETAIL "A"

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL FABRIC WALL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4″ Ø DRAINAGE PIPE, #78M STONE, WELDED WIRE FORM, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF SECTION 1028-3 OF THE STANDARD SPECIFICATIONS.

THE COST OF FORM LINERS AND SPECIAL SURFACE FINISH ARE INCLUDED IN THE LUMP SUM PRICE BID FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT.

QUANTITIES FOR SIDEWALK, CONCRETE MEDIAN & PARAPETS ARE NOT INCLUDED.

FOR ARCHITECTURAL CONCRETE SURFACE TREATMENT, SEE SPECIAL PROVISIONS.

FOR CONCRETE MEDIAN DETAILS, SEE "CONCRETE MEDIAN" SHEET.

FOR SIDEWALK DETAILS, SEE "SIDEWALK DETAILS STAGE II" SHEET.

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER HING-HSIUNG FANG
2/24/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			47

STD. NO. BAS5

ASSEMBLED BY : HARISH SHAH	DATE : 2-24-10
CHECKED BY : O.T. NGUYEN	DATE : 7-10
DRAWN BY : TLA 10/05	ADDED 5/1/06RR KMM/GM
CHECKED BY : GM 5/06	REV. 10/1/11 MAA/GM

24-FEB-2012 08:25
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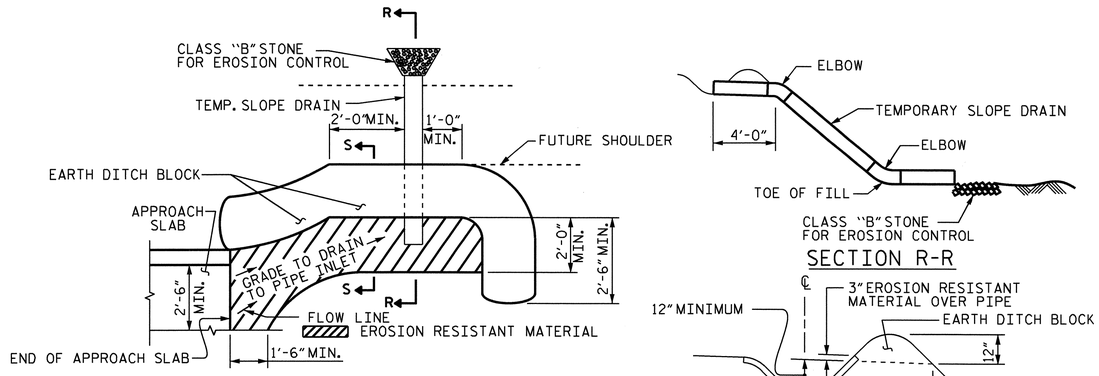
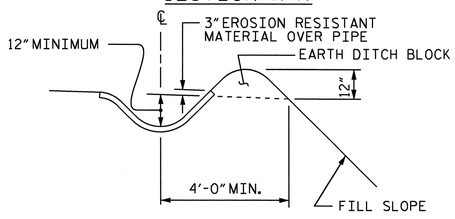
tfang



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

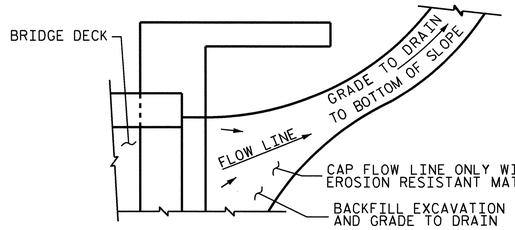
SECTION R-R



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

ASSEMBLED BY : HARISH SHAH		DATE : 2-25-10	
CHECKED BY : O.T. NGUYEN		DATE : 7-10	
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

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JAYannaccone

PROJECT NO. U-2551

BURKE COUNTY

STATION: 76+15.21 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			47

STD. NO. BAS10

NORTH CAROLINA PROFESSIONAL SEAL 16301 ENGINEER TING HSIUNG FANG

1/9/12

OVERHANG BRACKET CALCULATION INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

DEFINITIONS

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

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHARNG-CHUAN VICTOR CHAO
Charng-Chuan V. Chao
1/10/2012

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES
III, IV, V, AND VI

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			47

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

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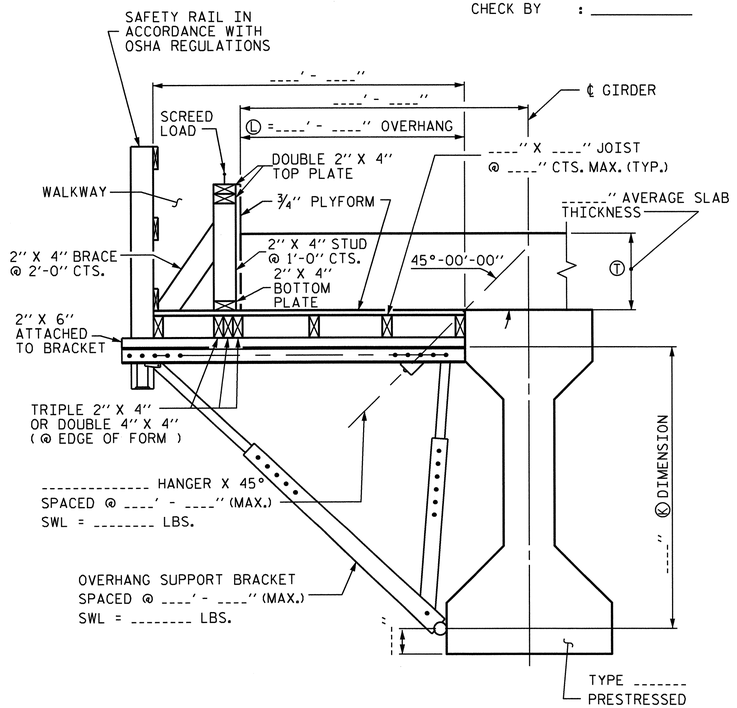
JAYannaccone

OF1

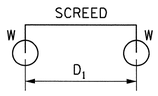
BRIDGE OVERHANG BRACKET SUMMARY

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

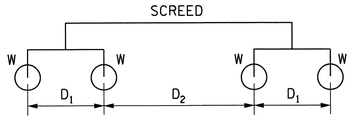
PROJECT No. : _____
COUNTY : _____
STATION : _____
DESCRIPTION : _____
DATE : _____
DESIGN BY : _____
CHECK BY : _____



OVERHANG FALSEWORK



4-WHEEL MACHINE



8-WHEEL MACHINE

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

TABLE 2: SCREED LOAD FACTOR "R"

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

NOTES

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

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

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

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

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

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

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

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHARNG-CHUAN VICTOR CHAO

Charng-Chuan Victor Chao
1/10/2012

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			47

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

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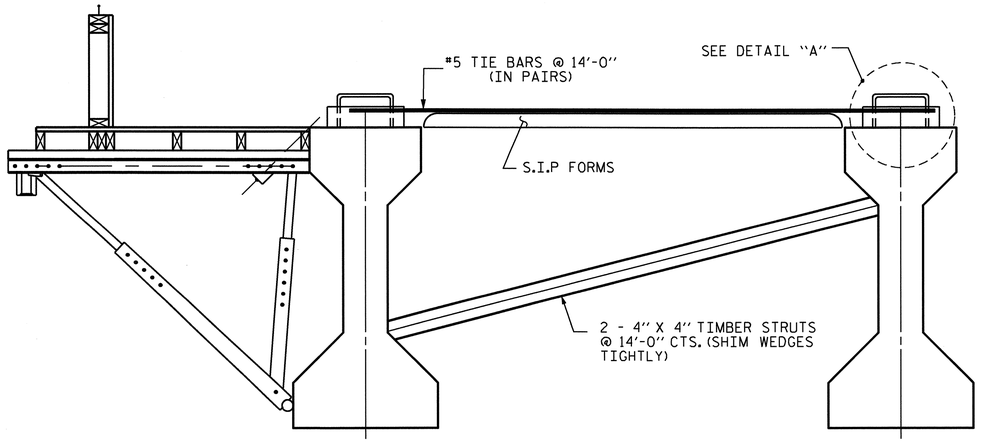
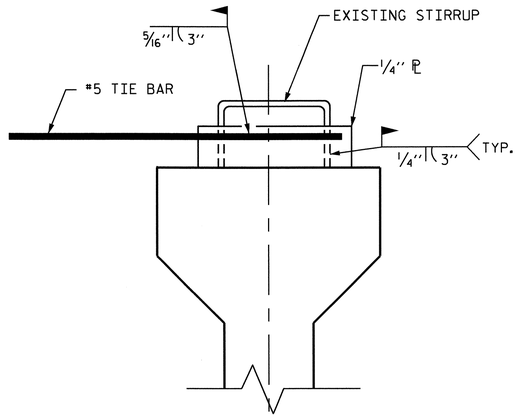


EXTERIOR GIRDER INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



DETAIL "A"

NOTES:

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

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 14'-0" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

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

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan V. Chao
1-10-2012

PROJECT NO. U-2551
BURKE COUNTY
STATION: 76+15.21 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES
III, IV, V, AND VI

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

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

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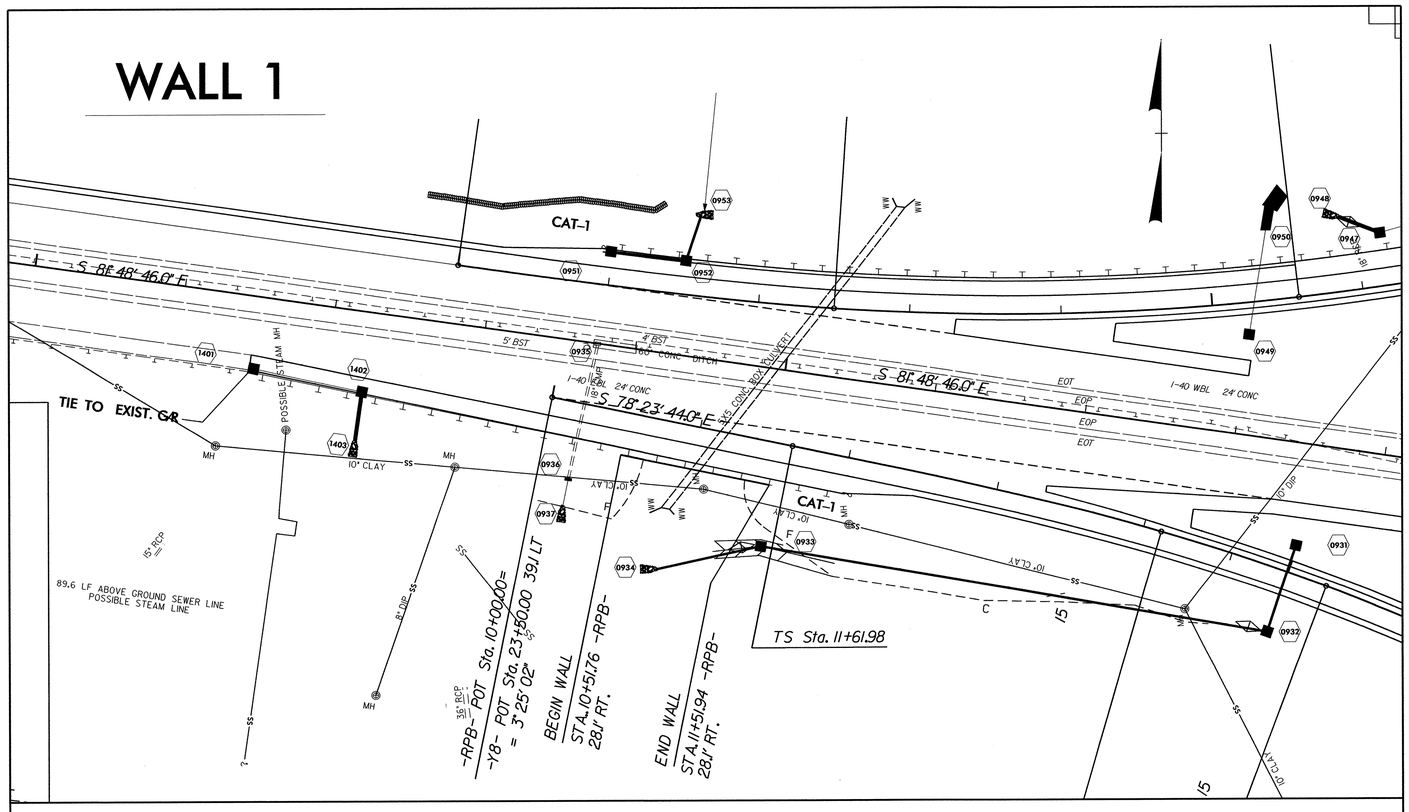
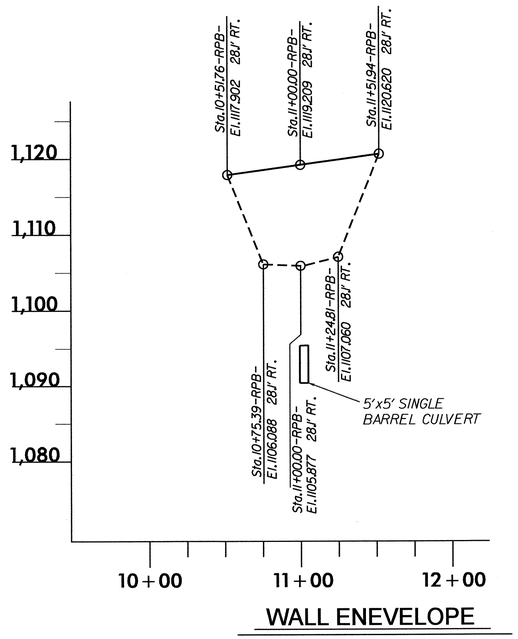
WALL 1



LOCATION SKETCH



WALL ENEVELOPE

PREPARED BY: EJS	DATE: 11/09
REVIEWED BY: SCC	DATE: 1/12

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029869 ENGINEER SHANE C. CLARK

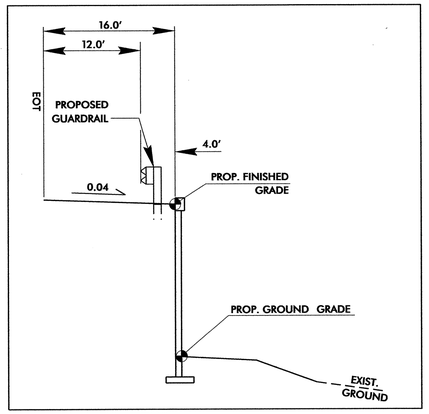
SIGNATURE 1/10/12 DATE

ENGINEER

SIGNATURE DATE

TOTAL STRUCTURE QUANTITIES

MSE RETAINING WALL 964 SQ. FT.



TYPICAL SECTION

PROJECT NO.: U-2551

BURKE *COUNTY*

STATION: 10+51.76-RPB- TO 11+51.94-RPB- = 24+00.00-Y8- TO 25+00.00-Y8-

SHEET 1 OF 3

GEOTECHNICAL ENGINEERING UNIT

☐ *EASTERN REGIONAL OFFICE*

☒ *WESTERN REGIONAL OFFICE*

☐ *CONTRACT OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL #1

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

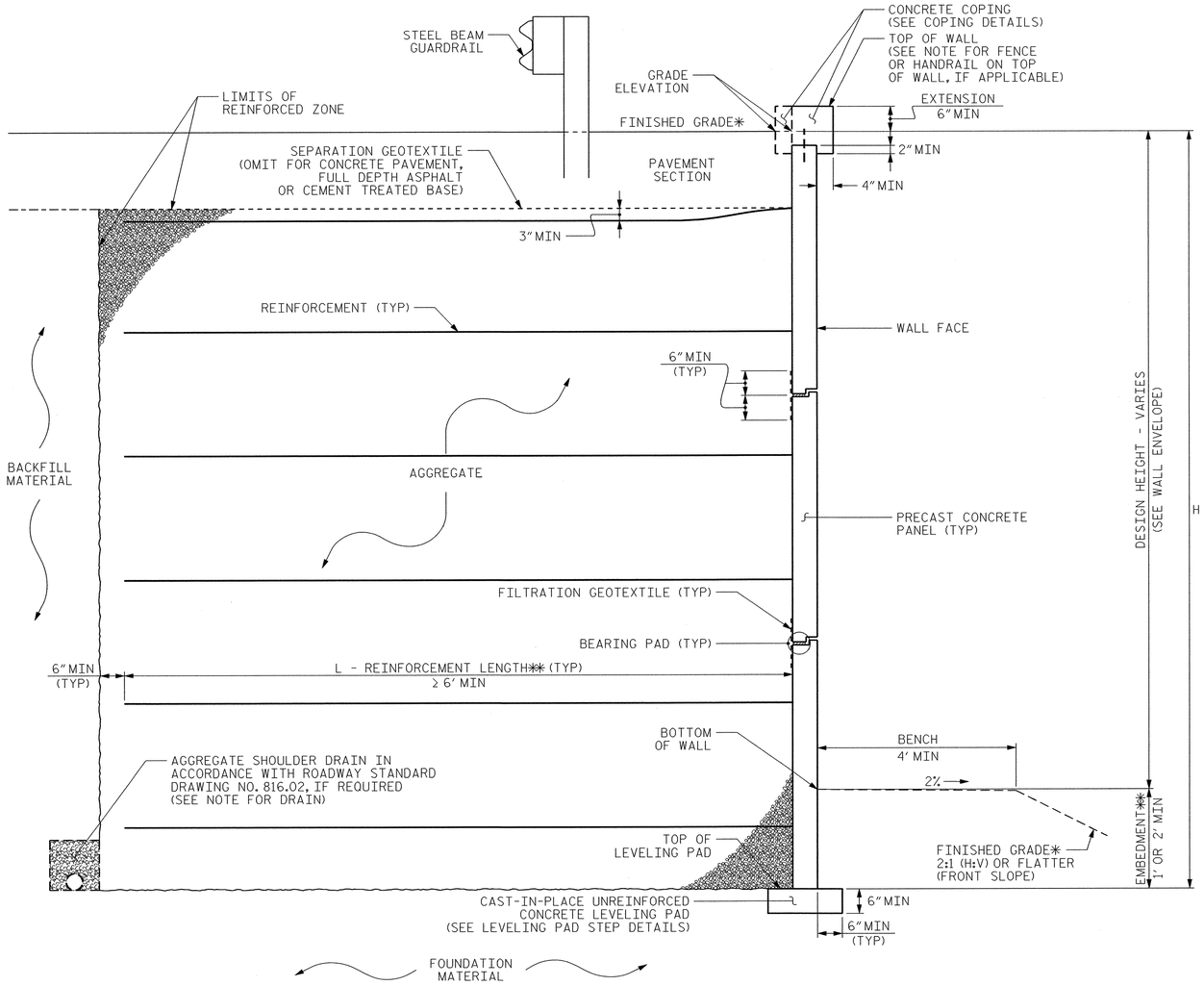
GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029669 ENGINEER SHANE C. CLARK

SIGNATURE DATE 1/10/12

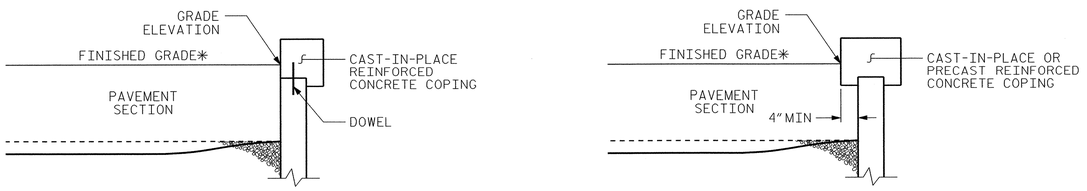
ENGINEER

SIGNATURE DATE



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.

PREPARED BY: EJS	DATE: 5/2011
REVIEWED BY: SCC	DATE: 1/12

PROJECT NO.: U-2551

BURKE ***COUNTY***

STATION: 10+51.76-RPB- TO 11+51.94-RPB-
= 24+00.00-Y8- TO 25+00.00-Y8-

SHEET 2 OF 3

GEOTECHNICAL ENGINEERING UNIT

☐ ***EASTERN REGIONAL OFFICE***
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL #1

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 029869 ENGINEER SHANE C. CLARK

SIGNATURE DATE 1/30/12

ENGINEER

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.

USE AN MSE WALL SYSTEM WITH PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 1.

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

AN ASHLAR ARCHITECTURAL FINISH IS REQUIRED FOR FRONT FACES OF PRECAST CONCRETE PANELS FOR RETAINING WALL NO. 1.

A DRAIN IS REQUIRED FOR RETAINING WALL NO. 1.

BEFORE BEGINNING MSE WALL DESIGN FOR RETAINING WALL NO. 1, 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. 1 FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 4000 LB/SF
4) MINIMUM REINFORCEMENT LENGTH (L) = 0.85 X H or 6 FT, WHICHEVER IS GREATER
5) MINIMUM EMBEDMENT ELEVATION = 2 FT
6) AGGREGATE PARAMETERS:

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

7) IN-SITU ASSUMED MATERIAL PARAMETERS:

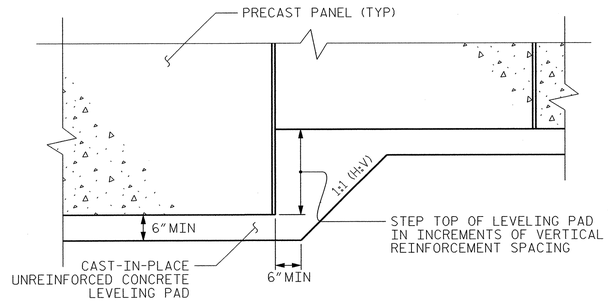
MATERIAL TYPE	UNIT WEIGHT (γ) LB/CF	FRICTION ANGLE (ϕ) DEGREES	COHESION (c) LB/SF
BACKFILL	120	30	0
FOUNDATION	120	30	0

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

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

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

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



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PREPARED BY: EJS	DATE: 5/2011
REVIEWED BY: SCC	DATE: 1/12

PROJECT NO.: U-2551

BURKE ***COUNTY***

STATION: 10+51.76-RPB- TO 11+51.94-RPB-
= 24+00.00-Y8- TO 25+00.00-Y8-

SHEET 3 OF 3

GEOTECHNICAL ENGINEERING UNIT

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

MSE RETAINING WALL #1

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

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 BEM @ RGW REV. 5-7-03 RWW @ JTE
REV. 6-16-99 RWW @ LES REV. 5-1-06 TLA @ GM

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