



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 08-07

Regarding revised Guardrail Standard Drawings S-GR-11, S-GR- 22, S-GR-26, and
Cantilever Signal Support Standard Drawing T-SG-9.

Effective immediately, the revised guardrail standard drawings S-GR-11, S-GR-22, S-GR-26, and cantilever signal support T-SG-9 are to be printed with the plans. The drawings shall be identified on the lower left side of the index sheet **“To be printed with plans”**.

Copies of the new standard drawings are attached. The Metric version of the subject Standard Drawings may be obtained by calling the Quality Assurance and Standards Office at (615)741-2806.

ROADWAY DESIGN STANDARDS – ENGLISH

<u>Drawing Number</u>	<u>Current Revision Date</u>	<u>Drawing Title</u>
S-GR-11	11-26-07	W-Beam & Thrie Beam Barrier Rail and Rub Rail alternates
S-GR-22	03-13-08	Guardrail Attachment to Concrete Decks of Box and Slab Culverts and Bridges
S-GR-26	03-15-08	Guardrail Terminal Anchor (Type 21) Post Layout and Erection Details
T-SG-9	11-16-07	Details of Cantilever Signal Support

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

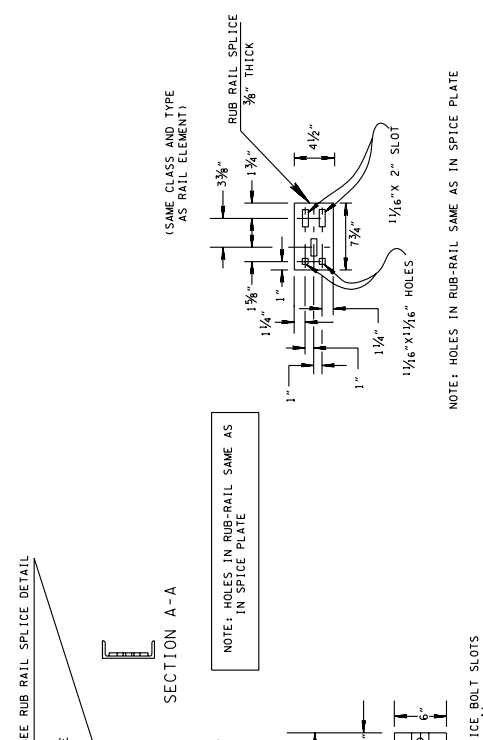
May 6, 2008
JCJ:arh
Attachment

REV. 9-1-89: CHANGED S-GR-1 TO S-GR-2.
 REV. 7-1-89: ADDED ITEM 705-03.11. DELETED W-42-131 AS REFERENCE DIM. DIMENSION TO W-BEAM RAIL.
 REV. 9-1-86: CHANGED ITEM DESCRIPTIONS AND ADDED NOTE 7.
 REV. 5-1-84: CHANGED ITEM NOS. TO 705-01.01, 705-01.02, 705-01.03, 705-01.04, 705-01.05, AND 705-02.05. DELETED ITEM NO. 705-02.05.
 REV. 11-4-87: ADDED ITEM NOS. 705-01.07 AND 705-06. CORRECTED REFERENCE FOR 705-01.04.
 REV. 3-6-90: ADDED RUB RAIL. DELETED ITEM NOS. 705-04.08 AND 705-04.09.
 REV. 10-26-91: REDREW AND REVISED DRAWING TO CONFORM TO 1991 STANDARD DRAWING TO 1991 STANDARD.

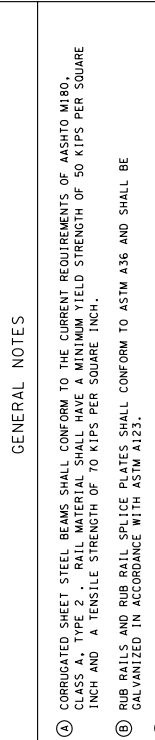
REV. 10-26-94: IN GENERAL NOTES
 CHANGED DRAWING NUMBER.
 REV. 1-19-95: IN GENERAL NOTE
 CHANGED DRAWING NUMBER.
 REV. 7-29-95: IN GENERAL NOTE
 ADDED ITEM NOS. 705-04.20 AND 705-04.21.
 REV. 5-27-95: IN GENERAL NOTE
 ADDED ITEM NO. 705-04.06.
 REV. 6-10-96: ADDED DIMENSION FOR WIDTH TO RUB RAIL SPLICE DETAIL.
 REV. 7-29-98: MODIFIED GENERAL NOTE
 REV. 9-5-98: MODIFIED GENERAL NOTE
 REV. 10-26-99: DELETED BACK UP PLATE DETAILS.
 REV. 9-5-00: IN GENERAL NOTES
 CORRECTED NOTE
 REV. 5-27-01: IN GENERAL NOTE TO CONCUR WITH NEW PAVEMENT SYSTEM.
 REV. 9-5-01: CORRECTED DESCRIPTION FOR ITEM NO. 705-04.07.
 REV. 9-11-02: DELETED ITEM NO. 705-01.02.
 REV. 9-5-03: CHANGED GENERAL NOTE
 DELETED GENERAL NOTE
 RENUMBERED REMAINING GENERAL NOTES.
 REV. 8-22-05: CHANGED GENERAL NOTES AND
 REV. 6-30-05: MODIFIED GENERAL NOTE
 REV. 11-26-07: REVISED STD. DIM. NUMBERS.

UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN INCHES.
 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TO FACE UNLESS INDICATED OTHERWISE.
 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TO CENTER UNLESS INDICATED OTHERWISE.
 UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TO CENTER UNLESS INDICATED OTHERWISE.

STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 W-BEAM & THRIE BEAM BARRIER RAIL AND RUB RAIL ALTERNATES
 S-GR-11

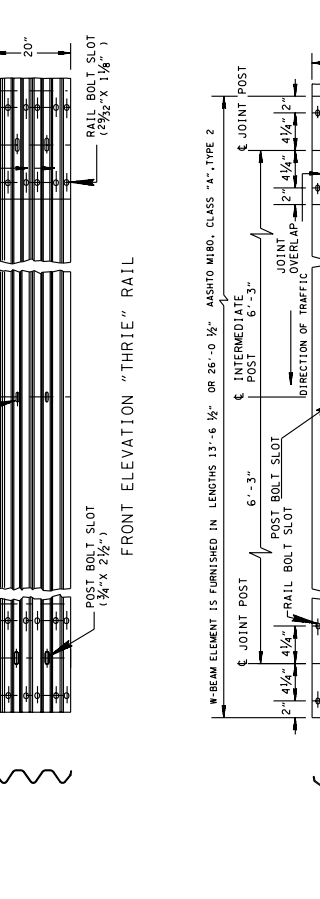
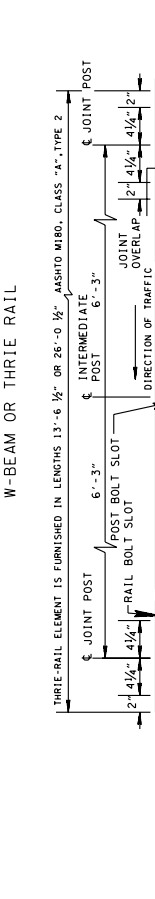
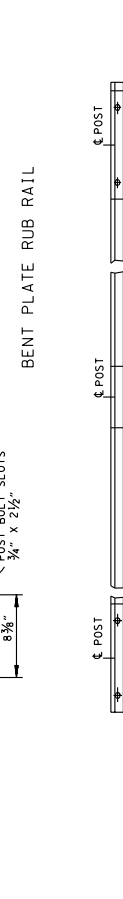
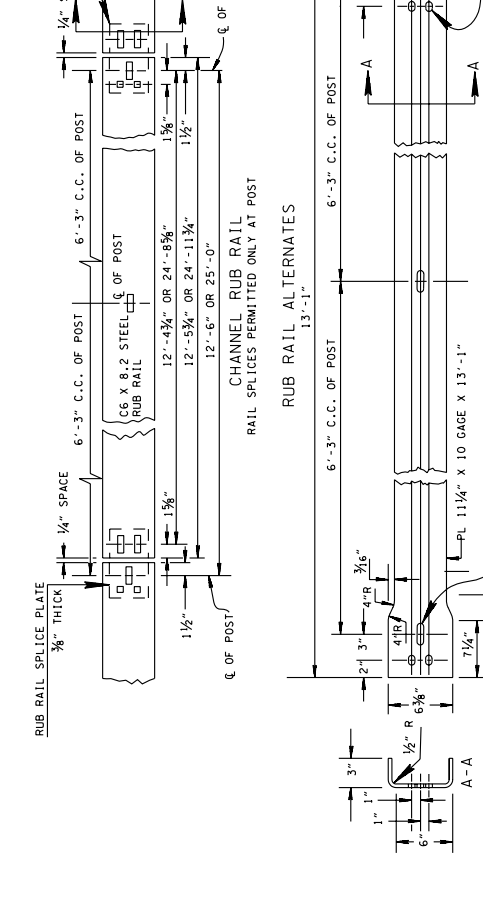


NOTE: HOLES IN RUB-RAIL SAME AS IN SPLICE PLATE
 RUB RAIL SPLICE DETAIL



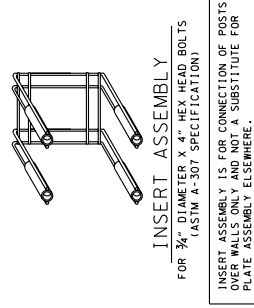
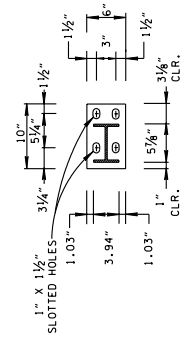
ITEM NO.	DESCRIPTION	ON DIM NO.
705-01-01	GUARDRAIL AT BRIDGE ENDS	S-GR-17 & S-GR-23
705-01-02	W-BEAM GUARDRAIL	S-GR-22
705-02-01	SINGLE GUARDRAIL WITH RUB-RAIL (TYPE 2)	S-GR-13 & S-GR-18
705-02-02	SINGLE GUARDRAIL (TYPE 2)	S-GR-13 & S-GR-18
705-03-01	MEDIAN DIVIDER GUARDRAIL W/RUB-RAIL (TYPE 2)	S-GR-13 & S-GR-18
705-03-02	MEDIAN DIVIDER GUARDRAIL (TYPE 2)	S-GR-13 & S-GR-18
705-03-04	MEDIAN DIVIDER GUARDRAIL AT CONCRETE BARRIER	S-GR-13 & S-GR-18
705-04-02	GUARDRAIL TERMINAL (TYPE 1)	S-GR-19 & S-GR-19B
705-04-03	GUARDRAIL TERMINAL (TYPE 2)	S-GR-19 & S-GR-19C
705-04-04	GUARDRAIL TERMINAL (TYPE 3)	S-GR-19 & S-GR-19C
705-04-05	TANGENT ENERGY ABSORBING TERMINAL (TYPE IN-LINE)	S-GR-18
705-04-07	TANGENT ENERGY ABSORBING TERMINAL (NCHRP 350 - TL3)	S-GR-43, S-GR-44

TYPE 1: 3'-1 1/2" SPACING
 TYPE 2: 6'-3" SPACING



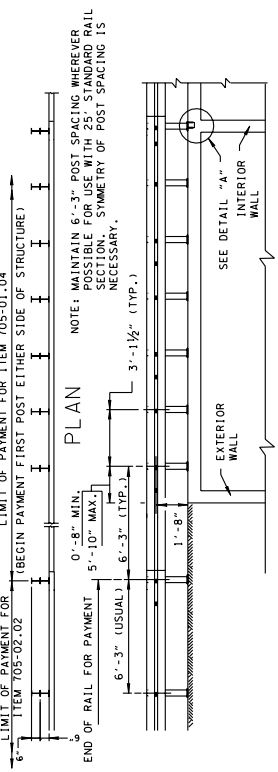
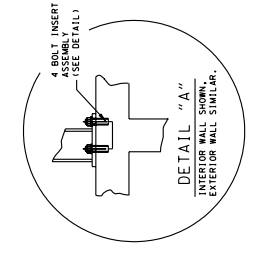
FRONT ELEVATION "W"-BEAM

- REV. 9-5-97: MODIFIED INSIDE ELEVATION OF GUARDRAIL DETAIL.
- REV. 7-29-98: CHANGED STEEL WELDED TO TOP OF WOOD BLOCK-OUTS IN ALL DETAILS AND NOTES.
- REV. 5-27-99: RELOCATED 1 1/2" DIAMETER FORMED HOLES OUTWARDLY 1 1/2".
- REV. 10-26-01: ELIMINATED DETAILS FOR PRECAST CONCRETE DECK PANELS FOR HEIGHT OF FILLS OVER 1'-6". CHANGED DESIGN NOTE.
- REV. 4-15-02: CHANGED ITEM NO. 705-06-01 TO 705-01.04.
- REV. 11-26-02: ELIMINATED DETAILS FOR PRECAST CONCRETE DECK PANELS FOR HEIGHTS LESS THAN 1'-6". CHANGED TYPE OF CHER TO COMPLY WITH NEW STANDARD DRAWINGS STD-12-6 AND STD-15-7.
- REV. 11-21-07: REVISED GUARDRAIL POST SPACING.
- REV. 3-13-08: REVISED FILLED WELD SIZE BETWEEN POST/BASE PLATE.

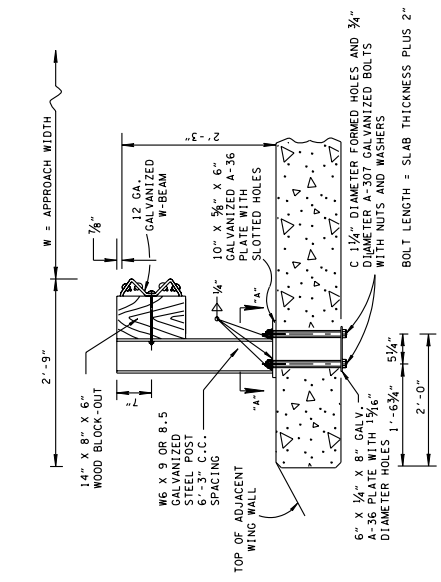


INSERT ASSEMBLY
FOR 3/4" DIAMETER X 4" HEX HEAD BOLTS
(ASTM A-307 SPECIFICATION)

INSERT ASSEMBLY IS FOR CONNECTION OF POSTS OVER WALLS ONLY AND NOT A SUBSTITUTE FOR PLATE ASSEMBLY ELSEWHERE.



INSIDE ELEVATION OF GUARDRAIL

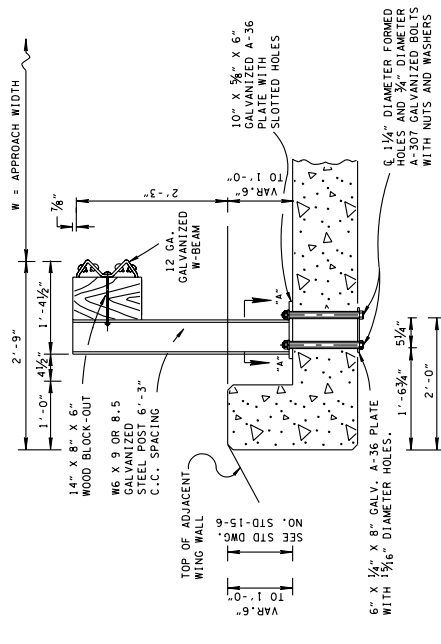


DETAIL FOR CONCRETE DECK USED AS A RIDING SURFACE SHOWING OUTLET END

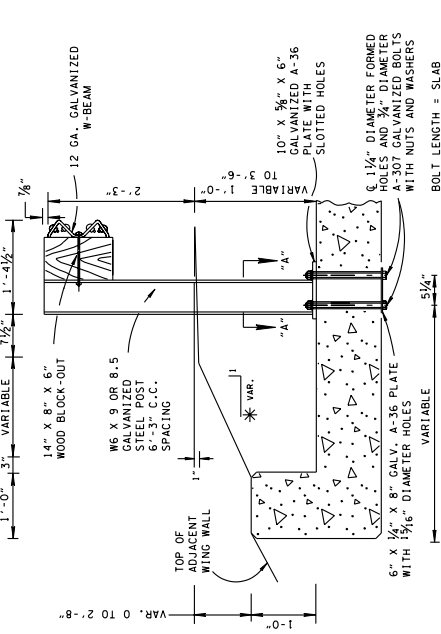
GENERAL NOTES

- (A) THE EXACT POSITION OF GUARDRAIL SHALL BE AS SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER. GUARDRAIL SHALL BE INSTALLED AS SHOWN ELSEWHERE ON PLANS. GUARDRAIL OR STRUCTURE RAILING AS SHOWN ELSEWHERE ON PLANS.
- (B) AT THE OPTION OF THE CONTRACTOR THE RAIL ELEMENTS FOR THE GUARDRAIL MAY BE FURNISHED WITH EITHER 3/4" OR 5/8" NOMINAL LENGTHS WITH POST BOLT SLOTS FOR CONNECTION TO POSTS.
- (C) BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.
- (D) GUARDRAIL THAT IS INSTALLED ON CURVE WITH A RADIUS OF 150 FEET OR LESS SHALL BE SHOP CURVED.
- (E) STEEL POST SHALL BE BLOCKED OUT. A 6" X 6" WOOD BLOCK-OUT SHALL BE USED WITH EACH STEEL POST. SEE STANDARD DRAWING S-GR-13 FOR SPECIFICATIONS AND DETAILS.
- (F) WELDED STEEL POSTS SHALL MEET THE REQUIREMENTS OF ASTM A-769. THE FLANGE WIDTH AND THICKNESS, WEB THICKNESS, AND DEPTH OF THE FLANGE SHALL BE AS SHOWN ON THE DRAWING. DIMENSIONS OF A STANDARD ROLLED W6 X 8.5 OR W6 X 9.0 STEEL POST.
- (G) STEEL POSTS SHALL MEET THE REQUIREMENTS OF ASTM A-36. BOLT HOLES SHALL BE PRECISELY CENTERED BETWEEN WEB AND EDGE OF FLANGE OF SPACERS AND POSTS.
- (H) FOR DIMENSIONS AND DETAILS NOT SHOWN SEE STANDARD DRAWING NOS. STD-15-6, STD-15-7, AND THE S-GR-SERIES.

DETAIL FOR CONCRETE DECK WITH 6" TO 1'-0" OF ROADWAY FILL COVER



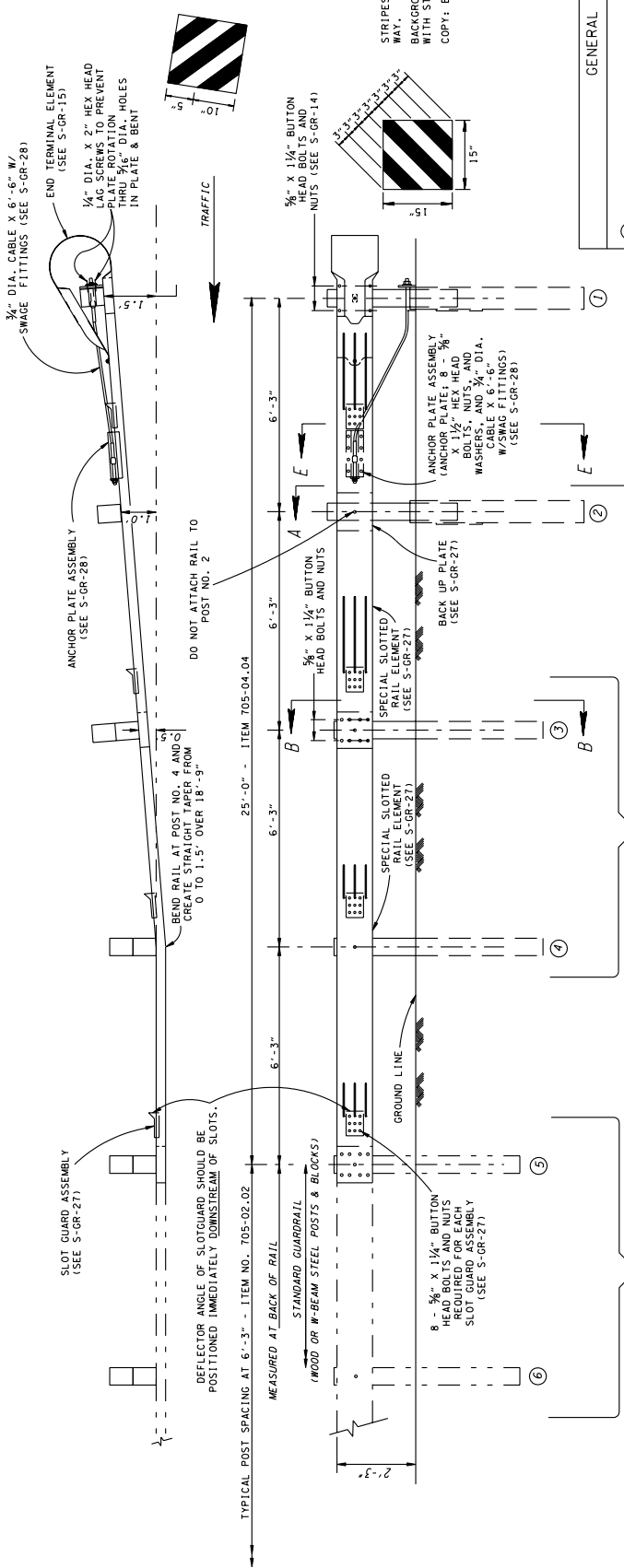
DETAIL FOR CONCRETE DECK WITH 1'-0" TO 3'-6" OF ROADWAY FILL COVER



DESIGN NOTES

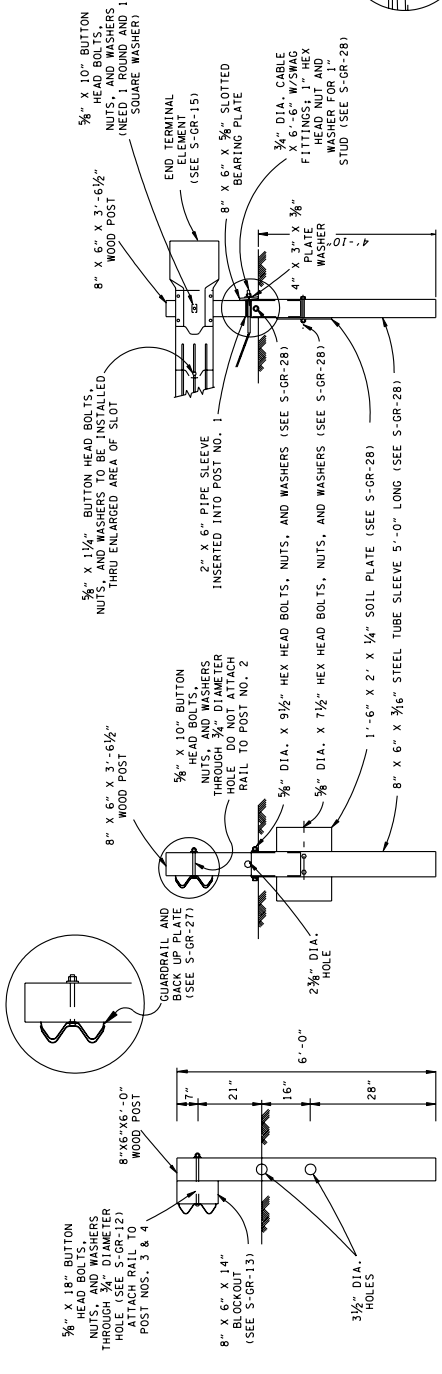
- (1) GUARDRAIL POST SPACING SHALL BE REDUCED TO 3'-1 1/2" AT CONCRETE DECK ATTACHMENTS.
- (2) WHEN DEPTH OF FILL AT FACE OF GUARDRAIL EXCEEDS 3'-6" DELETE THE USE OF BOLTED BASE PLATES AND DRIVE POSTS.
- (3) THE USE OF PRECAST, PRESTRESSED CONCRETE DECK PANELS IN BOX AND SLAB TYPE CULVERTS IS PROHIBITED.
- (4) THIS RAIL SYSTEM HAS BEEN TESTED IN ACCORDANCE WITH THE CRITERIA SET FORTH IN NCHRP REPORT NUMBER 230, MARCH 1981, AND SUCCESSFULLY CONTAINED A 4,450 POUND VEHICLE AT A VELOCITY OF 61.8 MPH AND AN IMPACT ANGLE OF 25.3 DEGREES. REFERENCE REPORT FHWA/TX-86/64-405-2F, NOVEMBER 1986.
- (5) ANY REINFORCING STEEL THAT INTERFERES WITH THE 1 1/4" DIAMETER FORMED HOLES SHALL BE MOVED HORIZONTALLY TO PROVIDE A 1" MINIMUM CLEARANCE TO THE HOLE.

- REV. 12-18-95: REMOVED GROUND RAIL FROM BEARING PLATE AND MADE OTHER MINOR CHANGES.
- REV. 5-27-96: CHANGED DIAMETER OF HOLES IN 8" X 6" SLOTTED BEARING PLATE FROM $\frac{3}{8}$ " TO $\frac{1}{2}$ ".
- REV. 5-27-98: REPLACED SHELF ANGLE WITH BACK UP PLATE ON POST NO. 2.
- REV. 12-18-98: MODIFIED OLD BEARING PLATE TO BE INSTALLED WITH OLD BEARING NOTE (3) TO MAKE NEW GENERAL NOTE (2).
- REV. 5-27-01: CHANGED PAY ITEM NO. 705-04.21 TO 705-04.04. ADDED SPECIAL GUARDRAIL INSTALLATION NOTE.
- REV. 11-01-01: CHANGED SPECIAL GUARDRAIL INSTALLATION NOTE FOR SPECIAL INSTALLATION NOTE.
- REV. 9-25-01: CHANGED HEADING FOR SPECIAL INSTALLATION NOTE.
- REV. 10-26-07: REMOVED SPECIAL INSTALLATION NOTE. ADDED GENERAL NOTE (1).
- REV. 3-15-08: REMAINED.



GENERAL NOTES

- (A) TO BE USED ON LOCAL ROADS ONLY. NOT TO BE USED ON INTERSTATE OR STATE HIGHWAY SYSTEM. SLOTTED RAIL (TYPE 21) TERMINAL SHALL BE USED ON SLOTTED RAIL (TYPE 21). 40 MI. PAYMENT IS TO BE MADE UNDER ITEM 705-04.04 GUARDRAIL TERMINAL (TYPE 21).
- (B) THE EARTH PAD MUST BE CONSTRUCTED PER STANDARD DRAWING NO. S-GR-59 FOR ALL NEW GRADE AND DRAIN PROJECTS.
- (C) THE POST OFFSET DIMENSIONS ARE GIVEN TO THE CENTER OF THE TRAFFIC FACE OF THE BLOCKOUTS, EXCEPT AT THE FIRST TWO POSTS. THE POST DIMENSIONS TO THE CENTER OF THE TRAFFIC FACE OF THE BLOCKOUTS SHALL BE USED FOR ALL OTHER POSTS. MEASUREMENTS AT THE BACK OF THE RAIL EQUAL TO THE NOMINAL POST SPACINGS SHOWN. POSTS ARE TO BE SET APPROXIMATELY RADIAL TO THE RAILINGS AT EACH POST LOCATION.
- (D) OMIT THE RECTANGULAR WASHER BETWEEN BUTTON HEAD BOLT AND RAIL ON POST NOS. 2 THROUGH 6.
- (E) SAFETY PERFORMANCE OF SLOTTED GUARDRAIL TERMINAL IS ACCEPTABLE ACCORDING TO THE ILS-2 EVALUATION CRITERIA SPECIFIED IN NCHRP REPORT 350.



ENLARGED VIEW AT POST NO. 1

SECTION "A-A"
(TYPICAL AT POST NO. 2)

SECTION "B-B"
(TYPICAL AT POST NOS. 3 & 4)

MINOR REVISION - CIVIL APPROVAL NOT REQUIRED

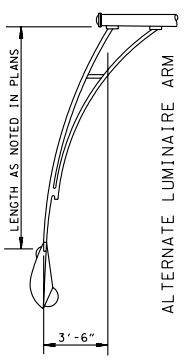
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SLOTTED GUARDRAIL TERMINAL ANCHOR (TYPE 21)

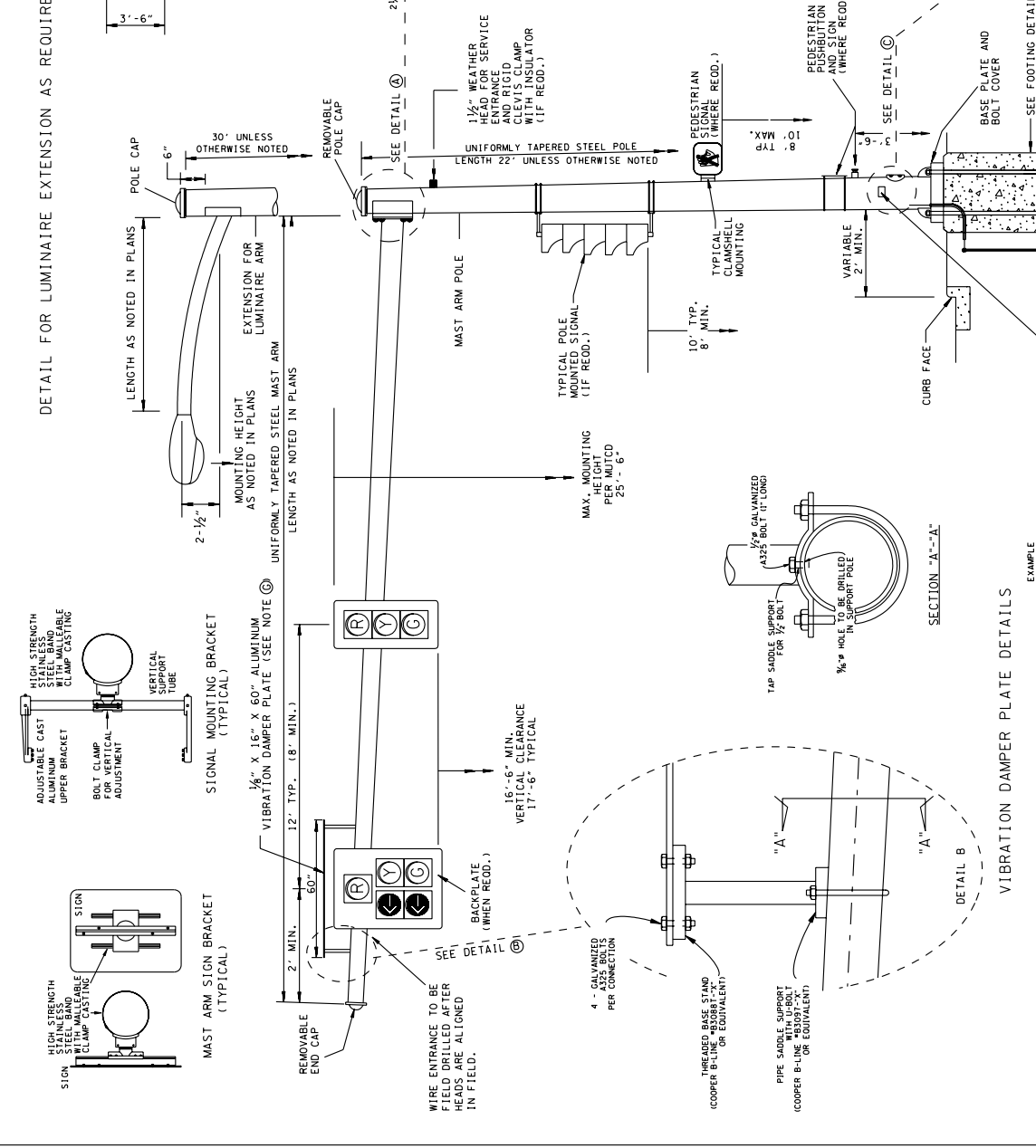
7-29-95 S-GR-26

- REV. 7-29-92: DELETED CLAMP AND CLEVIS MOUNT FOR SIGNAL HEADS.
- REV. 7-29-96: REDREW SHEET ON CADD AND MADE MINOR CHANGES.
- REV. 12-16-03: REDREW SHEET, REV. SIGNAL MOUNTING BRACKET, ADDED SIGN MOUNTING BRACKET, ADDED SIGNAL MOUNTING HEIGHT FOR SIGNAL HEADS AND ADDED HAND HOLE DETAIL.
- REV. 7-29-04: REDREW AND REDDESIGNED SHEET.
- REV. 11-16-07: ADDED VIBRATION DAMPER PLATE DETAILS.

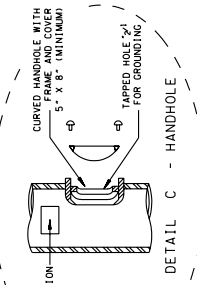
DETAIL FOR LUMINAIRE EXTENSION AS REQUIRED BY PLANS



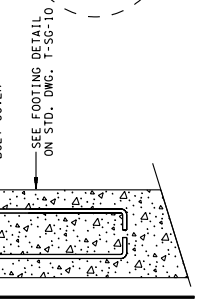
ALTERNATE LUMINAIRE ARM



- MAST ARM GENERAL NOTES**
- ADJUSTMENT OF MAST ARM POLE FOUNDATIONS MAY BE ADJUSTED UP TO 2'. ADJUSTMENTS GREATER THAN 2' MUST BE REVIEWED AND APPROVED BY ENGINEER.
 - IF GARBHET IS POLE MOUNTED, POWER SERVICE CABLE MAY BE RUN DOWN OUTSIDE OF STEEL STRAIN POLE IN 1" RGS RISER AS ALTERNATE TO INTERNAL RUN UNDERGROUND. POWER SERVICE SHALL BE RUN THROUGH SEPARATE 1" RGS CONDUIT THROUGH POLE FOUNDATION (SEE STD. DWG. T-SG).
 - ENTRANCES FOR MAST ARM AND POLE MOUNTED SIGNAL HEADS SHALL BE FIELD DRILLED TO ENSURE PROPER PLACEMENT.
 - THE BOTTOM OF ALL SIGNAL HEADS ON EACH APPROACH TO BE APPROX. SAME HEIGHT.
 - SIGNALS TO BE MOUNTED WITH 17' 6" TYPICAL VERTICAL CLEARANCE (16' 6" MIN.). MAXIMUM MOUNTING HEIGHT SHALL BE CHECKED PER MUTCD AND HEIGHT ADJUSTED IF NECESSARY.
 - PEDESTRIAN SIGNAL HEADS TO BE CLAMHELL MOUNTED UNLESS OTHERWISE SHOWN ON PLANS.
 - VIBRATION DAMPER PLATE SHOULD BE INSTALLED ON ALL MAST ARMS 50' OR LONGER AND ALWAYS BE INSTALLED AT OUTSIDE TIP.



DETAIL C - HANDHOLE



VIBRATION DAMPER PLATE DETAILS

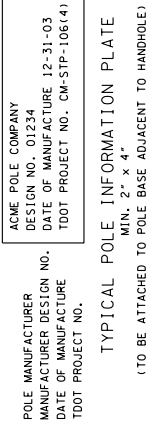
EXAMPLE

ACME POLE COMPANY
 DESIGN NO. 01234
 DATE OF MANUFACTURE 12-31-03
 TDOT PROJECT NO. CM-STP-106(4)

POLE MANUFACTURER
 MANUFACTURER DESIGN NO.
 DATE OF MANUFACTURE
 TDOT PROJECT NO.

TYPICAL POLE INFORMATION PLATE
 MIN. 2' x 4'

(TO BE ATTACHED TO POLE BASE ADJACENT TO HANDHOLE)



DETAIL B



DETAIL A