CONTRACT: C201429 TIP PROJECT: I-2102

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2102		

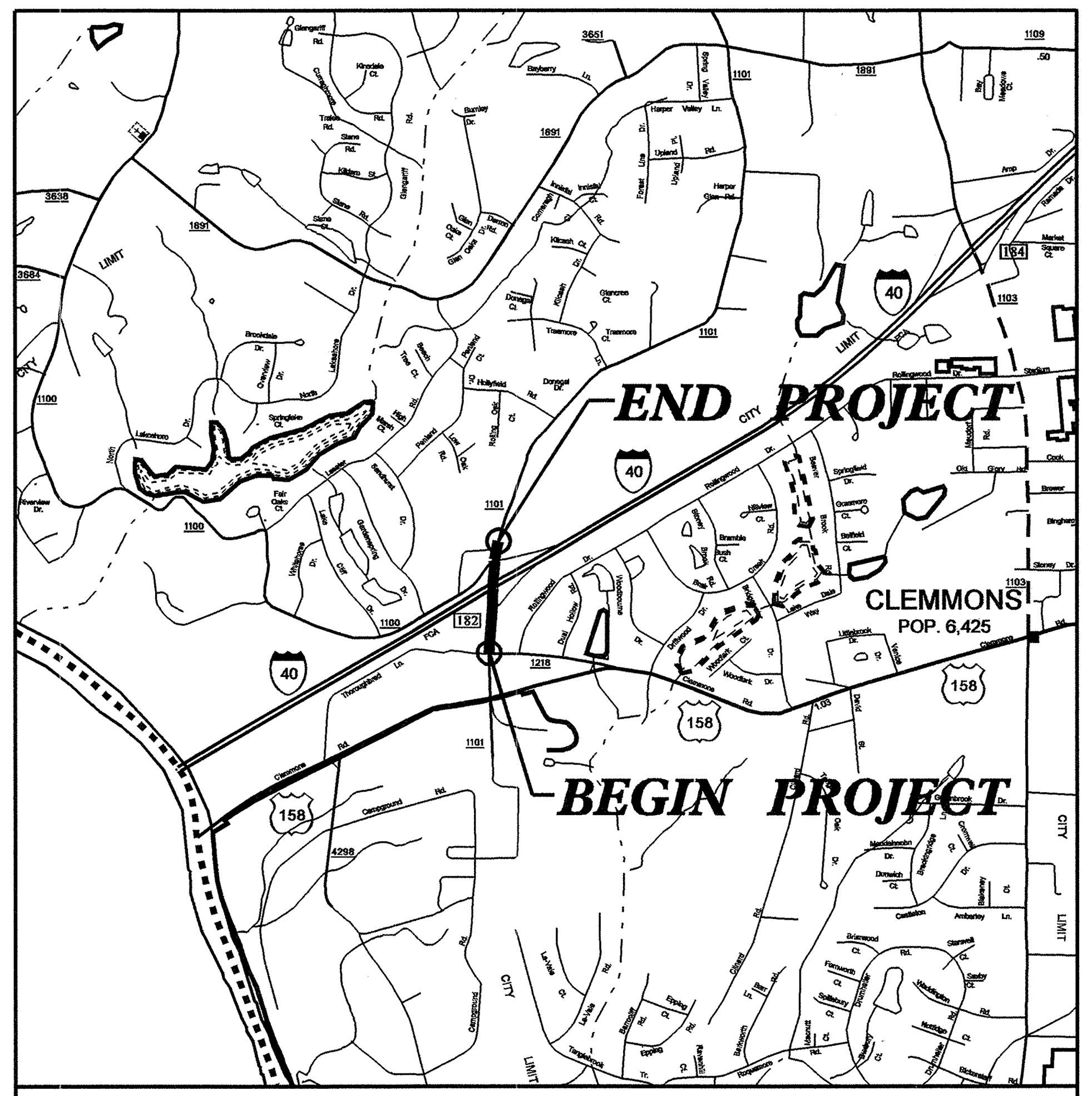
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34153.1.1	IMF-40-3(101)182	P.E.
34153.1.2	IMF-40-3(101)182	R/W
34153.3.2	IMF-40-3(101)182	CONST.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

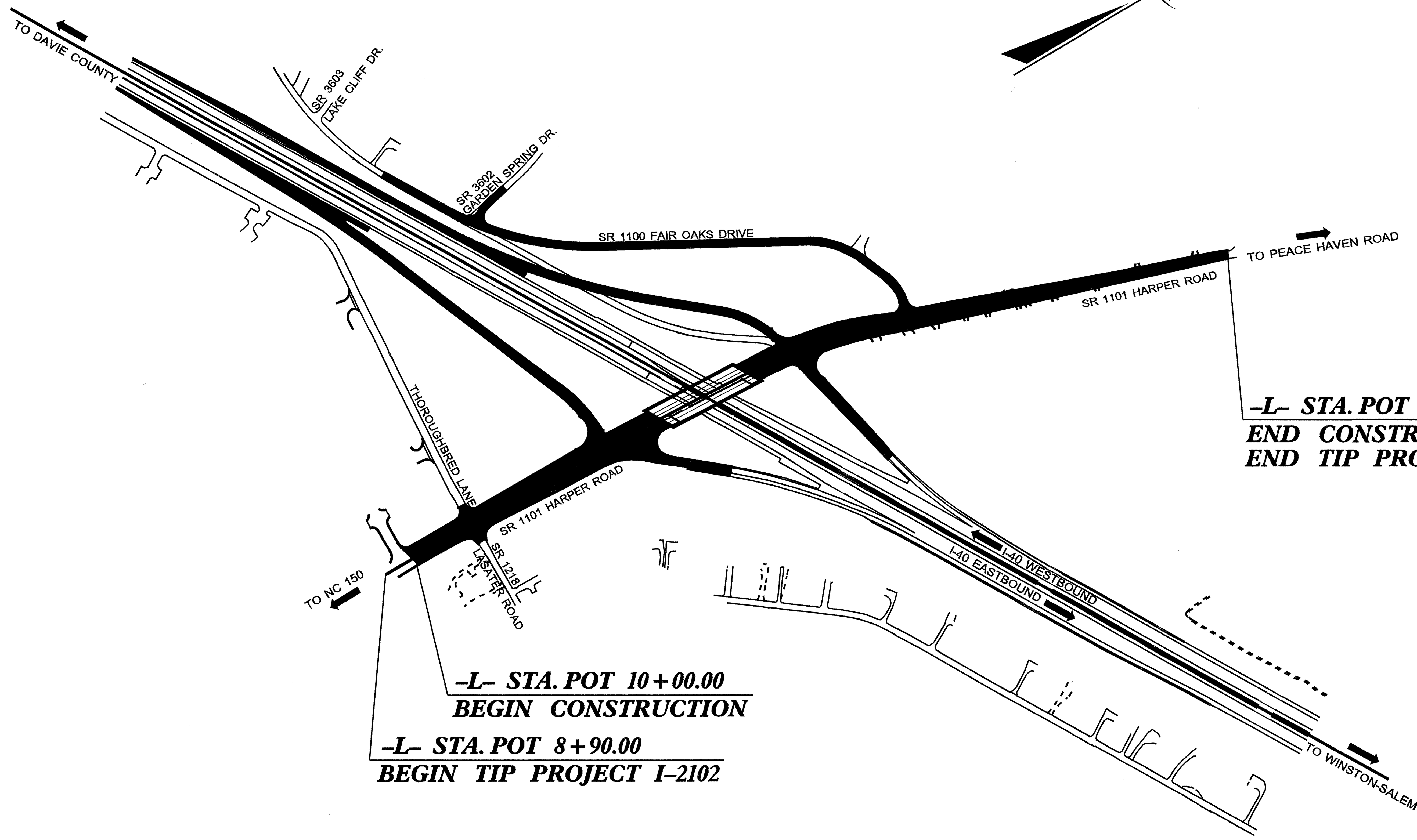
LOCATION: I-40 AT (SR 1101) HARPER ROAD INTERCHANGE, APPROX. 0.9 MILES EAST OF THE YADKIN RIVER

TYPE OF WORK: STRUCTURE, GRADING, WIDENING, PAVING, DRAINAGE, RESURFACING AND SIGNALS



VICINITY MAP

STRUCTURES



-L- STA. POT 38+41.64
END CONSTRUCTION
END TIP PROJECT I-2102

-L- STA. POT 10+00.00
BEGIN CONSTRUCTION

-L- STA. POT 8+90.00
BEGIN TIP PROJECT I-2102

DESIGN DATA

ADT 2000 = 6000
ADT 2025 = 13300
DHV = 10 %
D = 60 %
T = 3 % *
V = 45 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

TOTAL LENGTH ROADWAY TIP PROJECT I-2102 = 0.534 MILES
TOTAL LENGTH STRUCTURE TIP PROJECT I-2102 = 0.054 MILES
TOTAL LENGTH STATE TIP PROJECT I-2102 = 0.588 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh, NC 27610

2002 STANDARD SPECIFICATIONS

LETTING DATE:
MAY 16, 2006

B.C. HUNT, P.E.
PROJECT ENGINEER

T.G. PAYNE, P.E.
PROJECT DESIGN ENGINEER

STRUCTURE DESIGN UNIT

NORTH CAROLINA PROFESSIONAL SEAL 14552 ENGINEER GREGORY R. PERFETTI
4-7-06

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR *DATE*

09-FEB-2006 11:28

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tpayne

F.A. PROJECT NO. IMF-40-3(101)182

19+00 19+50 20+00 20+50 21+00 21+50 22+00

815 810 805 800 795 790 785 780

STA. 19+27.04 -L-
FILL FACE @ END BENT 1
GRADE POINT EL. 812.366

1'-0" MIN. BERM NORMAL TO CAP (TYP.)

BEGIN FRONT SLOPE
STA. 19+13.93 -L-
EL. 812.108

EXP.

+ 6.5780 % - 1.3667 %

P.I. STA. 18+72.48 -L-
LENGTH = 600.000
EL. 817.100

HP 12 X 53 STEEL PILES (TYP.)

EL. 805.0 ±

UNCLASSIFIED STRUCTURE EXCAVATION (SEE NOTES)

EL. 787.4 ±

GRADE DATA

SPAN A

17'-8" MIN. VERTICAL CL.

EL. 787.4 ±

EL. 787.0 ±

EL. 787.0 ±

FIXED

EL. 786.2 ±

TOP OF FTG. EL. 784.700

EL. 787.0 ±

EL. 787.0 ±

SPAN B

17'-0" MIN. VERTICAL CL.

EL. 787.4 ±

UNCLASSIFIED STRUCTURE EXCAVATION (SEE NOTES)

EXP.

2 : 1 SLOPE NORMAL TO CAP (TYP.)

EL. 787.4 ±

4" CONCRETE SLOPE PROTECTION (TYP.)

STA. 22+11.54 -L-
FILL FACE @ END BENT 2
GRADE POINT EL. 812.466

BEGIN FRONT SLOPE
STA. 22+26.76 -L-
EL. 812.258

1'-6" (TYP.)

EL. 809.0 ±

APPROX. NATURAL GROUND LINE

END BENT 1 BENT 1 END BENT 2

SECTION ALONG -L-

SECTION TAKEN AT RIGHT ANGLES TO BENT AND END BENTS

1'-0" BERM EL. 803.716

2:1 SLOPE NORMAL TO CAP

STA. 19+03.24 -L-
BEGIN APPRAOCH SLAB

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC

TO NC 158

STA. 19+27.04 -L-
FILL FACE @ END BENT 1
W.P. 1

BEGIN FRONT SLOPE
STA. 19+13.93 -L-

4" CONC. SLOPE PROTECTION (TYP.)

3'-0" BERM EL. 803.716

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC

15'-11" MIN. HORIZONTAL CLEARANCE

EXISTING 12'-0" PAVED SHOULDER

EXISTING 24'-0" RIGHT LANE

EXISTING 12'-0" PAVED SHOULDER

-L-

STA. 20+71.54 -L-
STA. 35+70.22 -I-40-
CONTROL LINE BENT 1
W.P. 2

56°-40'-14" (TYP.)

EXISTING 13'-0" PAVED SHOULDER

EXISTING 24'-0" LEFT LANE

EXISTING 11'-0" PAVED SHOULDER

15'-11" MIN. HORIZONTAL CLEARANCE

I-40

EXISTING STRUCTURE (TO BE REMOVED)

1'-0" BERM EL. 803.026

2:1 SLOPE NORMAL TO CAP

STA. 22+11.54 -L-
FILL FACE @ END BENT 2
W.P. 3

BEGIN FRONT SLOPE
STA. 22+26.76 -L-

TO PEACE HAVEN RD.

STA. 22+35.34 -L-
END APPROACH SLAB

TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC

2'-10" BERM EL. 803.026

144'-6" (SPAN A)

140'-0" (SPAN B)

284'-6" (TOTAL LENGTH OF BRIDGE FILL FACE TO FILL FACE ALONG ℄ SURVEY -L-)

PLAN

PILES AND FOOTINGS NOT SHOWN FOR CLARITY

NORTH CAROLINA PROFESSIONAL SEAL 4091 ENGINEER BRUCE CHARLES HUIE
4/7/06

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
4/7/06

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-
35+70.22 -I-40-

SHEET 1 OF 3 REPLACES BRIDGE NO. 50

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1101 OVER I-40 BETWEEN PEACE HAVEN RD AND NC 158

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

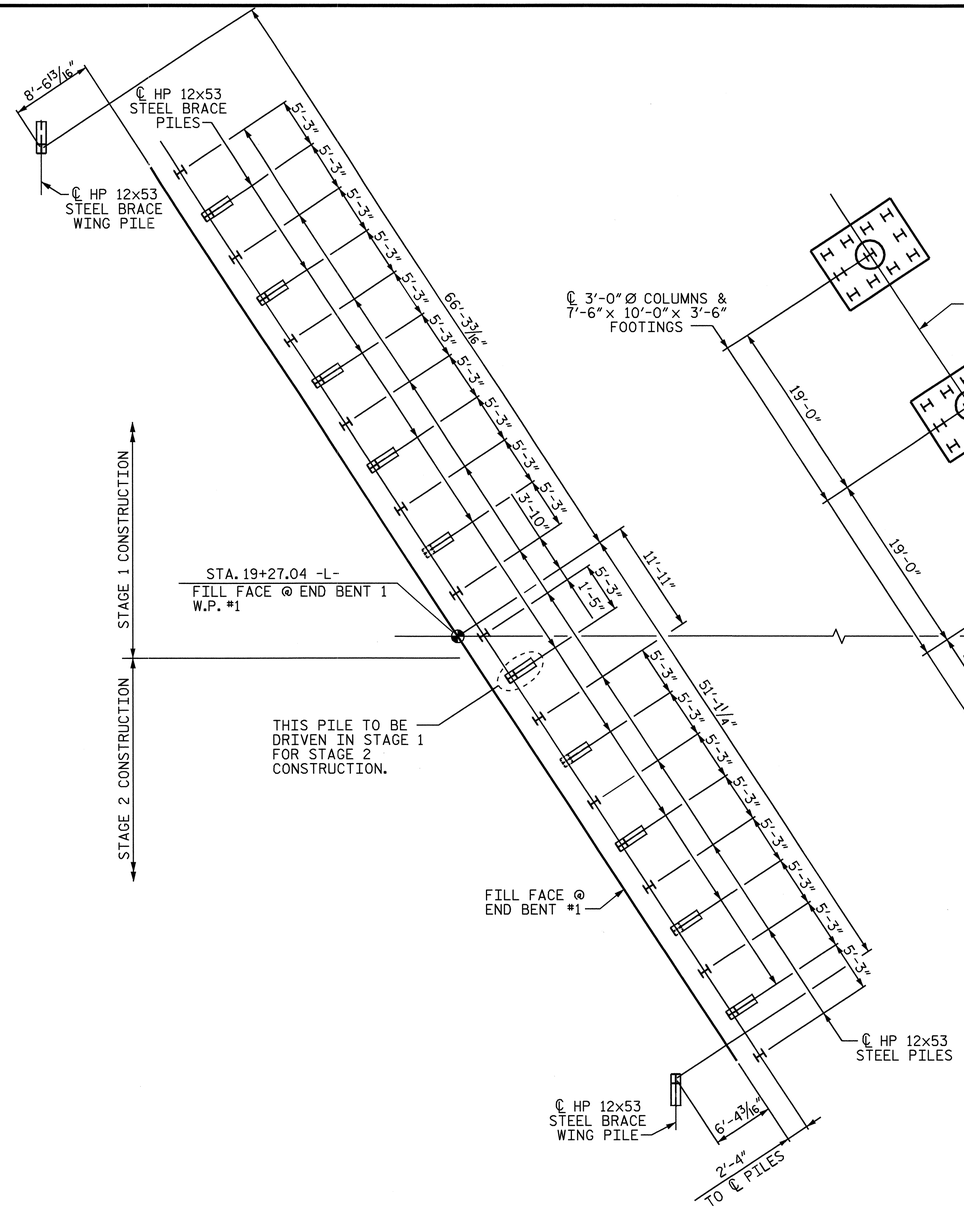
DRAWN BY : KEITH D. LAYNE DATE : 5-28-04
CHECKED BY : S. H. SOCKWELL DATE : 6/04

FOUNDATION NOTES

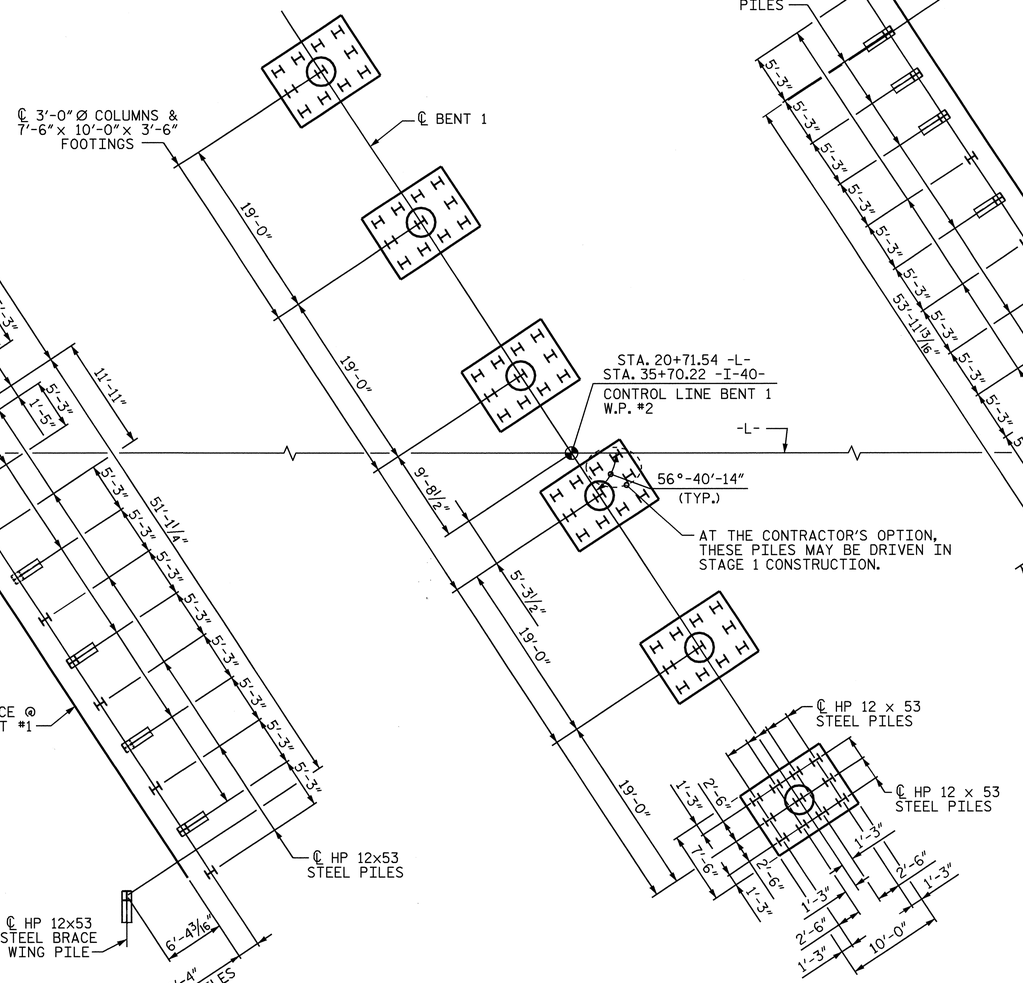
PILES FOR END BENT NO.1, END BENT NO.2, AND BENT NO.1 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 50 TONS EACH.

WHEN DRIVING PILES, THE MAXIMUM BLOW COUNT SHALL NOT BE EXCEEDED.

FOR STEEL H PILES, SEE SPECIAL PROVISIONS.

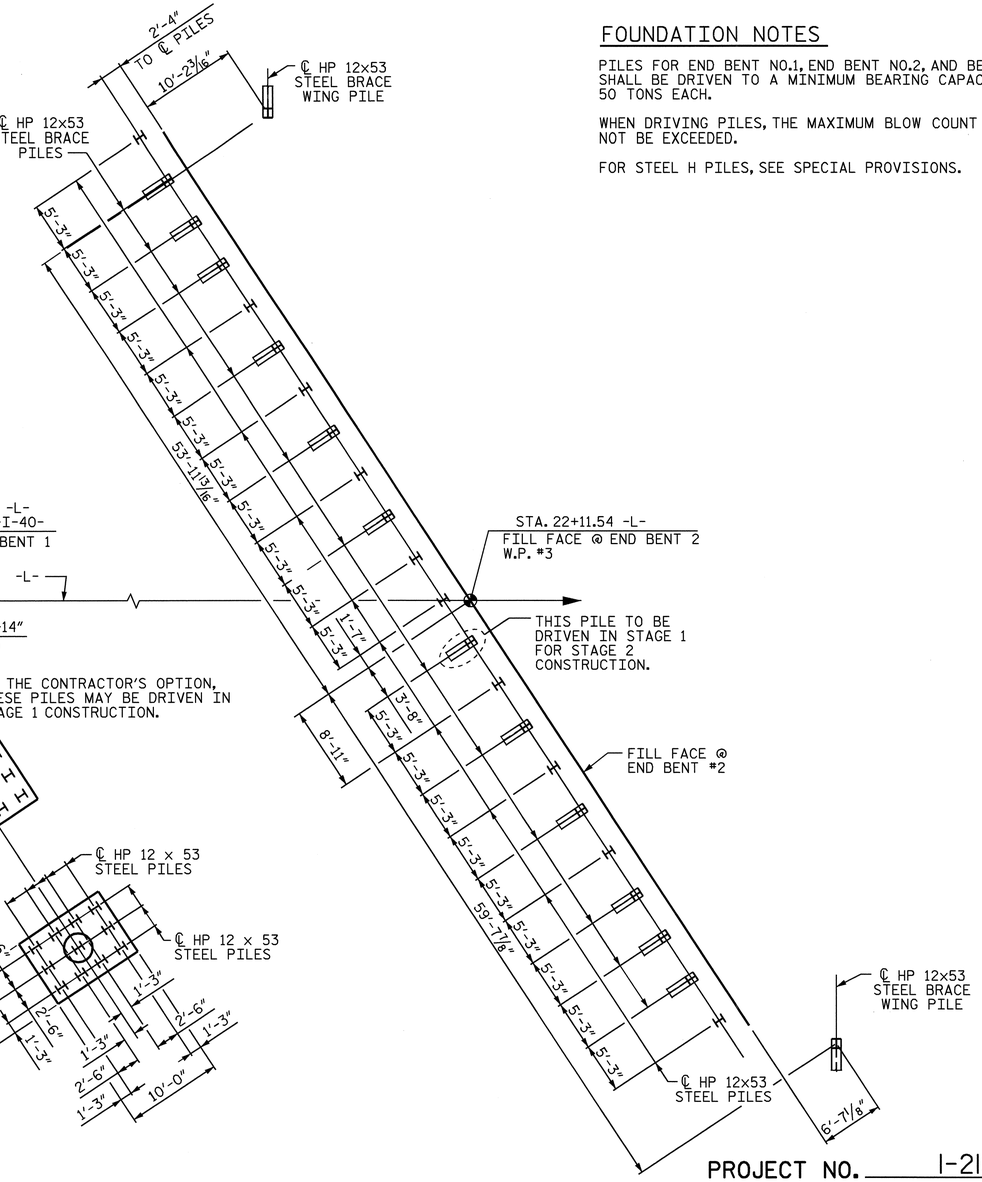


END BENT #1



BENT #1

ALL COLUMN FOOTINGS AND PILE SPACINGS ARE IDENTICAL AT BENT



END BENT #2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE.

HP 12x53 STEEL PILES AT END BENTS ARE BATTERED 3 TO 12.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1101 OVER I-40 BETWEEN PEACE HAVEN RD AND NC 158

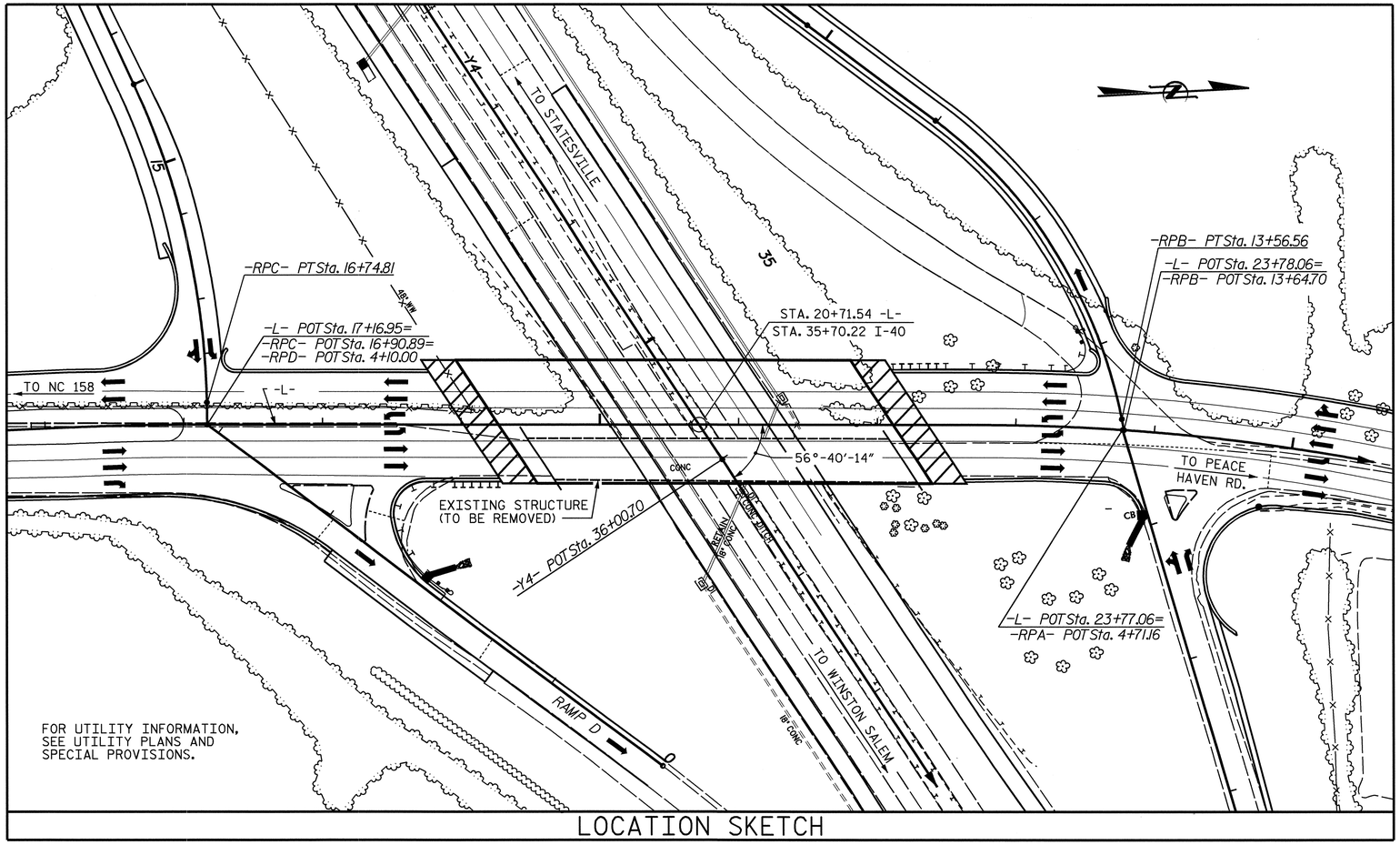
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			51

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
4/7/06

DRAWN BY : Keith D. Layne DATE : 5-28-04
CHECKED BY : S. H. SOCKWELL DATE : 6/04

06-APR-2006 11:36
R:\STRUCTURAL\I2102\final\I2E58021.DGN
ssockwell

BM. #4 PK NAIL IN SOUTH EAST CORNER OF CONC. BASE OF BELL SOUTH TELEPHONE EXCHANGE BOX, 17.0' RIGHT OF STA. 21+97 EL. 823.120



LOCATION SKETCH

NOTES :

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO 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 EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 65'-9", 2 @ 65'-0", AND 1 @ 65'-9") OF COMPOSITE REINFORCED CONCRETE DECK ON 5 LINES OF 45" PRESTRESSED CONCRETE GIRDERS WITH A CLEAR ROADWAY WIDTH OF 28'-0" ON REINFORCED CONCRETE CAPS WITH STEEL PILES AT END BENTS AND REINFORCED CONCRETE POST AND BEAM AT BENTS AND LOCATED AT THE PROPOSED SITE SHALL BE REMOVED. THE EXISTING SPREAD FOOTINGS THAT ARE IN CONFLICT WITH THE PROPOSED STRUCTURE SHALL BE ENTIRELY REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 52 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE MEASURED AND PAID FOR AS 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.

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.

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLE 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 FALSEWORK AND FORMS OVER OR ADJACENT TO TRAFFIC, SEE SPECIAL PROVISIONS.

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.

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

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	FOUNDATION EXCAVATION	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	STRUCTURAL STEEL (APPROX.)	HP12x53 STEEL PILES		TWO BAR METAL RAIL	THREE BAR METAL RAIL	1'-2" X 2'-6" CONCRETE PARAPET	4" SLOPE PROTECTION	POT BEARINGS	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEAL
	LUMP SUM	LUMP SUM	CU. YDS.	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	LBS.	EA.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE				25,122	25,617		LUMP SUM			1,005,950			273.55	273.55	281.91		LUMP SUM	LUMP SUM	LUMP SUM
END BENT NO.1			1,402			89.8		11,841			24	1,800				558			
BENT NO.1		LUMP SUM				166.3		28,958	2,327		66	3,630							
END BENT NO.2			502			104.9		13,016			24	1,680				502			
TOTAL	LUMP SUM	LUMP SUM	1,904	25,122	25,617	361.0	LUMP SUM	53,815	2,327	1,005,950	114	7,110	273.55	273.55	281.91	1,060	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1101 OVER I-40 BETWEEN PEACE HAVEN RD. AND NC 158

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

Thomas G. Payne 4/7/06

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

DRAWN BY : Keith D. Layne DATE : 5-28-04
CHECKED BY : S. H. SOCKWELL DATE : 6/04

06-APR-2006 15:52
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tpayne

STR. #1

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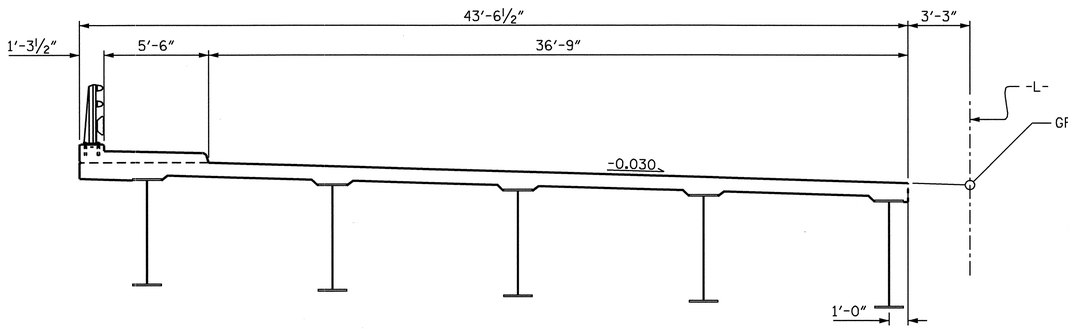
tpayne

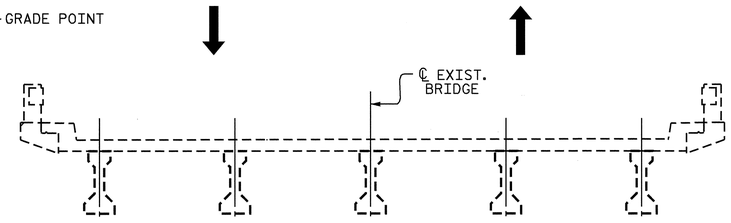
NOTES

FOR PHASING AND MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS.

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE PORTABLE CONCRETE BARRIER RAIL.

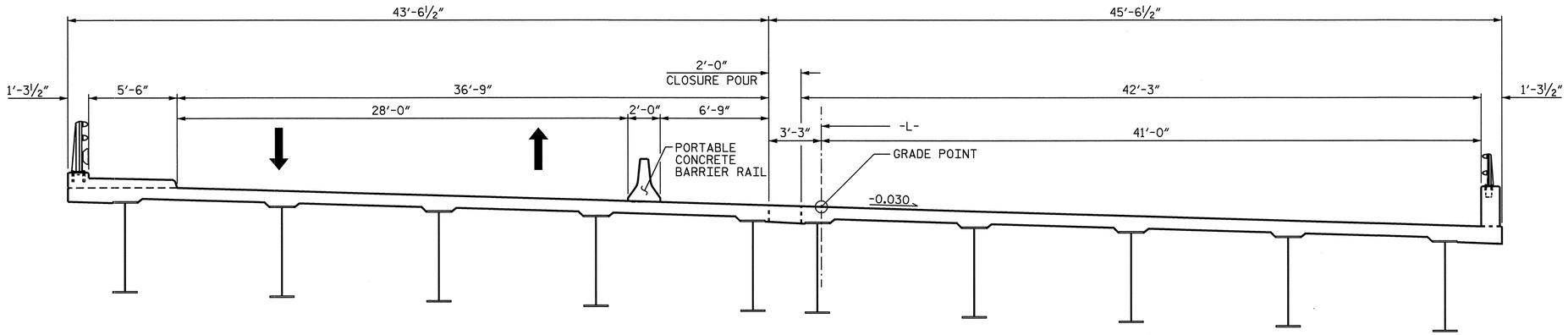


PROPOSED STAGE 1



EXISTING STRUCTURE

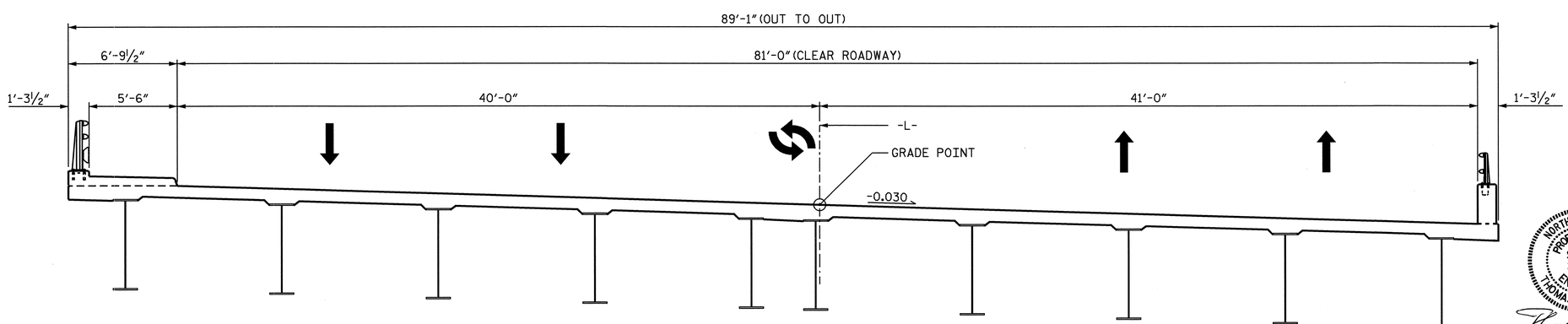
STAGE 1



EXISTING STAGE 1

PROPOSED STAGE 2

STAGE 2



FINAL TYPICAL SECTION

DRAWN BY : J.P. ADAMS DATE : 9/5/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
Thomas G. Payne 8/2/04

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONSTRUCTION SEQUENCE

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

07-APR-2006 08:07
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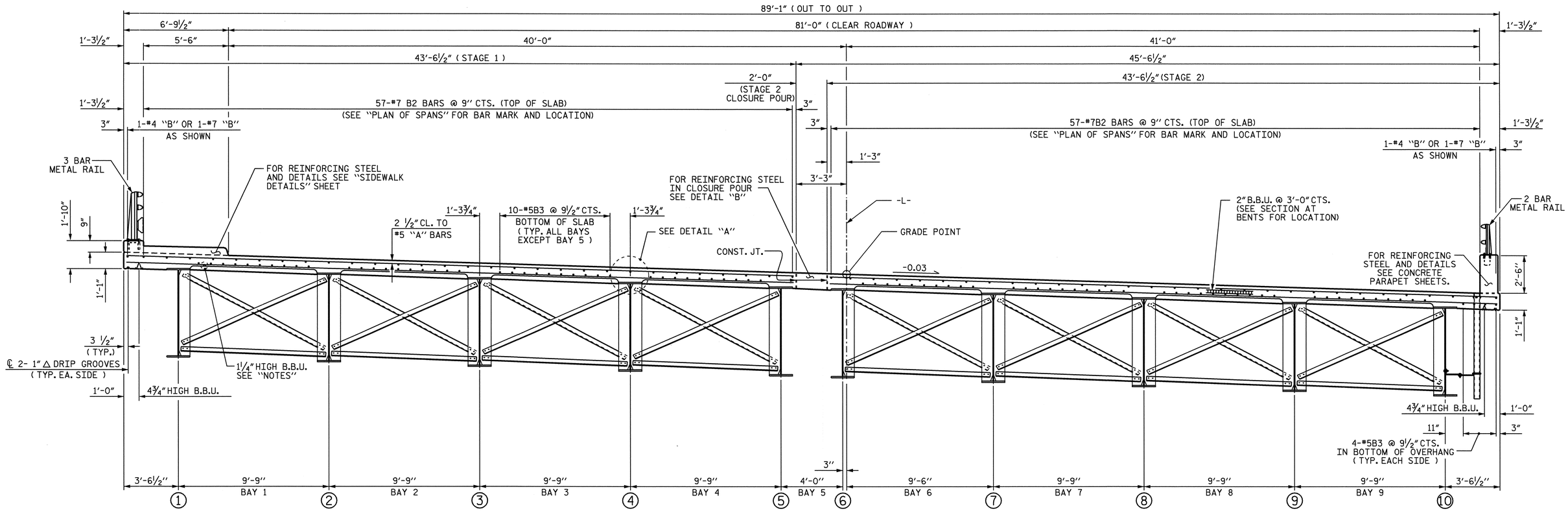


NOTES :

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.

THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE SIDEWALK AND PARAPET.

DOWELS SHALL BE PLACED IN THE SAME HORIZONTAL PLANE AS THE TOP SLAB REINFORCING STEEL.

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 DETAILS" SHEETS.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

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

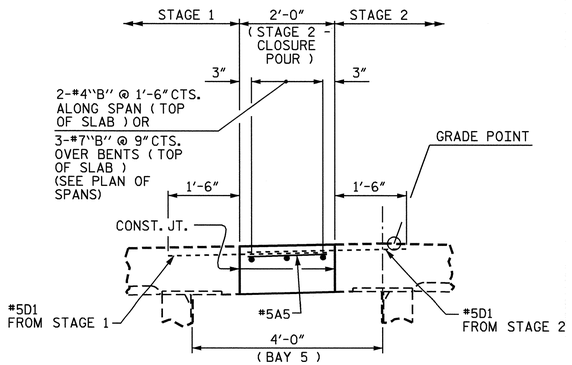
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

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.

AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.

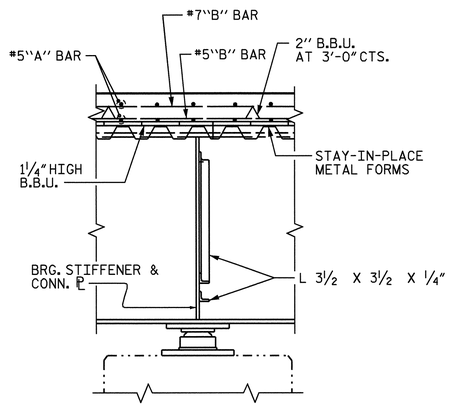
TYPICAL SECTION @ INTERMEDIATE AND BENT DIAPHRAGMS

FOR INTERMEDIATE AND BENT DIAPHRAGM LOCATIONS AND DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEETS.

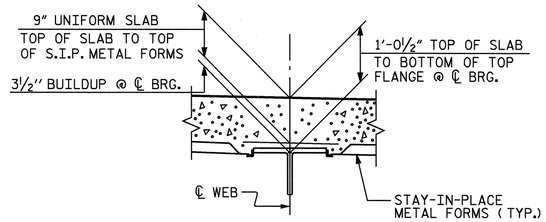


DETAIL "B"

(STAGE 2 - CLOSURE POUR)



SECTION @ BENTS



DETAIL "A"

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

4/7/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 8/29/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

07-APR-2006 08:06
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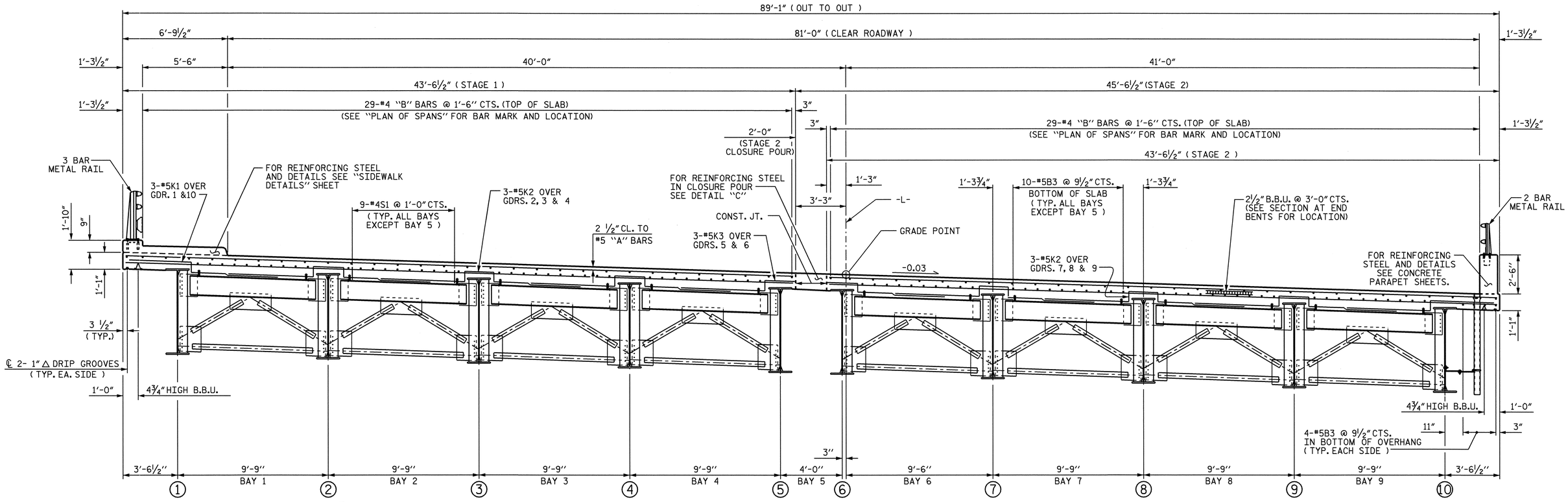
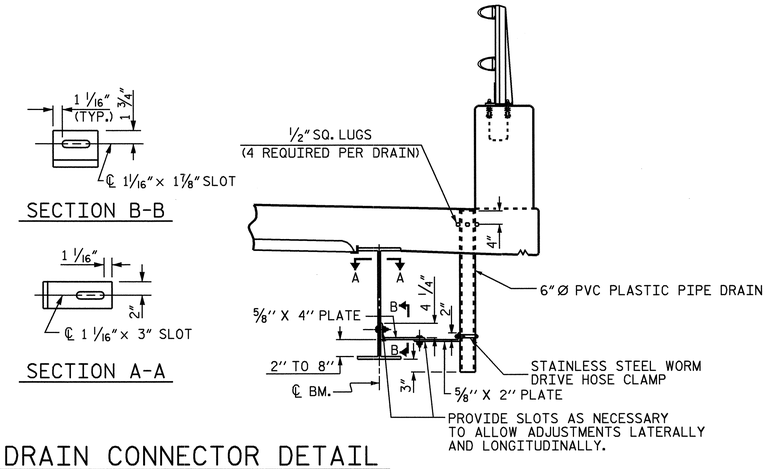
tpayne



TYPICAL SECTION @ END BENT DIAPHRAGMS

FOR END BENT DIAPHRAGM LOCATIONS AND DETAILS, SEE "STRUCTURAL STEEL DETAILS" SHEETS.



DRAIN CONNECTOR DETAIL

SEE PLAN OF SPANS (STAGE 2) FOR LOCATIONS.

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

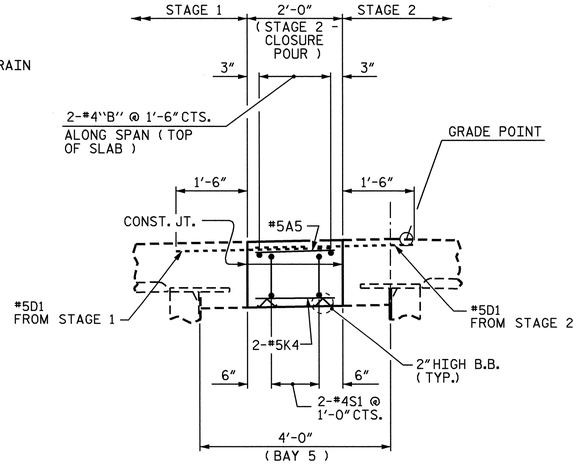
TOP OF FLOOR DRAIN TO BE SET ⅜" BELOW SURFACE OF SLAB.

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

BOLT SIZE TO BE SAME AS DIAPHRAGM AND CROSSFRAME CONNECTIONS. STAINLESS STEEL WORM DRIVE HOSE CLAMP SHALL BE COMMERCIAL QUALITY.

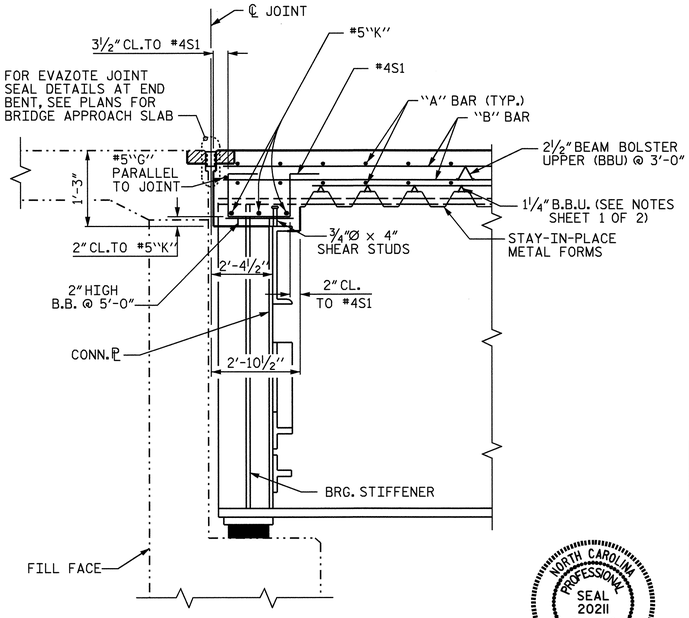
PVC DECK DRAINS SHALL BE PAINTED WITH TWO COATS OF BROWN PRIMER MEETING THE REQUIREMENTS OF ARTICLE 1080-12 OF THE STANDARD SPECIFICATIONS. EACH COAT SHALL BE 2 DRY MILS THICK. DECK DRAINS SHALL BE ROUGHENED PRIOR TO PAINTING. NO SEPERATE PAYMENT SHALL BE MADE FOR PAINTING PVC DECK DRAINS AS THIS IS CONSIDERED INCIDENTAL TO THE PAY ITEM FOR REINFORCED CONCRETE DECK SLAB.

THE 6" Ø PVC PLASTIC PIPE AND FITTINGS SHALL BE SCHEDULE 40 AND CONFORM TO ASTM D1785.



DETAIL "C"

(STAGE 2 - CLOSURE POUR)



SECTION @ END BENTS

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL SEAL 2021I ENGINEER THOMAS G. PAYNE
4/7/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 8/29/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

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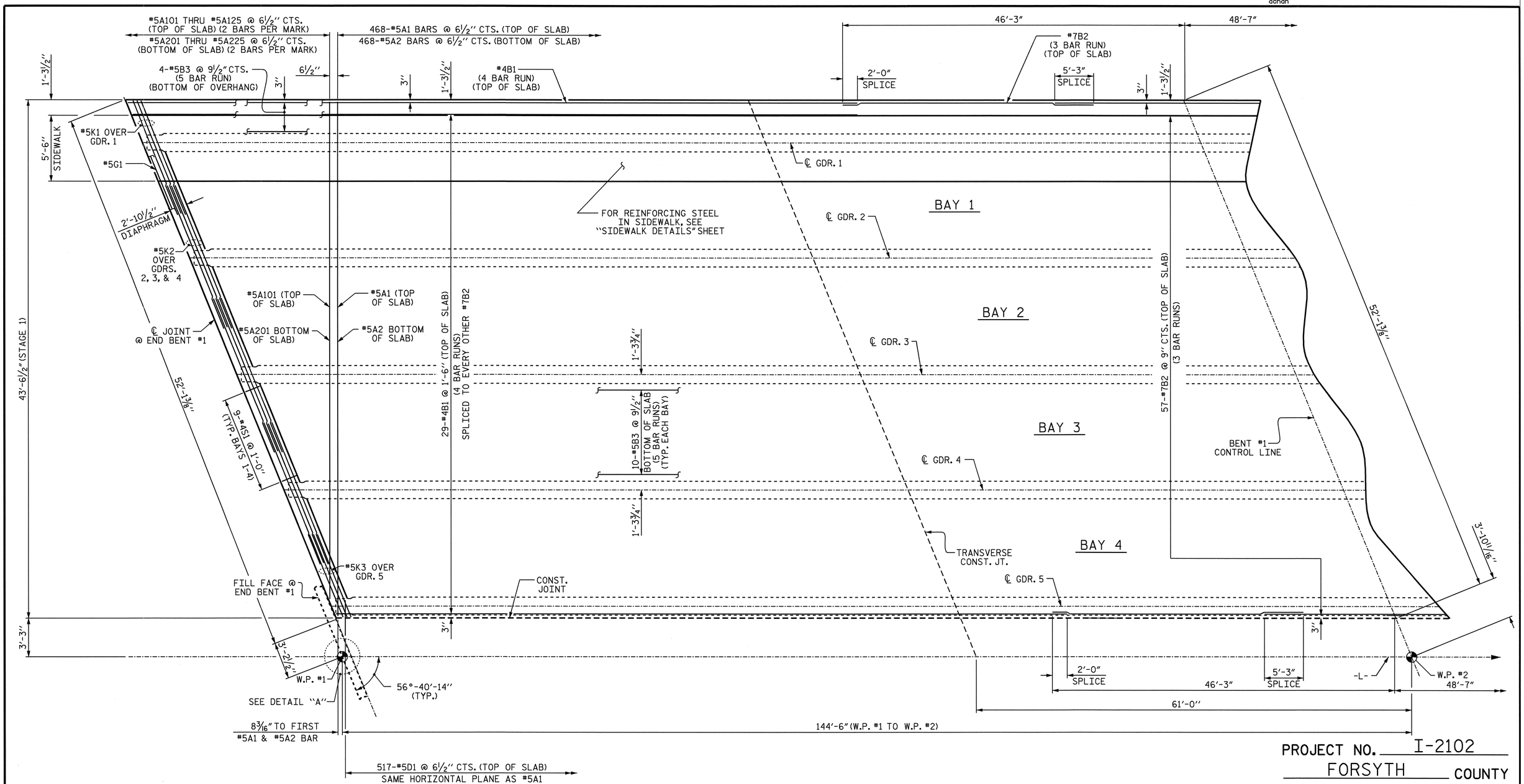
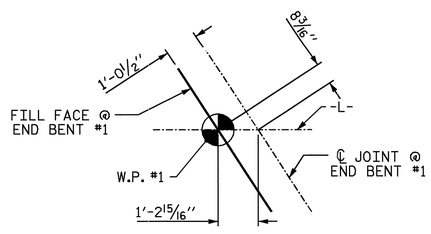
achan

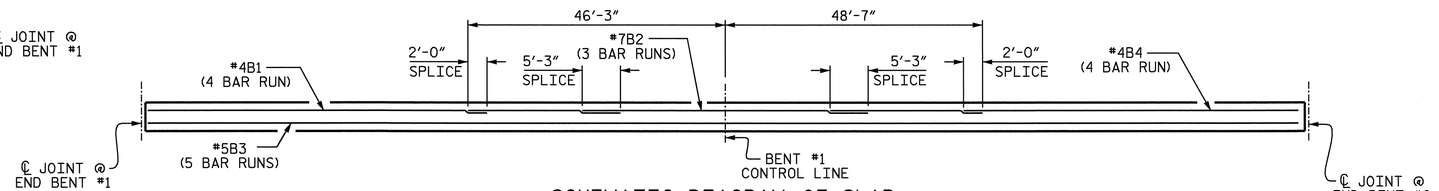




DETAIL "A"

PLAN OF SPAN A - STAGE 1

FOR REINFORCING STEEL AND DETAILS IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
FOR TRANSVERSE CONSTRUCTION JOINT AND POUR SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



SCHEMATIC DIAGRAM OF SLAB

DRAWN BY : J.P. ADAMS DATE : 8/18/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A
(STAGE 1)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
7/1/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			51

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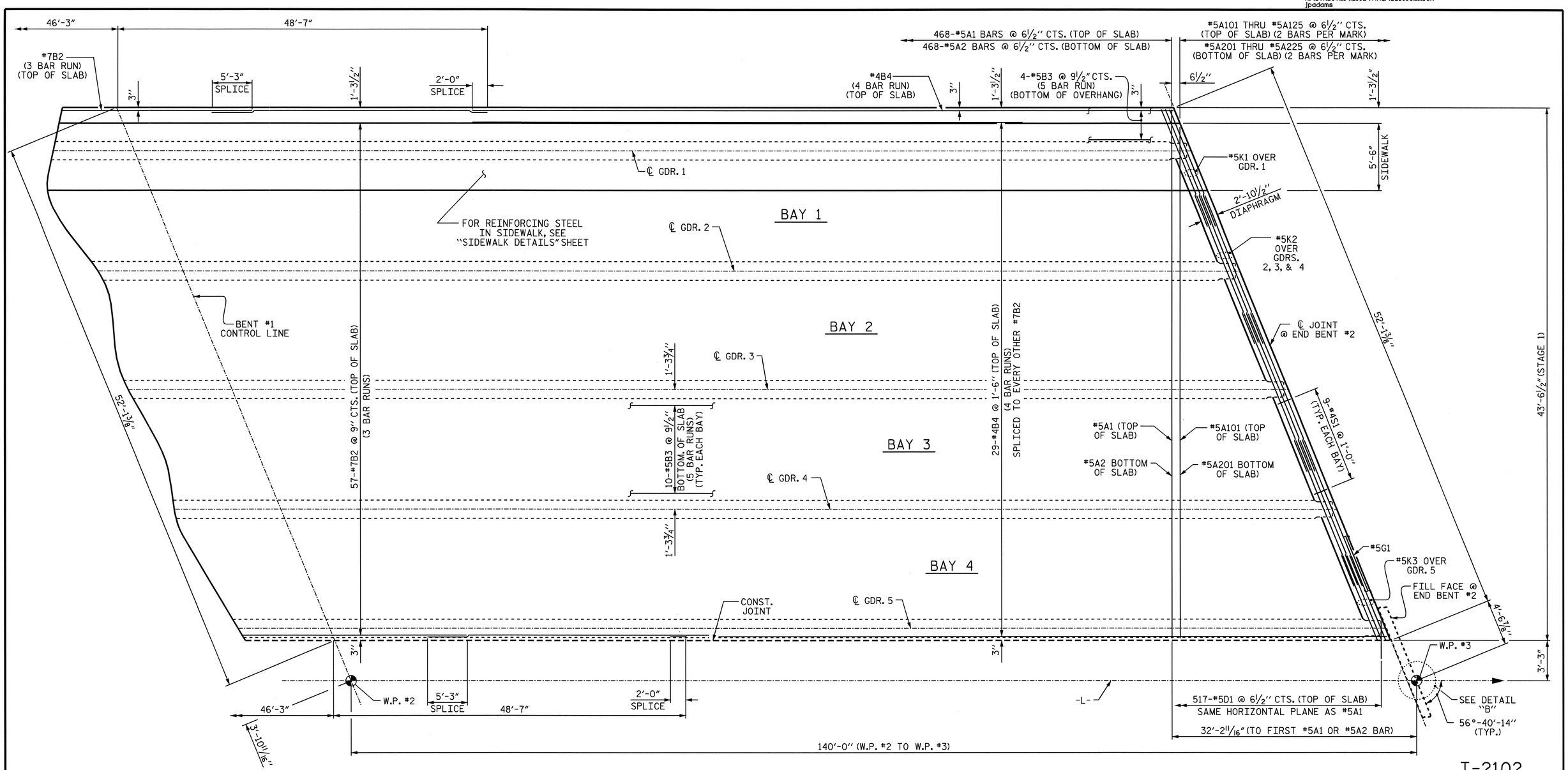

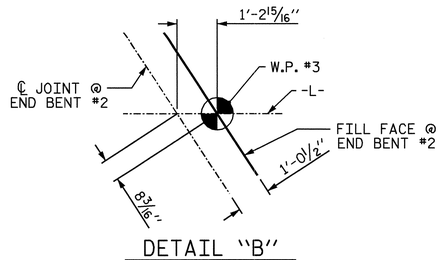

DETAIL "B"

PLAN OF SPAN B - STAGE 1

FOR REINFORCING STEEL AND DETAILS IN SIDEWALK, SEE "SIDEWALK DETAILS" SHEET.
FOR TRANSVERSE CONSTRUCTION JOINT AND POUR SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
7/17/06

DRAWN BY : J.P. ADAMS DATE : 8/19/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B
(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			51

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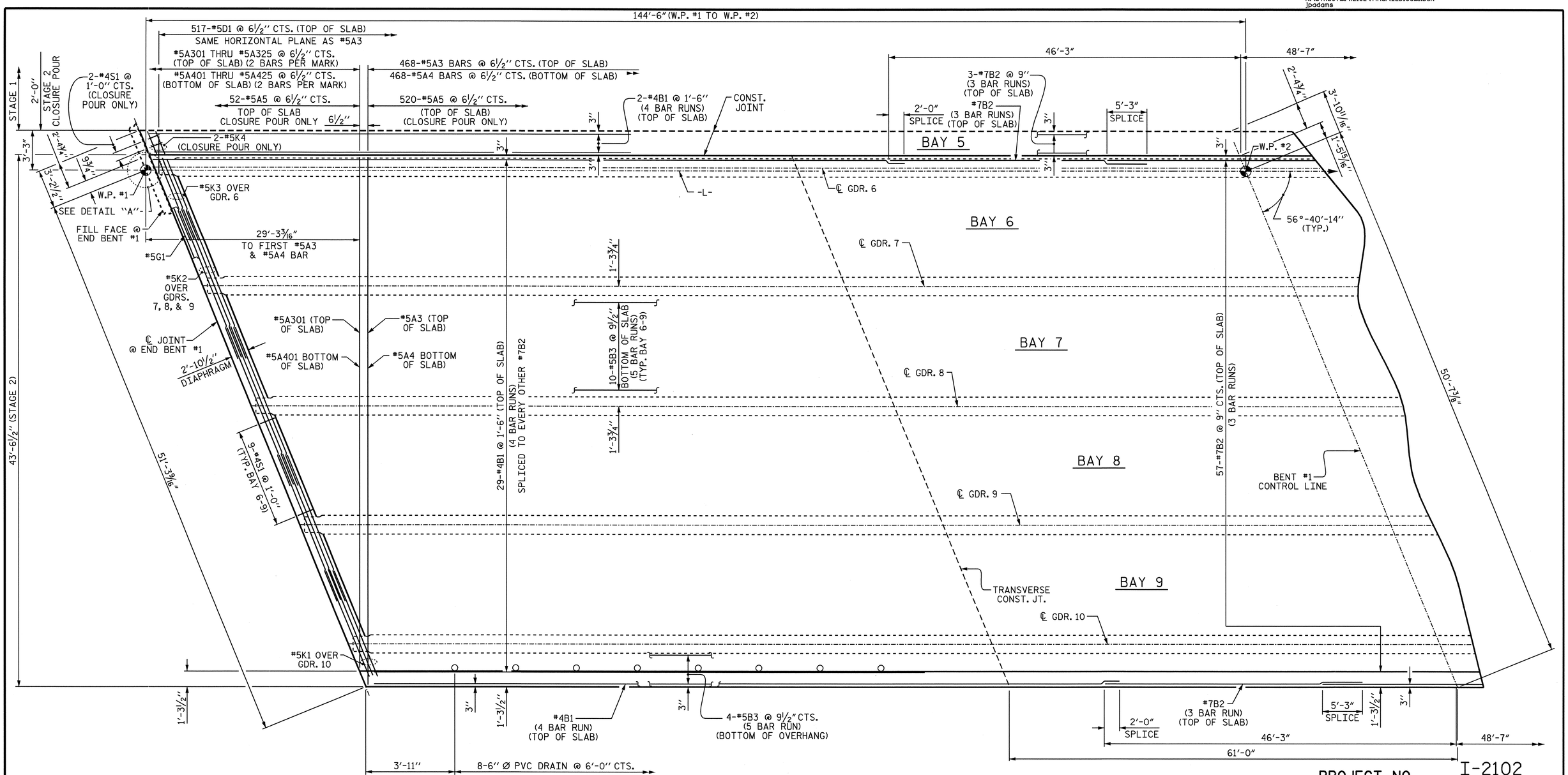
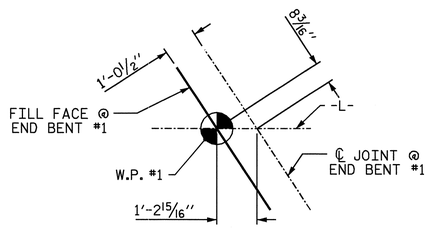
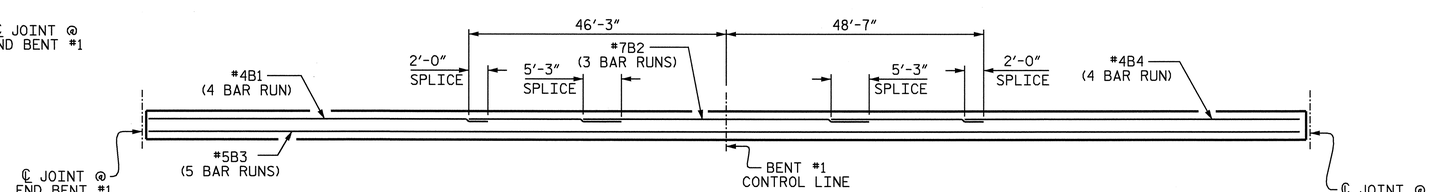


PLAN OF SPAN A - STAGE 2

FOR REINFORCING STEEL AND DETAILS IN PARAPET, SEE "CONCRETE PARAPET AND END POST DETAILS" SHEET. FOR TRANSVERSE CONSTRUCTION JOINT AND POUR SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.



DETAIL "A"



SCHEMATIC DIAGRAM OF SLAB

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
2/17/06

DRAWN BY : J.P. ADAMS DATE : 8/18/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
PLAN OF SPAN A
(STAGE 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			51

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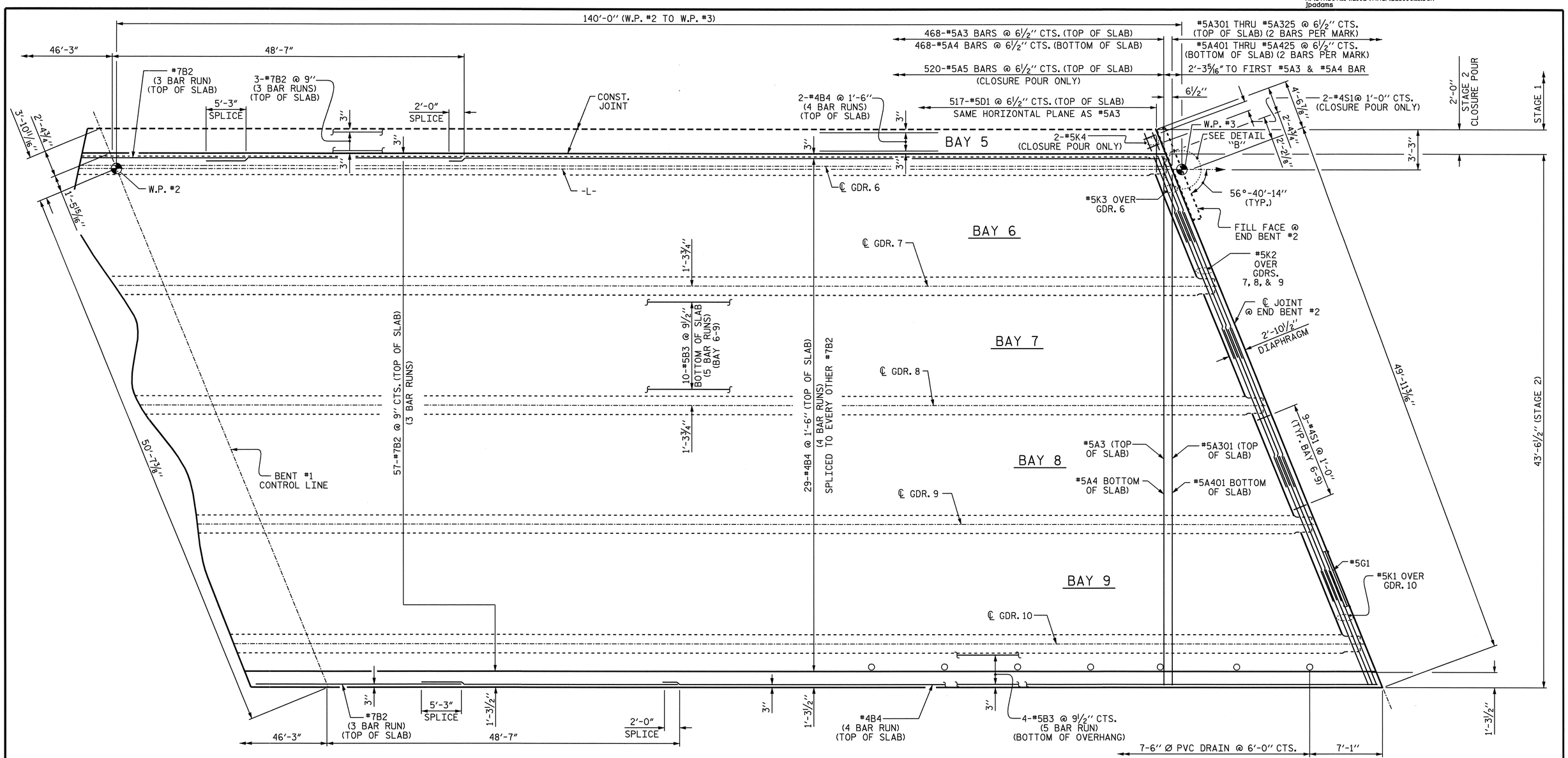

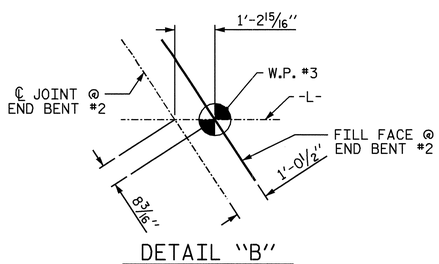

DETAIL "B"

PLAN OF SPAN B - STAGE 2

FOR REINFORCING STEEL AND DETAILS IN PARAPET, SEE "CONCRETE PARAPET AND END POST DETAILS" SHEET. FOR TRANSVERSE CONSTRUCTION JOINT AND POUR SEQUENCE, SEE "SUPERSTRUCTURE BILL OF MATERIAL" SHEET.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN B
(STAGE 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

Thomas G. Payne
2/17/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 8/18/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

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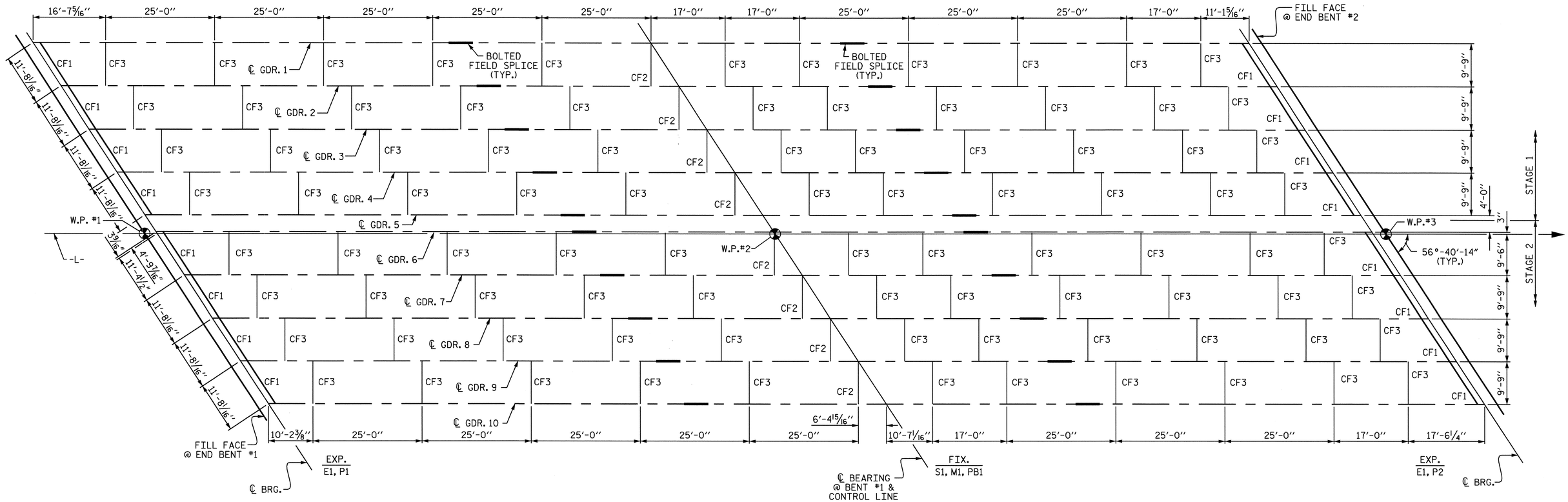


FRAMING PLAN

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

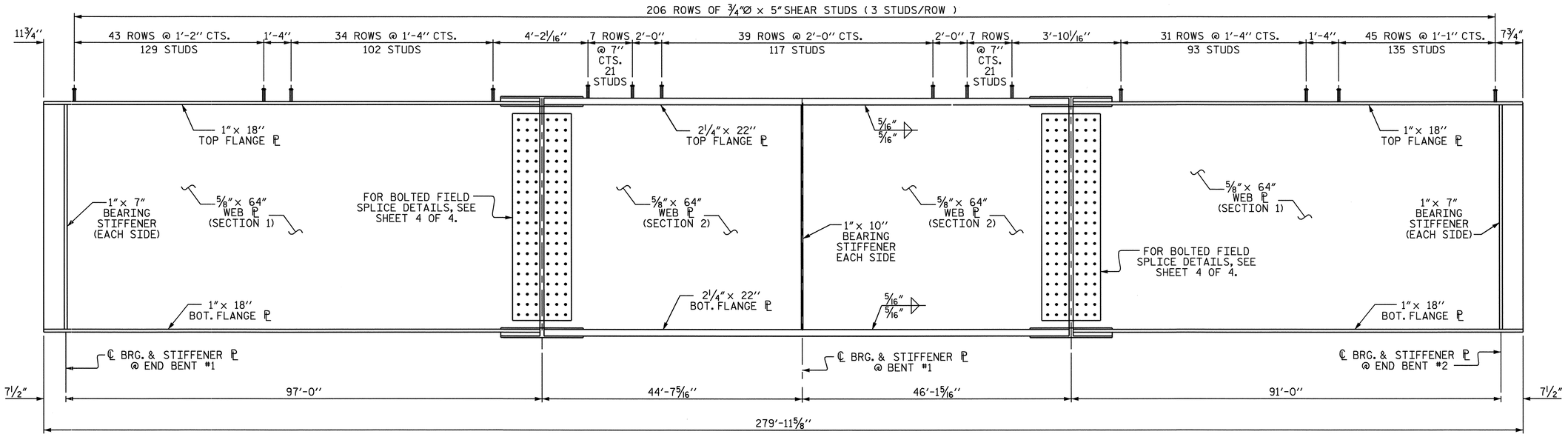
STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

7/12/06

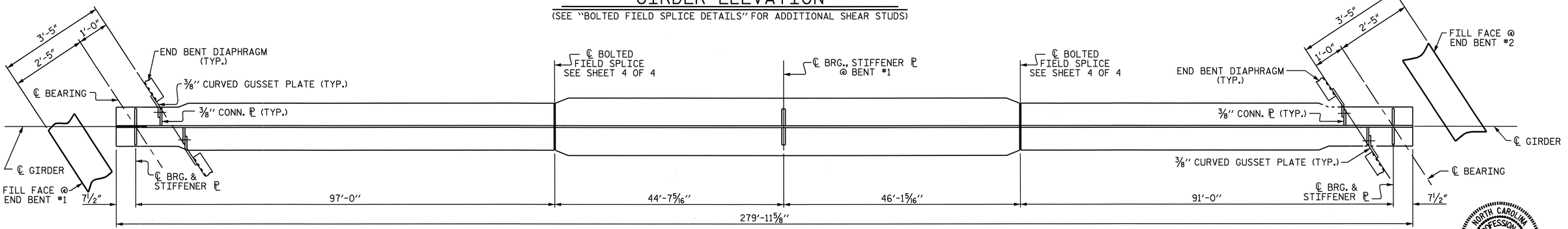
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			51

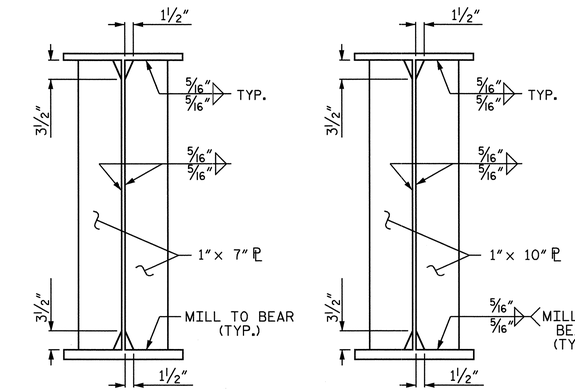
DRAWN BY : J.P. ADAMS DATE : 7/31/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03



GIRDER ELEVATION

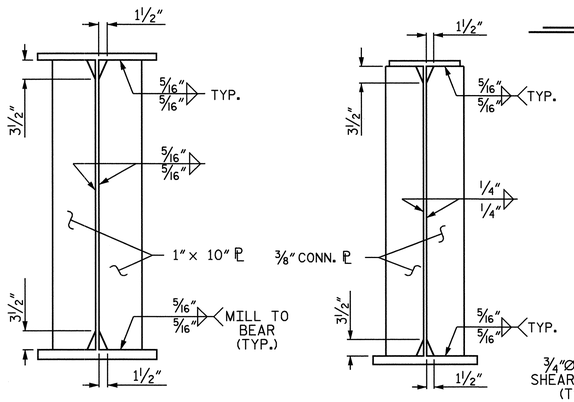
(SEE "BOLTED FIELD SPLICE DETAILS" FOR ADDITIONAL SHEAR STUDS)





BEARING STIFFENER PLATE DETAIL

@ END BENTS

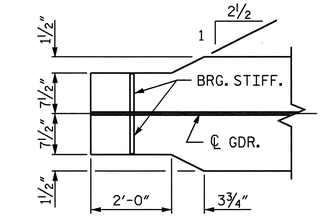


BEARING STIFFENER PLATE DETAIL

@ BENT

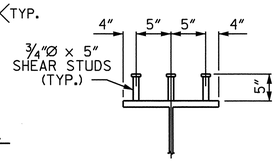
CONNECTOR PLATE DETAIL

BOTTOM FLANGE DETAILS



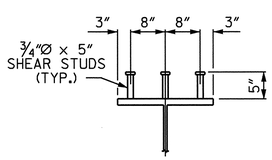
END OF GIRDER DETAIL

(BOTTOM FLANGE ONLY)



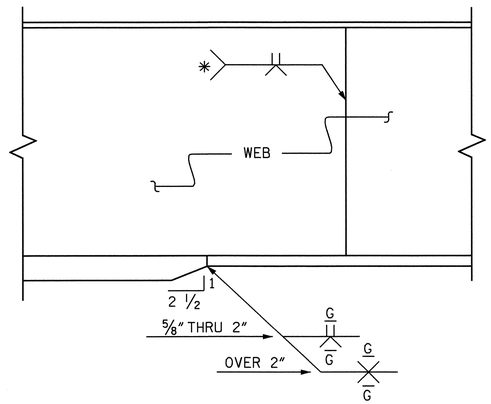
TOP FLANGE SHEAR STUD DETAILS

(SECTION 1)



TOP FLANGE SHEAR STUD DETAILS

(SECTION 2)



TYPICAL FLANGE AND WEB BUTT JOINT

* GRIND SMOOTH AND FLUSH ON OUTER FACE OF EXTERIOR GIRDERS

DRAWN BY : J.P. ADAMS DATE : 7/22/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			51

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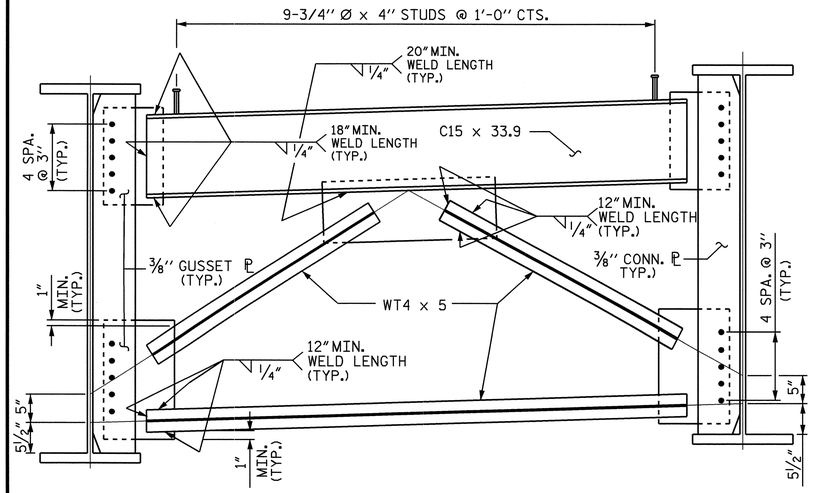
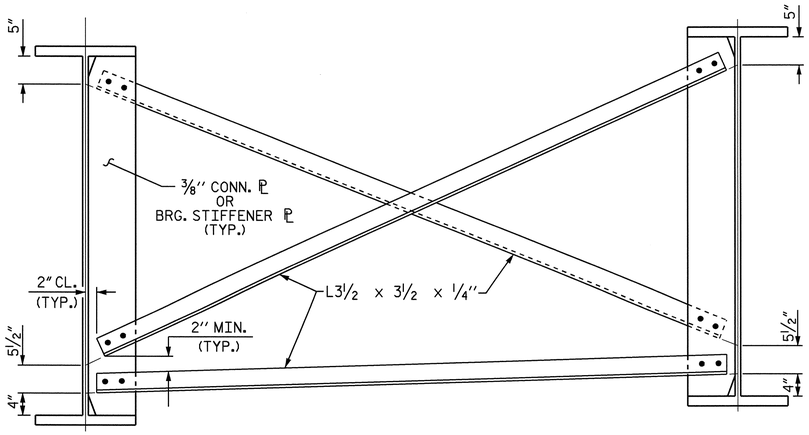
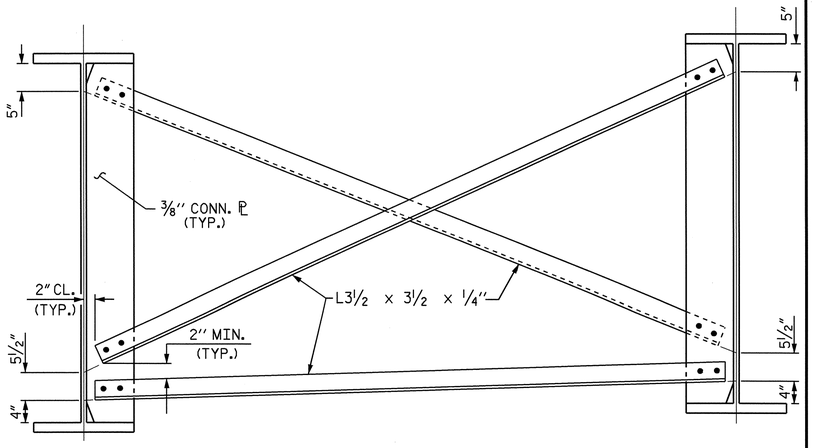


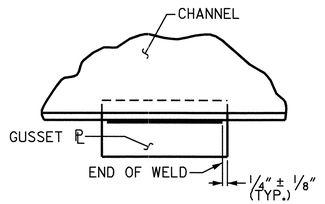
END BENT CROSSFRAME (CF1)



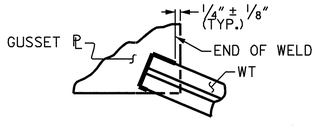
BENT CROSSFRAME (CF2)



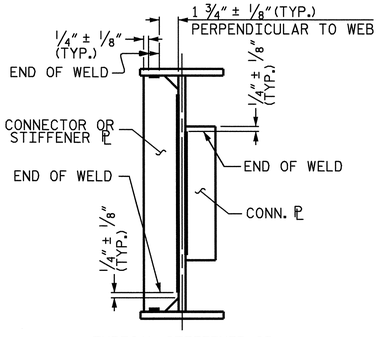
INTERMEDIATE CROSSFRAME (CF3)



TYPICAL GUSSET PLATE CONNECTION

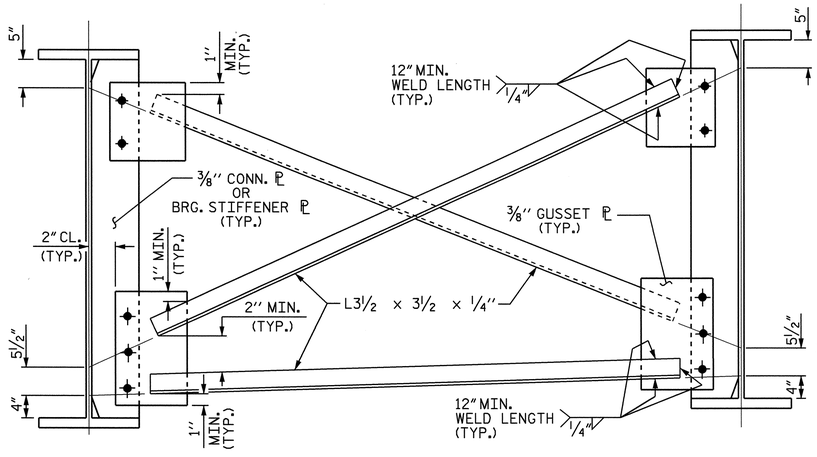


TYPICAL "TEE" TO GUSSET PLATE CONNECTION

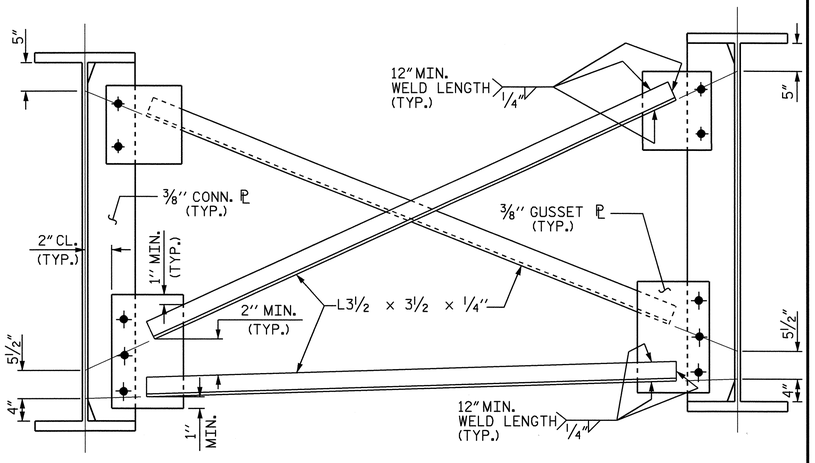


TYPICAL STIFFENER OR CONNECTOR PLATE CONNECTION

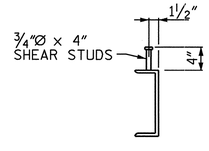
WELD TERMINATION DETAILS



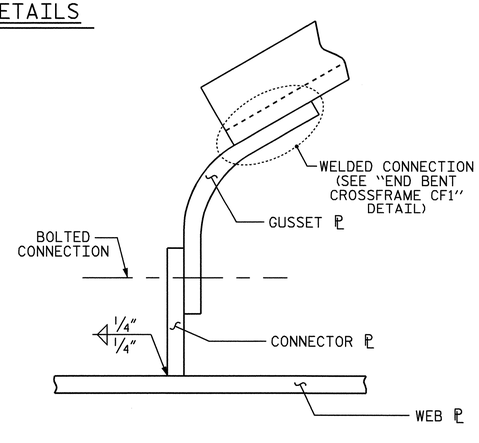
OPTIONAL BENT CROSSFRAME



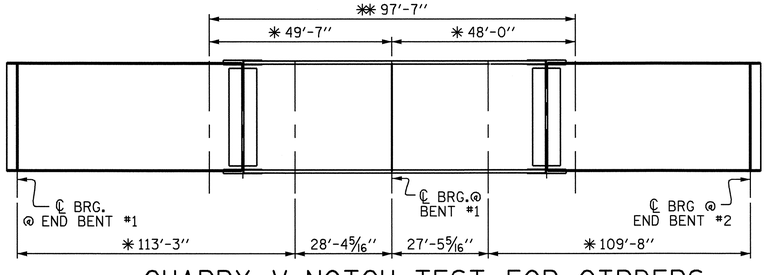
OPTIONAL INTERMEDIATE CROSSFRAME



END BENT CROSSFRAME SHEAR STUD DETAILS



WELD DETAIL FOR CURVED GUSSET PL



CHARPY V-NOTCH TEST FOR GIRDERS

*CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALLS WITHIN THESE LIMITS, INCLUDING ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE TOP FLANGE PLATE. FOR CHARPY V-NOTCH TESTS, SEE ARTICLE 1072-9 OF THE STANDARD SPECIFICATIONS.

**NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
4/7/06

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 3 OF 4

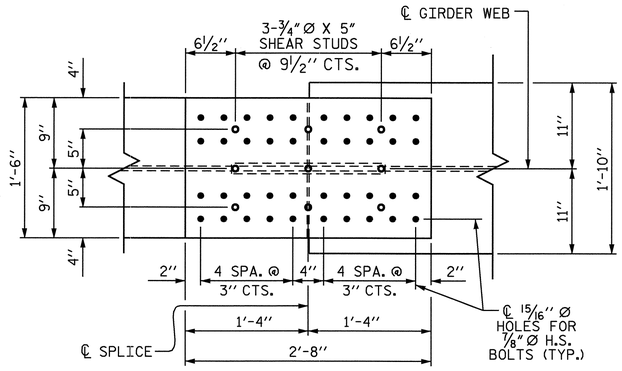
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

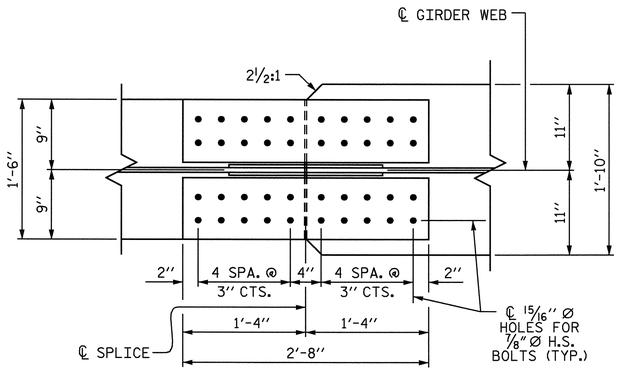
STRUCTURAL STEEL DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 7/28/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03



PLAN (TOP OF FLANGE)



PLAN (TOP OF BOTTOM FLANGE)

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 ⅞″DIA. HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

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

CAMBERED GIRDER LENGTHS SHALL BE ADJUSTED AND BEARINGS ARE TO BE PLACED ON THE CAMBERED GIRDER SO AS TO BE ALIGNED WITH THE ANCHORS AFTER THE DEAD LOAD DEFLECTION HAS OCCURRED. SHOP DRAWINGS SHALL BE PREPARED ACCORDINGLY.

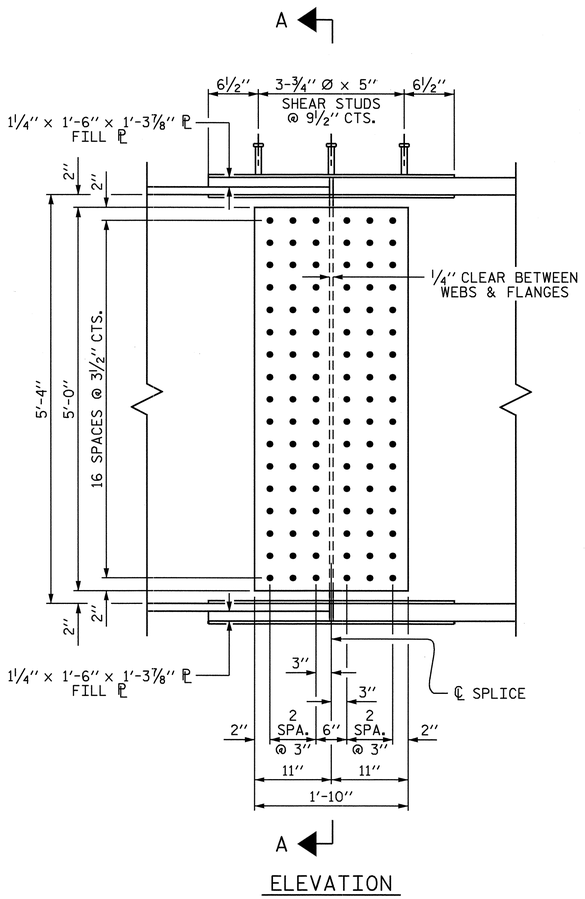
END OF BEAMS AND GIRDERS SHALL BE PLUMB.

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

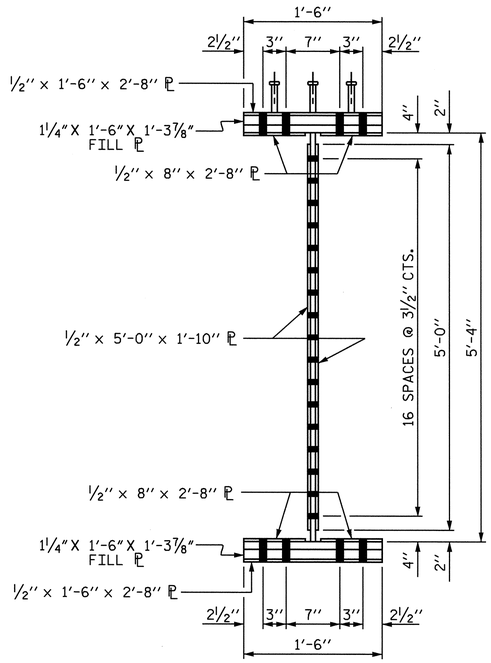
SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED FLANGE PIECE LENGTHS TO 60 FEET AND WEB PIECE LENGTHS TO 45 FEET. PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 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.

TENSION ON THE AASHTO M164 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-10 OF THE STANDARD SPECIFICATIONS.

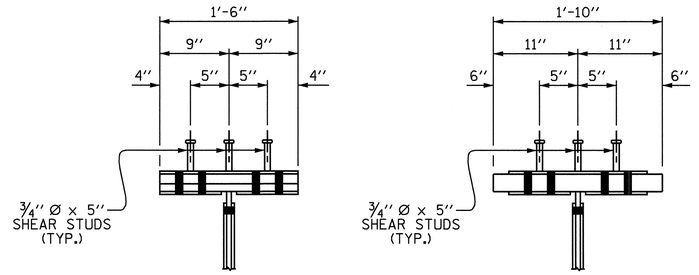
AT THE CONTRACTOR'S OPTION, THE DIAPHRAGM WITH THE WELDED GUSSET PLATES MAY BE USED IN LIEU OF THE DIAPHRAGM WITH BOLTED ANGLES AT NO ADDITIONAL COST TO THE DEPARTMENT.



ELEVATION



SECTION A-A



SHEAR STUD DETAIL
FOR TOP FLANGE SPLICE PLATE

BOLTED FIELD SPLICE DETAILS

(TYPICAL EACH FIELD SPLICE)

DRAWN BY : J.P. ADAMS DATE : 7/31/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 4 OF 4

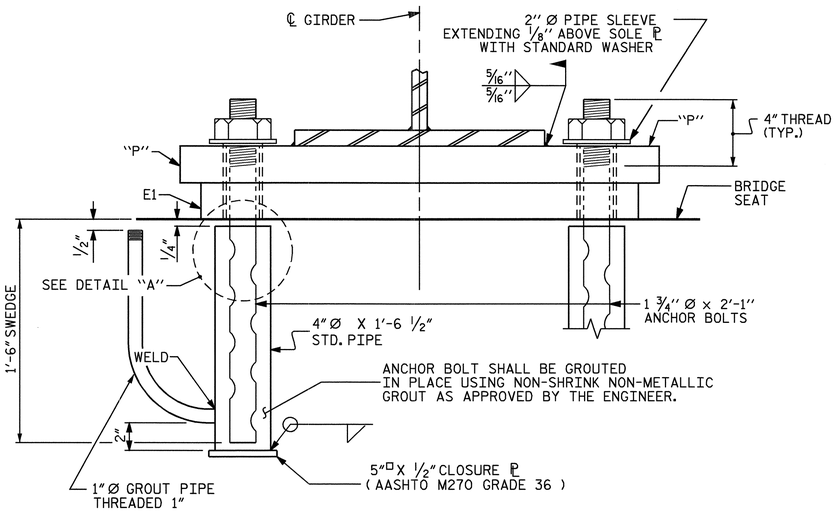
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

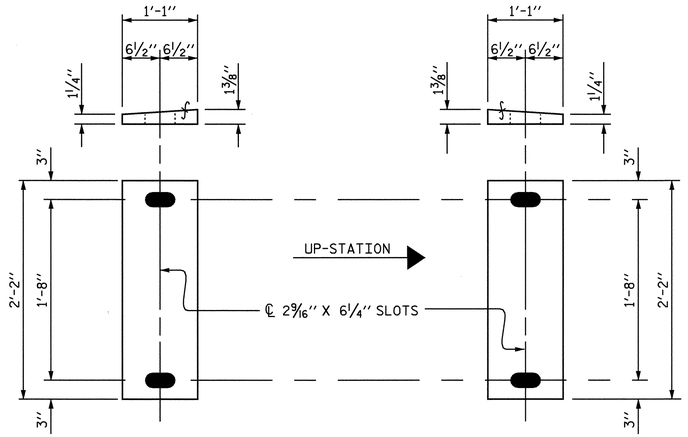
STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
9/10/04

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			51



END VIEW
(EXPANSION)



SOLE PLATE DETAILS

NOTES

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL POINTS OF SUPPORT FOR END BENT 1 AND 2, 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.

PAYMENT FOR THE PIPE SLEEVES AND THE 4" Ø X 1'-6 1/2" STANDARD PIPE ASSEMBLY 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.

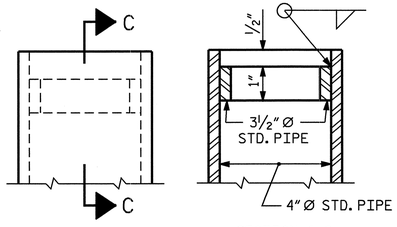
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

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 IV	184 K

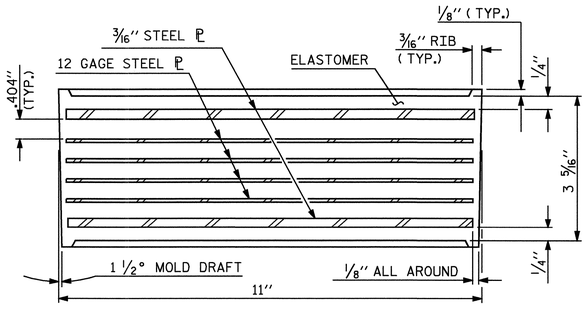


SECTION C-C

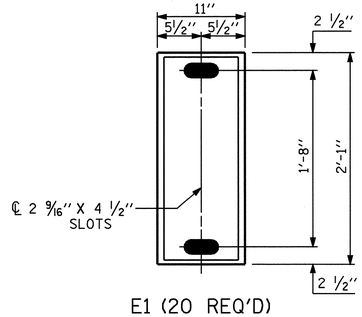
DETAIL "A"

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURES TO ACCOMMODATE GIRDER TRANSLATION AND END ROTATION:

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



TYPICAL SECTION OF ELASTOMERIC BEARING



E1 (20 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE IV

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

(STEEL SUPERSTRUCTURE)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			51

ASSEMBLED BY : J.P. ADAMS DATE : 7/11/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

DRAWN BY : EEM 10/95
CHECKED BY : PEK 10/95

REV. 8/16/99 MAB/LES
REV. 10/17/00 RWW/LES
REV. 7/10/01 LES/RDR

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
7/1/06

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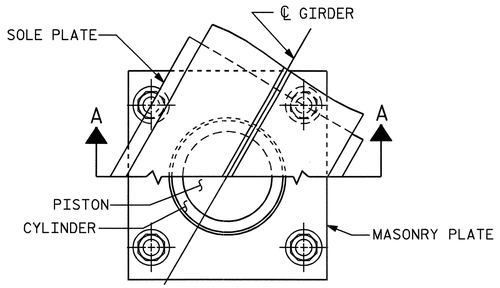
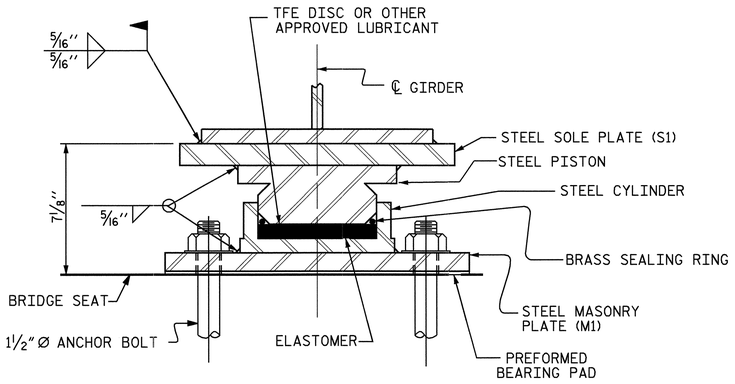


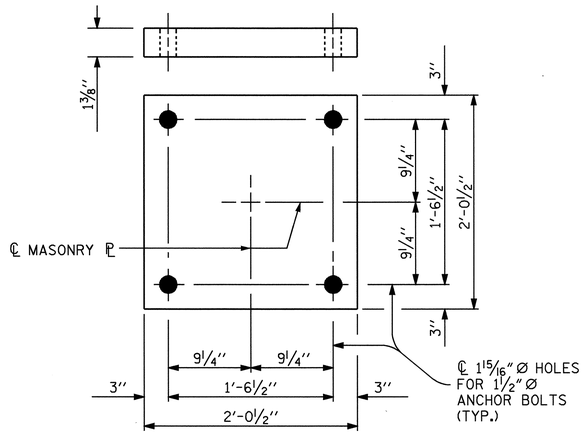
CUT-AWAY PLAN



SECTION A-A

PB1, FIXED
(10 REQ'D.)

POT BEARING DETAILS



PLAN
M1 (10 REQ'D.)

MASONRY PLATE DETAILS

NOTES

FOR POT BEARINGS, SEE SPECIAL PROVISIONS.

AT ALL POINTS OF SUPPORT AT BENT #1, NUTS FOR ANCHOR BOLTS SHALL BE TIGHTENED FINGER TIGHT AND GIVEN AN ADDITIONAL 1/4 TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR ELASTOMER.

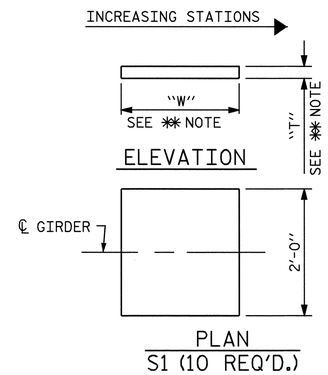
SOLE PLATES SHOULD BE WELDED TO BEAM FLANGES BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

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

THE CONTRACTOR MAY SUBSTITUTE DISC BEARINGS FOR THE POT BEARINGS SHOWN. FOR OPTIONAL DISC BEARINGS, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL ADJUST THE GIRDER BUILDUPS AS NECESSARY TO INCORPORATE A MAXIMUM PERMISSIBLE VARIATION IN POT BEARING DEPTH OF 1/2'', SEE SPECIAL PROVISION FOR POT BEARINGS.



PLAN
S1 (10 REQ'D.)

** NOTE:
DIMENSIONS ''W'' AND ''T'' ARE TO BE DETERMINED BY THE MANUFACTURER.

SOLE PLATE DETAILS

TABLE FOR LOADS AND MOVEMENTS						
BEARING	LOCATION	VERTICAL LOAD (KIPS)			LATERAL LOAD (KIPS)	TOTAL MOVEMENT (INCHES)
		DEAD	LIVE	TOTAL		
PB1 (FIXED)	BENT #1	397	126	523	79	0

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

POT BEARING DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
Thomas G. Payne
2/1/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			51

ASSEMBLED BY : J.P. ADAMS		DATE :7/11/03
CHECKED BY : S.H. SOCKWELL		DATE :10/2/03
DRAWN BY : RWW 8/99	REV. 10/17/00	RWW/LES
CHECKED BY : LES 8/99	REV. 7/10/01	LES/RDR
	REV. 5/7/03	RWW/JTE

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																					SPAN B																						
	GIRDER 1																					GIRDER 1																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.013	-0.025	-0.035	-0.045	-0.052	-0.058	-0.061	-0.062	-0.061	-0.058	-0.053	-0.047	-0.040	-0.032	-0.025	-0.017	-0.011	-0.006	-0.002	0.000	0.000	-0.001	-0.003	-0.007	-0.012	-0.018	-0.024	-0.030	-0.036	-0.042	-0.046	-0.049	-0.050	-0.050	-0.047	-0.043	-0.037	-0.029	-0.020	-0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	-0.029	-0.056	-0.081	-0.103	-0.120	-0.133	-0.141	-0.143	-0.141	-0.134	-0.123	-0.109	-0.092	-0.075	-0.057	-0.041	-0.026	-0.013	-0.004	0.000	0.000	-0.001	-0.006	-0.015	-0.026	-0.038	-0.052	-0.066	-0.080	-0.092	-0.102	-0.108	-0.111	-0.110	-0.105	-0.095	-0.082	-0.065	-0.045	-0.023	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	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	0.000	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	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.042	-0.081	-0.117	-0.148	-0.173	-0.191	-0.202	-0.205	-0.202	-0.192	-0.176	-0.156	-0.132	-0.107	-0.082	-0.058	-0.037	-0.019	-0.006	0.000	0.000	-0.001	-0.009	-0.021	-0.037	-0.056	-0.076	-0.096	-0.116	-0.134	-0.148	-0.157	-0.161	-0.160	-0.152	-0.138	-0.119	-0.094	-0.065	-0.034	0.000
VERTICAL CURVE ORDINATE	0.000	+0.063	+0.120	+0.169	+0.212	+0.249	+0.279	+0.302	+0.319	+0.329	+0.332	+0.329	+0.319	+0.302	+0.279	+0.249	+0.212	+0.169	+0.120	+0.063	0.000	0.000	+0.059	+0.112	+0.158	+0.198	+0.232	+0.260	+0.282	+0.297	+0.306	+0.309	+0.306	+0.296	+0.281	+0.259	+0.230	+0.196	+0.155	+0.109	+0.055	0.000
REQUIRED CAMBER	0	+1 1/4″	+2 3/8″	+3 7/16″	+4 5/16″	+5 1/16″	+5 5/8″	+6 1/16″	+6 5/16″	+6 3/8″	+6 5/16″	+6 1/16″	+5 11/16″	+5 3/16″	+4 5/8″	+3 15/16″	+3 1/4″	+2 1/2″	+1 11/16″	+1 3/16″	0	0	+3/4″	+1 7/16″	+2 1/8″	+2 13/16″	+3 7/16″	+4 1/16″	+4 9/16″	+4 15/16″	+5 1/4″	+5 1/2″	+5 9/16″	+5 1/2″	+5 5/16″	+4 15/16″	+4 7/16″	+3 3/4″	+3″	+2 1/16″	+1 1/16″	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																					SPAN B																						
	GIRDERS 2 & 3																					GIRDERS 2 & 3																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.013	-0.025	-0.035	-0.045	-0.052	-0.058	-0.061	-0.062	-0.061	-0.058	-0.053	-0.047	-0.040	-0.032	-0.025	-0.017	-0.011	-0.006	-0.002	0.000	0.000	-0.001	-0.003	-0.007	-0.012	-0.018	-0.024	-0.030	-0.036	-0.042	-0.046	-0.049	-0.050	-0.050	-0.047	-0.043	-0.037	-0.029	-0.020	-0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	-0.029	-0.056	-0.081	-0.103	-0.120	-0.133	-0.141	-0.143	-0.141	-0.134	-0.123	-0.109	-0.092	-0.075	-0.057	-0.041	-0.026	-0.013	-0.004	0.000	0.000	-0.001	-0.006	-0.015	-0.026	-0.038	-0.052	-0.066	-0.080	-0.092	-0.102	-0.108	-0.111	-0.110	-0.105	-0.095	-0.082	-0.065	-0.045	-0.023	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	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	0.000	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	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.042	-0.081	-0.117	-0.148	-0.173	-0.191	-0.202	-0.205	-0.202	-0.192	-0.176	-0.156	-0.132	-0.107	-0.082	-0.058	-0.037	-0.019	-0.006	0.000	0.000	-0.001	-0.009	-0.021	-0.037	-0.056	-0.076	-0.096	-0.116	-0.134	-0.148	-0.157	-0.161	-0.160	-0.152	-0.138	-0.119	-0.094	-0.065	-0.034	0.000
VERTICAL CURVE ORDINATE	0.000	+0.063	+0.120	+0.169	+0.212	+0.249	+0.279	+0.302	+0.319	+0.329	+0.332	+0.329	+0.319	+0.302	+0.279	+0.249	+0.212	+0.169	+0.120	+0.063	0.000	0.000	+0.058	+0.110	+0.156	+0.195	+0.228	+0.255	+0.276	+0.290	+0.299	+0.301	+0.297	+0.286	+0.270	+0.247	+0.218	+0.183	+0.141	+0.095	+0.048	0.000
REQUIRED CAMBER	0	+1 1/4″	+2 3/8″	+3 7/16″	+4 5/16″	+5 1/16″	+5 5/8″	+6 1/16″	+6 5/16″	+6 3/8″	+6 5/16″	+6 1/16″	+5 11/16″	+5 3/16″	+4 5/8″	+3 15/16″	+3 1/4″	+2 1/2″	+1 11/16″	+1 3/16″	0	0	+1 1/16″	+1 7/16″	+2 1/8″	+2 13/16″	+3 7/16″	+4″	+4 7/16″	+4 7/8″	+5 3/16″	+5 3/8″	+5 7/16″	+5 3/8″	+5 3/16″	+4 13/16″	+4 1/4″	+3 5/8″	+2 13/16″	+1 15/16″	+1″	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

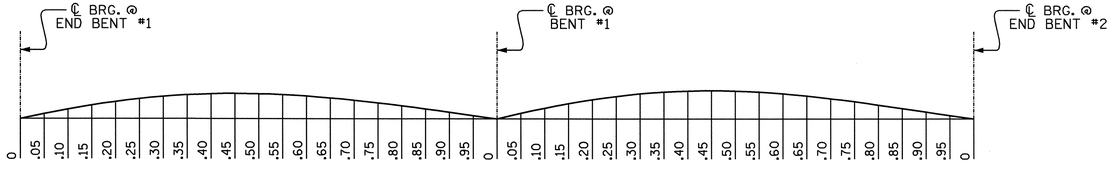
	SPAN A																					SPAN B																						
	GIRDER 4																					GIRDER 4																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.013	-0.025	-0.035	-0.045	-0.052	-0.058	-0.061	-0.062	-0.061	-0.058	-0.053	-0.047	-0.040	-0.032	-0.025	-0.017	-0.011	-0.006	-0.002	0.000	0.000	-0.001	-0.003	-0.007	-0.012	-0.018	-0.024	-0.030	-0.036	-0.042	-0.046	-0.049	-0.050	-0.050	-0.047	-0.043	-0.037	-0.029	-0.020	-0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳	0.000	-0.029	-0.056	-0.081	-0.103	-0.120	-0.133	-0.141	-0.143	-0.141	-0.134	-0.123	-0.109	-0.092	-0.075	-0.057	-0.041	-0.026	-0.013	-0.004	0.000	0.000	-0.001	-0.006	-0.015	-0.026	-0.038	-0.052	-0.066	-0.080	-0.092	-0.102	-0.108	-0.111	-0.110	-0.105	-0.095	-0.082	-0.065	-0.045	-0.023	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	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	0.000	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	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.042	-0.081	-0.117	-0.148	-0.173	-0.191	-0.202	-0.205	-0.202	-0.192	-0.176	-0.156	-0.132	-0.107	-0.082	-0.058	-0.037	-0.019	-0.006	0.000	0.000	-0.001	-0.009	-0.021	-0.037	-0.056	-0.076	-0.096	-0.116	-0.134	-0.148	-0.157	-0.161	-0.160	-0.152	-0.138	-0.119	-0.094	-0.065	-0.034	0.000
VERTICAL CURVE ORDINATE	0.000	+0.063	+0.120	+0.169	+0.212	+0.249	+0.279	+0.302	+0.319	+0.329	+0.332	+0.329	+0.319	+0.302	+0.279	+0.249	+0.212	+0.169	+0.120	+0.063	0.000	0.000	+0.057	+0.107	+0.152	+0.190	+0.221	+0.247	+0.266	+0.279	+0.286	+0.287	+0.282	+0.270	+0.252	+0.228	+0.197	+0.161	+0.121	+0.080	+0.040	0.000
REQUIRED CAMBER	0	+1 1/4″	+2 3/8″	+3 7/16″	+4 5/16″	+5 1/16″	+5 5/8″	+6 1/16″	+6 5/16″	+6 3/8″	+6 5/16″	+6 1/16″	+5 11/16″	+5 3/16″	+4 5/8″	+3 15/16″	+3 1/4″	+2 1/2″	+1 11/16″	+1 3/16″	0	0	+1 11/16″	+1 3/8″	+2 1/16″	+2 3/4″	+3 5/16″	+3 7/8″	+4 3/8″	+4 3/4″	+5 1/16″	+5 1/4″	+5 1/4″	+5 3/16″	+4 15/16″	+4 9/16″	+4″	+3 3/8″	+2 9/16″	+1 3/4″	+7/8″	0

✳ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

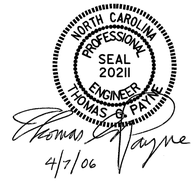
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " REQUIRED CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEFLECTIONS ARE TAKEN AT TWENTIETH PONTS BETWEEN BEARINGS.

SIGN CONVENTION FOR DEAD LOAD DEFLECTION TABLES + 0 −



SCHEMATIC CAMBER ORDINATES



DRAWN BY : J.P. ADAMS DATE : 8/21/03
CHECKED BY : S.H. SOCKWELL DATE : 10/3/03

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			51

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																					SPAN B																						
	GIRDERS 5 & 6																					GIRDERS 5 & 6																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.013	-0.025	-0.035	-0.045	-0.052	-0.058	-0.061	-0.062	-0.061	-0.058	-0.053	-0.047	-0.040	-0.032	-0.025	-0.017	-0.011	-0.006	-0.002	0.000	0.000	-0.001	-0.003	-0.007	-0.012	-0.018	-0.024	-0.030	-0.036	-0.042	-0.046	-0.049	-0.050	-0.050	-0.047	-0.043	-0.037	-0.029	-0.020	-0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✱	0.000	-0.029	-0.056	-0.081	-0.103	-0.120	-0.133	-0.141	-0.143	-0.141	-0.134	-0.123	-0.109	-0.092	-0.075	-0.057	-0.041	-0.026	-0.013	-0.004	0.000	0.000	-0.001	-0.006	-0.015	-0.026	-0.038	-0.052	-0.066	-0.080	-0.092	-0.102	-0.108	-0.111	-0.110	-0.105	-0.095	-0.082	-0.065	-0.045	-0.023	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	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	0.000	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	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.042	-0.081	-0.117	-0.148	-0.173	-0.191	-0.202	-0.205	-0.202	-0.192	-0.176	-0.156	-0.132	-0.107	-0.082	-0.058	-0.037	-0.019	-0.006	0.000	0.000	-0.001	-0.009	-0.021	-0.037	-0.056	-0.076	-0.096	-0.116	-0.134	-0.148	-0.157	-0.161	-0.160	-0.152	-0.138	-0.119	-0.094	-0.065	-0.034	0.000
VERTICAL CURVE ORDINATE	0.000	+0.063	+0.120	+0.169	+0.212	+0.249	+0.279	+0.302	+0.319	+0.329	+0.332	+0.329	+0.319	+0.302	+0.279	+0.249	+0.212	+0.169	+0.120	+0.063	0.000	0.000	+0.055	+0.104	+0.147	+0.183	+0.213	+0.237	+0.255	+0.267	+0.272	+0.271	+0.264	+0.251	+0.231	+0.206	+0.174	+0.139	+0.104	+0.069	+0.035	0.000
REQUIRED CAMBER	0	+1 1/4"	+2 3/8"	+3 7/16"	+4 5/16"	+5 1/16"	+5 5/8"	+6 1/16"	+6 5/16"	+6 3/8"	+6 5/16"	+6 1/16"	+5 11/16"	+5 3/16"	+4 5/8"	+3 15/16"	+3 1/4"	+2 1/2"	+1 11/16"	+1 3/16"	0	0	+11/16"	+1 3/8"	+2"	+2 5/8"	+3 1/4"	+3 3/4"	+4 3/16"	+4 9/16"	+4 7/8"	+5"	+5 1/16"	+4 15/16"	+4 11/16"	+4 5/16"	+3 3/4"	+3 1/16"	+2 3/8"	+1 5/8"	+1 3/16"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																					SPAN B																						
	GIRDER 7																					GIRDER 7																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.013	-0.025	-0.035	-0.045	-0.052	-0.058	-0.061	-0.062	-0.061	-0.058	-0.053	-0.047	-0.040	-0.032	-0.025	-0.017	-0.011	-0.006	-0.002	0.000	0.000	-0.001	-0.003	-0.007	-0.012	-0.018	-0.024	-0.030	-0.036	-0.042	-0.046	-0.049	-0.050	-0.050	-0.047	-0.043	-0.037	-0.029	-0.020	-0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✱	0.000	-0.029	-0.056	-0.081	-0.103	-0.120	-0.133	-0.141	-0.143	-0.141	-0.134	-0.123	-0.109	-0.092	-0.075	-0.057	-0.041	-0.026	-0.013	-0.004	0.000	0.000	-0.001	-0.006	-0.015	-0.026	-0.038	-0.052	-0.066	-0.080	-0.092	-0.102	-0.108	-0.111	-0.110	-0.105	-0.095	-0.082	-0.065	-0.045	-0.023	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	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	0.000	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	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.042	-0.081	-0.117	-0.148	-0.173	-0.191	-0.202	-0.205	-0.202	-0.192	-0.176	-0.156	-0.132	-0.107	-0.082	-0.058	-0.037	-0.019	-0.006	0.000	0.000	-0.001	-0.009	-0.021	-0.037	-0.056	-0.076	-0.096	-0.116	-0.134	-0.148	-0.157	-0.161	-0.160	-0.152	-0.138	-0.119	-0.094	-0.065	-0.034	0.000
VERTICAL CURVE ORDINATE	0.000	+0.063	+0.120	+0.169	+0.212	+0.249	+0.279	+0.302	+0.319	+0.329	+0.332	+0.329	+0.319	+0.302	+0.279	+0.249	+0.212	+0.169	+0.120	+0.063	0.000	0.000	+0.053	+0.100	+0.141	+0.175	+0.204	+0.226	+0.242	+0.251	+0.254	+0.252	+0.243	+0.227	+0.206	+0.178	+0.148	+0.119	+0.089	+0.059	+0.030	0.000
REQUIRED CAMBER	0	+1 1/4"	+2 3/8"	+3 7/16"	+4 5/16"	+5 1/16"	+5 5/8"	+6 1/16"	+6 5/16"	+6 3/8"	+6 5/16"	+6 1/16"	+5 11/16"	+5 3/16"	+4 5/8"	+3 15/16"	+3 1/4"	+2 1/2"	+1 11/16"	+1 3/16"	0	0	+5/8"	+1 5/16"	+1 15/16"	+2 9/16"	+3 1/8"	+3 5/8"	+4 1/16"	+4 3/8"	+4 5/8"	+4 13/16"	+4 13/16"	+4 5/8"	+4 3/8"	+3 15/16"	+3 3/16"	+2 7/8"	+2 3/16"	+1 1/2"	+3/4"	0

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																					SPAN B																						
	GIRDERS 8 & 9																					GIRDERS 8 & 9																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.013	-0.025	-0.035	-0.045	-0.052	-0.058	-0.061	-0.062	-0.061	-0.058	-0.053	-0.047	-0.040	-0.032	-0.025	-0.017	-0.011	-0.006	-0.002	0.000	0.000	-0.001	-0.003	-0.007	-0.012	-0.018	-0.024	-0.030	-0.036	-0.042	-0.046	-0.049	-0.050	-0.050	-0.047	-0.043	-0.037	-0.029	-0.020	-0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✱	0.000	-0.029	-0.056	-0.081	-0.103	-0.120	-0.133	-0.141	-0.143	-0.141	-0.134	-0.123	-0.109	-0.092	-0.075	-0.057	-0.041	-0.026	-0.013	-0.004	0.000	0.000	-0.001	-0.006	-0.015	-0.026	-0.038	-0.052	-0.066	-0.080	-0.092	-0.102	-0.108	-0.111	-0.110	-0.105	-0.095	-0.082	-0.065	-0.045	-0.023	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	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	0.000	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	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.042	-0.081	-0.117	-0.148	-0.173	-0.191	-0.202	-0.205	-0.202	-0.192	-0.176	-0.156	-0.132	-0.107	-0.082	-0.058	-0.037	-0.019	-0.006	0.000	0.000	-0.001	-0.009	-0.021	-0.037	-0.056	-0.076	-0.096	-0.116	-0.134	-0.148	-0.157	-0.161	-0.160	-0.152	-0.138	-0.119	-0.094	-0.065	-0.034	0.000
VERTICAL CURVE ORDINATE	0.000	+0.063	+0.120	+0.169	+0.212	+0.249	+0.279	+0.302	+0.319	+0.329	+0.332	+0.329	+0.319	+0.302	+0.279	+0.249	+0.212	+0.169	+0.120	+0.063	0.000	0.000	+0.050	+0.094	+0.132	+0.163	+0.188	+0.207	+0.220	+0.227	+0.227	+0.221	+0.209	+0.191	+0.168	+0.144	+0.120	+0.096	+0.072	+0.048	+0.024	0.000
REQUIRED CAMBER	0	+1 1/4"	+2 3/8"	+3 7/16"	+4 5/16"	+5 1/16"	+5 5/8"	+6 1/16"	+6 5/16"	+6 3/8"	+6 5/16"	+6 1/16"	+5 11/16"	+5 3/16"	+4 5/8"	+3 15/16"	+3 1/4"	+2 1/2"	+1 11/16"	+1 3/16"	0	0	+5/8"	+1 1/4"	+1 13/16"	+2 3/8"	+2 15/16"	+3 3/8"	+3 13/16"	+4 1/8"	+4 5/16"	+4 7/16"	+4 3/8"	+4 1/4"	+3 15/16"	+3 9/16"	+3 1/8"	+2 9/16"	+2"	+1 3/8"	+11/16"	0

✱ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.
ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " REQUIRED CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).
DEFLECTIONS ARE TAKEN AT TWENTIETH PONTS BETWEEN BEARINGS.

SIGN CONVENTION FOR DEAD LOAD DEFLECTION TABLES + 0 −

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
4/7/06

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 8/21/03
CHECKED BY : S.H. SOCKWELL DATE : 10/3/03

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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

	SPAN A																					SPAN B																						
	GIRDER 10																					GIRDER 10																						
TWENTIETH POINTS	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0	0	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER	0.000	-0.013	-0.025	-0.035	-0.045	-0.052	-0.058	-0.061	-0.062	-0.061	-0.058	-0.053	-0.047	-0.040	-0.032	-0.025	-0.017	-0.011	-0.006	-0.002	0.000	0.000	-0.001	-0.003	-0.007	-0.012	-0.018	-0.024	-0.030	-0.036	-0.042	-0.046	-0.049	-0.050	-0.050	-0.047	-0.043	-0.037	-0.029	-0.020	-0.010	0.000
DEFLECTION DUE TO WEIGHT OF SLAB *	0.000	-0.029	-0.056	-0.081	-0.103	-0.120	-0.133	-0.141	-0.143	-0.141	-0.134	-0.123	-0.109	-0.092	-0.075	-0.057	-0.041	-0.026	-0.013	-0.004	0.000	0.000	-0.001	-0.006	-0.015	-0.026	-0.038	-0.052	-0.066	-0.080	-0.092	-0.102	-0.108	-0.111	-0.110	-0.105	-0.095	-0.082	-0.065	-0.045	-0.023	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL	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	0.000	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	0.000	0.000	0.000	0.000
TOTAL DEAD LOAD DEFLECTION	0.000	-0.042	-0.081	-0.117	-0.148	-0.173	-0.191	-0.202	-0.205	-0.202	-0.192	-0.176	-0.156	-0.132	-0.107	-0.082	-0.058	-0.037	-0.019	-0.006	0.000	0.000	-0.001	-0.009	-0.021	-0.037	-0.056	-0.076	-0.096	-0.116	-0.134	-0.148	-0.157	-0.161	-0.160	-0.152	-0.138	-0.119	-0.094	-0.065	-0.034	0.000
VERTICAL CURVE ORDINATE	0.000	+0.063	+0.120	+0.169	+0.212	+0.249	+0.279	+0.302	+0.319	+0.329	+0.332	+0.329	+0.319	+0.302	+0.279	+0.249	+0.212	+0.169	+0.120	+0.063	0.000	0.000	+0.047	+0.087	+0.121	+0.149	+0.170	+0.186	+0.195	+0.198	+0.195	+0.185	+0.170	+0.151	+0.132	+0.113	+0.094	+0.075	+0.057	+0.038	+0.019	0.000
REQUIRED CAMBER	0	+1 1/4"	+2 3/8"	+3 7/16"	+4 5/16"	+5 1/16"	+5 5/8"	+6 1/16"	+6 5/16"	+6 3/8"	+6 5/16"	+6 1/16"	+5 11/16"	+5 3/16"	+4 5/8"	+3 15/16"	+3 1/4"	+2 1/2"	+1 11/16"	+1 3/16"	0	0	+9/16"	+1 1/8"	+1 11/16"	+2 1/4"	+2 11/16"	+3 1/8"	+3 1/2"	+3 3/4"	+3 15/16"	+4"	+3 15/16"	+3 3/4"	+3 1/2"	+3 3/16"	+2 13/16"	+2 5/16"	+1 13/16"	+1 1/4"	+5/8"	0

* INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " REQUIRED CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

DEFLECTIONS ARE TAKEN AT TWENTIETH PONTS BETWEEN BEARINGS.

SIGN CONVENTION FOR DEAD LOAD DEFLECTION TABLES + 0 -

DRAWN BY : J.P. ADAMS DATE : 8/21/03
CHECKED BY : S.H. SOCKWELL DATE : 10/3/03

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
4/7/06

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			51

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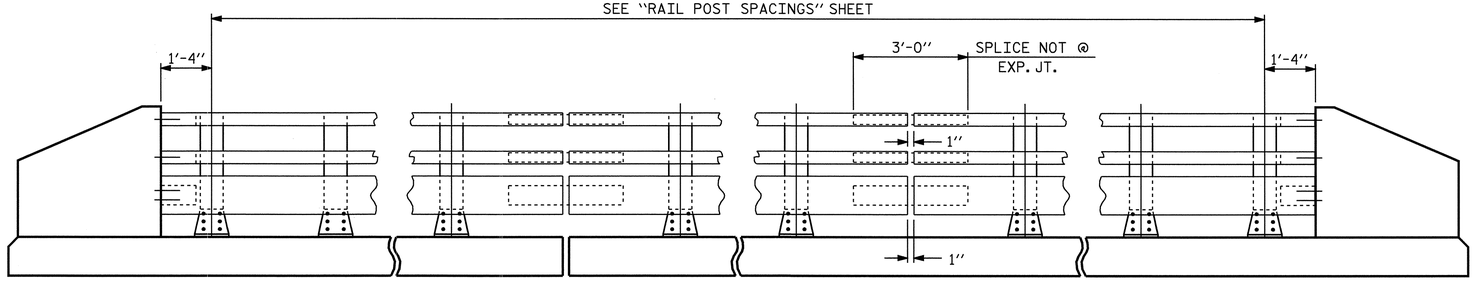
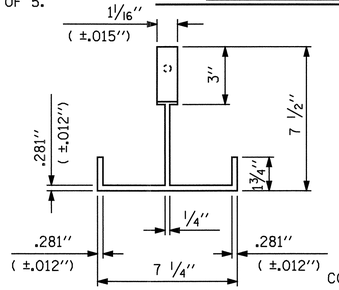
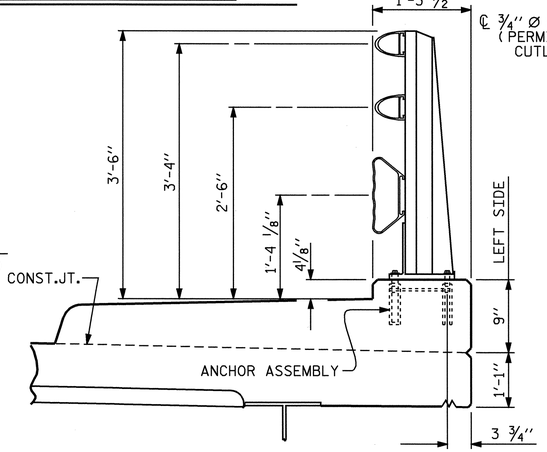


ELEVATION

NOTE:
FOR ATTACHMENT OF METAL RAIL TO END POST, SEE "3 BAR METAL RAIL", SHEET 3 OF 5.

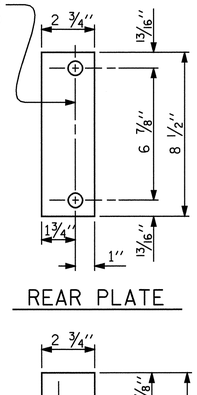


PLAN

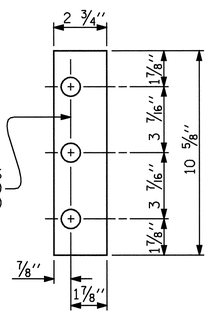


SECTION THRU RAIL

FOR ANCHOR ASSEMBLY, SEE "3 BAR METAL RAIL", SHEET 2 OF 5.



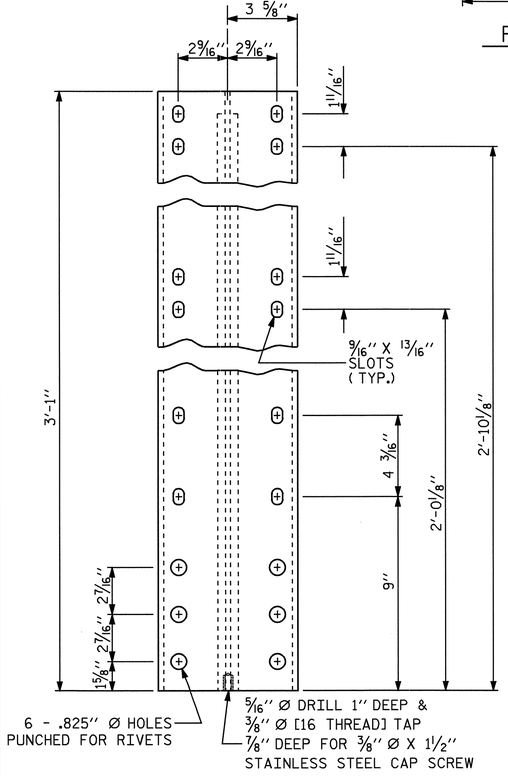
REAR PLATE



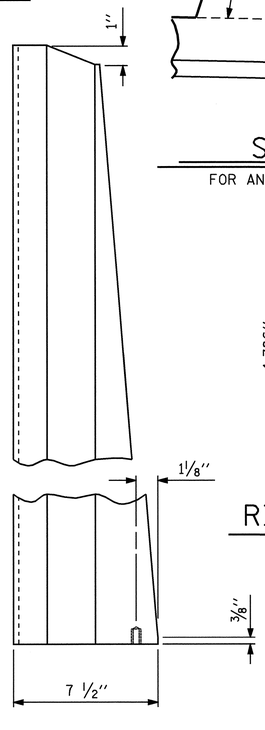
FRONT PLATE

SHIM DETAILS

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

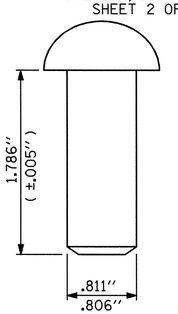


FRONT ELEVATION

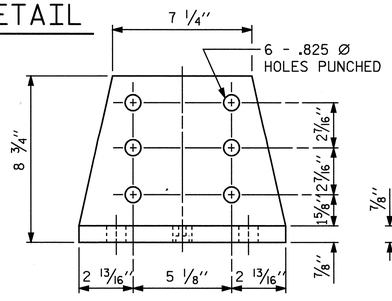


SIDE ELEVATION

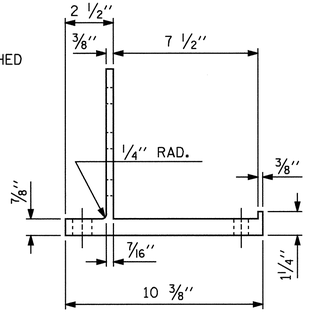
DETAILS OF POST



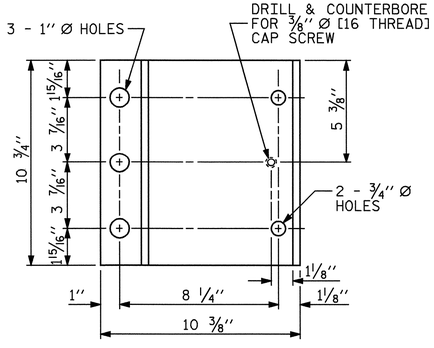
RIVET DETAIL



FRONT ELEVATION



SIDE ELEVATION



PLAN

POST BASE DETAILS

NOTES

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

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B221 ALLOY 6061-T6.

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS. PLACE ONE JOINT SPLICE JUST BEYOND THE 3RD RAIL POST FROM EACH END, TYPICALLY 14' FROM THE END. PLACE OTHER JOINTS AS NEEDED.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR7.

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

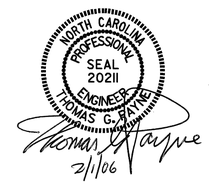
TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAIN VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

PAY LENGTH = 273.55 LIN.FT.



PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

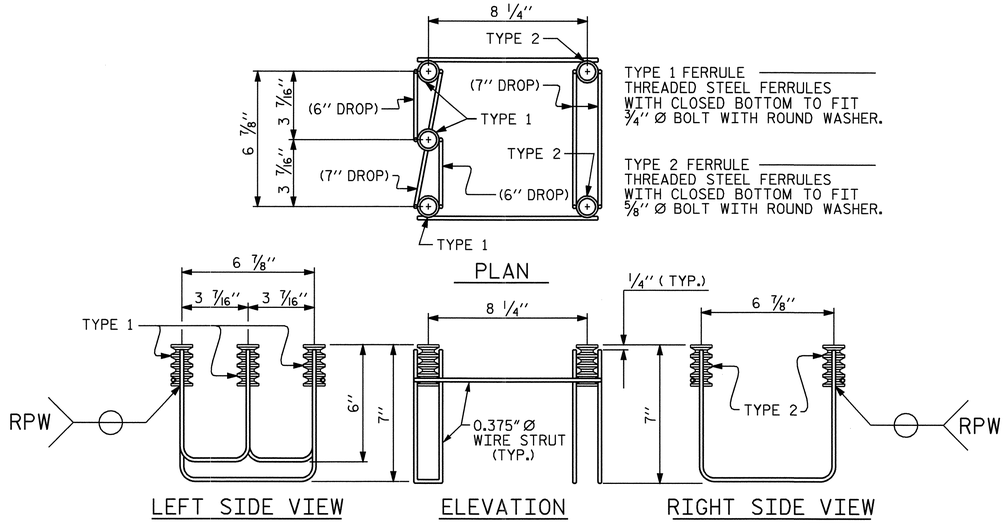
3 BAR METAL RAIL

ASSEMBLED BY : J.P. ADAMS	DATE : 8/1/03
CHECKED BY : S.H. SOCKWELL	DATE : 10/2/03

DRAWN BY : JMB 1/88	REV. 8/16/99 RWW/LES
CHECKED BY : GGH 1/88	REV. 10/17/00 RWW/LES
	REV. 5/7/03 RWW/JTE

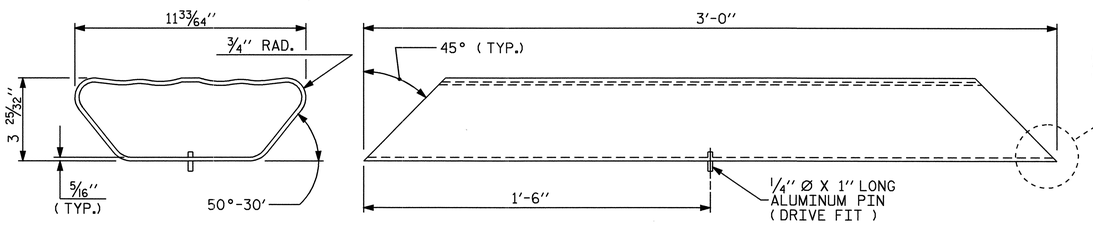
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			51

STD. NO. BMR5



5-BOLT METAL RAIL ANCHOR ASSEMBLY

(46 ASSEMBLIES REQUIRED)



BOTTOM RAIL EXPANSION BAR

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES AND 1 3/4" FOR 5/8" FERRULES.

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

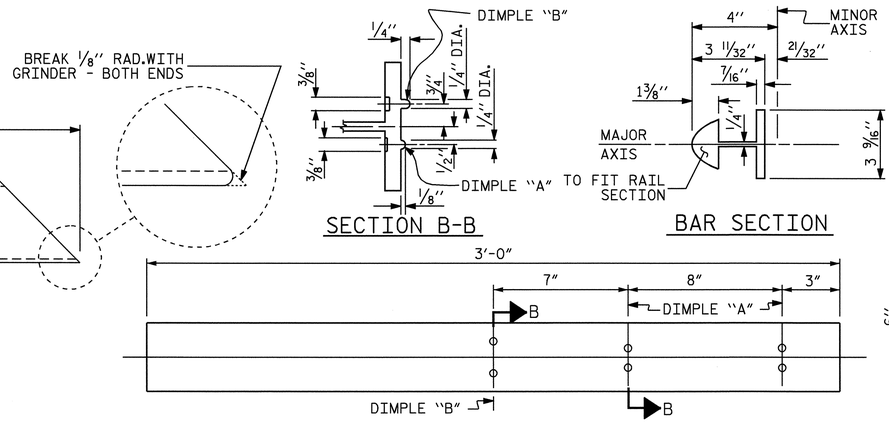
C. 2 - 5/8" Ø X 2 1/4" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 5/8" Ø X 2 1/4" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

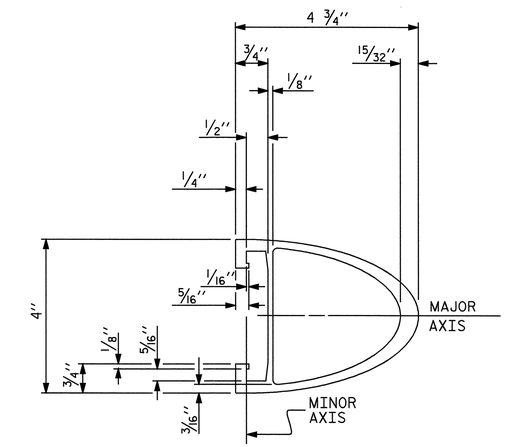
E. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

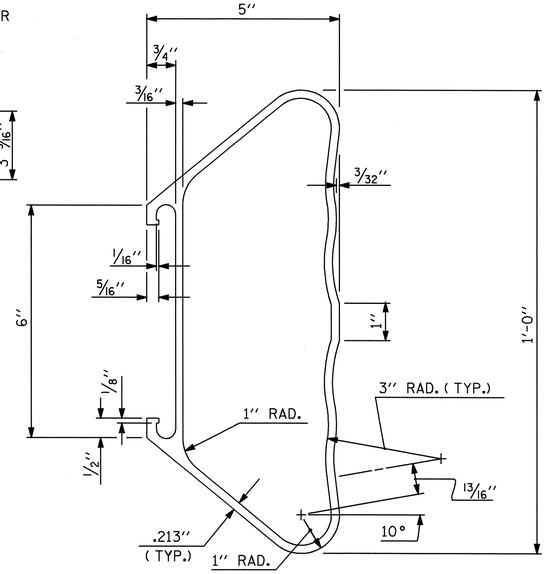
G. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.



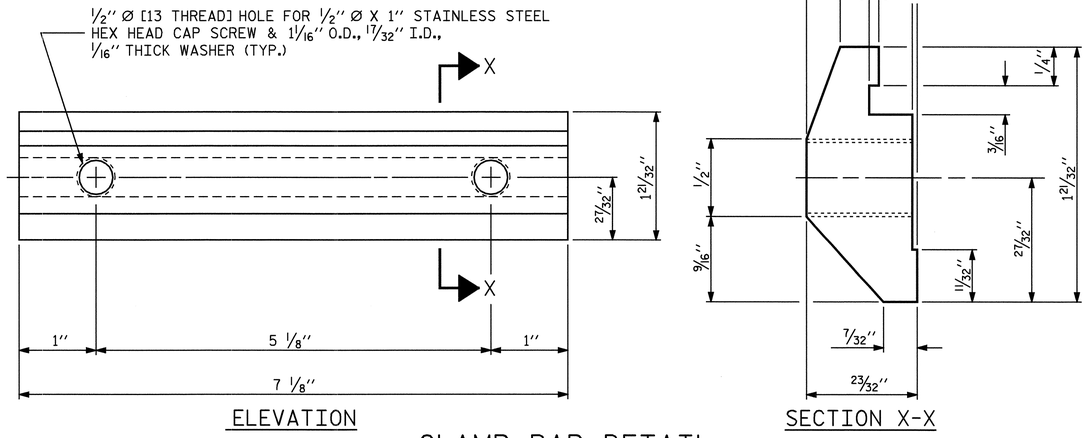
TOP & MIDDLE RAIL EXPANSION BAR



TOP & MIDDLE RAIL SECTION

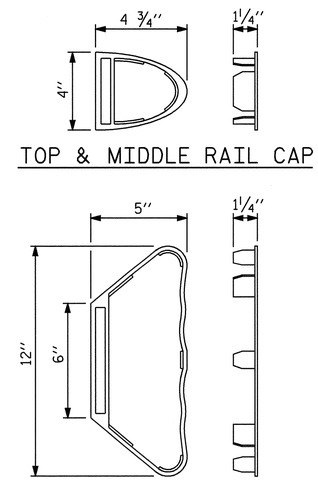


BOTTOM RAIL SECTION

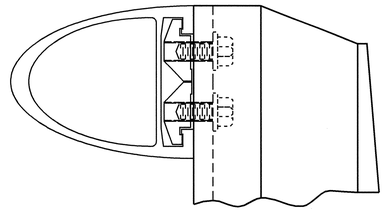


CLAMP BAR DETAIL

(6 REQUIRED PER POST)



NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
2/1/06



CLAMP ASSEMBLY

TOP RAIL SHOWN
(MIDDLE & BOTTOM RAIL ARE SIMILAR)

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

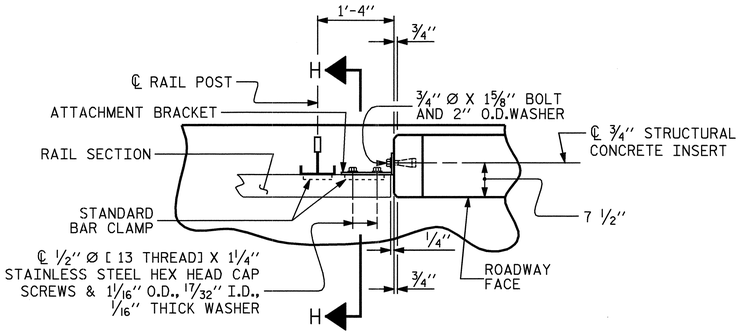
STANDARD

3 BAR METAL RAIL

ASSEMBLED BY : J.P. ADAMS	DATE : 8/1/03
CHECKED BY : S.H. SOCKWELL	DATE : 10/2/03
DRAWN BY : JMB 1/88	REV. 10/17/00 LES/RDR
CHECKED BY : GGH 1/88	REV. 7/10/01 RWW/LES
	REV. 5/7/03 RWW/JTE

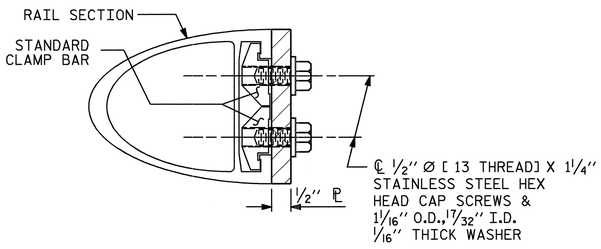
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			51

SID NO. BMR6



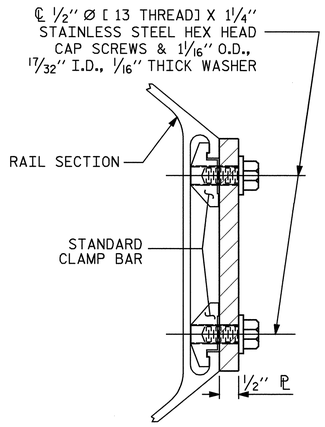
PLAN OF RAIL AND END POST

(STIFFENER ON 1/2" ℙ NOT SHOWN FOR CLARITY)



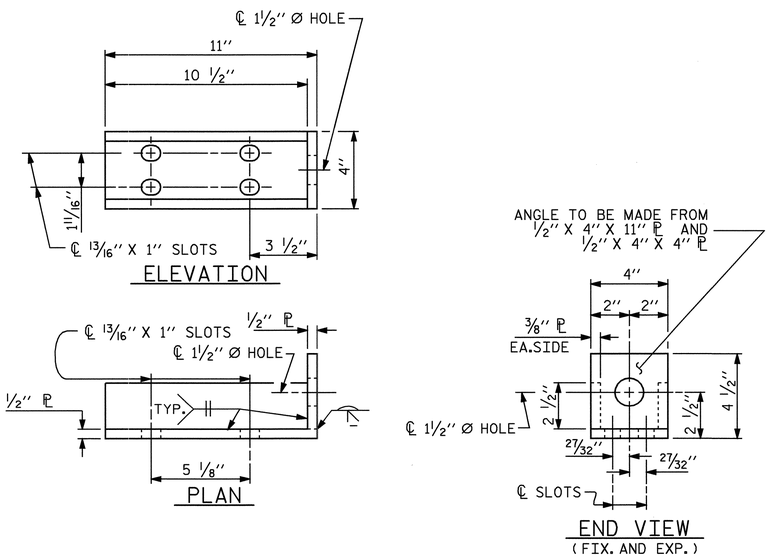
SECTION H-H

(FOR TOP & MIDDLE RAIL)



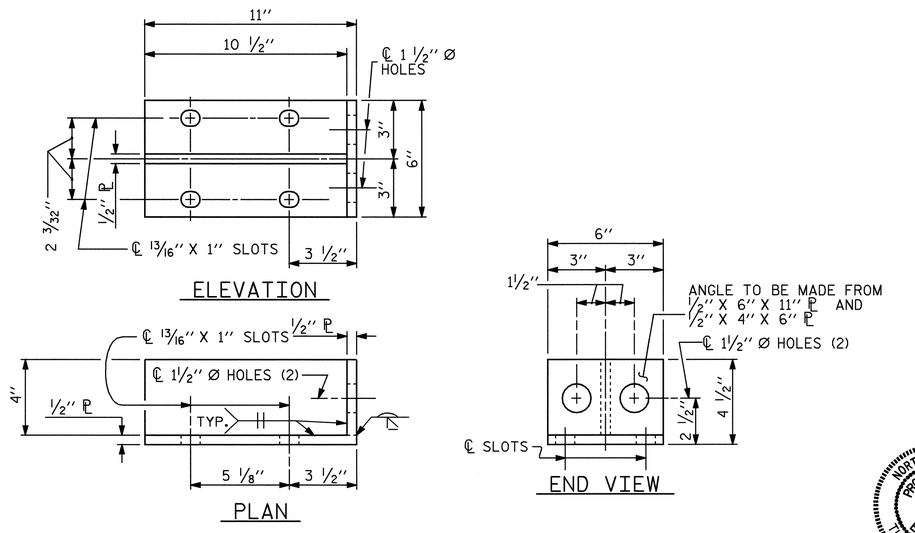
SECTION H-H

(FOR BOTTOM RAIL)



DETAILS FOR ATTACHMENT BRACKET

(TOP & MIDDLE RAIL ONLY)



DETAILS FOR ATTACHMENT BRACKET

(BOTTOM RAIL ONLY)

NOTES

METAL RAIL TO END POST CONNECTION

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

A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N. C. THREADS.

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F. WASHERS FOR RAIL ATTACHMENT SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

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

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 3 BAR METAL RAIL.

THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS". FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

NOTES

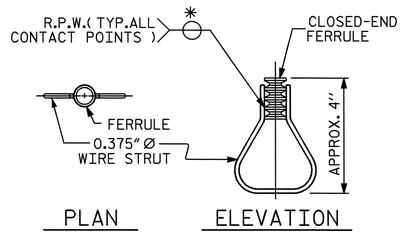
STRUCTURAL CONCRETE INSERT

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".

B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. AT THE CONTRACTORS OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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



STRUCTURAL CONCRETE INSERT

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

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

3 BAR METAL RAIL

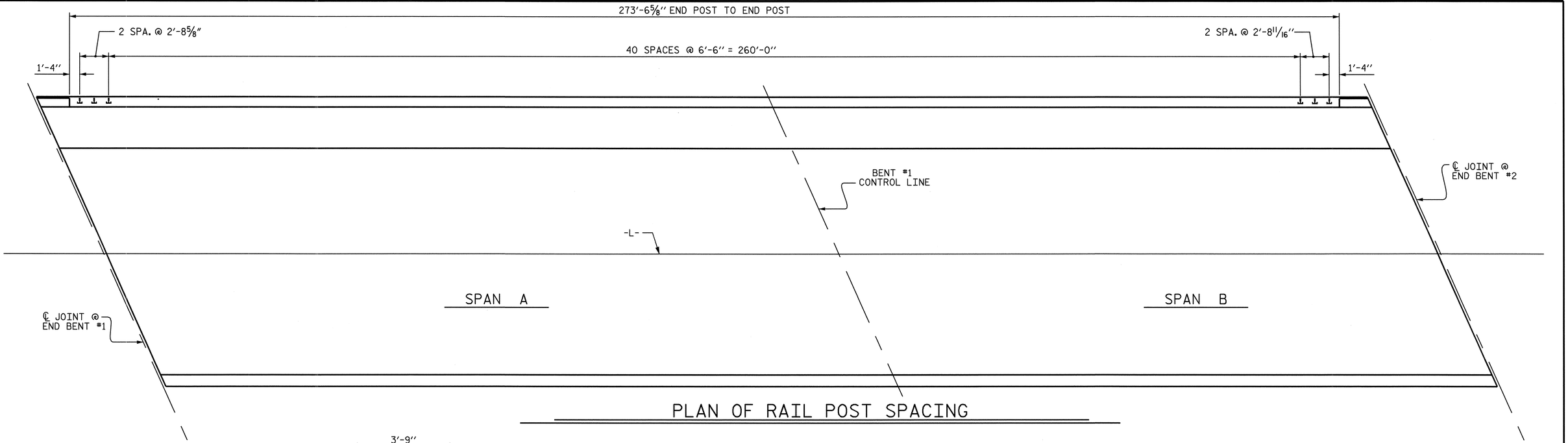
NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
2/1/06

ASSEMBLED BY : J.P. ADAMS	DATE : 8/1/03
CHECKED BY : S.H. SOCKWELL	DATE : 10/2/03

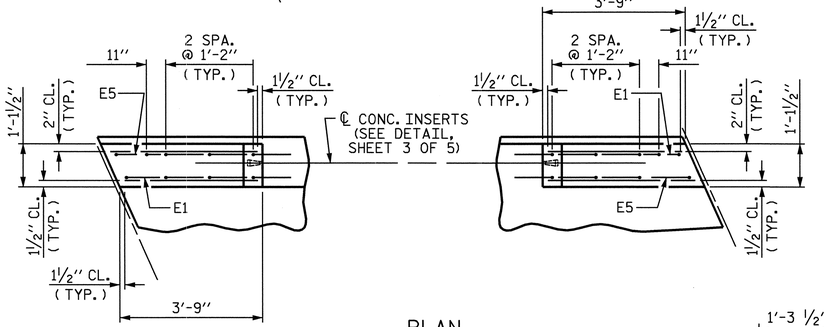
DRAWN BY : JMB 1/88	REV. 10/17/00 RWW/LES
CHECKED BY : GGH 1/88	REV. 7/10/01 RWW/LES
	REV. 5/7/03 RWW/JTE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			51

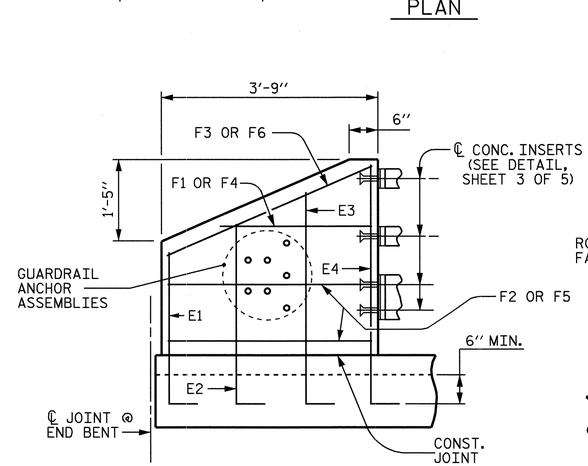
SID NO. RMR7



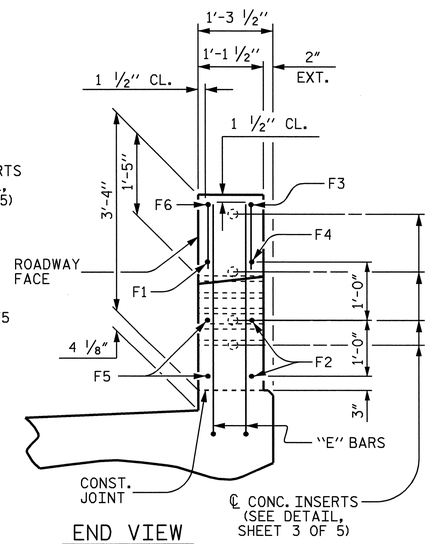
PLAN OF RAIL POST SPACING



PLAN



ELEVATION

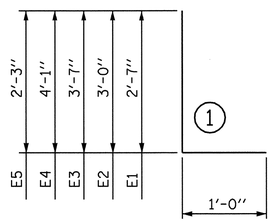


END VIEW

END POST DETAILS

DRAWN BY : J.P. ADAMS DATE : 8/1/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

BAR TYPES



BILL OF MATERIAL
FOR TWO END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱E1	2	#7	1	3'-7"	15
✱E2	4	#7	1	4'-0"	33
✱E3	4	#7	1	4'-7"	37
✱E4	4	#7	1	5'-1"	42
✱E5	2	#7	1	3'-3"	13
✱F1	4	#6	STR	3'-3"	20
✱F2	4	#6	STR	3'-5"	21
✱F3	2	#6	STR	3'-9"	11
✱F4	2	#6	STR	2'-5"	7
✱F5	4	#6	STR	4'-2"	25
✱F6	2	#6	STR	4'-7"	14
✱EPOXY COATED REINF. STEEL = 238 LBS					
CLASS "AA" CONCRETE 1.0 C.Y.					
✱THESE BARS ARE EPOXY COATED					

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

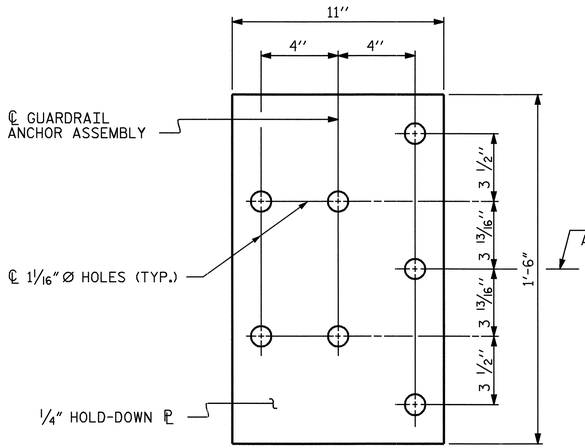
SHEET 4 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
Thomas Payne
2/17/06

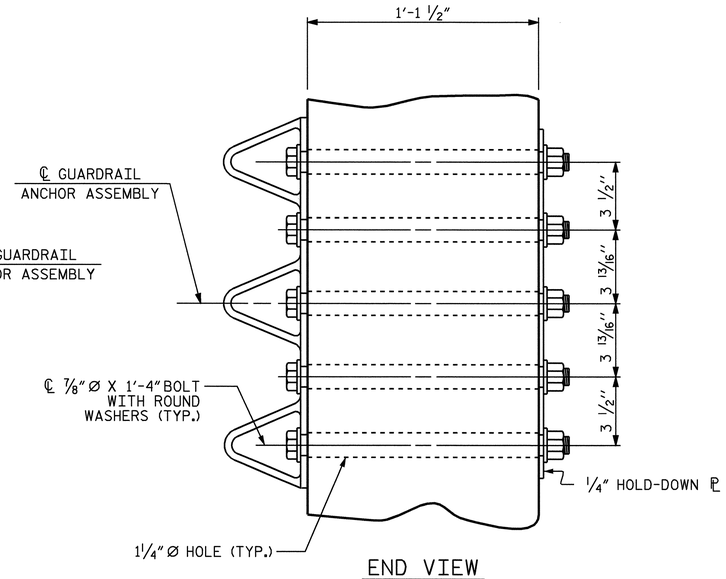
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR THREE BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			51



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

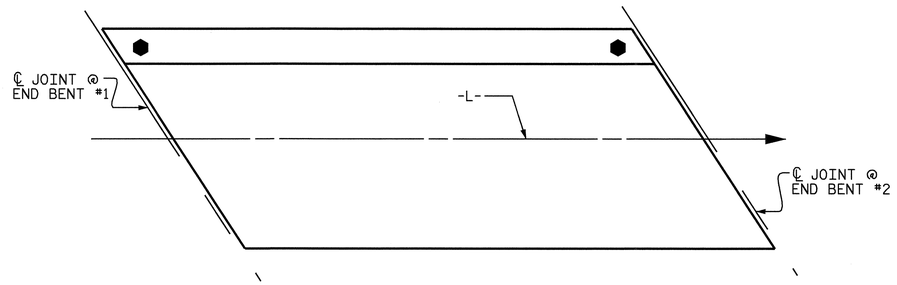
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

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

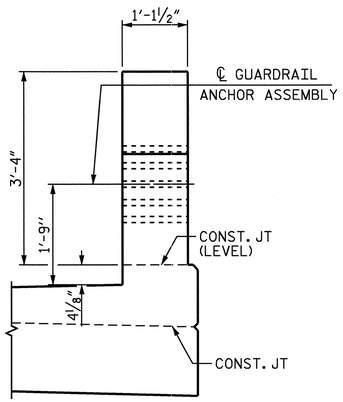
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

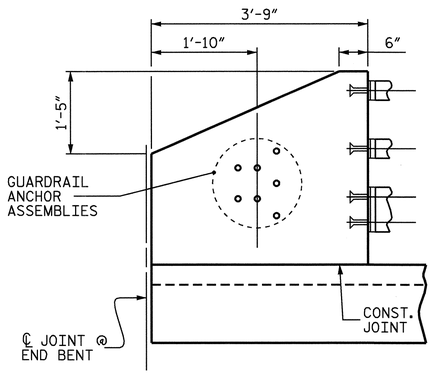


SKETCH SHOWING POINTS OF ATTACHMENT

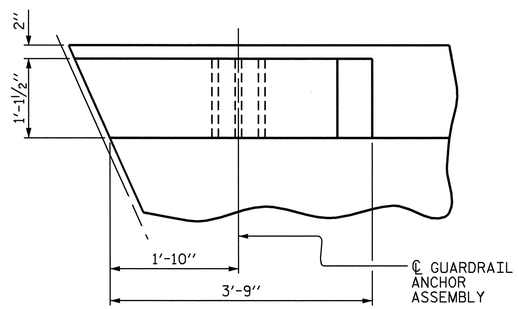
⬢ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(THREE BAR METAL RAIL)



ELEVATION



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

ASSEMBLED BY : J.P. ADAMS	DATE : 8/1/03		
CHECKED BY : S.H. SOCKWELL	DATE : 10/2/03		
DRAWN BY : EEM 6/94	REV. 8/16/99	RWW/LES	
CHECKED BY : RGW 6/94	REV. 10/17/00R	RWW/LES	

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS

FOR THREE BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			51

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

2/1/06

STD. NO. RMR8

18-JAN-2006 09:14
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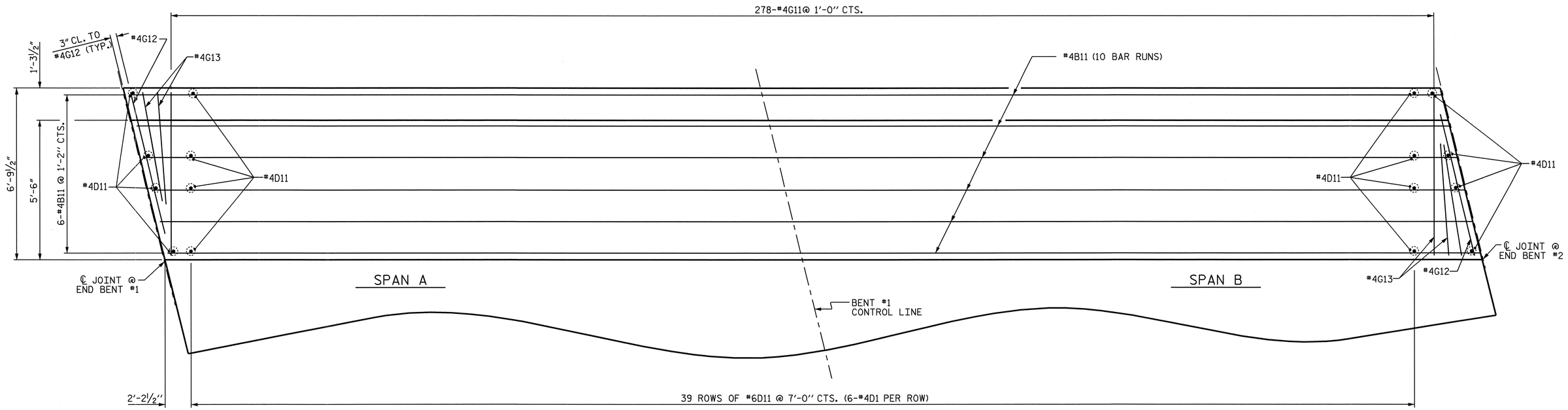
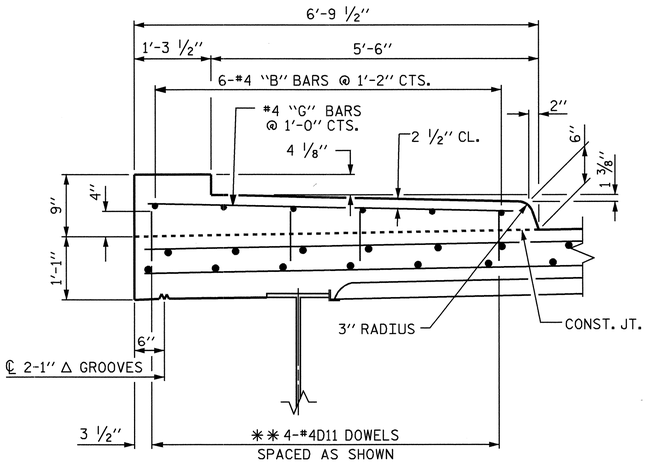
jpadams



PLAN OF SIDEWALK



SECTION THRU SIDEWALK

✱✱ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SPAN HAS BEEN SCREEDED OFF.

NOTES

THE #4D11 & #4G12 BARS MAY BE SHIFTED SLIGHTLY IN ORDER TO MAINTAIN A 2" CLEARANCE TO THE 1" EXPANSION JOINT MATERIAL IN SIDEWALK.

THE SIDEWALK IN A CONTINOUS 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.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINTS SHALL BE LOCATED AT A SPACING OF 8 FEET TO 10 FEET BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

BILL OF MATERIAL

SIDEWALK

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱B11	60	#4	STR	30'-0"	1202
✱D11	164	#4	STR	0'-10"	91
✱G11	278	#4	STR	6'-5"	1192
✱G12	2	#4	STR	5'-9"	8
✱G13	4	#4	STR	4'-5"	12

✱EPOXY COATED REINF. STEEL = 2505 LBS

CLASS "AA" CONCRETE 36.8 C.Y.

✱THESE BARS ARE EPOXY COATED

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

Thomas Payne 7/1/06

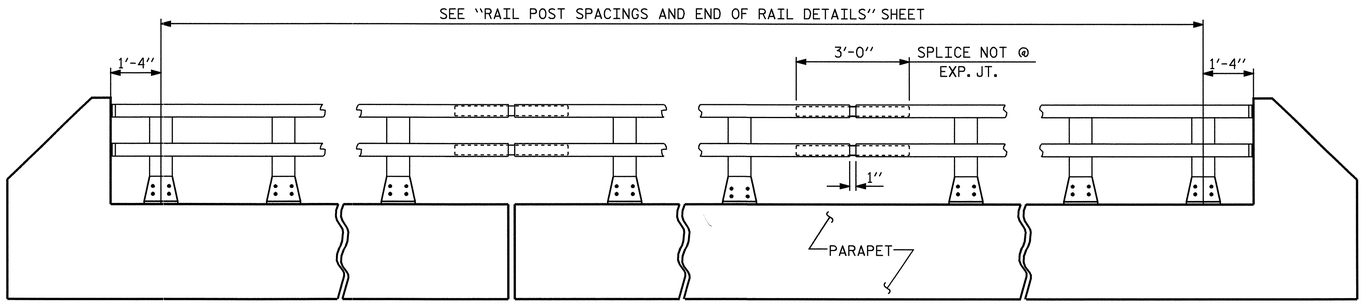
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

SIDEWALK DETAILS

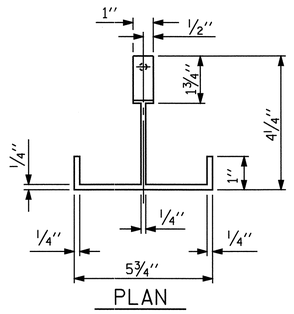
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 8/12/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

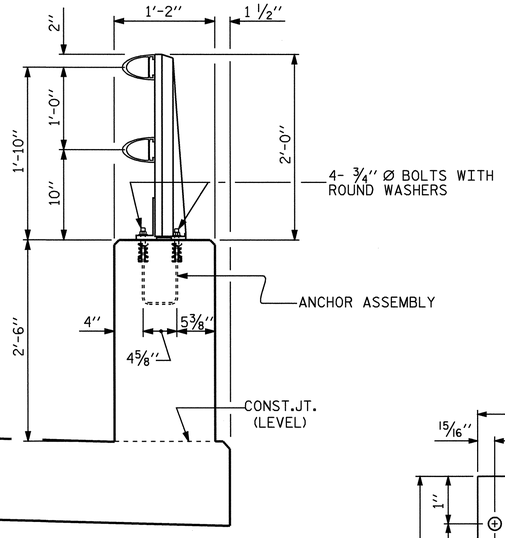


ELEVATION

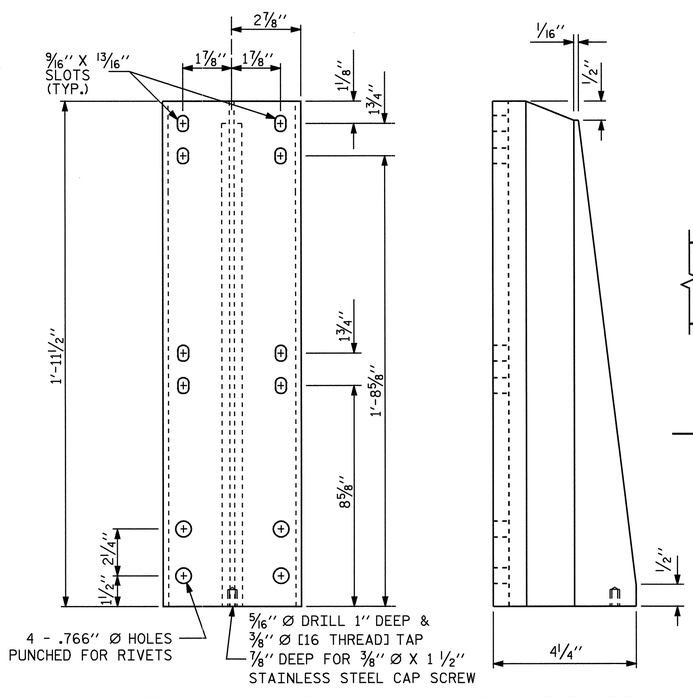
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST,
SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS FOR TWO BAR METAL RAILS".



PLAN

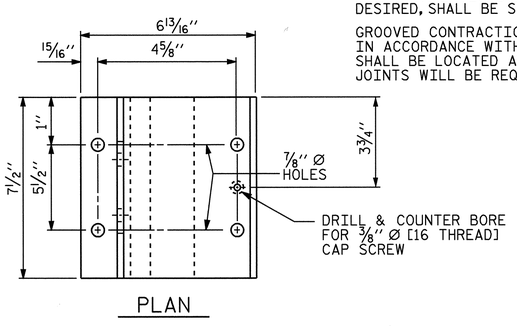


SECTION THRU PARAPET AND RAIL

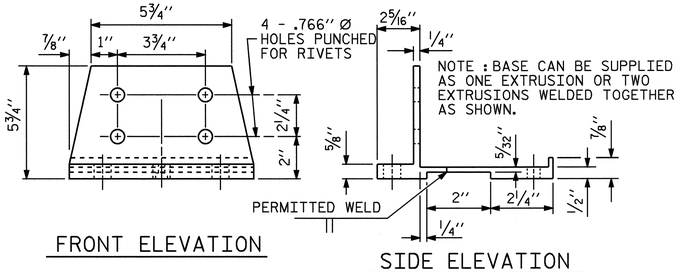


FRONT ELEVATION SIDE ELEVATION

DETAILS OF POST

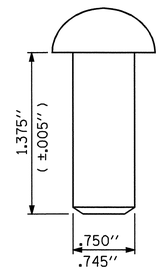


PLAN



FRONT ELEVATION SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

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

ALUMINUM RAILS

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

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

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

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

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

GENERAL NOTES

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

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

CAP SCREWS SHALL BE ASTM F1593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 273.55 LIN. FT.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

7/1/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			51

STD. NO. BMR3

ASSEMBLED BY : J.P. ADAMS		DATE : 8/1/03
CHECKED BY : S.H. SOCKWELL		DATE : 10/2/03
DRAWN BY : EEM 6/94	REV. 8/16/99	RWW/LES
CHECKED BY : RGW 6/94	REV. 10/17/00	LES/RDR
	REV. 5/7/03	RWW/JTE

18-JAN-2006 09:10
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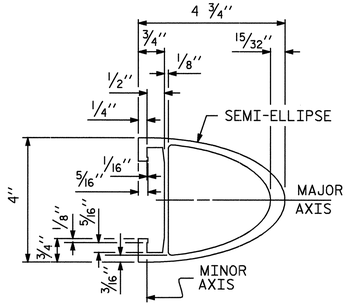
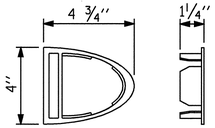
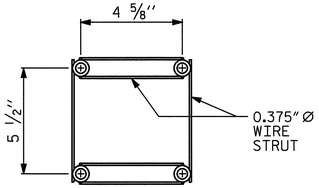
jpadams



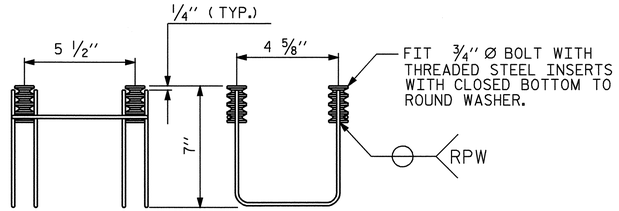
RAIL SECTION



RAIL CAP



PLAN



SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 1 3/4"

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(46 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

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

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

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

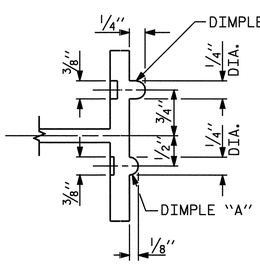
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

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

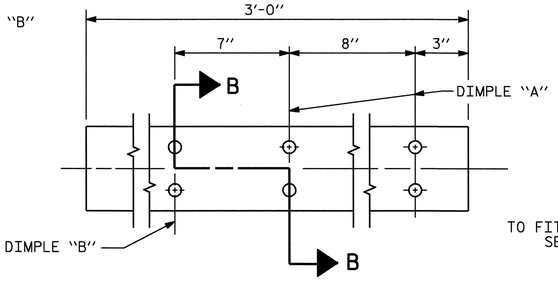
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

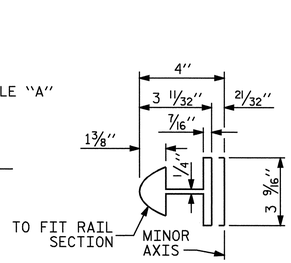
THE CONTRACTOR, AT HIS OPTION, MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN LIEU OF THE METAL RAIL ANCHOR ASSEMBLY. THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS REQUIRED. SEE SPECIAL PROVISIONS FOR "ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS".

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F1593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F1594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



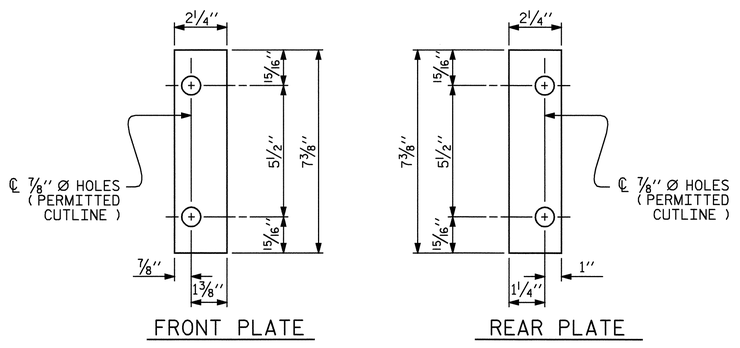
SECTION B - B





BAR SECTION

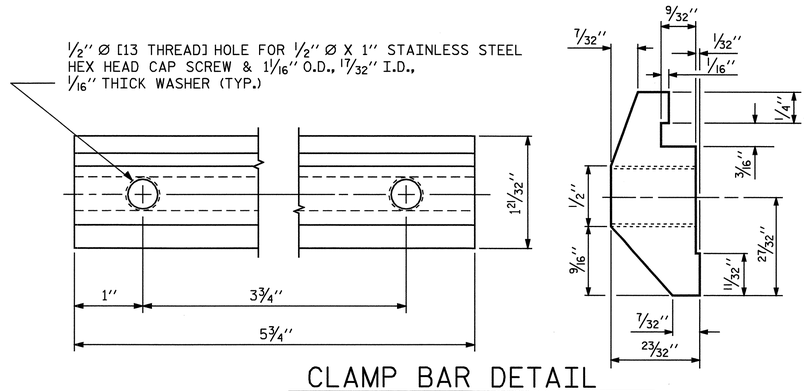
EXPANSION BAR DETAILS



FRONT PLATE REAR PLATE

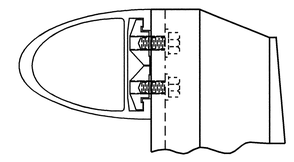
SHIM DETAILS

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



CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			51

ASSEMBLED BY : J.P. ADAMS		DATE : 8/1/03
CHECKED BY : S.H. SOCKWELL		DATE : 10/2/03
DRAWN BY : EEM 6/94	REV. 2/6/97	EEM/RGW
CHECKED BY : RGW 6/94	REV. 8/16/99	MAB/LES
	REV. 5/7/03	RWW/JTE

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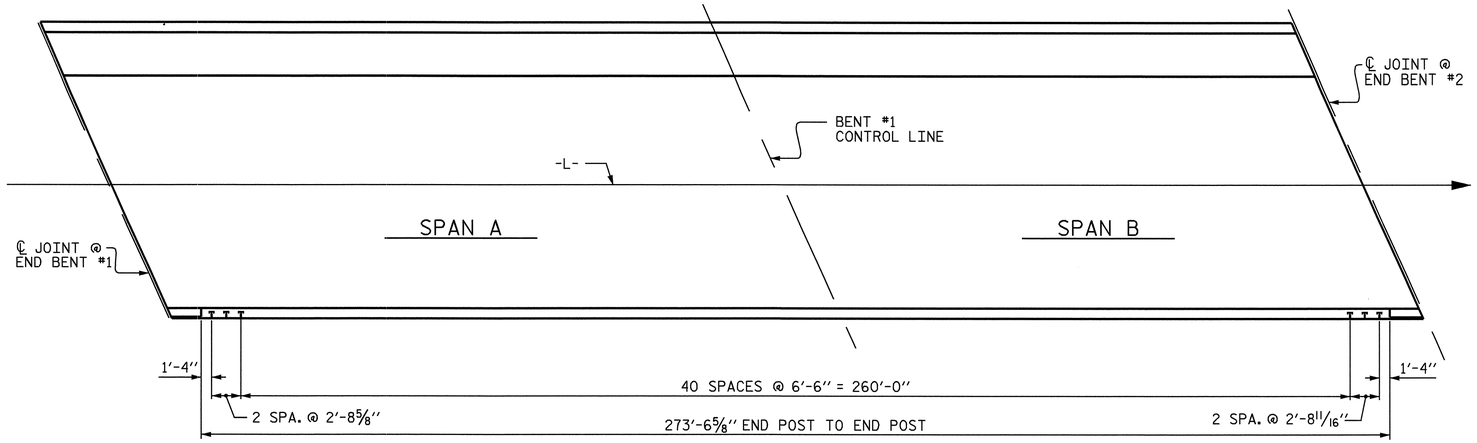
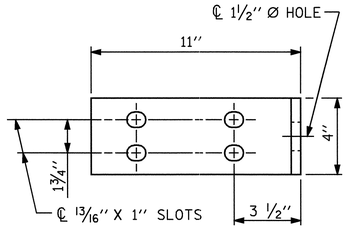
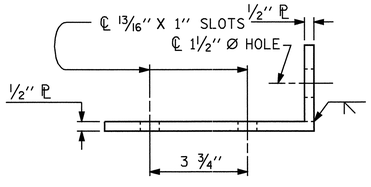
STD. NO. BMR4



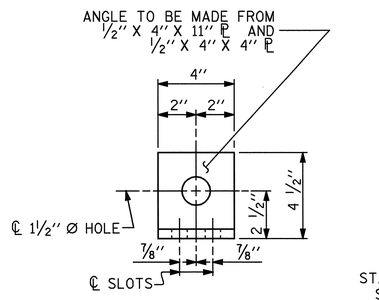
PLAN OF RAIL POST SPACINGS



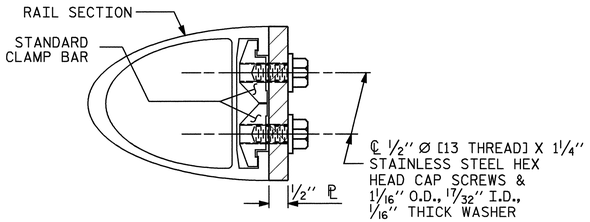
ELEVATION



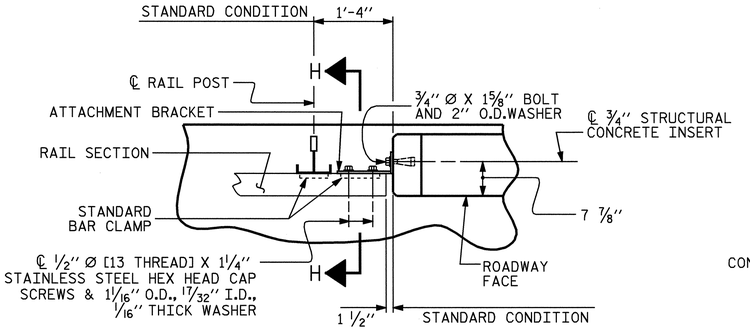
TOP VIEW



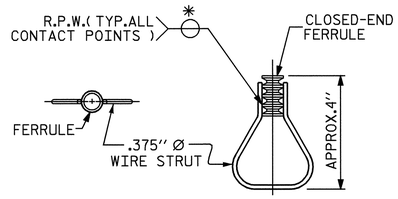
END VIEW (FIX AND EXP.)



SECTION H-H



PLAN - RAIL AND END POST



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

NOTES

STRUCTURAL CONCRETE INSERT

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

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

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

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

NOTES

METAL RAIL TO END POST CONNECTION

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

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

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

C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.

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

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

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

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

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

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

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			51

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
2/1/06

ASSEMBLED BY : J.P. ADAMS	DATE : 8/1/03	
CHECKED BY : S.H. SOCKWELL	DATE : 10/2/03	
DRAWN BY : FCJ 1/88	REV. 8/16/99	RWW/LES
CHECKED BY : CRK 3/89	REV. 10/17/00	LES/RDR
	REV. 5/7/03	RWW/JTE

DETAILS FOR ATTACHING METAL RAIL TO END POST

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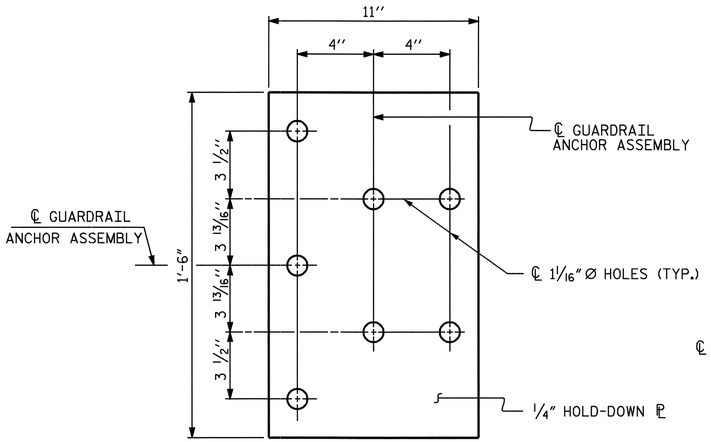
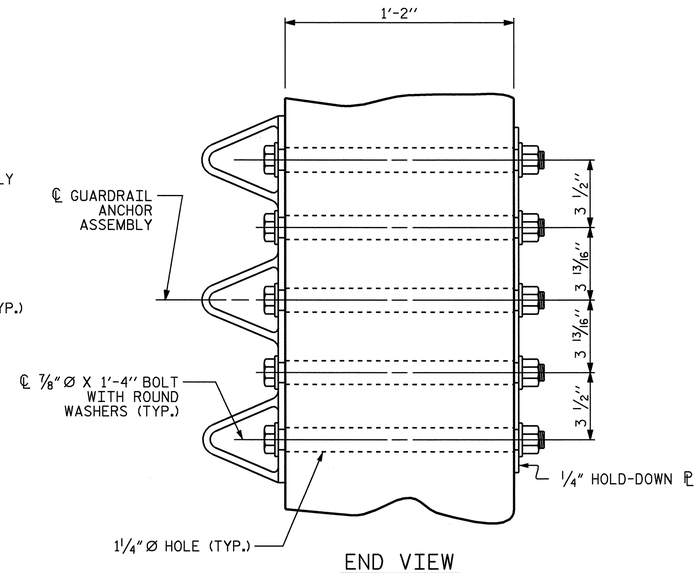


PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

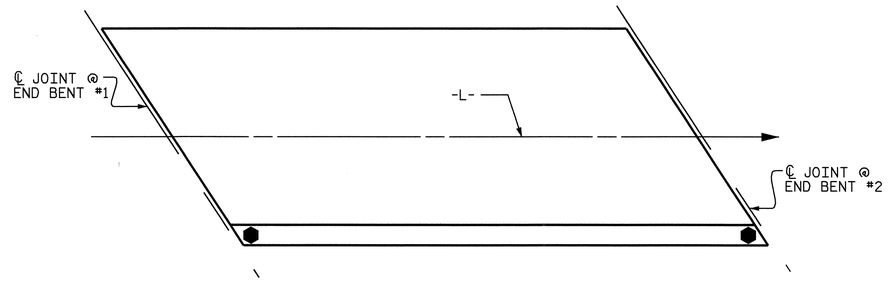
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

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

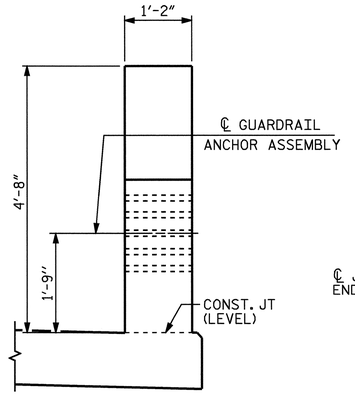
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

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

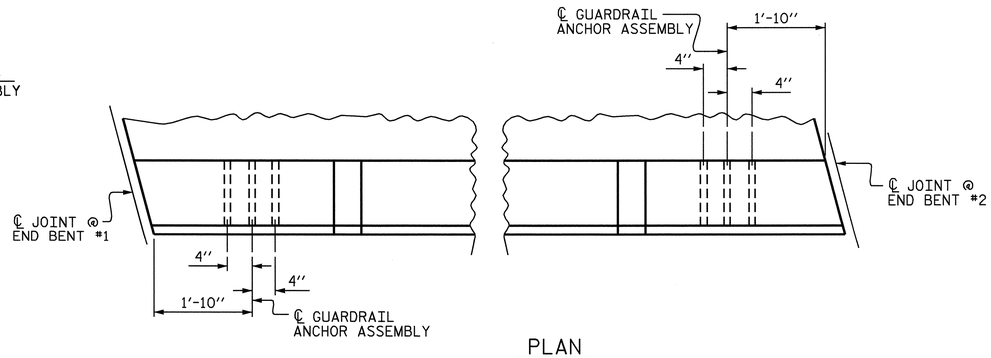


SKETCH SHOWING POINTS OF ATTACHMENT

⬢ LOCATION OF GUARDRAIL ATTACHMENT



END VIEW
(TWO BAR METAL RAIL)



PLAN

LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS

FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			51

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
Thomas G. Payne 2/1/06

ASSEMBLED BY : J.P. ADAMS		DATE : 8/1/03
CHECKED BY : S.H. SOCKWELL		DATE : 10/2/03
DRAWN BY : EEM 6/94	REV. 8/16/99	RWW/LES
CHECKED BY : RGW 6/94	REV. 10/17/00	RWW/LES
	REV. 5/7/03	RWW/JTE

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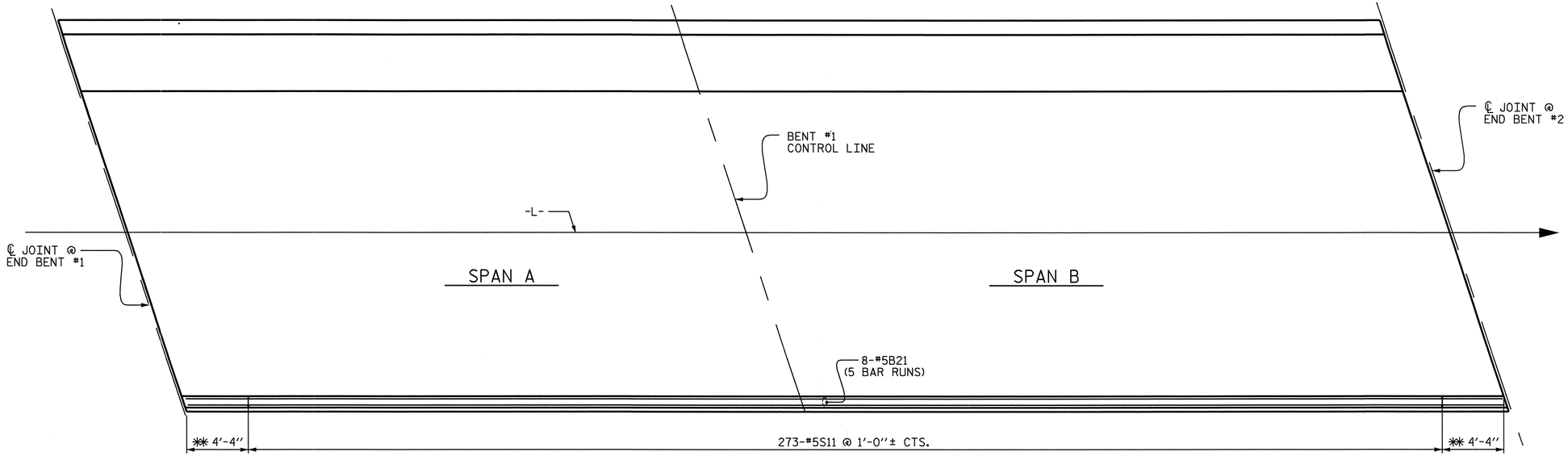
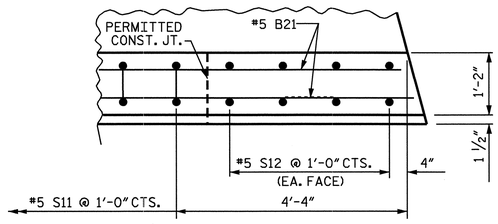
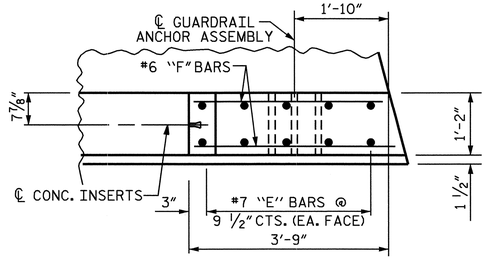


PLAN OF PARAPET REINFORCING

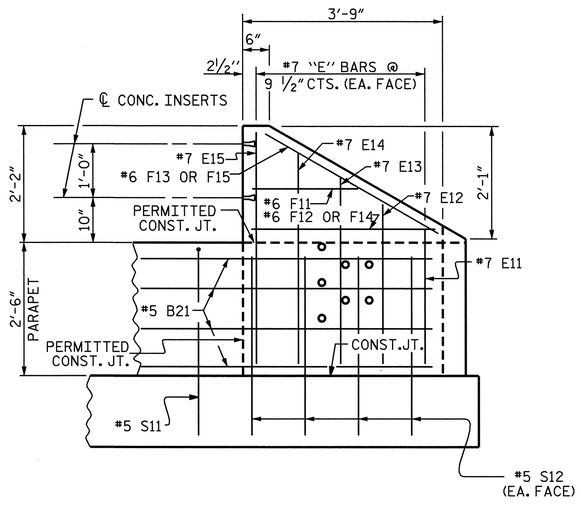
✳✳ SEE "PARAPET AND END POST FOR TWO BAR RAIL" FOR ADDITIONAL REINFORCING.



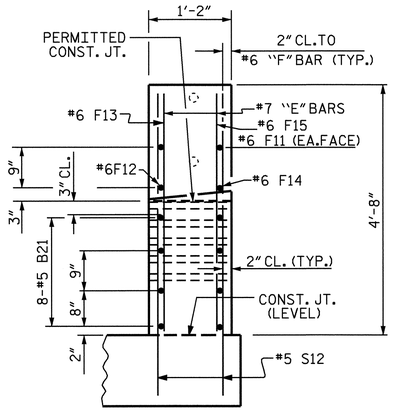
PLAN OF PARAPET



PLAN OF END POST



ELEVATION



END VIEW

BILL OF MATERIAL

PARAPET AND TWO END POSTS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B21	40	#5	STR	59′-2″	2468
✳E11	4	#7	STR	2′-6″	20
✳E12	4	#7	STR	3′-0″	25
✳E13	4	#7	STR	3′-6″	29
✳E14	4	#7	STR	4′-0″	33
✳E15	4	#7	STR	4′-4″	35
✳F11	4	#6	STR	2′-2″	13
✳F12	2	#6	STR	3′-5″	10
✳F13	2	#6	STR	3′-7″	11
✳F14	2	#6	STR	3′-8″	11
✳F15	2	#6	STR	4′-5″	13
✳S11	273	#5	1	7′-0″	1993
✳S12	16	#5	STR	3′-0″	50

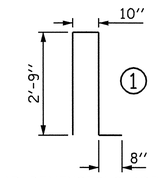
✳EPOXY COATED REINF. STEEL = 4711 LBS.

CLASS "AA" CONCRETE 31.16 C.Y.

CONCRETE PARAPET 281.91 L.F.

✳THESE BARS ARE EPOXY COATED

BAR TYPE



BAR DIMENSIONS ARE OUT TO OUT.

NOTES

ALL REINFORCING STEEL IN PARAPET SHALL BE EPOXY COATED.

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

THE #5S12 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT. FOR ADHESIVELY ANCHORED BOLTS OR DOWELS, SEE SPECIAL PROVISIONS. THE YIELD LOAD OF THE #5S12 BARS IS 18.6 KIPS. FIELD TESTING OF THE ADHESIVE BONDING IS NOT REQUIRED.

VERTICAL GROOVED CONTRACTION JONTS, ½″ IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A JOINT SHALL BE LOCATED AT THE BENT CONTROL LINE AND THEN ABOUT EVERY 10′-0″ ± ALONG SPANS. CONTRACTOR SHALL AVOID PLACING JOINTS AT LOACTION OF RAIL POST.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE PARAPET AND RAIL END POST DETAILS
FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			51

PARAPET AND END POST FOR TWO BAR RAIL

DRAWN BY : J.P. ADAMS DATE : 8/4/03
CHECKED BY : S.H. SOCKWELL DATE : 10/2/03

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jpadams

REINFORCING BAR SCHEDULE (SPANS A-B)

STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	468	#5	STR	43'-2"	21071
✳A101	4	#5	STR	41'-9"	174
✳A102	4	#5	STR	40'-1"	167
✳A103	4	#5	STR	38'-6"	161
✳A104	4	#5	STR	36'-10"	154
✳A105	4	#5	STR	35'-2"	147
✳A106	4	#5	STR	33'-6"	140
✳A107	4	#5	STR	31'-11"	133
✳A108	4	#5	STR	30'-3"	126
✳A109	4	#5	STR	28'-7"	119
✳A110	4	#5	STR	26'-11"	112
✳A111	4	#5	STR	25'-4"	106
✳A112	4	#5	STR	23'-8"	99
✳A113	4	#5	STR	22'-0"	92
✳A114	4	#5	STR	20'-4"	85
✳A115	4	#5	STR	18'-8"	78
✳A116	4	#5	STR	17'-1"	71
✳A117	4	#5	STR	15'-5"	64
✳A118	4	#5	STR	13'-9"	57
✳A119	4	#5	STR	12'-1"	50
✳A120	4	#5	STR	10'-6"	44
✳A121	4	#5	STR	8'-10"	37
✳A122	4	#5	STR	7'-2"	30
✳A123	4	#5	STR	5'-6"	23
✳A124	4	#5	STR	3'-11"	16
✳A125	4	#5	STR	2'-3"	9
A2	468	#5	STR	43'-2"	21071
A201	4	#5	STR	41'-9"	174
A202	4	#5	STR	40'-1"	167
A203	4	#5	STR	38'-6"	161
A204	4	#5	STR	36'-10"	154
A205	4	#5	STR	35'-2"	147
A206	4	#5	STR	33'-6"	140
A207	4	#5	STR	31'-11"	133

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A208	4	#5	STR	30'-3"	126
A209	4	#5	STR	28'-7"	119
A210	4	#5	STR	26'-11"	112
A211	4	#5	STR	25'-4"	106
A212	4	#5	STR	23'-8"	99
A213	4	#5	STR	22'-0"	92
A214	4	#5	STR	20'-4"	85
A215	4	#5	STR	18'-8"	78
A216	4	#5	STR	17'-1"	71
A217	4	#5	STR	15'-5"	64
A218	4	#5	STR	13'-9"	57
A219	4	#5	STR	12'-1"	50
A220	4	#5	STR	10'-6"	44
A221	4	#5	STR	8'-10"	37
A222	4	#5	STR	7'-2"	30
A223	4	#5	STR	5'-6"	23
A224	4	#5	STR	3'-11"	16
A225	4	#5	STR	2'-3"	9
✳ B1	120	#4	STR	26'-3"	2104
✳ B2	174	#7	STR	35'-2"	12507
B3	220	#5	STR	58'-2"	13347
✳ B4	120	#4	STR	24'-8"	1977
✳ D1	517	#5	STR	3'-0"	1618
✳ G1	2	#5	STR	51'-8"	108
✳ K1	6	#5	1	11'-9"	74
✳ K2	18	#5	2	15'-7"	293
✳ K3	6	#5	1	11'-1"	69
✳ S1	72	#4	3	4'-10"	232

REINFORCING STEEL (LBS.) 36,712
✳EPOXY COATED REINFORCING STEEL (LBS.) 42,347

STAGE 2

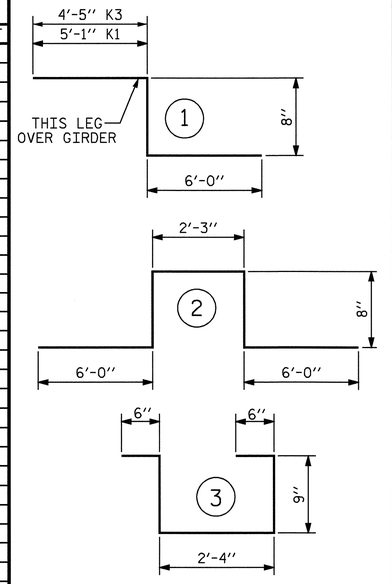
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A3	468	#5	STR	43'-2"	21071
✳A301	4	#5	STR	41'-9"	174
✳A302	4	#5	STR	40'-1"	167
✳A303	4	#5	STR	38'-6"	161
✳A304	4	#5	STR	36'-10"	154
✳A305	4	#5	STR	35'-2"	147
✳A306	4	#5	STR	33'-6"	140
✳A307	4	#5	STR	31'-11"	133
✳A308	4	#5	STR	30'-3"	126
✳A309	4	#5	STR	28'-7"	119
✳A310	4	#5	STR	26'-11"	112
✳A311	4	#5	STR	25'-4"	106
✳A312	4	#5	STR	23'-8"	99
✳A313	4	#5	STR	22'-0"	92
✳A314	4	#5	STR	20'-4"	85
✳A315	4	#5	STR	18'-8"	78
✳A316	4	#5	STR	17'-1"	71
✳A317	4	#5	STR	15'-5"	64
✳A318	4	#5	STR	13'-9"	57
✳A319	4	#5	STR	12'-1"	50
✳A320	4	#5	STR	10'-6"	44
✳A321	4	#5	STR	8'-10"	37
✳A322	4	#5	STR	7'-2"	30
✳A323	4	#5	STR	5'-6"	23
✳A324	4	#5	STR	3'-11"	16
✳A325	4	#5	STR	2'-3"	9
A4	468	#5	STR	43'-2"	21071
A401	4	#5	STR	41'-9"	174
A402	4	#5	STR	40'-1"	167
A403	4	#5	STR	38'-6"	161
A404	4	#5	STR	36'-10"	154
A405	4	#5	STR	35'-2"	147
A406	4	#5	STR	33'-6"	140
A407	4	#5	STR	31'-11"	133

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A408	4	#5	STR	30'-3"	126
A409	4	#5	STR	28'-7"	119
A410	4	#5	STR	26'-11"	112
A411	4	#5	STR	25'-4"	106
A412	4	#5	STR	23'-8"	99
A413	4	#5	STR	22'-0"	92
A414	4	#5	STR	20'-4"	85
A415	4	#5	STR	18'-8"	78
A416	4	#5	STR	17'-1"	71
A417	4	#5	STR	15'-5"	64
A418	4	#5	STR	13'-9"	57
A419	4	#5	STR	12'-1"	50
A420	4	#5	STR	10'-6"	44
A421	4	#5	STR	8'-10"	37
A422	4	#5	STR	7'-2"	30
A423	4	#5	STR	5'-6"	23
A424	4	#5	STR	3'-11"	16
A425	4	#5	STR	2'-3"	9
✳ A5	520	#5	STR	1'-8"	904
✳ B1	128	#4	STR	26'-3"	2244
✳ B2	183	#7	STR	35'-2"	13514
B3	220	#5	STR	58'-2"	13347
✳ B4	128	#4	STR	24'-8"	2109
✳ D1	517	#5	STR	3'-0"	1618
✳ G1	2	#5	STR	51'-8"	108
✳ K1	6	#5	1	11'-9"	74
✳ K2	18	#5	2	15'-7"	293
✳ K3	6	#5	1	11'-1"	69
✳ K4	4	#5	STR	1'-11"	8
✳ S1	76	#4	3	4'-10"	245

REINFORCING STEEL (LBS.) 36,712
✳EPOXY COATED REINFORCING STEEL (LBS.) 44,551

REINFORCING STEEL FOR CLOSURE POUR INCLUDED IN STAGE 2.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

GROOVING BRIDGE FLOORS

BRIDGE DECK	21,958 SQ.FT.
APPROACH SLAB	3,659 SQ.FT.
TOTAL	25,617 SQ.FT.

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"			

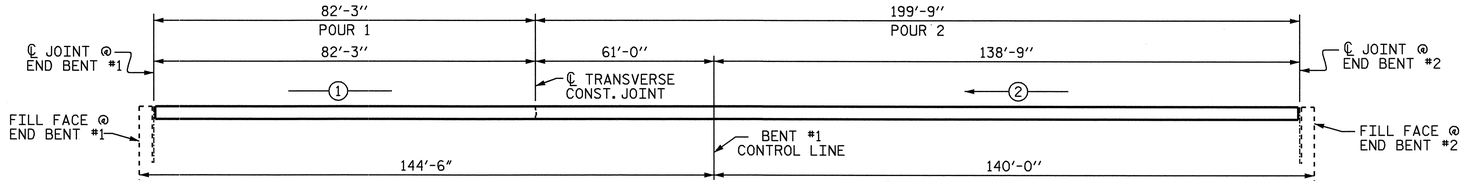
REINFORCING STEEL QUANTITIES

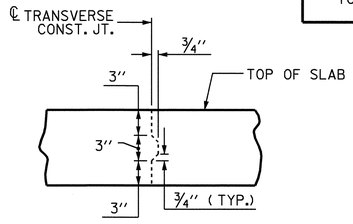
	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
STAGE 1	36,712 Lbs.	42,347 Lbs.
STAGE 2	36,712 Lbs.	44,551 Lbs.
END POSTS & SIDEWALK		2,743 Lbs.
TOTAL	73,424 Lbs.	89,641 Lbs.

CONCRETE QUANTITIES WITH POUR SEQUENCE BREAKDOWN

CLASS AA CONCRETE (CU. YARDS)

	POUR #1	POUR #2	TOTAL
STAGE 1	119.3	284.5	403.8
STAGE 2	119.3	284.5	403.8
CLOSURE POUR			21.8
END POSTS & SIDEWALK			37.8
TOTAL CONCRETE (CU. YDS.)			867.2



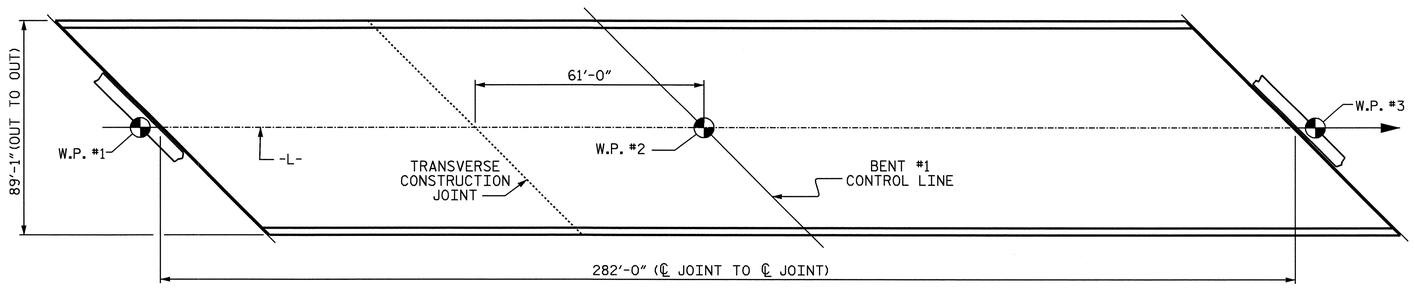


TRANSVERSE CONSTRUCTION JOINT DETAIL

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

SHOWS DIRECTION OF POUR

LAYOUT FOR POURING SEQUENCE OF REINFORCED CONCRETE DECK SLAB



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB

AREA CONCRETE DECK SLAB = 25,122 Sq. Ft.

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
SUPERSTRUCTURE
BILL OF MATERIAL

ASSEMBLED BY : J.P. ADAMS	DATE : 8/25/03
CHECKED BY : S.H. SOCKWELL	DATE : 10/2/03
DRAWN BY : JMB 5/87	REV. 6/1/94 EEM/GRP
CHECKED BY : SJD 9/87	REV. 8/16/99 RWW/LES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			51

STD. NO. BOM1

NOTES

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

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

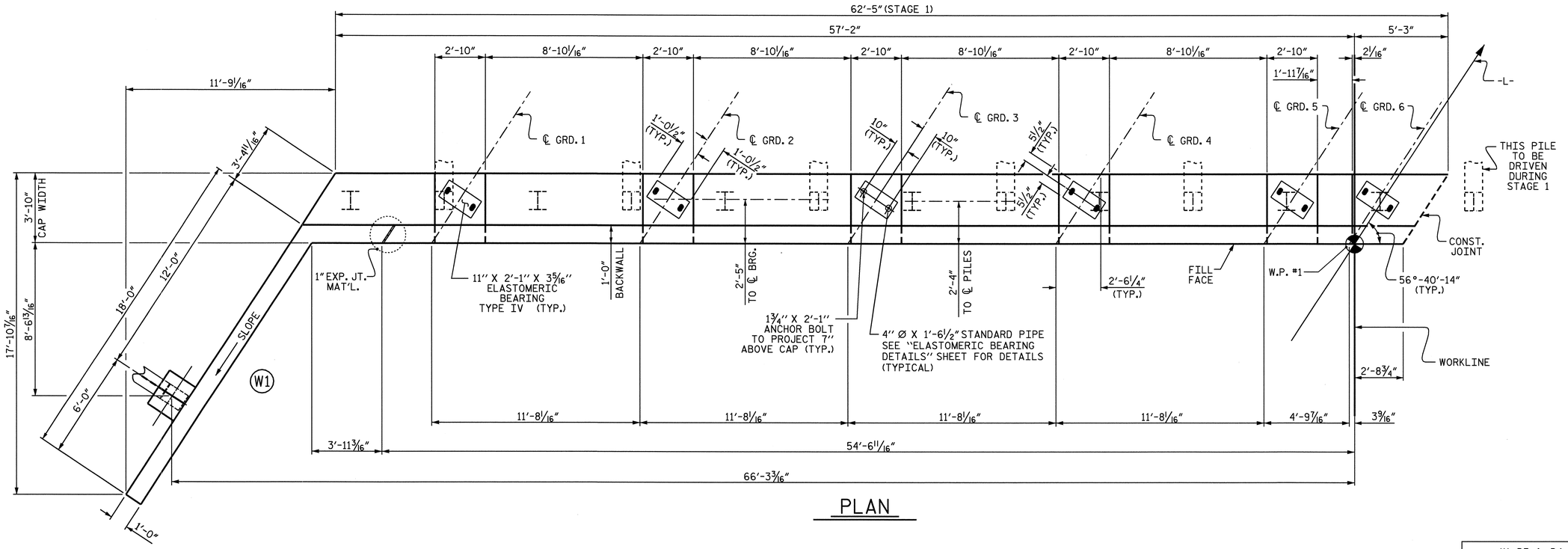
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

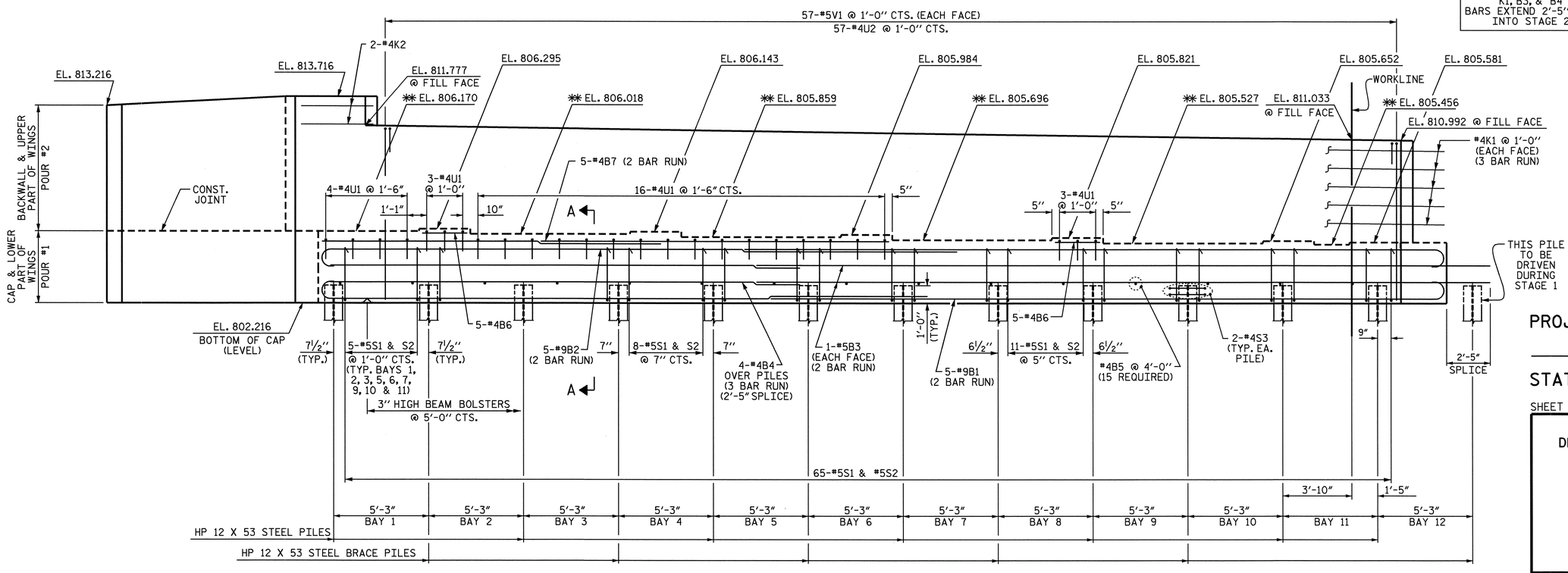
THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

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



PLAN

K1, B3, & B4 BARS EXTEND 2'-5" MIN. INTO STAGE 2



ELEVATION

BRACE PILES ON WINGS NOT SHOWN FOR CLARITY

✱✱ SEE SHEET 4 OF 5 FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS.

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
Thomas G. Payne 4/7/06

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 1/12/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04

06-APR-2006 09:53
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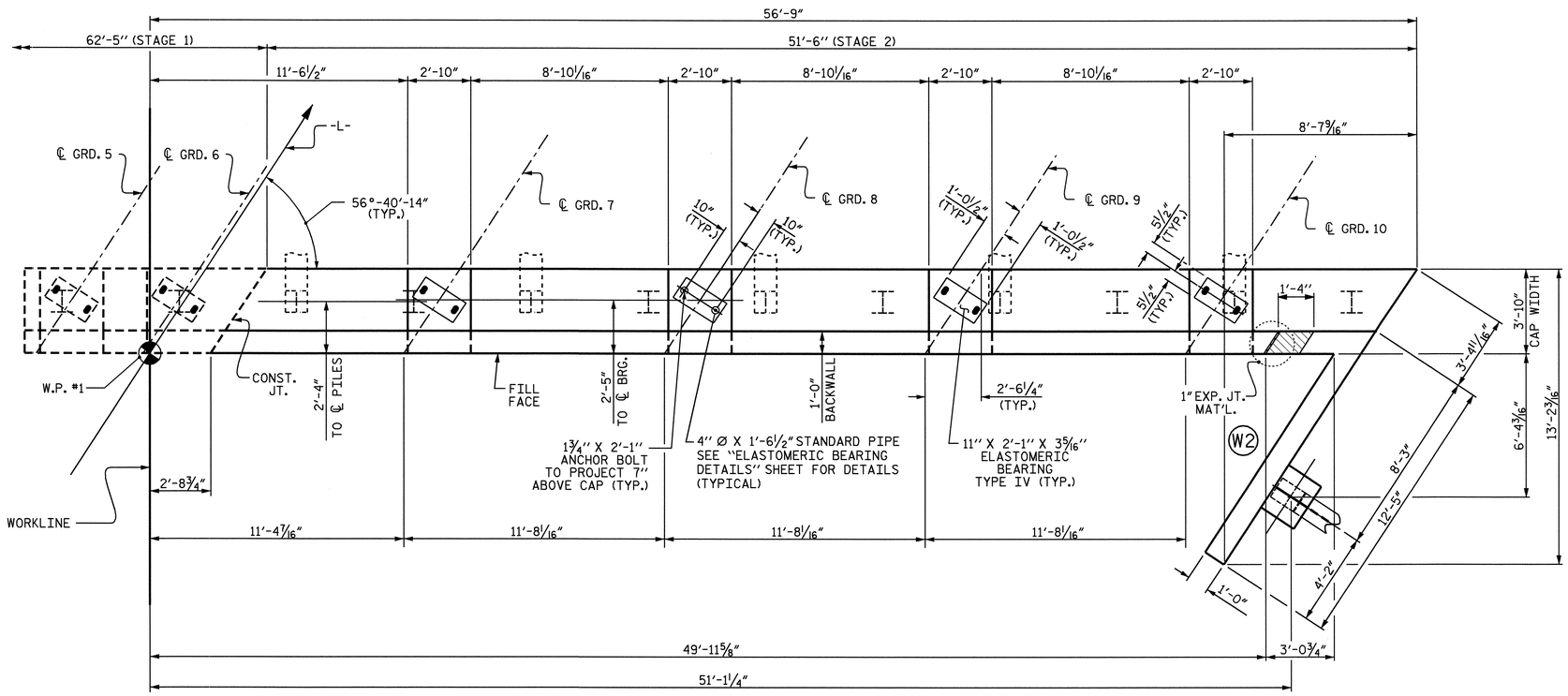
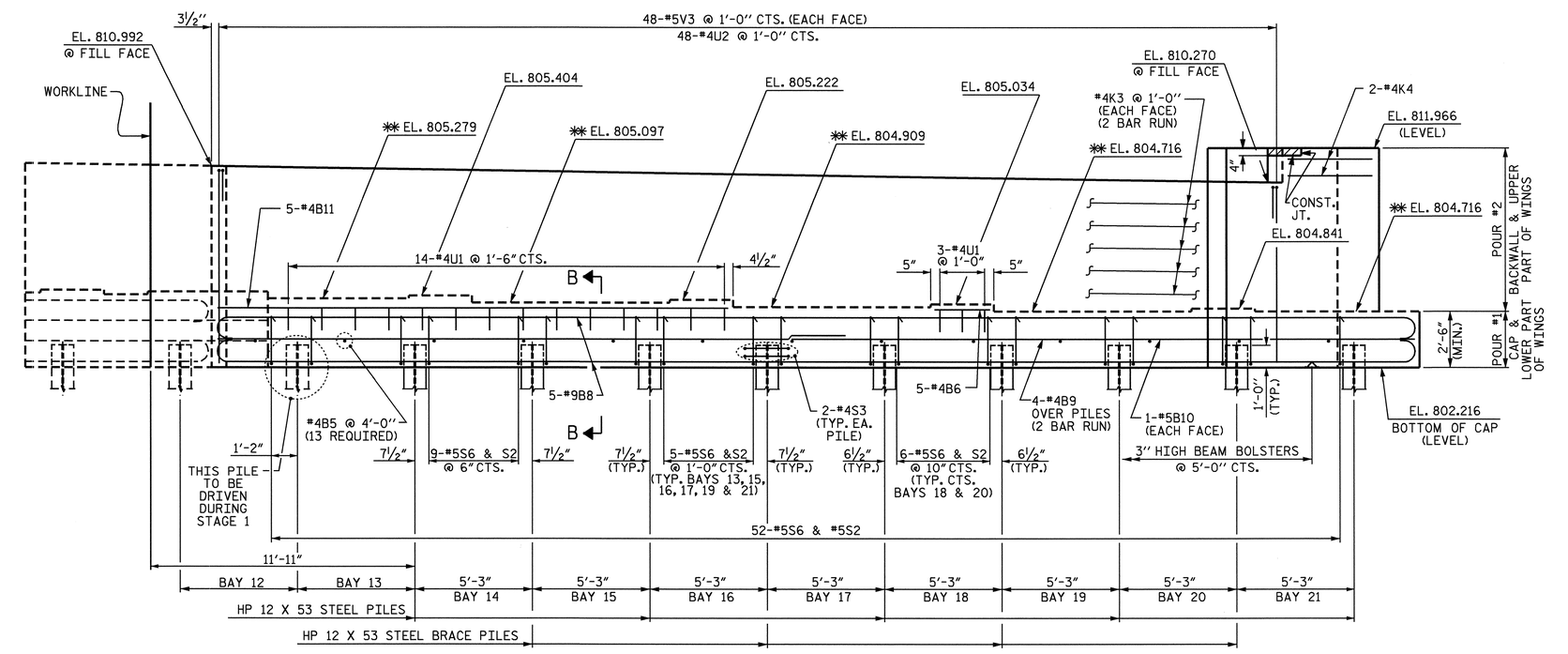
jpadams



PLAN



ELEVATION

BRACE PILES ON WINGS NOT SHOWN FOR CLARITY

✻✻ SEE SHEET 5 OF 5 FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS.

NOTES

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

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

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 THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

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

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

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

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

(STAGE 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

4/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS 1/12/04
CHECKED BY : H.A. LOCKLEAR 5/04

06-APR-2006 09:53
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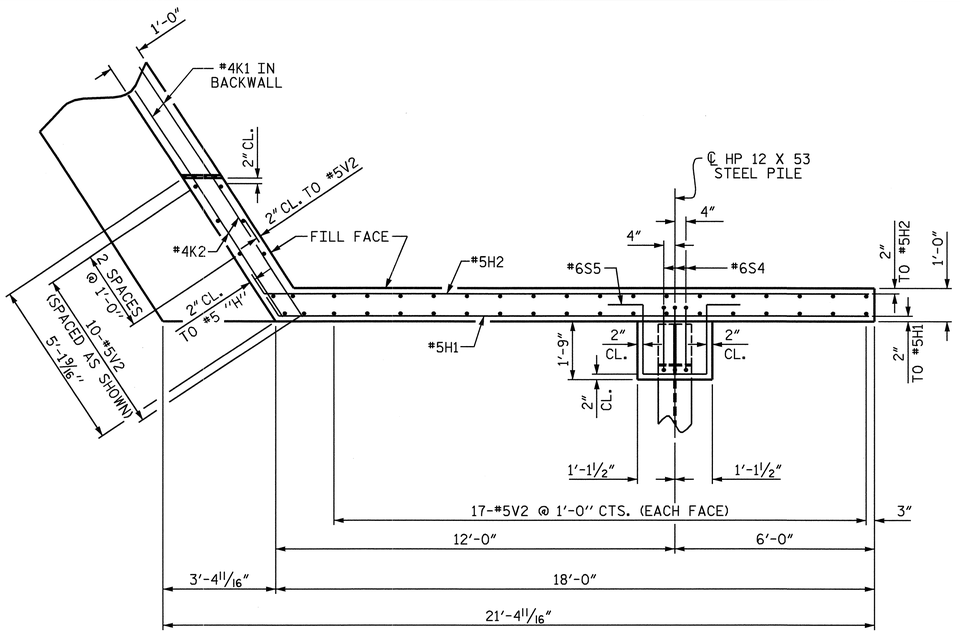
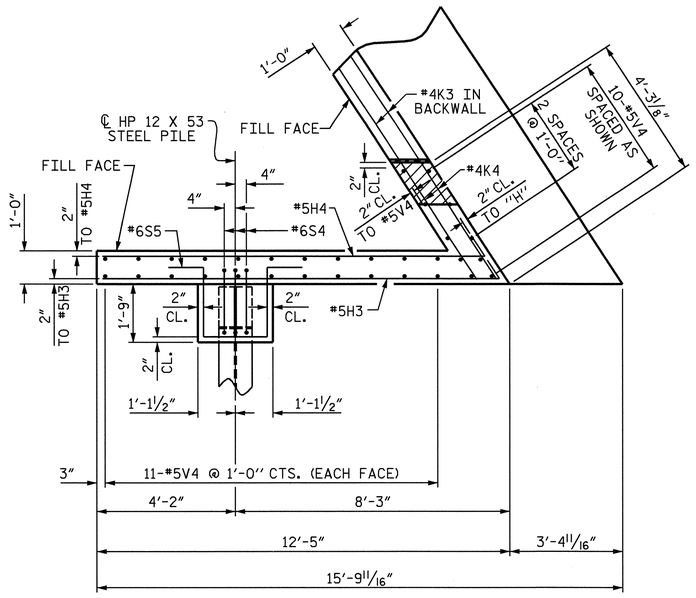
jpadams



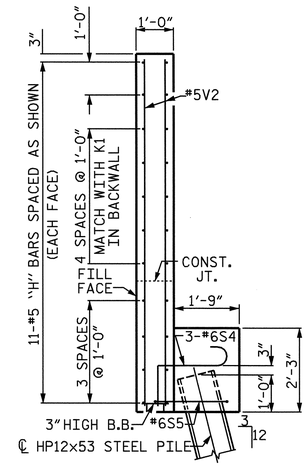
PLAN OF WING - (W1)

(STAGE 1)

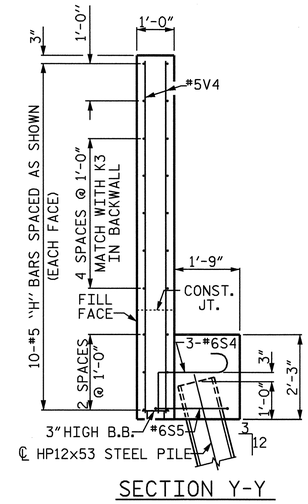


PLAN OF WING - (W2)

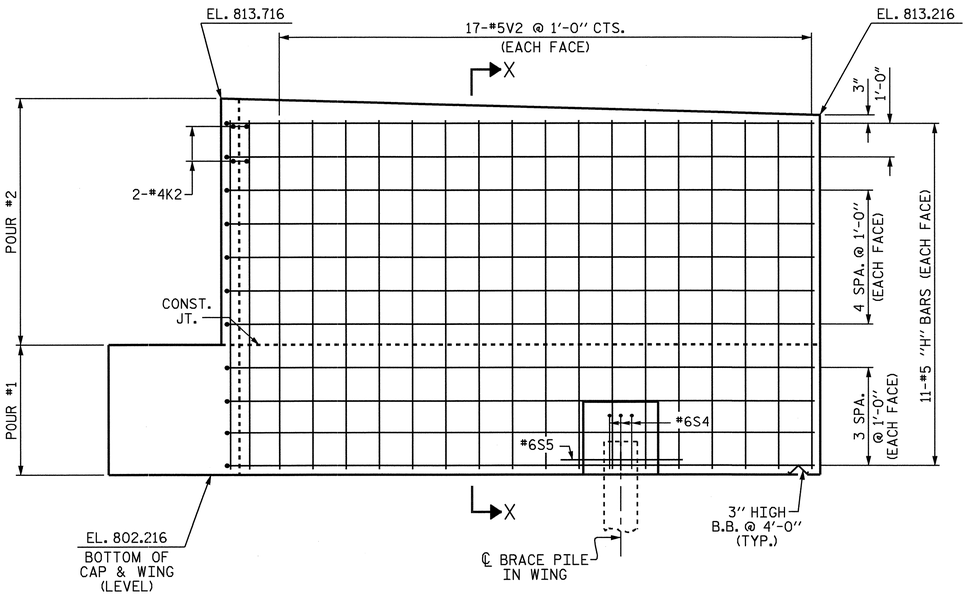
(STAGE 2)



SECTION X-X

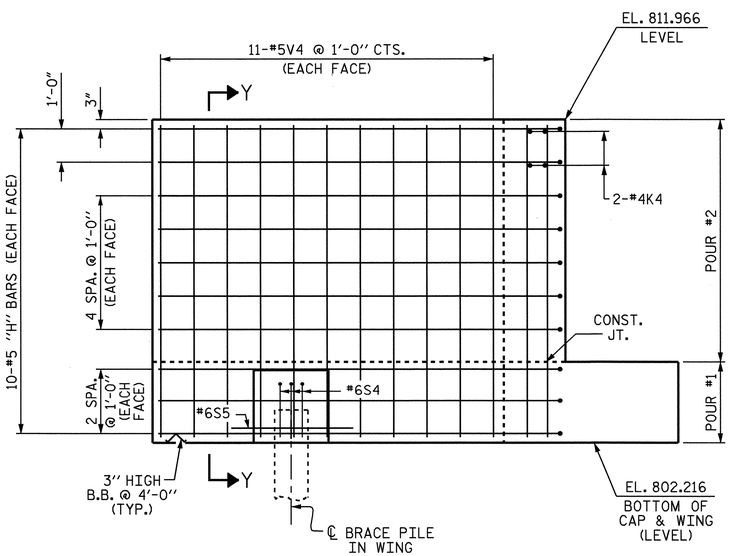


SECTION Y-Y



ELEVATION OF WING - (W1)

(STAGE 1)



ELEVATION OF WING - (W2)

(STAGE 2)

DRAWN BY : J.P. ADAMS DATE : 1/30/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04

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jpadams

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 3 OF 5

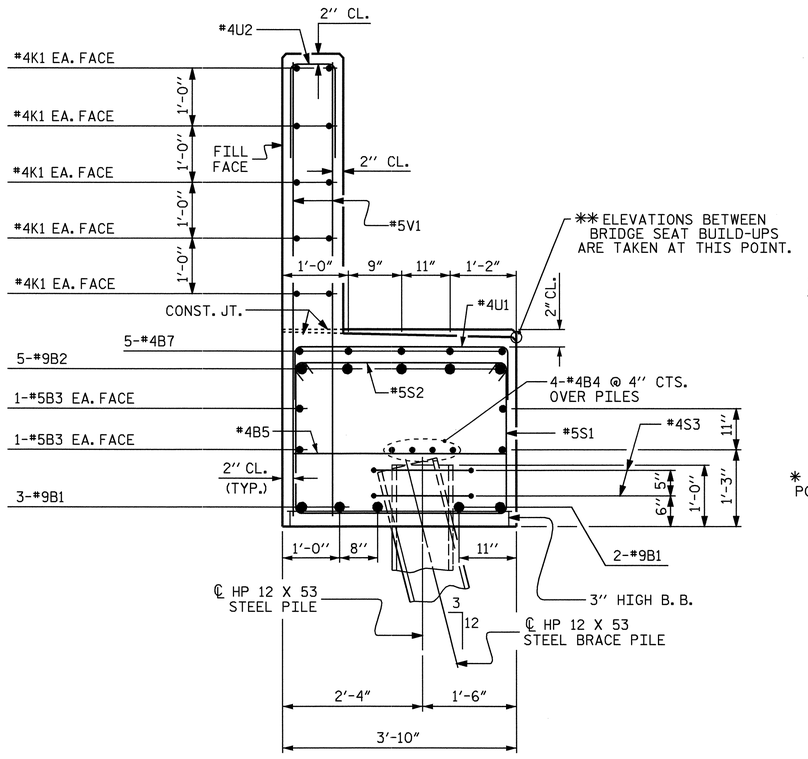
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #1

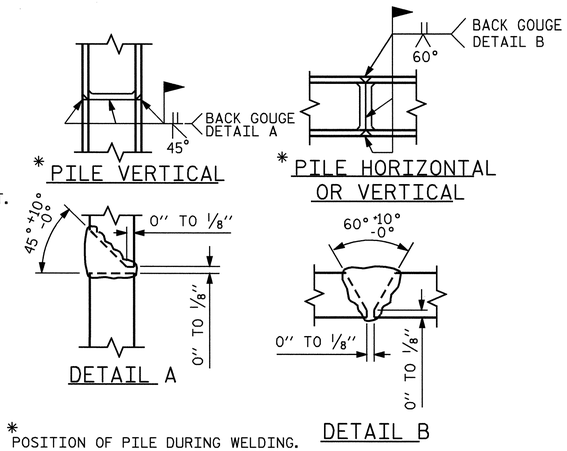
(STAGE 1 AND 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
2/1/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-34
1			3			TOTAL SHEETS
2			4			51

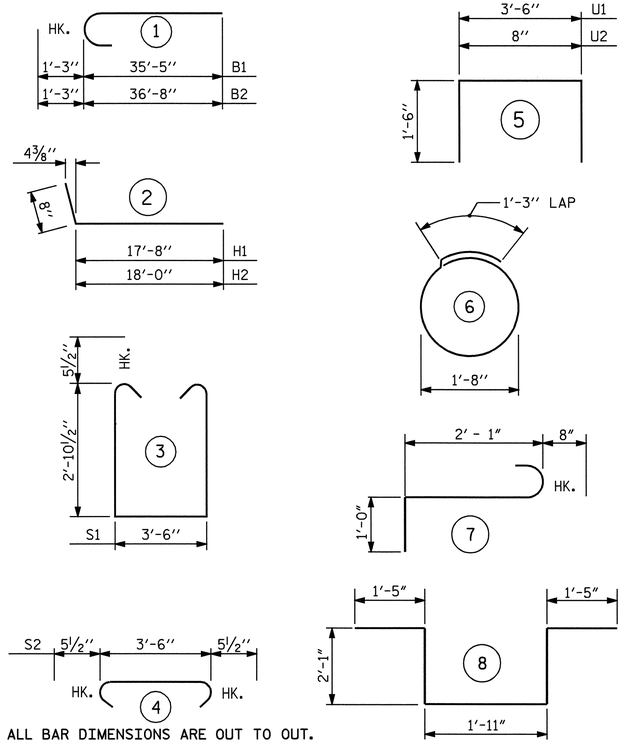


SECTION A-A



PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	36'-8"	1247
B2	10	9	1	37'-11"	1289
B3	8	5	STR.	33'-11"	283
B4	12	4	STR.	23'-3"	186
B5	15	4	STR.	3'-6"	35
B6	10	4	STR.	2'-6"	17
B7	10	4	STR.	16'-9"	115
H1	11	5	2	18'-4"	210
H2	11	5	2	18'-8"	214
K1	30	4	STR.	23'-3"	465
K2	4	4	STR.	4'-8"	12
S1	65	5	3	10'-2"	689
S2	65	5	4	4'-5"	299
S3	24	4	6	6'-6"	104
S4	3	6	7	3'-9"	17
S5	1	6	8	8'-11'	13
U1	26	4	5	6'-6"	113
U2	57	4	5	3'-8"	140
V1	114	5	STR.	8'-5"	1001
V2	44	5	STR.	10'-8"	490

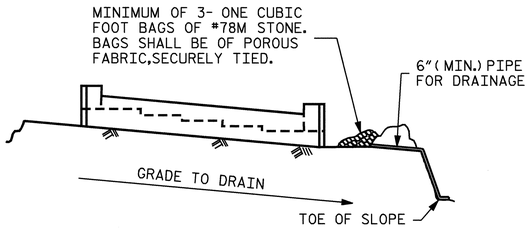
REINFORCING STEEL 6939

CLASS A CONCRETE BREAKDOWN
POUR #1
CAP & LOWER WINGS 34.7 Yds.3

POUR #2
BACKWALL & UPPER WINGS 18.1 Yds.3

TOTAL CLASS A CONCRETE 52.8 Yds.3

HP 12 X 53 STEEL PILES
NO. 14 1050 Lin. Ft.



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. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

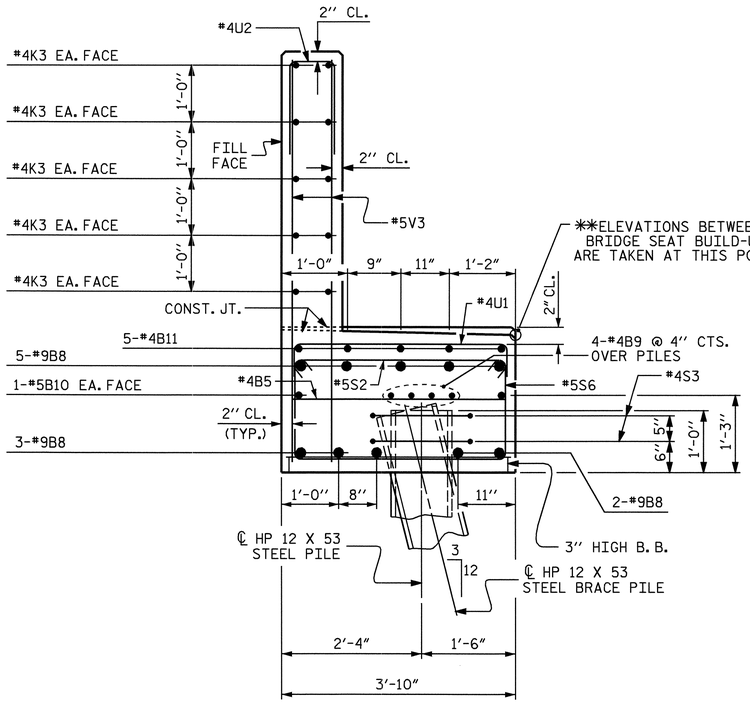
SUBSTRUCTURE

END BENT #1

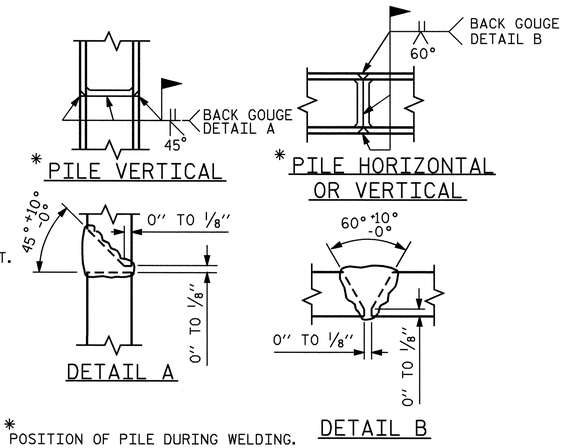
(STAGE 1)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 1/21/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04



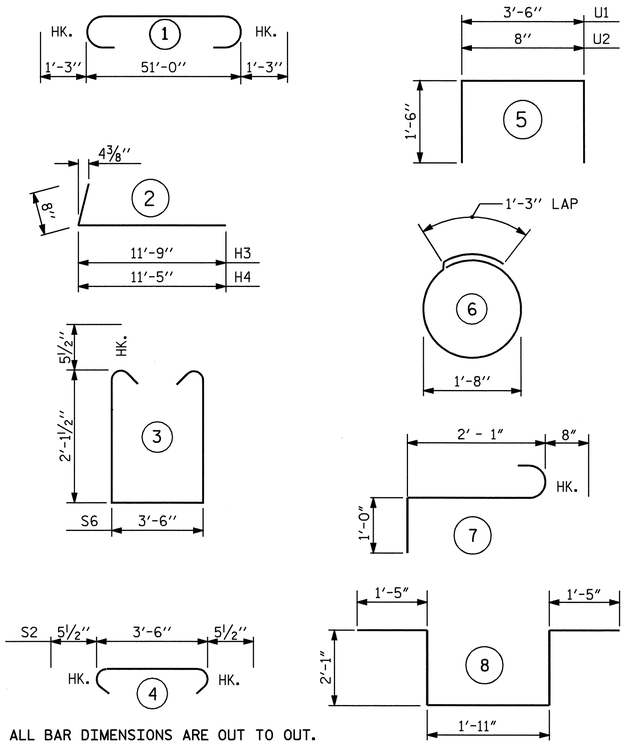
SECTION B-B



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



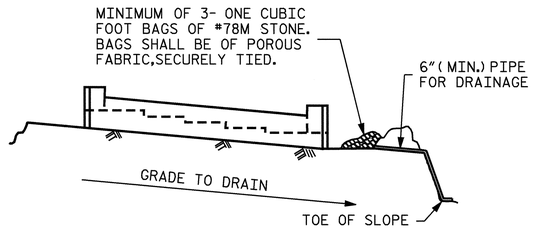
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B5	13	4	STR.	3'-6"	30
B6	5	4	STR.	2'-6"	8
B8	10	9	1	53'-6"	1819
B9	8	4	STR.	26'-10"	143
B10	2	5	STR.	51'-2"	107
B11	5	4	STR.	20'-7"	70
H3	10	5	2	12'-5"	129
H4	10	5	2	12'-1"	126
K3	20	4	STR.	27'-0"	361
K4	4	4	STR.	3'-10"	10
S2	52	5	4	4'-5"	240
S3	20	4	6	6'-6"	87
S4	3	6	7	3'-9"	17
S5	1	6	8	8'-11"	13
S6	52	5	3	8'-8"	470
U1	17	4	5	6'-6"	74
U2	48	4	5	3'-8"	118
V3	96	5	STR.	7'-8"	768
V4	32	5	STR.	9'-4"	312

REINFORCING STEEL	4902
CLASS A CONCRETE BREAKDOWN	
POUR #1	
CAP & LOWER WINGS	22.8 Yds.3
POUR #2	
BACKWALL & UPPER WINGS	14.2 Yds.3
TOTAL CLASS A CONCRETE	37.0 Yds.3
HP 12 X 53 STEEL PILES	
NO. 10	750 Lin. Ft.



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

		STAGE 1	STAGE 2	TOTAL
REINFORCING STEEL (LBS.)		6939	4902	11841
TOTAL CLASS A CONCRETE (C.Y.)		52.8	37.0	89.8
HP 12 X 53 STEEL PILES	NO.	14	10	24
	LIN. FT.	1050	750	1800

DRAWN BY : J.P. ADAMS DATE : 1/21/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
Thomas G. Payne 4/7/06

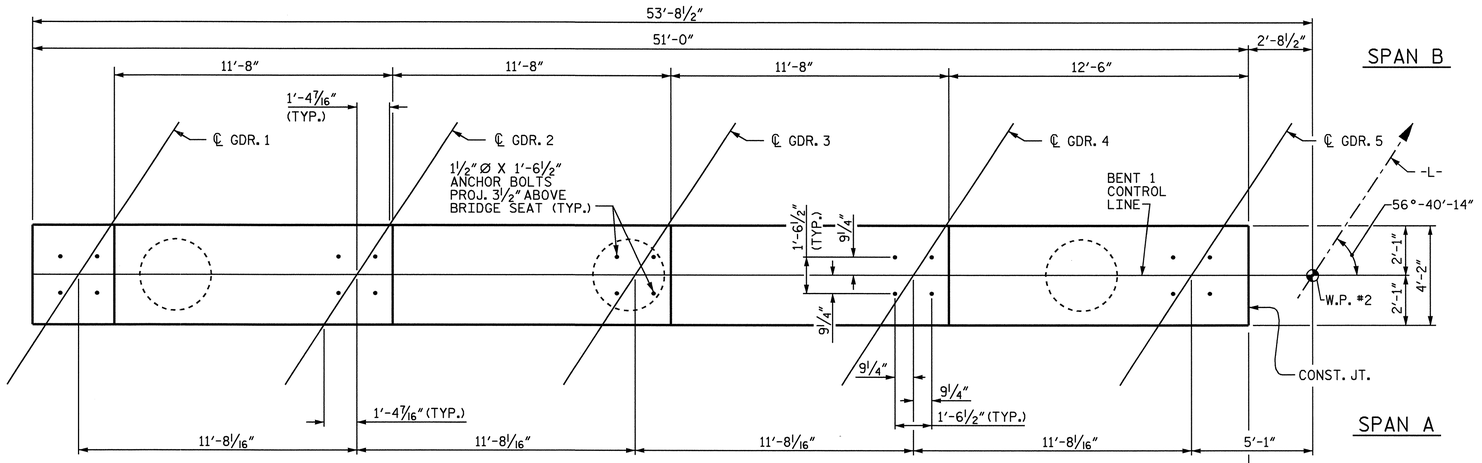
PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

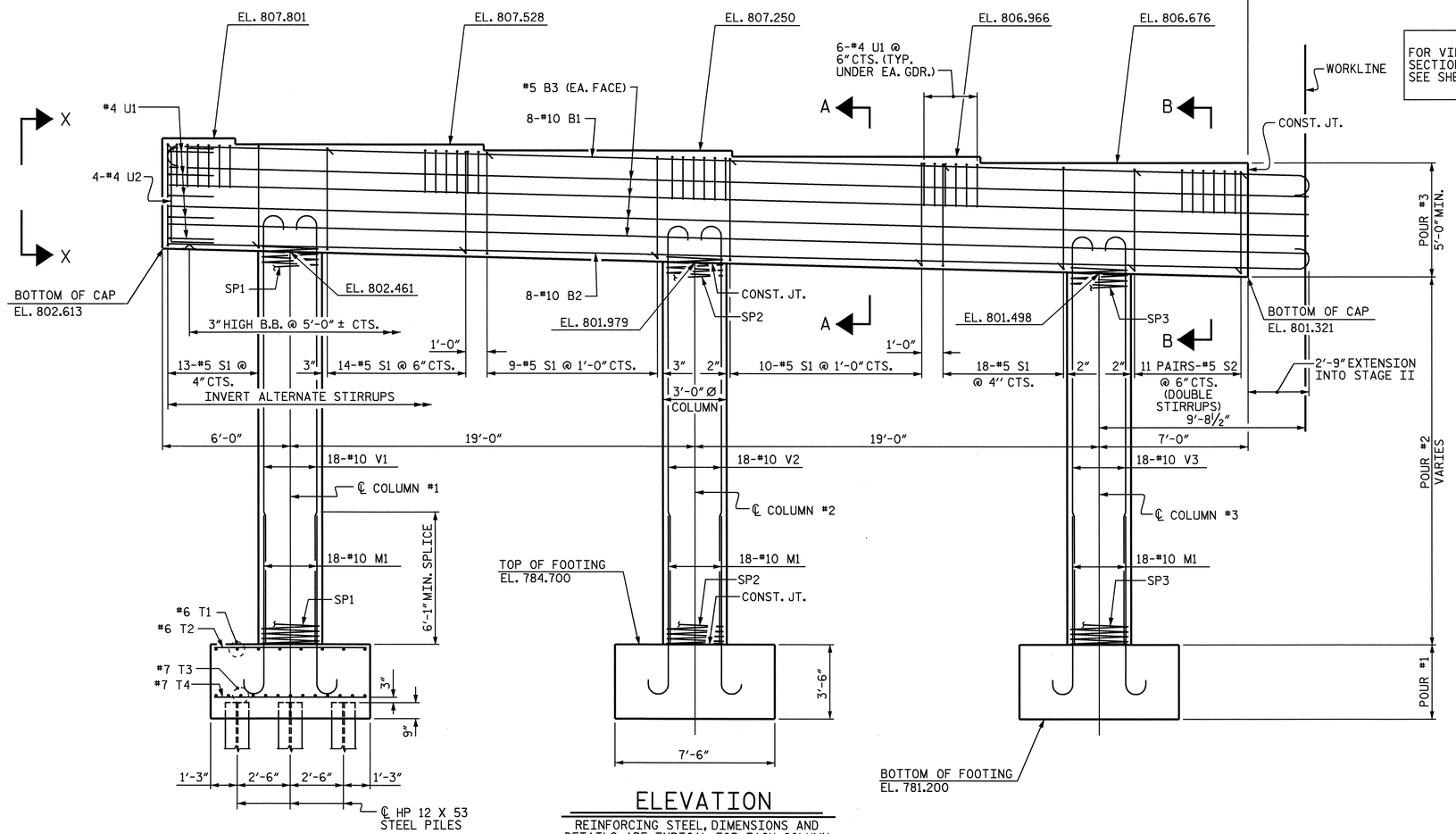
SUBSTRUCTURE
END BENT #1
(STAGE 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			51



PLAN

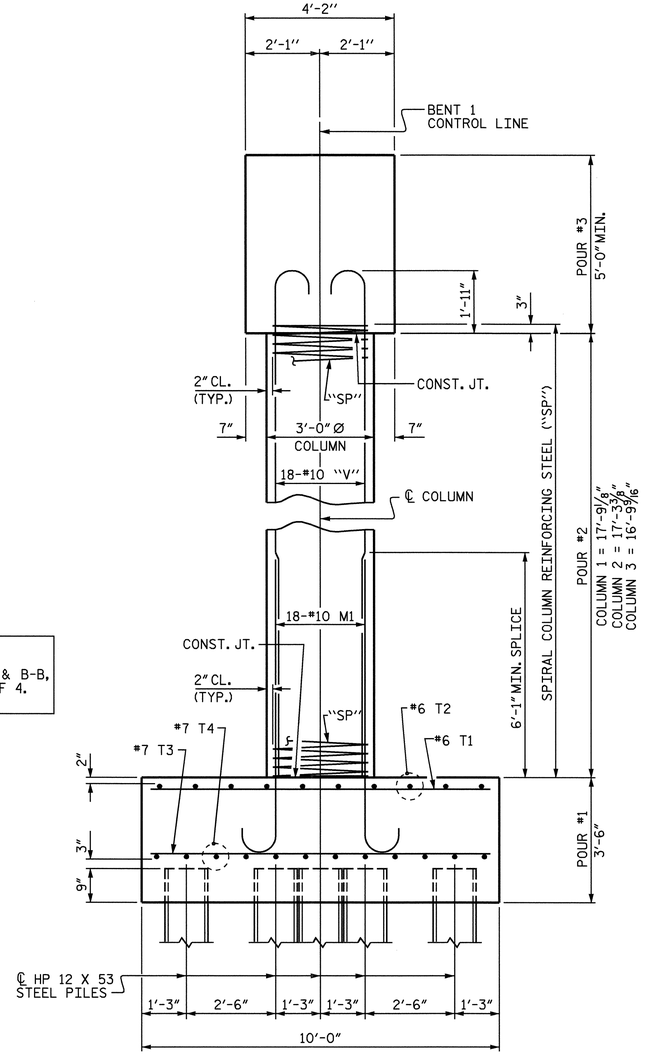
STAGE I STAGE II



ELEVATION

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

FOR VIEW X-X, SECTIONS A-A & B-B, SEE SHEET 2 OF 4.



END VIEW

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE I

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

Thomas G. Payne 4/1/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : A.R.CHESSON/JPA DATE : 2-04
CHECKED BY : A.K. PATEL DATE : 3-23-04

06-APR-2006 09:55
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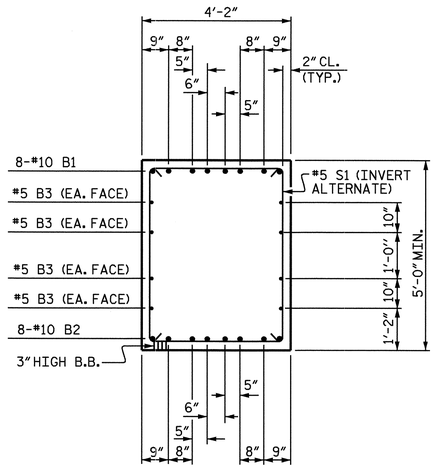
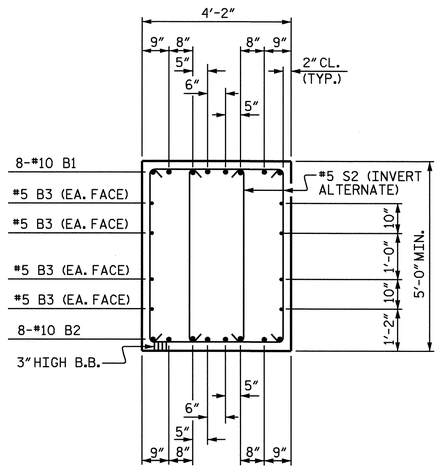
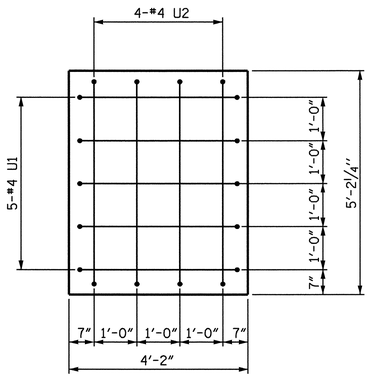
jpadams



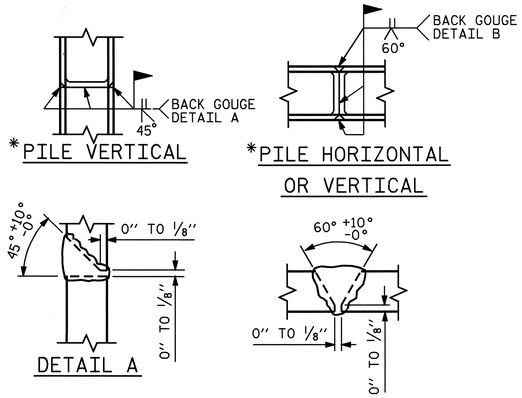
SECTION A-A



SECTION B-B



VIEW X-X



*PILE VERTICAL

*PILE HORIZONTAL OR VERTICAL

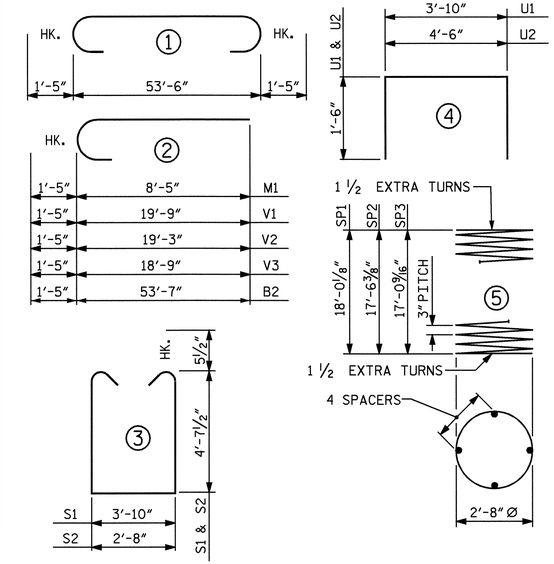
DETAIL A

DETAIL B

*POSITION OF PILE DURING WELDING.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



BILL OF MATERIAL

BENT 1 - STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#10	1	56'-4"	1939
B2	8	#10	2	55'-0"	1893
B3	8	#5	STR	53'-7"	447
M1	54	#10	2	9'-10"	2285
S1	64	#5	3	14'-0"	935
S2	22	#5	3	12'-10"	294
T1	24	#6	STR	9'-8"	348
T2	30	#6	STR	7'-2"	323
T3	39	#7	STR	9'-8"	771
T4	36	#7	STR	7'-2"	527
U1	35	#4	4	6'-10"	160
U2	4	#4	4	7'-6"	20
V1	18	#10	2	21'-2"	1639
V2	18	#10	2	20'-8"	1601
V3	18	#10	2	20'-2"	1562

REINFORCING STEEL = 14744 LBS

SP1	1	**	5	618'-7"	413
SP2	1	**	5	602'-10"	403
SP3	1	**	5	586'-10"	392

SPIRAL COLUMN REINFORCING STEEL ("SP") = 1208 LBS

CLASS A CONCRETE BREAKDOWN :

POUR #1 (FOOTINGS)	29.2 C.Y.
POUR #2 (COLUMNS)	13.6 C.Y.
POUR #3 (CAP)	40.8 C.Y.
TOTAL CLASS A CONCRETE	83.6 C.Y.

HP 12 X 53 STEEL PILES

No. 33 LIN. FT. 1,815

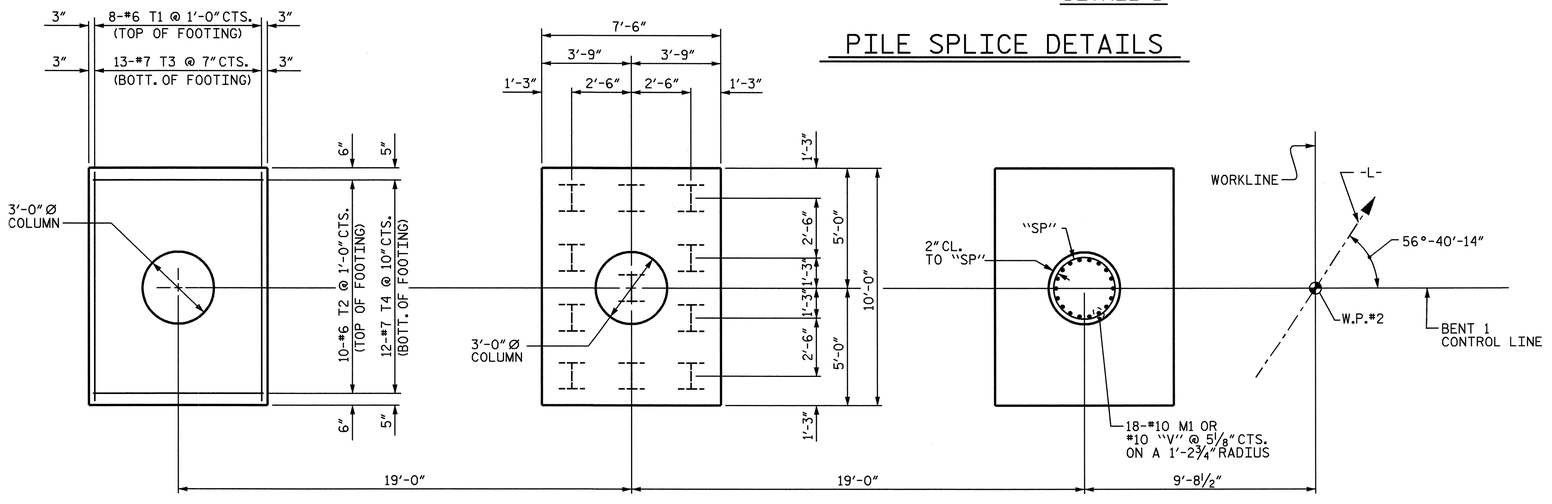
FOUNDATION EXCAVATION LUMP SUM

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.

** THE SP1, SP2 & SP3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.



PILE SPLICE DETAILS

PLAN OF FOOTINGS & COLUMNS

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : A.R.CHESSON/JPA DATE : 2-04

CHECKED BY : A.K. PATEL DATE : 3-23-04

06-APR-2006 09:12
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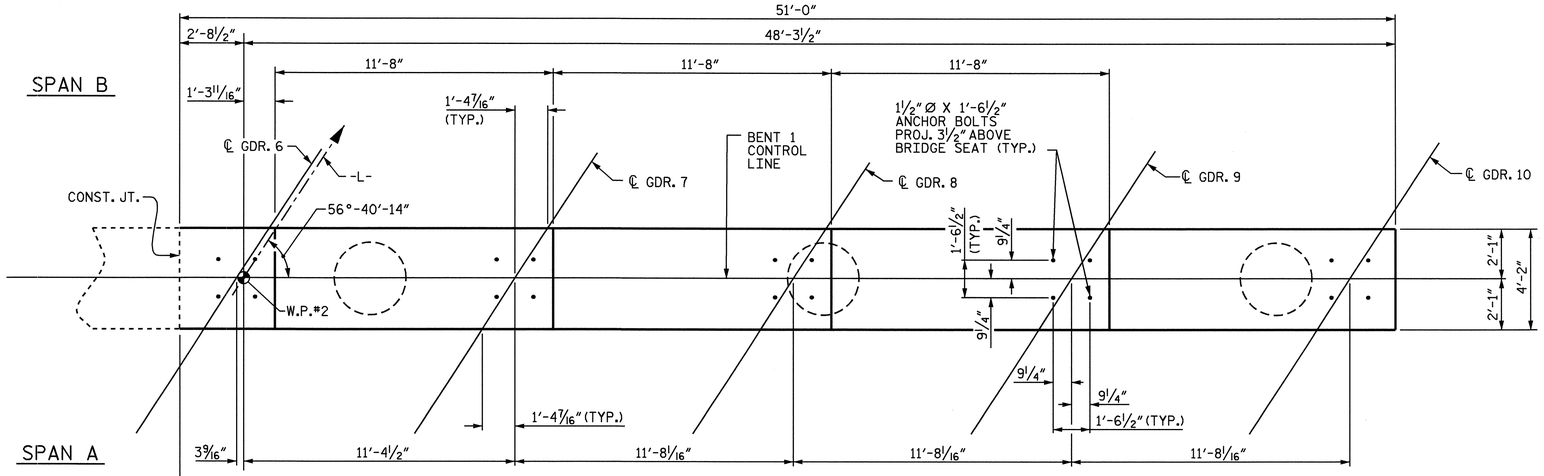
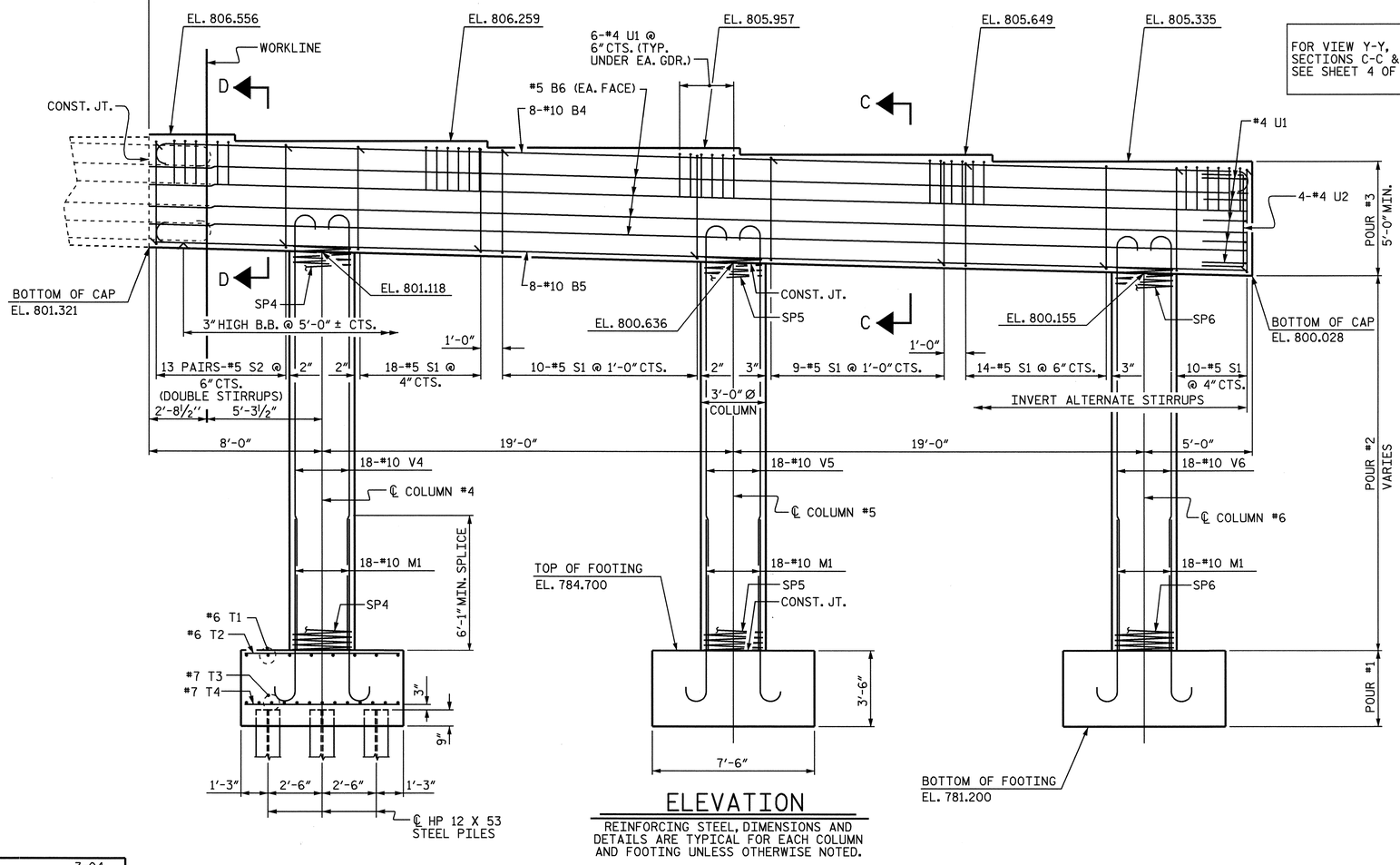
jpadams



STAGE I STAGE II

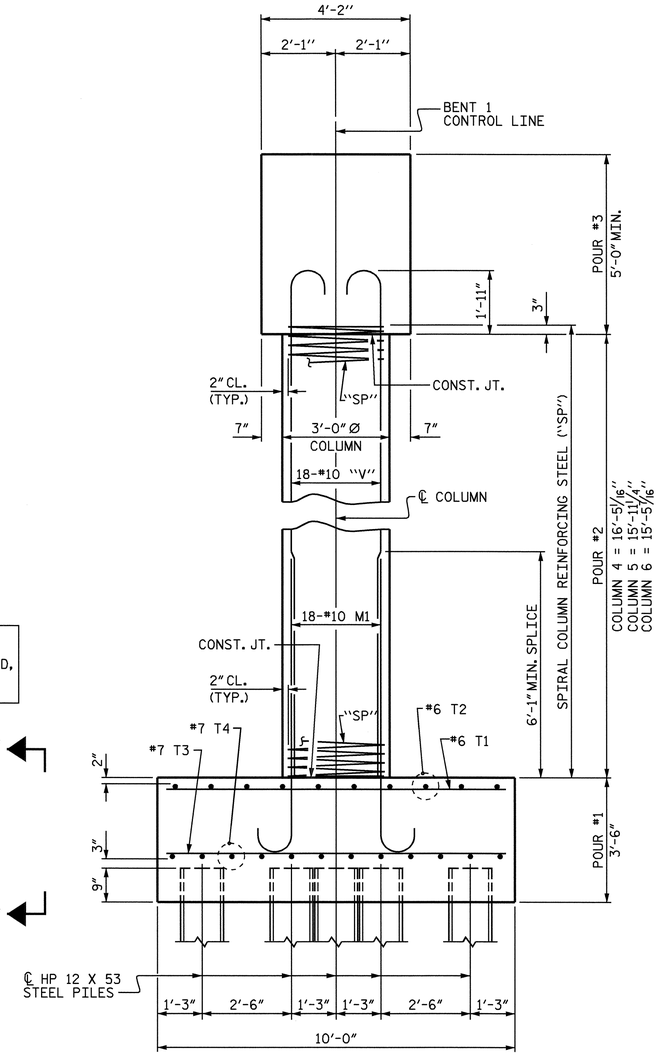
PLAN



ELEVATION

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

FOR VIEW Y-Y, SECTIONS C-C & D-D, SEE SHEET 4 OF 4.



END VIEW

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE II

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

4/7/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : A.R.CHESSON/JPA DATE : 3-04
CHECKED BY : A.K. PATEL DATE : 3/23/04

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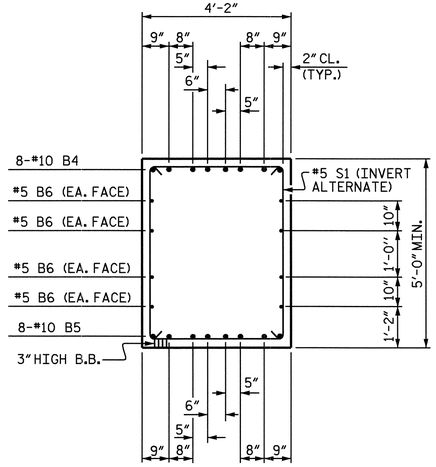
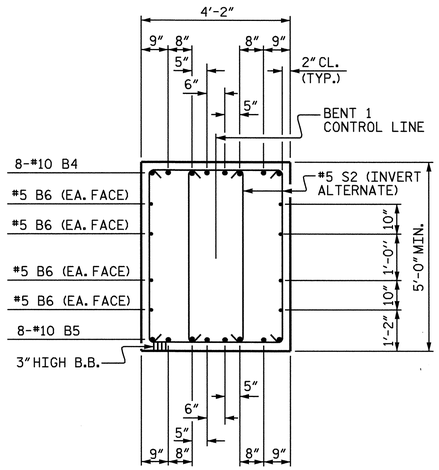
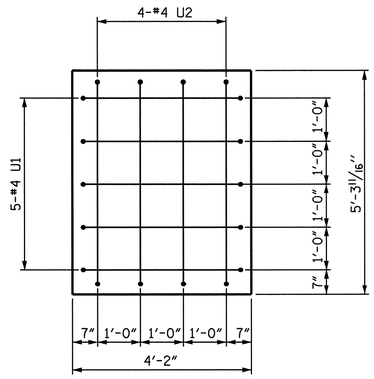


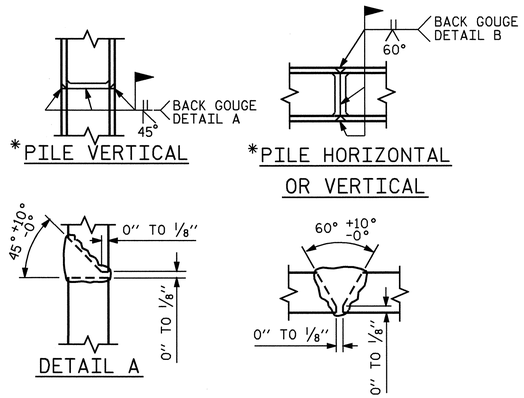
SECTION C-C



SECTION D-D

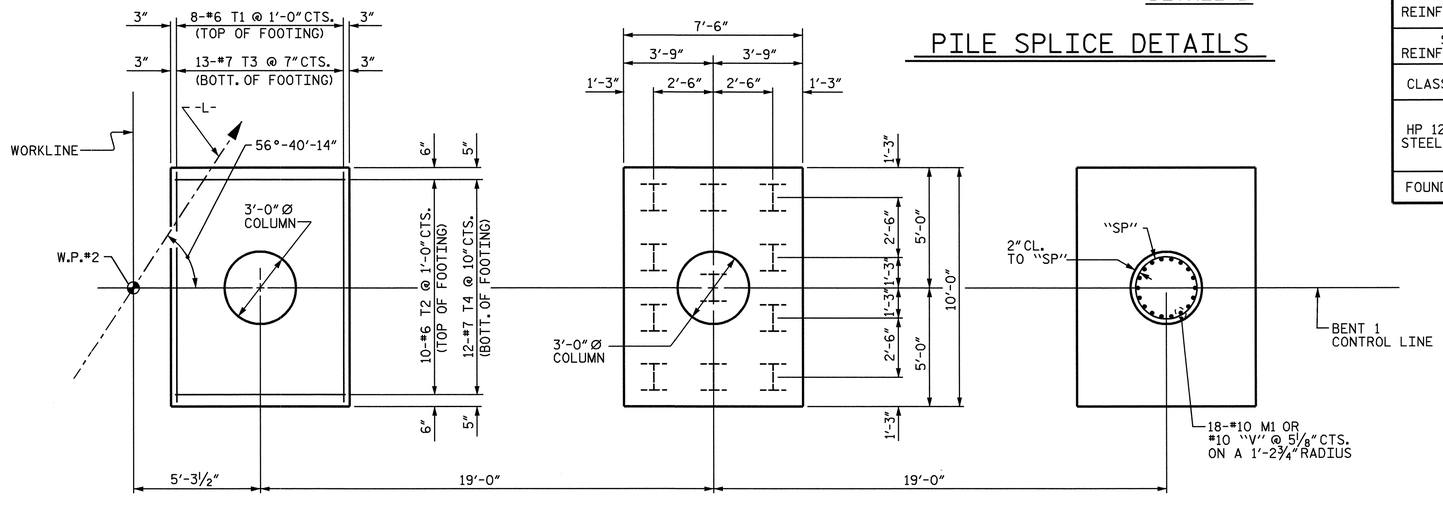


VIEW Y-Y



*POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

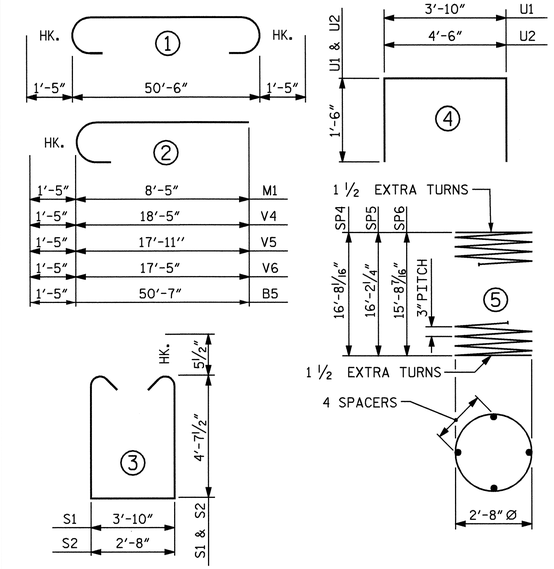


PLAN OF FOOTINGS & COLUMNS

REINFORCING STEEL, DIMENSIONS AND DETAILS ARE TYPICAL FOR EACH COLUMN AND FOOTING UNLESS OTHERWISE NOTED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



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.

		STAGE I	STAGE II	TOTAL
REINFORCING STEEL (LBS.)		14744	14214	28958
SPIRAL COLUMN REINFORCING STEEL (LBS.)		1208	1119	2327
CLASS A CONCRETE (C.Y.)		83.6	82.7	166.3
HP 12 X 53 STEEL PILES	NO.	33	33	66
	LIN. FT.	1815	1815	3630
FOUNDATION EXCAVATION		LUMP SUM	LUMP SUM	LUMP SUM

BILL OF MATERIAL

BENT 1 - STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B4	8	#10	1	53'-4"	1836
B5	8	#10	2	52'-0"	1790
B6	8	#5	STR	50'-8"	423
M1	54	#10	2	9'-10''	2285
S1	61	#5	3	14'-0"	891
S2	26	#5	3	12'-10"	348
T1	24	#6	STR	9'-8"	348
T2	30	#6	STR	7'-2"	323
T3	39	#7	STR	9'-8"	771
T4	36	#7	STR	7'-2"	527
U1	35	#4	4	6'-10"	160
U2	4	#4	4	7'-6"	20
V4	18	#10	2	19'-10''	1536
V5	18	#10	2	19'-4''	1497
V6	18	#10	2	18'-10''	1459
REINFORCING STEEL				=	14214 LBS
SP4	1	**	5	574'-6"	384
SP5	1	**	5	558'-6"	373
SP6	1	**	5	542'-6"	362
SPIRAL COLUMN REINFORCING STEEL ("SP")				=	1119 LBS

CLASS A CONCRETE BREAKDOWN :

POUR #1 (FOOTINGS)	29.2 C.Y.
POUR #2 (COLUMNS)	12.5 C.Y.
POUR #3 (CAP)	41.0 C.Y.
TOTAL CLASS A CONCRETE	82.7 C.Y.

HP 12 X 53 STEEL PILES

No. 33 LIN. FT. 1,815

FOUNDATION EXCAVATION LUMP SUM

** THE SP4, SP5 & SP6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

STAGE II

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

4/7/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : A.R.CHESSON/JPA DATE : 3-04
CHECKED BY : A.K. PATEL DATE : 3-23-04

06-APR-2006 09:12
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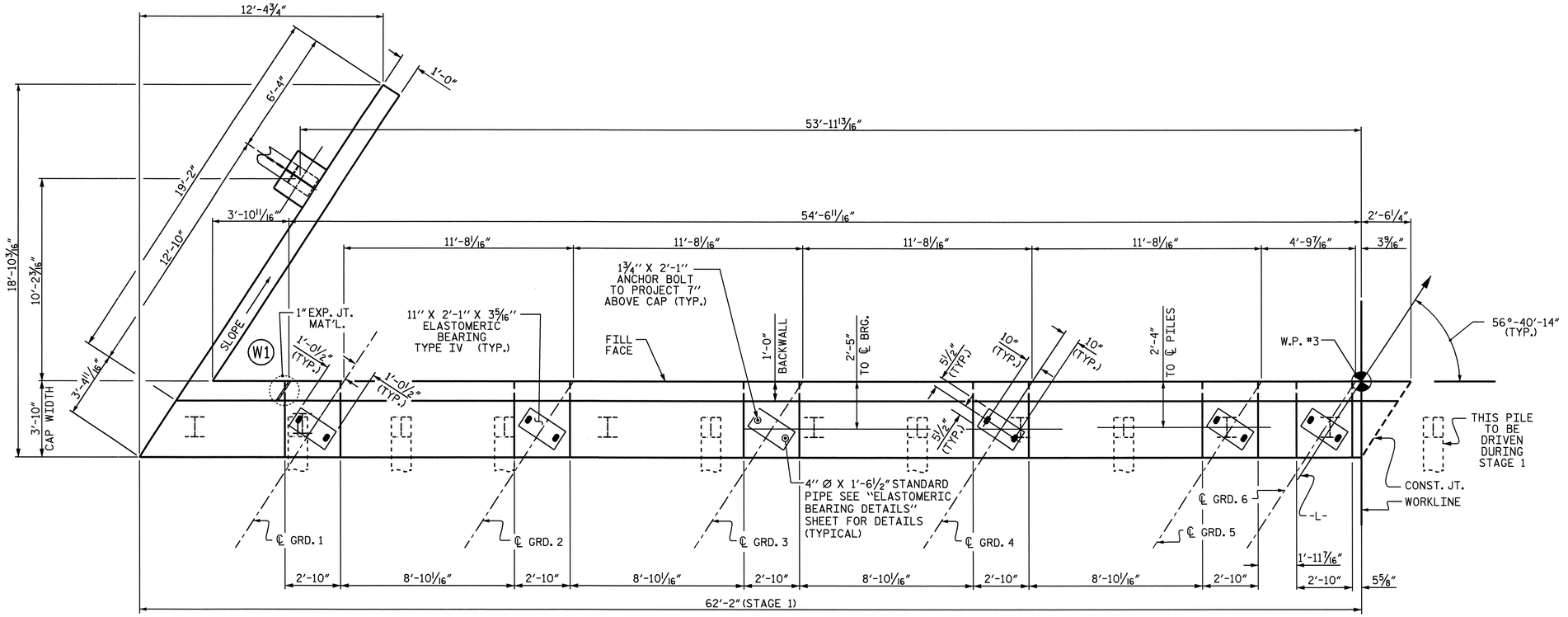
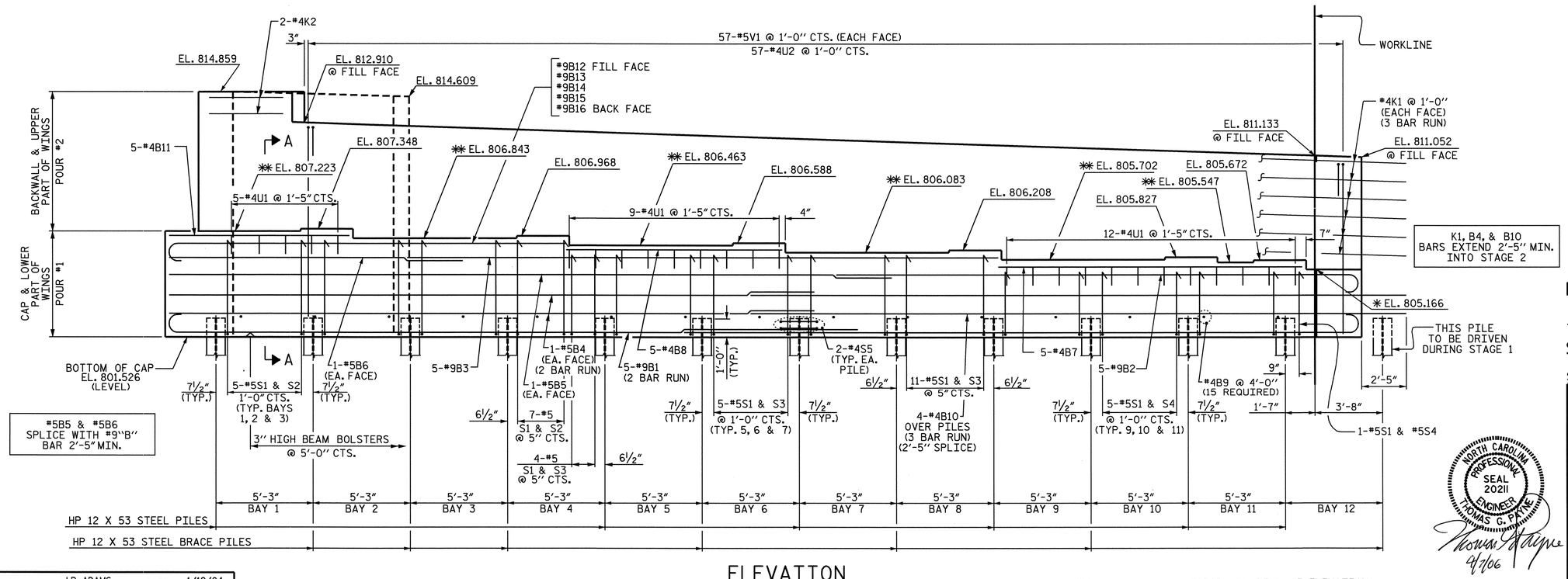


PLAN



ELEVATION

BRACE PILES ON WINGS NOT SHOWN FOR CLARITY

✱✱ SEE SHEET 4 OF 5 FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS.

NOTES

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

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

PIPE DRAINS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR REINFORCING STEEL AND 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 THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

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

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

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

(STAGE 1)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

4/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 1/12/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04

06-APR-2006 09:54
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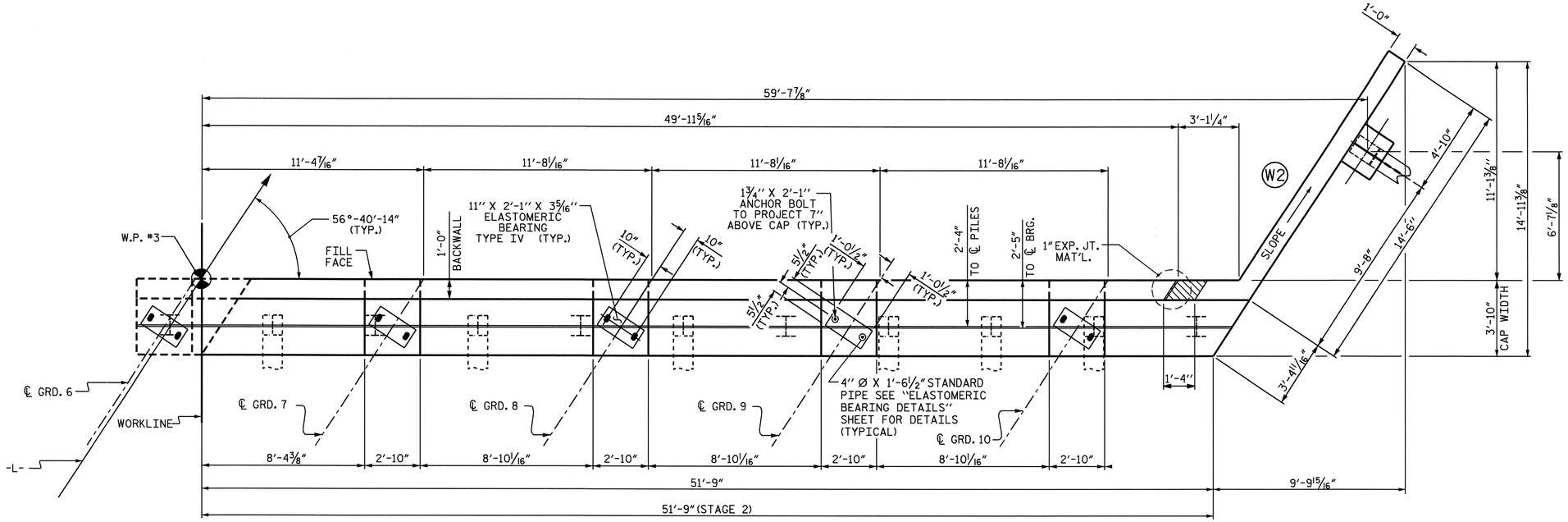
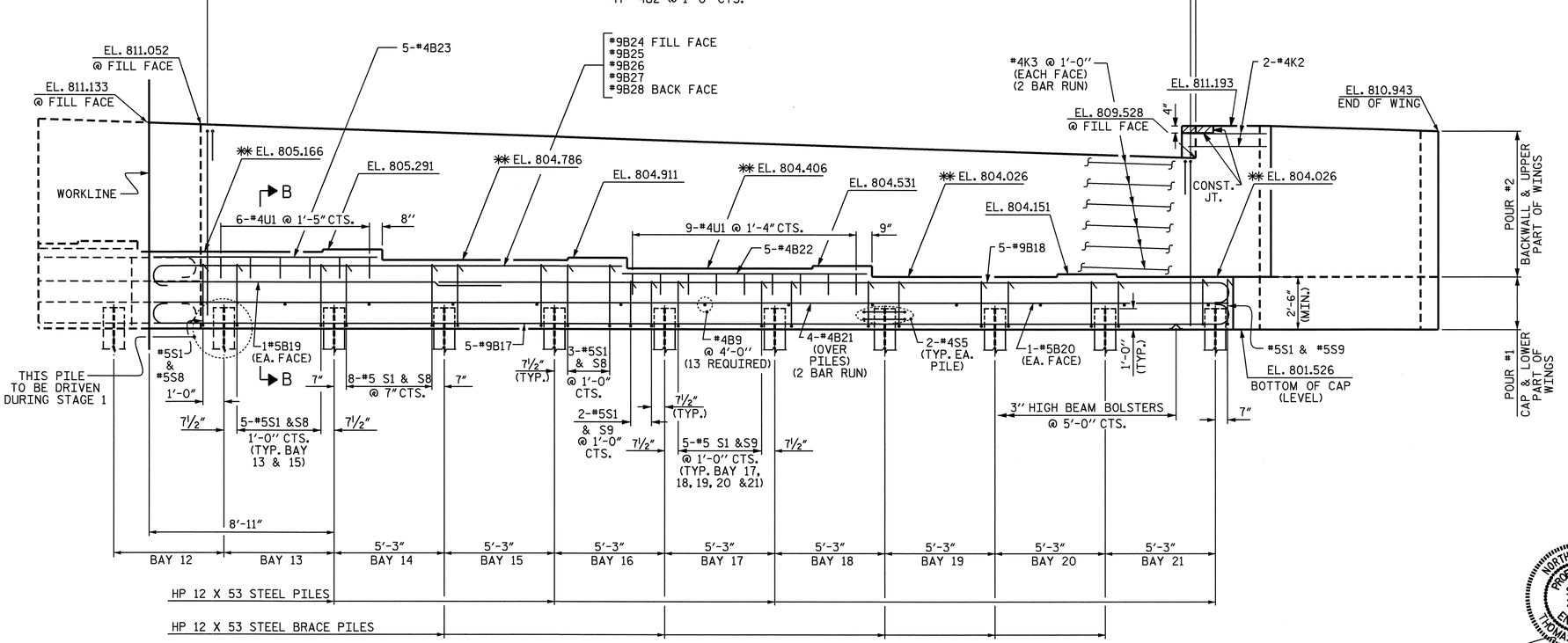


PLAN



ELEVATION

BRACE PILES ON WINGS NOT SHOWN FOR CLARITY

✻✻ SEE SHEET 4 OF 5 FOR LOCATION OF ELEVATION BETWEEN BRIDGE SEAT BUILD-UPS.

NOTES

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

FOR EPOXY PROTECTIVE COATING, SEE SPECIAL PROVISIONS.

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 THAT THE MEMBRANE CURING COMPOUND METHOD SHALL NOT BE USED.

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

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

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

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

DRAWN BY : J.P. ADAMS DATE : 1/12/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04

06-APR-2006 09:54
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jpadams

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

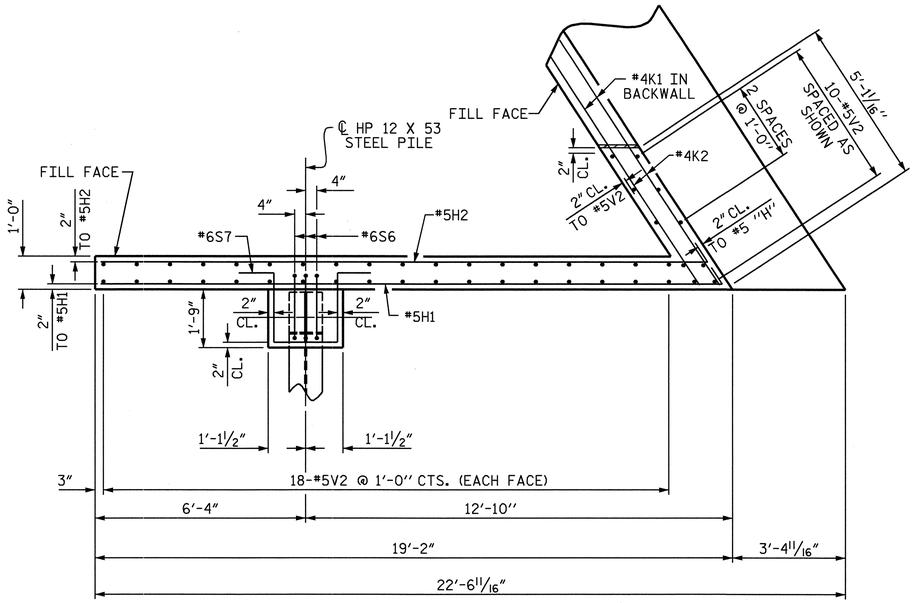
SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT #2
(STAGE 2)

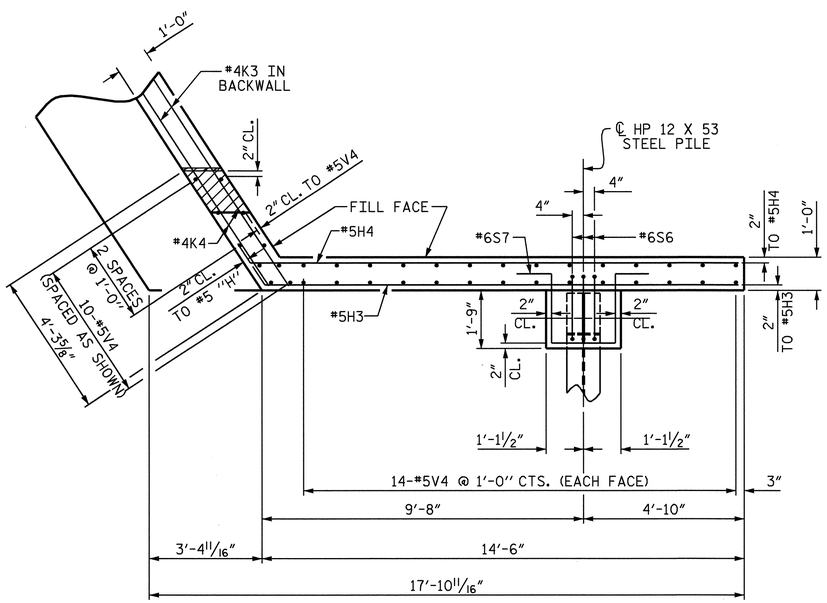
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-42
1			3			TOTAL SHEETS
2			4			51

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
4/7/06



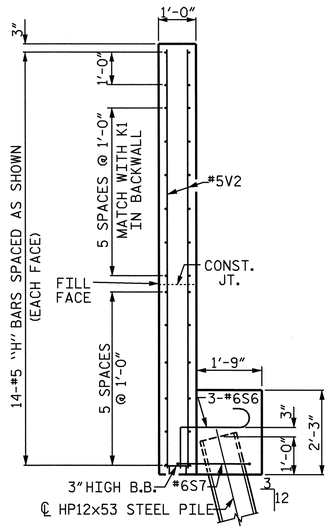
PLAN OF WING - (W1)

(STAGE 1)

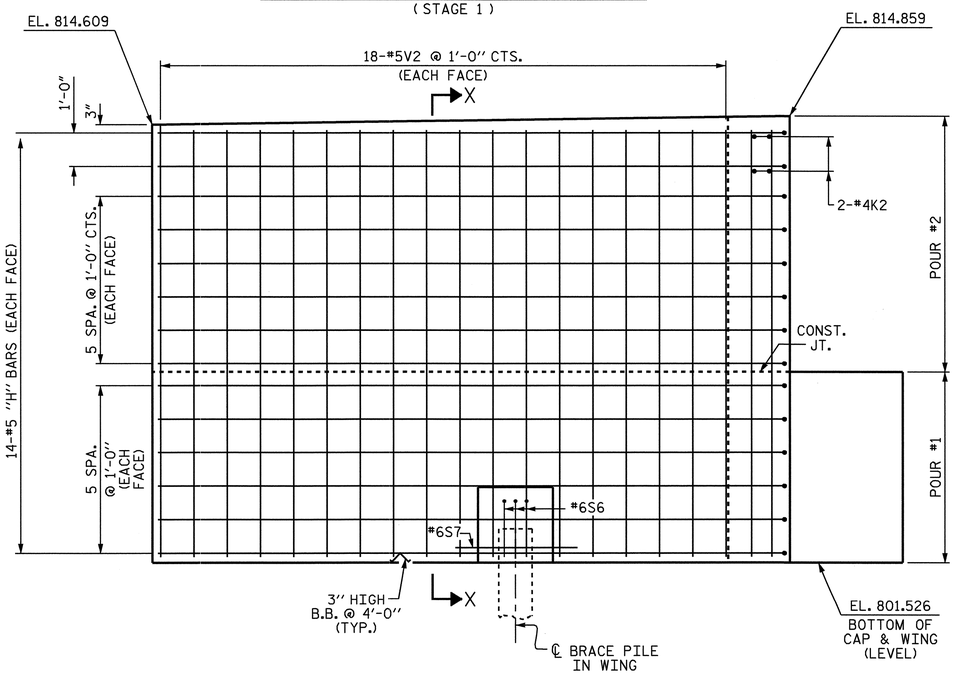


PLAN OF WING - (W2)

(STAGE 2)

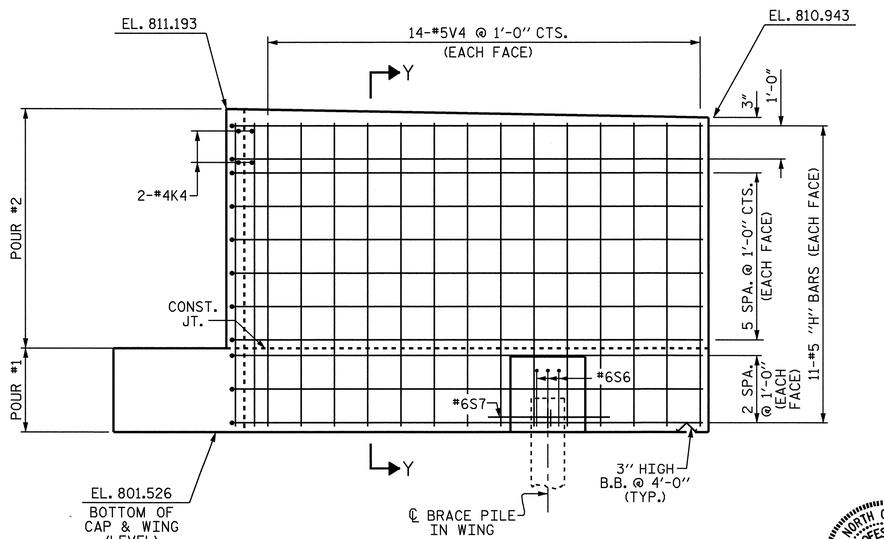


SECTION X-X



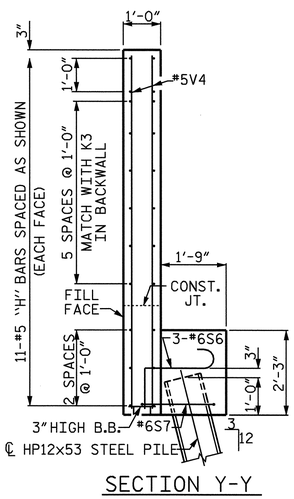
ELEVATION OF WING - (W1)

(STAGE 1)



ELEVATION OF WING - (W2)

(STAGE 2)



SECTION Y-Y

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 3 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

(STAGE 1 AND 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
2/1/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 1/30/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04

20-SEP-2005 14:43
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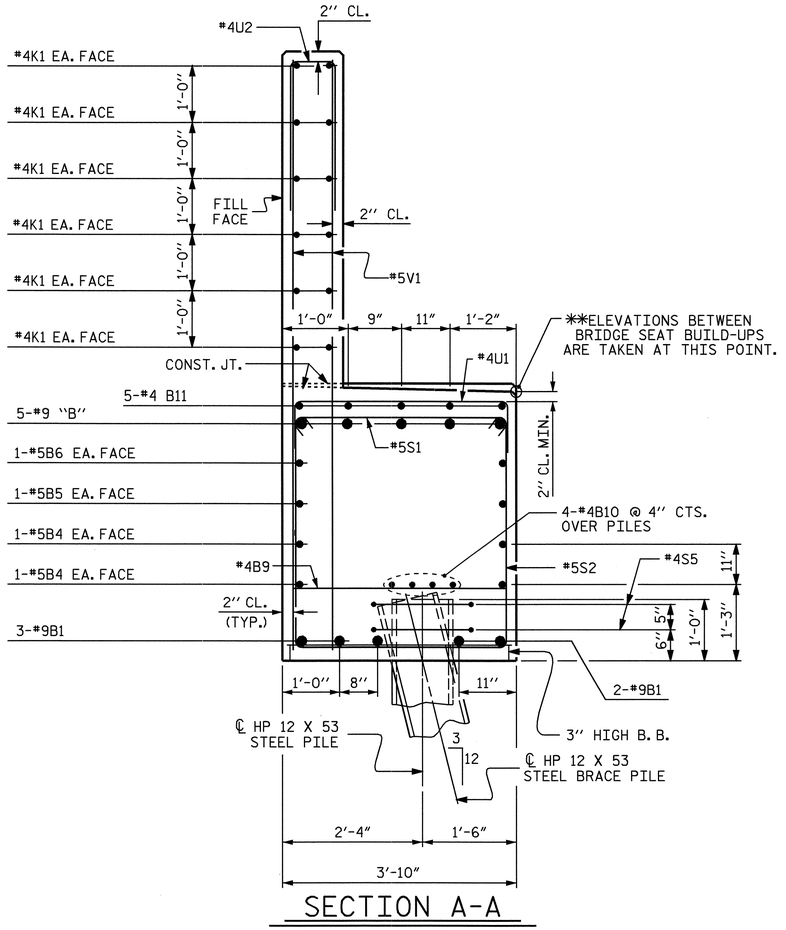
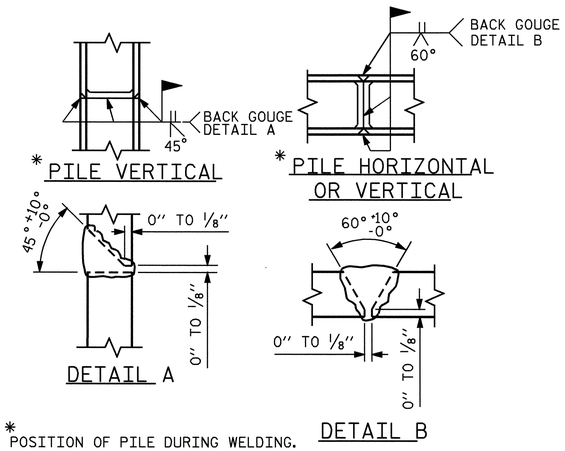
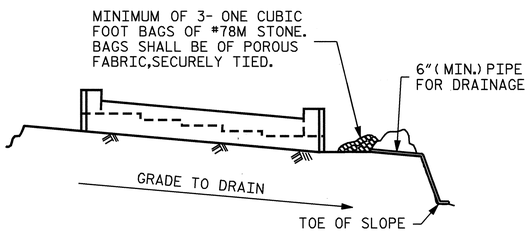


SECTION A-A



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS



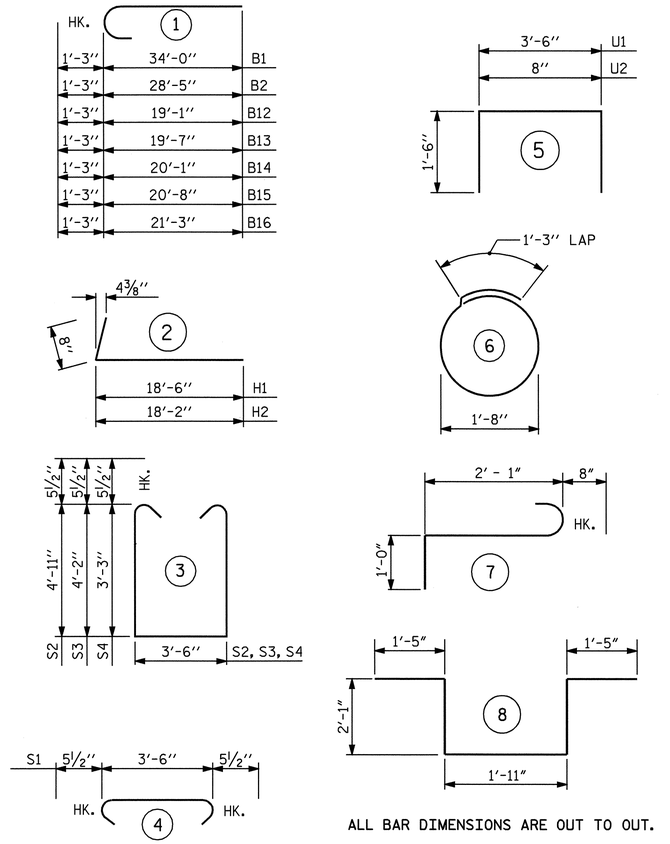
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

STAGE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	9	1	35'-3"	1199
B2	5	9	1	29'-8"	504
B3	5	9	STR.	31'-9"	540
B4	8	5	STR.	33'-5"	279
B5	2	5	STR.	36'-2"	75
B6	2	5	STR.	15'-7"	33
B7	5	4	STR.	16'-5"	55
B8	5	4	STR.	11'-8"	39
B9	15	4	STR.	3'-6"	35
B10	12	4	STR.	23'-2"	186
B11	5	4	STR.	7'-6"	25
B12	1	9	1	20'-4"	69
B13	1	9	1	20'-10"	71
B14	1	9	1	21'-4"	73
B15	1	9	1	21'-11"	75
B16	1	9	1	22'-6"	77
H1	14	5	2	19'-2"	280
H2	14	5	2	18'-10"	275
K1	36	4	STR.	23'-2"	557
K2	4	4	STR.	4'-8"	12
S1	68	5	4	4'-5"	313
S2	22	5	3	14'-3"	327
S3	30	5	3	12'-9"	399
S4	16	5	3	10'-11"	182
S5	24	4	6	6'-6"	104
S6	3	6	7	3'-9"	17
S7	1	6	8	8'-11'	13
U1	26	4	5	6'-6"	113
U2	57	4	5	3'-8"	140
V1	114	5	STR.	9'-2"	1090
V2	46	5	STR.	12'-9"	612
REINFORCING STEEL					7769

CLASS A CONCRETE BREAKDOWN

POUR #1	
CAP & LOWER WINGS	47.3 Yds.3
POUR #2	
BACKWALL & UPPER WINGS	18.3 Yds.3
TOTAL CLASS A CONCRETE	65.6 Yds.3

HP 12 X 53 STEEL PILES	
NO. 14	980 Lin. Ft.

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

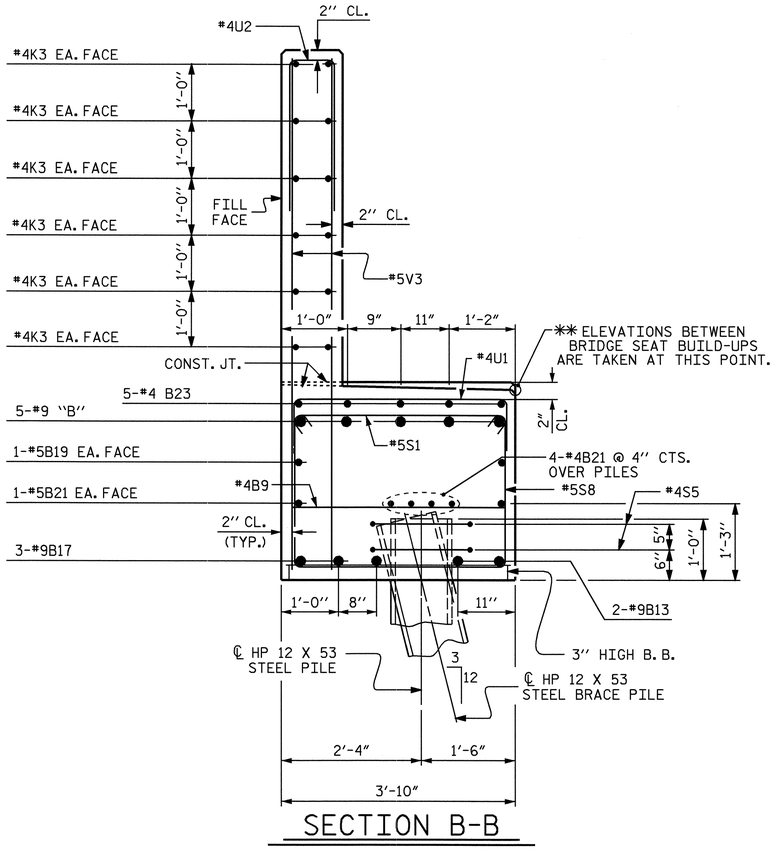
END BENT #2

(STAGE 1)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
4/7/06

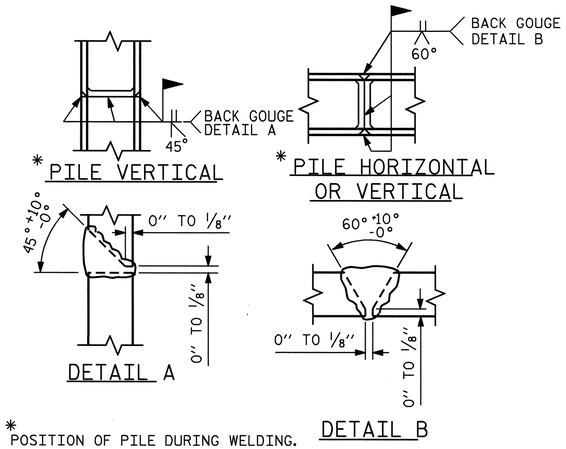
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 1/21/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04



** ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS ARE TAKEN AT THIS POINT.

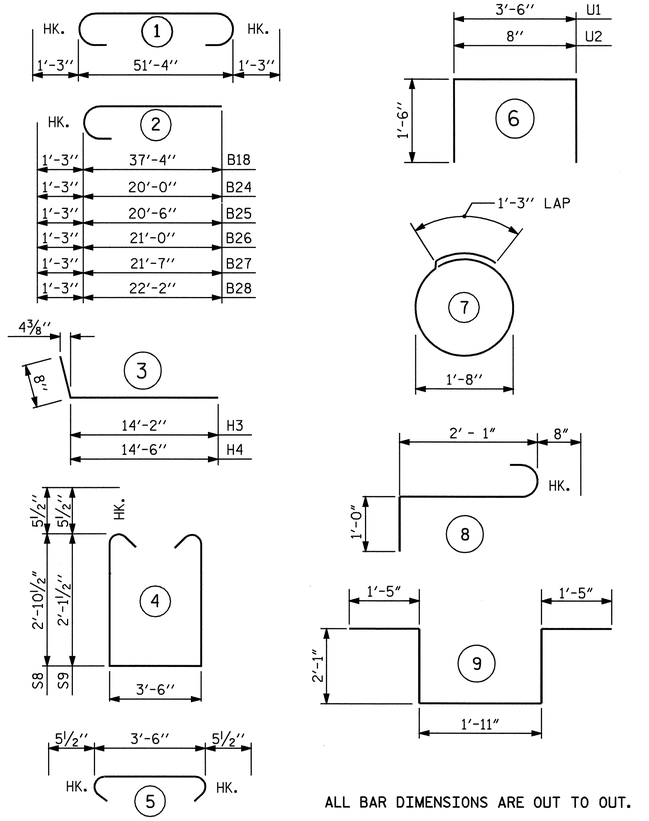
SECTION B-B



* POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

STAGE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B9	13	4	STR.	3'-6'	30
B17	5	9	1	53'-10"	915
B18	5	9	2	38'-7"	656
B19	2	5	STR.	16'-10"	35
B20	2	5	STR.	51'-5"	107
B21	8	4	STR.	26'-11"	144
B22	5	4	STR.	11'-8"	39
B23	5	4	STR.	8'-5"	28
B24	1	9	2	21'-3"	72
B25	1	9	2	21'-9"	74
B26	1	9	2	22'-3"	76
B27	1	9	2	22'-10"	78
B28	1	9	2	23'-5"	80
H3	11	5	3	14'-10"	170
H4	11	5	3	15'-2"	174
K3	24	4	STR.	27'-1"	434
K4	4	4	STR.	3'-10"	10
S1	50	5	5	4'-5"	230
S5	20	4	7	6'-6'	87
S6	3	6	8	3'-9"	17
S7	1	6	9	8'-11"	13
S8	22	5	4	10'-2"	233
S9	28	5	4	8'-8"	253
U1	15	4	6	6'-6"	65
U2	47	4	6	3'-8"	115
V3	94	5	STR.	7'-8"	752
V4	38	5	STR.	9'-1"	360
REINFORCING STEEL					5247

CLASS A CONCRETE BREAKDOWN

POUR #1

CAP & LOWER WINGS 23.8 Yds.3

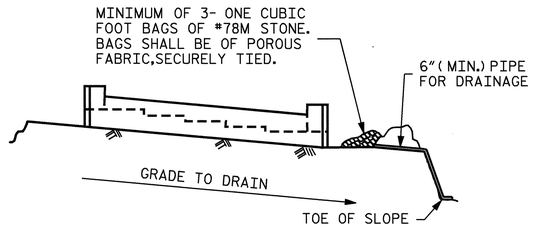
POUR #2

BACKWALL & UPPER WINGS 15.5 Yds.3

TOTAL CLASS A CONCRETE 39.3 Yds.3

HP 12 X 53 STEEL PILES

NO. 10 700 Lin. Ft.



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

		STAGE 1	STAGE 2	TOTAL
REINFORCING STEEL (LBS.)		7769	5247	13016
TOTAL CLASS A CONCRETE (C.Y.)		65.6	39.3	104.9
HP 12 X 53 STEEL PILES	NO.	14	10	24
	LIN. FT.	980	700	1680

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

(STAGE 2)

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
4/7/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			51

DRAWN BY : J.P. ADAMS DATE : 1/21/04
CHECKED BY : H.A. LOCKLEAR DATE : 5/04

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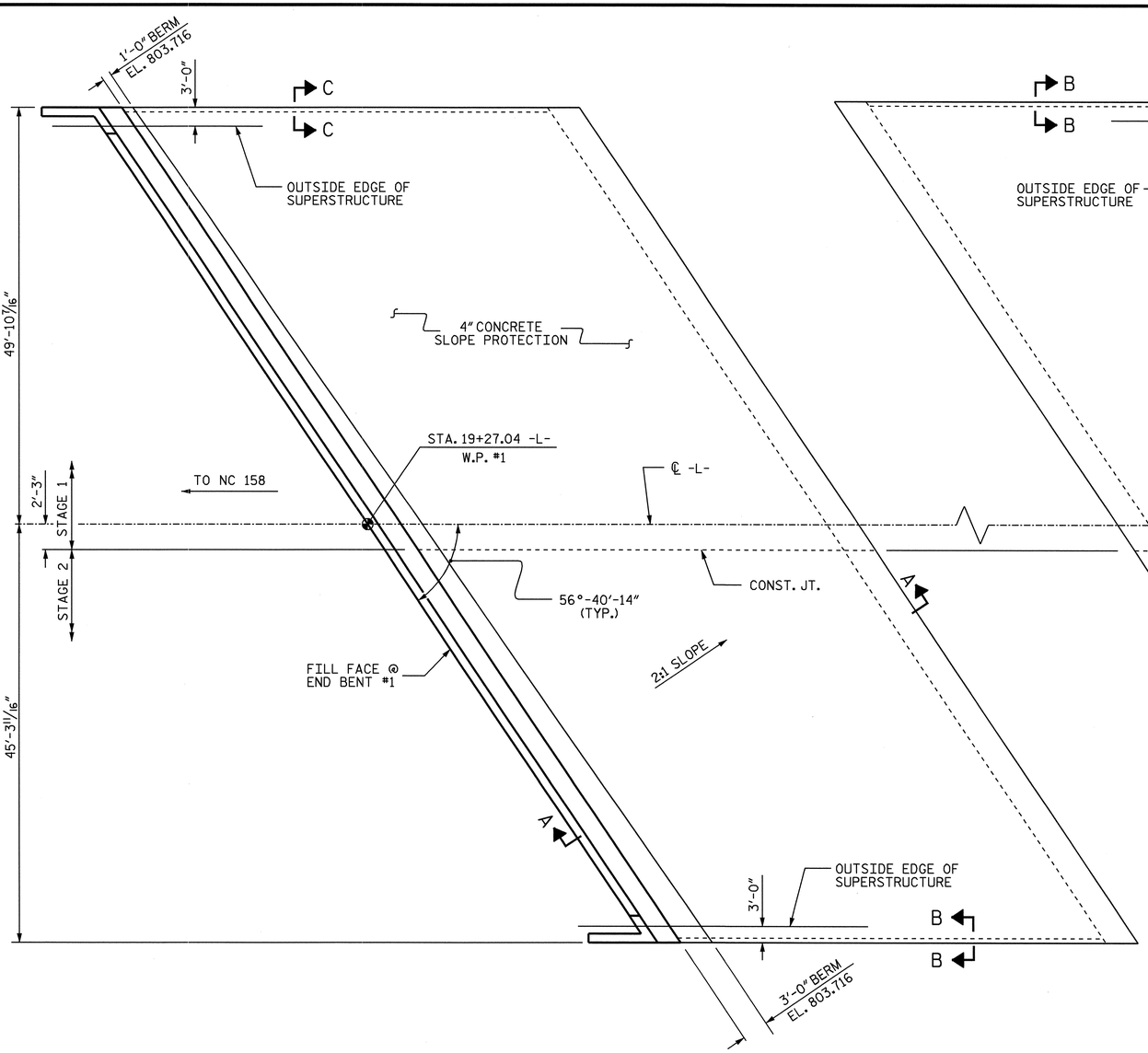
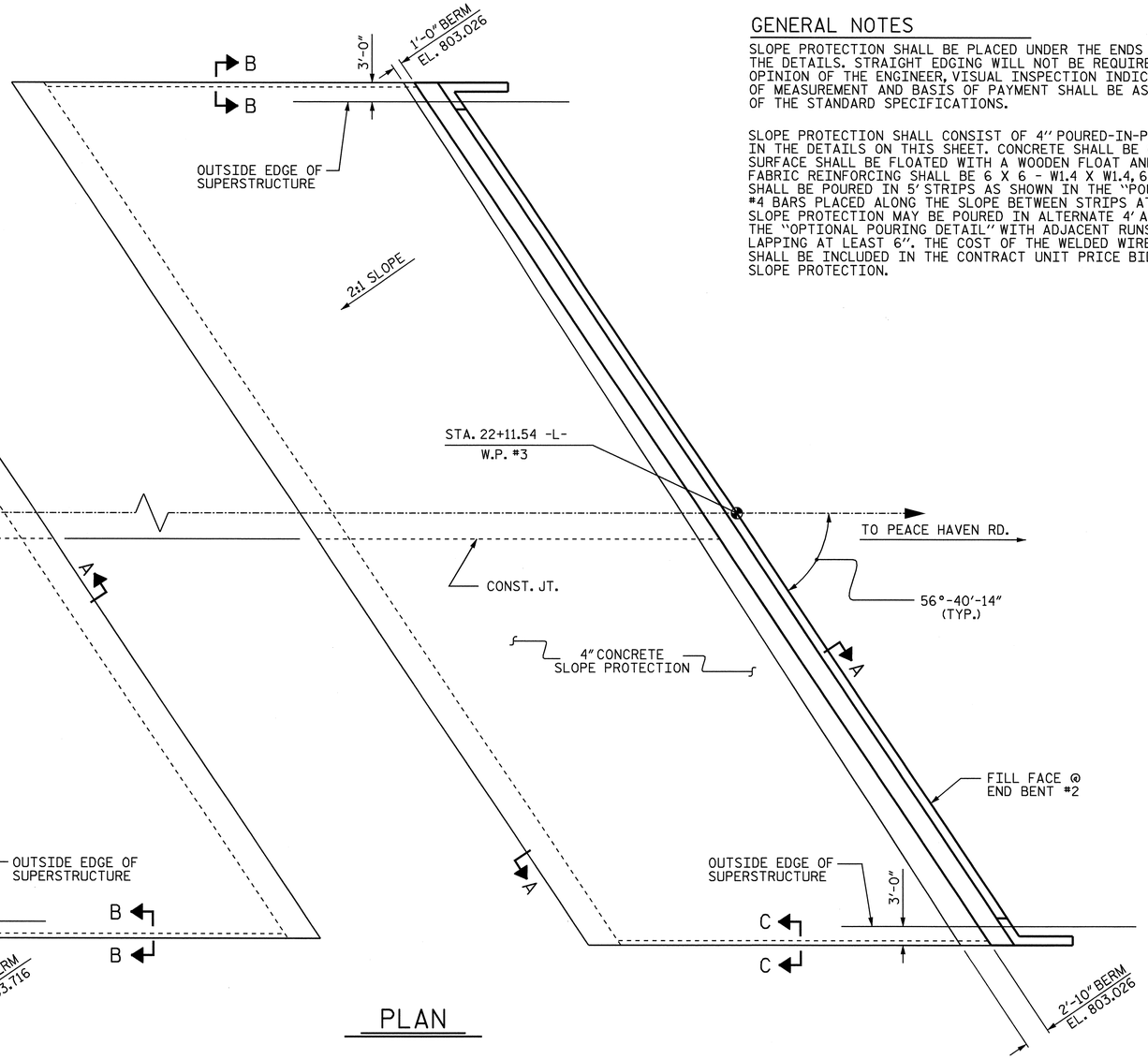
klayne



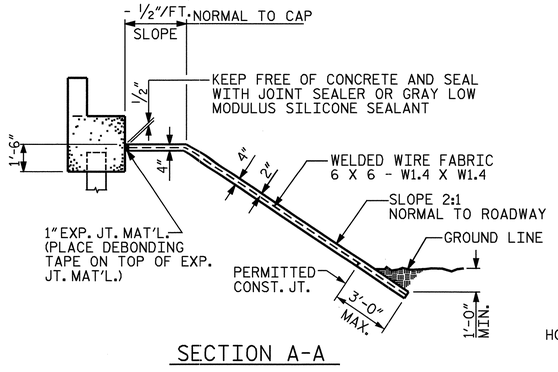


PLAN

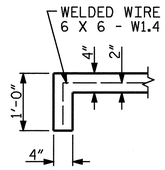
GENERAL NOTES

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. METHOD OF MEASUREMENT AND BASIS OF PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

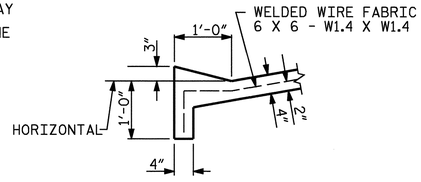
SLOPE PROTECTION SHALL CONSIST OF 4'' POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS ''B''. THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60'' WIDE. SLOPE PROTECTION 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.



SECTION A-A



SECTION B-B



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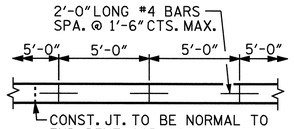
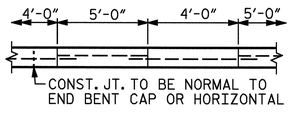


STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



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

OPTIONAL POURING DETAIL

BRIDGE @ STA. 20+71.54 -L-	4 INCH SLOPE PROTECTION			✳WELDED WIRE FABRIC 60 INCHES WIDE		
	SQUARE YARDS			APPROX. L.F.		
	STAGE 1	STAGE 2	TOTAL	STAGE 1	STAGE 2	TOTAL
END BENT #1	306	252	558	612	504	1116
END BENT #2	273	229	502	546	458	1004
TOTAL			1060			2120

✳QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

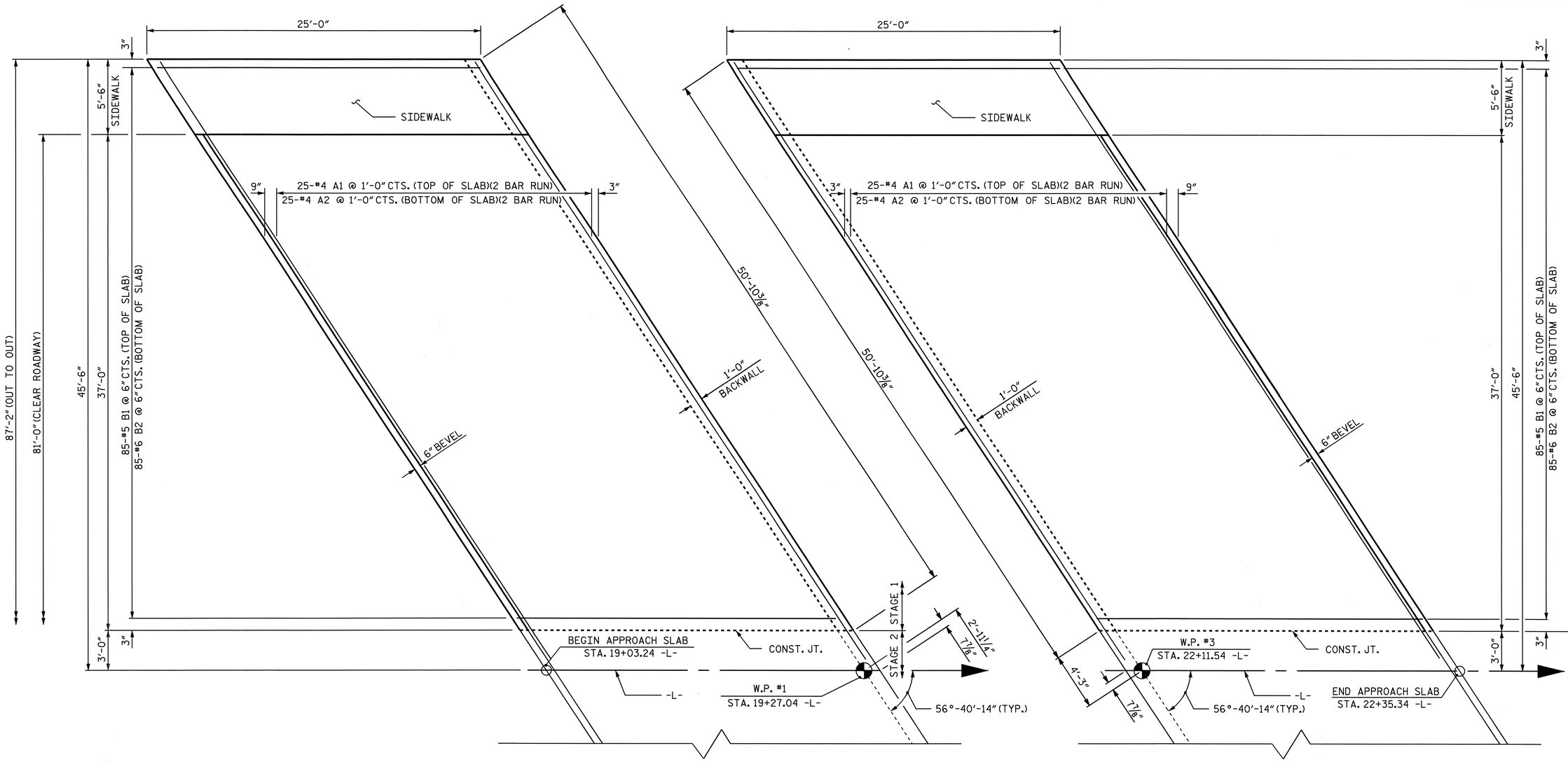
SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
Thomas G. Payne 9/10/04

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

SHEET NO. S-46
TOTAL SHEETS 51

DRAWN BY : L.L. MURPHY/A.C. DATE : 7/03
CHECKED BY : SH SOCKWELL DATE : 6/04



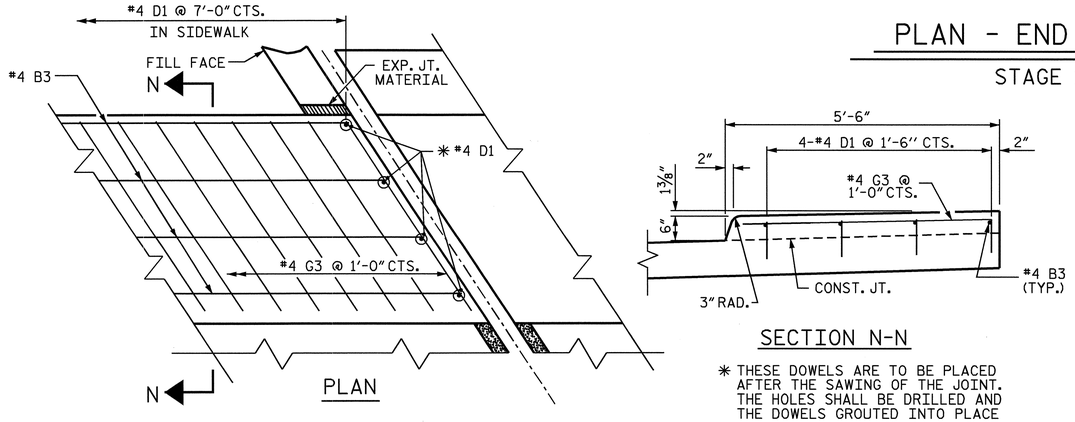
PLAN - END BENT 1

STAGE 1

PLAN - END BENT 2

STAGE 1

EXTEND #4A1 BARS 2'-2" BEYOND CONST. JT. FOR 2'-0" SPLICE. EXTEND #4A2 BARS 1'-11" FOR 1'-9" SPLICE.



SECTION N-N

* THESE DOWELS ARE TO BE PLACED AFTER THE SAWING OF THE JOINT. THE HOLES SHALL BE DRILLED AND THE DOWELS GROUTED INTO PLACE

DETAILS OF SIDEWALK ON APPROACH SLAB

BEGIN APPROACH SLAB SHOWN, END APPROACH SLAB SIMILAR

DRAWN BY : A. CHAN DATE : 9/7/05
CHECKED BY : A.K. PATEL/JPA DATE : 9/7/05

20-SEP-2005 14:45
R:\STRUCTS\I2102\final\I2102_SD_AS_01.dgn
jpadams

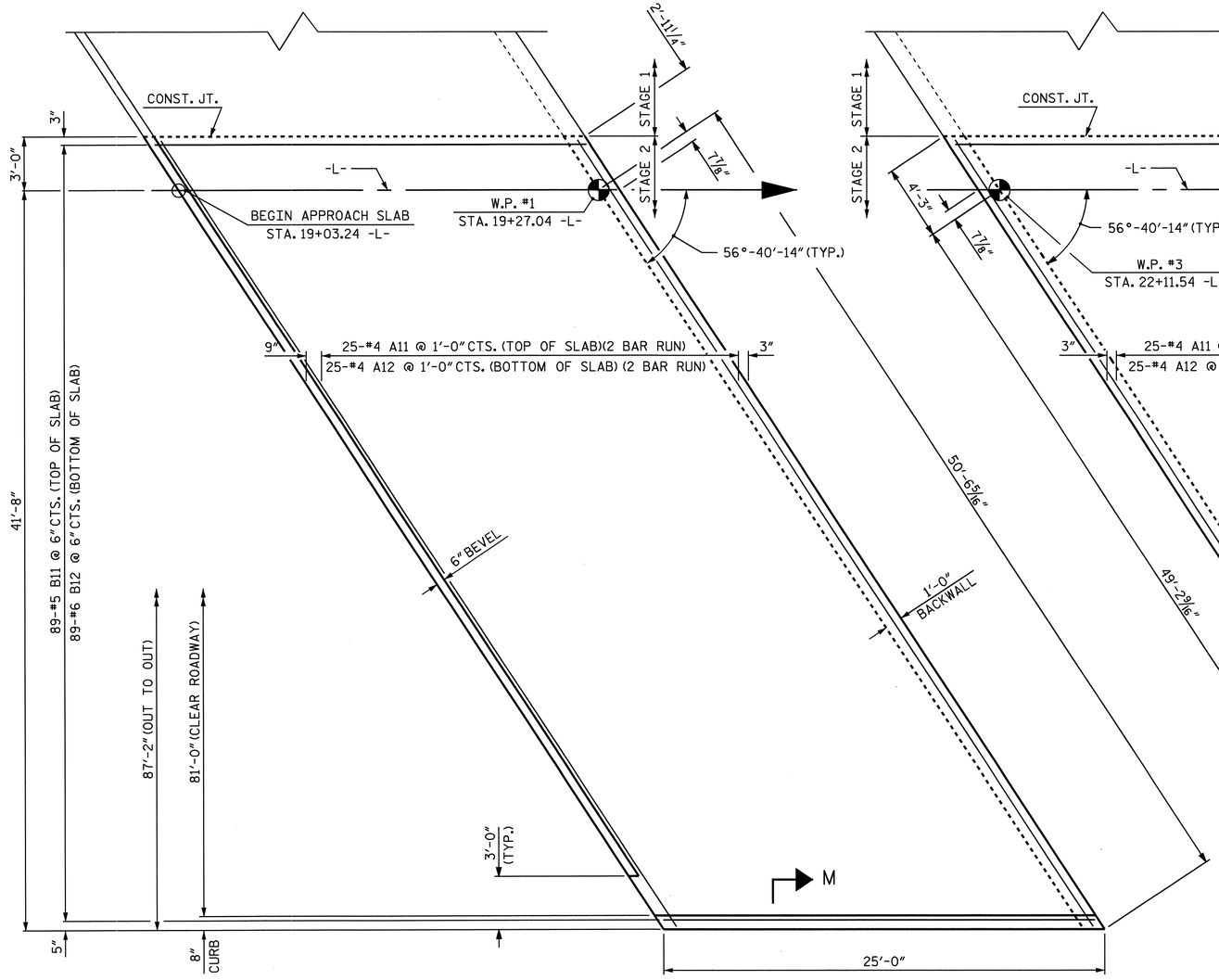
NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE
2/1/06

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 1 OF 5

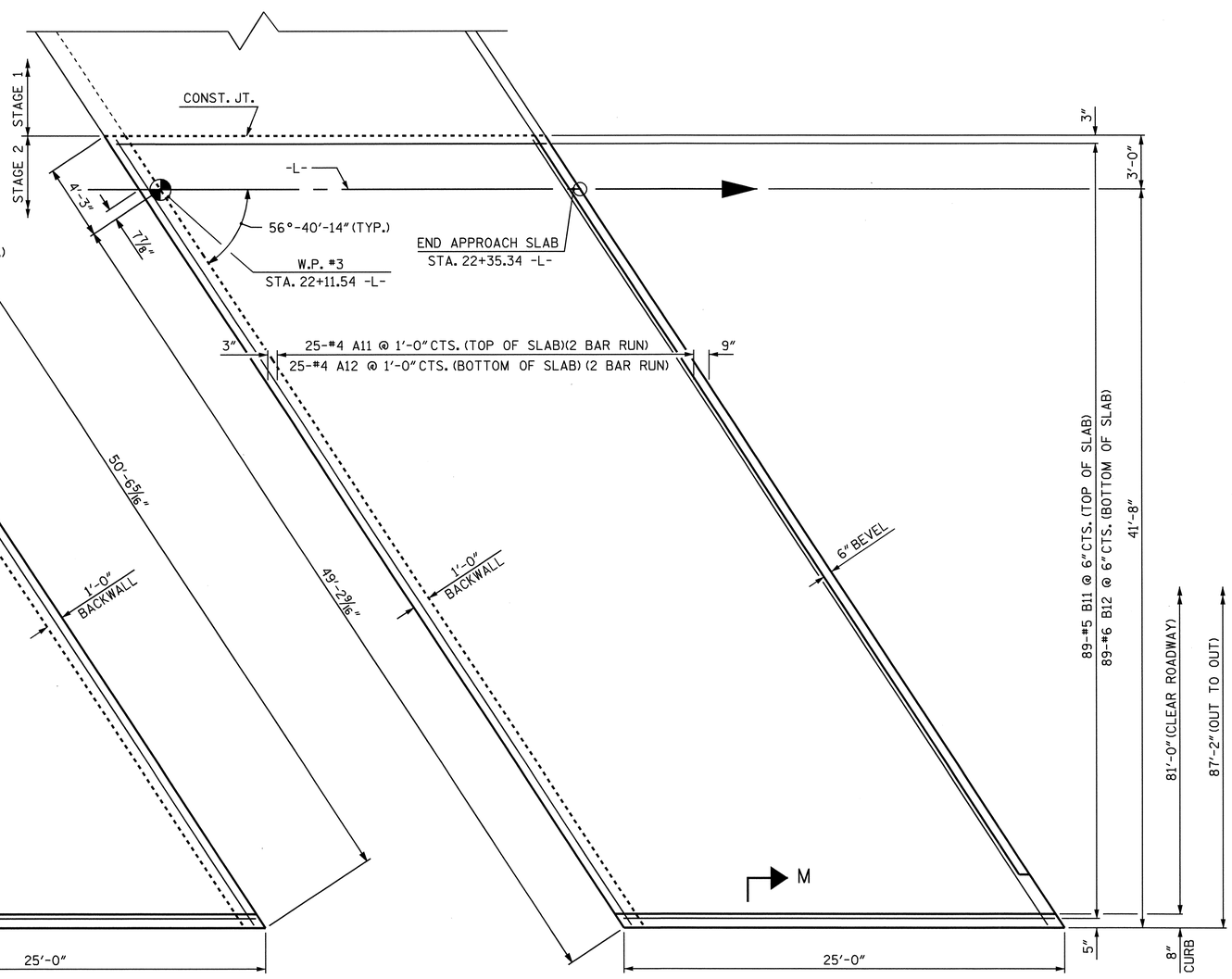
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT
STAGE 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			51



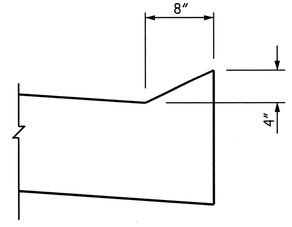
PLAN - END BENT 1

STAGE 2



PLAN - END BENT 2

STAGE 2



SECTION M-M

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

STAGE 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			51

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

2/1/06

DRAWN BY : A. CHAN DATE : 9/7/05

CHECKED BY : A.K. PATEL/JPA DATE : 9/7/05

20-SEP-2005 15:35
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jpadams

NOTES

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

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

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

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 EXTEND 10′-0″ BEYOND THE END OF THE APPROACH SLAB AND 1′-0″ OUTSIDE OF EACH EDGE OF 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 EXTEND 1′-0″ BEYOND THE 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 EXTEND 1′-0″ BEYOND THE 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 SIDEWALK.

PAYMENT FOR APPROACH SLAB GROOVING IS INCLUDED IN THE "GROOVING BRIDGE FLOORS PAY ITEM".

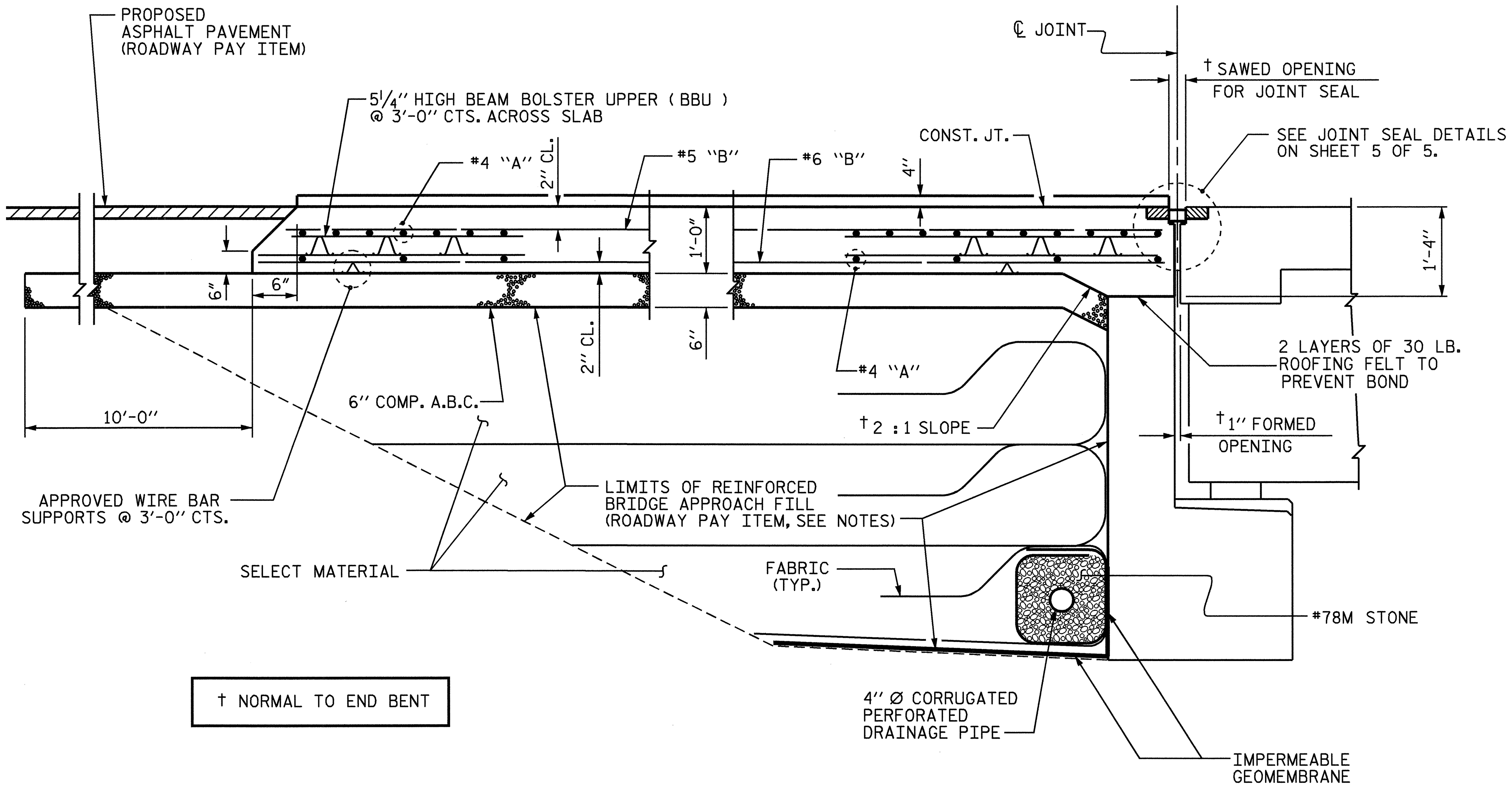
WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

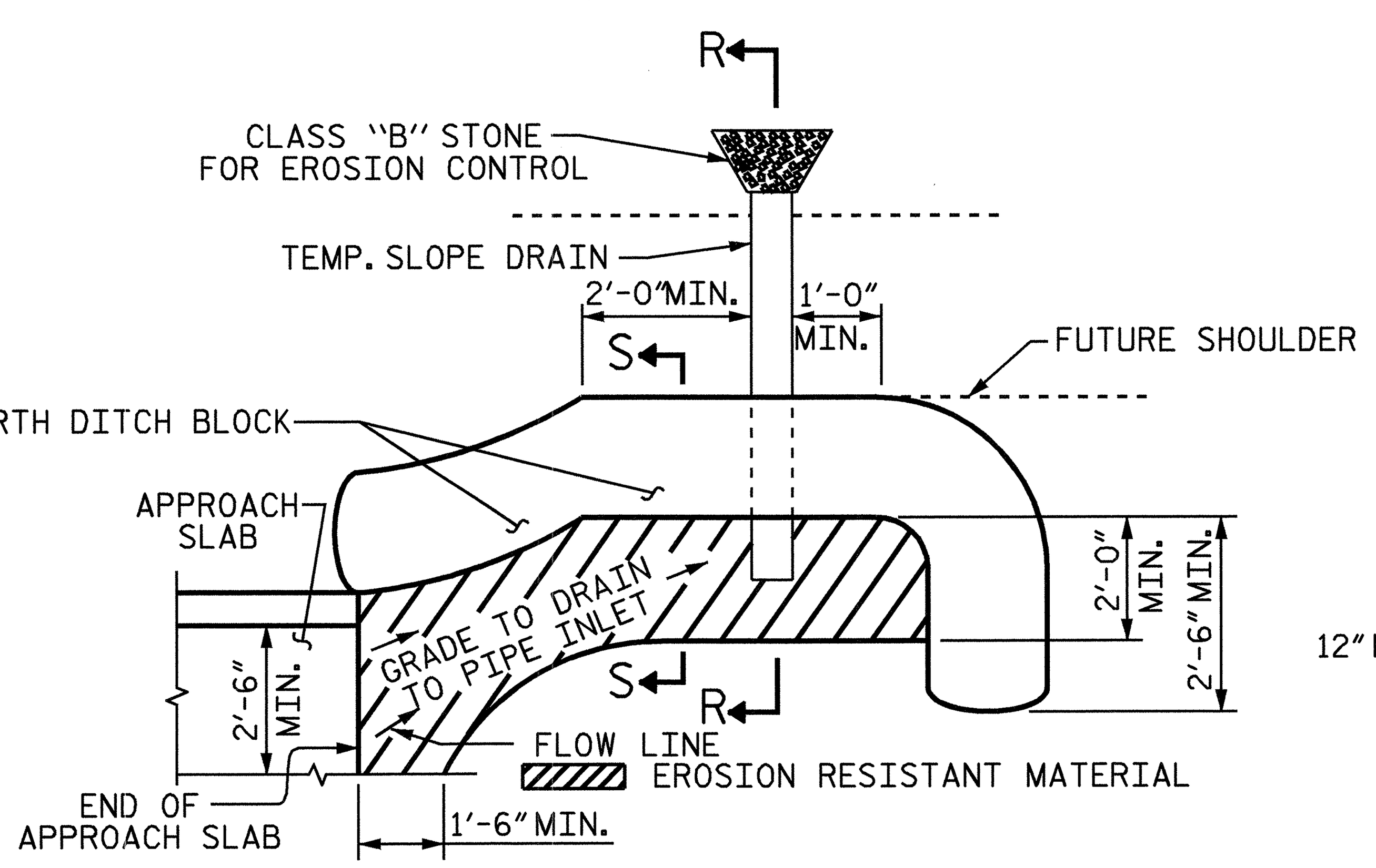
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

PAYMENT FOR ELASTOMERIC CONCRETE SHALL BE INCLUDED IN THE LUMP SUM PAY ITEM FOR EVAZOTE JOINT SEALS.



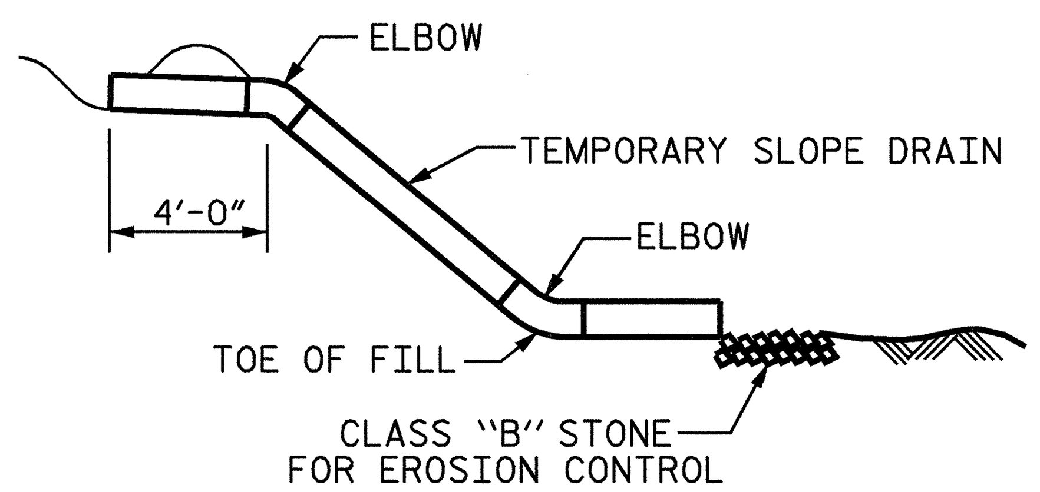
† NORMAL TO END BENT

SECTION THRU SLAB

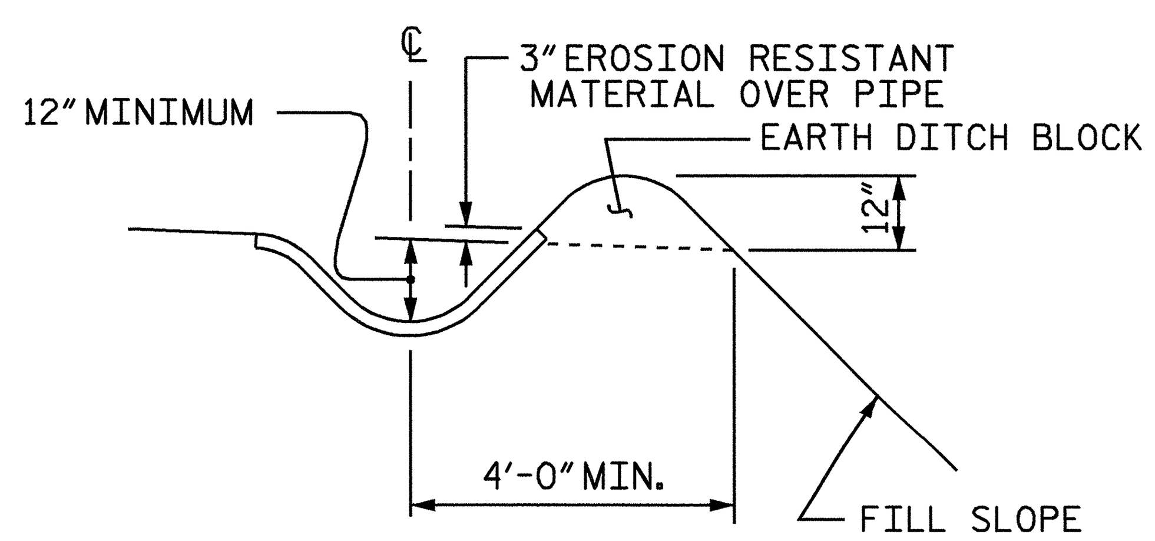


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW

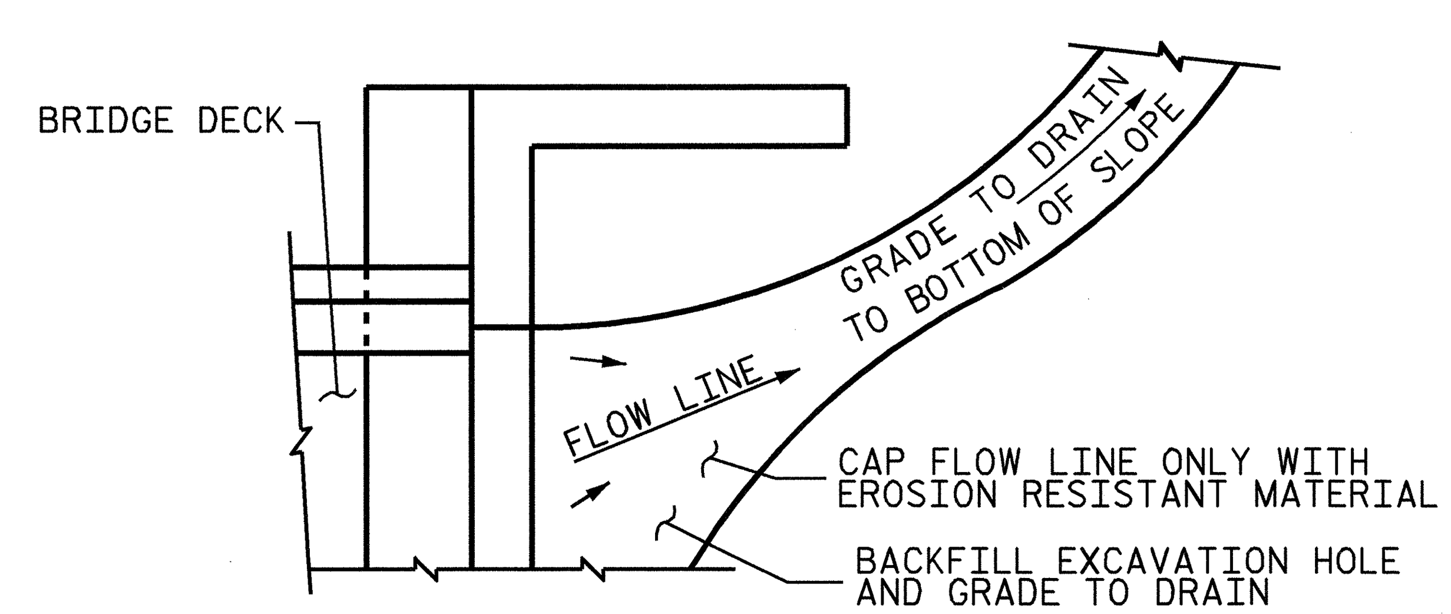


SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 3 OF 5

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

Thomas G. Payne
2/1/06

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			51

STD. NO. BAS5

ASSEMBLED BY : A. CHAN	DATE : 9/7/05
CHECKED BY : A. K. PATEL/JPA	DATE : 9/7/05
DRAWN BY : LES 8/01 CHECKED BY : RDR 8/01	REV. 5/7/03 RWW/JTE

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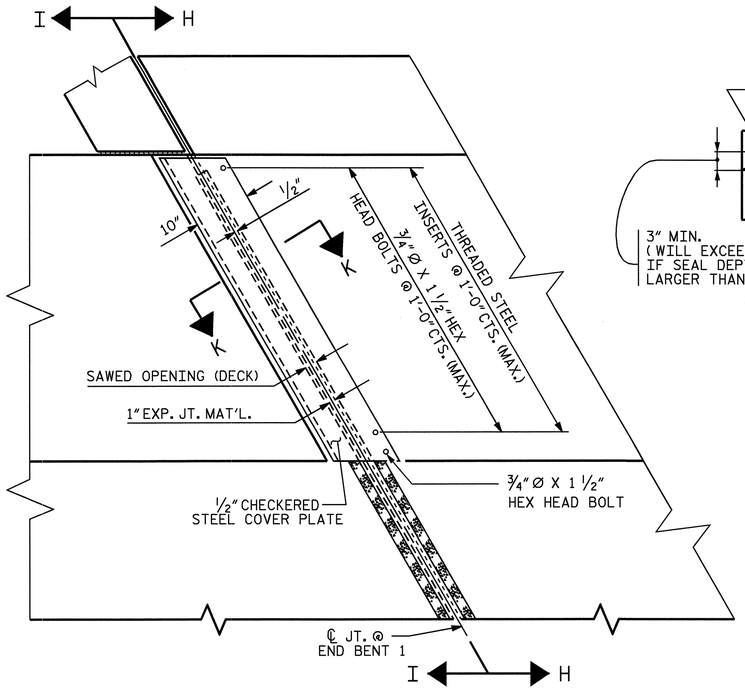
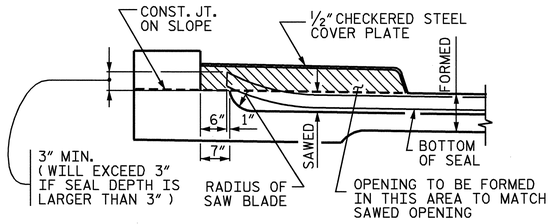
jpadams

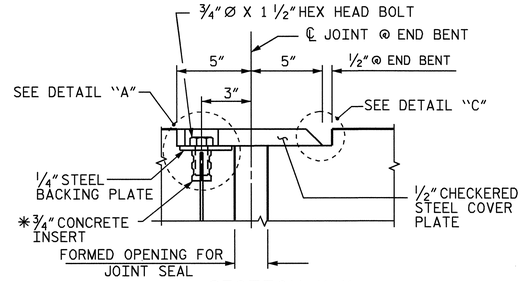


PLAN VIEW OF EVAZOTE JOINT SEAL @ END BENT FOR SIDEWALK

BEGIN APPROACH SLAB SHOWN, END APPROACH SLAB SIMILAR

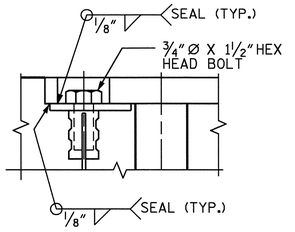


SECTION H-H

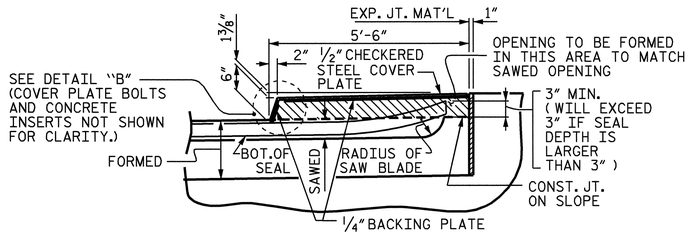


SECTION K-K

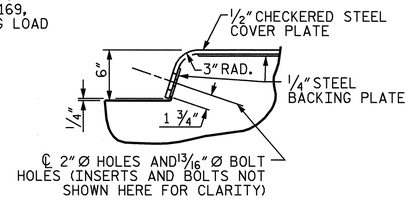
*THE 3/4" CONCRETE INSERTS SHALL BE CLOSED-END FERRULES WITH LOOPED WIRE STRUTS ATTACHED TO THEM. THE INSERTS SHALL CONFORM TO AASHTO M169, GRADE 12L14 AND SHALL HAVE A TENSILE WORKING LOAD CAPACITY OF 3000 LBS.



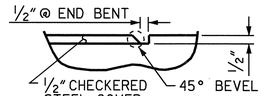
DETAIL "A"



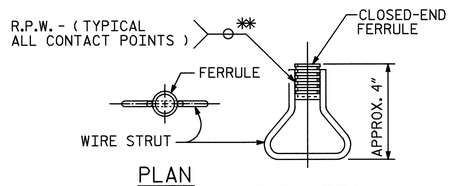
SECTION I-I



DETAIL "B"



DETAIL "C"



PLAN

ELEVATION

CONCRETE INSERT

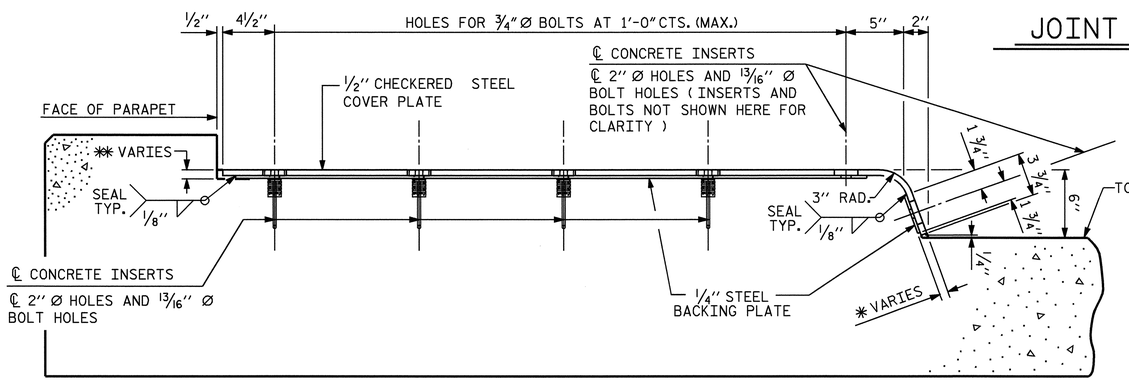
** EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

NOTES

THE STEEL PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 OR APPROVED EQUAL. AFTER FABRICATION, THE PLATES SHALL BE COMMERICALLY BLAST CLEANED AND COATED WITH A MINIMUM THICKNESS OF 4 MILS (DRY) OF ZINC-RICH PAINT IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. AT THE CONTRACTOR'S OPTION, THESE SURFACES MAY BE METALLIZED TO A MINIMUM THICKNESS OF 6 MILS. SEE SPECIAL PROVISIONS FOR THERMAL SPRAYED COATINGS (METALLIZATION).

THE 3/4" Ø HEX HEAD BOLTS SHALL CONFORM TO ASTM F593 ALLOY 304 STAINLESS STEEL.

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



END VIEW

(NORMAL TO SIDEWALK)

** CONCRETE RECESS DIMENSIONS:
13/16" FOR THE SIDE OF THE JOINT HAVING THE 1/2" COVER PLATE WITH A 1/4" BACKING PLATE.
9/16" FOR THE SIDE OF THE JOINT HAVING ONLY THE 1/2" COVER PLATE.

COVER PLATE DETAILS

JOINT SEAL DETAILS @ END BENT

(FOR SIDEWALK)

PROJECT NO. I-2102

FORSYTH COUNTY

STATION: 20+71.54 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE

2/1/06

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			51

ASSEMBLED BY :	A. CHAN	DATE :	7/5/05
CHECKED BY :	A.K. PATEL	DATE :	7/6/05
DRAWN BY : FCJ	11/88	REV. 8/16/99	MAB/LES
CHECKED BY : ARB	11/88	REV. 10/17/00	RWW/LES
		REV. 5/7/03	RWW/JTE

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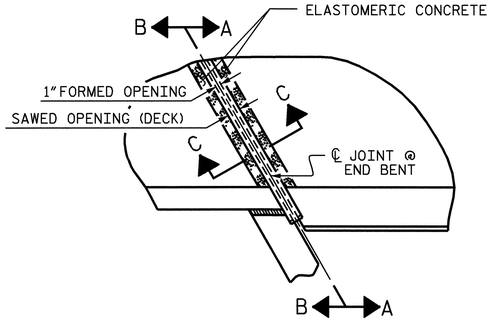
jpaddams

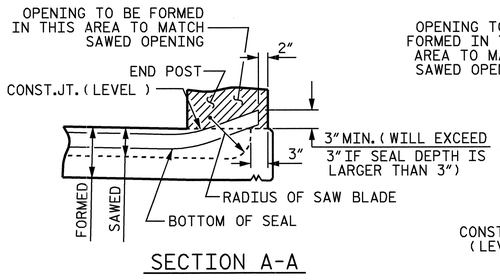
STD. NO. BAS10



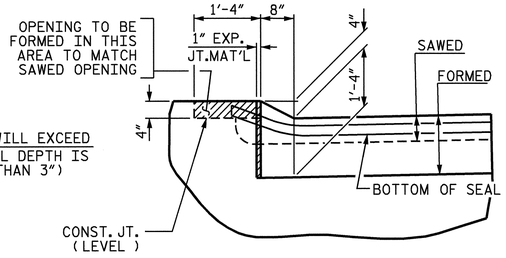
PLAN

ELASTOMERIC CONCRETE			
END BENT NO.	STAGE 1 (CU. FT.)	STAGE 2 (CU. FT.)	TOTAL ELASTOMERIC CONCRETE * (CU. FT.)
1	7.3	8.6	15.9
2	7.3	8.6	15.9
TOTAL	14.6	17.2	31.8

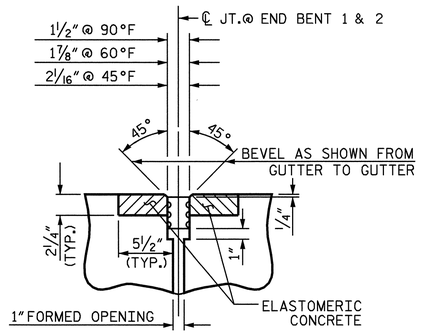
* BASED ON THE MINIMUM BLOCKOUT SHOWN.



SECTION A-A



SECTION B-B



SECTION C-C
EVAZOTE JOINT SEAL

JOINT SEAL DETAILS @ END BENT

(FOR 2 BAR METAL RAIL WITH CURB)

BILL OF MATERIAL

STAGE 1

APP. SLAB @ END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	27'-5"	916
A2	50	#4	STR	27'-2"	907
* B1	85	#5	STR	24'-3"	2150
B2	85	#6	STR	24'-7"	3139
* B3	4	#4	STR	24'-7"	66
* D1	16	#4	STR	1'-0"	11
* G3	25	#4	STR	5'-10"	97

REINFORCING STEEL = 4046 LBS.
*EPOXY COATED REINF. STEEL= 3240 LBS.

CLASS AA CONCRETE BREAKDOWN
STAGE 1 - END BENT 1
POUR 1 - SLAB 40.0 C.Y.
POUR 2 - SIDEWALK 2.4 C.Y.

CLASS AA CONCRETE 42.4 C.Y.

APP. SLAB @ END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	50	#4	STR	27'-5"	916
A2	50	#4	STR	27'-2"	907
* B1	85	#5	STR	24'-3"	2150
B2	85	#6	STR	24'-7"	3139
* B3	4	#4	STR	24'-7"	66
* D1	16	#4	STR	1'-0"	11
* G3	25	#4	STR	5'-10"	97

REINFORCING STEEL = 4046 LBS.
*EPOXY COATED REINF. STEEL= 3240 LBS.

CLASS AA CONCRETE BREAKDOWN
STAGE 1 - END BENT 2
POUR 1 - SLAB 40.0 C.Y.
POUR 2 - SIDEWALK 2.4 C.Y.

CLASS AA CONCRETE 42.4 C.Y.

STAGE 1 TOTAL

REINFORCING STEEL 8092 LBS.
*EPOXY COATED REINF. STEEL 6480 LBS.

CLASS AA CONCRETE 84.8 C.Y.

STAGE 2

APP. SLAB @ END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A11	50	#4	STR	27'-8"	924
A12	50	#4	STR	27'-6"	919
* B11	89	#5	STR	24'-3"	2251
B12	89	#6	STR	24'-7"	3286

REINFORCING STEEL = 4205 LBS.
*EPOXY COATED REINF. STEEL= 3175 LBS.

CLASS AA CONCRETE BREAKDOWN
STAGE 2 - END BENT 1
POUR 1 - SLAB & CURB 42.1 C.Y.

CLASS AA CONCRETE 42.1 C.Y.

APP. SLAB @ END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A11	50	#4	STR	27'-8"	924
A12	50	#4	STR	27'-6"	919
* B11	89	#5	STR	24'-3"	2251
B12	89	#6	STR	24'-7"	3286

REINFORCING STEEL = 4205 LBS.
*EPOXY COATED REINF. STEEL= 3175 LBS.

CLASS AA CONCRETE BREAKDOWN
STAGE 2 - END BENT 2
POUR 1 - SLAB & CURB 42.1 C.Y.

CLASS AA CONCRETE 42.1 C.Y.

STAGE 2 TOTAL

REINFORCING STEEL 8410 LBS.
*EPOXY COATED REINF. STEEL 6350 LBS.

CLASS AA CONCRETE 84.2 C.Y.

PROJECT NO. I-2102
FORSYTH COUNTY
STATION: 20+71.54 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BILL OF MATERIAL

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 20211 ENGINEER THOMAS G. PAYNE PE
Thomas Payne
2/1/06

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

DRAWN BY : A. CHAN DATE : 9/7/05
CHECKED BY : A.K. PATEL/JPA DATE : 9/7/05

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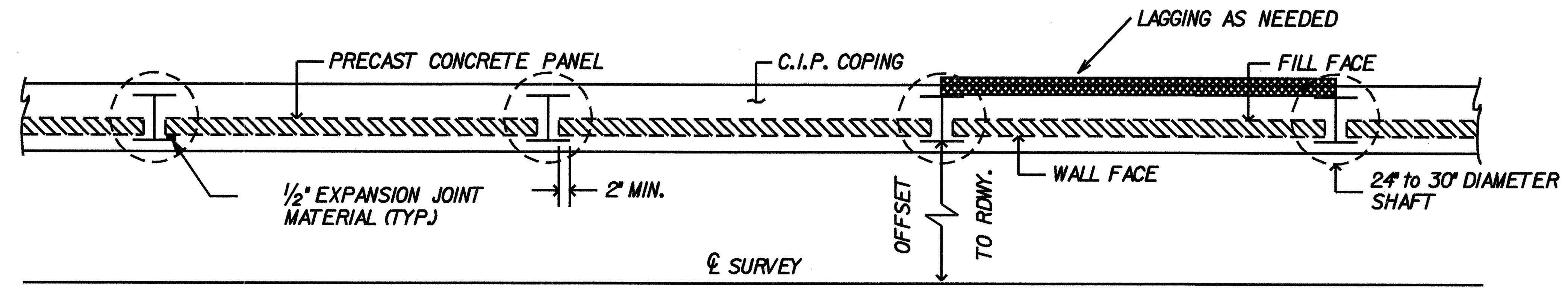
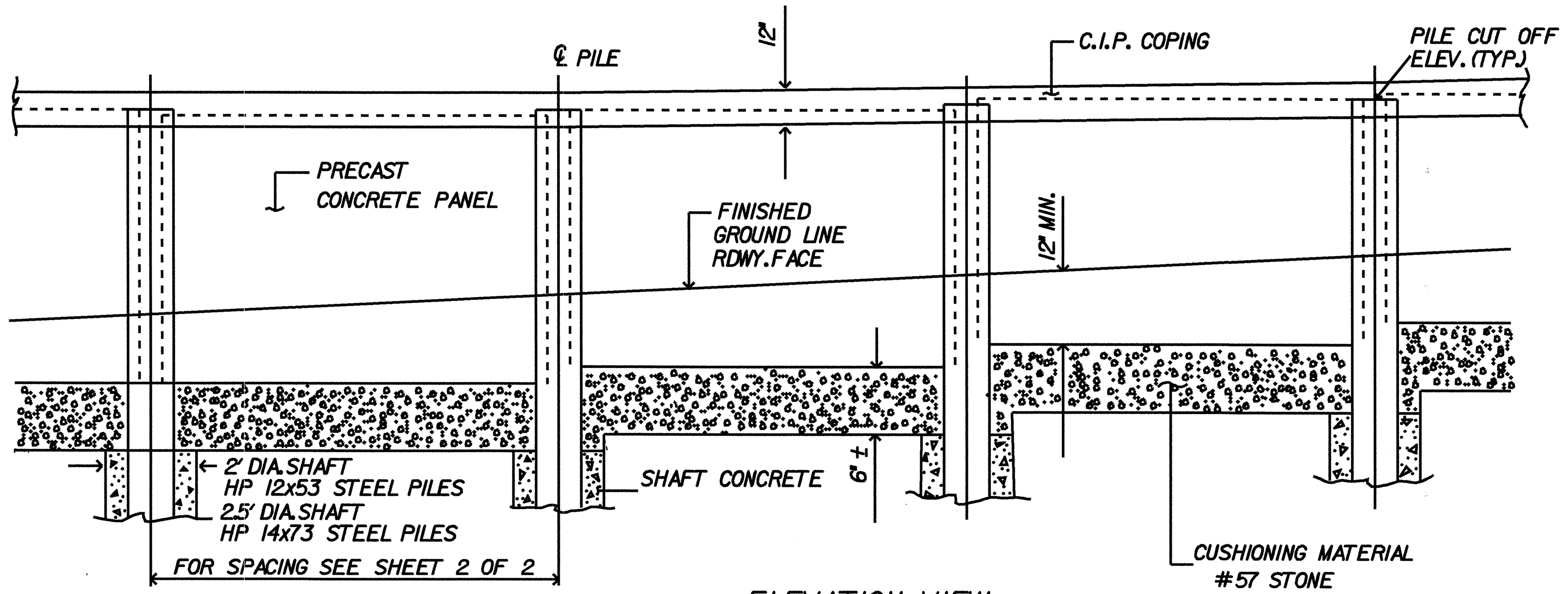
jpadams



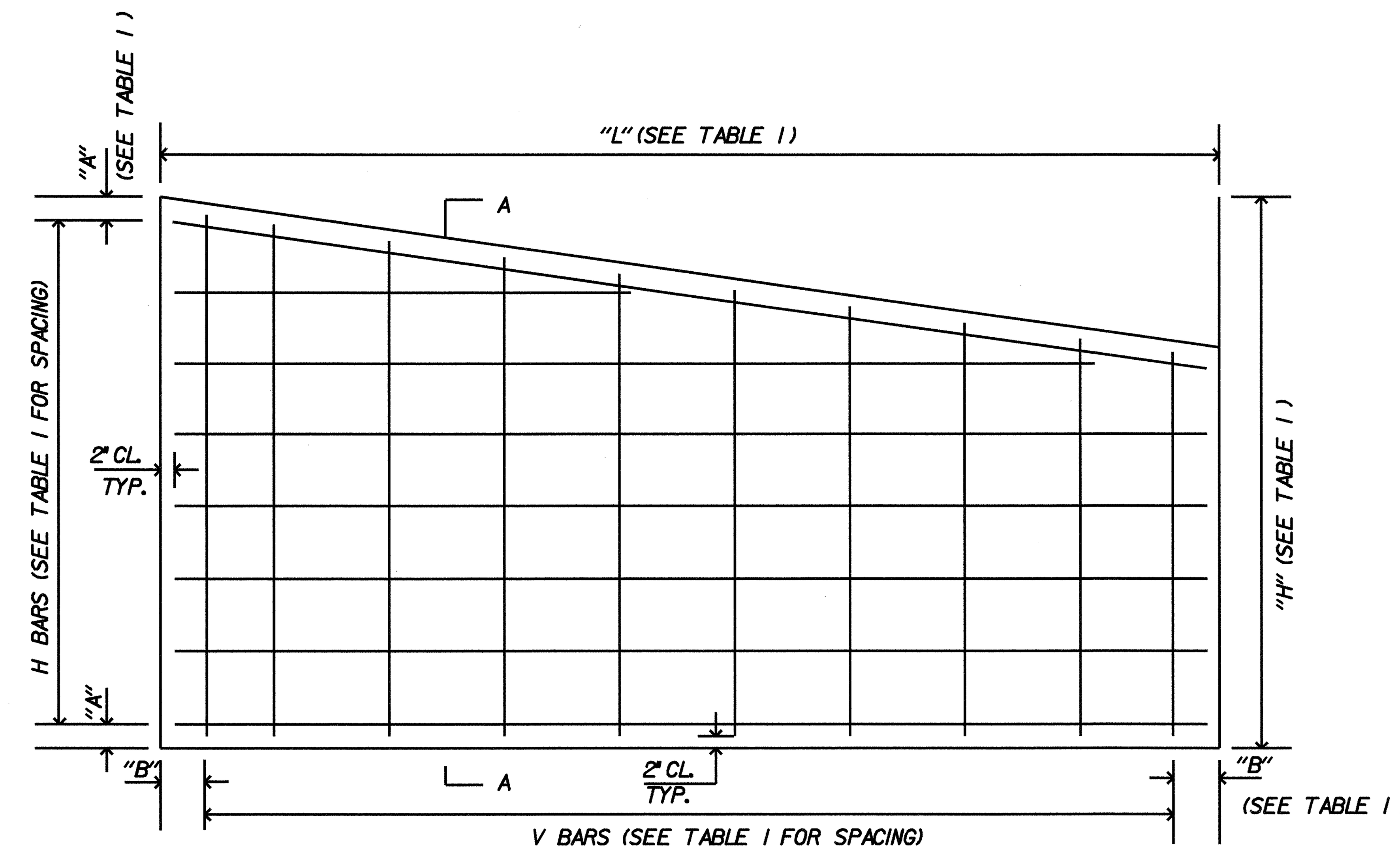
PLAN VIEW

N.T.S.



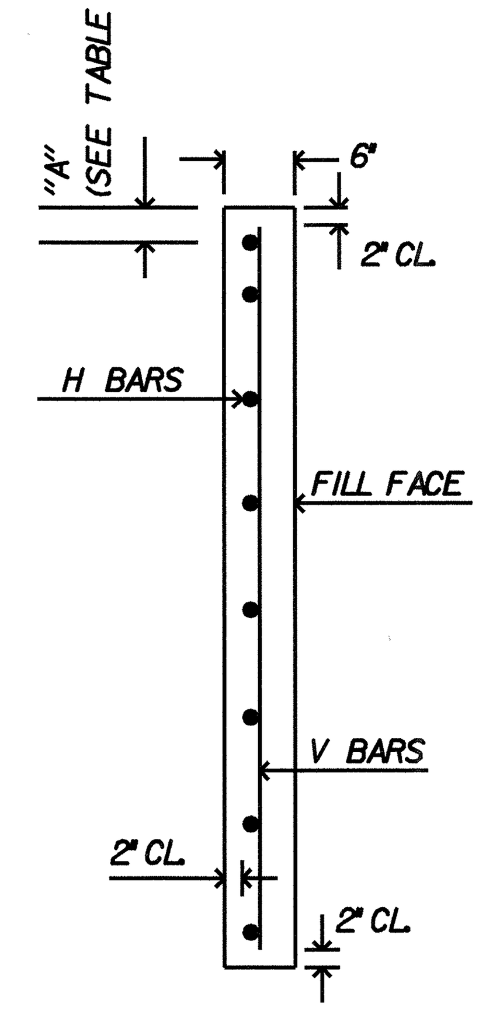
ELEVATION VIEW

N.T.S.



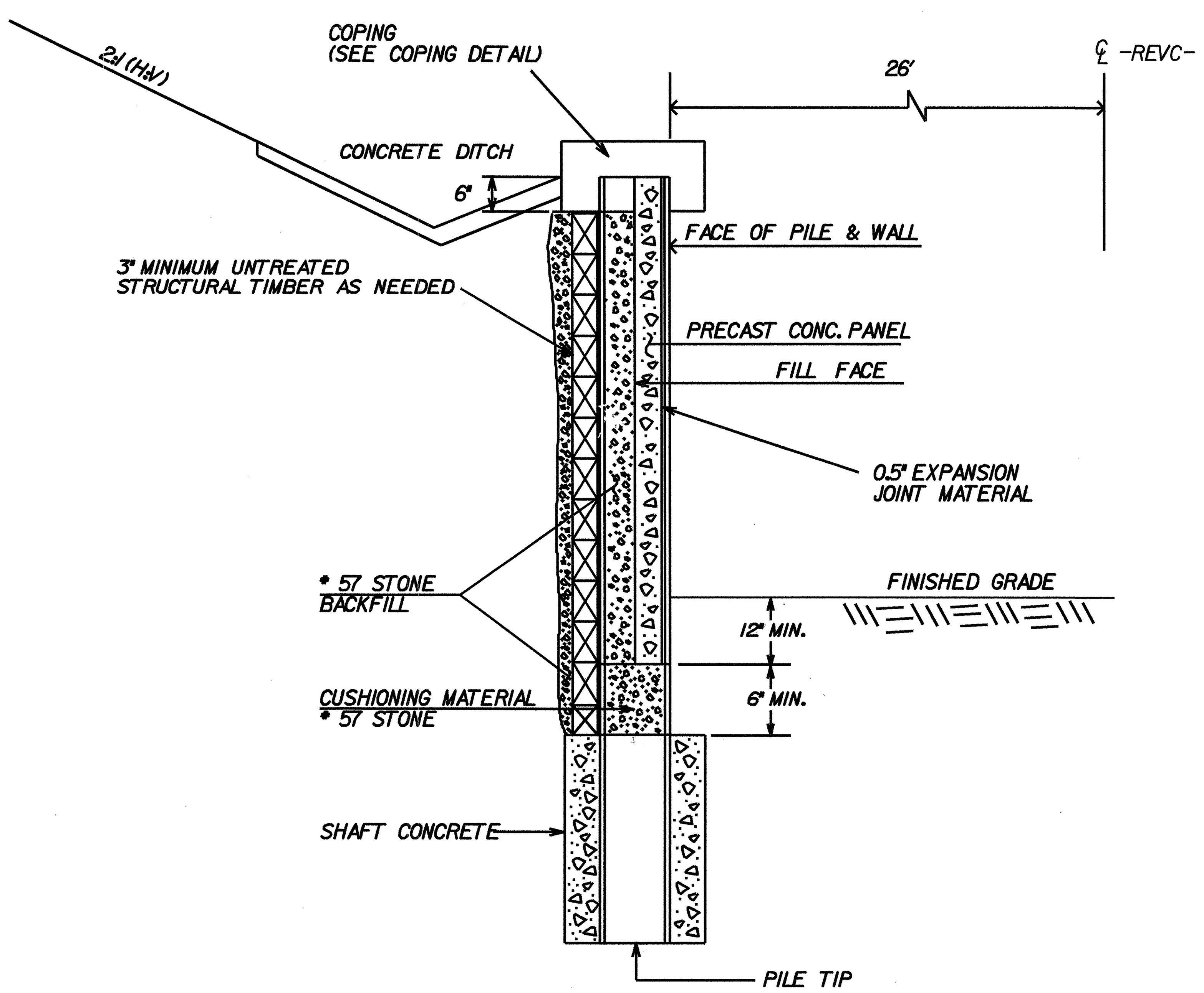
EXAMPLE BLOCKED OUT PRECAST PANEL DETAIL (BACK FACE OF WALL)

N.T.S.



SECTION A-A

TABLE 1 PRECAST PANELS										
PANEL TYPE	NO. REQ'D	"H"	"L"	BAR TYPES HORIZONTAL NO. PER PANEL	HORIZONTAL SPACING C-C	VERTICAL NO. PER PANEL	VERTICAL SPACING C-C	"A"	"B"	CONC. CUBIC YARDS PER PANEL
A1	7	3'	9'-6"	6-H1	6"	19-V1	6"	3"	3"	0.528
B1	15	4'	9'-6"	8-H1	6"	19-V2	6"	3"	3"	0.704
C1	6	5'	9'-6"	10-H1	6"	19-V3	6"	3"	3"	0.880
D1	3	6'	9'-6"	17-H1	4"	19-V4	6"	4"	3"	1.060
E1	4	7'	9'-6"	20-H1	4"	19-V5	6"	4"	3"	1.230
F1	4	8'	9'-6"	19-H1A	5"	19-V6	6"	3"	3"	1.410
G1	1	9'	9'-6"	21-H1A	5"	19-V7	6"	4"	3"	1.580
G2	3	9'	7'	18-H2	6"	14-V7	6"	3"	3"	1.170
H2	3	10'	7'	24-H2	5"	14-V8	6"	2.5"	3"	1.300



TYPICAL SECTION

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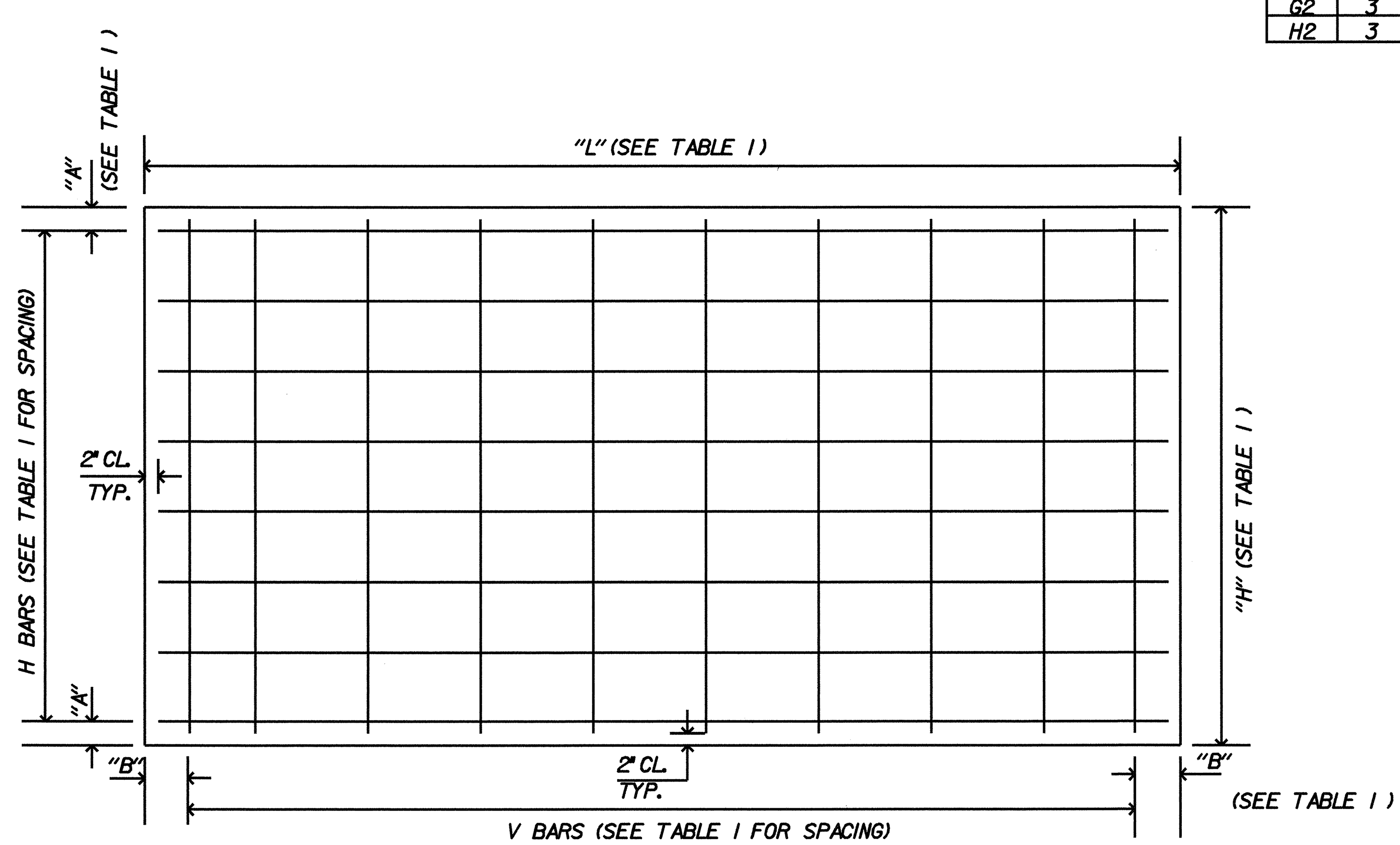

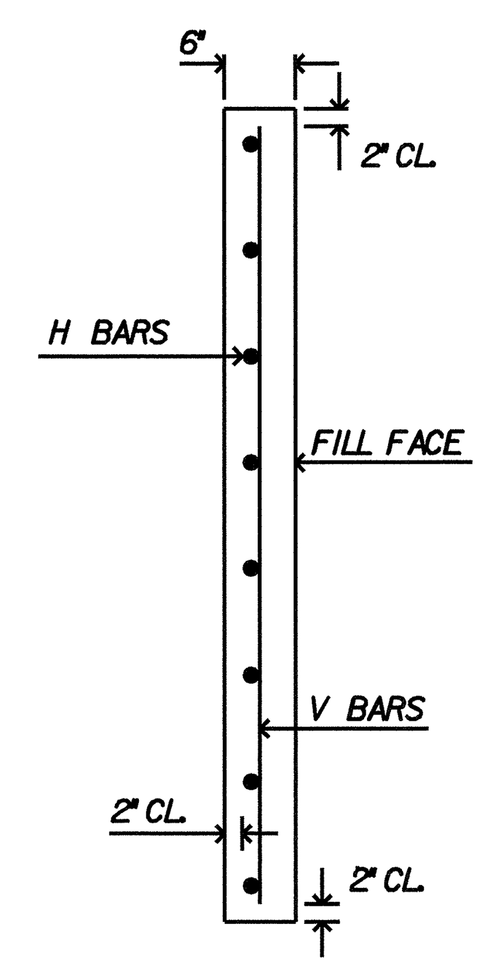

TYPICAL PRECAST PANEL DETAIL

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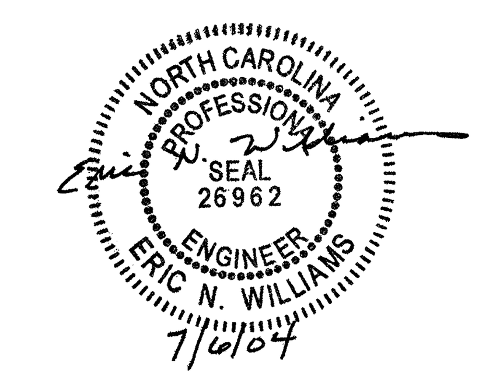

PROJECT I-2102

FORSYTH COUNTY

STATION 1+50.000 TO 5+95.000 -REVC-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE/PANEL WALL

DRAWN BY ENW DATE 07/03

CHECKED BY CAK DATE 07/03

SHEET W-1 OF 3

29-JUN-2004 09:24
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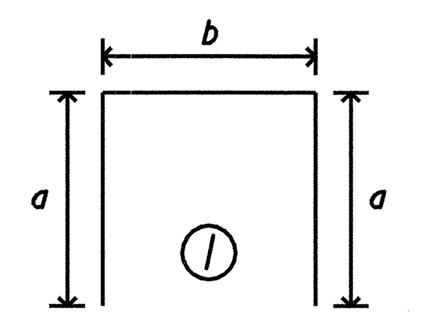
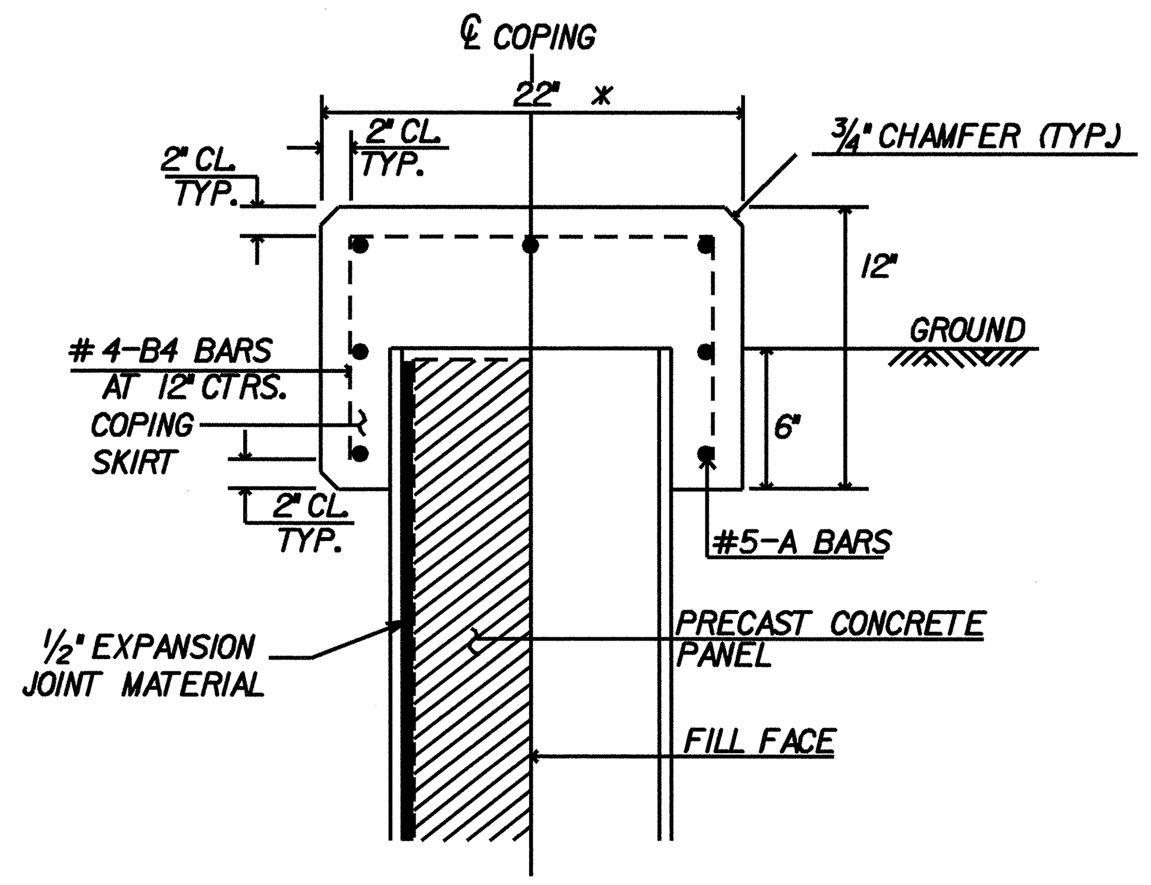
tpayne

BAR TYPES

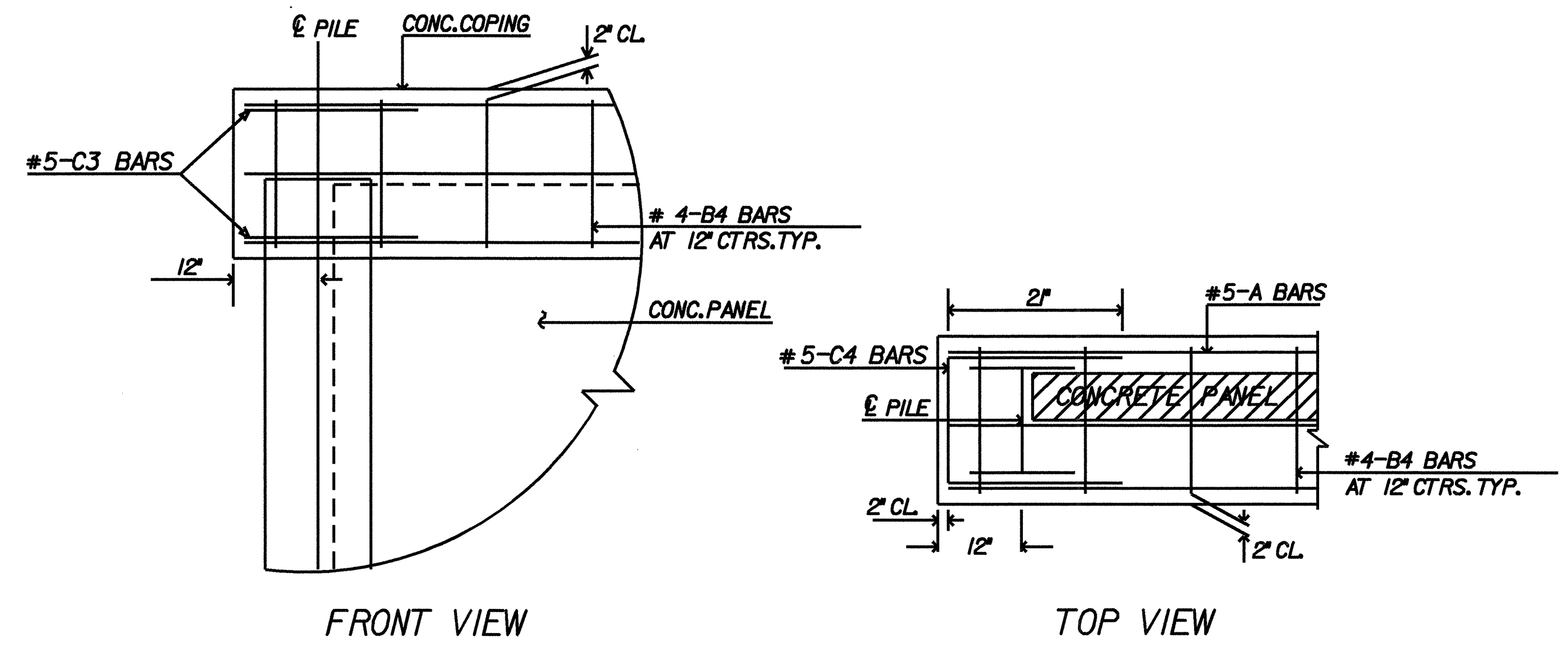


ALL DIMENSIONS OUT TO OUT

BAR	COPING TYPE	PILE SIZE	DIMENSION a	DIMENSION b
B4	FULL	ALL	8"	1'-6"
C3	COPING	PILES	2"	1'-6"



FULL COPING DETAIL
N.T.S.
x - 22" FOR BOTH HP12X53 AND HP14X73 PILES



END OF COPING DETAIL
N.T.S.

BILL OF MATERIALS

BILL OF MATERIALS	
PILE/PANEL RETAINING WALL	2,280 SQ.FT.

BILL OF MATERIALS

PRECAST CONCRETE PANELS

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT (LB)
H1	353	#4	STR	9'-2"	2210
H2	126	#4	STR	6'-8"	574
V1	133	#4	STR	2'-8"	242
V2	285	#4	STR	3'-8"	714
V3	144	#4	STR	4'-8"	363
V4	57	#4	STR	5'-8"	221
V5	76	#4	STR	6'-8"	346
V6	76	#4	STR	7'-8"	398
V7	61	#4	STR	8'-8"	361
V8	42	#4	STR	9'-8"	277

REINFORCING STEEL	LBS	6648
CLASS 'A' CONCRETE	CUBIC YARDS	42

C.I.P. COPING

A	70	#5	STR	VAR	3445
B4	445	#4	1	2'-10"	861
C3	4	#5	1	4'-10"	20

REINFORCING STEEL (COPING)	LBS	4326
CLASS 'A' CONCRETE (COPING)	CUBIC YARDS	26

ESTIMATED QUANTITIES

C.I.P. COPING	LINEAR FEET	447
#57 STONE BACKFILL	CUBIC YARDS	123
SHAFT EXCAVATION	LINEAR FEET	892
SHAFT CONCRETE	CUBIC YARDS	84
3" TIMBER LAGGING	FBM	6840
PRECAST CONCRETE PANEL TYPE 'A1'	NO.	7
PRECAST CONCRETE PANEL TYPE 'B1'	NO.	15
PRECAST CONCRETE PANEL TYPE 'C1'	NO.	6
PRECAST CONCRETE PANEL TYPE 'D1'	NO.	3
PRECAST CONCRETE PANEL TYPE 'E1'	NO.	4
PRECAST CONCRETE PANEL TYPE 'F1'	NO.	4
PRECAST CONCRETE PANEL TYPE 'G1'	NO.	1
PRECAST CONCRETE PANEL TYPE 'G2'	NO.	3
PRECAST CONCRETE PANEL TYPE 'H2'	NO.	3
HP 12X53 STEEL PILES	NO. = 32	LF = 501
HP 14X73 STEEL PILES	NO. = 15	LF = 391

PILE ELEVATIONS AND PANEL TYPES

PILE STATION	PILE NO.	PILE SIZE	PILE SPACE	PILE LENGTH	TOP SHAFT CONC ELEV	CUTOFF ELEV	PANEL TYPE
1+50	1	HP 12X53		10.78	762.37	765.87	
1+60	2	HP 12X53	10	11.16	762.37	766.25	A1
1+70	3	HP 12X53	10	11.16	762.75	766.63	A1
1+80	4	HP 12X53	10	11.16	763.13	767.01	A1
1+90	5	HP 12X53	10	11.16	763.51	767.40	A1
2+00	6	HP 12X53	10	11.16	763.90	767.78	A1
2+10	7	HP 12X53	10	11.10	764.28	768.10	A1
2+20	8	HP 12X53	10	13.53	764.60	768.42	A1
2+30	9	HP 12X53	10	14.53	763.92	768.73	B1
2+40	10	HP 12X53	10	14.53	764.23	769.05	B1
2+50	11	HP 12X53	10	14.53	764.55	769.37	B1
2+60	12	HP 12X53	10	14.43	764.87	769.59	B1
2+70	13	HP 12X53	10	14.43	765.09	769.82	B1
2+80	14	HP 12X53	10	14.43	765.32	770.04	B1
2+90	15	HP 12X53	10	14.43	765.54	770.26	B1
3+00	16	HP 12X53	10	14.43	765.76	770.49	B1
3+10	17	HP 12X53	10	14.49	766.00	770.77	B1
3+20	18	HP 12X53	10	14.49	766.27	771.05	B1
3+30	19	HP 12X53	10	14.49	766.55	771.33	B1
3+40	20	HP 12X53	10	14.49	766.83	771.61	B1
3+50	21	HP 12X53	10	14.49	767.11	771.89	B1
3+60	22	HP 12X53	10	14.55	767.39	772.23	B1
3+70	23	HP 12X53	10	16.96	767.73	772.57	B1
3+80	24	HP 12X53	10	17.96	767.07	772.91	C1
3+90	25	HP 12X53	10	17.96	767.41	773.25	C1
4+00	26	HP 12X53	10	17.96	767.75	773.59	C1
4+10	27	HP 12X53	10	18.15	768.09	774.12	C1
4+20	28	HP 12X53	10	20.59	768.62	774.65	C1
4+30	29	HP 12X53	10	21.59	768.15	775.18	D1
4+40	30	HP 12X53	10	21.59	768.68	775.71	D1
4+50	31	HP 12X53	10	21.13	769.21	776.23	D1
4+60	32	HP 14X73	10	22.08	768.73	776.72	E1
4+70	33	HP 14X73	10	22.08	769.22	777.20	E1
4+80	34	HP 14X73	10	24.09	769.70	777.68	E1
4+90	35	HP 14X73	10	25.09	769.18	778.16	F1
5+00	36	HP 14X73	10	25.09	769.66	778.65	F1
5+10	37	HP 14X73	10	25.16	770.15	779.20	F1
5+20	38	HP 14X73	10	27.18	770.70	779.74	F1
5+30	39	HP 14X73	10	28.18	770.24	780.29	G1
5+37.5	40	HP 14X73	7.5	28.88	770.79	780.70	G2
5+45	41	HP 14X73	7.5	28.88	771.20	781.11	G2
5+52.5	42	HP 14X73	7.5	29.76	770.61	781.41	H2
5+60	43	HP 14X73	7.5	29.53	770.91	781.47	H2
5+67.5	44	HP 14X73	7.5	29.00	770.97	781.00	H2*
5+75	45	HP 14X73	7.5	25.08	771.50	779.50	G2*
5+85	46	HP 12X53	10	19.69	772.00	777.59	E1*
5+95	47	HP 12X53	10	13.70	772.09	775.72	C1*

* DENOTES SPECIAL PANELS.SEE EXAMPLE BLOCKED OUT PRECAST PANEL DETAIL AND NOTES.

NOTES:

1. PILES SHALL BE INSTALLED TO THE CUT OFF ELEVATIONS AND LENGTHS SHOWN ON THE PLANS. ROCK EXCAVATION IS ANTICIPATED IN SOME OF THE SHAFTS. IF 5 FEET OF ROCK IS ENCOUNTERED PRIOR TO PLAN LENGTH, THEN THE SHAFT CAN TERMINATE AND THE PILE LENGTH ADJUSTED.
2. USE ASTM A572 GRADE 50 STEEL PILES WITH THE ADDITION OF 0.2% MINIMUM COPPER.
3. SPLICING OF PILES IS NOT ALLOWED.
4. THE TOP OF THE INSTALLED PILES SHALL BE WITHIN 2 INCH OF THEIR PLAN LOCATION IN ANY DIRECTION.
5. CONCRETE PANELS SHALL HAVE A MINIMUM BEARING DISTANCE OF 2 INCH ON THE PILE FLANGE. ½ INCH THICK EXPANSION JOINT MATERIAL SHALL BE PLACED BETWEEN THE CONCRETE PANELS AND PILE FLANGES FOR THE WIDTH OF THE BEARING SURFACE.
6. THE CONCRETE PANELS SHALL HAVE A DARK GRAY EXPOSED AGGREGATE FACE. SEE SPECIAL PROVISIONS FOR COLOR, TEXTURE AND AGGREGATE REQUIREMENTS.
7. CONCRETE PANELS SHALL BE HELD SECURELY AGAINST PILES UNTIL BACKFILL IS PLACED. BACKFILL SHALL BE BROUGHT UP UNIFORMLY.
8. BACKFILL MATERIAL, BOTH CUSHIONING MATERIAL AND BACKFILL BEHIND PANELS, SHALL BE COMPACTED AS REQUIRED BY THE ENGINEER. THE STONE SHALL BE RODDED AND SPREAD IN ORDER TO FILL ALL VOIDS AND INSURE MAXIMUM DENSITY. FLUSHING THE STONE WITH WATER TO AID COMPACTION WILL NOT BE ALLOWED.
9. BACKFILLING SHALL BE COMPLETED PRIOR TO FORMING THE COPING.
10. TOP OF COPING TO BE ADJUSTED BY ENGINEER TO GIVE A UNIFORM APPEARANCE.
11. CONSTRUCTION JOINTS IN COPING ARE PERMITTED AT LOCATIONS WHERE COPING CHANGES SLOPE AND AT 90 FOOT CENTERS. EXPANSION JOINTS ARE NOT PERMITTED.
12. BLOCK OUT ONE OF THE H2 PANELS TO PROVIDE A 12:1 (H:V) SLOPE AT THE TOP OF THE PANEL MEASURED FROM LEFT BACK FACE DOWNWARD TO RIGHT BACK FACE.
13. BLOCK OUT ONE OF THE G2 PANELS, ONE OF THE E1 PANELS AND ONE OF C1 PANELS TO PROVIDE A 5:1 (H:V) SLOPE AT THE TOP OF THE PANEL MEASURED FROM LEFT BACK FACE DOWNWARD TO RIGHT BACK FACE.
14. THE RESIDENT ENGINEER SHALL VERIFY THE LOCATION OF DRAINAGE STRUCTURES AND UTILITIES PRIOR TO INSTALLING PILES. THE LAYOUT OF THE WALL MAY NEED TO BE ADJUSTED TO AVOID UNANTICIPATED INTERFERENCE.
15. CONSTRUCTION SEQUENCE:
    - DRILL 24 INCH DIAMETER SHAFTS FOR HP12X53 PILES AND 30 INCH DIAMETER SHAFTS FOR HP14X73 PILES FROM NATURAL GROUND. INSTALL PILES AND BACKFILL WITH CONCRETE TO THE TOP OF SHAFT CONCRETE ELEVATION BEFORE EXCAVATING TO INSTALL PANELS OR TIMBER LAGGING.
    - EXCAVATION TO INSTALL THE PANELS OR LAGGING SHALL BE VERTICAL, HAVE A MAXIMUM LIFT HEIGHT OF 4 FEET AND BE LIMITED IN EXTENT TO ONLY WHAT IS NECESSARY.
    - TIMBER LAGGING IS NEEDED ONLY TO MEET OSHA REQUIREMENTS FOR SAFE EXCAVATION HEIGHTS. IF CUT IS LESS THAN 4 FEET HIGH, LAGGING IS NOT REQUIRED.
    - THE LAGGING SHALL HAVE A MINIMUM BEARING DISTANCE OF 3 INCHES ON THE PILE FLANGE.
    - UNTREATED STRUCTURAL TIMBERS SHALL BE A MINIMUM OF 3 INCHES THICK AND SHALL CONFORM TO THE APPLICABLE PARTS OF SECTIONS 445 AND 1082 OF THE STANDARD SPECIFICATIONS.
    - PLACE BACKFILL BEHIND THE LAGGING IMMEDIATELY AFTER INSTALLATION.
    - WHERE PRACTICAL, THE TOP FEW PIECES OF LAGGING SHALL BE REMOVED PRIOR TO BACKFILLING BEHIND PANELS. ALL OTHER LAGGING SHALL BE LEFT IN PLACE.
    - THE CONTRACTOR MAY ELECT TO USE AN ALTERNATIVE METHOD OF PROVIDING A SAFE EXCAVATION. HOWEVER, THE ALTERNATE METHOD MUST BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
16. IF NECESSARY, SPECIAL MEASURES SHALL BE TAKEN TO INSURE THE STABILITY OF THE SHAFT SUCH AS INSTALLING TEMPORARY CASING PRIOR TO DRILLING, INSTALLING THE PILE AND PLACING CONCRETE IMMEDIATELY AFTER A SHAFT IS EXCAVATED BEFORE CAVING OCCURS. INSTALLING WELL POINTS OR OTHER MEASURES, IF CAVING OCCURS. THE SHAFT EXCAVATION OPERATION SHALL BE HALTED UNTIL SPECIAL MEASURES ARE IMPLEMENTED.
17. PILE/PANEL WALL MUST BE BUILT BEFORE PLACING ANY FILL MATERIAL BEHIND THE WALL.
18. PILES SHALL BE PAINTED BLACK FROM THE TOP OF THE PILE DOWN TO 18" BELOW GRADE.
19. FOR DESIGN CRITERIA AND DETAILS, SEE SPECIAL PROVISIONS.

PROJECT I-2102
FORSYTH COUNTY
STATION 1+50.000 TO 5+95.000 -REVC-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE/PANEL WALL

DRAWN BY ENW DATE 07/03
CHECKED BY CAK DATE 07/03

SHEET W-2 OF 3

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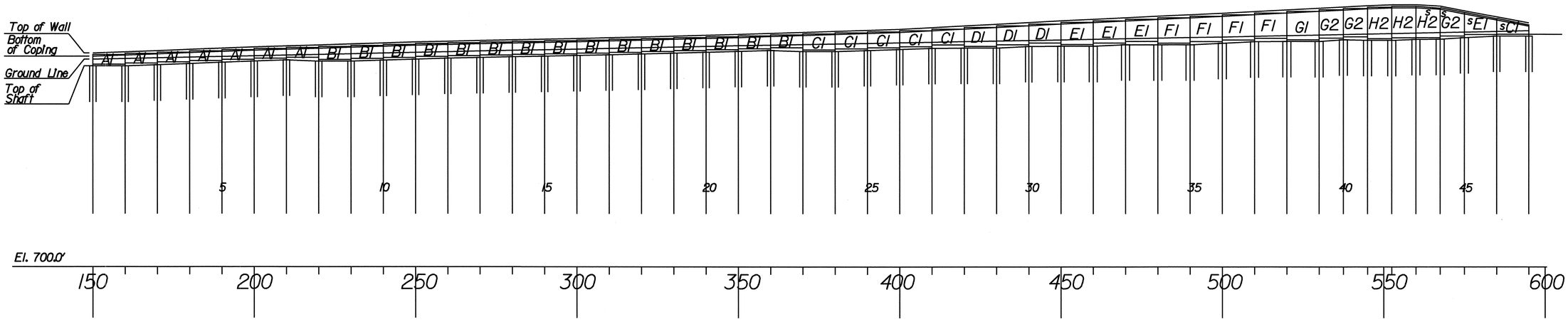

ELEVATION VIEW ALONG BACK FACE OF PILE PANEL WALL

N.T.S.

NORTH CAROLINA PROFESSIONAL SEAL 26962 ENGINEER ERIC N. WILLIAMS

7/6/04

PROJECT I-2102

FORSYTH **COUNTY**

STATION 1+50.000 TO 5+95.000 -REVC-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE/PANEL WALL

DRAWN BY ADS DATE 08/03

CHECKED BY EMW DATE 08/03

SHEET W-3 OF 3

STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2002 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; CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP; AND CLASS S SHALL BE USED FOR UNDERWATER FOOTING SEALS.

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 WITH THE EXCEPTION OF #2 BARS WHICH MAY BE FABRICATED FROM COLD DRAWN STEEL WIRE. 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.

PLACEMENT OF BEAM OR GIRDER MEMBERS ON TRUCKS FOR HAULING SHALL BE DONE IN COMPLIANCE WITH LIMITS SHOWN ON SKETCHES PROVIDED TO THE MATERIALS AND TEST UNIT APPROVED BY THE STRUCTURE DESIGN UNIT DATED MAY 8, 1991. THESE SKETCHES PRIMARILY LIMIT THE UNSUPPORTED CANTILEVER LENGTH OF MEMBERS. WHEN THE CONTRACTOR WISHES TO PLACE MEMBERS ON TRUCKS NOT IN ACCORDANCE WITH THESE LIMITS, TO SHIP BY RAIL, TO ATTACH SHIPPING RESTRAINTS TO THE MEMBERS OR TO INVERT MEMBERS, HE SHALL SUBMIT A SKETCH FOR APPROVAL PRIOR TO SHIPPING. SEE ALSO ARTICLE 1072-11.

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 ω RGW REV. 6-27-02 RWW ω JTE
REV. 8-16-99 RWW ω LES