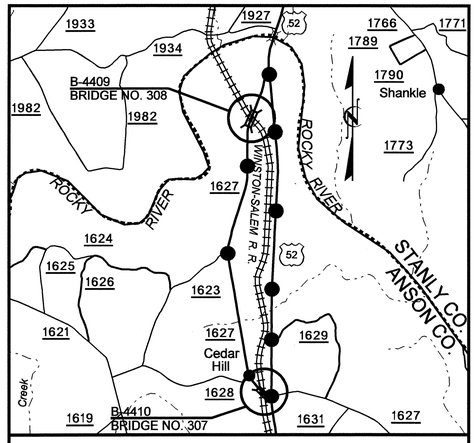

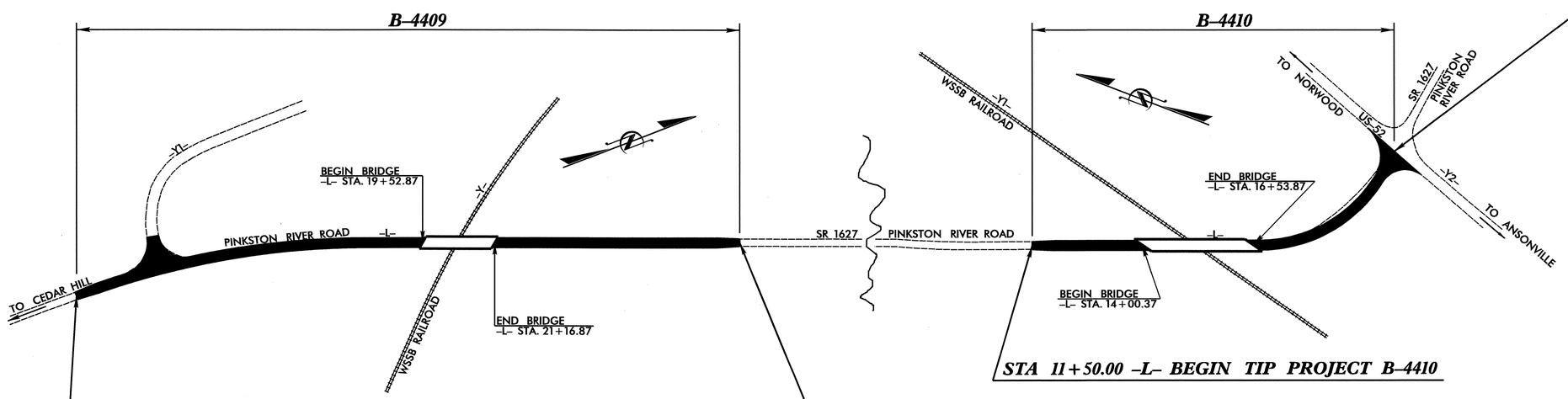

09/08/99

CONTRACT: C202154A /C202154B TIP PROJECT: B-4409 /B-4410

26-MAY-2009 14:06
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klayne

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4409/B-4410		

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
33687.1.1	BRZ-1627(3)	B-4409 (PE)
33687.2.1	BRZ-1627(3)	B-4409 (R/W & UTIL)
33687.2.2	BRZ-1627(3)	B-4409 (CONSTR.)
33688.1.1	BRZ-1627(4)	B-4410 (PE)
33688.2.1	BRZ-1627(4)	B-4410 (R/W & UTIL)
33688.3.1	BRZ-1627(4)	B-4410 (CONSTR.)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ANSON COUNTY

LOCATION: BRIDGE NO. 307 /308 OVER THE WINSTON-SALEM SOUTH BOUND RAILROAD ON SR 1627 (PINKSTON RIVER RD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURES

VICINITY MAP

●—●—● DETOUR ROUTE

STRUCTURES

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DESIGN DATA

ADT 2009 = 567
ADT 2029 = 789
DHV = 10 %
D = 60 %
T = 4 % *
V = 60 MPH
* TTST 2 DUAL 2
FUNC. CLASS = RURAL LOCAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECTS B-4409 /B-4410	=	0.384 MILES
LENGTH STRUCTURE TIP PROJECTS B-4409 /B4410	=	0.079 MILES
TOTAL LENGTH TIP PROJECTS B-4409 /B-4410	=	0.463 MILES

Prepared In the Office of:

DIVISION OF HIGHWAYS

2006 STANDARD SPECIFICATIONS

LETTING DATE:
JULY 21, 2009

B. C. Hunt, PE
R. M. Girolami, PE
PROJECT ENGINEERS

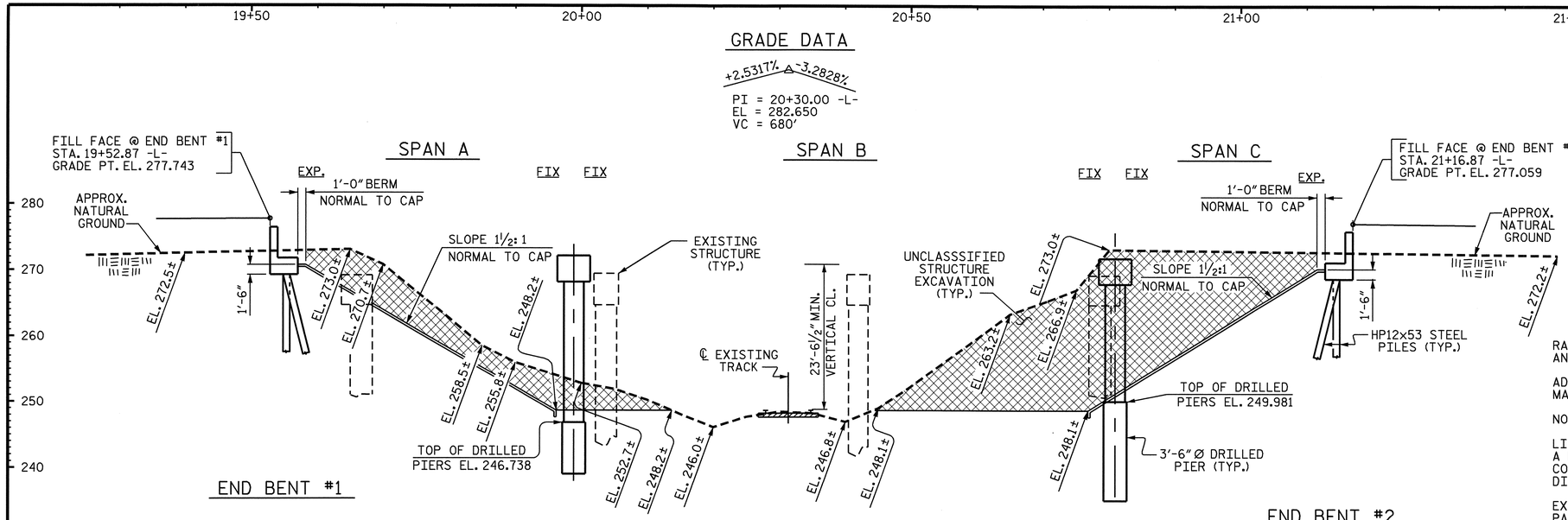
V. A. Patel, PE
D. R. Anderson, PE
PROJECT DESIGN ENGINEERS

STRUCTURE DESIGN UNIT
1000 BIRCH RIDGE DR.
RALEIGH, NC 27610

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

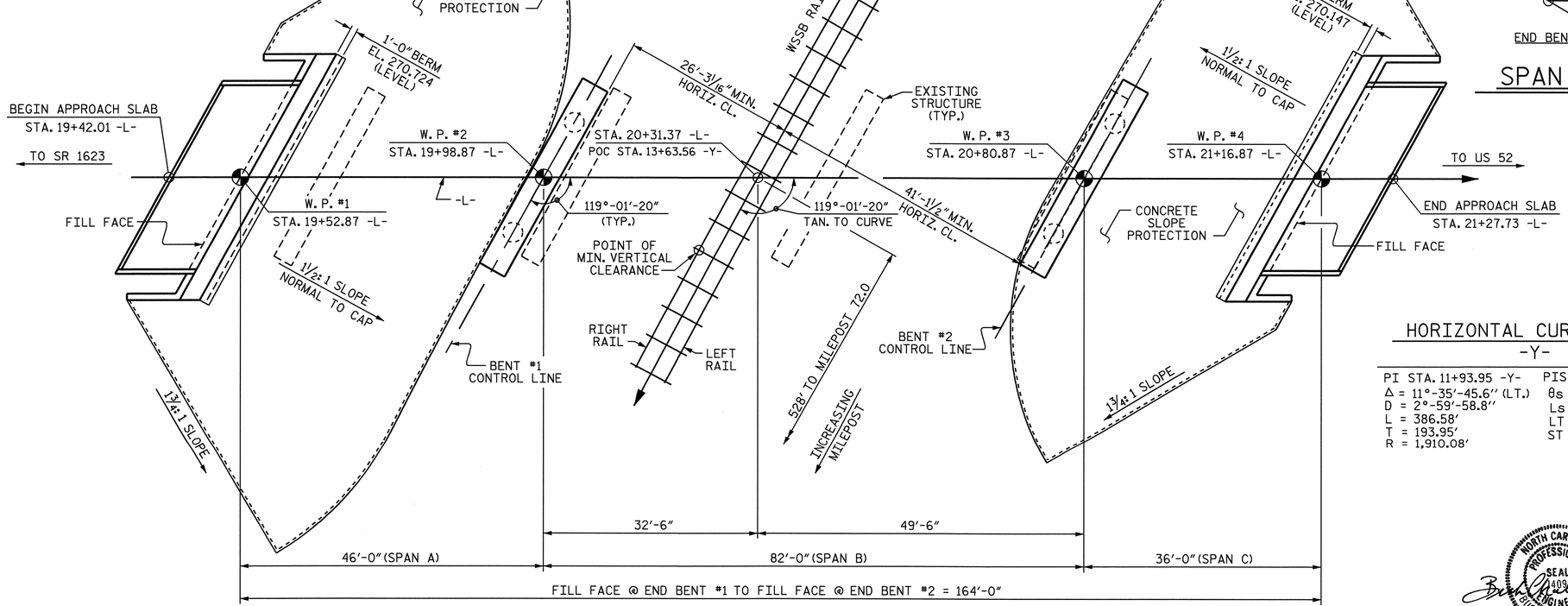
P.E.
STATE HIGHWAY DESIGN ENGINEER

F.A.PROJECT BRZ-1627(3)



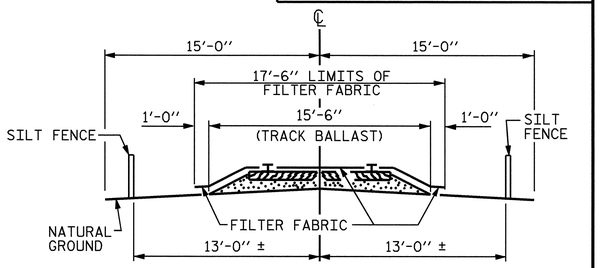
SECTION ALONG -L-

SECTION AT BENTS AND END BENTS TAKEN AT RIGHT ANGLES



PLAN

PILES ARE NOT SHOWN IN PLAN VIEW



RAILROAD EROSION CONTROL DETAIL

NOTES

RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

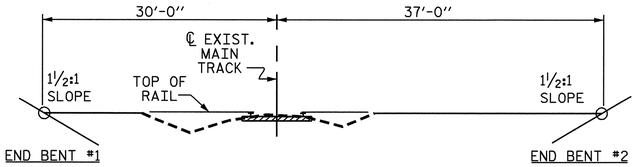
ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 10'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.

EXTEND FILTER FABRIC 25'-0" BEYOND OUTSIDE EDGE OF SUPERSTRUCTURE PARALLEL TO RAILROAD.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.



SPAN LENGTHS BASED ON THIS SECTION

(LOOKING DOWN STATION)

TOP OF RAIL ELEVATIONS			
STATION	LT. RAIL	STATION	RT. RAIL
12+62.43 -Y-	248.198	12+62.65 -Y-	248.339
13+20.54 -Y-	248.344	13+21.50 -Y-	248.466
13+77.89 -Y-	248.490	13+77.01 -Y-	248.607
14+29.73 -Y-	248.477	14+29.71 -Y-	248.566

HORIZONTAL CURVE DATA

-Y-

PI STA. 11+93.95 -Y-
Δ = 11°-35'-45.6" (LT.)
D = 2°-59'-58.8"
L = 386.58'
T = 193.95'
R = 1,910.08'

PIS STA. 14+86.64
θs = 4°-29'-58.1"
Ls = 300.00'
LT = 200.06'
ST = 100.06'

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-
POC 13+63.56 -Y-
MILEPOST W-71.90

SHEET 1 OF 3 REPLACES BRIDGE NO. 308

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER
WSSB RAILROAD ON SR 1627
(PINKSTON RIVER RD.)
BETWEEN SR 1623 AND US 52

NORTH CAROLINA PROFESSIONAL SEAL 24091 ENGINEER BUCK CHARLES HUNT
5/27/09

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
5/27/09

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

SHEET NO. S-1

TOTAL SHEETS 70

DRAWN BY : KEITH D. LAYNE DATE : 11/20/08
CHECKED BY : J. P. ADAMS DATE : 1/06/09

26-MAY-2009 14:23
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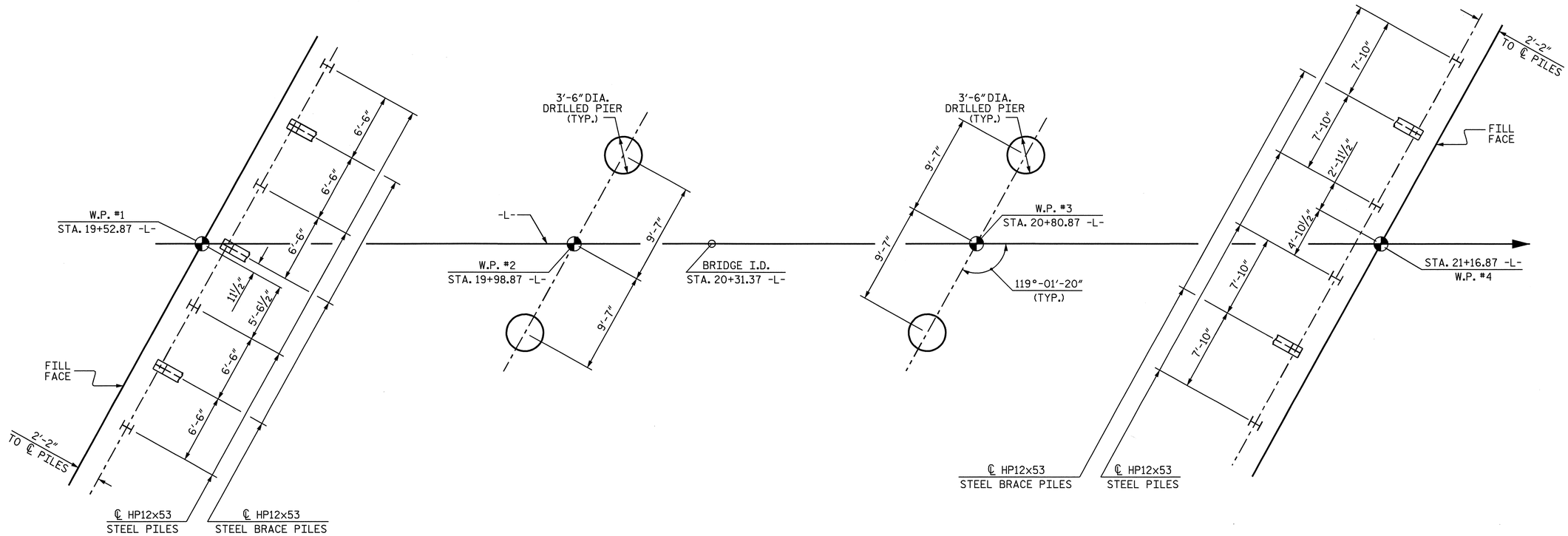

BENT #1

BENT #2

END BENT #1

END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING DRILLED PIERS ARE TO DRILLED PIER CENTER.
ALL PILES ARE HP12x53.
END BENT BRACE PILES ARE BATTERED 3:12.
DIMENSIONS LOCATING PILES ARE TO THE CENTERLINE OF PILE.

NOTES

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISION.

THE DRILLED PIERS FOR BENT No.1 AND BENT No.2 HAVE BEEN DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 25 TSF.

DRILLED PIERS FOR BENT No.1 HAVE BEEN DESIGNED FOR AN APPLIED LOAD OF 242 TONS (COLUMN 1) AND 243 TONS (COLUMN 2) EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS FOR BENT No.2 HAVE BEEN DESIGNED FOR AN APPLIED LOAD OF 224 TONS (COLUMN 1) AND 196 TONS (COLUMN 2) EACH AT THE TOP OF THE COLUMN.

INSTALL DRILLED PIERS AT BENT No.1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 238.988 (COLUMN 1) AND 234.988 (COLUMN 2) AND SATISFY THE REQUIRED END BEARING CAPACITY.

INSTALL DRILLED PIERS AT BENT No.2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 234.981 (COLUMN 1) AND 234.981 (COLUMN 2) AND SATISFY THE REQUIRED END BEARING CAPACITY.

SPT TESTING IS NOT REQUIRED FOR DRILLED PIERS AT BENT No.1 AND BENT No.2.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT No.1 AND BENT No.2.

SID INSPECTIONS MAY BE REQUIRED FOR ALL DRILLED PIERS AT BENT No.1 AND BENT No.2.

CSL TUBES AND TESTING MAY BE REQUIRED FOR DRILLED PIERS AT BENT No.1 AND BENT No.2. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISION.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT No.1 AND END BENT No.2 IS 60 TONS PER PILE.

DRIVE PILES FOR END BENT No.1 AND END BENT No.2 TO A REQUIRED BEARING CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO PLUS ANY ADDITIONAL CAPACITY TO ACCOUNT FOR DOWN DRAG OR NEGATIVE SKIN FRICTION AND SCOUR.

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER
WSSB RAILROAD ON SR 1627
(PINKSTON RIVER RD.)
BETWEEN SR 1623 AND US 52

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : KEITH D. LAYNE DATE : 11/21/08
CHECKED BY : J. P. ADAMS DATE : 1/06/09

24-MAR-2009 13:52
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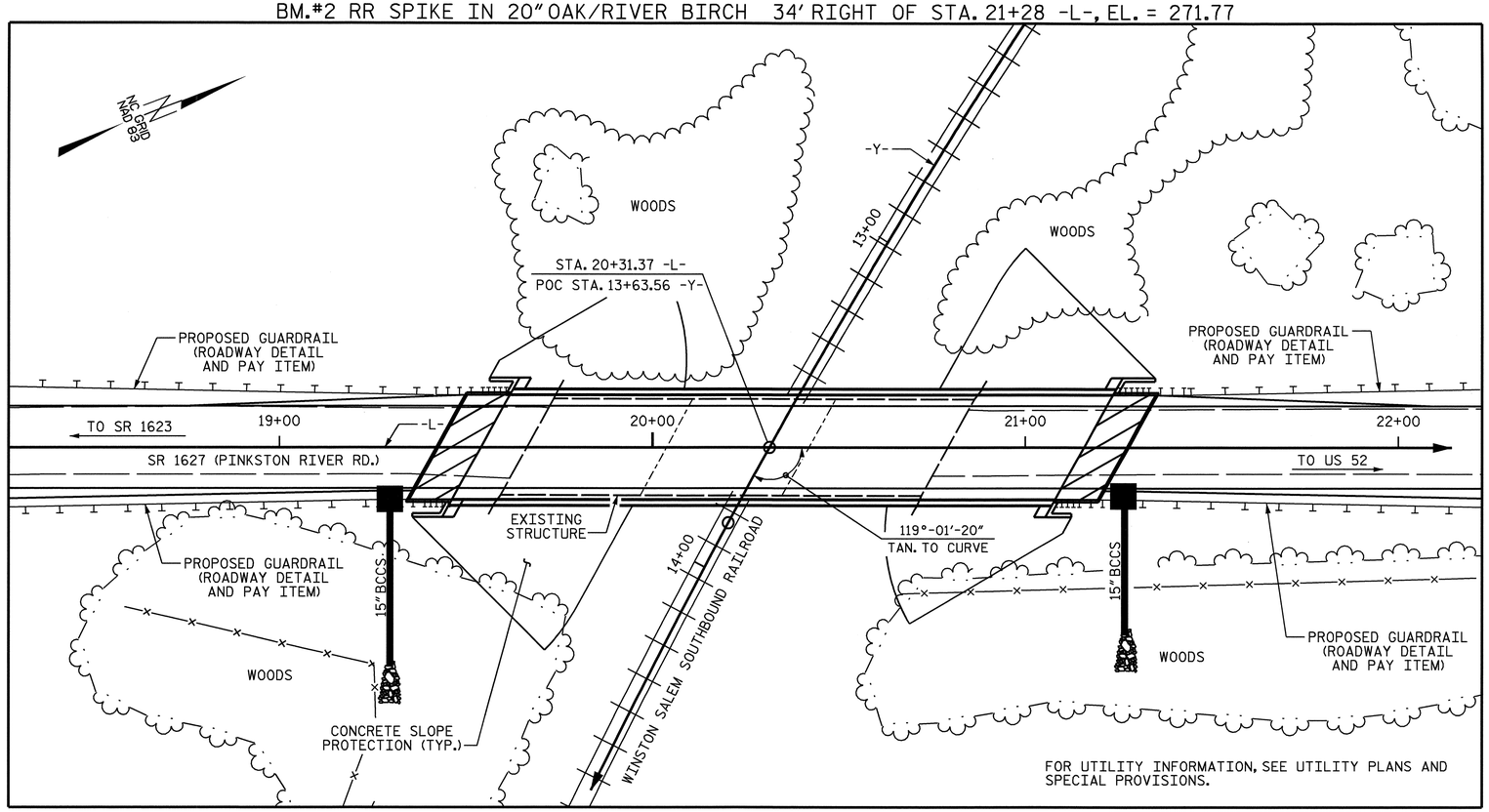

LOCATION SKETCH

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	3'-6" DIA. DRILLED PIERS IN SOIL	3'-6" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTION	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	CU. YDS.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM
SUPERSTRUCTURE							5,051	4,529		LUMP SUM
END BENT #1						433			28.3	
BENT #1		7.3	12.2						31.7	
BENT #2		14.8	15.2						29.6	
END BENT #2						1,495			27.7	
TOTAL	LUMP SUM	22.1	27.4	1	1	1,928	5,051	4,529	117.3	LUMP SUM

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	54" PRESTRESSED CONCRETE GIRDERS		HP12x53 STEEL PILES		CONCRETE BARRIER RAIL	96" CHAIN LINK FENCE	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE			12	632.00			323.24	318.0		LUMP SUM	LUMP SUM
END BENT #1	3,801				7	175			434		
BENT #1	6,643	1,380									
BENT #2	6,801	1,442									
END BENT #2	3,792				6	120			379		
TOTAL	21,037	2,822	12	632.00	13	295	323.24	318.0	813	LUMP SUM	LUMP SUM

GENERAL NOTES

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT THE GIRDERS ARE DESIGNED FOR HS 25.

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

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS, 1 @ 38.5', 1 @ 38.00', AND 1 @ 37.0' OF 4 LINES OF REINFORCED CONCRETE DECK GIRDERS AND A CLEAR ROADWAY WIDTH OF 25'-10" SUPPORTED ON REINFORCED CONCRETE SPILL THROUGH ABUTMENTS AT END BENTS AND REINFORCED CONCRETE POST AND BEAM AT BENTS AND LOCATED AT THE PROPOSED SITE SHALL BE REMOVED.

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED FOR A DISTANCE OF 25 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE PER CUBIC YARD FOR UNCLASSIFIED STRUCTURE EXCAVATION.

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

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

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRUL A. PATEL
3/26/09

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE OVER
WSSB RAILROAD ON SR 1627
(PINKSTON RIVER RD.)
BETWEEN SR 1623 AND US 52

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : KEITH D. LAYNE DATE : 11/20/08
CHECKED BY : J. P. ADAMS DATE : 1/06/09

24-MAR-2009 13:52
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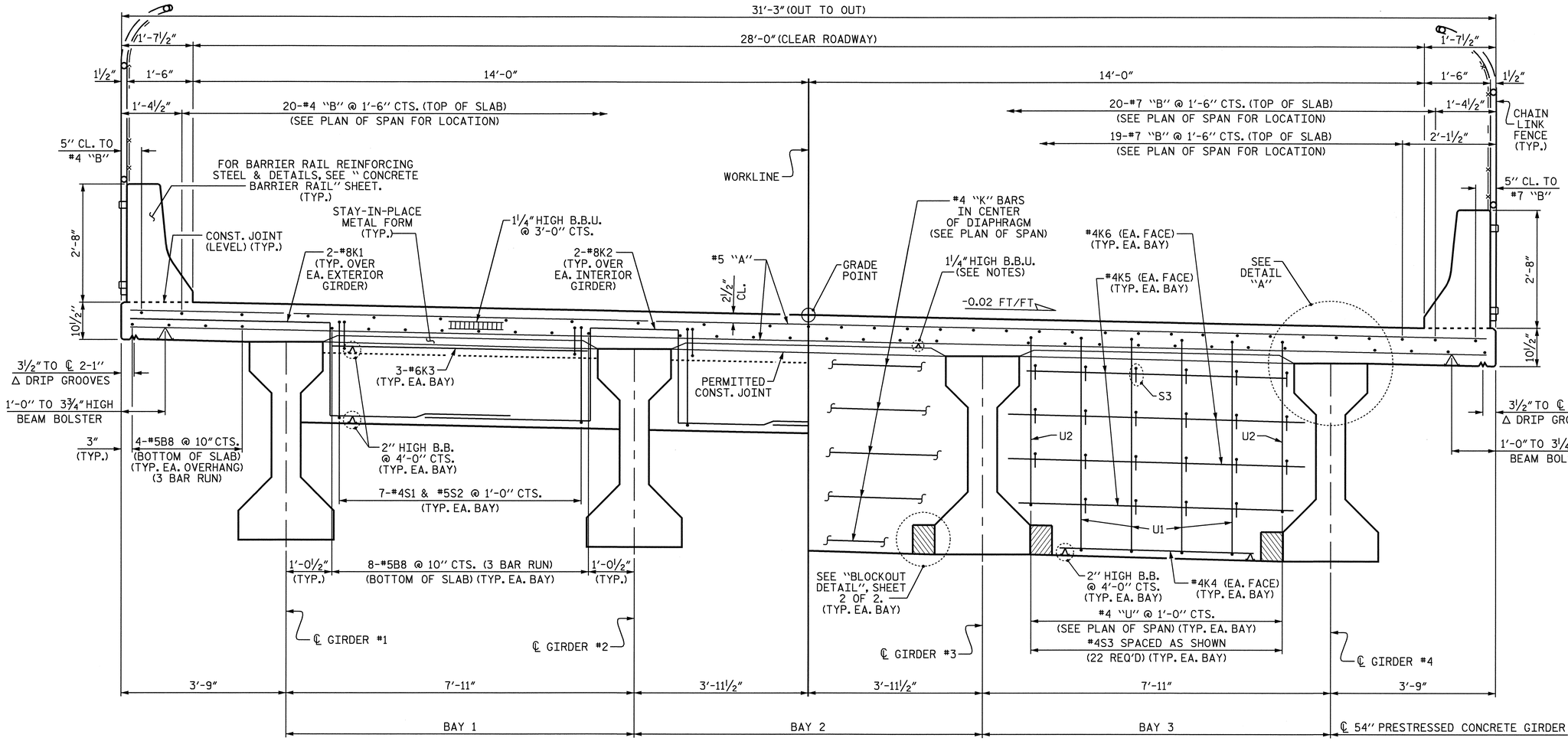
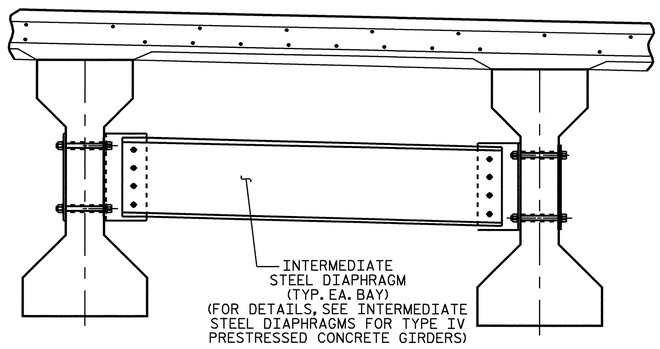
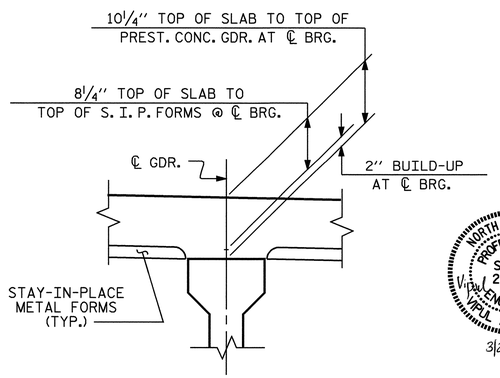


TYPICAL HALF SECTION
SHOWING END BENT DIAPHRAGM

TYPICAL HALF SECTION
SHOWING CONTINUOUS BENT DIAPHRAGM



INTERMEDIATE DIAPHRAGM



DETAIL "A"

NOTES

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

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

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

BARRIER RAIL 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.

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J.P. ADAMS DATE : 10/23/08
CHECKED BY : K.D. LAYNE DATE : 12/09/08

24-MAR-2009 13:52
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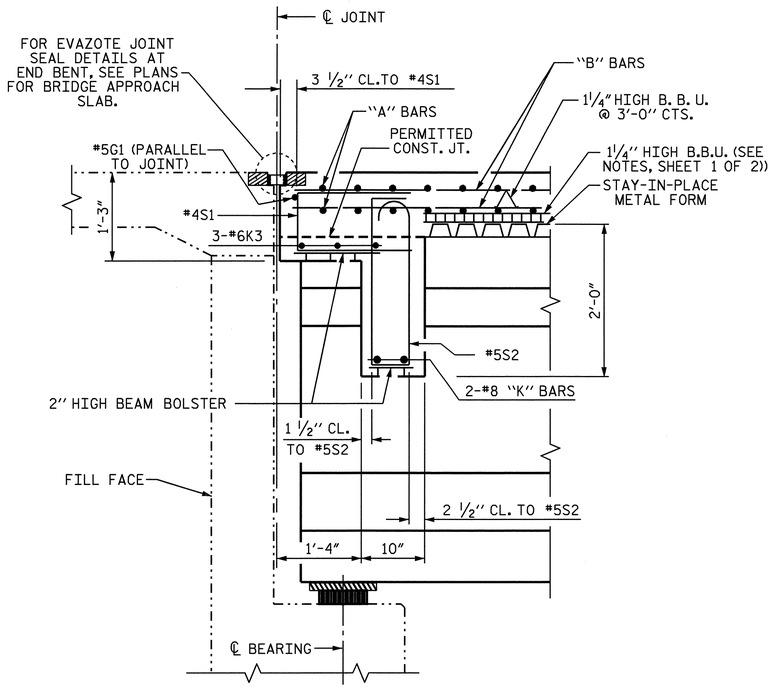
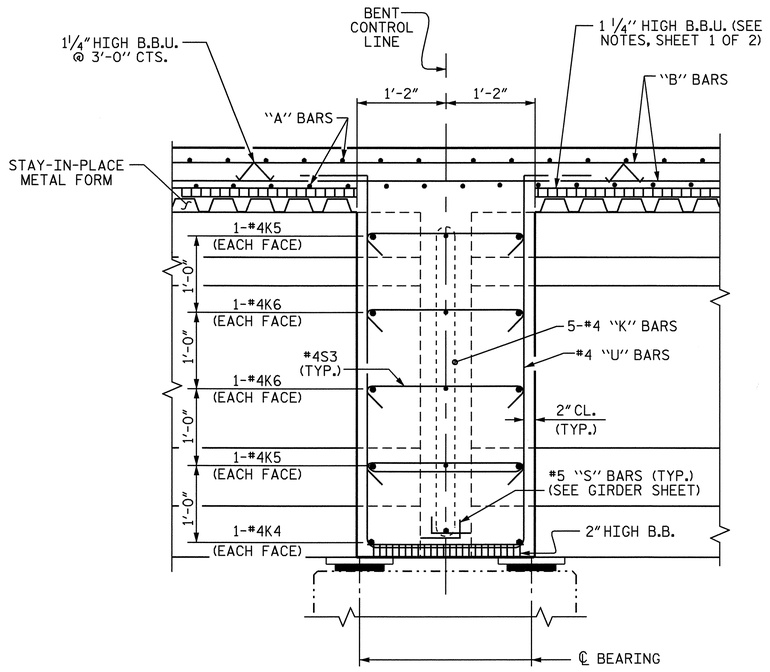
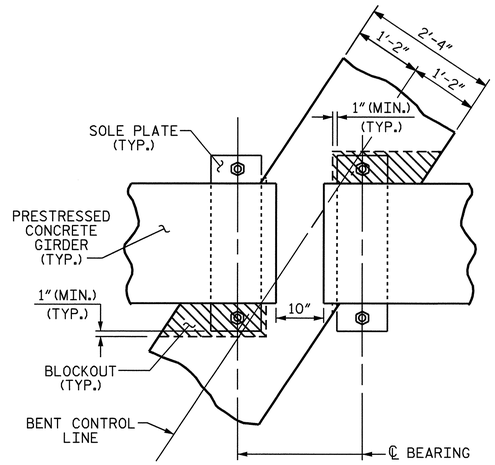


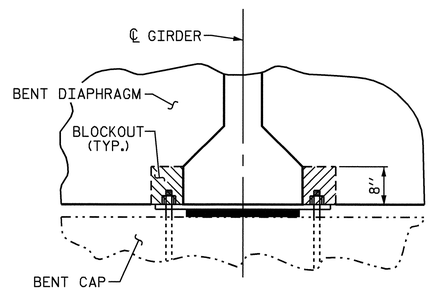
SECTION THRU END BENT DIAPHRAGM



SECTION THRU BENT DIAPHRAGM

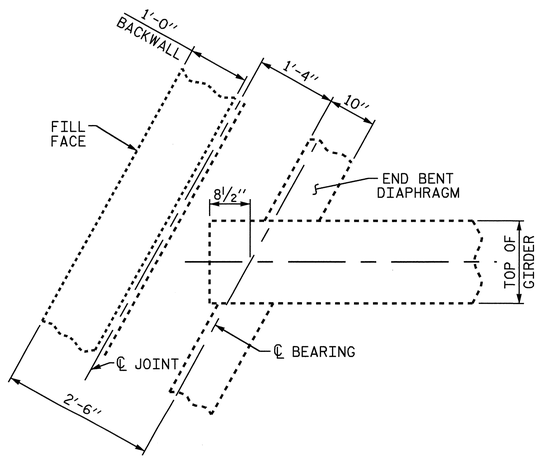


PLAN

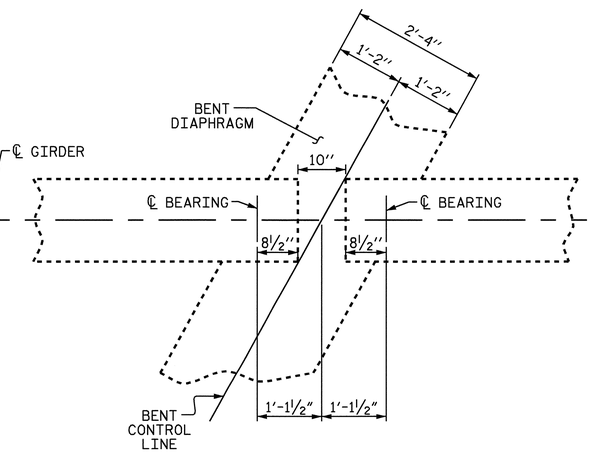


SECTION

BENT DIAPHRAGM BLOCK-OUT DETAIL



END BENT DIAPHRAGM



BENT DIAPHRAGM

PLAN OF DIAPHRAGMS

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRAL A. PATEL
3/26/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J.P. ADAMS DATE : 10/28/08
CHECKED BY : K.D. LAYNE DATE : 12/09/08

24-MAR-2009 13:52
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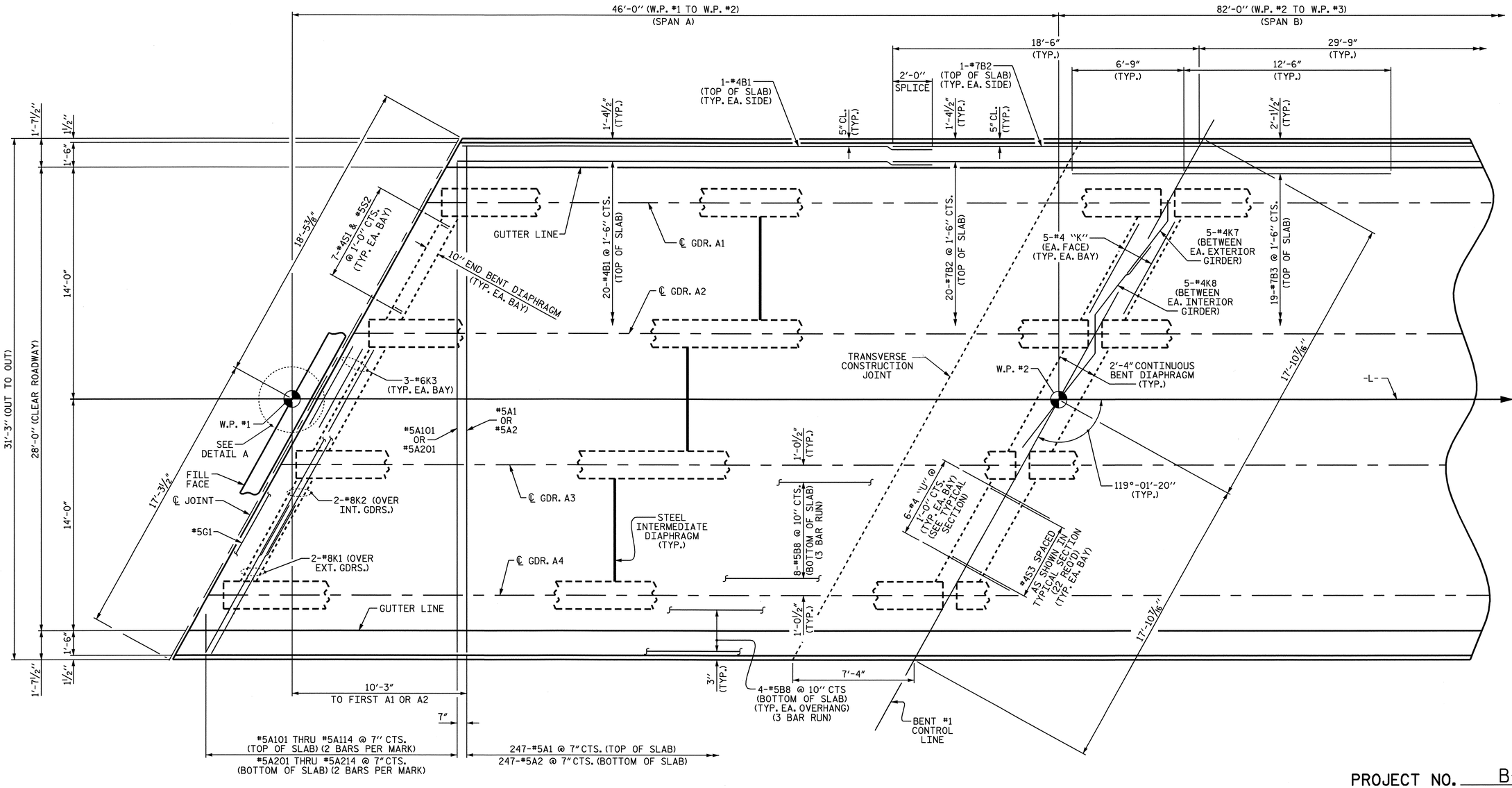
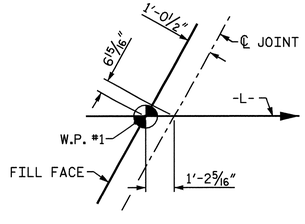


PLAN OF SPAN A



DETAIL A

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
5/27/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J.P. ADAMS DATE : 11/20/08
CHECKED BY : K.D. LAYNE DATE : 12/09/08

26-MAY-2009 14:05
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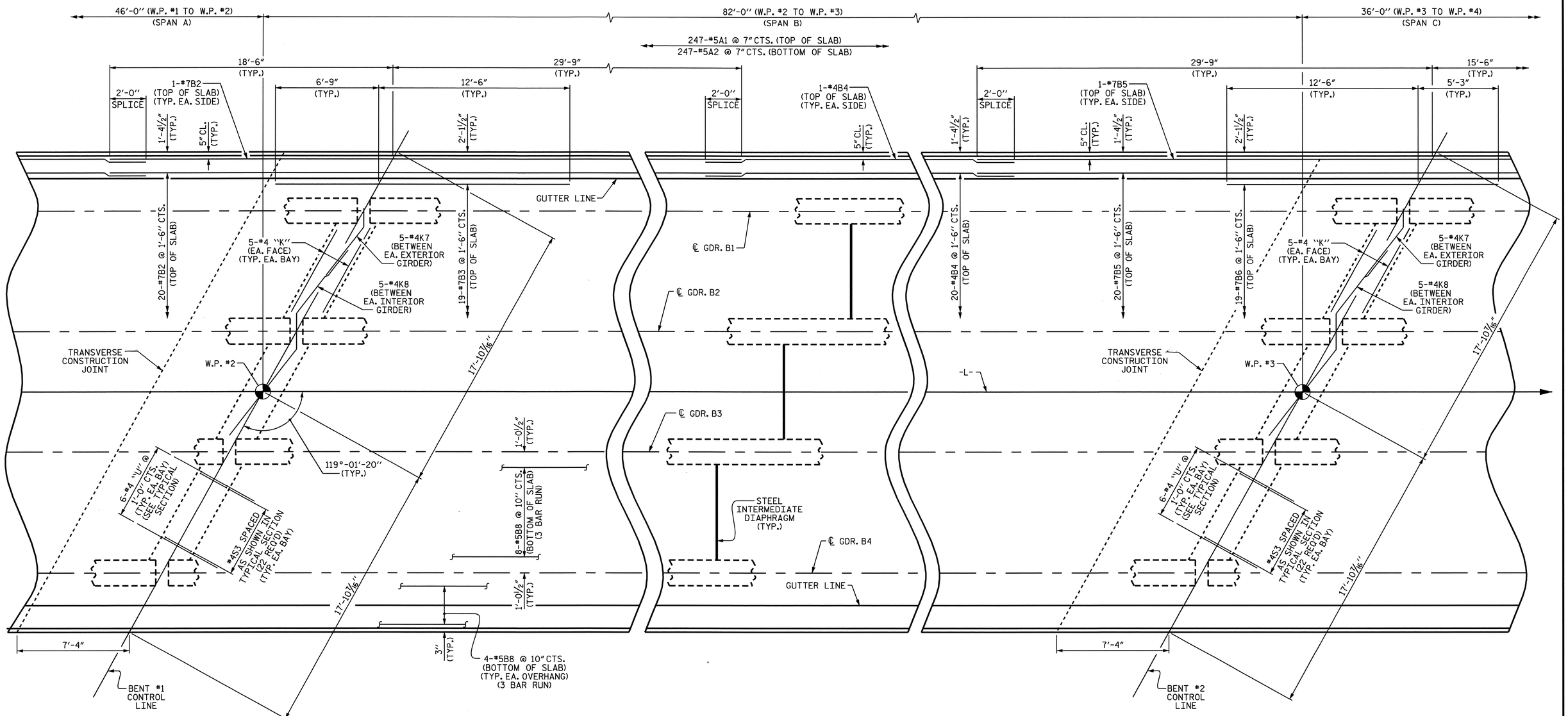
klayne



PLAN OF SPAN B

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
5/27/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J.P. ADAMS DATE : 11/20/08
CHECKED BY : K.D. LAYNE DATE : 12/09/08

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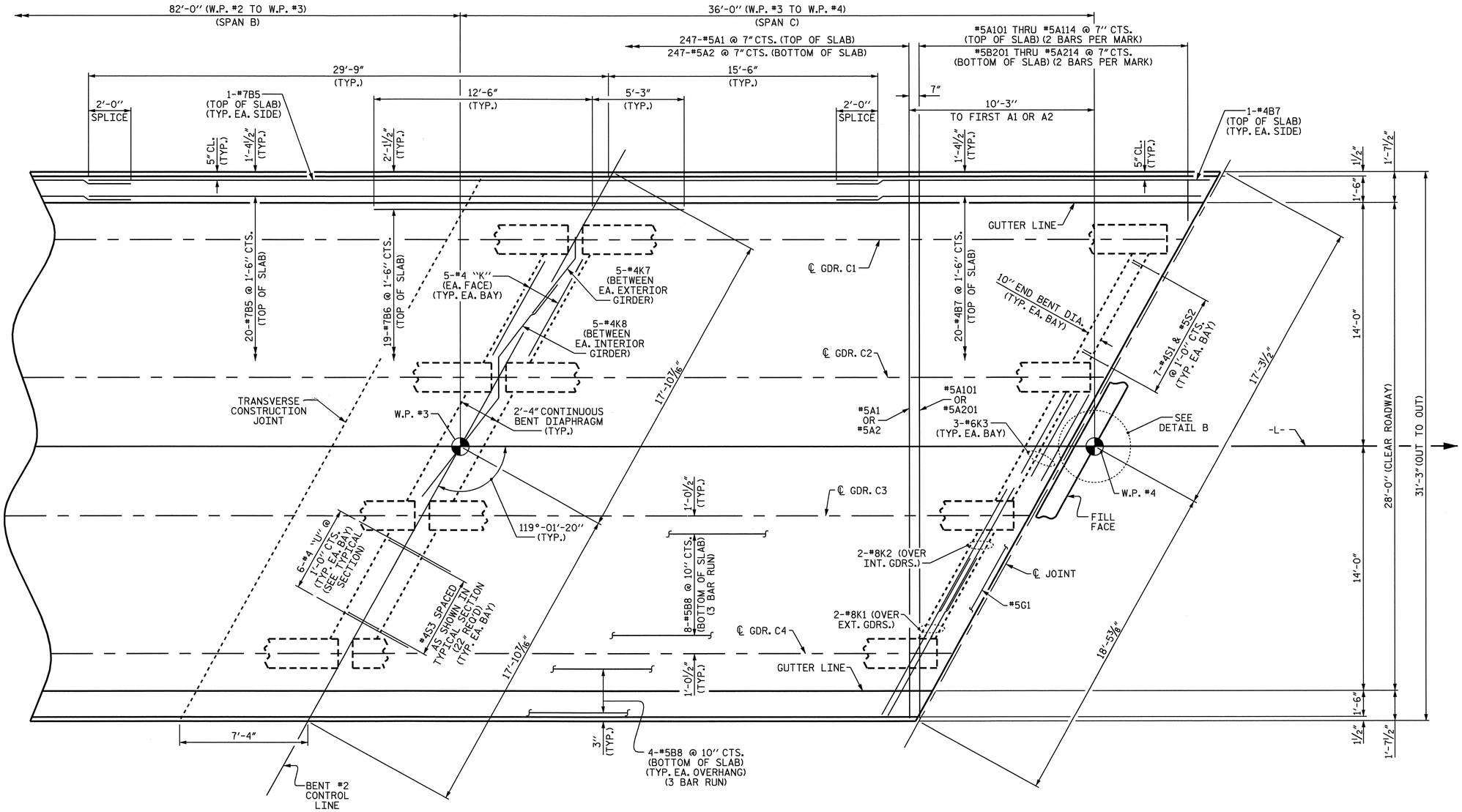
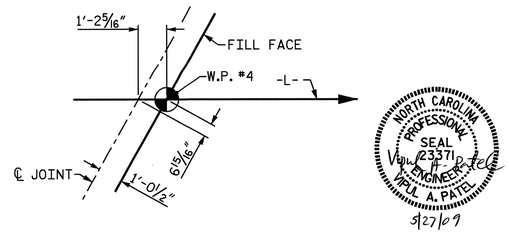


PLAN OF SPAN C



DETAIL B

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
5/27/09

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J.P. ADAMS DATE : 11/20/08
CHECKED BY : K.D. LAYNE DATE : 12/09/08

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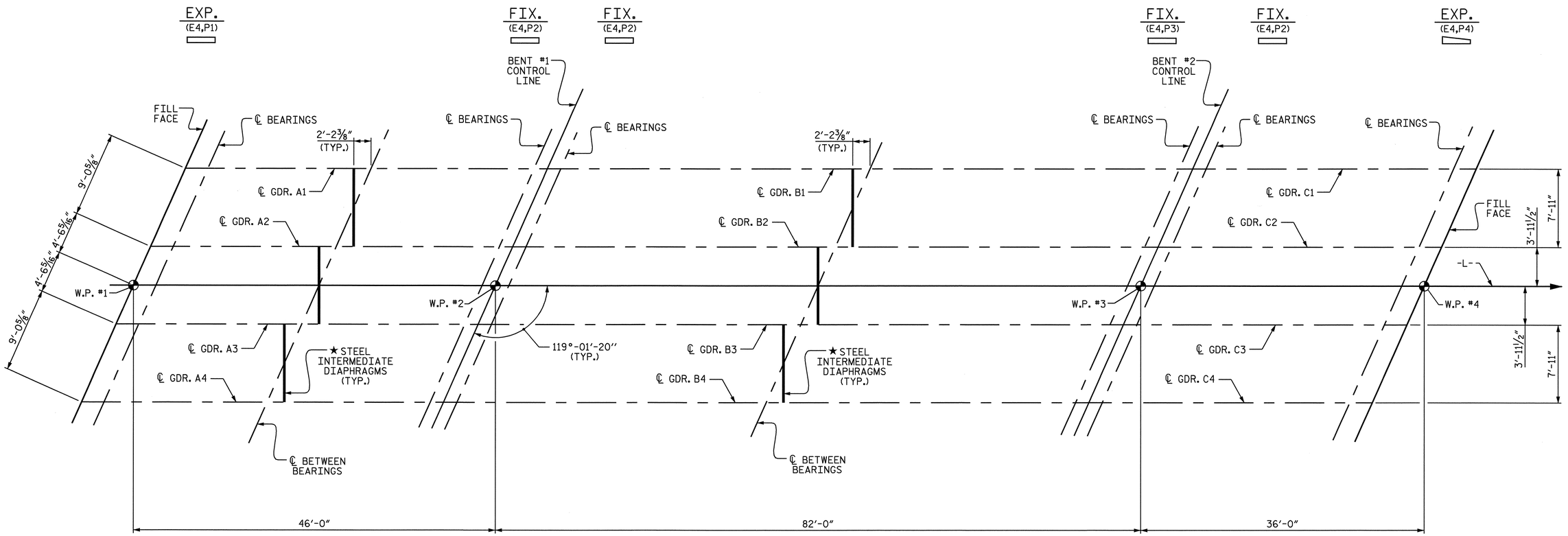

GIRDER LAYOUT

★ SEE "INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS" SHEET.

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER PAUL A. PATE

3/26/09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J.P. ADAMS DATE : 10/21/08
CHECKED BY : K.D. LAYNE DATE : 12/09/08

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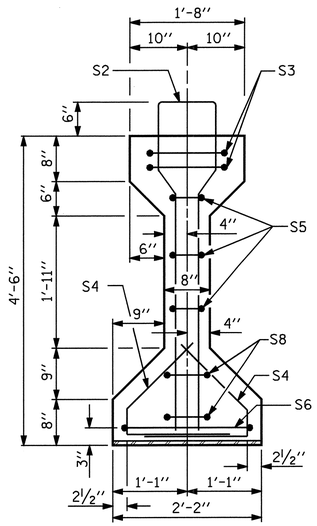
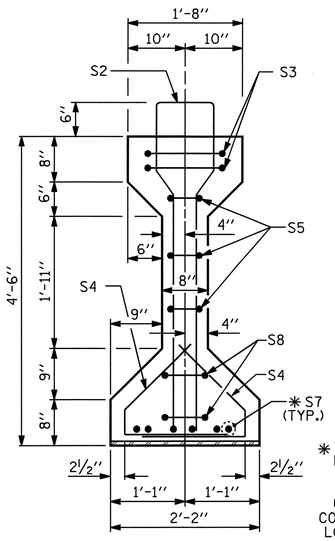
klayne

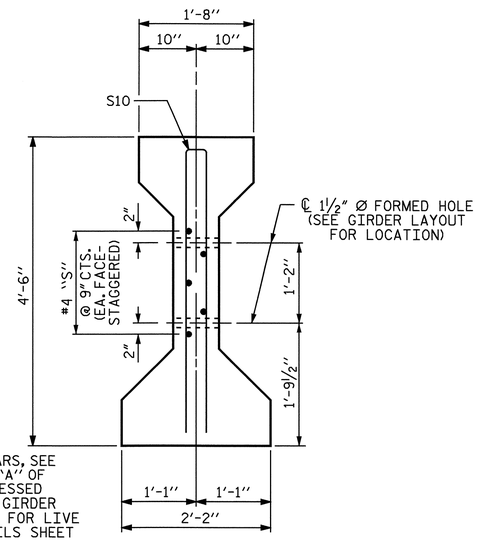


SECTION A-A

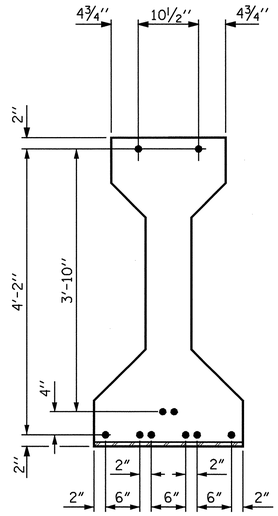


SECTION B-B

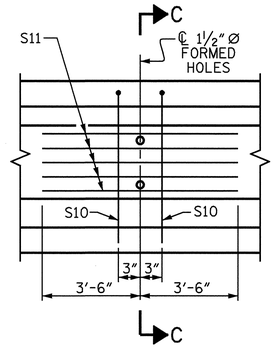
✱ FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



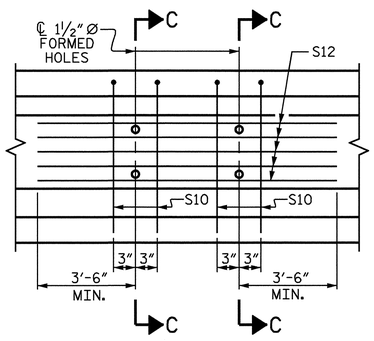
SECTION C-C
(S1 BARS NOT SHOWN)



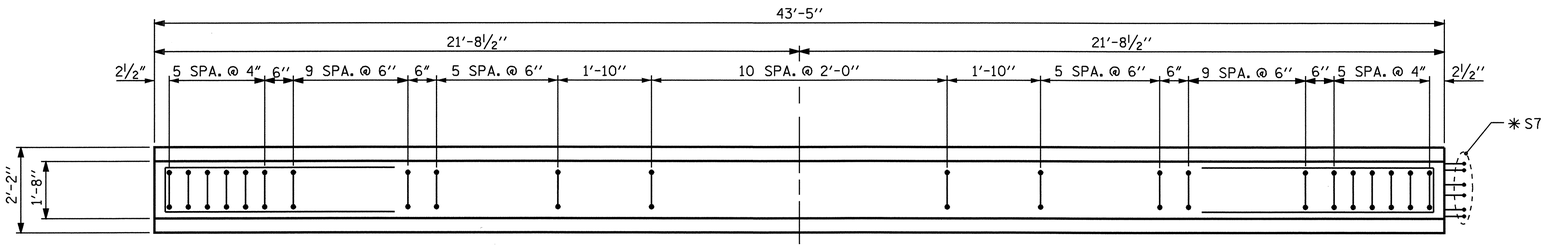
0.6" Ø LOW RELAXATION
STRAND LAYOUT



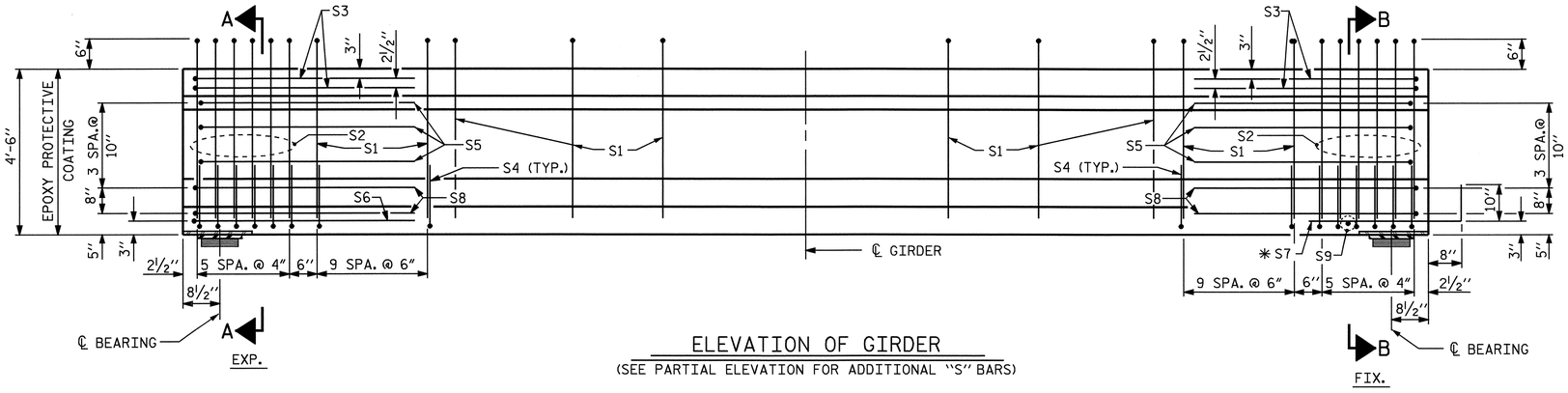
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR EXTERIOR GIRDERS



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR INTERIOR GIRDERS



PLAN OF GIRDER



ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

0.6" Ø L. R. GRADE 270 STRANDS

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

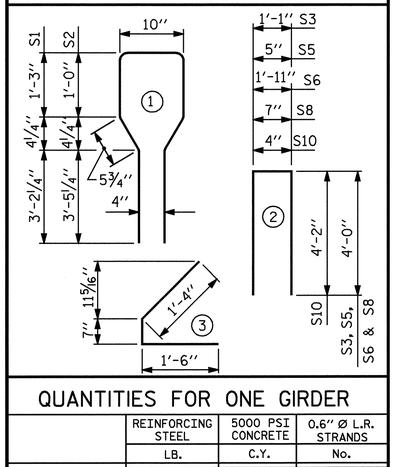
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	43	#4	1	10'-8"	306
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	64	#4	3	3'-5"	146
	S5	6	#4	2	8'-5"	34
	S6	1	#4	2	9'-11"	7
	✱S7	6	#5	STR	3'-8"	23
	S8	4	#4	2	8'-7"	23
	S9	1	#3	STR	1'-10"	1
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	11'-5"	38

✱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 LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	797	8.8	10
INTERIOR GIRDER	830	8.8	10

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
2 (EXTERIOR)	43'-5"	86'-10"
2 (INTERIOR)	43'-5"	86'-10"

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD

(SPAN A)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
9/27/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : J.P. ADAMS	DATE : 10/16/08
CHECKED BY : K.D. LAYNE	DATE : 12/09/08
DRAWN BY : ELR 8/91	REV. 7/17/98 RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R RWW/LES
	REV. 5/1/06 TLA/GM

27-MAY-2009 10:14
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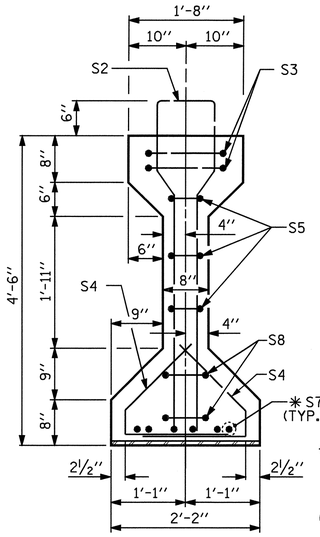
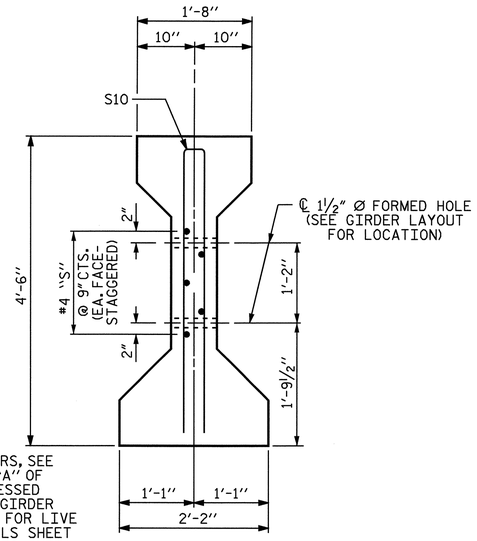
vpatel

STD. NO. PCG6

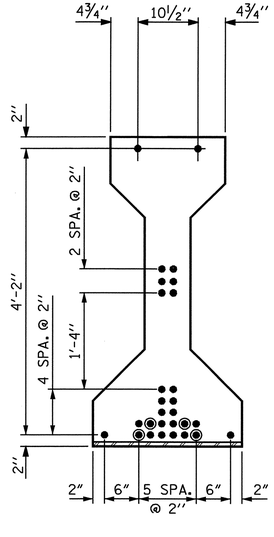


SECTION B-B

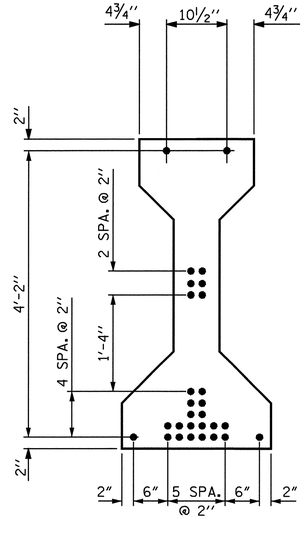


SECTION C-C
(S1 BARS NOT SHOWN)

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



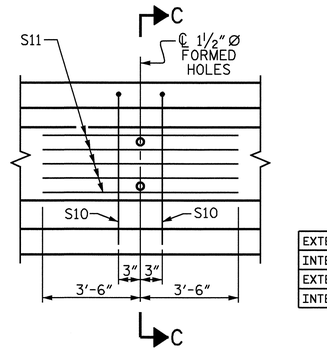
AT END OF GIRDER



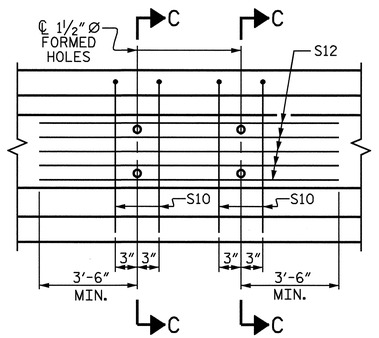
AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT

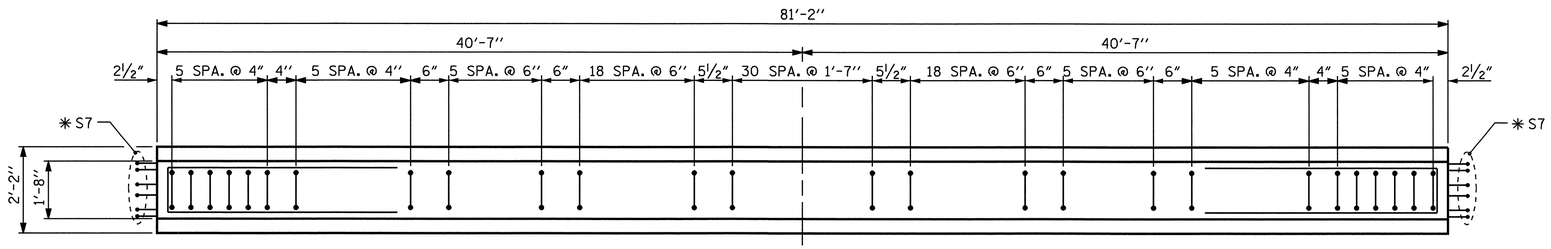
◉ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER



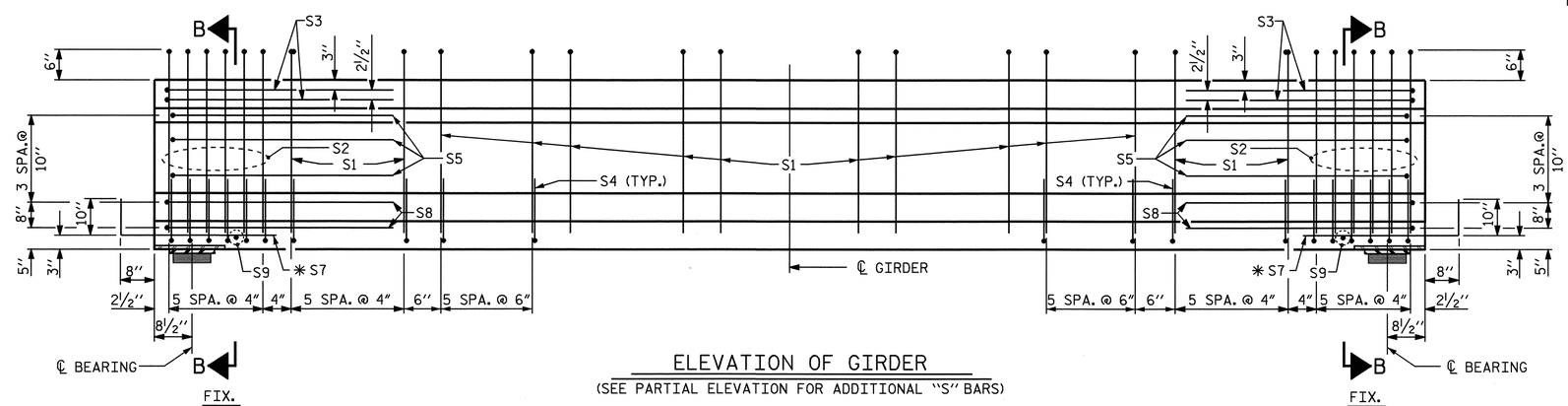
PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR EXTERIOR GIRDERS



PARTIAL ELEVATION
SHOWING INTERMEDIATE DIAPHRAGM
REINFORCING STEEL FOR INTERIOR GIRDERS



PLAN OF GIRDER



ELEVATION OF GIRDER
(SEE PARTIAL ELEVATION FOR ADDITIONAL "S" BARS)

0.6" Ø L. R. GRADE 270 STRANDS

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

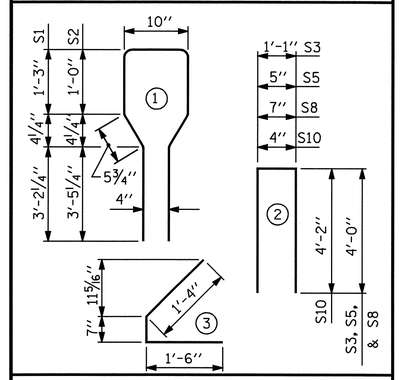
REINFORCING STEEL FOR ONE GIRDER

	BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
	S1	93	#4	1	10'-8"	663
	S2	12	#6	1	10'-8"	192
	S3	4	#4	2	9'-1"	24
	S4	72	#4	3	3'-5"	164
	S5	6	#4	2	8'-5"	34
	*S7	12	#5	STR	3'-8"	46
	S8	4	#4	2	8'-7"	23
	S9	2	#3	STR	1'-10"	1
EXTERIOR GDR.	S10	2	#5	2	8'-8"	18
INTERIOR GDR.	S10	4	#5	2	8'-8"	36
EXTERIOR GDR.	S11	5	#4	STR	7'-0"	23
INTERIOR GDR.	S12	5	#4	STR	11'-5"	38

* 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 LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
EXTERIOR GIRDER	1188	16.5	28
INTERIOR GIRDER	1221	16.5	28

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
2 (EXTERIOR)	81'-2"	162'-4"
2 (INTERIOR)	81'-2"	162'-4"

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD

(SPAN B)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : J.P. ADAMS	DATE : 10/16/08	
CHECKED BY : K.D. LAYNE	DATE : 12/09/08	
DRAWN BY : ELR 8/91	REV. 7/17/98	RWW/LES
CHECKED BY : GRP 8/91	REV. 10/17/00R	RWW/LES
	REV. 5/1/06	TLA/GM

24-MAR-2009 13:51
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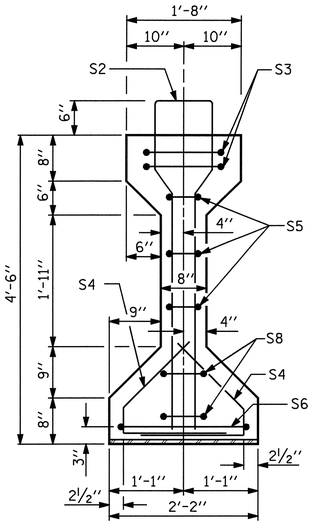
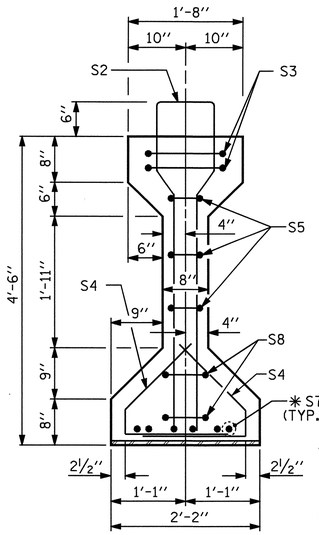
klayne

STD. NO. PCG6

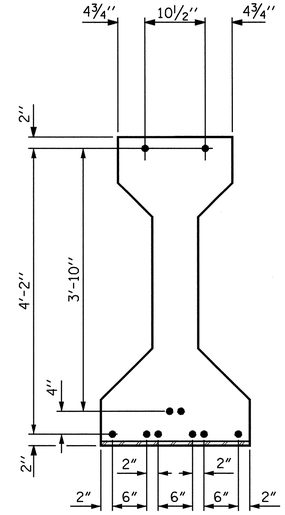


SECTION A-A

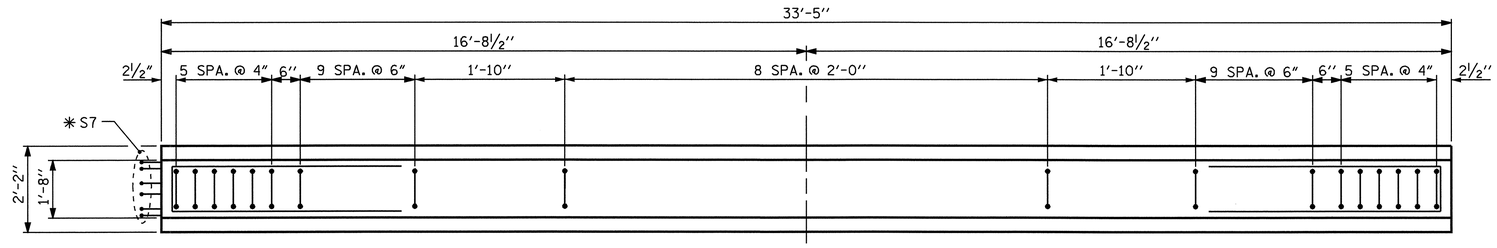


SECTION B-B

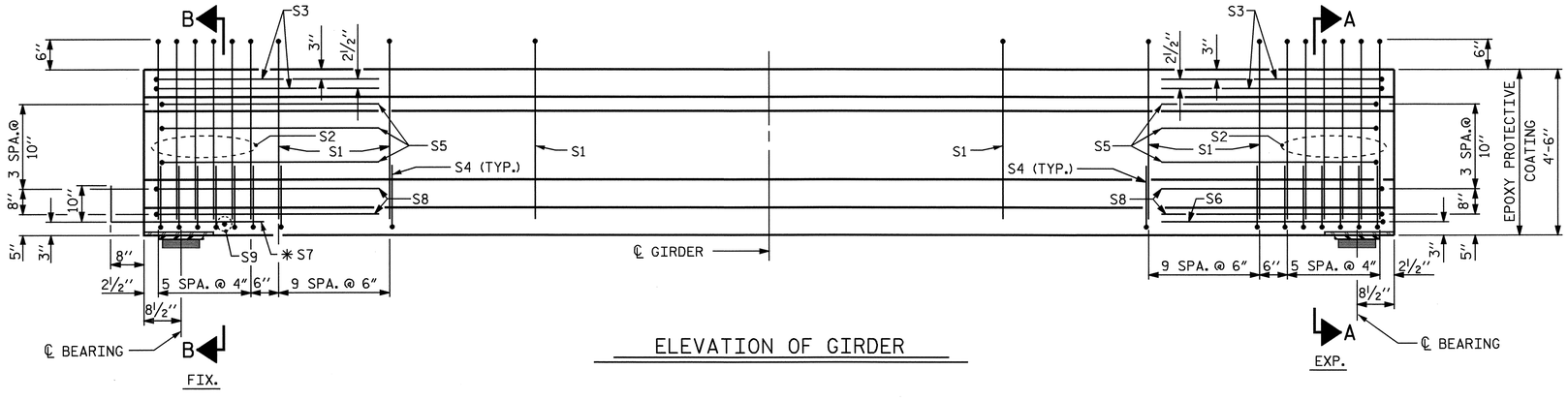
✱ FOR S7 BARS, SEE DETAIL "A" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



0.6" Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

ASSEMBLED BY : J.P. ADAMS	DATE : 10/16/08	REV. 7/17/98	RWW/LES
CHECKED BY : K.D. LAYNE	DATE : 12/09/08	REV. 10/17/00R	RWW/LES
DRAWN BY : ELR 8/91		REV. 5/1/06	TLA/GM
CHECKED BY : GRP 8/91			

27-MAY-2009 10:14
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vpatel

0.6" Ø L. R. GRADE 270 STRANDS

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

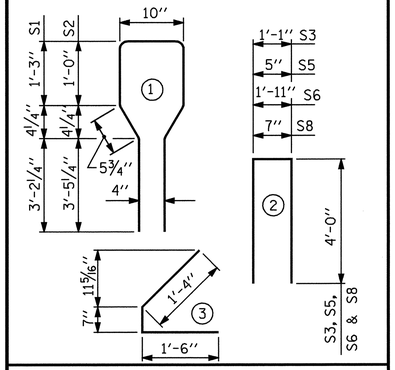
REINFORCING STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	29	#4	1	10'-8"	207
S2	12	#6	1	10'-8"	192
S3	4	#4	2	9'-1"	24
S4	64	#4	3	3'-5"	146
S5	6	#4	2	8'-5"	34
S6	1	#4	2	9'-11"	7
✱S7	6	#5	STR	3'-8"	23
S8	4	#4	2	8'-7"	23
S9	1	#3	STR	1'-10"	1

✱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 LB.	5000 PSI CONCRETE C.Y.	0.6" Ø L.R. STRANDS No.
SPAN C	657	6.8	10

GIRDERS REQUIRED

NUMBER	LENGTH	TOTAL LENGTH
4 (SPAN C)	33'-5"	133'-8"

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
5/27/09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
AASHTO TYPE IV
PRESTRESSED CONCRETE GIRDER
CONTINUOUS FOR LIVE LOAD
(SPAN C)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			70

STD. NO. PCG6

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

0.6"Ø LOW RELAXATION	SPAN A GIRDERS 1-4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	.007	.012	.017	.020	.021	.020	.017	.012	.007	0.0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	.002	.004	.006	.006	.007	.006	.006	.004	.002	0.0
VERTICAL CURVE ORDINATE ↑	0.0	.007	.012	.016	.018	.019	.018	.016	.012	.007	0.0
FINAL CAMBER ↑	0	1/8"	1/4"	5/16"	3/8"	3/8"	3/8"	5/16"	1/4"	1/8"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

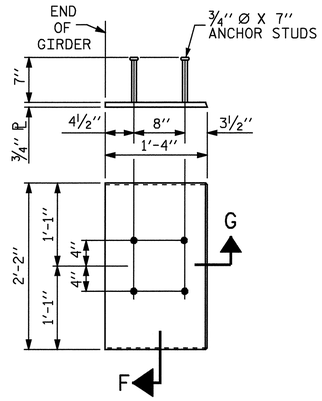
0.6"Ø LOW RELAXATION	SPAN B GIRDERS 1-4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	.051	.096	.131	.154	.162	.154	.131	.096	.051	0.0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	.027	.051	.069	.081	.085	.081	.069	.051	.027	0.0
VERTICAL CURVE ORDINATE ↑	0.0	.025	.044	.057	.065	.068	.065	.057	.044	.025	0.0
FINAL CAMBER ↑	0	9/16"	1 1/16"	1 7/16"	1 5/8"	1 3/4"	1 5/8"	1 7/16"	1 1/16"	9/16"	0

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

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

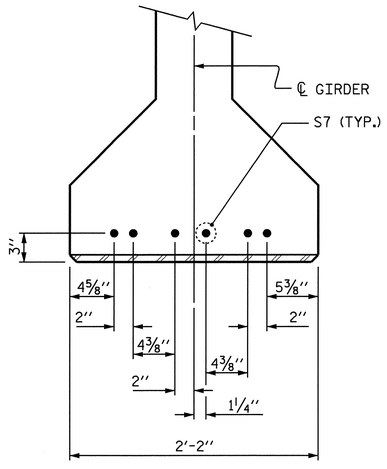
0.6"Ø LOW RELAXATION	SPAN C GIRDERS 1-4										
TENTH POINTS	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	0
CAMBER (GIRDER ALONE IN PLACE) ↑	0.0	.005	.009	.012	.014	.015	.014	.012	.009	.005	0.0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0.0	.001	.001	.002	.002	.002	.002	.002	.001	.001	0.0
VERTICAL CURVE ORDINATE ↑	0.0	.004	.007	.009	.011	.011	.011	.009	.007	.004	0.0
FINAL CAMBER ↑	0	1/8"	3/16"	1/4"	1/4"	5/16"	1/4"	1/4"	3/16"	1/8"	0

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



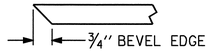
EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER

(2 REQ'D PER GIRDER)



DETAIL "A"

SECTION "G"



SECTION "F"

(SEE NOTES)

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 4000 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".

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			70

STD. NO. PCG11

ASSEMBLED BY : J.P. ADAMS	DATE : 10/16/08
CHECKED BY : K.D. LAYNE	DATE : 12/09/08
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

24-MAR-2009 13:51
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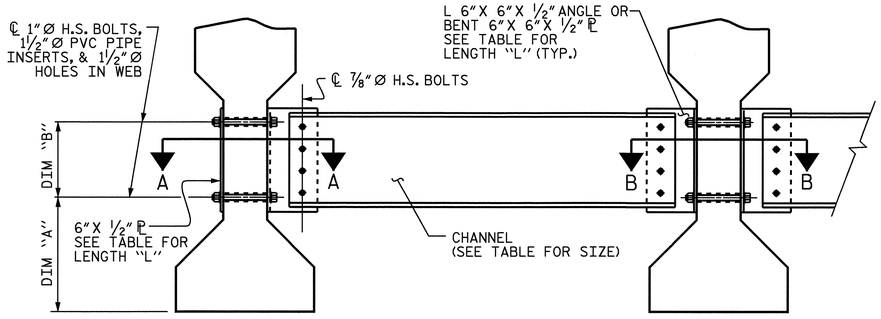
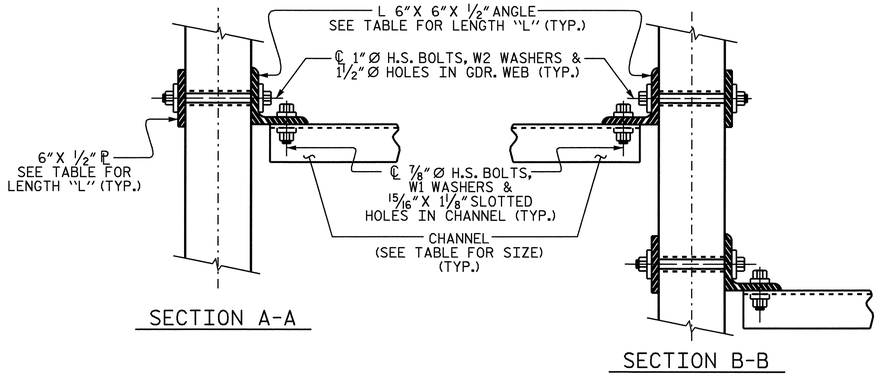
klayne



EXTERIOR GIRDER

INTERIOR GIRDER

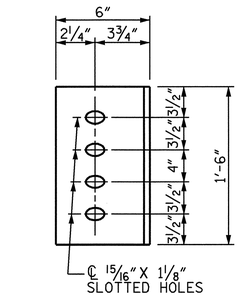
PART SECTION AT INTERMEDIATE DIAPHRAGM



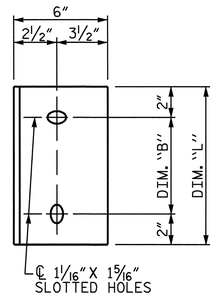
SECTION A-A

SECTION B-B

CONNECTION DETAILS



DIAPHRAGM FACE



WEB FACE

CONNECTOR PLATE DETAILS

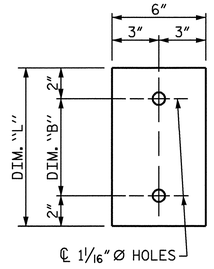
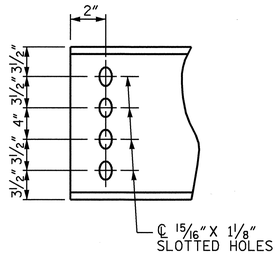
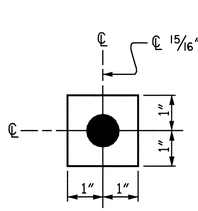


PLATE DETAILS



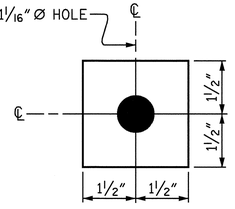
CHANNEL END



W1

ℙ 7/16"X 2"X 2"

USE WITH ⅞" Ø HVY. HEX NUTS & DIRECT TENSION INDICATOR WASHERS AT DIAPHRAGM CHANNEL TO CONNECTOR PLATE CONNECTIONS



W2

ℙ 7/16"X 3"X 3"

USE WITH 1" Ø HVY. HEX NUTS AT CONNECTOR PLATE TO GIRDER CONNECTIONS

WASHER DETAILS

STRUCTURAL STEEL NOTES

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

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

TENSION ON THE AASHTO M164 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL ¼ TURN.

THE CHANNELS, ANGLES, WASHERS, PLATE WASHERS, AND DIRECT TENSION INDICATORS 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 PROVISIONS AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, AND WASHERS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

USE A MINIMUM 7/16" THICK PLATE WASHER WITH STANDARD HOLES UNDER EACH BOLT HEAD AND NUT. THE PLATE WASHERS SHALL HAVE SUFFICIENT SIZE TO COVER THE HOLES AFTER INSTALLATION. DIRECT TENSION INDICATORS ARE TO BE USED IN CONJUNCTION WITH THE PLATE WASHERS.

PROVIDE SUFFICIENT LENGTH OF ALL BOLTS TO ACCOMMODATE WASHERS, DIRECT TENSION INDICATORS, THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST ¼" PROJECTION BEYOND THE NUT.

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

CONTRACTOR SHALL 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, TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. ALL AASHTO M164 H.S. BOLTS SHALL BE FULLY TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

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

TABLE

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

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 5 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRAL A. PATEL

3/26/09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

INTERMEDIATE STEEL DIAPHRAGMS FOR TYPE IV PRESTRESSED CONCRETE GIRDERS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : J.P. ADAMS	DATE : 10/16/08
CHECKED BY : K.D. LAYNE	DATE : 12/09/08
DRAWN BY : TLA 6/05	ADDED 10/21/05
CHECKED BY : VC 6/05	REV. 5/1/06R KMM/GM

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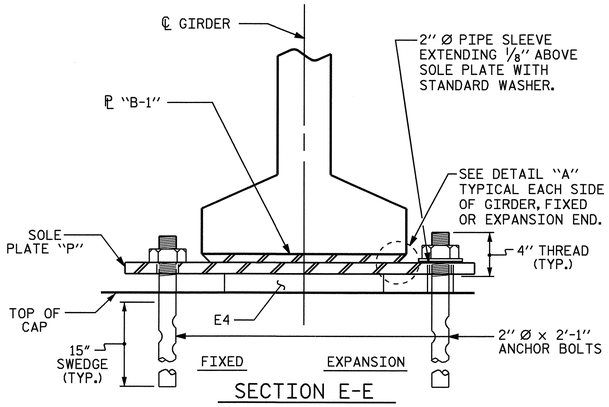
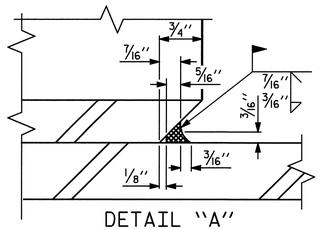
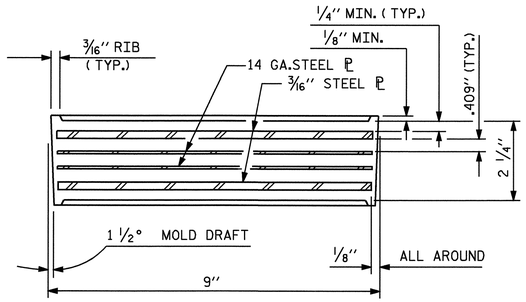
STD. NO. PCG12



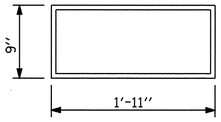
SECTION E-E



DETAIL "A"



TYPICAL SECTION OF ELASTOMERIC BEARINGS



E4 (24 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

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.

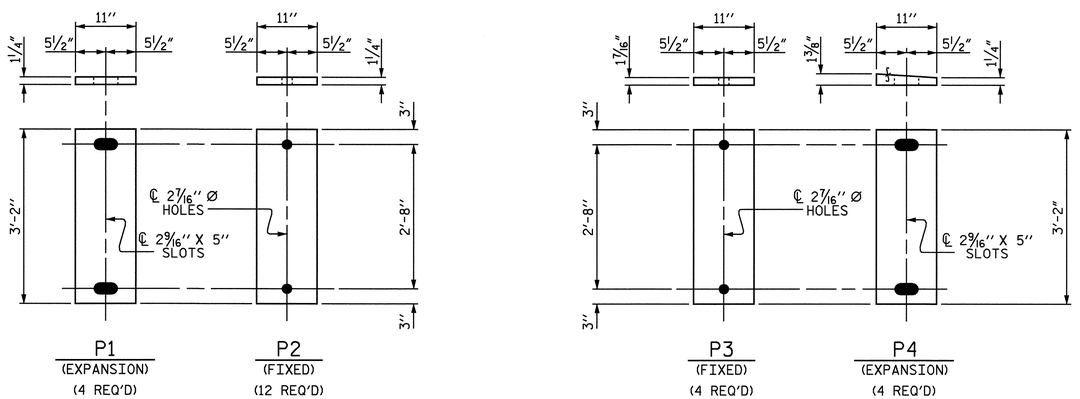
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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.

TYPE V

— LOAD RATING —	
	MAX.D.L.+ L.L.
TYPE V	180 K



SOLE PLATE DETAILS ("P")

UP-STATION

TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSFORMATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			70

STD. NO. EB4

ASSEMBLED BY : J.P. ADAMS	DATE : 10/16/08
CHECKED BY : K.D. LAYNE	DATE : 12/09/08
DRAWN BY : EEM 2/97	REV. 8/16/99 RWW/LES
CHECKED BY : VAP 2/97	REV. 10/17/00 RWW/LES
	REV. 5/1/06 TLA/GM

24-MAR-2009 13:51
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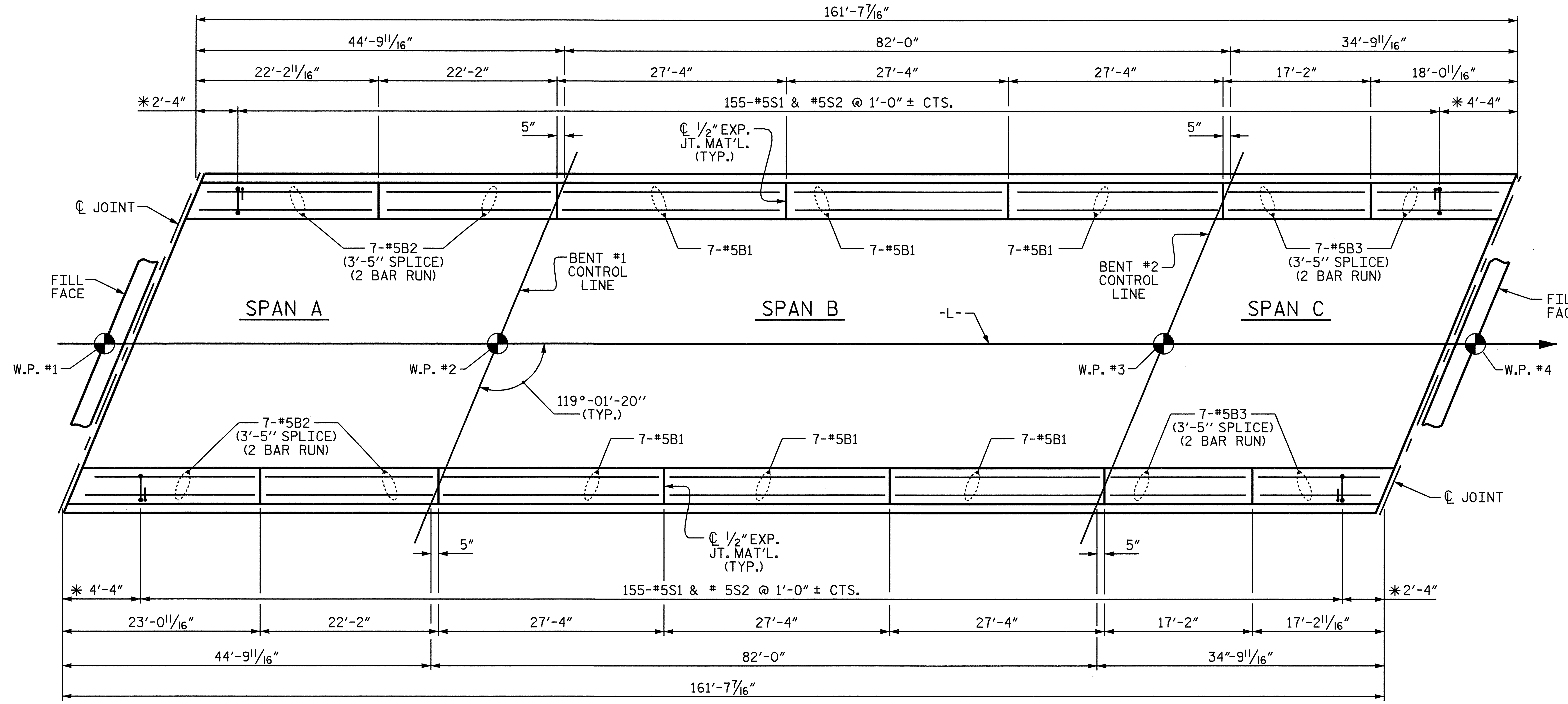
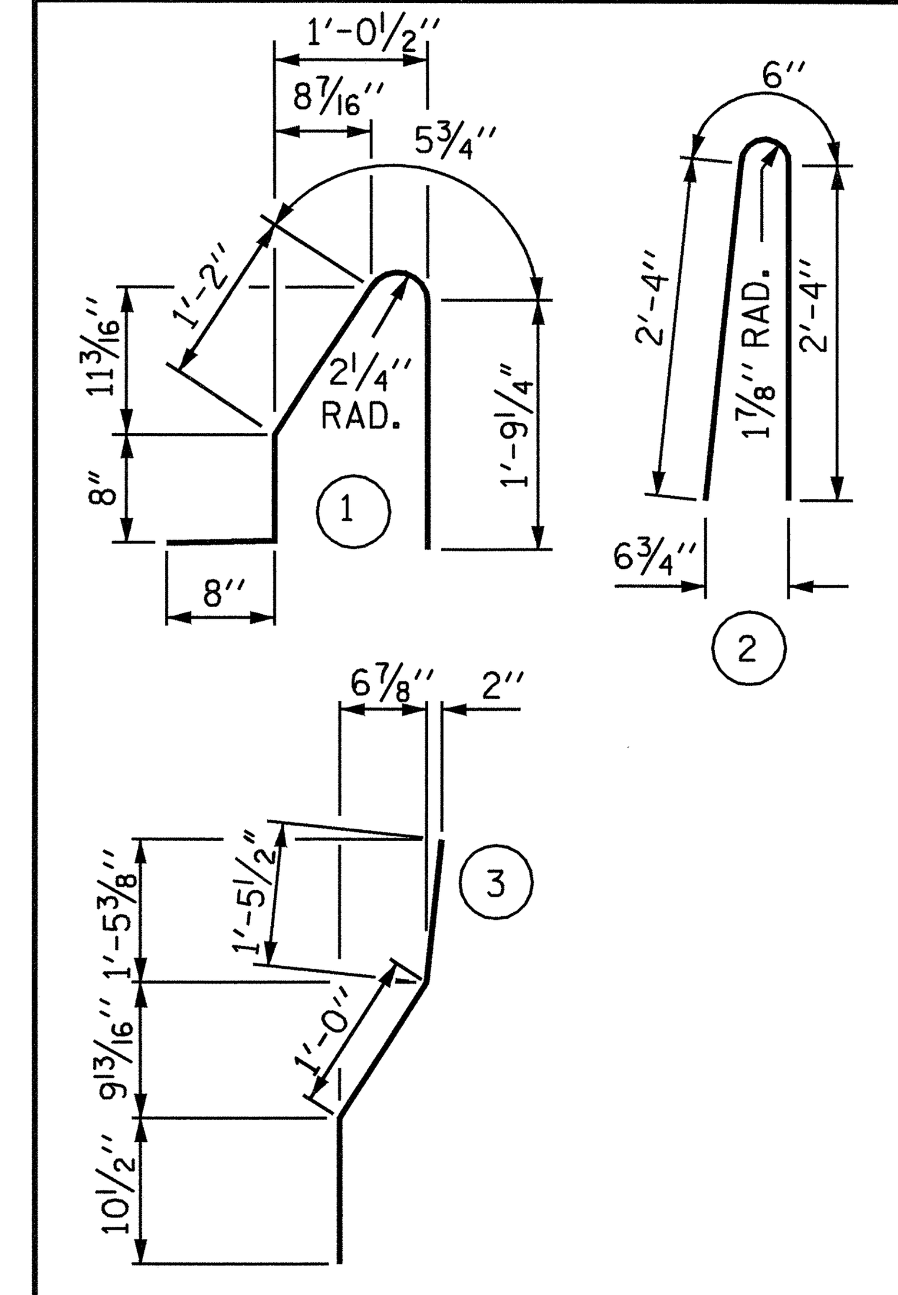
klayne



PLAN OF BARRIER RAIL

✱ SEE "END OF RAIL DETAILS" FOR REINFORCEMENT AT END OF BARRIER RAIL



BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ B1	42	#5	STR	26'-11"	1179
✱ B2	56	#5	STR	13'-0"	759
✱ B3	56	#5	STR	10'-6"	613
✱ S1	310	#5	1	4'-9"	1536
✱ S2	310	#5	2	5'-2"	1671
✱ S3	12	#5	3	3'-4"	42
✱ S4	12	#5	STR	3'-2"	40

✱ EPOXY COATED REINFORCING STEEL	5840 LBS.
CLASS AA CONCRETE	32.3 CU. YDS.
CONCRETE BARRIER RAIL	323.24 LIN. FT.

NOTES

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

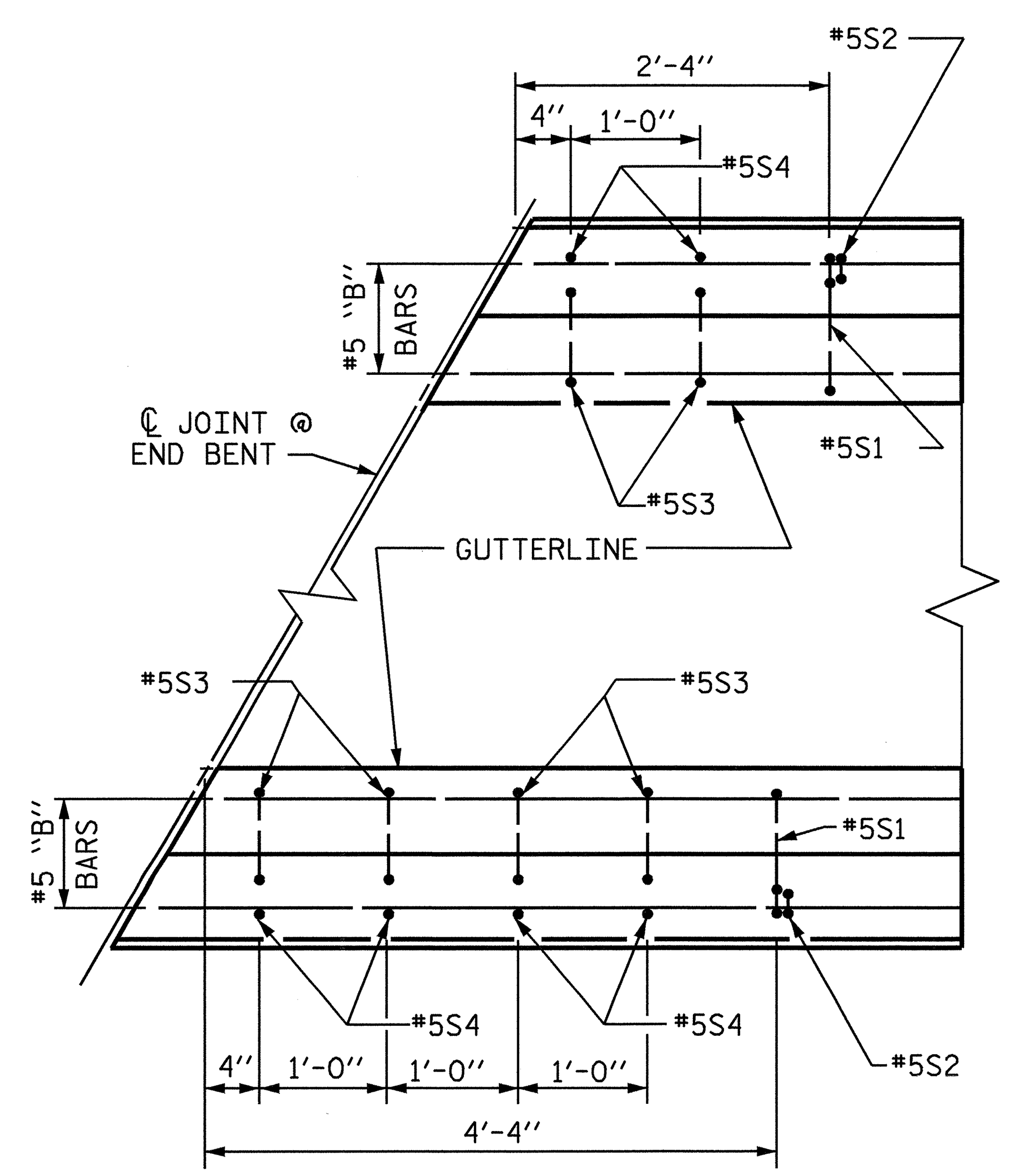
THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

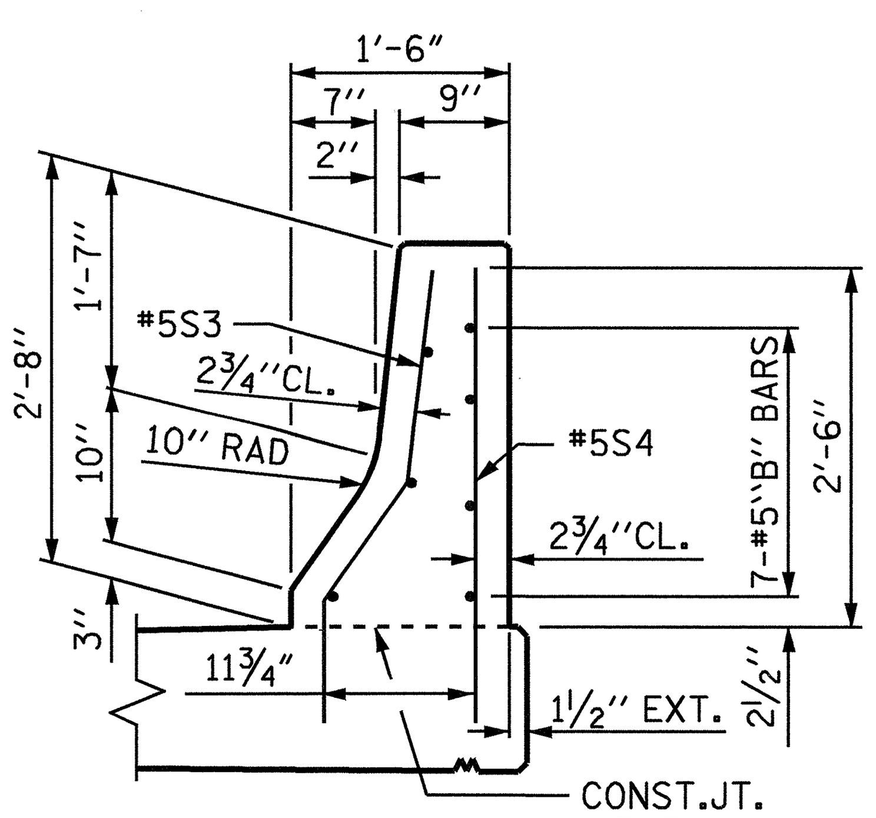
THE #5S3 AND #5S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5S3 AND #5S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

VERTICAL 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.

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL 3/26/09



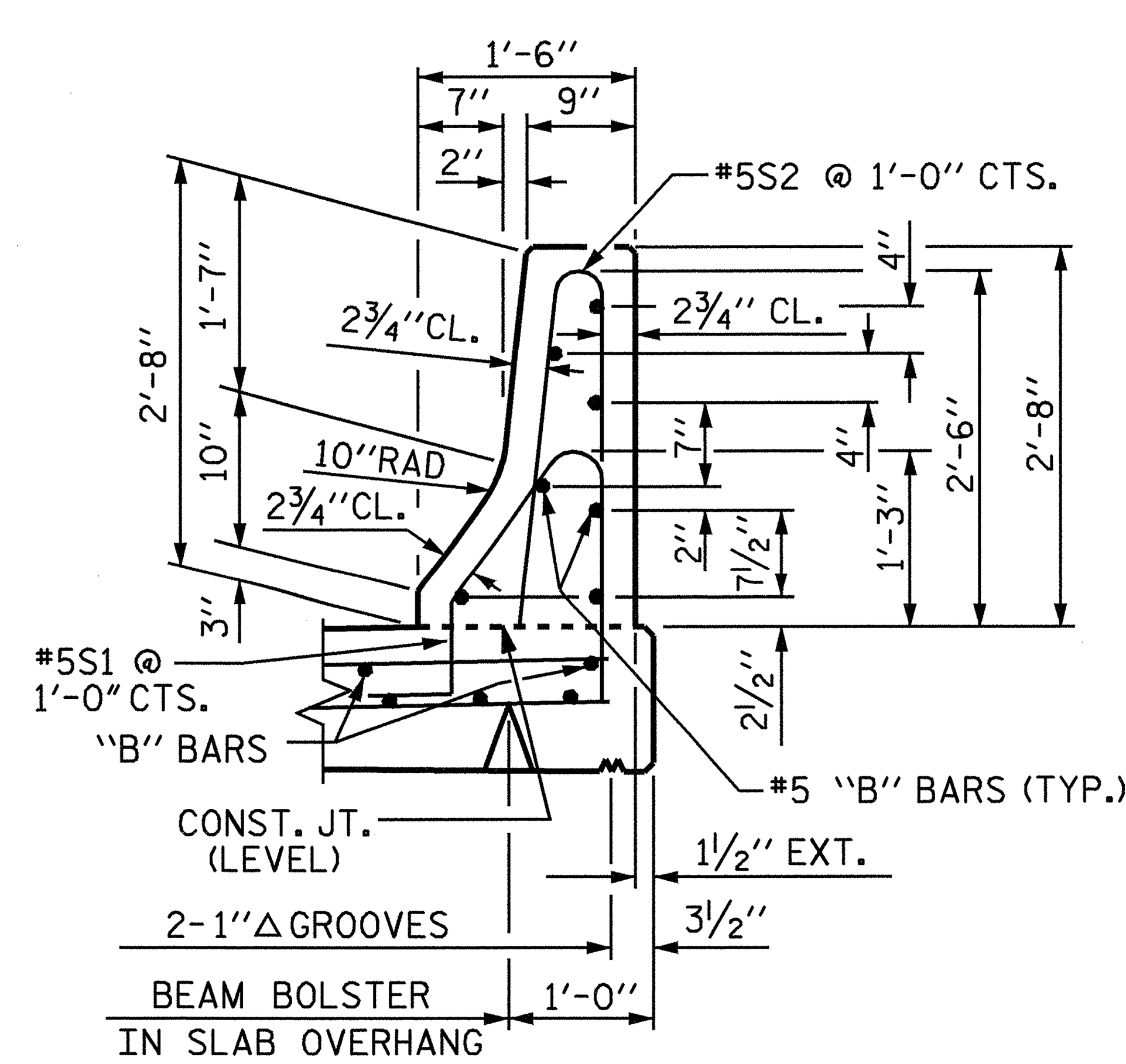
PLAN



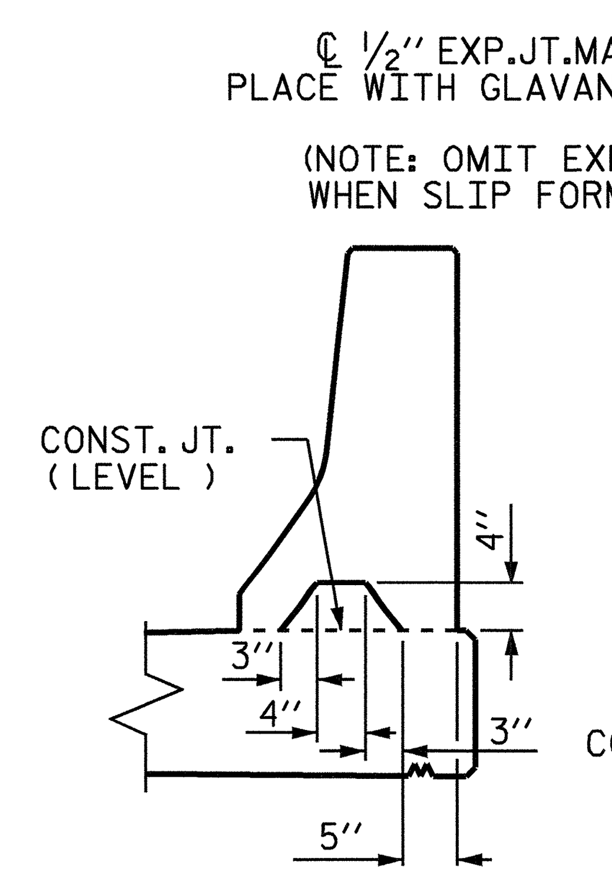
END VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

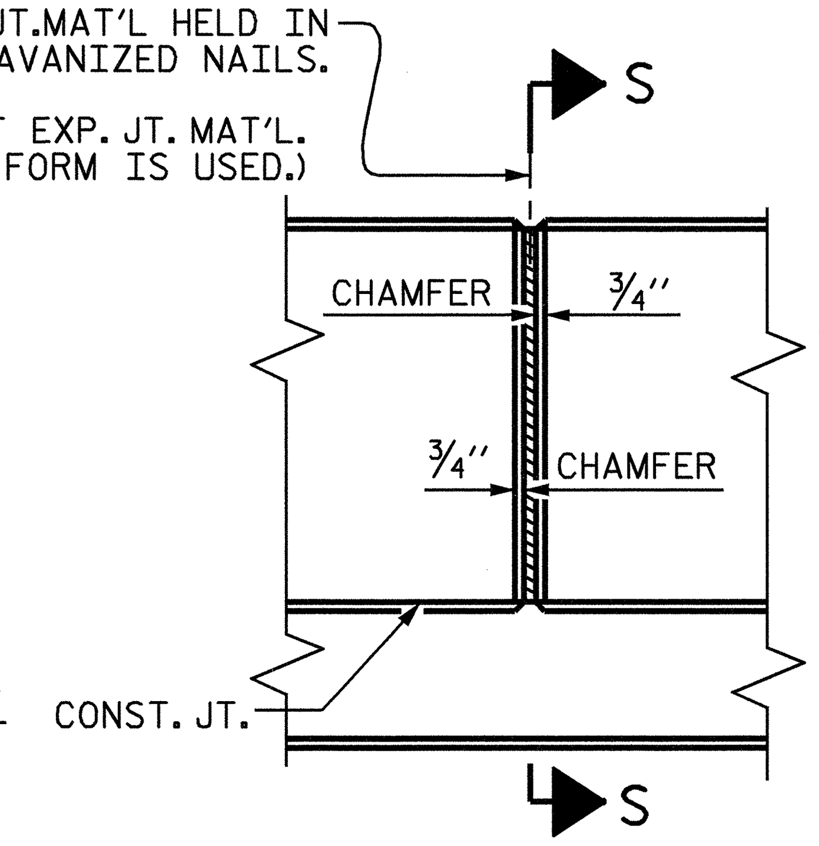


SECTION THRU RAIL



SECTION S-S

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



ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

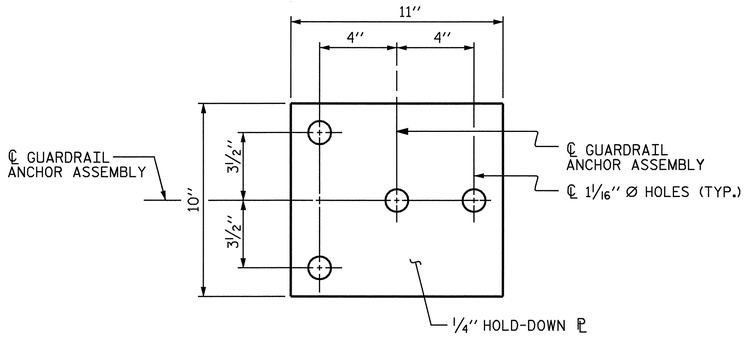
STANDARD

CONCRETE BARRIER RAIL

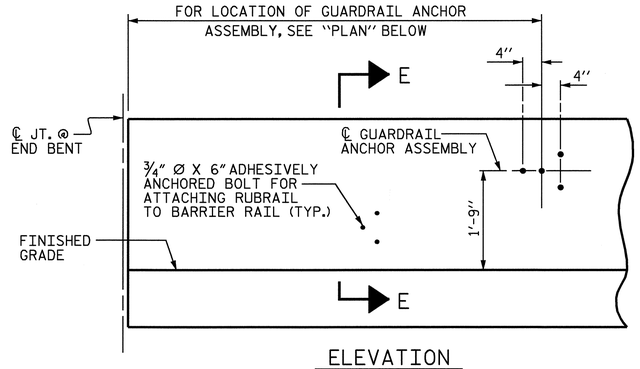
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S-16
1			3			TOTAL SHEETS	70
2			4				

STD. NO. CBR1

ASSEMBLED BY : J.P. ADAMS	DATE : 10/22/08
CHECKED BY : K.D. LAYNE	DATE : 12/09/08
DRAWN BY : ARB 5/87	REV. 10/17/00 RWW/LES
CHECKED BY : SJD 9/87	REV. 5/7/03R RWW/JTE
	REV. 5/1/06 TLA/GM

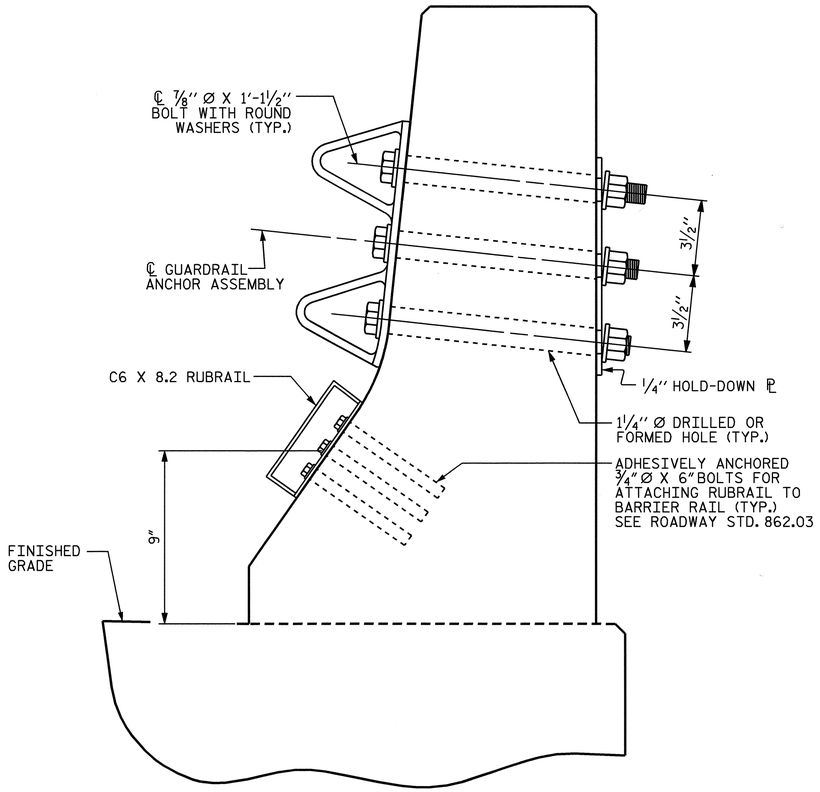


PLAN



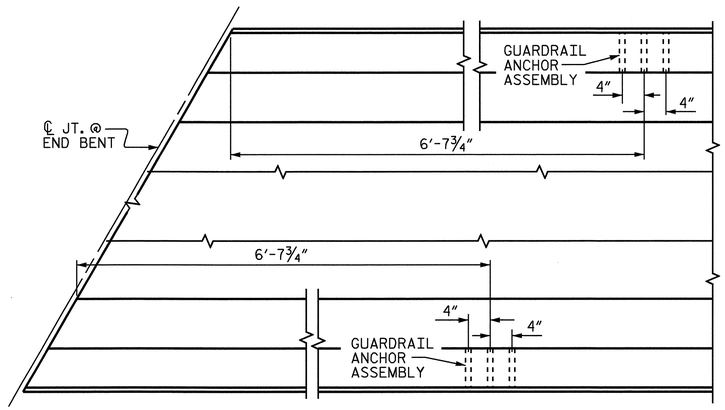
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



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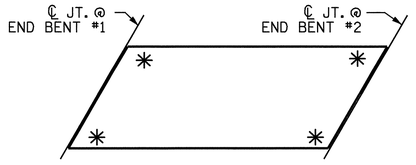

SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

NOTES

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

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

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

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

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

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

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

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

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIRAL A. PATEL

3/26/09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			70

STD. NO. GRA2

ASSEMBLED BY : J.P. ADAMS	DATE : 10/22/08
CHECKED BY : K.D. LAYNE	DATE : 12/09/08
DRAWN BY : TLA 5/06	ADDED 5/1/06R KMM/GM
CHECKED BY : GM 5/06	

24-MAR-2009 13:51
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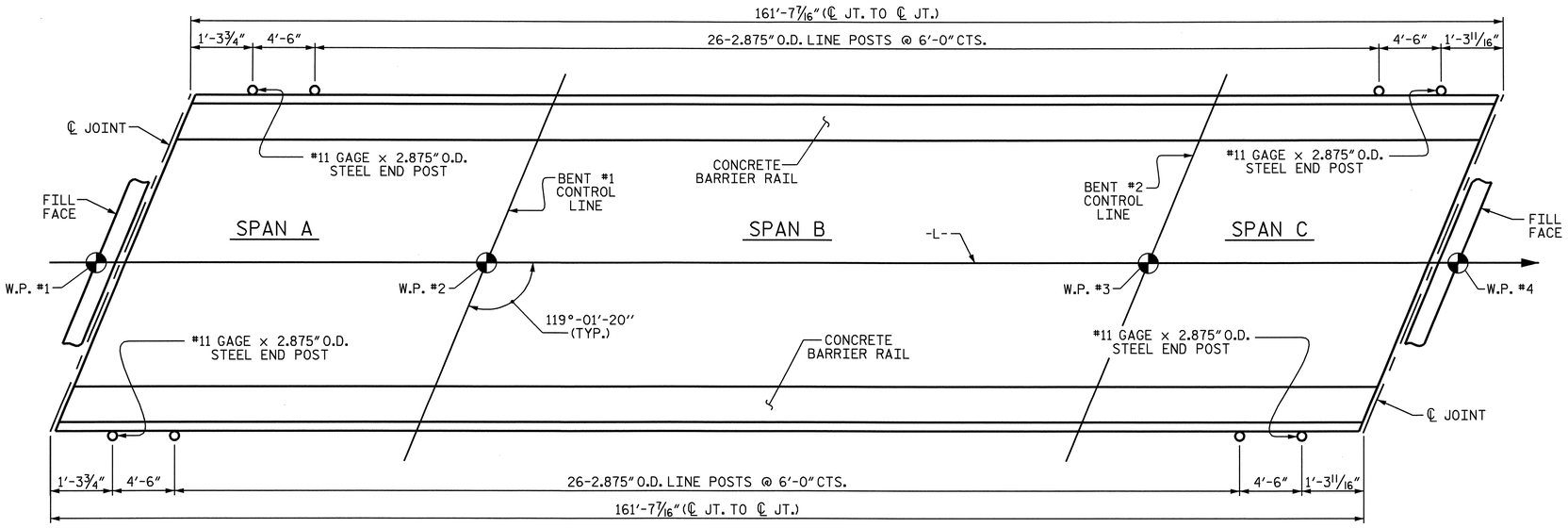
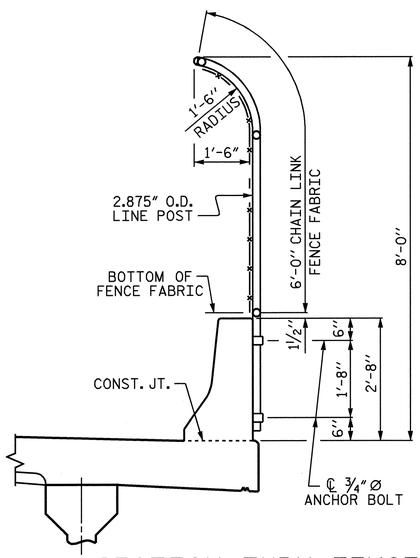
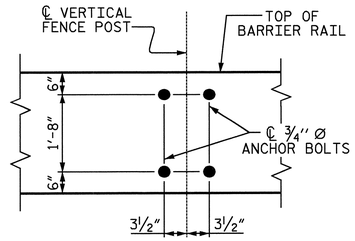
klayne



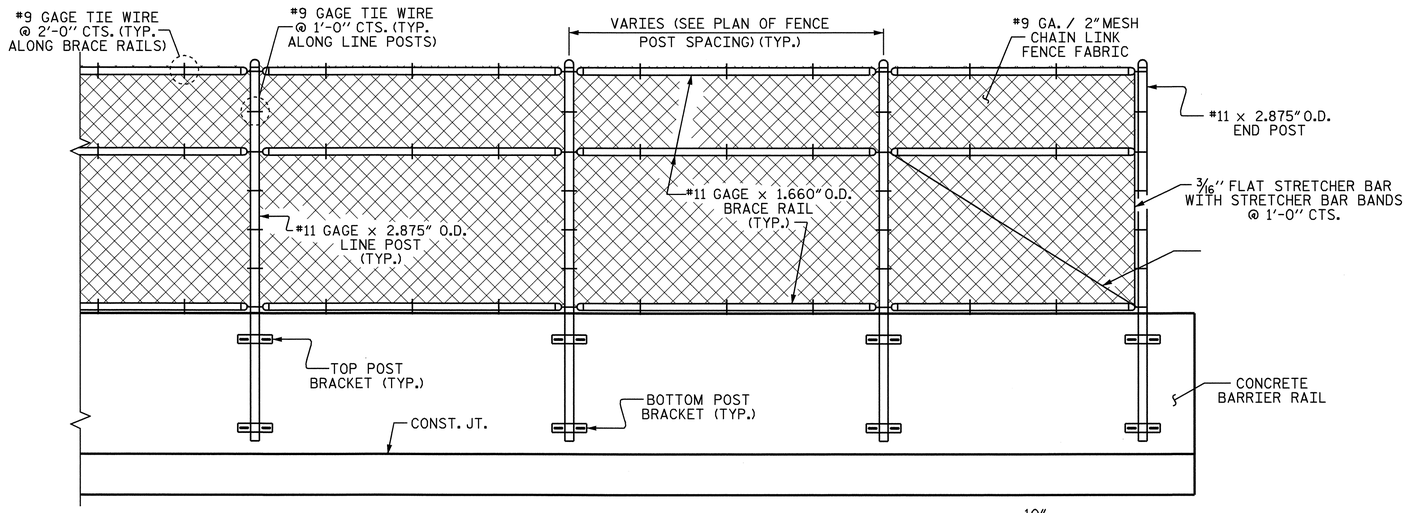
PLAN OF FENCE POST SPACING



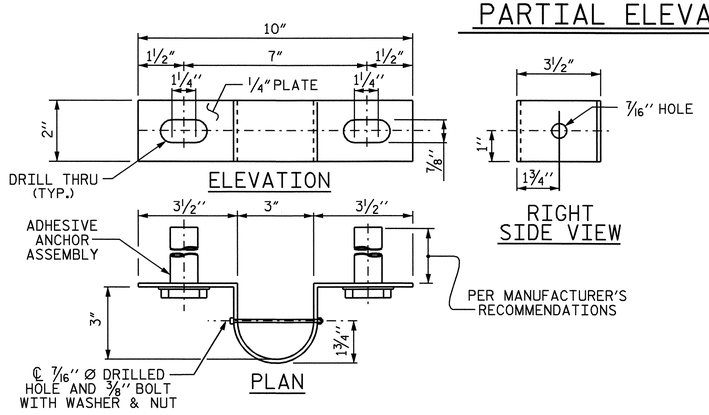
SECTION THRU FENCE



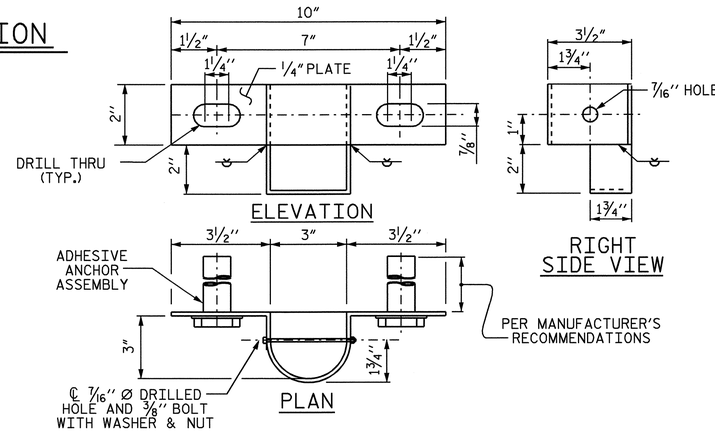
BOLT SETTING DETAIL



PARTIAL ELEVATION



TOP POST BRACKET



BOTTOM POST BRACKET

NOTES

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREADS.

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. SEE SPECIAL PROVISIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS. GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 1'-0" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN BARRIER RAIL.

WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-20 OF STANDARD SPECIFICATIONS.

ADHESIVE BONDING SYSTEM SHALL HAVE MINIMUM PULLOUT STRENGTH OF 10 KIPS. THE ADHESIVE BONDING SYSTEM SHALL BE CHOSEN FROM THOSE ON THE NCDOT APPROVED PRODUCTS LIST.

96" CHAIN LINK FENCE

TOTAL PAY LENGTH 318.0 LIN. FT.

NORTH CAROLINA PROFESSIONAL SEAL 23370 ENGINEER VIPUL A. PATEL
5/27/09

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BRIDGE MOUNTED CHAIN LINK FENCE DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : J.P. ADAMS DATE : 1/12/09
CHECKED BY : K.D. LAYNE DATE : 1/27/09

27-MAY-2009 09:00
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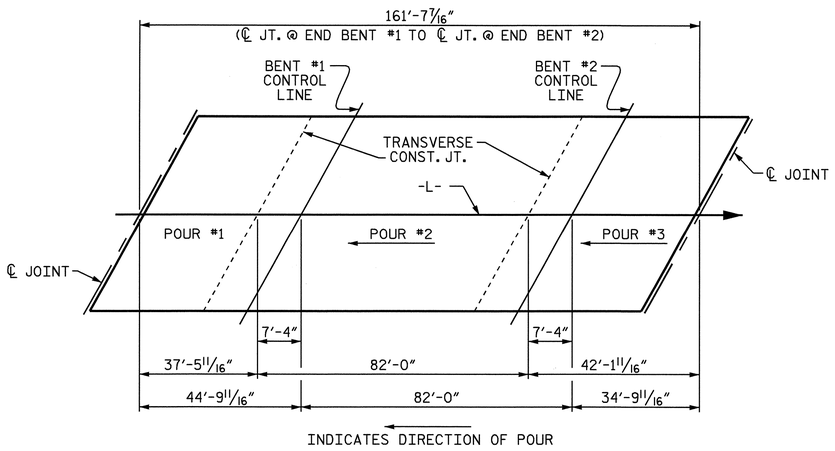
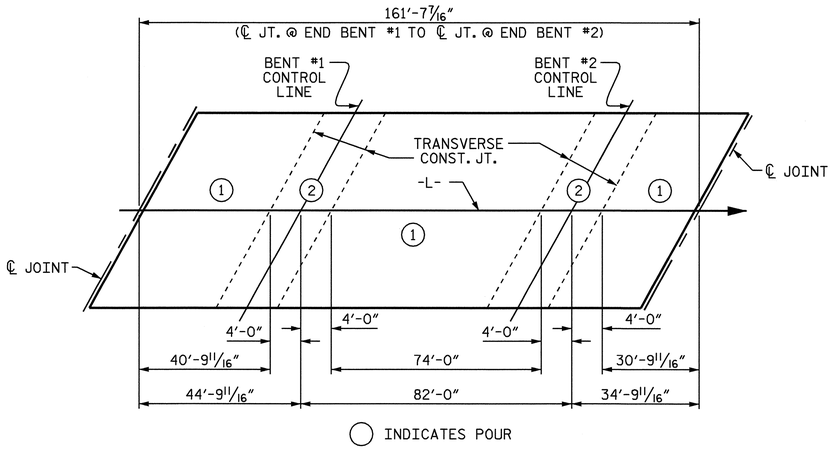
vpatel



POURING SEQUENCE



OPTIONAL POURING SEQUENCE

POUR #2 CAN NOT BE STARTED UNTIL
BOTH #1 POURS REACH A MINIMUM OF 3000 PSI

REINFORCING BAR SCHEDULE
SPANS A, B & C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	247	#5	STR	30'-11"	7965	✳ B1	22	#4	STR	28'-1"	413
A2	247	#5	STR	30'-11"	7965	✳ B2	22	#7	STR	48'-3"	2170
						✳ B3	19	#7	STR	19'-3"	748
✳ A101	4	#5	STR	29'-3"	122	✳ B4	22	#4	STR	26'-6"	389
✳ A102	4	#5	STR	27'-1"	113	✳ B5	22	#7	STR	45'-3"	2035
✳ A103	4	#5	STR	25'-0"	104	✳ B6	19	#7	STR	17'-9"	689
✳ A104	4	#5	STR	22'-11"	96	✳ B7	22	#4	STR	21'-1"	310
✳ A105	4	#5	STR	20'-10"	87	B8	96	#5	STR	55'-2"	5524
✳ A106	4	#5	STR	18'-8"	78						
✳ A107	4	#5	STR	16'-7"	69	✳ G1	2	#5	STR	35'-4"	74
✳ A108	4	#5	STR	14'-6"	60						
✳ A109	4	#5	STR	12'-5"	52	✳ K1	8	#8	1	14'-0"	299
✳ A110	4	#5	STR	10'-4"	43	✳ K2	8	#8	2	20'-0"	427
✳ A111	4	#5	STR	8'-2"	34	✳ K3	18	#6	STR	6'-9"	182
✳ A112	4	#5	STR	6'-1"	25	K4	12	#4	STR	4'-10"	39
✳ A113	4	#5	STR	4'-0"	17	K5	24	#4	STR	6'-9"	108
✳ A114	4	#5	STR	2'-0"	8	K6	24	#4	STR	7'-10"	126
						K7	20	#4	7	5'-9"	77
A201	4	#5	STR	29'-3"	122	K8	20	#4	8	11'-2"	149
A202	4	#5	STR	27'-1"	113						
A203	4	#5	STR	25'-0"	104	✳ S1	42	#4	3	4'-1"	115
A204	4	#5	STR	22'-11"	96	✳ S2	42	#5	4	5'-10"	256
A205	4	#5	STR	20'-10"	87	S3	132	#4	5	2'-9"	242
A206	4	#5	STR	18'-8"	78						
A207	4	#5	STR	16'-7"	69	U1	24	#4	6	15'-6"	248
A208	4	#5	STR	14'-6"	60	U2	12	#4	6	13'-6"	108
A209	4	#5	STR	12'-5"	52						
A210	4	#5	STR	10'-4"	43						
A211	4	#5	STR	8'-2"	34						
A212	4	#5	STR	6'-1"	25						
A213	4	#5	STR	4'-0"	17						
A214	4	#5	STR	2'-0"	8						

REINFORCING STEEL	15494 LBS
✳ EPOXY COATED REINFORCING STEEL	16980 LBS

SUPERSTRUCTURE BILL OF MATERIAL

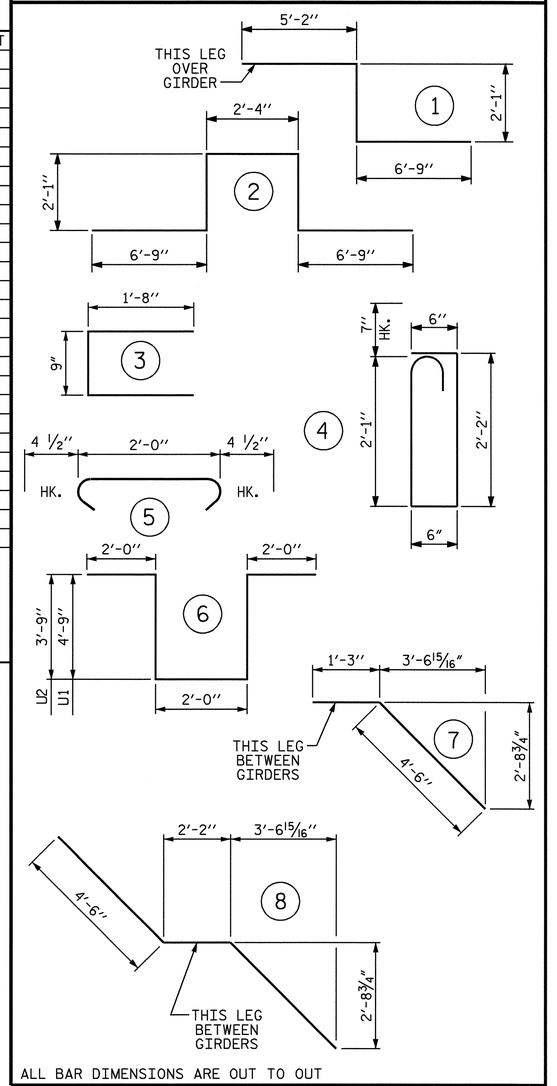
	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(LBS.)	(LBS.)
SPANS A, B & C		15494	16980
POUR #1	38.0		
POUR #2	87.4		
POUR #3	52.4		
TOTALS **	177.8	15494	16980

**QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

GROOVING BRIDGE FLOORS

APPROACH SLABS	527	SQ.FT.
BRIDGE DECK	4002	SQ.FT.
TOTAL	4529	SQ.FT.

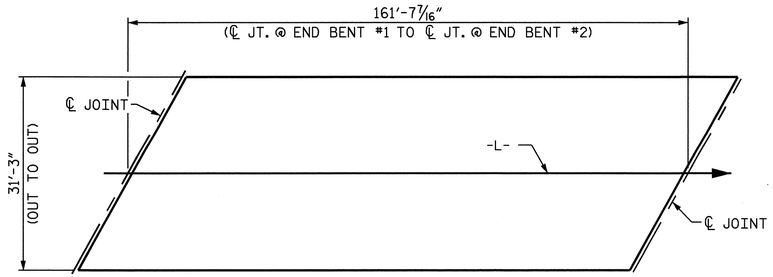
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

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. = 5051)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER WILL A. PATEL
3/26/09

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			70

STD. NO. BOM2

ASSEMBLED BY : J.P. ADAMS	DATE : 10/29/08
CHECKED BY : K.D. LAYNE	DATE : 12/09/08
DRAWN BY : JMB 5/87	REV. 6/1/94 EEM/GRP
CHECKED BY : SJD 9/87	REV. 8/16/99 RWW/LES
	REV. 5/1/06 TLA/GM

24-MAR-2009 13:51
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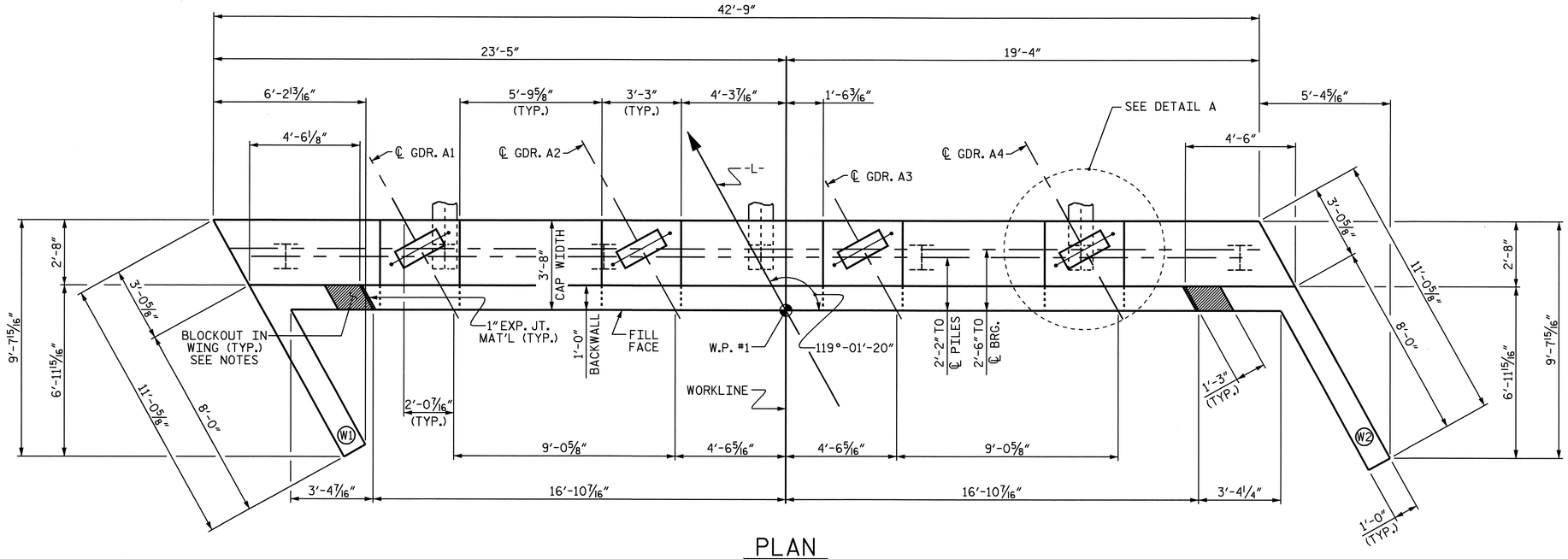
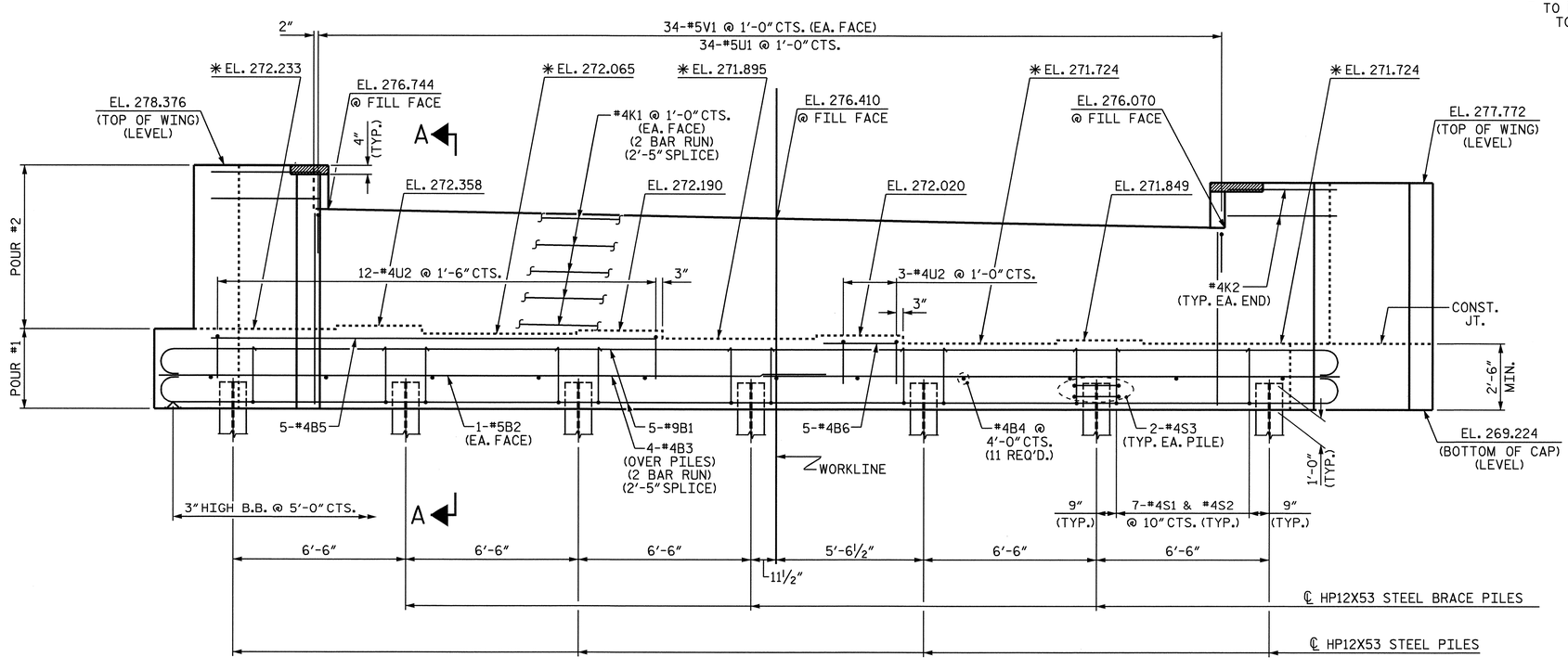
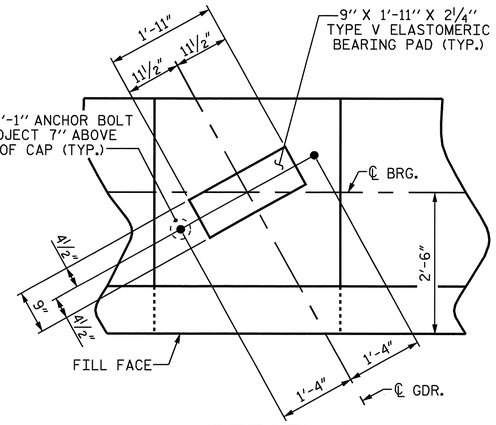
Klayne



PLAN



ELEVATION



DETAIL A
(TYP. EA. BRIDGE SEAT)

NOTES

STIRRUPS 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%.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND AFTER THE CASTING OF THE BARRIER RAIL.

✳ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE BUILDUPS, SEE SHEET 3 OF 3.

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G.M. GILLAND DATE : 11/08
CHECKED BY : J.P. ADAMS DATE : 11/08

24-MAR-2009 13:51
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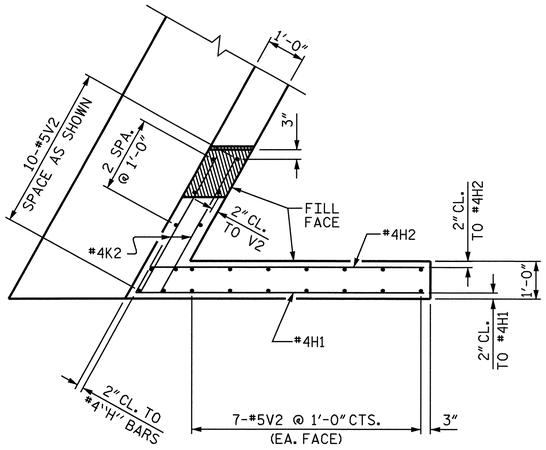
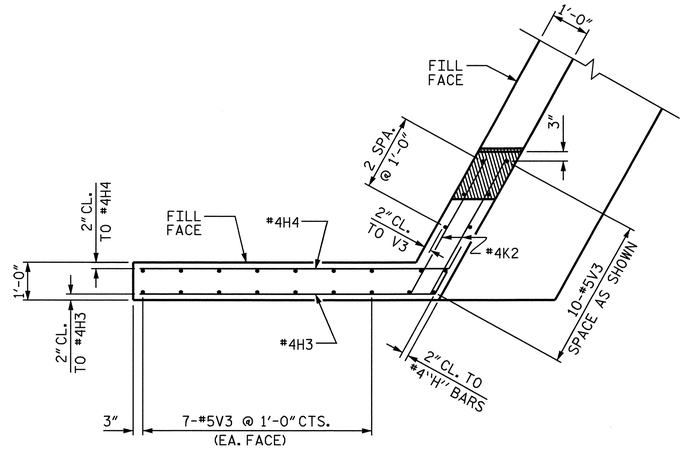
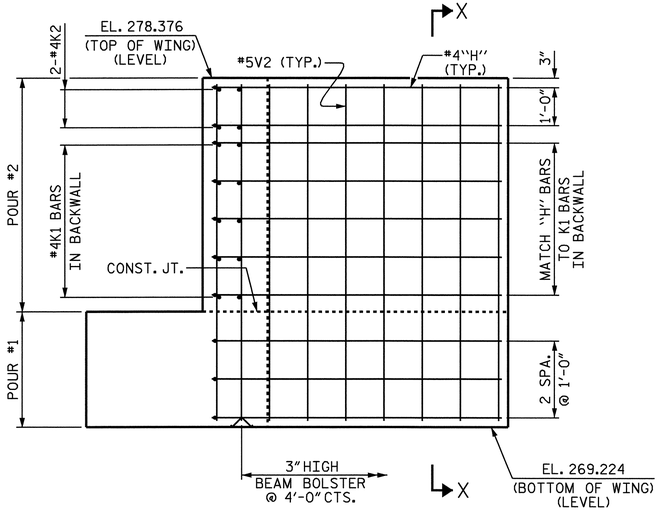


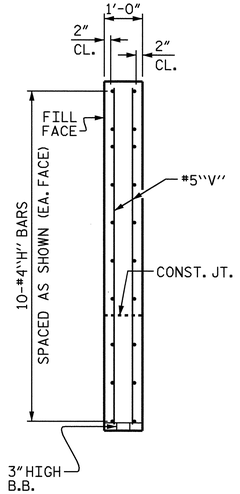
PLAN OF WING - W1



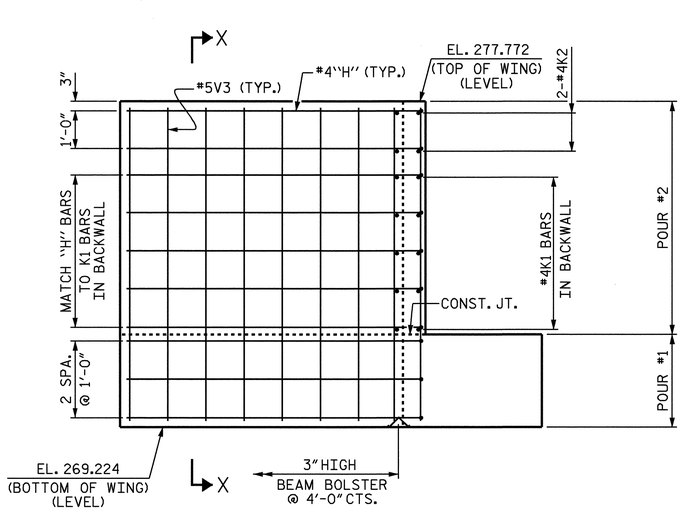
PLAN OF WING - W2



ELEVATION OF WING - W1



SECTION X-X



ELEVATION OF WING - W2

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
5/27/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G.M. GILLAND DATE : 11/08
CHECKED BY : J.P. ADAMS DATE : 11/08

26-MAY-2009 14:05
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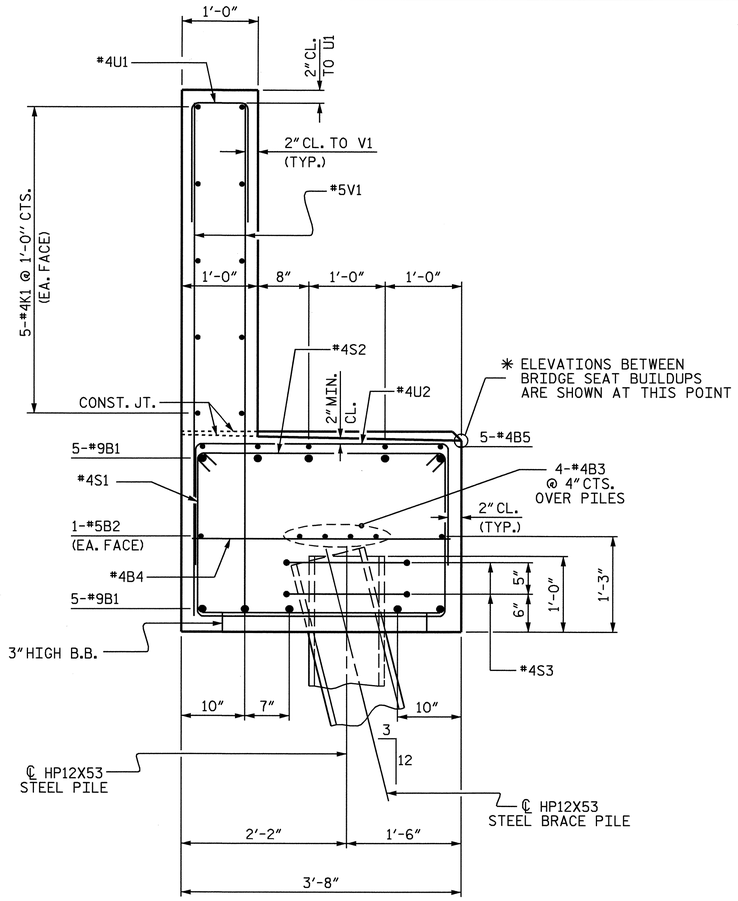
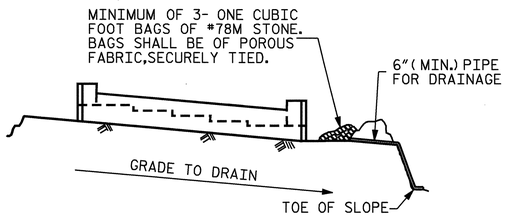
klayne



SECTION A-A



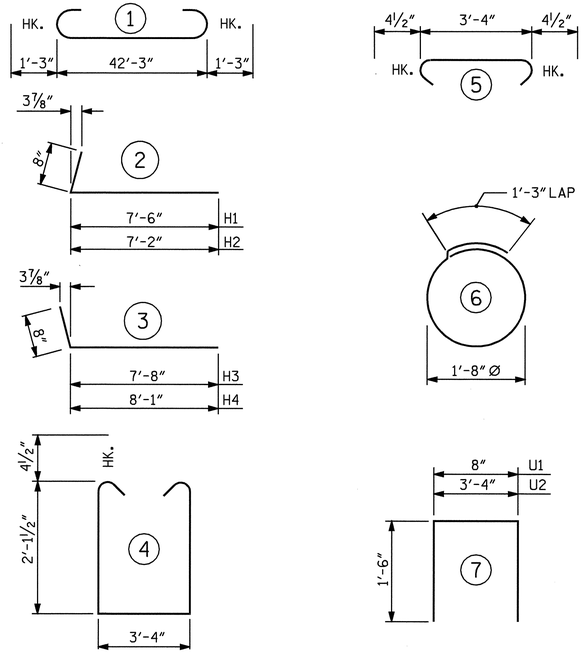
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	44'-9"	1522
B2	2	5	STR	42'-5"	88
B3	8	4	STR	22'-5"	120
B4	11	4	STR	3'-4"	24
B5	5	4	STR	16'-8"	56
B6	5	4	STR	2'-9"	9
H1	10	4	2	8'-2"	55
H2	10	4	2	7'-10"	52
H3	10	4	3	8'-4"	56
H4	10	4	3	8'-9"	58
K1	20	4	STR	22'-5"	299
K2	8	4	STR	4'-1"	22
S1	42	4	4	8'-4"	234
S2	42	4	5	4'-1"	115
S3	14	4	6	6'-6"	61
U1	34	4	7	3'-8"	83
U2	15	4	7	6'-4"	63
V1	68	5	STR	6'-6"	461
V2	24	5	STR	8'-9"	219
V3	24	5	STR	8'-2"	204

TOTAL REINFORCING STEEL LBS. 3801

CLASS A CONCRETE (CU. YDS.)

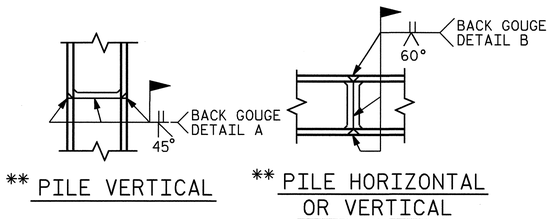
POUR #1 CAP & LOWER WINGS CU. YDS. 17.5

POUR #2 BACKWALL & UPPER WINGS CU. YDS. 10.8

TOTAL (CU. YDS.) 28.3

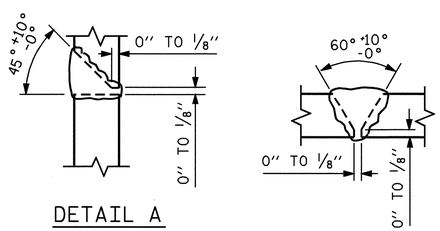
HP12x53 STEEL PILES

No. 7 LIN. FT. 175.0



** PILE VERTICAL

** PILE HORIZONTAL OR VERTICAL



DETAIL A

** POSITION OF PILE DURING WELDING.

DETAIL B

PILE SPLICE DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G.M. GILLAND DATE : 11/08
CHECKED BY : J.P. ADAMS DATE : 11/08

24-MAR-2009 13:51
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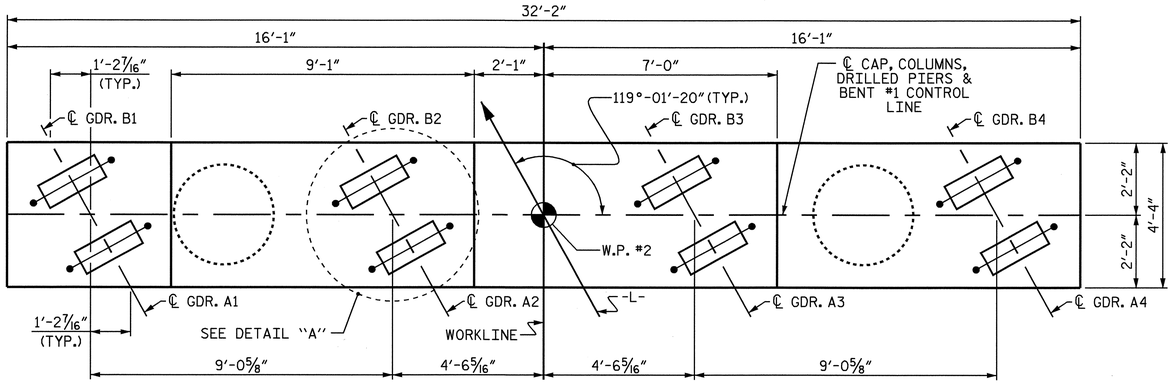
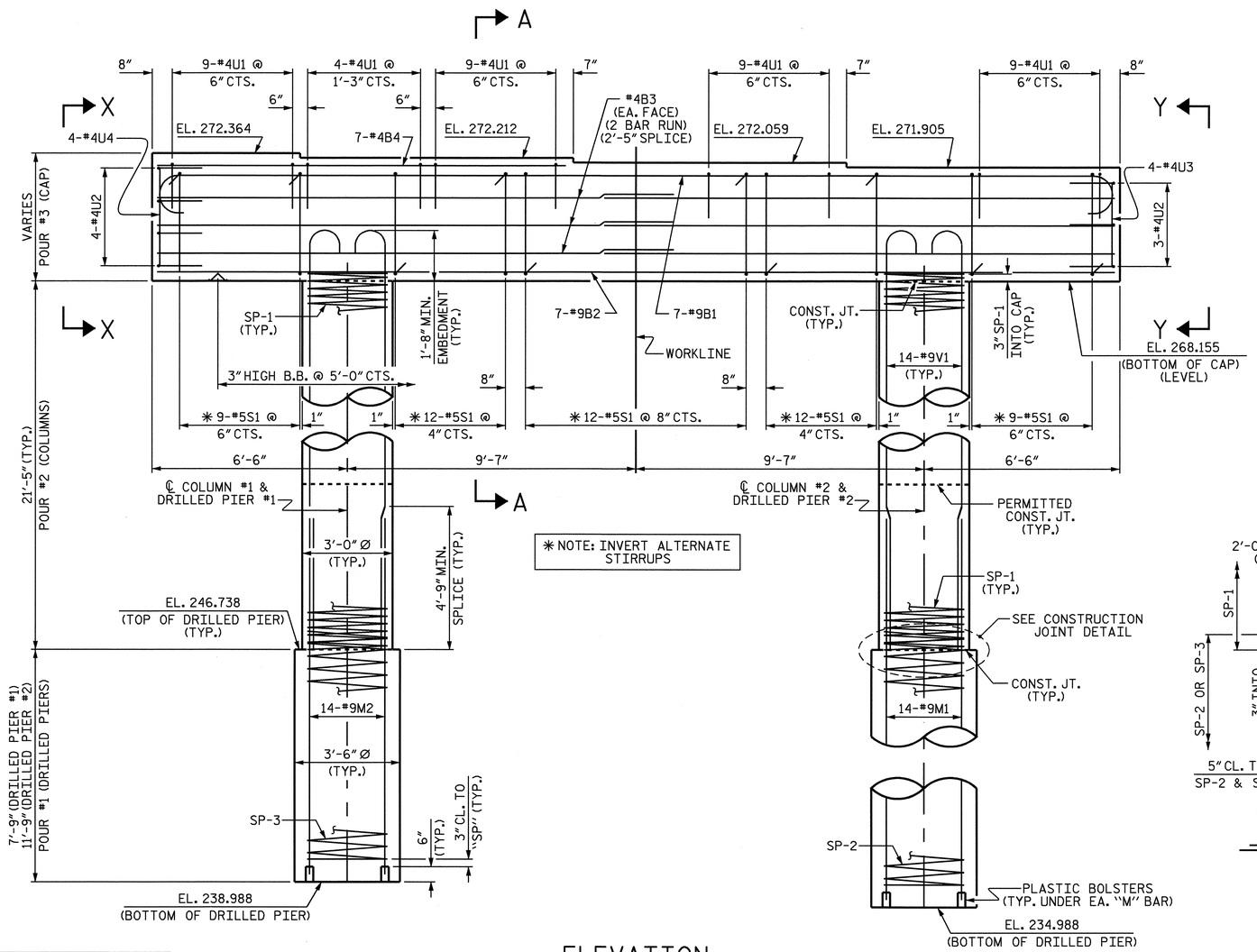


SPAN B
FIX

SPAN A
FIX

PLAN



✳ NOTE: INVERT ALTERNATE STIRRUPS

ELEVATION

NOTES

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

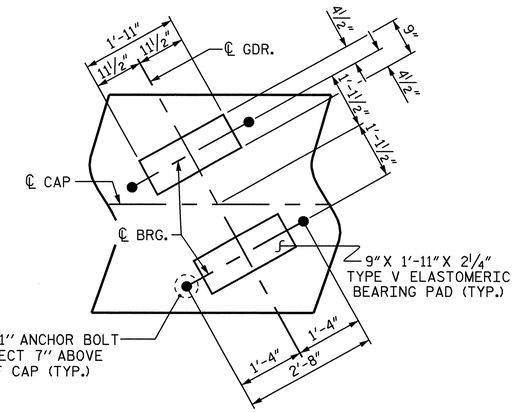
HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

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

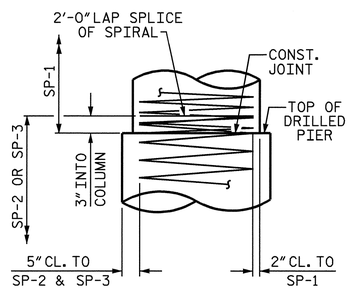
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.



DETAIL "A"
(TYP. EA. BRIDGE SEAT)



CONSTRUCTION JOINT DETAIL
(TYP. EA. DRILLED PIER)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G. M. GILLAND DATE : 11/08
CHECKED BY : J. P. ADAMS DATE : 1/09

24-MAR-2009 13:51
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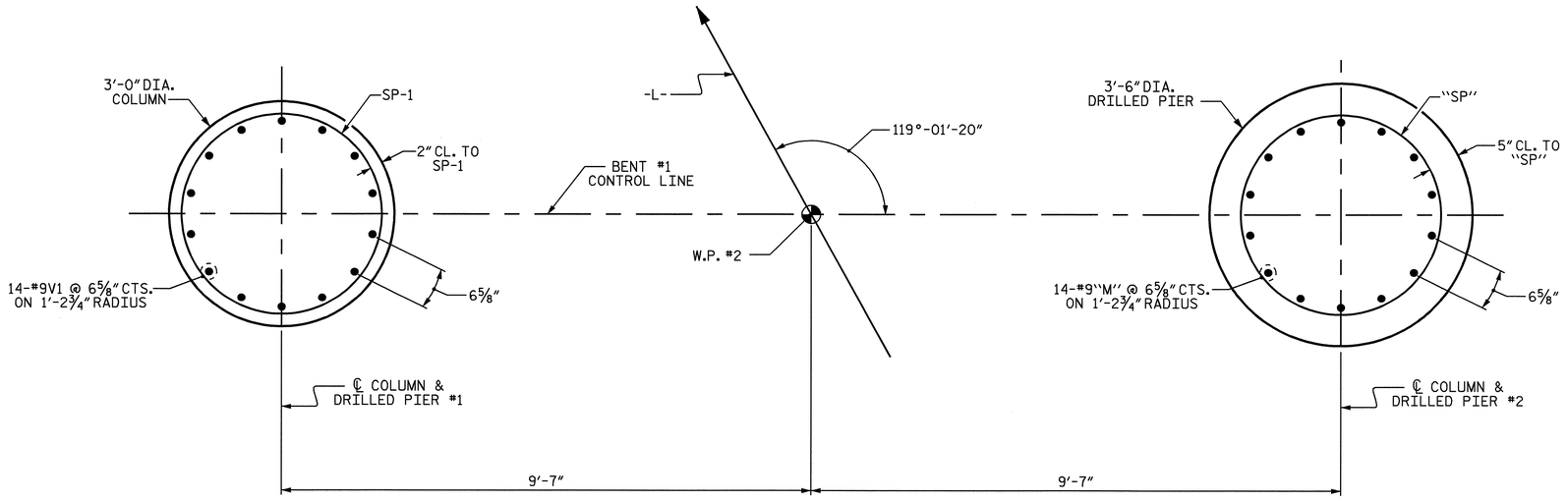
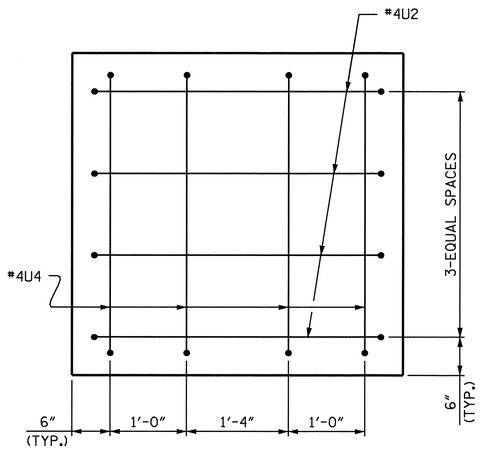


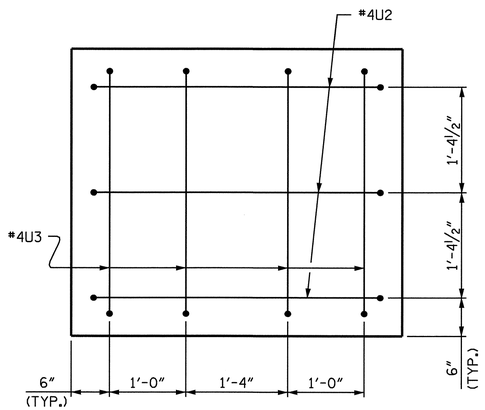
PLAN OF COLUMNS
(TYP.)

PLAN OF DRILLED PIERS
(TYP.)

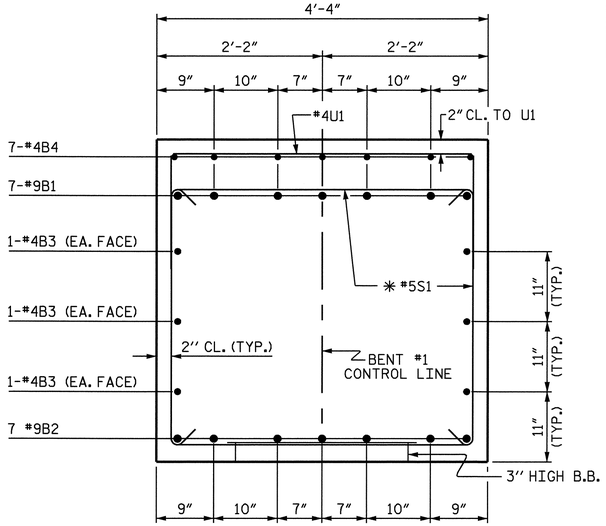
PLAN OF COLUMNS AND DRILLED PIERS



VIEW X-X

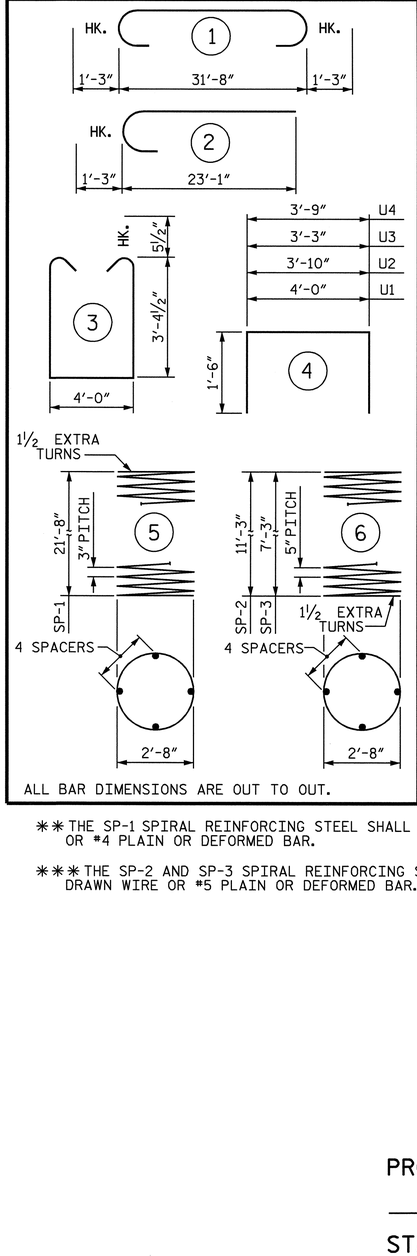


VIEW Y-Y



SECTION A-A
✱ INVERT ALTERNATE STIRRUPS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#9	1	34'-2"	813
B2	7	#9	STR	31'-10"	758
B3	12	#4	STR	17'-2"	138
B4	7	#4	STR	13'-7"	64
M1	14	#9	STR	19'-3"	916
M2	14	#9	STR	15'-3"	726
S1	54	#5	3	11'-8"	657
U1	40	#4	4	7'-0"	187
U2	7	#4	4	6'-10"	32
U3	4	#4	4	6'-3"	17
U4	4	#4	4	6'-9"	18
V1	28	#9	2	24'-4"	2317

TOTAL REINFORCING STEEL LBS. 6643

SP-1	2	✱✱	5	728'-2"	973
SP-2	1	✱✱✱	6	234'-5"	244
SP-3	1	✱✱✱	6	156'-4"	163

SPIRAL COLUMN REINFORCING STEEL LBS. 1380

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	11.3 C.Y.
POUR #3 (BENT CAP)	20.4 C.Y.
TOTAL	31.7 C.Y.

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	7.0 C.Y.
3'-6" DIA. DRILLED PIERS IN SOIL	7.3 LIN. FT.
3'-6" DIA. DRILLED PIERS NOT IN SOIL	12.2 LIN. FT.
CSL TUBES	98.0 LIN. FT.

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

✱✱✱ THE SP-2 AND SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G. M. GILLAND DATE : 11/08
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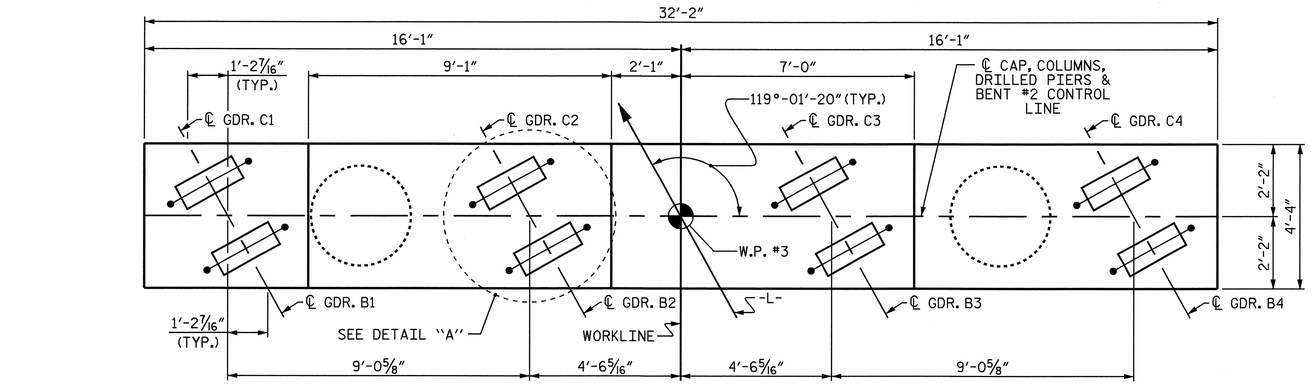
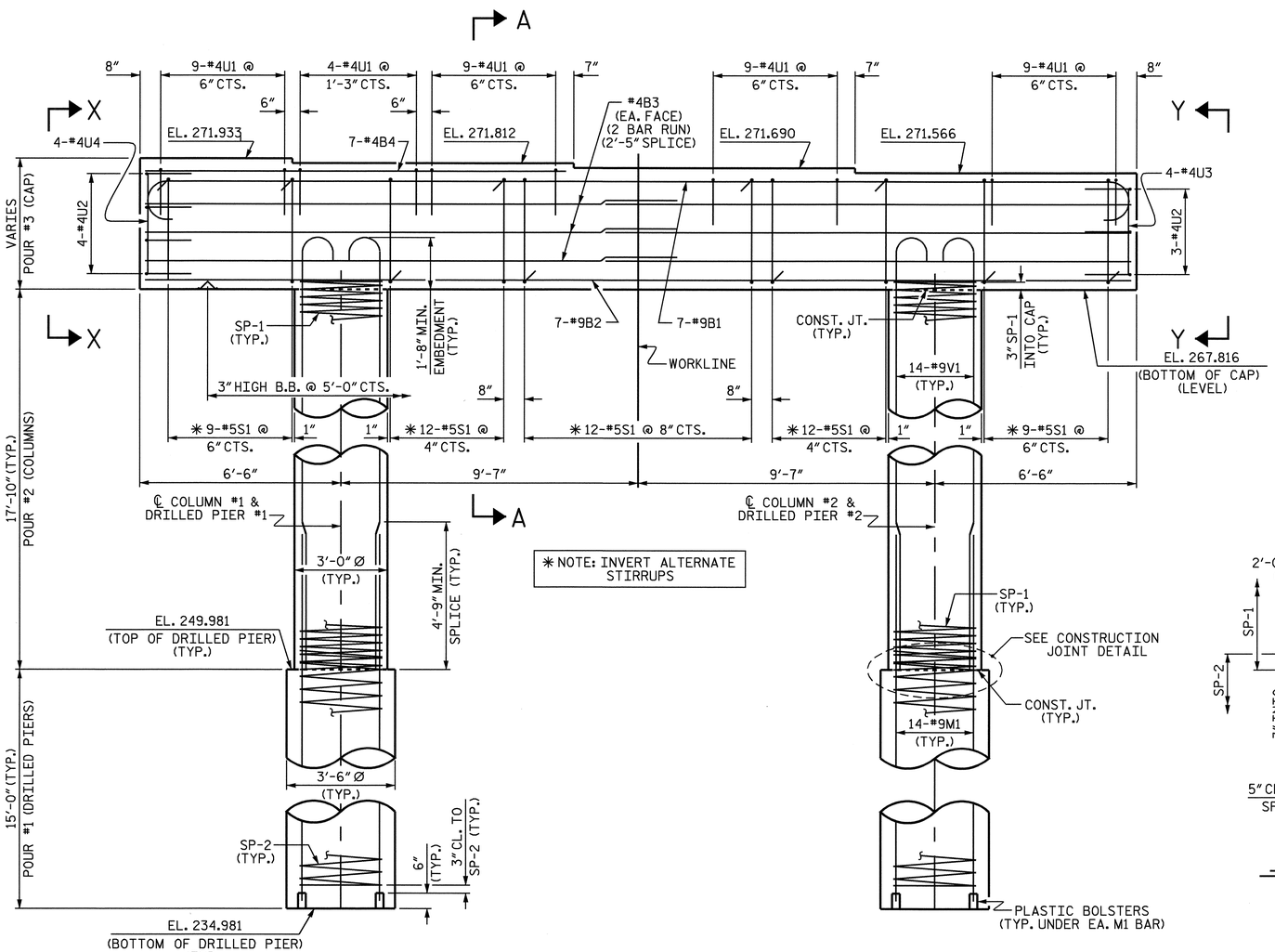


SPAN C
FIX

SPAN B
FIX

PLAN



ELEVATION

NOTES

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

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

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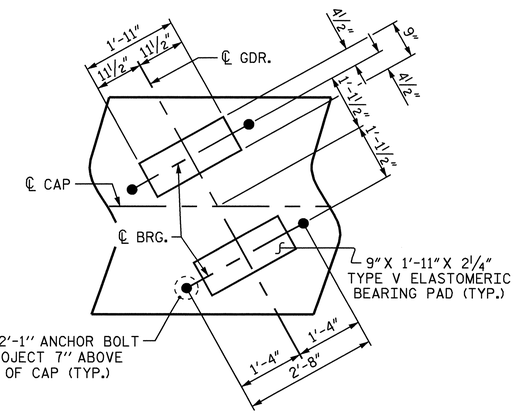
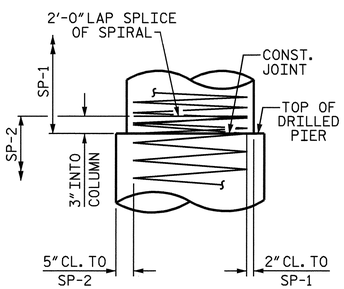
FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.



DETAIL "A"
(TYP. EA. BRIDGE SEAT)



CONSTRUCTION JOINT DETAIL
(TYP. EA. DRILLED PIER)

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3k6k9

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G. M. GILLAND DATE : 11/08
CHECKED BY : J. P. ADAMS DATE : 1/09

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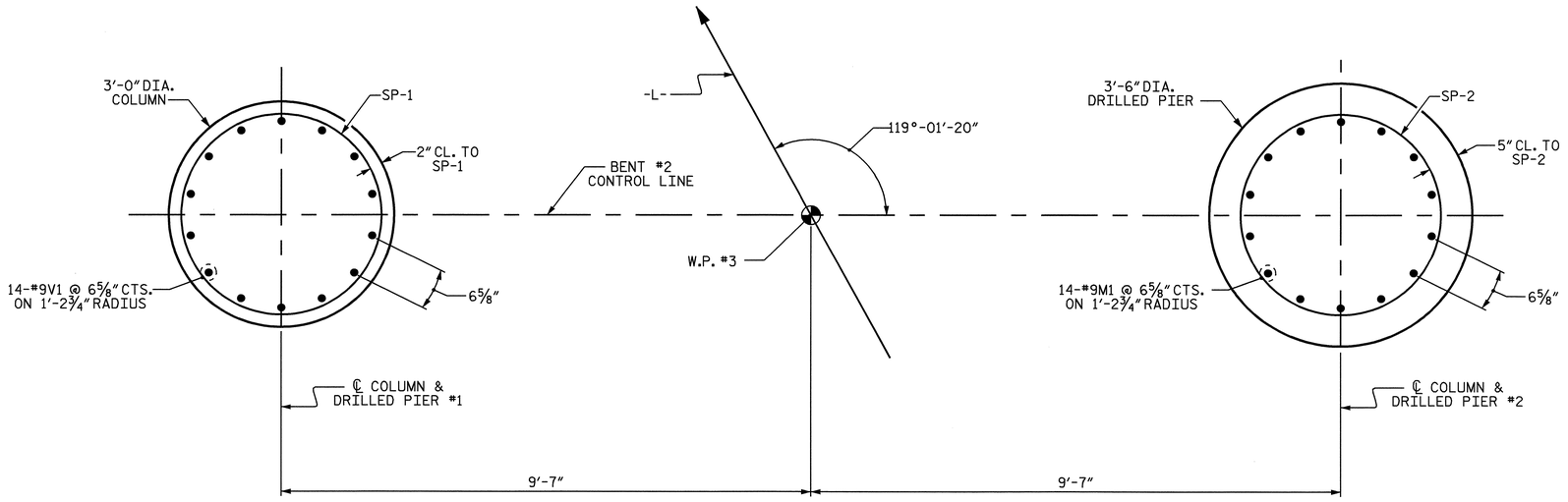
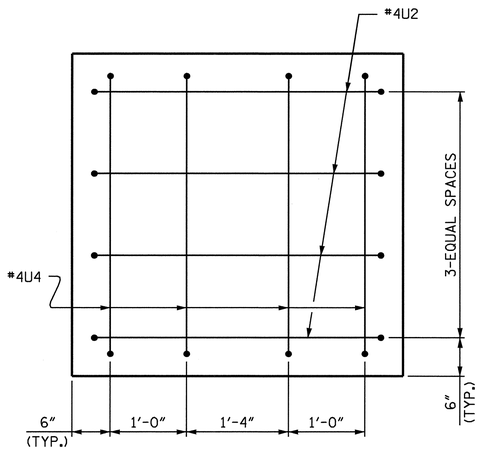


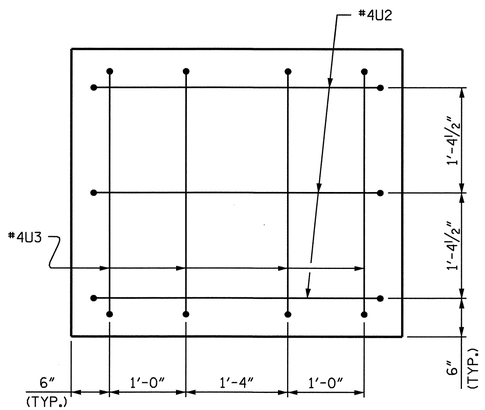
PLAN OF COLUMNS
(TYP.)

PLAN OF DRILLED PIERS
(TYP.)

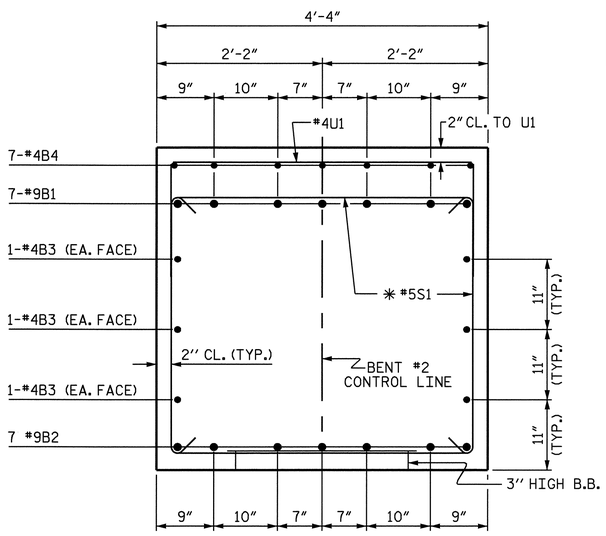
PLAN OF COLUMNS AND DRILLED PIERS



VIEW X-X

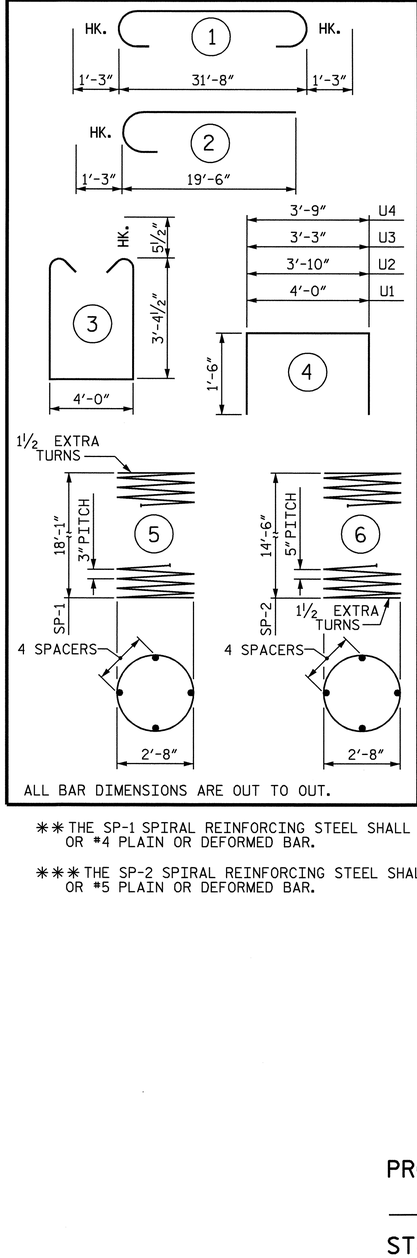


VIEW Y-Y



SECTION A-A
✱ INVERT ALTERNATE STIRRUPS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#9	1	34'-2"	813
B2	7	#9	STR	31'-10"	758
B3	12	#5	STR	17'-2"	138
B4	7	#4	STR	13'-7"	64
M1	28	#9	STR	22'-6"	2142
S1	54	#5	3	11'-8"	657
U1	40	#4	4	7'-0"	187
U2	7	#4	4	6'-10"	32
U3	4	#4	4	6'-3"	17
U4	4	#4	4	6'-9"	18
V1	28	#9	2	20'-9"	1975
TOTAL REINFORCING STEEL LBS.					6801
SP-1	2	✱✱	5	610'-7"	816
SP-2	2	✱✱✱	6	300'-3"	626

SPIRAL COLUMN REINFORCING STEEL LBS. 1442

CLASS A CONCRETE BREAKDOWN

POUR #2 (COLUMNS)	9.4 C.Y.
POUR #3 (BENT CAP)	20.2 C.Y.
TOTAL	29.6 C.Y.

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	10.7 C.Y.
3'-6" DIA. DRILLED PIERS IN SOIL	14.8 LIN. FT.
3'-6" DIA. DRILLED PIERS NOT IN SOIL	15.2 LIN. FT.
CSL TUBES	140.0 LIN. FT.

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

✱✱✱ THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G. M. GILLAND DATE : 11/08
CHECKED BY : J. P. ADAMS DATE : 1/09

24-MAR-2009 13:50
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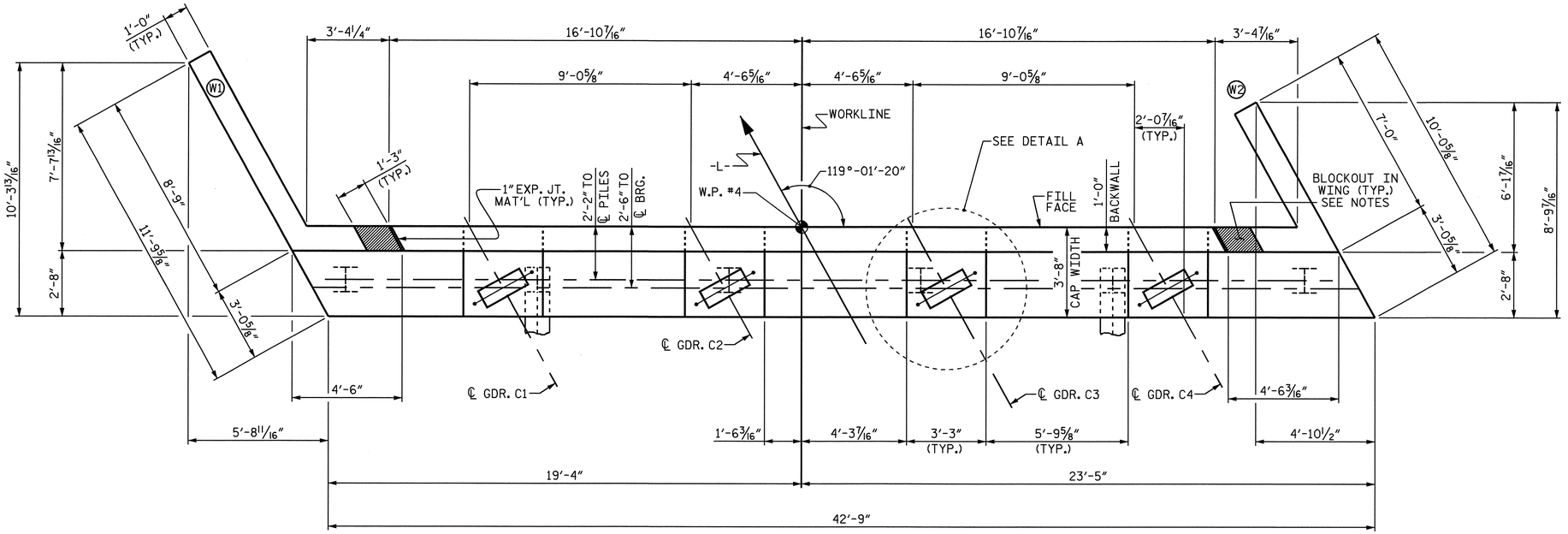


PLAN

NOTES

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

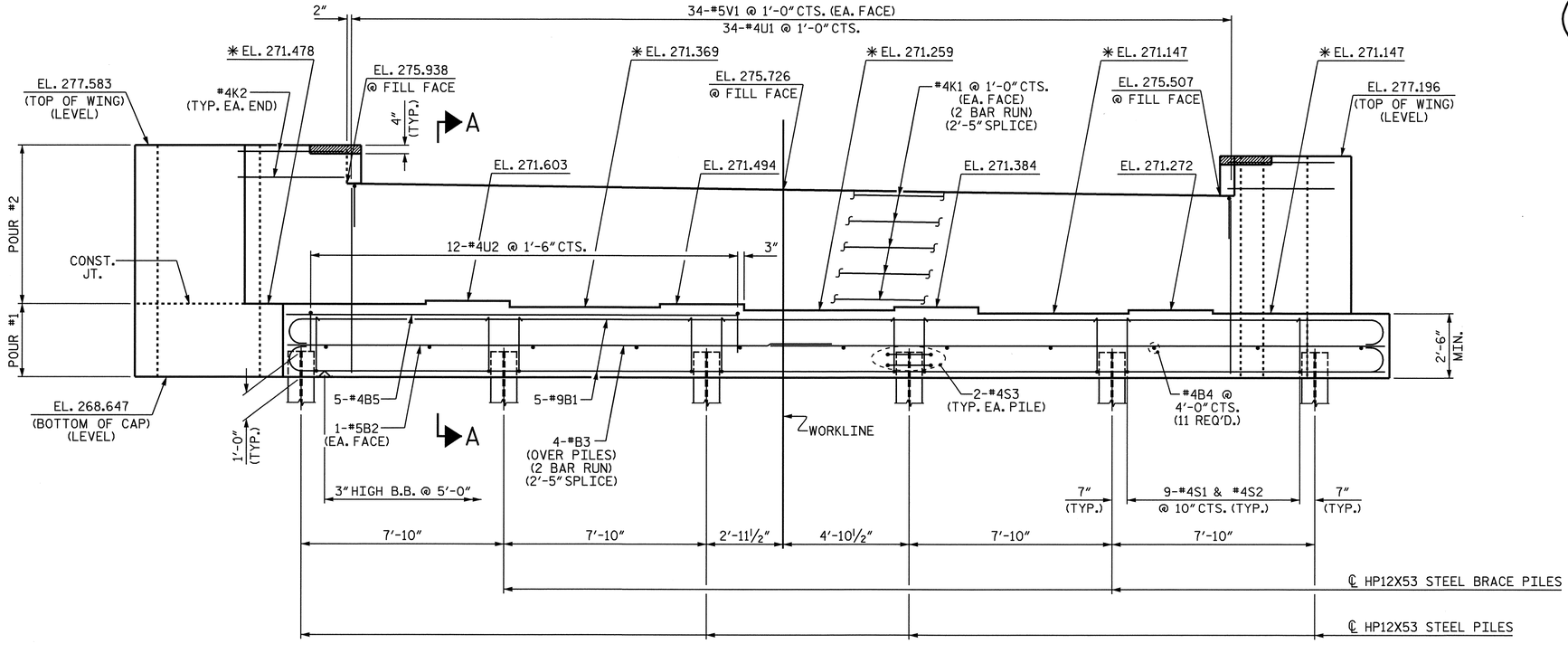
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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.

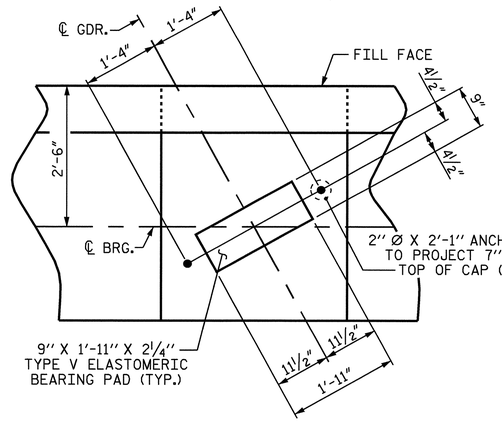
THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND AFTER THE CASTING OF THE BARRIER RAIL.

✳ FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE BUILDUPS, SEE SHEET 3 OF 3.



ELEVATION



DETAIL A
(TYP. EA. BRIDGE SEAT)

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER HIRAL A. PATEL
3/26/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G.M. GILLAND DATE : 11/08
CHECKED BY : J.P. ADAMS DATE : 11/08

24-MAR-2009 13:50
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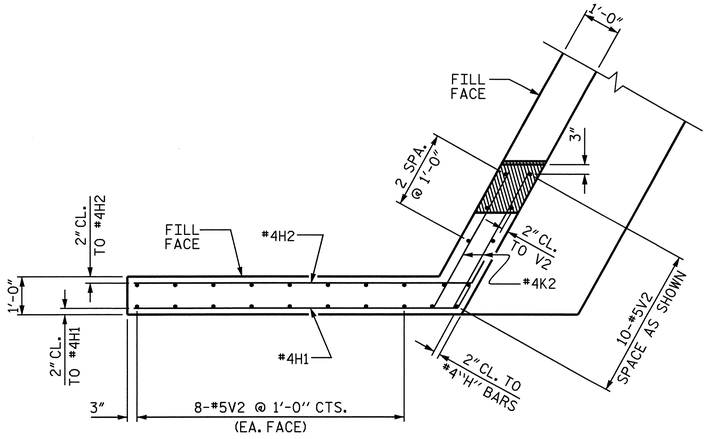
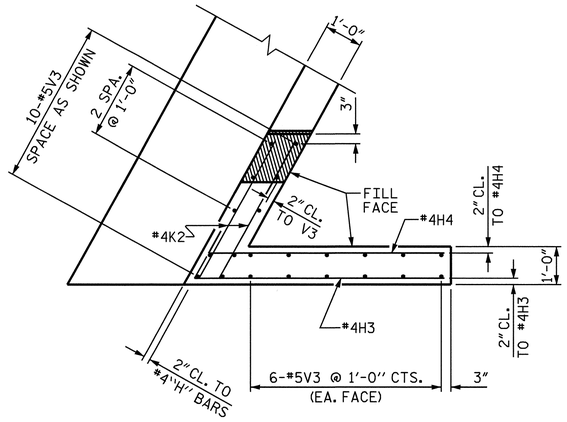
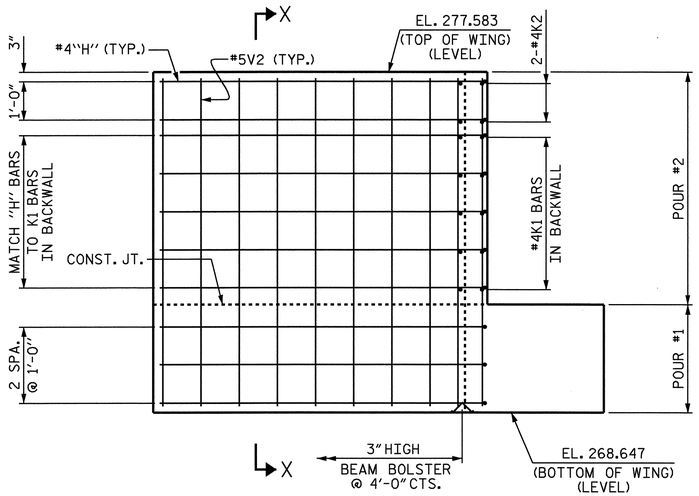


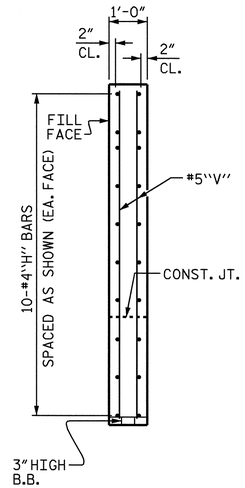
PLAN OF WING - W1



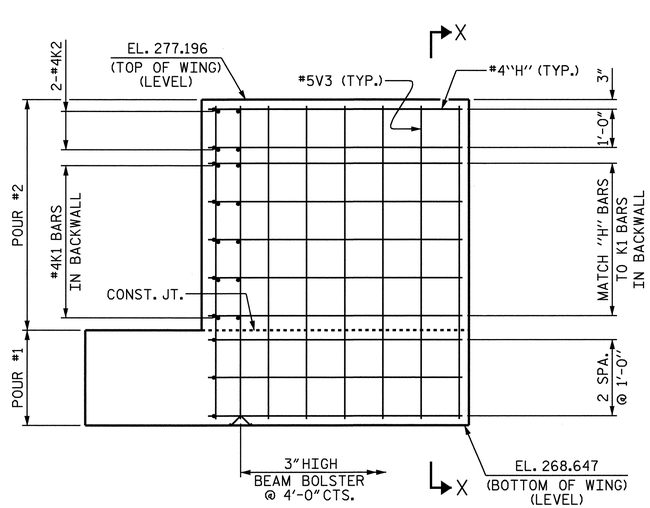
PLAN OF WING - W2



ELEVATION OF WING - W1



SECTION X-X



ELEVATION OF WING - W2

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL

5/27/09

DRAWN BY : G.M. GILLAND DATE : 11/08
CHECKED BY : J.P. ADAMS DATE : 11/08

26-MAY-2009 14:05
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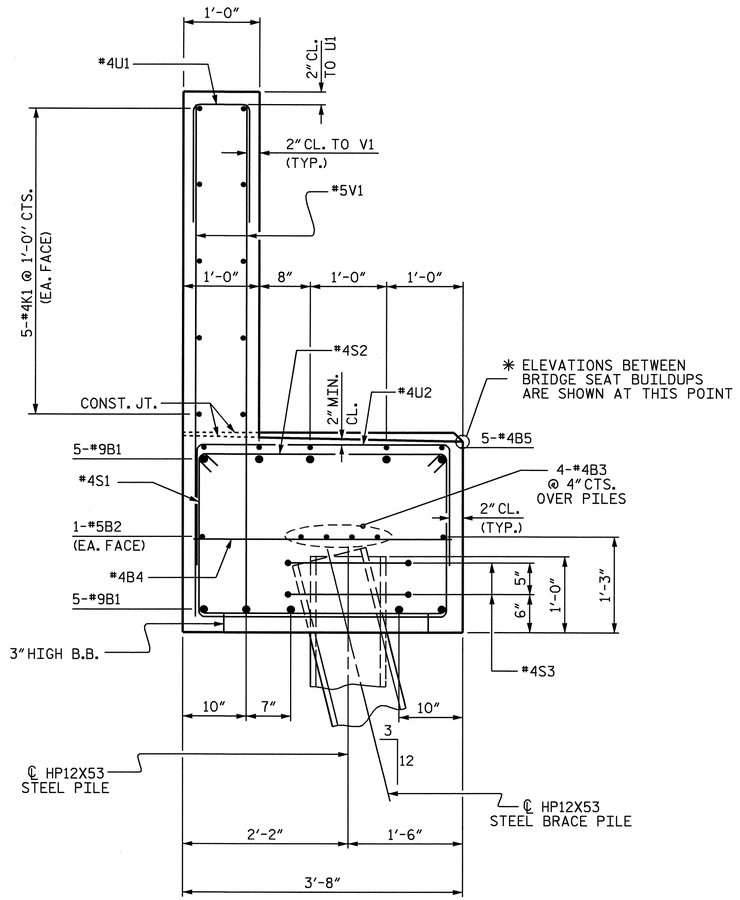
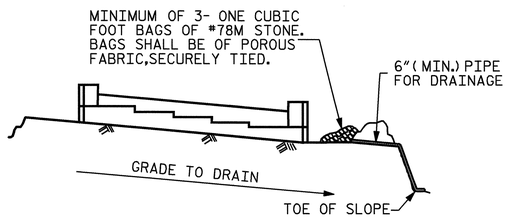


SECTION A-A



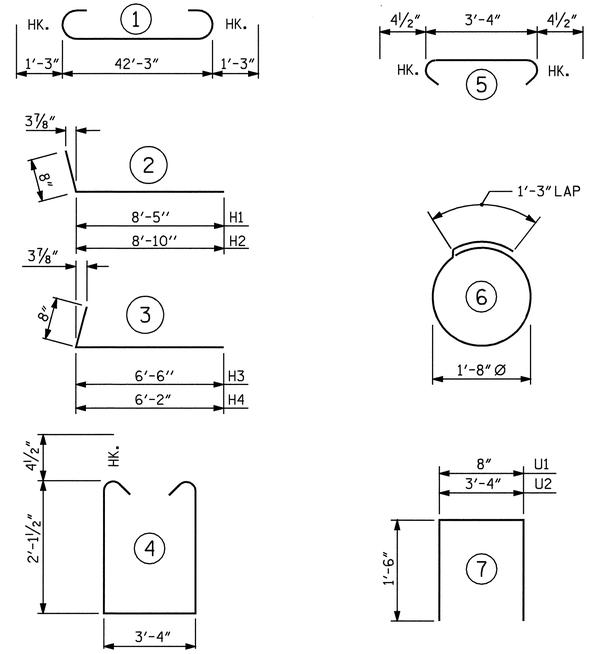
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	44'-9"	1522
B2	2	5	STR	42'-5"	88
B3	8	4	STR	22'-5"	120
B4	11	4	STR	3'-4"	24
B5	5	4	STR	17'-5"	58
H1	10	4	2	9'-1"	61
H2	10	4	2	9'-6"	63
H3	10	4	3	7'-2"	48
H4	10	4	3	6'-10"	46
K1	20	4	STR	22'-5"	299
K2	8	4	STR	4'-1"	22
S1	45	4	4	8'-4"	251
S2	45	4	5	4'-1"	123
S3	12	4	6	6'-6"	52
U1	34	4	7	3'-8"	83
U2	12	4	7	6'-4"	51
V1	68	5	STR	6'-6"	461
V2	26	5	STR	8'-7"	233
V3	22	5	STR	8'-2"	187

TOTAL REINFORCING STEEL LBS. 3792

CLASS A CONCRETE (CU. YDS.)

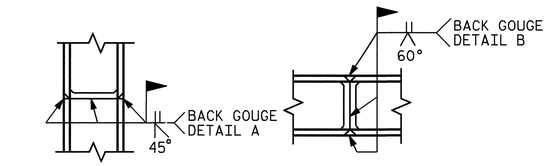
POUR #1 CAP & LOWER WINGS CU.YDS. 16.9

POUR #2 BACKWALL & UPPER WINGS CU. YDS. 10.8

TOTAL (CU. YDS.) 27.7

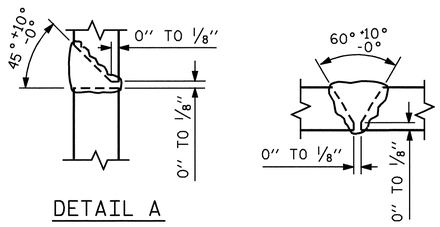
HP12x53 STEEL PILES

No. 6 LIN. FT. 120.0



** PILE VERTICAL

** PILE HORIZONTAL OR VERTICAL



DETAIL A

** POSITION OF PILE DURING WELDING.

DETAIL B

PILE SPLICE DETAILS

3/26/09

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : G.M. GILLAND DATE : 11/08

CHECKED BY : J.P. ADAMS DATE : 11/08

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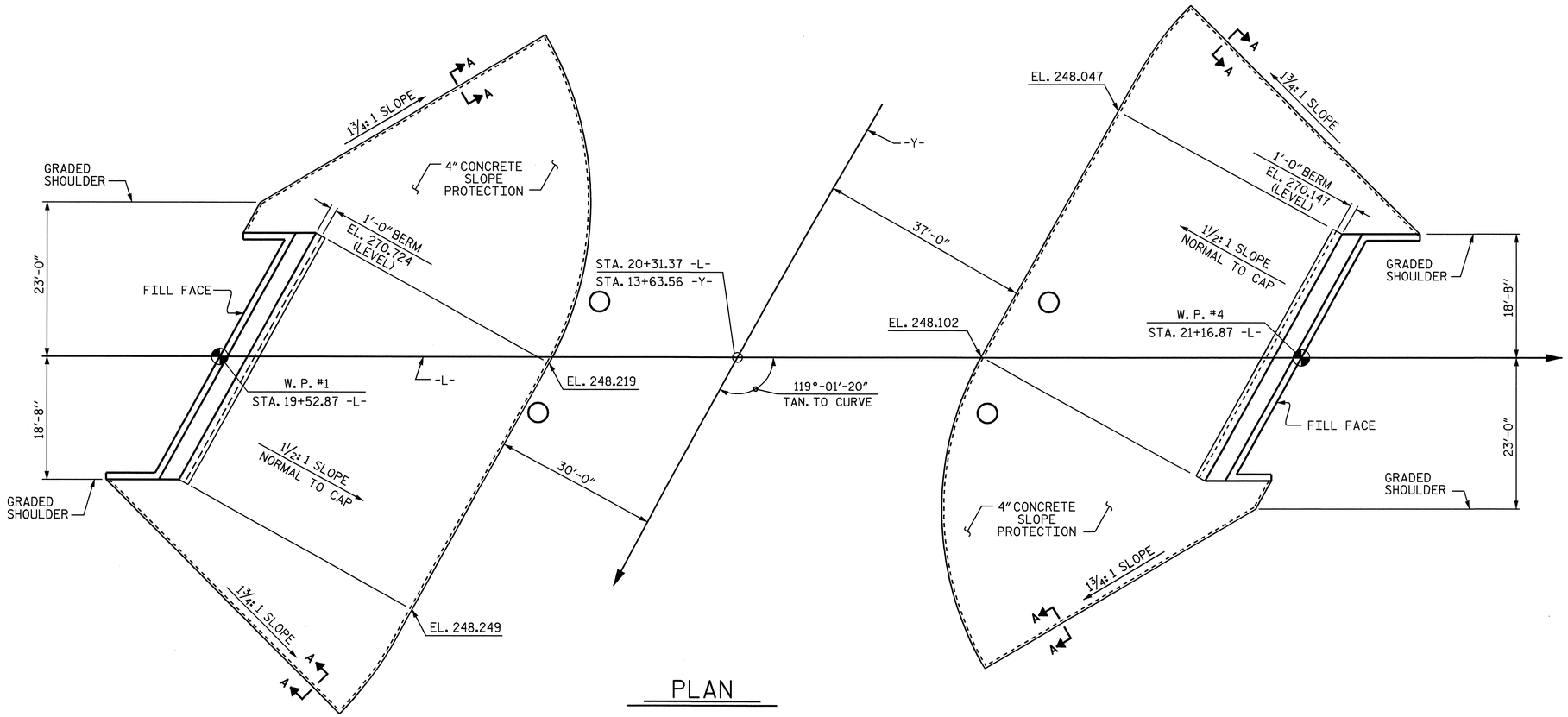


PLAN

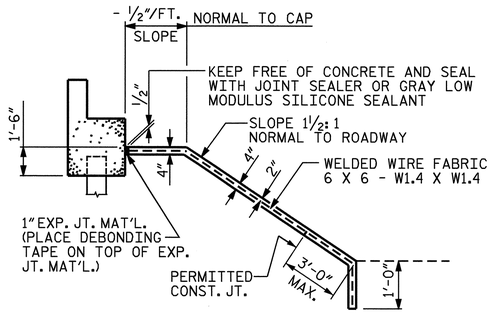
NOTES

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

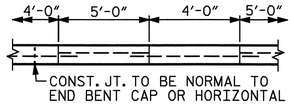
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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

BRIDGE @ STA. 20+31.37 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT #1	434	868
END BENT #2	379	758

* QUANTITY SHOWN IS BASED ON 5' POURS.

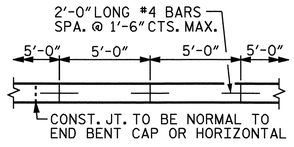


SECTION ALONG ℄ ROADWAY



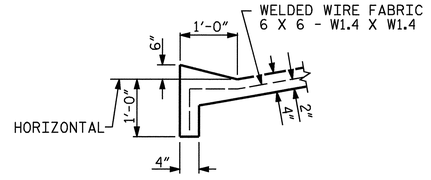
POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL

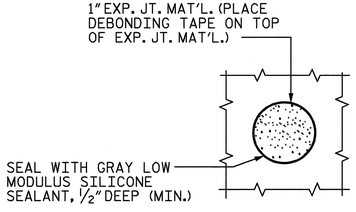


STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



SECTION A-A



PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE PLACED AROUND A BENT COLUMN

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SLOPE PROTECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER MIKUL A. PATEL
3/20/09

DRAWN BY : J. P. ADAMS DATE : 1/12/09
CHECKED BY : M. K. BEARD DATE : 1/27/09

24-MAR-2009 13:50
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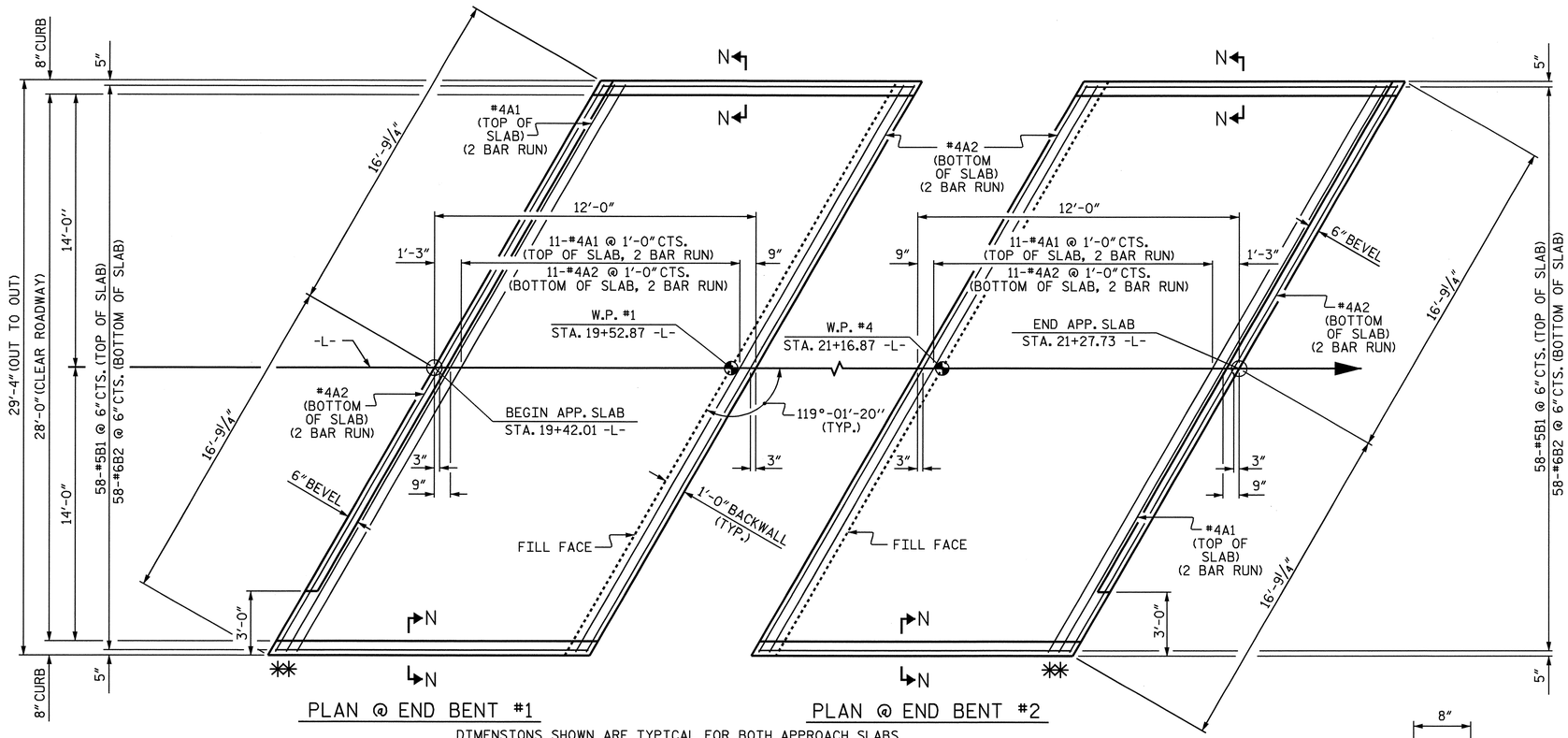
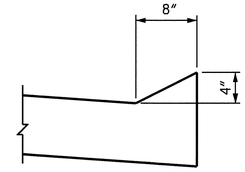
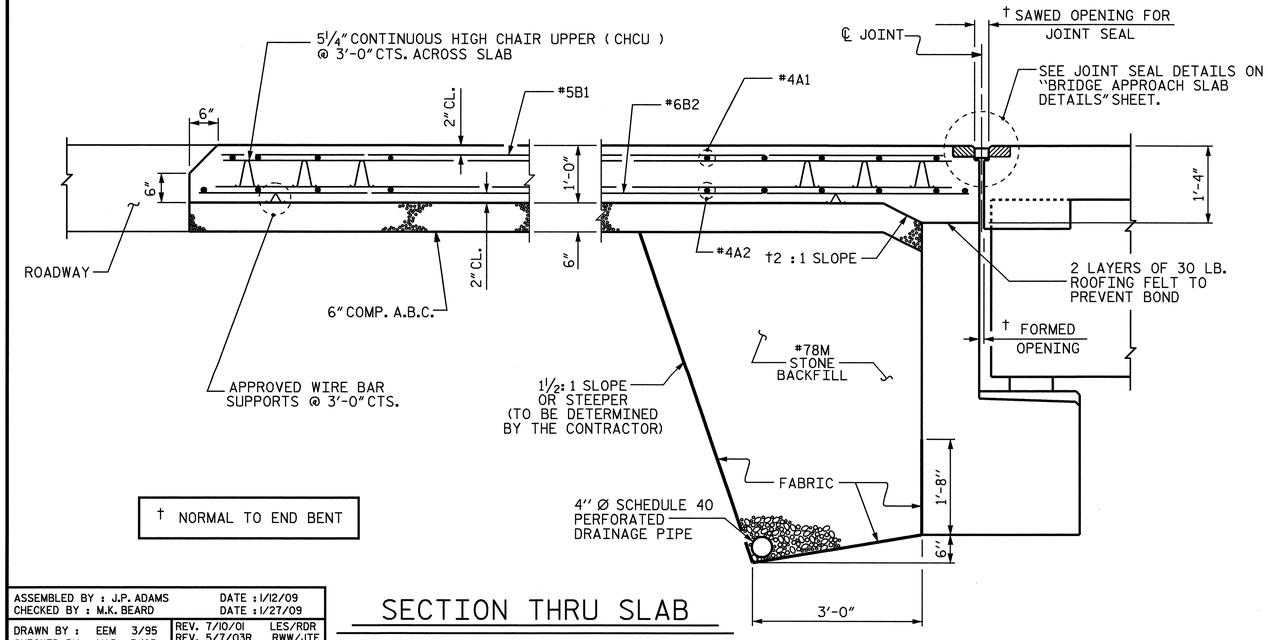
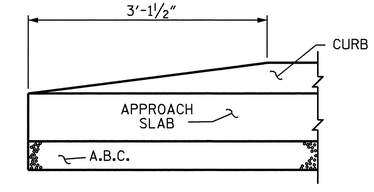




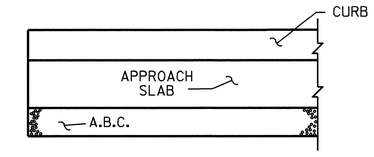
SECTION N-N



SECTION THRU SLAB



END OF CURB WITHOUT SHOULDER BERM GUTTER



** END OF CURB WITH SHOULDER BERM GUTTER

CURB DETAILS

BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	24	#4	STR	17'-7"	282
A2	26	#4	STR	17'-6"	304
* B1	58	#5	STR	10'-7"	640
B2	58	#6	STR	11'-7"	1009
REINFORCING STEEL				LBS.	1313
* EPOXY COATED REINFORCING STEEL				LBS.	922
CLASS AA CONCRETE				C. Y.	13.4

SPLICE CHART	
#4A1	2'-0"
#4A2	1'-9"

NOTES

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

FABRIC SHALL BE TYPE 1 ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2 1/2".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE BARRIER RAIL.

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 1 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

(SUB-REGIONAL TIER)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : J.P. ADAMS	DATE : 1/12/09	
CHECKED BY : M.K. BEARD	DATE : 1/27/09	
DRAWN BY : EEM 3/95	REV. 7/10/01	LES/RDR
CHECKED BY : VAP 3/95	REV. 5/7/03R	RWW/JTE
	REV. 5/1/06R	KMM/GM

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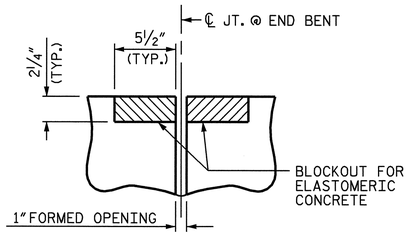
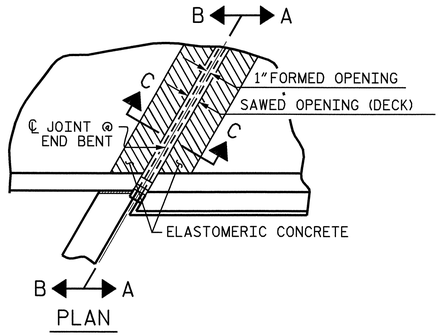
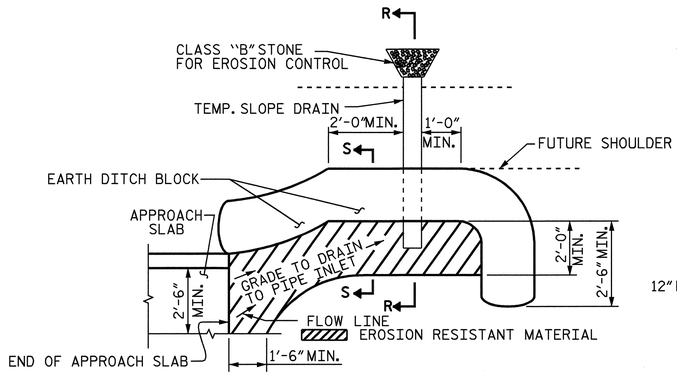


SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

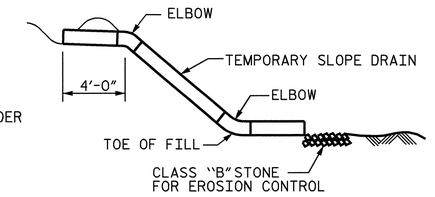


PLAN

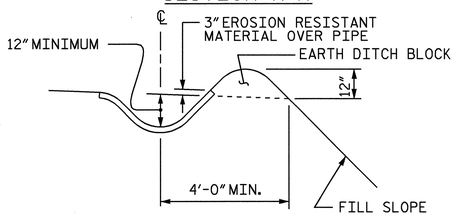


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



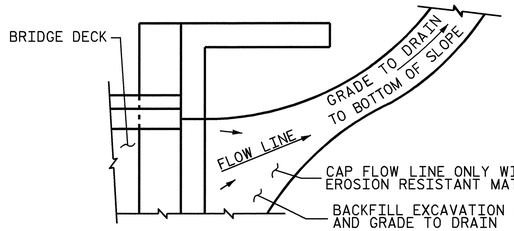
SECTION R-R



SECTION S-S

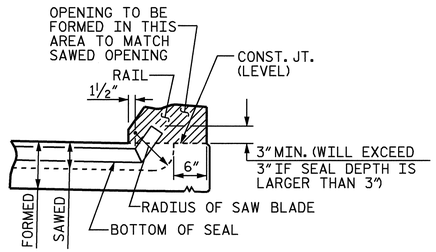
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

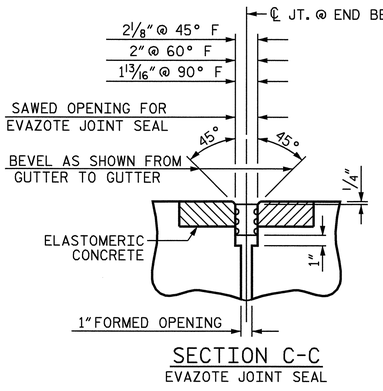


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

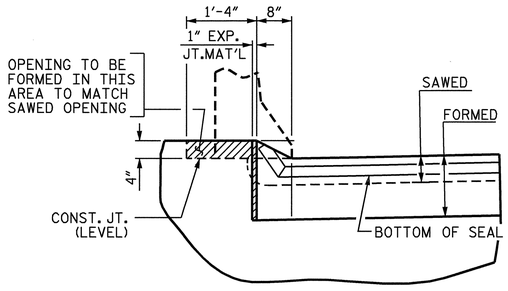
TEMPORARY DRAINAGE DETAIL



SECTION A-A



SECTION C-C
EVAZOTE JOINT SEAL



SECTION B-B

ELASTOMERIC CONCRETE	
END BENT #	ELASTOMERIC CONCRETE (CU. FT.)
1	5.5
2	5.5
TOTAL	11.0

JOINT SEAL DETAILS @ END BENT

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 23371 ENGINEER VIPUL A. PATEL
3/26/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			70

STD. NO. BAS10

ASSEMBLED BY : J.P. ADAMS		DATE : 1/12/09
CHECKED BY : M.K. BEARD		DATE : 1/27/09
DRAWN BY : FCJ 11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB 11/88	REV. 5/7/03	RWW/JTE
	REV. 5/1/06R	MAA/KMM

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OVERHANG BRACKET CALCULATION INSTRUCTIONS

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

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

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

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

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

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

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

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

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

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

DEFINITIONS

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

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO
Chang-Chuan Victor Chao
2-3-2009

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK
AASHTO TYPES III, IV, V, AND VI

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			35

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

03-FEB-2009 11:47
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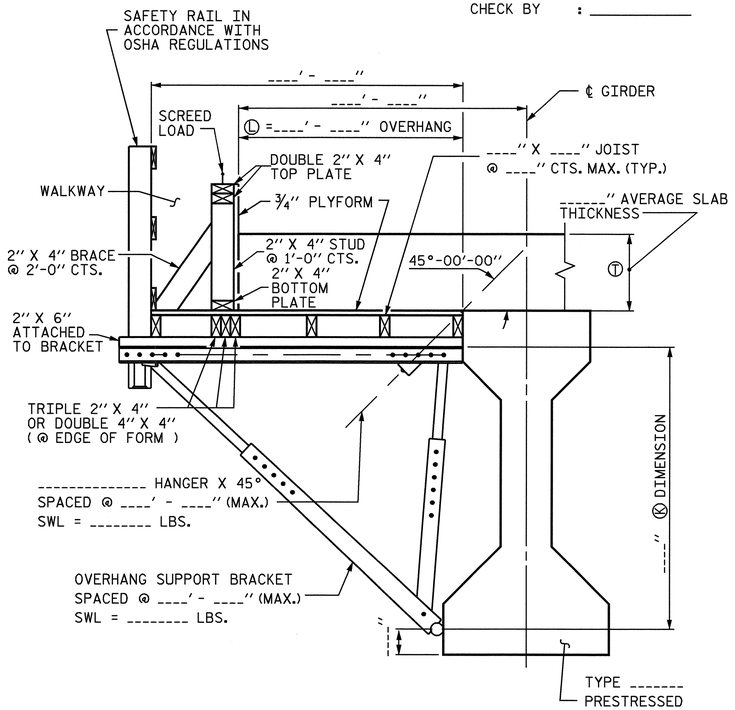
vchao

OF1

BRIDGE OVERHANG BRACKET SUMMARY

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

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



OVERHANG FALSEWORK

NOTES

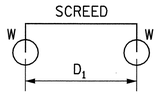
DESIGN INCLUDES CONSTRUCTION LIVE LOAD 20 PSF ON THE AREA SUPPORTED AND 75 PLF AT THE OUTSIDE DECK OF OVERHANGS.

REQUIRED MINIMUM DIAGONAL LEG CAPACITY: 3600 LB WORKING LOAD

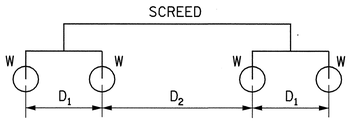
THE CONTRACTOR HAS THE OPTION OF SUBMITTING HIS OWN DESIGN FOR OVERHANG FALSEWORK IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

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

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



4-WHEEL MACHINE



8-WHEEL MACHINE

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

TABLE 2: SCREED LOAD FACTOR "R"

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

TABLE 3: ALLOWABLE SPAN LENGTH OF JOISTS AND JOIST SPACINGS

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

PROJECT NO. B-4409
ANSON COUNTY
STATION: 20+31.37 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHARNG-CHUAN VICTOR CHAO

Charng-Chuan Victor Chao
2-3-2009

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			35

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

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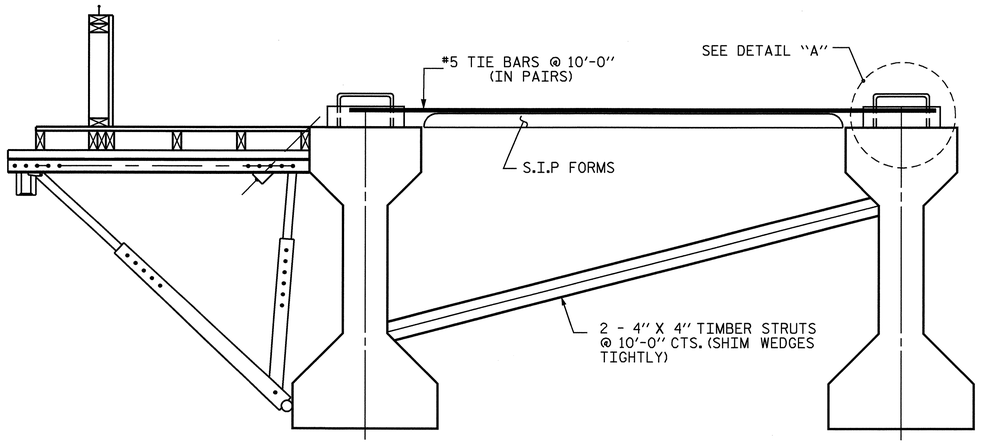
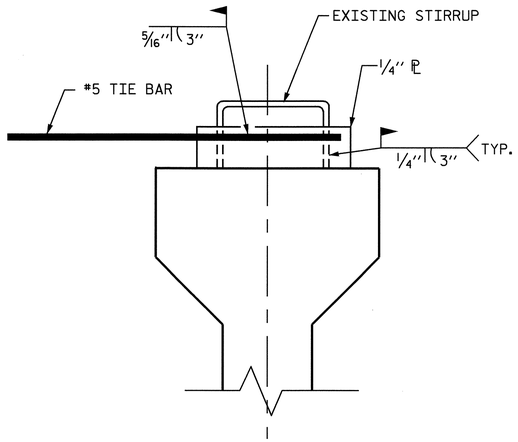


EXTERIOR GIRDER INTERIOR GIRDER

DETAIL OF REQUIRED OVERHANG FALSEWORK BRACING SYSTEM



DETAIL "A"

NOTES:

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

MAXIMUM SPACING BETWEEN THE BRACING (TIE BARS-TIMBER STRUT) IS 10'-0" CTS. #5 TIE BARS SHALL BE LOCATED OVER A TIMBER STRUT.

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

PROJECT NO. B-4409

ANSON COUNTY

STATION: 20+31.37 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD OVERHANG FALSEWORK

AASHTO TYPES
III, IV, V, AND VI

NORTH CAROLINA PROFESSIONAL SEAL 18788 ENGINEER CHANG-CHUAN VICTOR CHAO

Chang-Chuan Victor Chao
2-3-2009

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

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

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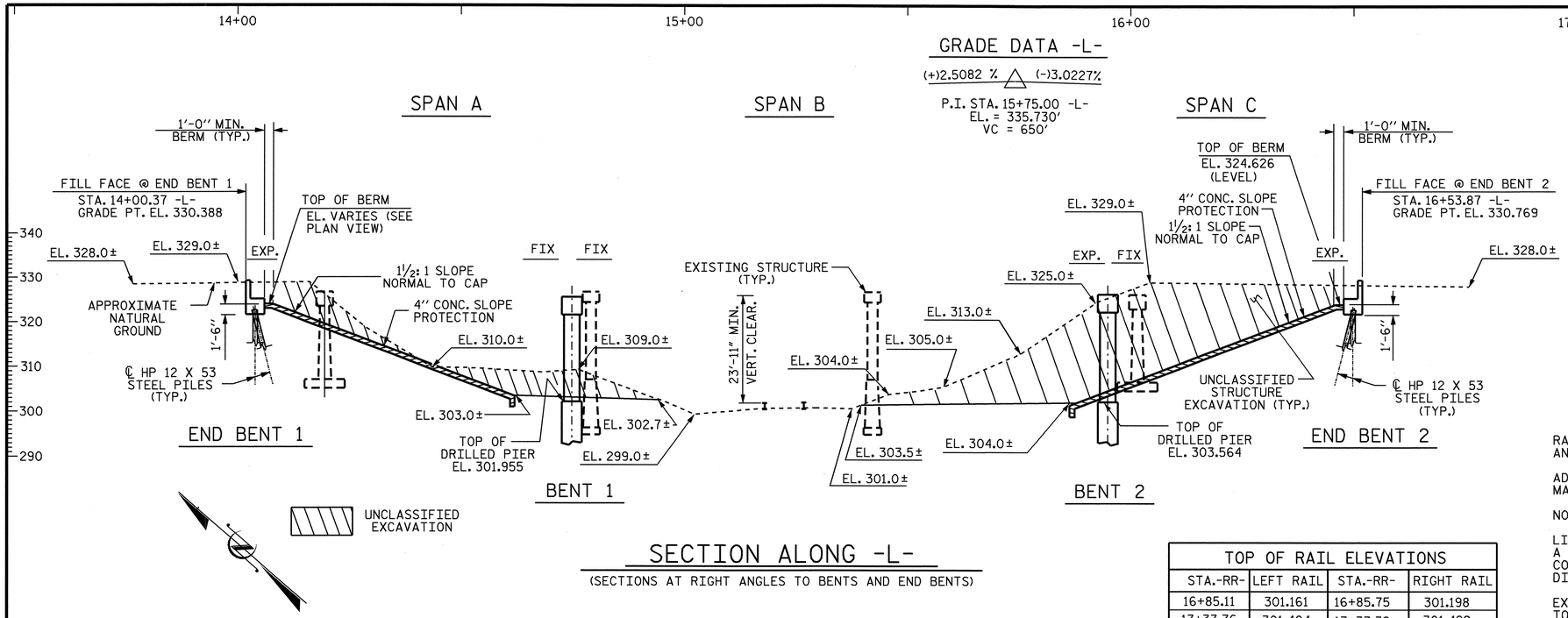
vchao

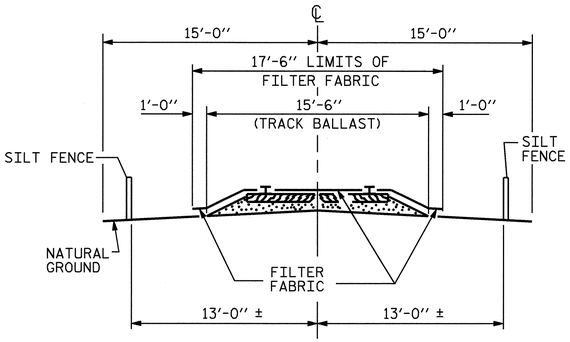
F.A. PROJ. NO. BRZ-1627 (4)



SECTION ALONG -L-

(SECTIONS AT RIGHT ANGLES TO BENTS AND END BENTS)

TOP OF RAIL ELEVATIONS			
STA.-RR-	LEFT RAIL	STA.-RR-	RIGHT RAIL
16+85.11	301.161	16+85.75	301.198
17+37.76	301.404	17+37.32	301.429
17+93.20	301.786	17+93.37	301.800
18+37.98	302.101	18+37.70	302.142



RAILROAD EROSION CONTROL DETAIL

NOTES

RAILROAD EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO PERFORMING ANY WORK IN THE RAILROAD RIGHT-OF-WAY.

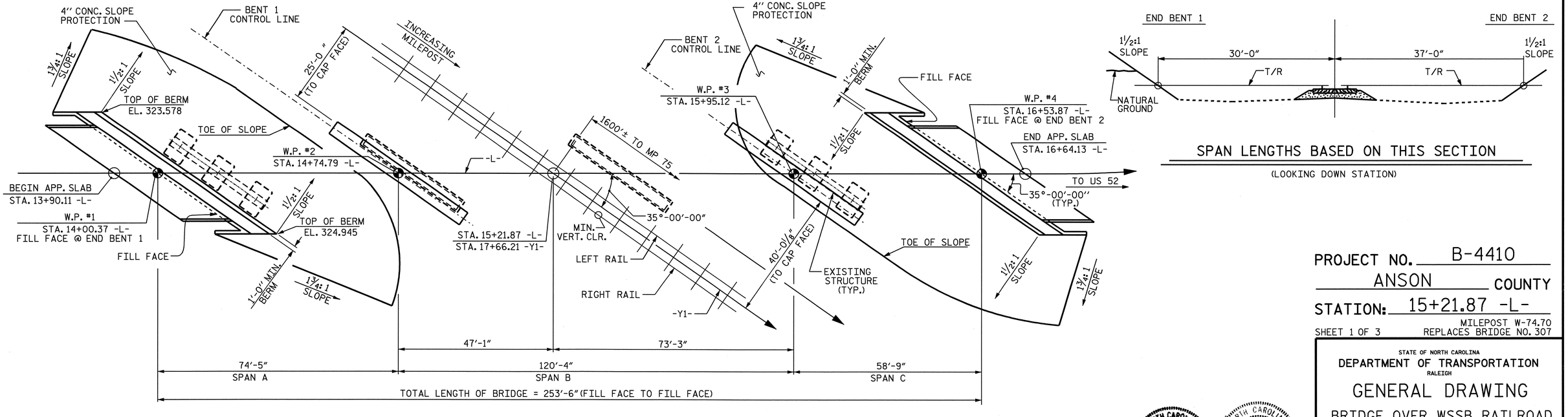
ADDITIONAL EROSION CONTROL MEASURES FOR PROTECTION OF RAILROAD DITCHES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

NO SEPARATE PAYMENT WILL BE MADE FOR RAILROAD EROSION CONTROL MEASURES.

LIMITS OF SILT FENCE AND FILTER FABRIC PARALLEL TO RAILROAD SHALL EXTEND A MINIMUM OF 10'-0" OUTSIDE EDGE OF SUPERSTRUCTURE OR TOE OF SLOPE ON CONSTRUCTION. A GREATER LENGTH OF SILT FENCE MAY BE REQUIRED IF SO DIRECTED BY THE ENGINEER.

EXTEND FILTER FABRIC 25'-0" BEYOND OUTSIDE EDGE OF SUPERSTRUCTURE PARALLEL TO RAILROAD.

FILTER FABRIC TO BE NAILED TO TIMBER RAIL TIES WITH PRIME SOURCE "GRIP CAP" OR EQUIVALENT. FILTER FABRIC ON SHOULDER TO BE SECURED AS DIRECTED BY THE ENGINEER AND RAILROAD.



PLAN

(PILES AND DRILLED PIERS NOT SHOWN FOR CLARITY)

SPAN LENGTHS BASED ON THIS SECTION

(LOOKING DOWN STATION)

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

MILEPOST W-74.70

SHEET 1 OF 3 REPLACES BRIDGE NO. 307

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER WSSB RAILROAD ON SR 1627 BETWEEN SR 1628 AND US 52

NORTH CAROLINA PROFESSIONAL SEAL 9804 ENGINEER ROY A. GIROLAMI
5-29-09

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : T. A. HARRIS / NQT DATE : 2/6/07
CHECKED BY : B.L.GREEN / JAT DATE : 2/2/09

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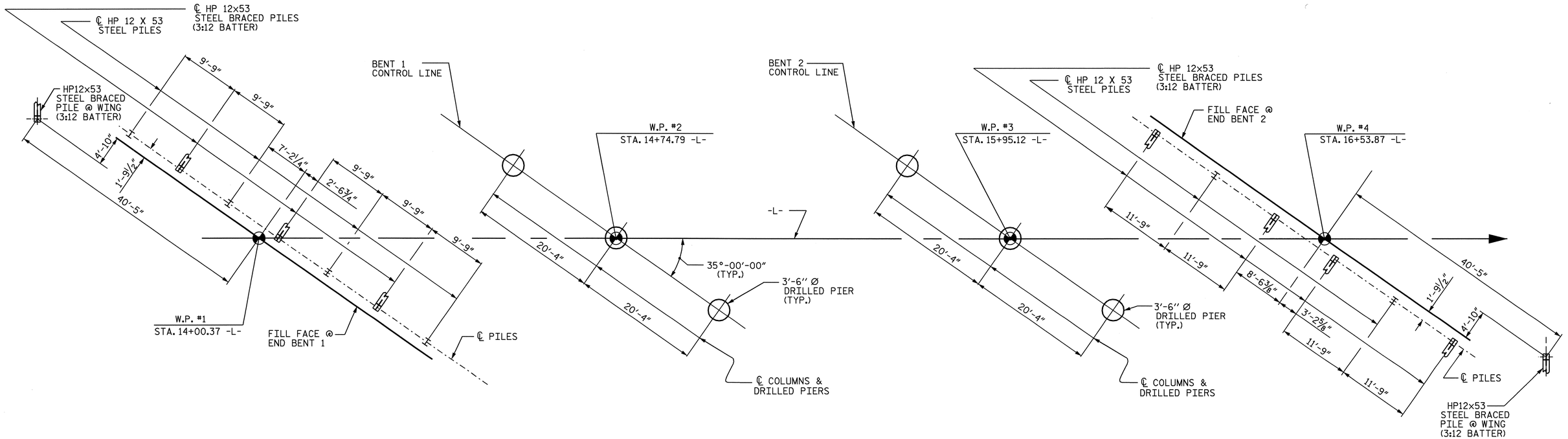
danderson



END BENT 1 | BENT 1 | BENT 2 | END BENT 2

FOUNDATION LAYOUT

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER WSSB RAILROAD
ON SR 1627 BETWEEN
SR 1628 AND US 52

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
5/29/09

DRAWN BY : S. M. RASHIDI DATE : 12/31/08
CHECKED BY : N. Q. TRAN DATE : 1/7/09

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danderson

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	3'-6" DIA. DRILLED PIERS IN SOIL	3'- 6" DIA. DRILLED PIERS NOT IN SOIL	SID INSPECTION	CROSSHOLE SONIC LOGGING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL	HP 12 X 53 STEEL PILES		CONCRETE BARRIER RAIL	96" CHAIN LINK FENCE	4" SLOPE PROTECTION	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS
	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	CU. YDS.	SQ.FT.	SQ.FT.	CU.YDS.	LUMP SUM	LBS.	LBS.	LBS.	NO.	LIN.FT.	LIN.FT.	LN.FT.	SQ. YDS.	LUMP SUM	LUMP SUM
SUPERSTRUCTURE							7808	6953.8		LUMP SUM			220,100			499.73	480.0		LUMP SUM	LUMP SUM
END BENT 1						650			37.4		5,785			8	480			655		
BENT 1		94.2	6.8	1	1				43.4		14,048	3,415								
BENT 2		86.4	6.6						41.4		13,345	3,180								
END BENT 2						2400			37.4		5,816			7	105			695		
TOTAL	LUMP SUM	180.6	13.4	1	1	3050	7808	6953.8	159.6	LUMP SUM	38,994	6,595	220,100	15	585	499.73	480.0	1350	LUMP SUM	LUMP SUM

NOTES

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING EXCEPT GIRDERS HAVE BEEN DESIGNED FOR HS 25.

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

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR SEISMIC DESIGN OF HIGHWAY BRIDGES FOR SEISMIC PERFORMANCE CATEGORY A.

THE DRILLED PIERS AT BENT 1 AND BENT 2 HAVE BEEN DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 25 TSF.

FOR DRILLED PIERS, SEE DRILLED PIERS SPECIAL PROVISIONS.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR AN APPLIED LOAD OF 117 TONS (COLUMN 1), 173 TONS (COLUMN 2), AND 112 TONS (COLUMN 3) EACH AT TOP OF COLUMN.

DRILLED PIERS AT BENT 2 ARE DESIGNED FOR AN APPLIED LOAD OF 114 TONS (COLUMN 1), 172 TONS (COLUMN 2), AND 107 TONS (COLUMN 3) EACH AT TOP OF COLUMN.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT 1 AND BENT 2

INSTALL DRILLED PIERS AT BENT 1 THAT EXTEND TO ELEVATION NO HIGHER THAN 274.0 FEET (COLUMN 1), 263.0 FEET (COLUMN 2), AND 268.0 FEET (COLUMN 3), AND SATISFY THE REQUIRED END BEARING CAPACITY.

INSTALL DRILLED PIERS AT BENT 2 THAT EXTEND TO ELEVATION NO HIGHER THAN 269.0 FEET (COLUMN 1), 264.0 FEET (COLUMN 2), AND 285.0 FEET (COLUMN 3), AND SATISFY THE REQUIRED END BEARING CAPACITY.

SPT TESTING IS NOT REQUIRED FOR DRILLED PIERS AT BENT 1 AND BENT 2

SID INSPECTION MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1 AND BENT 2

CSL TUBES AND TESTING MAY BE REQUIRED FOR DRILLED PIERS AT BENT 1 AND BENT 2. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISION.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENTS 1 AND 2 IS 60 TONS PER PILE.

DRIVE PILES AT END BENTS 1 AND 2 TO REQUIRED CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPCITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO PLUS ANY ADDITIONAL CAPACITY TO ACCOUNT FOR DOWN DRAG OR NEGATIVE SKIN FRICTION AND SCOUR.

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.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR SHIPPING STRUCTURAL STEEL MEMBERS, SEE SPECIAL PROVISIONS.

FOR HIGH STRENGTH BOLTS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO 270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON PLANS.

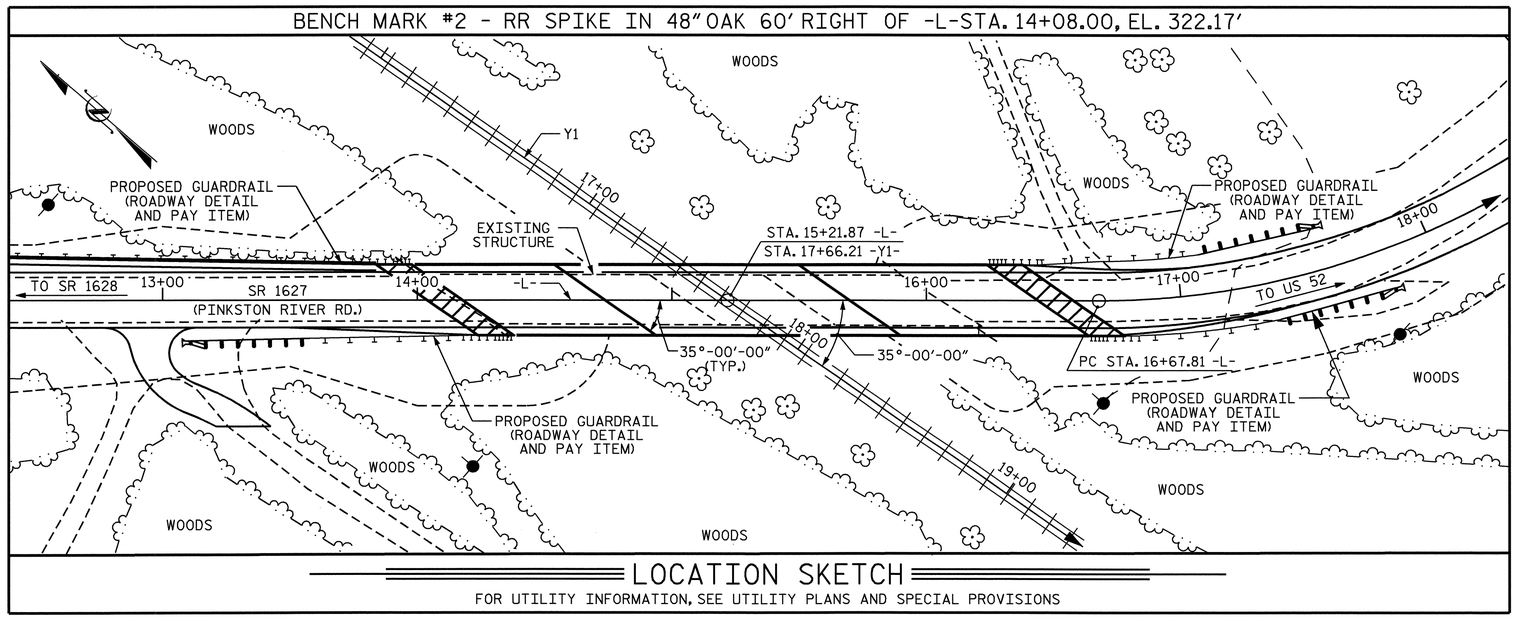
THE EXISTING STRUCTURE CONSISTING OF 3 SPANS: 1 @ 63'-3", 1 @ 62'-10", 1 @ 63'-3" OF 3 LINES OF REINFORCED CONCRETE DECK GIRDER WITH A CLEAR ROADWAY WIDTH OF 20'-0" SUPPORTED ON REINFORCED CONCRETE SPILL THROUGH ABUTMENTS AT END BENTS AND REINFORCED CONCRETE POST AND BEAMS AT BENTS AND LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET 1 OF 3 SHALL BE EXCAVATED FOR DISTANCE OF APPROXIMATELY 50 FT. EACH SIDE OF CENTERLINE ROADWAY IS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AS UNCLASSIFIED STRUCTURE EXCAVATION.

THE RAILROAD TRACK TOP OF RAIL ELEVATIONS SHOWN ON THE PLANS ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE TOP OF RAIL ELEVATIONS AND REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

BENCH MARK #2 - RR SPIKE IN 48" OAK 60' RIGHT OF -L-STA. 14+08.00, EL. 322.17'



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE OVER WSSB RAILROAD ON SR 1627 BETWEEN SR 1628 AND US 52

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID B ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : N. Q. TRAN DATE : 1/4/09
CHECKED BY : J. A. TILLMAN DATE : 2/2/09

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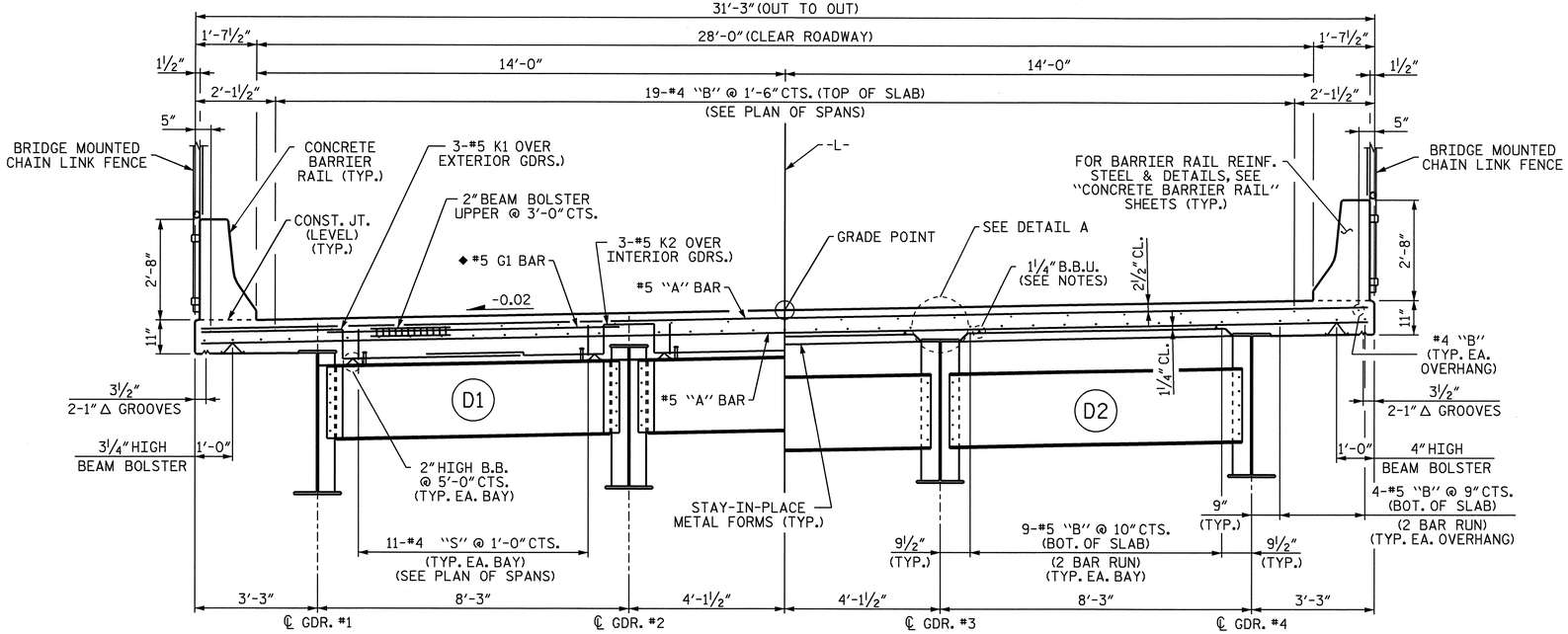


PART TYPICAL SECTION
(SHOWING BENT OR END BENT DIAPHRAGMS FOR SPAN A OR C)

PART TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS FOR SPAN A OR C)

NOTES

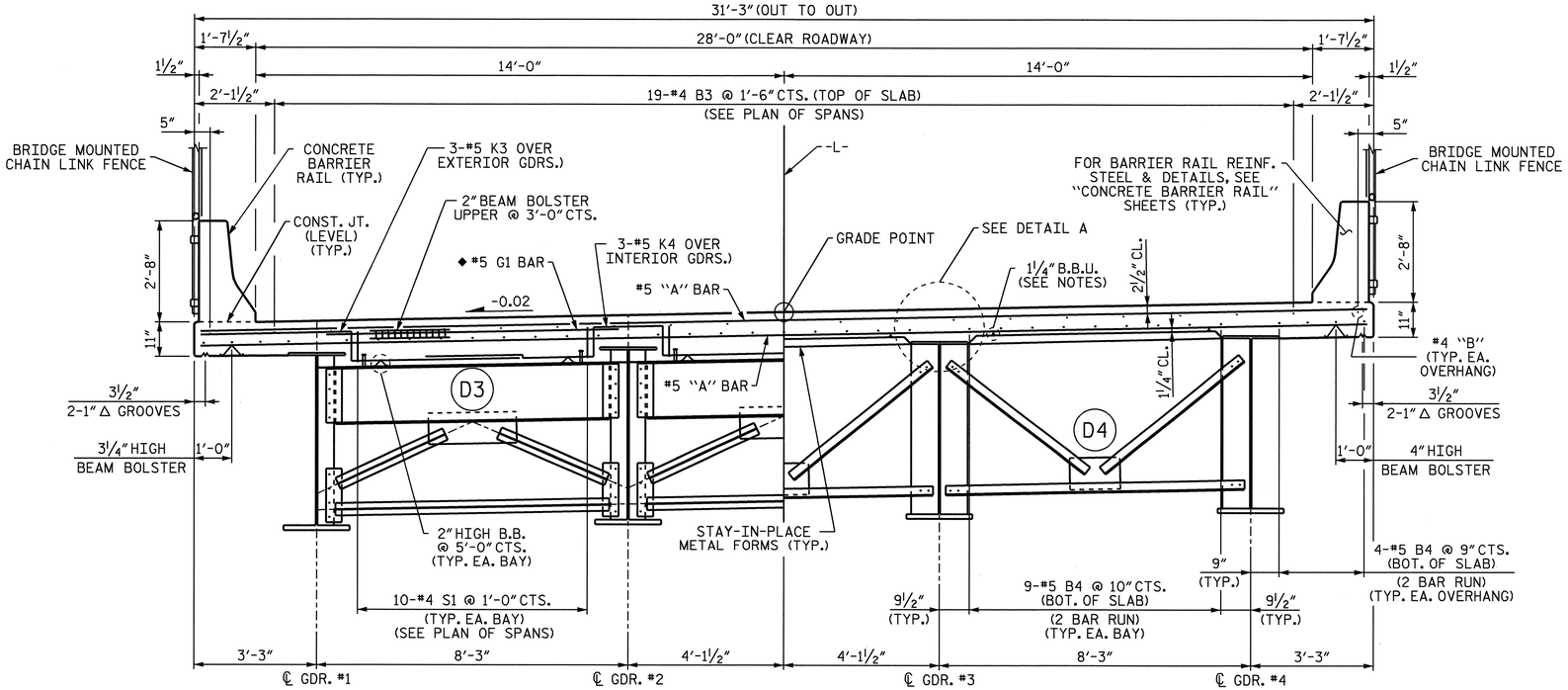
PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE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

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.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO BEAM OR GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

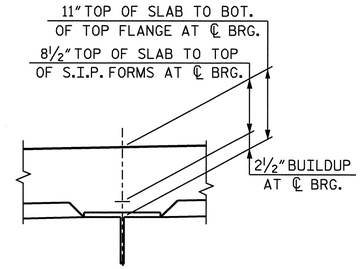
◆#5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

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



PART TYPICAL SECTION
(SHOWING BENT DIAPHRAGMS FOR SPAN B)

PART TYPICAL SECTION
(SHOWING INTERMEDIATE DIAPHRAGMS FOR SPAN B)



DETAIL A

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : William F. Parker DATE : 12/10/08
CHECKED BY : N.Q. TRAN DATE : 1-12-09

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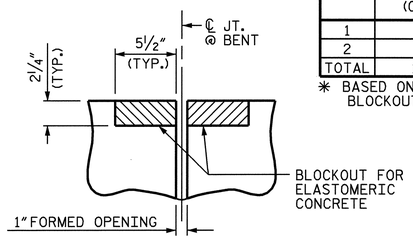
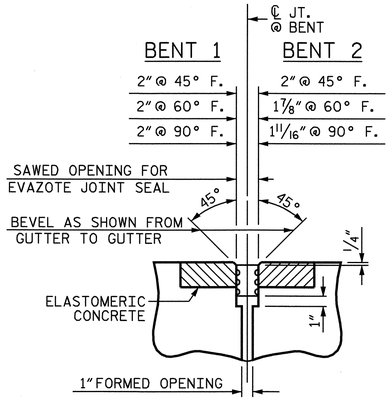
ELASTOMERIC CONCRETE	
BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	9.4
2	9.4
TOTAL	18.8

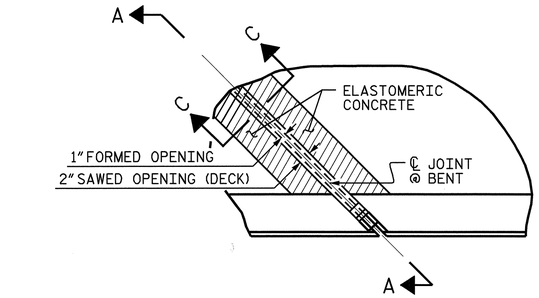
* BASED ON MINIMUM BLOCKOUT SHOWN.



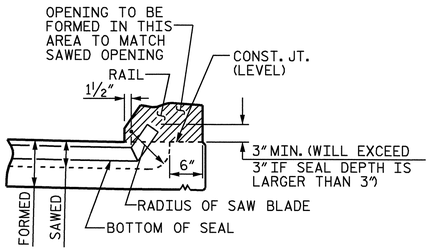
SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION C-C
EVAZOTE JOINT SEAL
(EXPANSION)



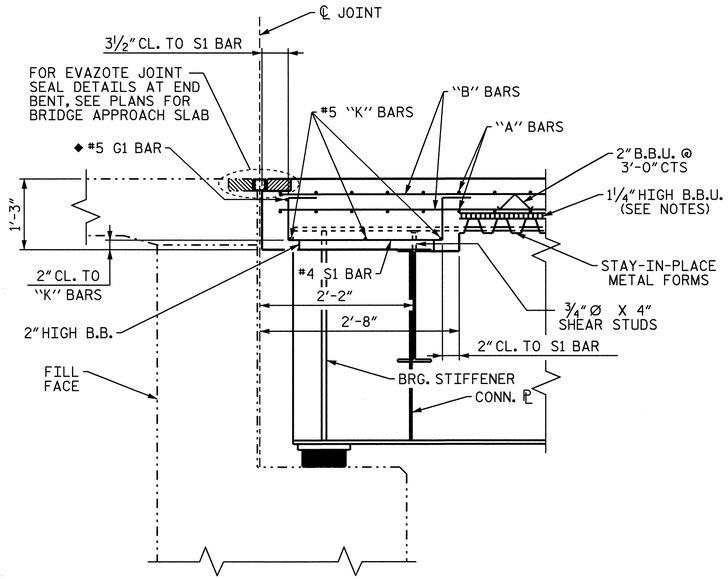
PLAN



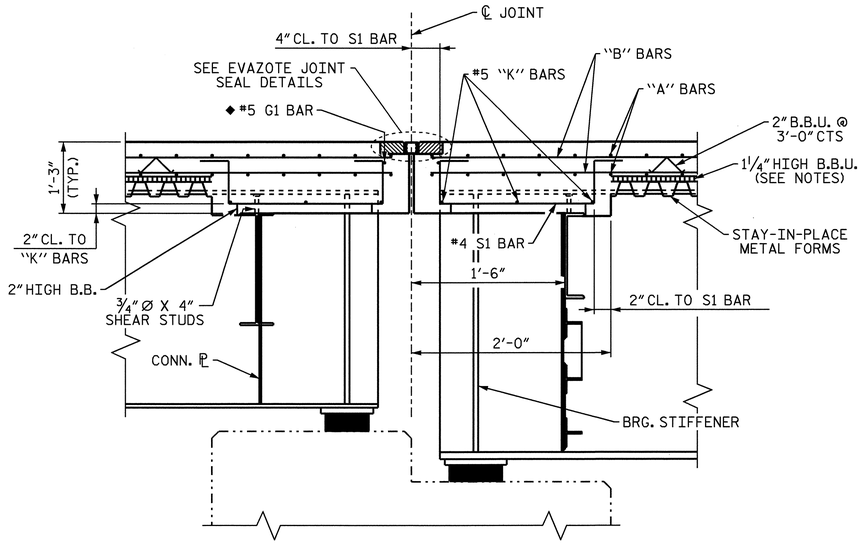
SECTION A-A

EVAZOTE JOINT SEAL DETAILS @ BENT 1 & 2

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.



SECTION THRU END BENT
(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SECTION THRU BENT
(BENT 1 SHOWN, BENT 2 SIMILAR)

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
5/29/09

DRAWN BY : William T. Parker DATE : 12/10/08
CHECKED BY : N.Q. TRAN DATE : 1-12-09

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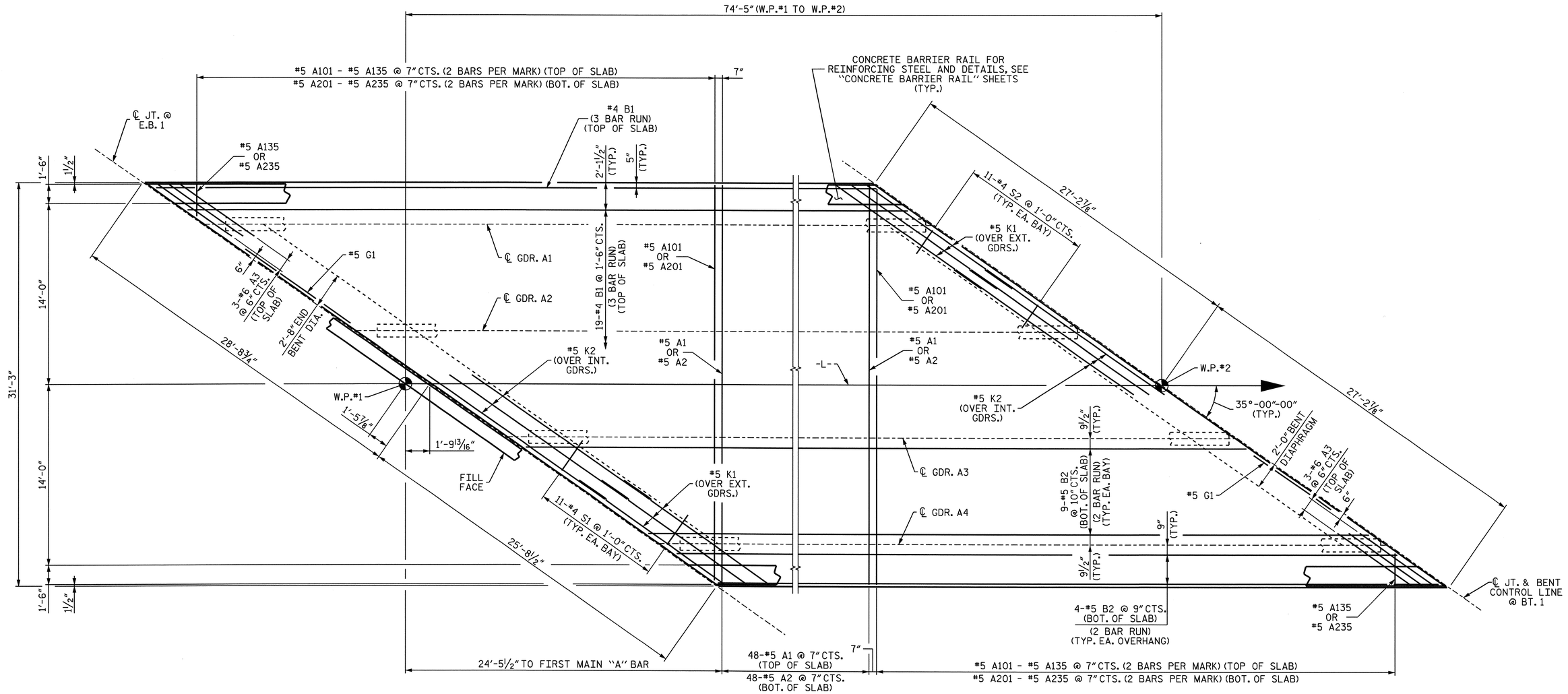

PLAN OF SPAN A

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-41
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : William T. Parker DATE : 12/16/08
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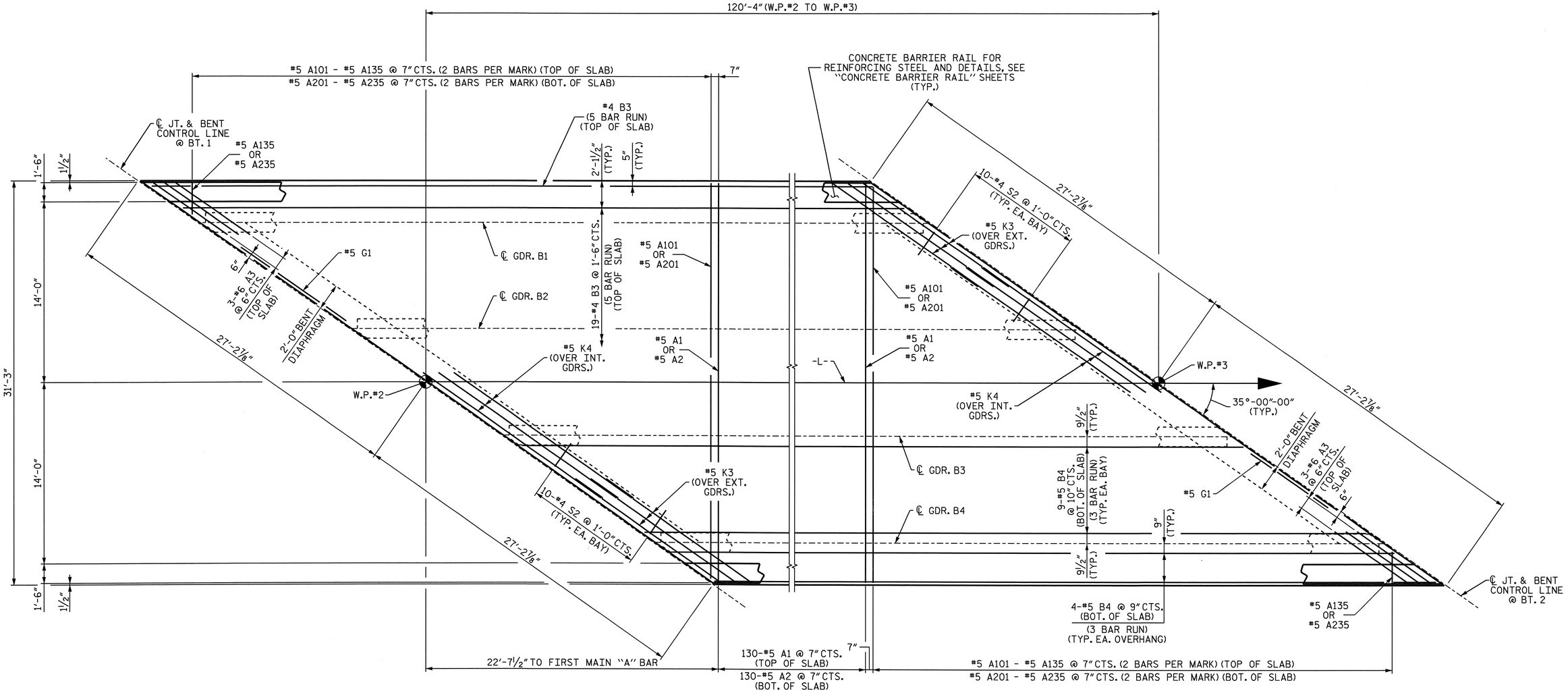

PLAN OF SPAN B

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : William F. Parker DATE : 12/16/08
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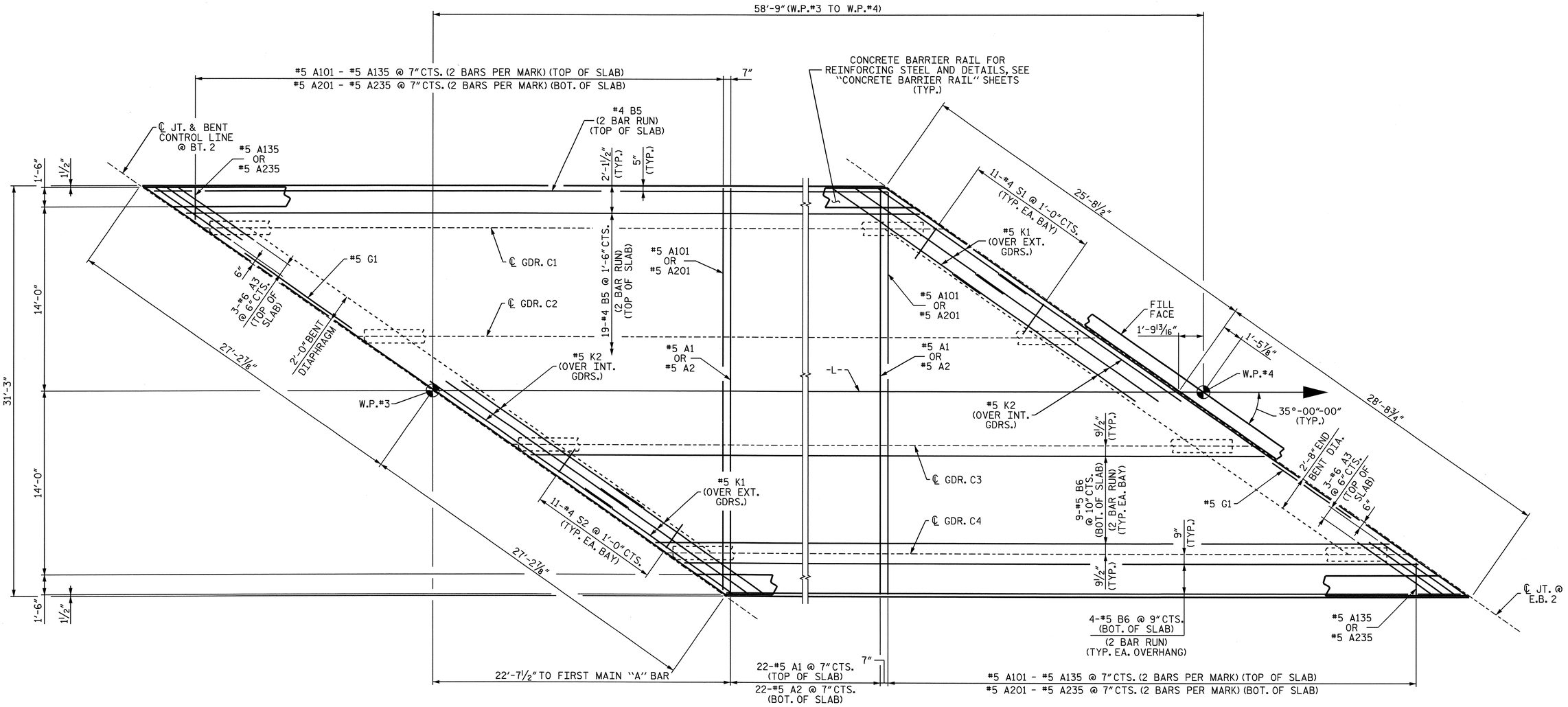

PLAN OF SPAN C

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN C

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : William T. Parker DATE : 12/16/08
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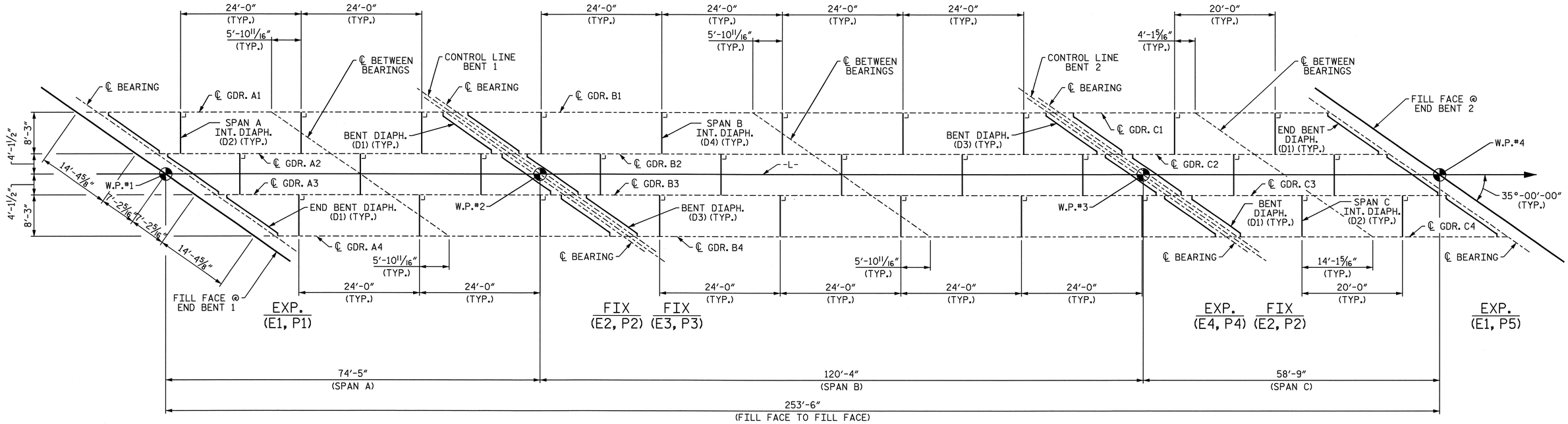

FRAMING PLAN

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
FRAMING PLAN

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11259 DAVID R. ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : William F. Parker DATE : 12/1/08
CHECKED BY : N.Q. TRAN DATE : 1-12-09

26-MAY-2009 15:43
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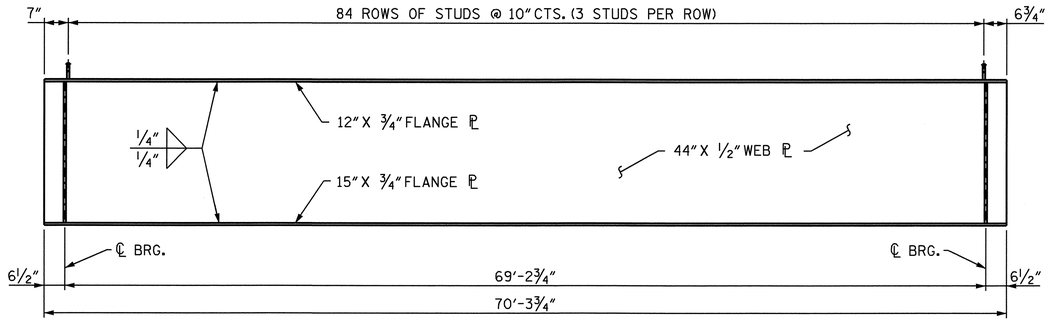
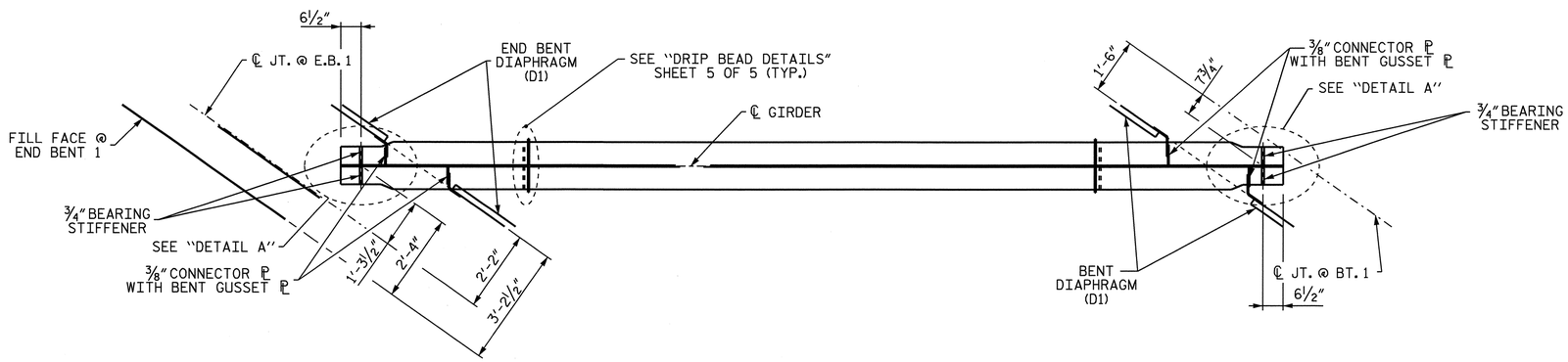


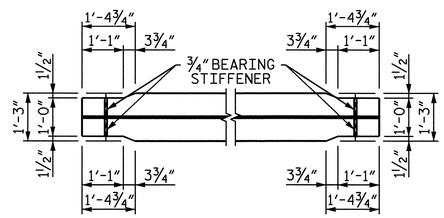
GIRDER ELEVATION

(SPAN A)



BOTTOM FLANGE DETAIL

(SPAN A)



DETAIL A

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

(SPAN A)

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : William T. Parker DATE : 12/16/08

CHECKED BY : N.Q. TRAN DATE : 1-12-09

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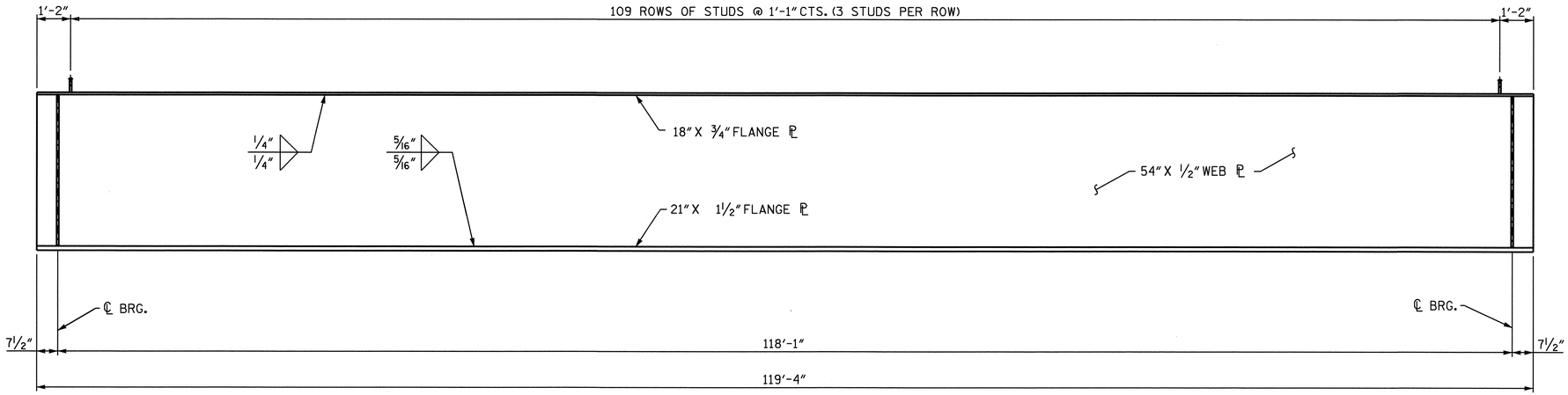
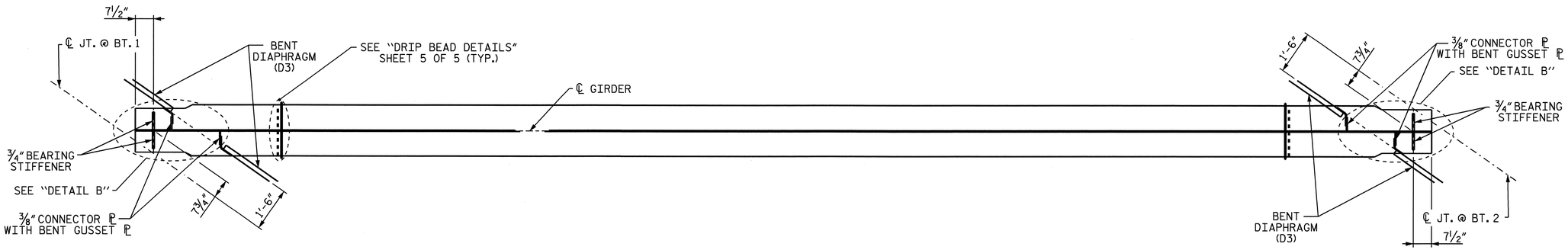


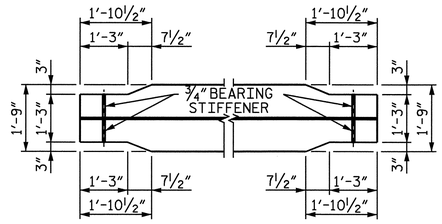
GIRDER ELEVATION

(SPAN B)



BOTTOM FLANGE DETAIL

(SPAN B)



DETAIL B

DRAWN BY : William T. Parker DATE : 12/16/08
CHECKED BY : N.Q. TRAN DATE : 1-12-09

13-APR-2009 14:05
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NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

SHEET 2 OF 5

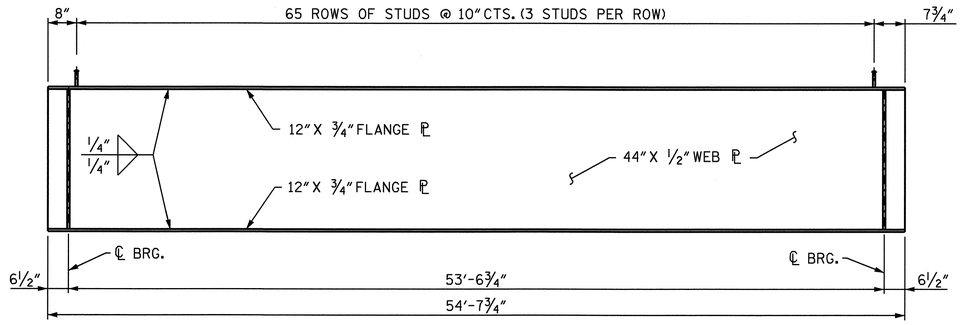
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

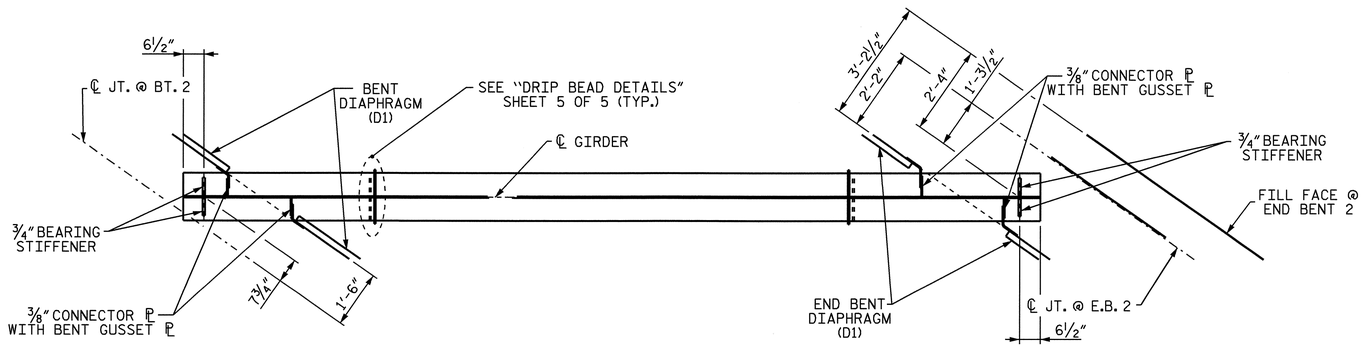
(SPAN B)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-46
1			3			TOTAL SHEETS
2			4			70



GIRDER ELEVATION

(SPAN C)



BOTTOM FLANGE DETAIL

(SPAN C)

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

(SPAN C)

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : William T. Parker DATE : 12/16/08
CHECKED BY : N.Q. TRAN DATE : 1-12-09

13-APR-2009 14:05
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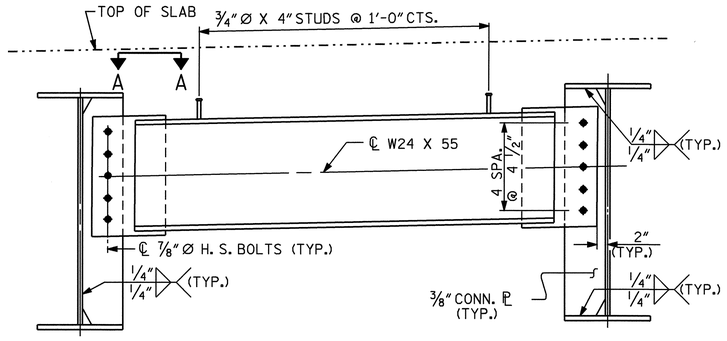
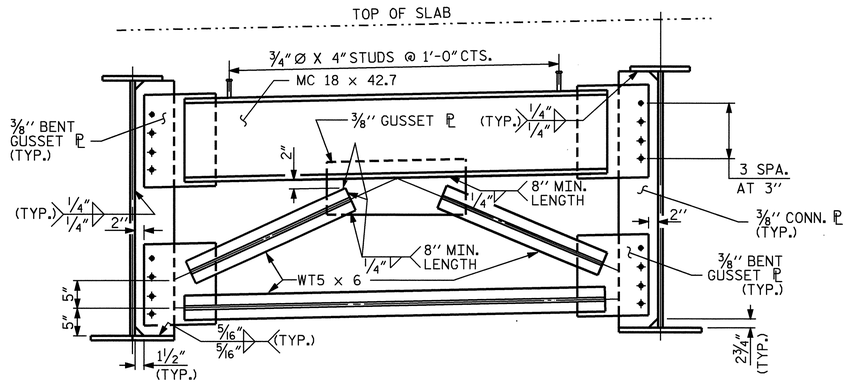


TYPICAL END BENT & BENT DIAPHRAGM (D1)



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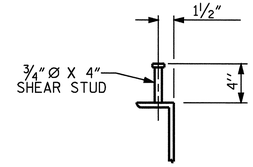

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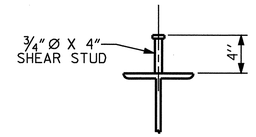
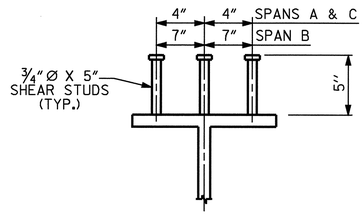
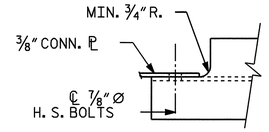


@ D1

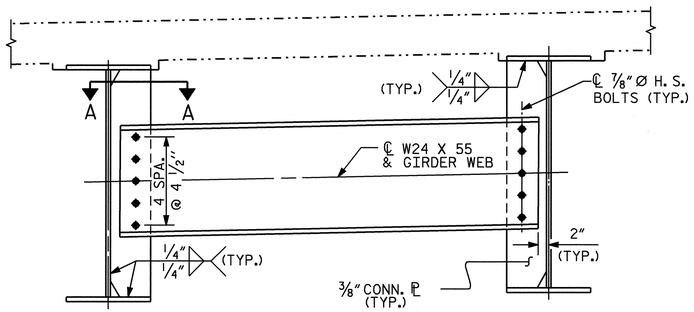


@ GIRDERS

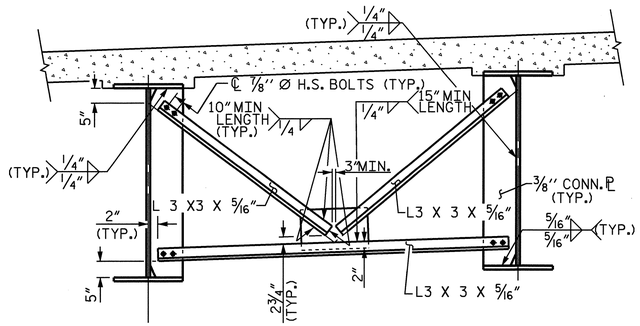
SHEAR STUD DETAILS



SECTION A-A



TYPICAL INTERMEDIATE DIAPHRAGM (D2)



TYPICAL INTERMEDIATE DIAPHRAGM (D4)

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : William T. Parker DATE : 12/16/08
CHECKED BY : N.Q. TRAN DATE : 1-12-09

13-APR-2009 14:06
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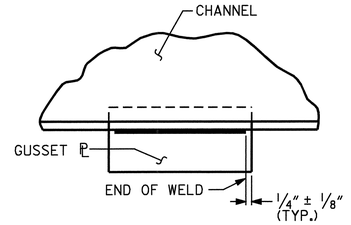
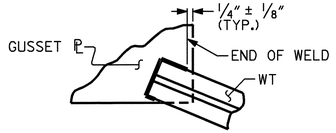
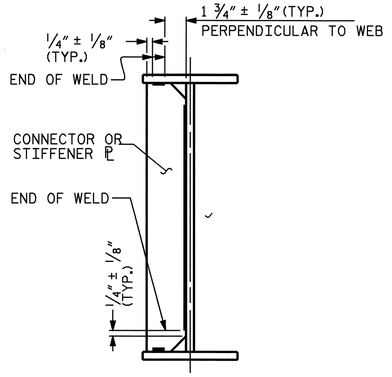


TYPICAL GUSSET PLATE CONNECTION

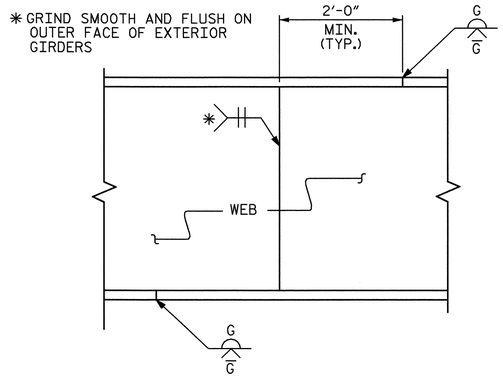


TYPICAL "TEE" TO GUSSET PLATE CONNECTION



TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTIONS

WELD TERMINATION DETAILS



ELEVATION

PERMISSIBLE SHOP FLANGE & WEB SPLICE

NOTES

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 4 OF ARTICLE 442-7 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

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

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

STIFFENERS ARE NOT REQUIRED ON THE OUTSIDE OF EXTERIOR GIRDERS.

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

A CHARPY V-NOTCH TEST IS REQUIRED FOR WEB PLATES, BOTTOM FLANGE PLATES, BOTTOM FLANGE SPLICE PLATES AND WEB SPLICE PLATES (IF USED) FOR ALL GIRDERS AND IN ACCORDANCE WITH ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

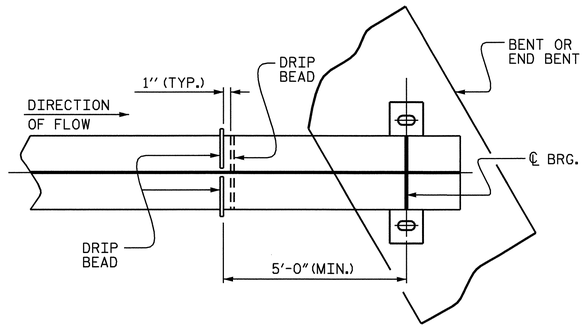
SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6" MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

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

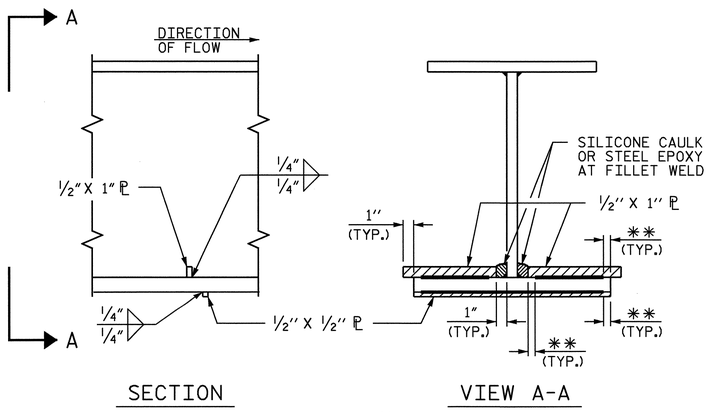
TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF BEAMS AND GIRDERS SHALL BE PLUMB.

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



PART PLAN - BOTTOM FLANGE
(DIAPHRAGM NOT SHOWN FOR CLARITY)

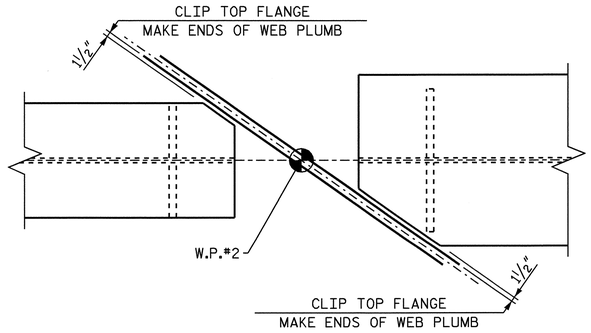


SECTION

VIEW A-A

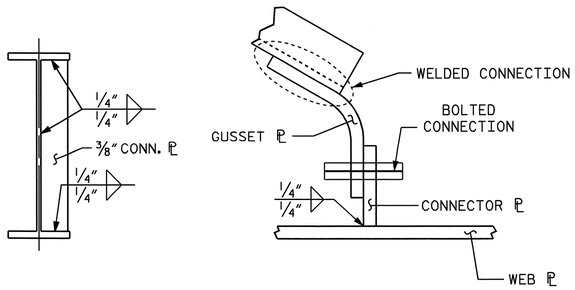
** SEE WELD TERMINATION DETAILS

DRIP BEAD DETAILS

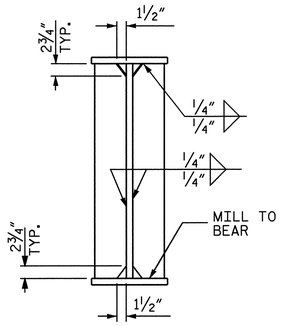


TOP FLANGE CLIP DETAIL

(TOP FLANGES AT BENT 1 SHOWN, BENT 2 SIMILAR)



BENT GUSSET PLATE DETAIL



BEARING STIFFENER

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			70

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
5/29/09

DRAWN BY : William F. Parker DATE : 12/16/08
CHECKED BY : N.Q. TRAN DATE : 1-12-09

26-MAY-2009 15:41
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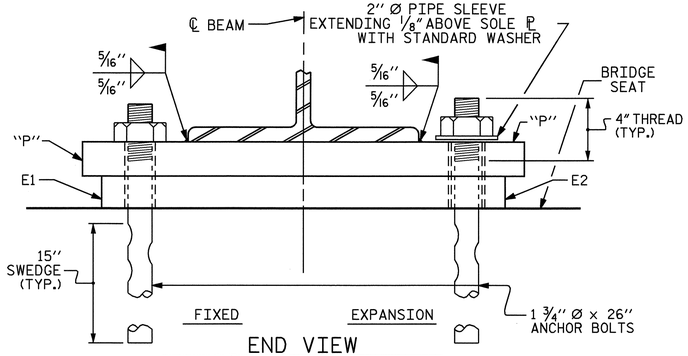
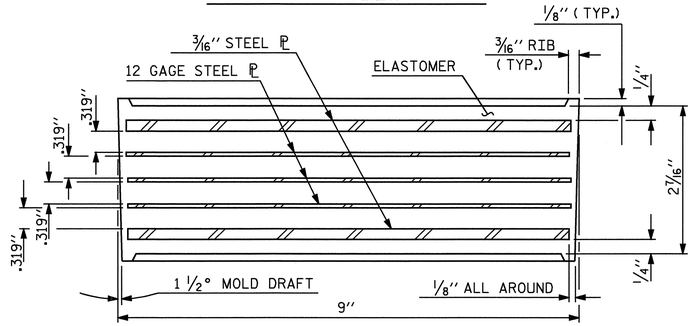


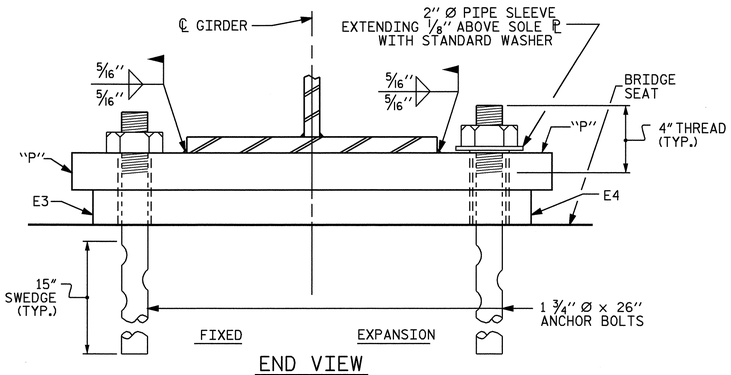
END VIEW



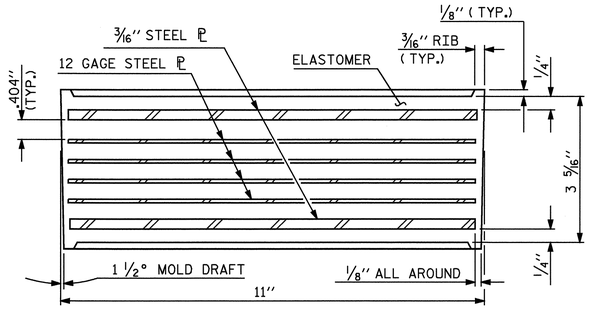
TYPICAL SECTION OF ELASTOMERIC BEARINGS

PLAN VIEW OF ELASTOMERIC BEARING

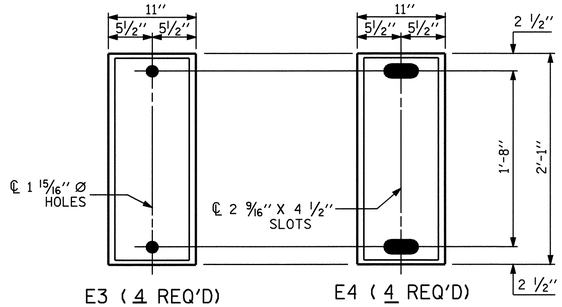
TYPE II



END VIEW



TYPICAL SECTION OF ELASTOMERIC BEARING



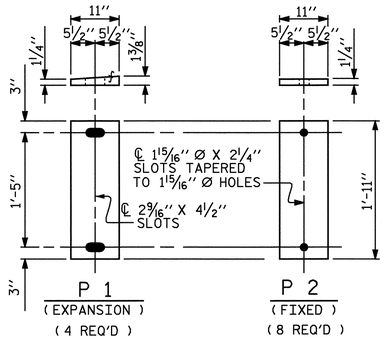
PLAN VIEW OF ELASTOMERIC BEARING

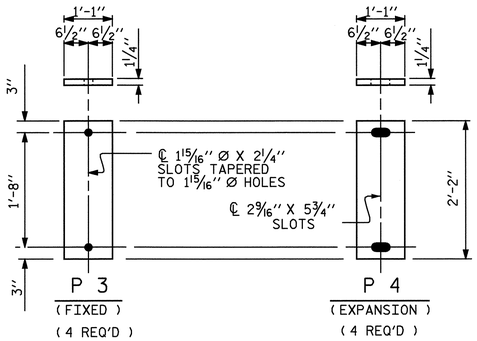
TYPE IV

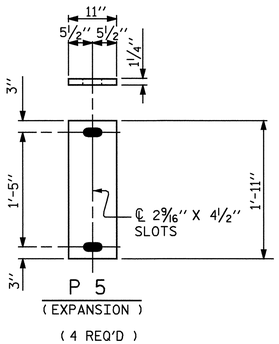
UP STATION

SOLE ℙ ("P")

SOLE ℙ 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.

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

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

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

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

—LOAD RATINGS—

	MAX.D.L.+L.L.
TYPE II	119 K
TYPE IV	184 K

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

(STEEL SUPERSTRUCTURE)

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : N. Q. TRAN DATE : 12-5-08
CHECKED BY : J. A. TILLMAN DATE : 1-28-09

13-APR-2009 14:11
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SPAN A

DEAD LOAD DEFLECTION TABLE FOR EXTERIOR GIRDERS A1 AND A4

TENTH POINTS	℄ BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.006	0.011	0.015	0.018	0.019	0.018	0.015	0.011	0.006	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.033	0.063	0.087	0.101	0.107	0.101	0.087	0.063	0.033	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.003	0.006	0.009	0.010	0.011	0.010	0.009	0.006	0.003	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.042	0.080	0.111	0.129	0.137	0.129	0.111	0.080	0.042	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.018	0.033	0.043	0.049	0.051	0.049	0.043	0.033	0.018	0.000
ORDINATE DUE TO SUPERELEVATION ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0	3/4"	1 3/8"	1 7/8"	2 1/8"	2 1/4"	2 1/8"	1 7/8"	1 3/8"	3/4"	0

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

SPAN A

DEAD LOAD DEFLECTION TABLE FOR INTERIOR GIRDERS A2 AND A3

TENTH POINTS	℄ BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.006	0.011	0.015	0.018	0.019	0.018	0.015	0.011	0.006	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.036	0.068	0.093	0.109	0.115	0.109	0.093	0.068	0.036	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.003	0.006	0.008	0.010	0.010	0.010	0.008	0.006	0.003	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.045	0.085	0.116	0.137	0.144	0.137	0.116	0.085	0.045	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.018	0.033	0.043	0.049	0.051	0.049	0.043	0.033	0.018	0.000
ORDINATE DUE TO SUPERELEVATION ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0	3/4"	1 1/16"	1 15/16"	2 1/4"	2 5/16"	2 1/4"	1 15/16"	1 1/16"	3/4"	0

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

SPAN C

DEAD LOAD DEFLECTION TABLE FOR EXTERIOR GIRDERS C1 AND C4

TENTH POINTS	℄ BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.002	0.004	0.006	0.007	0.007	0.007	0.006	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.013	0.025	0.034	0.040	0.042	0.040	0.034	0.025	0.013	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.001	0.003	0.003	0.004	0.004	0.004	0.003	0.003	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.016	0.032	0.043	0.051	0.053	0.051	0.043	0.032	0.016	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.011	0.020	0.026	0.030	0.031	0.030	0.026	0.020	0.011	0.000
ORDINATE DUE TO SUPERELEVATION ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0	5/16"	5/8"	13/16"	1"	1"	1"	13/16"	5/8"	5/16"	0

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

SPAN C

DEAD LOAD DEFLECTION TABLE FOR INTERIOR GIRDERS C2 AND C3

TENTH POINTS	℄ BRG.	.10	.20	.30	.40	.50	.60	.70	.80	.90	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.002	0.004	0.006	0.007	0.007	0.007	0.006	0.004	0.002	0.000
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0.000	0.014	0.027	0.037	0.043	0.045	0.043	0.037	0.027	0.014	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.001	0.002	0.003	0.004	0.004	0.004	0.003	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.017	0.033	0.046	0.054	0.056	0.054	0.046	0.033	0.017	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.011	0.020	0.026	0.029	0.031	0.029	0.026	0.020	0.011	0.000
ORDINATE DUE TO SUPERELEVATION ↑	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
REQUIRED CAMBER ↑	0	5/16"	5/8"	7/8"	1"	1 1/16"	1"	7/8"	5/8"	5/16"	0

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

ASSEMBLED BY : N. Q. TRAN DATE : 12-1-08
CHECKED BY : J. A. TILLMAN DATE : 1-9-09

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NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION -SPAN A & C-

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			70

SPAN B

DEAD LOAD DEFLECTION TABLE FOR EXTERIOR GIRDERS B1 AND B4

TWENTIETH POINTS	℄ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.016	0.031	0.045	0.058	0.070	0.079	0.087	0.093	0.097	0.098	0.097	0.093	0.087	0.079	0.070	0.058	0.045	0.031	0.016	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.035	0.081	0.125	0.164	0.200	0.229	0.253	0.271	0.281	0.285	0.281	0.271	0.253	0.229	0.200	0.164	0.125	0.081	0.035	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.006	0.011	0.016	0.021	0.025	0.029	0.032	0.034	0.035	0.036	0.035	0.034	0.032	0.029	0.025	0.021	0.016	0.011	0.006	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.057	0.123	0.186	0.243	0.295	0.337	0.372	0.398	0.413	0.419	0.413	0.398	0.372	0.337	0.295	0.243	0.186	0.123	0.057	0
VERTICAL CURVE ORDINATE ↑	0	0.028	0.053	0.075	0.094	0.111	0.124	0.134	0.142	0.146	0.148	0.146	0.142	0.134	0.124	0.111	0.094	0.075	0.053	0.028	0
ORDINATE DUE TO SUPERELEVATION ↑	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
REQUIRED CAMBER ↑	0	1''	2 1/8''	3/8''	4 1/16''	4 7/8''	5 9/16''	6 1/16''	6 1/2''	6 11/16''	6 13/16''	6 11/16''	6 1/2''	6 1/16''	5 9/16''	4 7/8''	4 1/16''	3/8''	2 1/8''	1''	0

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

SPAN B

DEAD LOAD DEFLECTION TABLE FOR INTERIOR GIRDERS B2 AND B3

TWENTIETH POINTS	℄ BRG.	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	℄ BRG.
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0	0.016	0.031	0.045	0.058	0.070	0.079	0.087	0.093	0.097	0.098	0.097	0.093	0.087	0.079	0.070	0.058	0.045	0.031	0.016	0
DEFLECTION DUE TO WEIGHT OF SLAB * ↓	0	0.033	0.078	0.119	0.157	0.191	0.228	0.243	0.260	0.270	0.273	0.270	0.260	0.243	0.228	0.191	0.157	0.119	0.078	0.033	0
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0	0.006	0.011	0.016	0.020	0.025	0.029	0.031	0.033	0.034	0.034	0.034	0.033	0.031	0.029	0.025	0.020	0.016	0.011	0.006	0
TOTAL DEAD LOAD DEFLECTION ↓	0	0.055	0.120	0.180	0.235	0.286	0.327	0.361	0.386	0.401	0.405	0.401	0.386	0.361	0.327	0.286	0.235	0.180	0.120	0.055	0
VERTICAL CURVE ORDINATE ↑	0	0.028	0.053	0.075	0.094	0.111	0.124	0.134	0.142	0.146	0.148	0.146	0.142	0.134	0.124	0.111	0.094	0.075	0.053	0.028	0
ORDINATE DUE TO SUPERELEVATION ↑	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0
REQUIRED CAMBER ↑	0	1''	2 1/16''	3/16''	3 15/16''	4 3/4''	5 1/16''	5 15/16''	6 5/16''	6 9/16''	6 5/8''	6 9/16''	6 5/16''	5 15/16''	5 1/16''	4 3/4''	3 15/16''	3/16''	2 1/16''	1''	0

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

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION
-SPAN B-

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : N. Q. TRAN DATE : 12-1-08
CHECKED BY : J. A. TILLMAN DATE : 1-9-09

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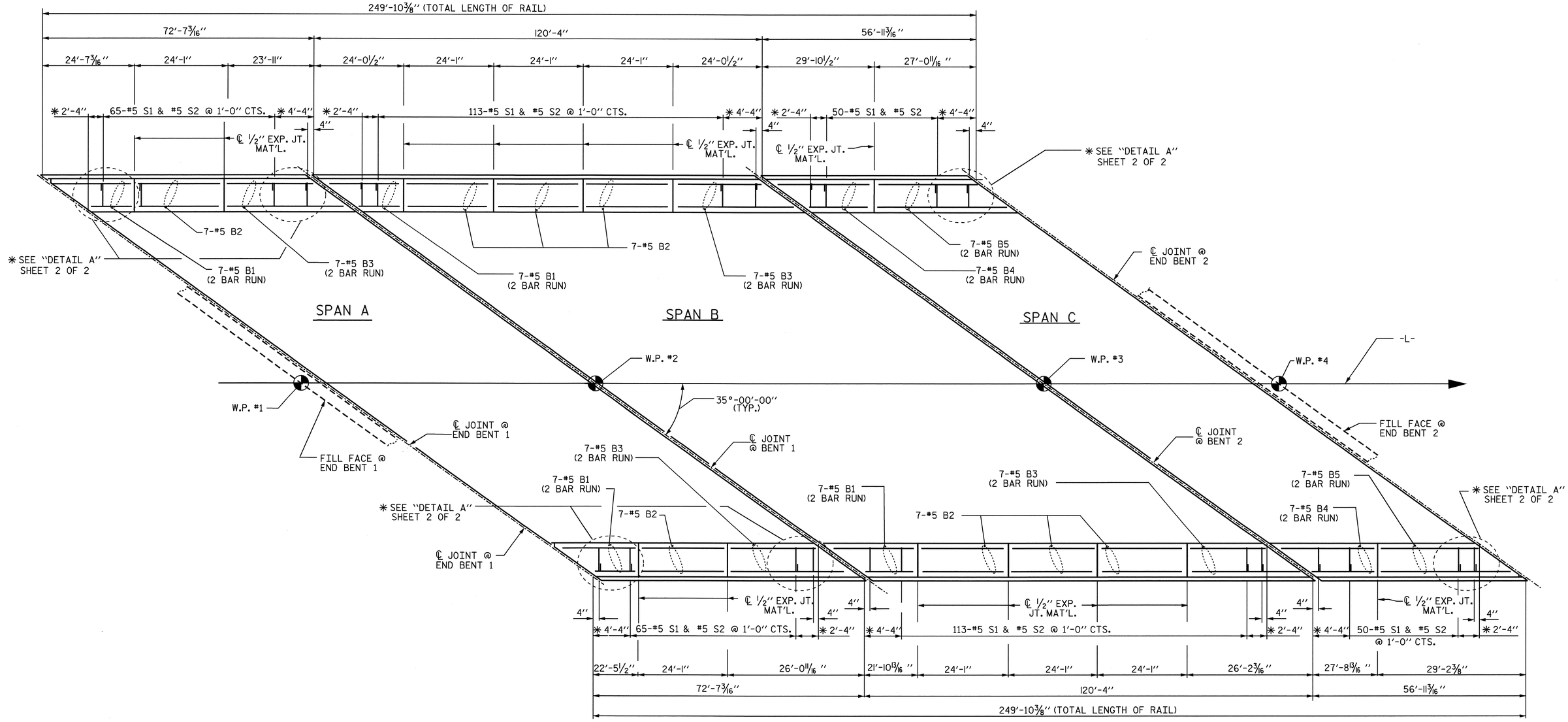

PLAN

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : N. Q. TRAN DATE : 12-9-08
CHECKED BY : J. A. TILLMAN DATE : 1-29-09

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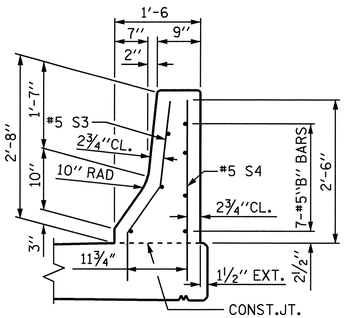
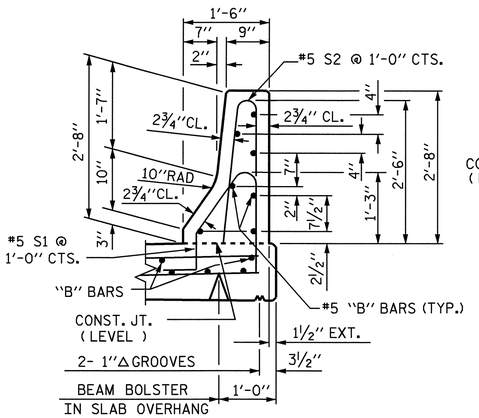
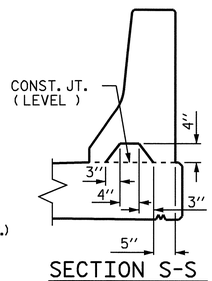


END VIEW



SECTION THRU RAIL



SECTION S-S

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

NOTES

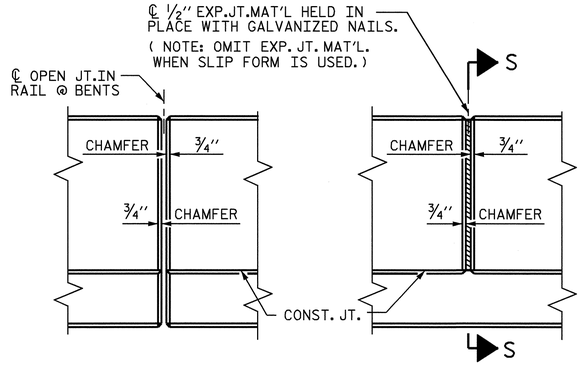
THE BARRIER RAIL IN EACH SPAN SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT SPAN HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

WHEN EVAZOTE JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

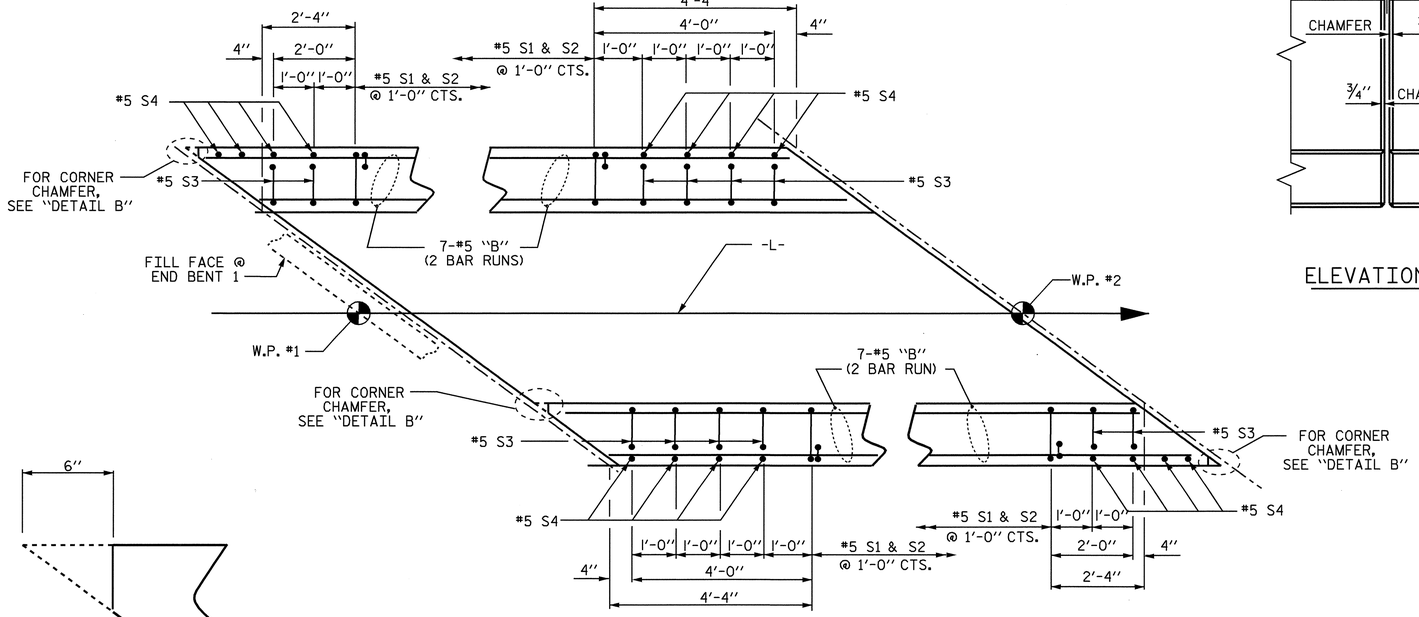
ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3 AND #5 S4 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3 AND #5 S4 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

VERTICAL 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.

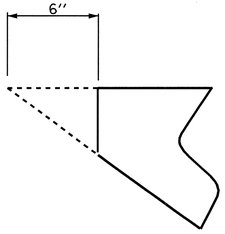


ELEVATION AT EXPANSION JOINTS



DETAIL A

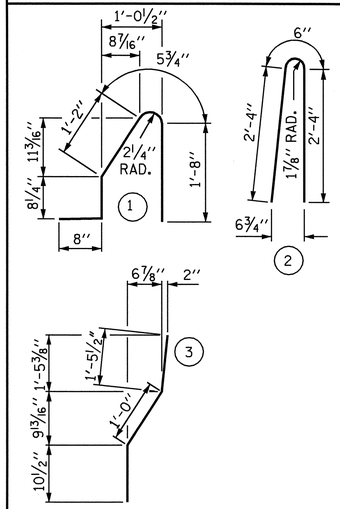
(DETAIL @ SPAN A SHOWN; DETAIL @ SPANS B &C SIMILAR)



DETAIL B

CORNER CHAMFER

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	56	#5	STR	13'-7''	793
✳ B2	56	#5	STR	23'-8''	1382
✳ B3	56	#5	STR	14'-4''	837
✳ B4	28	#5	STR	16'-4''	477
✳ B5	28	#5	STR	16'-0''	467
✳ S1	456	#5	1	4'-8''	2220
✳ S2	456	#5	2	5'-2''	2457
✳ S3	36	#5	3	3'-4''	125
✳ S4	48	#5	STR	3'-2''	159

✳ EPOXY COATED REINFORCING STEEL	LBS.	8,917
CLASS AA CONCRETE	CU. YDS.	50.1
CONCRETE BARRIER RAIL	LN. FT.	499.73

SPLICE LENGTH

BAR	SIZE	SPLICE
''B''	#5	3'-5''

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-54
1			3			TOTAL SHEETS 70
2			4			

ASSEMBLED BY : N. Q. TRAN DATE : 12-9-08
CHECKED BY : J. A. TILLMAN DATE : 1-29-09

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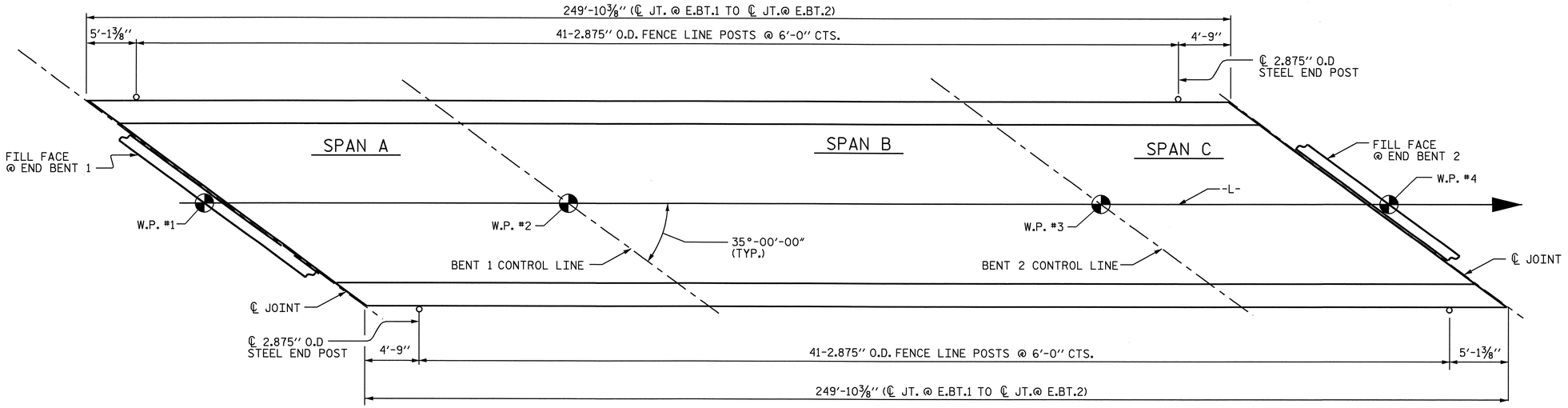
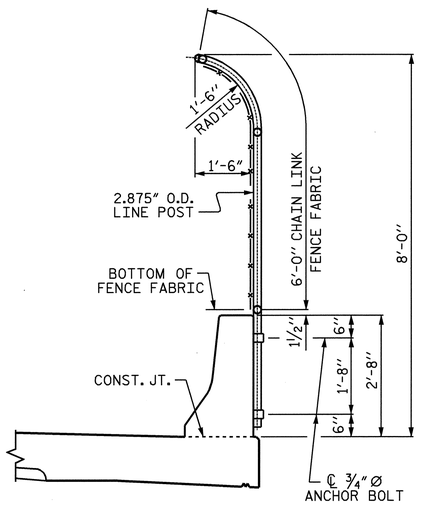
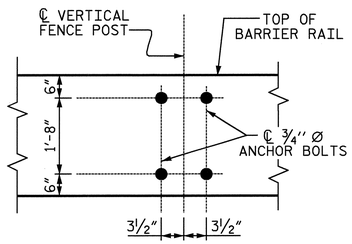
BARRIER RAIL DETAILS

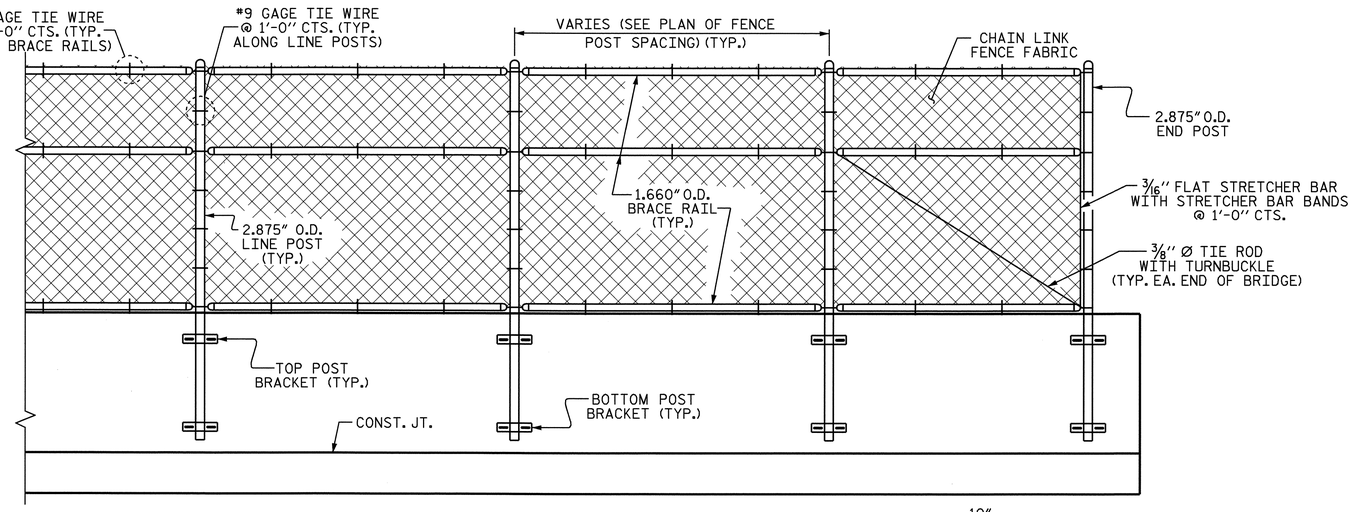




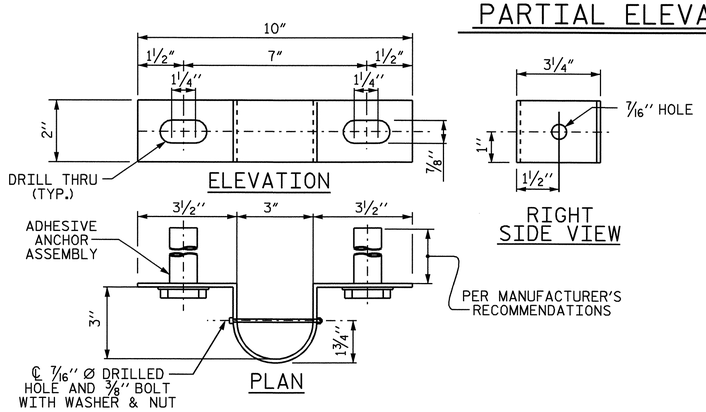
SECTION THRU FENCE



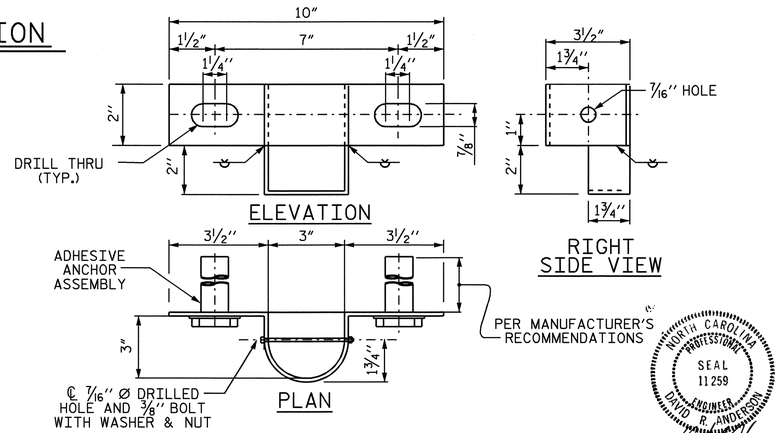
BOLT SETTING DETAIL



PARTIAL ELEVATION



TOP POST BRACKET



BOTTOM POST BRACKET

NOTES

FOR BRIDGE MOUNTED CHAIN LINK FENCE, SEE SPECIAL PROVISIONS.

MATERIAL FOR ANCHOR BOLTS SHALL BE TYPE 304 STAINLESS STEEL WITH A MINIMUM 9000 PSI ULTIMATE STRENGTH. NUTS AND WASHERS SHALL BE TYPE 304 STAINLESS STEEL. ANCHOR BOLTS SHALL BE EMBEDDED AS PER ADHESIVE BONDING SYSTEM MANUFACTURER SPECIFICATIONS. NUTS SHALL BE AMERICAN STANDARD FINISHED HEXAGON THICK NUTS, CLASS 2B THREADS.

FOR SETTING ANCHOR BOLTS, THE CONTRACTOR SHALL USE AN ADHESIVE BONDING SYSTEM. SEE SPECIAL PROVISIONS FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS. LEVEL ONE FIELD TESTING OF BONDING SYSTEM IS REQUIRED.

ALL FENCE MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 1050 OF THE STANDARD SPECIFICATIONS, GALVANIZE ALL STEEL PARTS AND HARDWARE IN ACCORDANCE WITH ARTICLE 1076 OF THE STANDARD SPECIFICATIONS.

FENCE POST LOCATIONS SHALL BE SHIFTED, AS NECESSARY, TO MAINTAIN 1'-0" MINIMUM DISTANCE FROM ANCHOR BOLT TO JOINTS IN BARRIER RAIL.

WELDING SHALL BE DONE IN ACCORDANCE WITH ARTICLE 1072-20 OF STANDARD SPECIFICATIONS.

ADHESIVE BONDING SYSTEM SHALL HAVE MINIMUM PULLOUT STRENGTH OF 10 KIPS. THE ADHESIVE BONDING SYSTEM SHALL BE CHOSEN FROM THOSE ON THE NCDOT APPROVED PRODUCTS LIST.

TOTAL PAY LENGTH 480.0 LIN. FT.

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BRIDGE MOUNTED CHAIN LINK FENCE

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-55
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : N. Q. TRAN DATE : 12-9-08
CHECKED BY : J. A. TILLMAN DATE : 1-30-08

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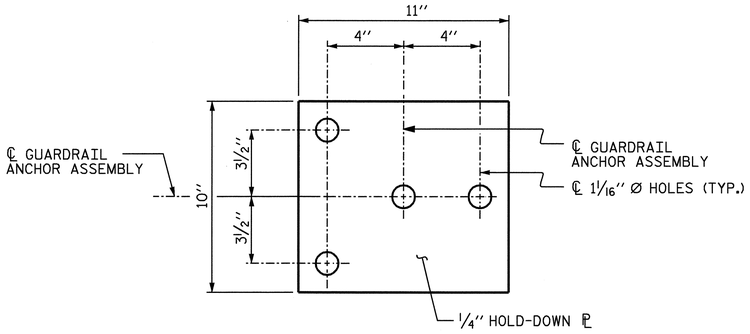
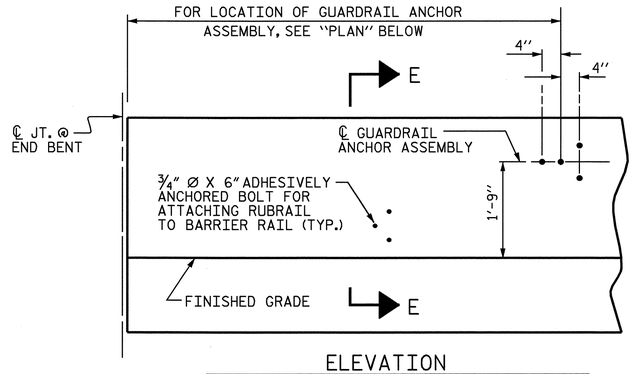
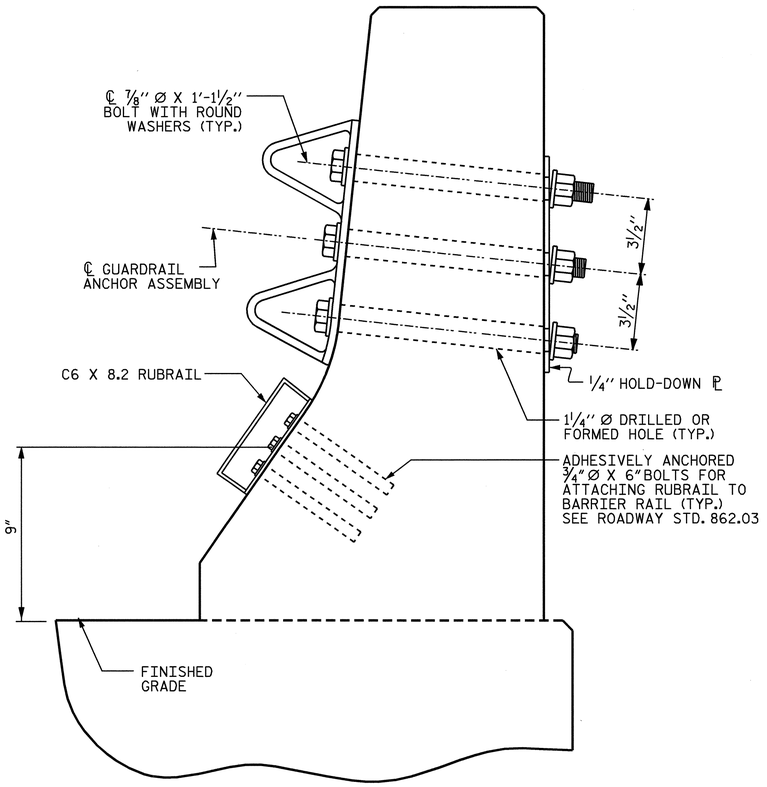


PLAN



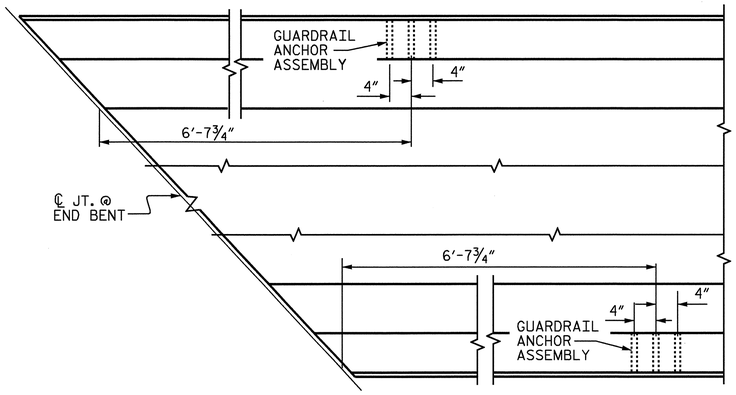
ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



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LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

NOTES

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

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

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

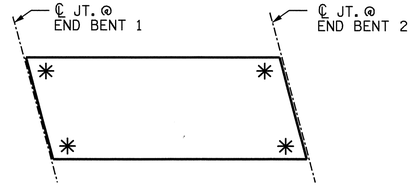
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GUARDRAIL ANCHORAGE FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : N. Q. TRAN DATE : 12-9-08
CHECKED BY : J. A. TILLMAN DATE : 1-29-09

13-APR-2009 14:14
V:\Structures\FINAL PLANS\08_B4410_SD_01_BR.dgn

BILL OF MATERIAL — SPAN A

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	48	#5	STR	30′-11	1548	A206	4	#5	STR	26′- 1″	109
A2	48	#5	STR	30′-11	1548	A207	4	#5	STR	25′- 4″	106
✳A3	6	#6	STR	7′- 0″	63	A208	4	#5	STR	24′- 6″	102
						A209	4	#5	STR	23′- 8″	99
✳A101	4	#5	STR	30′- 2″	126	A210	4	#5	STR	22′-10″	95
✳A102	4	#5	STR	29′- 5″	123	A211	4	#5	STR	22′- 0″	92
✳A103	4	#5	STR	28′- 7″	119	A212	4	#5	STR	21′- 3″	89
✳A104	4	#5	STR	27′- 9″	116	A213	4	#5	STR	20′- 5″	85
✳A105	4	#5	STR	26′-11″	112	A214	4	#5	STR	19′- 7″	82
✳A106	4	#5	STR	26′- 1″	109	A215	4	#5	STR	18′- 9″	78
✳A107	4	#5	STR	25′- 4″	106	A216	4	#5	STR	17′-11″	75
✳A108	4	#5	STR	24′- 6″	102	A217	4	#5	STR	17′- 2″	72
✳A109	4	#5	STR	23′- 8″	99	A218	4	#5	STR	16′- 4″	68
✳A110	4	#5	STR	22′-10″	95	A219	4	#5	STR	15′- 6″	65
✳A111	4	#5	STR	22′- 0″	92	A220	4	#5	STR	14′- 8″	61
✳A112	4	#5	STR	21′- 3″	89	A221	4	#5	STR	13′-10″	58
✳A113	4	#5	STR	20′- 5″	85	A222	4	#5	STR	13′- 0″	54
✳A114	4	#5	STR	19′- 7″	82	A223	4	#5	STR	12′- 3″	51
✳A115	4	#5	STR	18′- 9″	78	A224	4	#5	STR	11′- 5″	48
✳A116	4	#5	STR	17′-11″	75	A225	4	#5	STR	10′- 7″	44
✳A117	4	#5	STR	17′- 2″	72	A226	4	#5	STR	9′- 9″	41
✳A118	4	#5	STR	16′- 4″	68	A227	4	#5	STR	8′-11″	37
✳A119	4	#5	STR	15′- 6″	65	A228	4	#5	STR	8′- 2″	34
✳A120	4	#5	STR	14′- 8″	61	A229	4	#5	STR	7′- 4″	31
✳A121	4	#5	STR	13′-10″	58	A230	4	#5	STR	6′- 6″	27
✳A122	4	#5	STR	13′- 0″	54	A231	4	#5	STR	5′- 8″	24
✳A123	4	#5	STR	12′- 3″	51	A232	4	#5	STR	4′-10″	20
✳A124	4	#5	STR	11′- 5″	48	A233	4	#5	STR	4′- 1″	17
✳A125	4	#5	STR	10′- 7″	44	A234	4	#5	STR	3′- 3″	14
✳A126	4	#5	STR	9′- 9″	41	A235	4	#5	STR	2′- 5″	10
✳A127	4	#5	STR	8′-11″	37						
✳A128	4	#5	STR	8′- 2″	34	✳B1	63	#4	STR	25′- 4″	1066
✳A129	4	#5	STR	7′- 4″	31	B2	70	#5	STR	37′- 0″	2701
✳A130	4	#5	STR	6′- 6″	27						
✳A131	4	#5	STR	5′- 8″	24	✳G1	2	#5	STR	53′-10″	112
✳A132	4	#5	STR	4′-10″	20						
✳A133	4	#5	STR	4′- 1″	17	✳K1	12	#5	1	14′- 7″	183
✳A134	4	#5	STR	3′- 3″	14	✳K2	12	#5	2	18′- 6″	232
✳A135	4	#5	STR	2′- 5″	10						
						✳S1	33	#4	3	4′- 8″	103
A201	4	#5	STR	30′- 2″	126	✳S2	33	#4	3	4′- 0″	88
A202	4	#5	STR	29′- 5″	123						
A203	4	#5	STR	28′- 7″	119	REINFORCING STEEL = 6633 LBS					
A204	4	#5	STR	27′- 9″	116	✳EPOXY COATED					
A205	4	#5	STR	26′-11″	112	REINFORCING STEEL = 5779 LBS					

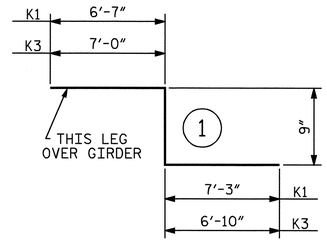
BILL OF MATERIAL — SPAN B

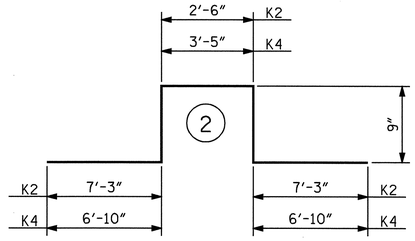
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	130	#5	STR	30′-11	4192	A206	4	#5	STR	26′- 1″	109
A2	130	#5	STR	30′-11	4192	A207	4	#5	STR	25′- 4″	106
✳A3	6	#6	STR	7′- 0″	63	A208	4	#5	STR	24′- 6″	102
						A209	4	#5	STR	23′- 8″	99
✳A101	4	#5	STR	30′- 2″	126	A210	4	#5	STR	22′-10″	95
✳A102	4	#5	STR	29′- 5″	123	A211	4	#5	STR	22′- 0″	92
✳A103	4	#5	STR	28′- 7″	119	A212	4	#5	STR	21′- 3″	89
✳A104	4	#5	STR	27′- 9″	116	A213	4	#5	STR	20′- 5″	85
✳A105	4	#5	STR	26′-11″	112	A214	4	#5	STR	19′- 7″	82
✳A106	4	#5	STR	26′- 1″	109	A215	4	#5	STR	18′- 9″	78
✳A107	4	#5	STR	25′- 4″	106	A216	4	#5	STR	17′-11″	75
✳A108	4	#5	STR	24′- 6″	102	A217	4	#5	STR	17′- 2″	72
✳A109	4	#5	STR	23′- 8″	99	A218	4	#5	STR	16′- 4″	68
✳A110	4	#5	STR	22′-10″	95	A219	4	#5	STR	15′- 6″	65
✳A111	4	#5	STR	22′- 0″	92	A220	4	#5	STR	14′- 8″	61
✳A112	4	#5	STR	21′- 3″	89	A221	4	#5	STR	13′-10″	58
✳A113	4	#5	STR	20′- 5″	85	A222	4	#5	STR	13′- 0″	54
✳A114	4	#5	STR	19′- 7″	82	A223	4	#5	STR	12′- 3″	51
✳A115	4	#5	STR	18′- 9″	78	A224	4	#5	STR	11′- 5″	48
✳A116	4	#5	STR	17′-11″	75	A225	4	#5	STR	10′- 7″	44
✳A117	4	#5	STR	17′- 2″	72	A226	4	#5	STR	9′- 9″	41
✳A118	4	#5	STR	16′- 4″	68	A227	4	#5	STR	8′-11″	37
✳A119	4	#5	STR	15′- 6″	65	A228	4	#5	STR	8′- 2″	34
✳A120	4	#5	STR	14′- 8″	61	A229	4	#5	STR	7′- 4″	31
✳A121	4	#5	STR	13′-10″	58	A230	4	#5	STR	6′- 6″	27
✳A122	4	#5	STR	13′- 0″	54	A231	4	#5	STR	5′- 8″	24
✳A123	4	#5	STR	12′- 3″	51	A232	4	#5	STR	4′-10″	20
✳A124	4	#5	STR	11′- 5″	48	A233	4	#5	STR	4′- 1″	17
✳A125	4	#5	STR	10′- 7″	44	A234	4	#5	STR	3′- 3″	14
✳A126	4	#5	STR	9′- 9″	41	A235	4	#5	STR	2′- 5″	10
✳A127	4	#5	STR	8′-11″	37						
✳A128	4	#5	STR	8′- 2″	34	✳B3	105	#4	STR	25′- 6″	1789
✳A129	4	#5	STR	7′- 4″	31	B4	105	#5	STR	41′- 2″	4508
✳A130	4	#5	STR	6′- 6″	27						
✳A131	4	#5	STR	5′- 8″	24	✳G1	2	#5	STR	53′-10″	112
✳A132	4	#5	STR	4′-10″	20						
✳A133	4	#5	STR	4′- 1″	17	✳K3	12	#5	1	14′- 7″	183
✳A134	4	#5	STR	3′- 3″	14	✳K4	12	#5	2	18′- 7″	233
✳A135	4	#5	STR	2′- 5″	10						
						✳S2	60	#4	3	4′- 0″	160
A201	4	#5	STR	30′- 2″	126						
A202	4	#5	STR	29′- 5″	123						
A203	4	#5	STR	28′- 7″	119	REINFORCING STEEL = 11084 LBS					
A204	4	#5	STR	27′- 9″	116	✳EPOXY COATED					
A205	4	#5	STR	26′-11″	112	REINFORCING STEEL = 9116 LBS					

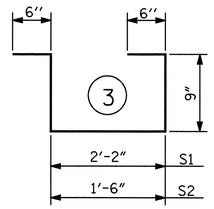
BILL OF MATERIAL — SPAN C

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	22	#5	STR	30′-11	709	A206	4	#5	STR	26′- 1″	109
A2	22	#5	STR	30′-11	709	A207	4	#5	STR	25′- 4″	106
✳A3	6	#6	STR	7′- 0″	63	A208	4	#5	STR	24′- 6″	102
						A209	4	#5	STR	23′- 8″	99
✳A101	4	#5	STR	30′- 2″	126	A210	4	#5	STR	22′-10″	95
✳A102	4	#5	STR	29′- 5″	123	A211	4	#5	STR	22′- 0″	92
✳A103	4	#5	STR	28′- 7″	119	A212	4	#5	STR	21′- 3″	89
✳A104	4	#5	STR	27′- 9″	116	A213	4	#5	STR	20′- 5″	85
✳A105	4	#5	STR	26′-11″	112	A214	4	#5	STR	19′- 7″	82
✳A106	4	#5	STR	26′- 1″	109	A215	4	#5	STR	18′- 9″	78
✳A107	4	#5	STR	25′- 4″	106	A216	4	#5	STR	17′-11″	75
✳A108	4	#5	STR	24′- 6″	102	A217	4	#5	STR	17′- 2″	72
✳A109	4	#5	STR	23′- 8″	99	A218	4	#5	STR	16′- 4″	68
✳A110	4	#5	STR	22′-10″	95	A219	4	#5	STR	15′- 6″	65
✳A111	4	#5	STR	22′- 0″	92	A220	4	#5	STR	14′- 8″	61
✳A112	4	#5	STR	21′- 3″	89	A221	4	#5	STR	13′-10″	58
✳A113	4	#5	STR	20′- 5″	85	A222	4	#5	STR	13′- 0″	54
✳A114	4	#5	STR	19′- 7″	82	A223	4	#5	STR	12′- 3″	51
✳A115	4	#5	STR	18′- 9″	78	A224	4	#5	STR	11′- 5″	48
✳A116	4	#5	STR	17′-11″	75	A225	4	#5	STR	10′- 7″	44
✳A117	4	#5	STR	17′- 2″	72	A226	4	#5	STR	9′- 9″	41
✳A118	4	#5	STR	16′- 4″	68	A227	4	#5	STR	8′-11″	37
✳A119	4	#5	STR	15′- 6″	65	A228	4	#5	STR	8′- 2″	34
✳A120	4	#5	STR	14′- 8″	61	A229	4	#5	STR	7′- 4″	31
✳A121	4	#5	STR	13′-10″	58	A230	4	#5	STR	6′- 6″	27
✳A122	4	#5	STR	13′- 0″	54	A231	4	#5	STR	5′- 8″	24
✳A123	4	#5	STR	12′- 3″	51	A232	4	#5	STR	4′-10″	20
✳A124	4	#5	STR	11′- 5″	48	A233	4	#5	STR	4′- 1″	17
✳A125	4	#5	STR	10′- 7″	44	A234	4	#5	STR	3′- 3″	14
✳A126	4	#5	STR	9′- 9″	41	A235	4	#5	STR	2′- 5″	10
✳A127	4	#5	STR	8′-11″	37						
✳A128	4	#5	STR	8′- 2″	34	✳B5	42	#4	STR	29′- 3″	821
✳A129	4	#5	STR	7′- 4″	31	B6	70	#5	STR	29′- 3″	2136
✳A130	4	#5	STR	6′- 6″	27						
✳A131	4	#5	STR	5′- 8″	24	✳G1	2	#5	STR	53′-10″	112
✳A132	4	#5	STR	4′-10″	20						
✳A133	4	#5	STR	4′- 1″	17	✳K1	12	#5	1	14′- 7″	183
✳A134	4	#5	STR	3′- 3″	14	✳K2	12	#5	2	18′- 6″	232
✳A135	4	#5	STR	2′- 5″	10						
						✳S1	33	#4	3	4′- 8″	103
A201	4	#5	STR	30′- 2″	126	✳S2	33	#4	3	4′- 0″	88
A202	4	#5	STR	29′- 5″	123						
A203	4	#5	STR	28′- 7″	119	REINFORCING STEEL = 5229 LBS					
A204	4	#5	STR	27′- 9″	116	✳EPOXY COATED					
A205	4	#5	STR	26′-11″	112	REINFORCING STEEL = 4695 LBS					

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT

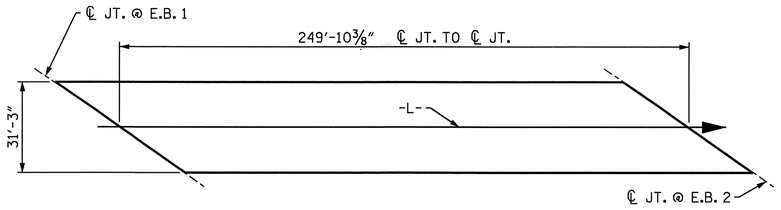
SUPERSTRUCTURE BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
SPAN "A"	64.1	6633	5779
SPAN "B"	106.3	11084	9116
SPAN "C"	50.3	5229	4695
TOTALS**	220.7	22946	19590

**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 OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 7808)

GROOVING BRIDGE FLOORS

APPROACH SLABS	685.5 SQ.FT.
BRIDGE DECK	6268.3 SQ.FT.
TOTAL	6953.8 SQ.FT.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
4/14/09

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			70

STD. NO. BOM1

ASSEMBLED BY : William T. Parker DATE : 12/1/08
CHECKED BY : N.Q. TRAN DATE : 1-12-09

DRAWN BY : JMB 5/87
CHECKED BY : SJD 9/87

REV. 6/1/94 EEM/GRP
REV. 8/16/99 RWW/LES
REV. 5/1/06 TLA/GM

13-APR-2009 11:20
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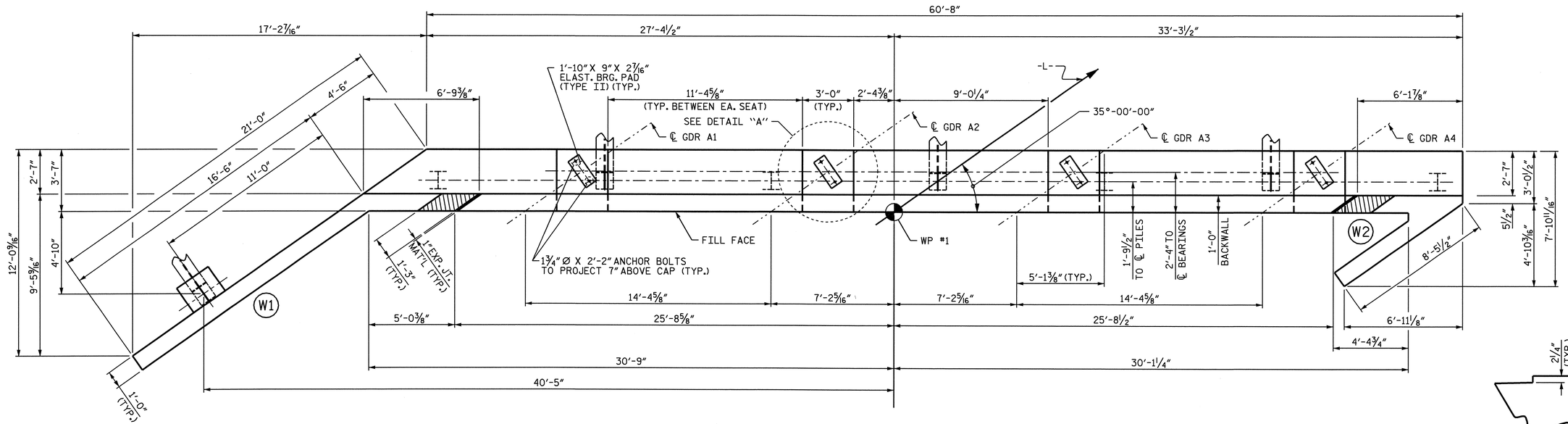
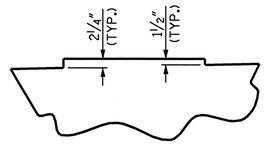
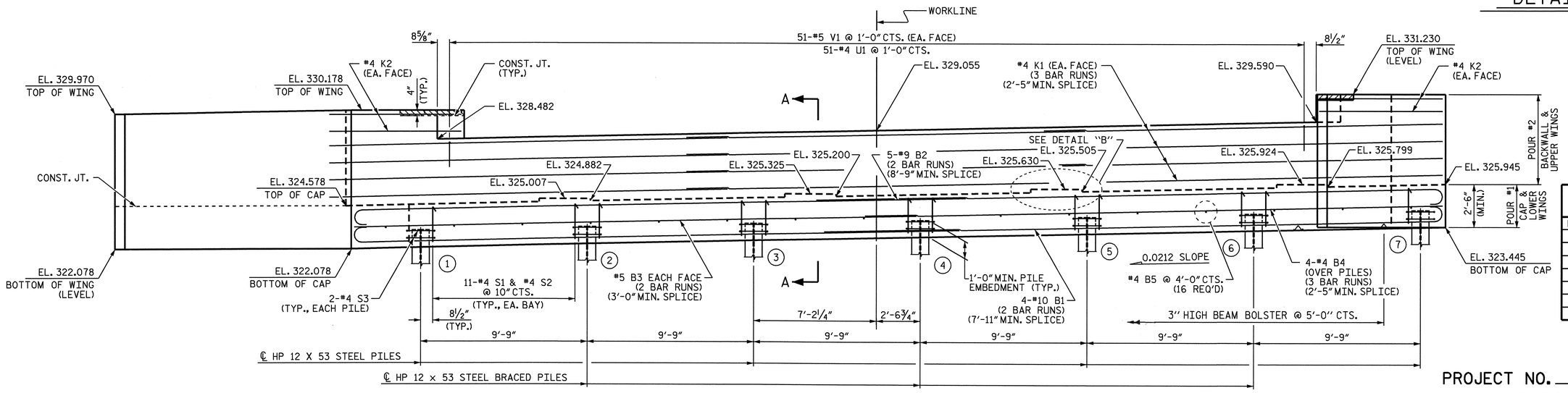


PLAN



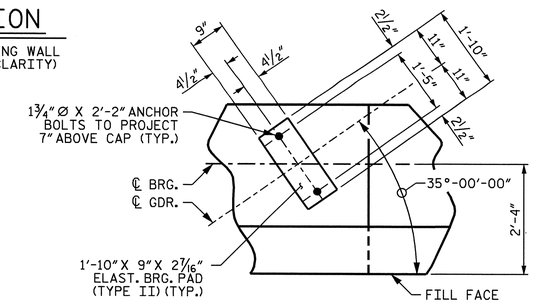
DETAIL "B"



ELEVATION

(BRACE PILE @ WING WALL NOT SHOWN FOR CLARITY)

TOP OF PILE ELEVATIONS	
PILE NO.	ELEVATION
1	323.170
2	323.354
3	323.561
4	323.769
5	323.976
6	324.183
7	324.420



DETAIL "A"

NORTH CAROLINA PROFESSIONAL SEAL 21545 ENGINEER STEVEN L WANCE

NOTES

STIRRUPS 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 CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

DRAWN BY : R. WITHROW DATE : 1/5/09
CHECKED BY : S. WANCE DATE : 1/28/09

04-MAR-2009 10:48
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drwithrow

PROJECT NO. B-4410

ANSON COUNTY

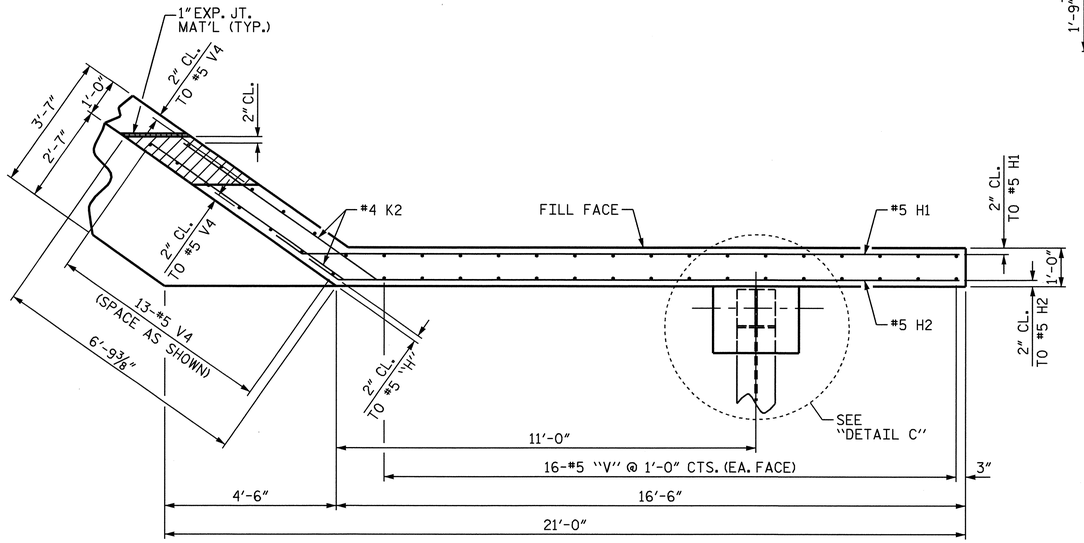
STATION: 15+21.87 -L-

SHEET 1 OF 3

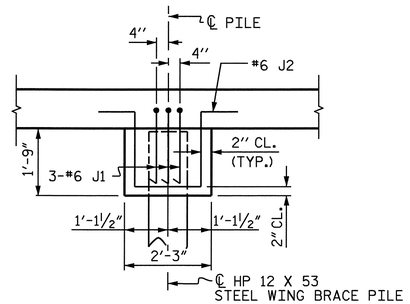
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

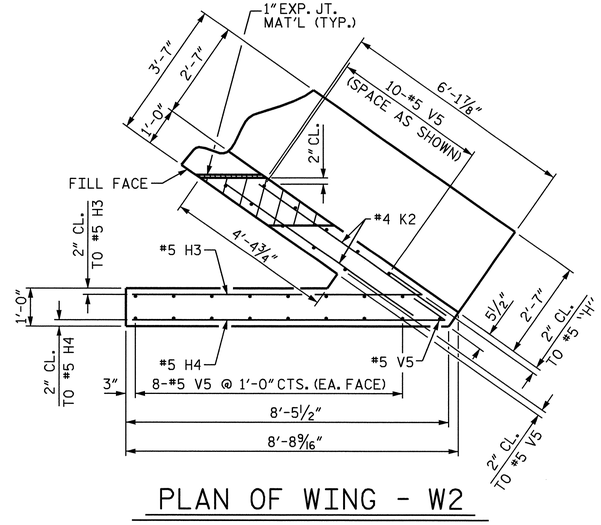
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			70



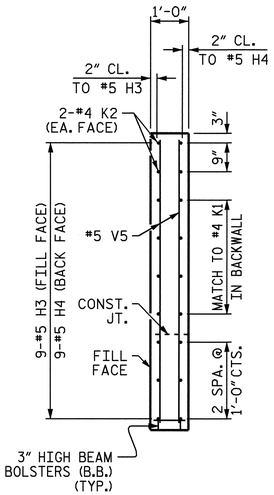
PLAN OF WING - W1



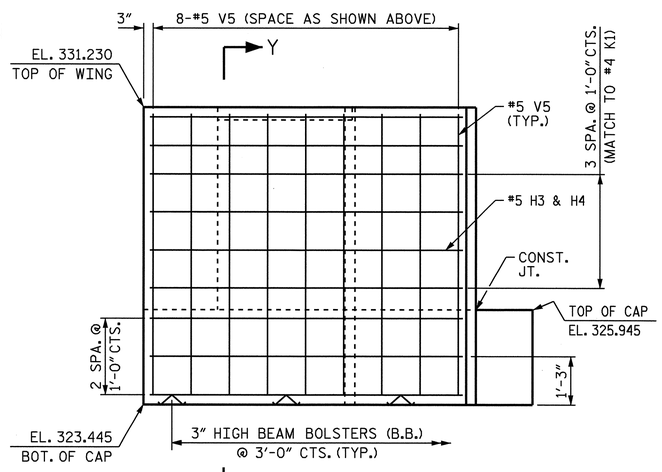
DETAIL C



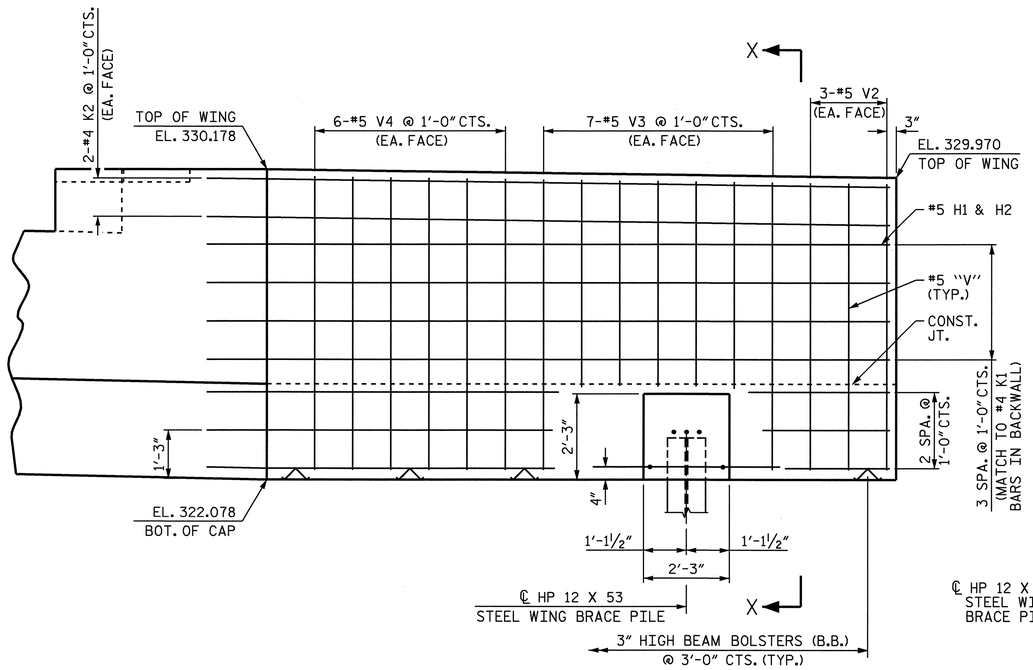
PLAN OF WING - W2



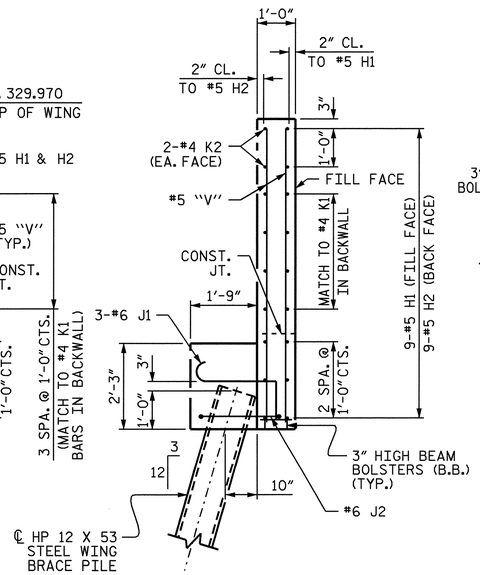
SECTION Y-Y



ELEVATION OF WING - W2



ELEVATION OF WING - W1



SECTION X-X

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 21545 ENGINEER STEVEN L. WANCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : R. WITHROW DATE : 1/5/09
CHECKED BY : S. WANCE DATE : 1/28/09

13-APR-2009 11:40
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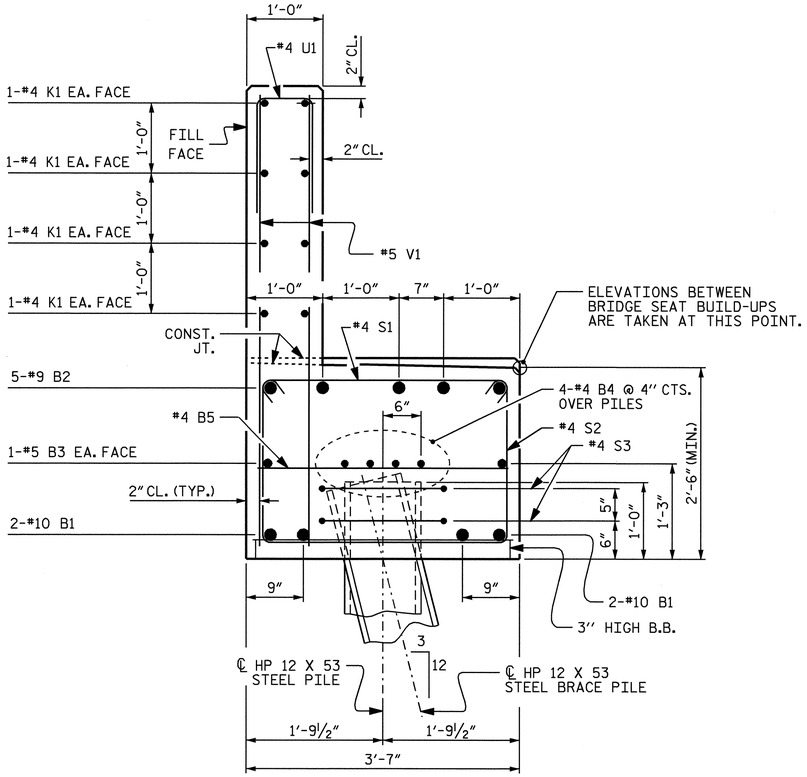


SECTION A-A

* PILE VERTICAL

* PILE HORIZONTAL OR VERTICAL

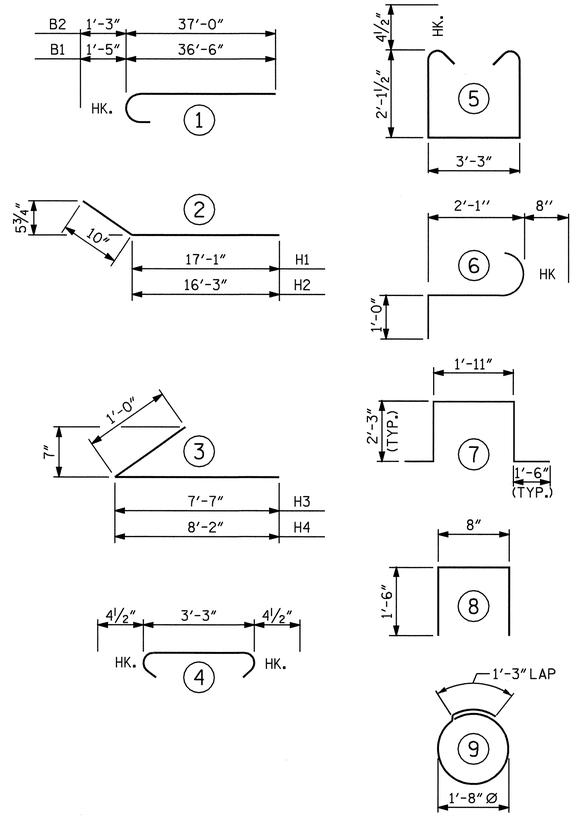
DETAIL A

DETAIL B

* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	37'-11"	1305
B2	10	#9	1	38'-3"	1301
B3	4	#5	STR	34'-0"	142
B4	12	#4	STR	22'-10"	183
B5	16	#4	STR	3'-3"	35
H1	9	#5	2	17'-11"	168
H2	9	#5	2	17'-1"	160
H3	9	#5	3	8'-7"	81
H4	9	#5	3	9'-2"	86
J1	3	#6	6	3'-9"	17
J2	1	#6	7	9'-5"	14
K1	24	#4	STR	23'-4"	374
K2	8	#4	STR	6'-0"	32
S1	66	#4	4	4'-0"	176
S2	66	#4	5	8'-3"	364
S3	14	#4	9	6'-6"	61
U1	51	#4	8	3'-8"	125
V1	102	#5	STR	5'-8"	603
V2	6	#5	STR	7'-5"	46
V3	14	#5	STR	7'-6"	110
V4	25	#5	STR	7'-7"	198
V5	27	#5	STR	7'-3"	204

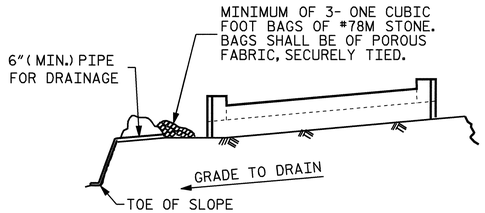
REINFORCING STEEL = 5785 LBS

CLASS A CONCRETE BREAKDOWN

POUR 1 - CAP AND LOWER WINGS & WING BRACE PILE CAP	23.2 C.Y.
POUR 2 - BACKWALL & UPPER PORTION OF WINGS	14.2 C.Y.
CLASS A CONCRETE TOTAL	37.4 C.Y.

HP 12 x 53 STEEL PILES

NO. 8 LIN. FT. = 480.0

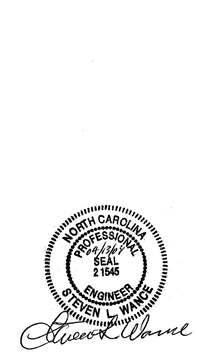


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : R. WITHROW DATE : 1/5/09
CHECKED BY : S. WANCE DATE : 1/28/09

13-APR-2009 11:40
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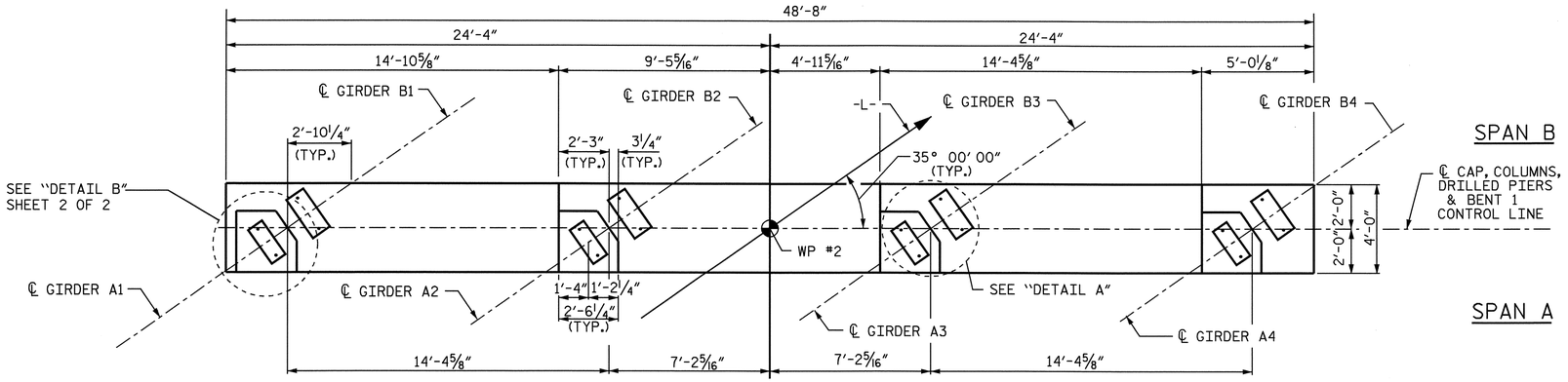
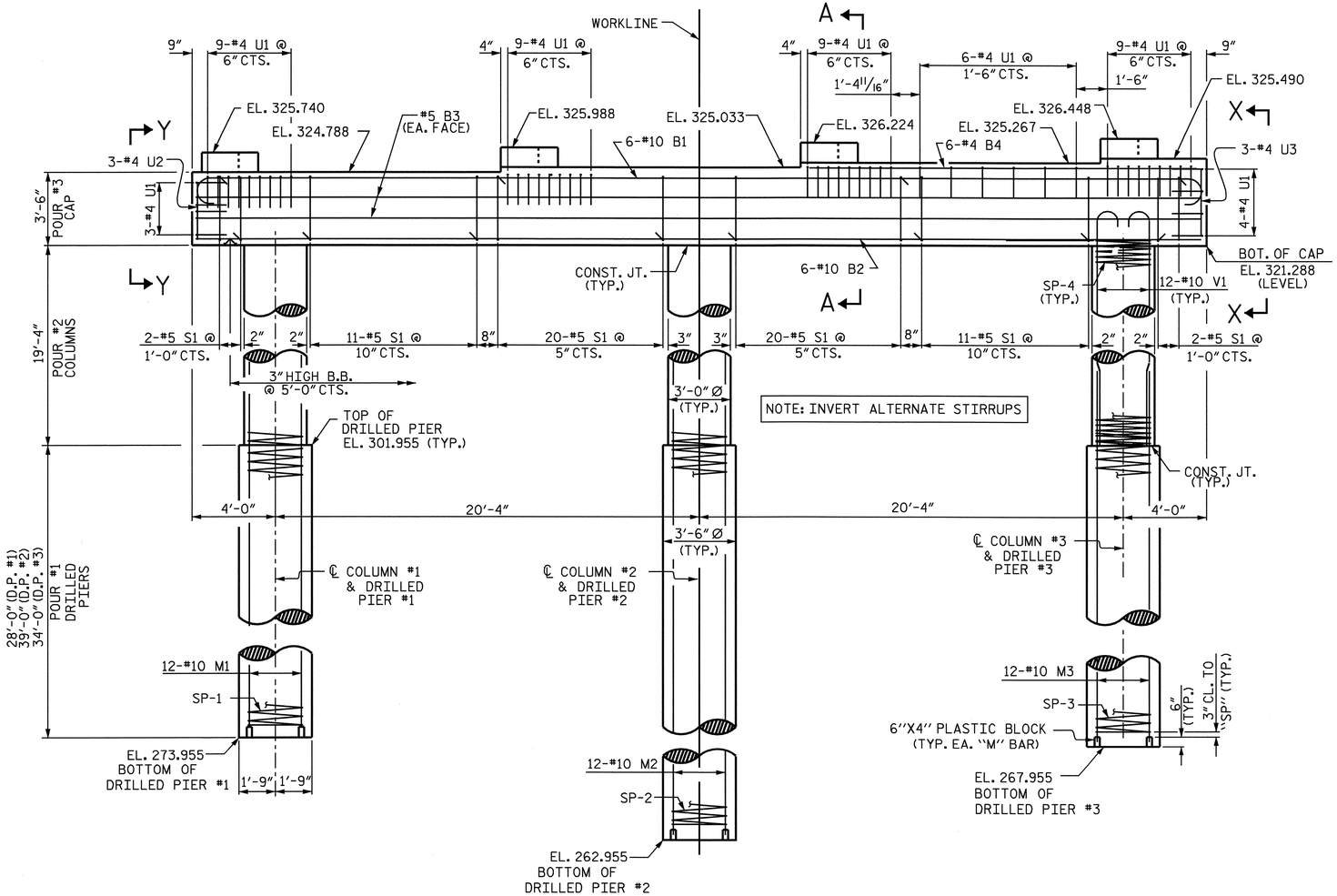
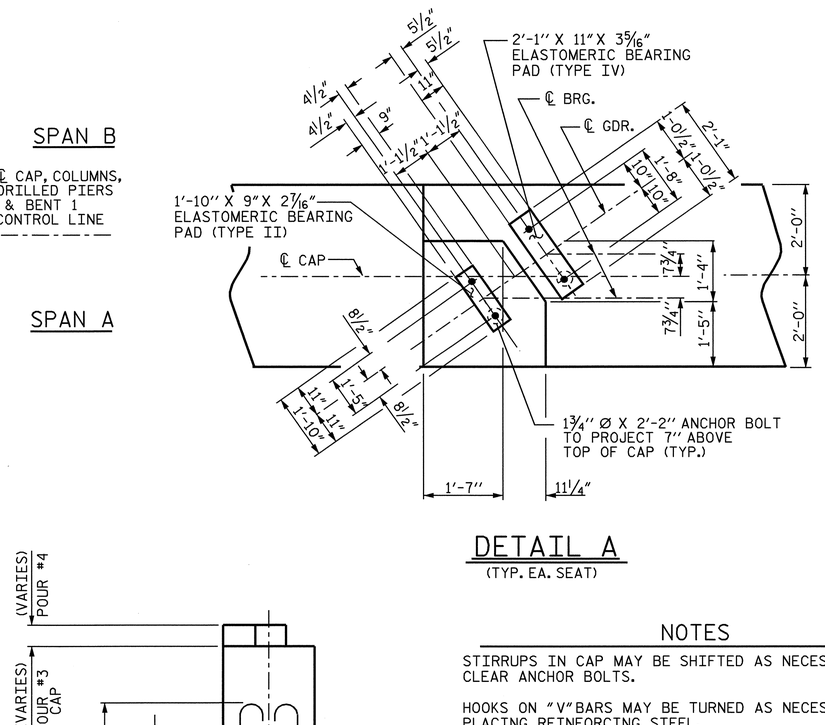
swance



PLAN

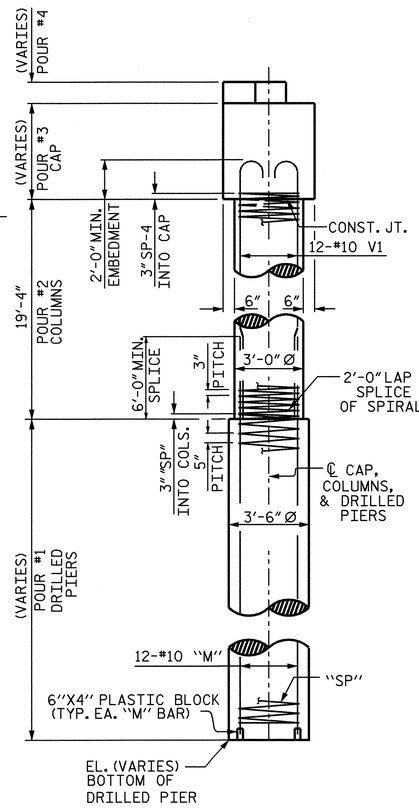


ELEVATION



DETAIL A

(TYP. EA. SEAT)



END ELEVATION

NOTES

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

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

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

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

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIER IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FOOT BELOW THE GROUND LINE.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : N. Q. TRAN DATE : 12-9-08
CHECKED BY : J. A. TILLMAN DATE : 1-9-09

29-MAY-2009 08:57
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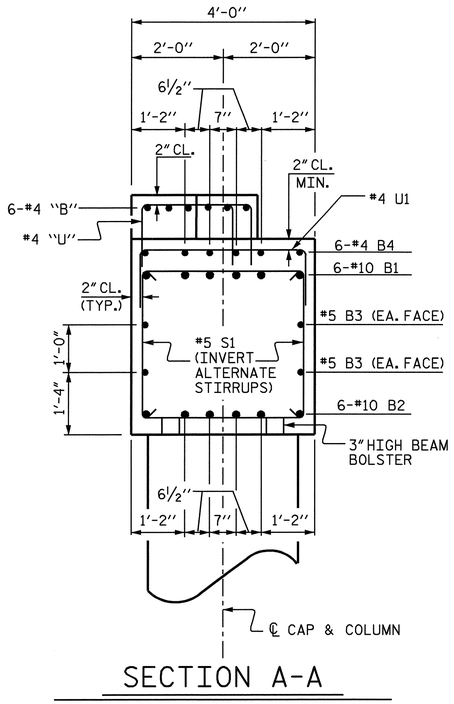
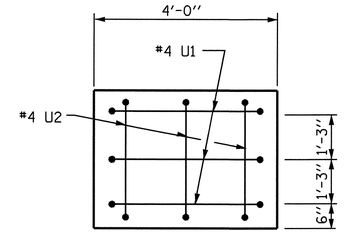
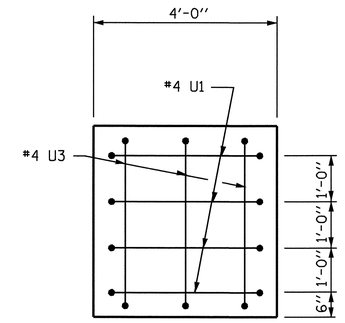
DANDERSON



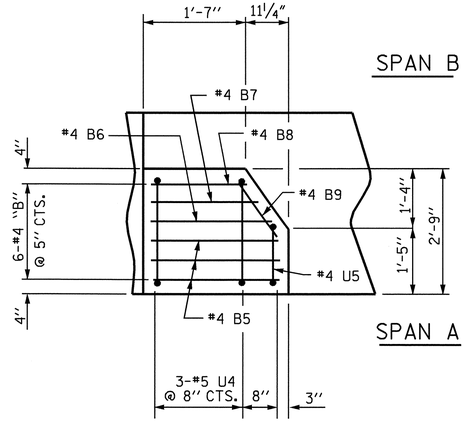
SECTION A-A



SECTION Y-Y

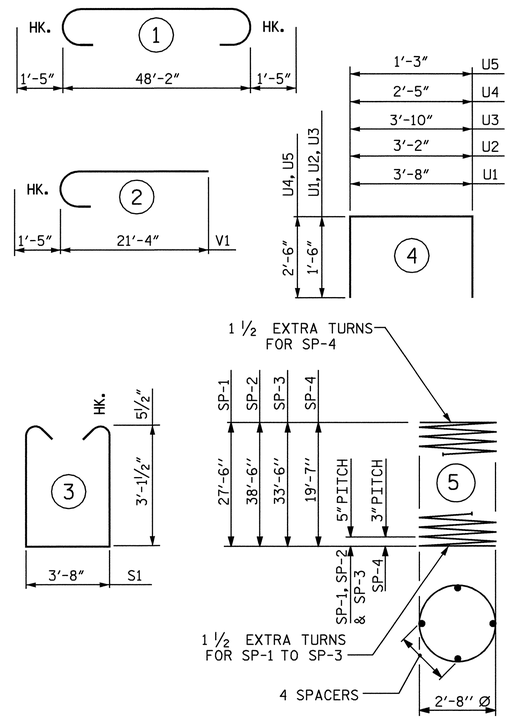


SECTION X-X



DETAIL B
(TYP. EA. BRIDGE SEAT)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

✳ THE SP-1, SP-2, SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

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

BILL OF MATERIAL

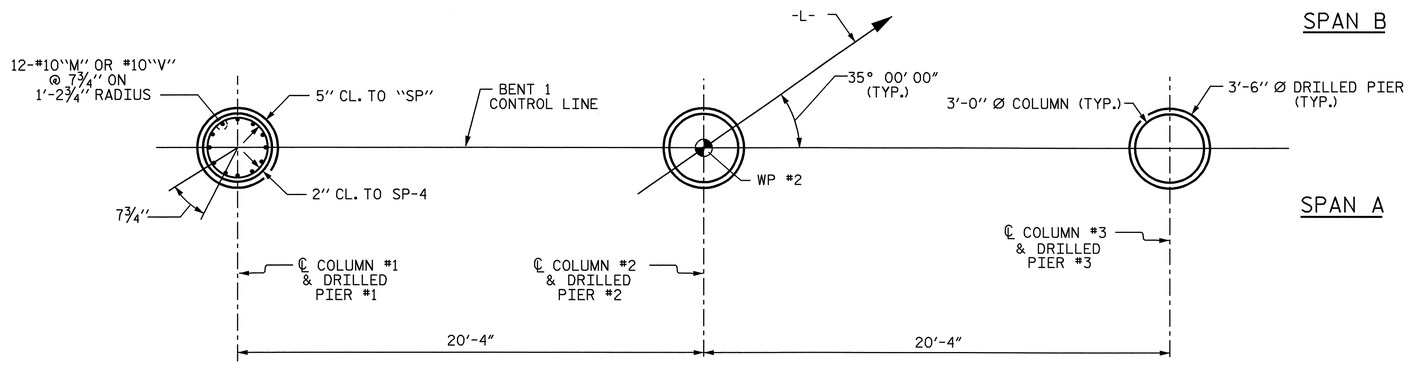
BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	10	1	51'-0"	1317
B2	6	10	STR	48'-4"	1248
B3	4	5	STR	48'-4"	202
B4	6	4	STR	19'-0"	76
B5	12	4	STR	2'-3"	19
B6	4	4	STR	2'-1"	6
B7	4	4	STR	1'-9"	5
B8	4	4	STR	1'-6"	4
B9	4	4	STR	1'-7"	4
M1	12	10	STR	36'-6"	1885
M2	12	10	STR	47'-6"	2453
M3	12	10	STR	42'-6"	2195
S1	66	5	3	10'-10"	746
U1	49	4	4	6'-8"	218
U2	3	4	4	6'-2"	13
U3	3	4	4	6'-10"	14
U4	12	5	4	7'-5"	93
U5	4	5	4	6'-3"	26
V1	36	10	2	22'-9"	3524
REINFORCING STEEL				LBS.	14,048
SP-1	1	✳	5	559'-4"	583
SP-2	1	✳	5	773'-2"	806
SP-3	1	✳	5	674'-5"	703
SP-4	3	✳✳	5	660'-1"	1323
SPIRAL COLUMN REINFORCING STEEL				LBS.	3,415

CLASS 'A' CONCRETE		
POUR #2 (COLUMNS)	CU. YDS.	15.1
POUR #3 (BENT CAP)	CU. YDS.	27.3
POUR #4 (SEATS)	CU. YDS.	1.0
TOTAL:	CU. YDS.	43.4

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	C.Y.	36.0
3'-6" Ø DRILLED PIERS IN SOIL, LIN. FT.	=	94.2
3'-6" Ø DRILLED PIERS NOT IN SOIL, LIN. FT.	=	6.8
CSL TUBES, LIN. FT.	=	434



PLAN OF COLUMNS AND DRILLED PIERS
(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-62
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : N. Q. TRAN DATE : 12-9-08
CHECKED BY : J. A. TILLMAN DATE : 1-9-09

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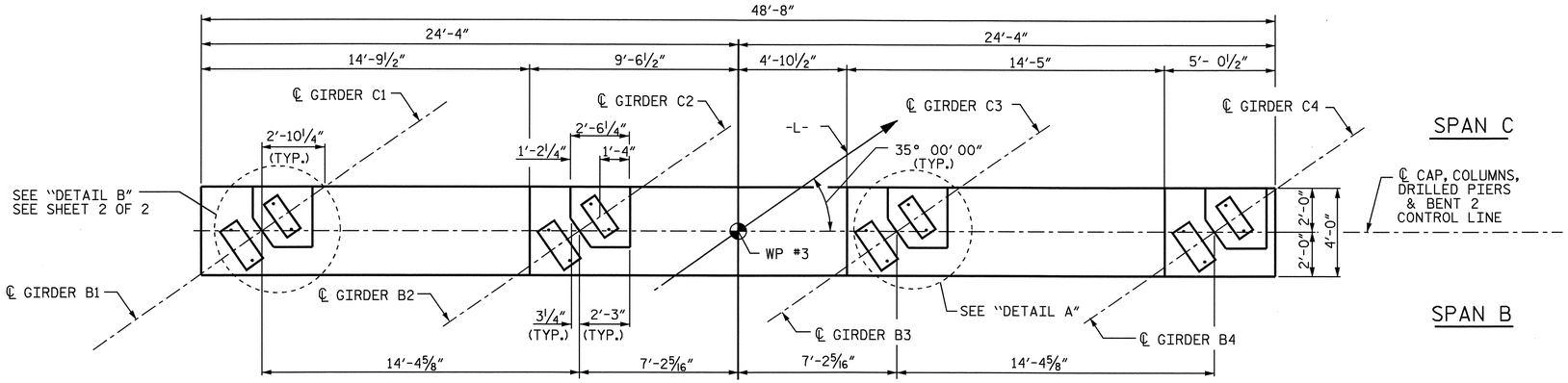
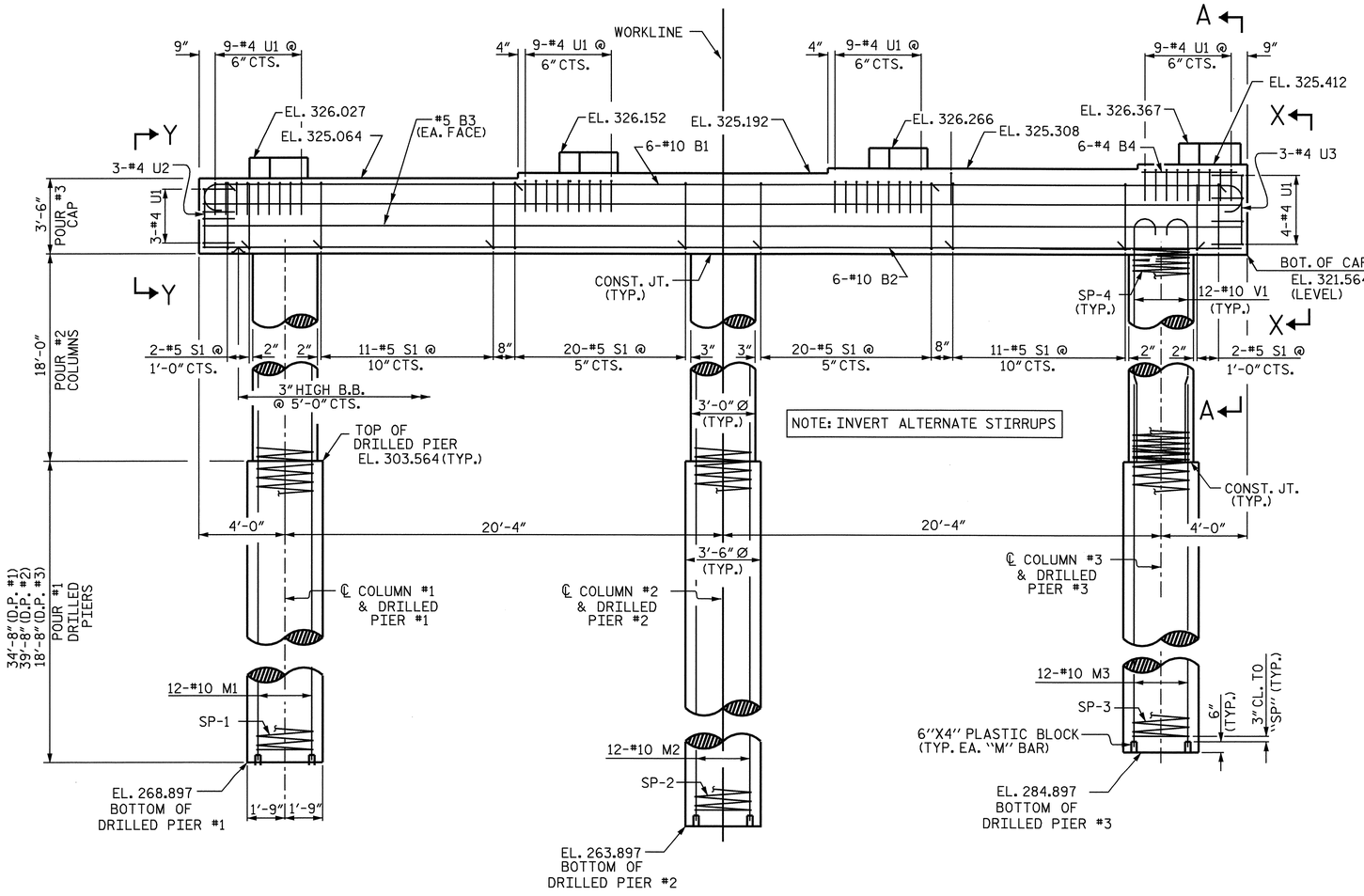
DANDERSON



PLAN



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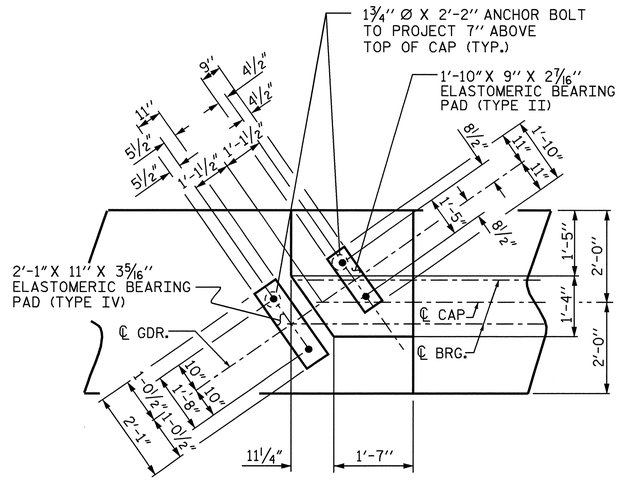
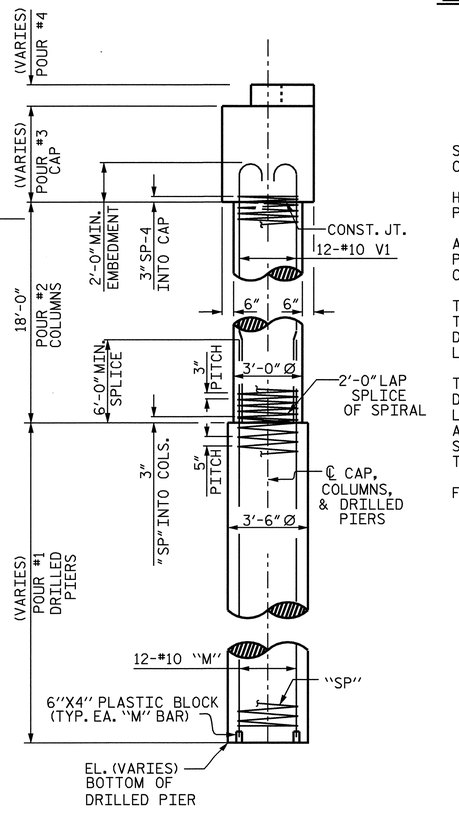


DETAIL A



END ELEVATION

NOTES

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FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-63
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : N. Q. TRAN DATE : 12-9-08
CHECKED BY : J. A. TILLMAN DATE : 1-9-09

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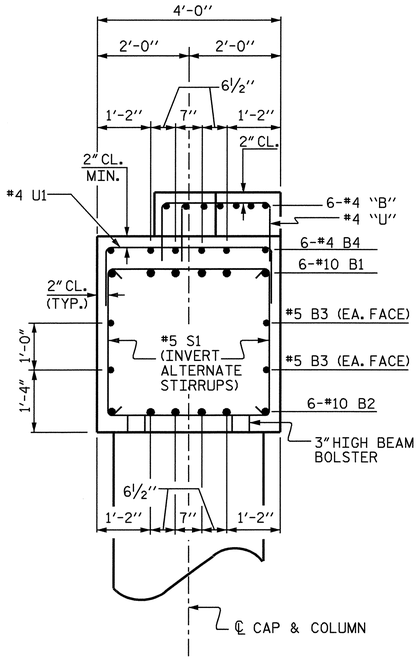
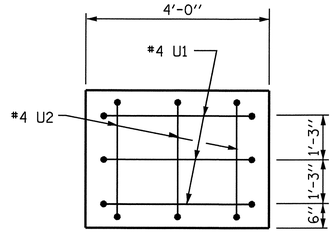
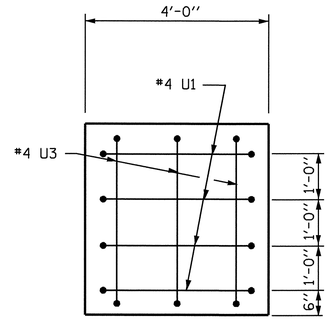
DANDERSON



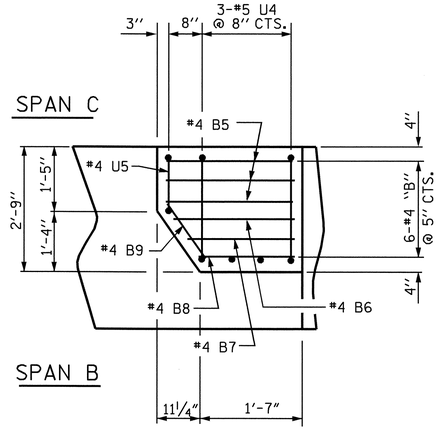
SECTION A-A



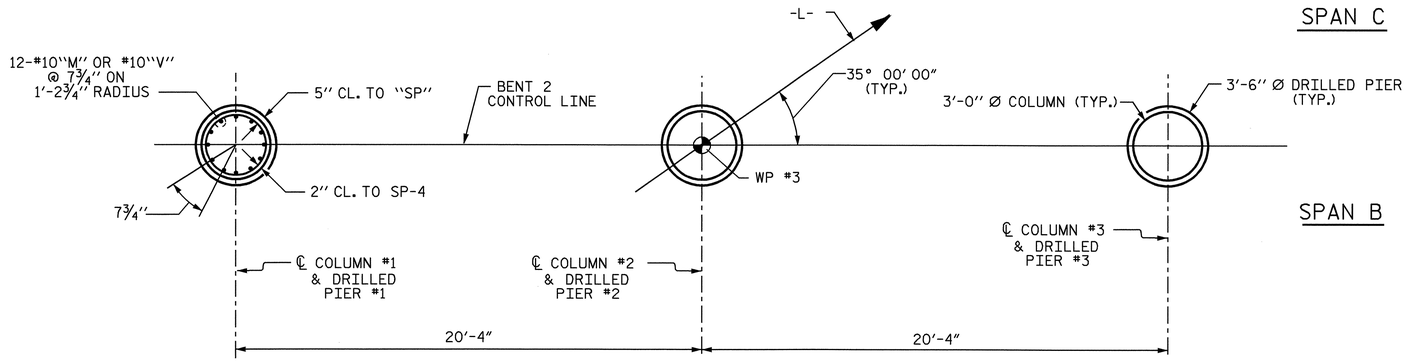
SECTION Y-Y



SECTION X-X

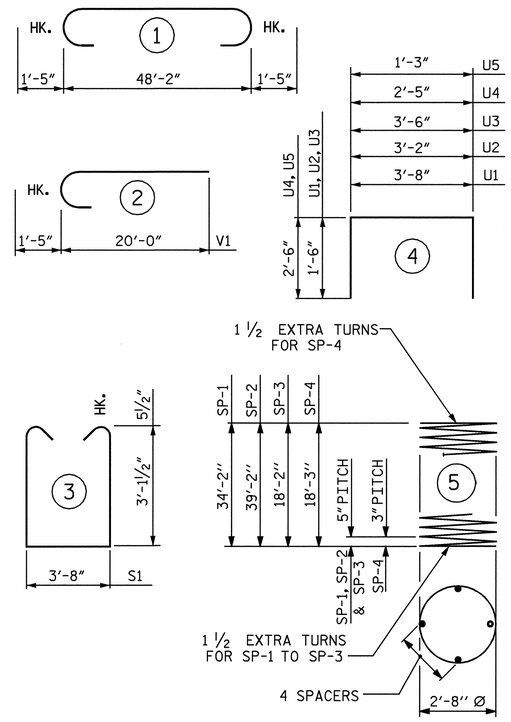


DETAIL B
(TYP. EA. BRIDGE SEAT)



PLAN OF COLUMNS AND DRILLED PIERS
(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL FOR ALL COLUMNS AND DRILLED PIERS)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

✳ THE SP-1, SP-2, SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

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

BILL OF MATERIAL

BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	10	1	51'-0"	1317
B2	6	10	STR	48'-4"	1248
B3	4	5	STR	48'-4"	202
B4	6	4	STR	4'-8"	19
B5	12	4	STR	2'-3"	19
B6	4	4	STR	2'-1"	6
B7	4	4	STR	1'-9"	5
B8	4	4	STR	1'-6"	4
B9	4	4	STR	1'-7"	4
M1	12	10	STR	43'-2"	2229
M2	12	10	STR	48'-2"	2487
M3	12	10	STR	27'-2"	1403
S1	66	5	3	10'-10"	746
U1	43	4	4	6'-8"	192
U2	3	4	4	6'-2"	13
U3	3	4	4	6'-10"	14
U4	12	5	4	7'-5"	93
U5	4	5	4	6'-3"	26
V1	36	10	2	21'-5"	3318
REINFORCING STEEL				LBS.	13,345
SP-1	1	✳	5	690'-11"	721
SP-2	1	✳	5	789'-7"	824
SP-3	1	✳	5	378'-4"	395
SP-4	3	✳✳	5	618'-10"	1240
SPIRAL COLUMN REINFORCING STEEL				LBS.	3,180

CLASS 'A' CONCRETE		
POUR #2 (COLUMNS)	CU. YDS.	14.1
POUR #3 (BENT CAP)	CU. YDS.	26.3
POUR #4 (SEATS)	CU. YDS.	1.0
TOTAL:	CU. YDS.	41.4

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	C.Y.	33.1
3'-6" Ø DRILLED PIERS IN SOIL, LIN. FT.	=	86.4
3'-6" Ø DRILLED PIERS NOT IN SOIL, LIN. FT.	=	6.6
CSL TUBES, LIN. FT.	=	402

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
5/29/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-64
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : N. Q. TRAN DATE : 12-9-08
CHECKED BY : J. A. TILLMAN DATE : 1-9-09

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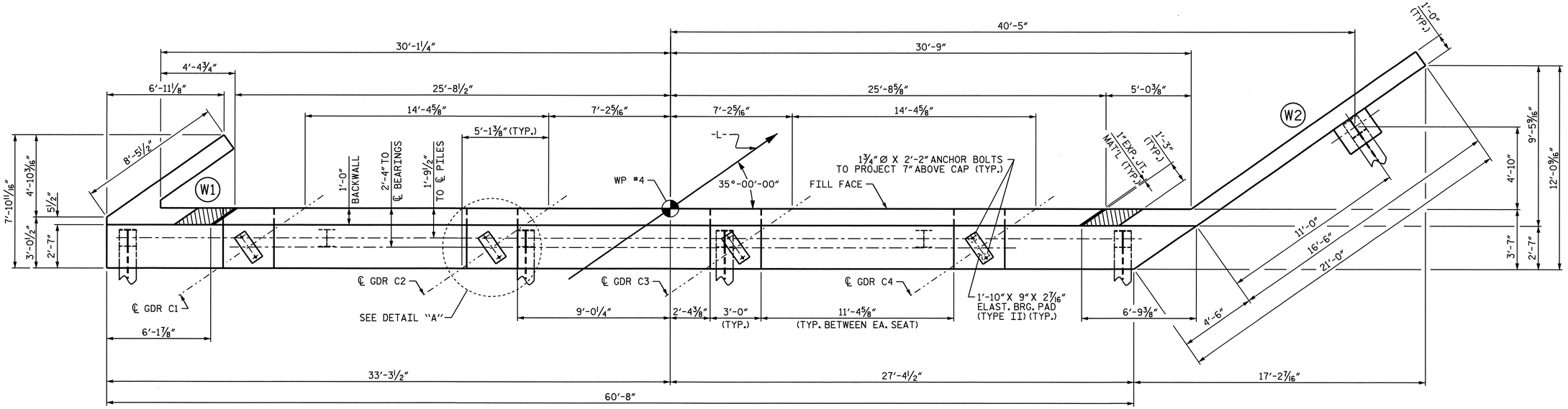
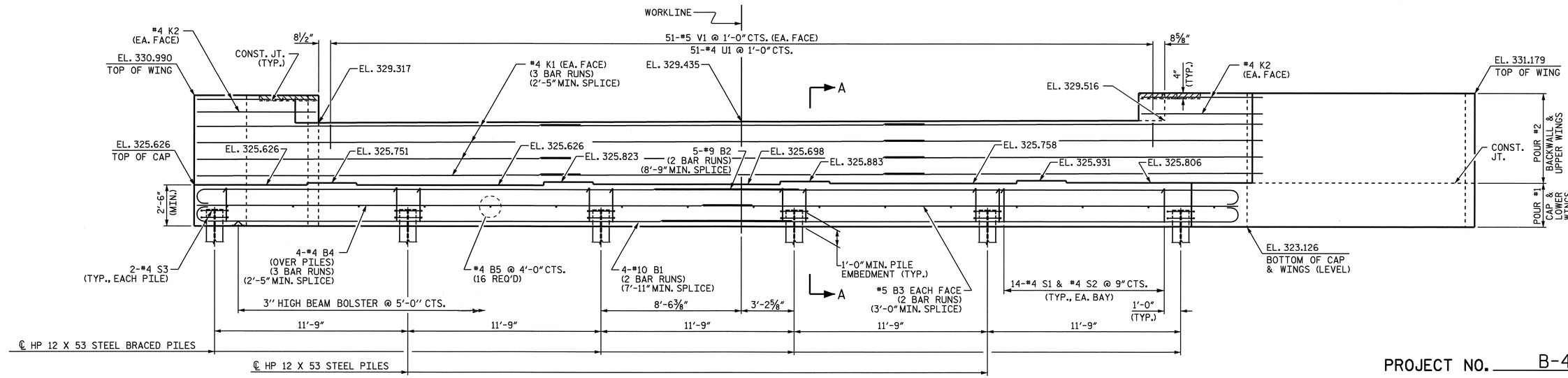
DANDERSON

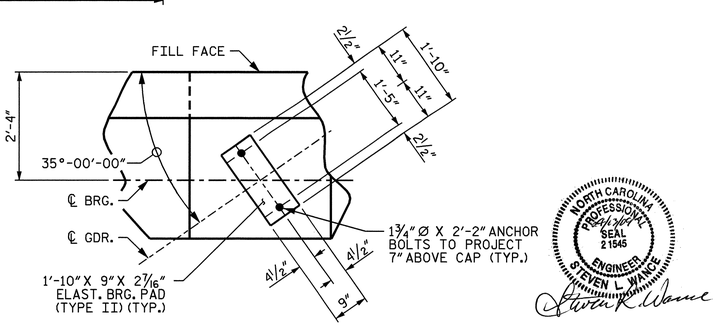


PLAN



ELEVATION

(BRACE PILE @ WING WALL NOT SHOWN FOR CLARITY)



DETAIL "A"

NOTES

STIRRUPS 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 CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

DRAWN BY : R. WITHROW DATE : 1/14/09
CHECKED BY : S. WANCE DATE : 1/28/09

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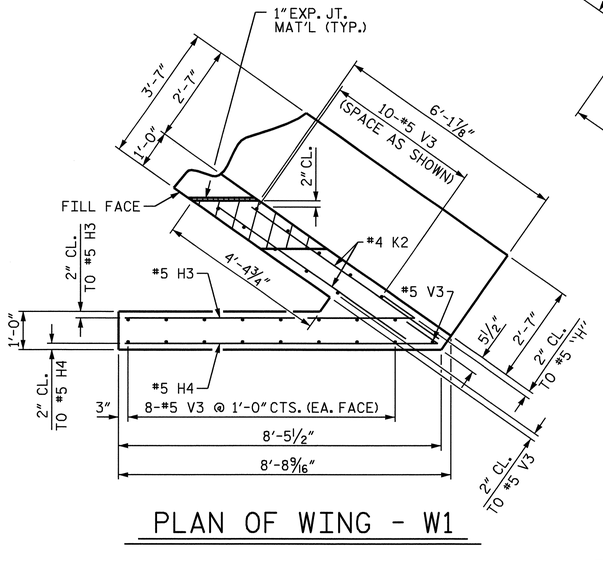
PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

SHEET 1 OF 3

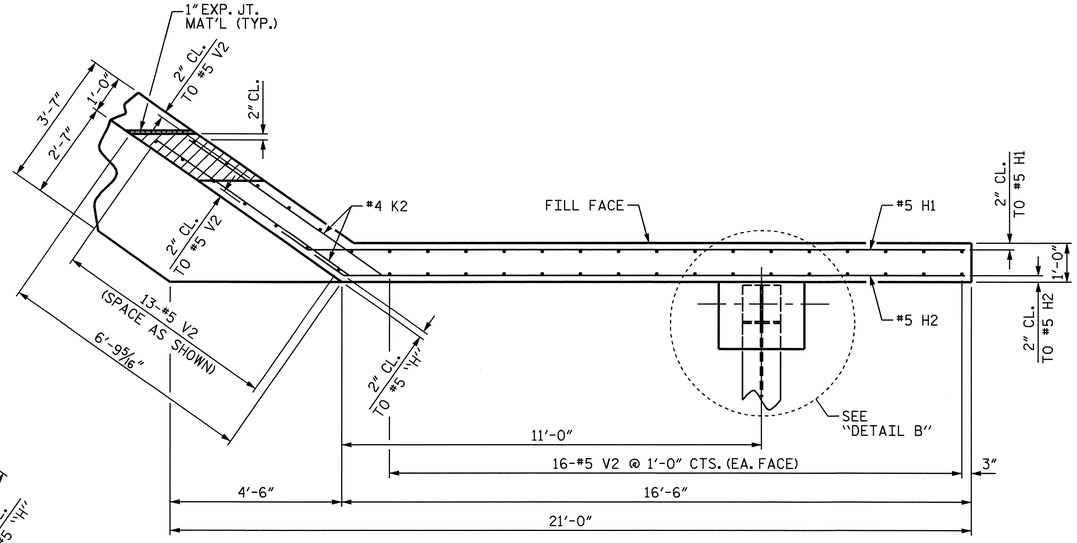
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

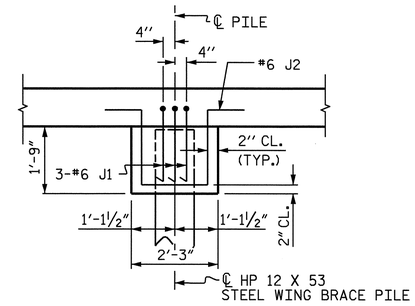
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			70



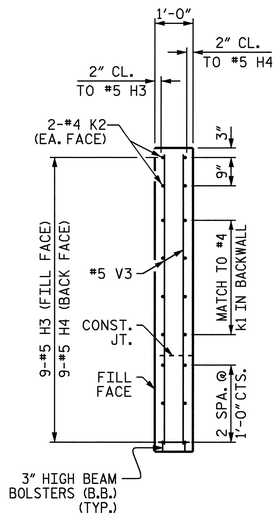
PLAN OF WING - W1



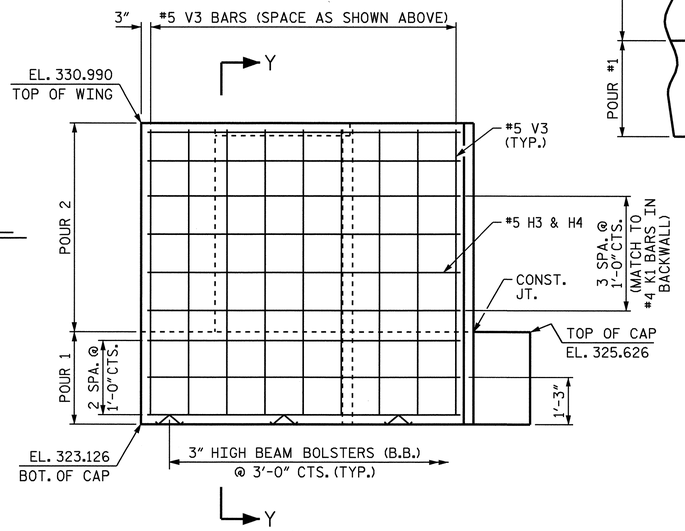
PLAN OF WING - W2



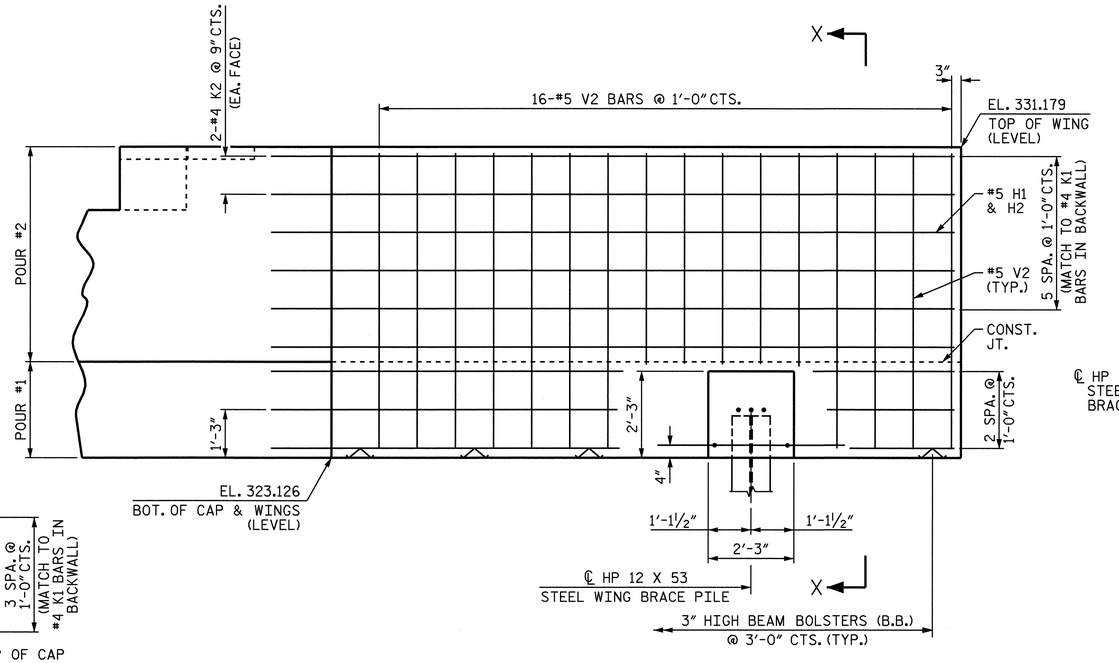
DETAIL B



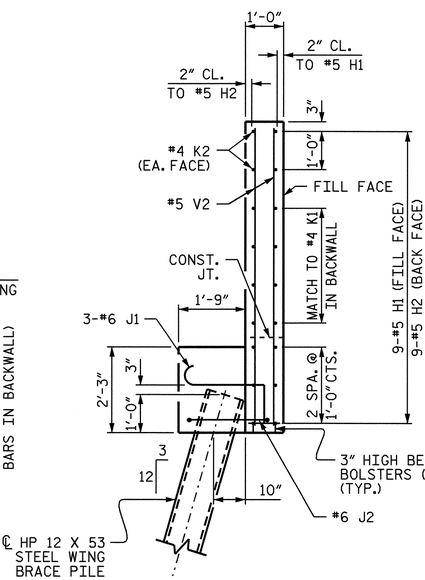
SECTION Y-Y



ELEVATION OF WING - W1



ELEVATION OF WING - W2



SECTION X-X

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 21545 ENGINEER STEVEN L. WANCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : R. WITHROW DATE : 1/14/09
CHECKED BY : S. WANCE DATE : 1/28/09

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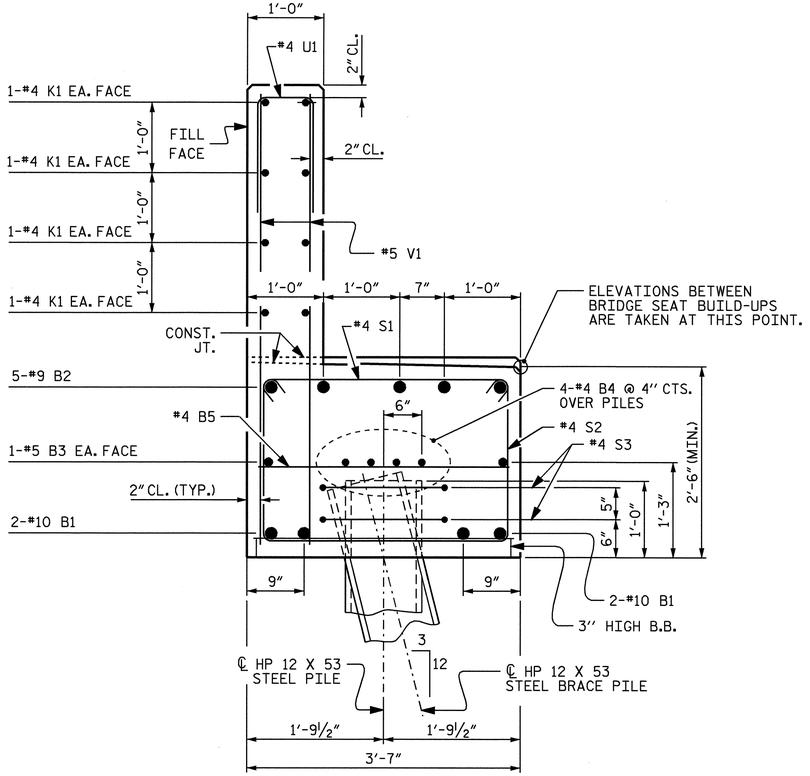
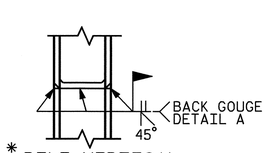
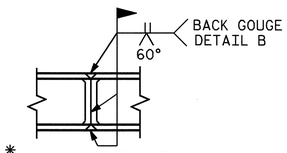


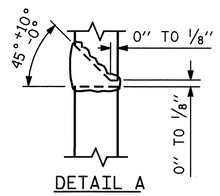
SECTION A-A



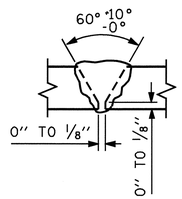
* PILE VERTICAL



* PILE HORIZONTAL OR VERTICAL



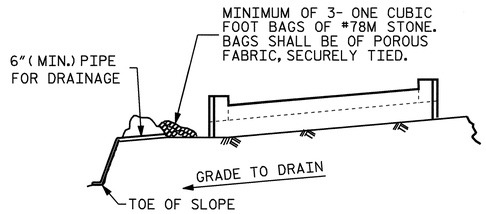
DETAIL A



DETAIL B

* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



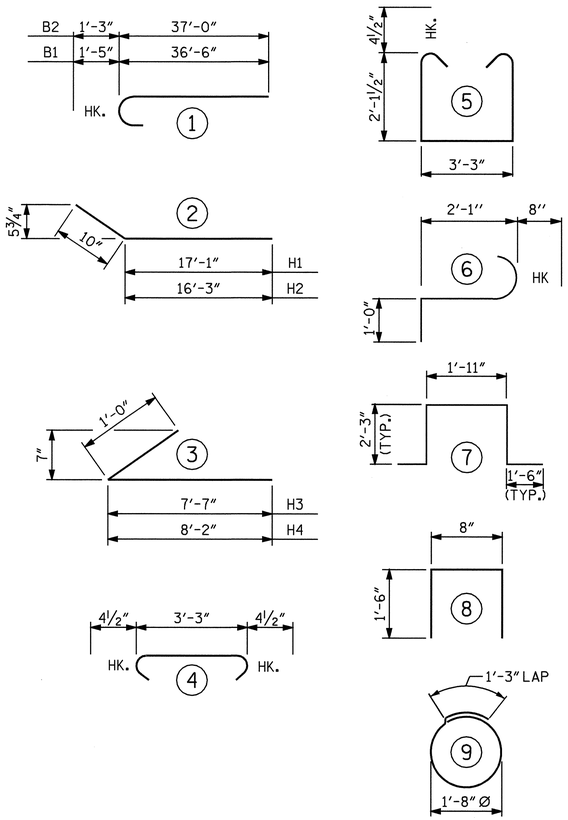
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	37'-11"	1305
B2	10	#9	1	38'-3"	1301
B3	4	#5	STR	34'-0"	142
B4	12	#4	STR	22'-10"	183
B5	16	#4	STR	3'-3"	35
H1	9	#5	2	17'-11"	168
H2	9	#5	2	17'-1"	160
H3	9	#5	3	8'-7"	81
H4	9	#5	3	9'-2"	86
J1	3	#6	6	3'-9"	17
J2	1	#6	7	9'-5"	14
K1	24	#4	STR	23'-4"	374
K2	8	#4	STR	6'-0"	32
S1	70	#4	4	4'-0"	187
S2	70	#4	5	8'-3"	386
S3	12	#4	9	6'-6"	52
U1	51	#4	8	3'-8"	125
V1	102	#5	STR	5'-8"	603
V2	45	#5	STR	7'-7"	356
V3	27	#5	STR	7'-5"	209

REINFORCING STEEL = 5816 LBS

CLASS A CONCRETE BREAKDOWN

POUR 1 - CAP AND LOWER WINGS & WING BRACE PILE CAP	23.2 C.Y.
POUR 2 - BACKWALL & UPPER PORTION OF WINGS	14.2 C.Y.
CLASS A CONCRETE TOTAL	37.4 C.Y.

HP 12 x 53 STEEL PILES

NO. 7 LIN. FT. = 105.0

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 21545 ENGINEER STEVEN L WANCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-67
1			3			TOTAL SHEETS
2			4			70

DRAWN BY : R. WITHROW DATE : 1/14/09
CHECKED BY : S. WANCE DATE : 1/28/09

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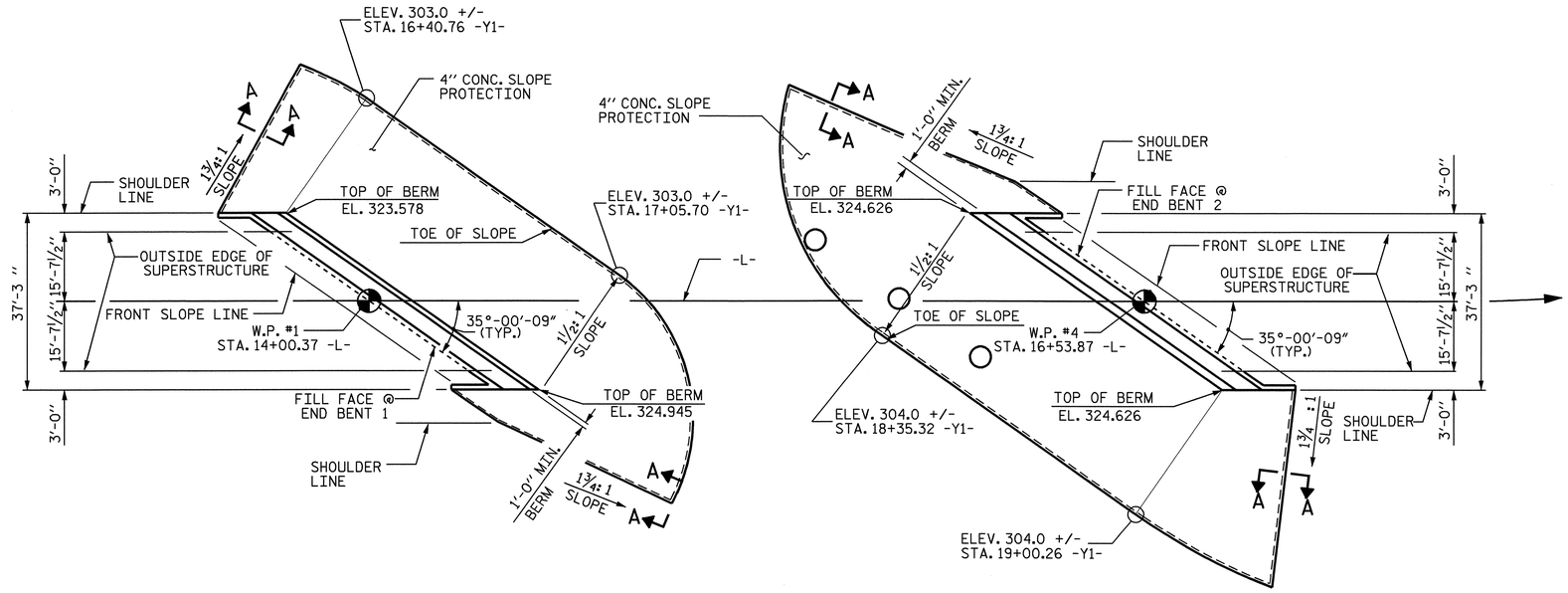


PLAN OF SLOPE PROTECTION

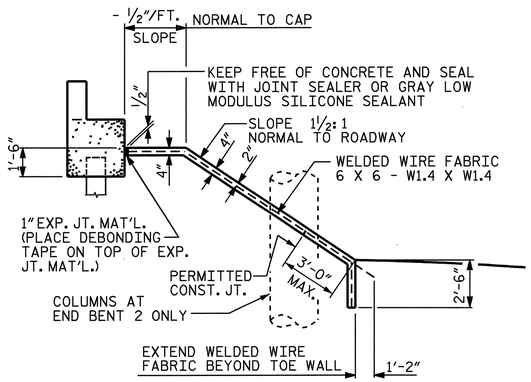
GENERAL NOTES

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

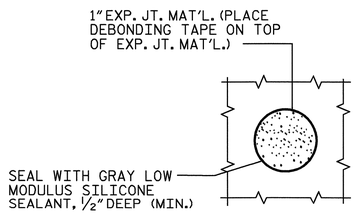
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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

BRIDGE @ STA.15+21.87 -L-	4" INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	655	1300
END BENT 2	695	1400

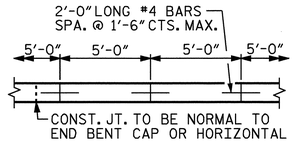
* QUANTITY SHOWN IS BASED ON 5' POURS.



SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH

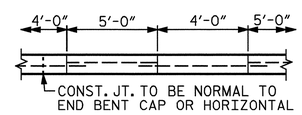


PLAN WHERE CONCRETE SLOPE PROTECTION MUST BE BE PLACED AROUND A BENT COLUMN
(AT END BENT 2 ONLY)



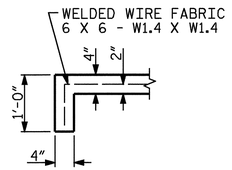
STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL



SECTION A-A

PROJECT NO. B-4410
ANSON COUNTY
STATION: 15+21.87 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
5/09/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-68
1			3			TOTAL SHEETS
2			4			70

ASSEMBLED BY : S. M. RASHIDI	DATE : 12/15/08		
CHECKED BY : N. Q. TRAN	DATE : 1/6/09		
DRAWN BY : ELR 5/92	REV. 7/10/01	LES/RDR	
CHECKED BY : GRP 6/92	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06	TLA/GM	

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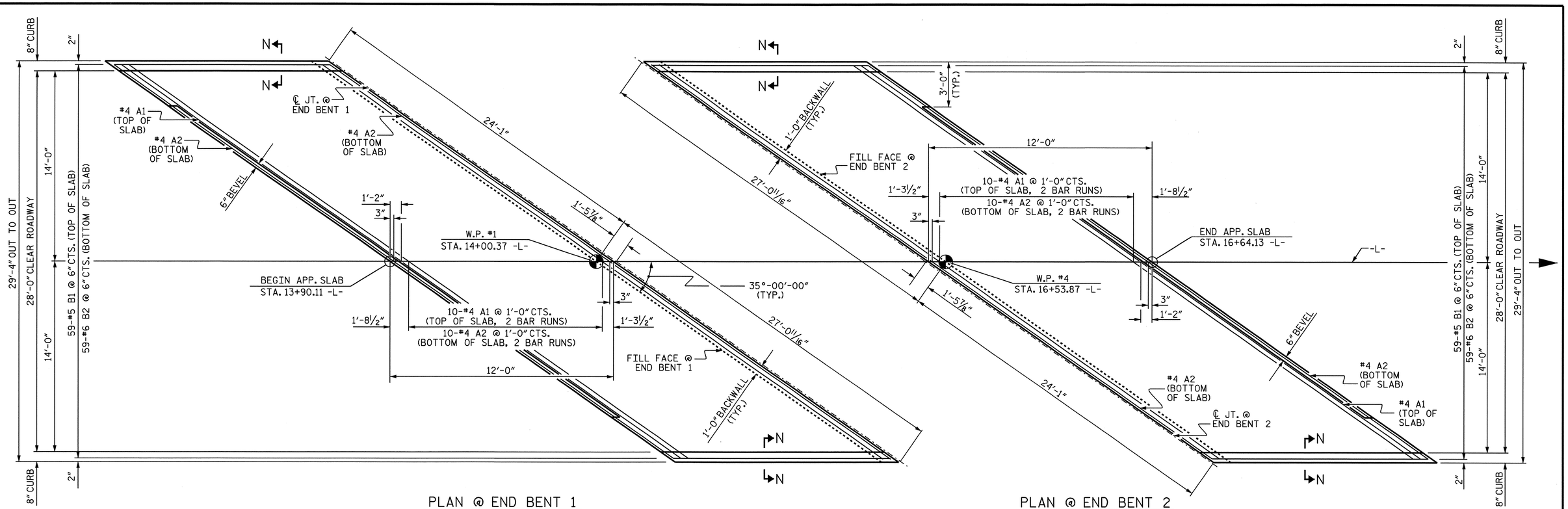
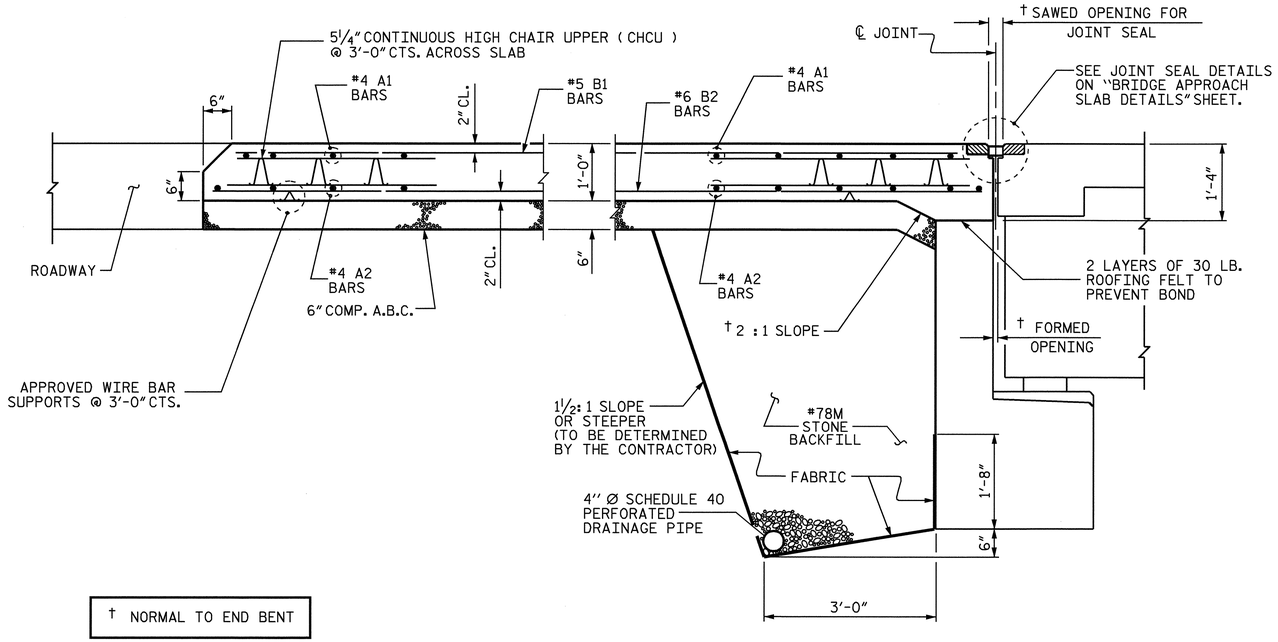
DANDERSON

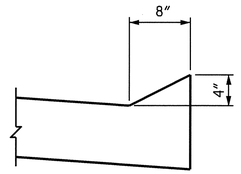
STD. NO. SP1



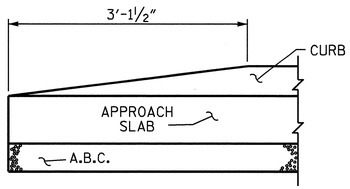


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

BILL OF MATERIAL

APPROACH SLAB AT EB 1						APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	22	#4	STR	26'-3"	386	✳A1	22	#4	STR	26'-3"	386
A2	24	#4	STR	26'-2"	420	A2	24	#4	STR	26'-2"	420
✳B1	59	#5	STR	9'-9"	600	✳B1	59	#5	STR	9'-9"	600
B2	59	#6	STR	11'-5"	1012	B2	59	#6	STR	11'-5"	1012
REINFORCING STEEL			LBS.		1432	REINFORCING STEEL			LBS.		1432
✳EPOXY COATED REINFORCING STEEL			LBS.		986	✳EPOXY COATED REINFORCING STEEL			LBS.		986
CLASS AA CONCRETE			C.Y.		13.8	CLASS AA CONCRETE			C.Y.		13.8

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
4/14/09

ASSEMBLED BY : J.A. TILLMAN	DATE : 1/28/09		
CHECKED BY : N.O. TRAN	DATE : 1/28/09		
DRAWN BY : EEM 3/95	REV. 7/10/01	LES/RDR	
CHECKED BY : VAP 3/95	REV. 5/7/03R	RWW/JTE	
	REV. 5/1/06R	KMM/GM	

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			70

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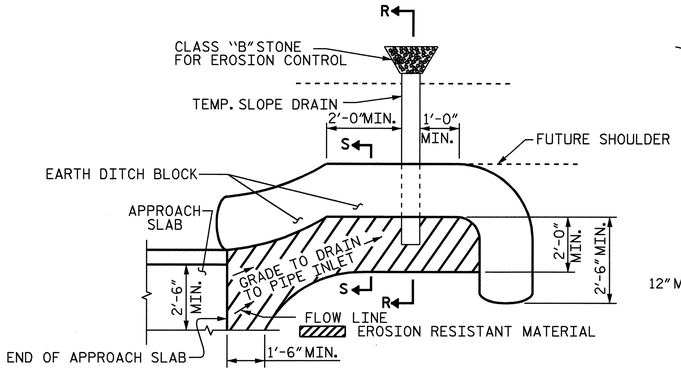
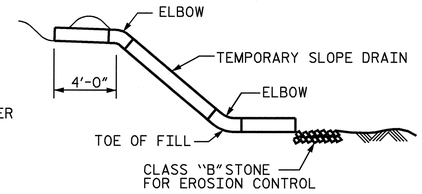
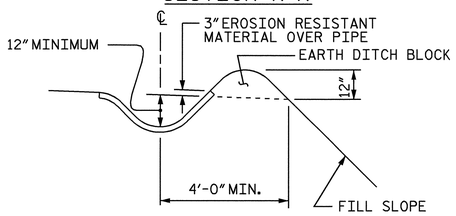


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



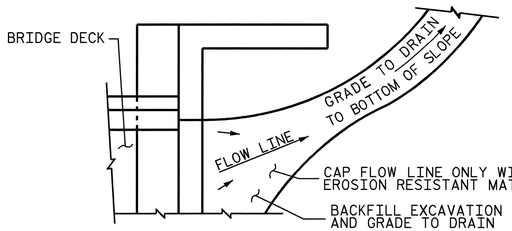
SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



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

TEMPORARY DRAINAGE DETAIL

NOTES

FOR BRIDGE APPROACH FILL INCLUDING FABRIC, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

FABRIC SHALL BE TYPE 1 ENGINEERING FABRIC IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE OF EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

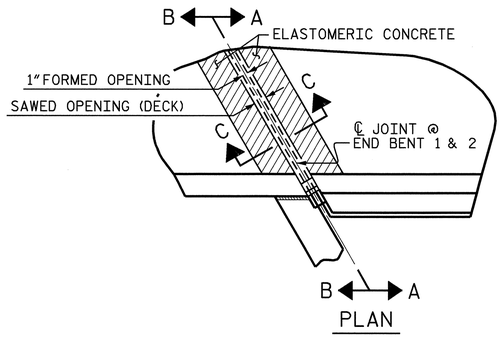
THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

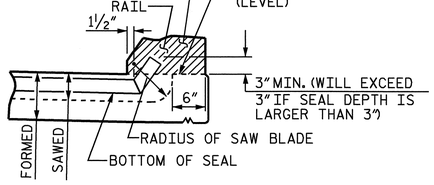
FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

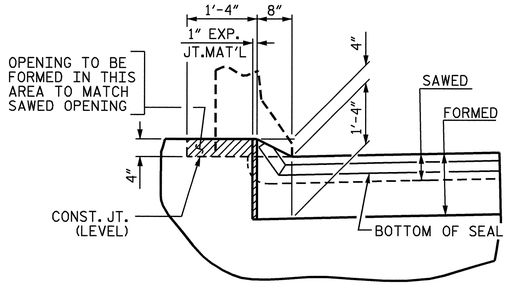
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.



PLAN



SECTION A-A

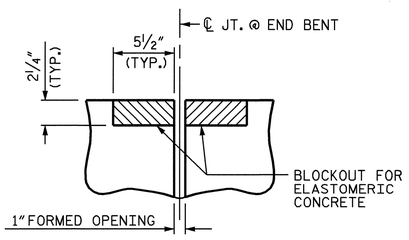


SECTION B-B

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

SECTION C-C

EVAZOTE JOINT SEAL
(EXPANSION)



SECTION C-C

EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

ELASTOMERIC CONCRETE	
END BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	9.4
2	9.4
TOTAL	18.8

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

JOINT SEAL DETAILS @ END BENT

ASSEMBLED BY : J.A. TILLMAN		DATE : 1/28/09	
CHECKED BY : N.O. TRAN		DATE : 1/28/09	
DRAWN BY : FCJ	11/88	REV. 10/17/00	RWW/LES
CHECKED BY : ARB	11/88	REV. 5/7/03	RWW/JTE
		REV. 5/1/06R	MAA/KMM

PROJECT NO. B-4410

ANSON COUNTY

STATION: 15+21.87 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

4/14/09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			70

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STD. NO. BAS10 (SHT 4)

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 @ RGW REV. 5-7-03 RWW @ JTE
REV. 8-16-99 RWW @ LES REV. 5-1-06 TLA @ GM

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