09/08/99

TIP PROJECT: I-4413

CONTRACT: C202847

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4413		

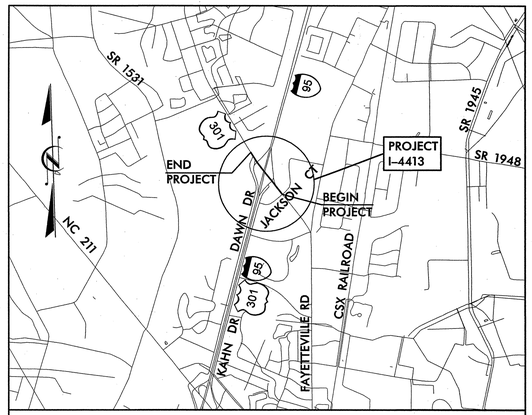
WBS NO.	F.A. PROJ. NO.	DESCRIPTION
35901.1.1	IMF-95-1(64)22	PE
35901.2.1	IMF-095-1(85)22	ROW/UTIL.
35901.2.1	IMF-095-1(87)22	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

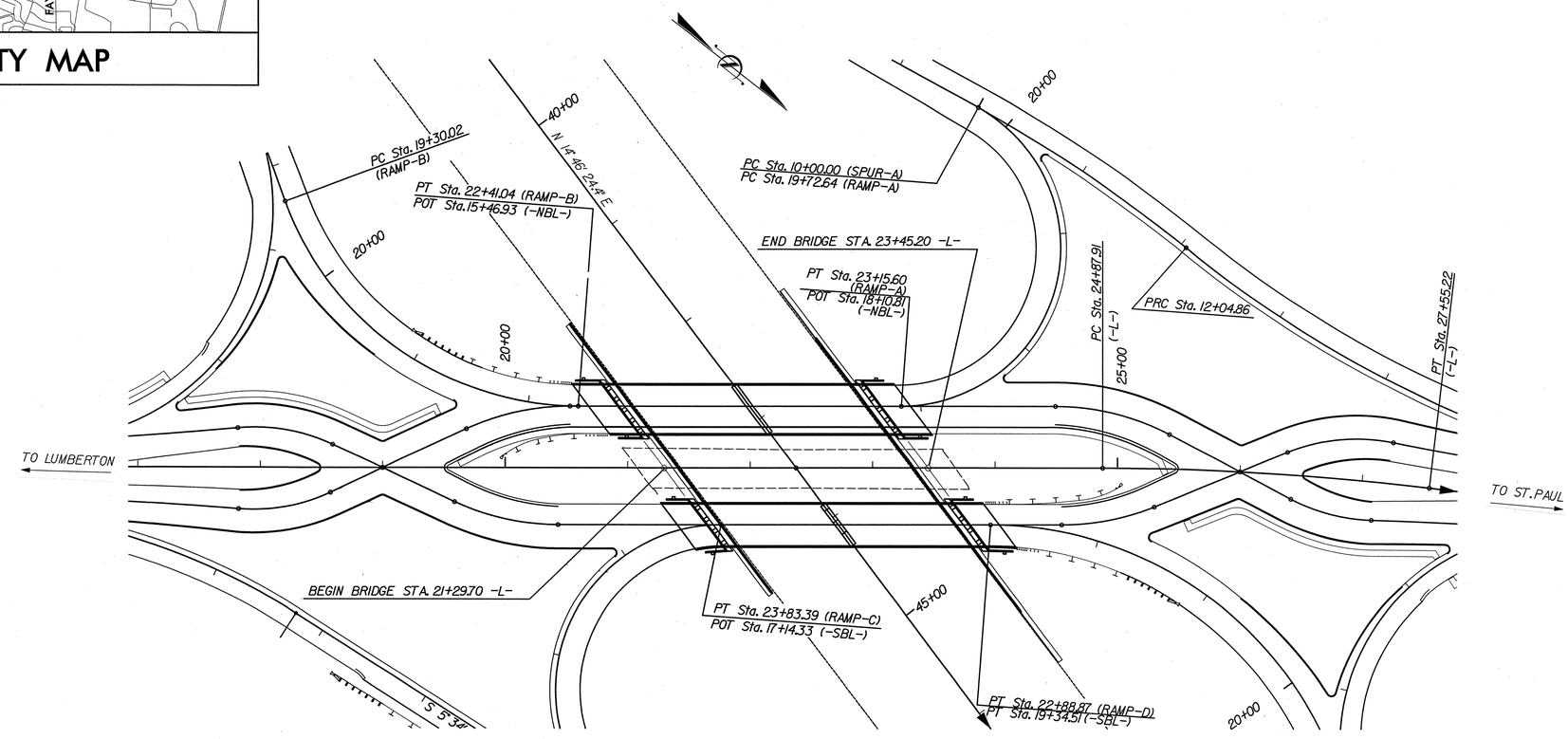
LOCATION: BRIDGE NO. 36 ON US 301 (FAYETTEVILLE ROAD) OVER I-95 (EXIT 22)

TYPE OF WORK: BRIDGES AND RETAINING WALLS.



VICINITY MAP

STRUCTURES



- THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF LUMBERTON.
- THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGE.

DESIGN DATA

ADT 2012	=	26,000
ADT 2032	=	37,200
DHV	=	9 %
D	=	55 %
T	=	6 % *
V	=	50 MPH
FUNC. CLASS:		URBAN COLLECTOR

* (TTST 2% + DUAL 4%)

PROJECT LENGTH

LENGTH OF ROADWAY T.I.P. PROJECT I-4413	=	0.545 MI.
LENGTH OF STRUCTURE T.I.P. PROJECT I-4413	=	0.041 MI
TOTAL LENGTH OF T.I.P. PROJECT I-4413	=	0.586 MI

PREPARED IN THE OFFICE OF:
Stantec
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801 Jones Franklin Road, Suite 300
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27606
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FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2012 STANDARD SPECIFICATIONS

LETTING DATE:
JULY 17, 2012

JOSEPH T. KELVINGTON, PE
PROJECT ENGINEER

THOMAS R. DUDECK, PE
PROJECT DESIGN ENGINEER

NCDOT CONTACT: LONNIE I. BROOKS, PE
PROJECT ENGINEER

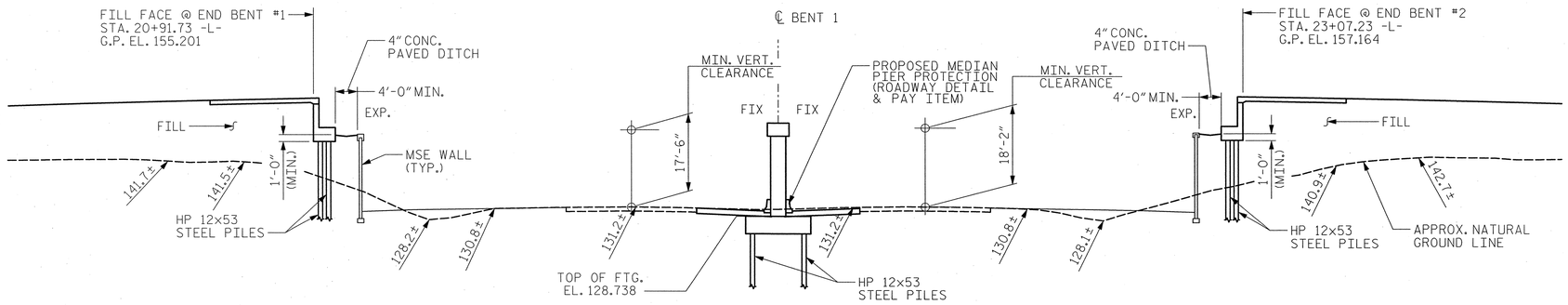
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

F.A. PROJECT NO. IMF-95-1(87)22

SPAN A

SPAN B



END BENT No. 1 — BENT No. 1 — END BENT No. 2

SECTION ALONG NBL

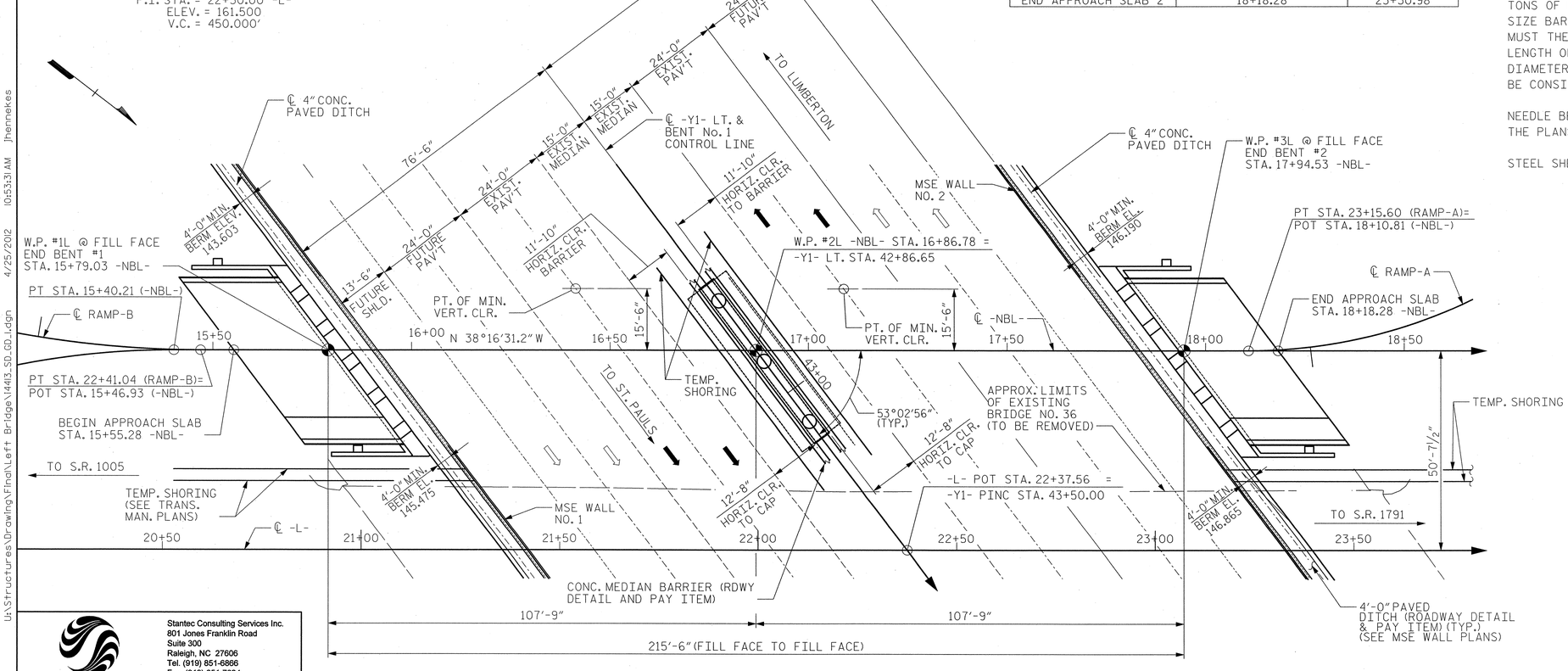
SECTIONS @ BENTS & END BENTS ARE AT RIGHT ANGLES

-NBL- AND -L- EQUALITY STATIONS		
LOCATION	-NBL- STATION	-L- STATION
BEGIN APPROACH SLAB 1	15+55.28	20+67.98
WORK POINT #1L	15+79.03	20+91.73
WORK POINT #2L	16+86.78	21+99.48
WORK POINT #3L	17+94.53	23+07.23
END APPROACH SLAB 2	18+18.28	23+30.98

3.7507% -3.5733%

GRADE DATA

P.I. STA. = 22+50.00 -L-
ELEV. = 161.500
V.C. = 450.000'



PLAN ALONG NBL

PILES NOT SHOWN IN PLAN VIEW

NOTES:

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE 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.

STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.

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License No. F-0672

DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JEFFREY T. KELVINGTON

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-
43+50.00 -Y1-

SHEET 1 OF 3 BRIDGE No. 510

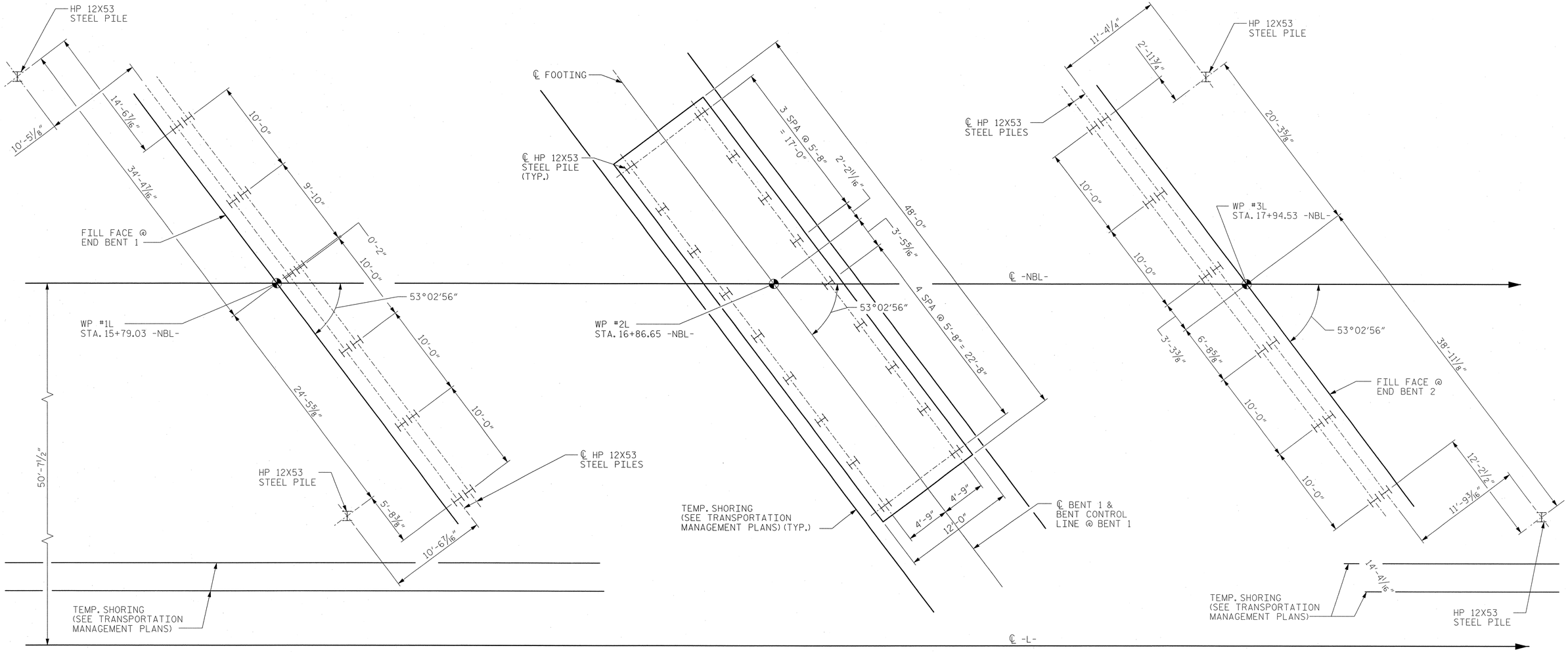
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 301
OVER I-95 (EXIT 22)
BETWEEN SR 1005 AND SR 1791

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1
1			3			TOTAL SHEETS
2			4			72



END BENT NO. 1 | BENT NO. 1 | END BENT NO. 2

FOUNDATION LAYOUT PLAN

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 70 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE.

PILES AT BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 185 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.

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DRAWN BY : B. J. ELLIOT DATE : 02-16-12
CHECKED BY : J. T. KELVINGTON DATE : 02-16-12

Joseph T. Kelvington 4/25/12
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-
43+50.00 -Y1-

SHEET 2 OF 3 BRIDGE No. 510

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 301
OVER I-95 (EXIT 22)
BETWEEN SR 1005 AND SR 1791

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S2
1			3			TOTAL SHEETS
2			4			72

TOTAL BILL OF MATERIAL

	FOUNDATION EXCAVATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONC. GIRDERS		HP 12 X 53 STEEL PILES		PILE REDRIVES	TWO BAR METAL RAIL	1'-2"X 2'-6" CONCRETE PARAPET	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS
	LUMP SUM	EACH	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	EACH	LIN.FT.	LIN.FT.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			8,958	8,008		LUMP SUM			10	1,040.31				510.00	526.00	LUMP SUM	LUMP SUM
END BENT NO.1					74.3		10,227				12	900	3				
BENT NO.1	LUMP SUM				139.8		26,819	1,378			18	1,350	5				
END BENT NO.2					72.3		9,955				12	960	3				
TOTAL	LUMP SUM	1	8,958	8,008	286.4	LUMP SUM	47,001	1,378	10	1,040.31	42	3,210	11	510.00	526.00	LUMP SUM	LUMP SUM

NOTES:

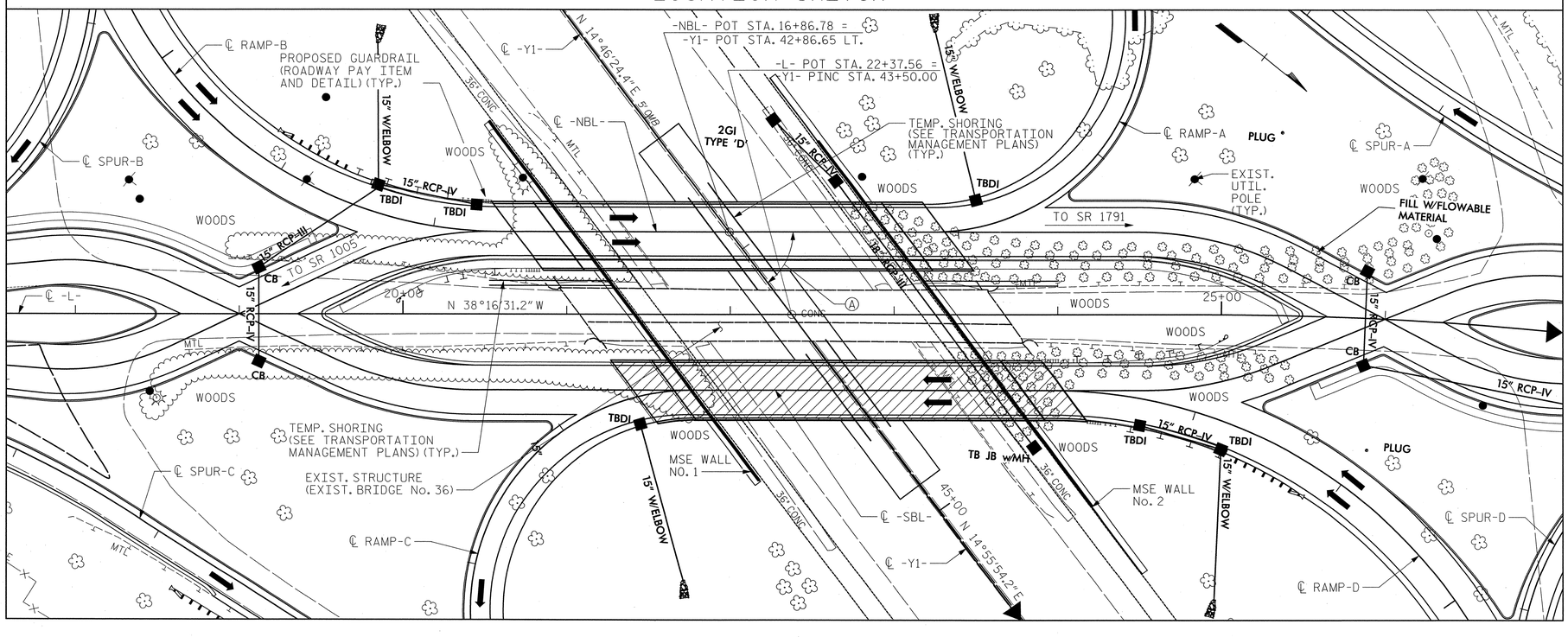
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

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

THE APPROXIMATE LIMITS 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 SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

B.M.#1
RR SPIKE IN BASE OF 15" OAK
227.0' RT. OF -L- STA. 17+87.00
ELEV. 133.92

LOCATION SKETCH



Ⓐ INTERSECTION SKEW = 53° 02' 56"

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DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

Joseph Kelvington 4/25/12
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH KELVINGTON

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-
43+50.00 -Y1-

SHEET 3 OF 3 BRIDGE No. 510

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 301
OVER I-95 (EXIT 22)
BETWEEN SR 1005 AND SR 1791

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S3
1			3			TOTAL SHEETS
2			4			72

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	⟨#⟩ CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (FT)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	⟨1⟩	1.03	--	1.75	0.81	1.03	1	ER	102.6	0.96	1.31	1	I	92.9	0.80	0.81	1.29	1	ER	40.9	
		HL-93 (OPERATING)	N/A		1.33	--	1.35	0.81	1.33	1	--	102.6	0.96	1.73	1	I	92.9	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	⟨2⟩	1.91	69	1.75	0.81	1.95	1	ER	102.6	0.96	1.91	1	I	92.9	0.80	0.81	1.79	1	ER	40.9	
		HS-20 (OPERATING)	36.000		2.51	90	1.35	0.81	2.53	1	--	102.6	0.96	2.51	1	I	92.9	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		6.42	87	1.40	0.81	5.88	1	ER	40.9	0.96	6.42	1	I	92.9	0.80	0.81	4.23	1	ER	40.9	
		SNGARBS2	20.000		3.05	61	1.40	0.81	4.25	1	ER	40.9	0.96	4.43	1	I	92.9	0.80	0.81	3.05	1	ER	40.9	
		SNAGRIS2	22.000		2.85	62	1.40	0.81	3.97	1	ER	40.9	0.96	4.07	1	I	92.9	0.80	0.81	2.85	1	ER	40.9	
		SNCOTTS3	27.250		2.11	57	1.40	0.81	2.93	1	ER	40.9	0.96	3.12	1	I	92.9	0.80	0.81	2.11	1	ER	40.9	
		SNAGGRS4	34.925		1.73	60	1.40	0.81	2.41	1	ER	40.9	0.96	2.42	1	I	92.9	0.80	0.81	1.73	1	ER	40.9	
		SNS5A	35.550		1.70	60	1.40	0.81	2.37	1	ER	40.9	0.96	2.42	1	I	92.9	0.80	0.81	1.70	1	ER	40.9	
		SNS6A	39.950		1.55	62	1.40	0.81	2.15	1	ER	40.9	0.96	2.17	1	I	92.9	0.80	0.81	1.55	1	ER	40.9	
		SNS7B	42.000		1.48	62	1.40	0.81	2.05	1	ER	40.9	0.96	2.07	1	I	92.9	0.80	0.81	1.48	1	ER	40.9	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.89	62	1.40	0.81	2.65	1	ER	40.9	0.96	2.60	1	I	92.9	0.80	0.81	1.89	1	ER	40.9	
		TNT4A	33.075		1.88	62	1.40	0.81	2.63	1	ER	40.9	0.96	2.68	1	I	92.9	0.80	0.81	1.88	1	ER	40.9	
		TNT6A	41.600		1.53	64	1.40	0.81	2.14	1	ER	40.9	0.96	2.16	1	I	92.9	0.80	0.81	1.53	1	ER	40.9	
		TNT7A	42.000		1.53	64	1.40	0.81	2.14	1	ER	40.9	0.96	2.15	1	I	92.9	0.80	0.81	1.53	1	ER	40.9	
		TNT7B	42.000		1.55	65	1.40	0.81	2.16	1	ER	102.6	0.96	2.08	1	I	92.9	0.80	0.81	1.55	1	ER	40.9	
		TNAGRIT4	43.000		1.50	65	1.40	0.81	2.08	1	ER	102.6	0.96	2.03	1	I	92.9	0.80	0.81	1.50	1	ER	40.9	
		TNAGT5A	45.000		1.43	64	1.40	0.81	2.00	1	ER	102.6	0.96	1.94	1	I	92.9	0.80	0.81	1.43	1	ER	40.9	
		TNAGT5B	45.000	⟨3⟩	1.41	63	1.40	0.81	1.97	1	ER	40.9	0.96	1.94	1	I	92.9	0.80	0.81	1.41	1	ER	40.9	

LOAD FACTORS:

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

NOTES:

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

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

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

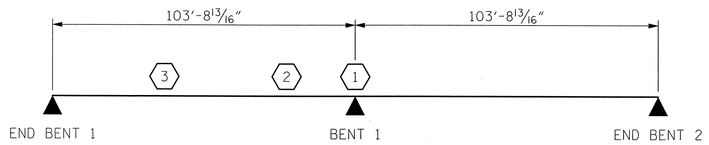
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

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DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : T. R. DUDECK DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

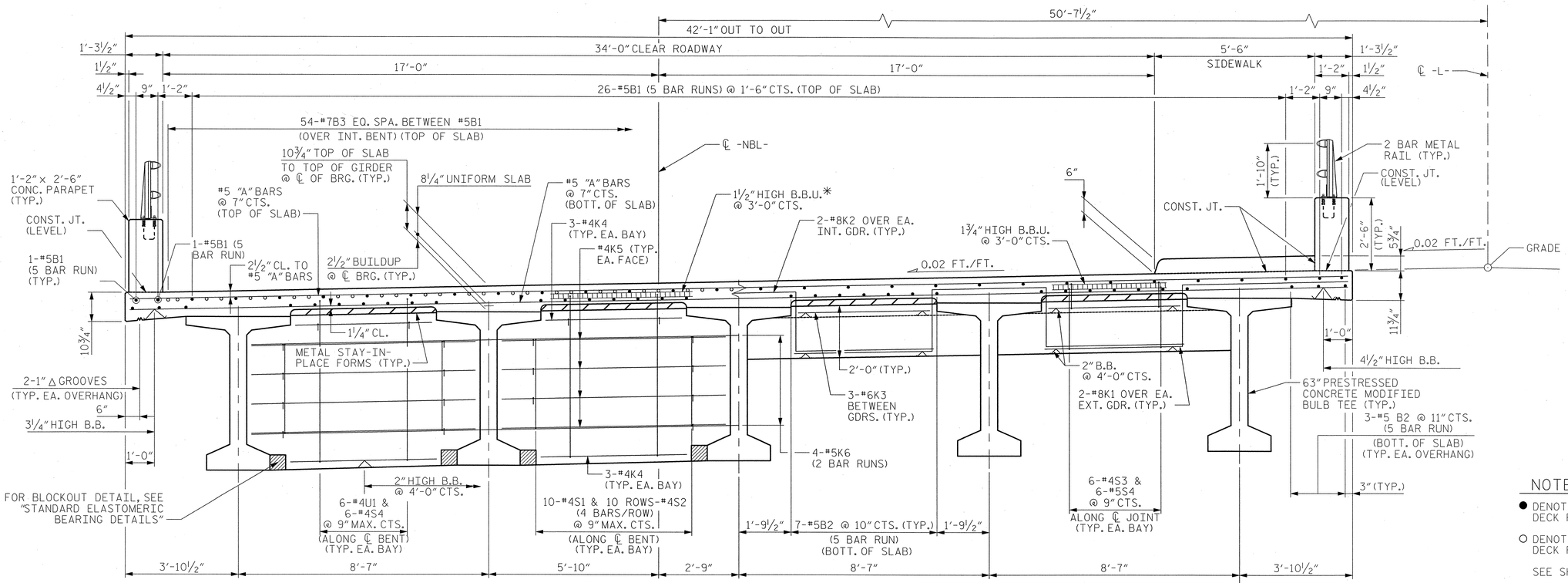
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S4
1			3			TOTAL SHEETS
2			4			72

STD. NO. LRFR1

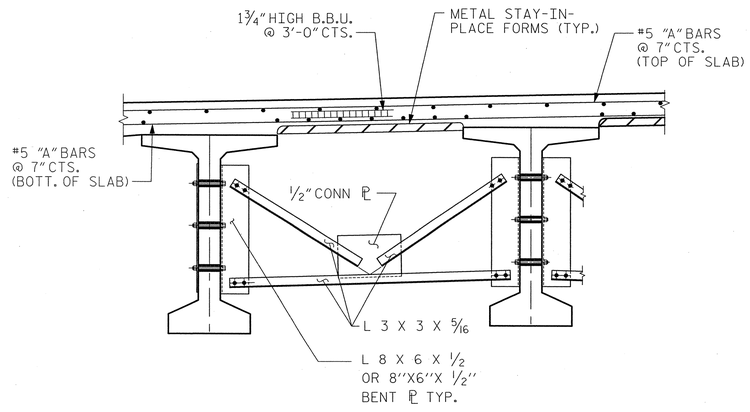


INTERIOR BENT DIAPHRAGMS

END BENT DIAPHRAGMS

TYPICAL SECTION

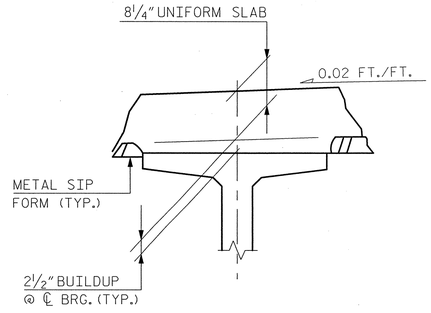
*TO BE USED IN REGIONS WITH #7B3 DECK REINFORCEMENT.



EXTERIOR GIRDER INTERIOR GIRDER

NOTE: FOR ADDITIONAL STEEL INTERMEDIATE DIAPHRAGM DETAILS, SEE "INTERMEDIATE STEEL DIAPHRAGMS".

TYPICAL SECTION
INTERMEDIATE DIAPHRAGMS



BUILD-UP DETAIL

NOTES:

- ● DENOTES CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
- ○ DENOTES NON-CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.

SEE SHEET 2 OF 2 FOR NOTES.

FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET RAIL" SHEET.

FOR 2 BAR METAL RAILS DETAILS, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" AND "2 BAR METAL RAIL" SHEETS.

FOR SIDEWALK PLAN, SECTION AND DETAILS, SEE "PLAN OF SPAN DETAILS" SHEETS.

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DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : J. T. KELVINGTON DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 1 of 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S5
1			3			TOTAL SHEETS
2			4			72

NOTES:

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

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.

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

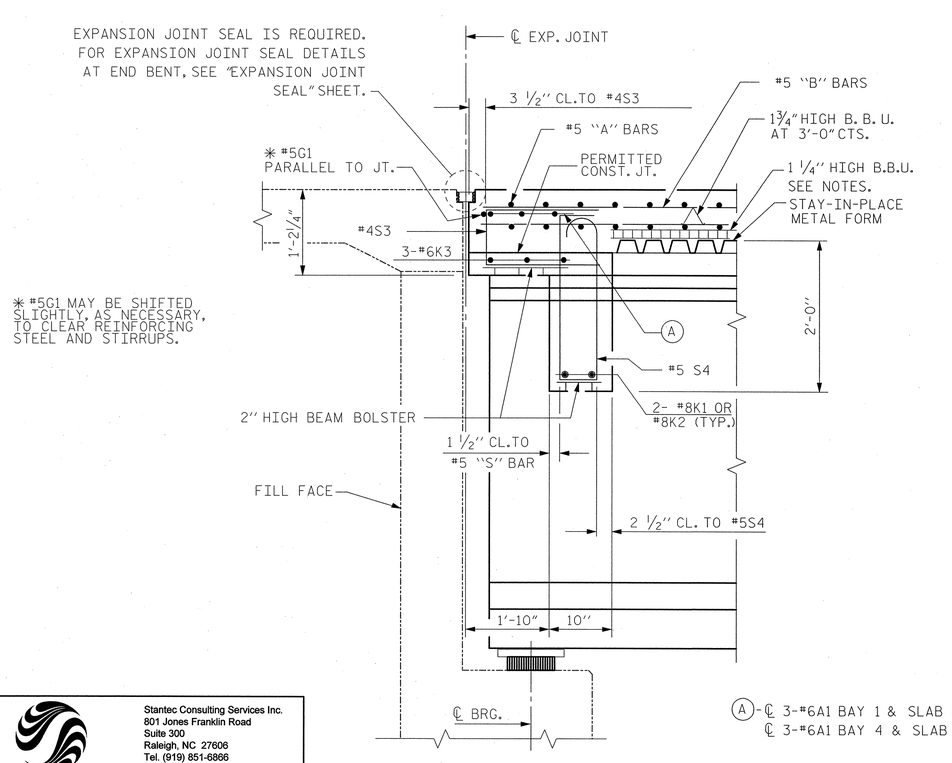
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

SIDEWALK & CONCRETE 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.

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

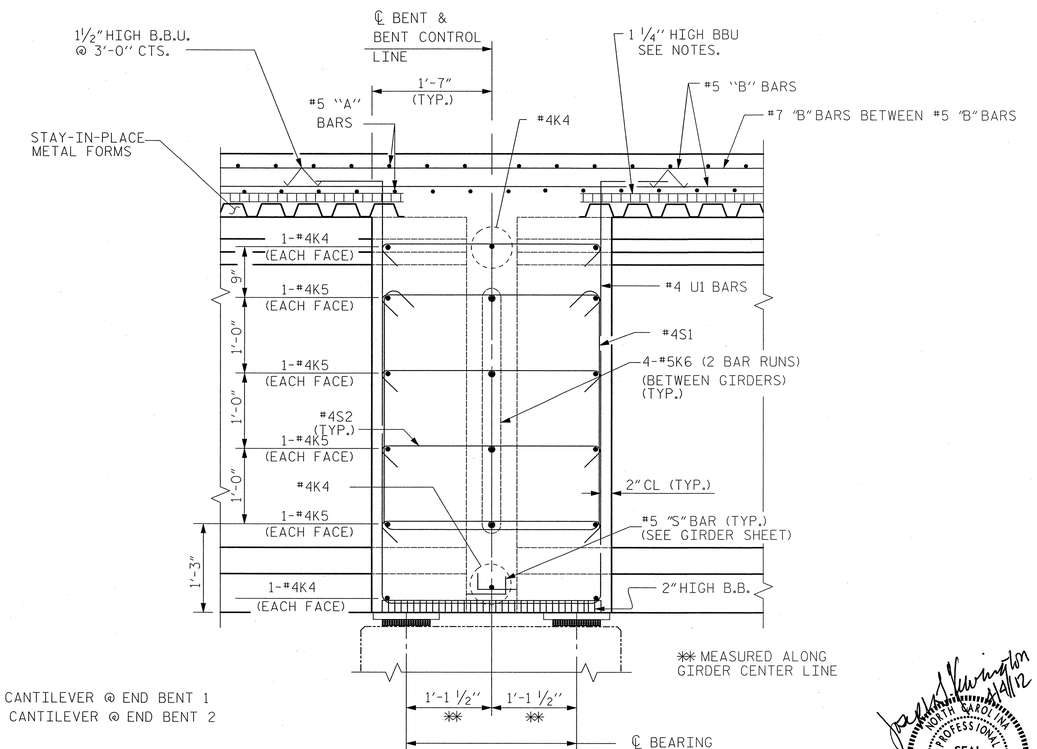
ALL REINFORCING STEEL IN CONCRETE PARAPETS AND SIDEWALKS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS ½" 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 EXPANSIONS JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.



Ⓐ-℄ 3-#6A1 BAY 1 & SLAB CANTILEVER @ END BENT 1
℄ 3-#6A1 BAY 4 & SLAB CANTILEVER @ END BENT 2

SECTION THRU DIAPHRAGM AT END BENT



SECTION THRU DIAPHRAGM AT INTERIOR BENT

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DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : J. T. KELVINGTON DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER J. T. KELVINGTON 4/4/12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 2 of 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION DETAILS

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S6
1			3			TOTAL SHEETS
2			4			72

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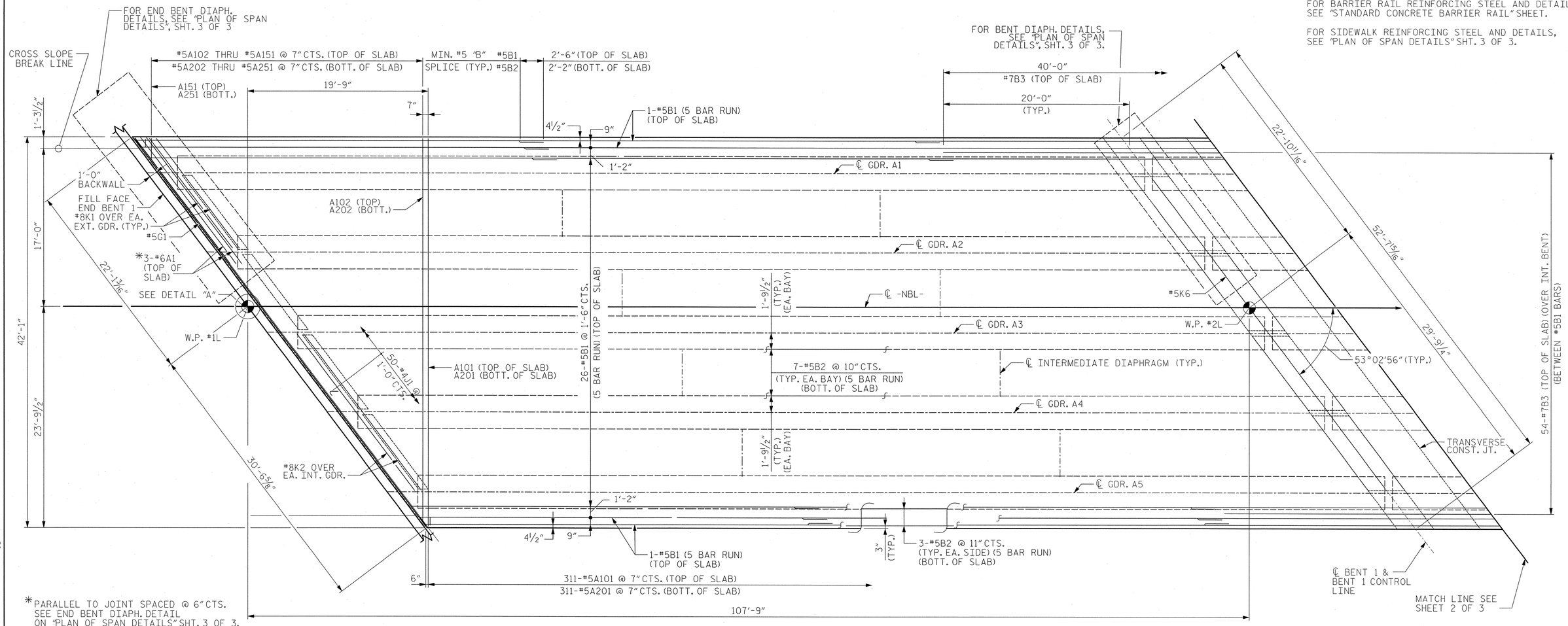
NOTES:

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

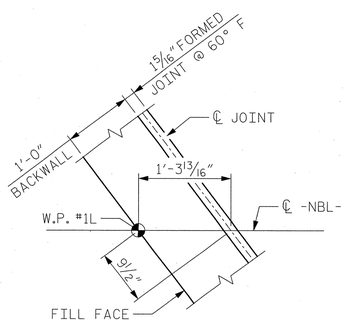
FOR SIDEWALK REINFORCING STEEL AND DETAILS, SEE "PLAN OF SPAN DETAILS" SHT. 3 OF 3.



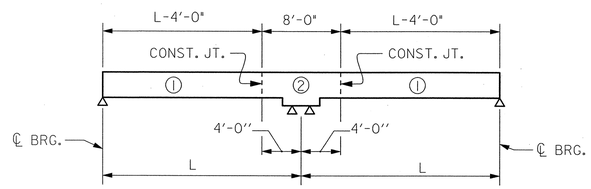
*PARALLEL TO JOINT SPACED @ 6" CTS. SEE END BENT DIAPH. DETAIL ON "PLAN OF SPAN DETAILS" SHT. 3 OF 3.

FOR PLACEMENT OF #4J1 SEE "EXPANSION JOINT SEALS" SHEET 1 OF 4.

PLAN OF SPAN A



DETAIL "A"



KEY

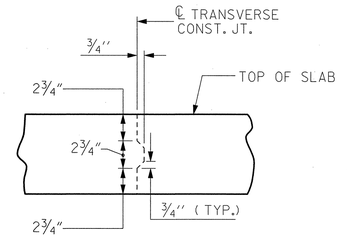
L = LENGTH OF EACH SPAN

NOTE: POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI.

"OPTIONAL" POURING SEQUENCE- PRESTRESSED CONCRETE SUPERSTRUCTURE

(CONTINUOUS FOR LIVE LOAD)

(FOR "POURING SEQUENCE", SEE SHEET S26)



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S7
1			3			TOTAL SHEETS
2			4			72

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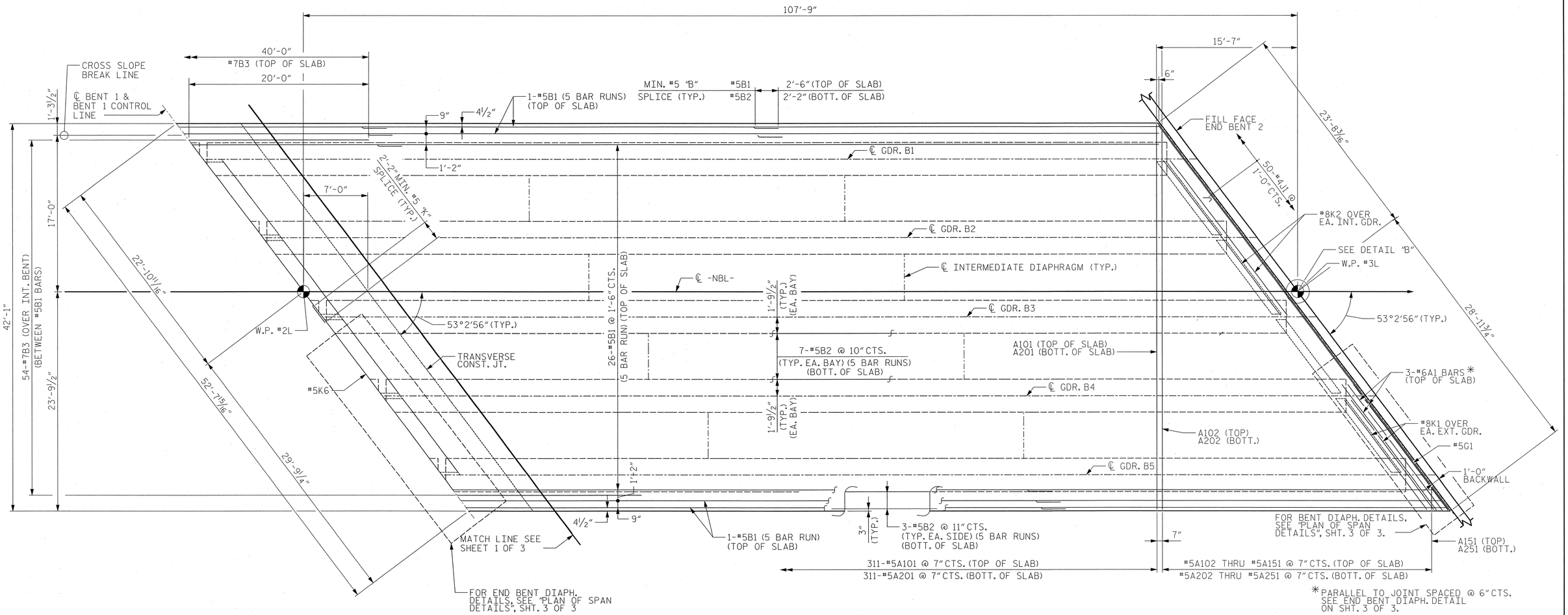
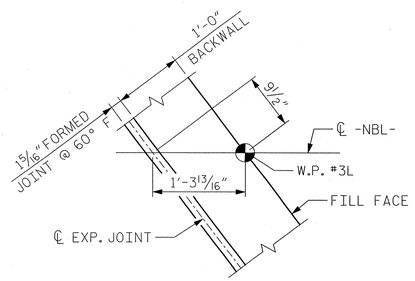


* PARALLEL TO JOINT SPACED @ 6" CTS. SEE END BENT DIAPH. DETAIL ON SHT. 3 OF 3.

FOR PLACEMENT OF #4J1 SEE "EXPANSION JOINT SEALS" SHEET 1 OF 4.

PLAN OF SPAN B



DETAIL "B"

NOTES:

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

FOR SIDEWALK REINFORCING STEEL AND DETAILS, SEE "PLAN OF SPAN DETAILS" SHT. 3 OF 3.

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S8
1			3			TOTAL SHEETS
2			4			72

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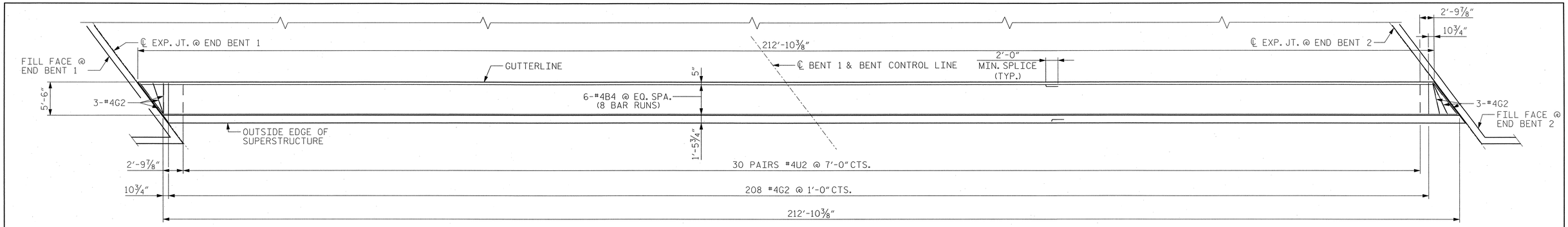
CHECKED BY : J. T. KELVINGTON DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/17/12

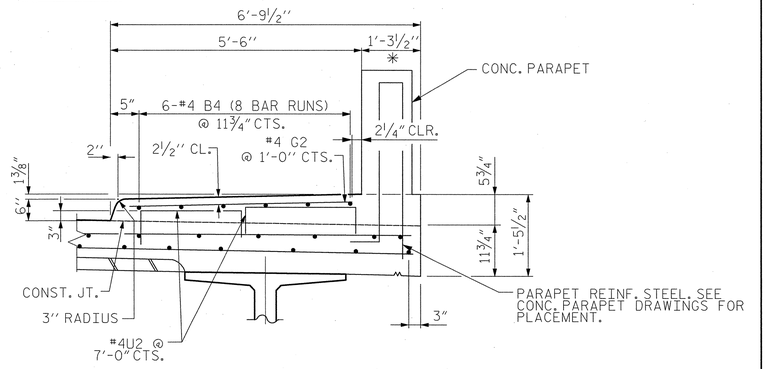


SPAN A

PLAN OF SIDEWALK ON BRIDGE SPANS

(PARAPET REINFORCEMENT NOT SHOWN FOR CLARITY)
(FOR SIDEWALK CONCRETE AND REINF. STEEL ON BRIDGE SPANS, SEE SUPERSTRUCTURE BILL OF MATERIAL)
(FOR SIDEWALK ON APPROACH SLABS, SEE APPROACH SLAB DWGS.)

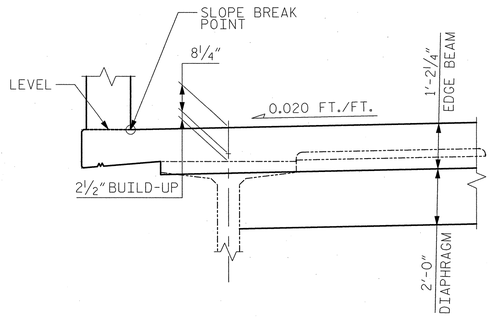
SPAN B



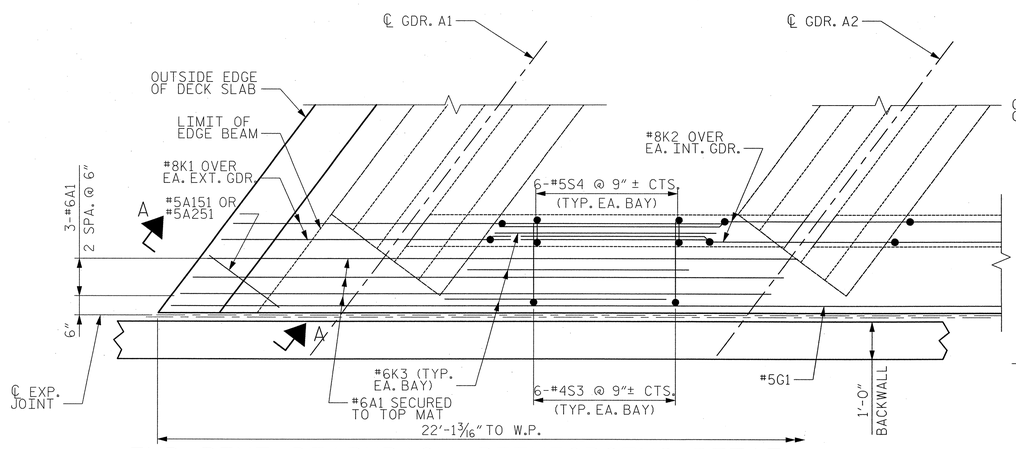
SECTION THRU SIDEWALK

*SIDEWALK SURFACE UNDER PARAPET SHALL BE LEVEL.

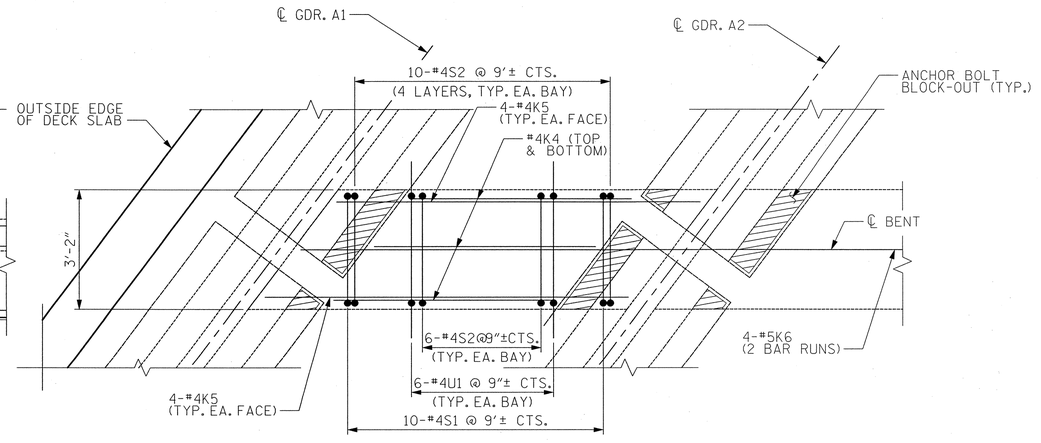
NOTE: SEE SUPERSTRUCTURE TYPICAL SECTION FOR LONGITUDINAL REINFORCING BAR SPACING.



SECTION A-A



END BENT DIAPHRAGM REINFORCING DETAIL



BENT DIAPHRAGM REINFORCING DETAIL

BAY 1 SHOWN, OTHERS TYPICAL

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DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : J. T. KELVINGTON DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 3 OF 3

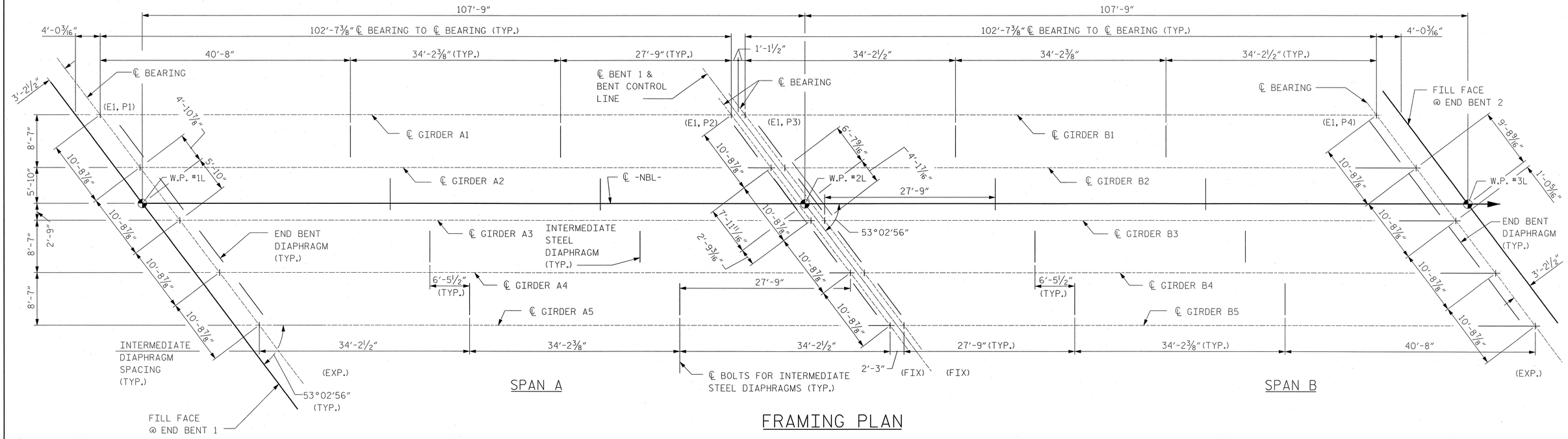
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

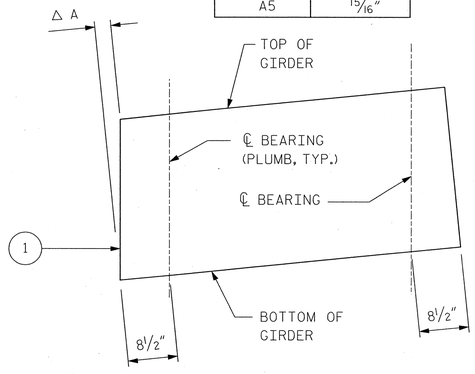
(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S9
1			3			TOTAL SHEETS
2			4			72



FRAMING PLAN

SPAN A BEVEL REQUIREMENTS	
GIRDER	Δ A
A1	1 1/4"
A1	1 3/16"
A3	1 1/16"
A4	1"
A5	15/16"



1 BEVEL FOR GRADE TO SET END OF GIRDER PLUMB (TYP.)

SPAN A

GIRDER BEVEL DETAIL

NOTES:

(E1, P1) DENOTES ELASTOMERIC BEARING, SOLE PLATE, TYP SEE SHEET "ELASTOMERIC BEARING".

SEE TYPICAL SECTION FOR END BENT DIAPHRAGM AND INTERIOR BENT DIAPHRAGM DETAILS.

REFER TO "PLAN OF SPAN DETAILS" FOR BENT & END BENT DIAPHRAGMS.

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CHECKED BY : S. S. YUEN DATE : 02-16-12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
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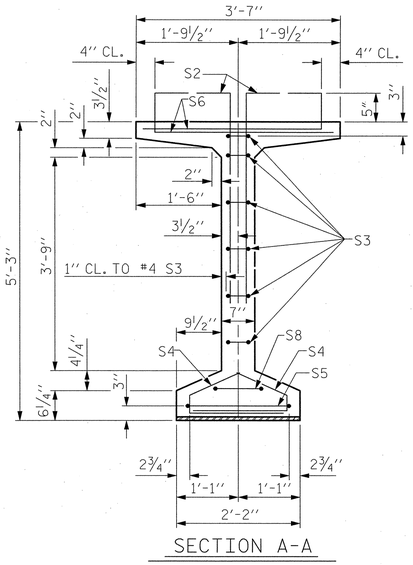
SUPERSTRUCTURE

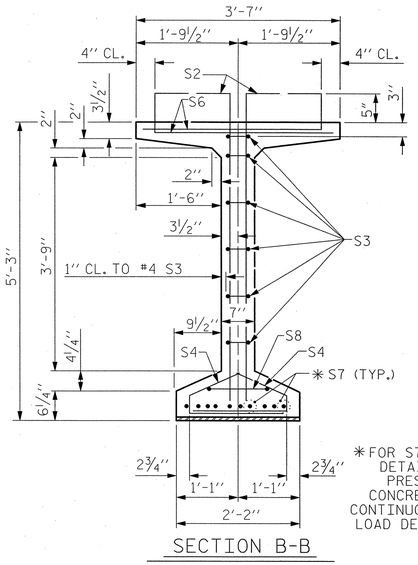
FRAMING PLAN

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S10
1			3			TOTAL SHEETS
2			4			72

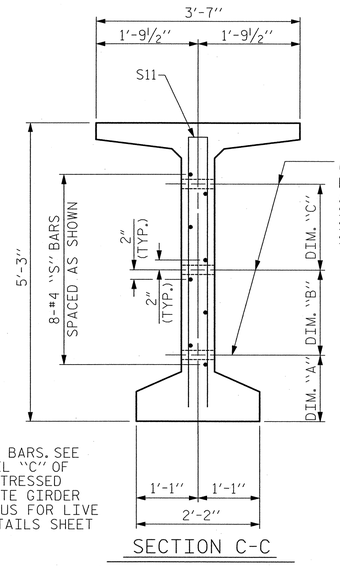


SECTION A-A



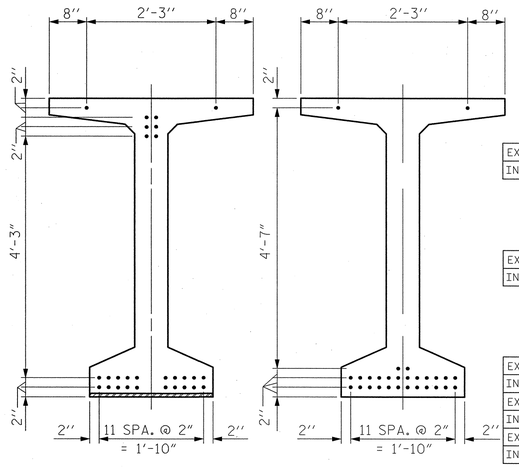
SECTION B-B

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



SECTION C-C

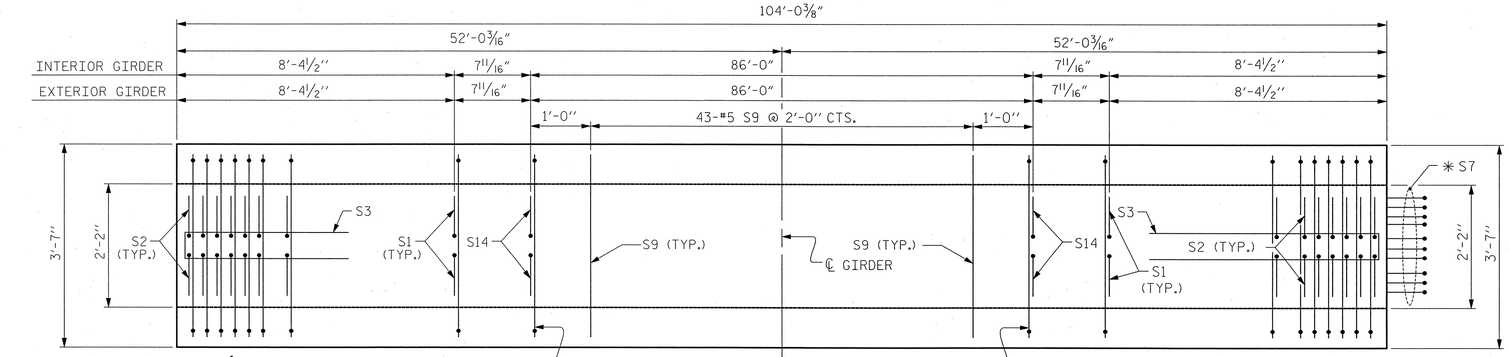
(S1, S6 AND S9 BARS NOT SHOWN)



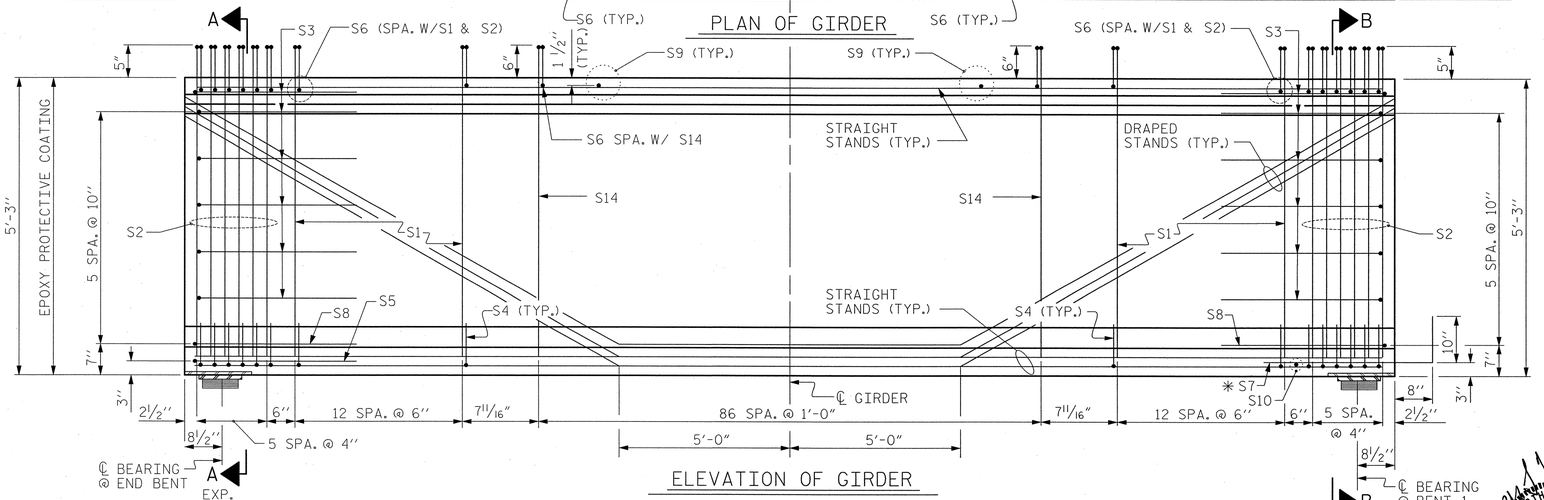
● FULLY BONDED STRANDS

AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

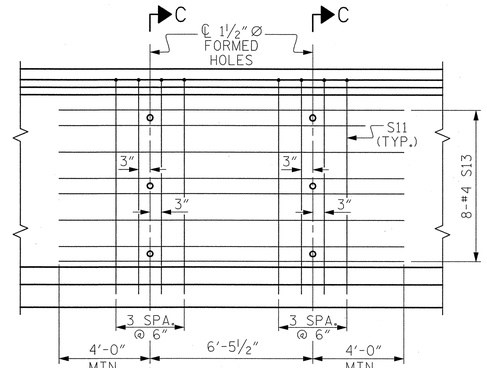


PLAN OF GIRDER



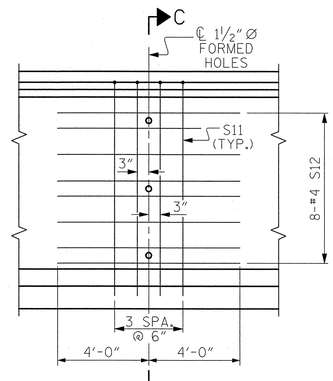
ELEVATION OF GIRDER

THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 25 KIPS



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2, 3 AND 4



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 AND 5

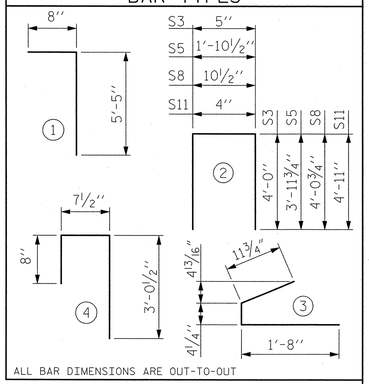
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
EXTERIOR GDR.	S1	52	#5	1	6'-1"	330
INTERIOR GDR.	S1	52	#5	1	6'-1"	330
	S2	24	#5	1	6'-1"	152
	S3	12	#4	2	8'-5"	67
	S4	76	#4	3	3'-0"	152
	S5	1	#5	2	9'-10"	10
EXTERIOR GDR.	S6	250	#5	4	4'-4"	1,130
INTERIOR GDR.	S6	250	#5	4	4'-4"	1,130
	✱S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
	S9	43	#5	STR	3'-3"	146
	S10	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S11	8	#5	2	10'-2"	85
INTERIOR GDR.	S11	16	#5	2	10'-2"	170
EXTERIOR GDR.	S12	32	#4	STR	8'-0"	171
INTERIOR GDR.	S13	32	#4	STR	14'-6"	310
EXTERIOR GDR.	S14	174	#4	1	6'-1"	707
INTERIOR GDR.	S14	174	#4	1	6'-1"	707

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,008	20.6	28
INTERIOR GIRDER	3,232	20.6	28

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
10	104'-0⅜"	1,040'-3¾"

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S11
1			3			TOTAL SHEETS
2			4			72

ASSEMBLED BY : J.B. GEILE DATE : 02-16-12
CHECKED BY : J.T. KELVINGTON DATE : 02-16-12

DRAWN BY : EEM 2/6/97
CHECKED BY : VAP 2/6/97

REV. 10/17/00		RWW/LES
REV. 5/1/06R		TLA/GM
REV. 10/1/11		MAA/GM

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13406 JOSEPH T. KELVINGTON 2/14/12

STD. NO. PCG7 (Sht. 1)

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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 5,000 PSI.

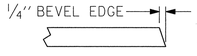
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

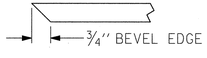
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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.

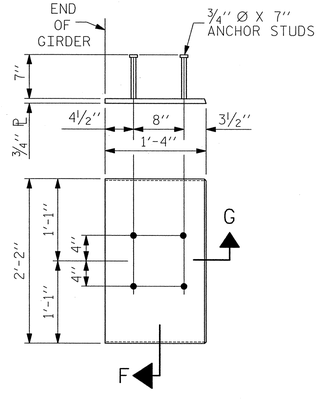


SECTION "G"



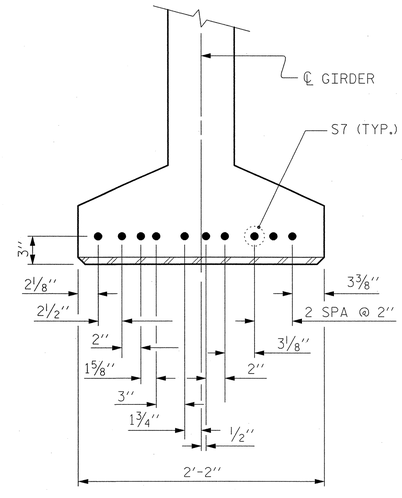
SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



DETAIL "C"

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S12
1			3			TOTAL SHEETS
2			4			72

STD. NO. PCG9

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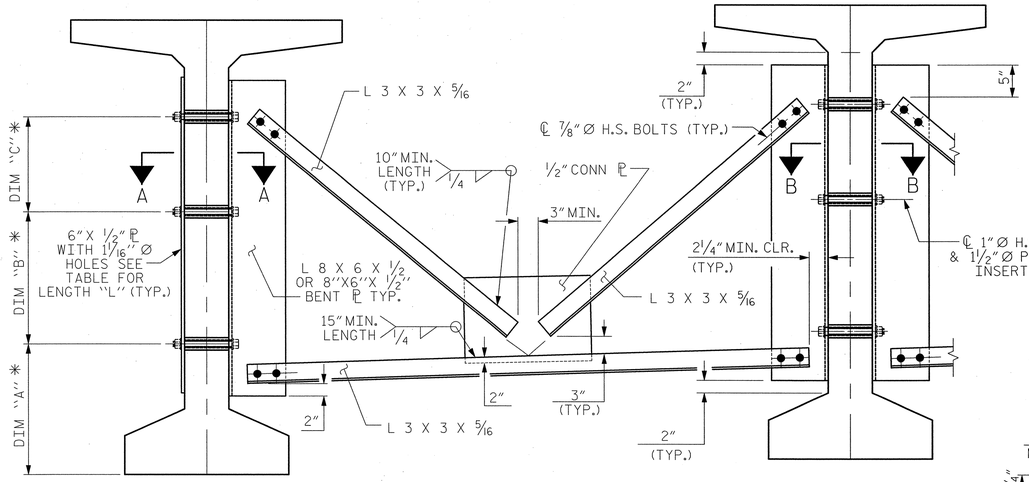
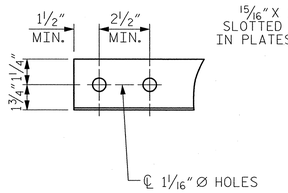
ASSEMBLED BY : T.R. DUDECK	DATE : 02-16-12	REV. 7/10/01	RR LES/RDR
CHECKED BY : J.T. KELVINGTON	DATE : 02-16-12	REV. 5/1/06	TLA/GM
DRAWN BY : ELR 11/91		REV. 10/1/11	MAA/GM
CHECKED BY : GRP 11/91			



EXTERIOR GIRDER

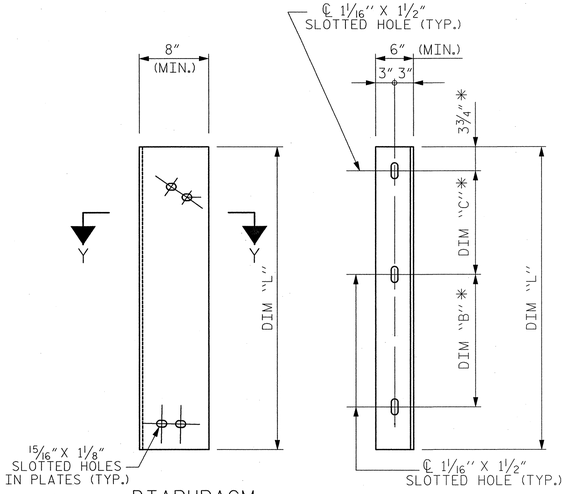
INTERIOR GIRDER

PART SECTION AT INTERMEDIATE DIAPHRAGM



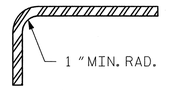
ANGLE END

(L 3 X 3 X 5/16)



DIAPHRAGM FACE

WEB FACE



SECTION Y-Y

CONNECTION PLATE 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 ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

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

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

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

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

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

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

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

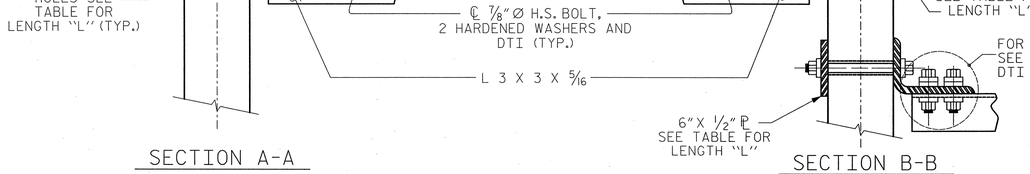
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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

* BOLT LOCATIONS SHALL BE ADJUSTED BY FABRICATOR TO AVOID DRAPED STRANDS IN GIRDERS.

TABLE

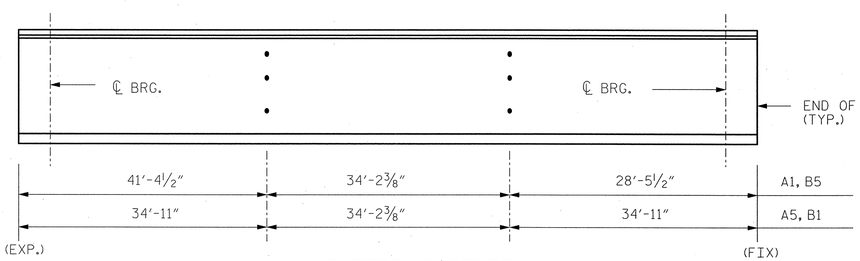
GIRDER TYPE	DIM "A" *	DIM "B" *	DIM "C" *	DIM "L"
63" BULB TEE	1'-9 1/4"	1'-2 1/4"	1'-2 1/4"	3'-5"



SECTION A-A

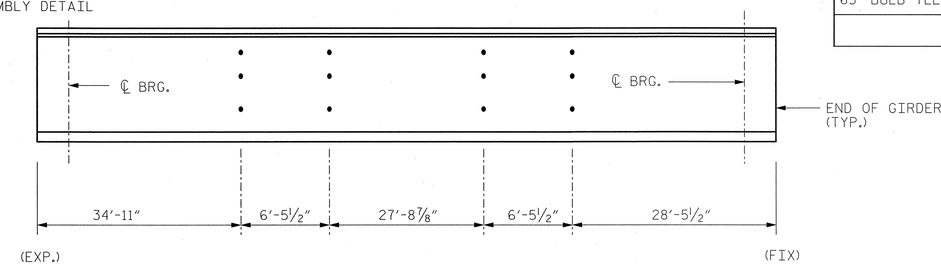
SECTION B-B

CONNECTION DETAILS



EXTERIOR GIRDER DIAPHRAGM HOLE LOCATION

DIMENSIONS SHOWN ARE MEASURED ALONG BOTTOM FLANGE.



INTERIOR GIRDER DIAPHRAGM HOLE LOCATION

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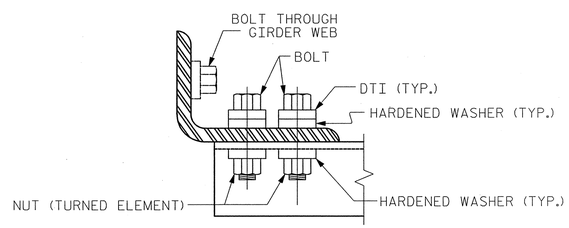

BOLT WITH DTI ASSEMBLY DETAIL

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ASSEMBLED BY : J.B. GEILE	DATE : 02-16-12
CHECKED BY : J.T. KELVINGTON	DATE : 02-16-12
DRAWN BY : RWW 11/09	ADDED 11/23/09R
CHECKED BY : GM 11/09	REV. 10/1/11 MAA/GM

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

INTERMEDIATE STEEL DIAPHRAGMS

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S13
1			3			TOTAL SHEETS
2			4			72

STD. NO. PCG11

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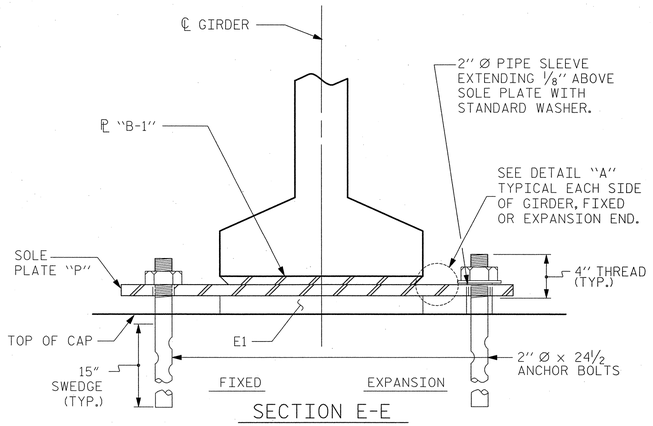
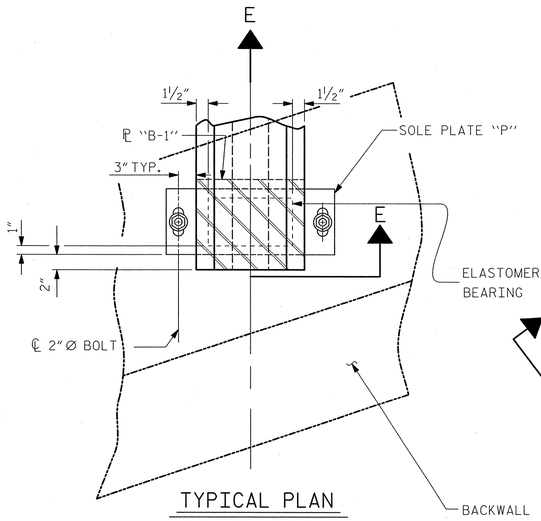
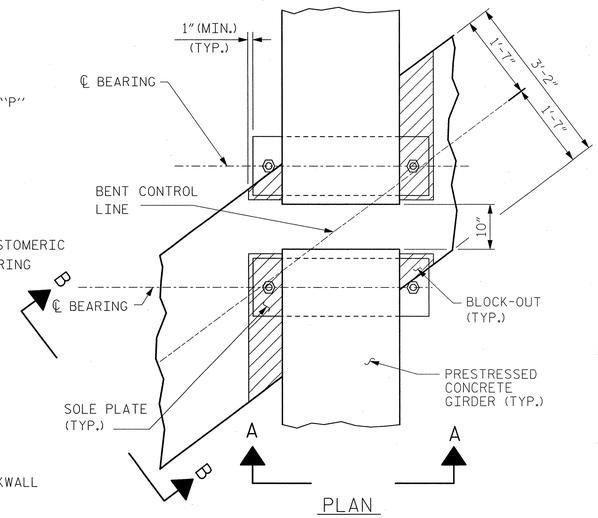


SECTION E-E



TYPICAL PLAN

(SHOWING END BENT)



PLAN

NOTES

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

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

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

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

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

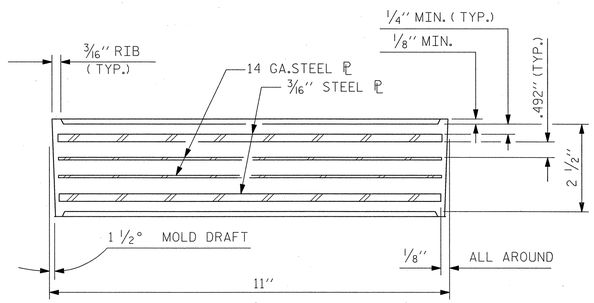
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

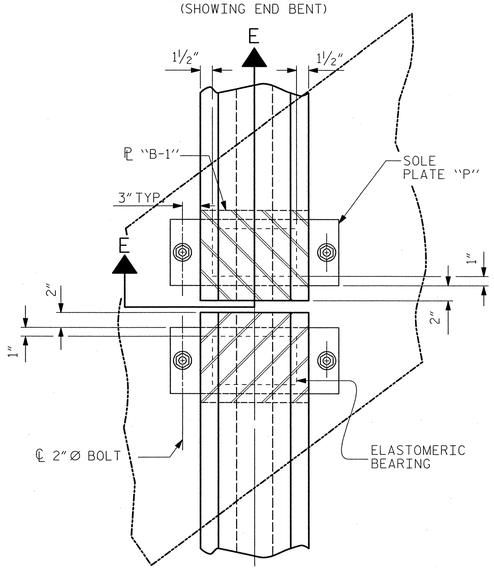
ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50.

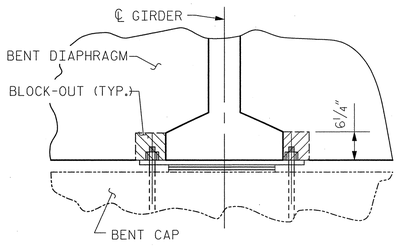


TYPICAL SECTION OF ELASTOMERIC BEARINGS



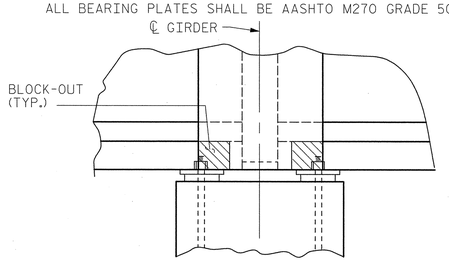
TYPICAL PLAN

(SHOWING CONTINUOUS BENT)

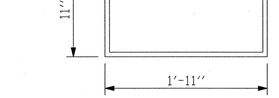


SECTION A-A

BENT DIAPHRAGM BLOCKOUT DETAIL



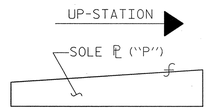
SECTION B-B



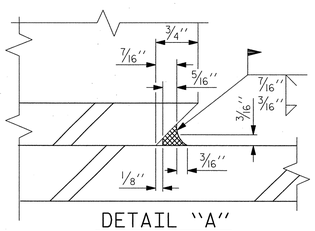
E1 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

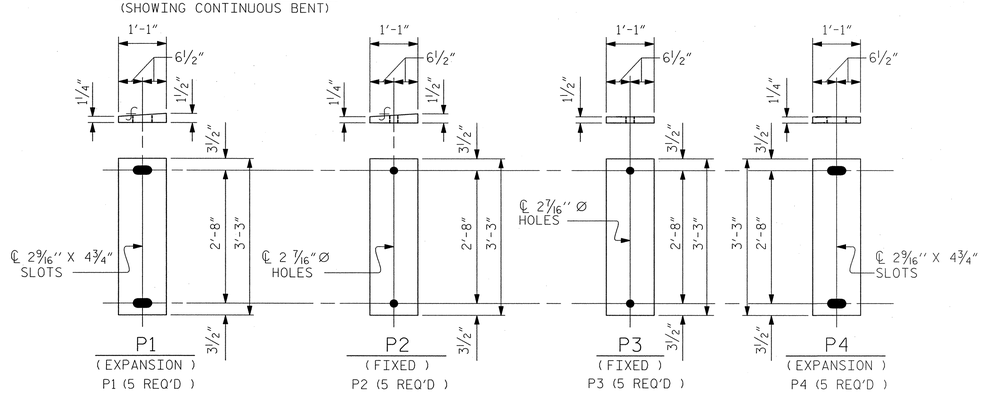
TYPE VI



SOLE ℙ PLACEMENT DETAIL



DETAIL "A"



SOLE PLATE DETAILS ("P")

PROJECT NO. I-4413

ROBESON COUNTY

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ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (NBL)

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ASSEMBLED BY : J.B. GEILE	DATE : 02-16-12
CHECKED BY : J.T. KELVINGTON	DATE : 02-16-12
DRAWN BY : EEM 2/97	REV. 10/17/00 RWW/LES
CHECKED BY : VAP 2/97	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/25/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S14
1			3			TOTAL SHEETS
2			4			72

STD. NO. EB4

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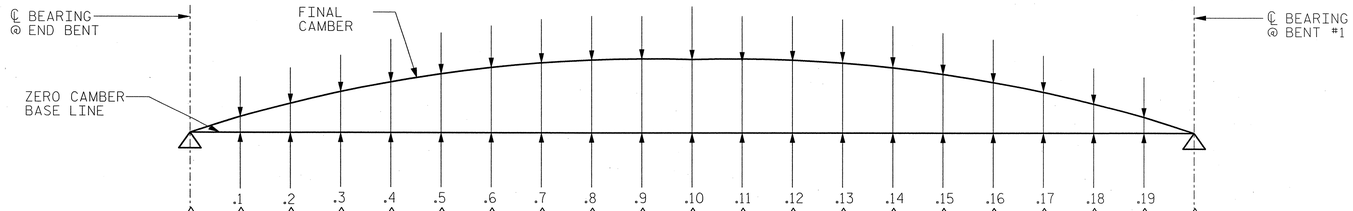
SPANS A & B



GIRDER 1

CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.054	0.108	0.149	0.190	0.218	0.247	0.263	0.279	0.284	0.289	0.284	0.279	0.263	0.247	0.218	0.190	0.149	0.108	0.054	0.000
DEFLEC. DUE TO SUPERIMPOSED DL ** ↓	0.000	0.020	0.040	0.059	0.078	0.092	0.107	0.115	0.124	0.126	0.128	0.125	0.122	0.113	0.103	0.089	0.074	0.056	0.038	0.019	0.000
FINAL CAMBER ↑	0	3/8"	13/16"	1 1/16"	1 5/16"	1 1/2"	1 11/16"	1 3/4"	1 7/8"	1 7/8"	1 15/16"	1 15/16"	1 7/8"	1 13/16"	1 11/16"	1 9/16"	1 3/8"	1 1/8"	13/16"	7/16"	0

GIRDERS 2-4

CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.054	0.108	0.149	0.190	0.218	0.247	0.263	0.279	0.284	0.289	0.284	0.279	0.263	0.247	0.218	0.190	0.149	0.108	0.054	0.000
DEFLEC. DUE TO SUPERIMPOSED DL ** ↓	0.000	0.021	0.041	0.060	0.080	0.094	0.109	0.118	0.126	0.129	0.131	0.128	0.125	0.115	0.106	0.091	0.076	0.057	0.038	0.019	0.000
FINAL CAMBER ↑	0	3/8"	13/16"	1 1/16"	1 5/16"	1 1/2"	1 5/8"	1 3/4"	1 13/16"	1 7/8"	1 7/8"	1 7/8"	1 7/8"	1 3/4"	1 11/16"	1 1/2"	1 3/8"	1 1/8"	13/16"	7/16"	0

GIRDER 5

CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.054	0.108	0.149	0.190	0.218	0.247	0.263	0.279	0.284	0.289	0.284	0.279	0.263	0.247	0.218	0.190	0.149	0.108	0.054	0.000
DEFLEC. DUE TO SUPERIMPOSED DL ** ↓	0.000	0.020	0.041	0.060	0.079	0.093	0.108	0.116	0.125	0.127	0.130	0.127	0.123	0.114	0.105	0.090	0.075	0.057	0.038	0.019	0.000
FINAL CAMBER ↑	0	3/8"	13/16"	1 1/16"	1 5/16"	1 1/2"	1 11/16"	1 3/4"	1 7/8"	1 7/8"	1 15/16"	1 7/8"	1 7/8"	1 13/16"	1 11/16"	1 9/16"	1 3/8"	1 1/8"	13/16"	7/16"	0

** INCLUDES BRIDGE DECK, BUILDUP, STAY-IN-PLACE FORMS, DIAPHRAGMS, PARAPET, SIDEWALK, AND FUTURE WEARING SURFACE.

SCHEMATIC CAMBER ORDINATES SPAN A & B

ALL VALUES ARE SHOWN IN DECIMALS OF A FOOT EXCEPT "FINAL CAMBER" WHICH IS GIVEN IN INCHES.

ALL VALUES SHOWN ARE SYMMETRICAL ABOUT ℄ BENT 1.

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

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DRAWN BY : J. B. GEILE DATE : 02-16-12

CHECKED BY : T. R. DUDECK DATE : 02-16-12

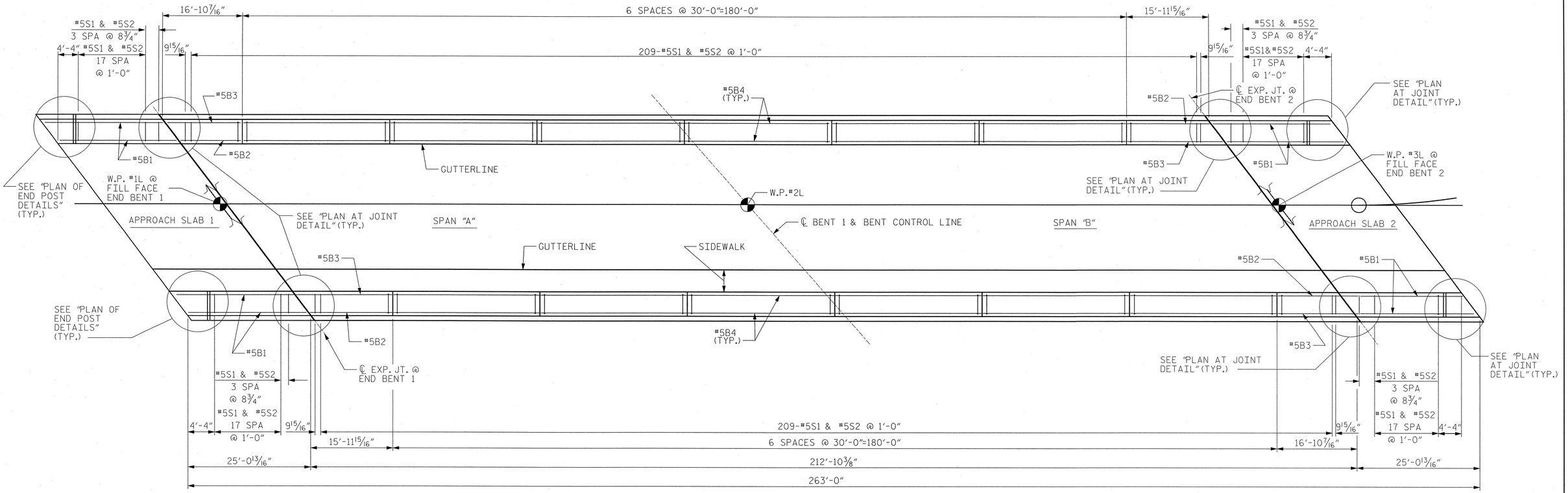
Joseph T. Kelvington 4/25/12
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

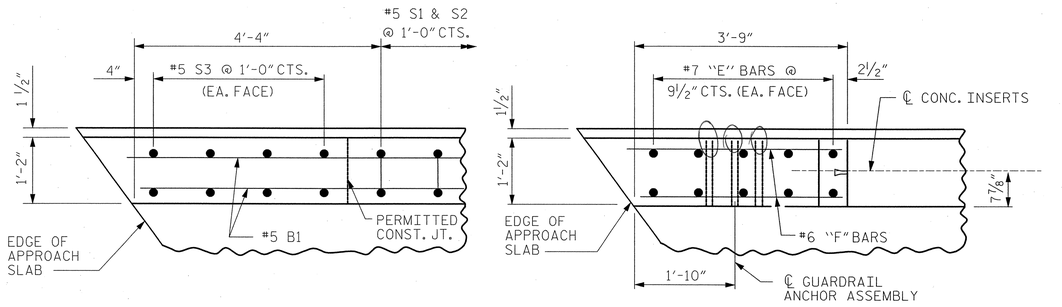
SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS

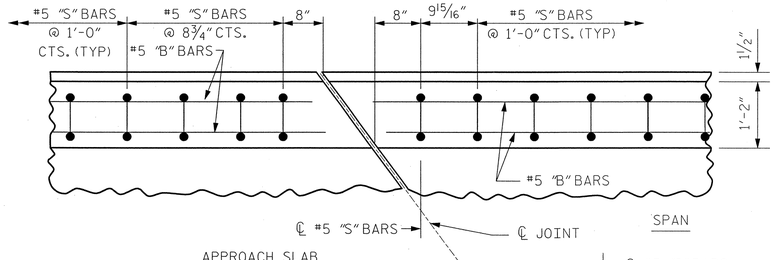
(NBL)

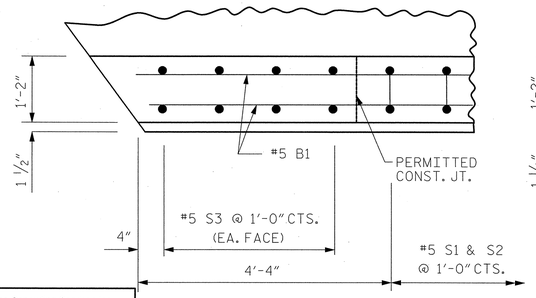
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S15
1			3			TOTAL SHEETS
2			4			72

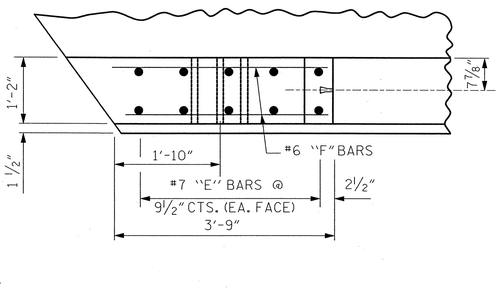


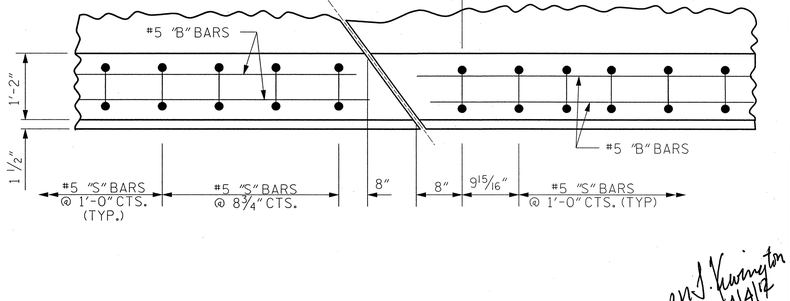
PARAPET PLAN











PLAN OF PARAPET

PLAN OF END POST

PLAN AT JOINT

PARAPET AND END POST FOR TWO BAR RAIL

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License No. F-0672

DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE PROVISIONS OF THE NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS.
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JEFFERY T. KELVINGTON
2/9/12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

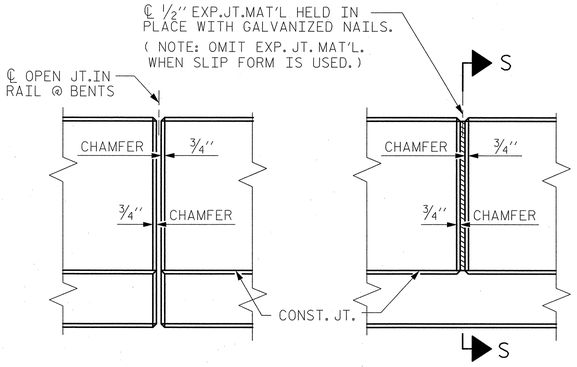
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

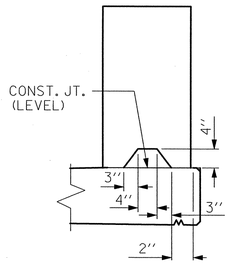
CONCRETE
PARAPET AND END POST

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S16
1			3			TOTAL SHEETS
2			4			72



ELEVATION AT EXPANSION JOINTS



SECTION S-S

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

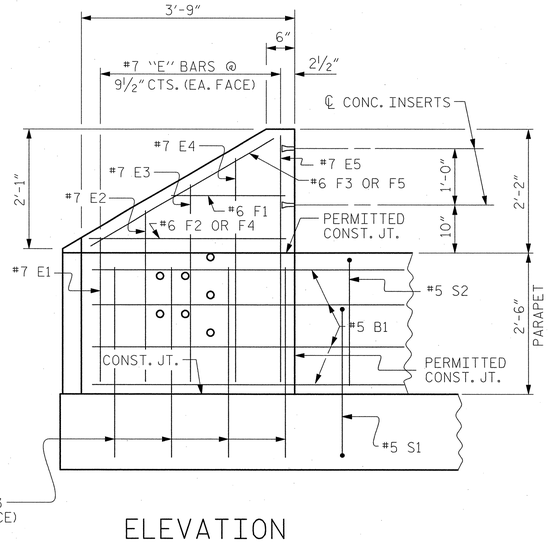
BARRIER RAIL DETAILS

NOTES

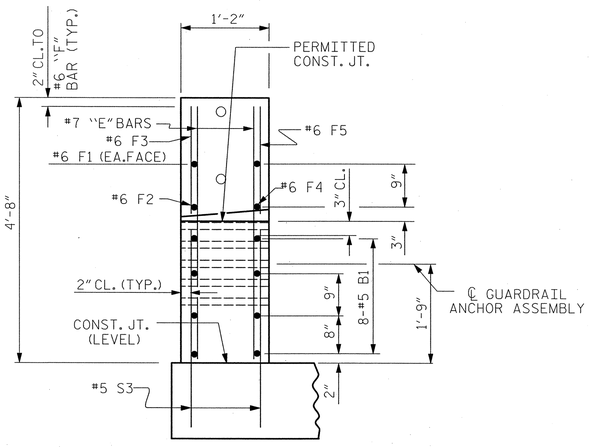
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

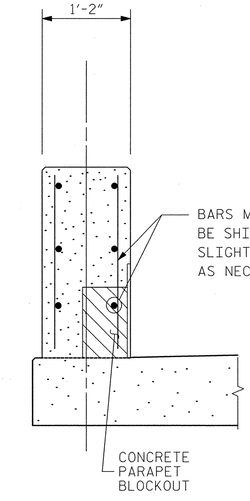
GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED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



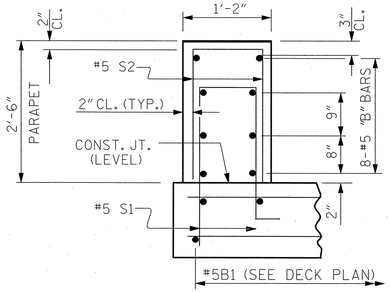
ELEVATION



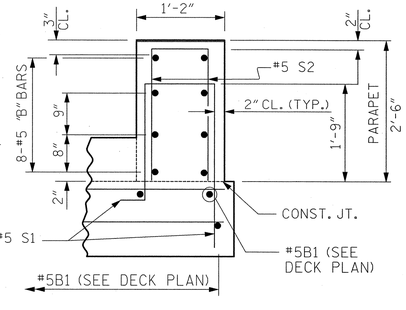
END VIEW



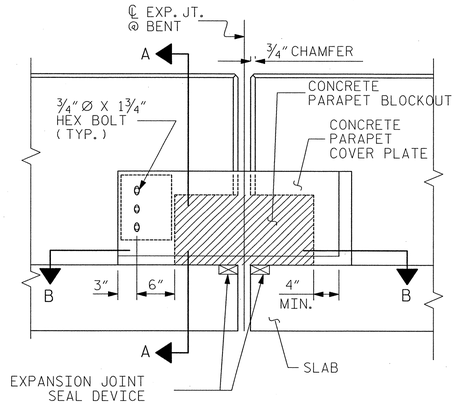
SECTION A-A



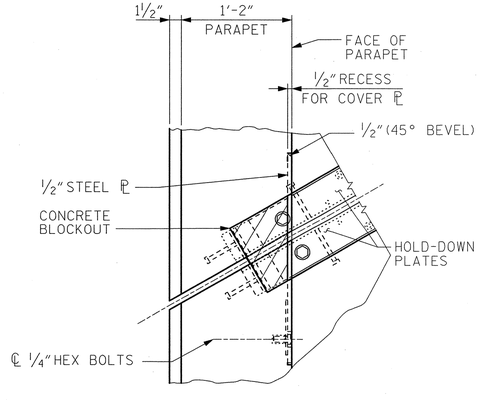
SECTION THRU PARAPET



SECTION THRU PARAPET @ SIDEWALK

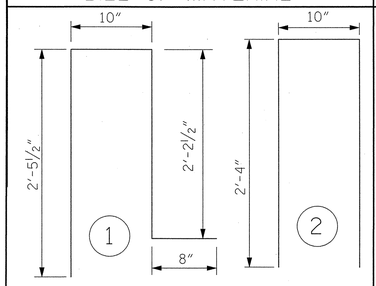


ELEVATION @ EXP. JT.



SECTION B-B

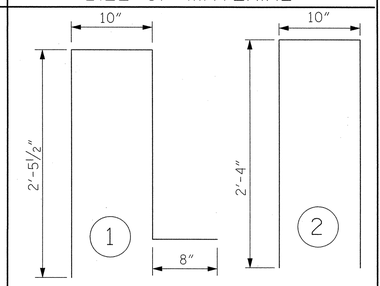
BILL OF MATERIAL



LEFT PARAPET AND TWO END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	16	#5	STR	24'-8"	412
✳B2	8	#5	STR	15'-7"	130
✳B3	8	#5	STR	16'-5"	137
✳B4	48	#5	STR	29'-8"	1483
✳E1	4	#7	STR	2'-6"	20
✳E2	4	#7	STR	3'-4"	27
✳E3	4	#7	STR	3'-6"	29
✳E4	4	#7	STR	4'-0"	33
✳E5	4	#7	STR	4'-4"	35
✳F1	4	#6	STR	12'-3"	74
✳F2	2	#6	STR	3'-9"	11
✳F3	2	#6	STR	3'-6"	11
✳F4	2	#6	STR	3'-5"	10
✳F5	2	#6	STR	3'-6"	11
✳S1	253	#5	1	6'-2"	1627
✳S2	253	#5	2	5'-6"	1451
✳S3	16	#5	STR	3'-0"	50
✳EPOXY COATED REINFORCING STEEL				LBS.	5551
CLASS AA CONCRETE				C.Y.	28.8
CONCRETE PARAPET				L.F.	263.00

BILL OF MATERIAL



RIGHT PARAPET AND TWO END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	16	#5	STR	24'-8"	412
✳B2	8	#5	STR	15'-7"	130
✳B3	8	#5	STR	16'-5"	137
✳B4	48	#5	STR	29'-8"	1483
✳E1	4	#7	STR	2'-6"	20
✳E2	4	#7	STR	3'-4"	27
✳E3	4	#7	STR	3'-6"	29
✳E4	4	#7	STR	4'-0"	33
✳E5	4	#7	STR	4'-4"	35
✳F1	4	#6	STR	12'-3"	74
✳F2	2	#6	STR	3'-9"	11
✳F3	2	#6	STR	3'-6"	11
✳F4	2	#6	STR	3'-5"	10
✳F5	2	#6	STR	3'-6"	11
✳S1	253	#5	1	6'-2"	1627
✳S2	253	#5	2	5'-6"	1451
✳S3	16	#5	STR	3'-0"	50
✳EPOXY COATED REINFORCING STEEL				LBS.	5551
CLASS AA CONCRETE				C.Y.	28.8
CONCRETE PARAPET				L.F.	263.00

CONCRETE PARAPET REQUIRED L.F. 526.00

ALL BAR DIMENSIONS ARE MEASURED OUT TO OUT

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET AND END POST

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S17
1			3			TOTAL SHEETS
2			4			72

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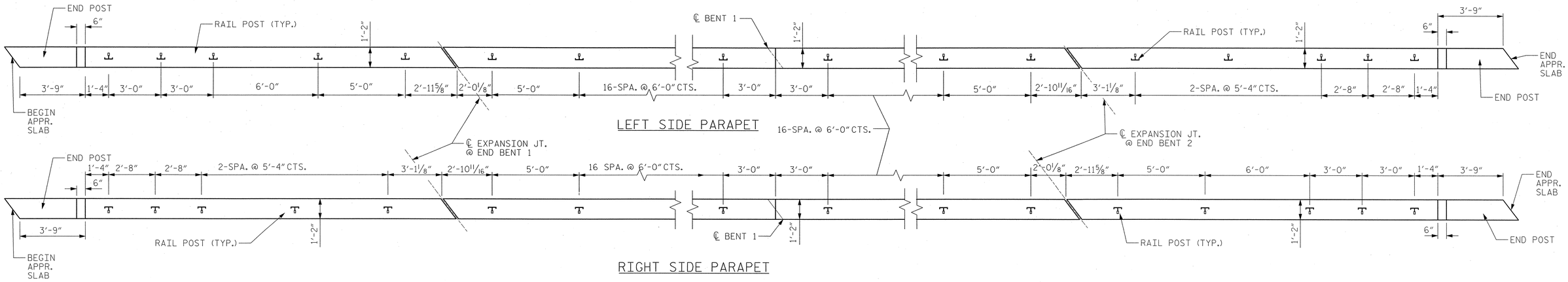
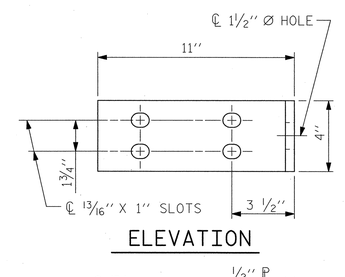
DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/25/12

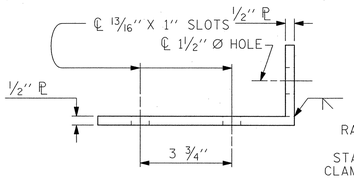
$FILE$ $DATE$ $TIME$ $USER$



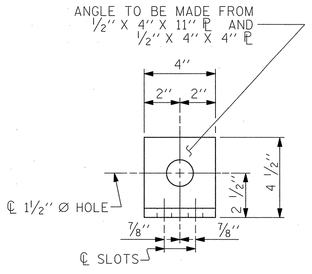
PLAN OF RAIL POST SPACINGS



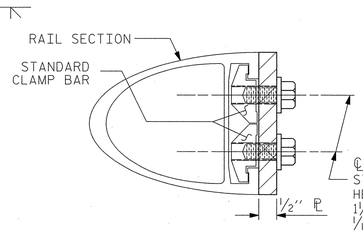
ELEVATION



TOP VIEW

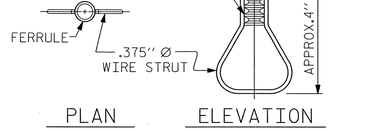


END VIEW (FIX AND EXP.)



SECTION H-H (FIX)

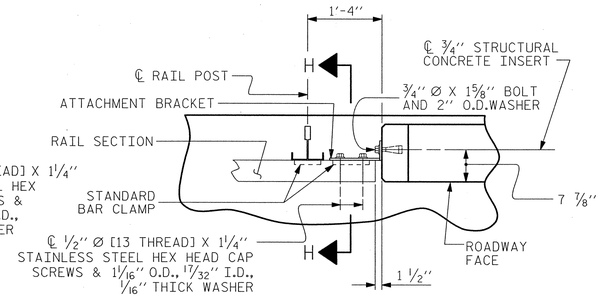
FIXED



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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



PLAN - RAIL AND END POST

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

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

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 3#4″Ø X 15#8″ BOLT WITH 2″ O.D. WASHER IN PLACE. THE ¾″Ø X 15⁄8″ BOLT SHALL HAVE N. C. THREADS.

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

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

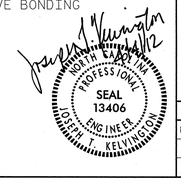
E. ½″Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

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

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4″Ø X 1⅝″ BOLT WITH WASHER SHALL BE REPLACED WITH A ¾″Ø X 6½″ BOLT AND 2″ O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾″Ø X 1⅝″ BOLT SHALL APPLY TO THE ¾″Ø X 6½″ BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

Stantec
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License No. F-0672

ASSEMBLED BY : JLH	DATE : 02/16/12
CHECKED BY : S. S. YUEN	DATE : 02/16/12
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

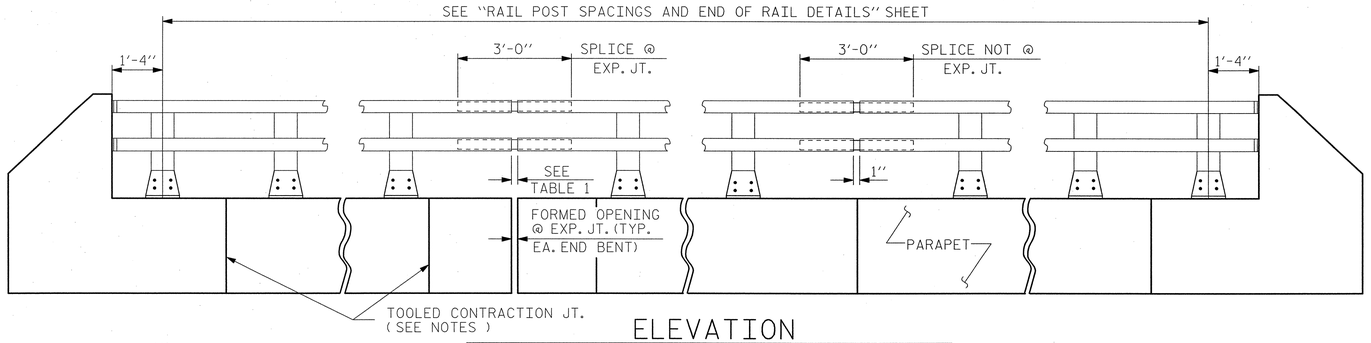
FOR TWO BAR METAL RAILS

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S18
1			3			TOTAL SHEETS
2			4			72

STD. NO. BMR2

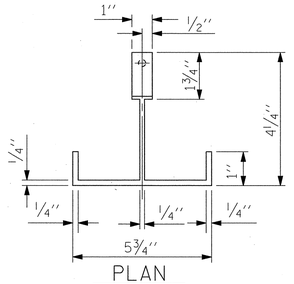
U:\Structures\Drawing\Final\Left Bridge\1413_SD_BMR2_12.dgn 4/4/2012 8:42:14 AM jgelle



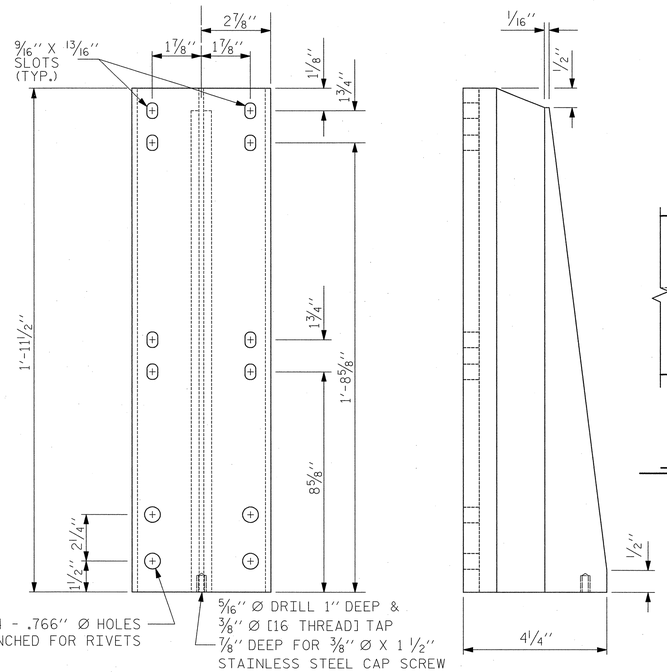
ELEVATION

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

TABLE 1	
℄ EXP. JT. @	RAIL OPENING
END BENT No. 1	1⅝"
END BENT No. 2	1⅝"

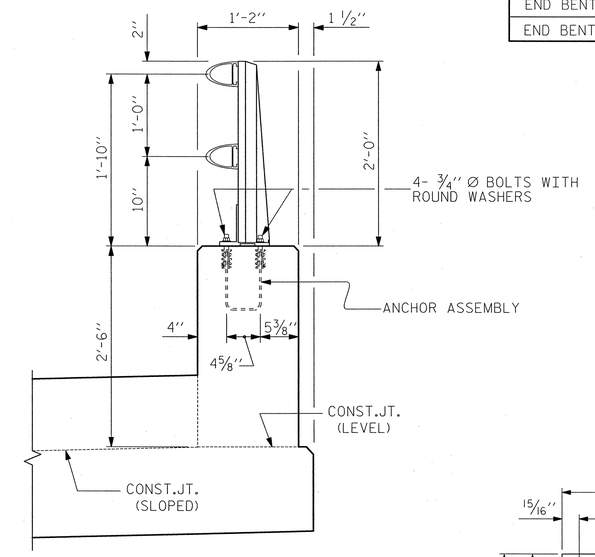


PLAN

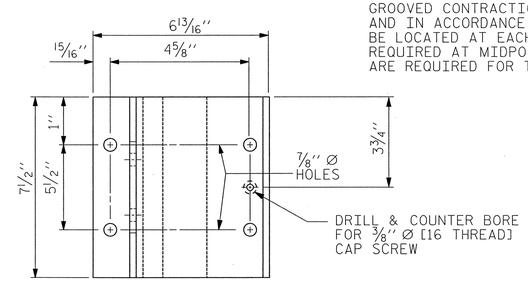


FRONT ELEVATION SIDE ELEVATION

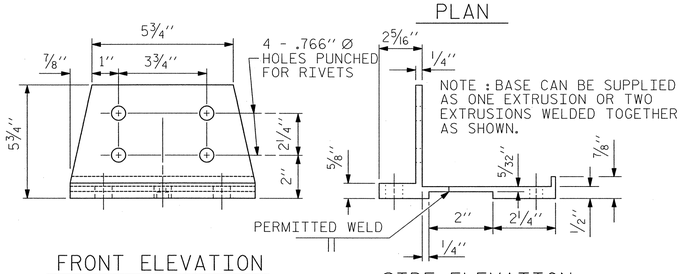
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

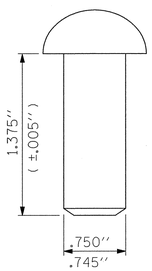


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

ALUMINUM RAILS

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

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 510.00 LIN. FT.

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S19
1			3			TOTAL SHEETS
2			4			72

STD. NO. BMR3

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ASSEMBLED BY : J. L. HENNEKES	DATE : 02-16-12		
CHECKED BY : T. R. DUDECK	DATE : 02-16-12		
DRAWN BY : EEM 6/94	REV. 5/7/03	RWW/JTE	
CHECKED BY : RGW 6/94	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

JOSEPH T. KELVINGTON — NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER — 4/4/12

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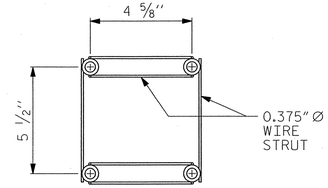
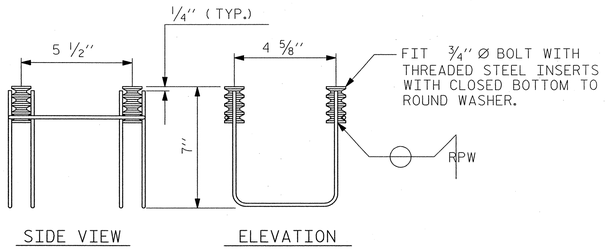


PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(92 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.

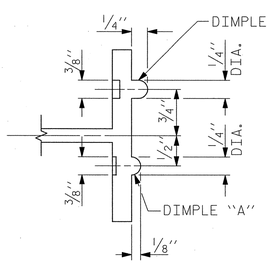
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

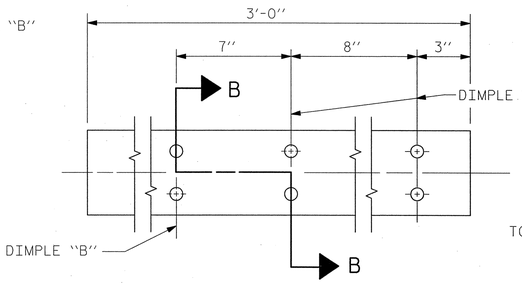
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

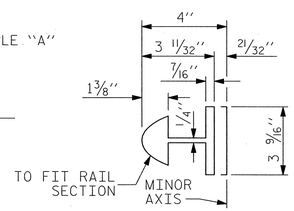
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

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



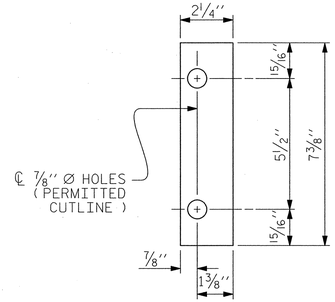
SECTION B - B



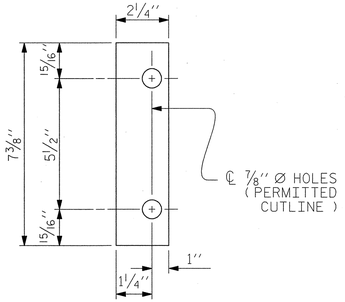


BAR SECTION

EXPANSION BAR DETAILS



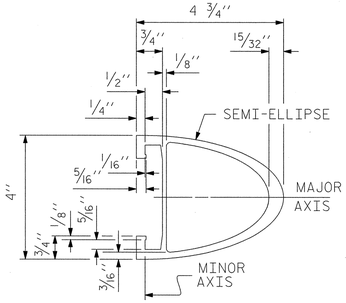
FRONT PLATE



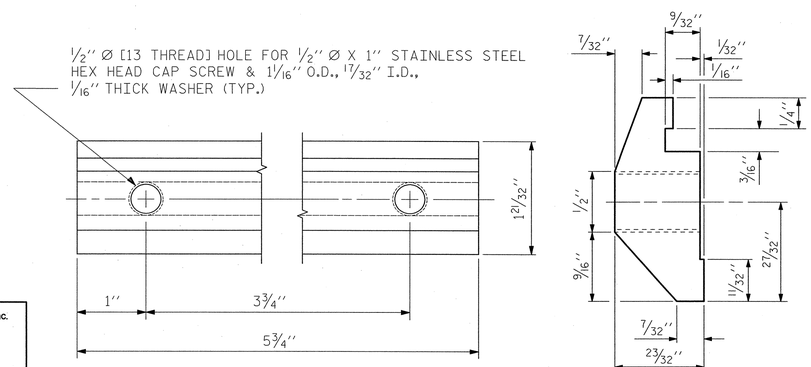
REAR PLATE

SHIM DETAILS

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

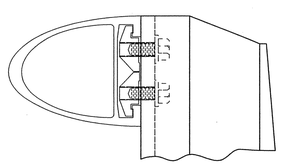


RAIL SECTION

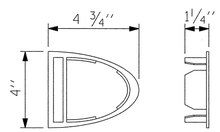


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S20
1			3			TOTAL SHEETS
2			4			72

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ASSEMBLED BY : J. L. HENNEKES	DATE : 02-16-12	
CHECKED BY : T. R. DUDECK	DATE : 02-16-12	
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

SEAL 13406 NORTH CAROLINA PROFESSIONAL ENGINEER JOSEPH T. KELVINGTON

STD. NO. BMR4

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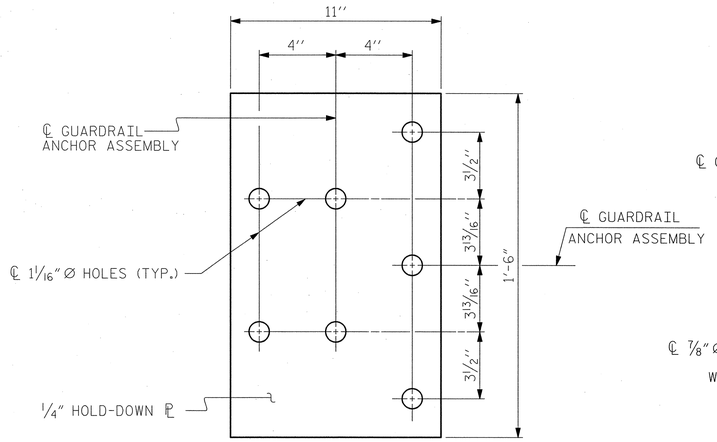

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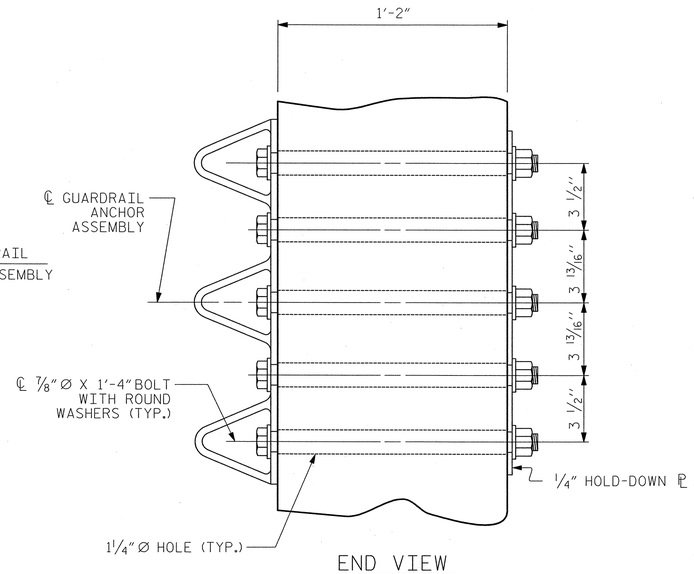


END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

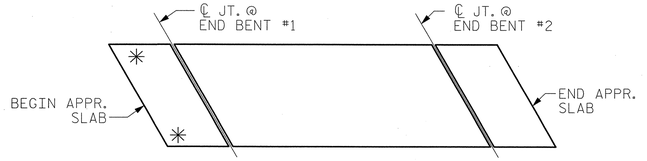
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

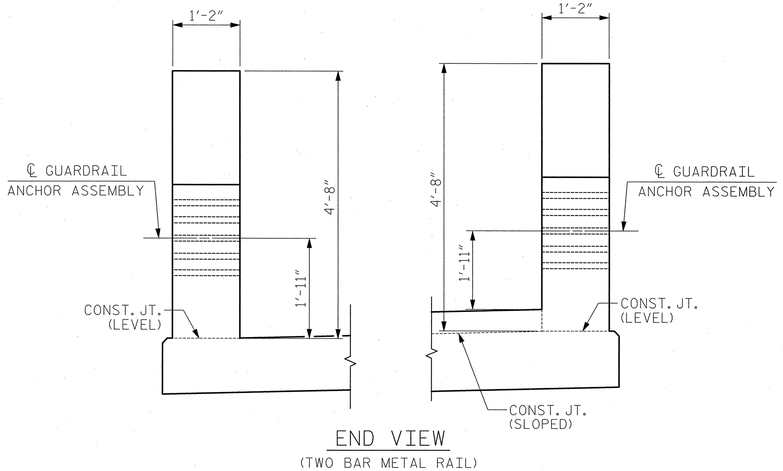
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

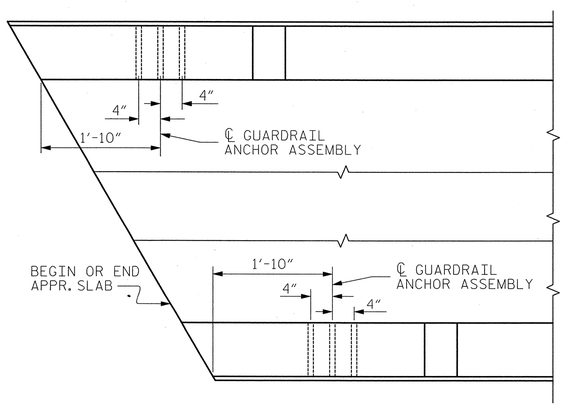


SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

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ASSEMBLED BY : J. L. HENNEKES	DATE : 02-16-12
CHECKED BY : T. R. DUDECK	DATE : 02-16-12
DRAWN BY : MAA 5/10	ADDED 5/6/10
CHECKED BY : GM 5/10	REV. 10/1/11 MAA/GM
	REV. 12/5/11 MAA/GM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

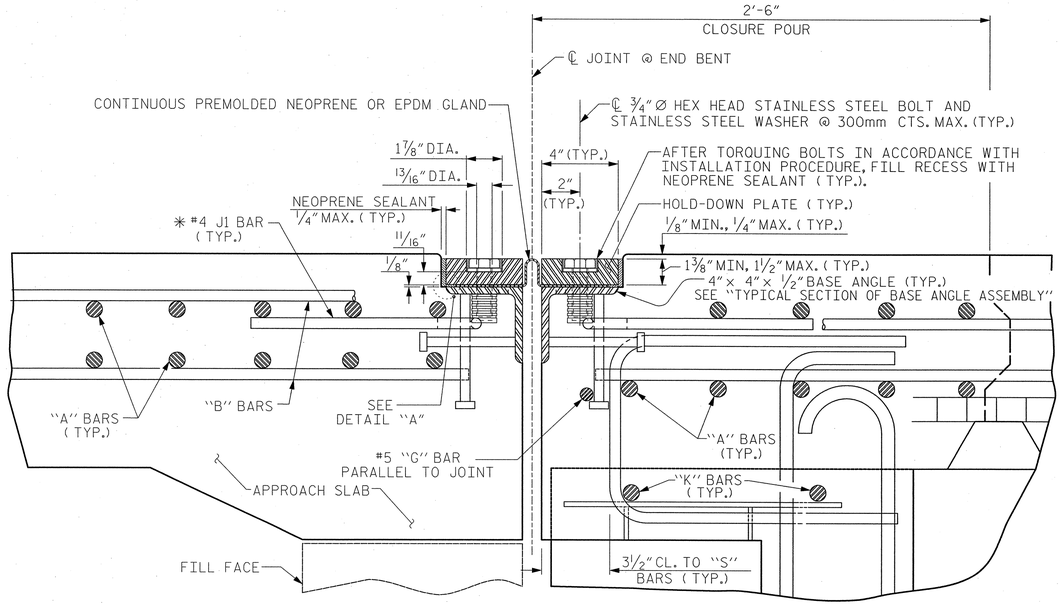
GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

(NBL)

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON
12/5/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S21
1			3			TOTAL SHEETS
2			4			72

STD. NO. GRA3



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

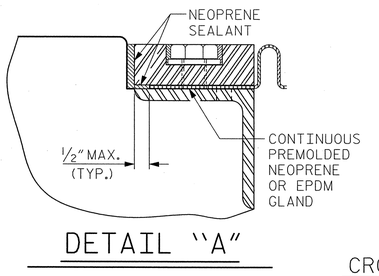
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

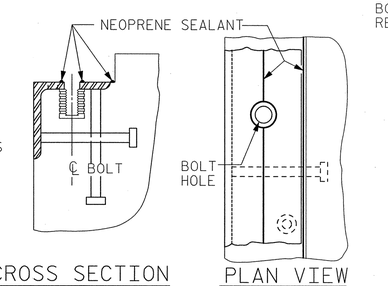
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4⅛" TO 4¼" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO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

GENERAL NOTES

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

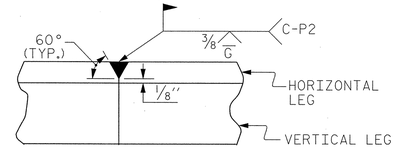


DETAIL "A"



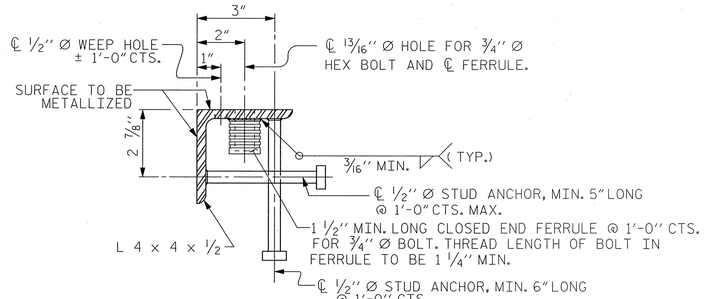
CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END 1 & 2	53.05°	⅞"	1 7/16"	1 5/16"	1⅛"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S22
1			3			TOTAL SHEETS
2			4			72

STD. NO. EJS1

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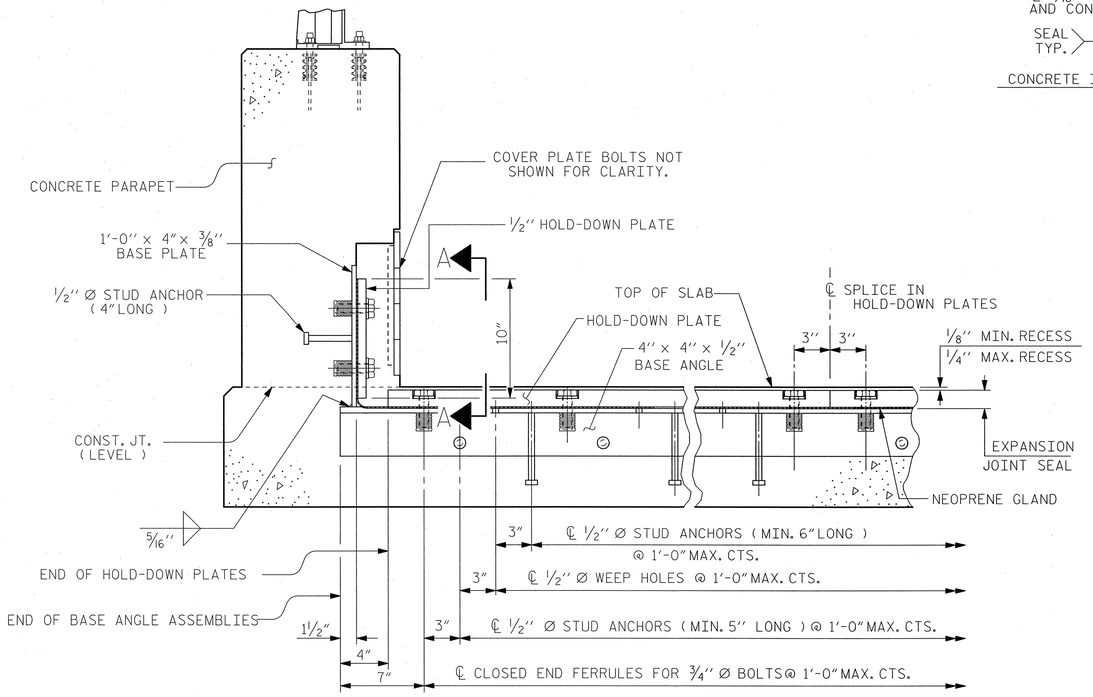
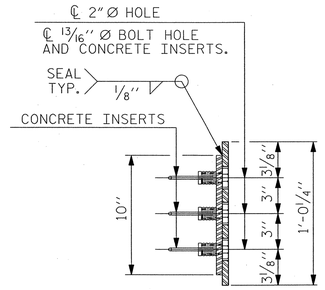
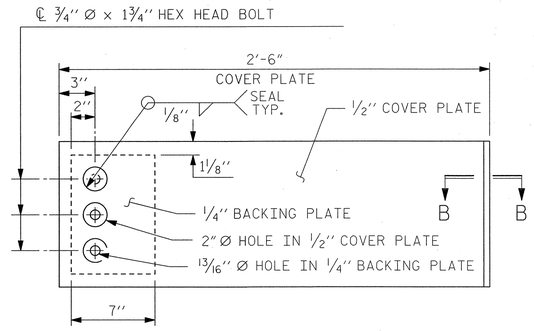
ASSEMBLED BY : J. B. GEILE	DATE : 02-16-12	
CHECKED BY : S. S. YUEN	DATE : 02-16-12	
DRAWN BY : REK 9/87	REV. 5/7/03R	RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R	TLA/GM
	REV. 10/1/11	MAA/GM



SECTION THRU PARAPET NORMAL TO JOINT

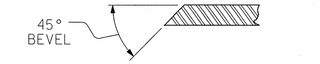


END VIEW

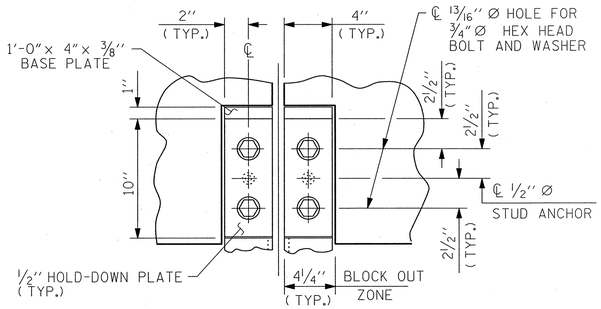


TYPE I ELEVATION VIEW

COVER PLATE DETAILS

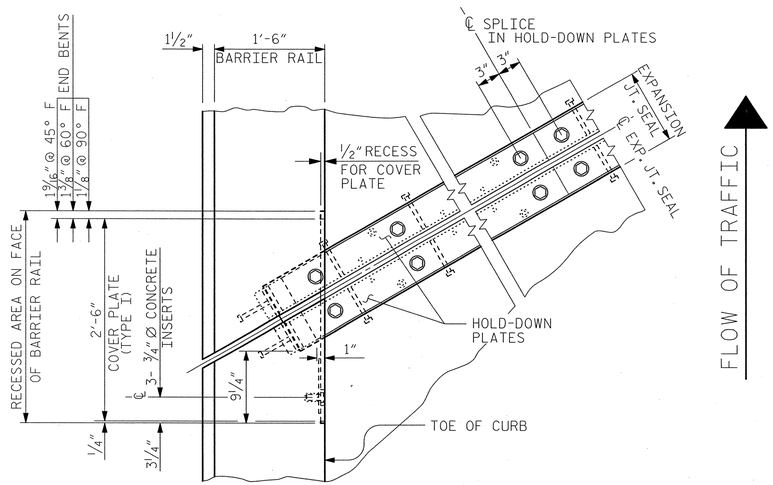


SECTION B - B

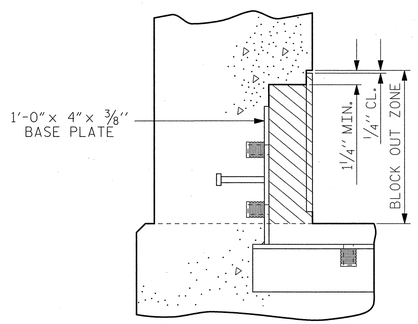


SECTION A - A

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

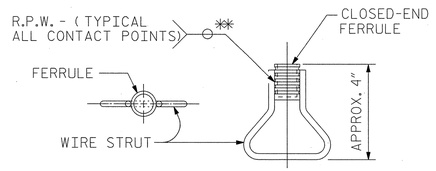


PLAN OF EXPANSION JOINT SEAL



BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR CONCRETE PARAPET

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S23
1			3			TOTAL SHEETS
2			4			72

ASSEMBLED BY : J.L. HENNEKES DATE : 02-16-2012
CHECKED BY : S.S. YUEN DATE : 02-16-2012

DRAWN BY : MAA 2/12
CHECKED BY : GM 2/12

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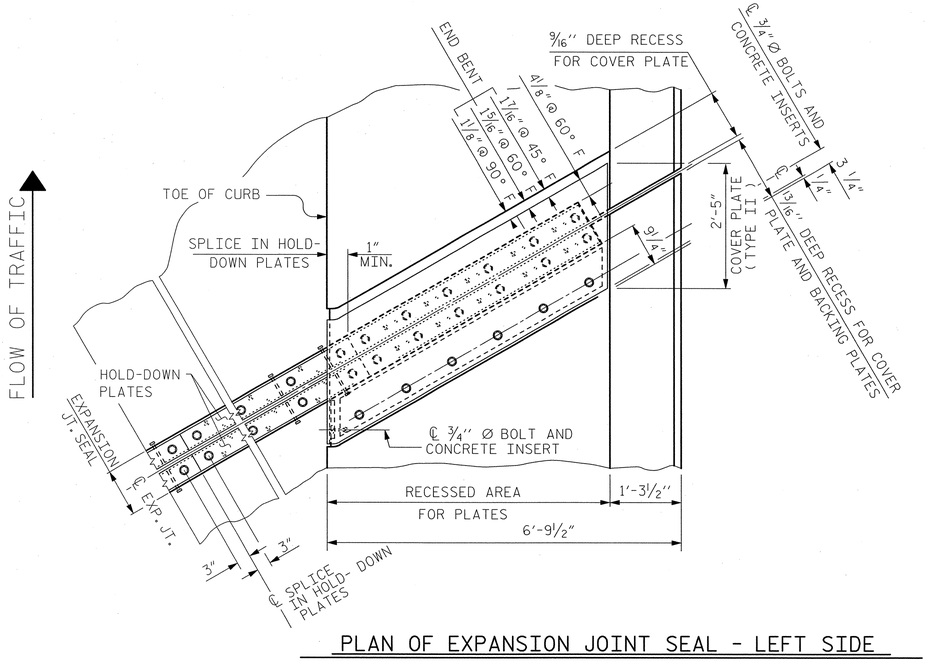
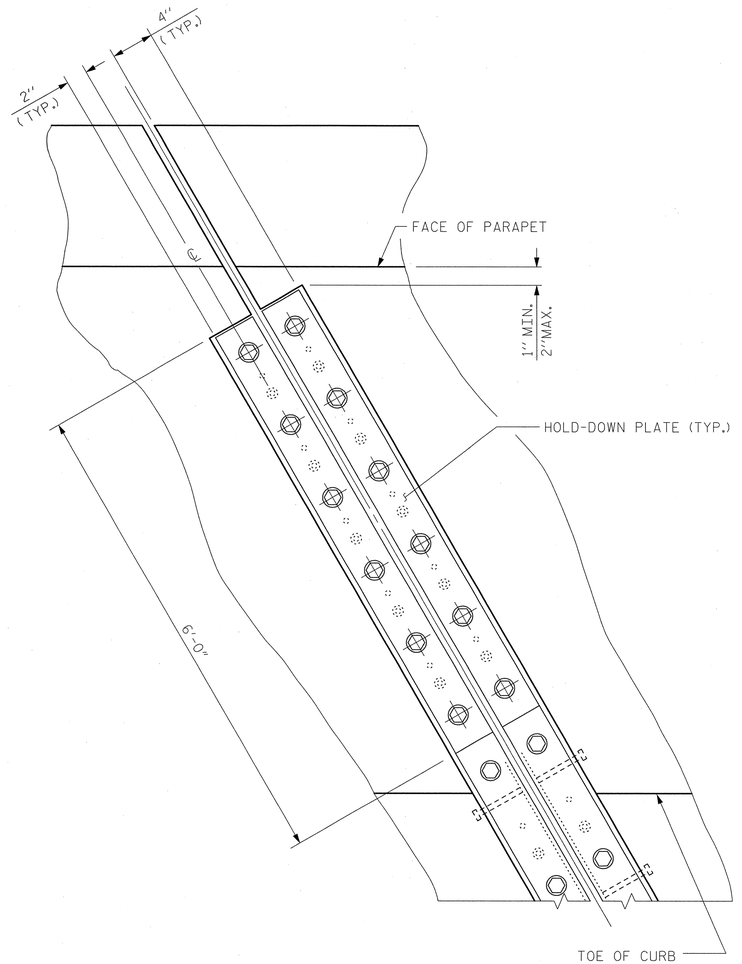
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T KELVINGTON 9/12

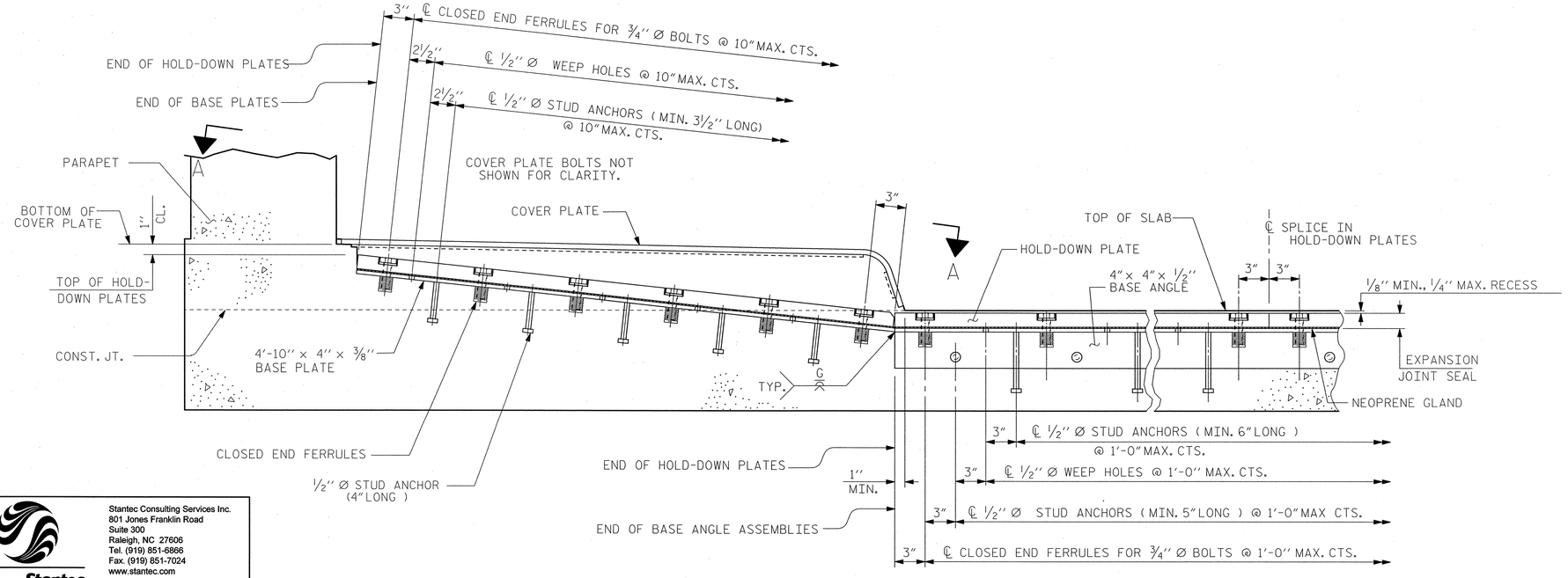
STD. NO. EJS5 SHT 3b



PLAN OF EXPANSION JOINT SEAL - LEFT SIDE



SECTION A - A



SECTION THRU SIDEWALK NORMAL TO JOINT

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

(NBL)

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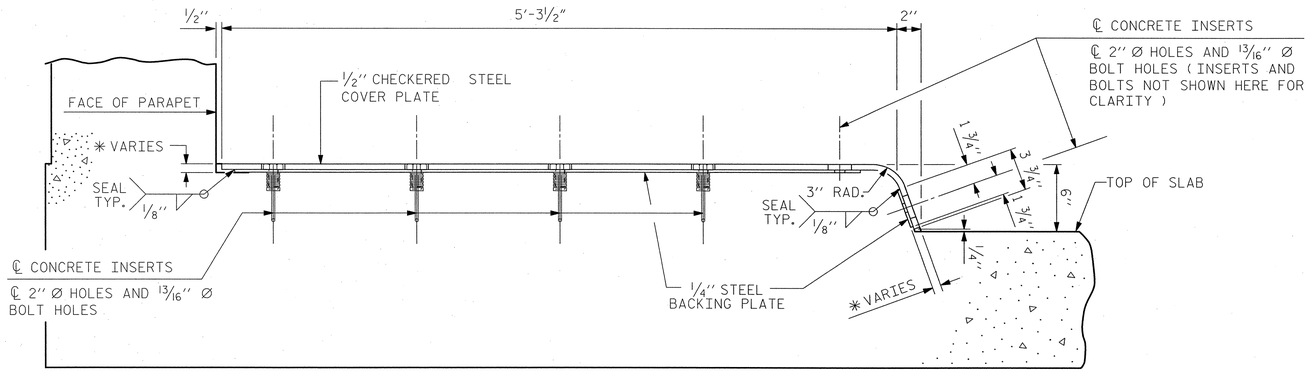
ASSEMBLED BY :	J. B. GEILE	DATE :	02-16-12
CHECKED BY :	S. S. YUEN	DATE :	02-16-12
DRAWN BY : REK 10/87	REV. 2/6/97		EEM/RGW
CHECKED BY : CRK 1/88	REV. 5/1/06		TLA/GM
	REV. 10/1/11		MAA/GM

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

SHEET NO. S24

TOTAL SHEETS 72

STD. NO. EJS3 SHT 3a



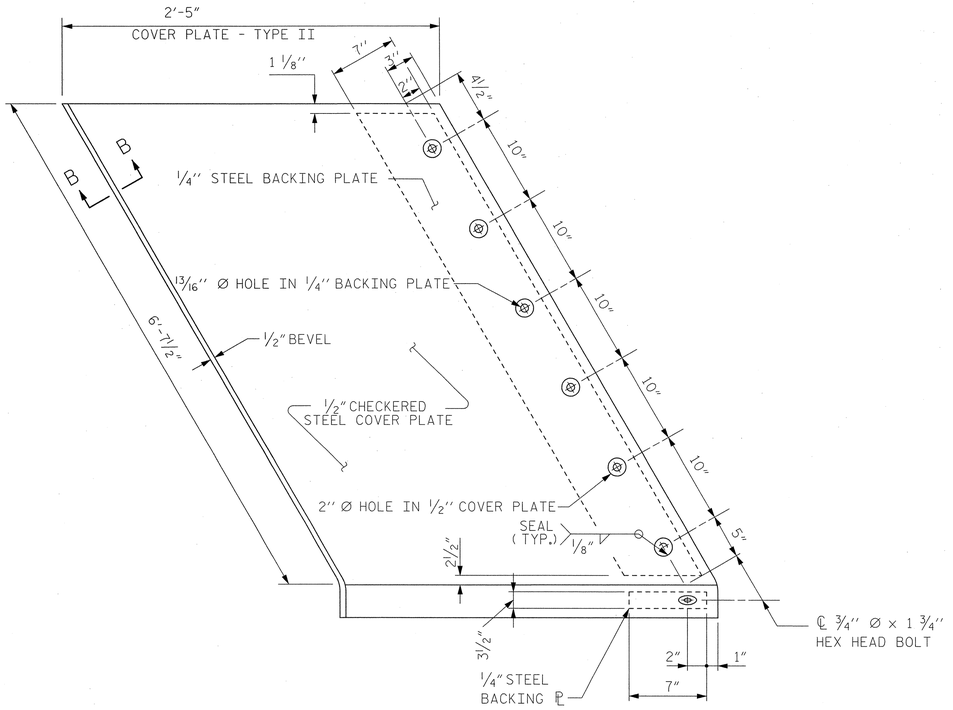
END VIEW

(NORMAL TO SIDEWALK)

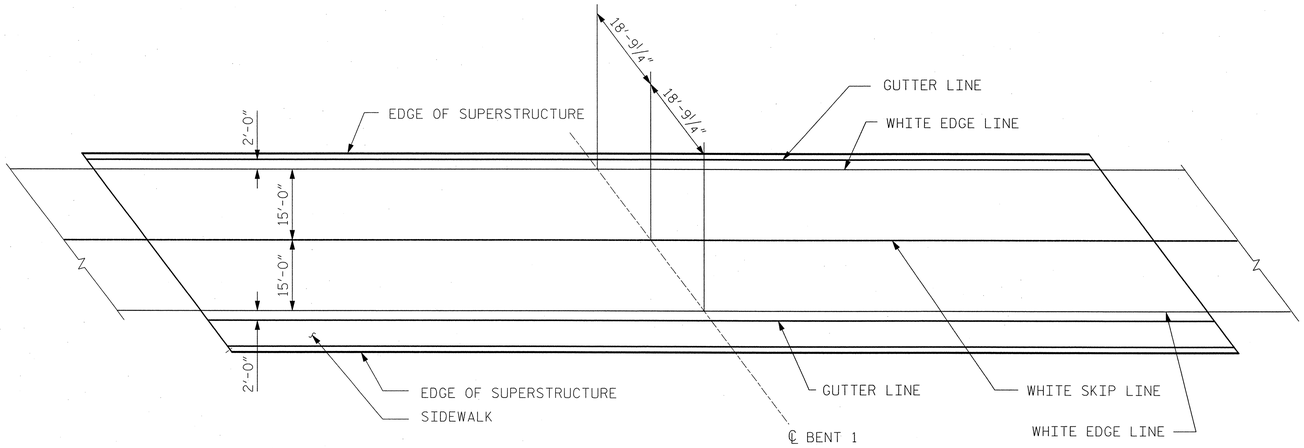
* CONCRETE RECESS DIMENSIONS:

13/16'' FOR THE SIDE OF THE JOINT HAVING THE 1/2'' COVER PLATE WITH A 1/4'' BACKING PLATE.

9/16'' FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2'' COVER PLATE.



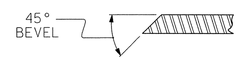
SIDEWALK COVERPLATE DETAIL-TYPE II



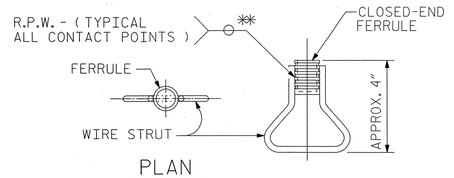
PAVEMENT MARKING ALIGNMENT

TYPE II - PLAN VIEW

COVER PLATE DETAILS



SECTION B - B

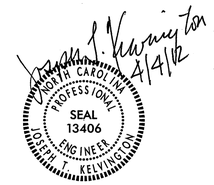


PLAN

ELEVATION

CONCRETE INSERT

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



PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR SIDEWALK

(NBL)

REVISIONS						SHEET NO.
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STD. NO. EJS4

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ASSEMBLED BY : J. B. GEILE	DATE : 02-16-12		
CHECKED BY : S. S. YUEN	DATE : 02-16-12		
DRAWN BY : REK 10/87	REV. 10/17/00	RWW/LES	
CHECKED BY : CRK 1/88	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	6	6	STR.	16′-3″	146
✳ A101	311	5	STR.	41′-9″	13543
✳ A102	2	5	STR.	41′-1″	86
✳ A103	2	5	STR.	40′-4″	84
✳ A104	2	5	STR.	39′-7″	83
✳ A105	2	5	STR.	38′-9″	81
✳ A106	2	5	STR.	38′-0″	79
✳ A107	2	5	STR.	37′-3″	78
✳ A108	2	5	STR.	36′-6″	76
✳ A109	2	5	STR.	35′-8″	74
✳ A110	2	5	STR.	34′-11″	73
✳ A111	2	5	STR.	34′-2″	71
✳ A112	2	5	STR.	33′-4″	70
✳ A113	2	5	STR.	32′-7″	68
✳ A114	2	5	STR.	31′-10″	66
✳ A115	2	5	STR.	31′-0″	65
✳ A116	2	5	STR.	30′-3″	63
✳ A117	2	5	STR.	29′-6″	62
✳ A118	2	5	STR.	28′-9″	60
✳ A119	2	5	STR.	27′-11″	58
✳ A120	2	5	STR.	27′-2″	57
✳ A121	2	5	STR.	26′-5″	55
✳ A122	2	5	STR.	25′-7″	53
✳ A123	2	5	STR.	24′-10″	52
✳ A124	2	5	STR.	24′-1″	50
✳ A125	2	5	STR.	23′-3″	48
✳ A126	2	5	STR.	22′-6″	47
✳ A127	2	5	STR.	21′-9″	45
✳ A128	2	5	STR.	20′-11″	44
✳ A129	2	5	STR.	20′-2″	42
✳ A130	2	5	STR.	19′-5″	41
✳ A131	2	5	STR.	18′-8″	39
✳ A132	2	5	STR.	17′-10″	37
✳ A133	2	5	STR.	17′-1″	36
✳ A134	2	5	STR.	16′-4″	34
✳ A135	2	5	STR.	15′-6″	32

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A136	2	5	STR.	14′-9″	31
✳ A137	2	5	STR.	14′-0″	29
✳ A138	2	5	STR.	13′-2″	27
✳ A139	2	5	STR.	12′-5″	26
✳ A140	2	5	STR.	11′-8″	24
✳ A141	2	5	STR.	10′-10″	23
✳ A142	2	5	STR.	10′-1″	21
✳ A143	2	5	STR.	9′-4″	19
✳ A144	2	5	STR.	8′-7″	18
✳ A145	2	5	STR.	7′-9″	16
✳ A146	2	5	STR.	7′-0″	15
✳ A147	2	5	STR.	6′-3″	13
✳ A148	2	5	STR.	5′-5″	11
✳ A149	2	5	STR.	4′-8″	10
✳ A150	2	5	STR.	3′-11″	8
✳ A151	2	5	STR.	3′-1″	6
A201	311	5	STR.	41′-9″	13543
A202	2	5	STR.	41′-1″	86
A203	2	5	STR.	40′-3″	84
A204	2	5	STR.	39′-6″	82
A205	2	5	STR.	38′-9″	81
A206	2	5	STR.	37′-11″	79
A207	2	5	STR.	37′-2″	78
A208	2	5	STR.	36′-5″	76
A209	2	5	STR.	35′-7″	74
A210	2	5	STR.	34′-10″	73
A211	2	5	STR.	34′-1″	71
A212	2	5	STR.	33′-4″	70
A213	2	5	STR.	32′-6″	68
A214	2	5	STR.	31′-9″	66
A215	2	5	STR.	31′-0″	65
A216	2	5	STR.	30′-2″	63
A217	2	5	STR.	29′-5″	61
A218	2	5	STR.	28′-8″	60
A219	2	5	STR.	27′-10″	58
A220	2	5	STR.	27′-1″	56

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A221	2	5	STR.	26′-4″	55
A222	2	5	STR.	25′-6″	53
A223	2	5	STR.	24′-9″	52
A224	2	5	STR.	24′-0″	50
A225	2	5	STR.	23′-3″	48
A226	2	5	STR.	22′-5″	47
A227	2	5	STR.	21′-8″	45
A228	2	5	STR.	20′-11″	44
A229	2	5	STR.	20′-1″	42
A230	2	5	STR.	19′-4″	40
A231	2	5	STR.	18′-7″	39
A232	2	5	STR.	17′-9″	37
A233	2	5	STR.	17′-0″	35
A234	2	5	STR.	16′-3″	34
A235	2	5	STR.	15′-5″	32
A236	2	5	STR.	14′-8″	31
A237	2	5	STR.	13′-11″	29
A238	2	5	STR.	13′-2″	27
A239	2	5	STR.	12′-4″	26
A240	2	5	STR.	11′-7″	24
A241	2	5	STR.	10′-10″	23
A242	2	5	STR.	10′-0″	21
A243	2	5	STR.	9′-3″	19
A244	2	5	STR.	8′-6″	18
A245	2	5	STR.	7′-8″	16
A246	2	5	STR.	6′-11″	14
A247	2	5	STR.	6′-2″	13
A248	2	5	STR.	5′-4″	11
A249	2	5	STR.	4′-7″	10
A250	2	5	STR.	3′-10″	8
A251	2	5	STR.	3′-1″	6
✳ B1	150	5	STR.	44′-5″	6949
B2	170	5	STR.	44′-3″	7846
✳ B3	54	7	STR.	40′-0″	4415
✳ B4	48	4	STR.	28′-3″	906

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ G1	2	5	STR.	51′-11″	108
✳ G2	214	4	STR.	5′-0″	714
✳ J1	100	4	8	1′-5″	95
✳ K1	8	8	1	15′-0″	320
✳ K2	12	8	2	21′-2″	678
✳ K3	24	6	STR.	6′-8″	240
K4	24	4	STR.	5′-9″	92
K5	32	4	STR.	9′-7″	205
K6	8	5	STR.	22′-0″	184
S1	40	4	7	10′-2″	272
S2	184	4	6	3′-7″	440
✳ S3	48	4	5	5′-1″	163
✳ S4	48	5	3	6′-2″	309
U1	24	4	4	14′-11″	239
✳ U2	60	4	5	3′-0″	134

✳ = EPOXY COATED REINF. STEEL

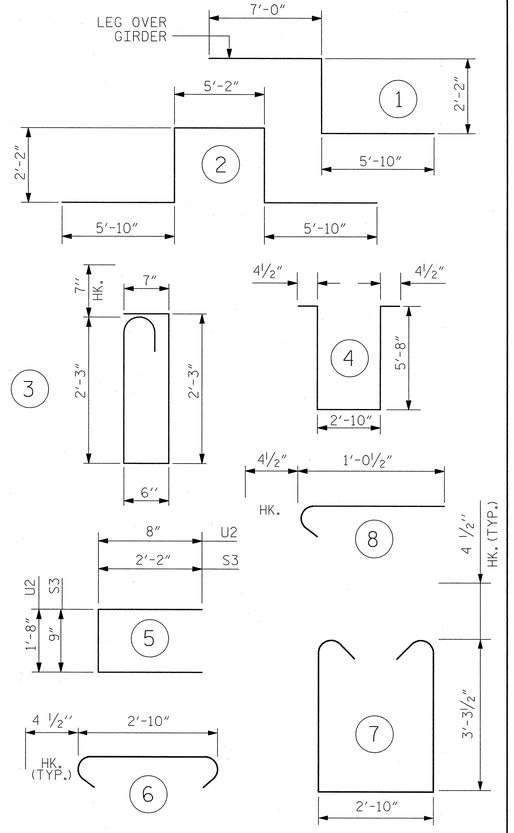
SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS

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″			

CLASS AA CONC. BREAKDOWN

POUR 1 135.0 C.Y.
POUR 2 178.0 C.Y.
SIDEWALK 26.6 C.Y.
TOTAL CLASS AA CONC. 339.6 C.Y.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

SPANS	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
"A" AND "B"	339.6	25,121	31,026
TOTALS✳✳	339.6	25,121	31,026

✳✳ QUANTITIES FOR CONCRETE PARAPET ARE NOT INCLUDED

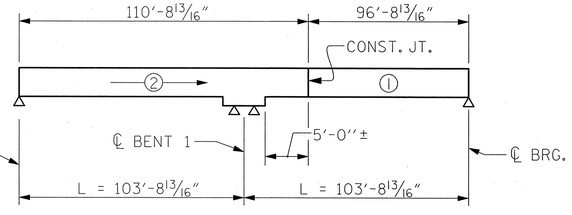
GROOVING BRIDGE FLOORS

APPROACH SLABS	1454 SQ.FT.
BRIDGE DECK	6554 SQ.FT.
TOTAL	8008 SQ.FT.

KEY

(#) = INDICATES POUR NUMBER AND DIRECTION OF POUR

L = LENGTH OF EACH SPAN

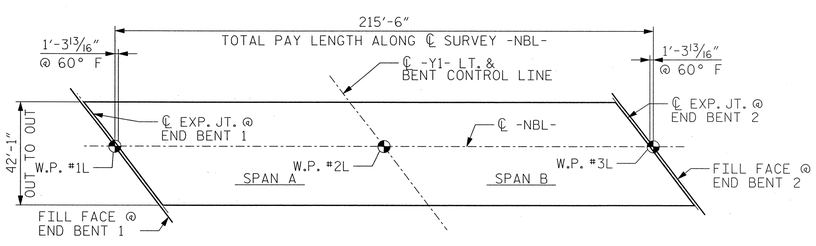


2 SPANS

POURING SEQUENCE-PRESTRESSED CONCRETE SUPERSTRUCTURE

(CONTINUOUS FOR LIVE LOAD)

(FOR "OPTIONAL POURING SEQUENCE", SEE SHEET S7)



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB

(SQ. FT. = 8958)

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ASSEMBLED BY : JBG	DATE : 2/12	
CHECKED BY : JTK	DATE : 2/12	
DRAWN BY : JMB 5/87	REV. 8/16/99	RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

JOSEPH T. KELVINGTON — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13406 — 4/25/12

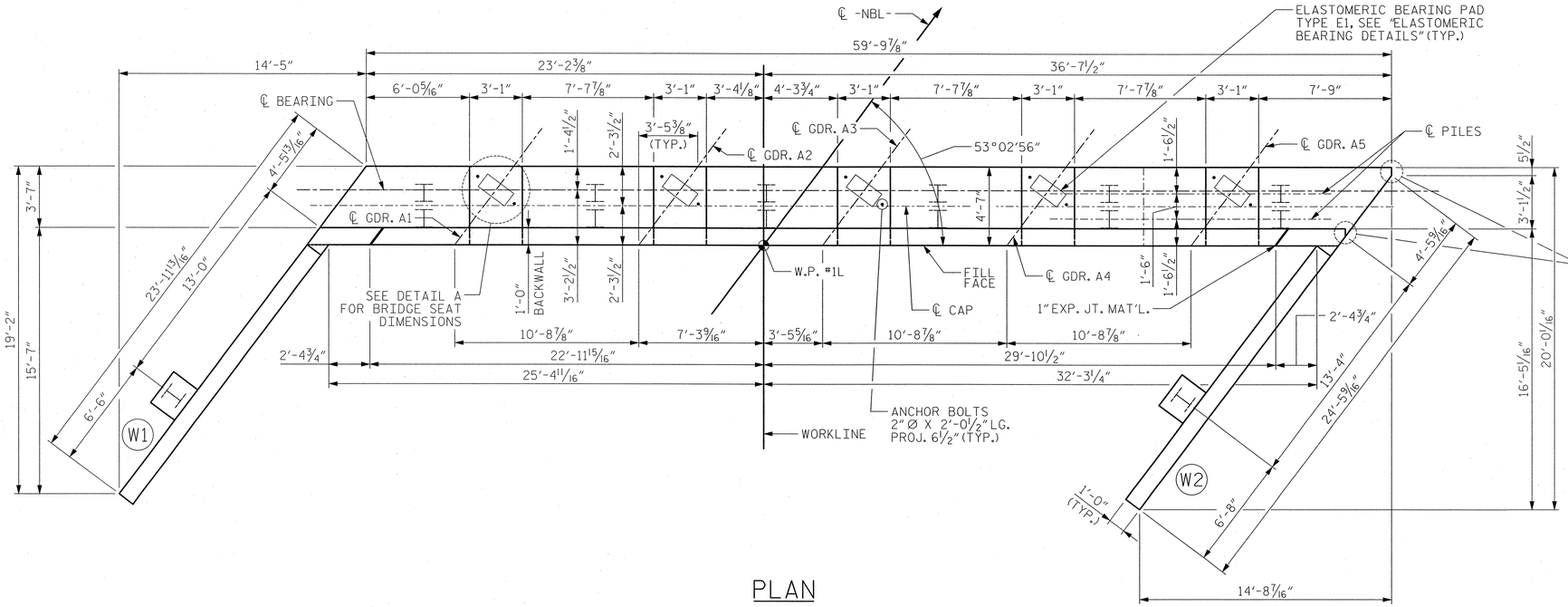
PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE BILL OF MATERIAL
(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S26
1			3			TOTAL SHEETS
2			4			72

STD. NO. BOM2



PLAN

NOTES

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

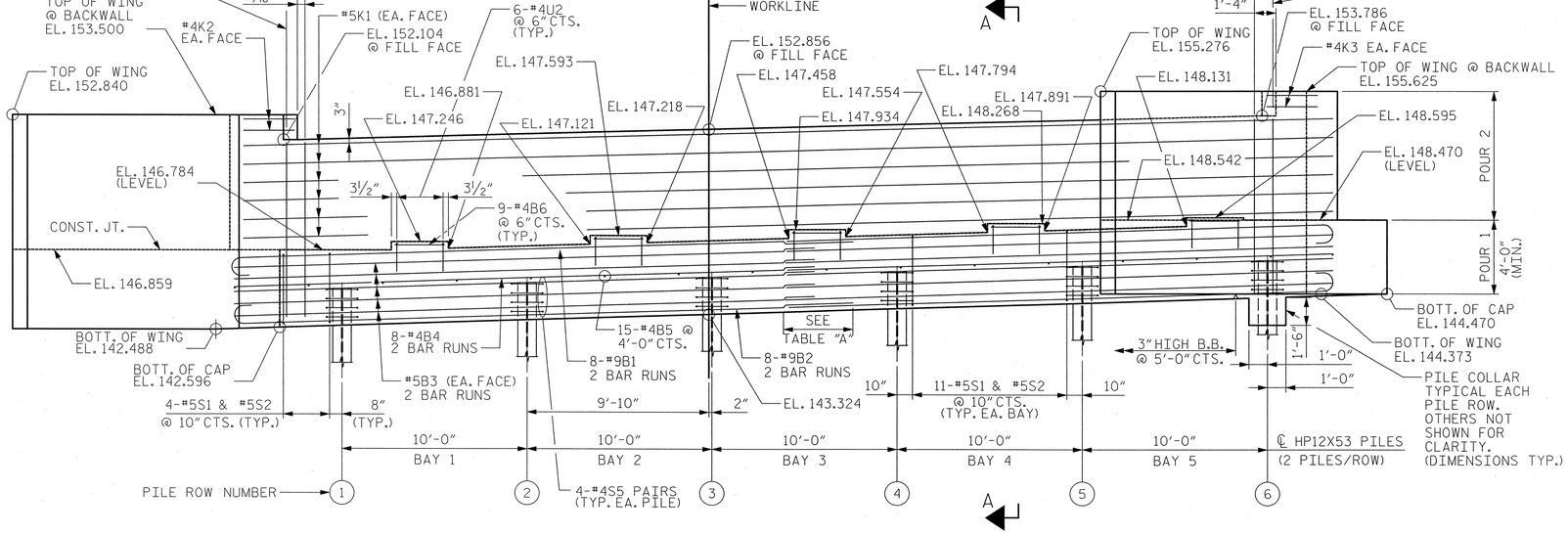
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

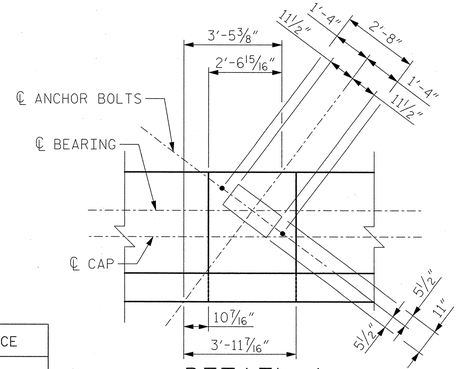
FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS BUILD-UPS, SEE SECTION A-A, SHEET 3 OF 3.

FOR GALVANIZED REINFORCING STRAPS, SEE MSE WALL PLANS.



ELEVATION

NOTE: WING WALL PILES NOT SHOWN FOR CLARITY



DETAIL A

BAR	MIN. SPLICE
#5B3	3'-0"
#4B4	2'-5"
#9B1	8'-9"
#9B2	6'-3"

TABLE "A"

END BENT 1	
PILE	ELEVATION
1	144.701
2	145.014
3	145.328
4	145.641
5	145.954
6	146.268

TOP OF PILE ELEVATIONS

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S27
1			3			TOTAL SHEETS
2			4			72

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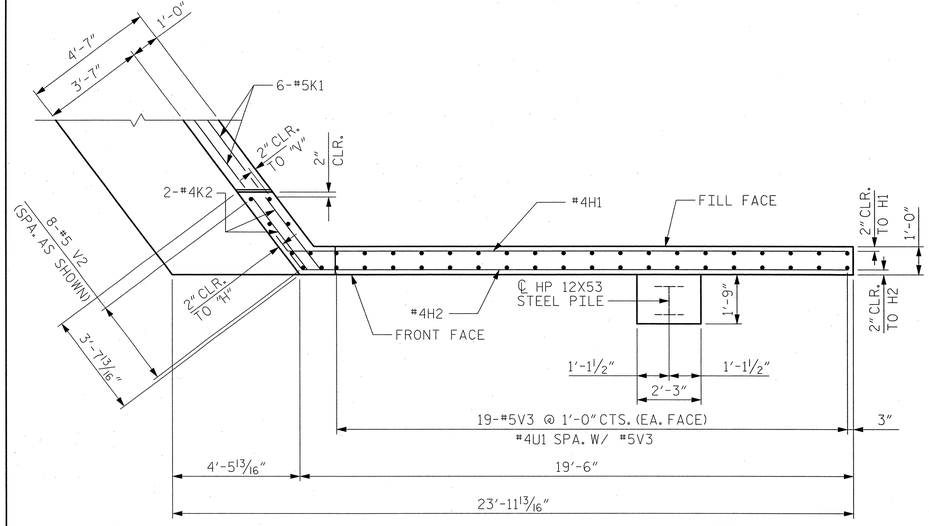
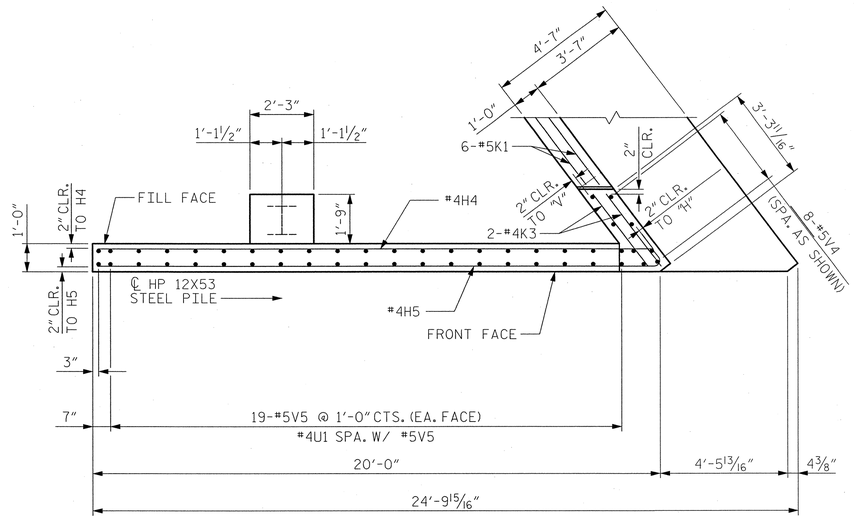
DRAWN BY : B. J. ELLIOT DATE : 02-16-12
CHECKED BY : T. R. DUDECK DATE : 02-16-12

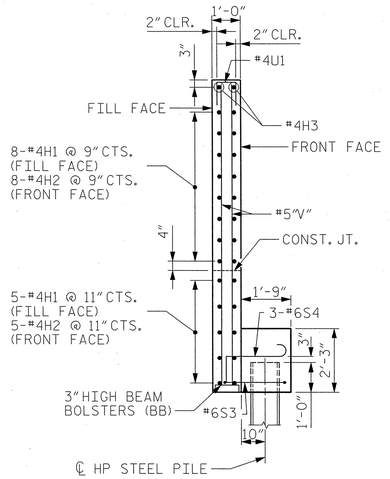
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 2/14/12



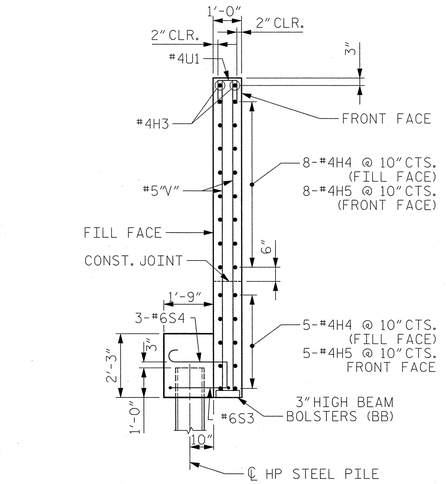
PLAN OF LEFT WING (W1)



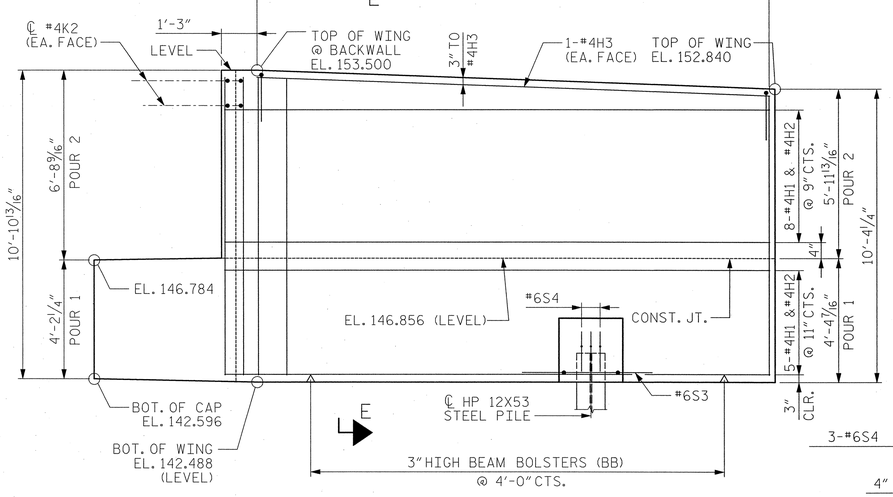
PLAN OF RIGHT WING (W2)



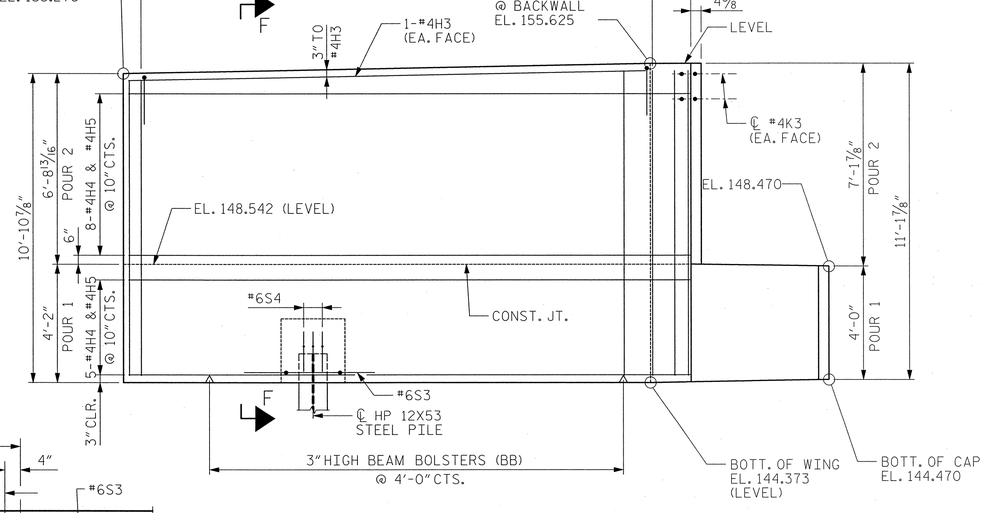
SECTION E-E



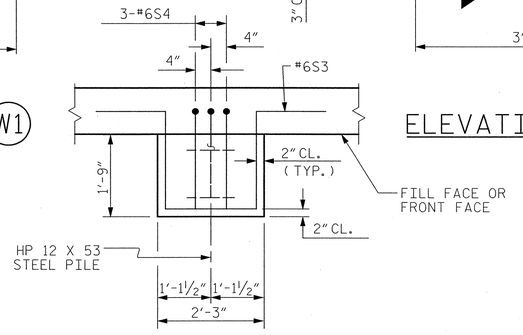
SECTION F-F



ELEVATION OF LEFT WING (W1)



ELEVATION OF RIGHT WING (W2)



WING WALL PILE DETAIL

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CHECKED BY : T. R. DUDECK DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH W. KELVINGTON 4/4/12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

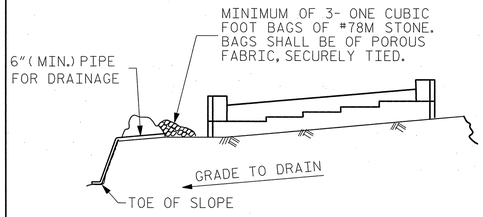
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S28
1			3			TOTAL SHEETS
2			4			72

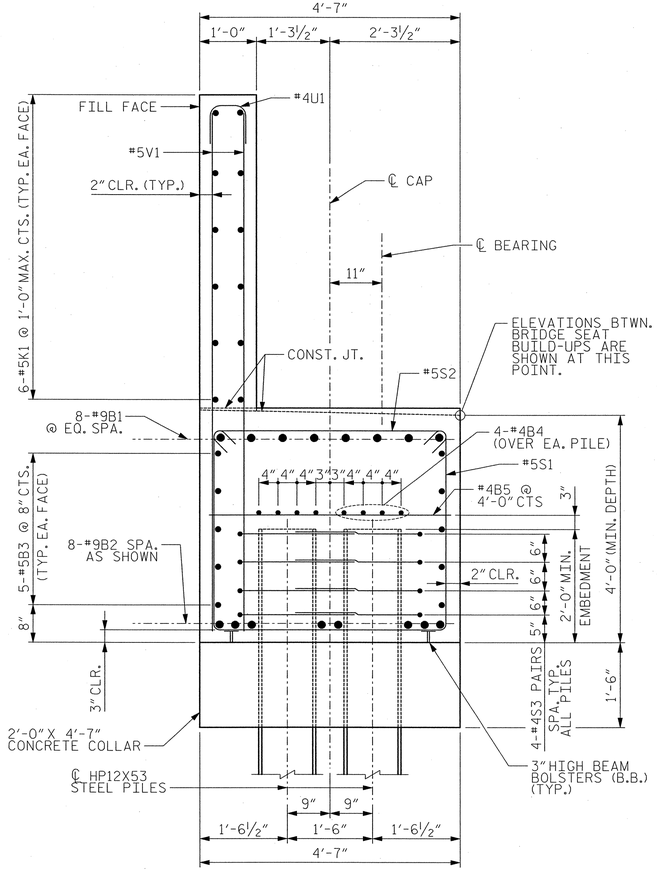


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

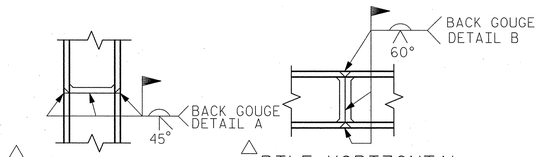
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

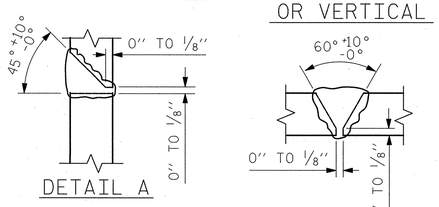


SECTION A-A



△ PILE VERTICAL

△ PILE HORIZONTAL OR VERTICAL



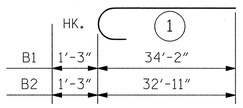
DETAIL A

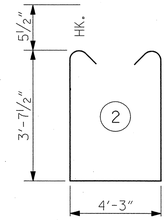
DETAIL B

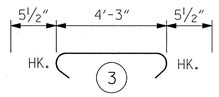
△ POSITION OF PILE DURING WELDING.

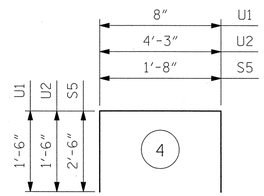
PILE SPLICE DETAILS

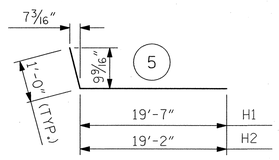
BAR TYPES

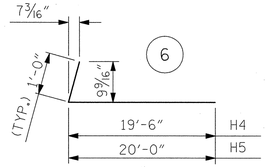


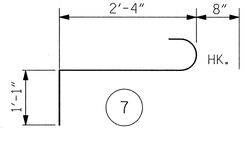


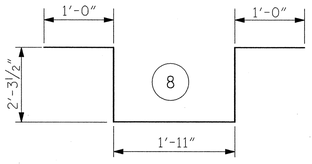




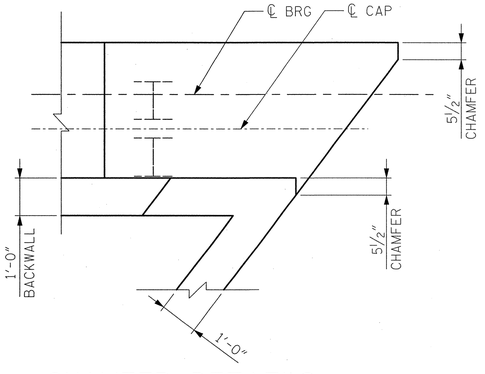








ALL BAR DIMENSIONS ARE OUT TO OUT.



CHAMFER DETAILS

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	9	1	35'- 5"	1927
B2	16	9	1	34'- 2"	1859
B3	20	5	STR.	31'- 3"	652
B4	16	4	STR.	30'- 8"	328
B5	15	4	STR.	4'- 3"	43
B6	30	4	STR.	2'- 9"	55
H1	12	4	5	20'- 7"	165
H2	12	4	5	20'- 2"	162
H3	4	4	STR.	19'- 3"	51
H4	13	4	6	20'- 6"	178
H5	13	4	6	21'- 0"	182
K1	12	5	STR.	59'- 3"	742
K2	4	4	STR.	3'- 2"	8
K3	4	4	STR.	3'- 1"	8
S1	63	5	2	12'- 5"	816
S2	63	5	3	5'- 2"	339
S3	4	6	8	8'- 6"	51
S4	12	6	7	4'- 1"	74
S5	48	4	4	6'- 8"	214
U1	90	4	4	3'- 8"	220
U2	30	4	4	7'- 3"	145
V1	106	5	STR.	9'- 2"	1013
V2	8	5	STR.	10'- 6"	88
V3	38	5	STR.	10'- 0"	396
V4	8	5	STR.	11'- 0"	92
V5	38	5	STR.	10'- 7"	419

REINFORCING STEEL	LBS	10,227
CLASS A CONCRETE BREAKDOWN		
POUR 1 -		
(CAP & BOT. WINGS)	C.Y.	52.3
POUR 2 -		
(BACKWALL & TOP OF WINGS)	C.Y.	22.0
CLASS A CONCRETE TOTAL	C.Y.	74.3
HP12X53 PILES		
NO. 12	FEET	900

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

(NBL)

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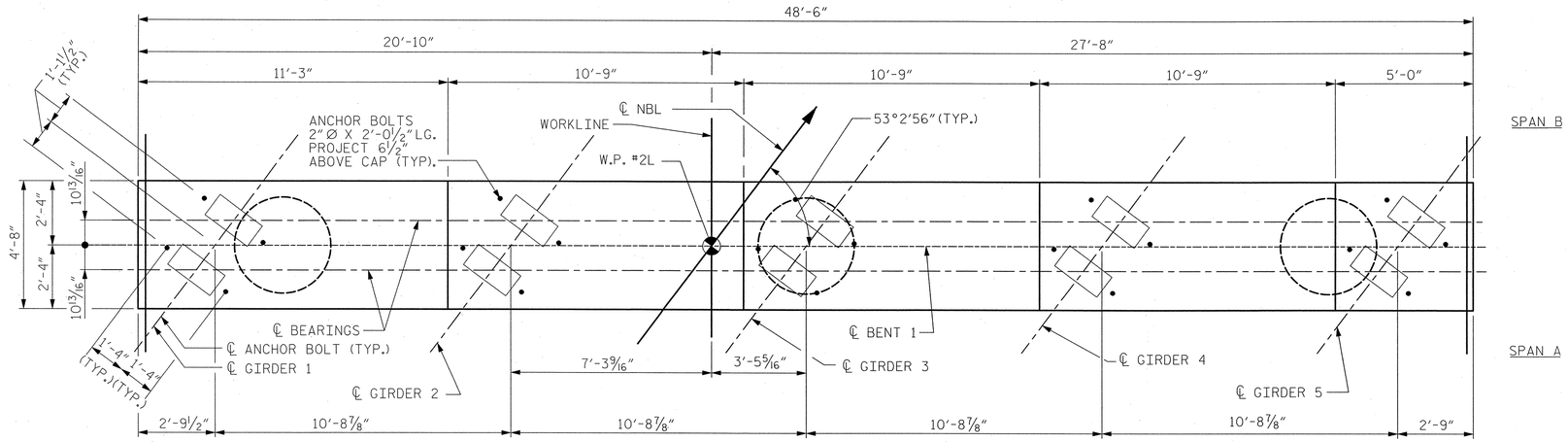
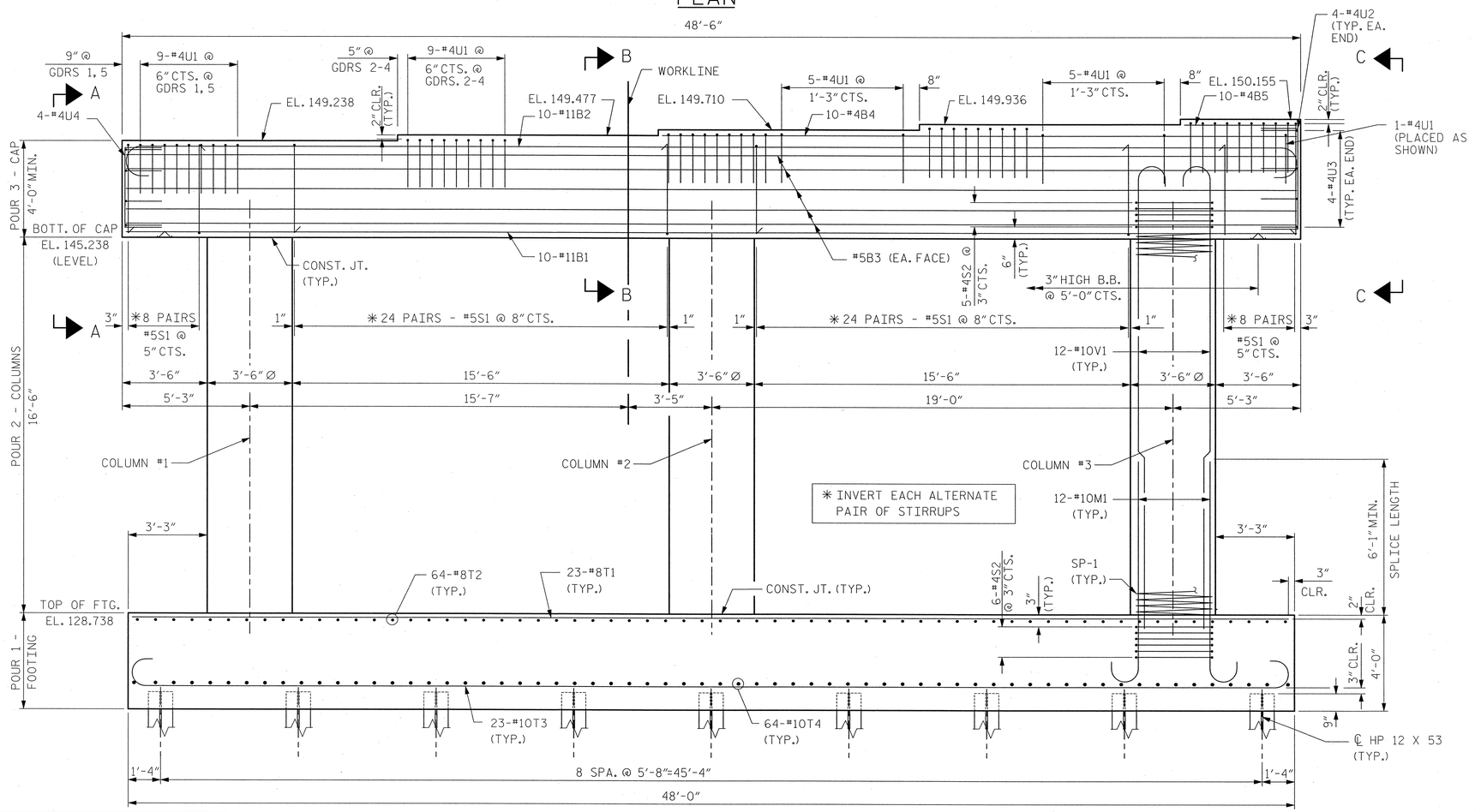
CHECKED BY : T. R. DUDECK DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JEFFERY T. KELVINGTON 4/4/12



PLAN



ELEVATION

NOTES:

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

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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1

(NBL)

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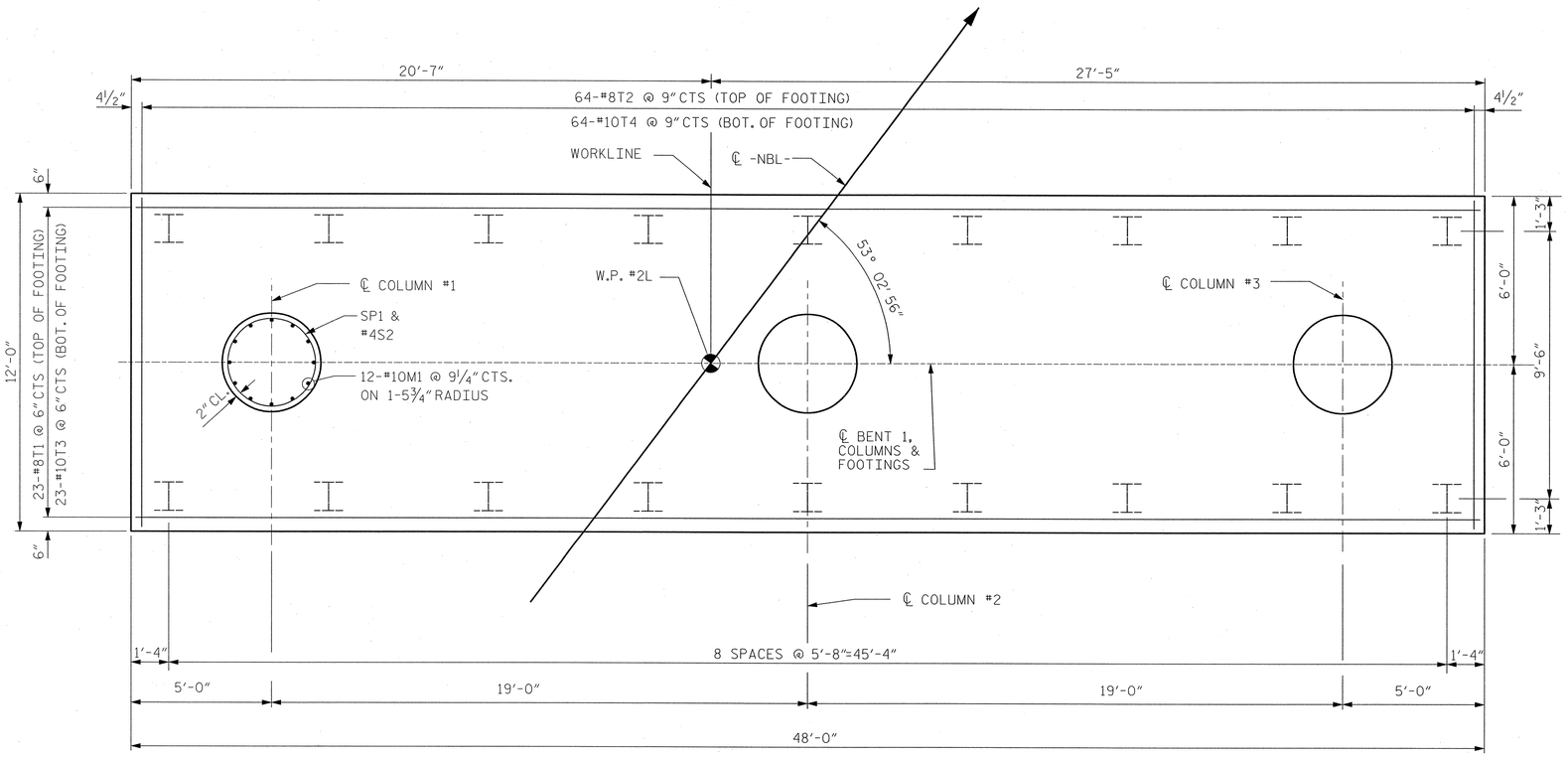
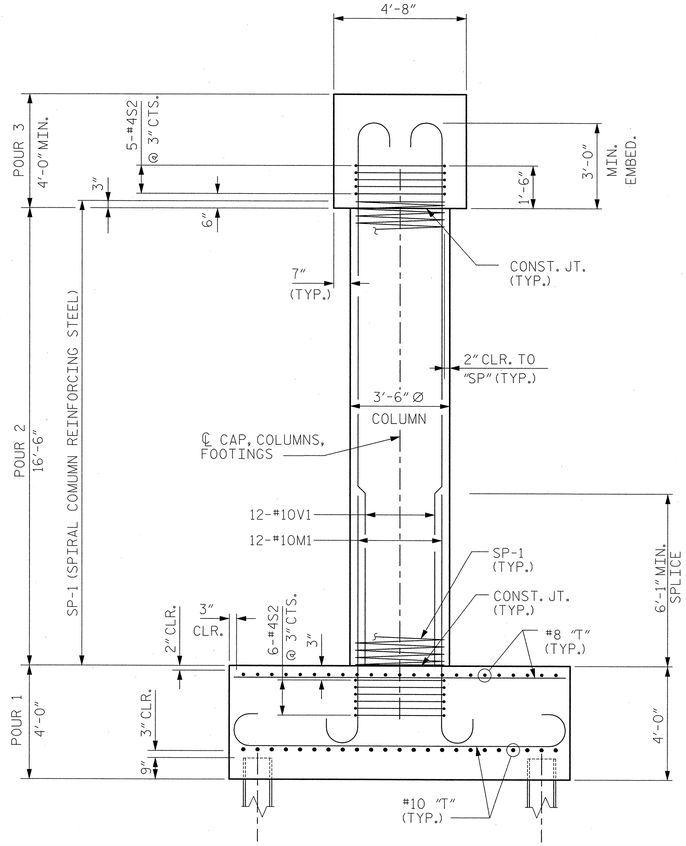
JOSEPH KELVINGTON NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER 4/9/12





PLAN OF FOOTING

FOR PLACEMENT OF "M" BARS IN
FOOTING, SEE SECTION THRU COLUMN

#4#4S2, SP-1 & M1 DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN.

END ELEVATION

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1

(NBL)

REVISIONS						SHEET NO.
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NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/12

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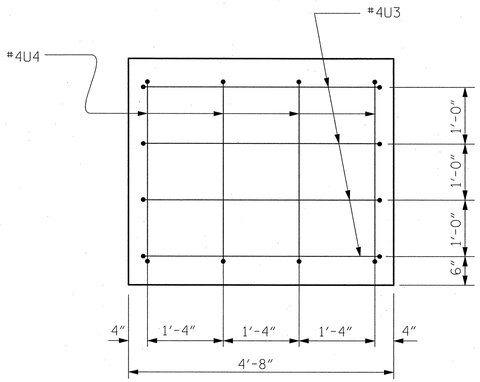
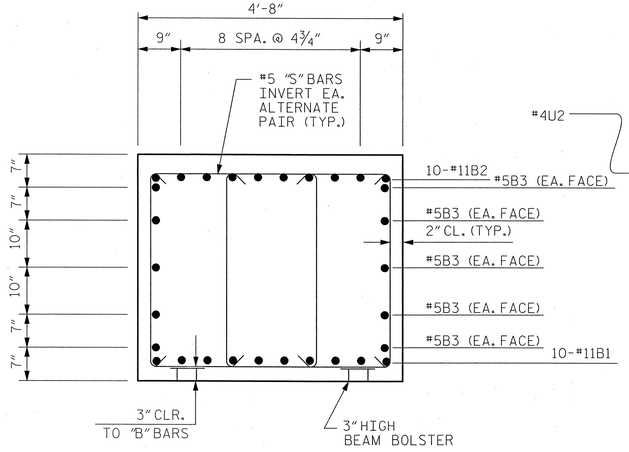


SECTION A-A



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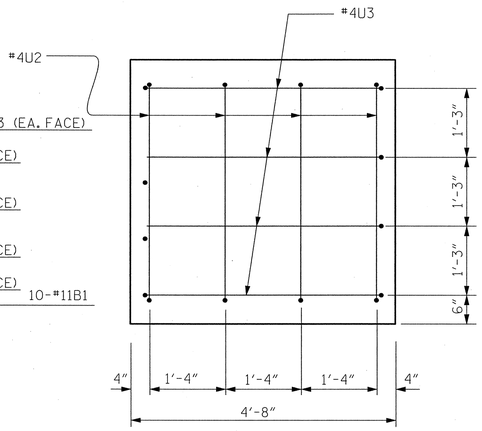

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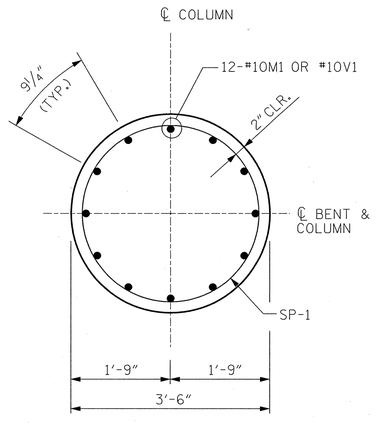
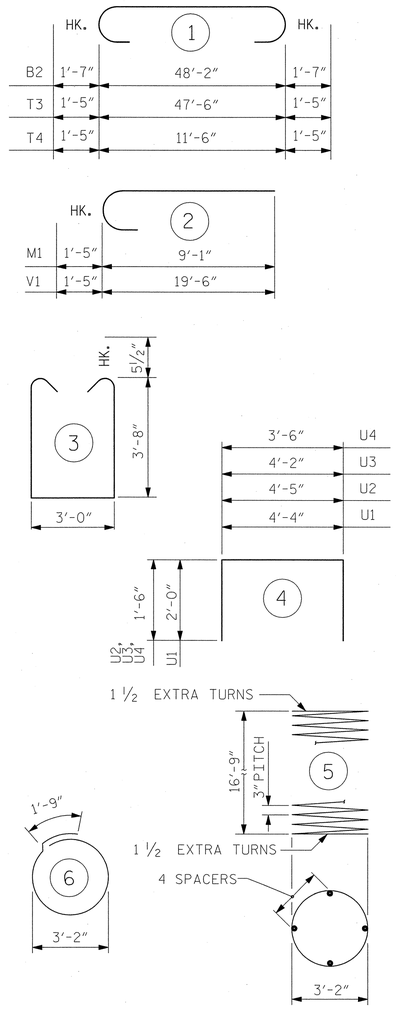


SECTION THRU COLUMN
TYPICAL ALL COLUMNS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	STR	48'-2"	2559
B2	10	#11	1	51'-4"	2727
B3	10	#5	STR	48'-2"	502
B4	10	#4	STR	26'-2"	175
B5	10	#4	STR	4'-8"	31
M1	36	#10	2	10'-6"	1627
S1	128	#5	3	11'-3"	1502
S2	33	#4	6	11'-9"	259
T1	23	#8	STR	47'-6"	2917
T2	64	#8	STR	11'-6"	1965
T3	23	#10	1	50'-4"	4981
T4	64	#10	1	14'-4"	3947
U1	56	#4	4	8'-4"	312
U2	4	#4	4	7'-5"	20
U3	8	#4	4	7'-2"	38
U4	4	#4	4	6'-6"	17
V1	36	#10	2	20'-11"	3240
REINFORCING STEEL				LBS.	26819
SP-1	3	**	5	687'-6"	1378
SPIRAL COLUMN					
REINFORCING STEEL				LBS.	1378
CLASS A CONCRETE BREAKDOWN					
POUR #1 FOOTINGS				C.Y.	85.3
POUR #2 COLUMNS				C.Y.	17.6
POUR #3 CAP				C.Y.	36.9
TOTAL				C.Y.	139.8
HP 12 X 53 STEEL PILES					
NO. 18				FT.	1350
FOUNDATION EXCAVATION				LUMP SUM	

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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1

(NBL)

REVISIONS						SHEET NO.
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2			4			72

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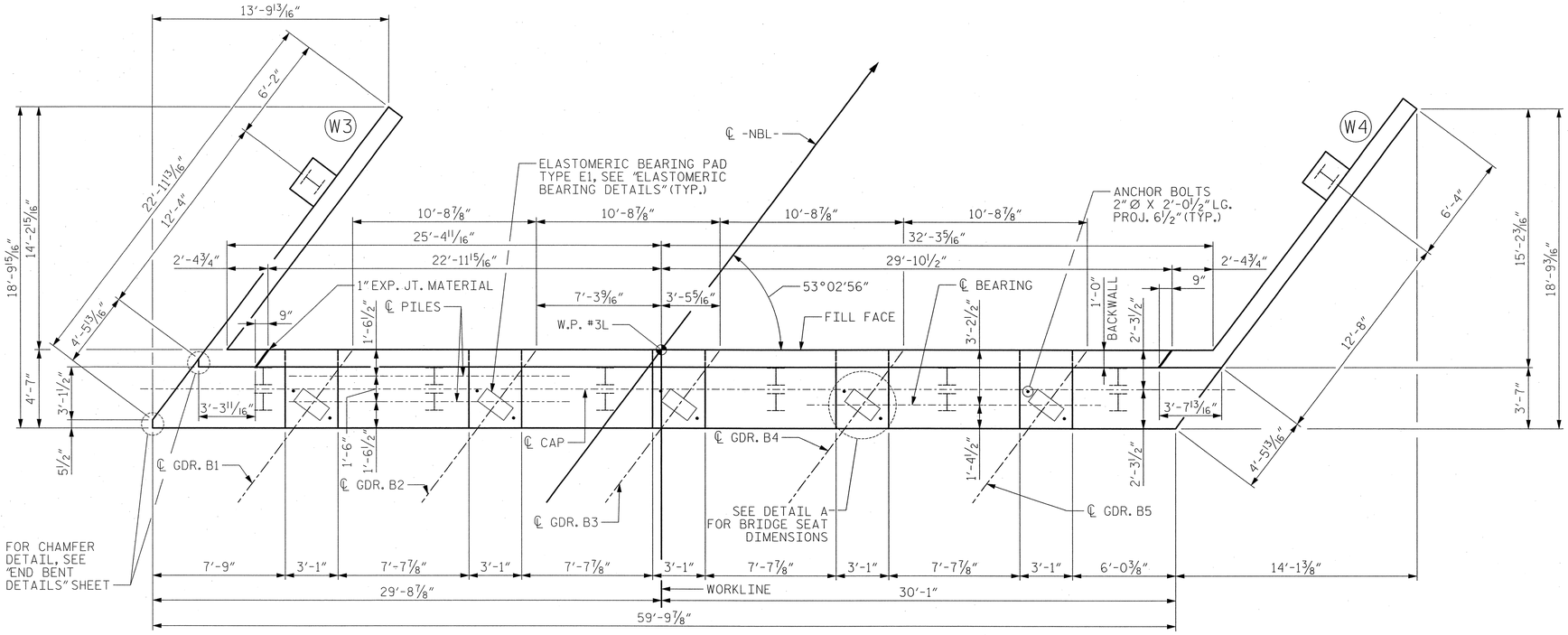
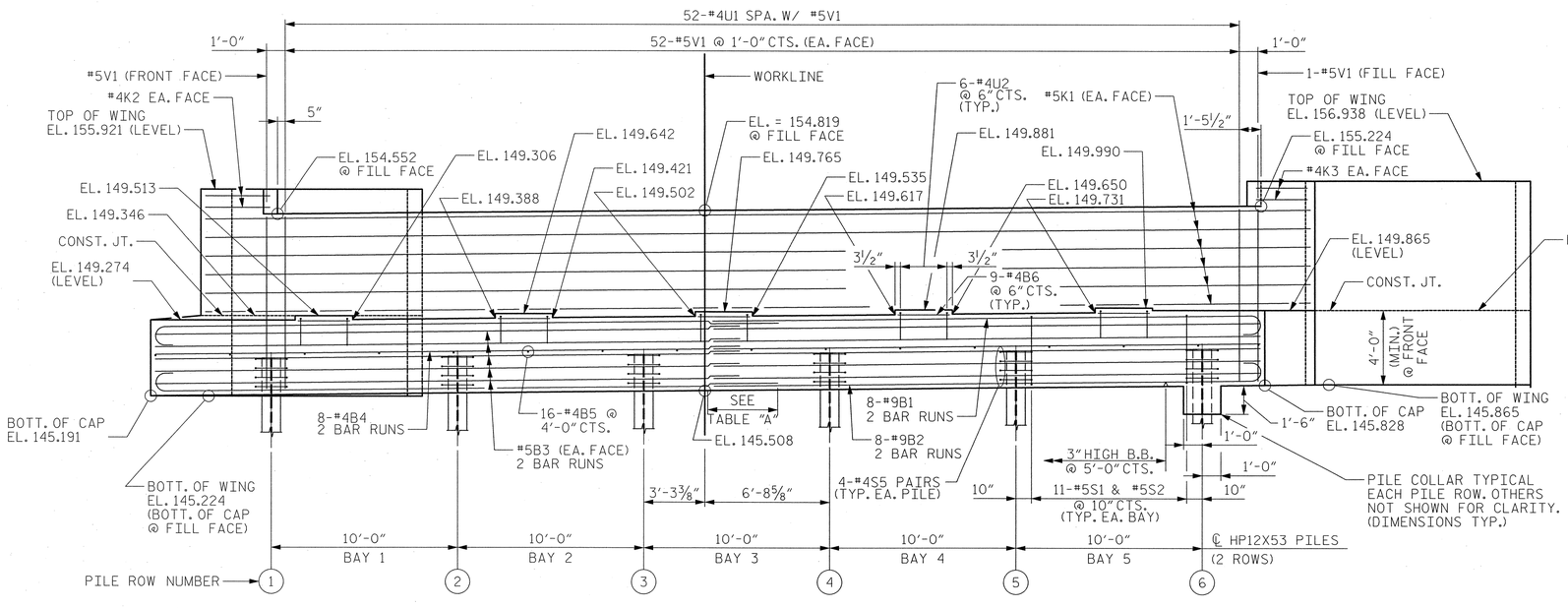
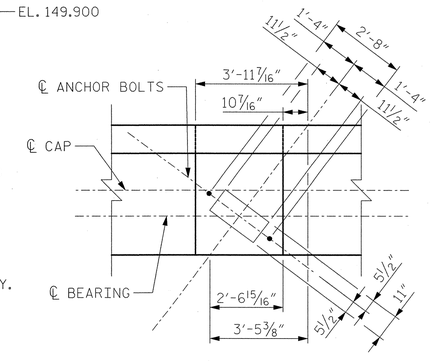


PLAN



ELEVATION



DETAIL A

NOTES

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

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS BUILD-UPS, SEE SECTION A-A, SHEET 3 OF 3.

FOR GALVANIZED REINFORCING STRAPS, SEE MSE WALL PLANS.

END BENT 1	
PILE ROW	ELEVATION
1	147.260
2	147.366
3	147.473
4	147.579
5	147.686
6	147.792

TOP OF PILE ELEVATIONS

BAR	MIN. SPLICE
#5B3	3'-0"
#4B4	2'-5"
#9B1	8'-9"
#9B2	6'-3"

TABLE "A"

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

(NBL)

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CHECKED BY : T. R. DUDECK DATE : 02-16-12

SEAL 13406 NORTH CAROLINA PROFESSIONAL ENGINEER JEFFERY T. KEVINGTON 4/4/12

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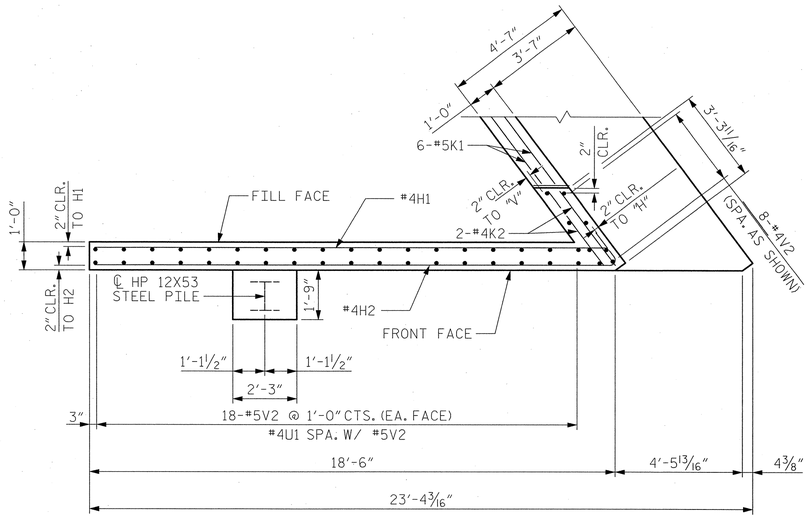
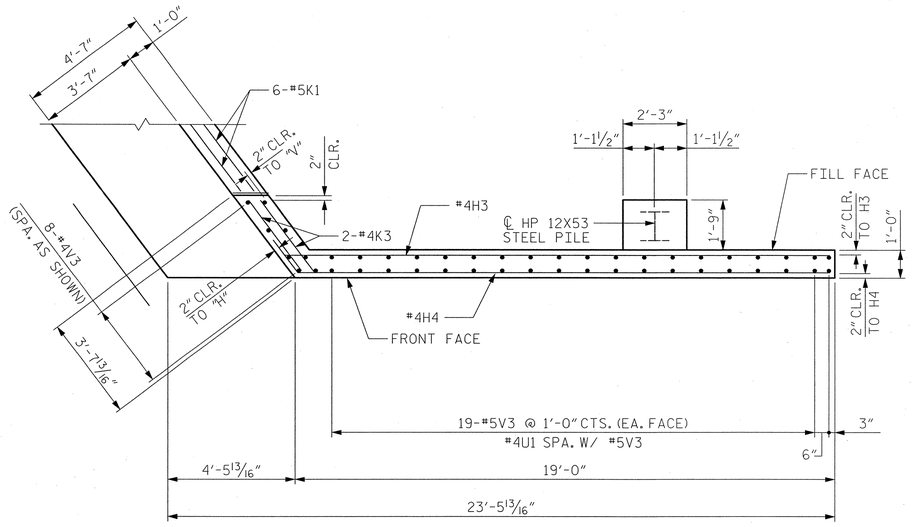
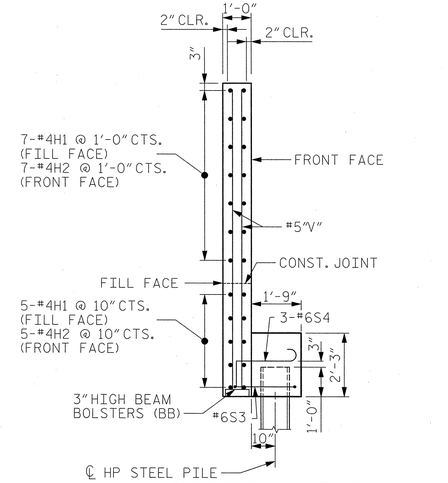


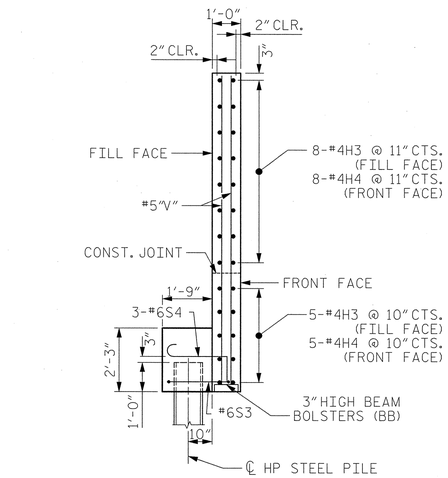
PLAN OF LEFT WING (W3)



PLAN OF RIGHT WING (W4)



SECTION E-E



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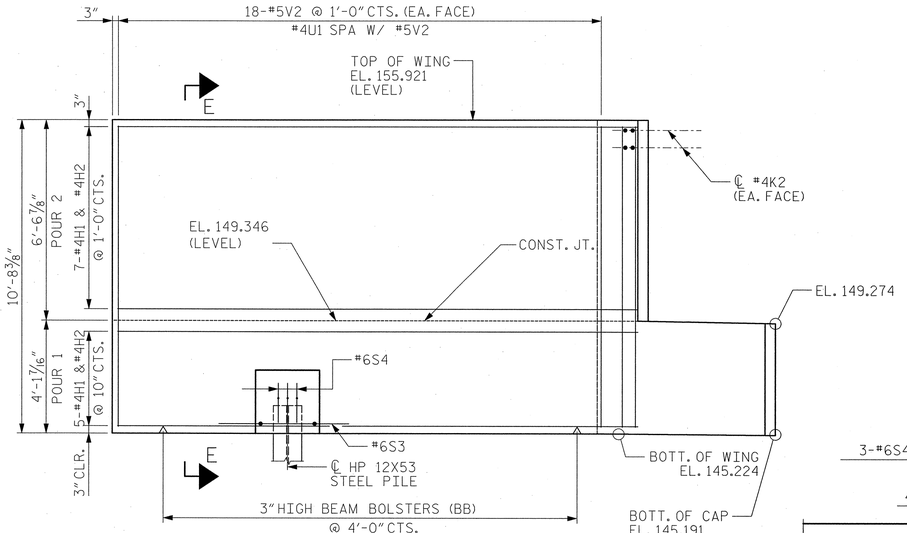
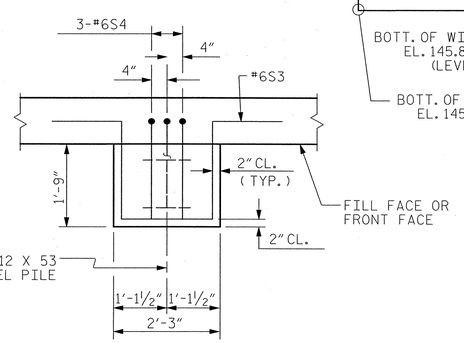
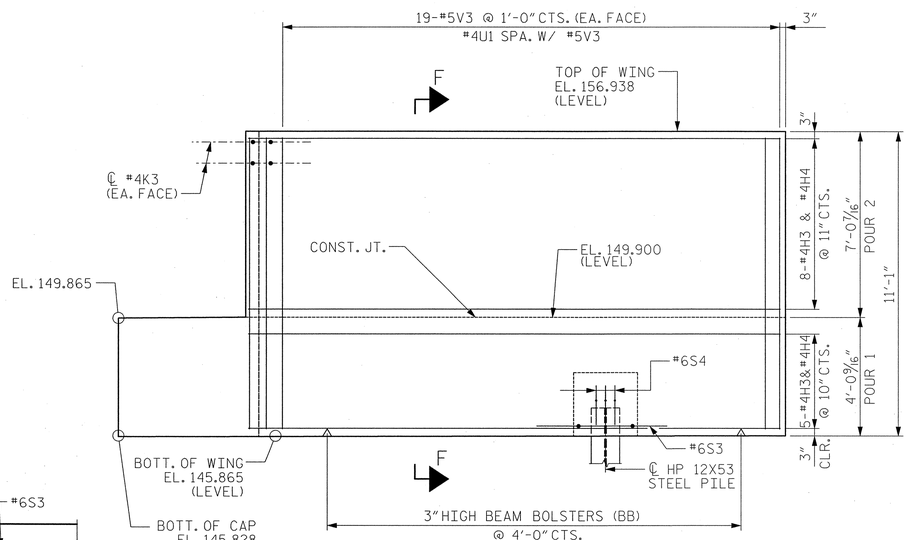


ELEVATION OF LEFT WING (W3)



WING WALL PILE DETAIL



ELEVATION OF RIGHT WING (W4)

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S34
1			3			TOTAL SHEETS
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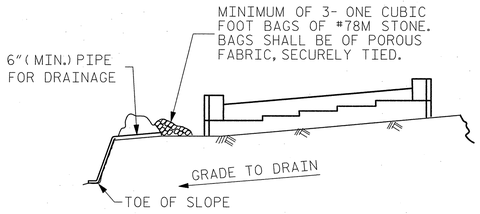
DRAWN BY : C.B. BAKER DATE : 02-16-12
CHECKED BY : T. R. DUDECK DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON
5/9/12

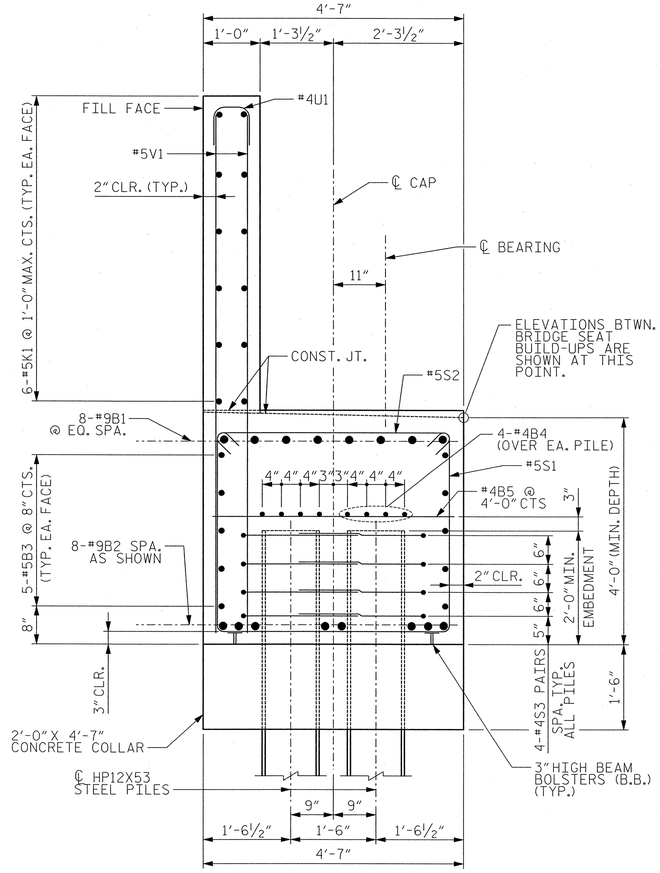


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

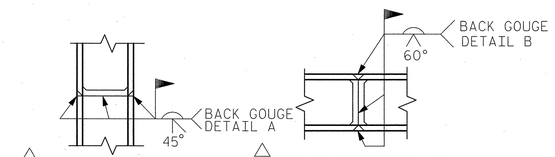
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

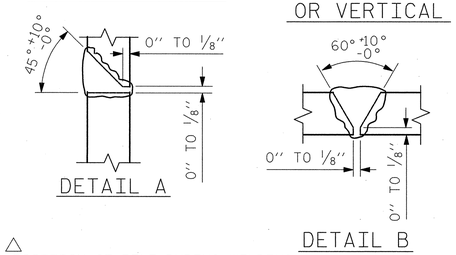


SECTION A-A



△ PILE VERTICAL

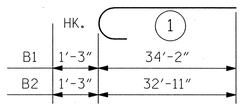
△ PILE HORIZONTAL OR VERTICAL

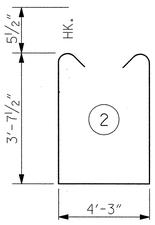


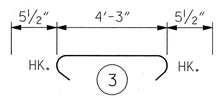
△ POSITION OF PILE DURING WELDING.

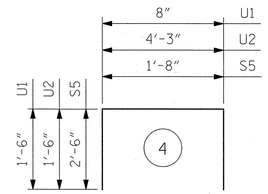
PILE SPLICE DETAILS

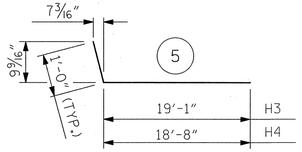
BAR TYPES

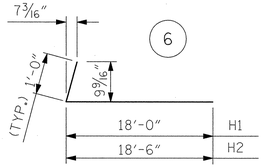


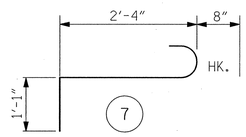


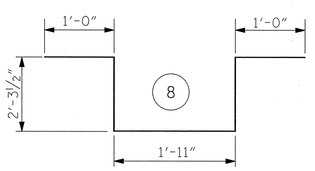




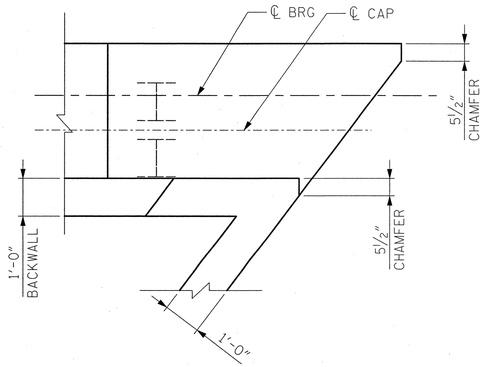








ALL BAR DIMENSIONS ARE OUT TO OUT.



CHAMFER DETAILS

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	9	1	35'- 5"	1927
B2	16	9	1	34'- 2"	1859
B3	20	5	STR.	31'- 3"	652
B4	16	4	STR.	30'- 8"	328
B5	15	4	STR.	4'- 3"	43
B6	30	4	STR.	2'- 9"	55
H1	12	4	6	19'- 0"	152
H2	12	4	6	19'- 6"	156
H3	13	4	5	20'- 1"	174
H4	13	4	5	19'- 8"	171
K1	12	5	STR.	59'- 3"	742
K2	4	4	STR.	3'- 1"	8
K3	4	4	STR.	3'- 2"	8
S1	63	5	2	12'- 5"	816
S2	63	5	3	5'- 2"	339
S3	2	6	8	8'- 6"	26
S4	6	6	7	4'- 1"	37
S5	48	4	4	6'- 8"	214
U1	52	4	4	3'- 8"	127
U2	30	4	4	7'- 3"	145
V1	106	5	STR.	8'- 11"	986
V2	44	5	STR.	10'- 4"	474
V3	46	5	STR.	10'- 9"	516

REINFORCING STEEL	LBS	9,955
CLASS A CONCRETE BREAKDOWN		
POUR 1 -		
(CAP & BOT. WINGS)	C.Y.	51.0
POUR 2 -		
(BACKWALL & TOP OF WINGS)	C.Y.	21.3
CLASS A CONCRETE TOTAL	C.Y.	72.3
HP12X53 PILES		
NO. 12	FEET	960

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DRAWN BY : B. J. ELLIOT DATE : 02-16-12
CHECKED BY : T. R. DUDECK DATE : 02-16-12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

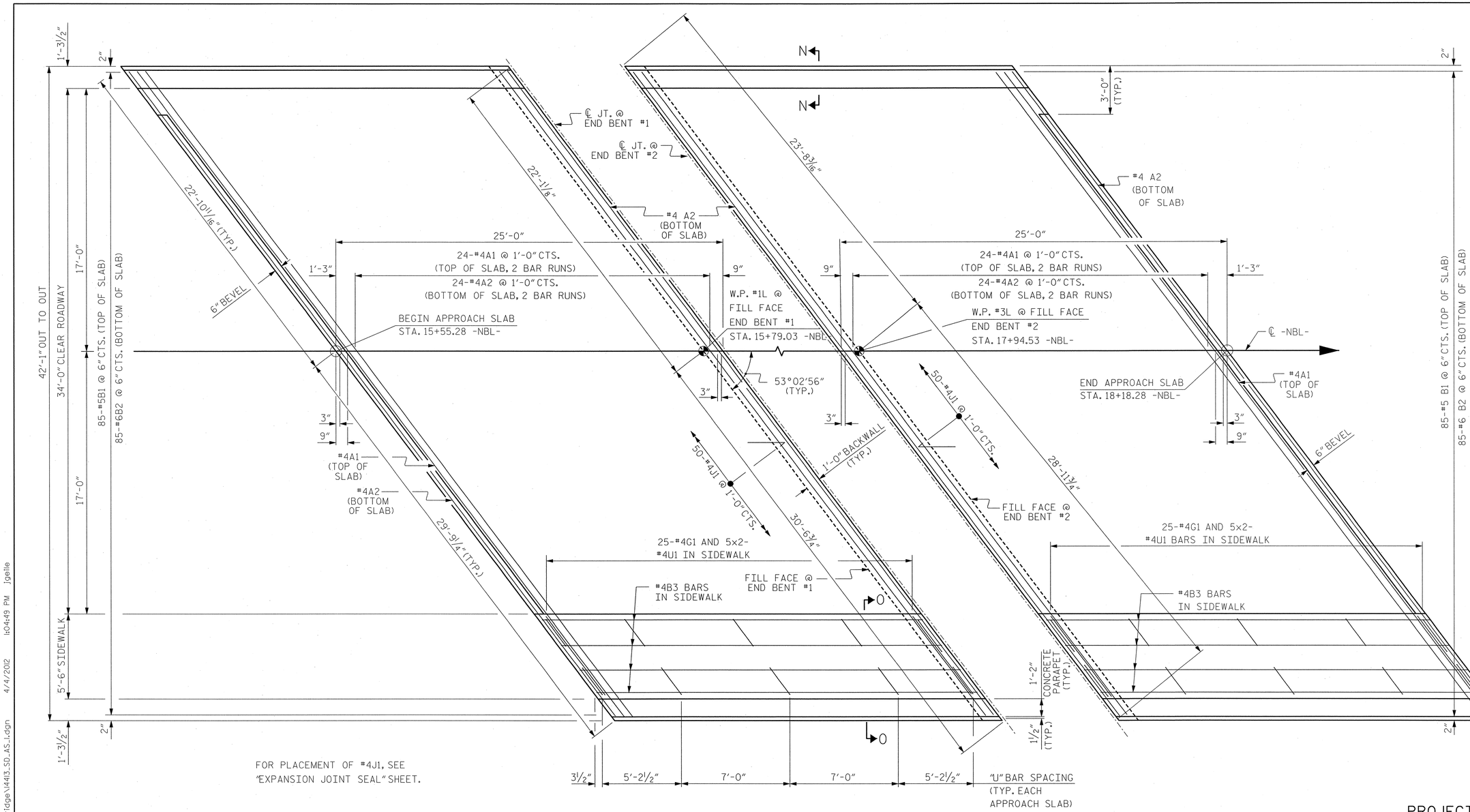
SUBSTRUCTURE

END BENT 2 DETAILS

(NBL)

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JEREMY T. KELVINGTON
4/4/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S35
1			3			TOTAL SHEETS
2			4			72



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

PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS UNLESS NOTED.

† NORMAL TO END BENT

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

(NBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S36
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STD. NO. BAS2

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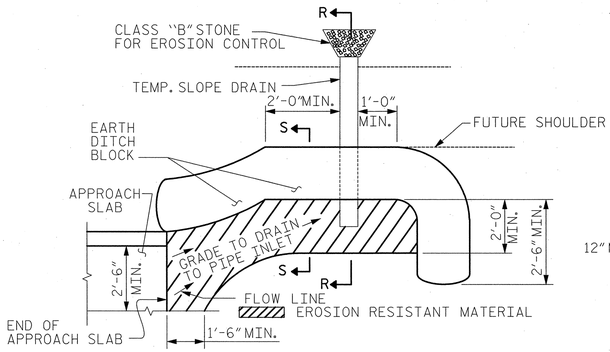
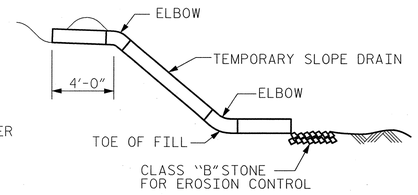
ASSEMBLED BY : J.B. GEILE	DATE :	02-16-12
CHECKED BY : J.T. KELVINGTON	DATE :	02-16-12
DRAWN BY : EEM 3/95	REV. 5/1/06RR	KMM/GM
CHECKED BY : VAP 3/95	REV. 10/1/11	MAA/GM
	REV. 12/21/11	MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/4/12

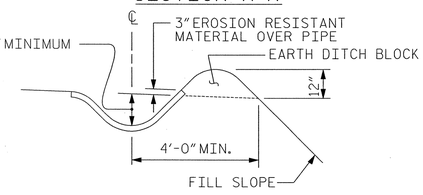


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

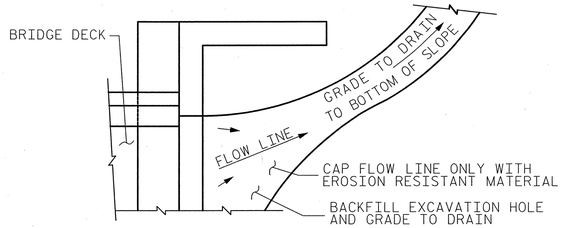


SECTION R-R



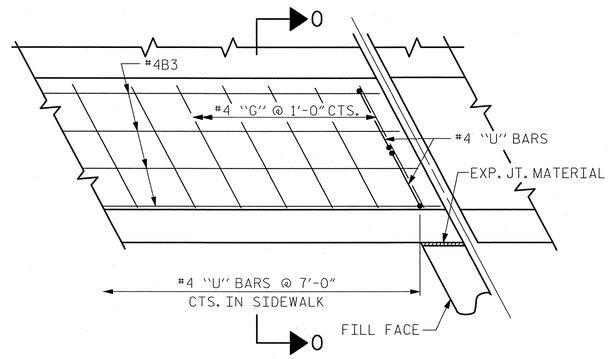
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

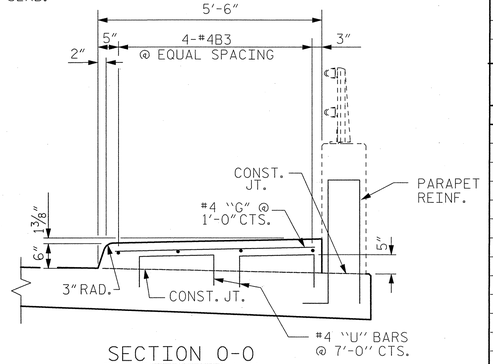


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL



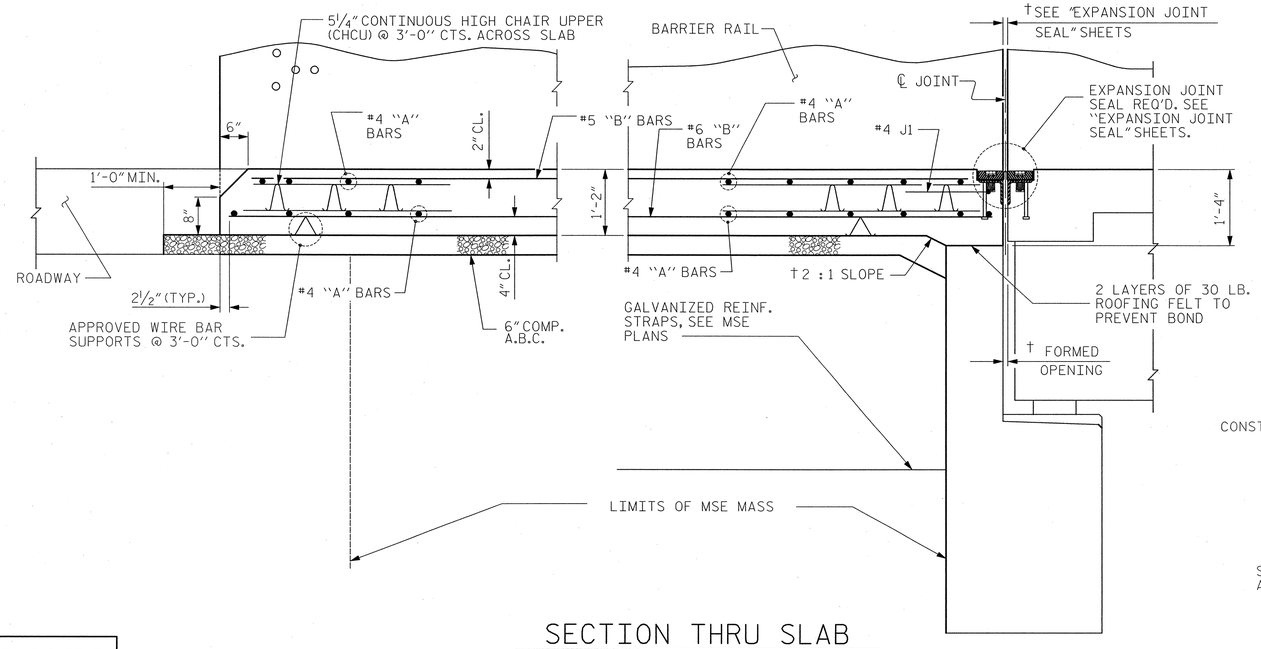
PLAN



SECTION O-O

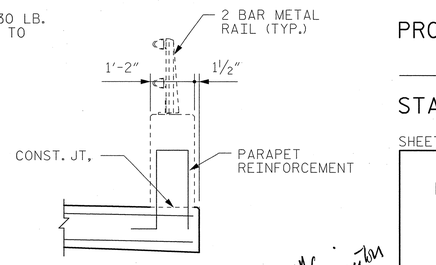
SEE "CONCRETE PARAPET AND END POST" SHEETS.

DETAILS OF SIDEWALK ON APPROACH SLAB



SECTION THRU SLAB

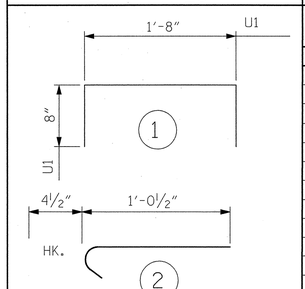
† NORMAL TO END BENT



SECTION N-N

SEE "CONCRETE PARAPET AND END POST" SHEETS.

BAR TYPES



BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	50	#4	STR	27'-2"	907
A2	52	#4	STR	27'-0"	938
✳B1	85	#5	STR	24'-7"	2179
B2	85	#6	STR	24'-7"	3139
✳B3	4	#4	STR	24'-7"	66
✳G1	25	#4	STR	6'-1"	101
✳U1	10	#4	1	3'-0"	20
✳J1	50	#4	2	1'-3"	42

REINFORCING STEEL	LBS.	4076
✳EPOXY COATED REINFORCING STEEL	LBS.	3315
CLASS AA CONCRETE	C.Y.	48.5

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	50	#4	STR	27'-2"	907
A2	52	#4	STR	27'-0"	938
✳B1	85	#5	STR	24'-7"	2179
B2	85	#6	STR	24'-7"	3139
✳B3	4	#4	STR	24'-7"	66
✳G1	25	#4	STR	6'-1"	101
✳U1	10	#4	1	3'-0"	20
✳J1	50	#4	2	1'-3"	42

REINFORCING STEEL	LBS.	4076
✳EPOXY COATED REINFORCING STEEL	LBS.	3315
CLASS AA CONCRETE	C.Y.	49.1

SPLICE LENGTHS

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

NOTES

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

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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.66 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

(NBL)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			72

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ASSEMBLED BY : J.B. GEILE	DATE : 02-16-12	
CHECKED BY : J.T. KELVINGTON	DATE : 02-16-12	
DRAWN BY : EEM 3/96	REV. 6/1/06RR	KMM/GM
CHECKED BY : VAP 3/96	REV. 10/1/11	MAA/GM
	REV. 12/21/11	MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/12

STD. NO. BAS2 (SHT 1a)

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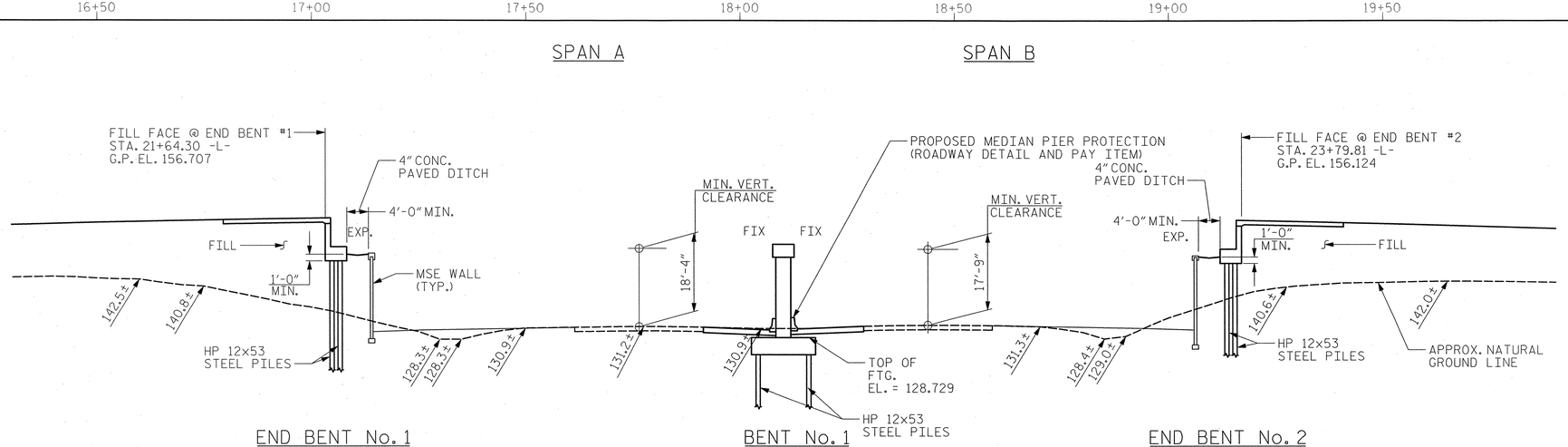
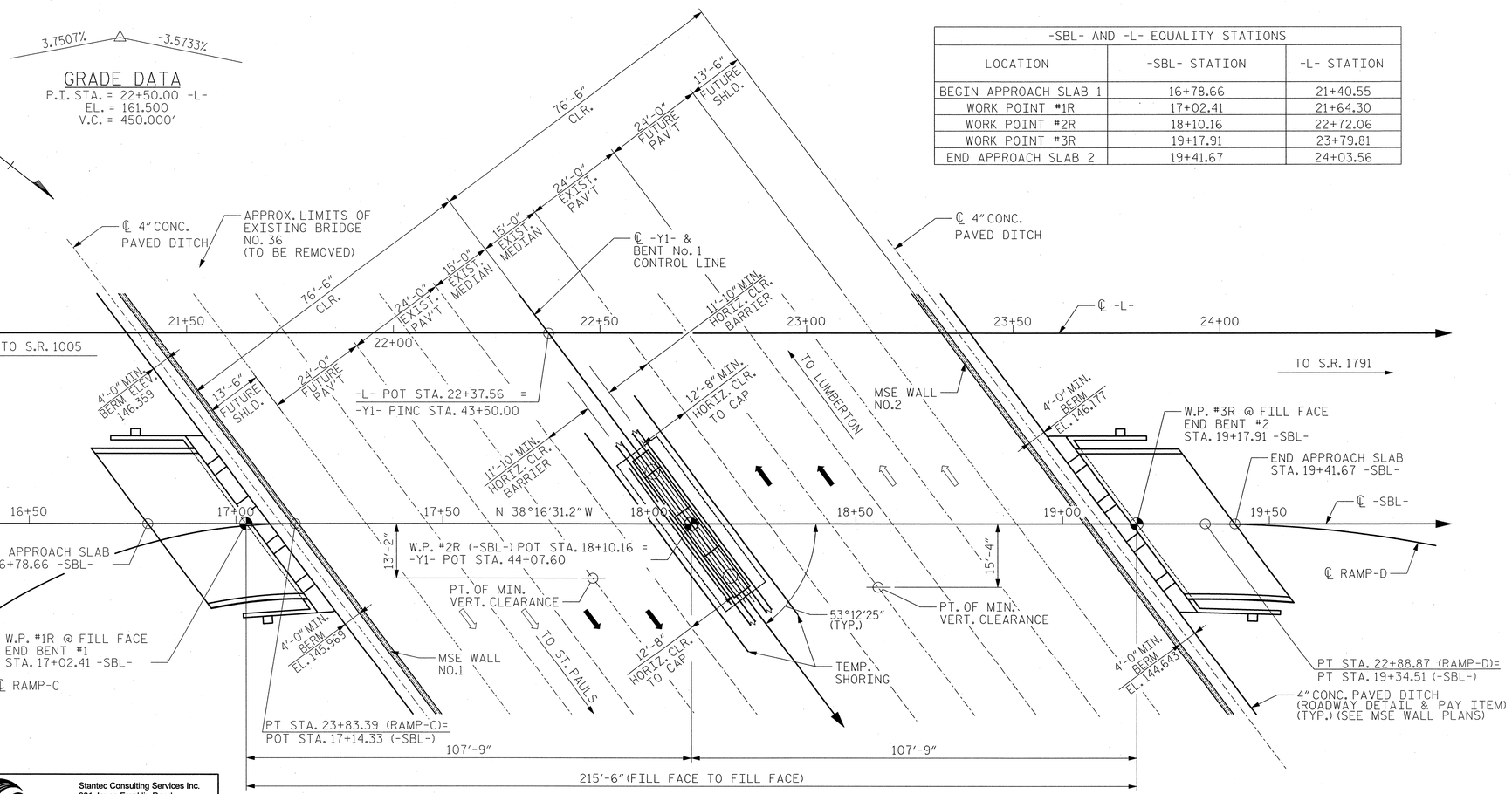
F.A. PROJECT NO. IMF-95-1(87)22



SECTION ALONG SBL

SECTIONS @ BENTS & END BENTS ARE AT RIGHT ANGLES



PLAN ALONG SBL

PILES NOT SHOWN IN PLAN VIEW

-SBL- AND -L- EQUALITY STATIONS		
LOCATION	-SBL- STATION	-L- STATION
BEGIN APPROACH SLAB 1	16+78.66	21+40.55
WORK POINT #1R	17+02.41	21+64.30
WORK POINT #2R	18+10.16	22+72.06
WORK POINT #3R	19+17.91	23+79.81
END APPROACH SLAB 2	19+41.67	24+03.56

NOTES:

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL PROVIDE 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.

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DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-
43+50.00 -Y1-

SHEET 1 OF 3 REPLACES BRIDGE No. 36

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 301
OVER I-95 (EXIT 22)
BETWEEN SR 1005 AND SR 1791

(SBL)

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON

REVISIONS						SHEET NO.
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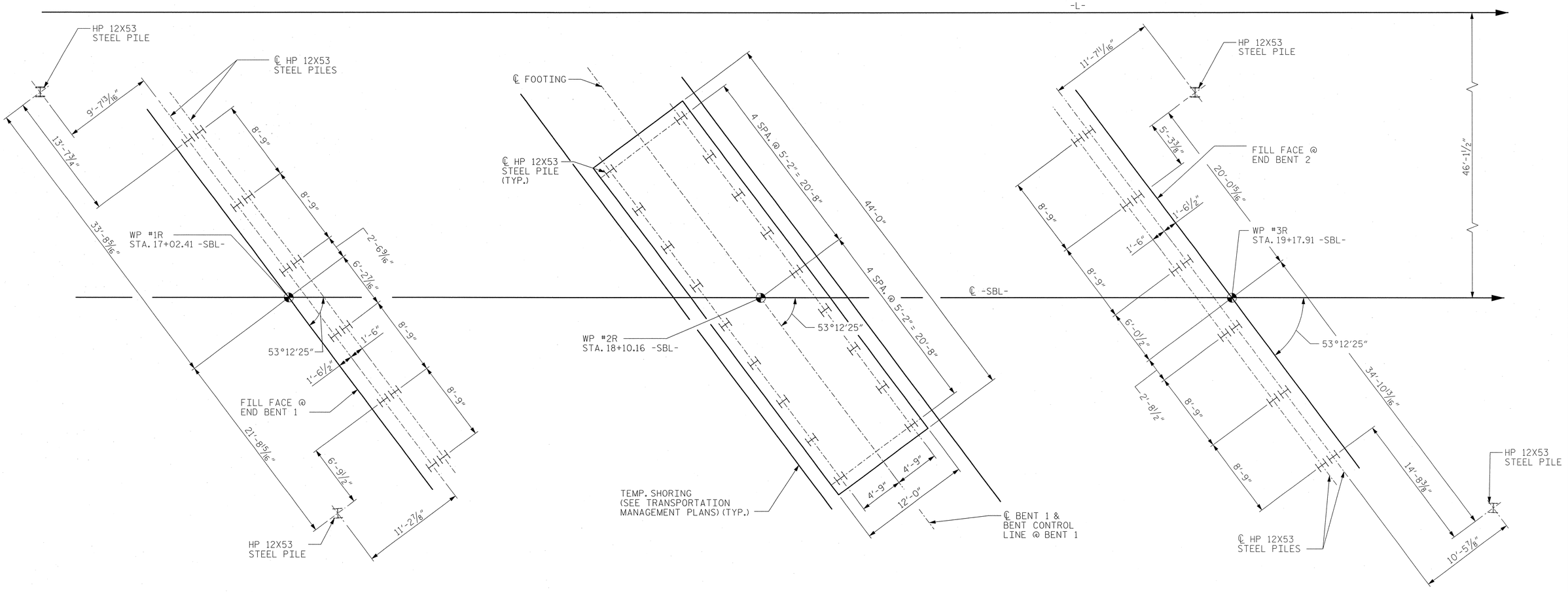

END BENT NO. 1

BENT NO. 1

END BENT NO. 2

FOUNDATION LAYOUT PLAN

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 75 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 125 TONS PER PILE.

PILES AT BENT NO. 1 ARE DESIGN FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 175 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.

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DRAWN BY : B. J. ELLIOT DATE : 02-16-12
CHECKED BY : J. T. KELVINGTON DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-
43+50.00 -Y1-

SHEET 2 OF 3 REPLACES BRIDGE No. 36

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 301
OVER I-95 (EXIT 22)
BETWEEN SR 1005 AND SR 1791

(SBL)

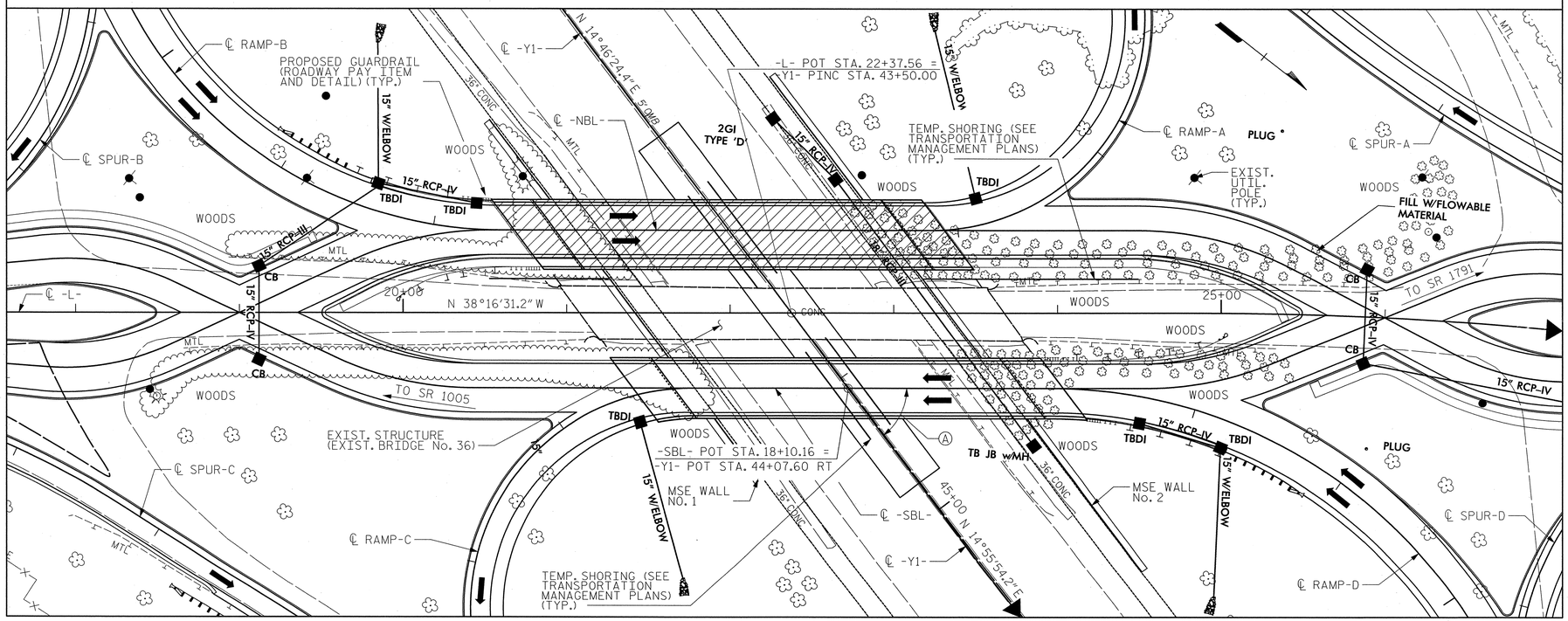
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S39
1			3			TOTAL SHEETS
2			4			72

TOTAL BILL OF MATERIAL

	REMOVAL OF EXIST STRUCTURE AT STATION 22+37.56 -L-	FOUNDATION EXCAVATION	PDA TESTING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	MODIFIED 63" PRESTRESSED CONC. GIRDERS		HP 12 X 53 STEEL PILES		PILE REDRIVES	TWO BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	ELASTOMERIC BEARINGS	EXPANSION JOINT SEALS	REMOVAL OF EXIST STRUCTURE AT STATION 32+45.00 -L-
	LUMP SUM	LUMP SUM	EACH	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN.FT.	NO.	LIN.FT.	EACH	LIN.FT.	LIN.FT.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE	LUMP SUM			7,788	8,013		LUMP SUM			8	832.25				510.00	524.91	LUMP SUM	LUMP SUM	
END BENT NO.1						64.9		8,696				12	960	3					
BENT NO.1		LUMP SUM				126.6		23,651	1,410			18	1,350	5					
END BENT NO.2						67.4		8,726				12	900	3					
TOTAL	LUMP SUM	LUMP SUM	1	7,788	8,013	258.9	LUMP SUM	41,073	1,410	8	832.25	42	3,210	11	510.00	524.91	LUMP SUM	LUMP SUM	LUMP SUM

B.M.#1
RR SPIKE IN BASE OF 15"OAK
227.0' RT. OF -L- STA. 17+87.00
ELEV. 133.92

LOCATION SKETCH



Ⓐ INTERSECTION SKEW = 53° 12' 25"

NOTES:

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 22+37.56 -L-".

AFTER SERVING AS A TEMPORARY STRUCTURE THE EXISTING STRUCTURE CONSISTING OF REINFORCED CONCRETE BRIDGE DECK ON 4 SPANS OF STEEL BEAM, WITH A CLEAR ROADWAY OF 28 FT. SUPPORTED BY REINFORCED CONCRETE SUBSTRUCTURE UNITS AND LOCATED 50.6 FT. RIGHT OF STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

THE EXISTING 3' X 4' SINGLE BARREL BOX CULVERT AT -L- STATION 32+45 +/- SHALL BE REMOVED. THE COST FOR REMOVING THIS EXISTING CULVERT SHALL BE INCLUDED IN THE LUMP SUM PRIDE BID FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 32+45.00 -L-".

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-
43+50.00 -Y1-

SHEET 3 OF 3 REPLACES BRIDGE No. 36

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON US 301
OVER I-95 (EXIT 22)
BETWEEN SR 1005 AND SR 1791

(SBL)

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2			4			72

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CHECKED BY : S. S. YUEN DATE : 02-16-12

Joseph J. Kelvington 4/25/2012
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH J. KELVINGTON

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

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SELVICE III LIMIT STATE						COMMENT NUMBEL
								MOMENT					SHEAR						MOMENT					
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.05	--	1.75	0.86	1.05	1	EL	102.6	1.04	1.17	1	I	92.9	0.80	0.86	1.13	1	EL	40.9	
		HL-93 (OPERATING)	N/A		1.36	--	1.35	0.86	1.36	1	EL	102.6	1.04	1.54	1	I	92.9	N/A	--	--	--	--	--	
		HS-20 (INVENTORY)	36.000	2	1.57	57	1.75	0.86	1.86	1	EL	40.9	1.04	1.71	1	I	92.9	0.80	0.86	1.57	1	EL	40.9	
		HS-20 (OPERATING)	36.000		2.24	81	1.35	0.86	2.41	1	EL	40.9	1.04	2.24	1	I	92.9	N/A	--	--	--	--	--	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.96	40	1.40	0.86	4.26	1	EL	40.9	1.04	4.44	1	I	92.9	0.80	0.86	2.96	1	EL	40.9	
		SNGARBS2	20.000		2.14	43	1.40	0.86	3.08	1	EL	40.9	1.04	3.06	1	I	92.9	0.80	0.86	2.14	1	EL	40.9	
		SNAGRIS2	22.000		2.00	44	1.40	0.86	2.88	1	EL	40.9	1.04	2.80	1	I	92.9	0.80	0.86	2.00	1	EL	40.9	
		SNCOTTS3	27.250		1.48	40	1.40	0.86	1.91	1	EL	40.9	1.04	1.79	1	I	92.9	0.80	0.86	1.48	1	EL	40.9	
		SNAGGRS4	34.925		1.21	42	1.40	0.86	1.74	1	EL	40.9	1.04	1.66	1	I	92.9	0.80	0.86	1.21	1	EL	40.9	
		SNS5A	35.550		1.19	42	1.40	0.86	1.72	1	EL	40.9	1.04	1.66	1	I	92.9	0.80	0.86	1.19	1	EL	40.9	
		SNS6A	39.950		1.08	43	1.40	0.86	1.56	1	EL	40.9	1.04	1.49	1	I	92.9	0.80	0.86	1.08	1	EL	40.9	
		SNS7B	42.000		1.03	43	1.40	0.86	1.49	1	EL	40.9	1.04	1.42	1	I	92.9	0.80	0.86	1.03	1	EL	40.9	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.33	44	1.40	0.86	1.91	1	EL	40.9	1.04	1.79	1	I	92.9	0.80	0.86	1.33	1	EL	40.9	
		TNT4A	33.075		1.31	43	1.40	0.86	1.89	1	EL	40.9	1.04	1.84	1	I	92.9	0.80	0.86	1.31	1	EL	40.9	
		TNT6A	41.600		1.07	45	1.40	0.86	1.54	1	EL	40.9	1.04	1.48	1	I	92.9	0.80	0.86	1.07	1	EL	40.9	
		TNT7A	42.000		1.07	45	1.40	0.86	1.54	1	EL	40.9	1.04	1.47	1	I	92.9	0.80	0.86	1.07	1	EL	40.9	
		TNT7B	42.000		1.09	46	1.40	0.86	1.56	1	EL	40.9	1.04	1.42	1	I	92.9	0.80	0.86	1.09	1	EL	40.9	
		TNAGRIT4	43.000		1.05	45	1.40	0.86	1.51	1	EL	40.9	1.04	1.39	1	I	92.9	0.80	0.86	1.05	1	EL	40.9	
		TNAGT5A	45.000		1.00	45	1.40	0.86	1.44	1	EL	40.9	1.04	1.33	1	I	92.9	0.80	0.86	1.00	1	EL	40.9	
		TNAGT5B	45.000	3	1.00	45	1.40	0.86	1.42	1	EL	40.9	1.04	1.33	1	I	92.9	0.80	0.86	1.00	1	EL	40.9	

LOAD FACTORS:

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

NOTES:

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

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

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

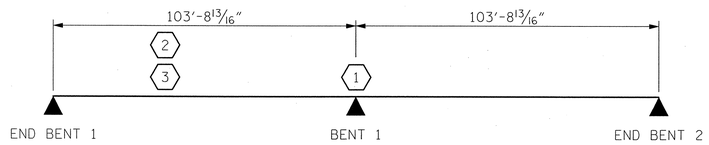
(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



LRFR SUMMARY

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S41
1			3			TOTAL SHEETS
2			4			72

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DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : T. R. DUDECK DATE : 02-16-12

SEAL 13406 PROFESSIONAL ENGINEER KELVINGTON

STD. NO. LRFR1

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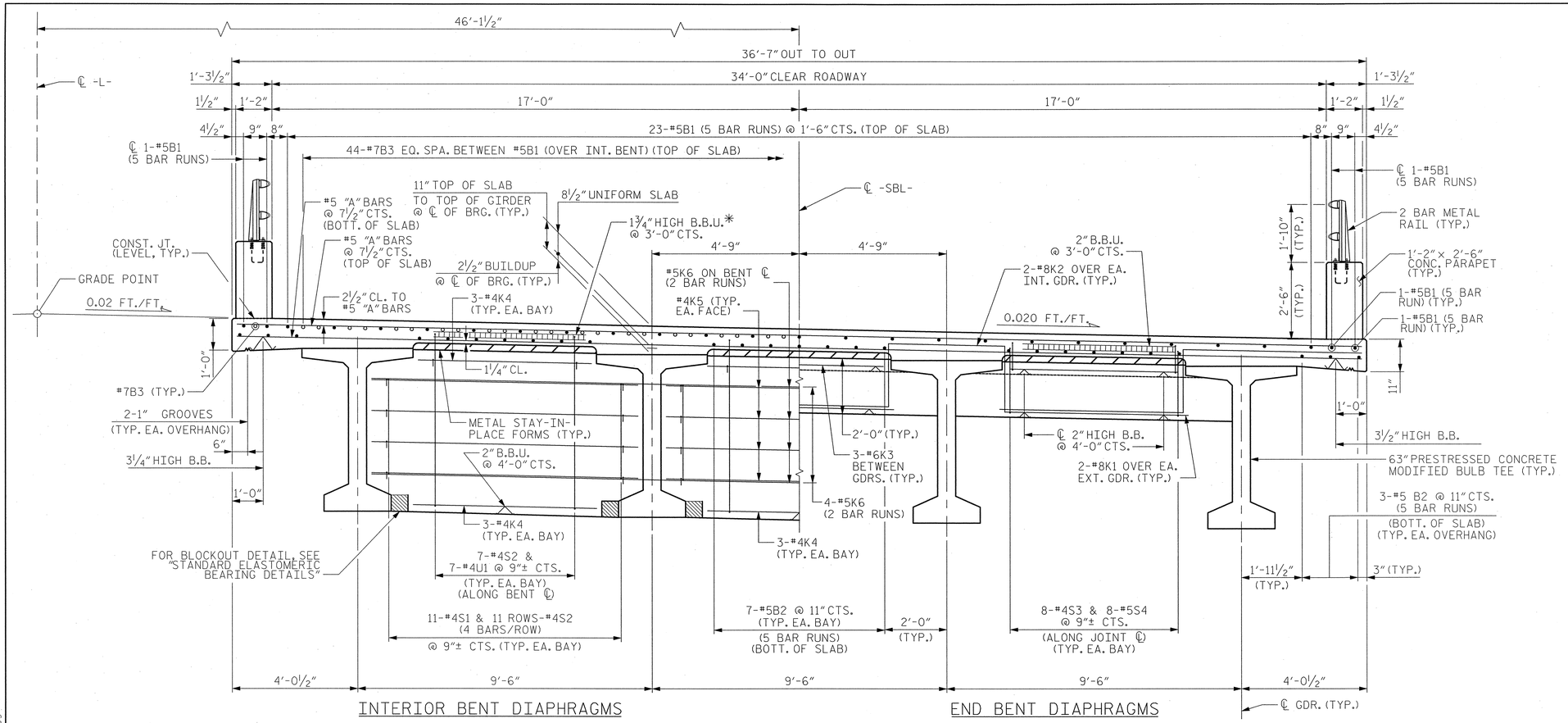


INTERIOR BENT DIAPHRAGMS

END BENT DIAPHRAGMS

*TO BE USED IN REGIONS WITH #7B3 DECK REINFORCEMENT.

TYPICAL SECTION

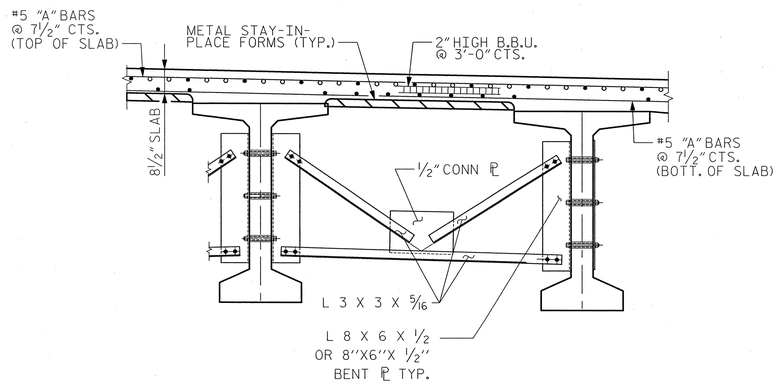
NOTES:

- ● DENOTES CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.
- ○ DENOTES NON-CONTINUOUS LONGITUDINAL DECK REINFORCEMENT.

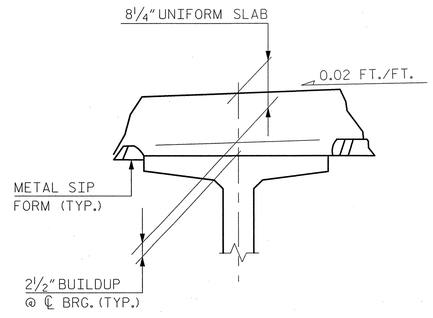
SEE SHEET 2 OF 2 FOR NOTES.

FOR CONCRETE PARAPET DETAILS, SEE "CONCRETE PARAPET RAIL" SHEET.

FOR 2 BAR METAL RAILS DETAILS, SEE "RAIL POST SPACING AND END OF RAIL DETAILS" AND "2 BAR METAL RAIL" SHEETS.



INTERIOR GIRDER EXTERIOR GIRDER



BUILD-UP DETAIL

TYPICAL SECTION INTERMEDIATE DIAPHRAGMS

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DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE

TYPICAL SECTION

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S42
1			3			TOTAL SHEETS
2			4			72

SEAL 13406 ENGINEER JOSEPH T. KELVINGTON NORTH CAROLINA PROFESSIONAL

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NOTES:

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

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.

NO CHAMFER IS REQUIRED ON CORNERS OF GIRDER BUILDUPS.

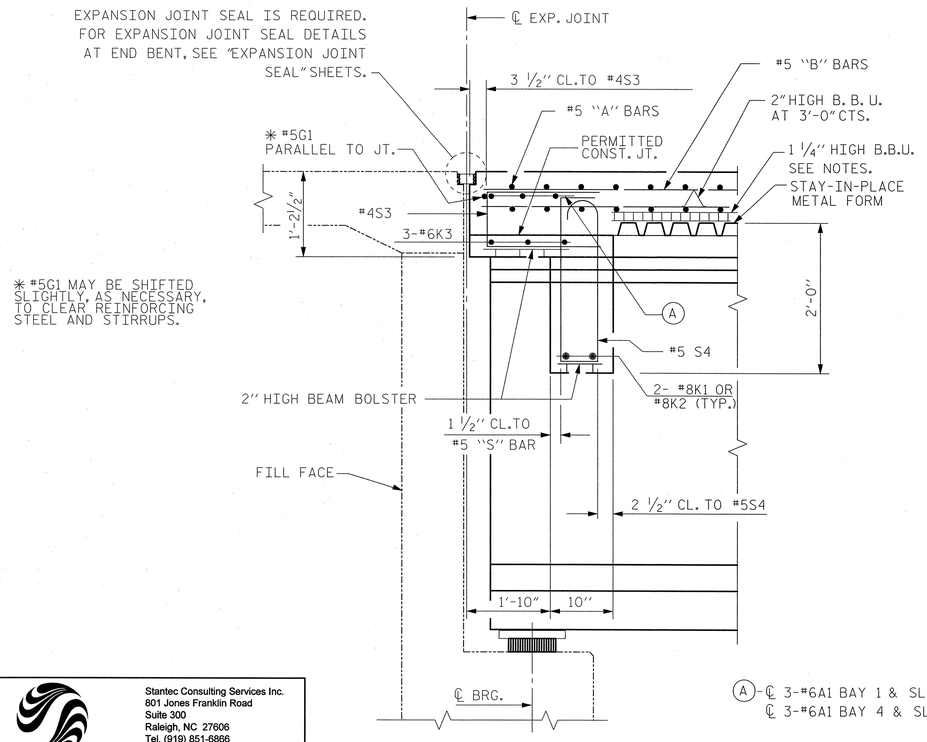
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

SIDEWALK & CONCRETE 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.

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

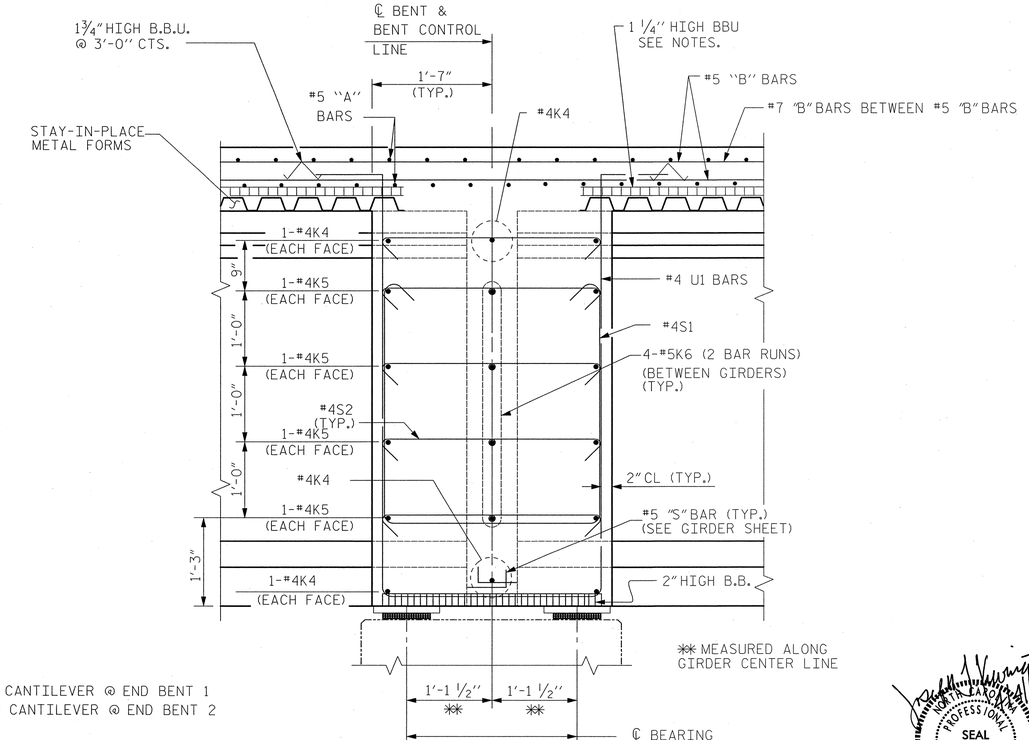
ALL REINFORCING STEEL IN CONCRETE PARAPETS AND SIDEWALKS SHALL BE EPOXY COATED.

GROOVED CONTRACTION JOINTS ½" 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 EXPANSIONS JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.



SECTION THRU DIAPHRAGM AT END BENT

Ⓐ ℄ 3-#6A1 BAY 1 & SLAB CANTILEVER @ END BENT 1
℄ 3-#6A1 BAY 4 & SLAB CANTILEVER @ END BENT 2



SECTION THRU DIAPHRAGM AT INTERIOR BENT

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 2 of 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S43
1			3			TOTAL SHEETS
2			4			72

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DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : J. T. KELVINGTON DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/12

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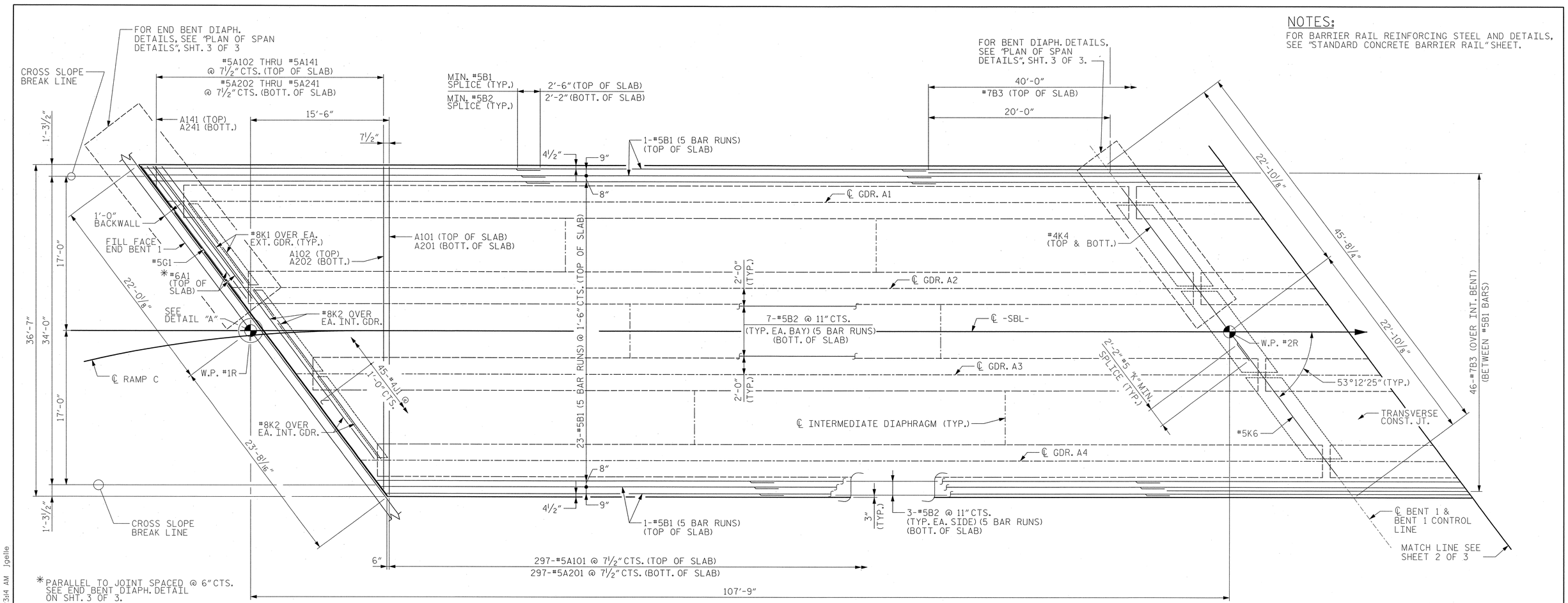


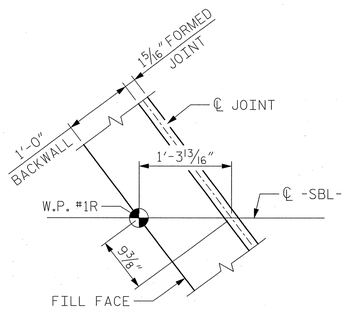
*PARALLEL TO JOINT SPACED @ 6"CTS. SEE END BENT DIAPH. DETAIL ON SHT. 3 OF 3.

NOTES:

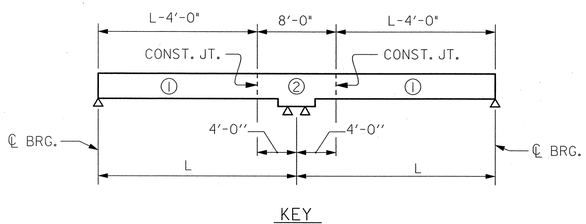
FOR BARRIER RAIL REINFORCING STEEL AND DETAILS, SEE "STANDARD CONCRETE BARRIER RAIL" SHEET.

PLAN OF SPAN A

FOR PLACEMENT OF #4J1 SEE "EXPANSION JOINT SEALS" SHEET 1 OF 4.



DETAIL "A"



KEY

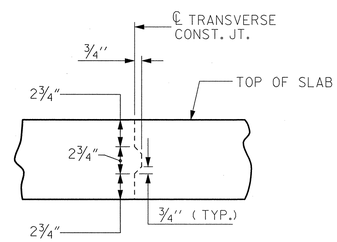
L = LENGTH OF EACH SPAN

NOTE: POUR ② CAN NOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI.

"OPTIONAL" POURING SEQUENCE- PRESTRESSED CONCRETE SUPERSTRUCTURE

(CONTINUOUS FOR LIVE LOAD)

(FOR "POURING SEQUENCE", SEE SHEET S61)



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

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DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 5/15/12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S44
1			3			TOTAL SHEETS
2			4			72

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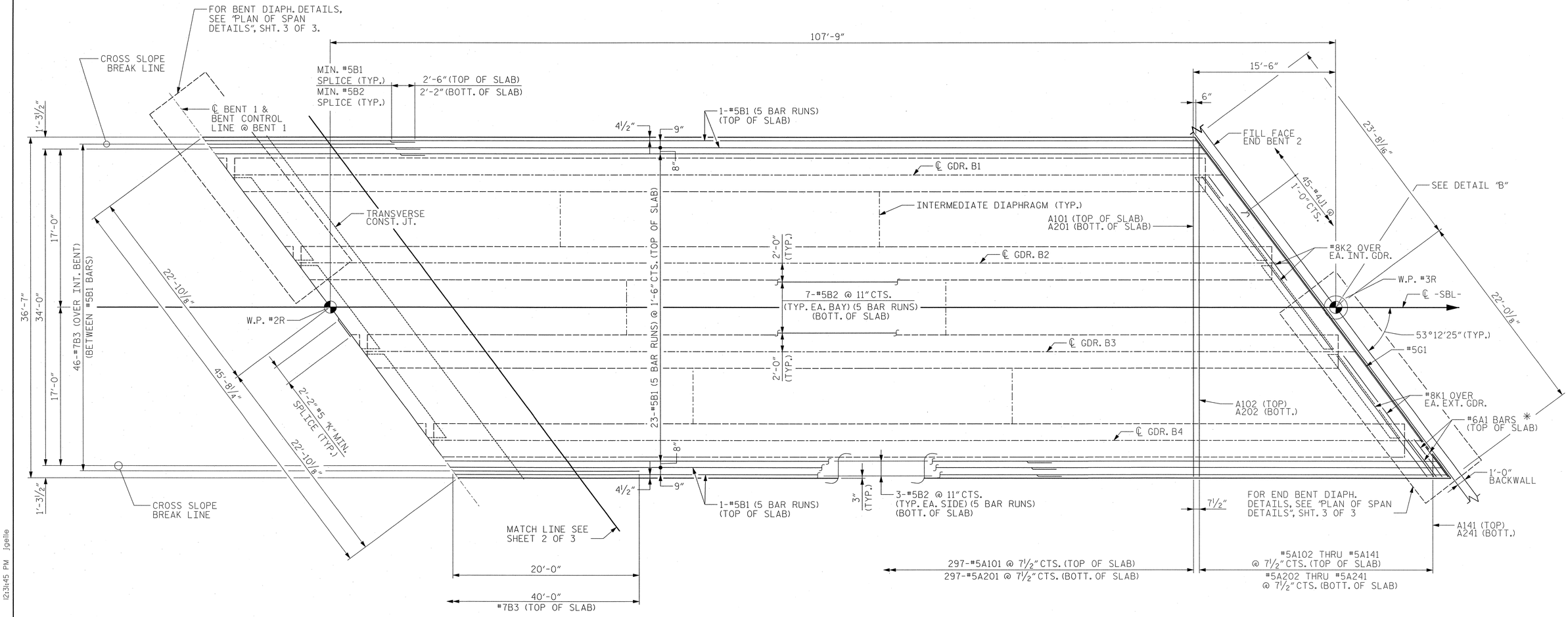
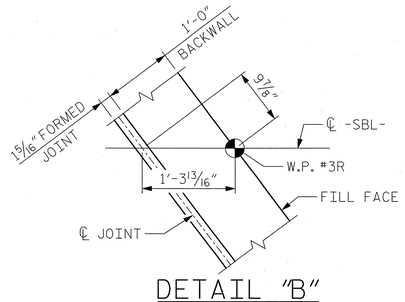


PLAN OF SPAN B



DETAIL "B"

* PARALLEL TO JOINT SPACED @ 6" CTS. SEE END BENT DIAPH. DETAIL ON SHT. 3 OF 3.

FOR PLACEMENT OF #4J1 SEE "EXPANSION JOINT SEALS" SHEET 1 OF 4.

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S45
1			3			TOTAL SHEETS
2			4			72

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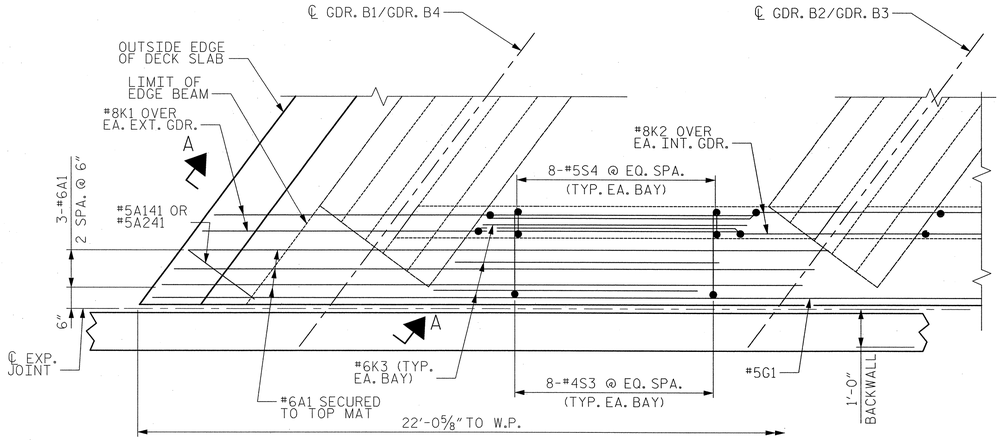
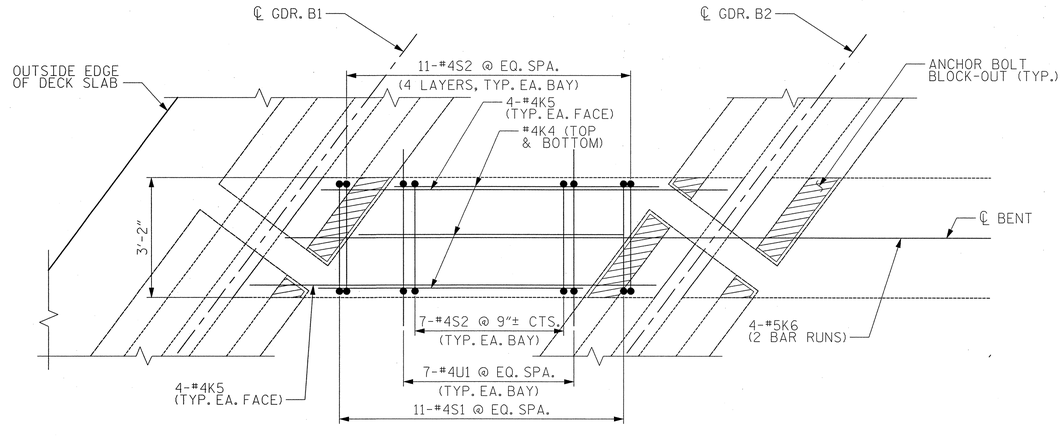
DRAWN BY : J. L. HENNEKES DATE : 02-16-12
CHECKED BY : J. TSKELVINGTON DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/4/12



END BENT DIAPHRAGM REINFORCING DETAIL

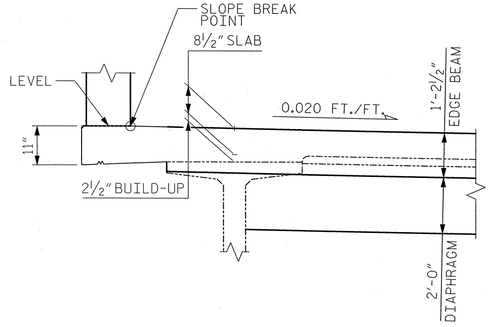


BENT DIAPHRAGM REINFORCING DETAIL

BAY 1 SHOWN, OTHERS TYPICAL

STANDARD EXPANSION JOINT SEAL IS REQUIRED. SEE APPROACH PLANS FOR BLOCKOUT REQUIRED IN DECK SLAB.

NOTE: SLAB "B" BARS AND "A" BARS NOT SHOWN FOR CLARITY.



SECTION A-S

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CHECKED BY : J. T. KELVINGTON DATE : 02-16-12

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN DETAILS

(SBL)

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON
2/14/12

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S46
1			3			TOTAL SHEETS
2			4			72

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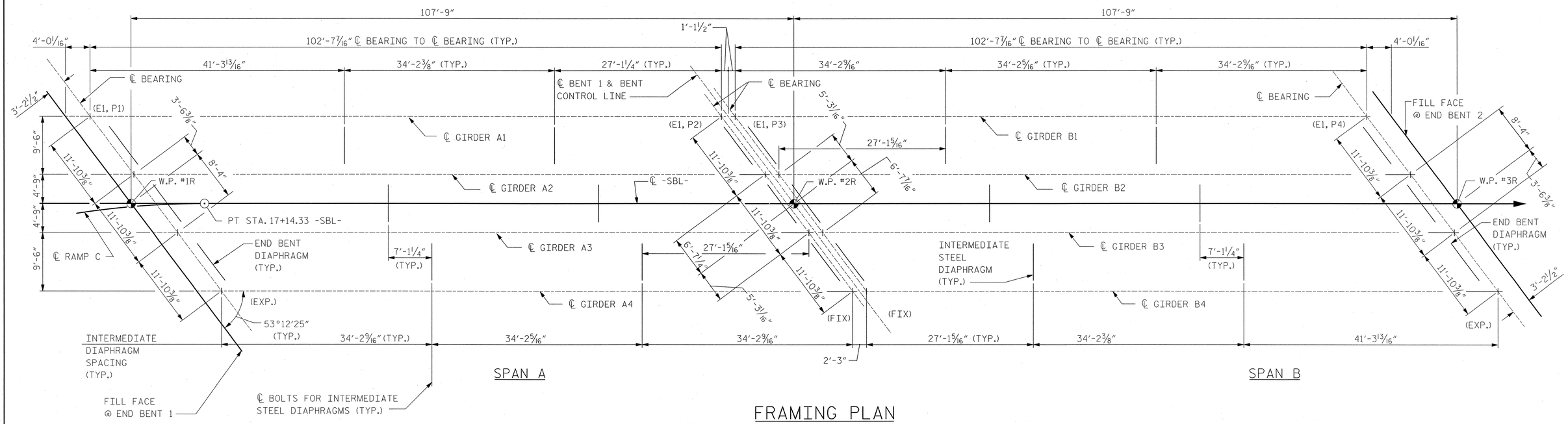


FRAMING PLAN

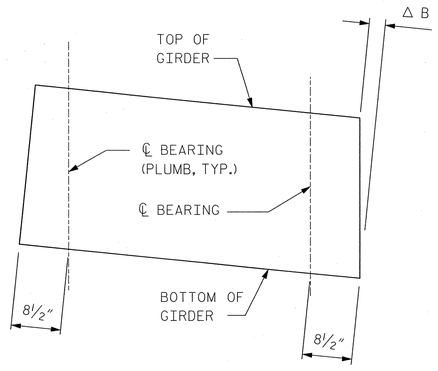
NOTES:

(E1, P1) DENOTES ELASTOMERIC BEARING, SOLE PLATE, TYP
SEE SHEET "ELASTOMERIC BEARING"

SEE TYPICAL SECTION FOR END BENT DIAPHRAGM
AND INTERIOR BENT DIAPHRAGM DETAILS.

REFER TO "PLAN OF SPAN DETAILS" FOR
BENT & END BENT DIAPHRAGMS.

SPAN B BEVEL REQUIREMENTS	
GIRDER	△ B
B1	5/8"
B2	11/16"
B3	3/4"
B4	13/16"



SPAN B

GIRDER BEVEL DETAIL

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DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

STATE OF NORTH CAROLINA
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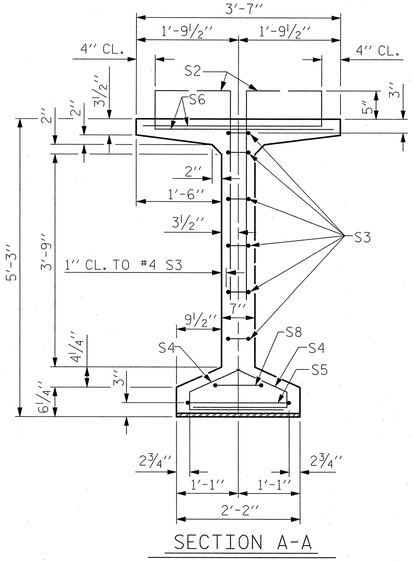
FRAMING PLAN

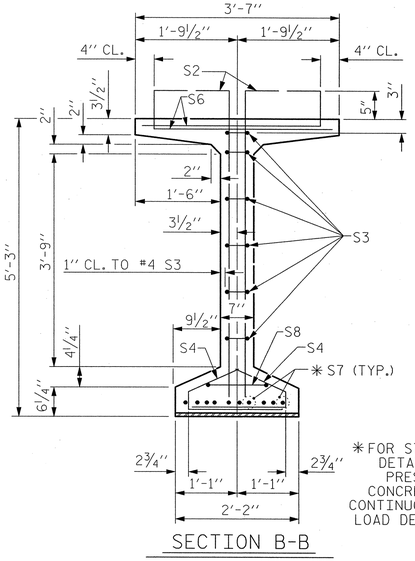
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S47
1			3			TOTAL SHEETS
2			4			72

Joseph J. Kelvington 4/4/12
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH J. KELVINGTON

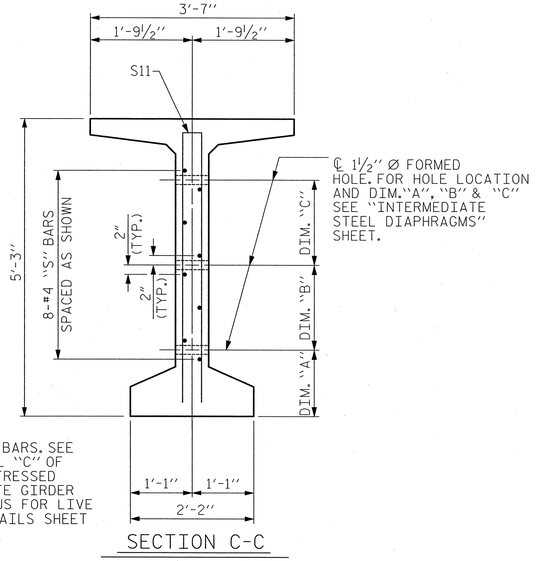


SECTION A-A



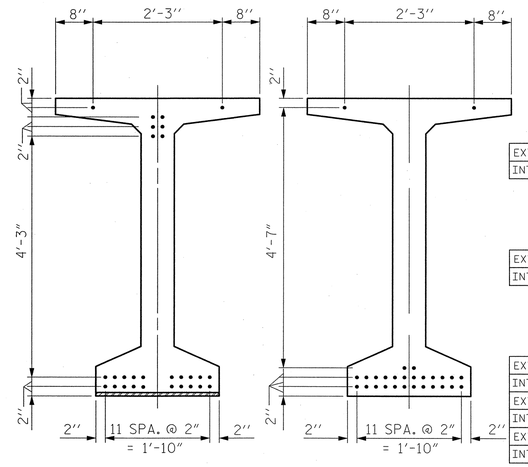
SECTION B-B

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



SECTION C-C

(S1, S6 AND S9 BARS NOT SHOWN)



● FULLY BONDED STRANDS

AT END OF GIRDER AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

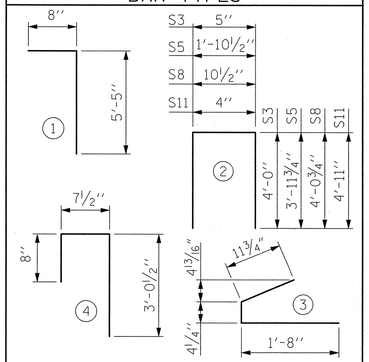
0.6" Ø L. R. GRADE 270 STRANDS		
AREA (SQUARE INCHES)	ULTIMATE STRENGTH (LBS. PER STRAND)	APPLIED PRESTRESS (LBS. PER STRAND)
0.217	58,600	43,950

REINFORCING STEEL FOR ONE GDR

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
EXTERIOR GDR.	S1	52	#5	1	6'-1"	330
INTERIOR GDR.	S1	52	#5	1	6'-1"	330
	S2	24	#5	1	6'-1"	152
	S3	12	#4	2	8'-5"	67
	S4	76	#4	3	3'-0"	152
	S5	1	#5	2	9'-10"	10
EXTERIOR GDR.	S6	250	#5	4	4'-4"	1,130
INTERIOR GDR.	S6	250	#5	4	4'-4"	1,130
	✱S7	10	#5	STR	3'-8"	38
	S8	2	#5	2	9'-0"	19
	S9	43	#5	STR	3'-3"	146
	S10	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S11	8	#5	2	10'-2"	85
INTERIOR GDR.	S11	16	#5	2	10'-2"	170
EXTERIOR GDR.	S12	32	#4	STR	8'-0"	171
INTERIOR GDR.	S13	32	#4	STR	14'-6"	310
EXTERIOR GDR.	S14	174	#4	1	6'-1"	707
INTERIOR GDR.	S14	174	#4	1	6'-1"	707

✱NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES



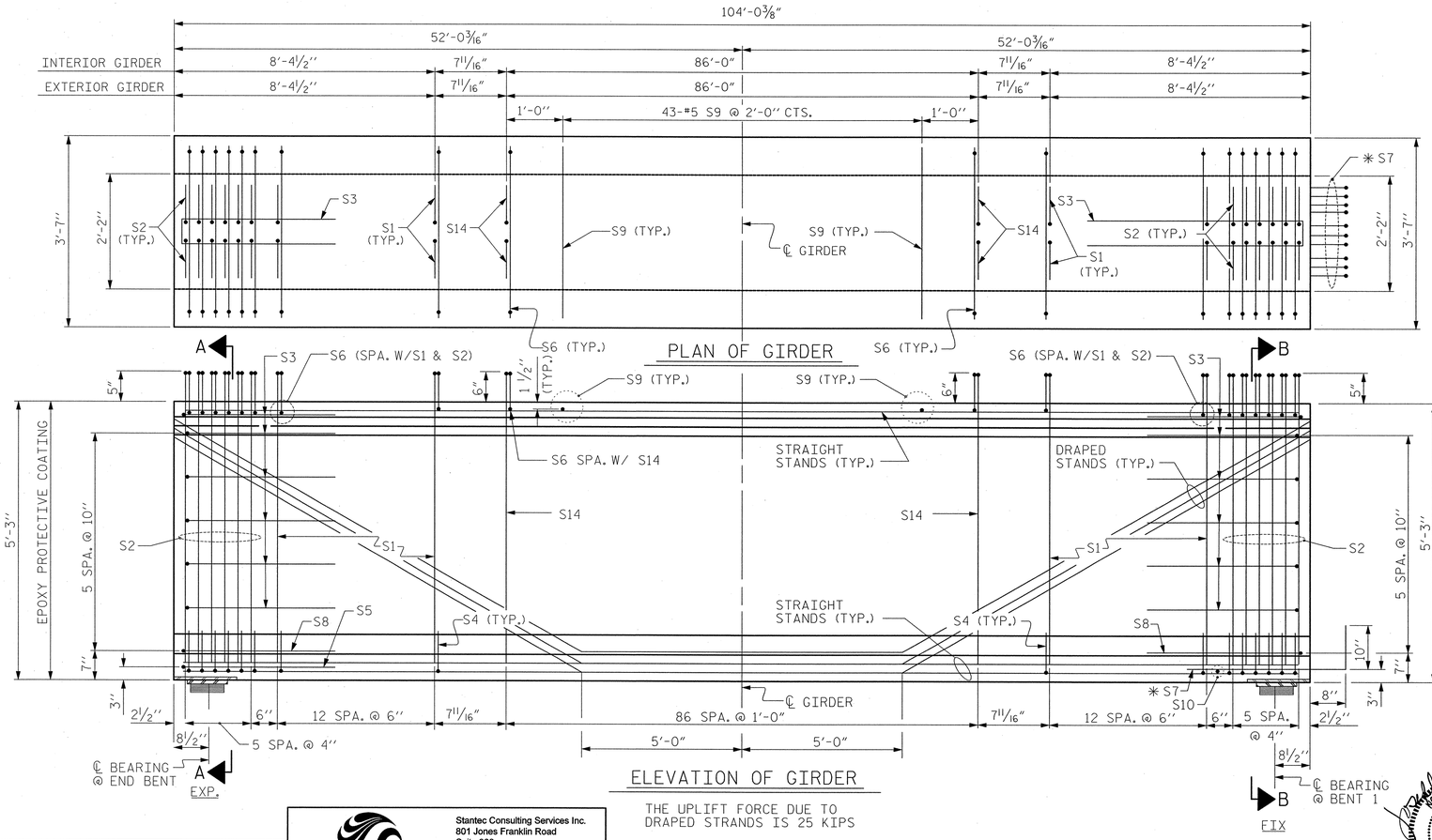
ALL BAR DIMENSIONS ARE OUT-TO-OUT

QUANTITIES FOR ONE GIRDER

	REINFORCING STEEL	7,000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	No.
EXTERIOR GIRDER	3,008	20.6	28
INTERIOR GIRDER	3,232	20.6	28

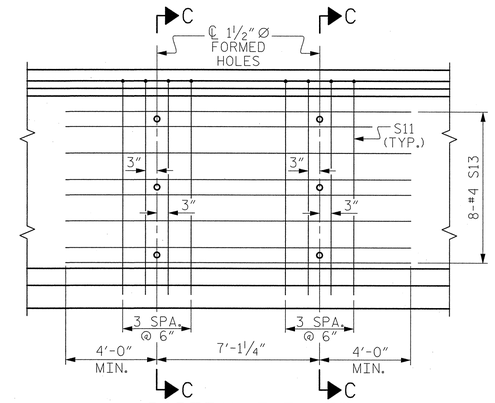
GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
8	104'-0⅜"	832'-3"



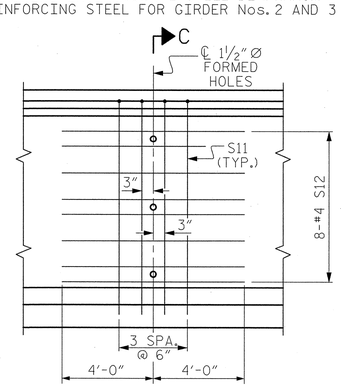
ELEVATION OF GIRDER

THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 25 KIPS



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 2 AND 3



PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL FOR GIRDER Nos. 1 AND 4

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S48
1			3			TOTAL SHEETS
2			4			72

ASSEMBLED BY : J.B. GEILE DATE : 02-16-12
CHECKED BY : J.T. KELVINGTON DATE : 02-16-12

DRAWN BY : EEM 2/6/97
CHECKED BY : VAP 2/6/97

REV. 10/17/00 RWW/LES
REV. 5/1/06R TLA/GM
REV. 10/1/11 MAA/GM

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13406 JOSEPH T. KELVINGTON

STD. NO. PCG7 (Sht. 1)

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 5,000 PSI.

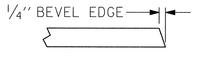
DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

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

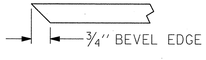
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN 1/2" OF THE THEORETICAL LOCATION SHOWN.

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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.

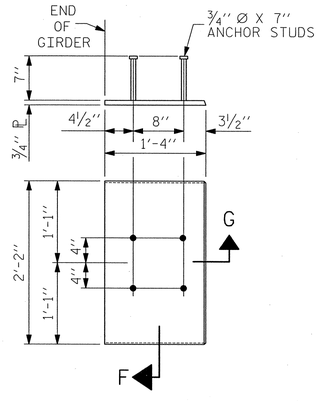


SECTION "G"



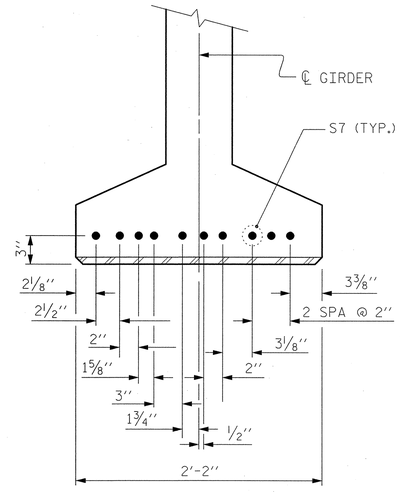
SECTION "F"

(SEE NOTES)



EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)



DETAIL "C"

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

(SBL)

REVISIONS						SHEET NO.
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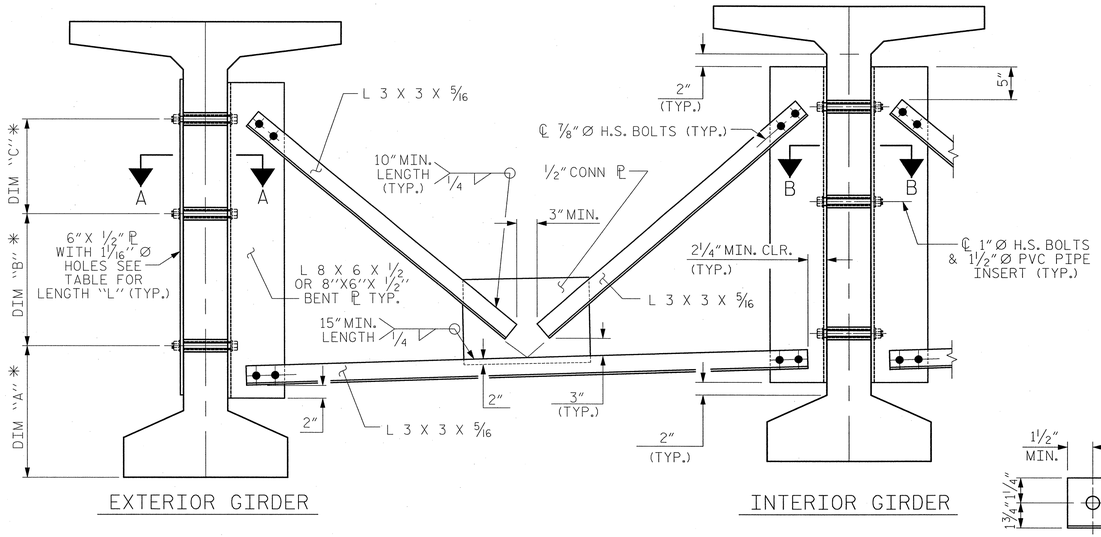
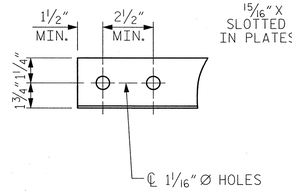
ASSEMBLED BY : T.R. DUDECK	DATE : 02-16-12	
CHECKED BY : J.T. KELVINGTON	DATE : 02-16-12	
DRAWN BY : ELR 11/91	REV. 7/10/01RR	LES/RDR
CHECKED BY : GRP 11/91	REV. 5/1/06	TLA/GM
	REV. 10/1/11	MAA/GM

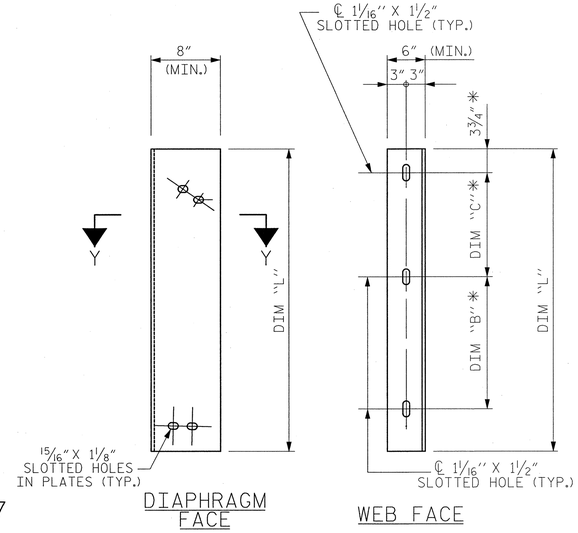
STD. NO. PCG9

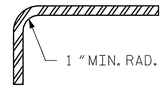


PART SECTION AT INTERMEDIATE DIAPHRAGM



ANGLE END
(L 3 X 3 X 5/16)





SECTION Y-Y

CONNECTION PLATE 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 ANGLE MEMBER SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

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

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

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

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

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

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

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

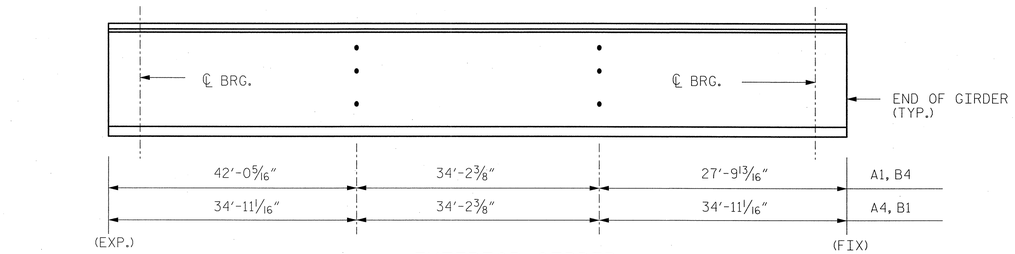
IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

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

* BOLT LOCATIONS SHALL BE ADJUSTED BY FABRICATOR TO AVOID DRAPED STRANDS IN GIRDERS.

TABLE

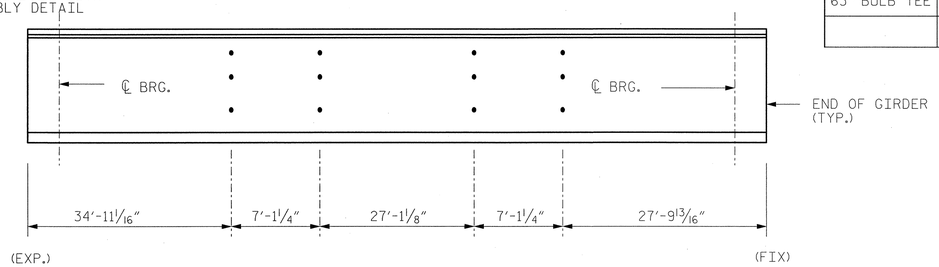
GIRDER TYPE	DIM "A" *	DIM "B" *	DIM "C" *	DIM "L"
63" BULB TEE	1'-9 1/4"	1'-2 1/4"	1'-2 1/4"	3'-5"



CONNECTION DETAILS

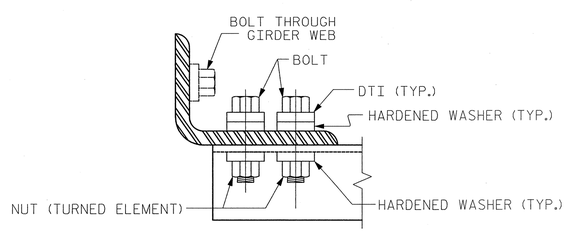
EXTERIOR GIRDER
DIAPHRAGM HOLE LOCATION

DIMENSIONS SHOWN ARE MEASURED ALONG BOTTOM FLANGE.



INTERIOR GIRDER
DIAPHRAGM HOLE LOCATION

DIMENSIONS SHOWN ARE MEASURED ALONG BOTTOM FLANGE.



BOLT WITH DTI ASSEMBLY DETAIL

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ASSEMBLED BY : J.B. GEILE	DATE : 02-16-12
CHECKED BY : J.T. KELVINGTON	DATE : 02-16-12
DRAWN BY : RWW 11/09	ADDED 11/23/09R
CHECKED BY : GM 11/09	REV. 10/1/11 MAA/GM

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

INTERMEDIATE STEEL DIAPHRAGMS

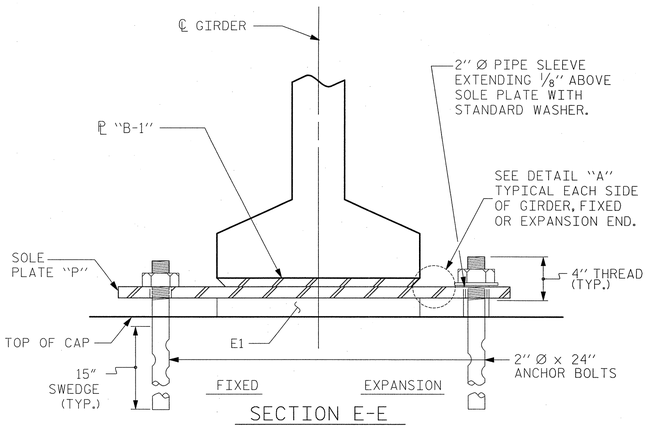
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S50
1			3			TOTAL SHEETS
2			4			72

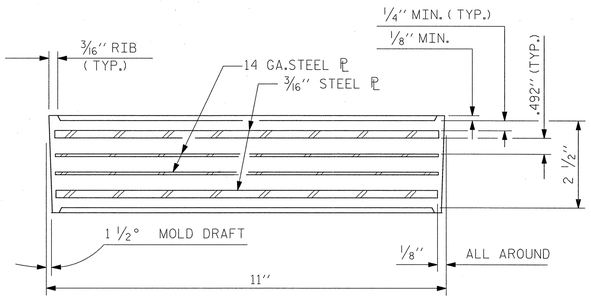
STD. NO. PCG11

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON

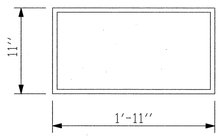
U:\Structures\Drawing\Final\Right Bridge\I4413_GDR.pcg.3.dgn 4/4/2012 9:01:49 AM



SECTION E-E



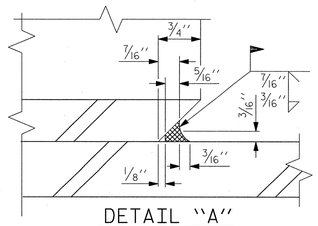
TYPICAL SECTION OF ELASTOMERIC BEARINGS



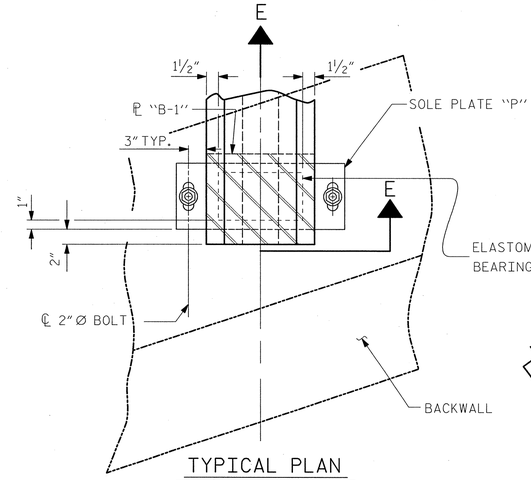
E1 (16 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

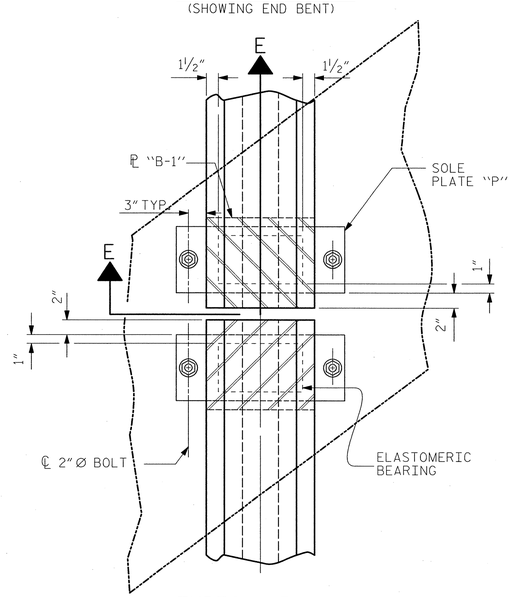
TYPE VI



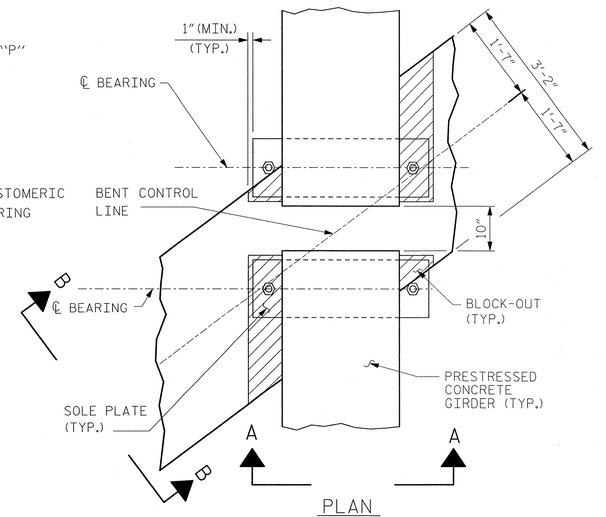
DETAIL "A"



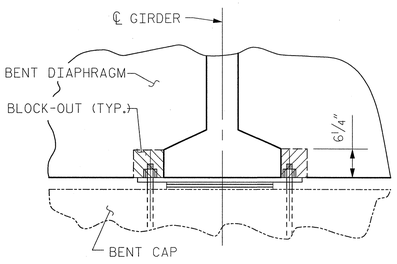
TYPICAL PLAN
(SHOWING END BENT)



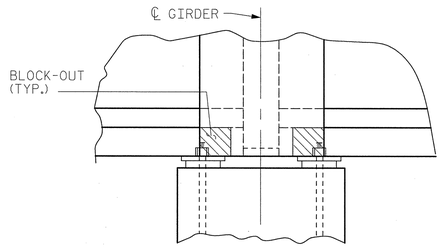
TYPICAL PLAN



PLAN

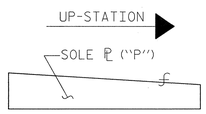


SECTION A-A

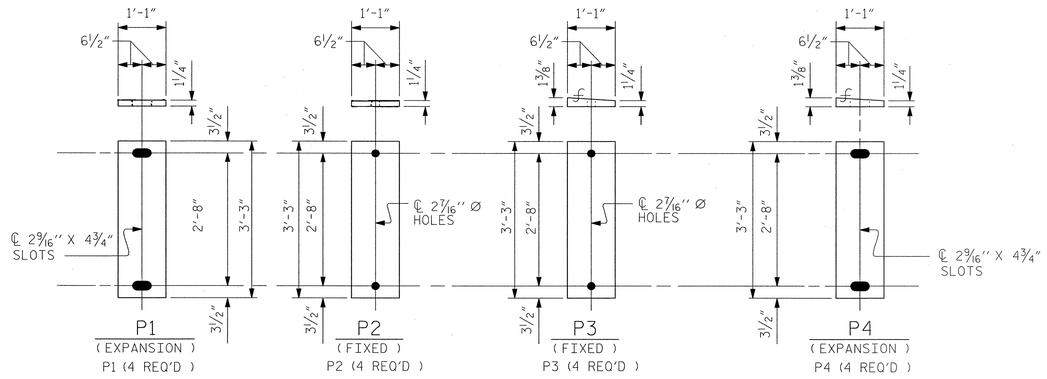


SECTION B-B

BENT DIAPHRAGM BLOCKOUT DETAIL



SOLE ℄ PLACEMENT DETAIL



SOLE PLATE DETAILS ("P")

NOTES

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

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

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

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50.

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

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ASSEMBLED BY : J.B. GEILE	DATE : 02-16-12
CHECKED BY : J.T. KELVINGTON	DATE : 02-16-12
DRAWN BY : EEM 2/97	REV. 10/17/00 RWW/LES
CHECKED BY : VAP 2/97	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

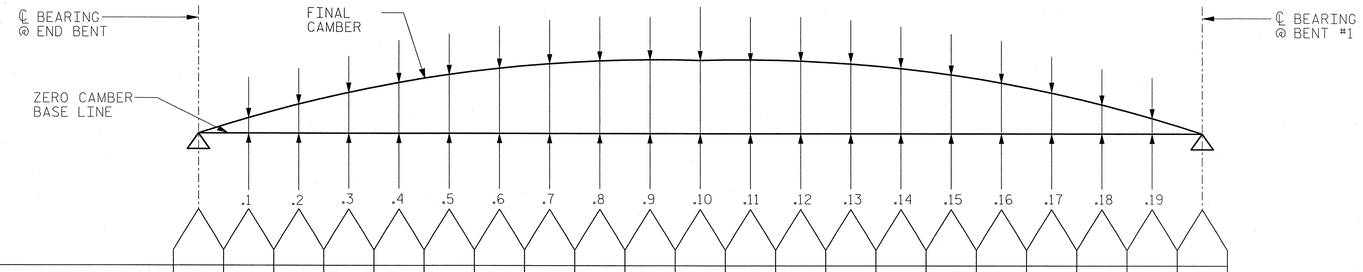
ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE (SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S51
1			3			TOTAL SHEETS
2			4			72

STD. NO. EB4

SPANS A & B



GIRDER 1

CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.054	0.108	0.149	0.190	0.218	0.247	0.263	0.279	0.284	0.289	0.284	0.279	0.263	0.247	0.218	0.190	0.149	0.108	0.054	0.000
DEFLEC. DUE TO SUPERIMPOSED DL ** ↓	0.000	0.022	0.043	0.063	0.084	0.099	0.114	0.123	0.132	0.135	0.138	0.134	0.130	0.120	0.110	0.095	0.079	0.060	0.040	0.020	0.000
FINAL CAMBER ↑	0	3/8"	3/4"	1"	1 1/4"	1 7/16"	1 9/16"	1 11/16"	1 3/4"	1 13/16"	1 13/16"	1 13/16"	1 13/16"	1 11/16"	1 5/8"	1 1/2"	1 5/16"	1 1/16"	13/16"	7/16"	0

GIRDERS 2-3

CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.054	0.108	0.149	0.190	0.218	0.247	0.263	0.279	0.284	0.289	0.284	0.279	0.263	0.247	0.218	0.190	0.149	0.108	0.054	0.000
DEFLEC. DUE TO SUPERIMPOSED DL ** ↓	0.000	0.022	0.045	0.065	0.086	0.102	0.118	0.127	0.137	0.139	0.142	0.138	0.135	0.125	0.114	0.098	0.082	0.062	0.041	0.021	0.000
FINAL CAMBER ↑	0	3/8"	3/4"	1"	1 1/4"	1 3/8"	1 9/16"	1 5/8"	1 11/16"	1 3/4"	1 3/4"	1 3/4"	1 3/4"	1 11/16"	1 9/16"	1 7/16"	1 5/16"	1 1/16"	13/16"	3/8"	0

GIRDER 4

CAMBER (GIRDER ALONE IN PLACE) ↑	0.000	0.054	0.108	0.149	0.190	0.218	0.247	0.263	0.279	0.284	0.289	0.284	0.279	0.263	0.247	0.218	0.190	0.149	0.108	0.054	0.000
DEFLEC. DUE TO SUPERIMPOSED DL ** ↓	0.000	0.021	0.043	0.062	0.082	0.097	0.113	0.122	0.131	0.133	0.136	0.132	0.128	0.119	0.109	0.093	0.078	0.059	0.039	0.020	0.000
FINAL CAMBER ↑	0	3/8"	13/16"	1 1/16"	1 5/16"	1 7/16"	1 5/8"	1 11/16"	1 13/16"	1 13/16"	1 7/8"	1 13/16"	1 13/16"	1 3/4"	1 5/8"	1 1/2"	1 5/16"	1 1/16"	13/16"	7/16"	0

** INCLUDES BRIDGE DECK, BUILDUP, STAY-IN-PLACE FORMS, DIAPHRAGMS, PARAPET, AND FUTURE WEARING SURFACE.

SCHEMATIC CAMBER ORDINATES SPANS A & B

ALL VALUES ARE SHOWN IN DECIMALS OF A FOOT EXCEPT "FINAL CAMBER" WHICH IS GIVEN IN INCHES.

ALL VALUES SHOWN ARE SYMMETRICAL ABOUT ℄ BENT 1.

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DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : T. R. DUDECK DATE : 02-16-12

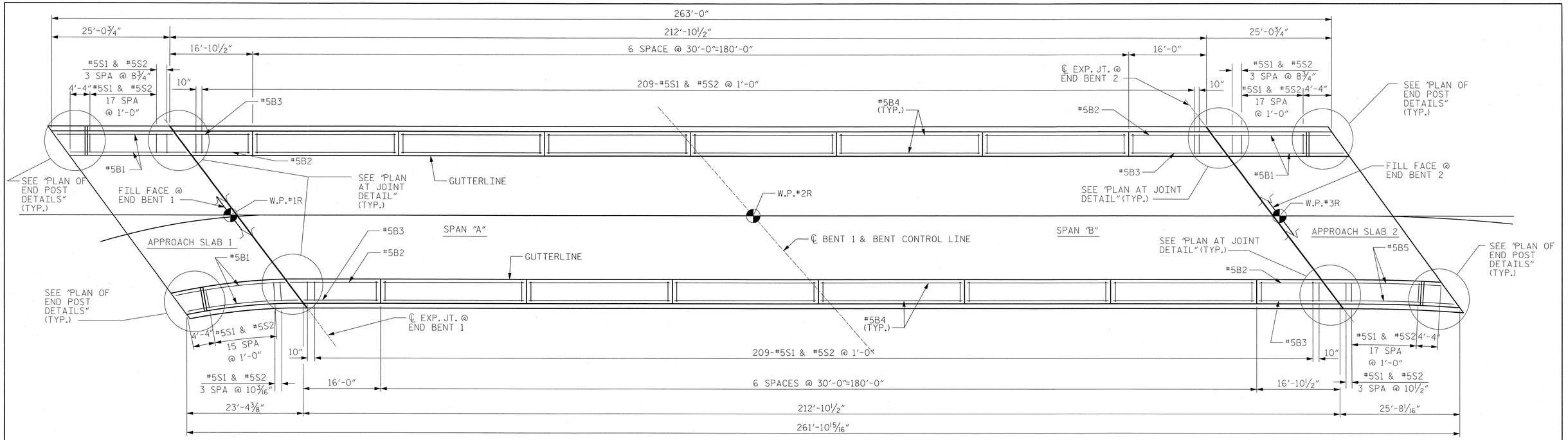
PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

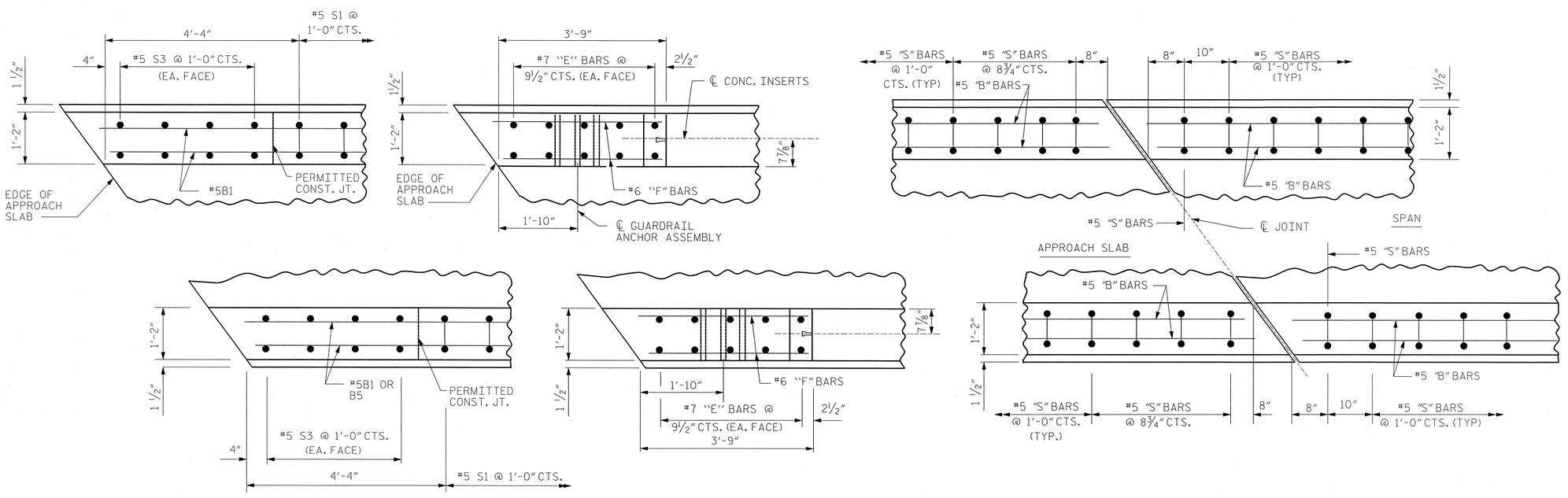
SUPERSTRUCTURE
DEAD LOAD DEFLECTIONS

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S52
1			3			TOTAL SHEETS
2			4			72



PARAPET PLAN



PLAN OF PARAPET

PLAN OF END POST

PLAN AT JOINT

PARAPET AND END POST FOR TWO BAR RAIL

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DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JEFFREY L. KELVINGTON

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE
PARAPET AND END POST

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S53
1			3			TOTAL SHEETS
2			4			72

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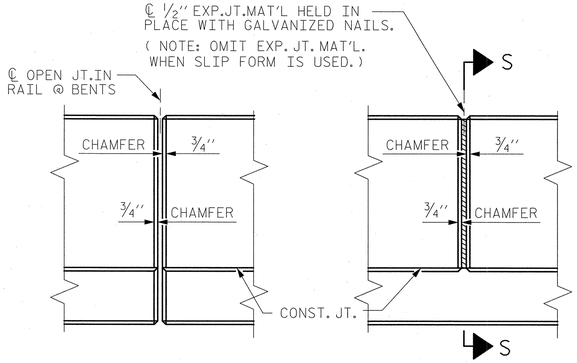
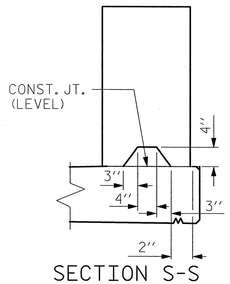


ELEVATION AT EXPANSION JOINTS



SECTION S-S

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

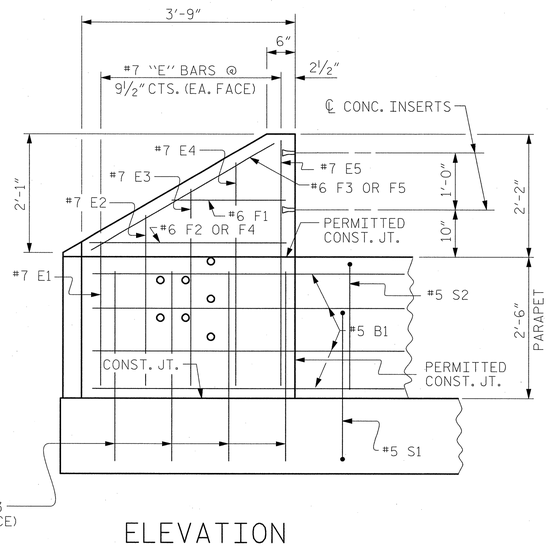
BARRIER RAIL DETAILS

NOTES

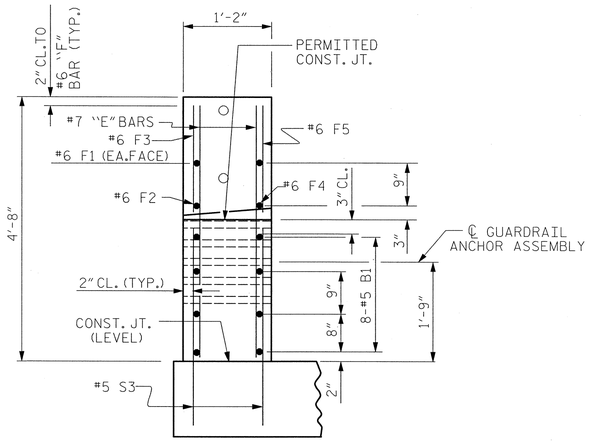
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

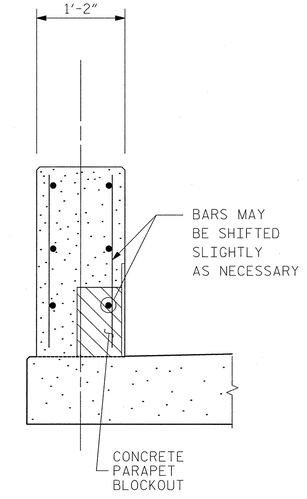
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS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



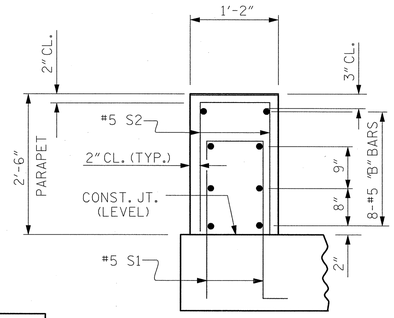
ELEVATION



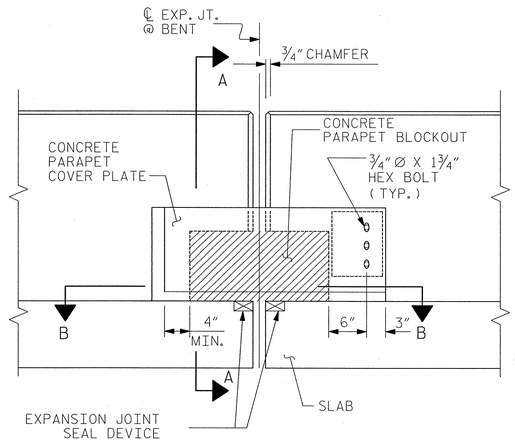
END VIEW



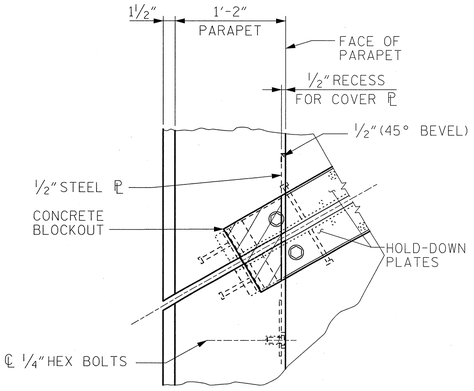
SECTION A-A



SECTION THRU PARAPET

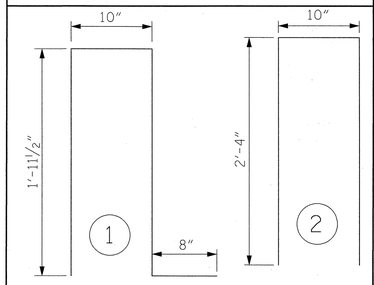


ELEVATION @ EXP. JT.



SECTION B-B

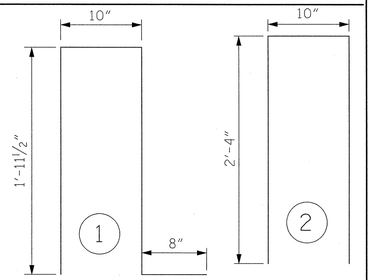
BILL OF MATERIAL



LEFT PARAPET AND TWO END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	16	#5	STR	24'-8"	412
✳B2	8	#5	STR	15'-7"	130
✳B3	8	#5	STR	16'-5"	137
✳B4	48	#5	STR	29'-8"	1483
✳E1	4	#7	STR	2'-6"	20
✳E2	4	#7	STR	3'-4"	27
✳E3	4	#7	STR	3'-6"	29
✳E4	4	#7	STR	4'-0"	33
✳E5	4	#7	STR	4'-4"	35
✳F1	4	#6	STR	12'-3"	74
✳F2	2	#6	STR	3'-9"	11
✳F3	2	#6	STR	3'-6"	11
✳F4	2	#6	STR	3'-5"	10
✳F5	2	#6	STR	3'-6"	11
✳S1	253	#5	1	5'-5"	1429
✳S2	253	#5	2	5'-6"	1451
✳S3	16	#5	STR	3'-0"	50
✳EPOXY COATED REINFORCING STEEL				LBS.	5353
CLASS AA CONCRETE				C.Y.	28.8
CONCRETE PARAPET				L.F.	263

BILL OF MATERIAL



RIGHT PARAPET AND TWO END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	8	#5	STR	23'-0"	192
✳B2	8	#5	STR	15'-7"	130
✳B3	8	#5	STR	16'5"	271
✳B4	48	#5	STR	29'-8"	1483
✳B5	8	#5	STR	29'-3"	244
✳E1	4	#7	STR	2'-6"	20
✳E2	4	#7	STR	3'-4"	27
✳E3	4	#7	STR	3'-6"	29
✳E4	4	#7	STR	4'-0"	33
✳E5	4	#7	STR	4'-4"	35
✳F1	4	#6	STR	12'-2"	73
✳F2	2	#6	STR	3'-6"	11
✳F3	2	#6	STR	3'-10"	12
✳F4	2	#6	STR	3'-5"	10
✳F5	2	#6	STR	3'-7"	11
✳S1	251	#5	1	5'-5"	1418
✳S2	251	#5	2	5'-6"	1440
✳S3	16	#5	STR	3'-0"	50
✳EPOXY COATED REINFORCING STEEL				LBS.	5355
CLASS AA CONCRETE				C.Y.	28.7
CONCRETE PARAPET				L.F.	261.91

CONCRETE PARAPET REQUIRED L.F. 524.91

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET AND END POST

(SBL)

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

SHEET NO. S54

TOTAL SHEETS 72

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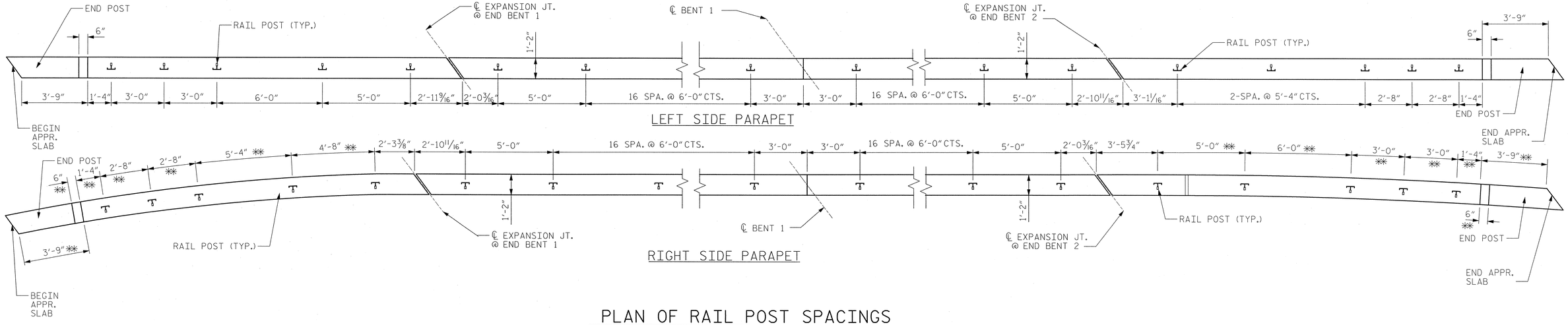
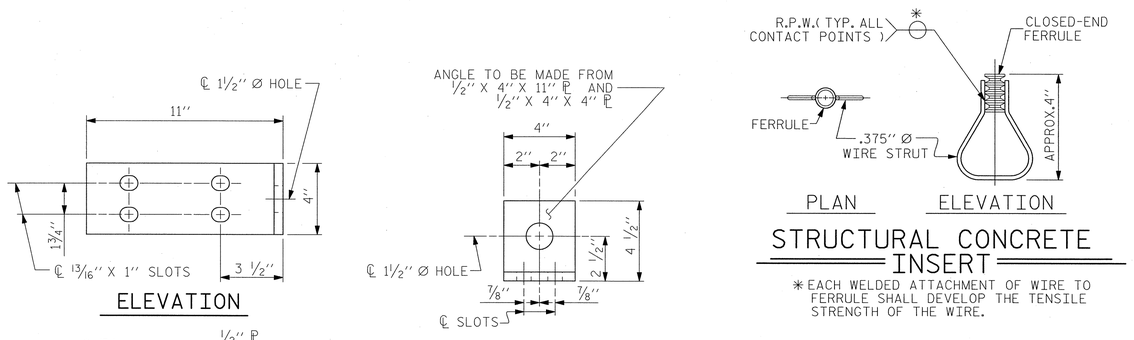
DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : S. S. YUEN DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 13406 JOSEPH T. KELVINGTON 2/25/12



PLAN OF RAIL POST SPACINGS

** DENOTES RADIAL DIMENSIONS ALONG TRAFFIC FACE OF PARAPET



NOTES

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

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 3#4"Ø X 15#8" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾" Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

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

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

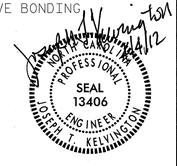
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

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

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

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



PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

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ASSEMBLED BY : J. B. GEILE	DATE : 02-16-12
CHECKED BY : S. S. YUEN	DATE : 02-16-12
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

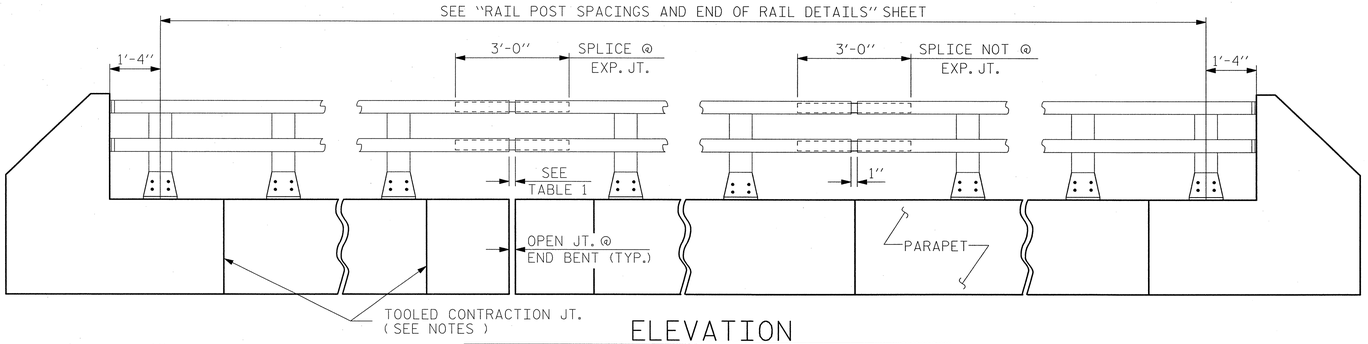
RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR TWO BAR METAL RAILS
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S55
1			3			TOTAL SHEETS
2			4			72

STD. NO. BMR2

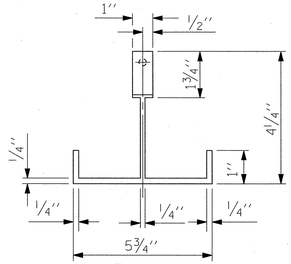
DETAILS FOR ATTACHING METAL RAIL TO END POST



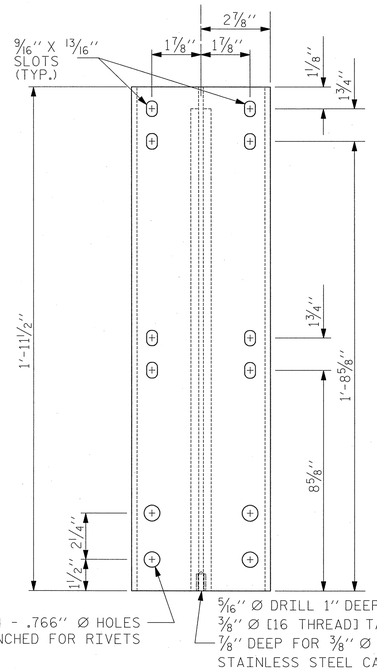
ELEVATION

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

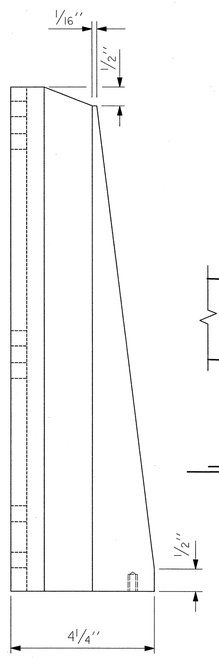
TABLE 1	
℄ EXP. JT. @	RAIL OPENING
END BENT No. 1	1⅝"
END BENT No. 2	1⅝"



PLAN

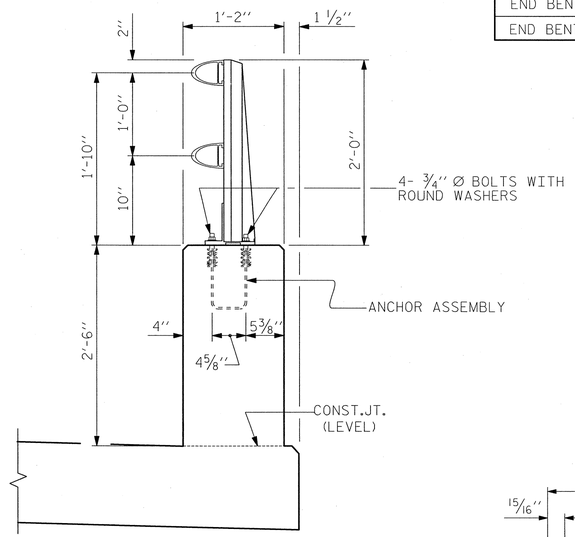


FRONT ELEVATION

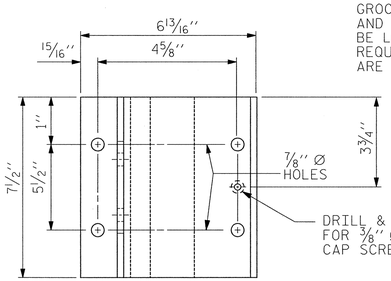


SIDE ELEVATION

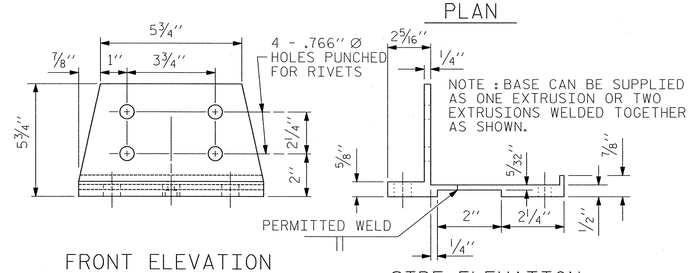
DETAILS OF POST



SECTION THRU PARAPET AND RAIL



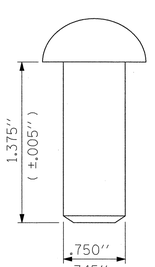
PLAN



FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

ALUMINUM RAILS

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

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 510.00 LIN. FT.

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ASSEMBLED BY : J. L. HENNEKES	DATE : 02-16-12
CHECKED BY : T. R. DUDECK	DATE : 02-16-12
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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

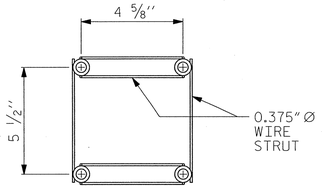
STANDARD

2 BAR METAL RAIL

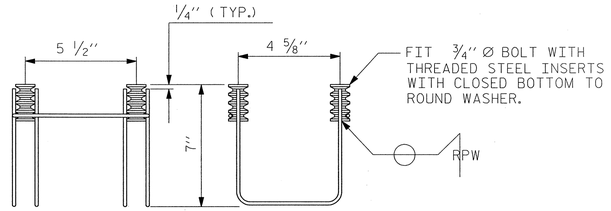
(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S56
1			3			TOTAL SHEETS
2			4			72

STD. NO. BMR3



PLAN



SIDE VIEW ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(92 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.

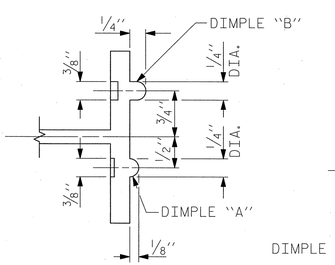
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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.

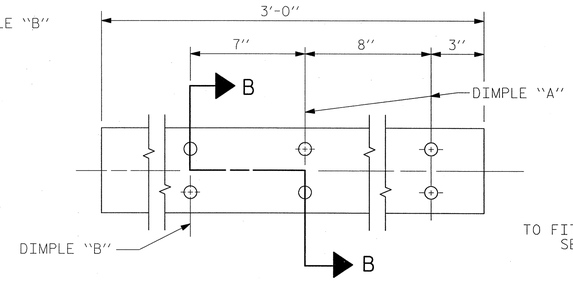
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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 THE STANDARD SPECIFICATIONS.

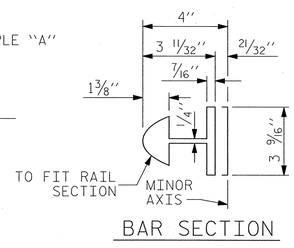
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



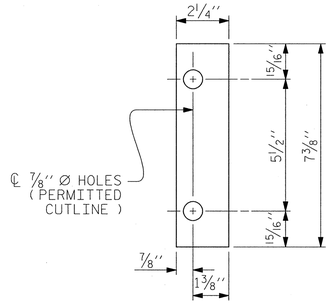
SECTION B - B



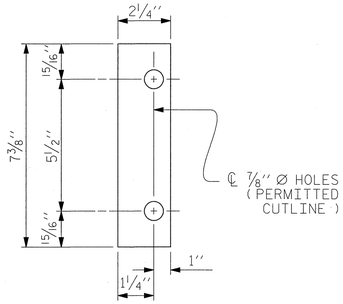
EXPANSION BAR DETAILS



BAR SECTION



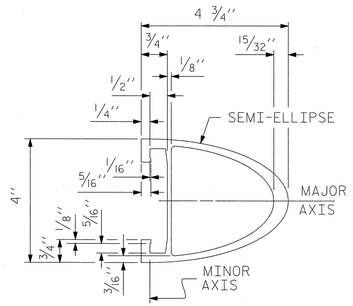
FRONT PLATE



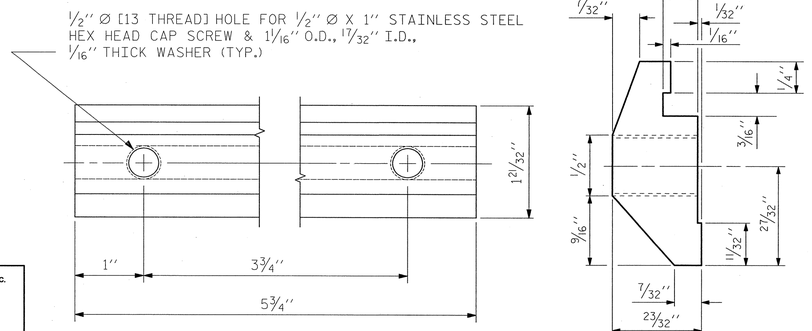
REAR PLATE

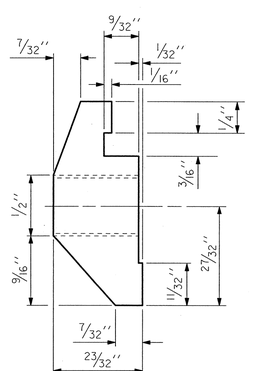
SHIM DETAILS

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



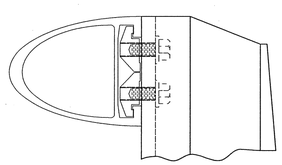
RAIL SECTION



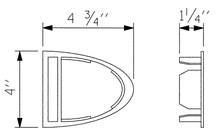


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

(SBL)

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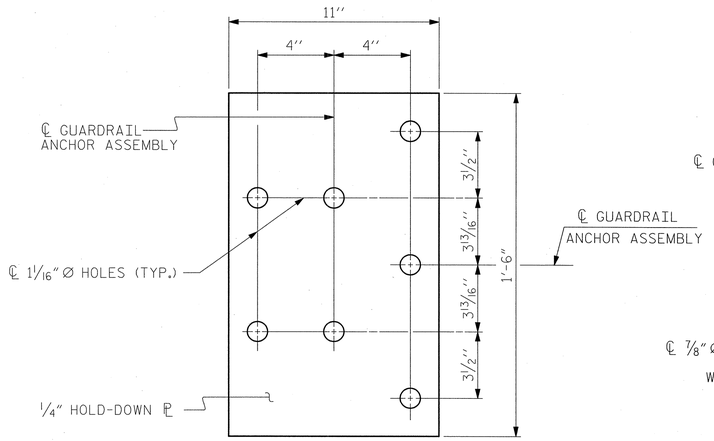
ASSEMBLED BY : J. L. HENNEKES	DATE : 02-16-12
CHECKED BY : T. R. DUDECK	DATE : 02-16-12
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM

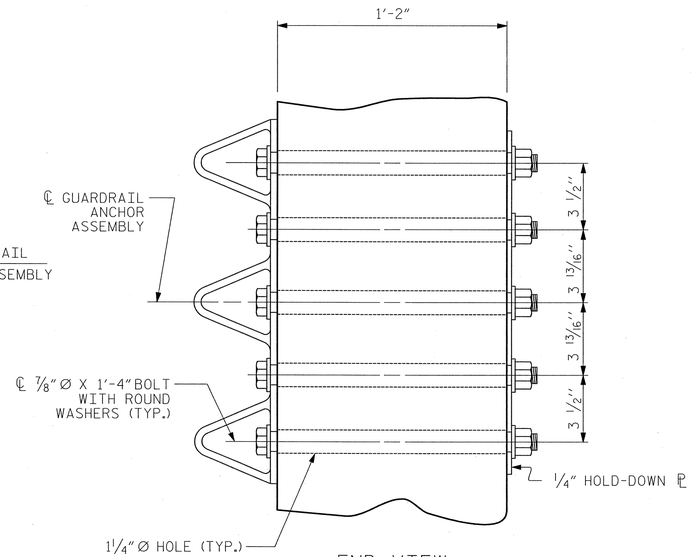
Joseph T. Kennington 4/12
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH KELVINGTON

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S57
1			3			TOTAL SHEETS
2			4			72

STD. NO. BMR4



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

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

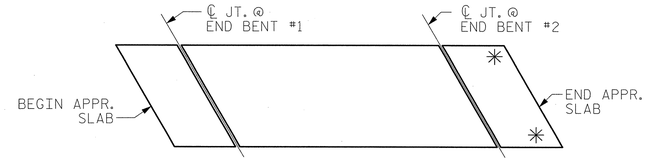
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

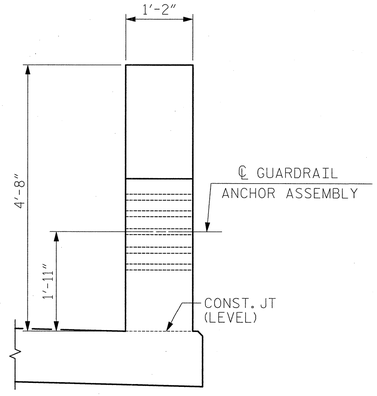
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

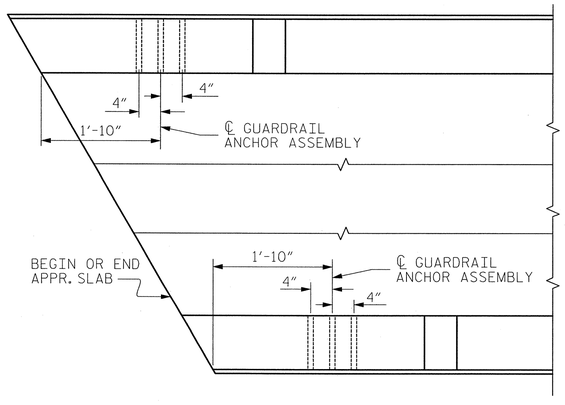


SKETCH SHOWING POINTS OF ATTACHMENT

✳ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S58
1			3			TOTAL SHEETS
2			4			72

STD. NO. GRA3

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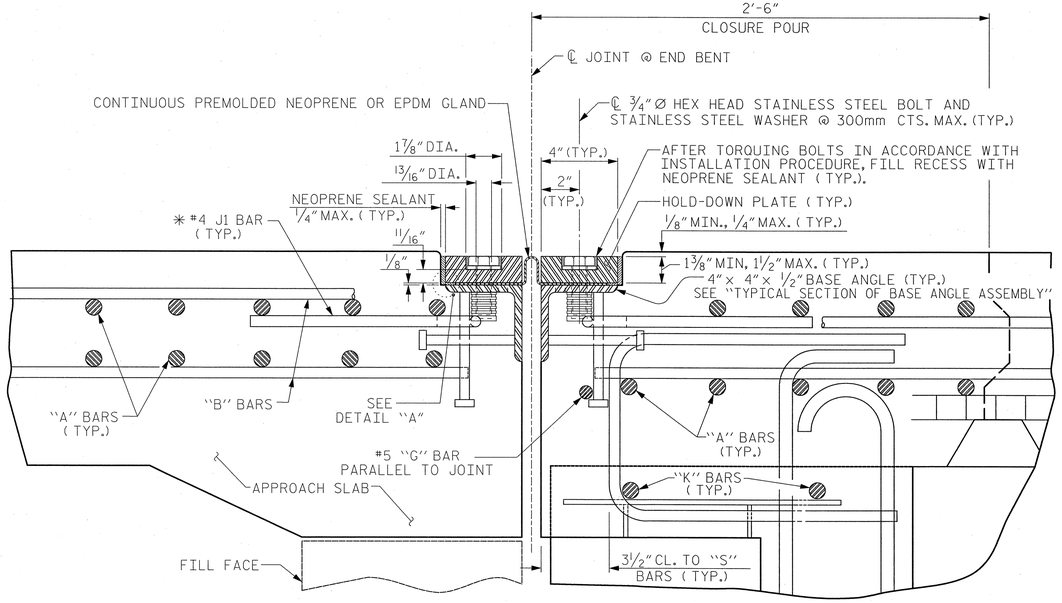
ASSEMBLED BY :	J. L. HENNEKES	DATE :	02-16-12
CHECKED BY :	T. R. DUDECK	DATE :	02-16-12
DRAWN BY :	MAA 5/10	ADDED	5/6/10
CHECKED BY :	GM 5/10	REV.	10/1/11 MAA/GM
		REV.	12/5/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON — 4/12



EXPANSION JOINT DETAILS

SECTION NORMAL TO JOINT -- PRESTRESSED GIRDER SUPERSTRUCTURE

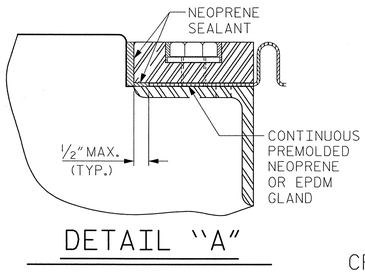
* THE QUANTITY OF #4 J1 BARS ON THE BILL OF MATERIAL IS BASED ON 1'-0" CENTERS. J1 BARS SHALL BE PLACED AT EACH VERTICAL STUD ANCHOR BOLT. IN THE EVENT THAT THE NUMBER OF VERTICAL STUD ANCHORS EXCEEDS THE NUMBER OF J1 BARS SPECIFIED, ADDITIONAL J1 BARS WILL NOT BE REQUIRED.

INSTALLATION PROCEDURE

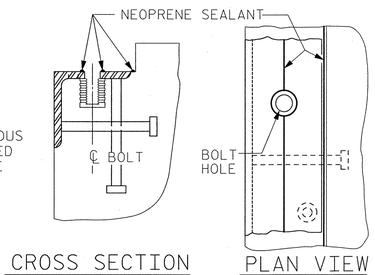
1. A TEMPLATE OR OTHER SUITABLE DEVICE SHALL BE USED TO FORM THE TOP OF THE EXPANSION JOINT SEAL BLOCKOUT TO THE PROPER DEPTH AND WIDTH. THE TEMPLATE SHALL BE 4 1/8" TO 4 1/4" WIDE AND OF SUCH THICKNESS AS TO PROVIDE FOR CORRECT FINAL ELEVATION OF TOP OF HOLD-DOWN PLATES. THE TEMPLATE SHALL BE ATTACHED TO THE BASE ANGLE ASSEMBLY WITH THE 3/4" Ø HEX HEAD BOLTS PROVIDED FOR THE HOLD-DOWN PLATES. A 1" Ø HOLE SHALL BE PROVIDED IN THE TEMPLATE CENTERED OVER EACH WEEP HOLE IN THE 4" X 4" X 1/2" BASE ANGLE. OTHER METHODS OF INSURING DRAINAGE THROUGH WEEP HOLES MAY BE EMPLOYED SUBJECT TO ENGINEER'S APPROVAL.
2. AFTER THE CONCRETE HAS BEEN CAST ON BOTH SIDES OF THE JOINT, REMOVE THE TEMPLATE. THOROUGHLY CLEAN THE BOLT HOLES AND THE ANGLE PLATE. REMOVE ANY EXCESS CONCRETE THAT COMES OUT OF THE WEEP HOLES. ANY DAMAGED STEEL SHALL BE COATED WITH A MINIMUM THICKNESS OF 4 DRY MILS OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
3. LAY THE GLAND ON THE BASE ANGLE AND FIELD MARK THE GLAND FOR THE BOLT HOLES. HOLES IN THE GLAND SHALL BE PUNCHED 7/8" IN DIAMETER WITH A HAND PUNCH.
4. IN ORDER TO CHECK FOR PROPER ALIGNMENT, PLACE THE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. DO NOT APPLY NEOPRENE SEALANT. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE BUT DO NOT TIGHTEN. THE ENGINEER SHALL INSPECT THE JOINT SEAL DEVICE FOR PROPER ALIGNMENT.
5. AFTER INSPECTION, REMOVE THE HOLD-DOWN PLATES AND GLAND. APPLY NEOPRENE SEALANT TO THE BASE ANGLE IN ACCORDANCE WITH THE "INSTALLATION SKETCH". PLACE GLAND AND HOLD-DOWN PLATES ON THE BASE ANGLE. BOLT THE HOLD-DOWN PLATES TO THE BASE ANGLE ASSEMBLY AND TORQUE THE BOLTS TO 88 FT-LBS WITH A TORQUE WRENCH. CHECK THE TORQUE AFTER THREE (3) HOURS AND, IF NECESSARY, RETIGHTEN TO 88 FT-LBS. A FINAL CHECK SHALL BE MADE AT SEVEN (7) DAYS. TORQUE SHALL NOT BE LESS THAN 80 FT-LBS AFTER SEVEN (7) DAYS.
6. AFTER PROPER TORQUING, CLEAN THE BOLT HOLE RECESSES AND THE RECESS BETWEEN THE JOINT SEAL DEVICE AND CONCRETE, COMPLETELY FILL THESE RECESSES WITH NEOPRENE SEALANT.

GENERAL NOTES

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

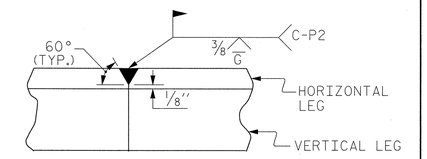


DETAIL "A"



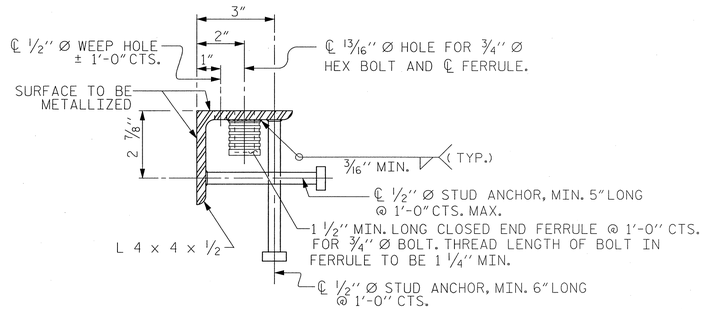
CROSS SECTION PLAN VIEW

INSTALLATION SKETCH



DETAIL- FIELD WELD SPLICE OF BASE ANGLE

MOVEMENT AND SETTING AT JOINT					
BENT NO.	SKEW ANGLE	TOTAL MOVEMENT (ALONG ℄ RDWY)	PERPENDICULAR JOINT OPENING AT 45° F	PERPENDICULAR JOINT OPENING AT 60° F	PERPENDICULAR JOINT OPENING AT 90° F
END 1 & 2	53.21°	7/8"	1 7/16"	1 5/16"	1 1/8"



TYPICAL SECTION OF BASE ANGLE ASSEMBLY

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S59
1			3			TOTAL SHEETS
2			4			72

STD. NO. EJS1

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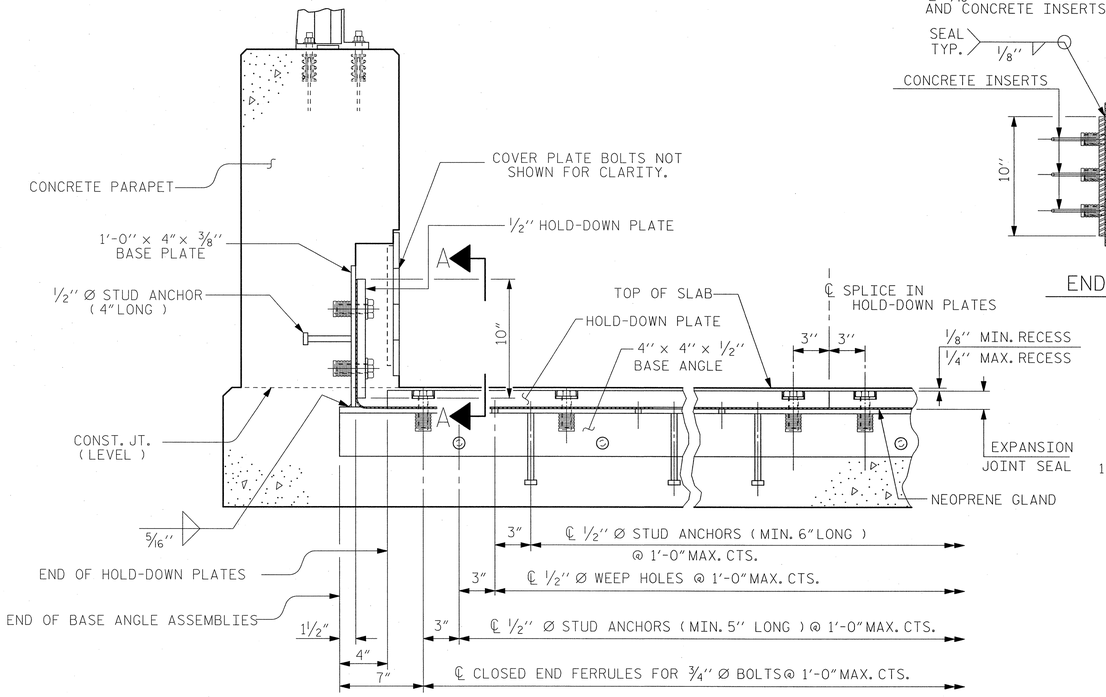
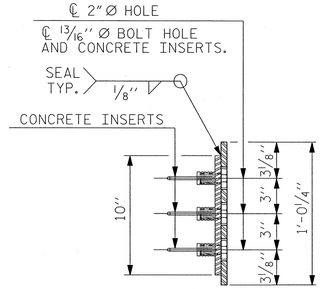
ASSEMBLED BY : J. B. GEILE	DATE : 02-16-12
CHECKED BY : S. S. YUEN	DATE : 02-16-12
DRAWN BY : REK 9/87	REV. 5/7/03R RWW/JTE
CHECKED BY : CRK 10/87	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/12

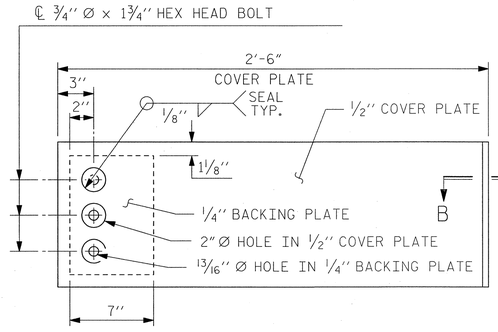
U:\Structures\Drawing\Final\Right Bridge\14413_SD_ejsl_12.dgn 4/4/2012 9:02:17 AM jgeile



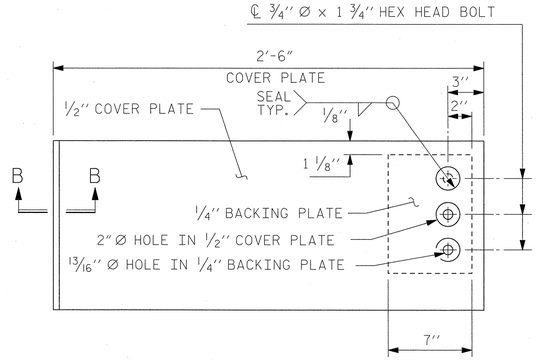
SECTION THRU PARAPET NORMAL TO JOINT



END VIEW

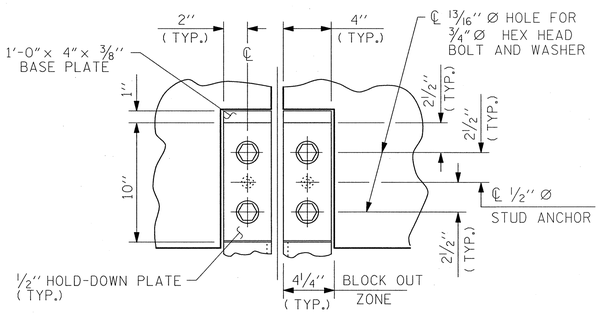


TYPE I ELEVATION VIEW

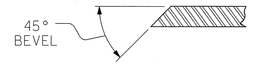


TYPE II - ELEVATION VIEW

COVER PLATE DETAILS

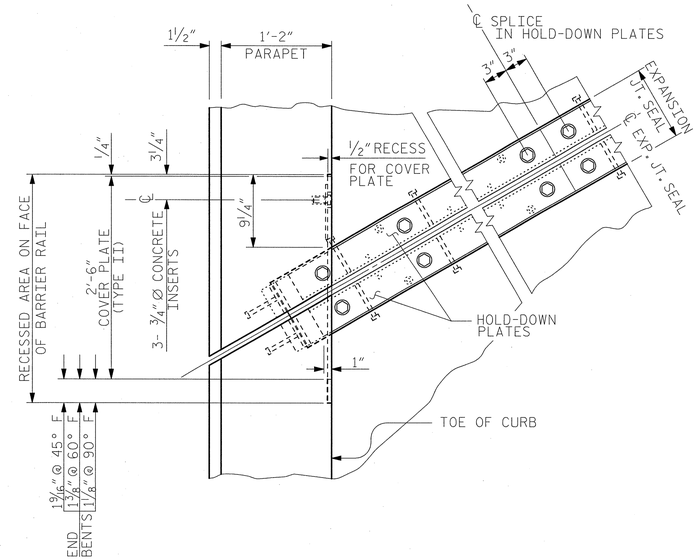


SECTION A - A



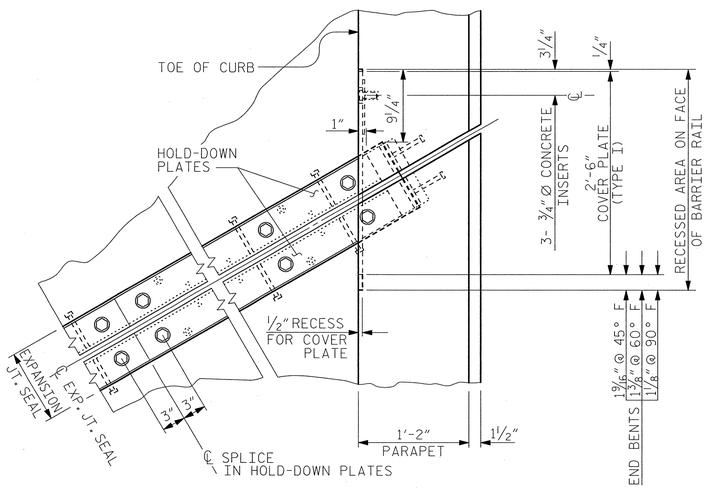
SECTION B - B

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

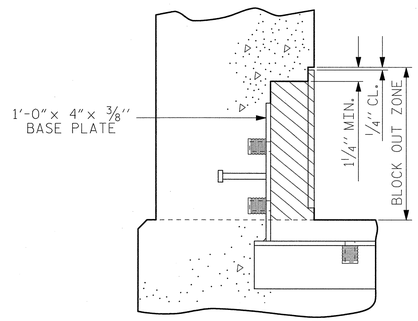


PLAN OF EXPANSION JOINT SEAL - LEFT SIDE

FLOW OF TRAFFIC

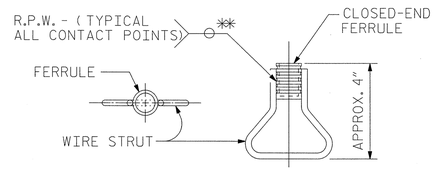


PLAN OF EXPANSION JOINT SEAL - RIGHT SIDE



BLOCK OUT DETAIL

SEE " SECTION A - A " FOR OTHER DETAILS.



PLAN ELEVATION

CONCRETE INSERT

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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

EXPANSION JOINT SEAL DETAILS FOR CONCRETE PARAPET

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S60
1			3			TOTAL SHEETS
2			4			72

ASSEMBLED BY : J.L. HENNEKES DATE : 02-16-2012
CHECKED BY : S.S. YUEN DATE : 02-16-2012

DRAWN BY : MAA 2/12
CHECKED BY : GM 2/12

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NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH KELVINGTON

STD. NO. EJS5 SHT 3b

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	6	6	STR.	17′-7″	158
✳ A101	297	5	STR.	36′-3″	11229
✳ A102	2	5	STR.	35′-7″	74
✳ A103	2	5	STR.	34′-9″	72
✳ A104	2	5	STR.	33′-11″	71
✳ A105	2	5	STR.	33′-1″	69
✳ A106	2	5	STR.	32′-3″	67
✳ A107	2	5	STR.	31′-5″	66
✳ A108	2	5	STR.	30′-7″	64
✳ A109	2	5	STR.	29′-8″	62
✳ A110	2	5	STR.	28′-10″	60
✳ A111	2	5	STR.	28′-0″	58
✳ A112	2	5	STR.	27′-2″	57
✳ A113	2	5	STR.	26′-4″	55
✳ A114	2	5	STR.	25′-6″	53
✳ A115	2	5	STR.	24′-8″	51
✳ A116	2	5	STR.	23′-10″	50
✳ A117	2	5	STR.	23′-0″	48
✳ A118	2	5	STR.	22′-2″	46
✳ A119	2	5	STR.	21′-4″	45
✳ A120	2	5	STR.	20′-6″	43
✳ A121	2	5	STR.	19′-8″	41
✳ A122	2	5	STR.	18′-10″	39
✳ A123	2	5	STR.	18′-0″	38
✳ A124	2	5	STR.	17′-2″	36
✳ A125	2	5	STR.	16′-4″	34
✳ A126	2	5	STR.	15′-6″	32
✳ A127	2	5	STR.	14′-8″	31
✳ A128	2	5	STR.	13′-10″	29
✳ A129	2	5	STR.	13′-0″	27
✳ A130	2	5	STR.	12′-2″	25
✳ A131	2	5	STR.	11′-4″	24
✳ A132	2	5	STR.	10′-6″	22
✳ A133	2	5	STR.	9′-8″	20
✳ A134	2	5	STR.	8′-10″	18
✳ A135	2	5	STR.	8′-0″	17
✳ A136	2	5	STR.	7′-2″	15

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A137	2	5	STR.	6′-4″	13
✳ A138	2	5	STR.	5′-6″	11
✳ A139	2	5	STR.	4′-8″	10
✳ A140	2	5	STR.	3′-10″	8
✳ A141	2	5	STR.	3′-0″	6
A201	297	5	STR.	36′-3″	11229
A202	2	5	STR.	35′-6″	74
A203	2	5	STR.	34′-8″	72
A204	2	5	STR.	33′-10″	71
A205	2	5	STR.	33′-0″	69
A206	2	5	STR.	32′-2″	67
A207	2	5	STR.	31′-4″	65
A208	2	5	STR.	30′-5″	63
A209	2	5	STR.	29′-7″	62
A210	2	5	STR.	28′-9″	60
A211	2	5	STR.	27′-11″	58
A212	2	5	STR.	27′-1″	56
A213	2	5	STR.	26′-3″	55
A214	2	5	STR.	25′-5″	53
A215	2	5	STR.	24′-7″	51
A216	2	5	STR.	23′-9″	50
A217	2	5	STR.	22′-11″	48
A218	2	5	STR.	22′-1″	46
A219	2	5	STR.	21′-3″	44
A220	2	5	STR.	20′-5″	43
A221	2	5	STR.	19′-7″	41
A222	2	5	STR.	18′-9″	39
A223	2	5	STR.	17′-11″	37
A224	2	5	STR.	17′-1″	36
A225	2	5	STR.	16′-3″	34
A226	2	5	STR.	15′-5″	32
A227	2	5	STR.	14′-7″	30
A228	2	5	STR.	13′-9″	29
A229	2	5	STR.	12′-11″	27

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A230	2	5	STR.	12′-1″	25
A231	2	5	STR.	11′-3″	23
A232	2	5	STR.	10′-5″	22
A233	2	5	STR.	9′-7″	20
A234	2	5	STR.	8′-9″	18
A235	2	5	STR.	7′-11″	17
A236	2	5	STR.	7′-1″	15
A237	2	5	STR.	6′-3″	13
A238	2	5	STR.	5′-5″	11
A239	2	5	STR.	4′-7″	10
A240	2	5	STR.	3′-9″	8
A241	2	5	STR.	2′-11″	6
✳ B1	135	5	STR.	44′-5″	6254
B2	135	5	STR.	44′-3″	6231
✳ B3	46	7	STR.	40′-0″	3761
✳ G1	2	5	STR.	45′-0″	94
✳ J1	90	4	8	1′-5″	85
✳ K1	8	8	1	15′-11″	340
✳ K2	8	8	2	23′-4″	498
✳ K3	18	6	STR.	7′-9″	210
K4	18	4	STR.	6′-10″	82
K5	24	4	STR.	10′-8″	171
K6	8	5	STR.	18′-4″	153
S1	33	4	7	10′-2″	224
S2	153	4	6	3′-7″	366
✳ S3	48	4	5	5′-1″	163
✳ S4	48	5	3	6′-2″	309
U1	21	4	4	14′-11″	209

✳ = EPOXY COATED REINF. STEEL

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″			

CLASS AA CONC. BREAKDOWN

POUR 1 119.9 C.Y.

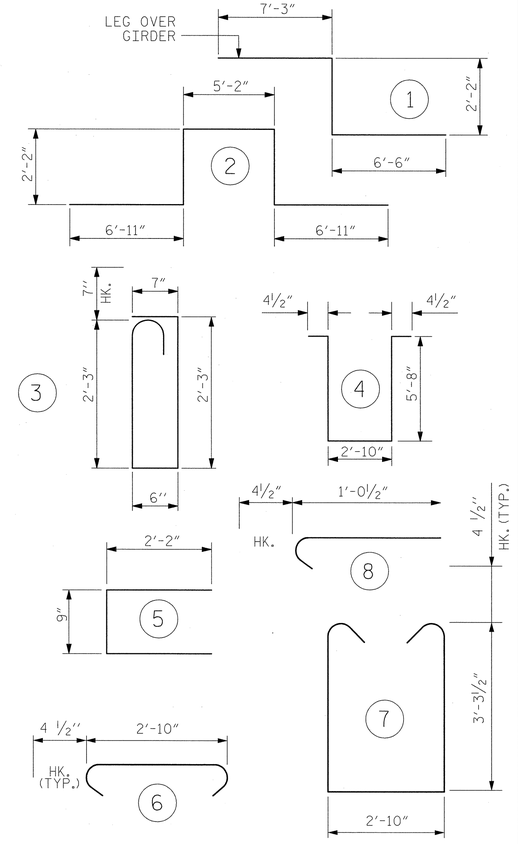
POUR 2 156.7 C.Y.

TOTAL CLASS AA CONC. 276.6 C.Y.

GROOVING BRIDGE FLOORS

APPROACH SLABS	1458 SQ.FT.
BRIDGE DECK	6555 SQ.FT.
TOTAL	8013 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

SUPERSTRUCTURE BILL OF MATERIAL

SPANS	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
″A″ AND ″B″	276.6	20,265	24,708
TOTALS✳✳	276.6	20,265	24,708

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. I-4413

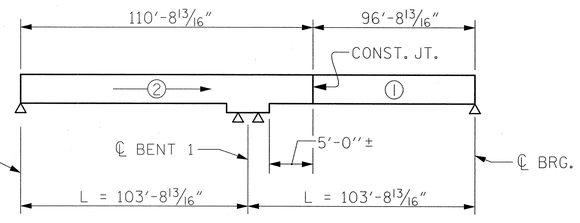
ROBESON COUNTY

STATION: 22+37.56 -L-

KEY

Ⓐ = INDICATES POUR NUMBER AND DIRECTION OF POUR

L = LENGTH OF EACH SPAN

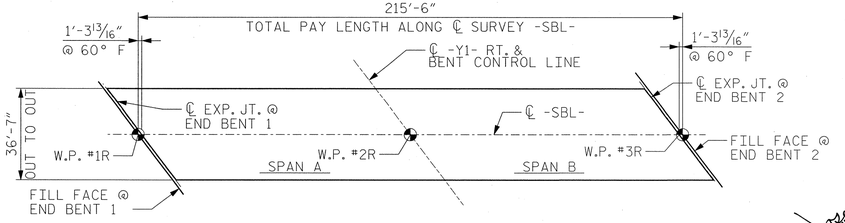


2 SPANS

POURING SEQUENCE-PRESTRESSED CONCRETE SUPERSTRUCTURE

(CONTINUOUS FOR LIVE LOAD)

(FOR "OPTIONAL POURING SEQUENCE", SEE SHEET S44)



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 7,788)

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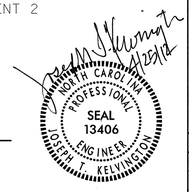
License No. F-0672

ASSEMBLED BY : JBG	DATE : 2/12		
CHECKED BY : JTK	DATE : 2/12		
DRAWN BY : JMB 5/87	REV. 8/16/99	RWW/LES	
CHECKED BY : SJD 9/87	REV. 5/1/06	TLA/GM	
	REV. 10/1/11	MAA/GM	



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SUPERSTRUCTURE BILL OF MATERIAL

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S61
1			3			TOTAL SHEETS
2			4			72

STD. NO. BOM2

REINFORCING BAR SCHEDULE

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	6	6	STR.	17′-7″	158
✳ A101	297	5	STR.	36′-3″	11229
✳ A102	2	5	STR.	35′-7″	74
✳ A103	2	5	STR.	34′-9″	72
✳ A104	2	5	STR.	33′-11″	71
✳ A105	2	5	STR.	33′-1″	69
✳ A106	2	5	STR.	32′-3″	67
✳ A107	2	5	STR.	31′-5″	66
✳ A108	2	5	STR.	30′-7″	64
✳ A109	2	5	STR.	29′-8″	62
✳ A110	2	5	STR.	28′-10″	60
✳ A111	2	5	STR.	28′-0″	58
✳ A112	2	5	STR.	27′-2″	57
✳ A113	2	5	STR.	26′-4″	55
✳ A114	2	5	STR.	25′-6″	53
✳ A115	2	5	STR.	24′-8″	51
✳ A116	2	5	STR.	23′-10″	50
✳ A117	2	5	STR.	23′-0″	48
✳ A118	2	5	STR.	22′-2″	46
✳ A119	2	5	STR.	21′-4″	45
✳ A120	2	5	STR.	20′-6″	43
✳ A121	2	5	STR.	19′-8″	41
✳ A122	2	5	STR.	18′-10″	39
✳ A123	2	5	STR.	18′-0″	38
✳ A124	2	5	STR.	17′-2″	36
✳ A125	2	5	STR.	16′-4″	34
✳ A126	2	5	STR.	15′-6″	32
✳ A127	2	5	STR.	14′-8″	31
✳ A128	2	5	STR.	13′-10″	29
✳ A129	2	5	STR.	13′-0″	27
✳ A130	2	5	STR.	12′-2″	25
✳ A131	2	5	STR.	11′-4″	24
✳ A132	2	5	STR.	10′-6″	22
✳ A133	2	5	STR.	9′-8″	20
✳ A134	2	5	STR.	8′-10″	18
✳ A135	2	5	STR.	8′-0″	17
✳ A136	2	5	STR.	7′-2″	15
✳ A137	2	5	STR.	6′-4″	13
✳ A138	2	5	STR.	5′-6″	11
✳ A139	2	5	STR.	4′-8″	10
✳ A140	2	5	STR.	3′-10″	8
✳ A141	2	5	STR.	3′-0″	6
A201	297	5	STR.	36′-3″	11229
A202	2	5	STR.	35′-6″	74
A203	2	5	STR.	34′-8″	72
A204	2	5	STR.	33′-10″	71
A205	2	5	STR.	33′-0″	69
A206	2	5	STR.	32′-2″	67
A207	2	5	STR.	31′-4″	65
A208	2	5	STR.	30′-5″	63
A209	2	5	STR.	29′-7″	62
A210	2	5	STR.	28′-9″	60
A211	2	5	STR.	27′-11″	58
A212	2	5	STR.	27′-1″	56
A213	2	5	STR.	26′-3″	55
A214	2	5	STR.	25′-5″	53
A215	2	5	STR.	24′-7″	51
A216	2	5	STR.	23′-9″	50
A217	2	5	STR.	22′-11″	48
A218	2	5	STR.	22′-1″	46
A219	2	5	STR.	21′-3″	44
A220	2	5	STR.	20′-5″	43
A221	2	5	STR.	19′-7″	41
A222	2	5	STR.	18′-9″	39
A223	2	5	STR.	17′-11″	37
A224	2	5	STR.	17′-1″	36
A225	2	5	STR.	16′-3″	34
A226	2	5	STR.	15′-5″	32
A227	2	5	STR.	14′-7″	30
A228	2	5	STR.	13′-9″	29
A229	2	5	STR.	12′-11″	27
A230	2	5	STR.	12′-1″	25
A231	2	5	STR.	11′-3″	23
A232	2	5	STR.	10′-5″	22
A233	2	5	STR.	9′-7″	20
A234	2	5	STR.	8′-9″	18
A235	2	5	STR.	7′-11″	17
A236	2	5	STR.	7′-1″	15
A237	2	5	STR.	6′-3″	13
A238	2	5	STR.	5′-5″	11
A239	2	5	STR.	4′-7″	10
A240	2	5	STR.	3′-9″	8
A241	2	5	STR.	2′-11″	6
✳ B1	135	5	STR.	44′-5″	6254
B2	135	5	STR.	44′-3″	6231
✳ B3	46	7	STR.	40′-0″	3761
✳ G1	2	5	STR.	45′-0″	94
✳ J1	90	4	8	1′-5″	85
✳ K1	8	8	1	15′-11″	340
✳ K2	8	8	2	23′-4″	498
✳ K3	18	6	STR.	7′-9″	210
K4	18	4	STR.	6′-10″	82
K5	24	4	STR.	10′-8″	171
K6	8	5	STR.	18′-4″	153
S1	33	4	7	10′-2″	224
S2	153	4	6	3′-7″	366
✳ S3	48	4	5	5′-1″	163
✳ S4	48	5	3	6′-2″	309
U1	21	4	4	14′-11″	209

✳ = EPOXY COATED REINF. STEEL

CLASS AA CONC. BREAKDOWN

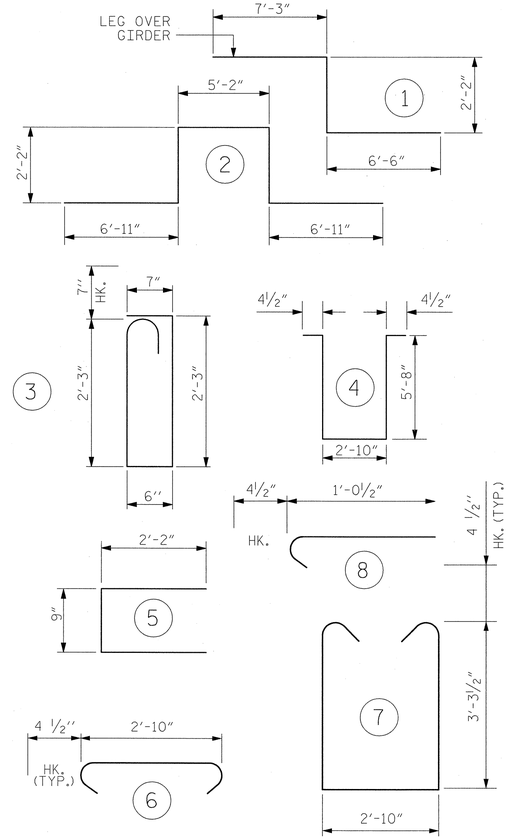
POUR 1 119.9 C.Y.

POUR 2 156.7 C.Y.

TOTAL CLASS AA CONC. 276.6 C.Y.

GROOVING BRIDGE FLOORS	
APPROACH SLABS	1458 SQ.FT.
BRIDGE DECK	6555 SQ.FT.
TOTAL	8013 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

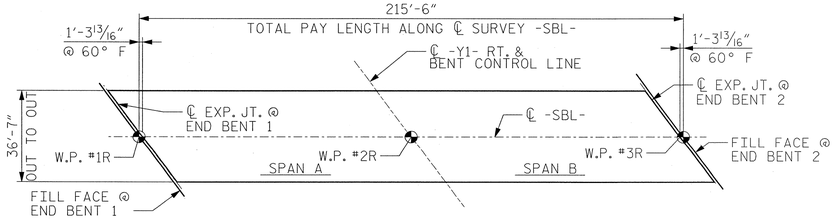
SUPERSTRUCTURE BILL OF MATERIAL

SPANS	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
"A" AND "B"	276.6	20,265	24,708
TOTALS✳✳	276.6	20,265	24,708

✳✳ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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″			



LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 7,788)

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SUPERSTRUCTURE BILL OF MATERIAL

(SBL)

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STD. NO. BOM2

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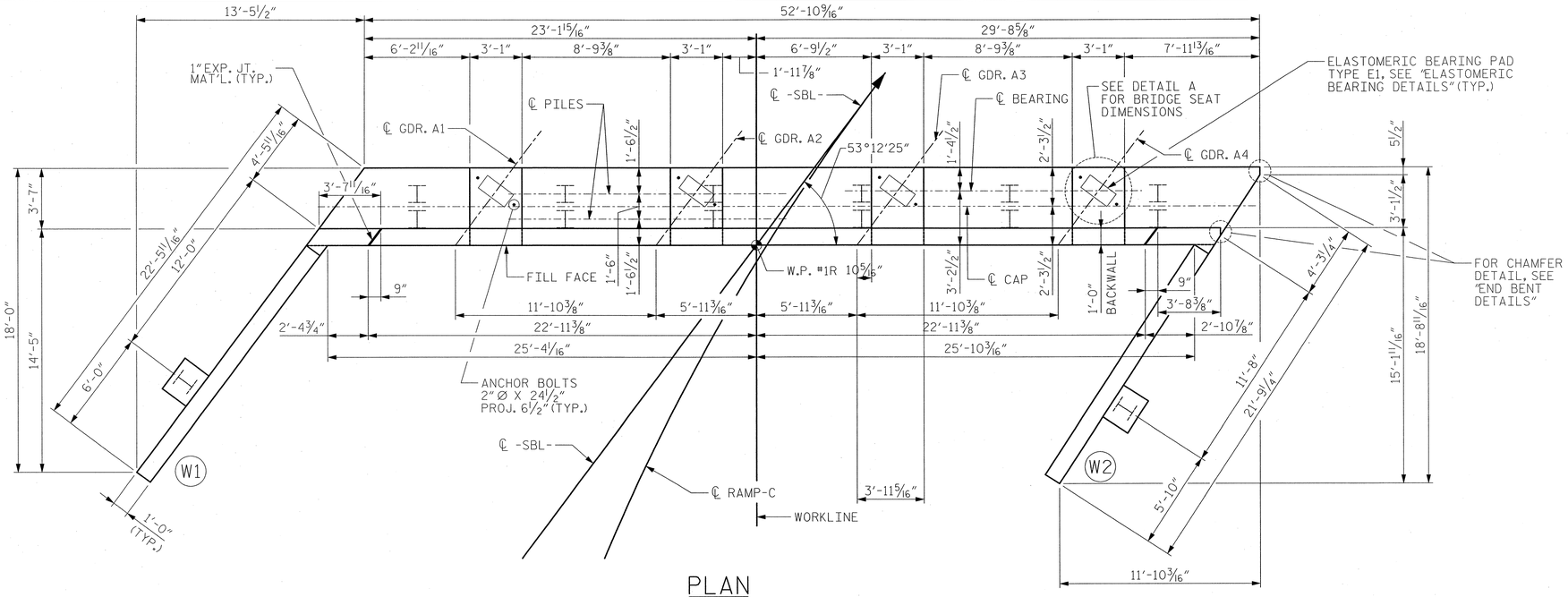
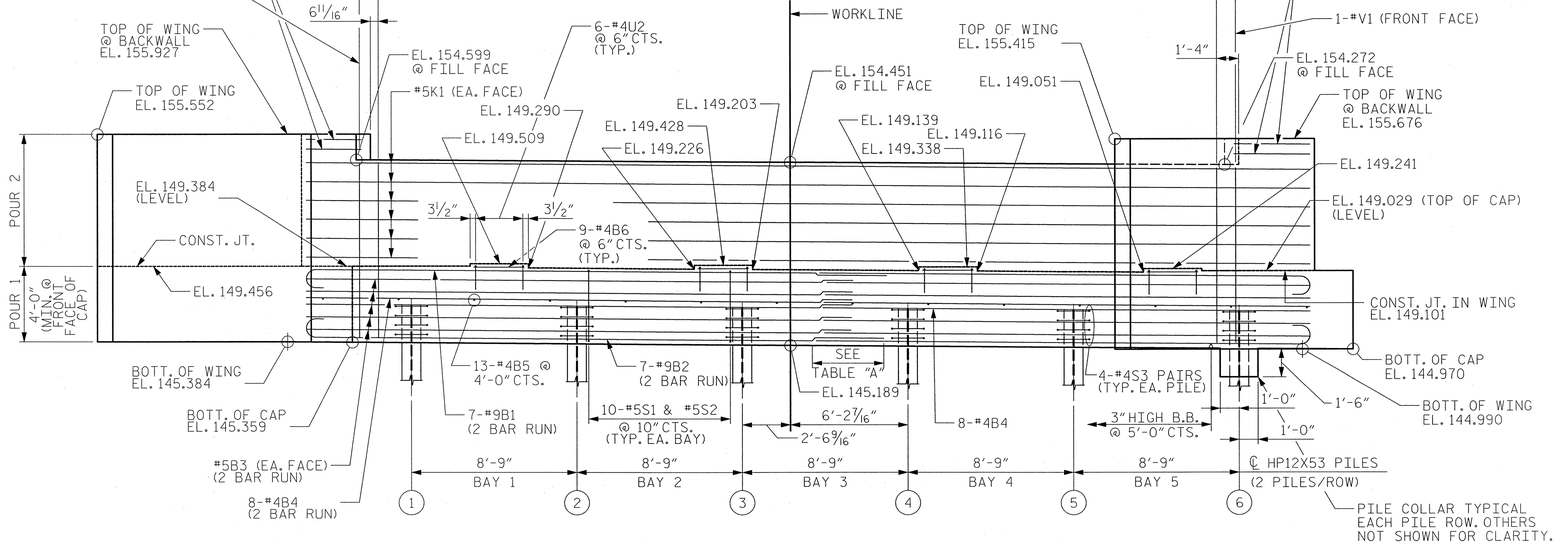
ASSEMBLED BY : JBG	DATE : 2/12
CHECKED BY : JTK	DATE : 2/12
DRAWN BY : JMB 5/87	REV. 8/16/99 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/4/12

U:\Structures\Drawing\Final\Right Bridge\I4413_SD_BM.dgn 4/4/2012 9:02:24 AM Jgeile



PLAN



ELEVATION

NOTES

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

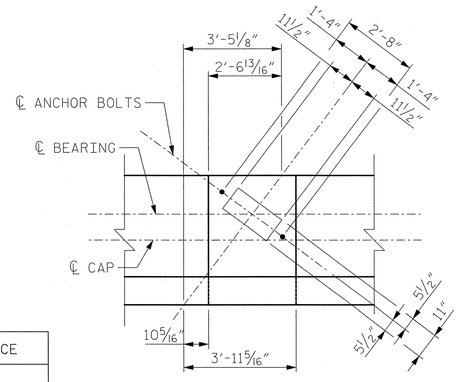
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS BUILD-UPS, SEE SECTION A-A, SHEET 3 OF 3.

FOR GALVANIZED REINFORCING STRAPS, SEE MSE WALL PLANS.



DETAIL A

BAR	MIN. SPLICE
#5B3	3'-0"
#4B4	2'-5"
#9B1	8'-9"
#9B2	6'-3"

TABLE "A"

END BENT 1	
PILE	ELEVATION
1	147.336
2	147.272
3	147.207
4	147.143
5	147.079
6	147.014

TOP OF PILE ELEVATIONS

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

(SBL)

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/12

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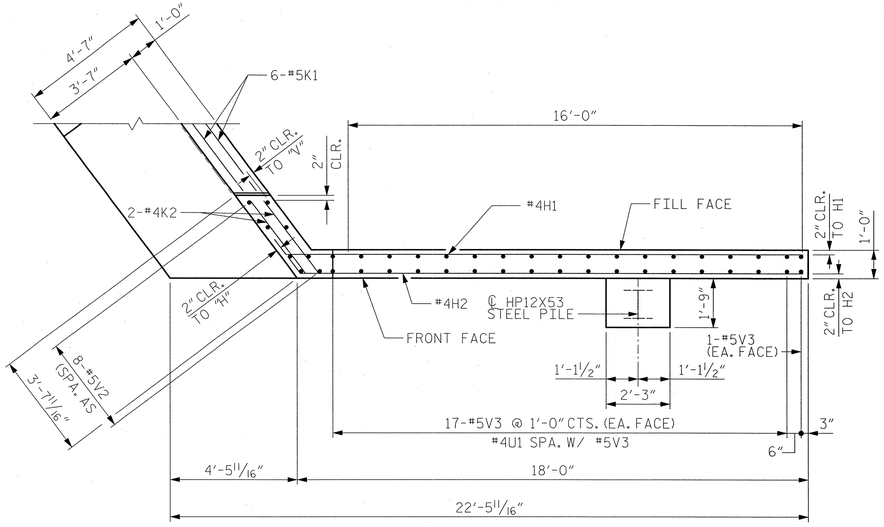
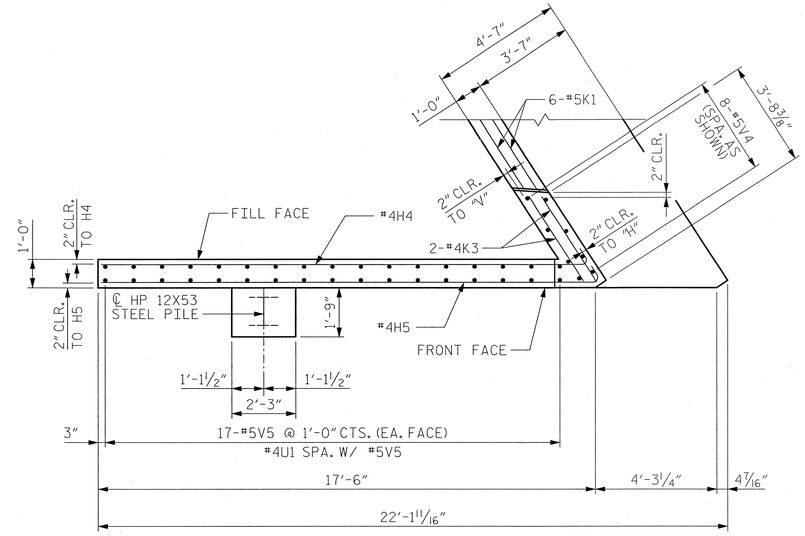
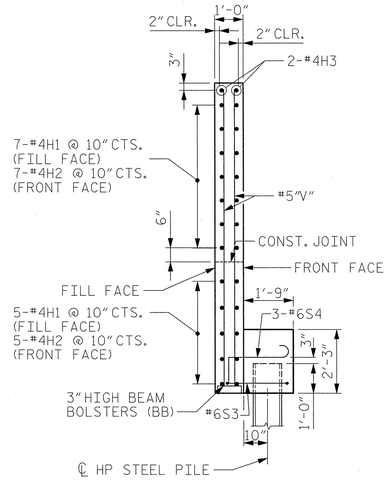
CHECKED BY : T. R. DUDECK DATE : 02-16-12



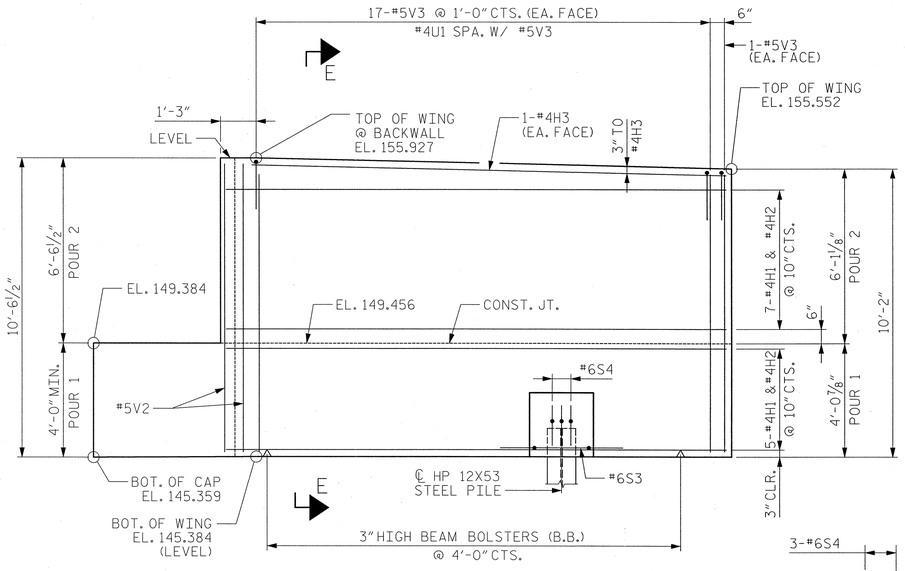
PLAN OF LEFT WING (W1)



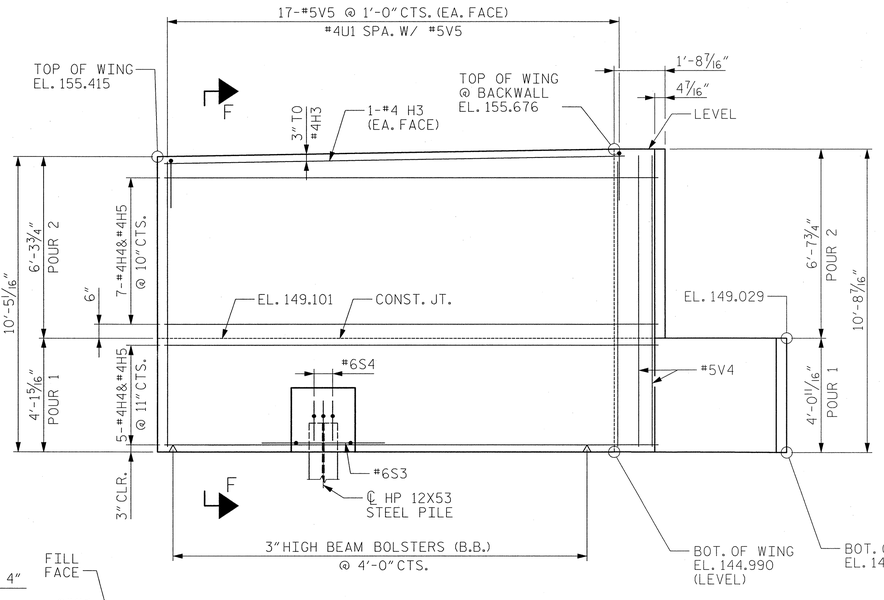
PLAN OF RIGHT WING (W2)



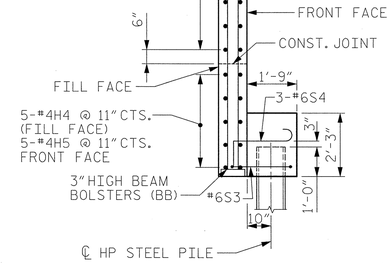
SECTION E-E



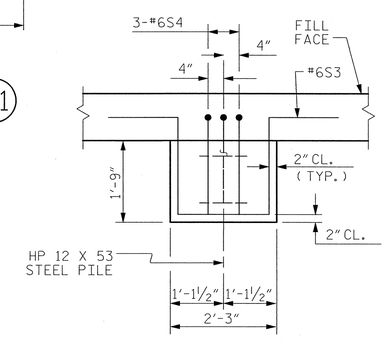
ELEVATION OF LEFT WING (W1)



ELEVATION OF RIGHT WING (W2)



SECTION F-F



WING WALL PILE DETAIL

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

(SBL)

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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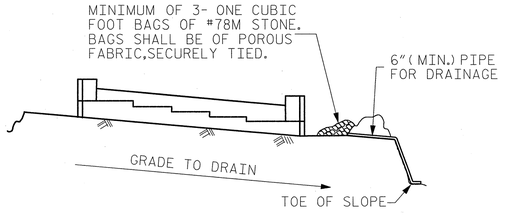
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH KELVINGTON 4/12

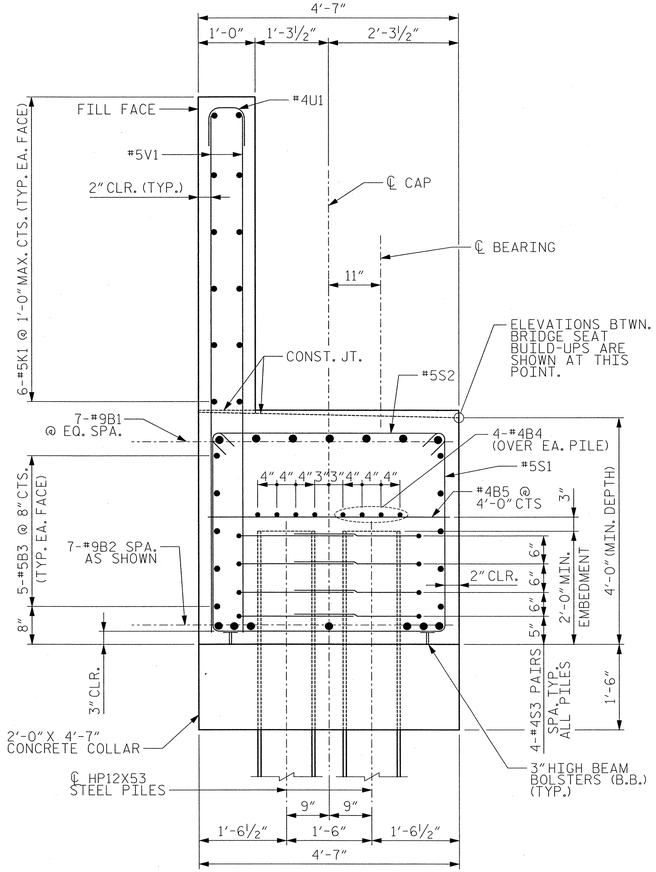


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

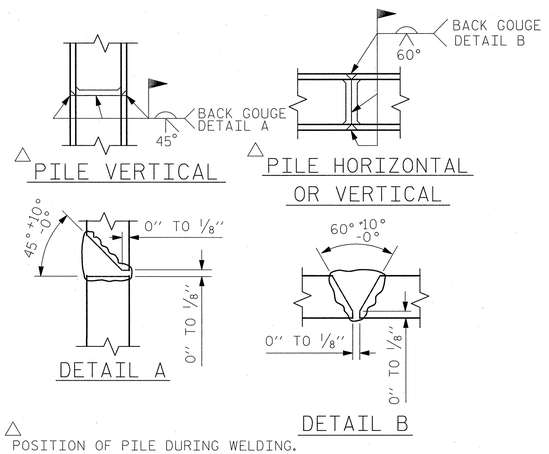
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

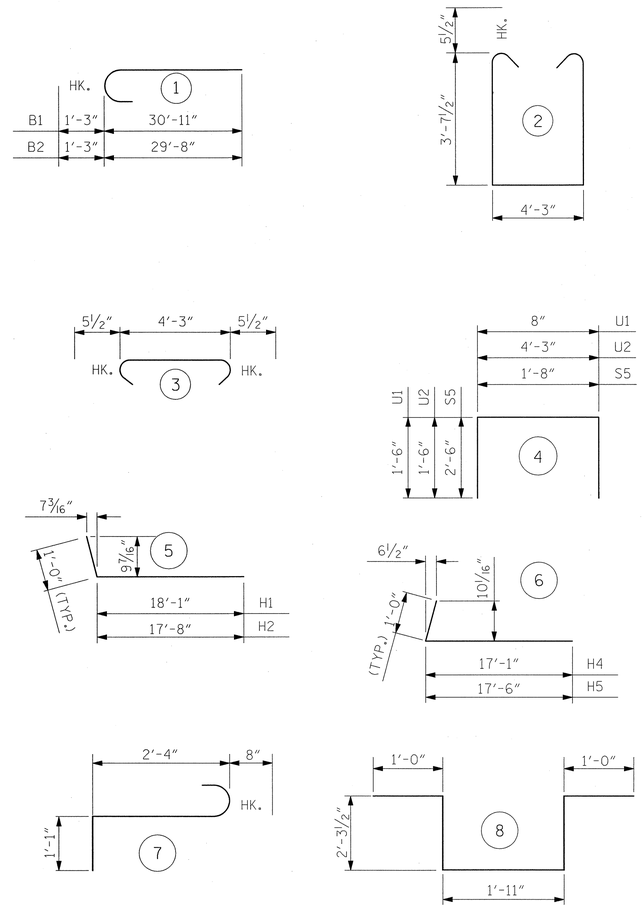


SECTION A-A

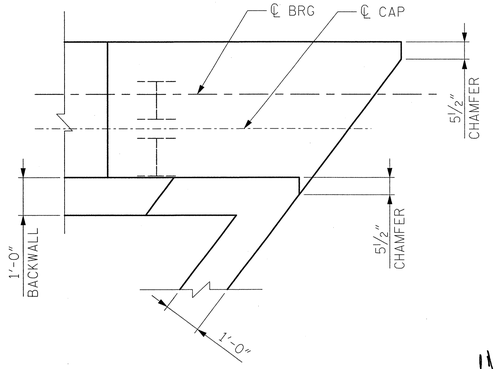


PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.



CHAMFER DETAILS

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	9	1	32'- 2"	1531
B2	14	9	1	30'- 11"	1472
B3	20	5	STR.	28'- 0"	584
B4	16	4	STR.	27'- 5"	293
B5	13	4	STR.	4'- 3"	37
B6	24	4	STR.	2'- 9"	44
H1	12	4	5	19'- 1"	153
H2	12	4	5	18'- 8"	150
H3	4	4	STR.	15'- 6"	41
H4	12	4	6	18'- 1"	145
H5	12	4	6	18'- 6"	148
K1	12	5	STR.	52'- 8"	659
K2	4	4	STR.	3'- 2"	8
K3	4	4	STR.	3'- 6"	9
S1	57	5	2	12'- 5"	738
S2	57	5	3	5'- 2"	307
S3	4	6	8	8'- 6"	51
S4	12	6	7	4'- 1"	74
S5	48	4	4	6'- 8"	214
U1	79	4	4	3'- 8"	193
U2	24	4	4	7'- 3"	116
V1	92	5	STR.	8'- 10"	848
V2	8	5	STR.	10'- 2"	85
V3	34	5	STR.	9'- 10"	349
V4	8	5	STR.	10'- 3"	86
V5	34	5	STR.	10'- 1"	358

REINFORCING STEEL	LBS	8,696
CLASS A CONCRETE BREAKDOWN		
POUR 1 -		
(CAP & BOT. WINGS)	C.Y.	46.0
POUR 2 -		
(BACKWALL & TOP OF WINGS)	C.Y.	18.9
CLASS A CONCRETE TOTAL	C.Y.	64.9
HP12X53 PILES		
NO. 12	FEET	960

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

(SBL)

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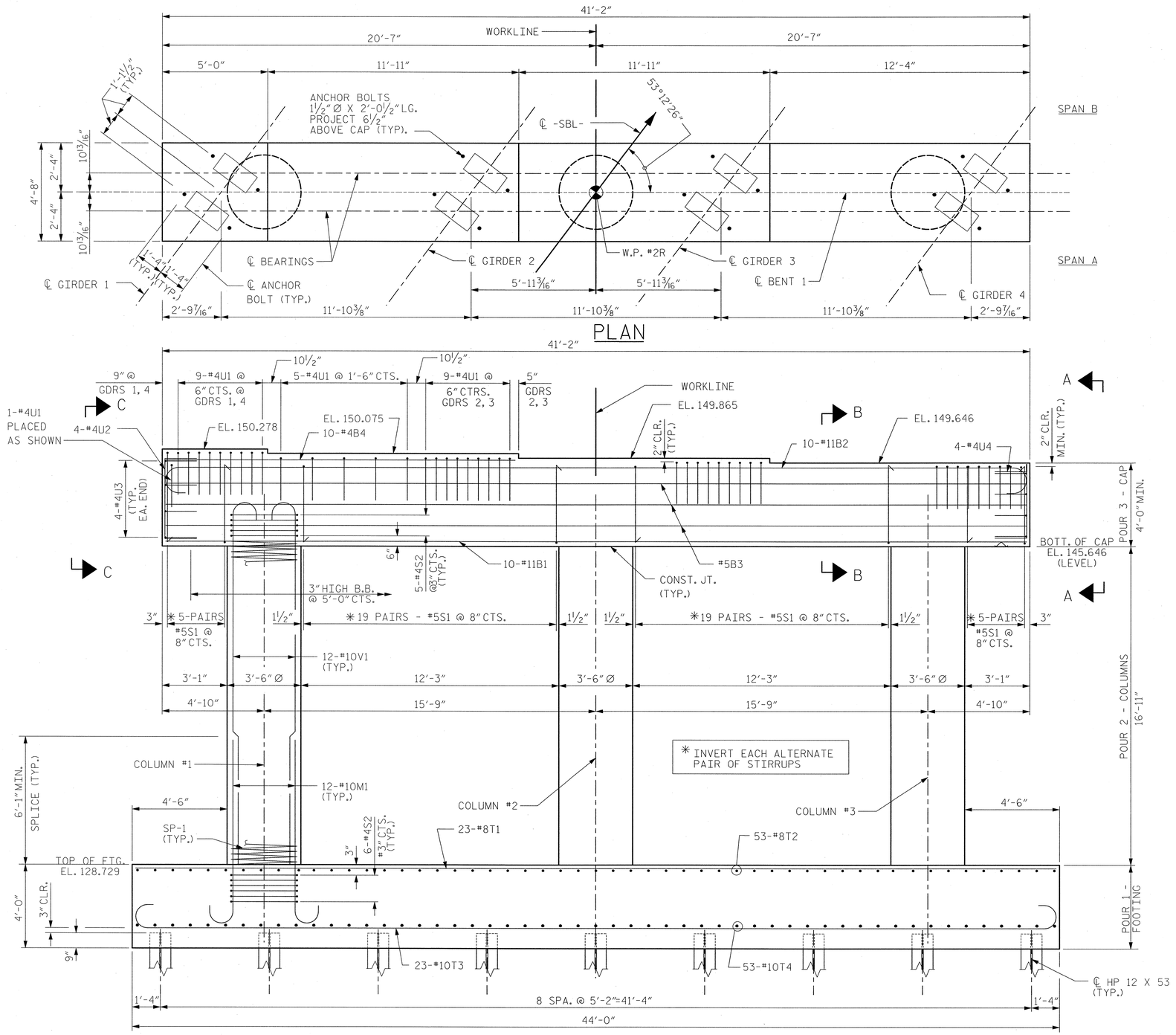
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KENNINGTON



NOTES:

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

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

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PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 1 OF 3

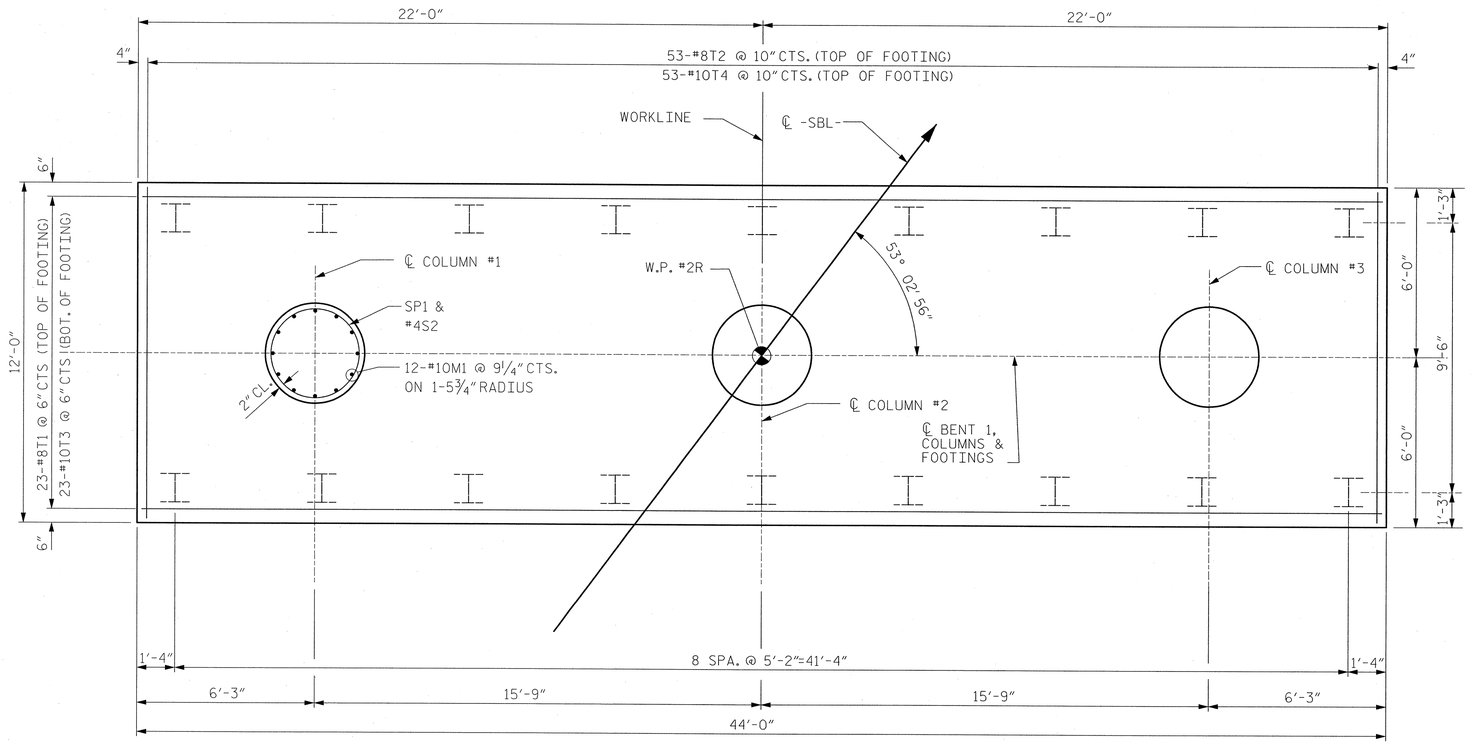
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE BENT #1

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S65
1			3			TOTAL SHEETS
2			4			72

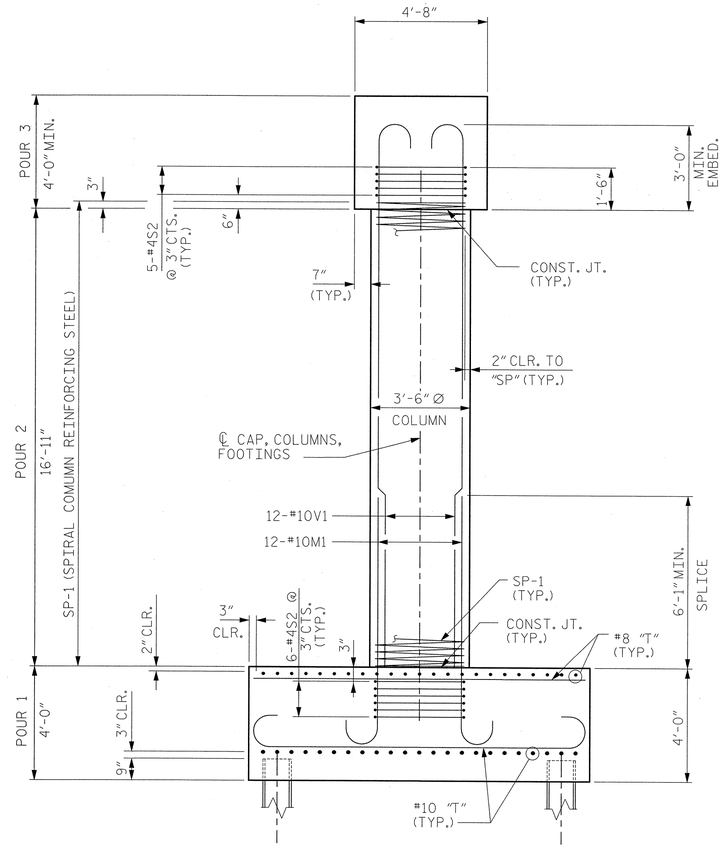
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER KELVINGTON



PLAN OF FOOTING

FOR PLACEMENT OF "M" BARS IN
FOOTING, SEE SECTION THRU COLUMN

#4#4S2, SP-1 & M1 DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN.



END ELEVATION

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1

(SBL)

REVISIONS						SHEET NO.
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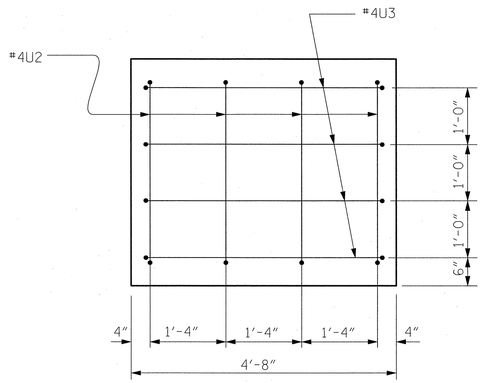
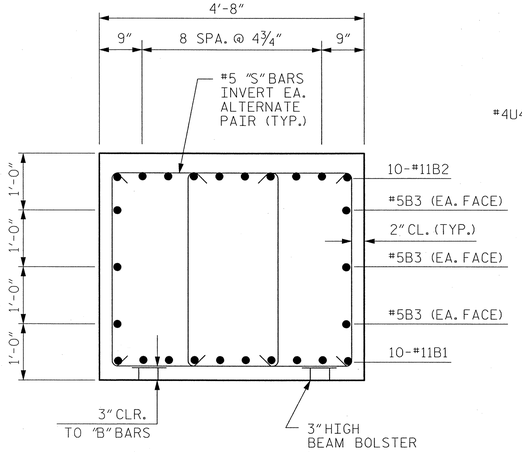
DRAWN BY : J. B. GEILE DATE : 02-16-12
CHECKED BY : T. R. DUDECK DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/12

U:\Structures\Drawing\Final\Right Bridge\I4413_SD_BL2.dgn 4/4/2012 2:04:52 PM jgeile



SECTION A-A



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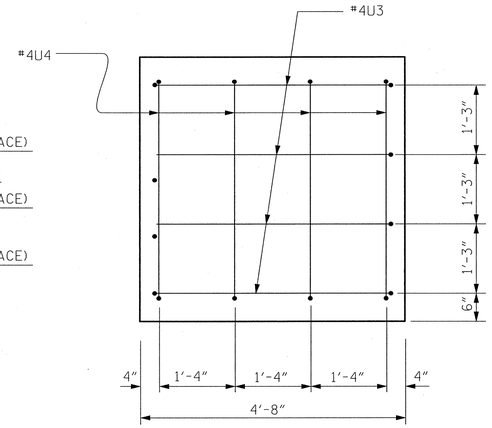

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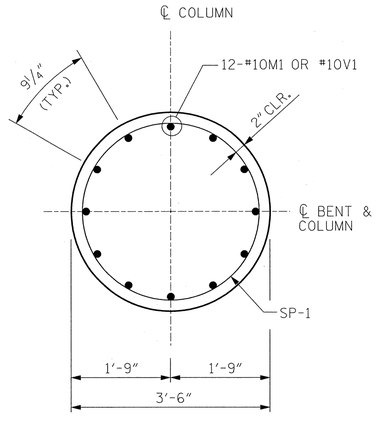
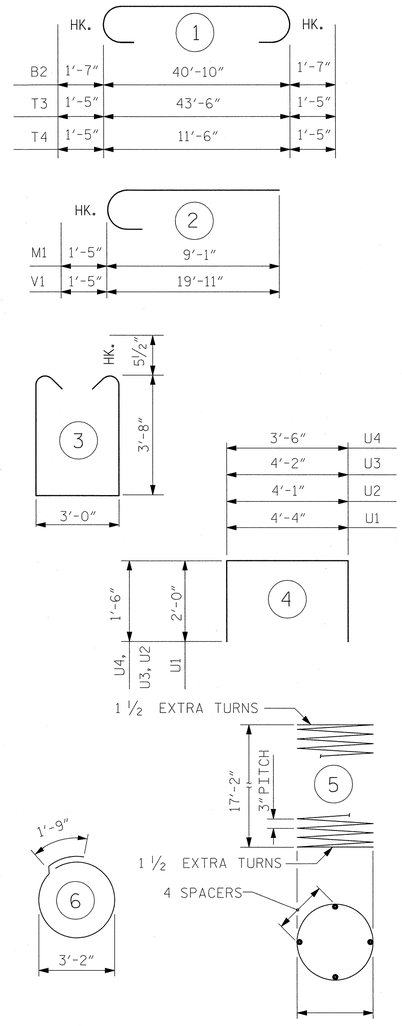


SECTION THRU COLUMN
TYPICAL ALL COLUMNS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	STR	40'-10"	2169
B2	10	#11	1	44'-0"	2337
B3	6	#5	STR	40'-10"	256
B4	10	#4	STR	16'-7"	111
M1	36	#10	2	10'-6"	1627
S1	96	#5	3	11'-3"	1126
S2	33	#4	6	11'-9"	259
T1	23	#8	STR	43'-6"	2671
T2	53	#8	STR	11'-6"	4586
T3	23	#10	1	46'-4"	4586
T4	53	#10	1	14'-4"	3269
U1	42	#4	4	8'-4"	234
U2	4	#4	4	7'-1"	19
U3	8	#4	4	7'-2"	38
U4	4	#4	4	6'-6"	17
V1	36	#10	2	21'-4"	3305

REINFORCING STEEL				LBS.	23651
SP-1	3	**	5	703'-10"	1410
SPIRAL COLUMN REINFORCING STEEL				LBS.	1410
CLASS A CONCRETE BREAKDOWN					
POUR #1 FOOTINGS				C. Y.	78.2
POUR #2 COLUMNS				C. Y.	18.1
POUR #3 CAP				C. Y.	30.3
TOTAL				C. Y.	126.6
HP 12 X 53 STEEL PILES					
NO. 18				FT.	1350
FOUNDATION EXCAVATION				LUMP SUM	

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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1

(SBL)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S67
1			3			TOTAL SHEETS
2			4			72

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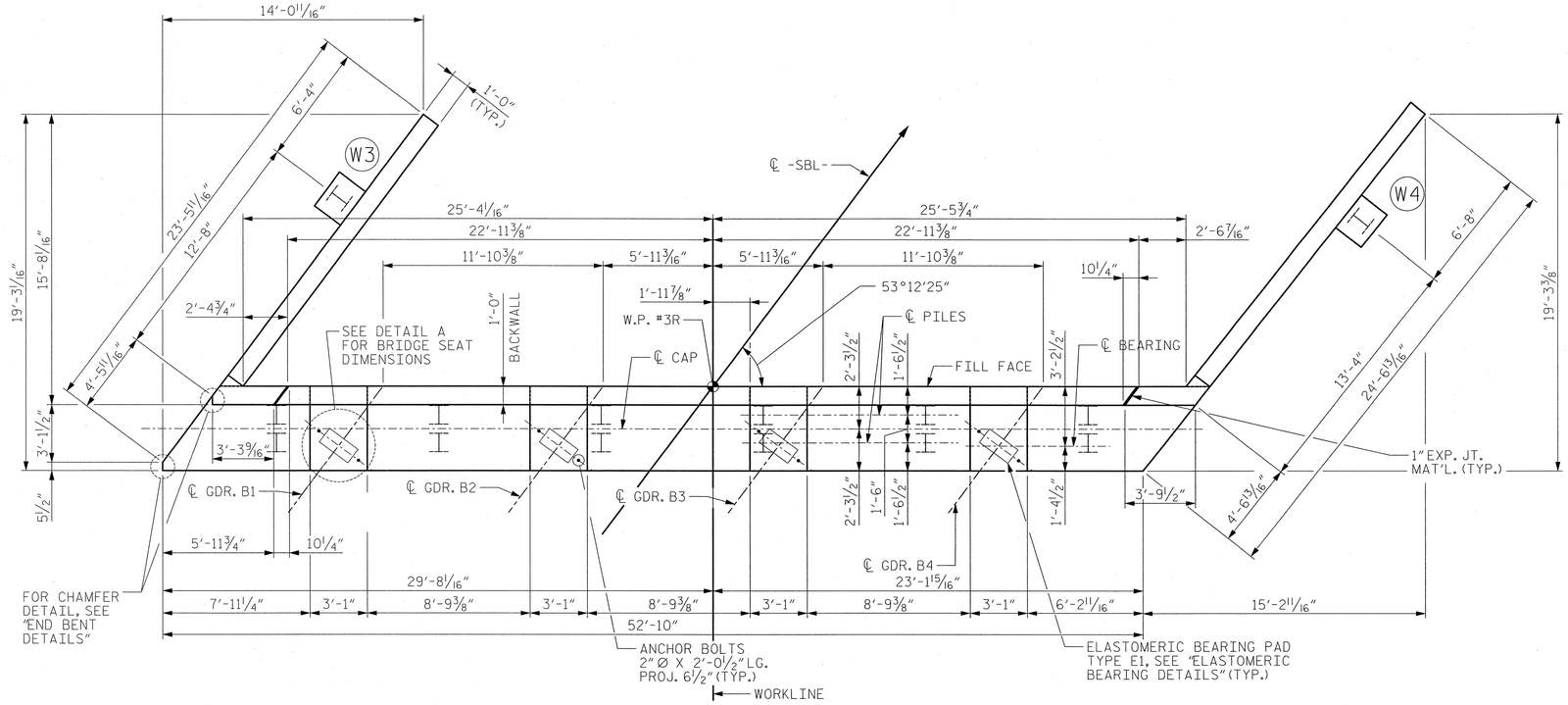
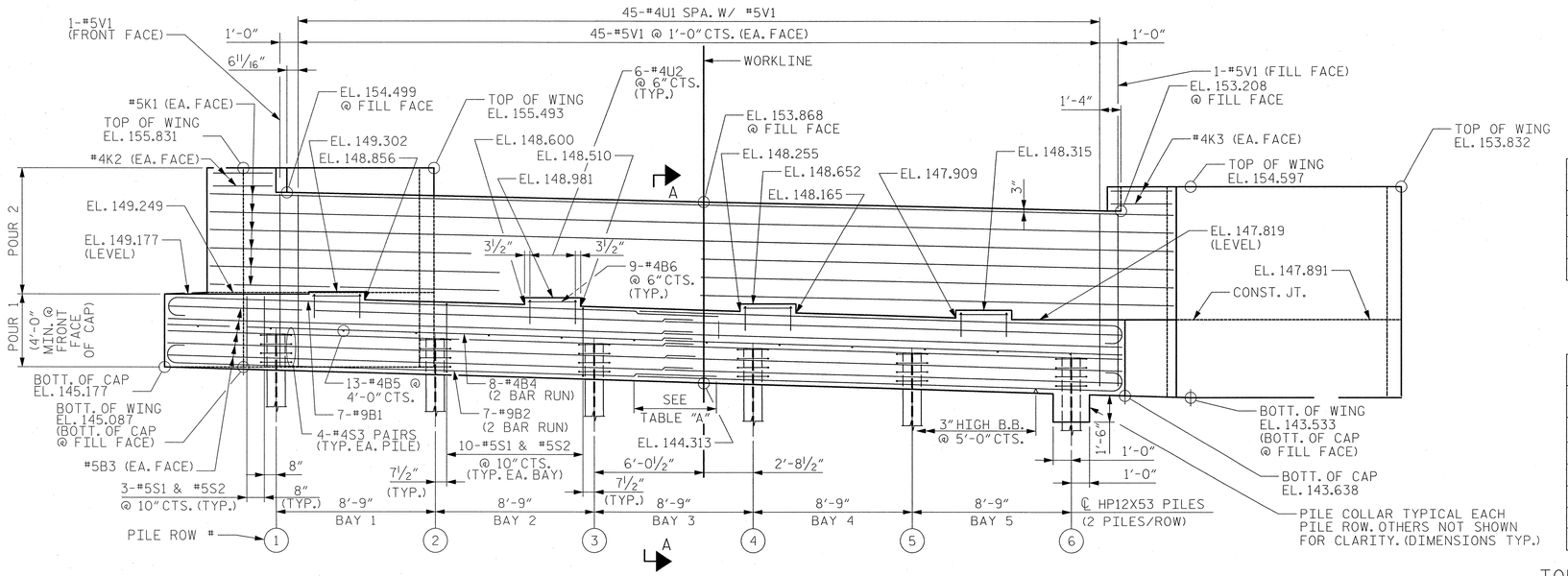
CHECKED BY : T. R. DUDECK DATE : 02-16-12



PLAN



ELEVATION

NOTE: WING WALL PILES NOT SHOWN FOR CLARITY.

NOTES

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

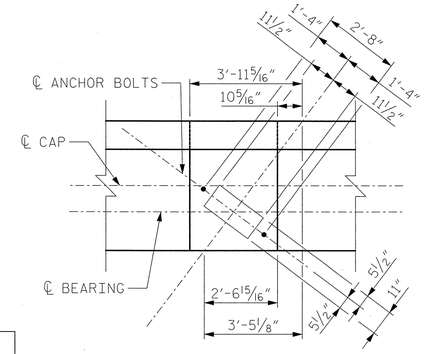
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS BUILD-UPS, SEE SECTION A-A, SHEET 3 OF 3.

FOR GALVANIZED REINFORCING STRAPS, SEE MSE WALL PLANS.



DETAIL A

BAR	MIN. SPLICE
#5B3	3'-0"
#4B4	2'-5"
#9B1	8'-9"
#9B2	6'-3"

TABLE "A"

BAR	MIN. SPLICE
PILE	ELEVATION
1	146.998
2	146.774
3	146.489
4	146.234
5	145.979
6	145.724

TOP OF PILE ELEVATIONS

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CHECKED BY : T. R. DUDECK DATE : 02-16-12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

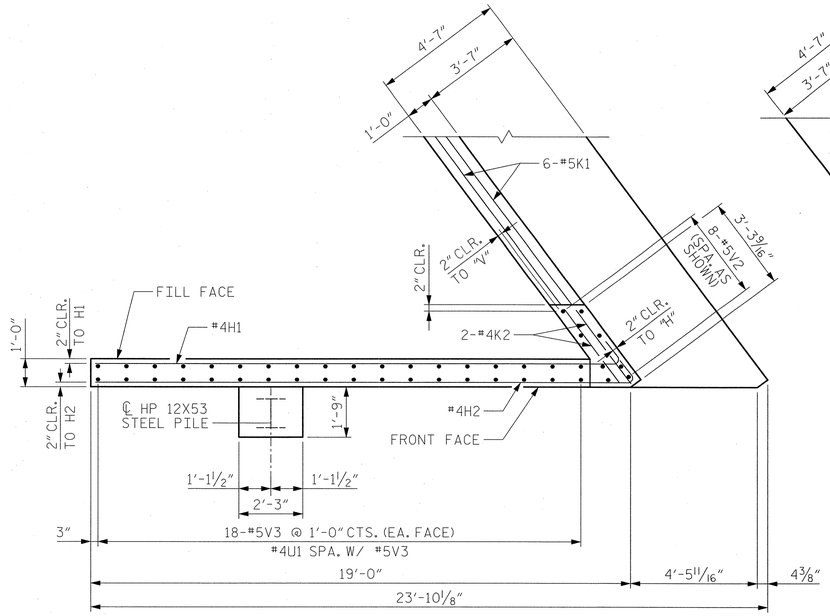
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT 2
(SBL)

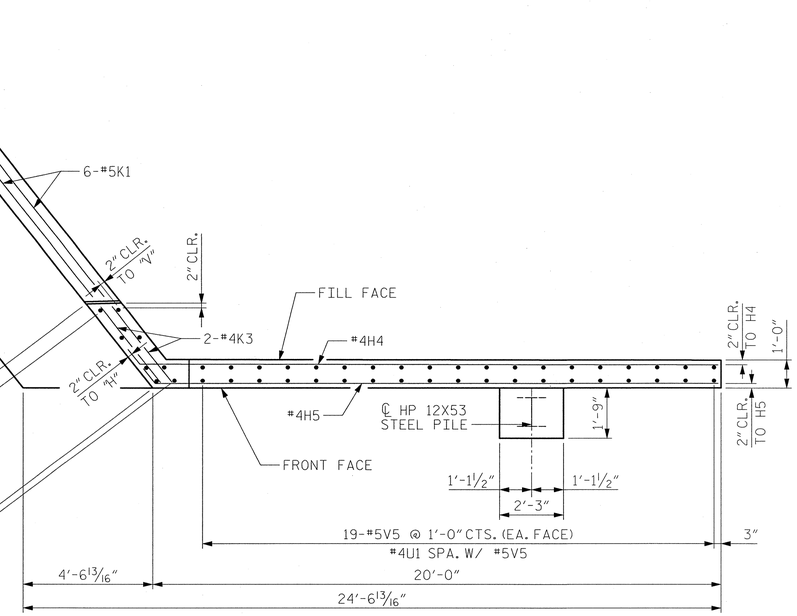
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S68
1			3			TOTAL SHEETS
2			4			72

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON 4/4/12

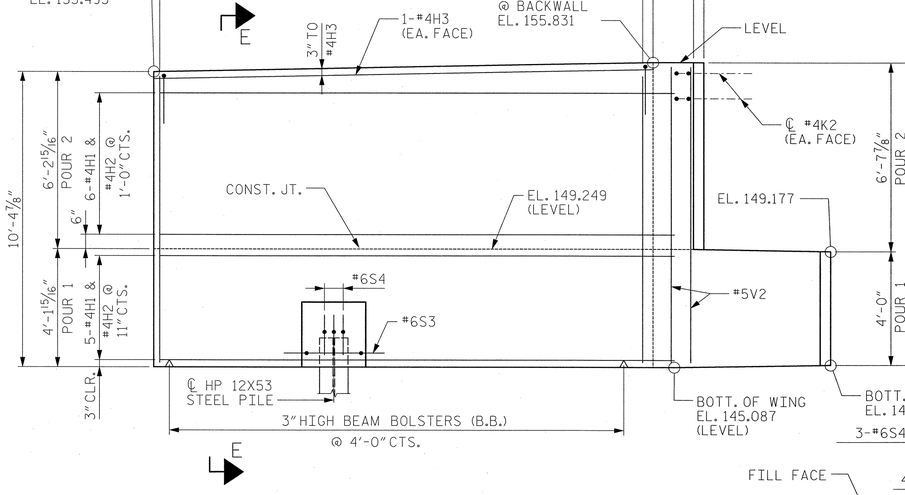
U:\Structures\Drawing\Final\Right Bridge\1443_SD_EB2_1.dgn 4/4/2012 9:14:26 AM jgelle



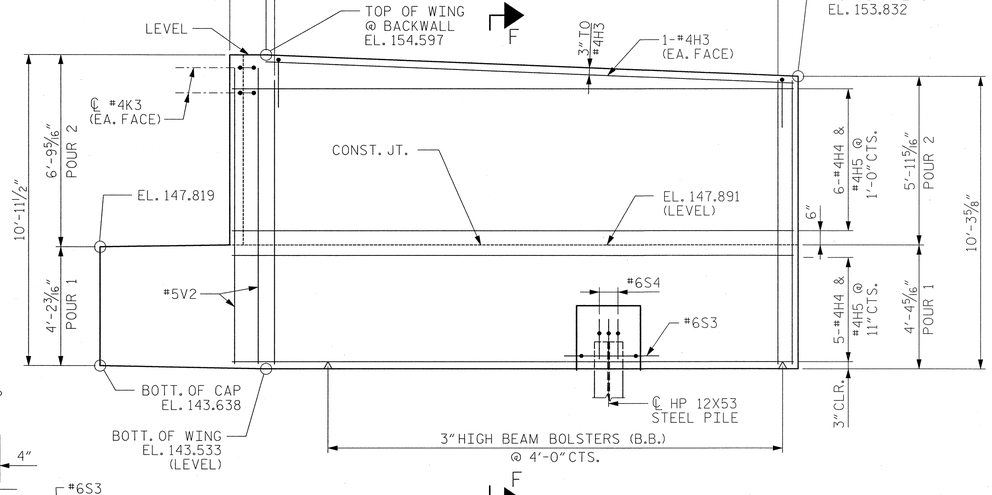
PLAN OF LEFT WING (W3)



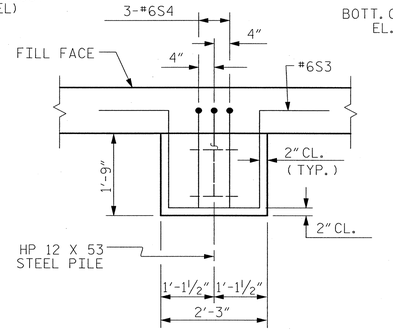
PLAN OF RIGHT WING (W4)



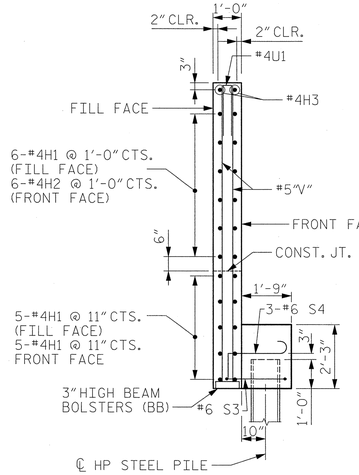
ELEVATION OF LEFT WING (W3)



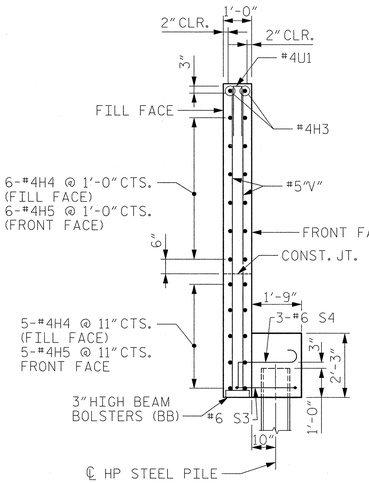
ELEVATION OF RIGHT WING (W4)



WING WALL PILE DETAIL



SECTION E-E



SECTION F-F

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

(SBL)

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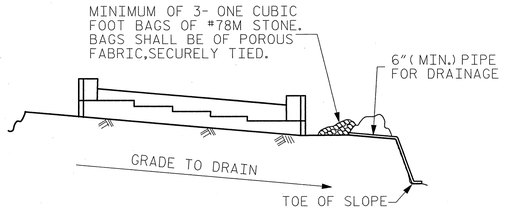
NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON — 4/9/12

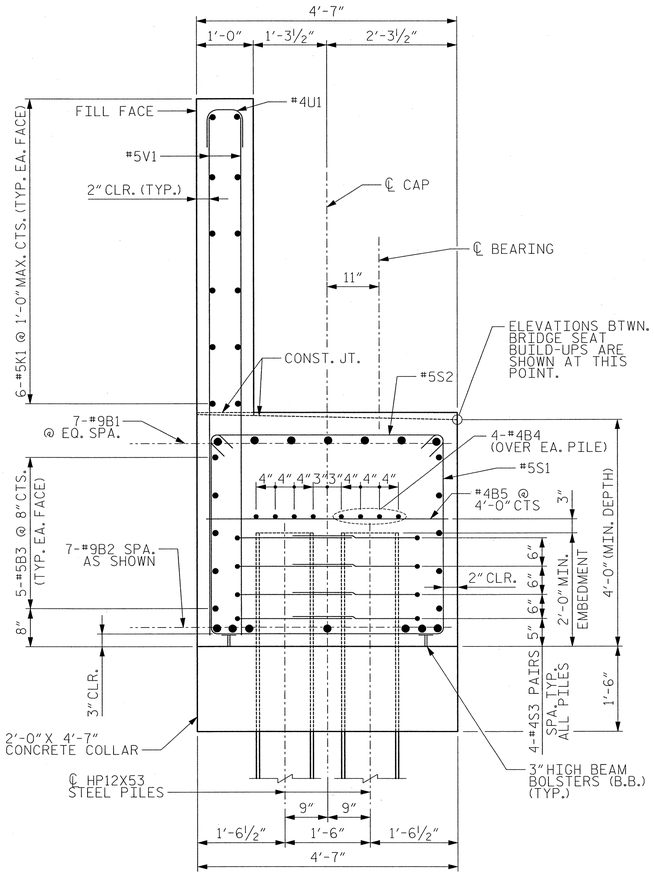


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

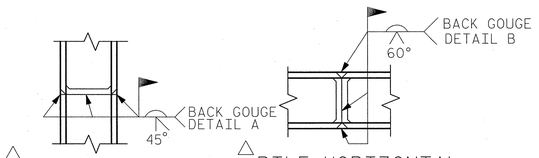
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

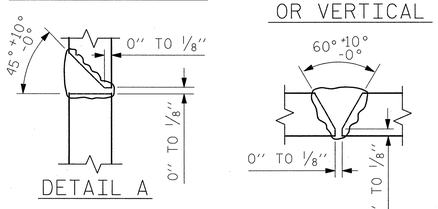


SECTION A-A



△ PILE VERTICAL

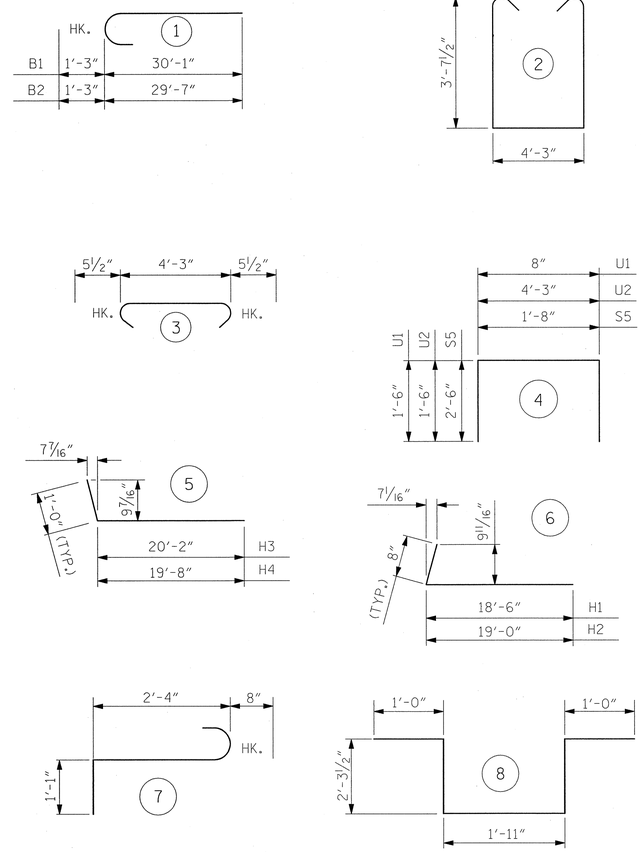
△ PILE HORIZONTAL OR VERTICAL



△ POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



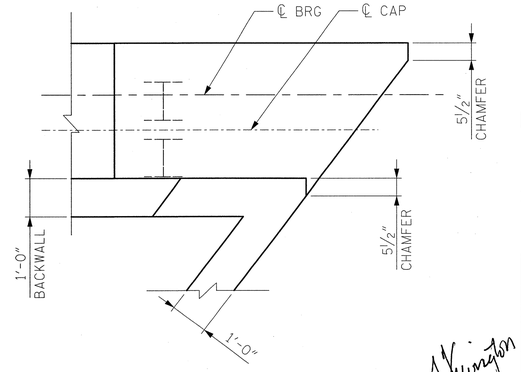
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	14	9	1	32'- 1"	1527
B2	14	9	1	30'- 10"	1468
B3	10	5	STR.	27'- 11"	582
B4	16	4	STR.	27'- 3"	291
B5	15	4	STR.	4'- 3"	43
B6	24	4	STR.	2'- 9"	44
H1	11	4	6	19'- 6"	143
H2	11	4	6	20'- 0"	147
H3	4	4	STR.	19'- 0"	51
H4	11	4	5	21'- 2"	156
H5	11	4	5	20'- 8"	152
K1	12	5	STR.	52'- 6"	657
K2	4	4	STR.	3'- 1"	8
K3	4	4	STR.	3'- 4"	9
S1	56	5	2	12'- 5"	725
S2	56	5	3	5'- 2"	302
S3	2	6	8	8'- 6"	26
S4	6	6	7	4'- 1"	37
S5	48	4	4	6'- 8"	214
U1	82	4	4	3'- 8"	201
U2	24	4	4	7'- 3"	116
V1	92	5	STR.	9'- 2"	880
V2	8	5	STR.	10'- 5"	87
V3	36	5	STR.	10'- 1"	379
V4	8	5	STR.	10'- 7"	88
V5	38	5	STR.	9'- 11"	393

REINFORCING STEEL	LBS 8,726
CLASS A CONCRETE BREAKDOWN	
POUR 1 -	
(CAP & BOT. WINGS)	C.Y. 47.4
POUR 2 -	
(BACKWALL & TOP OF WINGS)	C.Y. 20.0
CLASS A CONCRETE TOTAL	C.Y. 67.4
HP12X53 PILES	
NO. 12	FEET 900



CHAMFER DETAILS

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.56 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

(SBL)

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1			3			TOTAL SHEETS
2			4			72

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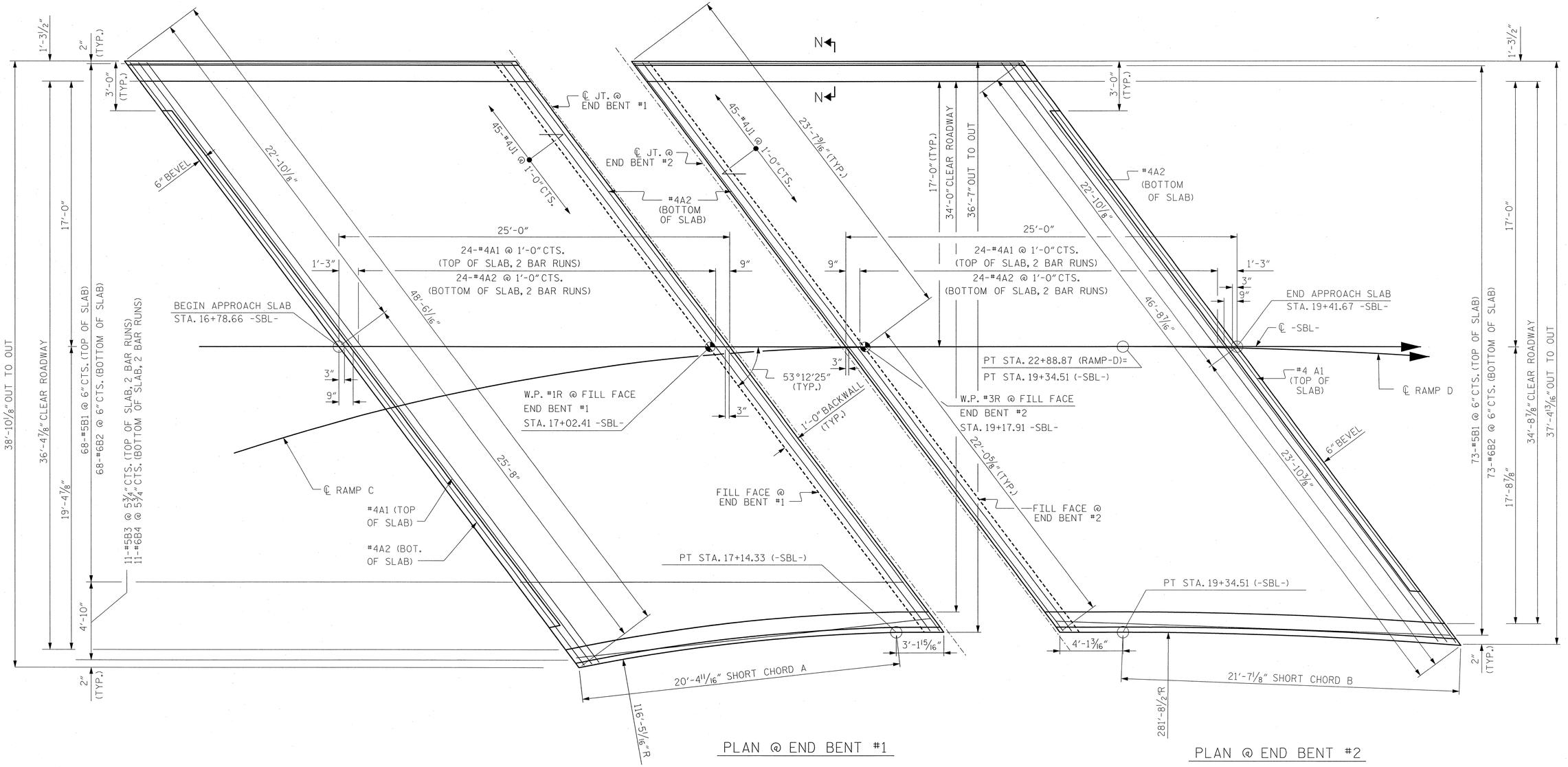
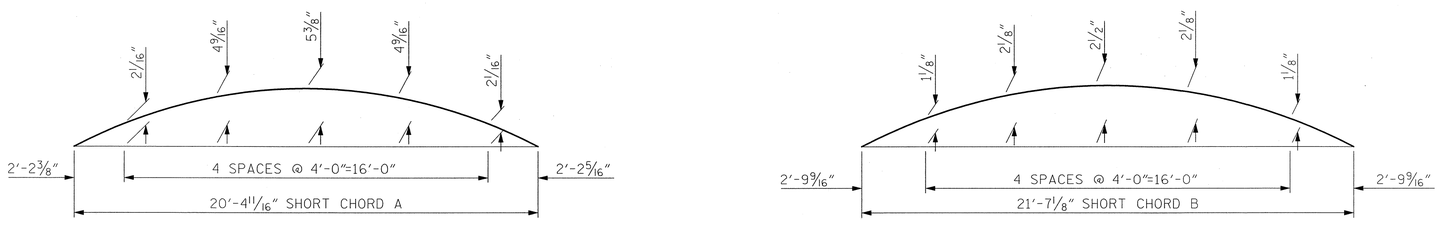
CHECKED BY : T. R. DUDECK DATE : 02-16-12

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH KEVINGTON
4/4/12



PLAN @ END BENT #1

PLAN @ END BENT #2



CHORD TO ARC OFFSETS

† NORMAL TO END BENT

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ASSEMBLED BY : J.B. GEILE	DATE : 02-16-12		
CHECKED BY : J.T. KELVINGTON	DATE : 02-16-12		
DRAWN BY : EEM 3/95	REV. 5/1/06RR	KMM/GM	
CHECKED BY : VAP 3/95	REV. 10/1/11	MAA/GM	
	REV. 12/21/11	MAA/GM	

NORTH CAROLINA PROFESSIONAL SEAL 13406 ENGINEER JOSEPH T. KELVINGTON
12/21/12

PROJECT NO. I-4413
ROBESON COUNTY
STATION: 22+37.56 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

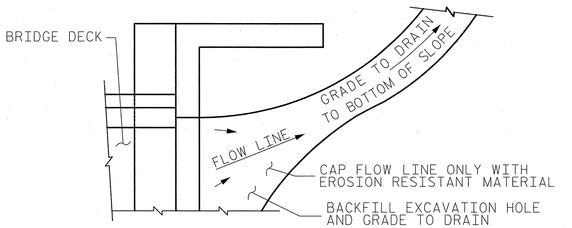
STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

(SBL)

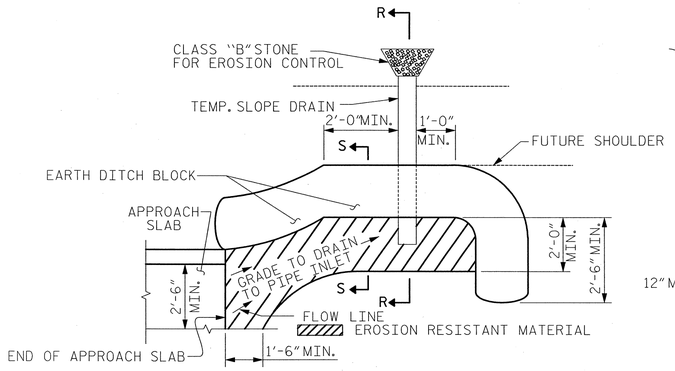
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S71
1			3			TOTAL SHEETS
2			4			72

STD. NO. BAS2 (SHT 1a)



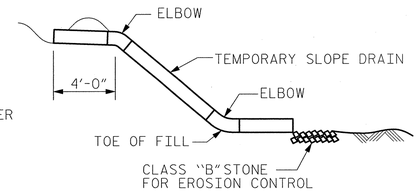
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

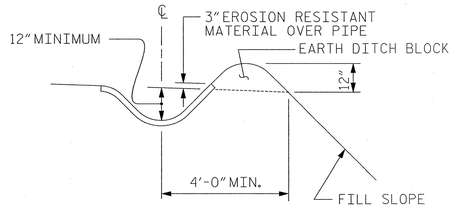


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW

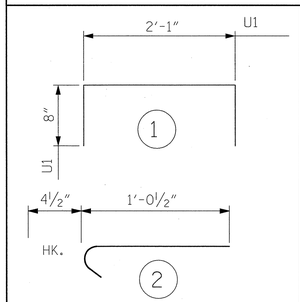


SECTION R-R



SECTION S-S

BAR TYPES



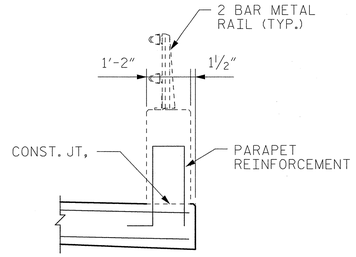
BILL OF MATERIAL

APPROACH SLAB AT EB #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	52	#4	STR	25'-1"	871
A2	54	#4	STR	25'-1"	905
✳B1	68	#5	STR	24'-7"	1744
B2	68	#6	STR	24'-7"	2511
✳B3	22	#5	STR	12'-9"	293
B3	22	#6	STR	13'-5"	443
✳J1	45	#4	2	1'-3"	38
REINFORCING STEEL				LBS.	3859
✳EPOXY COATED REINFORCING STEEL				LBS.	2945
CLASS AA CONCRETE				C.Y.	41.0

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	52	#4	STR	24'-2"	839
A2	54	#4	STR	24'-2"	872
✳B1	75	#5	STR	24'-7"	1923
B2	75	#6	STR	24'-7"	2769
✳J1	45	#4	2	1'-3"	38
REINFORCING STEEL				LBS.	3641
✳EPOXY COATED REINFORCING STEEL				LBS.	2800
CLASS AA CONCRETE				C.Y.	40.2



SECTION N-N

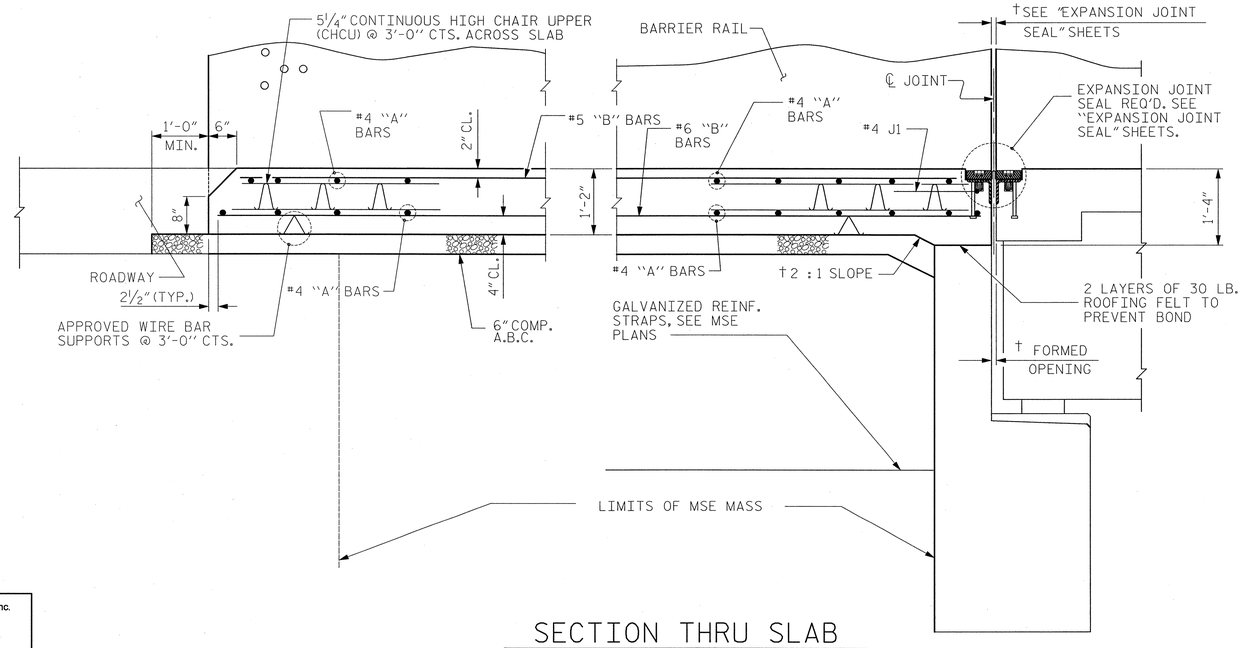
SEE "CONCRETE PARAPET AND END POST" SHEETS.

SPLICE LENGTHS

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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION THRU SLAB

† NORMAL TO END BENT

NOTES

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

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

PROJECT NO. I-4413

ROBESON COUNTY

STATION: 22+37.66 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

(SBL)

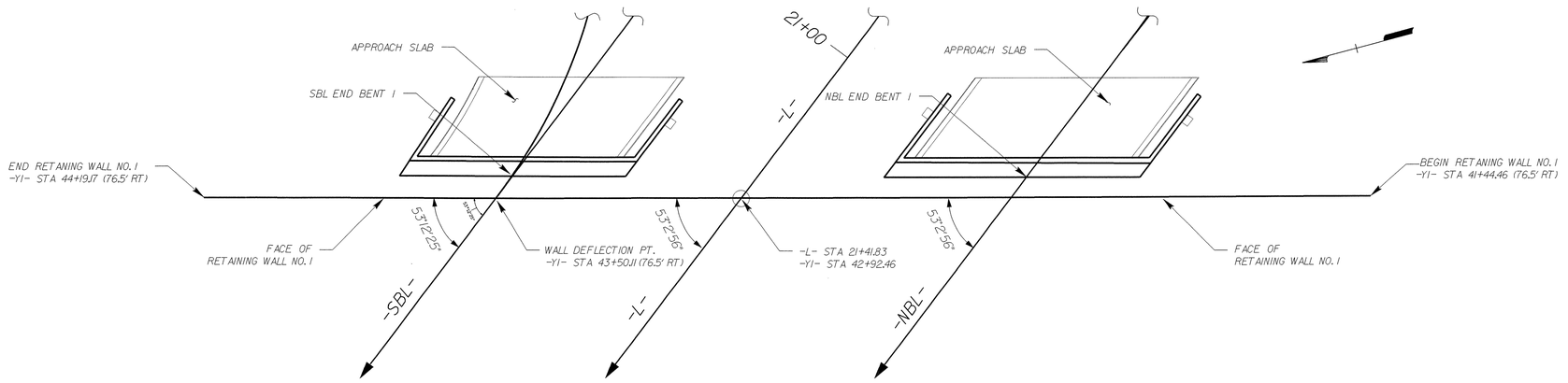
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S72
1			3			TOTAL SHEETS
2			4			72

Stantec
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606
Tel. (919) 861-6866
Fax. (919) 861-7024
www.stantec.com
License No. F-0672

ASSEMBLED BY : J.B. GEILE		DATE :	02-16-12
CHECKED BY : J.T. KELVINGTON		DATE :	02-16-12
DRAWN BY : EEM 3/96	REV. 6/1/06	RR	KMM/GM
CHECKED BY : VAP 3/96	REV. 10/1/11		MAA/GM
	REV. 12/21/11		MAA/GM

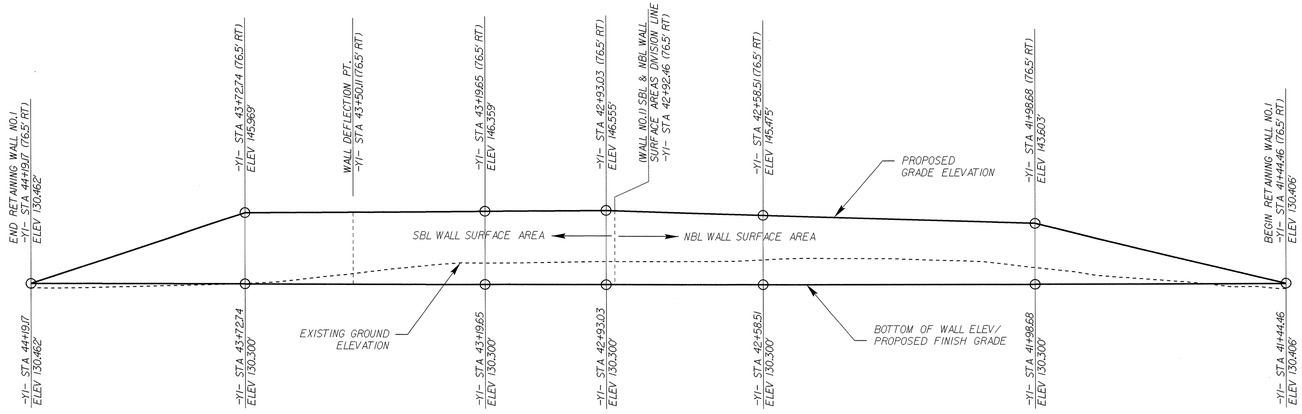
STD. NO. BAS2 (SHT 1a)

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 30942 ENGINEER THEIN TUN ZAN SIGNATURE 5/16/12 DATE	SIGNATURE DATE



RETAINING WALL NO. 1 PLAN

N.T.S.



RETAINING WALL NO. 1 ELEVATION

N.T.S.

MSE WALL QUANTITY (SQUARE FEET)	
MSE RETAINING WALL NO. 1	3,530 SF

PROJECT NO.: I-4413

ROBESON ***COUNTY***

STATION: 41+50 -Y1- RT

SHEET 1 OF 7

PREPARED BY: T.T. ZAN	DATE: 04/2012
REVIEWED BY: J.R. BATTS	DATE: 04/2012

GEOTECHNICAL ENGINEERING UNIT

[X] ***EASTERN REGIONAL OFFICE***

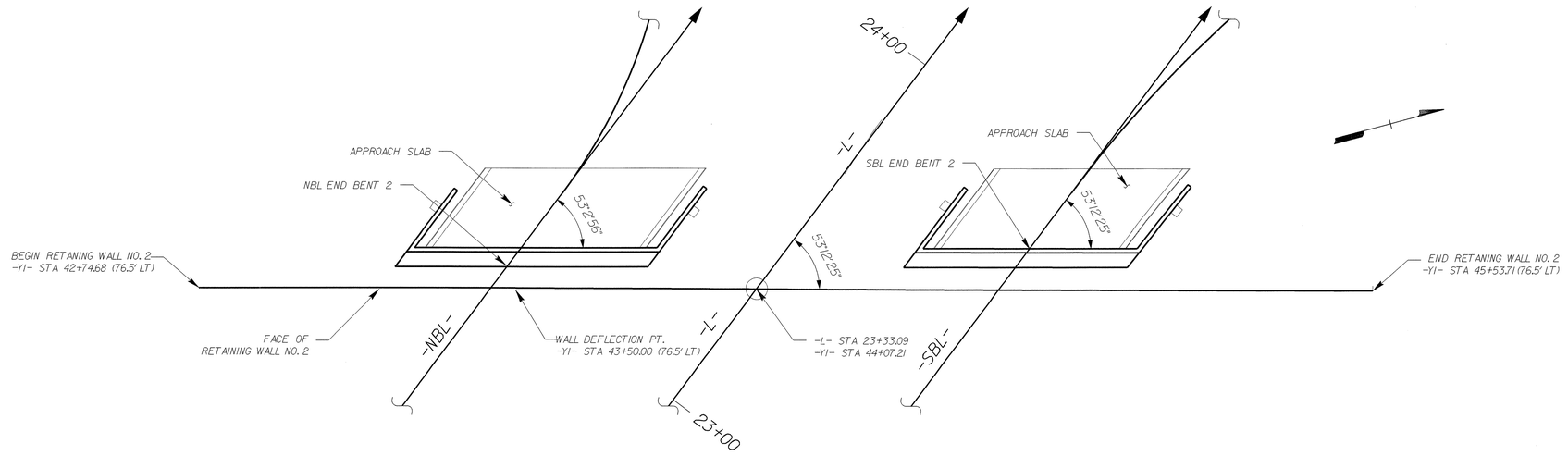
[ ] ***WESTERN REGIONAL OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RETAINING WALL NO. 1 PLAN & ELEVATION

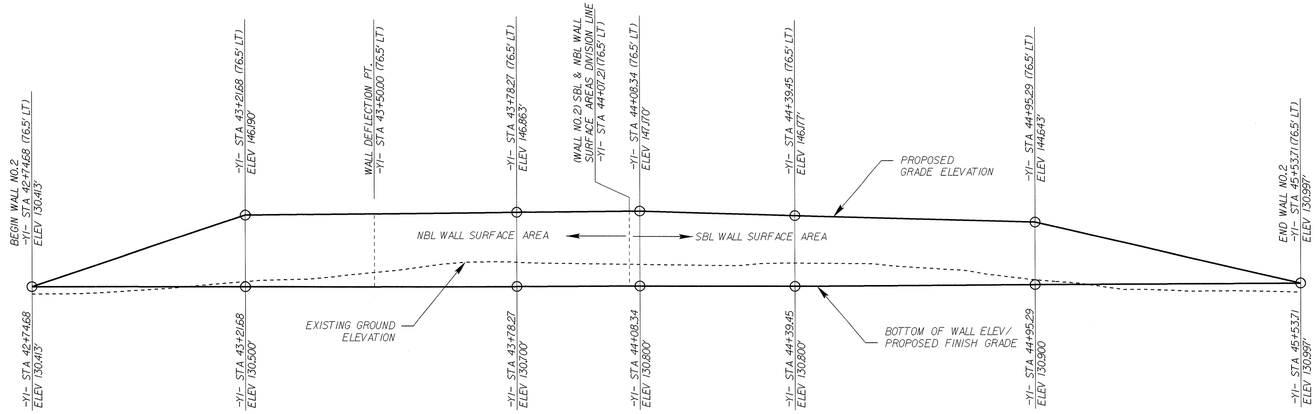
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-1
1			3			TOTAL SHEETS
2			4			7

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 30943 ENGINEER THEIN TUN ZAN — SIGNATURE — DATE 5/16/12	SIGNATURE — DATE



RETAINING WALL NO. 2 PLAN

N.T.S.



RETAINING WALL NO. 2 ELEVATION

N.T.S.

MSE WALL QUANTITY
(SQUARE FEET)

MSE RETAINING WALL NO. 2	3,620 SF

PROJECT NO.: I-4413

ROBESON ***COUNTY***

STATION: 42+80.00 -Y1- LT

SHEET 2 OF 7

PREPARED BY: T.T. ZAN	DATE: 04/2012
REVIEWED BY: J.R. BATTS	DATE: 04/2012

GEOTECHNICAL ENGINEERING UNIT

[X] ***EASTERN REGIONAL OFFICE***

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

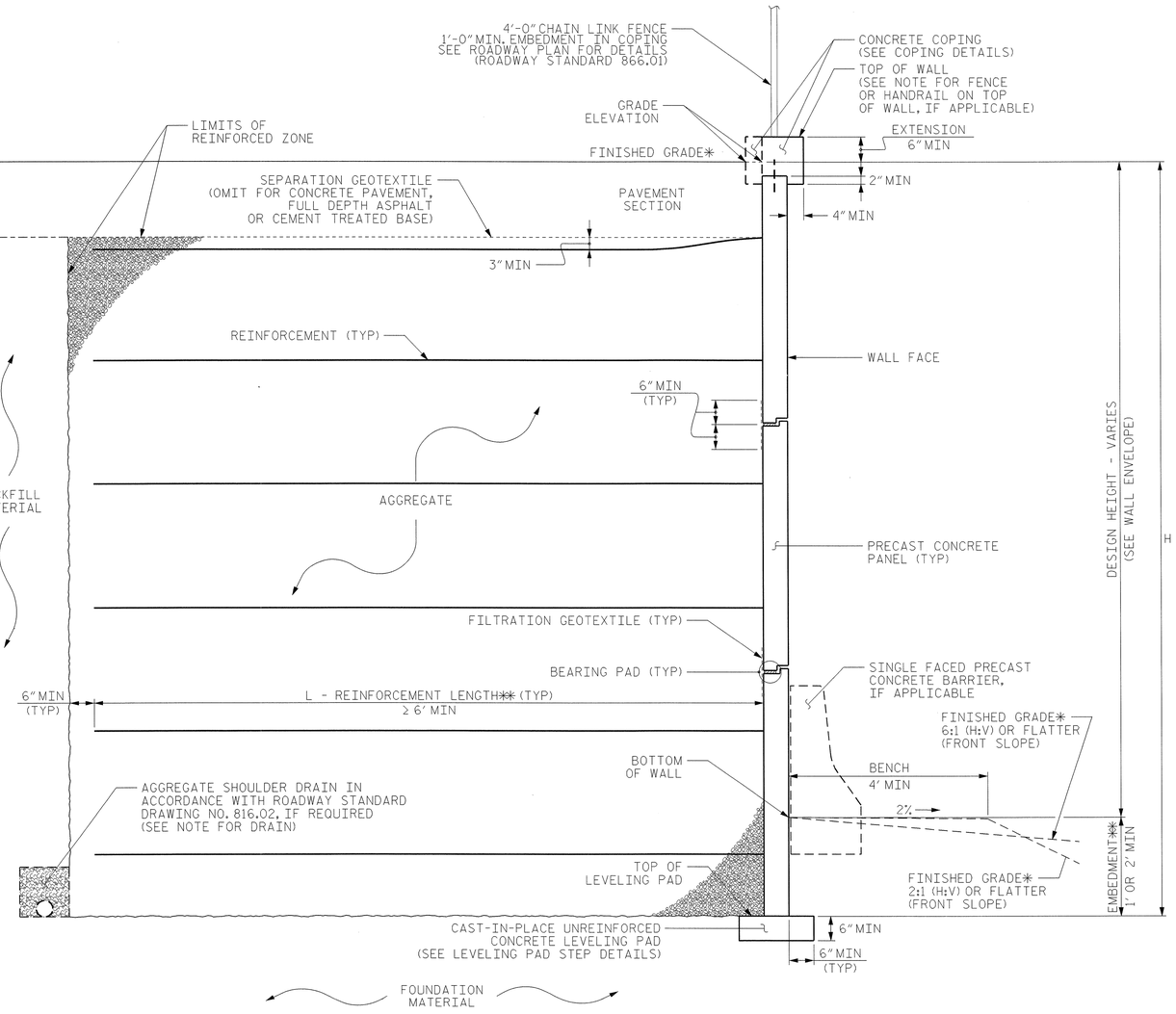
RETAINING WALL NO. 2
PLAN & ELEVATION

REVISIONS

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

SHEET NO. W-2
TOTAL SHEETS 7

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 30943 ENGINEER THEIN TUN ZAN — SIGNATURE — 5/16/12 DATE	SIGNATURE — DATE

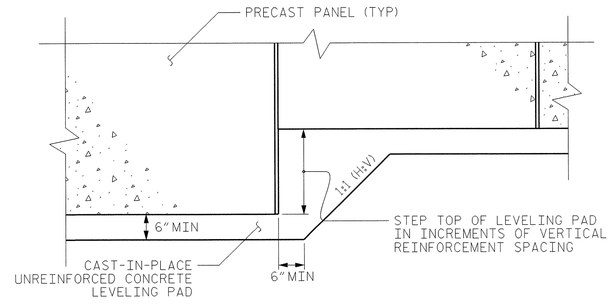


MSE WALL WITH PRECAST PANELS - TYPICAL SECTION

*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.



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

PREPARED BY: T.T. ZAN	DATE: 04/2012
REVIEWED BY: J.R. BATTS	DATE: 04/2012

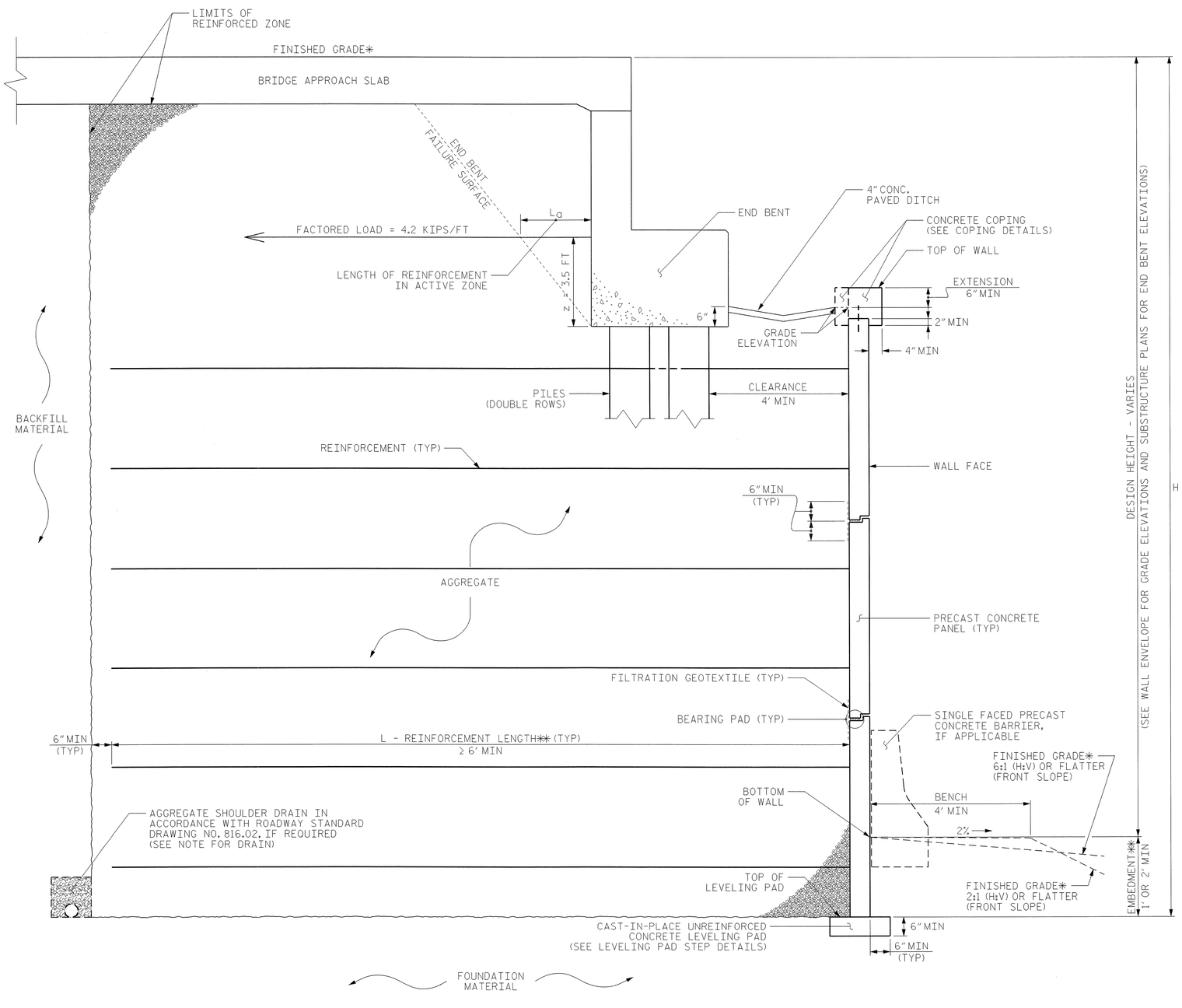
GEOTECHNICAL ENGINEERING UNIT
[X] EASTERN REGIONAL OFFICE
[ ] WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PROJECT NO.: I-4413
ROBESON ***COUNTY***
STATION: 41+50 -Y1- RT & 42+80 -Y1- LT
SHEET 3 OF 7

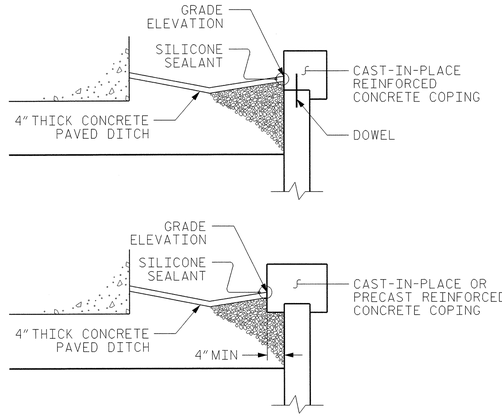
RETAINING WALL NO. 1 & 2
TYPICAL SECTIONS & DETAILS

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-3
1			3	_	_	TOTAL SHEETS
2	_	_	4	_	_	7



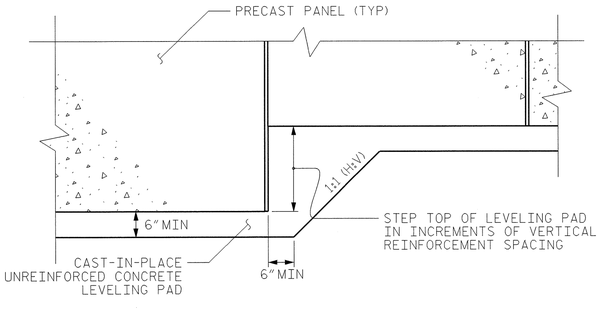
MSE ABUTMENT WALL WITH PRECAST PANELS - TYPICAL SECTION

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



COPING DETAILS

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



PRECAST CONCRETE PANELS

LEVELING PAD STEP DETAILS

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30943 ENGINEER THEIN TUN ZAN

5/16/12
SIGNATURE DATE

ENGINEER
SIGNATURE DATE

PREPARED BY: T.T. ZAN	DATE: 04/2012
REVIEWED BY: J.R. BATTS	DATE: 04/2012

GEOTECHNICAL ENGINEERING UNIT

[X] EASTERN REGIONAL OFFICE
[ ] WESTERN REGIONAL OFFICE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH

PROJECT NO.: I-4413
ROBESON **COUNTY**
STATION: 41+50 -Y1- RT & 42+80 -Y1- LT
SHEET 4 OF 7

RETAINING WALL NO. 1 & 2 TYPICAL SECTIONS & DETAILS

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

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30943 ENGINEER THEIN TUN ZAN

SIGNATURE 5/16/12 DATE

ENGINEER

SIGNATURE DATE

NOTES:

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

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

A FENCE IS REQUIRED ON TOP OF RETAINING WALL NO. 1 AND NO. 2. SEE ROADWAY PLANS FOR FENCE OR HANDRAIL ATTACHMENT DETAILS.

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

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

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

DESIGN RETAINING WALL NO. _ FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 100 YEARS
3) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 6,500 LB/SF
4) 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.			

5) 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 AND NO. 2 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_e) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 1 LOCATED AT STATION 21+41.83 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

DESIGN REINFORCEMENT CONNECTED TO END BENT CAPS FOR FACTORED LOAD AND LENGTH OF REINFORCEMENT IN ACTIVE ZONE (L_e) SHOWN. CAST REINFORCEMENT CONNECTORS INTO CAP BACKWALL FOR END BENT NO. 2 LOCATED AT STATION 23+33.09 -L-. MAINTAIN A CLEARANCE OF AT LEAST 3" BETWEEN CONNECTORS AND REINFORCING STEEL IN CAP.

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

FOUNDATIONS FOR END BENT NO. 1 LOCATED AT STATION 21+41.83 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 1. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

FOUNDATIONS FOR END BENT NO. 2 LOCATED AT STATION 23+33.09 -L- MAY INTERFERE WITH REINFORCEMENT FOR RETAINING WALL NO. 2. SEE "FOUNDATION LAYOUT" SHEET FOR FOUNDATION LOCATIONS.

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

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

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

PREPARED BY: T.T. ZAN	DATE: 04/2012
REVIEWED BY: J.R. BATTS	DATE: 04/2012

PROJECT NO.: I-4413

ROBESON ***COUNTY***

STATION: 41+50 -Y1- RT & 42+80 -Y1- LT

SHEET 5 OF 7

GEOTECHNICAL ENGINEERING UNIT

[X] ***EASTERN REGIONAL OFFICE***

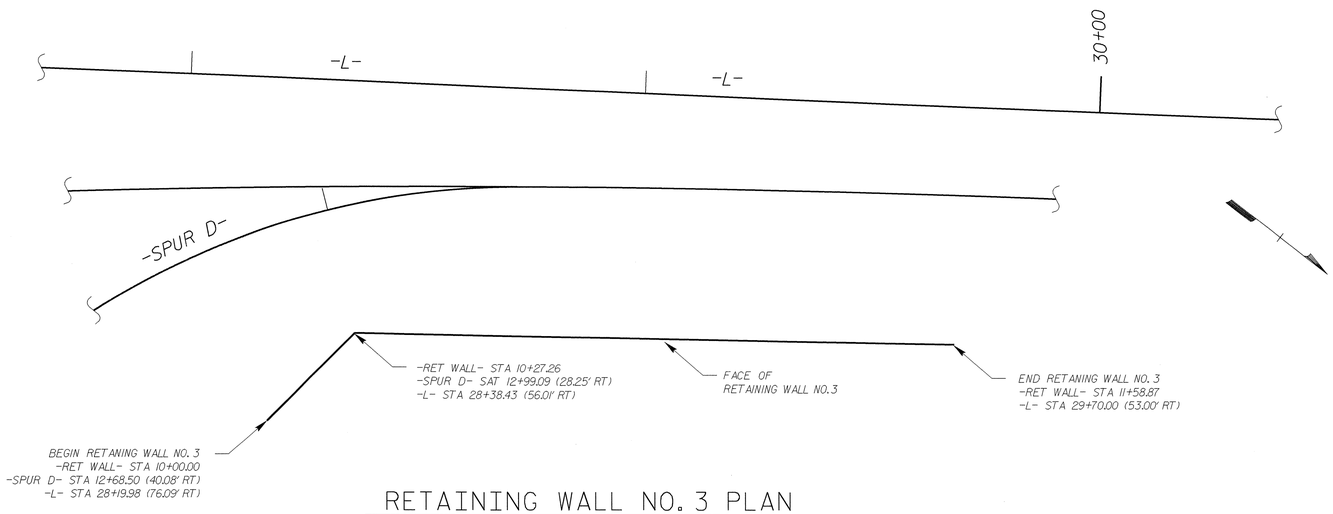
[ ] ***WESTERN REGIONAL OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RETAINING WALL NO. 1 & 2 NOTES

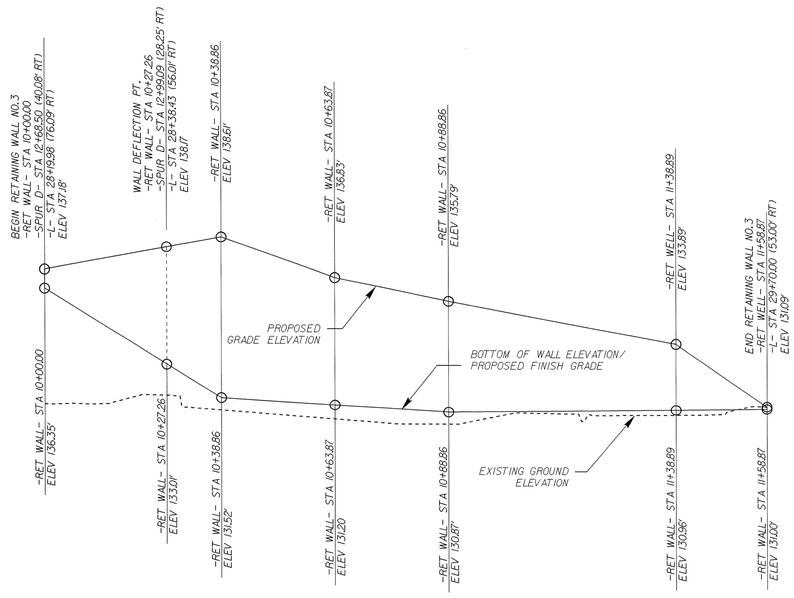
REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	W-5
1			3			TOTAL SHEETS
2			4			7

GEOTECHNICAL ENGINEER	ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 30943 ENGINEER THEIN TUN ZAN SIGNATURE 5/16/12 DATE	SIGNATURE DATE



RETAINING WALL NO. 3 PLAN

N.T.S.



RETAINING WALL NO. 3 ELEVATION

N.T.S.

ESTIMATED QUANTITY	
RETAINING WALL NO.	PRECAST GRAVITY RETAINING WALLS (SQUARE FEET)
3	720

PREPARED BY: T.T. ZAN	DATE: 04/2012
REVIEWED BY: J.R. BATTS	DATE: 04/2012

PROJECT NO.: I-4413

ROBESON ***COUNTY***

STATION: 28+20.00 -L- RT

SHEET 6 OF 7

GEOTECHNICAL ENGINEERING UNIT

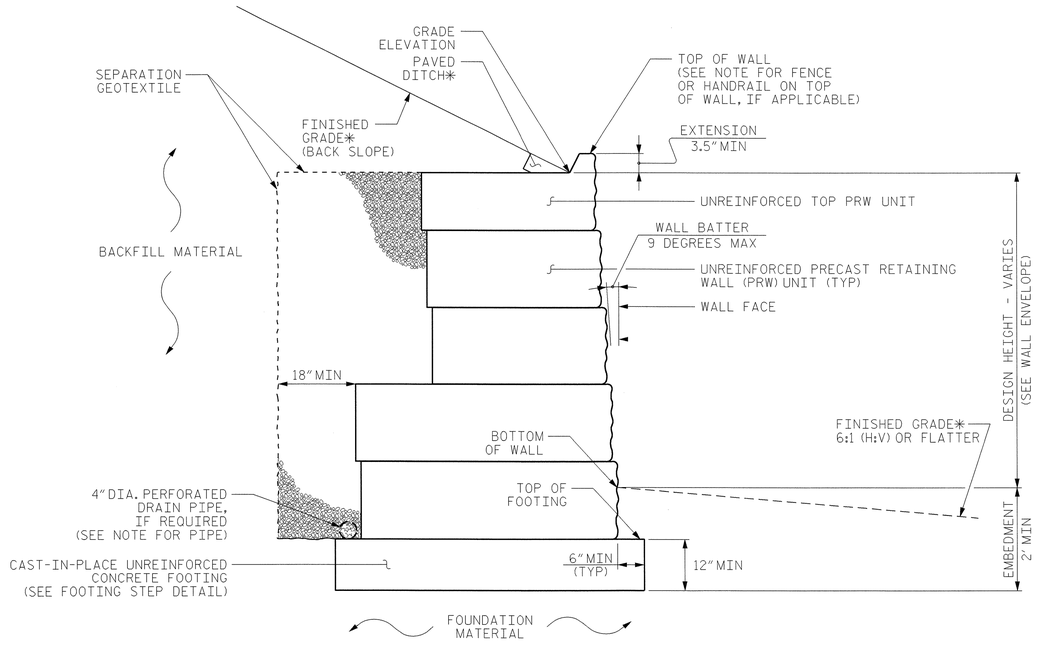
[X] ***EASTERN REGIONAL OFFICE***

[ ] ***WESTERN REGIONAL OFFICE***

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

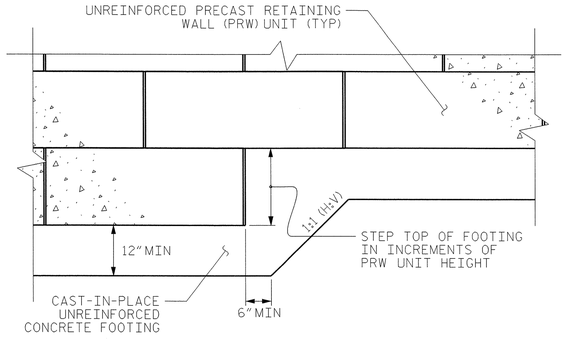
RETAINING WALL NO. 3 PLAN & ELEVATION

REVISIONS						SHEET NO. W-6
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS 7
1			3	-	-	
2	-	-	4	-	-	



PRECAST GRAVITY WALL - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS.



FOOTING STEP DETAIL

NOTES:

FOR PRECAST GRAVITY RETAINING WALLS, SEE PRECAST GRAVITY RETAINING WALLS PROVISION.

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

A DRAIN PIPE IS REQUIRED FOR RETAINING WALL NO. 3.

BEFORE BEGINNING PRECAST GRAVITY WALL DESIGN FOR RETAINING WALL NO. 3, 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. 3 FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT PLUS DEPTH TO TOP OF FOOTING (DIFFERENCE BETWEEN GRADE ELEVATION AND TOP OF FOOTING ELEVATION).

DESIGN RETAINING WALL NO. 3 FOR THE FOLLOWING:

1) IN-SITU ASSUMED MATERIAL PARAMETERS:

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

DESIGN RETAINING WALL NO. 3 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

ADJUST PAVED DITCH WIDTH OR BACK SLOPE FOR VARYING GRADE ELEVATIONS ALONG TOP OF RETAINING WALL NO. 3 AND SUBMIT A CAST-IN-PLACE CONCRETE DITCH DETAIL FOR STEPS AT TOP OF WALL.

DO NOT PLACE CONCRETE FOR FOOTINGS FOR RETAINING WALL NO. 3 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

GEOTECHNICAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 30943 ENGINEER THEIN TUN ZAN

5/16/12

SIGNATURE DATE

ENGINEER

SIGNATURE DATE

PREPARED BY: T.T. ZAN DATE: 04/2012

REVIEWED BY: J.R. BATTS DATE: 04/2012

PROJECT NO.: I-4413

ROBESON *COUNTY*

STATION: 28+20.00 -L- RT

SHEET 7 OF 7

GEOTECHNICAL ENGINEERING UNIT

[X] *EASTERN REGIONAL OFFICE*

[ ] *WESTERN REGIONAL OFFICE*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RETAINING WALL NO. 3 TYPICAL SECTIONS DETAILS & NOTES

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

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

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

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

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

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