# CONTRACT: C201569 TIP PROJECT: W-4704

# STRUCTURE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

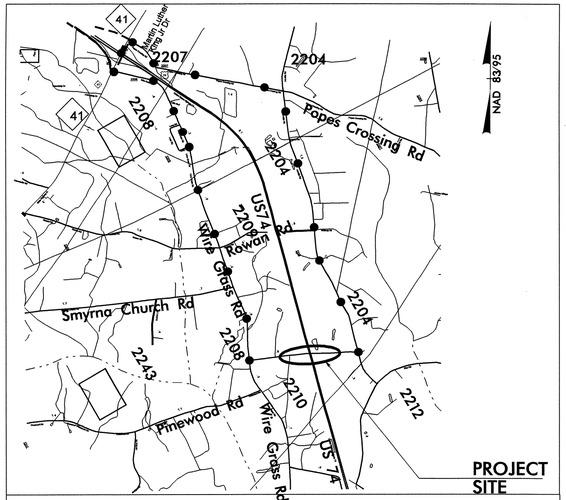
# ROBESON COUNTY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | W-4704 | | |

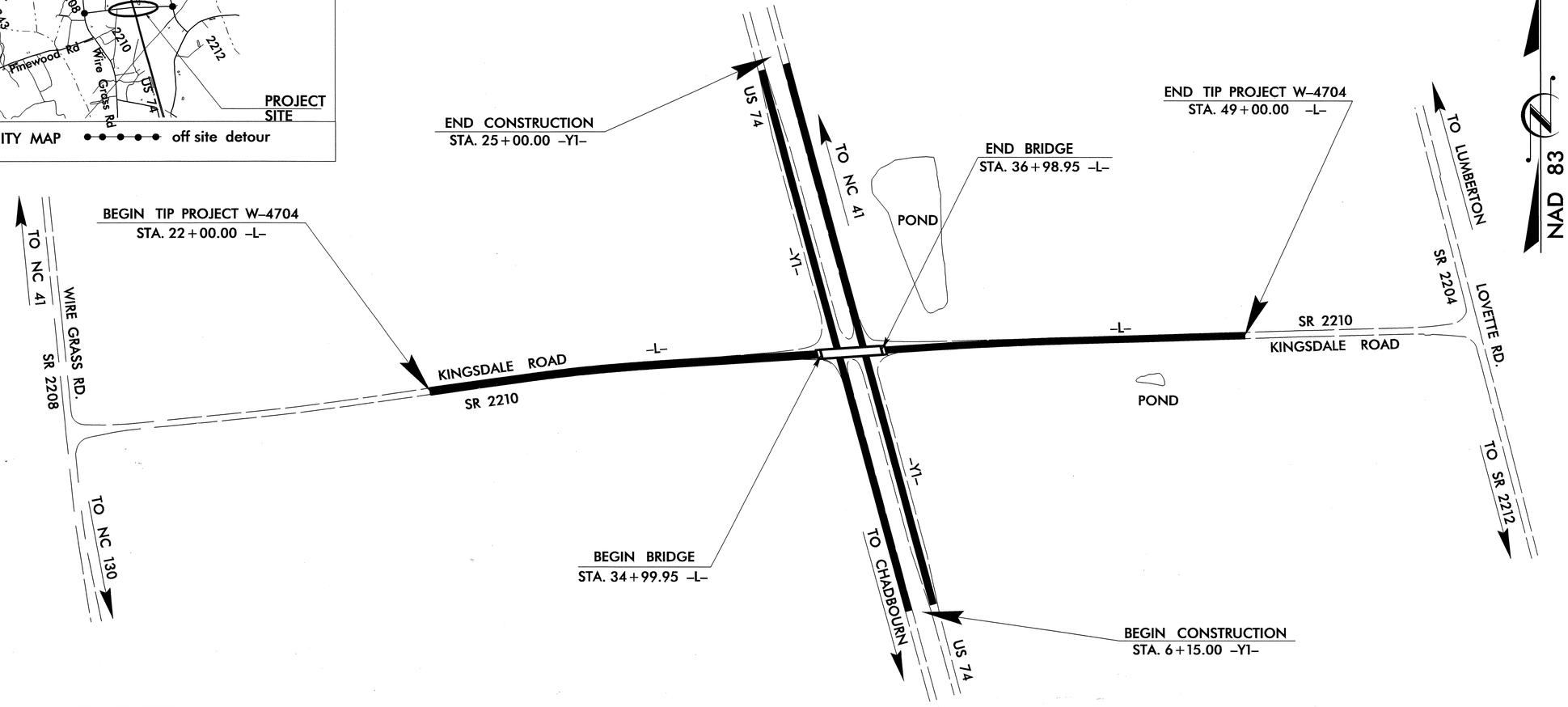
| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 37723.1.1 | STPNHS-74(66) | P.E. |
| 37723.2.1 | STPNHS-74(66) | R/W, UTIL. |
| 37723.3.1 | STPNHS-74(66) | CONST. |

***LOCATION: BRIDGE OVER US 74 AT SR 2210 (OLD KINGSDALE RD)***

***TYPE OF WORK: GRADING, DRAINAGE, GUARDRAIL, STRUCTURE, AND PAVING***




VICINITY MAP ●—●—●—● off site detour




***DESIGN DATA***

ADT 2006 = 1,500 VPD
ADT 2030 = 400 VPD
DHV = 11 %
D ≐ 60 %
T = 3 % *
V = 60 MPH

* TTST 1 % DUAL 2 %

***PROJECT LENGTH***

LENGTH ROADWAY TIP PROJECT W-4704 = 0.473 MILES
LENGTH STRUCTURE TIP PROJECT W-4704 = 0.038 MILES
TOTAL LENGTH TIP PROJECT W-4704 = 0.511 MILES

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

*2006 STANDARD SPECIFICATIONS*

***LETTING DATE: OCTOBER 21, 2008***

B. S. COX, P.E.
*PROJECT ENGINEER*

D. E. PETREY, P.E.
*PROJECT DESIGN ENGINEER*

***STRUCTURE DESIGN***

***DIVISION OF HIGHWAYS***
***STATE OF NORTH CAROLINA***

*P.E.*
*STATE DESIGN ENGINEER*

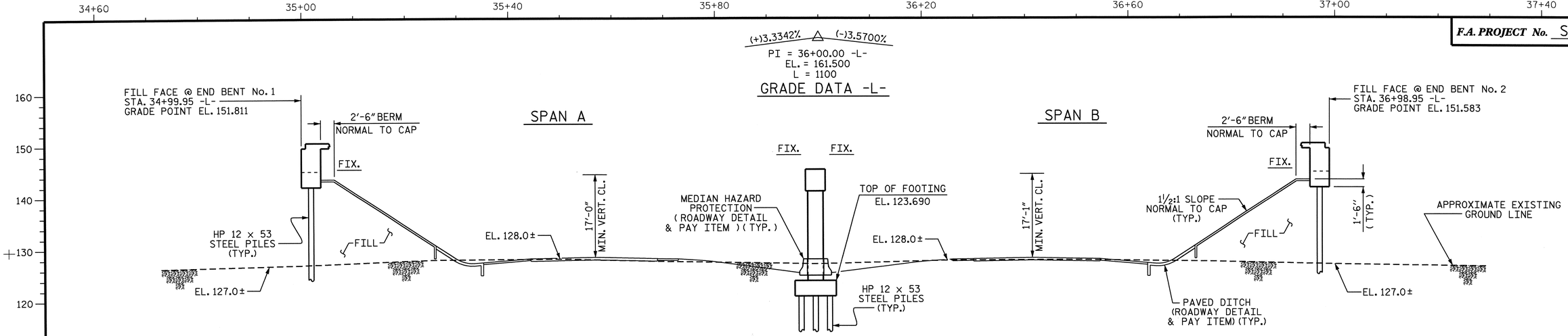
***DEPARTMENT OF TRANSPORTATION***
***FEDERAL HIGHWAY ADMINISTRATION***

*APPROVED* *P.E.*
*DIVISION ADMINISTRATOR* *DATE*

23-JUN-2008 08:05
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
tjbankovich

F.A. PROJECT No. STPNHS-74 (66)

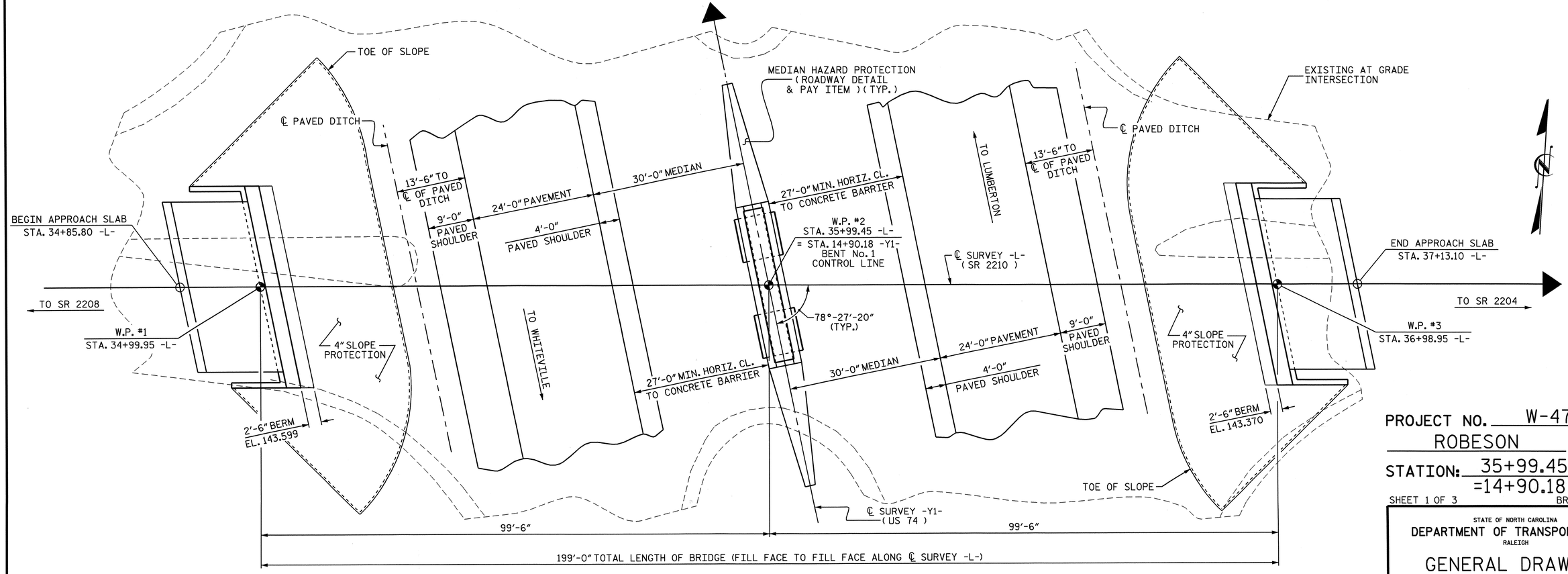
(+)3.3342% (-)3.5700%
PI = 36+00.00 -L-
EL. = 161.500
L = 1100
GRADE DATA -L-




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

## SECTION ALONG ℄ SURVEY -L-

( SECTIONS AT BENT AND END BENTS ARE AT RIGHT ANGLES )




## PLAN

( PILES AND COLUMNS NOT SHOWN FOR CLARITY )

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-
=14+90.18 -Y1-

SHEET 1 OF 3 BRIDGE No. 490

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

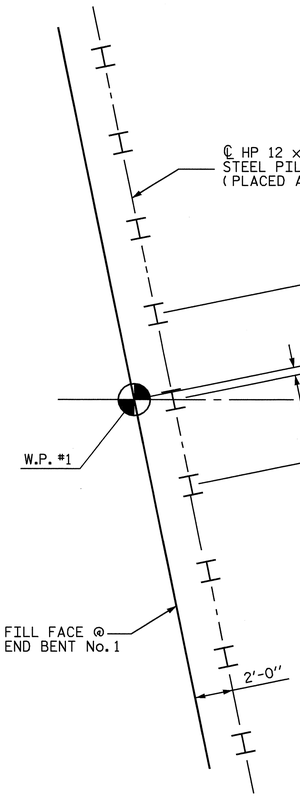
FOR BRIDGE ON SR 2210
( OLD KINGSDALE RD. )
OVER US 74
BETWEEN SR 2208 AND SR 2204

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
Betsy S. Cox 22 AUG 2008

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

DRAWN BY : B.N. GRADY/JMB DATE : 4-30-07
CHECKED BY : T.J. BEACH DATE : 5-08

22-AUG-2008 09:28
r:\structures\general_drawing\w4704_sd_gd_01.dgn
mbritt

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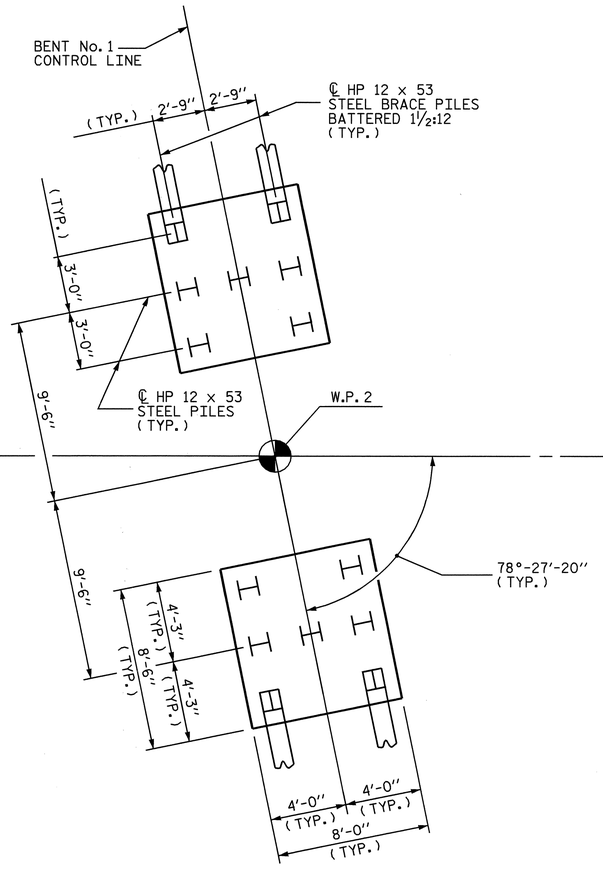


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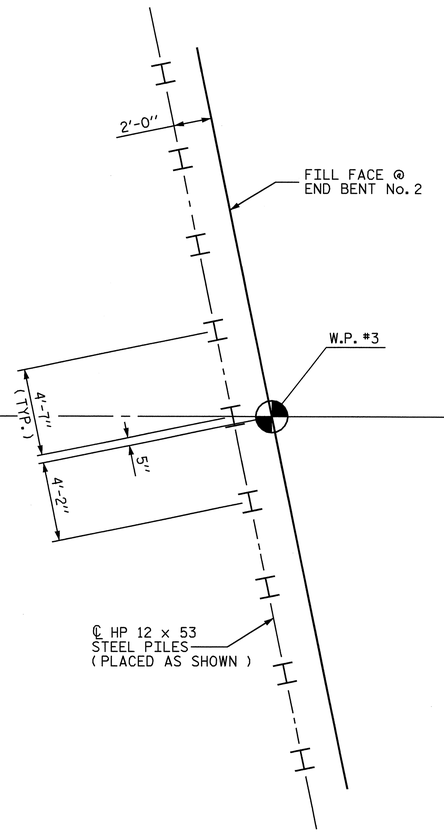


END BENT No. 2

## FOUNDATION LAYOUT

DIMENSIONS LOCATING THE PILES ARE TO THE CENTERLINE OF THE PILE AT THE BOTTOM OF CAP OR FOOTING

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

Betsy S. Cox 5-5-08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 2210
( OLD KINGSDALE RD. )
OVER US 74
BETWEEN SR 2208 AND SR 2204

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

DRAWN BY : MIKE BRITT DATE : 5-3-07
CHECKED BY : T.J. BEACH DATE : 5-08

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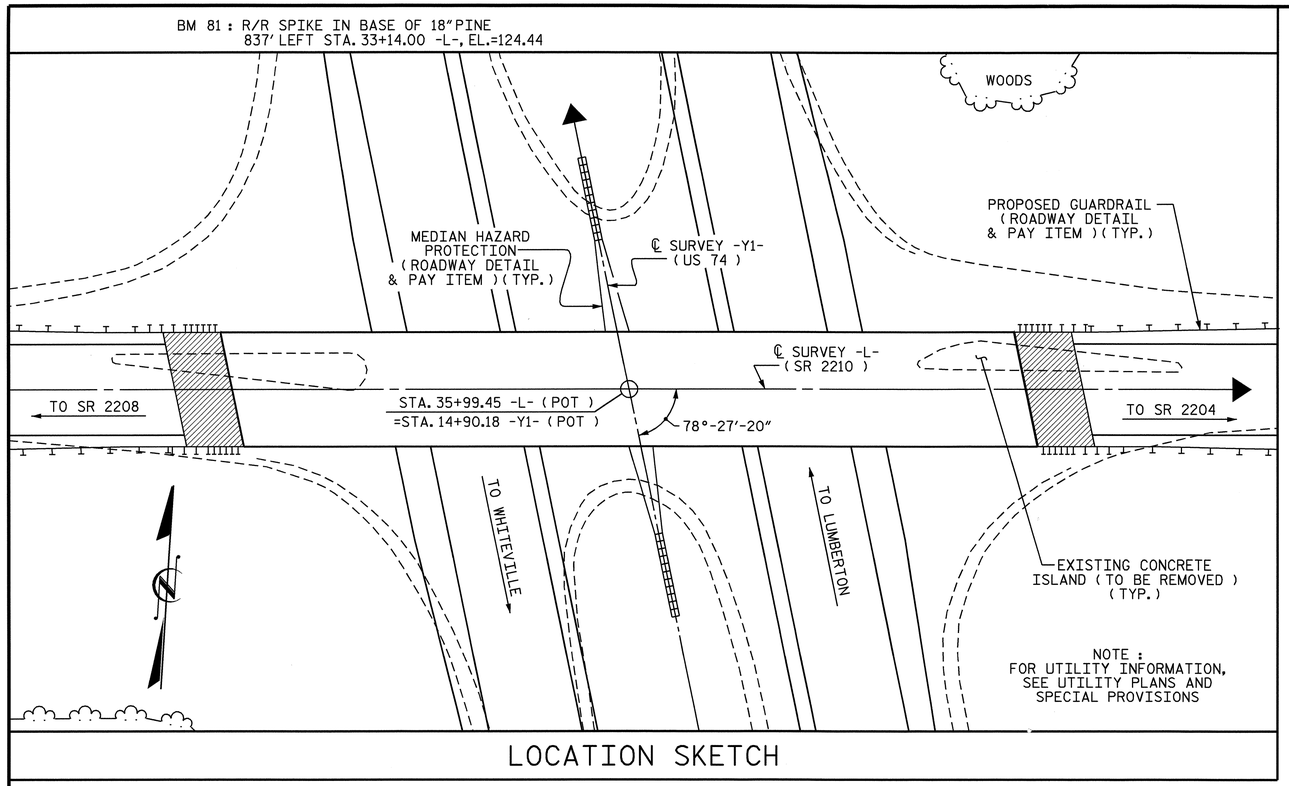
mbritt




LOCATION SKETCH

## NOTES

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

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

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

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

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

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.

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

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

DRIVE PILES AT END BENT No. 1, BENT No. 1 AND END BENT No. 2 TO A REQUIRED BEARING CAPACITY OF 120 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

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

TESTING PILES WITH THE PILE DRIVING ANALYZER (PDA) DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. SEE PILE DRIVING ANALYZER SPECIAL PROVISION.

THE EXISTING PAVEMENT WITHIN THE AREA OF THE END BENT PILES SHALL BE REMOVED AND THE ROADWAY SCARIFIED TO A MINIMUM DEPTH OF 2'-0".

FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

## TOTAL BILL OF MATERIAL

| | FOUNDATION EXCAVATION | PDA TESTING | PDA ASSISTANCE | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | MODIFIED 63" PRESTRESSED CONCRETE GIRDERS | | HP 12 X 53 STEEL PILES | | PILE REDRIVES | CONCRETE BARRIER RAIL | 4" SLOPE PROTECTION | ELASTOMERIC BEARINGS | EVAZOTE JOINT SEALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LUMP SUM | EACH | EACH | SQ.FT. | SQ.FT. | CU.YDS. | LUMP SUM | LBS. | LBS. | NO. | LIN.FT. | NO. | LIN.FT. | EACH | LIN.FT. | SQ.YDS. | LUMP SUM | LUMP SUM |
| SUPERSTRUCTURE | | | | 6,617 | 6,006 | | | | | 8 | 782.0 | | | | 394.58 | | LUMP SUM | LUMP SUM |
| END BENT No. 1 | | | | | | 24.5 | | 3,413 | | | | 9 | 810 | 9 | | 260 | | |
| BENT No. 1 | LUMP SUM | | | | | 41.7 | | 6,846 | 816 | | | 14 | 980 | 14 | | | | |
| END BENT No. 2 | | | | | | 24.6 | | 3,413 | | | | 9 | 900 | 9 | | 260 | | |
| TOTAL | LUMP SUM | 2 | 2 | 6,617 | 6,006 | 90.8 | LUMP SUM | 13,672 | 816 | 8 | 782.0 | 32 | 2,690 | 32 | 394.58 | 520 | LUMP SUM | LUMP SUM |

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

FOR BRIDGE ON SR 2210
( OLD KINGSDALE RD. )
OVER US 74
BETWEEN SR 2208 AND SR 2204

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
Betsy S. Cox 8-22-08

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

DRAWN BY : B.N. GRADY/JMB DATE : 4-30-07
CHECKED BY : T.J. BEACH DATE : 5-08

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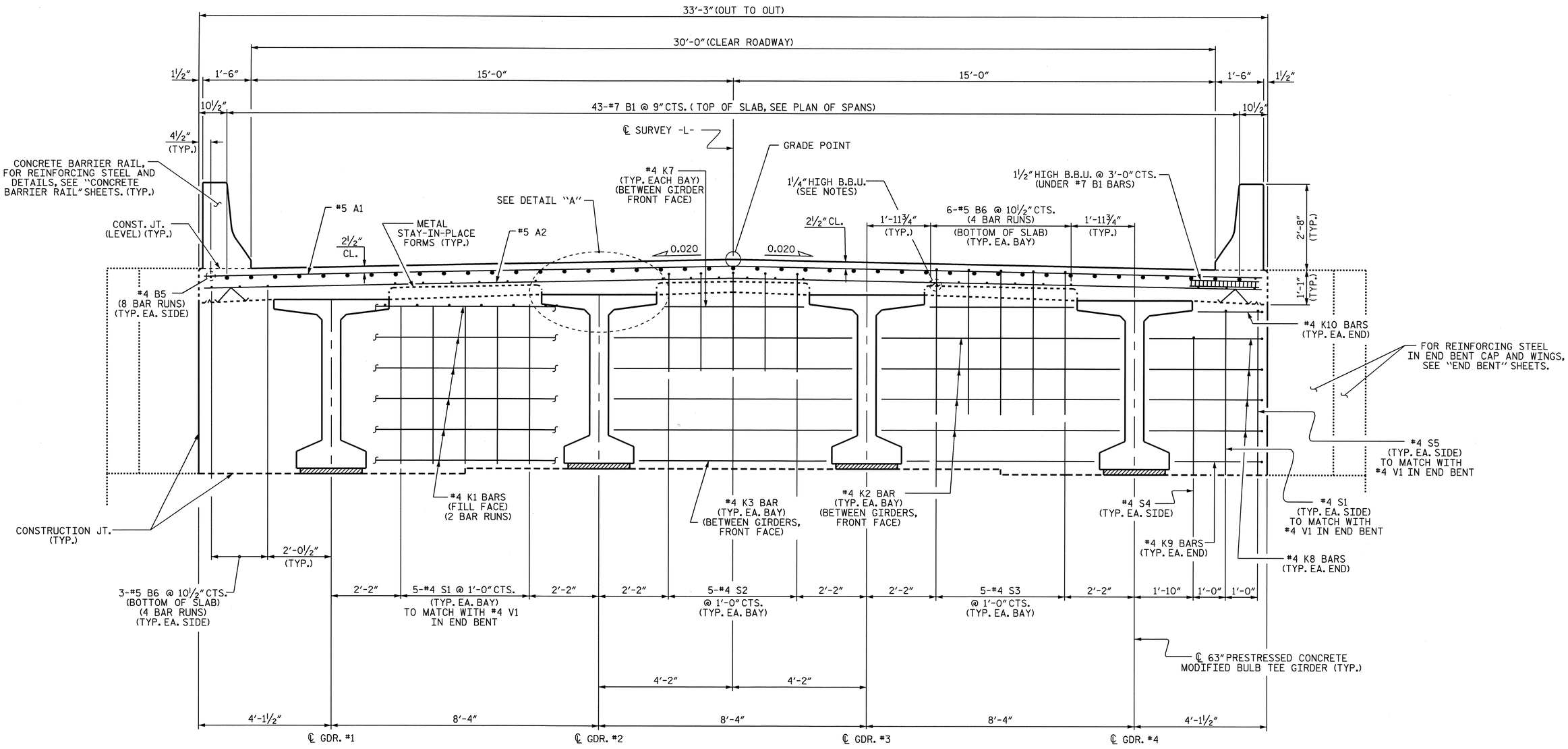
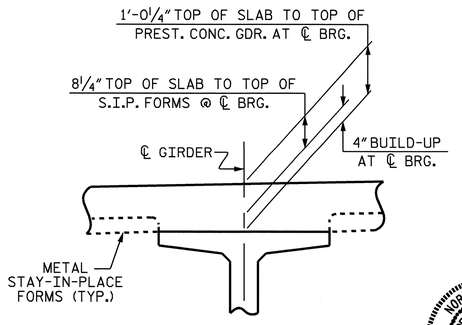



## END ELEVATION

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR)
(FOR SECTION THRU END BENT, SHEET 3 OF 3)




## DETAIL "A"

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

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

DRAWN BY : M.L. BROWN DATE : 7-07
CHECKED BY : S.B. WILLIAMS DATE : 8-07

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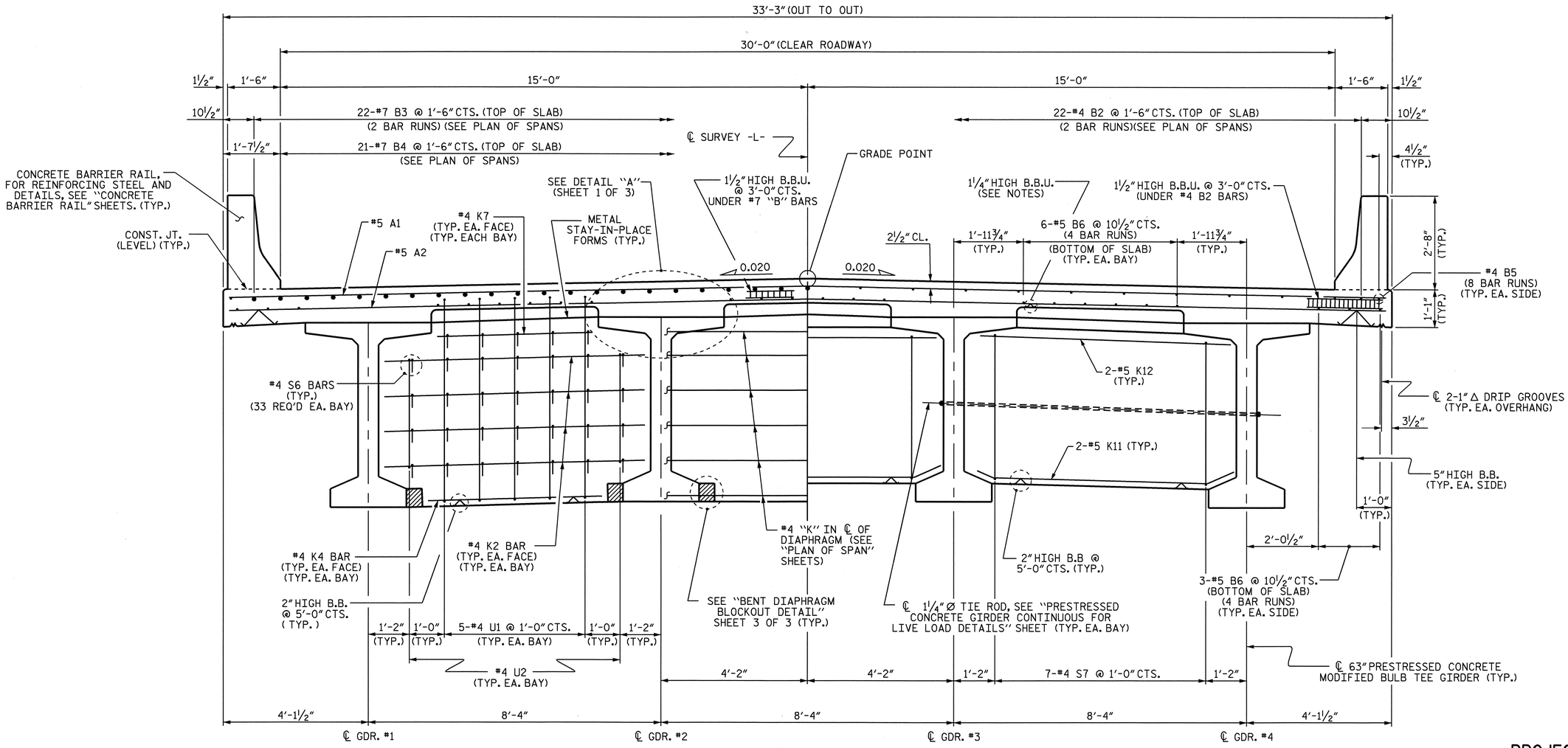
tjbankovich




PARTIAL TYPICAL SECTION
( SHOWING CONTINUOUS FOR LIVE LOAD DIAPHRAGMS )

PARTIAL TYPICAL SECTION
( SHOWING INTERMEDIATE DIAPHRAGMS )
( TYPICAL EA. SPAN, TYPICAL EA. BAY )

# TYPICAL SECTION

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-5 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

NORTH CAROLINA PROFESSIONAL SEAL 032886 ENGINEER BETSY S. COX
By betsy s. cox at 12:25:08

DRAWN BY : M.L. BROWN DATE : 7-07
CHECKED BY : S.B. WILLIAMS DATE : 8-07

23-JUN-2008 08:05
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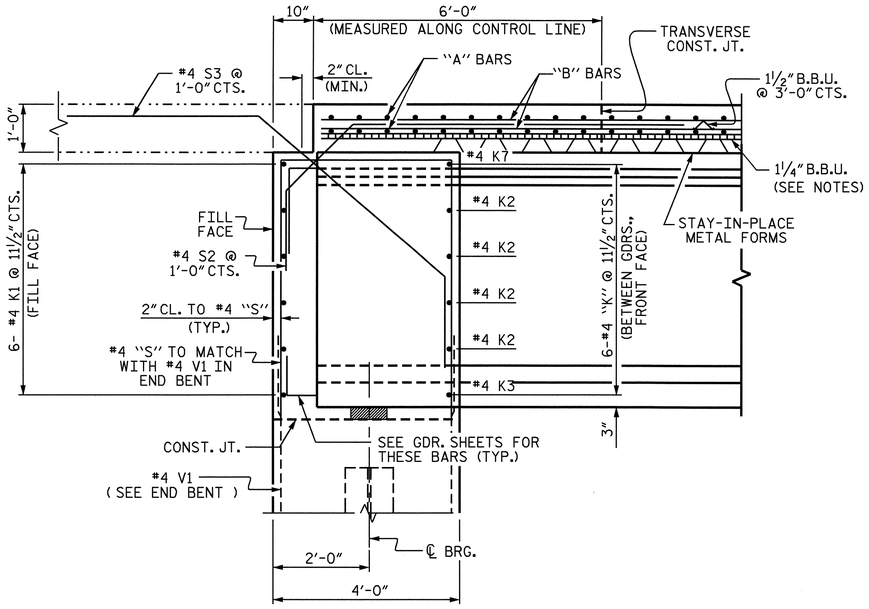
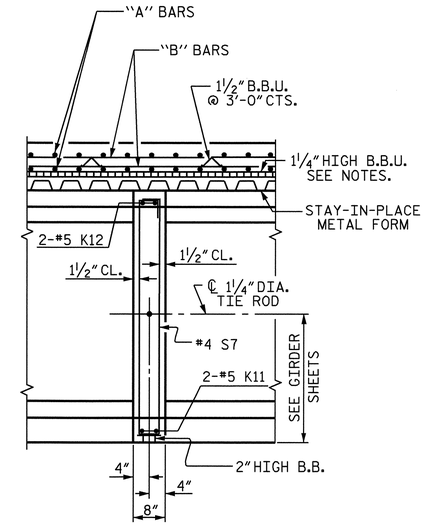
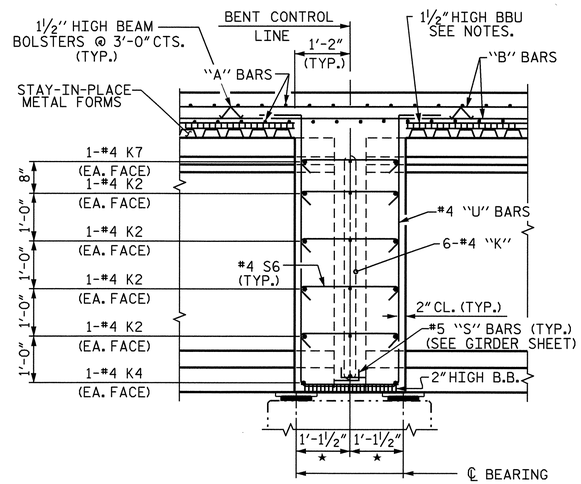
†jbankovich




## SECTION THRU END BENT




## SECTION A-A




## SECTION B-B

★ MEASURED ALONG ℄ GIRDER

## NOTES:

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

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

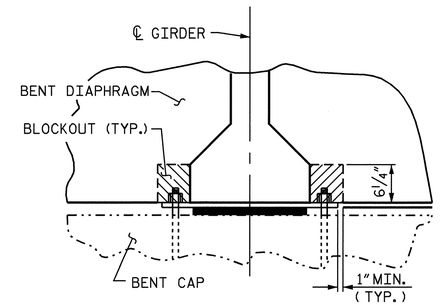
PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.

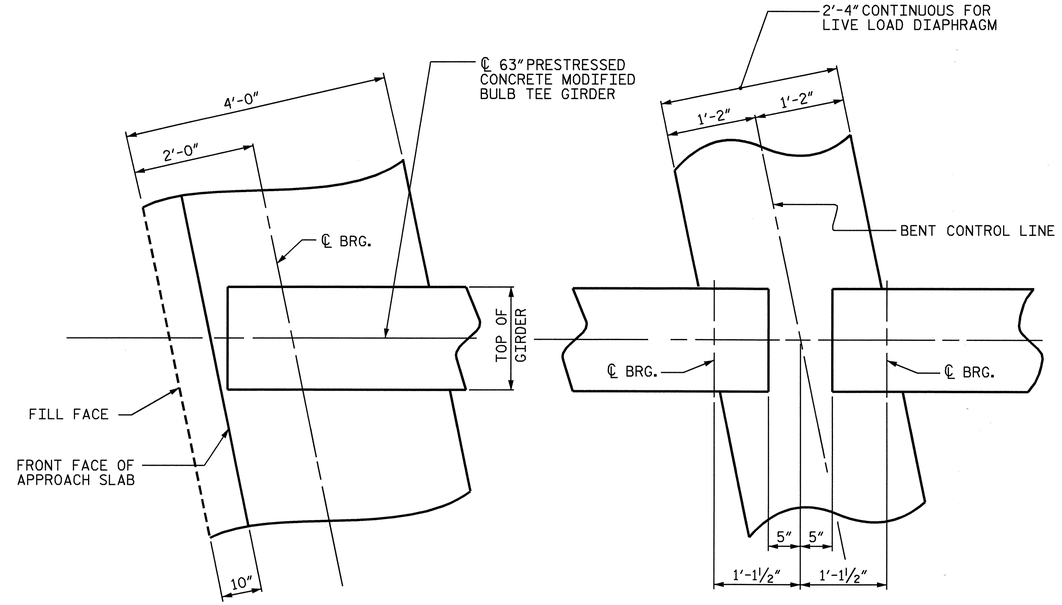
TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS, AND THE NUTS ON THE 1¼" DIA. TIE RODS SHALL BE FULLY TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.

FOR LOCATION OF SECTIONS, SEE "PLAN OF SPAN" SHEETS.

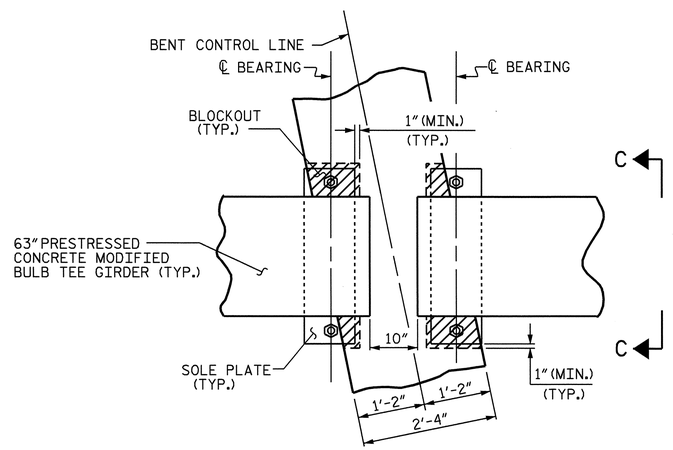



## SECTION C-C




END BENT BENT DIAPHRAGM

## PLAN OF DIAPHRAGMS




PLAN

## BENT DIAPHRAGM BLOCK-OUT DETAIL

#5 "S" BARS EXTENDING FROM ENDS OF GIRDERS NOT SHOWN FOR CLARITY

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
Betsy S. Cox 6-25-08

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TYPICAL SECTION

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-6 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : M.L. BROWN DATE : 7-07
CHECKED BY : S.B. WILLIAMS DATE : 8-07

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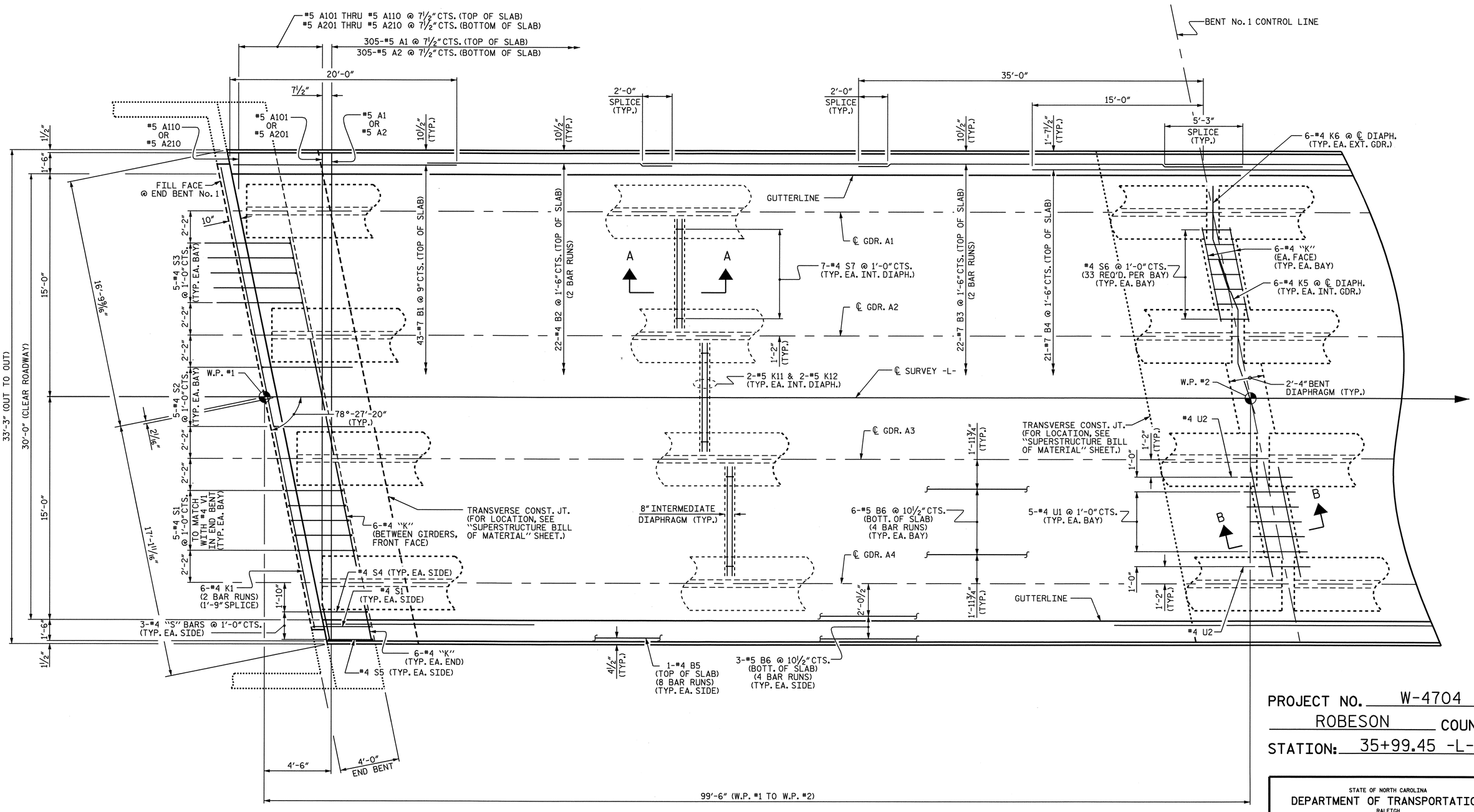
tjbankovich




## PLAN OF SPAN "A"

NOTES:

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

FOR SECTIONS, SEE "TYPICAL SECTION" SHEET 3 OF 3.

FOR REINFORCING STEEL IN END BENT CAP AND WINGS, SEE "END BENT" SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
Betsy S. Cox 6/25/08

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN "A"

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-7 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : M.L. BROWN DATE : 7/07
CHECKED BY : S.B. WILLIAMS DATE : 8/07

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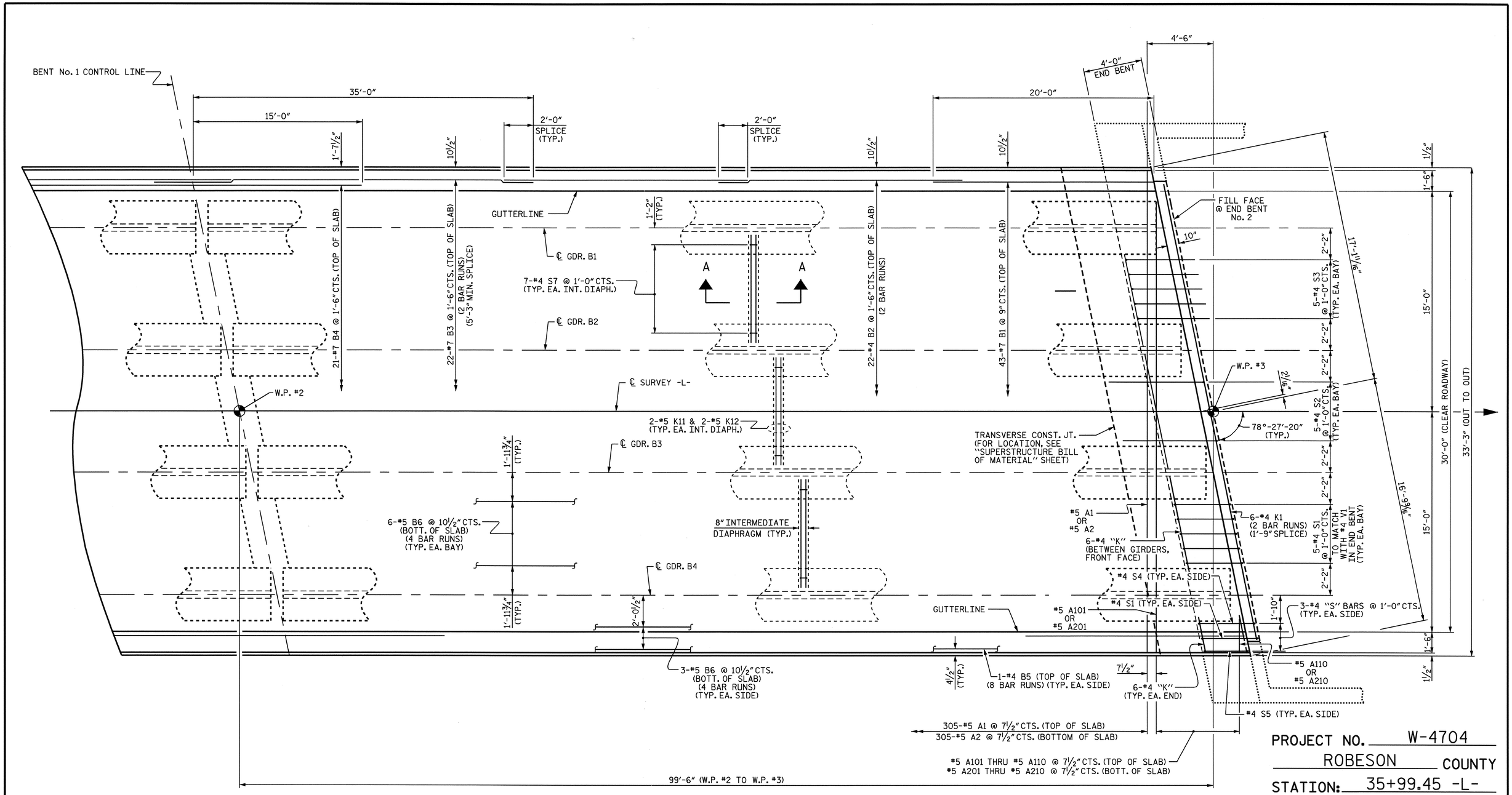
tjbankovich




PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

## PLAN OF SPAN "B"

NOTES:

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

FOR SECTIONS, SEE "TYPICAL SECTION" SHEET 3 OF 3.

FOR REINFORCING STEEL IN END BENT CAP AND WINGS, SEE "END BENT" SHEETS.

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

Licensed Engineer

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN "B"

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-8 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : M.L. BROWN DATE : 7/07
CHECKED BY : S.B. WILLIAMS DATE : 8/07

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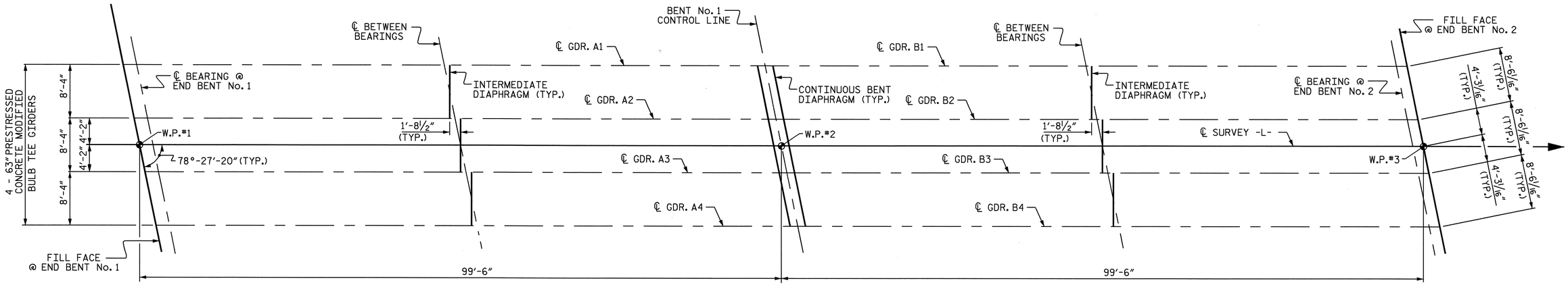
tjbankovich




FIX. E1

FIX. E4, P1

FIX. E4, P1

FIX. E1

SPAN "A"

SPAN "B"

# FRAMING PLAN

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

Betsy S. Cox 6-25-08

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-9 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : M.L. BROWN DATE : 7/07
CHECKED BY : S.B. WILLIAMS DATE : 7/07

23-JUN-2008 08:11
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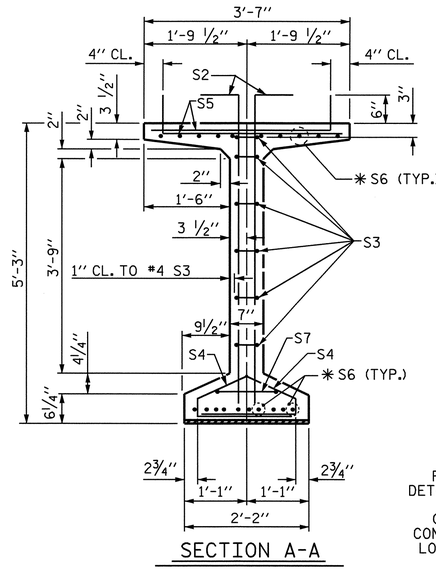
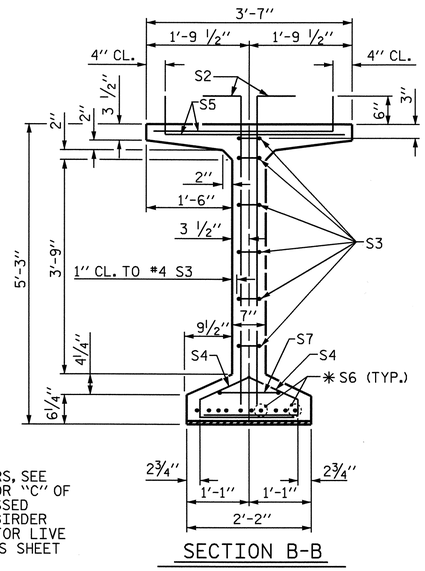
tjbankovich

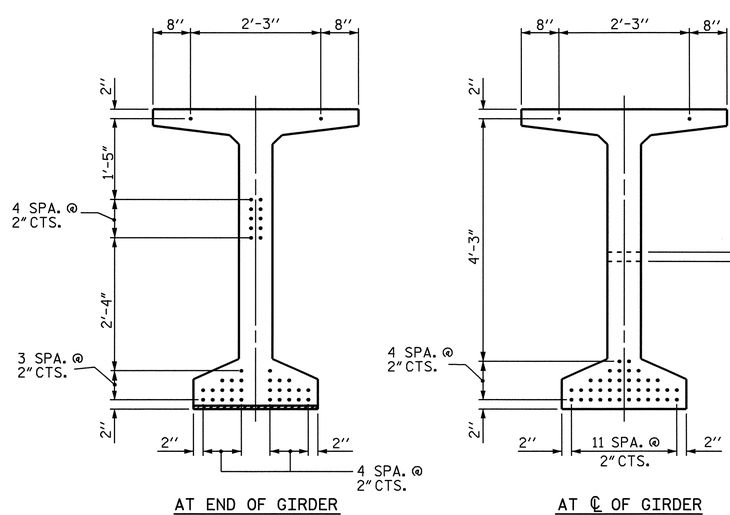



SECTION A-A

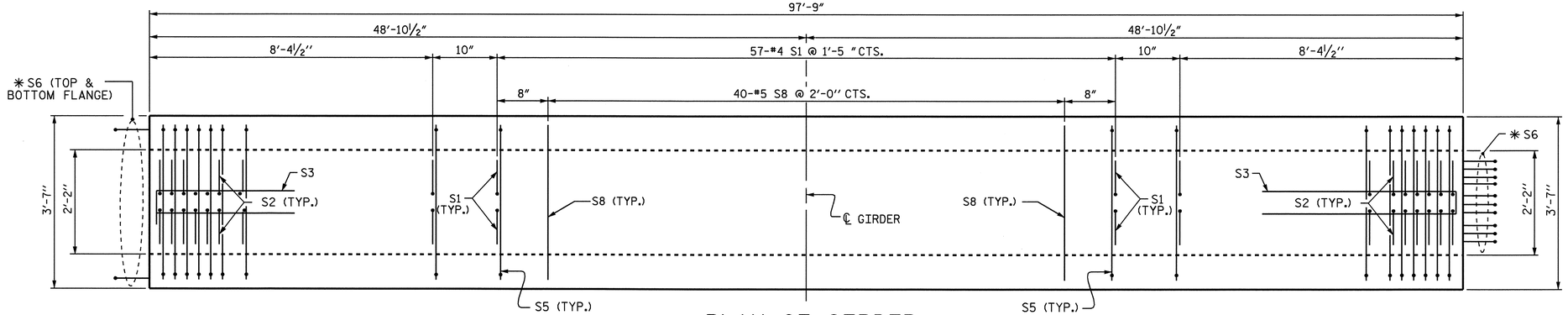



SECTION B-B

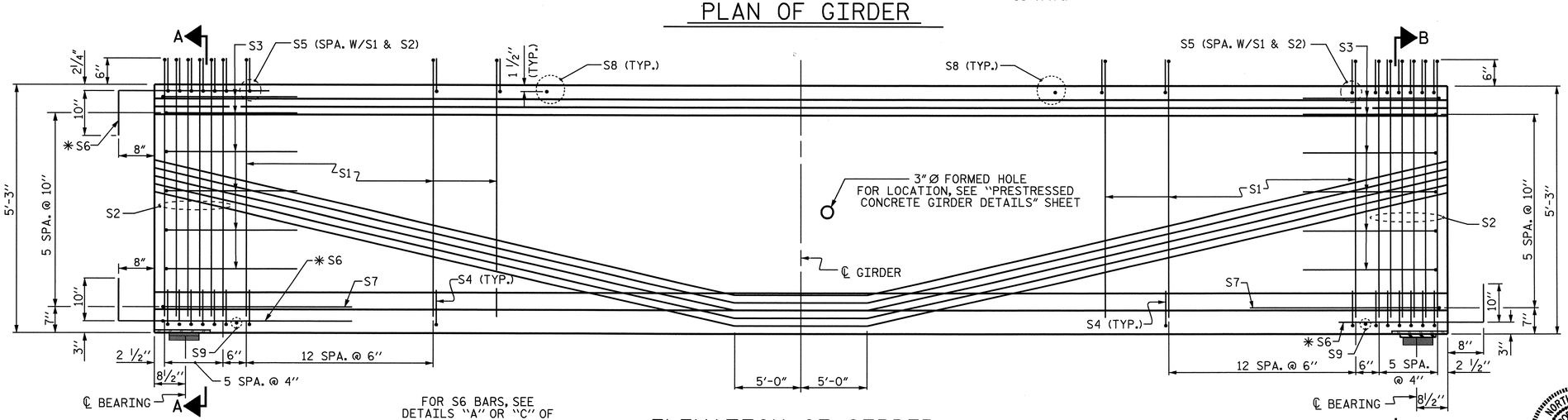
FOR S6 BARS, SEE DETAILS "A" OR "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET




1/2" Ø LOW RELAXATION STRAND LAYOUT




PLAN OF GIRDER




FOR S6 BARS, SEE DETAILS "A" OR "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

ELEVATION OF GIRDER

(SPAN A SHOWN, SPAN B SIMILAR)

| 1/2" Ø L. R. GRADE 270 STRANDS | | |
|---|---|---|
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
| 0.153 | 41,300 | 30,980 |

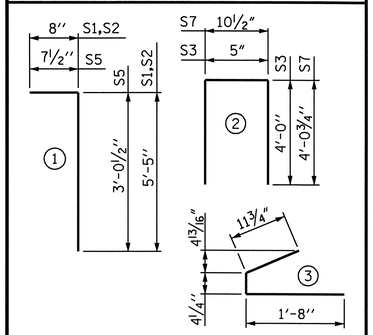
REINFORCING STEEL FOR ONE GDR

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 166 | #4 | 1 | 6'-1" | 675 |
| S2 | 24 | #5 | 1 | 6'-1" | 152 |
| S3 | 12 | #4 | 2 | 8'-5" | 67 |
| S4 | 76 | #4 | 3 | 3'-0" | 152 |
| S5 | 190 | #5 | 1 | 3'-8" | 727 |
| * S6 | 30 | #5 | STR | 3'-8" | 115 |
| S7 | 2 | #5 | 2 | 9'-0" | 19 |
| S8 | 40 | #5 | STR | 3'-3" | 136 |
| S9 | 2 | #3 | STR | 1'-10" | 1 |

* NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT




QUANTITIES FOR ONE GIRDER

| | REINFORCING STEEL | 7,000 PSI CONCRETE | 1/2" Ø L.R. STRANDS |
|---|---|---|---|
| | LB. | C.Y. | No. |
| GIRDER QUANTITY | 2044 | 19.4 | 40 |

GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 8 | 97'-9" | 782'-0" |

INITIAL CONCRETE STRENGTH = 5,700 psi

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD SPANS A AND B

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

8-22-08

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-10 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

ASSEMBLED BY : M.L. BROWN DATE : 7/07
CHECKED BY : S.B. WILLIAMS DATE : 8/07

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

REV. 8/16/99 RWW/LES
REV. 10/17/00 RWW/LES
REV. 5/1/06 TLA/GM

21-AUG-2008 10:15
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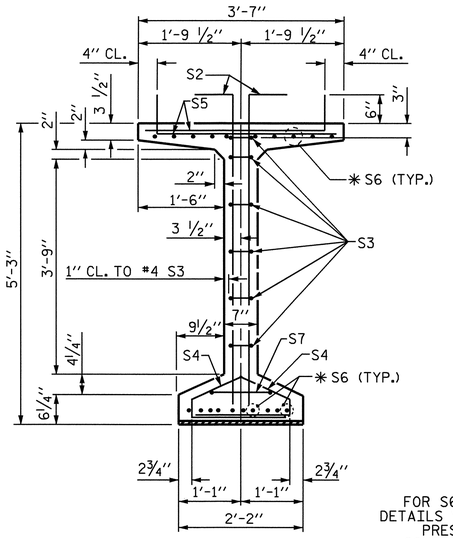
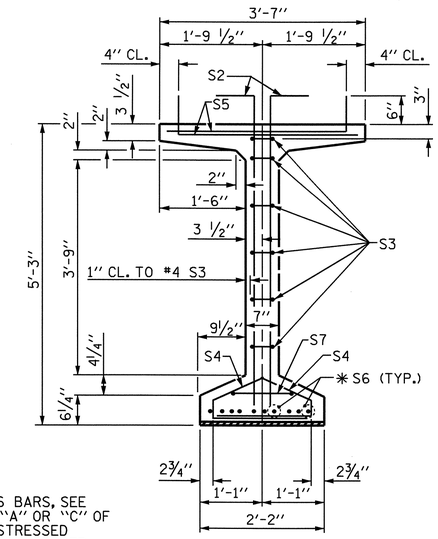
tbeach

STD. NO. PCG9 (Sht. 1)

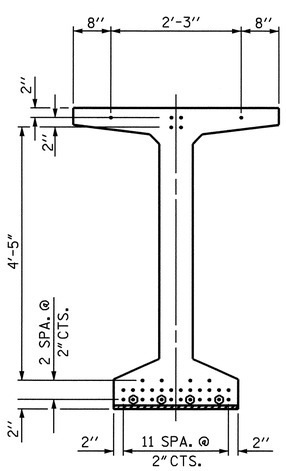



SECTION A-A

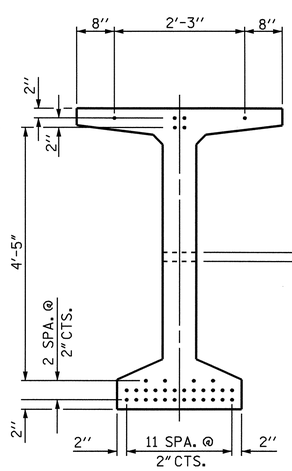



SECTION B-B

FOR S6 BARS, SEE DETAILS "A" OR "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET




AT END OF GIRDER

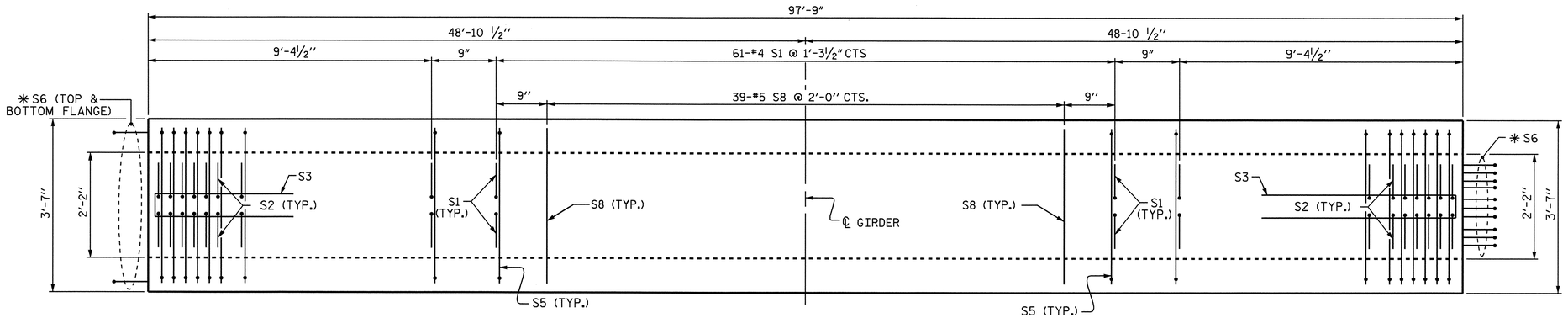



AT ℄ OF GIRDER

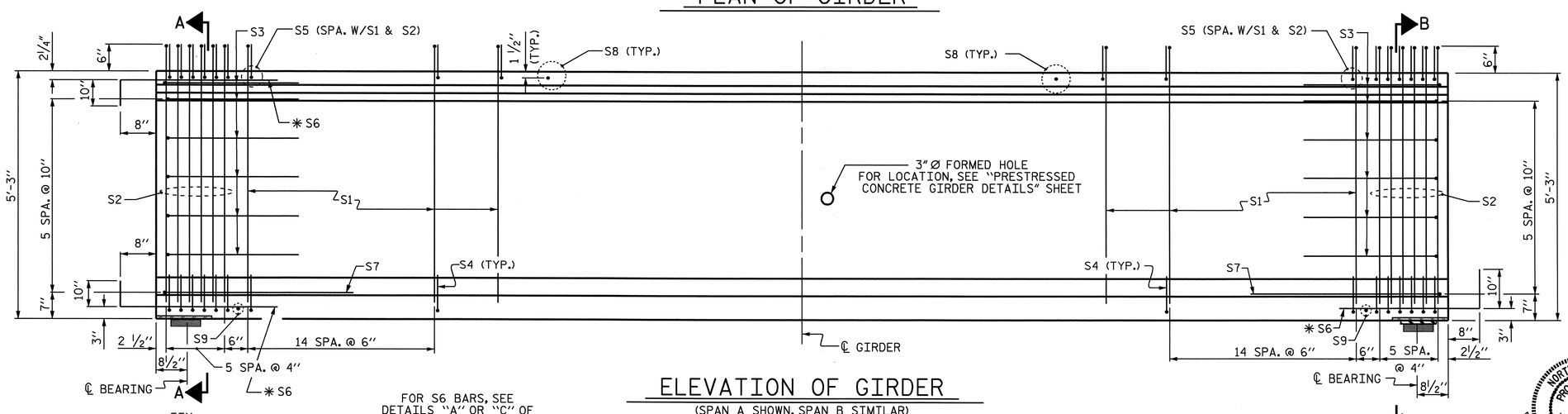
0.6" Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ⬣ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER




PLAN OF GIRDER




ELEVATION OF GIRDER

(SPAN A SHOWN, SPAN B SIMILAR)

FOR S6 BARS, SEE DETAILS "A" OR "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

## 0.6" Ø L. R. GRADE 270 STRANDS

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

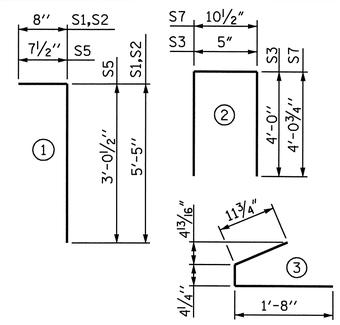
## REINFORCING STEEL FOR ONE GDR

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 182 | #4 | 1 | 6'-1" | 740 |
| S2 | 24 | #5 | 1 | 6'-1" | 152 |
| S3 | 12 | #4 | 2 | 8'-5" | 67 |
| S4 | 84 | #4 | 3 | 3'-0" | 168 |
| S5 | 206 | #5 | 1 | 3'-8" | 788 |
| ✱S6 | 30 | #5 | STR | 3'-8" | 115 |
| S7 | 2 | #5 | 2 | 9'-0" | 19 |
| S8 | 39 | #5 | STR | 3'-3" | 132 |
| S9 | 2 | #3 | STR | 1'-10" | 1 |

✱NOTE: S6 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

## BAR TYPES

ALL BAR DIMENSIONS ARE OUT-TO-OUT




## QUANTITIES FOR ONE GIRDER

| | REINFORCING STEEL | 7,000 PSI CONCRETE | 0.6" Ø L.R. STRANDS |
|---|---|---|---|
| | LB. | C.Y. | No. |
| GIRDER QUANTITY | 2182 | 19.4 | 34 |

## GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 8 | 97'-9" | 782'-0" |

INITIAL CONCRETE STRENGTH = 5,700 psi

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# OPTIONAL 63" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS) SPANS A AND B

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

Betsy S. Cox 8-21-08

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

| | |
|---|---|
| ASSEMBLED BY : M.L. BROWN | DATE : 7/07 |
| CHECKED BY : S.B. WILLIAMS | DATE : 8/07 |
| DRAWN BY : RWW 9/19/02 | ADDED 9/19/02 |
| CHECKED BY : GM 9/19/02 | REV. 5/1/06 TLA/GM |

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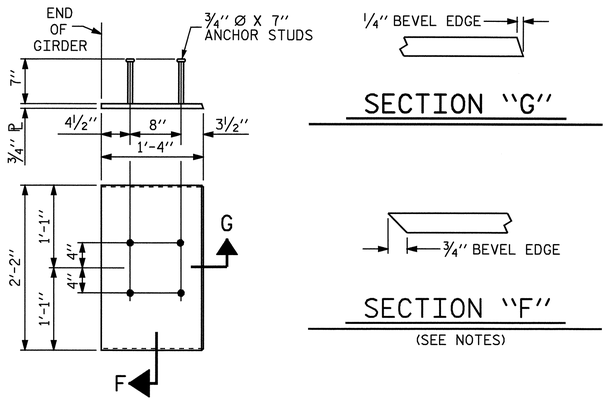
tbeach

STD. NO. PCGD9







SECTION "G"

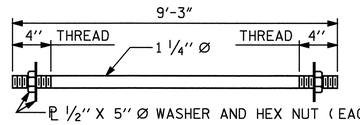



SECTION "F"

(SEE NOTES)

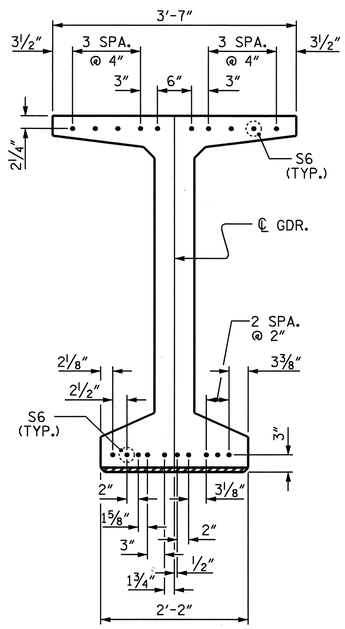
# EMBEDDED PLATE "B-1" DETAILS FOR AASHTO TYPE IV GIRDER AND 63" & 72" MODIFIED BULB TEES

(2 REQ'D PER GIRDER)



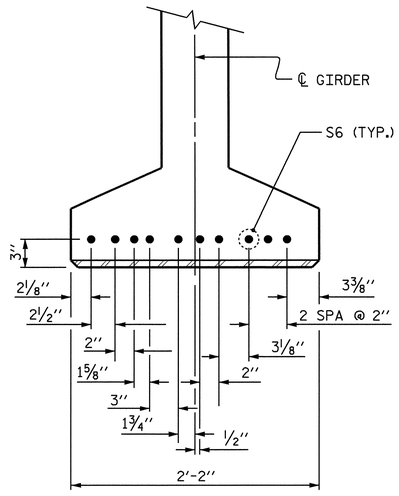

# 1 1/4" Ø TIE ROD ASSEMBLY

( 6 COMPLETE ASSEMBLIES REQUIRED )




DETAIL "A"

END BENT END




DETAIL "C"

INTERIOR BENT END

## NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 60.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5700 PSI.

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

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

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

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

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

FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

## DEAD LOAD DEFLECTION TABLE FOR SPANS "A" & "B"

| 1/2" Ø LOW RELAXATION STRANDS | ALL GIRDERS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 0 |
| CAMBER ( GIRDER ALONE IN PLACE ) ↑ | 0.0 | 0.093 | 0.176 | 0.241 | 0.282 | 0.296 | 0.282 | 0.241 | 0.176 | 0.093 | 0.0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.0 | 0.036 | 0.068 | 0.093 | 0.109 | 0.114 | 0.109 | 0.093 | 0.068 | 0.036 | 0.0 |
| FINAL CAMBER ↑ | 0.0 | 11/16" | 1 5/16" | 1 3/4" | 2 1/16" | 2 3/16" | 2 1/16" | 1 3/4" | 1 5/16" | 11/16" | 0.0 |

* INCLUDES FUTURE WEARING SURFACE

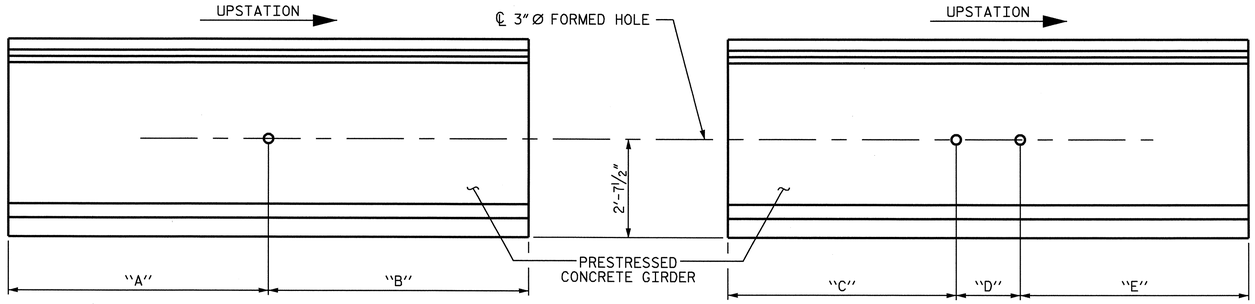
ALL VALUES ARE SHOWN IN FEET ( DECIMAL FORM ), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES ( FRACTION FORM ).

## DEAD LOAD DEFLECTION TABLE FOR SPANS "A" & "B" - OPTIONAL

| 0.6" Ø LOW RELAXATION STRANDS | ALL GIRDERS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TENTH POINTS | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 0 |
| CAMBER ( GIRDER ALONE IN PLACE ) ↑ | 0.0 | 0.094 | 0.177 | 0.242 | 0.284 | 0.298 | 0.284 | 0.242 | 0.177 | 0.094 | 0.0 |
| * DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.0 | 0.036 | 0.068 | 0.093 | 0.109 | 0.114 | 0.109 | 0.093 | 0.068 | 0.036 | 0.0 |
| FINAL CAMBER ↑ | 0.0 | 11/16" | 1 5/16" | 1 13/16" | 2 1/8" | 2 3/16" | 2 1/8" | 1 13/16" | 1 5/16" | 11/16" | 0.0 |

* INCLUDES FUTURE WEARING SURFACE

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




ELEVATION

ELEVATION

# TIE ROD PLACEMENT DETAILS

## TIE ROD PLACEMENT TABLE

SPANS "A" & "B"

| GIRDER | DIM "A" | DIM "B" | DIM "C" | DIM "D" | DIM "E" |
|---|---|---|---|---|---|
| #1 | 49'-8 3/4" | 48'-0 1/4" | | | |
| #2 | | | 48'-0 1/4" | 1'-8 1/2" | 48'-0 1/4" |
| #3 | | | 48'-0 1/4" | 1'-8 1/2" | 48'-0 1/4" |
| #4 | 48'-0 1/4" | 49'-8 3/4" | | | |


PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

| | |
|---|---|
| ASSEMBLED BY : M.L. BROWN DATE : 7/07 | |
| CHECKED BY : S.B. WILLIAMS DATE : 8/07 | |
| DRAWN BY : ELR 11/91 | REV. 10/17/00 RWW/LES |
| CHECKED BY : GRP 11/91 | REV. 7/10/01RR LES/RDR |
| | REV. 5/1/06 TLA/GM |

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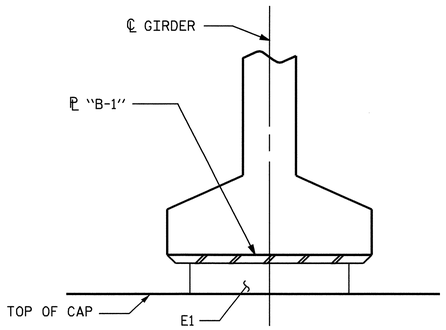
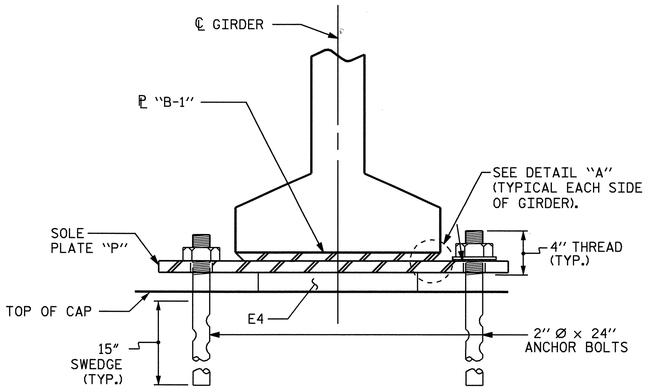
tbeach

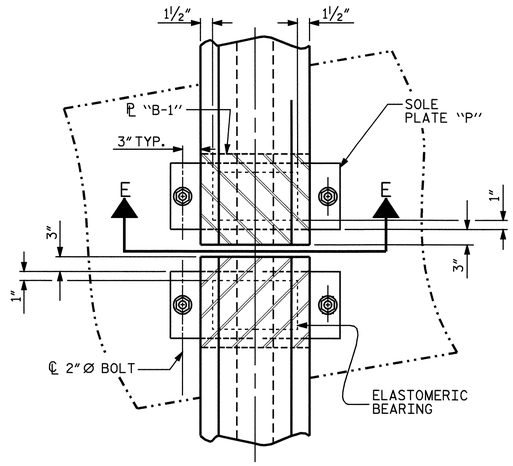
STD. NO. PCG11 (Sht. 5a)




SECTION D-D




SECTION E-E




PLAN VIEW AT BENT

## NOTES

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

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

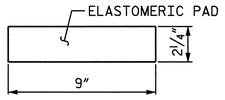
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

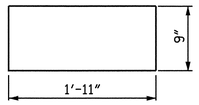
SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

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

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

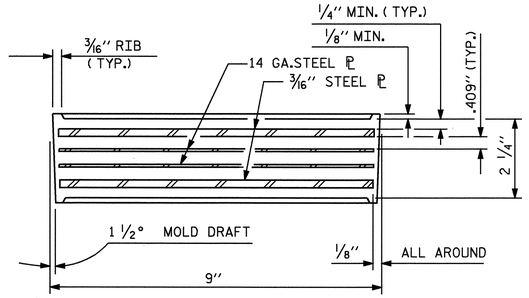



TYPICAL SECTION OF E1 ELASTOMERIC BEARINGS

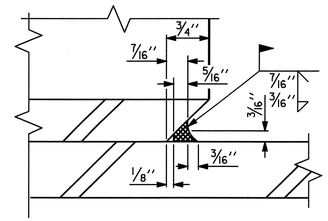



E1
( FIXED )
E1 ( 8 REQ'D )

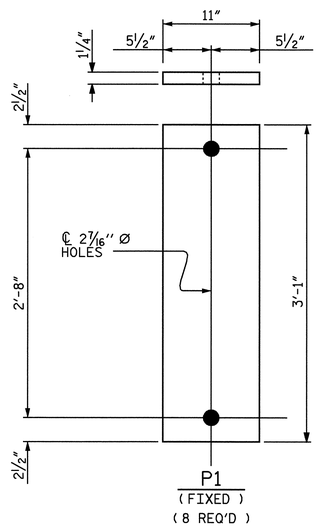
PLAN VIEW OF ELASTOMERIC BEARING




TYPICAL SECTION OF E4 ELASTOMERIC BEARINGS

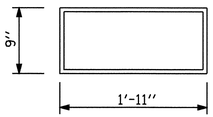



DETAIL "A"




P1
( FIXED )
( 8 REQ'D )

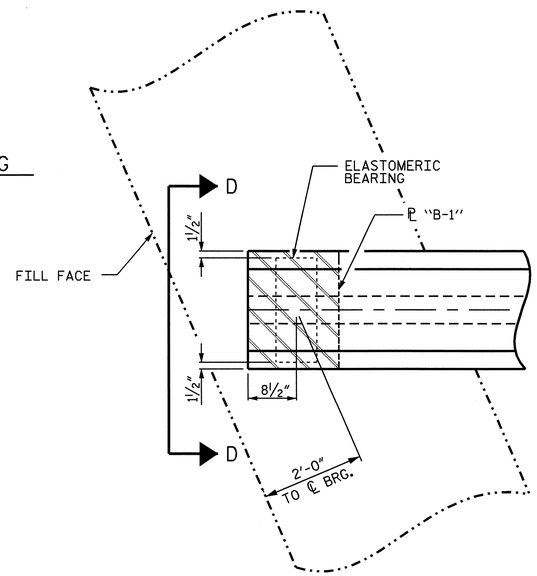
SOLE PLATE DETAILS ( "P" )




E4 ( 8 REQ'D )

PLAN VIEW OF ELASTOMERIC BEARING

TYPE V




PLAN VIEW AT END BENTS

| LOAD RATINGS | |
|---|---|
| | MAX.D.L.+ L.L. |
| TYPE V | 180 K |

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

| ASSEMBLED BY : M.L. BROWN | DATE : 7/07 |
|---|---|
| CHECKED BY : S.B. WILLIAMS | DATE : 7/07 |
| DRAWN BY : EEM 2/97 | REV. 8/16/99 RWW/LES |
| CHECKED BY : VAP 2/97 | REV. 10/17/00 RWW/LES |
| | REV. 5/1/06 TLA/GM |

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-13 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

Betsy S. Cox 12-22-08

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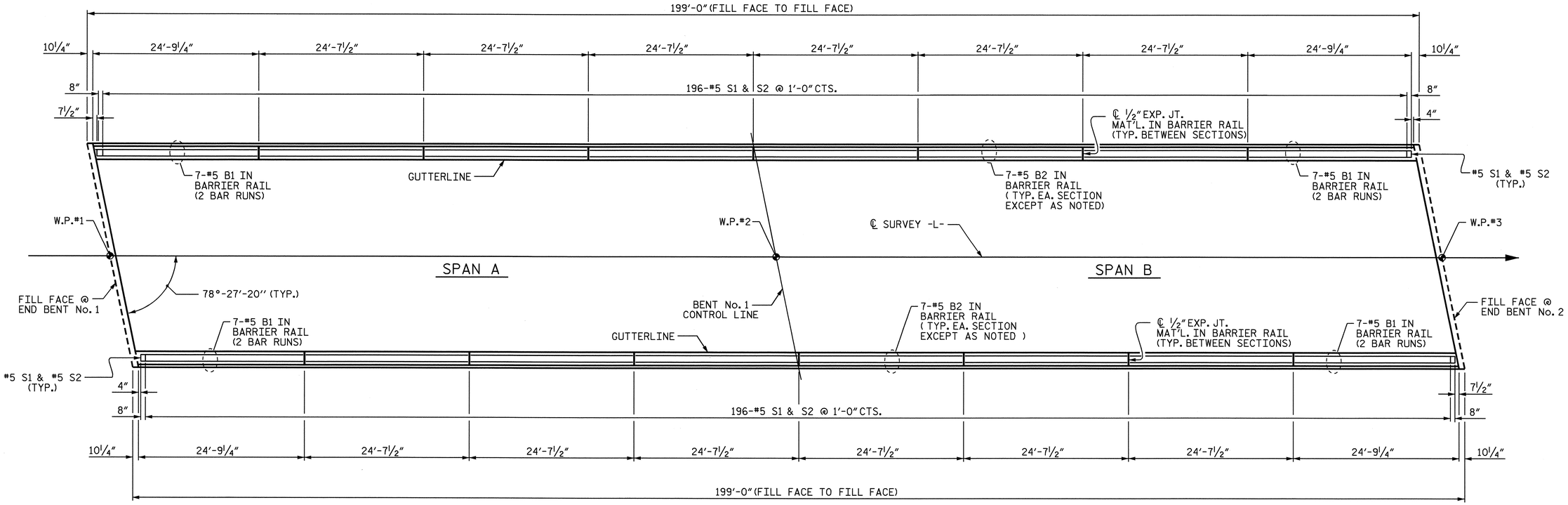
STD. NO. EB4




# PLAN OF BARRIER RAIL

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : M.L. BROWN DATE : 8/07
CHECKED BY : S.B. WILLIAMS DATE : 8/07

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tjbankovich

# NOTES

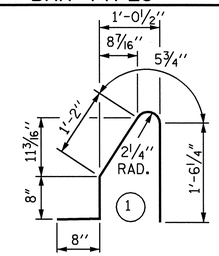
THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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

THE #5 "S" BARS MAY BE SHIFTED AS NECESSARY IN ORDER TO MAINTAIN A 2" MINIMUM CLEARANCE TO THE 1/2" EXPANSION JOINT MATERIAL IN BARRIER RAIL.

## BAR TYPES



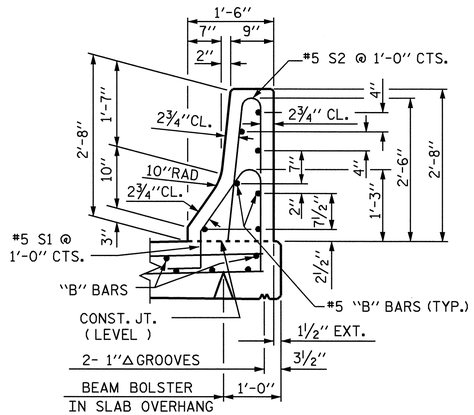

ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

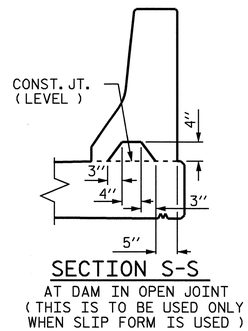
FOR CONCRETE BARRIER RAIL ONLY

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| * S1 | 396 | #5 | 1 | 4'-6" | 1859 |
| * S2 | 396 | #5 | 2 | 5'-2" | 2134 |
| * B1 | 56 | #5 | STR | 14'-1' | 823 |
| * B2 | 84 | #5 | STR | 24'-3" | 2125 |

| | |
|---|---|
| * EPOXY COATED REINFORCING STEEL | 6941 LBS. |
| CLASS AA CONCRETE | 39.5 CU. YDS. |
| CONCRETE BARRIER RAIL | 394.58 LIN. FT. |

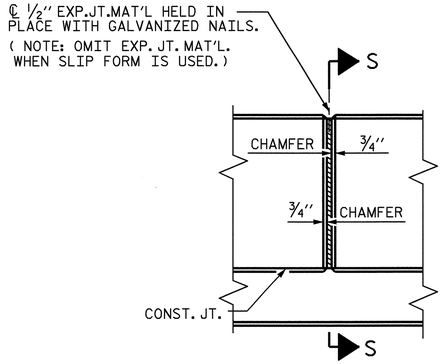



SECTION THRU RAIL




SECTION S-S

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




ELEVATION AT EXPANSION JOINTS

# BARRIER RAIL DETAILS

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
CONCRETE BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX 6/25/08

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

| | | |
|---|---|---|
| ASSEMBLED BY : M.L. BROWN | DATE : | 8/07 |
| CHECKED BY : S.B. WILLIAMS | DATE : | 8/07 |
| DRAWN BY : ARB | 5/87 | REV. 10/17/00 RWW/LES |
| CHECKED BY : SJD | 9/87 | REV. 5/7/03R RWW/JTE |
| | | REV. 5/1/06 TLA/GM |

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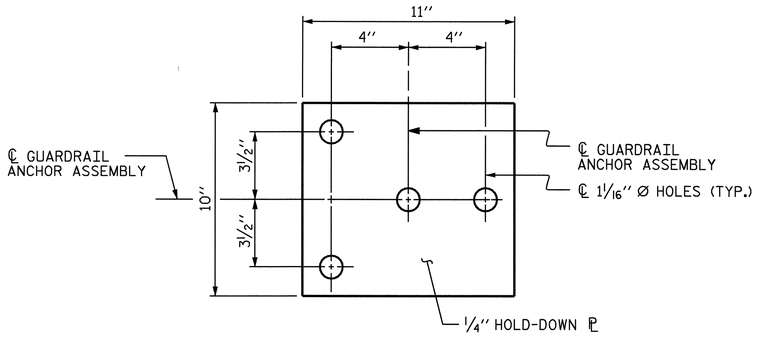
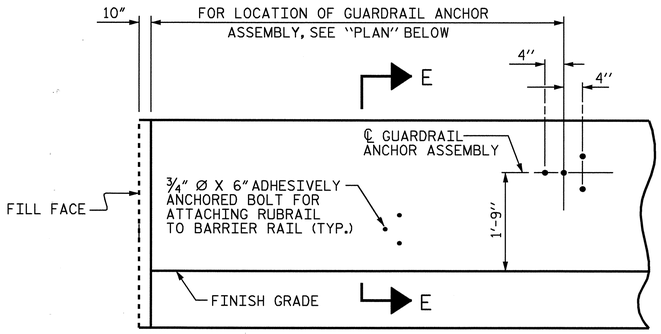
tjbankovich

STD. NO. CBR1 (SHT 3)

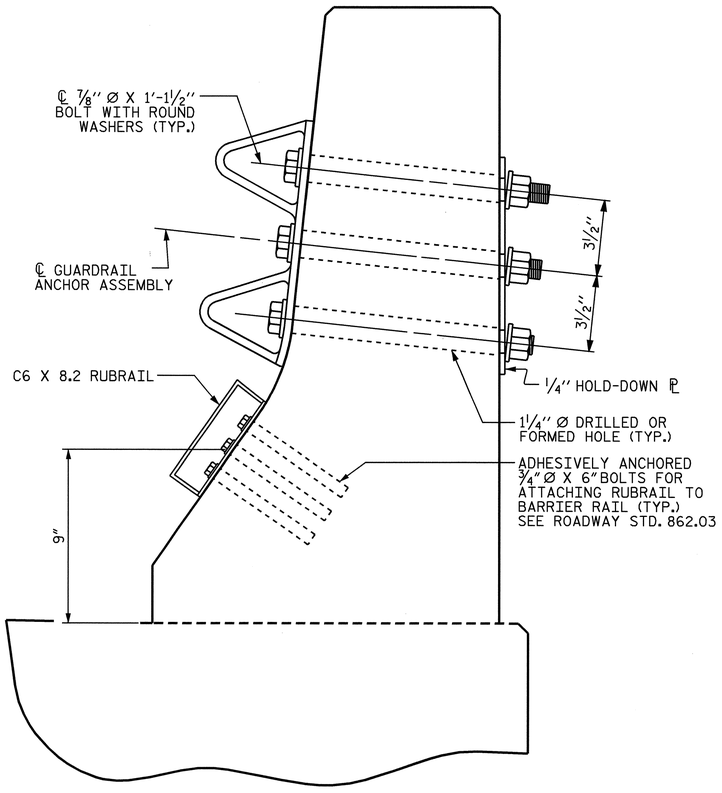



PLAN



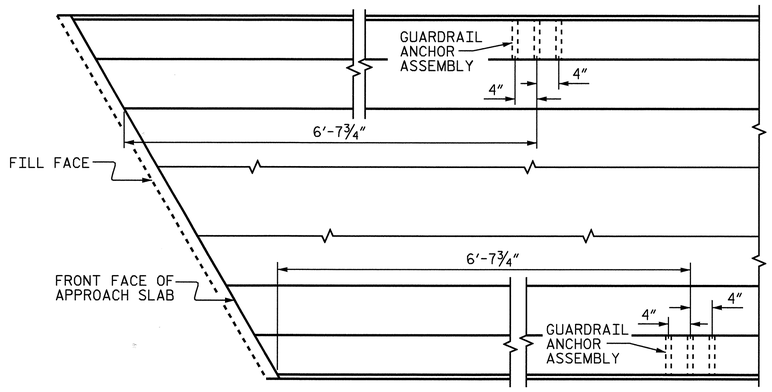

ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03




SECTION E-E

## GUARDRAIL ANCHOR ASSEMBLY DETAILS




PLAN

## LOCATION OF ANCHORS FOR GUARDRAIL

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

## NOTES

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

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

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

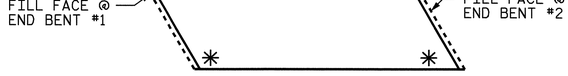
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

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




SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# GUARDRAIL ANCHORAGE FOR BARRIER RAIL

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
12/4/2008

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-16 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

| | |
|---|---|
| ASSEMBLED BY : M.L. BROWN DATE : 8/07 | |
| CHECKED BY : S.B. WILLIAMS DATE : 8/07 | |
| DRAWN BY : TLA 5/06 | ADDED 5/1/06 |
| CHECKED BY : GM 5/06 | |

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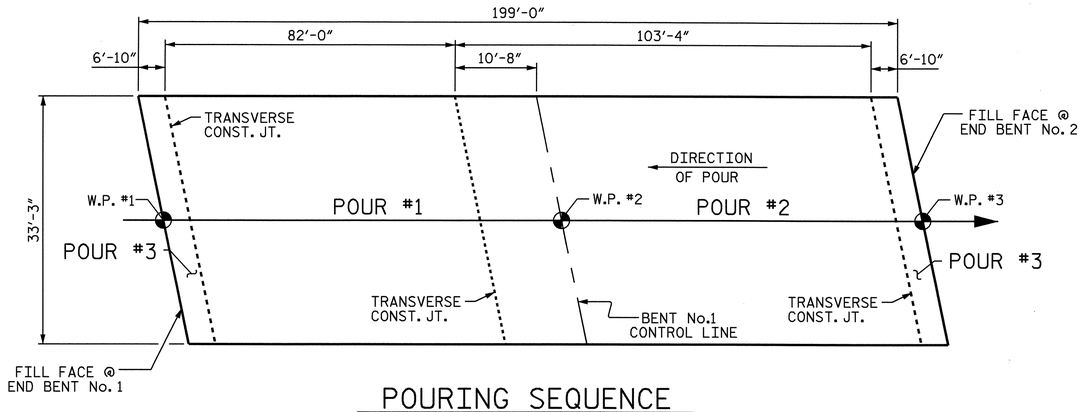
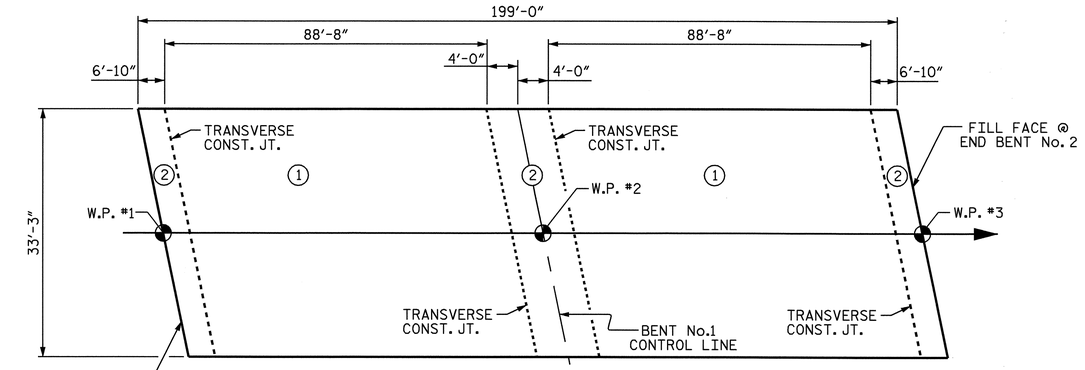
tjbankovich

(SHT 3) STD. NO. GRA2

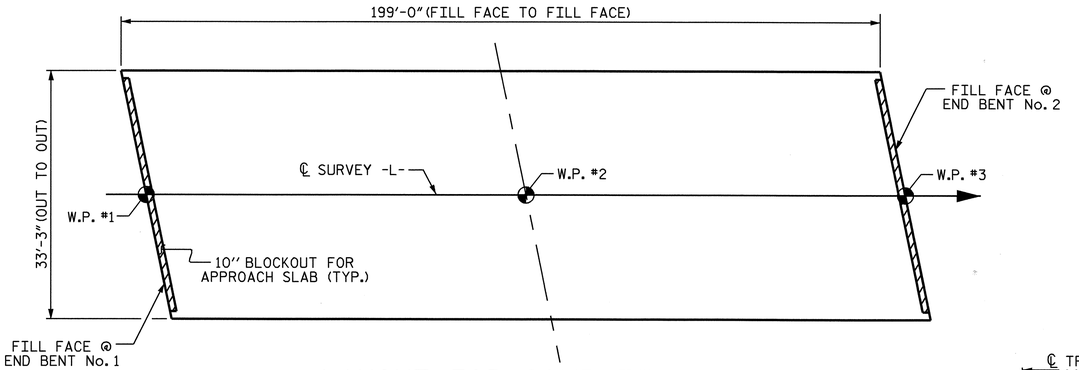



## POURING SEQUENCE

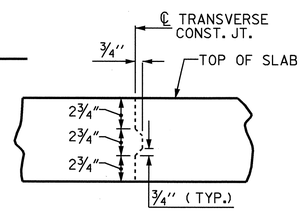



## OPTIONAL POURING SEQUENCE

POUR (2) CANNOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.




## LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB ( SQ. FT. = 6617.0 )




## TRANSVERSE CONSTRUCTION JOINT DETAIL

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

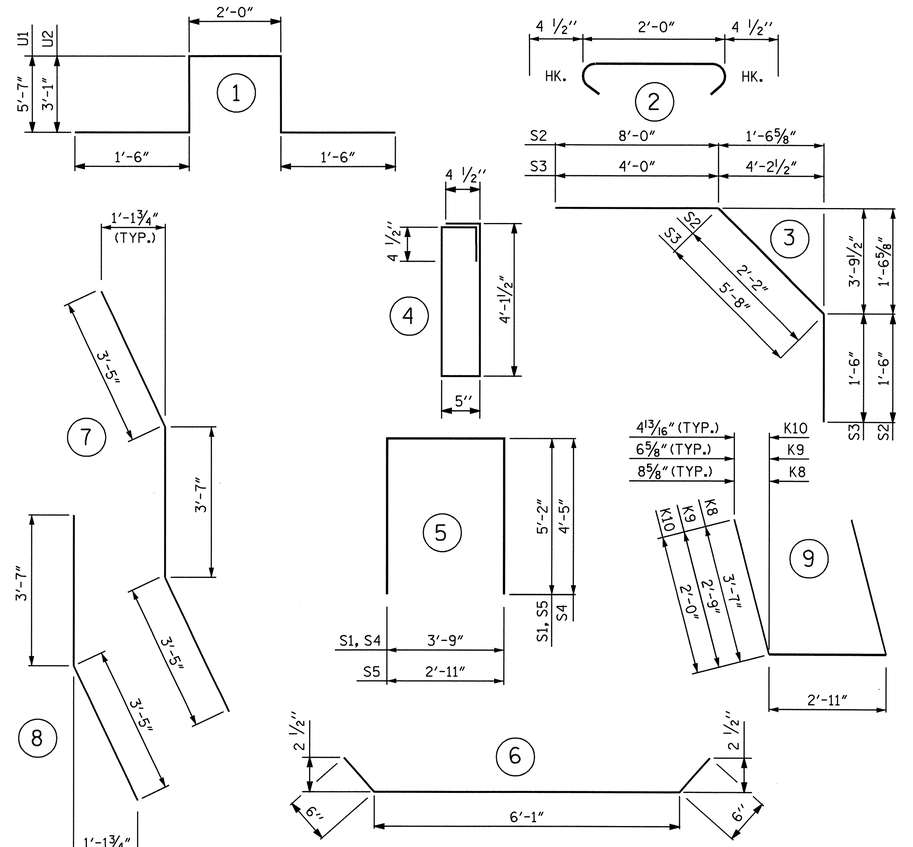
## BAR SCHEDULE

SPANS A & B

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✳A1 | 305 | #5 | STR | 32′-11″ | 10471 |
| A2 | 305 | #5 | STR | 32′-11″ | 10471 |
| | | | | | |
| ✳A101 | 2 | #5 | STR | 30-5″ | 63 |
| ✳A102 | 2 | #5 | STR | 27′-4″ | 57 |
| ✳A103 | 2 | #5 | STR | 24′-3″ | 51 |
| ✳A104 | 2 | #5 | STR | 21′-3″ | 44 |
| ✳A105 | 2 | #5 | STR | 18′-2″ | 38 |
| ✳A106 | 2 | #5 | STR | 15′-1″ | 31 |
| ✳A107 | 2 | #5 | STR | 12′-1″ | 25 |
| ✳A108 | 2 | #5 | STR | 9′-0″ | 19 |
| ✳A109 | 2 | #5 | STR | 5′-11″ | 12 |
| ✳A110 | 2 | #5 | STR | 2′-10″ | 6 |
| | | | | | |
| A201 | 2 | #5 | STR | 30-5″ | 63 |
| A202 | 2 | #5 | STR | 27′-4″ | 57 |
| A203 | 2 | #5 | STR | 24′-3″ | 51 |
| A204 | 2 | #5 | STR | 21′-3″ | 44 |
| A205 | 2 | #5 | STR | 18′-2″ | 38 |
| A206 | 2 | #5 | STR | 15′-1″ | 31 |
| A207 | 2 | #5 | STR | 12′-1″ | 25 |
| A208 | 2 | #5 | STR | 9′-0″ | 19 |
| A209 | 2 | #5 | STR | 5′-11″ | 12 |
| A210 | 2 | #5 | STR | 2′-10″ | 6 |
| | | | | | |
| ✳B1 | 86 | #7 | STR | 19′-10″ | 3486 |
| ✳B2 | 88 | #4 | STR | 24′-10″ | 1460 |
| ✳B3 | 44 | #7 | STR | 37′-8″ | 3388 |
| ✳B4 | 21 | #7 | STR | 30′-0″ | 1288 |
| ✳B5 | 16 | #4 | STR | 26′-4″ | 281 |
| B6 | 96 | #5 | STR | 50′-10″ | 5090 |
| | | | | | |
| K1 | 24 | #4 | STR | 16′-9″ | 269 |
| K2 | 48 | #4 | STR | 7′-5″ | 238 |
| K3 | 6 | #4 | STR | 5′-10″ | 23 |
| K4 | 6 | #4 | STR | 4′-10″ | 19 |
| K5 | 12 | #4 | 7 | 10′-5″ | 84 |
| K6 | 12 | #4 | 8 | 7′-0″ | 56 |
| K7 | 12 | #4 | STR | 4′-6″ | 36 |
| K8 | 16 | #4 | 9 | 10′-1″ | 108 |
| K9 | 4 | #4 | 9 | 8′-5″ | 22 |
| K10 | 4 | #4 | 9 | 6′-11″ | 18 |
| K11 | 12 | #5 | 6 | 7′-1″ | 89 |
| K12 | 12 | #5 | STR | 7′-5″ | 93 |
| | | | | | |
| S1 | 34 | #4 | 5 | 14′-1″ | 320 |
| ✳S2 | 30 | #4 | 3 | 11′-8″ | 234 |
| ✳S3 | 30 | #4 | 3 | 11′-2″ | 224 |
| S4 | 4 | #4 | 5 | 12′-7″ | 34 |
| S5 | 4 | #4 | 5 | 13′-3″ | 35 |
| S6 | 99 | #4 | 2 | 2′-9″ | 182 |
| S7 | 42 | #4 | 4 | 9′-10″ | 276 |
| | | | | | |
| U1 | 15 | #4 | 1 | 16′-2″ | 162 |
| U2 | 6 | #4 | 1 | 11′-2″ | 45 |
| | | | | | |

REINFORCING STEEL = 18016 LBS
✳EPOXY COATED REINF. STEEL = 21178 LBS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## GROOVING BRIDGE FLOORS

| | | |
|---|---|---|
| APPROACH SLABS | 679.0 | SQ.FT. |
| BRIDGE DECK | 5327.0 | SQ.FT. |
| TOTAL | 6006.0 | SQ.FT. |

## SUPERSTRUCTURE BILL OF MATERIAL

| | CLASS AA CONCRETE | REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|---|---|---|---|
| | ( CU. YDS. ) | ( LBS. ) | ( LBS. ) |
| SPAN A & B | | | |
| POUR #1 | 95.6 | | |
| POUR #2 | 130.2 | | |
| POUR #3 | 64.8 | | |
| | | | |
| TOTALS✳✳ | 290.6 | 18016 | 21178 |

✳✳QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

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

| BAR SIZE | SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL | | APPROACH SLABS | | PARAPET AND BARRIER RAIL |
|---|---|---|---|---|---|
| | EPOXY COATED | UNCOATED | EPOXY COATED | UNCOATED | |
| #4 | 2′-0″ | 1′-9″ | 2′-0″ | 1′-9″ | 2′-9″ |
| #5 | 2′-6″ | 2′-2″ | 2′-6″ | 2′-2″ | 3′-5″ |
| #6 | 3′-0″ | 2′-7″ | 3′-10″ | 2′-7″ | 4′-4″ |
| #7 | 5′-3″ | 3′-6″ | —— | —— | —— |
| #8 | 6′-10″ | 4′-7″ | —— | —— | —— |

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
# SUPERSTRUCTURE BILL OF MATERIAL

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-17 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

STD. NO. BOM2

| | | | |
|---|---|---|---|
| ASSEMBLED BY : M.L. BROWN | DATE : 8/07 | | |
| CHECKED BY : S.B. WILLIAMS | DATE : 8/07 | | |
| DRAWN BY : JMB 5/87 | REV. 6/1/94 | EEM/GRP | |
| CHECKED BY : SJD 9/87 | REV. 8/16/99 | RWW/LES | |
| | REV. 5/1/06 | TLA/GM | |

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tjbankovich

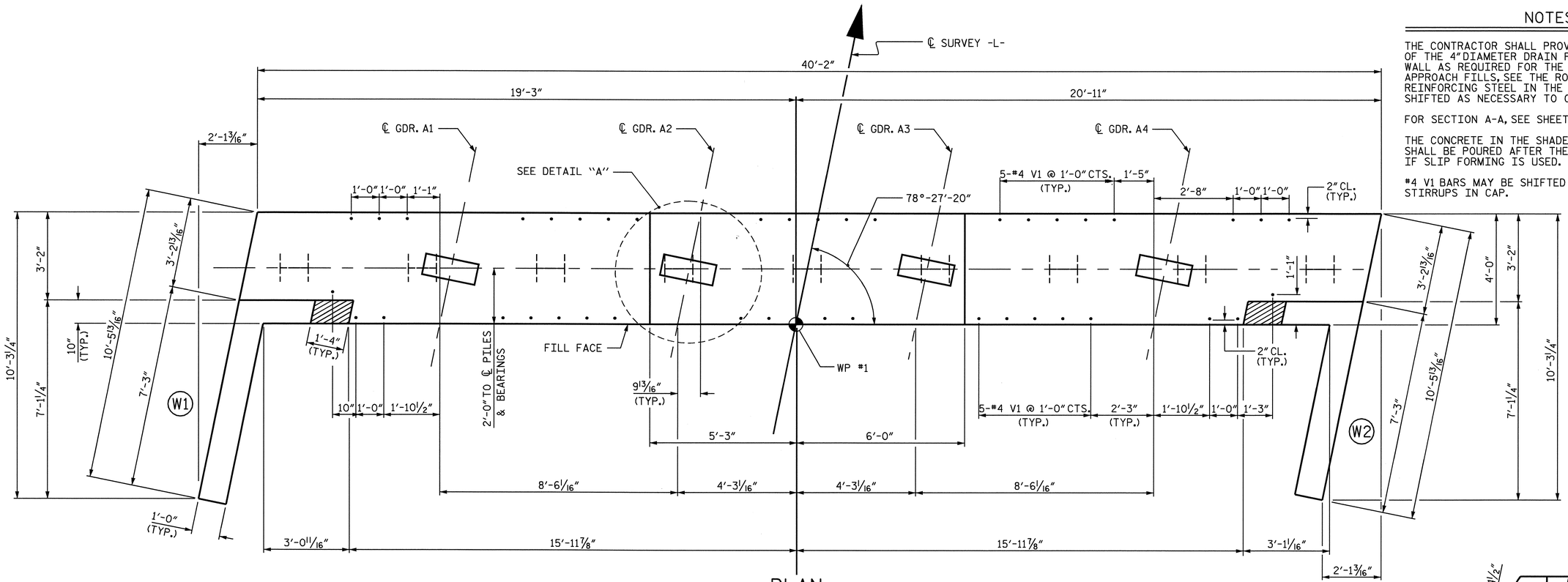
## NOTES:

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

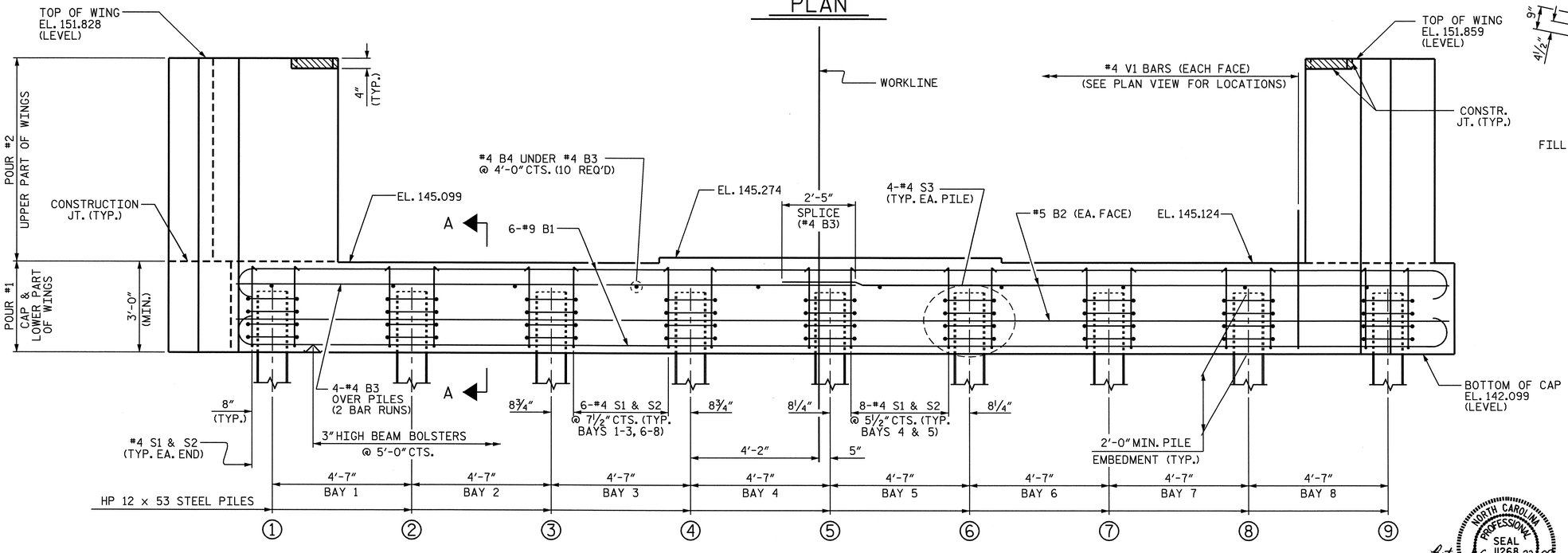
FOR SECTION A-A, SEE SHEET 3 OF 3.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

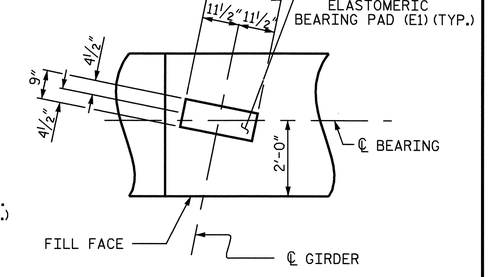
#4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.




PLAN




ELEVATION




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

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-18 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : M.L. BROWN DATE : 4/08
CHECKED BY : N. PIERCE DATE : 4/08

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
Betsy S. Cox 12-22-08

21-AUG-2008 12:06
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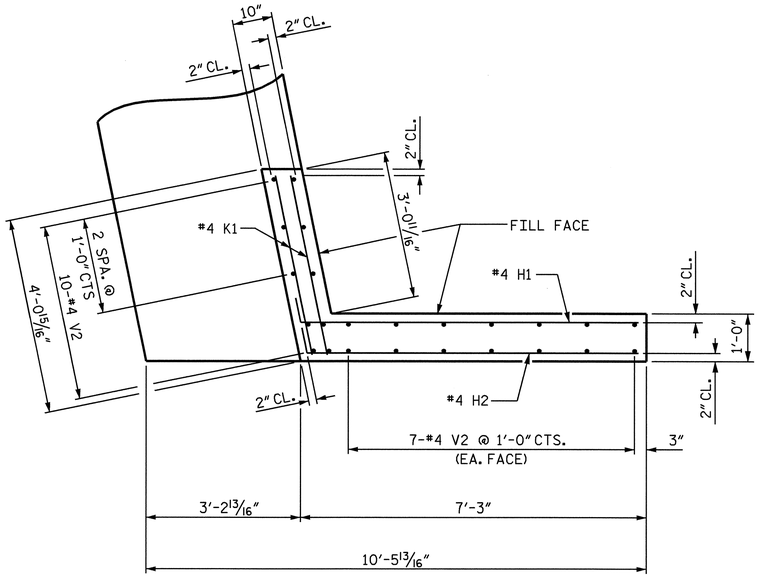
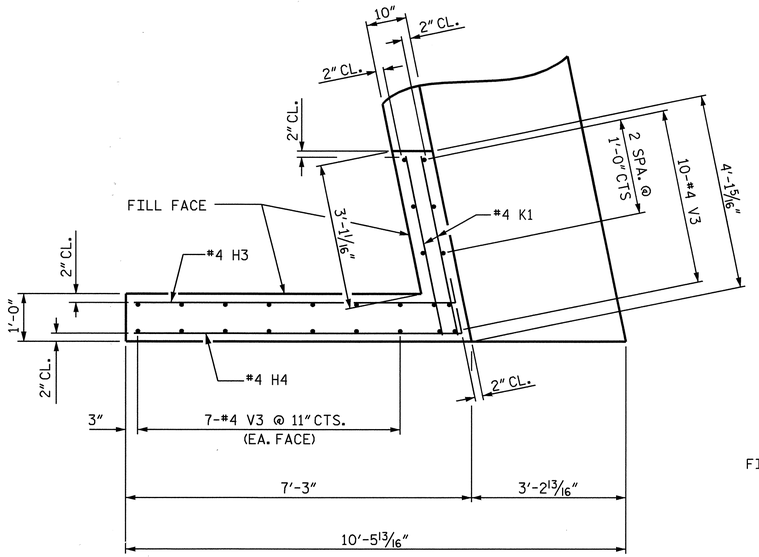
tbeach

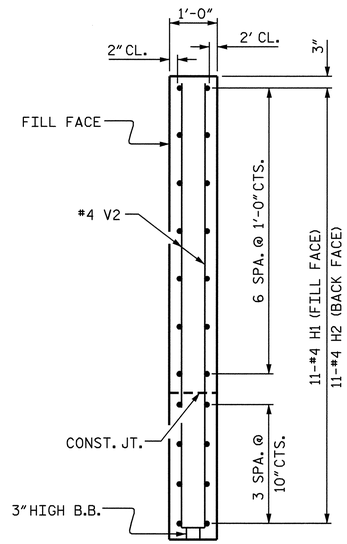
NCDOT



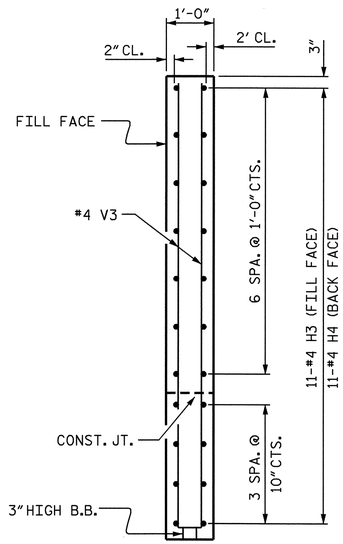

## PLAN OF WING W1



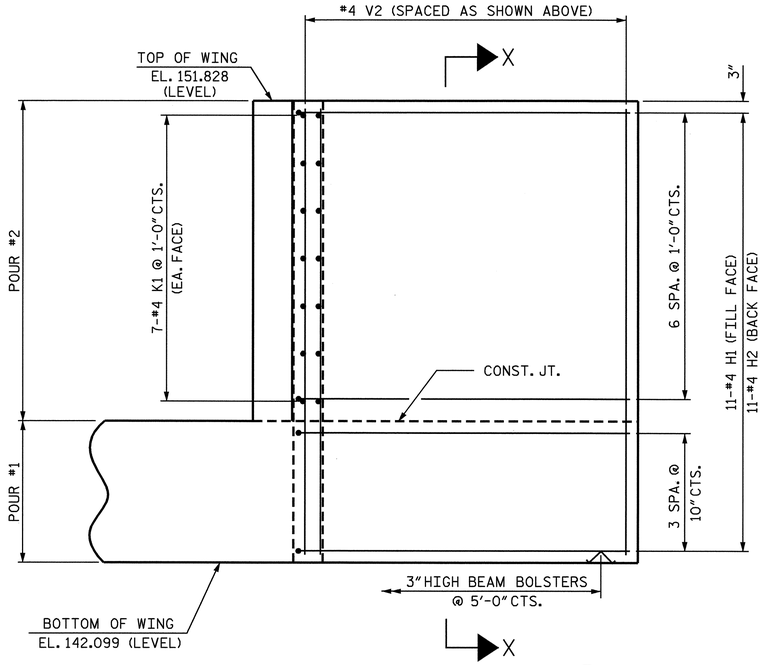

## PLAN OF WING W2



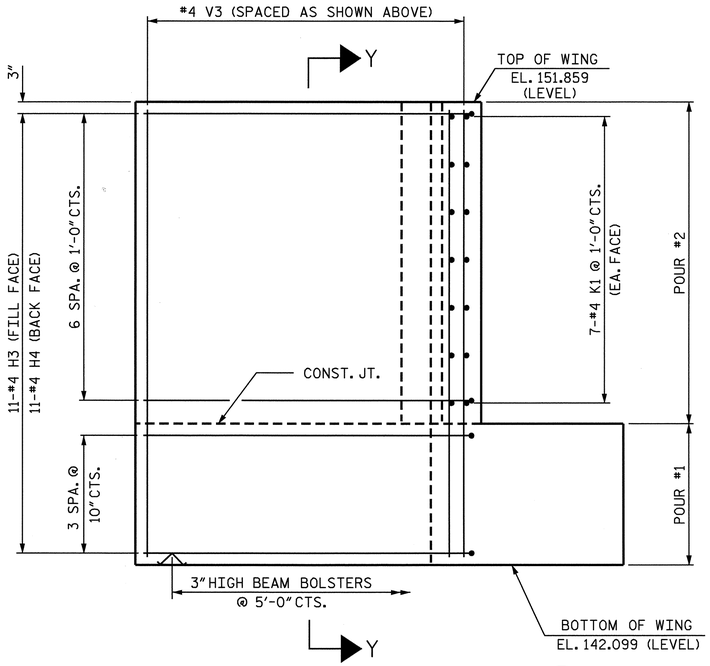

## SECTION X-X




## SECTION Y-Y




## ELEVATION OF WING W1




## ELEVATION OF WING W2

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
6/25/08

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-19 |
| 1 | | | 3 | | | TOTAL SHEETS |
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DRAWN BY : M. L. BROWN DATE : 4/08
CHECKED BY : N. PIERCE DATE : 4/08

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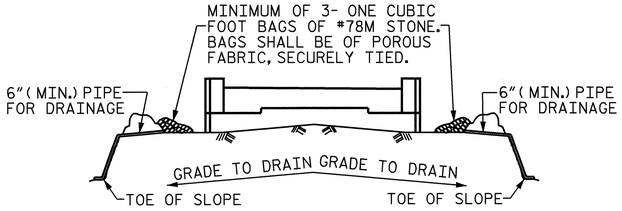
tjbankovich

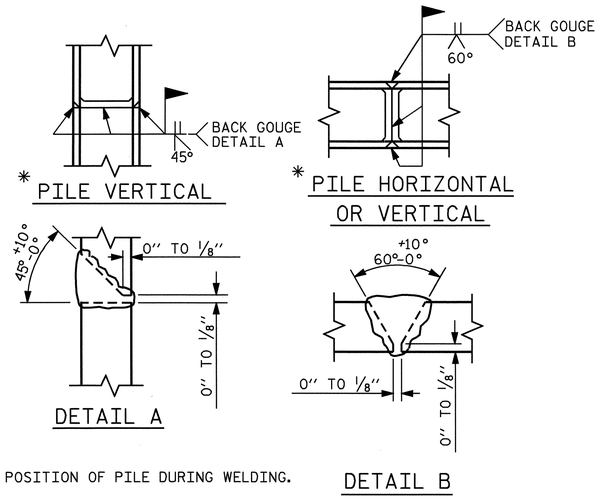



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

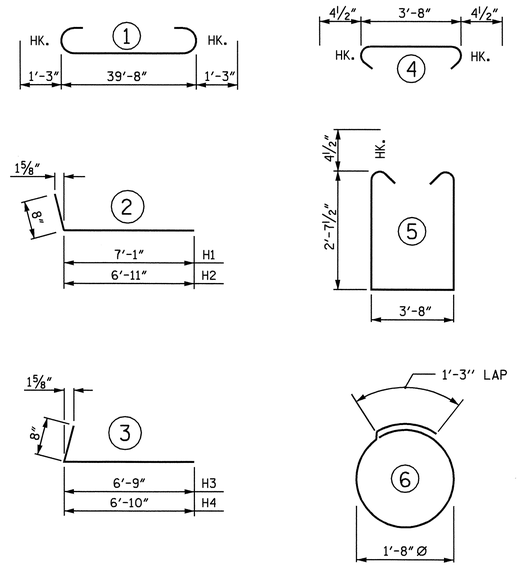
# TEMPORARY DRAINAGE AT END BENT




* POSITION OF PILE DURING WELDING.

# PILE SPLICE DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

### END BENT No. 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 12 | #9 | 1 | 42'-2" | 1720 |
| B2 | 4 | #5 | STR | 39'-10" | 166 |
| B3 | 8 | #4 | STR | 21'-2" | 113 |
| B4 | 10 | #4 | STR | 3'-8" | 24 |
| | | | | | |
| H1 | 11 | #4 | 2 | 7'-9" | 57 |
| H2 | 11 | #4 | 2 | 7'-7" | 56 |
| H3 | 11 | #4 | 3 | 7'-5" | 54 |
| H4 | 11 | #4 | 3 | 7'-6" | 55 |
| | | | | | |
| K1 | 28 | #4 | STR | 3'-9" | 70 |
| | | | | | |
| S1 | 54 | #4 | 4 | 4'-5" | 159 |
| S2 | 54 | #4 | 5 | 9'-8" | 349 |
| S3 | 36 | #4 | 6 | 6'-6" | 156 |
| | | | | | |
| V1 | 42 | #4 | STR | 4'-9" | 133 |
| V2 | 24 | #4 | STR | 9'-4" | 150 |
| V3 | 24 | #4 | STR | 9'-5" | 151 |

REINFORCING STEEL 3413 LBS.

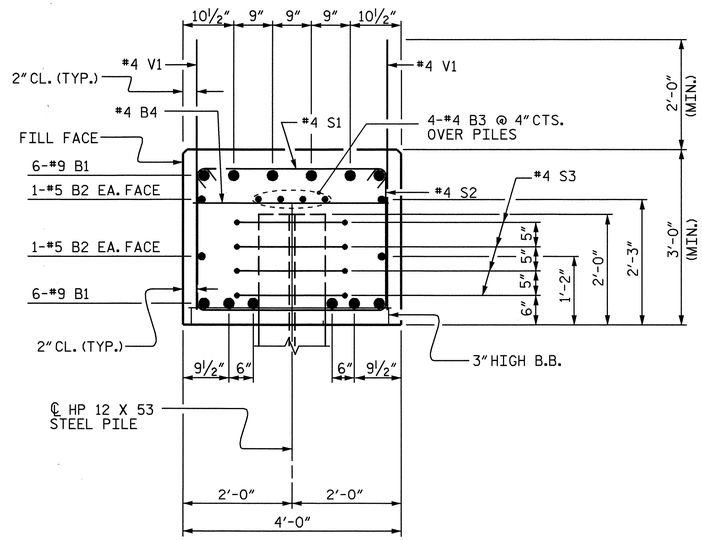
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP & LOWER PART OF WINGS 19.6 C.Y.

POUR #2 UPPER PART OF WINGS 4.9 C.Y.

TOTAL CLASS A CONCRETE 24.5 C.Y.

HP 12 X 53 STEEL PILES
NO: 9 LIN. FT.= 810




# SECTION A-A

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 11288 ENGINEER BETSY S. COX
Betsy S. Cox 6/25/08

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-20 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : M.L. BROWN DATE : 4/08
CHECKED BY : N. PIERCE DATE : 4/08

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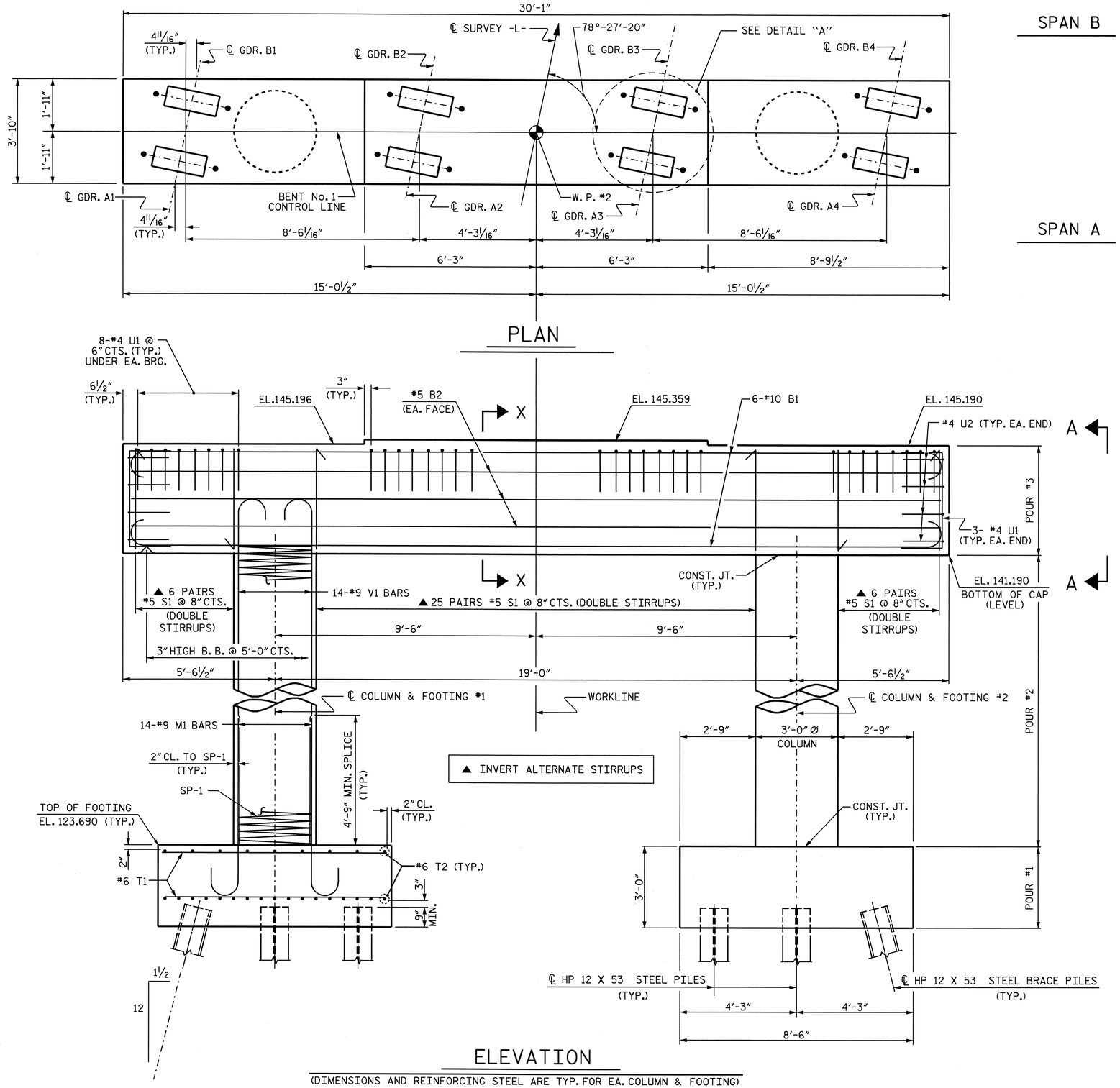
tjbankovich



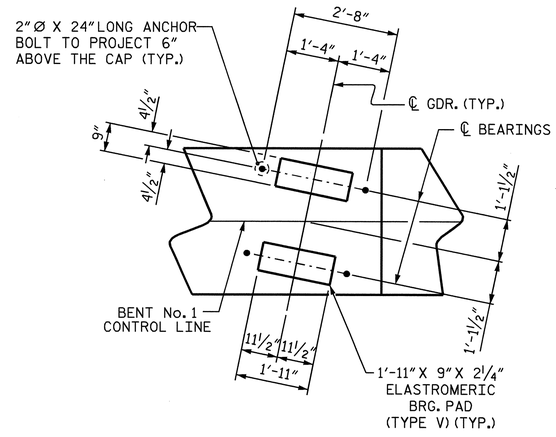

## ELEVATION

(DIMENSIONS AND REINFORCING STEEL ARE TYP. FOR EA. COLUMN & FOOTING)

## NOTES

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

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




## DETAIL "A"

(TYPICAL EACH GIRDER)

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT No. 1

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETTSY S. COX
Betsy S. Cox 8-22-08

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-21 |
| 1 | | | 3 | | | TOTAL SHEETS |
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DRAWN BY : A. V. ROYAL DATE : 8-07
CHECKED BY : J. M. BRITT DATE : 10-07

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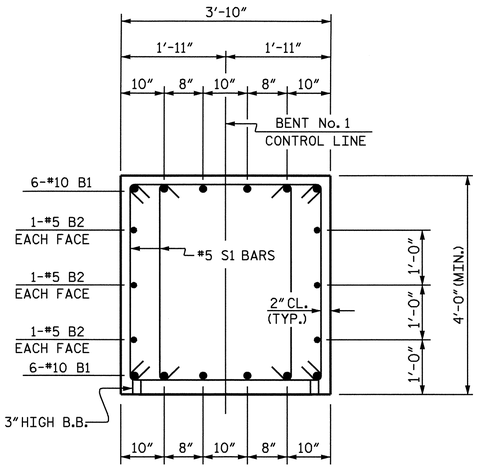
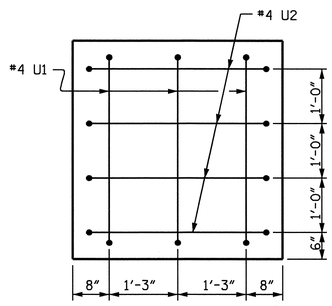
tbeach




## SECTION X-X

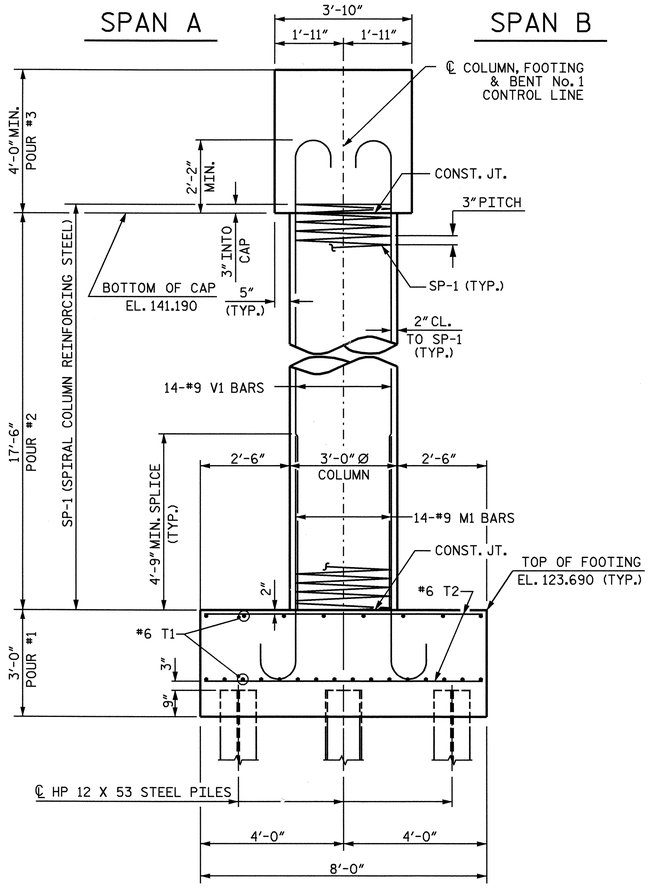



## VIEW A-A

(TYP. EA. END)

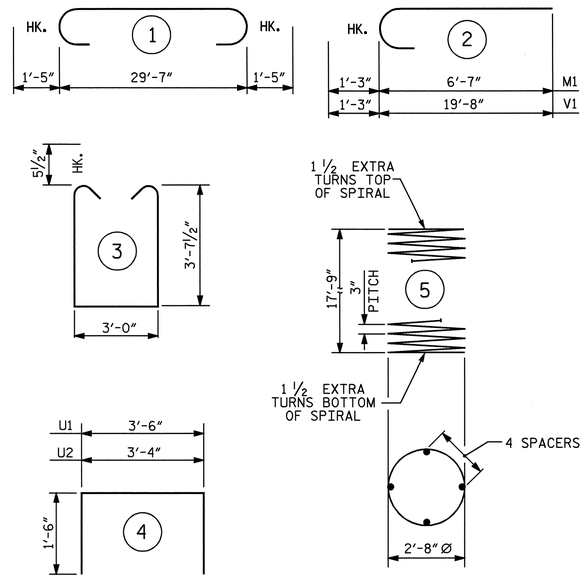
## SPAN A

## SPAN B




## END ELEVATION

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### BENT No. 1

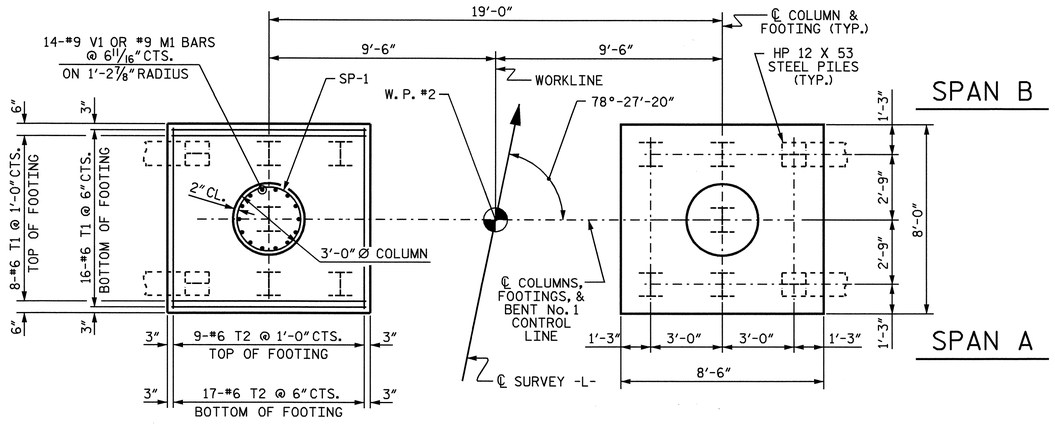
| BAR | NO | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 12 | 10 | 1 | 32'-5" | 1674 |
| B2 | 6 | 5 | STR | 29'-9" | 186 |
| M1 | 28 | 9 | 2 | 7'-10" | 746 |
| S1 | 74 | 5 | 3 | 11'-2" | 862 |
| T1 | 48 | 6 | STR | 8'-2" | 589 |
| T2 | 52 | 6 | STR | 7'-8" | 599 |
| U1 | 38 | 4 | 4 | 6'-6" | 165 |
| U2 | 8 | 4 | 4 | 6'-4" | 34 |
| V1 | 28 | 9 | 2 | 20'-11" | 1991 |
| REINFORCING STEEL | | | | LBS. | 6846 |
| SP-1 | 2 | * | 5 | 610'-7" | 816 |
| SPIRAL COLUMN REINFORCING STEEL | | | | LBS. | 816 |

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

HP 12 X 53 STEEL PILES NO. 14 — 980 FT.

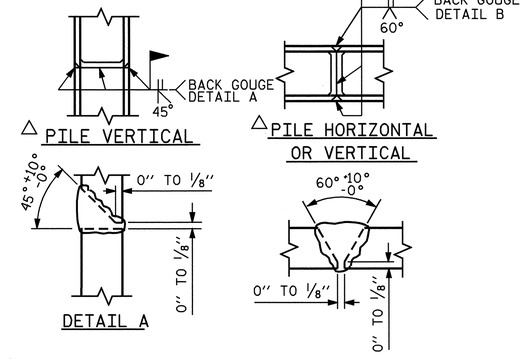
CLASS A CONCRETE BREAKDOWN

| | |
|---|---|
| POUR #1 - (FOOTINGS) | 15.1 C.Y. |
| POUR #2 (COLUMNS) | 9.2 C.Y. |
| POUR #3 - (CAP) | 17.4 C.Y. |
| TOTAL | 41.7 C.Y. |




## PLAN OF FOOTINGS AND COLUMNS

(PILE PLACEMENT, REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR EACH FOOTING & COLUMN)




## PILE SPLICE DETAILS

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-22 |
| 1 | | | 3 | | | TOTAL SHEETS |
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NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

Betsy S. Cox 8-22-08

DRAWN BY : A. V. ROYAL DATE : 8-07
CHECKED BY : J. M. BRITT DATE : 10-07

21-AUG-2008 11:28
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tbeach

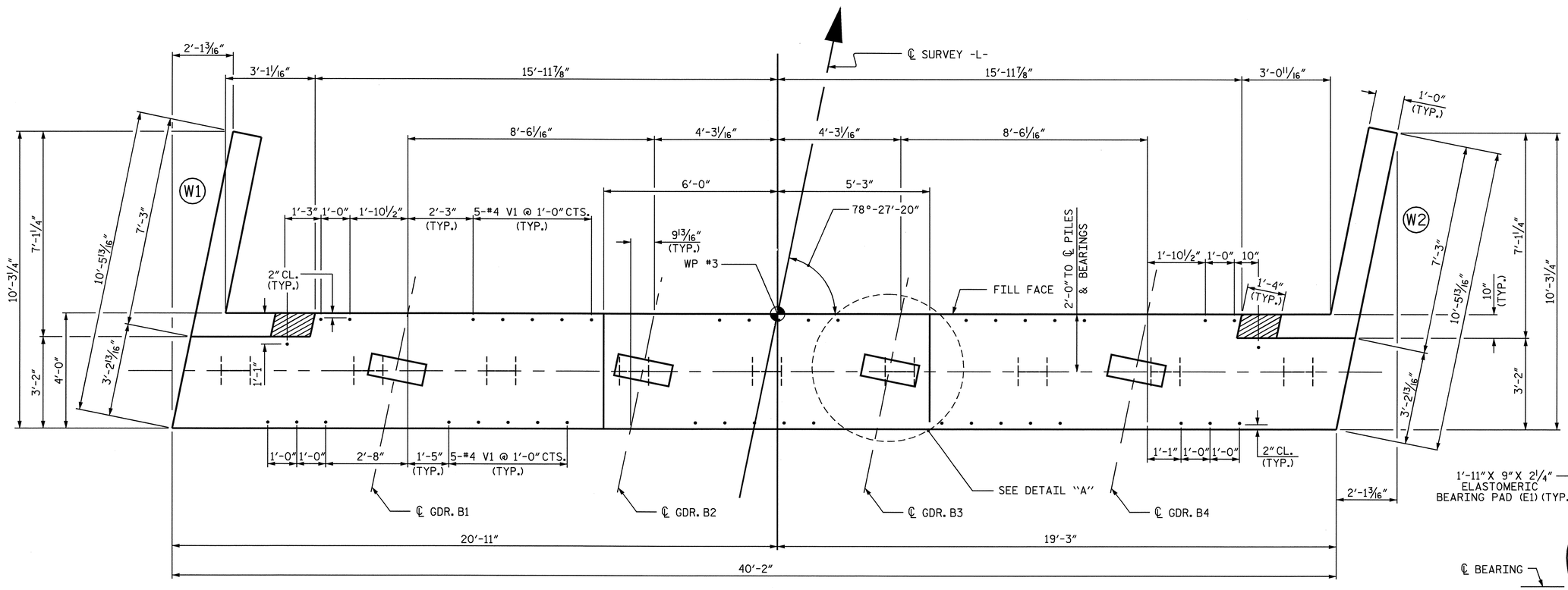
## NOTES:

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

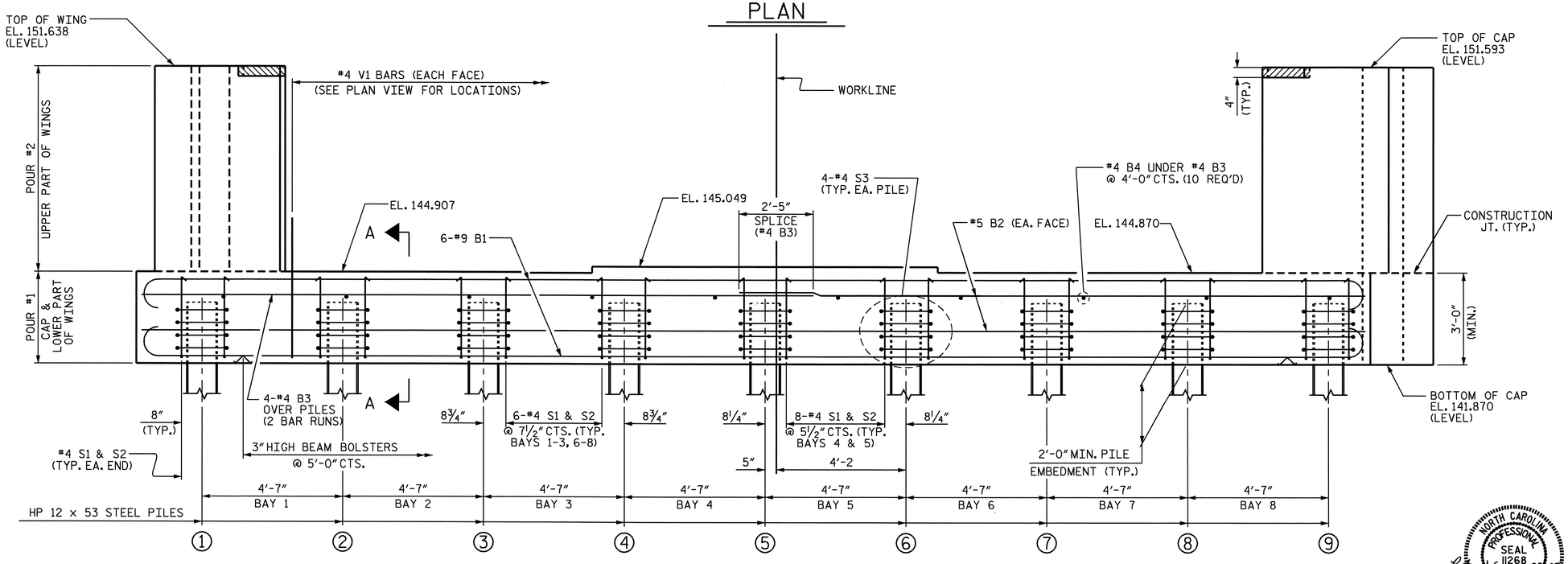
FOR SECTION A-A, SEE SHEET 3 OF 3.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

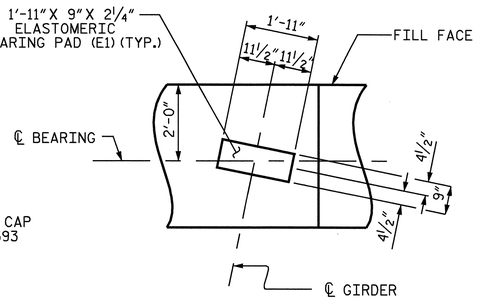
#4 V1 BARS MAY BE SHIFTED SLIGHTLY TO AVOID STIRRUPS IN CAP.




## PLAN




## ELEVATION




## DETAIL "A"

(TYP. EA. GDR.)

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-23 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

DRAWN BY : M.L. BROWN DATE : 4/08
CHECKED BY : N. PIERCE DATE : 4/08

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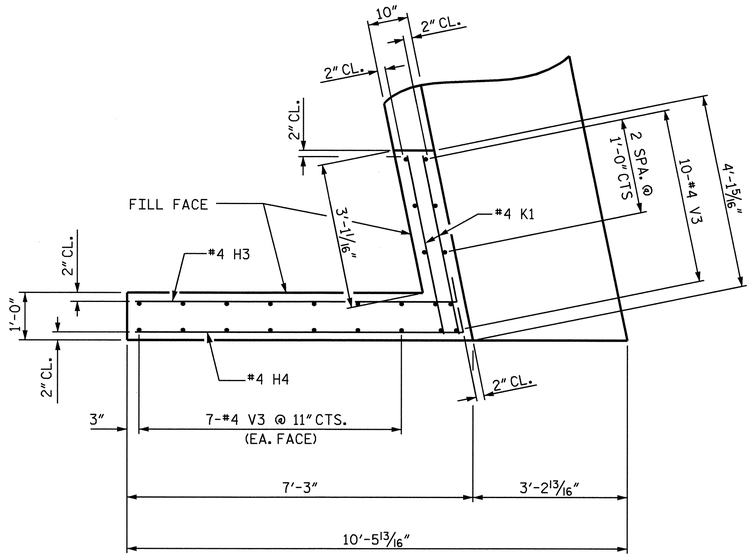
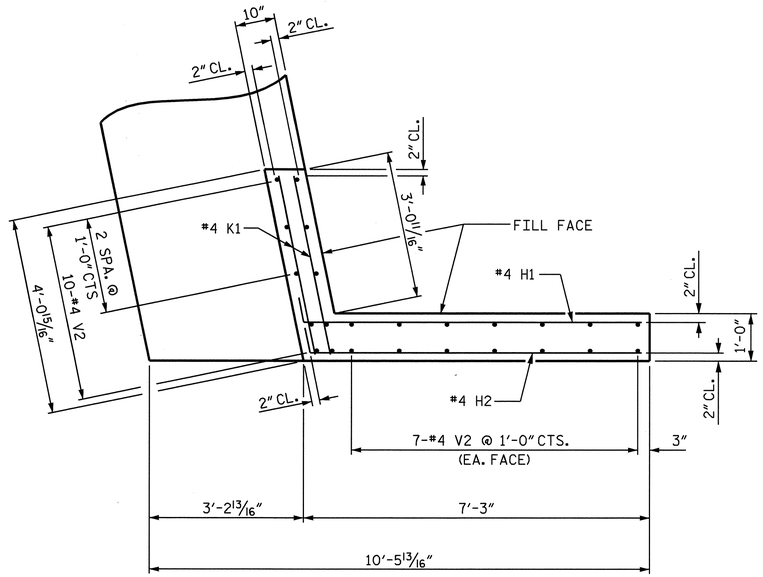
tbeach

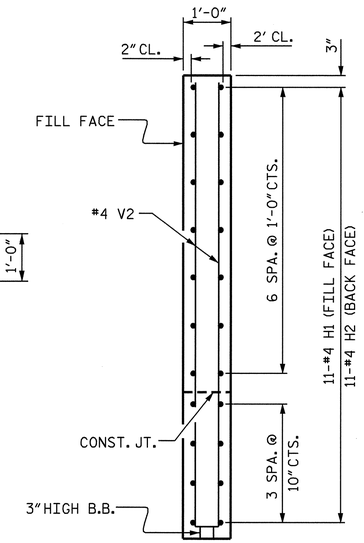
NCBDS



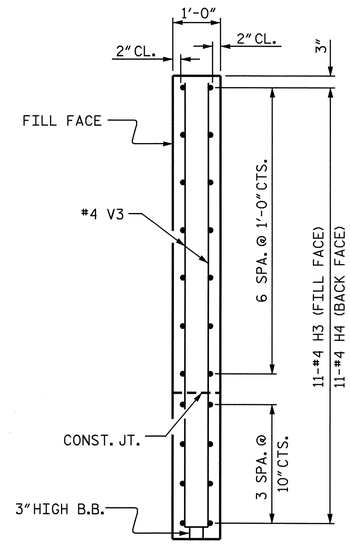

## PLAN OF WING (W1)



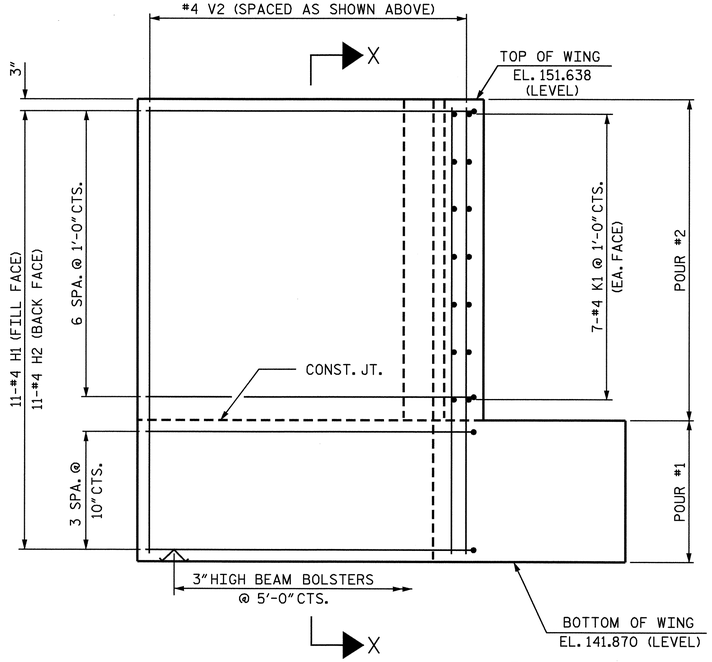

## PLAN OF WING (W2)



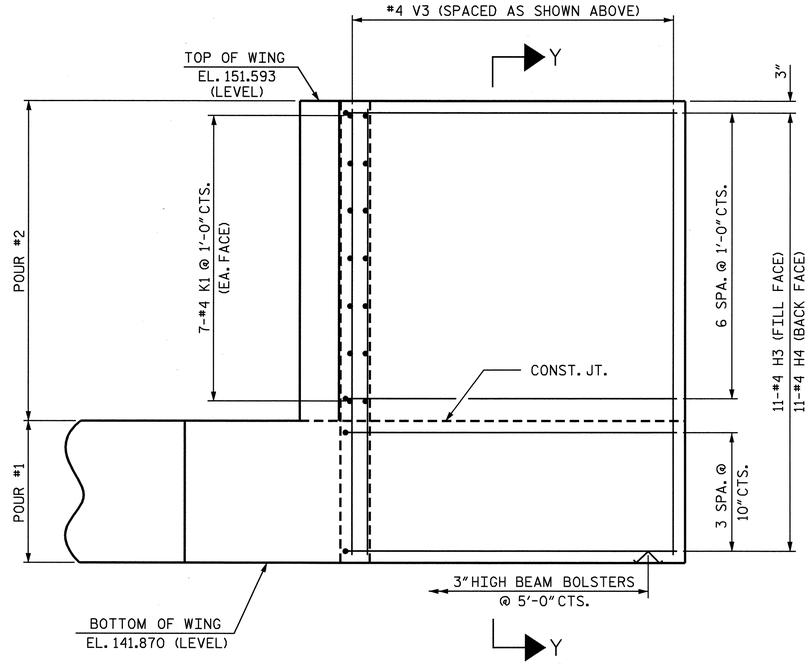

## SECTION X-X




## SECTION Y-Y




## ELEVATION OF WING (W1)




## ELEVATION OF WING (W2)

DRAWN BY : M. L. BROWN DATE : 4/08
CHECKED BY : N. PIERCE DATE : 4/08

23-JUN-2008 08:25
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rjbankovich

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-24 |
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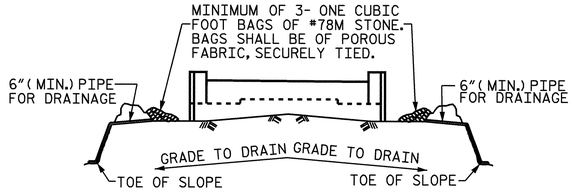
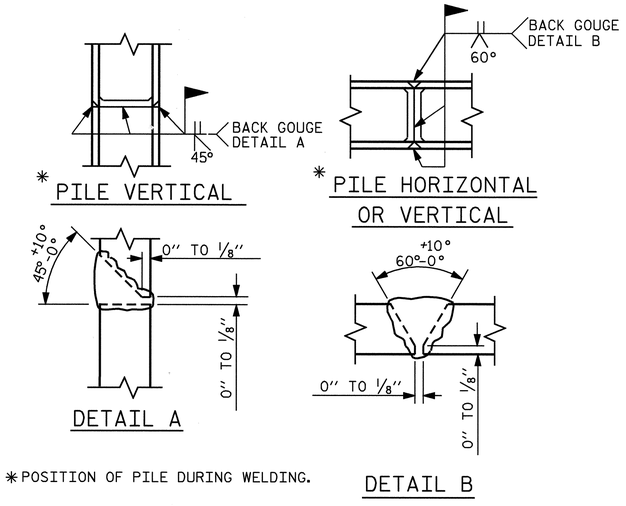



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

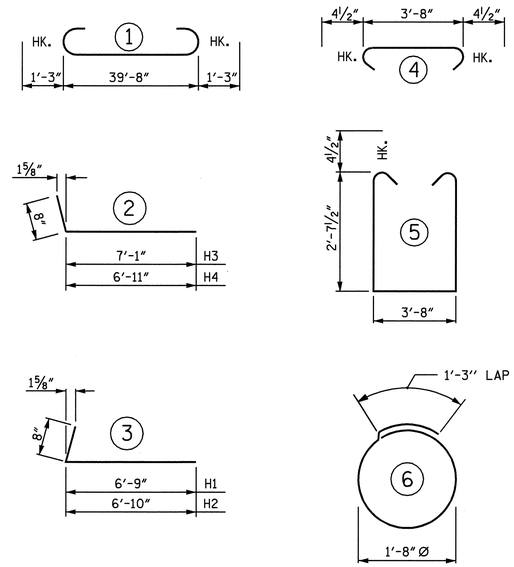
## TEMPORARY DRAINAGE AT END BENT




*POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

### END BENT No. 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 12 | #9 | 1 | 42'-2" | 1720 |
| B2 | 4 | #5 | STR | 39'-10" | 166 |
| B3 | 8 | #4 | STR | 21'-2" | 113 |
| B4 | 10 | #4 | STR | 3'-8" | 24 |
| | | | | | |
| H1 | 11 | #4 | 3 | 7'-5" | 54 |
| H2 | 11 | #4 | 3 | 7'-6" | 55 |
| H3 | 11 | #4 | 2 | 7'-9" | 57 |
| H4 | 11 | #4 | 2 | 7'-7" | 56 |
| | | | | | |
| K1 | 28 | #4 | STR | 3'-9" | 70 |
| | | | | | |
| S1 | 54 | #4 | 4 | 4'-5" | 159 |
| S2 | 54 | #4 | 5 | 9'-8" | 349 |
| S3 | 36 | #4 | 6 | 6'-6" | 156 |
| | | | | | |
| V1 | 42 | #4 | STR | 4'-9" | 133 |
| V2 | 24 | #4 | STR | 9'-5" | 151 |
| V3 | 24 | #4 | STR | 9'-4" | 150 |

REINFORCING STEEL 3413 LBS.

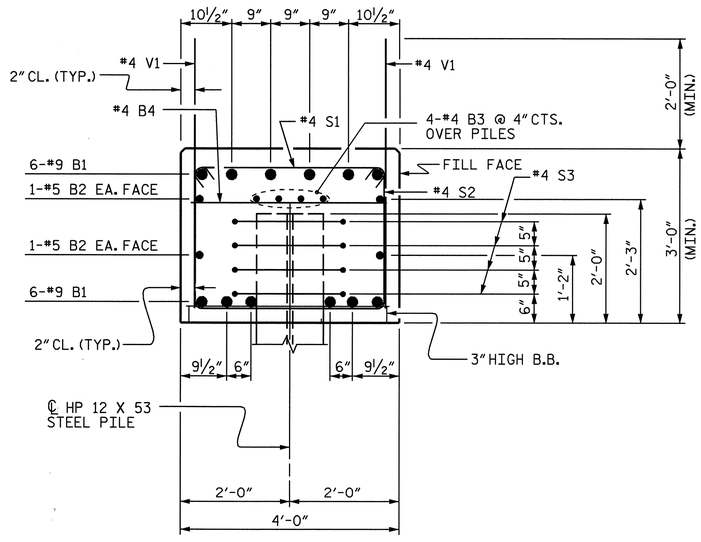
CLASS A CONCRETE BREAKDOWN

POUR #1 CAP & LOWER PART OF WINGS 19.7 C.Y.

POUR #2 UPPER PART OF WINGS 4.9 C.Y.

TOTAL CLASS A CONCRETE 24.6 C.Y.

HP 12 X 53 STEEL PILES
NO: 9 LIN. FT.= 900




## SECTION A-A

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
Betsy S. Cox 6/25/08

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-25 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : M.L. BROWN DATE : 4/08
CHECKED BY : N. PIERCE DATE : 4/08

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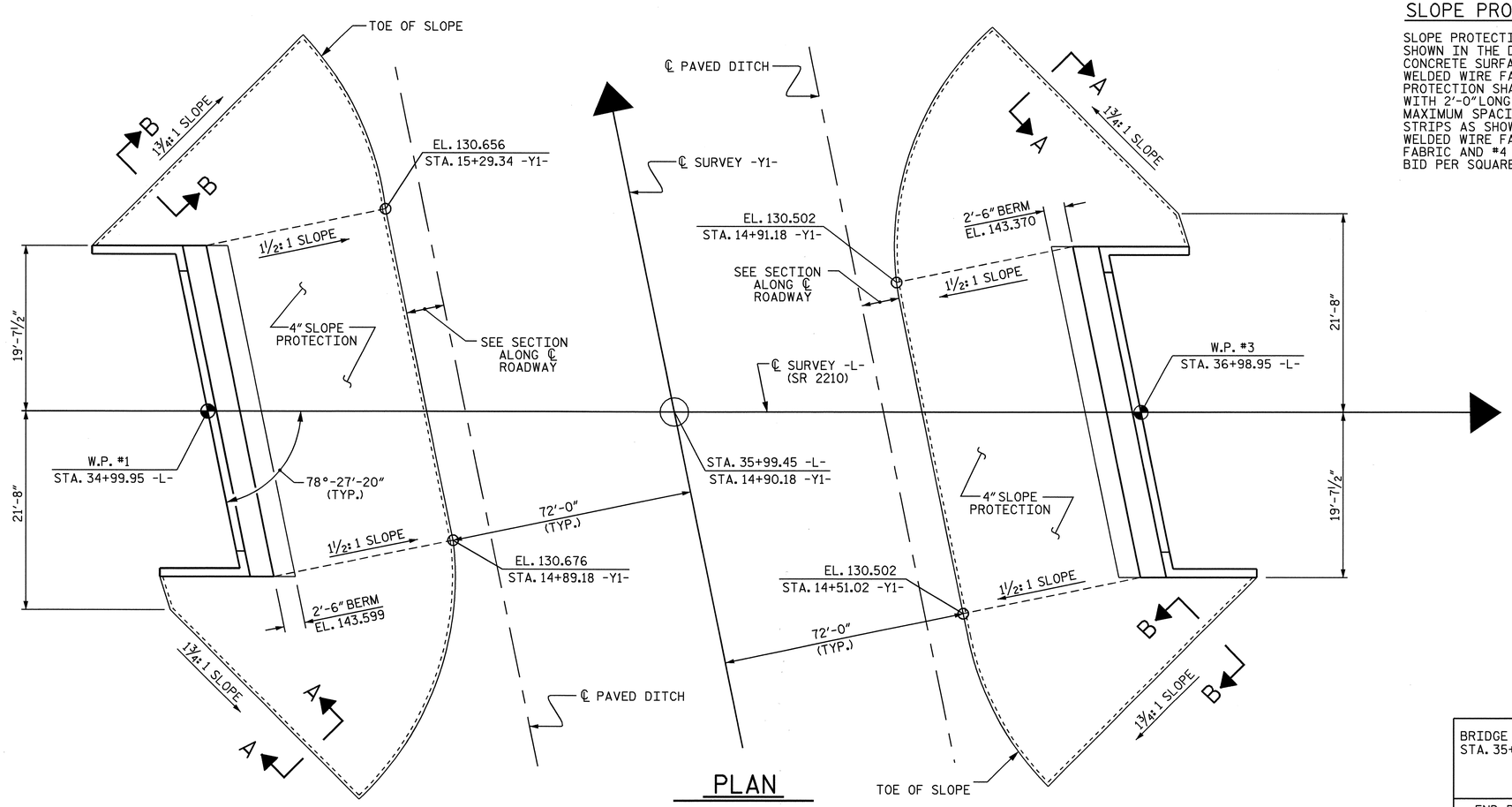
tjbankovich

## GENERAL NOTES

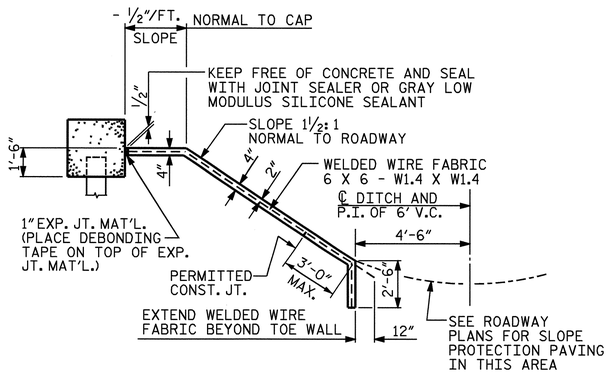
SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

## SLOPE PROTECTION

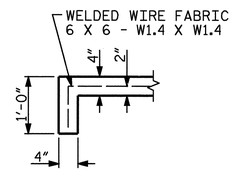
SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL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



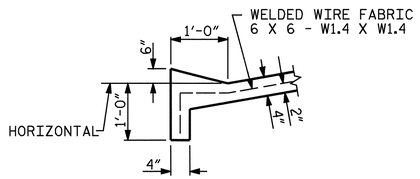

PLAN



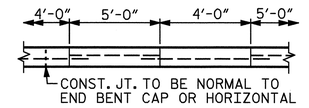

SECTION ALONG ℄ ROADWAY WHEN FILL CATCHES IN DITCH




SECTION A-A

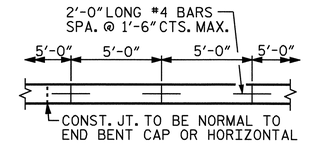



SECTION B-B




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

OPTIONAL POURING DETAIL




STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL

| BRIDGE @ STA. 35+99.45 -L- | 4 INCH SLOPE PROTECTION | * WELDED WIRE FABRIC 60 INCHES WIDE |
|---|---|---|
| | SQUARE YARDS | APPROX. L.F. |
| END BENT 1 | 260 | 470 |
| END BENT 2 | 260 | 470 |

* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# SLOPE PROTECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

Betsy S. Cox 6/25/08

| ASSEMBLED BY : A. V. ROYAL | DATE : 8-07 |
|---|---|
| CHECKED BY : T. BANKOVICH | DATE : 4-08 |
| DRAWN BY : ELR 5/92 | REV. 7/10/01 LES/RDR |
| CHECKED BY : GRP 6/92 | REV. 5/7/03 RWW/JTE |
| | REV. 5/1/06 TLA/GM |

## DETAILS FOR SLOPE PROTECTION

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-26 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

STD. NO. SP1

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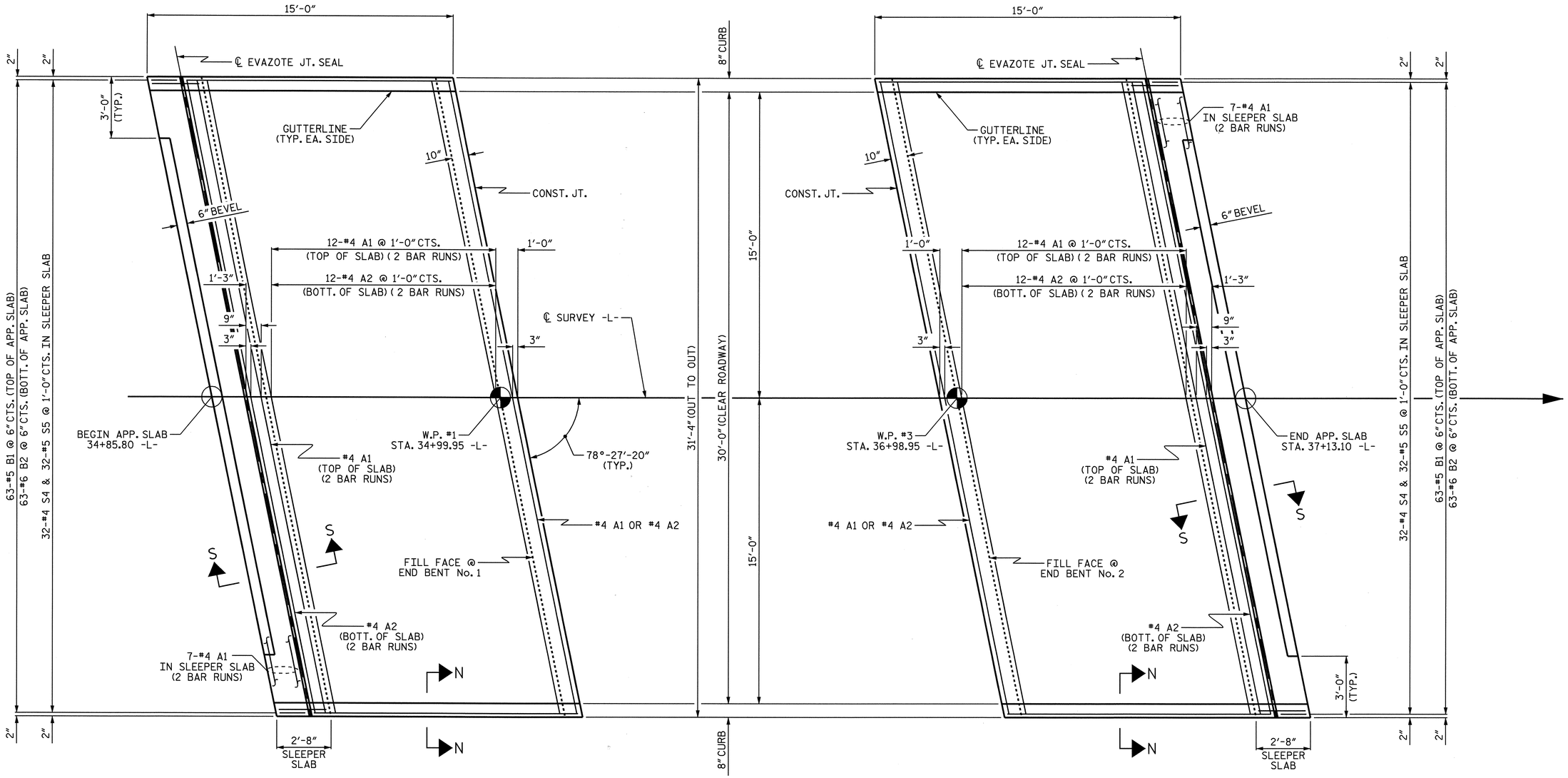
tjbankovich




AT END BENT No. 1

AT END BENT No. 2

# PLAN OF APPROACH SLAB

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS, FOR SECTIONS N-N AND S-S, SEE SHEET 3 OF 3.

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

Betsy S. Cox 6-25-08

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-27 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

DRAWN BY : T. BANKOVICH DATE : 4/2008
CHECKED BY : A.V. ROYAL DATE : 4/2008

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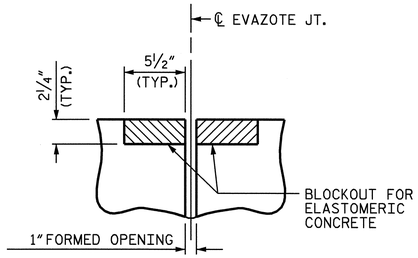
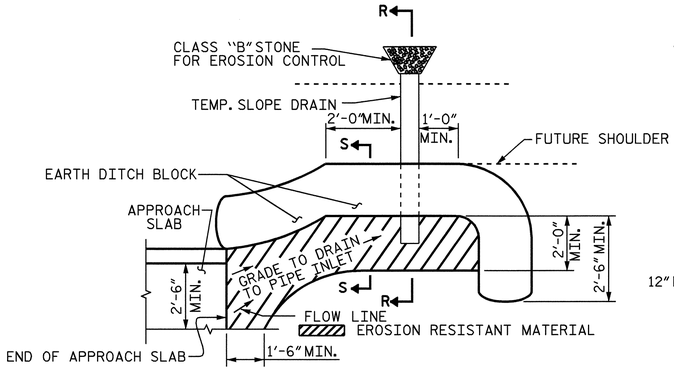
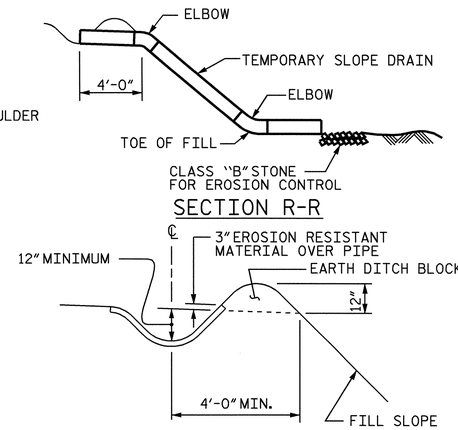



SECTION C-C
EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)




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

PLAN VIEW



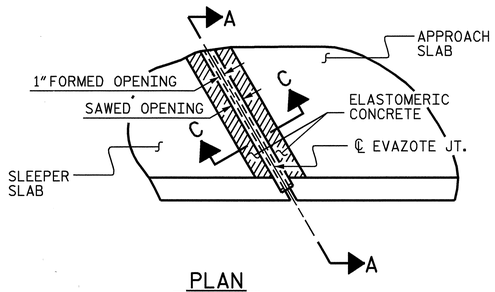

SECTION R-R



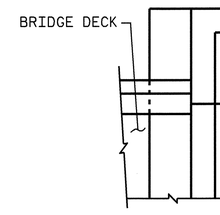

SECTION S-S

# TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

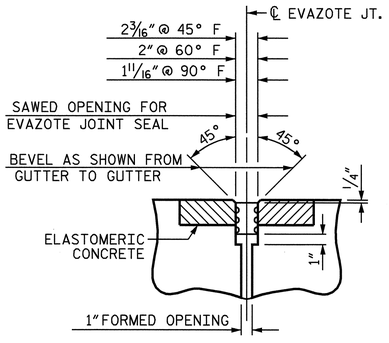



PLAN

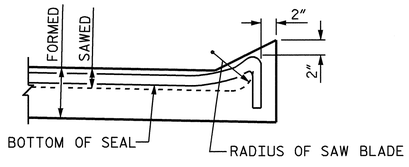



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL




SECTION C-C
EVAZOTE JOINT SEAL




SECTION A-A

| ELASTOMERIC CONCRETE | |
|---|---|
| END BENT NO. | ELASTOMERIC CONCRETE * (CU. FT.) |
| 1 | 5.3 |
| 2 | 5.3 |
| TOTAL | 10.6 |

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. W-4704
ROBESON COUNTY
STATION: 35+99.45 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

1988

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-28 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 29 |

STD. NO. BAS10

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX

| | | | |
|---|---|---|---|
| ASSEMBLED BY : T. BANKOVICH | | DATE : 4/2008 | |
| CHECKED BY : AV. ROYAL | | DATE : 4/2008 | |
| DRAWN BY : FCJ | 11/88 | REV. 10/17/00 | RWW/LES |
| CHECKED BY : ARB | 11/88 | REV. 5/7/03 | RWW/JTE |
| | | REV. 5/1/06 | TLA/GM |

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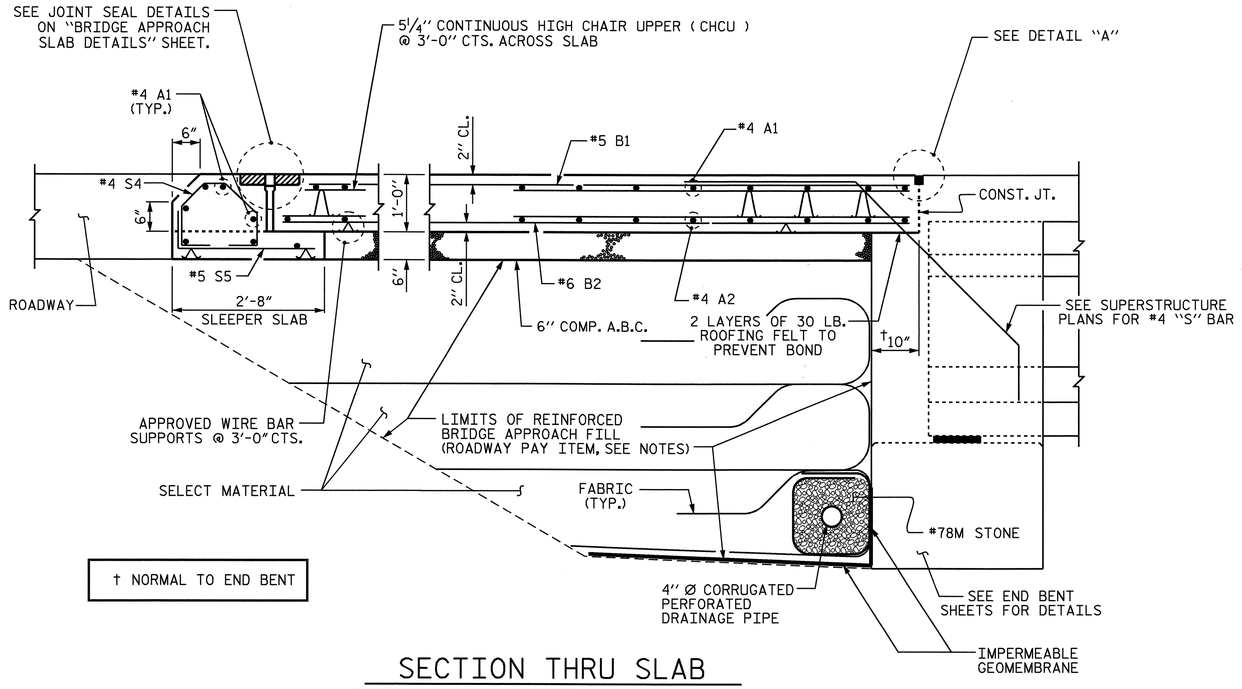



## SECTION THRU SLAB

# 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.

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

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

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

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE SLEEPER 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 VERTICAL JOINT ON THE RIGHT AND LEFT SIDE OF THE APPROACH SLAB AT THE ENDS OF THE EVAZOTE JOINT SHALL BE FILLED WITH SILICONE OR OTHER APPROVED MATERIAL IN ORDER TO PREVENT BACKFILL FROM ENTERING THE JOINT OPENING.

THE JOINT OPENING AT THE APPROACH SLAB/DECK INTERFACE SHALL BE SAWED NO MORE THAN 12 HOURS AFTER THE APPROACH SLAB IS CAST. THE JOINT SHALL BE CLEANED OF ALL DEBRIS BEFORE THE SEALANT IS APPLIED. THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT.

### WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

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

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

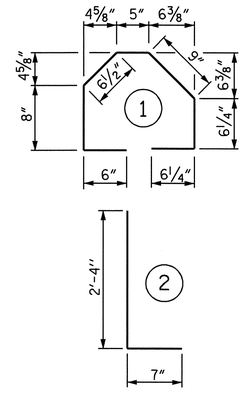
## BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

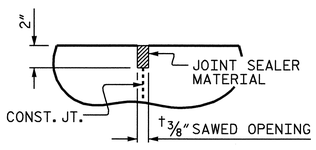
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✱ A1 | 42 | #4 | STR | 16'-10" | 472 |
| A2 | 28 | #4 | STR | 16'-9" | 313 |
| | | | | | |
| ✱ B1 | 63 | #5 | STR | 12'-5" | 816 |
| B2 | 63 | #6 | STR | 12'-10" | 1214 |
| | | | | | |
| ✱ S4 | 32 | #4 | 1 | 3'-11" | 84 |
| S5 | 32 | #5 | 2 | 2'-11" | 97 |

| | |
|---|---|
| REINFORCING STEEL | 1624 LBS. |
| ✱EPOXY COATED REINFORCING STEEL | 1372 LBS. |
| CLASS AA CONCRETE | |
| POUR #1 - SLEEPER SLAB | 3.3 C.Y |
| POUR #2 - SLAB & CURB | 15.4 C.Y |
| TOTAL | 18.7 C.Y. |

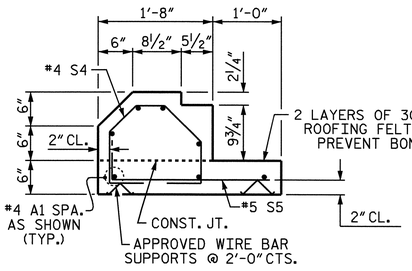
## BAR TYPES



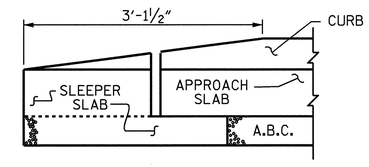

ALL BAR DIMENSIONS ARE OUT TO OUT



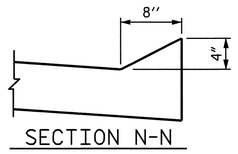

DETAIL "A"




SECTION S-S
SHOWING SLEEPER SLAB




END OF CURB WITHOUT SHOULDER BERM GUTTER




SECTION N-N

PROJECT NO. W-4704

ROBESON COUNTY

STATION: 35+99.45 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR INTEGRAL ABUTMENT

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

STD. NO. BAS11

NORTH CAROLINA PROFESSIONAL SEAL 11268 ENGINEER BETSY S. COX
Betsy S. Cox 6-25-08

| | |
|---|---|
| ASSEMBLED BY : T. BANKOVICH | DATE : 4/2008 |
| CHECKED BY : A.V. ROYAL | DATE : 4/2008 |
| DRAWN BY : TLA 10/05 | ADDED 5/1/06R KMM/GM |
| CHECKED BY : GM 5/06 | |

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tjbankovich

# 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.

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