

PLAN

ELEVATION

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

\* BRIDGE RAILING THRIE BEAM RETROFIT

4" MAX. HEIGHT CURB & GUTTER

\* 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.



PREPARED BY DESIGN DIVISION

DRAWN BY: B.L.T.

CHECKED BY: V.Z.

DEPARTMENT DIRECTOR Paul C. Ajegba

APPROVED BY: Matthew J. Chynoweth, P.E. Oct 14 2021 4:27 PM DIRECTOR, BUREAU OF BRIDGES AND STRUCTURES

APPROVED BY: Gregg Brunner, P.E. Oct 14 2021 12:29 PM DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: Bradley C. Wiefelrich Oct 14 2021 10:58 AM DIRECTOR, BUREAU OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR

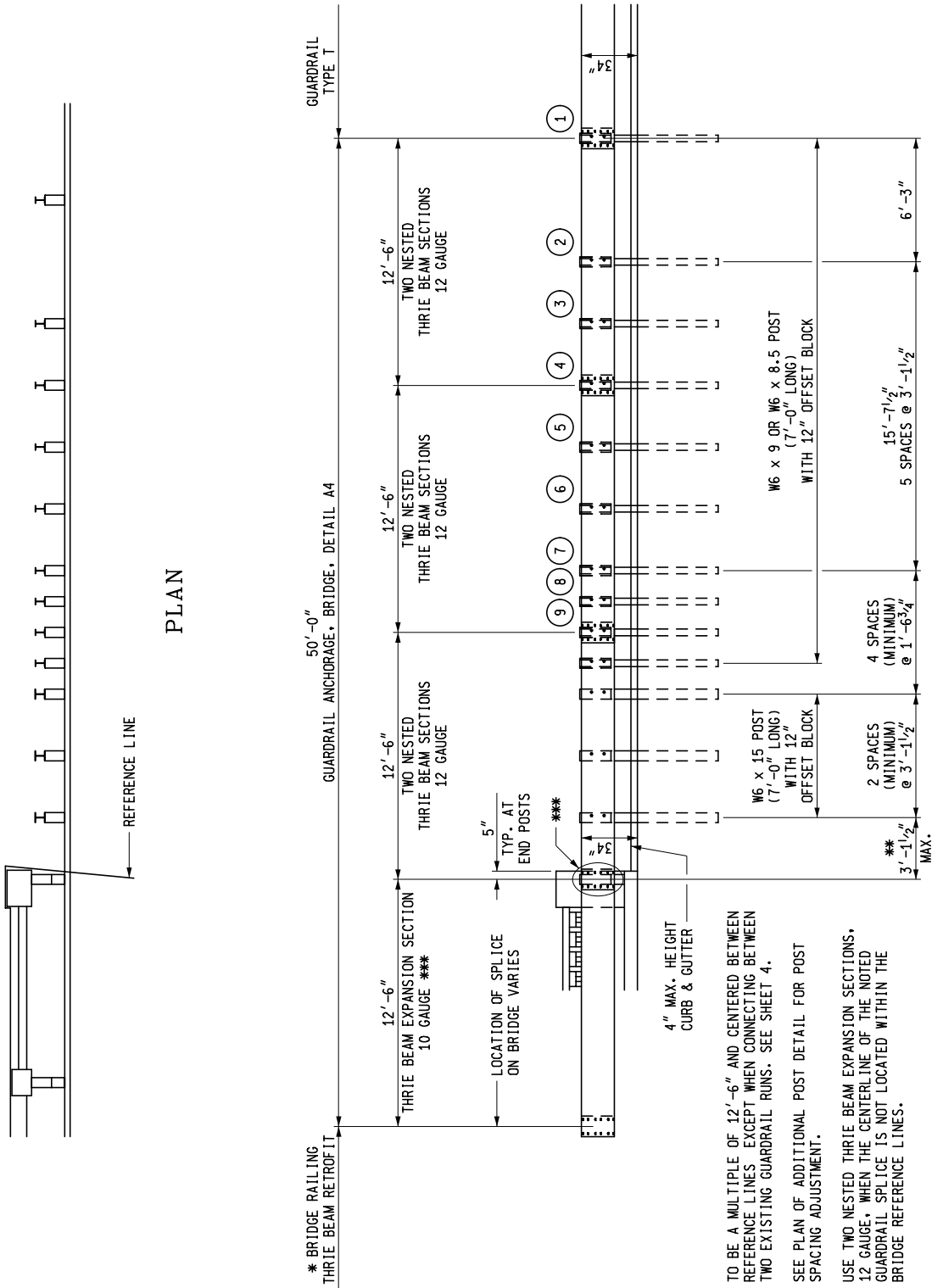
BRIDGE RAILING, THRIE BEAM RETROFIT (R4 TYPE BRIDGE RAILING)

4-7-2022 F.H.W.A. APPROVAL

10-23-2019 PLAN DATE

B-22-E

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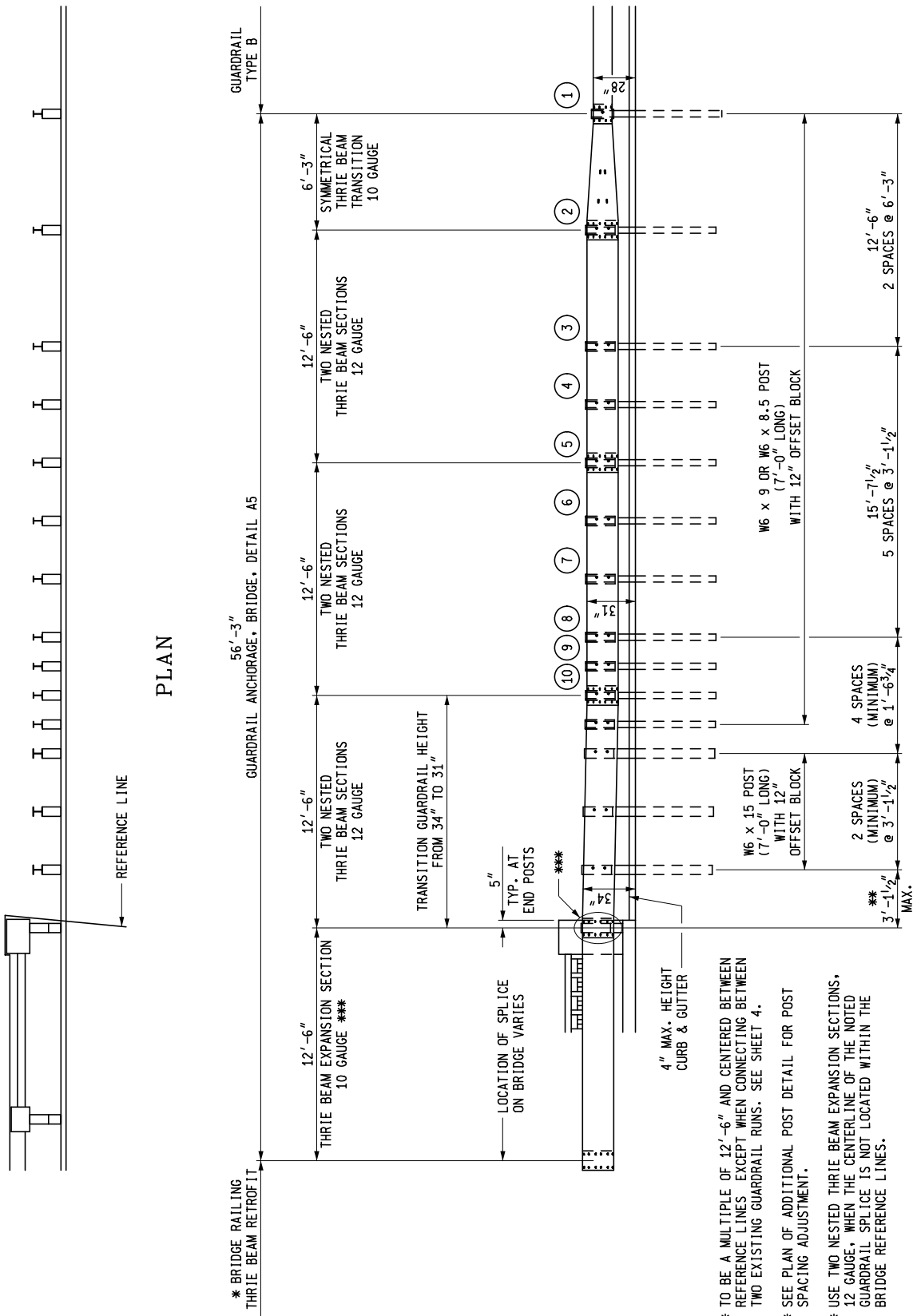
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DETAILS FOR CONNECTING GUARDRAIL TYPE T TO BRIDGE RAILING, THRIE BEAM RETROFIT

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

ELEVATION

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

56'-3" GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A5

\* BRIDGE RAILING THRIE BEAM RETROFIT

GUARDRAIL TYPE B

REFERENCE LINE

12'-6" THRIE BEAM EXPANSION SECTION 10 GAUGE \*\*\*

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

6'-3" SYMMETRICAL THRIE BEAM TRANSITION 10 GAUGE

TRANSITION GUARDRAIL HEIGHT FROM 34" TO 31"

5" TYP. AT END POSTS

LOCATION OF SPLICE ON BRIDGE VARIES

4" MAX. HEIGHT CURB & GUTTER

\* 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.

W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

4 SPACES (MINIMUM) @ 1'-6 3/4"

2 SPACES (MINIMUM) @ 3'-1 1/2"

5 SPACES @ 3'-1 1/2" MAX.

2 SPACES @ 6'-3"

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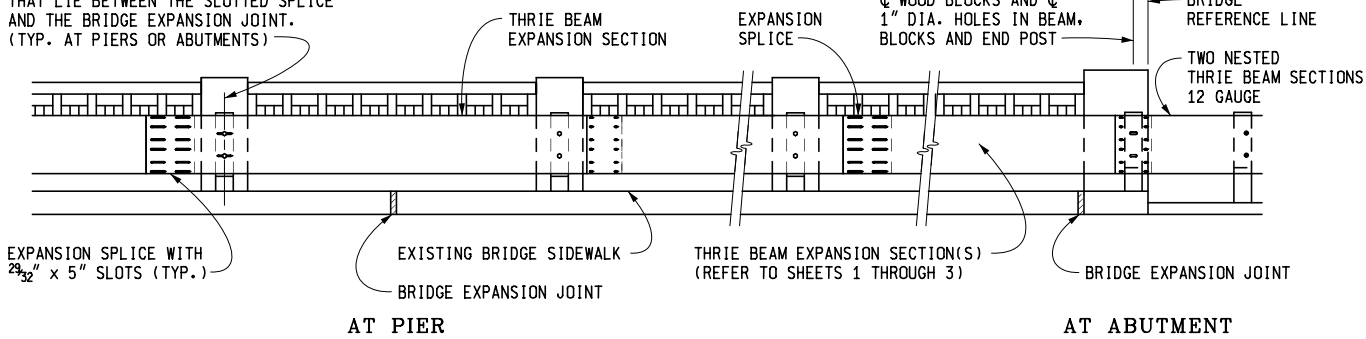
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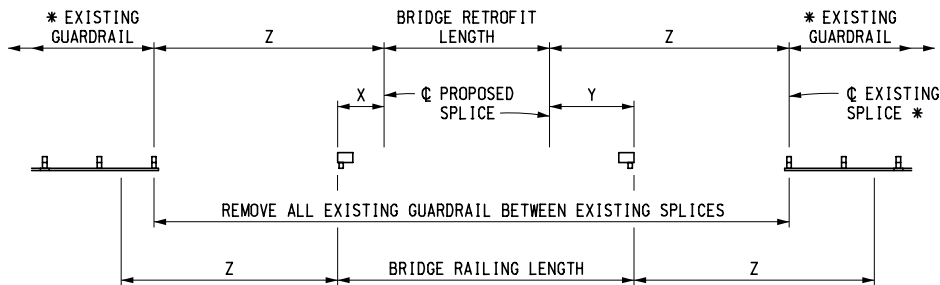
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PLACE 1" x 5" SLOTS FOR POST STUDS IN THRIE BEAM EXPANSION SECTION AT POSTS THAT LIE BETWEEN THE SLOTTED SPLICE AND THE BRIDGE EXPANSION JOINT. (TYP. AT PIERS OR ABUTMENTS)



ELEVATION SHOWING THRIE BEAM RETROFIT OVER BRIDGE EXPANSION JOINTS



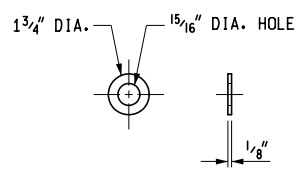
\* GUARDRAIL TYPE B OR TYPE T WITH 6'-3" POST SPACING DEPICTED IN DIAGRAM. SPLICE LOCATION WILL BE LOCATED AT MIDSPAN BETWEEN POSTS WITH GUARDRAIL TYPE MGS-8 AND A 6'-3" POST SPACING.

- 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 T. USE GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A4
- Z = 56'-3" WHEN CONNECTING TO BEAM GUARDRAIL, TYPE B. USE GUARDRAIL ANCHORAGE, BRIDGE, DETAIL A5

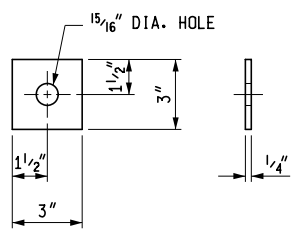
SKETCH FOR RETROFITTING BETWEEN TWO EXISTING RUNS OF GUARDRAIL

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. 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.

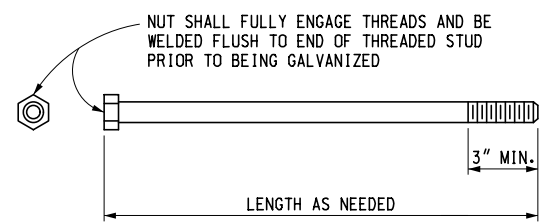


ROUND WASHER



SQUARE WASHER

WASHERS USED WITH 7/8" DIA. STUDS

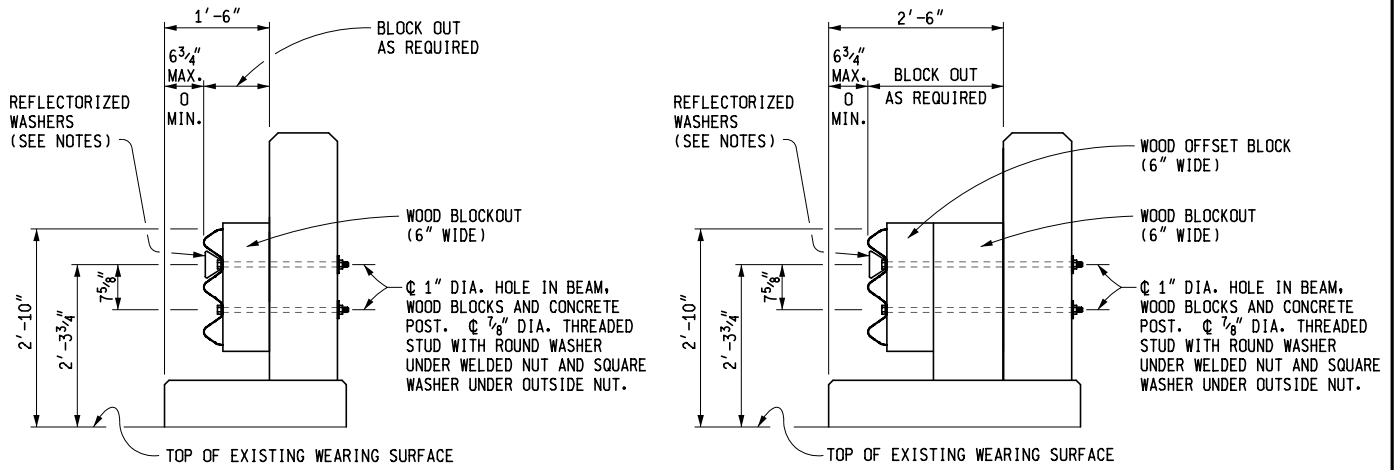


7/8" DIA. THREADED STUD

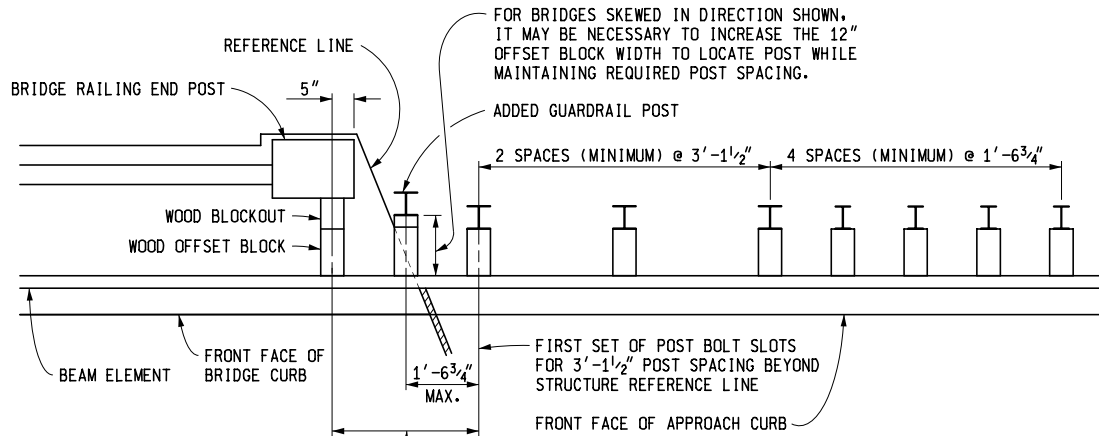
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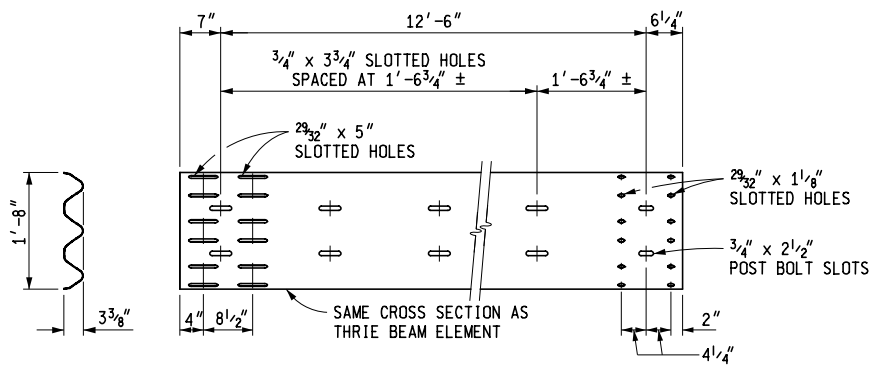


**SECTIONS THRU R4 RAILING**



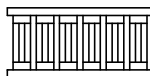
WHEN THIS DISTANCE EXCEEDS 3'-1 1/2", DRILL ADDITIONAL HOLES FOR POST BOLTS IN BEAM ELEMENT AND PLACE AN ADDITIONAL POST, BLOCK AND OFFSET BLOCK (AS SHOWN) IMMEDIATELY ADJACENT TO STRUCTURE

**PLAN OF ADDITIONAL POST DETAIL**



**THRIE BEAM EXPANSION SECTION**

NOTE:



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

NOTES:

THIS STANDARD IS INTENDED FOR USE IN UPGRADING OF EXISTING R4 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 MATERIAL 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 SPLICE BOLTS.

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