Purvis FYIO

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

Inter-Departmental Memorandum

TO: Roger McWilliams
FHWA Transportation Engineer

DATE: November 30, 1998

FROM: Steven W. Reeves
Standards Engineer

SUBJECT OR PROJECT NO: Guardrail sheets

INFORMATION COPY TO:

COUNTY:

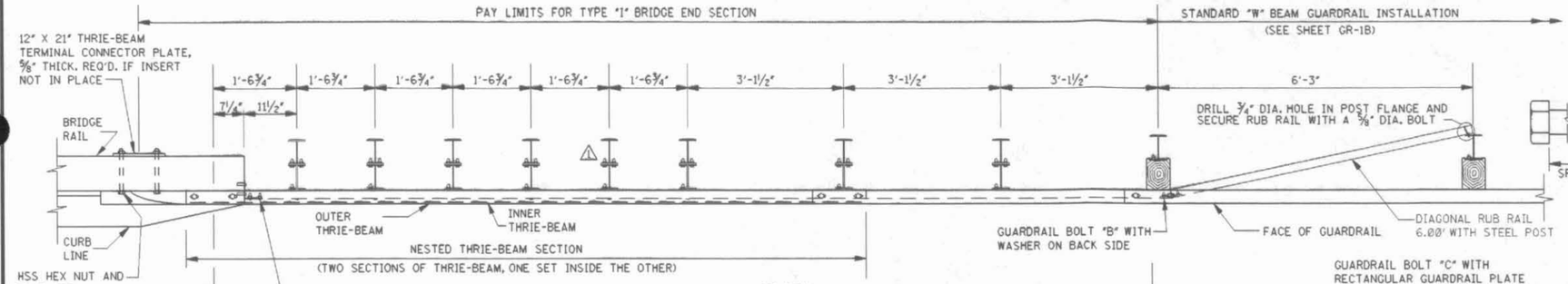
Construction Division (Lewis)
Bridge Division (Carr)

Please find enclosed the revised guardrail to bridge rail sheets and the bridge end pavement sheets. We have tried to apply all revisions from our meeting held in the Roadway Design conference room. Please review and comment on the new sheets. Return all comments to RWD by the end of October.

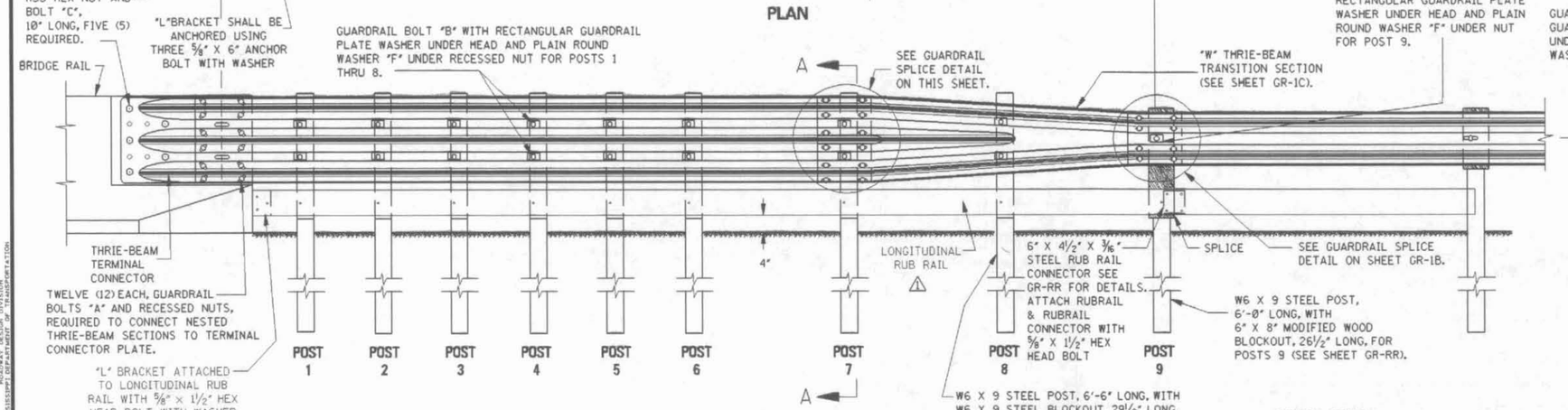
After all final comments have been addressed, the final sheets will be sent to FHWA to obtain their approval for use on projects.

If additional information is needed, please advise.

STATE	PROJECT NO.
MISS.	

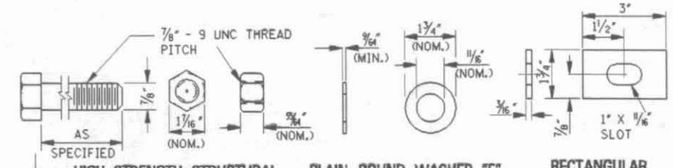


PLAN



ELEVATION FROM ℄ ROADWAY

NOTE: BACKUP PLATES ARE NOT USED IN THIS TRANSITION.

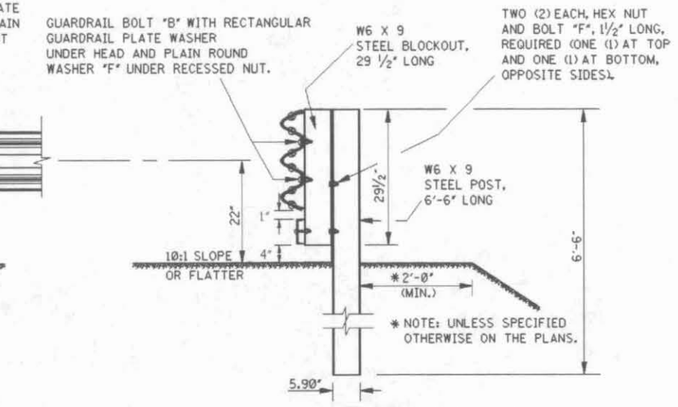


HIGH-STRENGTH STRUCTURAL HEX NUT AND BOLT "C"

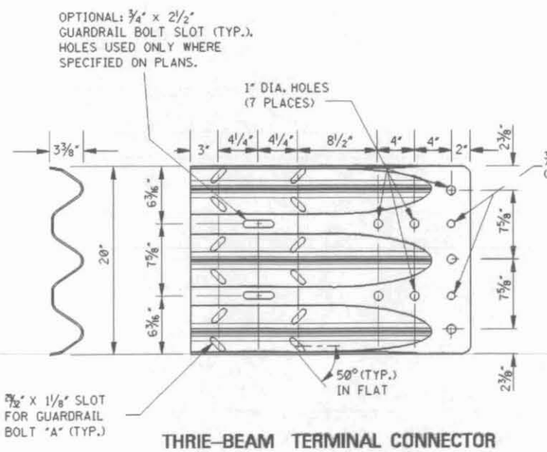
PLAIN ROUND WASHER "F"

RECTANGULAR GUARDRAIL PLATE WASHER

FASTENER DETAILS



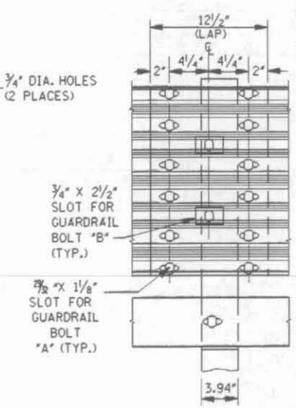
SECTION A–A



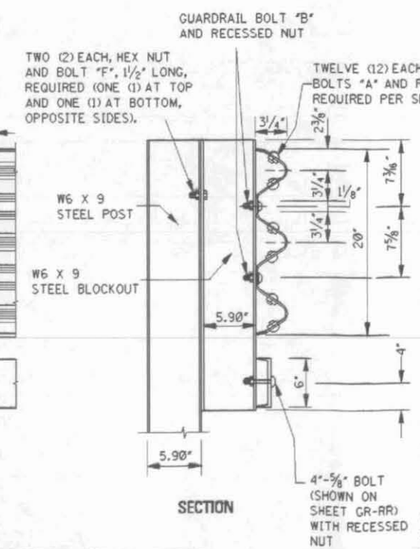
THRIE–BEAM TERMINAL CONNECTOR

NOTES:

1. THE THRIE-BEAM TERMINAL CONNECTOR IS TO BE AASHTO M 180 CORRUGATED SHEET STEEL, CLASS B, TYPE I.
2. ALTERNATIVELY, THE SPLICE SLOTS CAN BE ORIENTED PARALLEL TO THE LONGITUDINAL AXIS OF THE TERMINAL CONNECTOR. HOWEVER, THE 50° SLOT VERSION IS EASIER TO INSTALL WHERE SEVERAL GUARDRAIL SECTIONS ARE NESTED TOGETHER.



ELEVATION

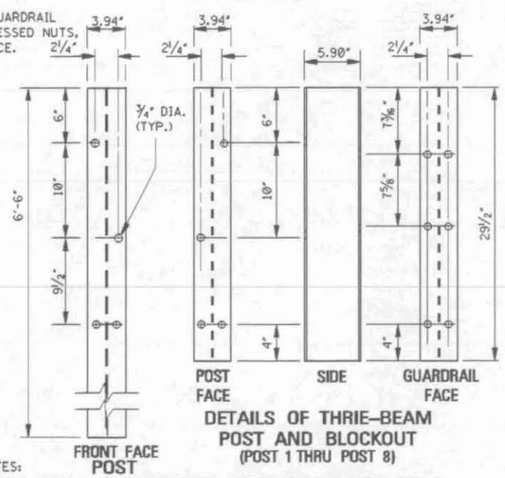


SECTION

GUARDRAIL SPLICE DETAIL
(POST 7)

GENERAL NOTES:

1. THIS GUARDRAIL TRANSITION IS APPROPRIATE FOR CONNECTION TO A MODIFIED RECEIVER CAST INTO A SAFETY SHAPE AND SHOULD NOT BE CONNECTED DIRECTLY TO A CONCRETE SAFETY SHAPE.
2. SEE RAILING DETAILS IN BRIDGE DRAWINGS FOR OTHER DETAILS.



FRONT FACE POST

DETAILS OF THRIE–BEAM POST AND BLOCKOUT
(POST 1 THRU POST 8)

NOTES:

1. HOLE DETAILS ARE REQUIRED FOR POSTS AND BLOCKOUTS 1 THRU 8.
2. STEEL POSTS AND BLOCKOUTS ARE FABRICATED FROM W6 X 9 STRUCTURAL STEEL SHAPES.
3. ALL HOLES IN BOTH POSTS AND BLOCKOUTS ARE 3/4" IN DIAMETER.

GENERAL NOTES (CONTINUED):

3. GUARDRAIL SHALL MEET THE REQUIREMENTS OF AASHTO M 180, CLASS A, TYPE I UNLESS OTHERWISE DESIGNATED.
4. THE TYPE "I" TRANSITION IS USED ON BOTH LEFT AND RIGHT SIDES OF EACH BRIDGE APPROACH WITH 2-WAY TRAFFIC AND THE GUARDRAIL SECTIONS SHALL BE LAPPED IN THE DIRECTION OF THE APPROACHING TRAFFIC.
5. POSTS AND BLOCKOUTS SHALL CONFORM TO AASHTO M 270/M 270M (ASTM A 709/A 709M) GRADE 250 STEEL UNLESS CORROSION RESISTANT STEEL IS REQUIRED IN WHICH CASE GRADE 50W STEEL SHALL BE USED. THE STRUCTURAL W6 X 9 DIMENSIONS ARE DEFINED IN AASHTO M 160M (ASTM A 6M). THE SECTION SHOULD BE ZINC-COATED PER AASHTO M 111 (ASTM A 123) AFTER CUTTING, DRILLING AND PUNCHING. CORROSION RESISTANT STEEL SHOULD NOT BE ZINC-COATED PAINTED OR OTHERWISE TREATED. GUARDRAIL IS EXEMPT FROM THE FRACTURE-CRITICAL TOUGHNESS IN AASHTO M 270/A 270 M.
6. FOR FASTENER DETAILS NOT FOUND ON THIS SHEET, SEE SHEET GR-1B.
7. DETAILS PERTINENT TO THE STANDARD INSTALLATION OF "W" AND THRIE-BEAM SECTIONS NOT SPECIFICALLY MODIFIED ON THIS SHEET WILL BE FOUND ON SHEETS GR-1B AND GR-1C, RESPECTIVELY.
8. FOR OTHER DETAILS OF POSTS, POST ACCESSORIES, FASTENERS & RAIL ELEMENTS, SEE AASHTO-AGC-ARTBA JOINT TASK FORCE NO. 13, TITLED "A GUIDE "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE," LATEST EDITION
9. STEEL BLOCKOUT SHOWN, WOOD BLOCKOUT PERMISSABLE. BOLT LENGTH FOR WOOD BLOCKOUT WILL BE SIMILAR TO THOSE SHOWN ON GR-2F

DATE	REVISION	BY
9-01-05	ADDED RUBRAIL AND POST	S.W.R.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

GUARDRAIL: BRIDGE END SECTION TYPE "I"
(STEEL POSTS)

WORKING NUMBER GR-2G

SHEET NUMBER

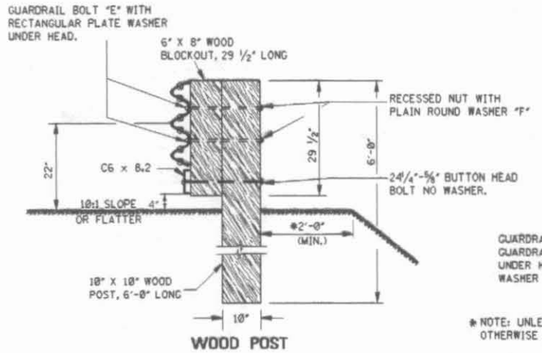
FILENAME:

DESIGN TEAM CHECKED DATE 08-09-05

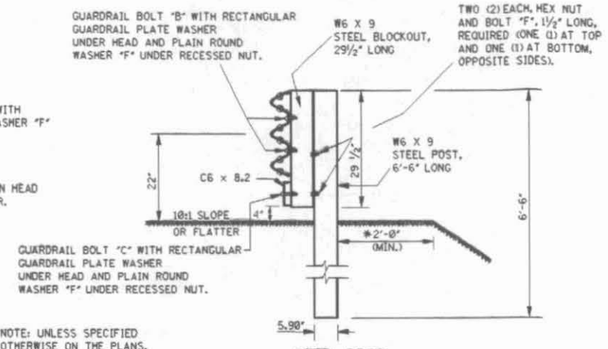
MISSISSIPPI DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN DIVISION

projects\rub railsheets\I.RB.dgn 9/6/2006 2:51 PM I. RB. DGN

STATE	PROJECT NO.
MISS.	



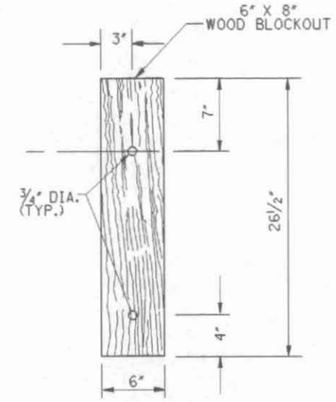
WOOD POST



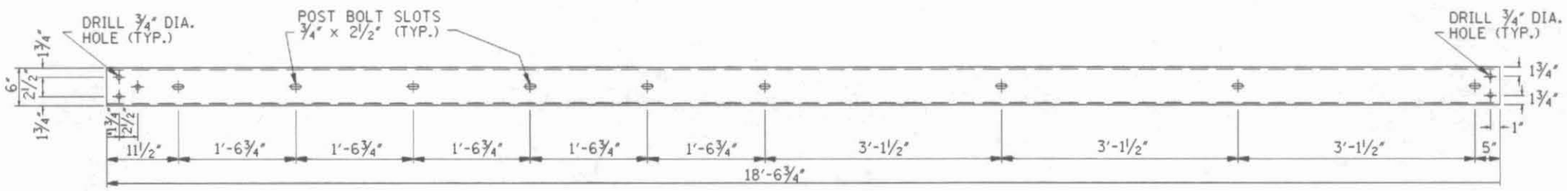
* NOTE: UNLESS SPECIFIED OTHERWISE ON THE PLANS.

STEEL POST

PROFILE VIEW OF POSTS



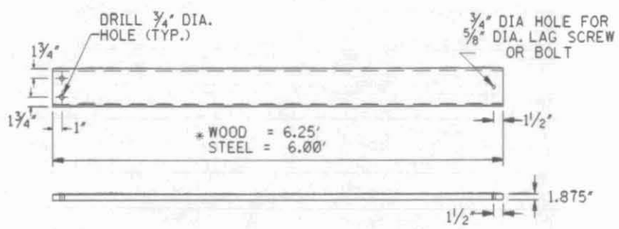
BLOCKOUT FOR POST 9 OF TYPE "I" BRIDGE END SECTION



* MEASURED ALONG RUBRAIL

CROSS-SECTION VIEW OF C6 x 8.2

LONGITUDINAL RUB RAIL

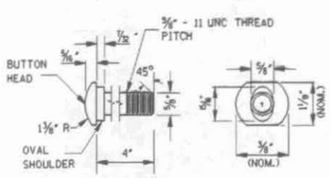


DIAGONAL RUB RAIL

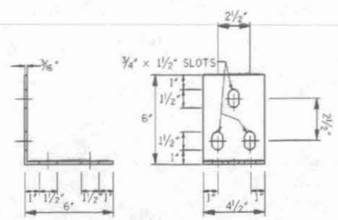
POSTS 1 THROUGH 9 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER BLOCKOUTS. STEEL POST REQUIRE 2 HOLES ON EITHER SIDE OF THE POST.

RUBRAIL BLOCKOUTS ARE TO BE SECURED WITH 5/8" BUTTONHEAD BOLT FOR STEEL POST AND 20" BOLT FOR WOOD POST. (SEE PROFILE VIEW FOR LENGTHS)

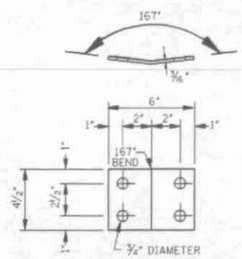
RUBRAIL & LONG BLOCKOUT (POST 9) ARE NOT REQUIRED IN CURB & GUTTER SECTIONS OF ROADWAY.



GUARDRAIL BOLT



"L" BRACKET



RUB RAIL CONNECTOR BRACKET

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

GUARDRAIL: RUB RAIL HARDWARE SHEET

BY	REVISION	DATE

FILENAME:

DESIGN TEAM _____ CHECKED _____ DATE 03-18-05

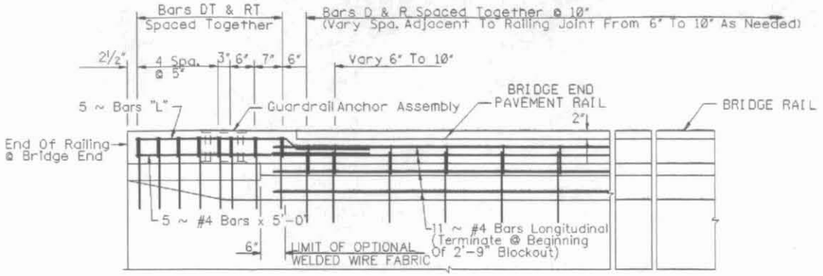
WORKING NUMBER GR-RR

SHEET NUMBER

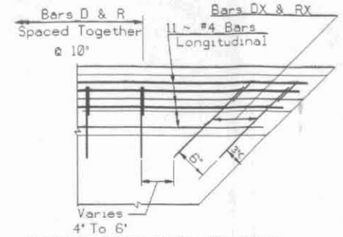
PLAN ROADWAY DESIGN DIVISION MISSISSIPPI DEPARTMENT OF TRANSPORTATION

rub railhardware.dgn 10-5-2005 2:51 PM RUB RAIL HARDWARE

STATE	PROJECT NO.
MISS.	



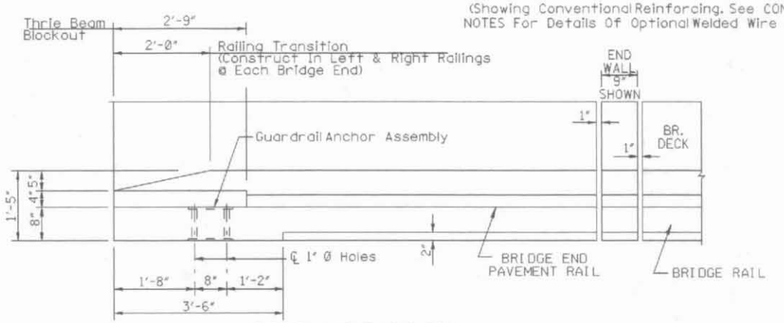
PART PLAN OF LEFT RAILING



SKEWED PART PLAN OF LEFT RAILING AT BRIDGE END WALL

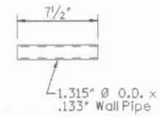
(Showing Conventional Reinforcing. See CONSTRUCTION NOTES For Details Of Optional Welded Wire Fabric.)

(Showing Conventional Reinforcing. See CONSTRUCTION NOTES For Details Of Optional Welded Wire Fabric.)



PART PLAN OF RIGHT RAILING

(Showing Concrete Dimensions)



PIPE SLEEVE DETAIL

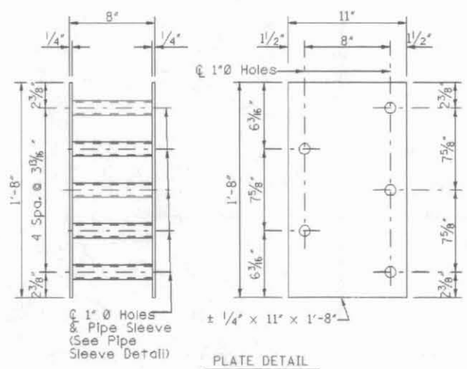
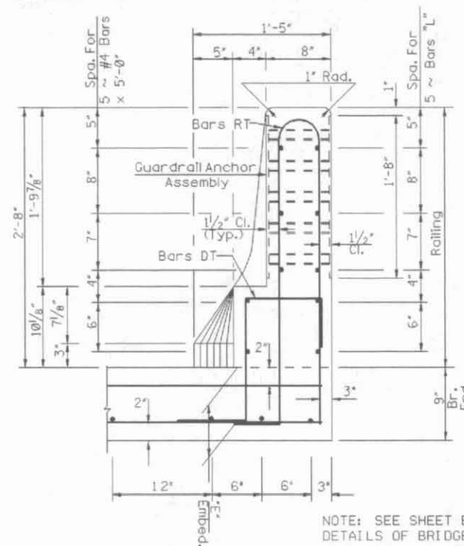


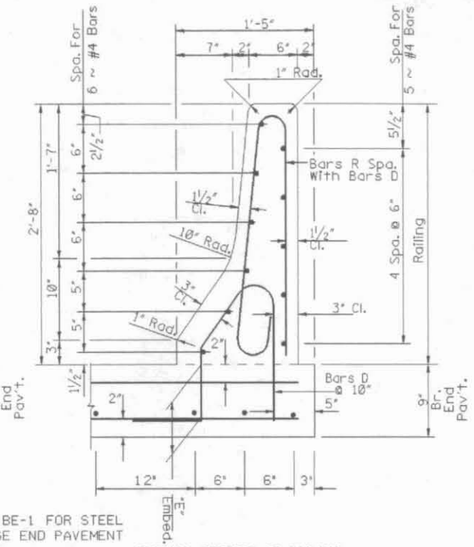
PLATE DETAIL

GUARDRAIL ANCHOR ASSEMBLY



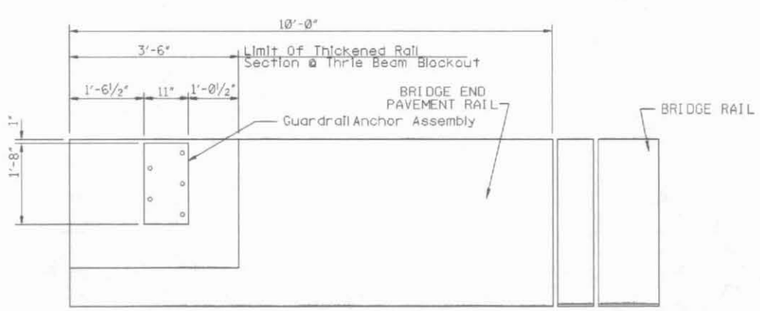
END ELEVATION OF RAILING

NOTE: SEE SHEET BE-1 FOR STEEL DETAILS OF BRIDGE END PAVEMENT

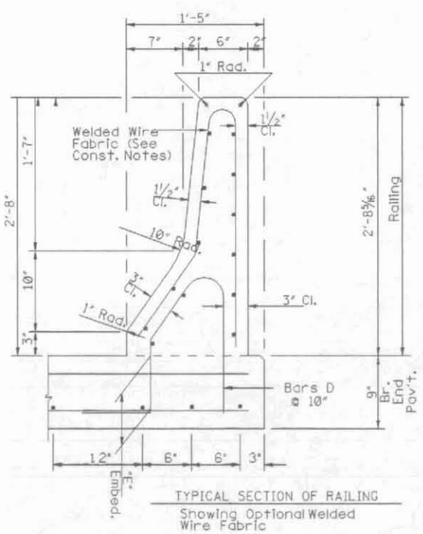


TYPICAL SECTION OF RAILING

NOTE: "E" = Slab Thickness (In.) - 1 Inch.



PART ELEVATION OF OUTSIDE FACE OF RAILING



TYPICAL SECTION OF RAILING

Showing Optional Welded Wire Fabric

CONSTRUCTION NOTES:

Fabricate Guardrail Anchor Assemblies By Tack Welding Each End Of Pipe Sleeves To Plates. Plates Shall Be ASTM A 36 Steel. Pipes Shall Be ASTM A 120. Galvanize Complete Assemblies After Fabrication Per ASTM A 153.

Attach Assemblies Securely To Forms Prior To Pouring Railing Concrete To Assure That Exposed Surfaces Of The Assemblies Will Be Flush With Concrete Surfaces.

GUARDRAIL ANCHOR ASSEMBLIES SHALL BE INSTALLED IN BOTH LEFT AND RIGHT RAILINGS AT EACH END OF ALL BRIDGES.

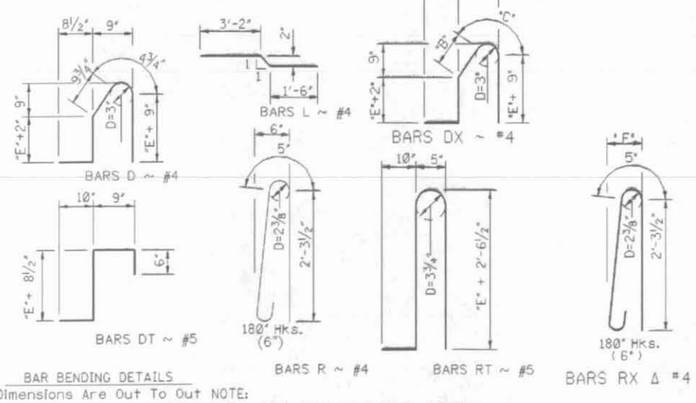
Welded Wire Fabric Meeting The Requirements Of ASTM A 497 And Details Shown On This Sheet May Be Used As An Option To Conventional Railing Reinforcing. Longitudinal Wires Shall Be D8 Spaced As Shown In The BAR BENDING DETAILS And Vertical Wires Shall Be D8 Spaced At 4".

Welded Wire Fabric Shall Not Be Used In The 2'-9" Thrie Beam Blockout Reinforcement For The 2'-9" Thrie Beam Blockout Shall Consist Of Conventional Reinforcing As Shown In Details On This Sheet. The Longitudinal Bars Of The Conventional Reinforcing Shall Extend Beyond The 2'-9" Thrie Beam Blockout Into The Welded Wire Fabric A Minimum Distance Of 1'-6".

Bridge End Pavement Rail Shall Be Constructed And Paid For In Accordance With Section 813 Of The Standard Specifications.

DESIGN DATA

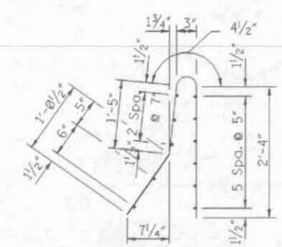
Specifications.....A.A.S.H.T.O. 1992 & Int. Thru 1995
Concrete.....Class "AA"(4,000 psi)
Reinforcing.....ASTM A 615 Grade 60 (Fy = 60 ksi)



BAR BENDING DETAILS

Dimensions Are Out To Out NOTE:
"E" = Slab Thickness (In.) - 1 Inch.

SKEW (DEG)	BARS DX ~ #4			BARS RX ~ #4
	"A"	"B"	"C"	"F"
0	9"	9¾"	5"	6"
5	9"	9¾"	5"	6"
10	9"	9¾"	5"	6"
15	9¼"	10"	5"	6¼"
20	9½"	10"	5"	6¼"
25	10"	10½"	5"	6½"
30	10¼"	10½"	5"	7"
35	11"	11¼"	4¾"	7¼"
40	11¾"	11¾"	4¾"	7¾"
45	12¼"	1'-0¾"	4½"	8½"
50	14"	1'-1¾"	4½"	9¼"
55	15¾"	1'-2½"	4½"	10½"



WELDED WIRE FABRIC

(Optional - See CONSTRUCTION NOTES)

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

32" BRIDGE END PAVEMENT RAIL

WORKING NUMBER BEPR-1

SHEET NUMBER

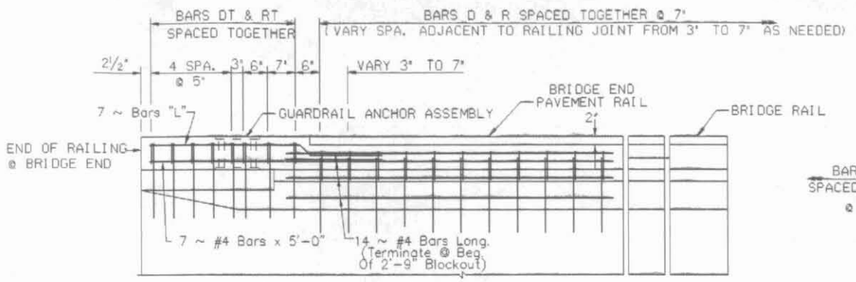
FILENAME:

DESIGN TEAM ____ CHECKED ____ DATE ____

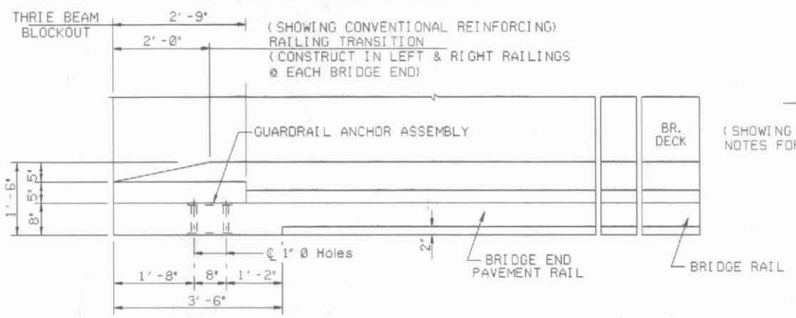
PLAN: ROADWAY DESIGN DIVISION MISSISSIPPI DEPARTMENT OF TRANSPORTATION

10/15/2006 2:54 PM BR END PAVE RAIL

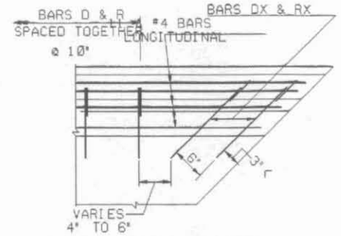
STATE	PROJECT NO.
MISS.	



PART PLAN OF LEFT RAILING

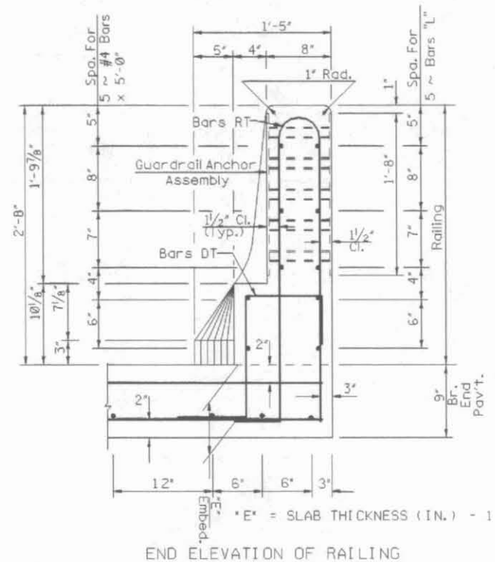


PART PLAN OF RIGHT RAILING
(SHOWING CONCRETE DIMENSIONS)



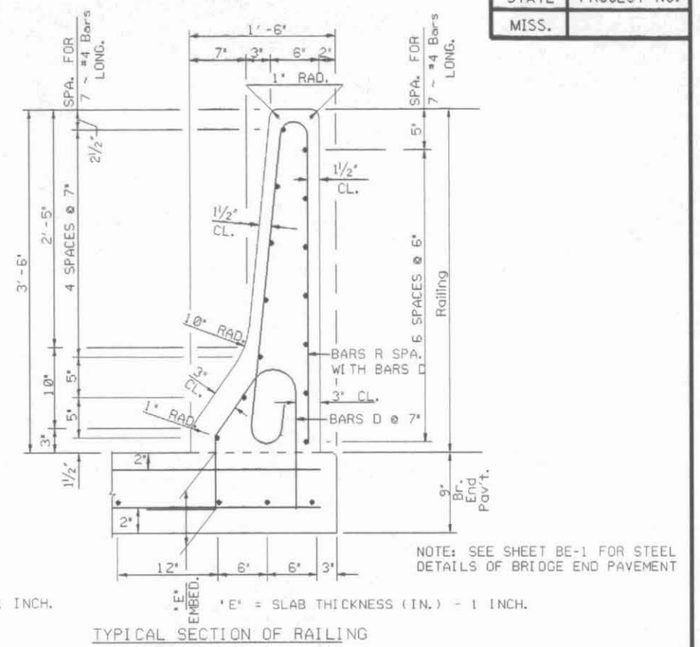
SKEWED PART PLAN OF LEFT RAILING AT BRIDGE END WALL

(SHOWING CONVENTIONAL REINFORCING. SEE CONSTRUCTION NOTES FOR DETAILS OF OPTIONAL WELDED WIRE FABRIC.)



"E" = SLAB THICKNESS (IN.) - 1 INCH.

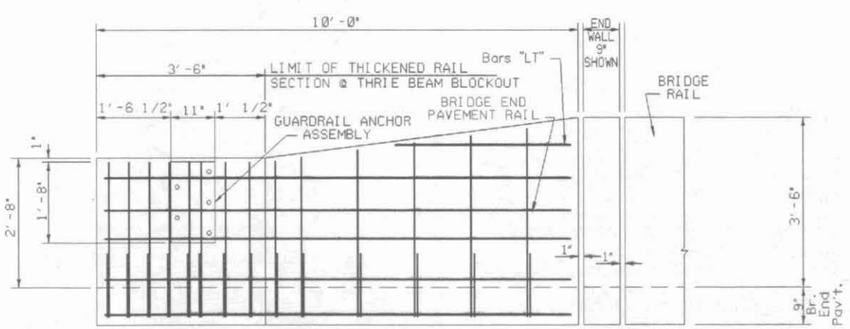
END ELEVATION OF RAILING



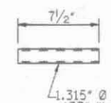
NOTE: SEE SHEET BE-1 FOR STEEL DETAILS OF BRIDGE END PAVEMENT

"E" = SLAB THICKNESS (IN.) - 1 INCH.

TYPICAL SECTION OF RAILING



PART ELEVATION OF OUTSIDE FACE OF RAILING



PIPE SLEEVE DETAIL

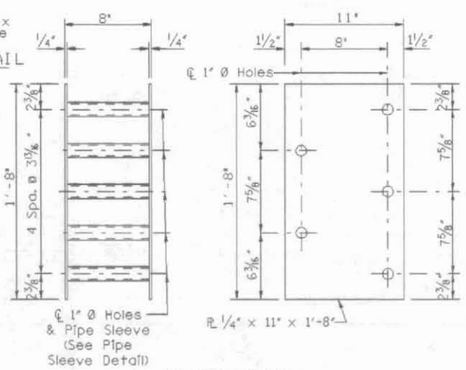
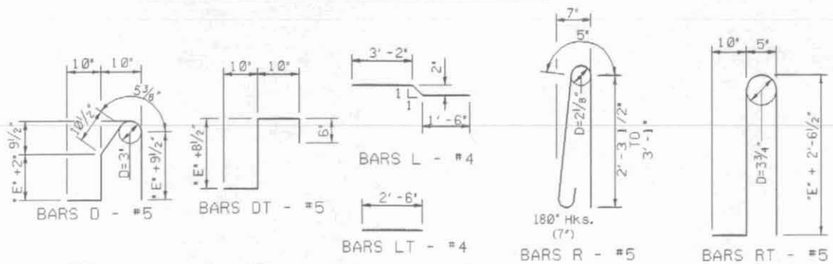


PLATE DETAIL
GUARDRAIL ANCHOR ASSEMBLY



NOTE:
"E" = SLAB THICKNESS (IN.) - 1 INCH.

BAR BENDING DETAILS
DIMENSIONS ARE OUT TO OUT

SKEW (DEG)	BARS DX ~ #5 "A"	"B"	"C"	BARS RX ~ #5 "F"
0	10"	10½"	5⅜"	7"
5	10"	10½"	5⅜"	7"
10	10"	10½"	5⅜"	7"
15	10¼"	10½"	5¼"	7¼"
20	10½"	10¾"	5¼"	7½"
25	11"	11¼"	5 3/16"	7¾"
30	11½"	11½"	5 1/16"	8"
35	12¼"	1'-0¼"	5"	8½"
40	13"	1'-0¾"	4⅞"	9"
45	14"	1'-1¾"	4 11/16"	9¾"
50	15½"	1'-3"	4⅝"	10¾"
55	17½"	1'-4¾"	4½"	12¼"

CONSTRUCTION NOTES:

FABRICATE GUARDRAIL ANCHOR ASSEMBLIES BY TACK WELDING EACH END OF PIPE SLEEVES TO PLATES. PLATES SHALL BE ASTM A 36 STEEL. PIPES SHALL BE ASTM A 120. GALVANIZE COMPLETE ASSEMBLIES AFTER FABRICATION PER ASTM A153.

ATTACH ASSEMBLIES SECURELY TO FORMS PRIOR TO POURING RAILING CONCRETE TO ASSURE THAT EXPOSED SURFACES OF THE ASSEMBLIES WILL BE FLUSH WITH CONCRETE SURFACES.

GUARDRAIL ANCHOR ASSEMBLIES SHALL BE INSTALLED IN BOTH LEFT AND RIGHT RAILINGS AT EACH END OF ALL BRIDGES.

BRIDGE END PAVEMENT RAIL SHALL BE CONSTRUCTED AND PAID FOR IN ACCORDANCE WITH SECTION 813 OF THE STANDARD SPECIFICATIONS.

DESIGN DATA

SPECIFICATIONS.....A.A.S.H.T.O. 1992 & INT. THRU 1995
CONCRETE.....CLASS "AA" (4,000 PSI)
REINFORCING.....ASTM A 615 GRADE 60 (FY = 60 KSI)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

42" BRIDGE END PAVEMENT RAIL

BY	REVISION	DATE

WORKING NUMBER: BEPR-1A

SHEET NUMBER

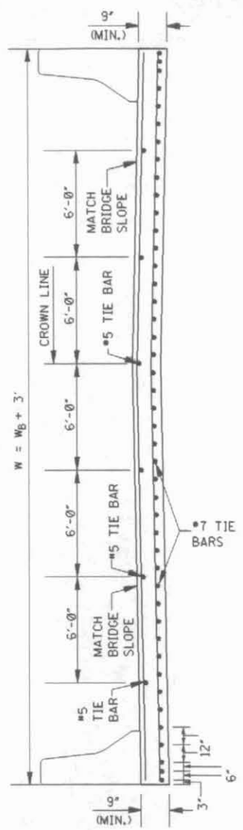
FILENAME:

DESIGN TEAM _____ CHECKED _____ DATE _____

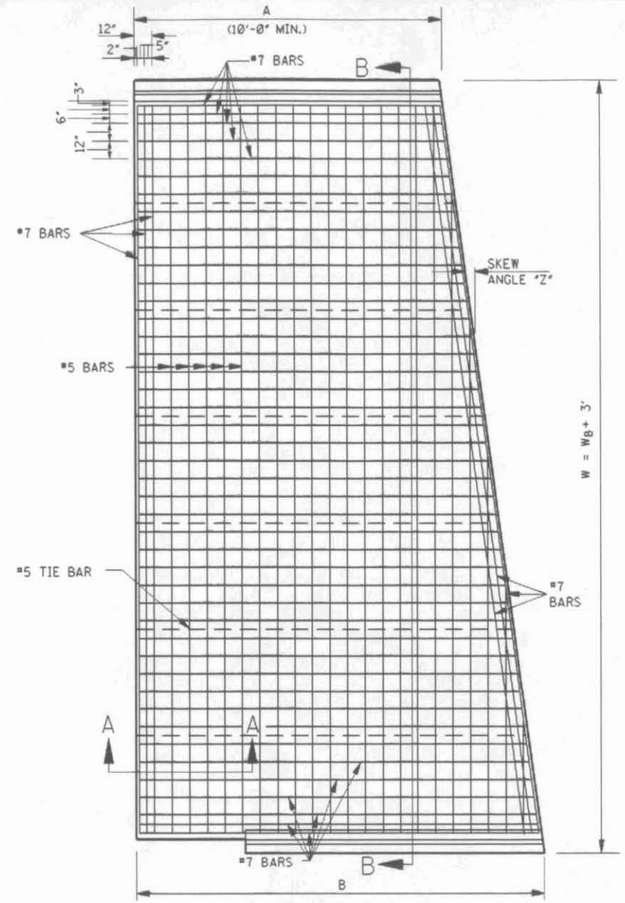
PLAN ROADWAY DESIGN DIVISION MISSISSIPPI DEPARTMENT OF TRANSPORTATION

13/5/2005 2:53 PM BR END PAVE RAIL

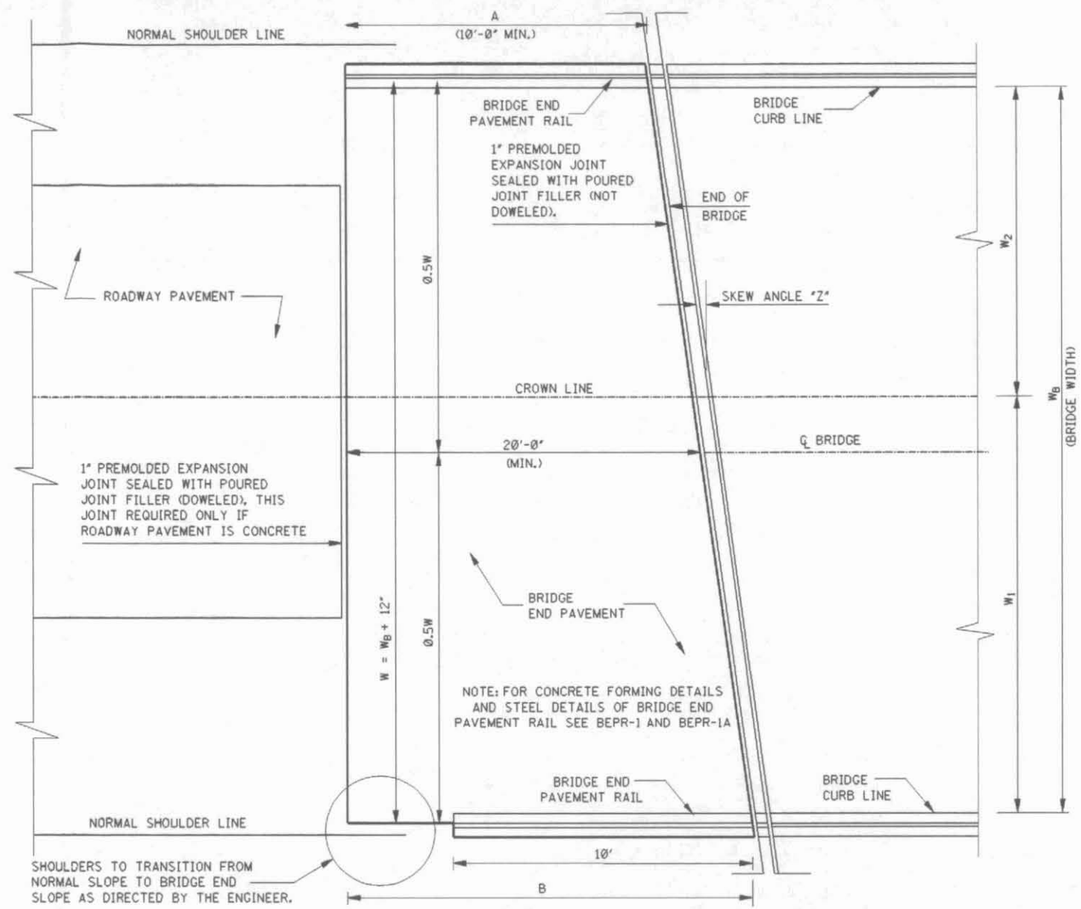
STATE	PROJECT NO.
MISS.	



SECTION B–B



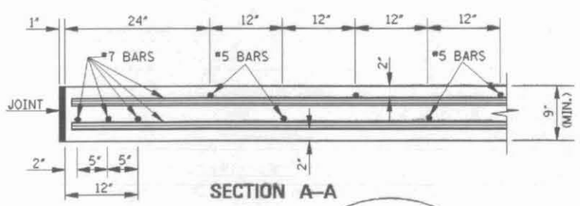
PLAN



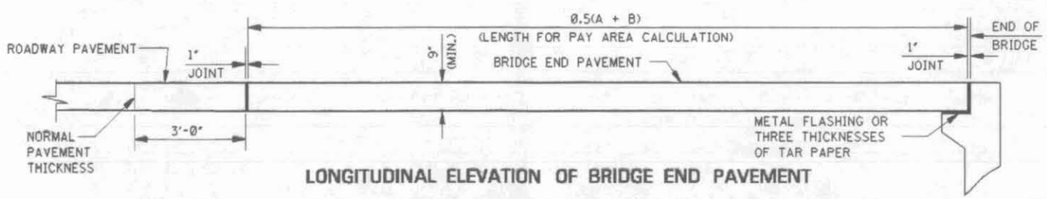
PLAN AT BRIDGE END

GENERAL NOTES:

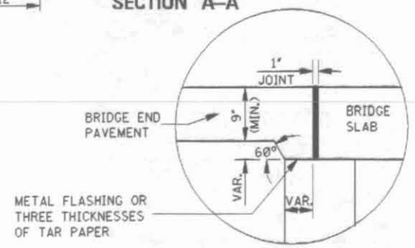
1. IF BRIDGE END PAVEMENT IS CONSTRUCTED IN MORE THAN ONE SECTION, LONGITUDINAL CONSTRUCTION JOINTS WITH TIE BARS WILL BE USED. TIE BARS WILL BE #5 BARS, 30" LONG AND SPACED 30" O.C. SUCH CONSTRUCTION WILL BE USED WHERE INDICATED ON PLANS.
2. DIMENSIONS "A" & "B" ARE BASED ON A MID-LENGTH OF 20'-0". EXCEPT IN NO CASE SHALL "A" BE LESS THAN 10'-0".
3. SEE QUANTITY SECTION OF PLANS FOR DIMENSIONS "W", "W_1", "W_2", "A", "B", SKEW ANGLE "Z" AND QUANTITIES.
4. SPACING OF OUTER LONGITUDINAL EDGE BARS AND TIE BARS MAY BE ADJUSTED TO MEET VARIOUS WIDTHS ("W") OF BRIDGE END PAVEMENT. SPACINGS SHOWN ARE FOR A BRIDGE WIDTH OF 40'-0".
5. REINFORCEMENT (DEFORMED) MAY BE FURNISHED FULL LENGTH OR MAY BE LAPPED. IF BARS ARE LAPPED THEY SHALL BE LAPPED NOT LESS THAN 30 DIAMETERS.



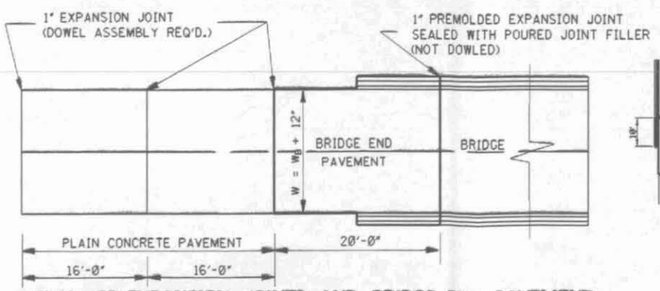
SECTION A–A



LONGITUDINAL ELEVATION OF BRIDGE END PAVEMENT



DETAIL SHOWING METHOD OF SEATING BRIDGE END PAVEMENT ON BRIDGES WITH NO PAVING BRACKET



PLAN OF EXPANSION JOINTS AND BRIDGE END PAVEMENT

DATE	REVISION	BY

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
STANDARD PLAN

BRIDGE END PAVEMENT

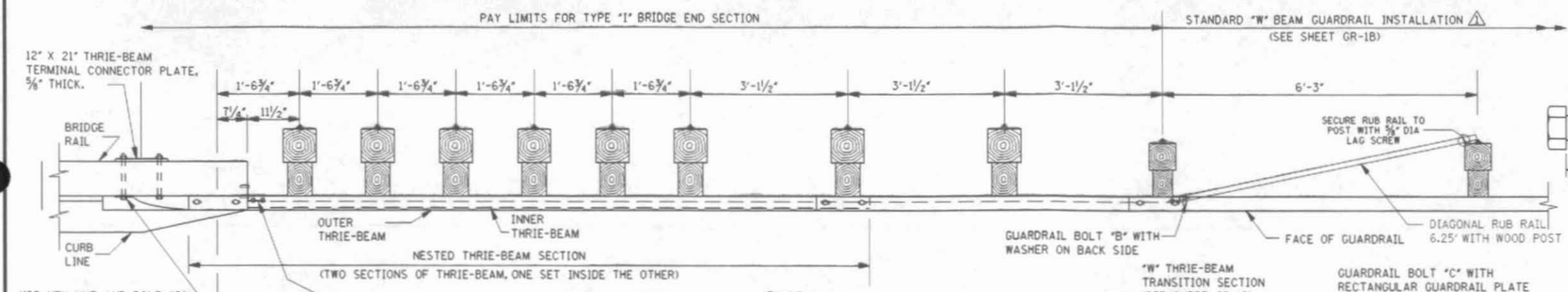
ENGLISH

WORKING NUMBER BE-1

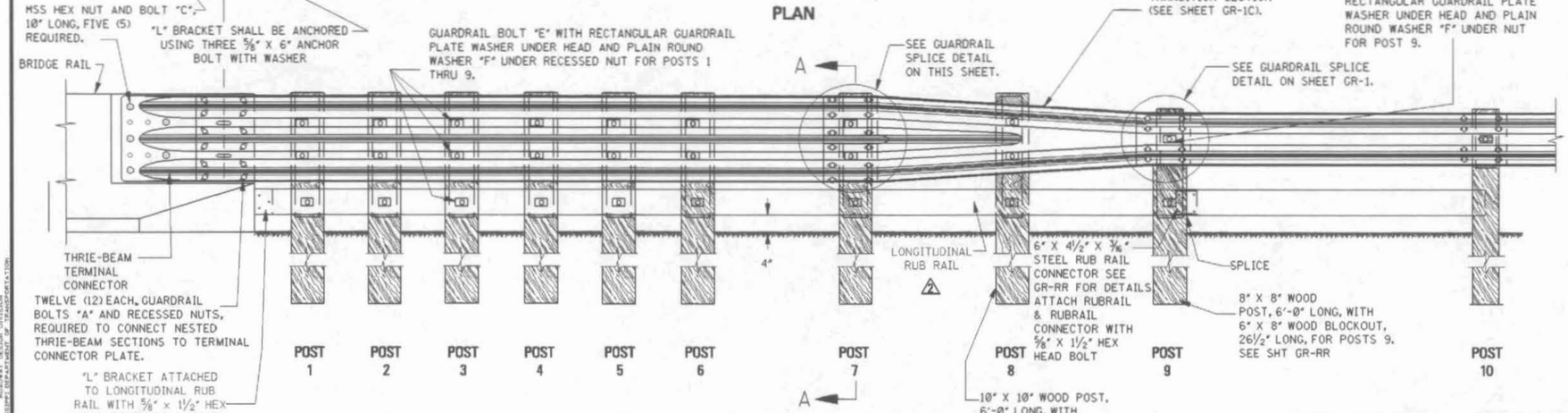
ISSUE DATE: OCTOBER 1, 1998

SHEET NUMBER 107

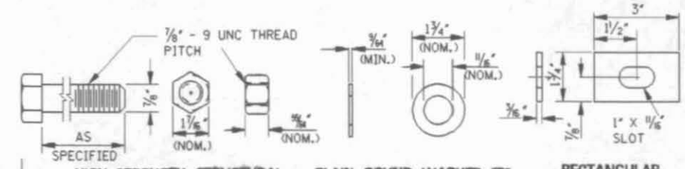
STATE	PROJECT NO.
MISS.	



PLAN

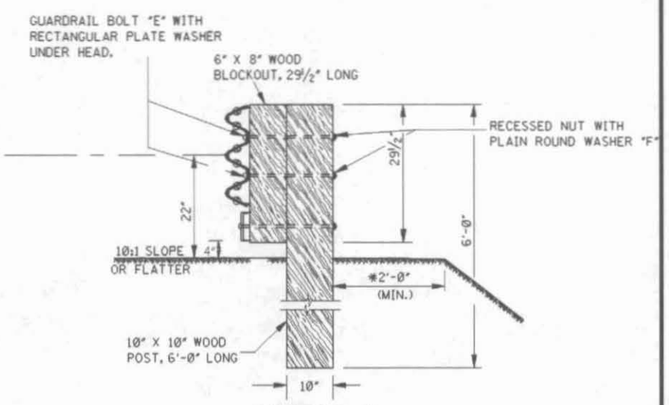


ELEVATION FROM ℄ ROADWAY



HIGH-STRENGTH STRUCTURAL HEX NUT AND BOLT "C" | PLAIN ROUND WASHER "F" | RECTANGULAR GUARDRAIL PLATE WASHER

FASTENER DETAILS



SECTION A–A

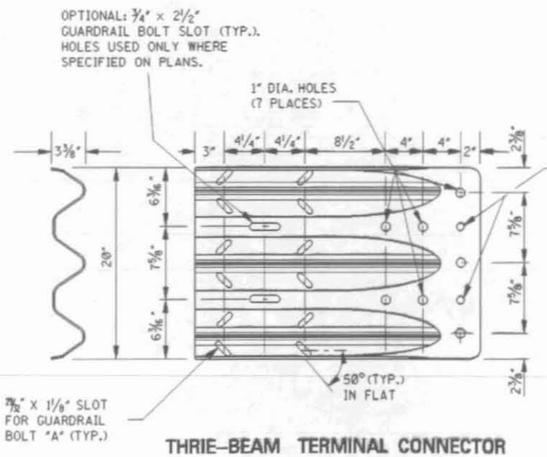
*NOTE: UNLESS SPECIFIED OTHERWISE ON THE PLANS.

GENERAL NOTES:

1. THIS GUARDRAIL TRANSITION IS APPROPRIATE FOR A CONNECTION TO A VERTICAL CONCRETE SHAPE AND SHOULD NOT BE CONNECTED DIRECTLY TO A CONCRETE SAFETY SHAPE. CONCRETE SAFETY SHAPE BARRIERS SHOULD BE TRANSITIONED TO A VERTICAL SHAPE AT THE GUARDRAIL CONNECTION. BRIDGE RAIL ENDS AND BRIDGE PARAPETS MUST BE OF ADEQUATE STRENGTH TO ACCEPT FULL IMPACT LOADING.

GENERAL NOTES (CONTINUED):

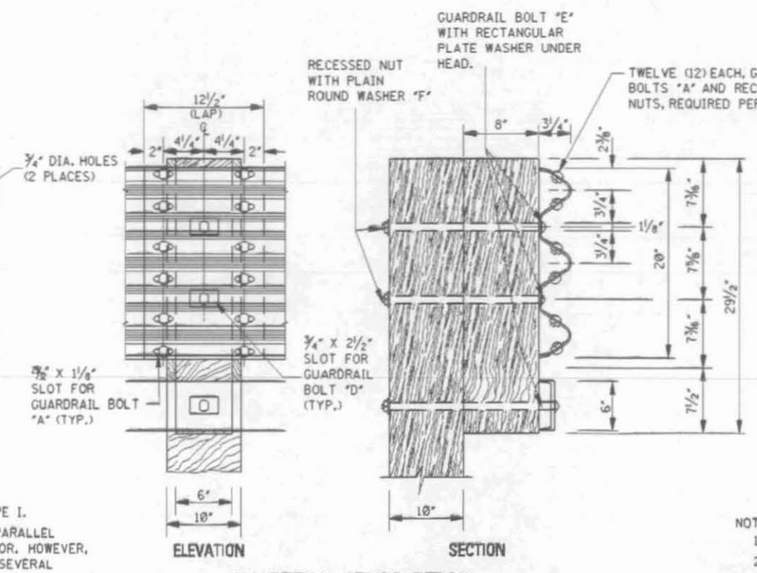
2. SEE RAILING DETAILS IN BRIDGE DRAWINGS FOR OTHER DETAILS.
3. GUARDRAIL SHALL MEET THE REQUIREMENTS OF AASHTO M 180, CLASS A, TYPE I UNLESS OTHERWISE DESIGNATED.
4. THE TYPE "I" TRANSITION IS USED ON BOTH LEFT AND RIGHT SIDES OF EACH BRIDGE APPROACH WITH 2-WAY TRAFFIC AND THE GUARDRAIL SECTIONS SHALL BE LAPPED IN THE DIRECTION OF THE APPROACHING TRAFFIC.
5. ALL WOOD POSTS AND BLOCKOUTS SHALL BE TREATED TIMBER IN ACCORDANCE WITH MISSISSIPPI DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
6. FOR FASTENER DETAILS NOT FOUND ON THIS SHEET, SEE SHEET GR-1.
7. DETAILS PERTINENT TO THE STANDARD INSTALLATION OF "W" AND THRIE-BEAM SECTIONS NOT SPECIFICALLY MODIFIED ON THIS SHEET WILL BE FOUND ON SHEETS GR-1 AND GR-1A, RESPECTIVELY.
8. FOR OTHER DETAILS OF POSTS, POST ACCESSORIES, FASTENERS & RAIL ELEMENTS, SEE AASHTO-AGC-ARTBA JOINT TASK FORCE NO. 13, TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE," LATEST EDITION.



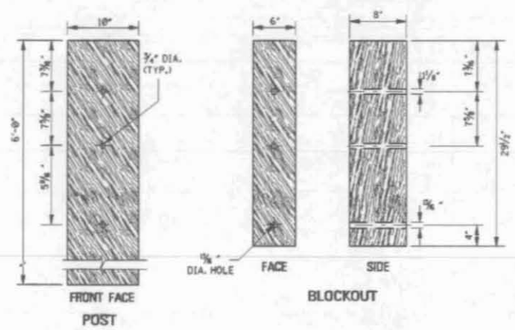
THRIE-BEAM TERMINAL CONNECTOR

NOTES:

1. THE THRIE-BEAM TERMINAL CONNECTOR IS TO BE AASHTO M 180 CORRUGATED SHEET STEEL, CLASS B, TYPE I.
2. ALTERNATIVELY, THE SPLICE SLOTS CAN BE ORIENTED PARALLEL TO THE LONGITUDINAL AXIS OF THE TERMINAL CONNECTOR. HOWEVER, THE 50° SLOT VERSION IS EASIER TO INSTALL WHERE SEVERAL GUARDRAIL SECTIONS ARE NESTED TOGETHER.



GUARDRAIL SPLICE DETAIL
(POST 7)



DETAILS OF THRIE-BEAM POST AND BLOCKOUT
(POST 1 THRU POST 8)

NOTES:

1. HOLE DETAILS ARE REQUIRED ON ALL WOOD POSTS AND BLOCKOUTS.
2. WOOD POSTS AND BLOCKOUTS ARE FABRICATED FROM TREATED TIMBER UNLESS SPECIFIED OTHERWISE ON THE PLANS.
3. ALL HOLES IN BOTH POSTS AND BLOCKOUTS ARE 3/4"IN DIAMETER.

DATE	REVISION	BY
03-18-05	ADDED RUB RAIL	S.W.R.
02-18-99	STANDARD W BEAM	S.W.R.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

GUARDRAIL: BRIDGE END SECTION TYPE "I" (WOOD POSTS)

WORKING NUMBER GR-2F

SHEET NUMBER

FILENAME:

DESIGN TEAM _____ CHECKED _____ DATE 03-18-05