**Beam Guardrail at Bridges - Dual Roadways**

- Compute Guardrail Length of Need (x)
- See Specific Guardrail Ending Standard for Post Number (See Notes)
- See Specific Guardrail Ending Standard for Post Number (See Notes)
- See Specific Guardrail Ending Standard for Post Number (See Notes)
- See Specific Guardrail Ending Standard for Post Number (See Notes)
- *Clear Zone Minimum to Back of Terminal*

**Beam Guardrail at Bridges - Two-Way Roadways**

- Compute Guardrail Length of Need (x)
- See Specific Guardrail Ending Standard for Post Number (See Notes)
- See Specific Guardrail Ending Standard for Post Number (See Notes)
- See Specific Guardrail Ending Standard for Post Number (See Notes)
- See Specific Guardrail Ending Standard for Post Number (See Notes)

---

**Legend**
- 1:10 slope between shoulder line and 2'-0" behind face of post.
- $L_t =$ Tangent length of barrier upstream from the hazard (125' min.)
- $L_t$ & $Z =$ Lateral distances measured from face of guardrail (as shown)
BEAM GUARDRAIL AT PIERS - LOCAL ROADWAYS - UNDER

COMPUTE GUARDRAIL LENGTH OF NEED (X)

SEE SPECIFIC GUARDRAIL ENDING STANDARD FOR POST NUMBER (SEE NOTES)

PIER LENGTH L1

SHOULDER

SHOULDER

PAVEMENT

SHOULDER

FACE OF PIER

GUARDRAIL SHALL BE CONSTRUCTED SO THAT ANY PART OF THE GUARDRAIL SYSTEM IS AT LEAST 2'-6" FROM THE PIER COLUMNS. POSTS THAT REST ON PIER FOOTINGS SHALL BE PLACED IN A 1'-0" DIAMETER HOLE FILLED WITH GRADE F2 CONCRETE.

SECTION A - A

BEAM GUARDRAIL AT BRIDGES - LOCAL ROADWAYS - OVER

COMPUTE GUARDRAIL LENGTH OF NEED (X)

SEE SPECIFIC GUARDRAIL ENDING STANDARD FOR POST NUMBER (SEE NOTES)

SHOULDER

SHOULDER

BRIDGE

II LEGEND

1:10 SLOPE BETWEEN SHOULDER LINE AND 2'-0" BEHIND FACE OF POST.

L1 = TANGENT LENGTH OF BARRIER UPSTREAM FROM THE HAZARD. (25' MIN.)

L2 & Z = LATERAL DISTANCES MEASURED FROM FACE OF GUARDRAIL. (AS SHOWN)

BEAM GUARDRAIL AT BRIDGES - SINGLE RAMPS

COMPUTE GUARDRAIL LENGTH OF NEED (X)

SEE SPECIFIC GUARDRAIL ENDING STANDARD FOR POST NUMBER (SEE NOTES)

SHOULDER

SHOULDER

BRIDGE

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
GUARDRAIL AT BRIDGES AND EMBANKMENTS

11-14-2003
F.R.W.A. APPROVAL

5-17-2002
PLAN DATE

R-59-E

SHEET 2 OF 6
BEAM GUARDRAIL AT EMBANKMENTS - TWO-WAY ROADWAYS

1:3 SLOPE OR FLATTER, SEE NOTES

SLOPE TRANSITION FROM 1:3 TO 1:2
1:2 FILL SLOPE

GUARDRAIL APPROACH TERMINAL
SEE SPECIFIC GUARDRAIL ENDING STANDARD

SHOULDER TRANSITION 100'

SHOULDER

1:3 SLOPE OR FLATTER, SEE NOTES

SLOPE TRANSITION FROM 1:3 TO 1:2
1:2 FILL SLOPE

GUARDRAIL APPROACH TERMINAL
SEE SPECIFIC GUARDRAIL ENDING STANDARD

SHOULDER TRANSITION 100'

SHOULDER

"HEIGHT OF FILL" MEASURED FROM WHERE SLOPE BEGINS TO TRANSITION FROM 1:3 TO 1:2

LENGTH OF NEED IN ADVANCE OF 1:3 SLOPE

1:2 FILL SLOPE

1:3 SLOPE OR FLATTER, SEE NOTES

FLARE POINT

44 SEE CHART FOR THE "X" AND THE "Y" DISTANCE. (SHEET 6 OF 6)

BEAM GUARDRAIL AT EMBANKMENTS - TWO-WAY ROADWAYS

LEGEND

1:10 SLOPE BETWEEN SHOULDER LINE AND 2'-6" BEHIND FACE OF POST.

1:6 BERM
GUARDRAIL DEPARTING TERMINAL
(SEE STANDARD PLAN R-66-SERIES)

SHOULDER TRANSITION 100'

TRANSITION TO BARN ROOF SECTION
100' MIN.

1:2 FILL SLOPE

1:6 BERM

SHOULDER

SHOULDER

MEDIAN

SHOULDER

SHOULDER

SHOULDER

SHOULDER

SHOULDER

SHOULDER

SEE SPECIFIC GUARDRAIL ENDING STANDARD FOR POST NUMBER (SEE NOTES)

SHOULDER TRANSITION 100'

100' TRANSITION TO BARN ROOF SECTION

150' MIN.

1:2 FILL SLOPE

BEAM GUARDRAIL AT EMBANKMENTS - DUAL ROADWAYS
(BARN ROOF SLOPE)

LEGEND

1:10 SLOPE BETWEEN SHOULDER LINE AND 2'-6" BEHIND FACE OF POST.

1:6 BERM

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
GUARDRAIL AT BRIDGES AND EMBANKMENTS

11-14-2003 F.B.W.A. APPROVAL
5-17-2002 PLAN DATE
R-59-E SHEET 4 OF 6
1:3 SLOPE OR FLATTER, SEE NOTES

SHOULDER TRANSITION 100'

GUARDRAIL DEPARTING TERMINAL (SEE STANDARD PLAN R-46-SERIES)

SHOULDER

SHOULDER

SHOULDER

SHOULDER

SHOULDER

SHOULDER

MEDIAN

SHOULDER

SHOULDER

SHOULDER

SHOULDER

SHOULDER

SHOULDER

1:3 SLOPE OR FLATTER, SEE NOTES

"HEIGHT OF FILL" MEASURED FROM WHERE SLOPE BEGINS TO TRANSITION FROM 1:3 TO 1:2

LENGTH OF NEED IN ADVANCE OF 1:3 SLOPE

FLARE POINT

SLOPE TRANSITION FROM 1:3 TO 1:2

1:2 FILL SLOPE

** SEE CHART FOR THE "A" AND THE "k" DISTANCE. (SHEET 6 OF 6)

BEAM GUARDRAIL AT EMBANKMENTS - DUAL ROADWAYS

LEGEND

1:10 SLOPE BETWEEN SHOULDER LINE AND 2'-0" BEHIND FACE OF POST.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
GUARDRAIL AT BRIDGES AND EMBANKMENTS

11-14-2003  5-17-2002  R-59-E  SHEET 5 OF 6


**GUARDRAIL AT EMBANKMENTS (FLARED INSTALLATIONS) b/o**

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<th>HEIGHT OF FILL AT 1:3 SLOPE (FEET)</th>
<th>70 MPH FLARE 1:15</th>
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<td>-118.5</td>
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</table>

**NOTES:**

The construction of guardrail shall be according to the current standard plans. Appropriate approach curb and gutter details and downspout header details, when used, are specified on the current standard plan R-32-series.

All post numbers are referenced according to those specified on the specific guardrail ending standard.

A 1:10 slope shall be maintained in front of and 2'-0" behind the guardrail beam outside the designated shoulder area. Slope beyond the 2'-0" hinge line behind the guardrail beam area may be 1:2 or flatter and shall be transitioned to normal graded slopes in such a way as to give a pleasing appearance.

Guardrail will not be required on departing end of structures on dual roadways which have continuous abutments or when fill slopes are 1:4 or flatter. If a downspout header is required on the departing ends of structures, it will be necessary to shield it with guardrail.

This standard plan applies only to new construction unless specifically called for on upgrading projects.

Area behind the guardrail departing end terminal shall have a 1:3 slope or flatter.

Area behind the guardrail approach terminal shall have a 1:4 slope or flatter unless the ending cannot be placed in a 1:4 because the predominate slope preceding the approach terminal is a 1:3. In this case, the ending may be placed in the 1:3 slope.

Guardrail anchorage, bridge, is included in the guardrail lengths specified. (See current standard plan R-67-series).

All 1:10 slopes shall be graded to "Class A" slope tolerances.

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**MICHIGAN DEPARTMENT OF TRANSPORTATION**

**BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR**

**GUARDRAIL AT BRIDGES AND EMBANKMENTS**