DETAILS FOR CONNECTING GUARDRAIL TYPE MGS-8 TO BRIDGE RAILING, THRIE BEAM RETROFIT

* BRIDGE RAILING

THRIE BEAM RETROFIT

50'-0"

GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A3

12'-6"

THRIE BEAM EXPANSION SECTION
10 GAUGE ***

LOCATIONS OF SPICE ON BRIDGE VARY

6'

TYP. AT END POSTS

**

SEE PLAN OF ADDITIONAL POST DETAIL FOR POST SPACING ADJUSTMENT.

*** USE TWO NESTED THRIE BEAM EXPANSION SECTIONS, 10 GAUGE, WHEN THE CENTERLINE OF THE NOTED GUARDRAIL SPICE IS NOT LOCATED WITHIN THE BRIDGE REFERENCE LINES.

12'-6"

THRIE BEAM SECTIONS
12 GAUGE

6'-3"

THRIE BEAM SECTION
12 GAUGE

6'-3"

SYMMETRICAL
THRIE BEAM TRANSITION
10 GAUGE

10 GAUGE

THRIE BEAM SECTIONS
TWO NESTED
W-BEAM SECTIONS
TWO NESTED

12'-6"

W6 x 15 POST
(7'-0" LONG)

12"

WITH 12"
OFFSET BLOCK

W6 x 9 OR W6 x 8.5 POST
(17'-0" LONG)

12"

WITH 12"
OFFSET BLOCK

W6 x 9 OR W6 x 8.5 POST
(6'-0" LONG)

12"

WITH 12"
OFFSET BLOCK

12 GAUGE

THRIE BEAM SECTIONS

12 GAUGE

THRIE BEAM SECTIONS

4" MAX. HEIGHT Curb & Gutter

MAX.

3'-1½"

3'-1½"

3'-1½"

3'-1½"

3'-1½"

3'-1½"

3'-1½"
DETAILS FOR CONNECTING GUARDRAIL TYPE T TO BRIDGE RAILING, THRIE BEAM RETROFIT

* BRIDGE RAILING
THRIE BEAM RETROFIT

50'-0"
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A4

12'-6"
THRIE BEAM RETROFIT

LOCATION OF SPLICE
ON BRIDGE VARIES

3'-1 1/2" @ 3'-1 1/2"
4" MAX. HEIGHT CURB & GUTTER

5" TYP. AT END POSTS

4" MAX. OFFSET BLOCK (7'-0" LONG)

12 GAUGE, WHEN THE CENTERLINE OF THE NOTED GUARDRAIL SPLICE IS NOT LOCATED WITHIN THE BRIDGE REFERENCE LINES.

** SEE PLAN OF ADDITIONAL POST DETAIL FOR POST SPACING ADJUSTMENT.

*** USE TWO NESTED THRIE BEAM EXPANSION SECTIONS, 12 GAUGE, WHEN THE CENTERLINE OF THE NOTED GUARDRAIL SPLICE IS NOT LOCATED WITHIN THE BRIDGE REFERENCE LINES.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR BRIDGE RAILING, THRIE BEAM RETROFIT

B-22-E
Sheet 2 of 5

10/31/2019
**BRIDGE RAILING, THRIE BEAM RETROFIT**

**DETAILS FOR CONNECTING GUARDRAIL TYPE B TO BRIDGE RAILING, THRIE BEAM RETROFIT**

**PLAN**

- **Bridge Railing Thrie Beam Retrofit**
- **Guardsrail Anchorage, Bridge, Detail A5**

**ELEVATION**

- **Location of Splice on Bridge Varies**
- **Transition Guardsrail Height from 34" to 31"**
- **Typ. at End Posts**
- **4" Max. Height Curb & Gutter**
- **2 Spaces @ 3'-1½" (Minimum)**
- **4 Spaces @ 3'-1½"**
- **5 Spaces @ 3'-1½" Max.**
- **12'-6"**
- **6'-3"**

**REFERENCES**

- **MICHIGAN DEPARTMENT OF TRANSPORTATION**
- **BUREAU OF DEVELOPMENT STANDARDS**
- **PLAN DATE: 10-23-2019**
- **F.H.W.A. APPROVAL:**
- **REFERENCE LINE**

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**F. H. W. A. APPROVAL**

**BUREAU OF DEVELOPMENT STANDARDS PLAN FOR**

**GUARDRAIL**

**GUARDRAIL TYPE B**

**3'-1½" WITH 12" OFFSET BLOCK (7'-0" LONG)**

**12 GAUGE, WHEN THE CENTERLINE OF THE NOTED GUARDRAIL SPLICE IS NOT LOCATED WITHIN THE BRIDGE REFERENCE LINES.**

**2 Spaces @ 3'-1½"**

**GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A5**

**CURB & GUTTER 4" MAX. HEIGHT**

**10 GAUGE, WHEN THE CENTERLINE OF THE NOTED GUARDRAIL SPLICE IS NOT LOCATED WITHIN THE BRIDGE REFERENCE LINES.**

**THRIE BEAM RETROFIT BRIDGE RAILING,**

**ON BRIDGE VARIES**

**REFERENCE LINES**

**EXCEPT WHEN CONNECTING BETWEEN**

**TO BE A MULTIPLE OF 12'-6" AND CENTERED BETWEEN REFERENCE LINES EXCEPT WHEN CONNECTING BETWEEN TWO EXISTING GUARDRAIL RUNS. SEE SHEET 4.**

**SEE PLAN OF ADDITIONAL POST DETAIL FOR POST SPACING ADJUSTMENT.**

**USE TWO NESTED THRIE BEAM EXPANSION SECTIONS, 12 GAUGE, WHEN THE CENTERLINE OF THE NOTED GUARDRAIL SPLICE IS NOT LOCATED WITHIN THE BRIDGE REFERENCE LINES.**

**THRIE BEAM EXPANSION SECTION 10 GAUGE.**

**TWO NESTED THRIE BEAM SECTIONS 12 GAUGE.**

**TWO NESTED THRIE BEAM SECTIONS 12 GAUGE.**

**12'-6"**

**56'-3"**

**12'-6"**

**12'-6"**

**12'-6"**

**SYMMETRICAL THRIE BEAM TRANSITION 10 GAUGE**

**REFERENCE LINES**

**END POSTS TYP. AT 3'-1½" (MINIMUM)**

**2 SPACES @ 1'-6¾" (MINIMUM)**

**3'-1½" max.**

**15'-7½" (17'-0" LONG) WITH 12" OFFSET BLOCK**

**W6 x 15 POST (17'-0" LONG) WITH 12" OFFSET BLOCK**

**W6 x 9 OR W6 x 8.5 POST**
ELEVATION SHOWING THRIE BEAM RETROFIT OVER BRIDGE EXPANSION JOINTS

1. Measure the appropriate "Z" distance from one end of the bridge railing and locate the first existing splice back toward the bridge.

2. From this splice, measure the same "Z" distance back toward the bridge to obtain the "X" dimension. This dimension will vary from 0 to 12'-6".

3. Repeat steps 1 and 2, from opposite end of the bridge to obtain "Y" dimension.

4. Subtract the sum of "X" + "Y" from bridge railing length. This will be the bridge retrofit length.

5. Divide the bridge retrofit length by 12'-6" to obtain the number of beam elements plus a remainder. The remainder will be the length of a shortened element.

6. When the remainder is less than 2'-6", add 12'-6" to the remainder and divide by two. The bridge retrofit will contain two shortened beam elements with one less 12'-6" beam element than calculated in step 5.

7/8" DIA. THREADED STUD

NUT SHALL FULLY ENGAGE THREADS AND BE WELDED FLUSH TO END OF THREADED STUD PRIOR TO BEING GALVANIZED

ROUND WASHER

SQUARE WASHER

WASHERS USED WITH 7/8" DIA. STUDS

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
BRIDGE RAILING,
THRIE BEAM RETROFIT
(R4 TYPE BRIDGE RAILING)

F.H.W.A. APPROVAL
10-23-2019 B-22-E
PLAN DATE
SHEET 4 OF 5
MICHIGAN DEPARTMENT OF TRANSPORTATION

OF SHEET

PLAN DATE

F.H.W.A. APPROVAL

BUREAU OF DEVELOPMENT STANDARD PLAN FOR

B-22-E

(SEE NOTES)

WASHERS

REFLECTORIZED

MAX. 6" MIN. 0"

AS REQUIRED

BLOCK OUT

MAX. 6" MIN. 0"

(6" WIDE)

WOOD BLOCKOUT

WOOD OFFSET BLOCK

1'-6"

2'-6"

2'-3½"

THREE BEAM ELEMENT

SAME CROSS SECTION AS SECTIONS 807 & 908 OF THE STANDARD SPECIFICATIONS.

ALL WORK AND MATERIAL SHALL BE IN ACCORDANCE WITH NOTES:

SPLICE BOLTS. ATTACHED AT UPPER POST BOLT SLOTS WITH STANDARD INTERVALS AT BEAM ELEMENT SPLICES. THEY SHALL BE REFLECTORIZED WASHERS SPACED AT 25'-0"

PLAN OF ADDITIONAL POST DETAIL

FIRST SET OF POST BOLT SLOTS FOR 3'-1½" POST SPACING BOUNDary STRUCTURE REFERENCE LINE

WOOD OFFSET BLOCK

FRONT FACE OF BRIDGE CURB

BEAM ELEMENT

FRONT FACE OF APPROACH CURB

WHEN THIS DISTANCE EXCEEDS 3'-1½", DRILL ADDITIONAL HOLES FOR POST BOLTS IN BEAM ELEMENT AND PLACE AN ADDITIONAL POST, ADDITIONAL HOLES FOR POST BOLTS IN BEAM ELEMENT AND PLACE AN ADDITIONAL POST, BLOCK AND OFFSET BLOCK (AS SHOWN) IMMEDIATELY ADJACENT TO STRUCTURE

PLAN OF ADDITIONAL POST DETAIL

7"

12'-6"

6½'

3½" x 3½" SLOTTED HOLES SPACED AT 1'-6½" ± 1'-6½" ±

2½" x 5" SLOTTED HOLES

3½" x 1½" SLOTTED HOLES

3½" x 2½" POST BOLT SLOTS

SAME CROSS SECTION AS THREE BEAM ELEMENT

NOTE:

R4 TYPE BRIDGE RAILINGS CAN BE IDENTIFIED AS HAVING CONCRETE POSTS AND REMOVABLE METAL PANELS WITH GRIDS OF THIS PATTERN.

SECTIONS THRU R4 RAILING

FOR BRIDGES SKewed IN DIRECTION SHOWN, IT MAY BE NECESSARY TO INCREASE THE 12" OFFSET BLOCK WIDTH TO LOCATE POST WHILE MAINTAINING REQUIRED POST SPACING.

WOOD BLOCKOUT

WOOD OFFSET BLOCK

1'-6"

4'-0"

SLOTTED HOLES

1½" x 2½"

THREE BEAM EXPANSION SECTION

NOTE:

R4 TYPE BRIDGE RAILINGS CAN BE IDENTIFIED AS HAVING CONCRETE POSTS AND REMOVABLE METAL PANELS WITH GRIDS OF THIS PATTERN.