DETAILS FOR CONNECTING GUARDRAIL TYPE MGS-8 TO BRIDGE RAILING, THRIE BEAM RETROFIT
MICHIGAN DEPARTMENT OF TRANSPORTATION

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

**PLATE 1**

**DATE**

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

**BUREAU OF DEVELOPMENT STANDARD PLAN FOR**

**GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A4**

**REFERENCE LINE**

**PLAN**

- **BRIDGE RAILING, THRIE BEAM RETROFIT**
  - **50'-0" GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A4**
  - **12'-6" THRIE BEAM RETROFIT**
  - **12'-6" TWO NESTED THRIE BEAM SECTIONS 12 GAUGE**
  - **12'-6" TWO NESTED THRIE BEAM SECTIONS 12 GAUGE**
  - **12'-6" TWO NESTED THRIE BEAM SECTIONS 12 GAUGE**

**ELEVATION**

- **REFERENCE LINE**
  - **LOCATION OF SPlice ON BRIDGE VARIES**
  - **4" MAX. HEIGHT CURB & GUTTER**
  - **W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK**
  - **W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK**
  - **2 SPACES (MINIMUM) @ 3'-1 1/2"**
  - **4 SPACES (MINIMUM) @ 1'-6 1/2"**
  - **5 SPACES @ 3'-1 1/2"**
  - **6'-3"**

**NOTE**

- **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.**

**DIRECTION OF FLOW**

- **PLAN - THRIE BEAM RETROFIT**
  - **OVER BRIDGE EXPANSION JOINTS.**
  - **SEE ELEVATION SHOWING THRIE BEAM RETROFIT SIDES OF EXPANSION SPLICE AND AT END POST.**
  - **PLACE WOOD BLOCKOUTS ON CONCRETE POSTS BOTH SIDES OF EXPANSION SPLICE AND AT END POST.**
  - **SEE ELEVATION SHOWING THRIE BEAM RETROFIT OVER BRIDGE EXPANSION JOINTS.**

**CONCRETE HEADWALL - SEE NOTES**

**ALTERNATE CONCRETE POSTS**

**B-23-F**

**OPEN PARAPET TYPE BRIDGE RAILING**
Details for connecting guardrail type B to bridge railing, thrice beam retrofit.

* Bridge railing, thrice beam retrofit.

** See plan of additional post detail for post spacing adjustment.

*** Use two nested thrice beam expansion sections. When the centerline of the noted guardrail splice is not located within the bridge reference lines.

Plan

Elevation

Details for connecting guardrail type B to bridge railing, thrice beam retrofit.
ELEVATION SHOWING THRIE BEAM RETROFIT OVER BRIDGE EXPANSION JOINTS

SKETCH FOR RETROFITTING BETWEEN TWO EXISTING RUNS OF GUARDRAIL

INSTRUCTIONS FOR LAYING OUT RETROFIT BETWEEN TWO EXISTING RUNS OF GUARDRAIL

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.
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.

Z = 50'-0" WHEN CONNECTING TO BEAM GUARDRAIL, TYPE MGS-8. USE GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A3
Z = 50'-0" WHEN CONNECTING TO BEAM GUARDRAIL, TYPE M. USE GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A4
Z = 56'-3" WHEN CONNECTING TO BEAM GUARDRAIL, TYPE B. USE GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A5

ROUND WASHER
SQUARE WASHER
WASHERS USED WITH 7/8" DIA. STUDS

7/8" DIA. THREADED STUD

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

LENGTH AS NEEDED

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR
BRIDGE RAILING,
THRIE BEAM RETROFIT
(OPEN PARAPET TYPE BRIDGE RAILING)
PLAN OF ADDITIONAL POST DETAIL

WOOD BLOCKOUT DETAIL
WOOD BLOCKOUTS MAY BE MADE FROM A COMBINATION OF SEPARATE BLOCKS

* DRILL 1" DIA. HOLES FOR LAG SCREW
* DRILL 1-1/2" DIA. HOLE FOR LAG SCREW
PROJECTING PORTION OF BLOCK MAY BE SEPARATE

CENTER HOLES ON BLOCK

HEIGHT AS NEEDED

DEPTH AS NEEDED

1-1/2"

NOTE: HOLE LOCATIONS SHOWN ARE FOR 2'-3" HIGH PARAPET RAILING. WHERE REQUIRED, SEE SECTION THRU 1'-10" HIGH PARAPET RAILING

FRONT
SIDE

CONCRETE RAILING POST DETAIL

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

BRIDGE RAILING,
THRIE BEAM RETROFIT
(OPEN PARAPET TYPE BRIDGE RAILING)
THRIE BEAM ELEMENT
SAME CROSS SECTION AS
2'-0" x 4'
1'-8"
3" x 7"
12'-6"
6' & 8" SLOTTED HOLES
SLOTTED HOLES
POST BOLT SLOTS
1'-6" < 6" & 9"
3' x 3'
3" x 3/4" SLOTTED HOLES
SLOTTED HOLES
2" x 2-1/2"
4'-1/2"
SAME CROSS SECTION AS
THRIE BEAM ELEMENT

2'-3" HIGH PARAPET RAILING
BEHIND 1'-6" TO 2'-0" WIDE BRUSHBLOCK

2'-3" HIGH PARAPET RAILING
BEHIND 6" OR 9" WIDE BRUSHBLOCK

1'-10" HIGH PARAPET RAILING
BEHIND 6" OR 9" WIDE BRUSHBLOCK

SECTIONS THRU PARAPET RAILING

THRIE BEAM EXPANSION SECTION

EXISTING CURB
HEIGHT

6" WIDE CURB

1" TO 3"

5" WIDE CURB

1" TO 3"

7" WIDE CURB

1" TO 3"

NOTES:

THIS STANDARD IS INTENDED FOR USE IN UPGRADING OF
EXISTING OPEN-PARAPET TYPE BRIDGE RAILINGS AND
APPROACH GUARDRAIL.

BRIDGE RAILING, THRIE BEAM RETROFIT AND GUARDRAIL
ANCHORAGES SHALL CONFORM TO THE CURRENT STANDARD
PLAN R-60 SERIES, WHERE APPLICABLE, EXCEPT AS
SHOWN ON THIS PLAN.

ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH
SECTIONS 807 & 908 OF THE STANDARD SPECIFICATIONS.

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

FOR PRECAST THREE SIDED OR ARCH CULVERTS SPACE
BLOCKOUTS FOR THRIE BEAM GUARDRAIL, AT A DISTANCE
OF 10'-7 6" OR LESS CENTER TO CENTER, PLACE FIRST
AND LAST BLOCK ON HEADWALL AS DETAILED ON THIS
STANDARD.

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

F.H.W.A. APPROVAL
PLAN DATE
B-23-F SHEET
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