NOTE 1. Payment for the added embankment (approximately 45 cu yds) for the flare shall be as follows:
A. Under Pay Item 603 when the contract plans includes Pay Item 603.
B. Included in the cost of the end anchorage (flared) when the contract plans do not include Pay Item 603. The added embankment shall be constructed in accordance with subsections 203.06 and/or 203.07.

NOTE 2. When the widened area is paved, payment for the pavement approach is as follows:
A. Under Pay Item 603 or 403 when the contract plan includes Pay Item 603 or 403.
B. Included in the cost of the end anchorage (flared) when the contract plan does not include Pay Item 603 or 403 (See sheet note 2 for Pay Item 403).

NOTE 3. Concrete paved areas shall have their tapered ends squared off as directed by the engineer.

NOTE 4. When overlay paving the finished surface at each point shall not be above the top roadway line on street. Assemble the widened area at the flared end anchorage shall not be exposed until the overlaying pavement is ready. The flared end anchorage shall be tapered to prevent a drop in the finished surface below the rail.

NOTE 5. See Plans 1, 2, 3, and 5 for standard Type 3 guardrail installation details.

NOTE 6. The cost of the gutter shall be paid for as "Gutter Type 2 (2 ft.)" for a length of 100 feet of gutter to 150 feet of length. A minimum slope may be used if approved by the engineer.

NOTE 7. Portions of embankment may be used instead of the gutter if specified on the plans and additional curb may be added in the vicinity of the end anchorage.

NOTE 8. For other highways, paving shall be as shown on the plans.

NOTE 9. The width area, except for curb option A, shall have the same grading as the adjacent guardrail for or placed if more than 2 ft from the edge of the pavement or curb/wall equal to roadway grade if 2 ft or less from grade.

NOTE 10. Widening for end anchorages shall be paved in accordance with procedures. For other highways, paving shall be as shown on the plans.

NOTE 11. Payment for the added embankment (approximately 45 cu yds) for the flare shall be as follows:
A. Under Pay Item 603 when the contract plans includes Pay Item 603.
B. Included in the cost of the end anchorage (flared) when the contract plans do not include Pay Item 603. The added embankment shall be constructed in accordance with subsections 203.06 and/or 203.07.

NOTE 12. When the widened area is paved, payment for the pavement approach is as follows:
A. Under Pay Item 603 or 403 when the contract plan includes Pay Item 603 or 403.
B. Included in the cost of the end anchorage (flared) when the contract plan does not include Pay Item 603 or 403 (See sheet note 2 for Pay Item 403).

NOTE 13. Concrete paved areas shall have their tapered ends squared off as directed by the engineer.

NOTE 14. When overlay paving the finished surface at each point shall not be above the top roadway line on street. Assemble the widened area at the flared end anchorage shall not be exposed until the overlaying pavement is ready. The flared end anchorage shall be tapered to prevent a drop in the finished surface below the rail.

NOTE 15. See Plans 1, 2, 3, and 5 for standard Type 3 guardrail installation details.

NOTE 16. The cost of the gutter shall be paid for as "Gutter Type 2 (2 ft.)" for a length of 100 feet of gutter to 150 feet of length. A minimum slope may be used if approved by the engineer.

NOTE 17. Portions of embankment may be used instead of the gutter if specified on the plans and additional curb may be added in the vicinity of the end anchorage.

NOTE 18. For other highways, paving shall be as shown on the plans.

NOTE 19. The width area, except for curb option A, shall have the same grading as the adjacent guardrail for or placed if more than 2 ft from the edge of the pavement or curb/wall equal to roadway grade if 2 ft or less from grade.

NOTE 20. Widening for end anchorages shall be paved in accordance with procedures. For other highways, paving shall be as shown on the plans.
NOTES FOR NONFLARED

1. The end anchorage (nonflared) shall either be the softstop as manufactured by Trinity Industries, Inc. (tel.: 800-773-7976), or the Max-Tension as manufactured by Lindsay Transportation Solutions (tel.: 402-829-6800), or the MSKT as manufactured by Road Systems, Inc. (tel.: 432-263-2435). The end anchorage (nonflared) shall include all post, rail, and hardware items required for a complete unit. The end anchorage (nonflared) shall be installed conforming to the manufacturer’s recommendations. The contractor shall provide a copy of the manufacturer’s installation instructions and parts list to the engineer prior to the installation of the device.

2. Do not attach these end anchorages directly to a rigid barrier (ex. concrete barrier, steel barrier, concrete structure) without a proper transition.

3. Connections to W-beam where the splice is not at mid-span but at a post can be made using a 3'-6" W-beam panel downstream of traffic.

4. For MSKT end anchorages (nonflared), use the manufacturer’s specified steel foundation tub for posts (1) and (2).

5. Hinged break away steel posts may be used conforming to the manufacturer’s instructions.

6. Retractable tabs shall not be used on end anchorage posts.

7. Delineation shall be applied to the end piece and shall not be paid for separately but be included in the cost of the work. See standard Plan S-612-I.

END ANCHORAGES (NONFLARED)
END ANCHORAGE (NONFLARED) PAY LIMIT

HINGED BREAK AWAY (HBA) STEEL POSTS MAY BE USED. SEE MANUFACTURER'S DETAILS.

GUARDRAIL SYSTEM (MGS)
TYPE 3 W-BEAM 31 INCHES

NOTES

1. PAYMENT FOR THE END ANCHORAGE (APPROXIMATELY 29 CU. YD.) FOR THE PLATE SHALL BE AS FOLLOWS:
A. INCLUDED WHEN THE CONTRACT PLAN INCLUDES PAY ITEM 203.
B. INCLUDED IN THE COST OF THE END ANCHORAGE WHEN THE CONTRACT PLAN DOES NOT INCLUDE PAY ITEM 203. THE END ANCHORAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 303.06(A), SUBSECTION 303.06(A).

2. WHEN THE WIDENED AREA IS PAID, PAYMENT FOR THE END ANCHORAGE SHALL BE AS FOLLOWS:
A. INCLUDED IN PAY ITEM 403 OR 412 WHEN THE CONTRACT PLAN INCLUDES PAY ITEM 403 OR 412.
B. INCLUDED IN THE COST OF THE END ANCHORAGE WHEN THE CONTRACT PLAN DOES NOT INCLUDE PAY ITEM 403 OR 412. SEE SHEET 1, NOTE 2 FOR PAYMENT TYPES.

3. WHEN OVERLAY PAVING IS PROVIDED, THE EDGE OF THE PAVED AREA AT EACH POST SHALL NOT BE ABOVE THE TOP OF THE WIDENED AREA OR STREET. THE END ANCHORAGE SHALL NOT BE OVERLAPPED UNLESS ENGINEER APPROVES ANY OVERLAY PAVEMENT ADDED TO THE END ANCHORAGE SHALL BE TAPERED TO PREVENT A DROP IN THE PAVED SURFACE BELOW THE END ANCHORAGE.

4. SEE SHEETS 1, 2, 3, AND 5 FOR STANDARD TYPE 3 GUARDRAIL INSTALLATION DETAILS.

5. THE COST OF THE OUTLET WILL BE PAID FOR AS AN ADDITIONAL 1'-1'-0" FOR A LENGTH OF 30 FT, OR 2'-0" FOR A LENGTH OF 50 FT.

6. PAINTS OR MARKINGS MAY BE USED INSTEAD OF THE OUTLET IF SPECIFIED ON THE PLANS. NO ADDITIONAL CURB SHALL BE ADDED IN THE VICINITY OF THE END TREATMENT.

7. AS OR FLATTENED SLOPES IN THE TRANSVERSE AREA SHALL BE USED RISING TO THE END ANCHORAGE AREA, AND IN ADVANCE OF POST 1. IF THIS IS NOT POSSIBLE A MINIMUM 3:1 SLOPE MAY BE USED IF APPROVED BY THE ENGINEER.

8. THE WIDENED AREA EXCEPT FOR CURB OPTION A, SHALL HAVE THE SAME GRADING AS THE ADJACENT GUARDRAIL 300 OR FLATTENED ON THE TRANSVERSE AREA. CURB OR FLATTENED ANCHORAGE SHALL BE ADDED TO THE END OF THE GRADE.

9. PAYMENT FOR END ANCHORAGES SHALL BE PAID ON INTERSTATES AT FREEWAYS FOR OTHER ROADWAYS, PAYING SHALL BE AS SHEETED ON THE PLANS.

10. AVENUE BREAK Area STONEolla MAY BE USED. SEE MANUFACTURER'S DETAILS.

WIDENED AREA FOR END ANCHORAGE (NONFLARED) PAY LIMIT

WIDENED AREA FOR END ANCHORAGE (NONFLARED) WITH CURB OPTION A

WIDENED AREA FOR END ANCHORAGE (NONFLARED) WITH CURB OPTION B

Computer File Information

Last Modification Date: 12/21/18

Last Modification Date: 12/21/18

File Name: 6060109019.dgn

file://www.colorado.gov/bureaus/traffic/support/3038e

Drawing File Name: 6060109019.dgn

Drawing File Name: 6060109019.dgn

Sheet No. 9 of 19

STANDARD PLAN NO.

MIDWEST

GUARDRAIL SYSTEM (MGS)

TYPE 3 W-BEAM 31 INCHES

Issued By: Project Development Branch November 1, 2018
CARDED POST MODE - END OF GUARDRAIL

GUARDRAIL TYPE 3 OR 18'-9" FOR TRANSIT TYPE 3G. (SEE PLANS)

6'-0"

CLIENT: MIDWEST GUARDRAIL SYSTEM (MGS) TYPE 3 W-BEAM 31 INCHES

STANDARD PLAN NO. M-606-1

Sheet No. 12 of 19

Issued: By: Project Development Branch November 1, 2018
NOTES

1. MEDIAN GUARDRAIL TANGENT TO THE EMBANKMENT MAY BE USED WHERE THE SHOULDER SLOPES IN THE MEDIAN AND STEEP.

2. SHOULDER LENGTHS SHOULD BE INCREASED TO ACCOUNT FOR STEEP EMBANKMENTS OR OTHER HAZARDS WITHIN CLOSE PROXIMITY.

- DO NOT CONSTRUCT THE TR AND GUARDRAIL ON THE TRAILING EDGE OF THE CURVES TO NOT DISTURB THE USE OF GUARDRAIL.

- SHOWN IN PLANS LENGTH TO SHIELD ALL HAZARDS IN BASED ON GUARDRAIL LENGTH OF MEDIAN CONSTRUCTION. SEE AASHTO ROADWAY DESIGN GUIDE. THE TOTAL LENGTH OF MEDIAN GUARDRAIL'S LENGTH OF NEED WILL INCLUDE THE LENGTH OF TRANSITION.

- MEDIAN BARRIERS TANGENT TO THE ROADWAY MAY BE FLARED OR NONFLARED.

- END ANCHORAGE CAN BE PLANNED OR UNPLANNED.

MULTILINE DIVIDED HIGHWAYS FOR STEEP EMBANKMENTS IN MEDIAN
MEDIAN 60 FT. AND OVER WITH 10 FT. OR WIDER SHOULDERS.

MEDIAN 60 FT. AND OVER WITH 4 TO 8 FT. SHOULDERS.

TRANSITION TO TYPICAL 15:1 TAPER

MULTILANE DIVIDED HIGHWAYS - (DEPRESSED MEDIANS, 60 FT. AND OVER WITH OPEN HAZARDS OR OBSTRUCTIONS)

NOTES
1. GUARDRAIL TRANSITIONS FROM PARALLEL TO ROADWAY SHOULDERS AT 30 DEGREES TO 15:1 TAPER WITHIN 18'-9" BASED ON POST OFFSET
2. SEE SHEET 14 FOR THE RIGHT SHOULDER GUARDRAIL LAYOUT.
MULTILANE DIVIDED HIGHWAYS - (DEPRESSED MEDIANS, 21 - 59 FT. WITH OPEN HAZARDS OR OBSTRUCTIONS)

1. GUARDRAIL TRANSITIONS FROM PARALLEL TO ROADWAY SHOULDER AT 3G SEGMENT TO 15:1 TAPER WITHIN 18'-9" BASED ON POST OFFSET DIMENSIONS SHOWN.
2. THE OPTION 2 LAYOUT SHALL BE USED WHEN "Y" EXCEEDS 50 FEET OR WHEN MEDIAN BARRIER IS CONTINUOUS.
3. THE OPTION 3 LAYOUT SHALL BE USED WHEN "Y" IS 50 FEET OR LESS.
4. SEE SHEET 14 FOR RIGHT SHOULDER GUARDRAIL LAYOUT.

NOTES

* L MUST MEET THE LENGTH OF NEED AND SHOULD NOT EXCEED 250 FT. UNLESS SITE CONDITIONS WARRANT.

10:1 TAPER

OPTION 1

OPTION 2

TRANSITION TO TYPICAL 15:1 TAPER

MULTILANE DIVIDED HIGHWAYS - (DEPRESSED MEDIANS, 21 - 59 FT. WITH OPEN HAZARDS OR OBSTRUCTIONS)

MIDWEST GUARDRAIL SYSTEM (MGS)
TYPE 3 W-BEAM 31 INCHES

STANDARD PLAN NO.
M-606-1

Sheet No. 16 of 19
NOTES

1. POSTS 1, 2, 9, and 10 MAY BE TIMBER OR STEEL.
2. THE NUMBER OF OMITTED POSTS IS DEPENDENT ON THE LENGTH OF THE GAP.

LONG-SPAN RAILING FOR ONE, TWO, OR THREE OMITTED POSTS AT GAP

TIMBER POST

POSTS 1-2 AND 9-10

STEEL POST

POSTS 1-2 AND 9-10

BREAKWAY TIMBER POST

POSTS 3 - 8

MIDWEST GUARDRAIL SYSTEM (MGS)

TYPE 3 W-BEAM 31 INCHES

STANDARD PLAN NO.

M-606-1

Sheet No. 18 of 19
GUARDRAIL FOR CULVERTS

RAIL PLACEMENT FOR INSIDE MOUNT

NOTES

1. LOCATION AND LENGTH OF MIDWEST GUARDRAIL APPROACHES TO CULVERTS WITH FULL HEURAIL AND
   MINIMUM LENGTH SHALL BE AS SHOWN FOR DATES ON SHEET 1. THE GUARDRAIL TYPE 3 SHADE CONTINUE
   ACROSS THE CULVERT AS SHOWN ON THIS SHEET.

2. REPEADED BOX GUARDRAIL TREATMENT IS SHOWN ON THIS SHEET FOR GUARDRAIL 20 FT. OR LESS IN
   LENGTH.

3. GUARDRAIL ACROSS CULVERTS WITH A LENGTH OF 20 FT. OR LESS SHALL BE AS FOLLOWS:
   a. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR GREATER,
   b. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR MORE AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   c. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR LESS AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   CONSTRUCTION IN ACCORDANCE WITH HEADWALL MOUNT DETAILS AND PAYMENT AS GUARDRAIL TYPE 3.

4. GUARDRAIL ACROSS CULVERTS WITH LENGTH GREATER THAN 20 FT SHALL BE AS FOLLOWS:
   a. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR GREATER
   b. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR MORE AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   c. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR LESS AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   CONSTRUCTION IN ACCORDANCE WITH HEADWALL MOUNT DETAILS AND PAYMENT AS GUARDRAIL TYPE 3.

5. GUARDRAIL DIAM BOLTS FOR BASE PLATE "B" WITH INSIDE MOUNT THE BOLTS SHALL BE 7/8 IN. X 10 IN.
   HEAD STRENGTH RODS, THREADS FULL LENGTH AND ALL GUARDRAIL FOR CULVERTS 20 FT. OR LESS SHALL BE AS FOLLOWS:
   a. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR GREATER
   b. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR MORE AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   c. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR LESS AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   CONSTRUCTION IN ACCORDANCE WITH HEADWALL MOUNT DETAILS AND PAYMENT AS GUARDRAIL TYPE 3.

6. GUARDRAIL ACROSS CULVERTS WITH LENGTH GREATER THAN 20 FT SHALL BE AS FOLLOWS:
   a. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR GREATER
   b. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR MORE AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   c. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR LESS AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   CONSTRUCTION IN ACCORDANCE WITH HEADWALL MOUNT DETAILS AND PAYMENT AS GUARDRAIL TYPE 3.

7. GUARDRAIL ACROSS CULVERTS WITH A LENGTH OF 20 FT. OR LESS SHALL BE AS FOLLOWS:
   a. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR GREATER
   b. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR MORE AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   c. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR LESS AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   CONSTRUCTION IN ACCORDANCE WITH HEADWALL MOUNT DETAILS AND PAYMENT AS GUARDRAIL TYPE 3.

8. GUARDRAIL ACROSS CULVERTS WITH LENGTH GREATER THAN 20 FT SHALL BE AS FOLLOWS:
   a. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR GREATER
   b. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR MORE AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   c. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR LESS AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   CONSTRUCTION IN ACCORDANCE WITH HEADWALL MOUNT DETAILS AND PAYMENT AS GUARDRAIL TYPE 3.

9. GUARDRAIL ACROSS CULVERTS WITH A LENGTH OF 20 FT. OR LESS SHALL BE AS FOLLOWS:
   a. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR GREATER
   b. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR MORE AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   c. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR LESS AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
   CONSTRUCTION IN ACCORDANCE WITH HEADWALL MOUNT DETAILS AND PAYMENT AS GUARDRAIL TYPE 3.

10. GUARDRAIL ACROSS CULVERTS WITH LENGTH GREATER THAN 20 FT SHALL BE AS FOLLOWS:
    a. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR GREATER
    b. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR MORE AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
    c. FULL HEIGHT AT GUARDRAIL POSTS 48 IN. OR LESS AND BLOCK FACE TO MissAHL HEIGHT OF 2 FT OR
    CONSTRUCTION IN ACCORDANCE WITH HEADWALL MOUNT DETAILS AND PAYMENT AS GUARDRAIL TYPE 3.