



# Road & Bridge Design Publications

## Monthly Update – January 2026

Revisions for the month of **January** are listed and displayed below and will be included in projects submitted for the **May** letting.

Email road related questions to [MDOT-Road-Design-Standards@Michigan.gov](mailto:MDOT-Road-Design-Standards@Michigan.gov).

Email bridge related questions to [MDOT-Bridge-Design-Standards@Michigan.gov](mailto:MDOT-Bridge-Design-Standards@Michigan.gov).

## Special Details

### **R:63-C: Guardrail Approach Terminal Type 3M:**

Converted notes and callouts to active voice.

### **R:67-G: Guardrail Anchorage, Bridge, Details:**

Converted notes and callouts to active voice.

### **R:67-SD: Guardrail Anchorage, Bridge, Details (For Safety Shape Bridge Barriers & Railings):**

Converted notes and callouts to active voice.

### **R:130-A: Light Standard Details:**

Converted notes and callouts to active voice.

### **B-28-A: Bridge Barrier Railing, Type 7:**

Removed Bridge Barrier Railing, Aesthetic Type 7, Det 1 railing.

### **B-29-A: Bridge Barrier Railing, Type 6:**

Removed Bridge Barrier Railing, Aesthetic Type 6, Det 1 railing.

### **B-41-D: Fencing for Bridge Railing, Aesthetic Parapet Tube:**

Added elastomeric leveling pad below fence post base plates and revised anchor bolt projection length. Updated font for ADA requirements and revised notes to active voice.



# Road & Bridge Design Publications

## Bridge Design Guides

### **1.21.01: Factors for Bridge Estimates:**

Removed Bridge Barrier Railing, Aesthetic Type 6, Det 1 and Bridge Barrier Railing, Aesthetic Type 7, Det 1 railings.

### **6.29.06: Bridge Railing, 2 Tube:**

Added elastomeric leveling pad below railing posts. Updated font for ADA requirements and revised design guide note designations. Added note to provide information related to the location of the screed rail and railing reinforcement. If a minimum of 1'-0" of clearance does not exist between the centerline of the fascia beam and railing reinforcement, designers are to contact BOBS Bridge Construction to discuss alternative screed rail options.

### **6.29.08: Bridge Barrier Railing Type 7:**

Updated font for ADA requirements and revised design guide note designations. Added note to provide information related to the location of the screed rail and railing reinforcement. If a minimum of 1'-0" of clearance does not exist between the centerline of the fascia beam and railing reinforcement, designers are to contact BOBS Bridge Construction to discuss alternative screed rail options.

### **6.29.09: Bridge Barrier Railing Type 6:**

Updated font for ADA requirements and revised design guide note designations. Added note to provide information related to the location of the screed rail and railing reinforcement. If a minimum of 1'-0" of clearance does not exist between the centerline of the fascia beam and railing reinforcement, designers are to contact BOBS Bridge Construction to discuss alternative screed rail options.

### **6.29.10: Bridge Railing, Aesthetic Parapet Tube:**

Added elastomeric leveling pad below railing posts. Updated font for ADA requirements and revised design guide note designations. Added note to provide information related to the location of the screed rail and railing reinforcement. If a minimum of 1'-0" of clearance does not exist between the centerline of the fascia beam and railing reinforcement, designers are to contact BOBS Bridge Construction to discuss alternative screed rail options.



# Road & Bridge Design Publications

## **6.29.17: Bridge Railing, 4 Tube Bicycle Railing Option:**

Added elastomeric leveling pad below railing posts. Updated font for ADA requirements and revised design guide note designations. Added note to provide information related to the location of the screed rail and railing reinforcement. If a minimum of 1'-0" of clearance does not exist between the centerline of the fascia beam and railing reinforcement, designers are to contact BOBS Bridge Construction to discuss alternative screed rail options.

## **6.29.17E: Bridge Railing, 4 Tube – Sidewalk Section Pedestrian Railing Option:**

Added elastomeric leveling pad below railing posts. Revised design guide note designations. Added note to provide information related to the location of the screed rail and railing reinforcement. If a minimum of 1'-0" of clearance does not exist between the centerline of the fascia beam and railing reinforcement, designers are to contact BOBS Bridge Construction to discuss alternative screed rail options.

## **Bridge Design Manual**

### **Chapter 12: Table of Contents:**

Updated section 12.03. and Appendix 12.02.01B titles. Added Appendix 12.02.01B.

### **12.02: Geometric Criteria:**

Updated reference to the 2018 AASHTO Green Book (A Policy on Geometric Design of Highways and Streets- 7th Edition) (GB7).

#### **12.02.01: Vertical Clearance:**

Updated reference to appendix 12.02.01A.

### **12.03: Design Exceptions/Design Variances:**

Updated section title and added information related to project classifications. Project Classification definitions have been updated in relation to new Performance Based Practical Design information in the 2018 AASHTO Green Book (A Policy on Geometric Design of Highways and Streets- 7th Edition) (GB7). This is in accordance with recent updates of the Road Design Manual. Clarified that Urgent Needs and Request for Action rehabilitation projects do not require design exceptions/design variances. See Section 8.03 for associated Plan Notes. Added references to a new appendix in Chapter 12 related to project classifications that require design exceptions / design variances.



# Road & Bridge Design Publications

## **Appendix 12.02.01B: Projects Requiring Design Exception/Design Variance:**

New appendix that identifies project classifications under the new GB7 definitions according to major project scope of work items. Design exceptions/design variances are required based on a project's classification.

Updates to the MDOT Cell Library, Sample Plans, and other automated tools may be required in tandem with some of this month's updates. Until such updates can be made, it is the designer's/detailer's responsibility to manually incorporate any necessary revisions to notes and plan details to reflect these revisions.

---

*This document contains complex files, plans, and/or information. If you require assistance accessing this information or require it in an alternative format, contact the Michigan Department of Transportation's (MDOT) Americans with Disabilities Act (ADA) coordinator at [www.Michigan.gov/MDOT-ADA](http://www.Michigan.gov/MDOT-ADA).*

# Index to Road Special Details

1-26-2026

⑥

SPECIAL DETAIL NUMBER	NUMBER OF SHEETS	TITLE	PLAN DATE
21	2	GUARDRAIL AT INTERSECTIONS	6-6-22
24	8	GUARDRAIL ANCHORED IN BACKSLOPE TYPES 4B, 4T, 7 4MGS-8	12-6-22
99	2	CHAIN LINK FENCE WITH WIRE ROPE	12-6-22
R-22-G	4	COVER V	4-14-25
R-23-F	3	COVER W	4-14-25
R-24-G	3	COVER VG (FOR USE WITH CONCRETE VALLEY GUTTER)	4-14-25
R-32-F	8	APPROACH CURB & GUTTER DOWNSPOUTS	12-5-25
R-32-SD	6	APPROACH CURB & GUTTER DOWNSPOUTS (FOR SAFETY SHAPES)	12-5-25
R-43-J	2	LOCATION OF TRANSVERSE JOINTS IN PLAIN CONCRETE PAVEMENT	1-4-22
R-44-G	7	CONCRETE PAVEMENT REPAIR	1-7-25
R-45-K	2	PAVEMENT REINFORCEMENT FOR BRIDGE APPROACH	1-4-22
R-50-H	6	LIGHT STANDARD FOUNDATION (CONCRETE BARRIER, DOUBLE FACE)	10-30-25
R-53-A	22	TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION	8-14-15
R-54-J	5	CONCRETE BARRIER, SINGLE FACE	12-15-25
R-55-H	5	FILLER WALLS AT BRIDGE PIER COLUMNS	3-13-24
R-56-F	6	GUARDRAIL MEDIAN OBJECT PROTECTION	10-10-23
R-60-J	16	GUARDRAIL TYPES A, B, BD, T, TD, MGS-8, & MGS-8D	1-29-24
R-62-H	5	GUARDRAIL APPROACH TERMINAL TYPE 2M	2-19-25
*R-63-C	3	GUARDRAIL APPROACH TERMINAL TYPE 3M	1-6-26
R-66-E	4	GUARDRAIL DEPARTING TERMINAL TYPES B, T, & MGS	9-14-23
*R-67-G	16	GUARDRAIL ANCHORAGE, BRIDGE, DETAILS	1-6-26
*R-67-SD	6	GUARDRAIL ANCHORAGE, BRIDGE, DETAILS (FOR SAFETY SHAPES)	1-6-26
R-72-D	6	GUARDRAIL LONG SPAN INSTALLATIONS	4-25-25
R-73-F	3	GUARDRAIL OVER BOX OR SLAB CULVERTS	8-1-19
R-76-F	4	CONCRETE GLARE SCREEN	11-4-25
R-80-F	8	GRANULAR BLANKETS, UNDERDRAINS, OUTLET ENDINGS, & BULKHEADS	4-2-25
R-97-D	4	HIGH TENSILE EIGHT WIRE FENCE	1-7-25
R-100-I	4	SEEDING AND TREE PLANTING	11-1-24
R-126-I	5	PLACEMENT OF TEMPORARY CONCRETE & STEEL BARRIER	8-21-25
R-127-I	8	DELINEATOR AND DRAINAGE MARKER INSTALLATIONS	10-24-25
*R-130-A	6	LIGHT STANDARD DETAILS	1-6-26
R-135-A	4	TOWER LIGHTING UNIT FOUNDATION	2-21-25

\*Denotes New or Revised Special Detail to be included in projects for (beginning with) the **May** letting.

Notes:

Former Standard Plans IV-87, IV-89, IV-90, and IV-91 Series, used for building cast in place concrete head walls for elliptical and circular pipe culverts, are now being replaced with plans that detail each specific size. The Bureau of Bridges & Structures, Structure Design Section, Special Structures Unit will provide special details for inclusion in construction plans for MDOT jobs. To ensure prompt delivery, requests **must be made in advance**.

Contact: [MDOT-TriezenbergSquad@Michigan.gov](mailto:MDOT-TriezenbergSquad@Michigan.gov)

Former Standard Plans IV-93 and IV-94 series have been replaced with precast concrete box & three-sided culverts as per the 2020 Standard Specifications for Construction.

# Index to Bridge Special Details

1-26-2026

7

SPECIAL DETAIL NUMBER	NUMBER OF SHEETS	TITLE	PLAN DATE
B-21-K	4	BRIDGE RAILING, 2 TUBE	9-10-24
B-25-L	8	BRIDGE RAILING, AESTHETIC PARAPET TUBE	9-9-24
B-26-G	8	BRIDGE RAILING, 4 TUBE	9-6-24
B-27-B	7	BRIDGE RAILING, 3 TUBE WITH PICKETS	9-11-24
*B-28-A	7	BRIDGE BARRIER RAILING, TYPE 7	12-17-25
*B-29-A	8	BRIDGE BARRIER RAILING, TYPE 6	12-17-25
*B-41-D	3	FENCING FOR BRIDGE RAILING, AESTHETIC PARAPET TUBE	12-10-25
B-102-D	4	STANDARD SLOPE PAVING DETAILS	9-18-23
B-103-F	2	MOLDING, BEVEL, LIGHT STD. ANCHOR BOLT ASSEMBLY AND NAME PLATE DETAILS	12-8-23
EJ3AG	1 to 5	EXPANSION JOINT DETAILS (See Notes)	4-28-25
EJ4T	1 to 5	EXPANSION JOINT DETAILS (See Notes)	4-28-25
PC-1Q	2	PRESTRESSED CONCRETE I-BEAM DETAILS (See Notes)	12-22-25
PC-2L	2	70" PRESTRESSED CONCRETE I-BEAM DETAILS (See Notes)	12-22-25
PC-4J	2	PRESTRESSED CONCRETE 1800 BEAM DETAILS (See Notes)	12-22-25
PC-5D	2	PRESTRESSED CONCRETE BULB-TEE BEAM DETAILS (See Notes)	12-22-25

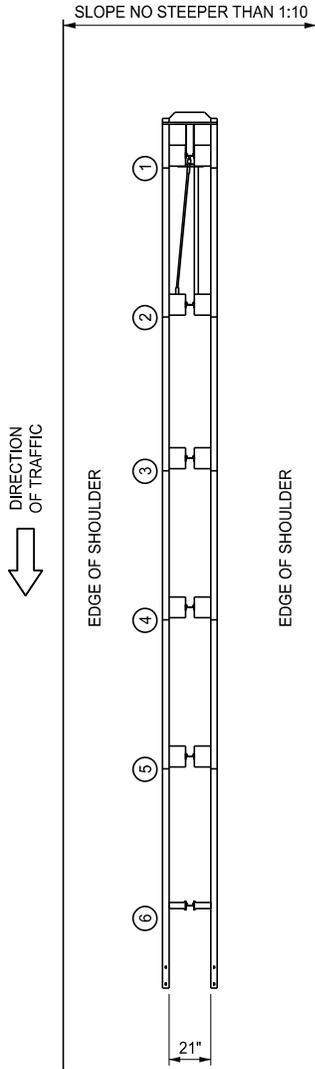
\*Denotes New or Revised Special Detail to be included in projects for (beginning with) the **May** letting.

**Notes:**

Details EJ3AG & EJ4T are interactive, i.e., designers and detailers choose details based upon railing type and angle of crossing and fill in the project specific dimensions for the end plate. Place all details appropriate for the project (including the end plate), structure specific information, and the Expansion Joint Device quantity on the sheet(s). Add the sheet(s) to the plans as a normal plan sheets. Call out and designate the location of the expansion joint device and the end plate on the Superstructure Sheet in the plan set. Include Rail Splice Detail sheet with all plans including an Expansion Joint Device.

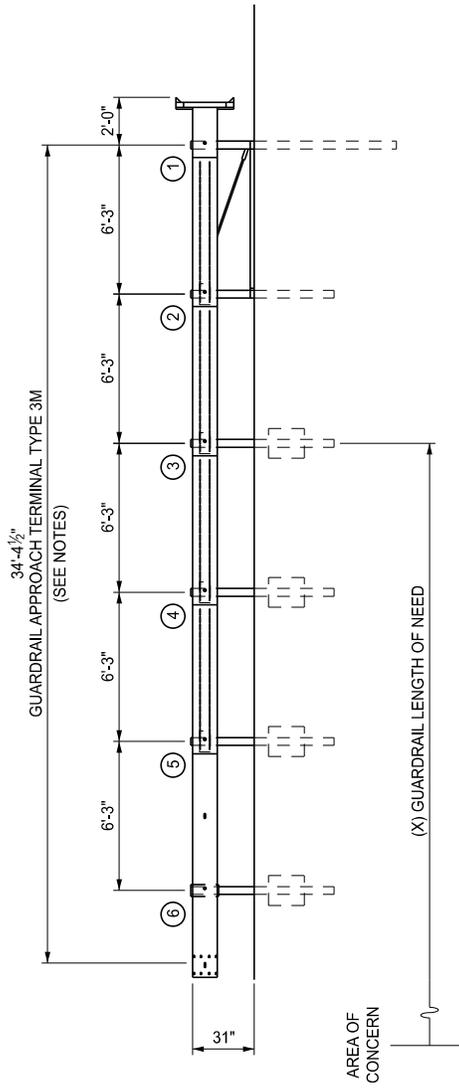
Details PC-1Q, PC-2L, PC-4J, and PC-5D shall have structure specific information and quantities added to the sheet. The sheet shall then be added to the plans as a normal plan sheet.





DIRECTION OF TRAFFIC

PLAN VIEW  
(UNIDIRECTIONAL OR BIDIRECTIONAL TRAFFIC FLOW)



ELEVATION  
GUARDRAIL APPROACH TERMINAL TYPE 3M  
"MATT"

OPTION 2



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
GUARDRAIL APPROACH TERMINAL TYPE 3M

(SPECIAL DETAIL)  
FHWA APPROVAL

01/06/2026  
PLAN DATE

R-63-C

SHEET  
2 OF 3

NOTES:

REFER TO STANDARD PLAN R-60-SERIES TO DETERMINE ADDITIONAL TRANSITION LENGTHS WHEN ATTACHING TERMINALS TO GUARDRAIL TYPES OTHER THAN MGS-8.

ENSURE ALL POSTS, OFFSET BLOCKS, BEAM ELEMENTS, AND HARDWARE (INCLUDING BOLTS, NUTS, AND WASHERS) CONFORM TO THE MANUFACTURER'S DETAILS AND SPECIFICATIONS.

GRADE ALL 1:10 OR FLATTER SLOPES TO MEET CLASS A SLOPE TOLERANCES.

DO NOT INSTALL GUARDRAIL REFLECTORS OR OTHER ATTACHMENTS ON THE GUARDRAIL APPROACH TERMINAL. BEGIN PLACING REFLECTORS AT THE START OF THE STANDARD GUARDRAIL RUN.

USE REFLECTIVE SHEETING ACCORDING TO THE FOLLOWING TRAFFIC CONDITIONS:  
(NOTE: ALTERNATE 3" BLACK AND 3" YELLOW STRIPES ON A 45° ANGLE)



TRAFFIC PASSING ON THE LEFT SIDE



TRAFFIC PASSING ON BOTH SIDES



TRAFFIC PASSING ON THE RIGHT SIDE

MATT (MEDIAN ATTENUATING TREND TERMINAL) IS MANUFACTURED BY VALTIR, LLC.

MAX-TENSION MEDIAN IS MANUFACTURED BY LINDSAY TRANSPORTATION SOLUTIONS, LLC.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
GUARDRAIL APPROACH TERMINAL TYPE 3M

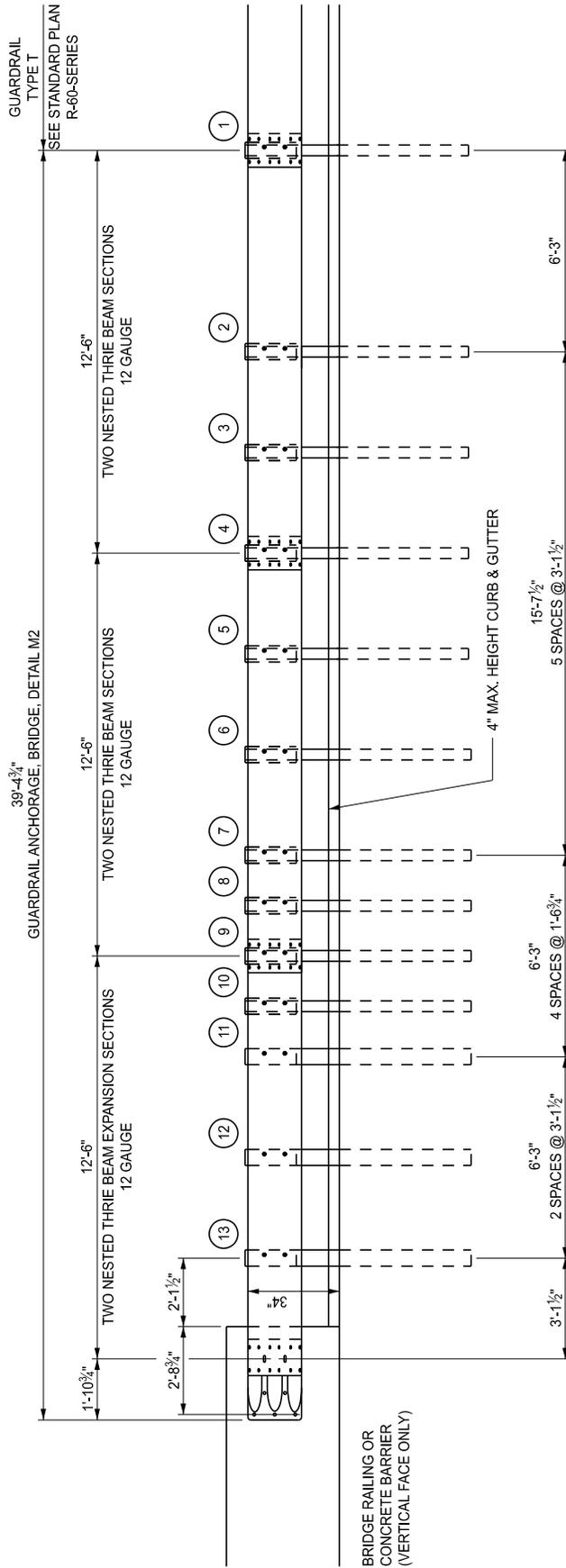
(SPECIAL DETAIL)  
FHWA APPROVAL

01/06/2026  
PLAN DATE

R-63-C

SHEET  
3 OF 3





POST 1 THROUGH 10 - W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK  
 POST 11 THROUGH 13 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE T TO  
 2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE, 3 TUBE WITH PICKETS,  
 CONCRETE BLOCK RETROFIT, PIER BASE WALL,  
 TYPE 6\*, TYPE 7\*, OR SINGLE FACE CONCRETE BARRIER\*  
 (WITHOUT EXPANSION AT BACKWALL)

\* TRANSITION BARRIER ENDING FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. THEN ATTACH ANCHORAGE TO VERTICAL FACE.



DEPARTMENT DIRECTOR  
 BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
 GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
 FHWA APPROVAL

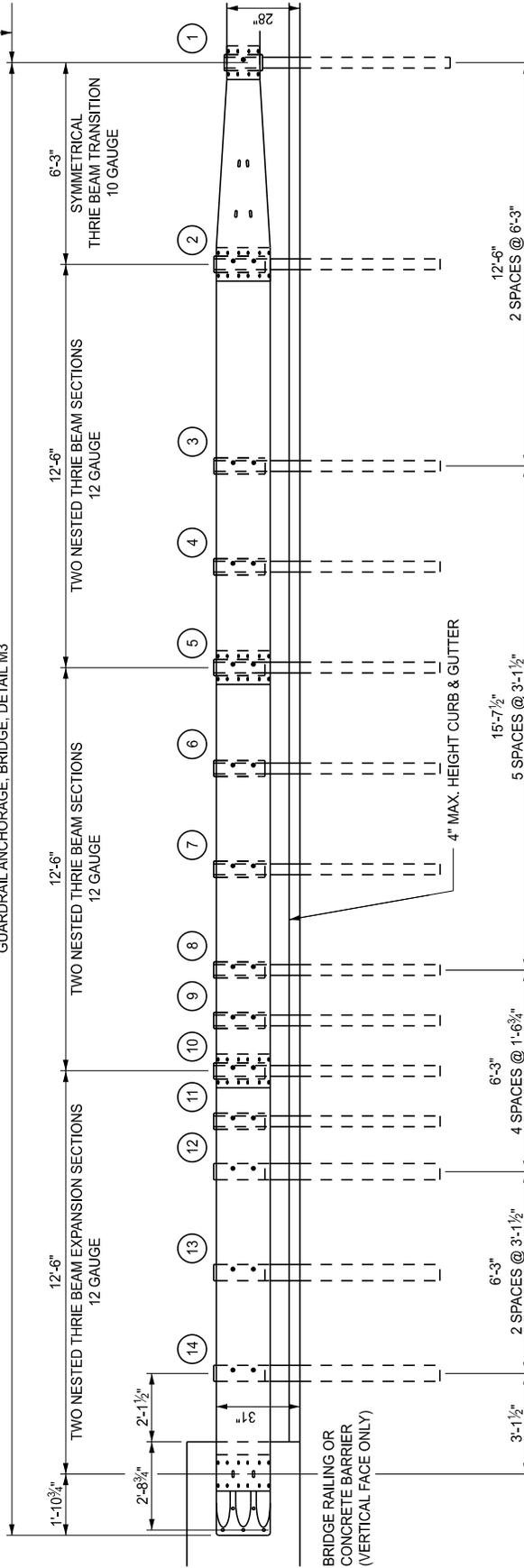
01/06/2026  
 PLAN DATE

R-67-G

SHEET  
 2 OF 16

GUARDRAIL TYPE B  
SEE STANDARD PLAN  
R-60-SERIES

45'-7 3/4"  
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M3



DETAILS FOR CONNECTING GUARDRAIL TYPE B TO  
2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE, 3 TUBE WITH PICKETS,  
CONCRETE BLOCK RETROFIT, PIER BASE WALL,  
TYPE 6\*, TYPE 7\*, OR SINGLE FACE CONCRETE BARRIER\*  
(WITHOUT EXPANSION AT BACKWALL)

\* TRANSITION BARRIER ENDING FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. THEN ATTACH ANCHORAGE TO VERTICAL FACE.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

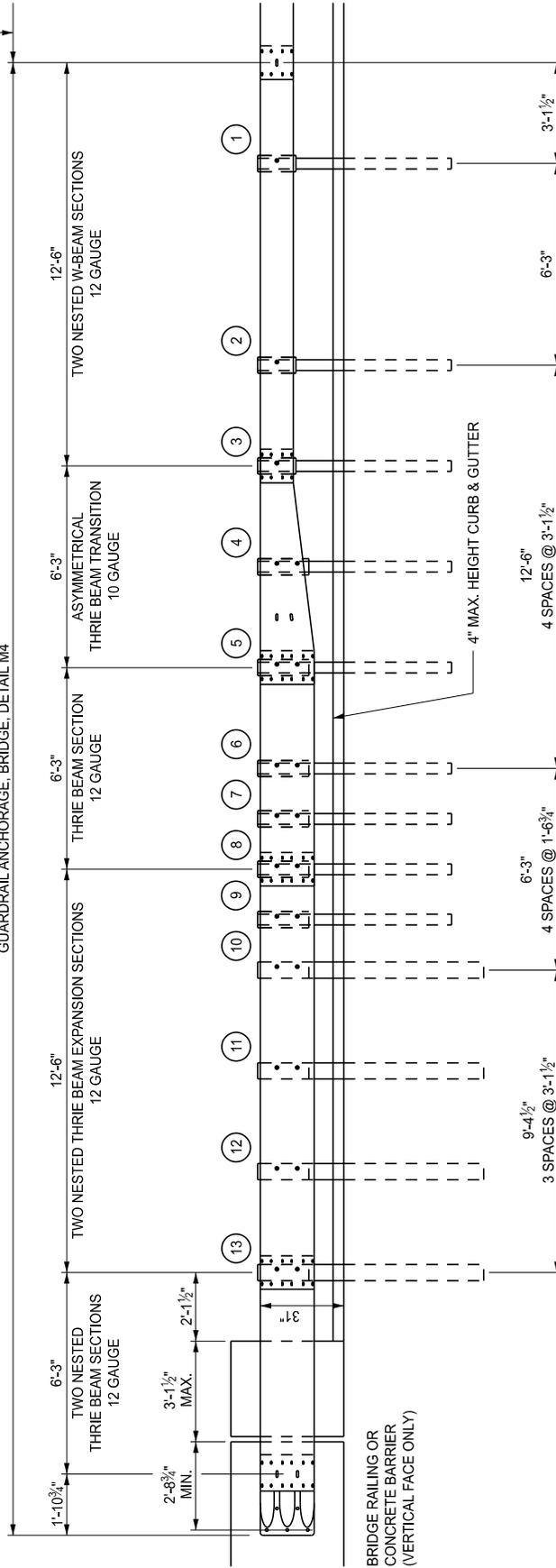
01/06/2026  
PLAN DATE

R-67-G

SHEET  
3 OF 16

GUARDRAIL TYPE MGS-8  
SEE STANDARD PLAN  
R-60-SERIES

45'-7 $\frac{1}{4}$ "  
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M4



POST 1 THROUGH 9 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK  
POST 10 THROUGH 13 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE MGS-8 TO  
2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE,  
3 TUBE WITH PICKETS, CONCRETE BLOCK RETROFIT,  
TYPE 6\*, TYPE 7\*, OR SINGLE FACE CONCRETE BARRIER\*  
(WITH EXPANSION AT BACKWALL/END WALL OR SLEEPER SLAB)

\* TRANSITION BARRIER ENDING FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. THEN ATTACH ANCHORAGE TO VERTICAL FACE.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

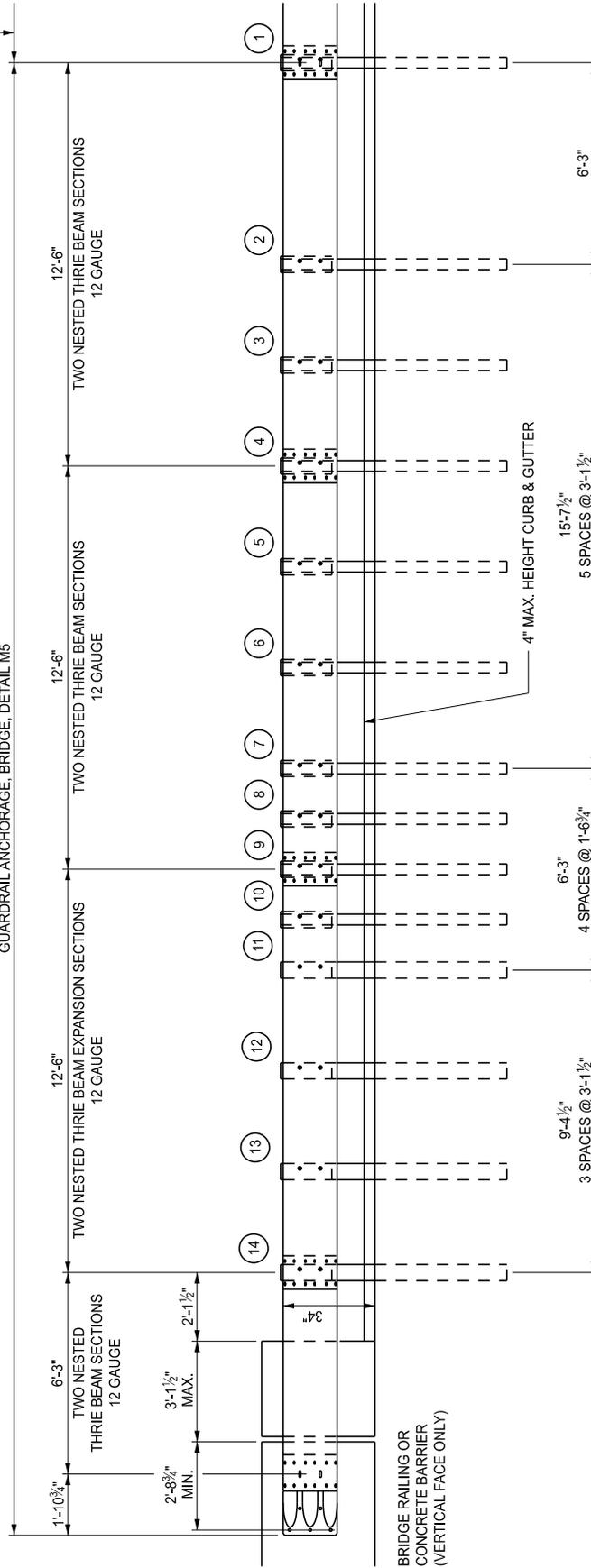
01/06/2026  
PLAN DATE

R-67-G

SHEET  
4 OF 16

GUARDRAIL TYPE T  
SEE STANDARD PLAN  
R-60-SERIES

45'-7 7/8"  
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M5



POST 1 THROUGH 10 - W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK  
POST 11 THROUGH 14 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE T TO  
2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE,  
3 TUBE WITH PICKETS, CONCRETE BLOCK RETROFIT,  
TYPE 6\*, TYPE 7\*, OR SINGLE FACE CONCRETE BARRIER\*  
(WITH EXPANSION AT BACKWALL/END WALL OR SLEEPER SLAB)

\* TRANSITION BARRIER ENDING FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. THEN ATTACH ANCHORAGE TO VERTICAL FACE.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

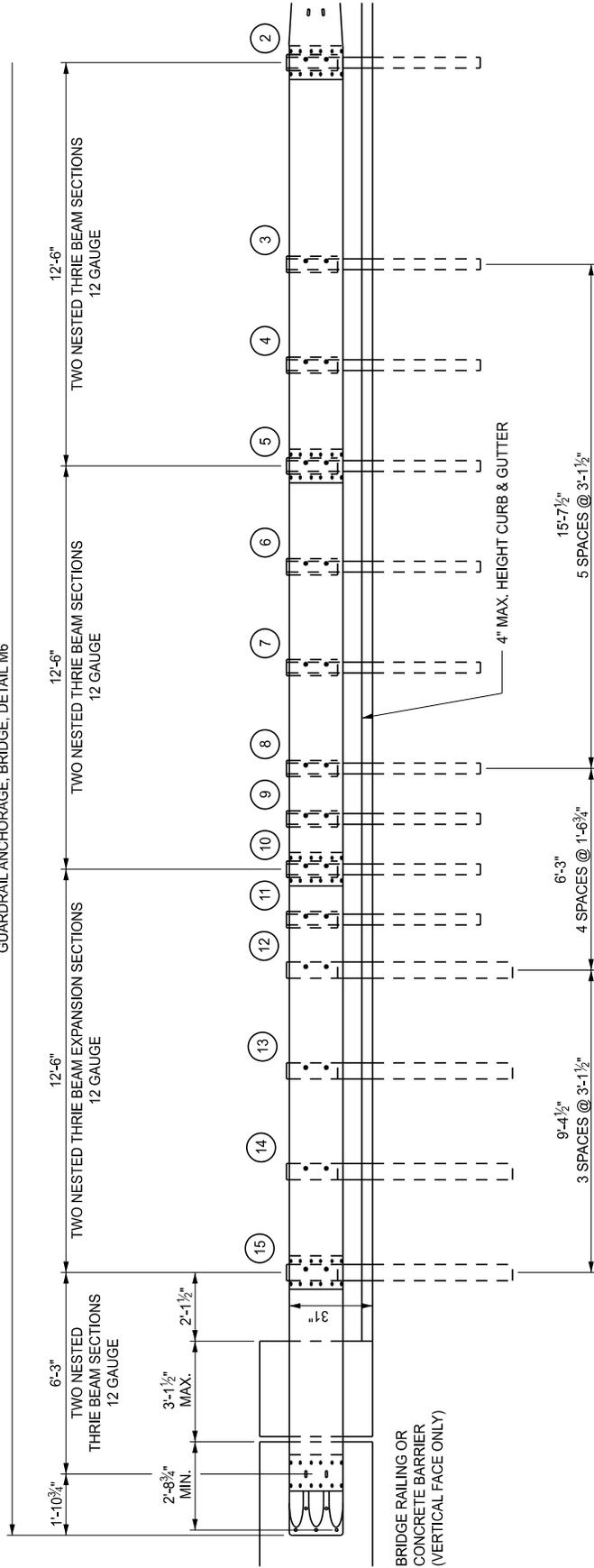
(SPECIAL DETAIL)  
FHWA APPROVAL

01/06/2026  
PLAN DATE

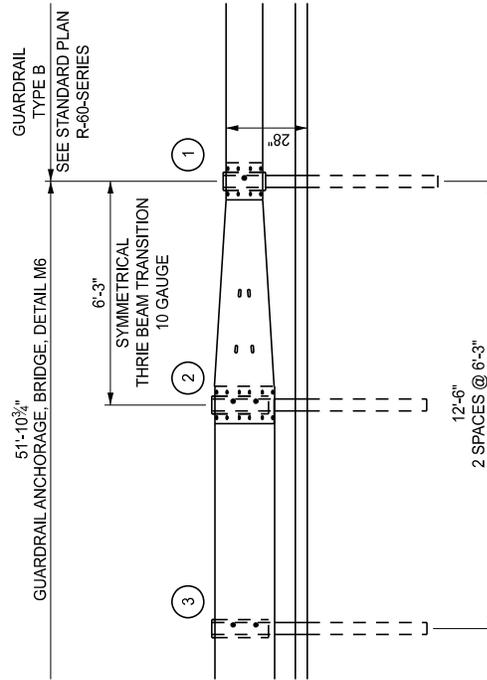
R-67-G

SHEET  
5 OF 16

51'-10<sup>3</sup>/<sub>4</sub>"  
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M6



BRIDGE RAILING OR  
CONCRETE BARRIER  
(VERTICAL FACE ONLY)



POST 1 THROUGH 11 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK  
POST 12 THROUGH 15 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

- DETAILS FOR CONNECTING GUARDRAIL TYPE B TO
- 2-TUBE, 4-TUBE, AESTHETIC PARAPET TUBE,
  - 3 TUBE WITH PICKETS, CONCRETE BLOCK RETROFIT,
  - TYPE 6\*, TYPE 7\*, OR SINGLE FACE CONCRETE BARRIER\*  
(WITH EXPANSION AT BACKWALL/END WALL OR SLEEPER SLAB)

\* TRANSITION BARRIER ENDING FROM SINGLE-SLOPE TO VERTICAL FACE IN ADVANCE OF END SHOE. THEN ATTACH ANCHORAGE TO VERTICAL FACE.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

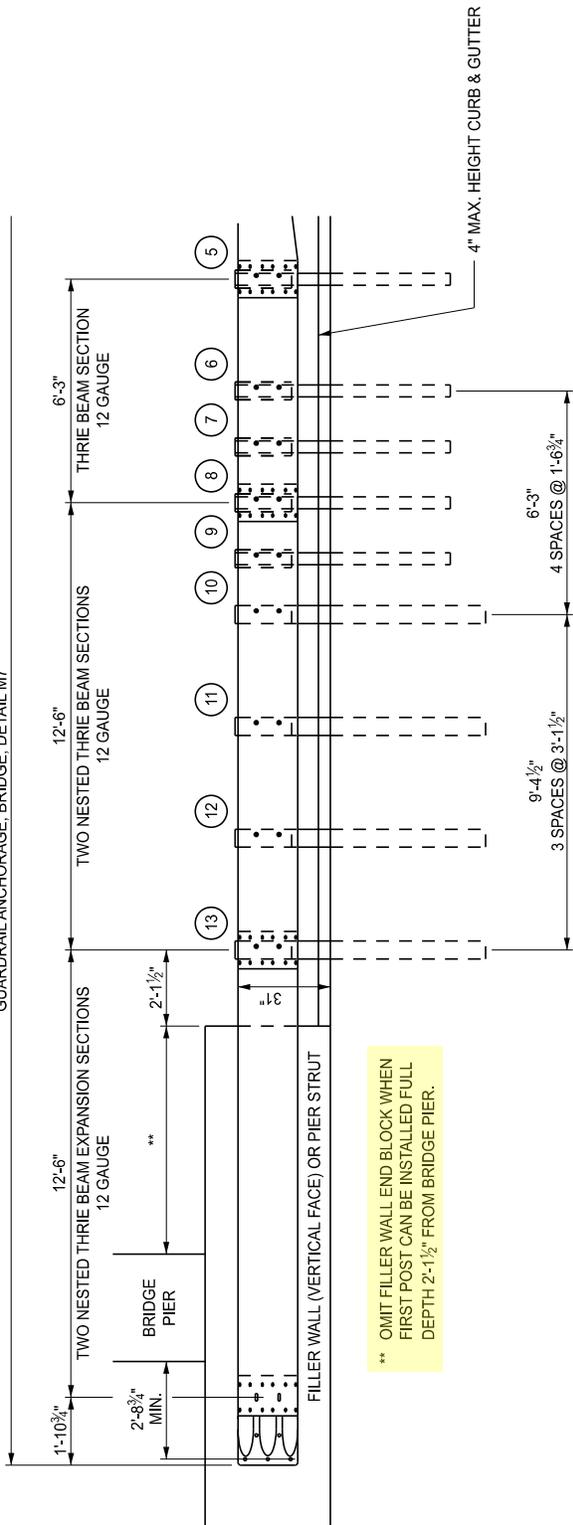
(SPECIAL DETAIL)  
FHWA APPROVAL

01/06/2026  
PLAN DATE

R-67-G

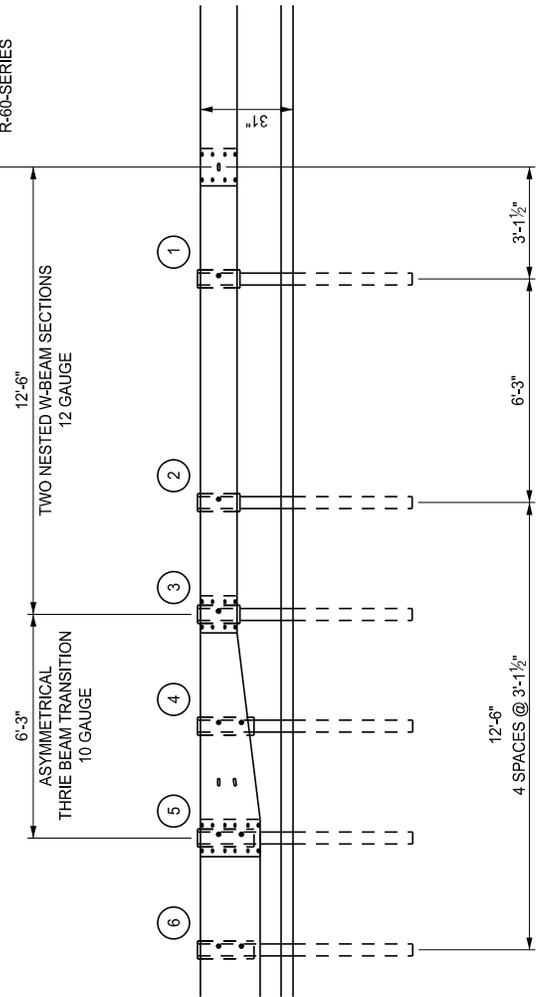
SHEET  
6 OF 16

51'-10 3/4"  
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M7



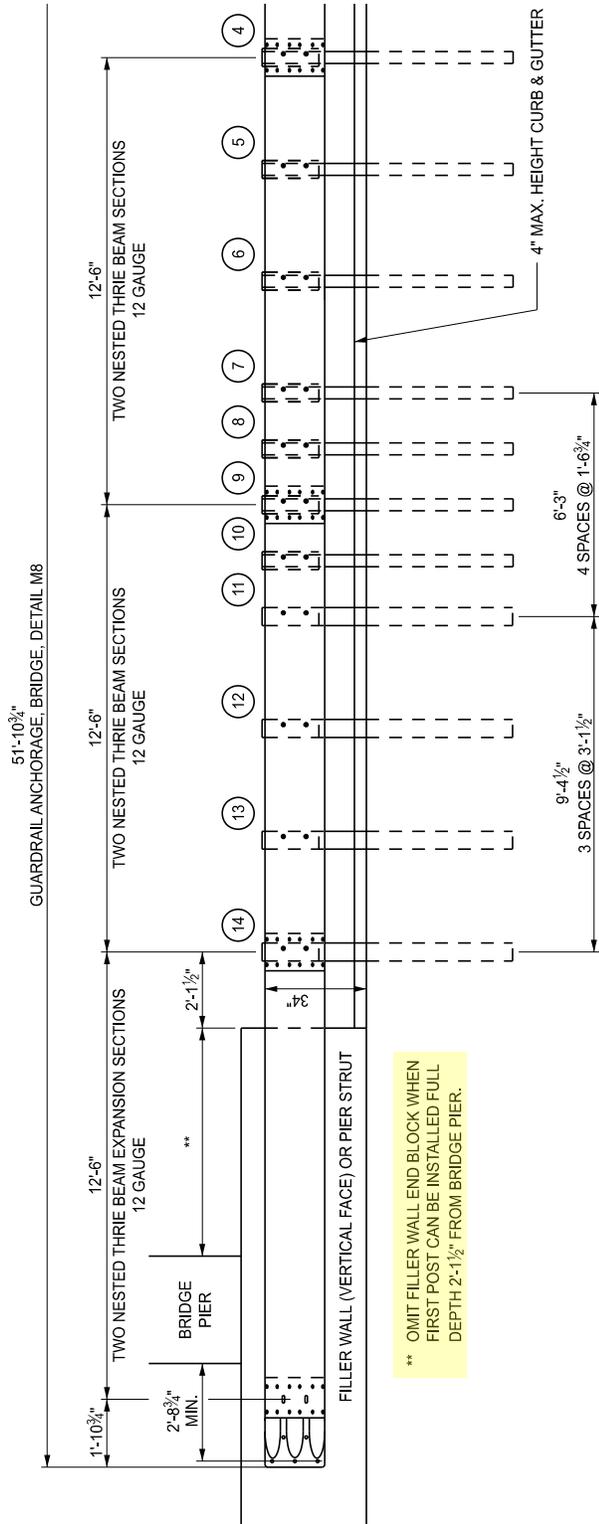
\*\* OMIT FILLER WALL END BLOCK WHEN FIRST POST CAN BE INSTALLED FULL DEPTH 2'-1 1/2" FROM BRIDGE PIER.

51'-10 3/4"  
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M7

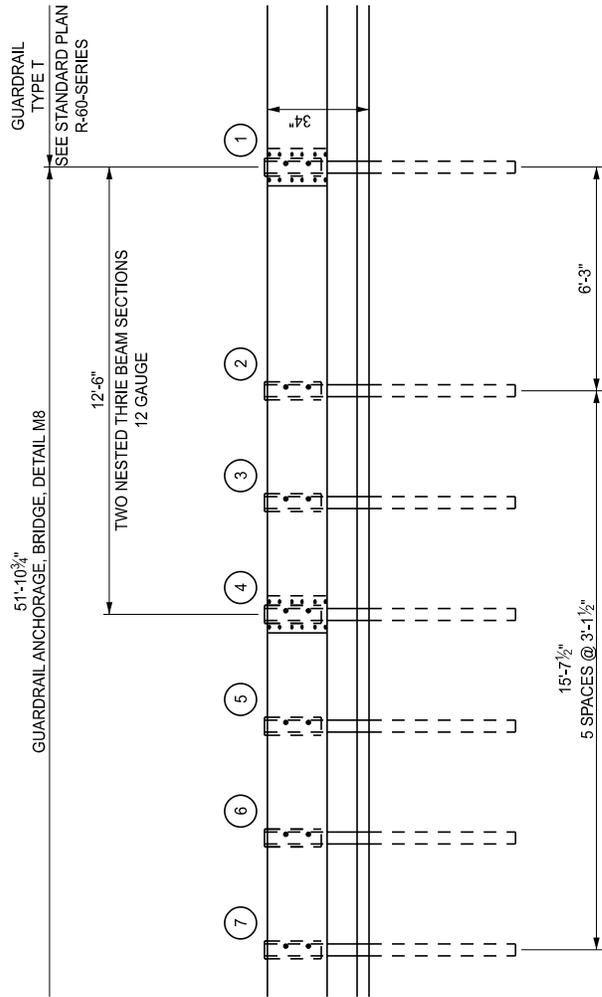


POST 1 THROUGH 9 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK  
POST 10 THROUGH 13 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE MGS-8 TO FILLER WALL OR PIER STRUT



\*\* OMIT FILLER WALL END BLOCK WHEN FIRST POST CAN BE INSTALLED FULL DEPTH 2'-1 1/2" FROM BRIDGE PIER.



POST 0 THROUGH 10 - W6 x 9 OR W6 x 8.5 POST (7'-0" LONG) WITH 12" OFFSET BLOCK  
 POST 11 THROUGH 14 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK

DETAILS FOR CONNECTING GUARDRAIL TYPE T TO FILLER WALL OR PIER STRUT



DEPARTMENT DIRECTOR  
 BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
 GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

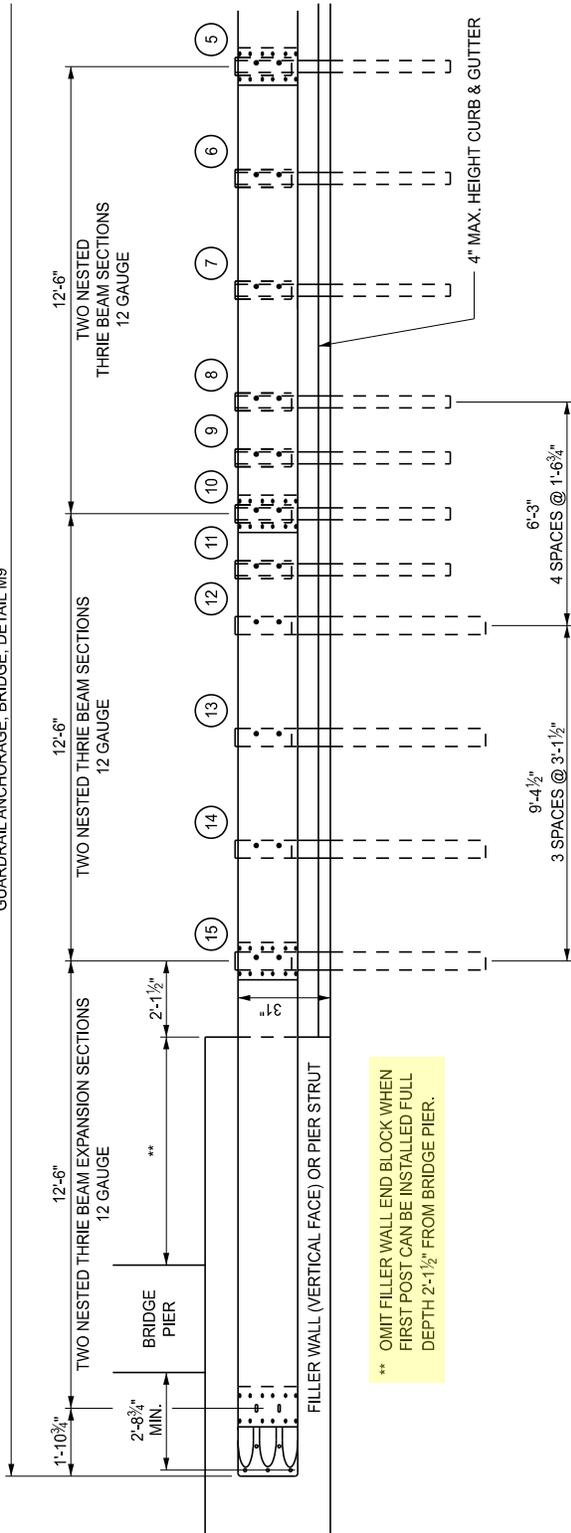
(SPECIAL DETAIL)  
 FHWA APPROVAL

01/06/2026  
 PLAN DATE

R-67-G

SHEET  
 8 OF 16

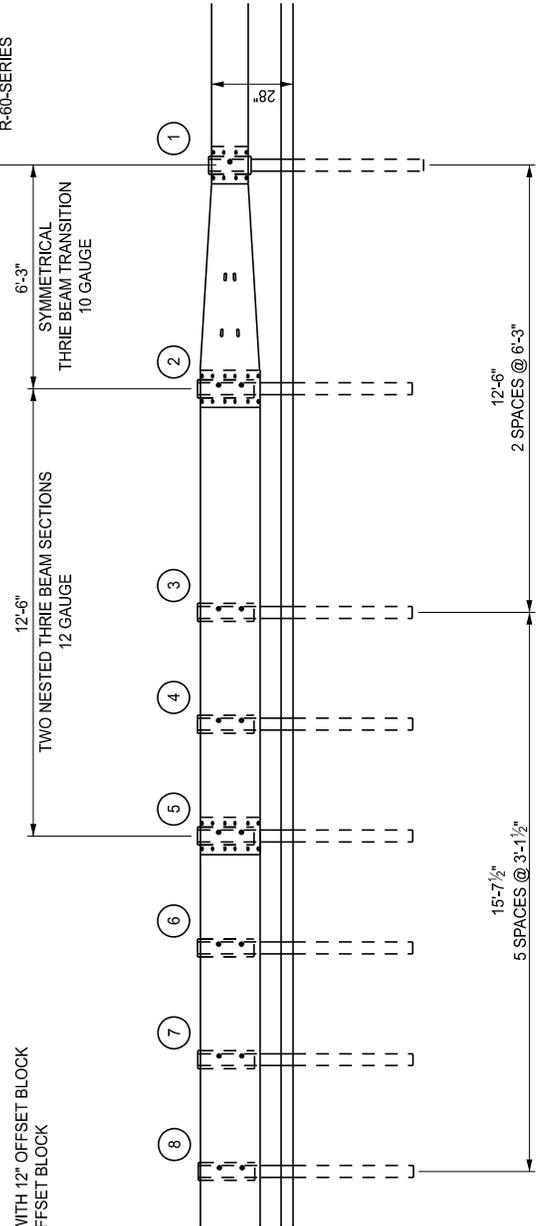
58'-1 1/2"  
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M9



\*\* OMIT FILLER WALL END BLOCK WHEN FIRST POST CAN BE INSTALLED FULL DEPTH 2'-1 1/2" FROM BRIDGE PIER.

58'-1 1/2"  
GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M9

POST 1 THROUGH 11 - W6 x 9 OR W6 x 8.5 POST (6'-0" LONG) WITH 12" OFFSET BLOCK  
POST 12 THROUGH 15 - W6 x 15 POST (7'-0" LONG) WITH 12" OFFSET BLOCK



DETAILS FOR CONNECTING GUARDRAIL TYPE B TO FILLER WALL OR PIER STRUT



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

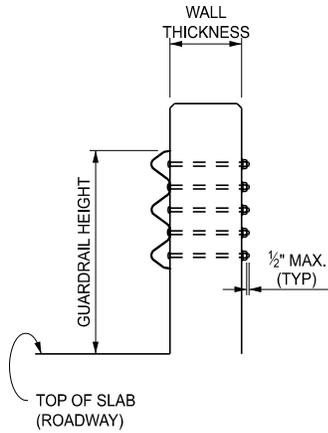
01/06/2026  
PLAN DATE

R-67-G

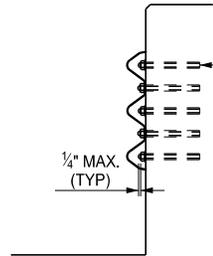
SHEET  
9 OF 16

REFER TO GUARDRAIL ANCHORAGE BRIDGE, DETAIL M1 THROUGH M9 FOR GUARDRAIL HEIGHT.

USE HIGH STRENGTH 7/8" DIA. HEX HEAD BOLT AND NUTS TO CONNECT GUARDRAIL TO BRIDGE RAILINGS WITH ROUND WASHERS ON FRONT AND SQUARE WASHERS ON BACK. (SEE CHART BELOW FOR BOLT LENGTH REQUIRED.) WASHER DETAILS ARE SHOWN ON SHEET 11.



BRIDGE RAILING & FILLER WALL



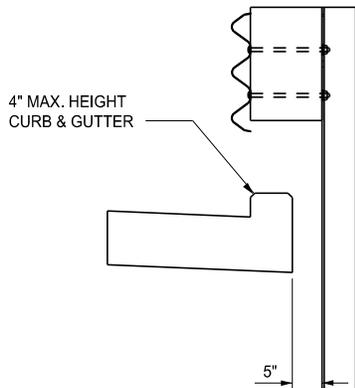
USE 7/8" DIA. ADHESIVE ANCHORED BOLTS EMBEDDED 8" TO ATTACH GUARDRAIL TO PIER BASE WALLS AND PIER STRUTS.

\*\* USE 7/8" DIA. ADHESIVE ANCHORED BOLTS EMBEDDED 8" INSTEAD OF BOLTING THROUGH THE FILLER WALL UNDER THE FOLLOWING CONDITIONS:

1. AT OR NEAR THE JOINT LINE WHEN A FILLER WALL IS A DIFFERENT THICKNESS THAN THE FILLER WALL EXTENSION
2. IN EXISTING FILLER WALLS THICKER THAN 1'-6"
3. WHEN CONDITIONS PROHIBIT THE USE OF BOLTS

ALTERNATE CONSTRUCTION METHOD

APPLIES TO PIER BASE WALLS, PIER STRUTS AND FILLER WALLS MEETING CERTAIN CONDITIONS



POST DETAIL

BOLT REQUIREMENTS FOR CONNECTING GUARDRAIL TO BRIDGE RAILINGS

BRIDGE RAILING	WALL THICKNESS	BOLT LENGTH	MINIMUM THREAD LENGTH
2 TUBE	1'-5 1/2"	1'-7 1/2"	4"
4 TUBE	1'-7"	1'-9"	4"
AESTHETIC PARAPET TUBE	1'-0"	1'-2"	4"
3 TUBE WITH PICKETS	1'-4 1/2"	1'-6 1/2"	4"
TYPE 6	1'-5 3/4" / 1'-6 3/4" ***	1'-7 3/4" / 1'-8 3/4" ***	4"
TYPE 7	1'-2 1/2" / 1'-3 1/2" ***	1'-4 1/2" / 1'-5 1/2" ***	4"
CONCRETE BLOCK RETROFIT	1'-3 3/4"	1'-5 3/4"	4"
FILLER WALL (WITH THROUGH BOLTS) **	VARIES	WALL THK + 2"	4"
PIER BASE WALL, PIER STRUT, FILLER WALL (WITH ADHESIVE ANCHORED BOLTS) **	VARIES	****	4"

SHORTER BOLT LENGTHS MAY BE USED PROVIDED THE BOLT EXTENDS 1/4" BEYOND THE NUT WHEN TIGHTENED.

\*\* REFER TO APPLICABLE NOTES UNDER ALTERNATE CONSTRUCTION METHOD TO DETERMINE APPLICABLE BOLTING METHOD FOR FILLER WALL

\*\*\* THICKNESS/LENGTH DEPENDENT UPON AESTHETIC TREATMENT ON RAILING

\*\*\*\* ENSURE LENGTH PROVIDES 8" EMBEDMENT AND BOLT EXTENDING 1/4" MAXIMUM BEYOND NUT WHEN FULLY ENGAGED

GUARDRAIL POST SECTIONS FOR GUARDRAIL ANCHORAGE, BRIDGE, DETAIL M1 THROUGH M9



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

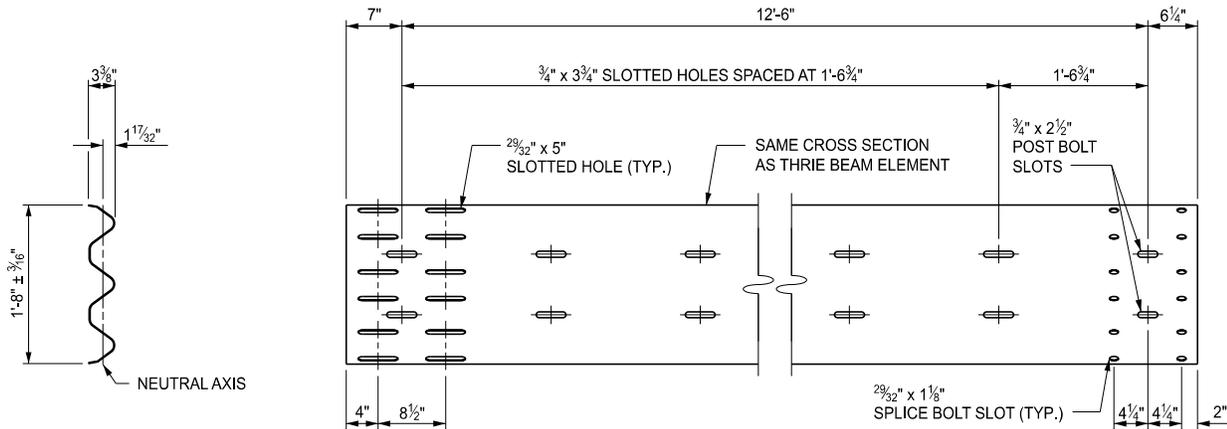
STANDARD PLAN FOR GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

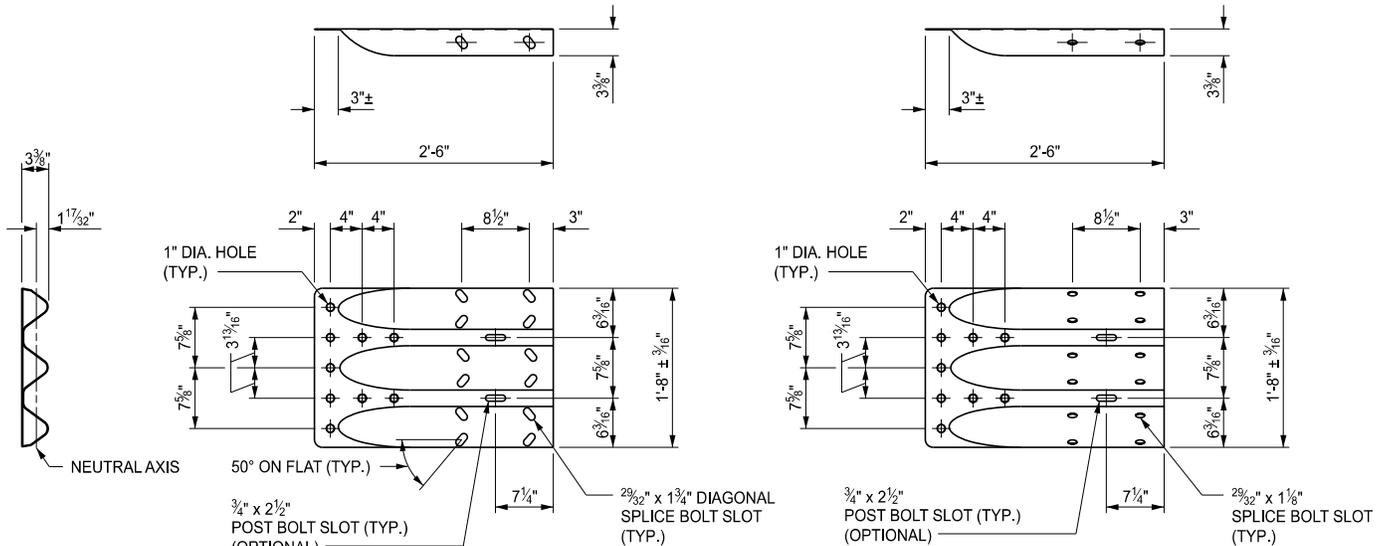
01/06/2026  
PLAN DATE

R-67-G

SHEET  
10 OF 16



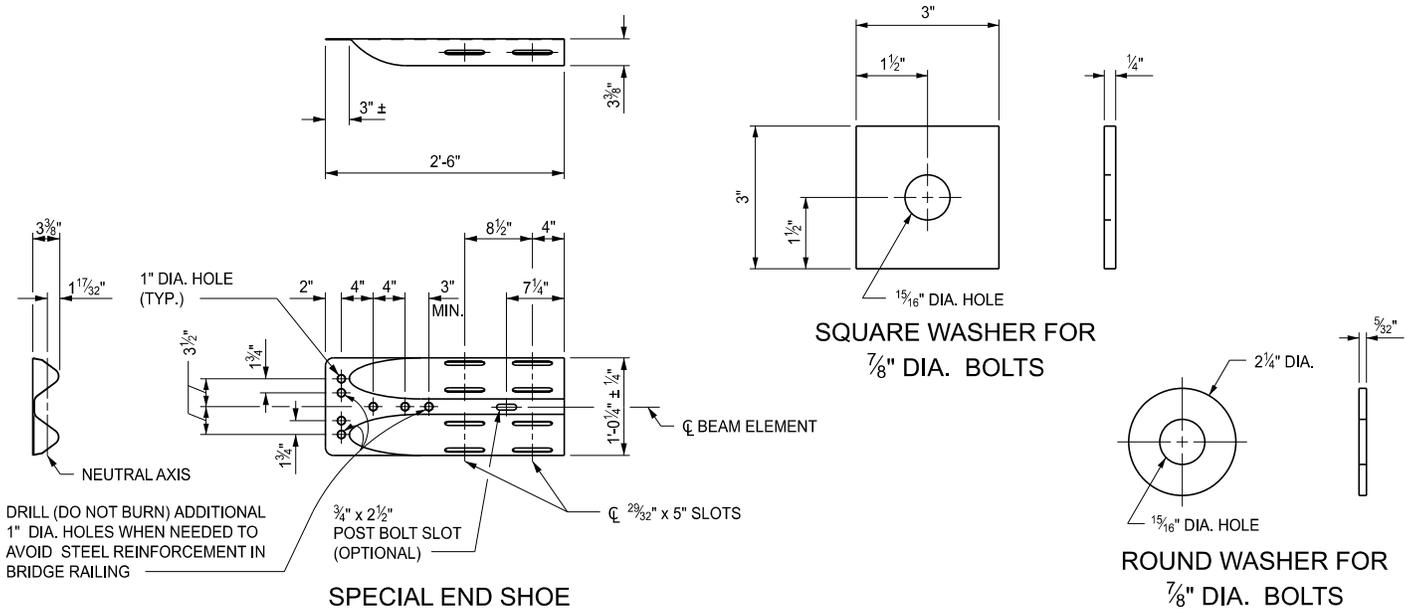
THRIE BEAM EXPANSION SECTION



OPTION 1

OPTION 2

THRIE BEAM TERMINAL CONNECTOR



SPECIAL END SHOE

SQUARE WASHER FOR 7/8" DIA. BOLTS

ROUND WASHER FOR 7/8" DIA. BOLTS



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

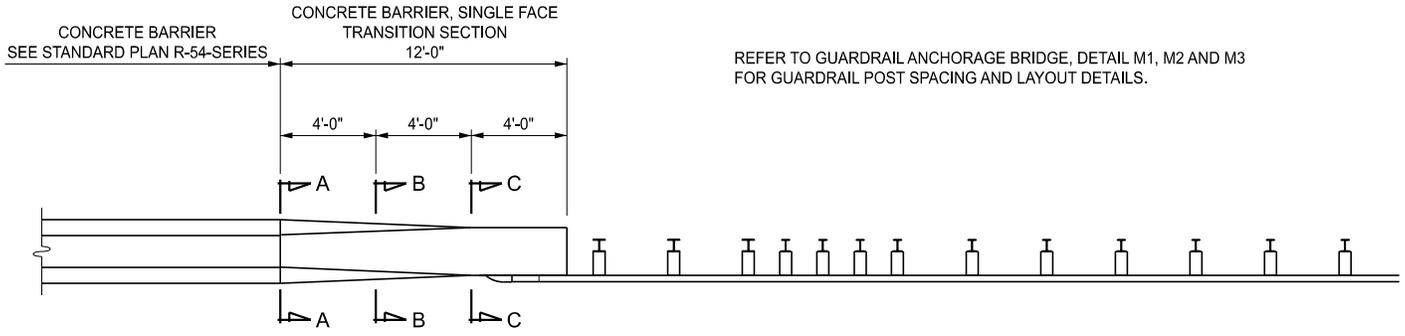
STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

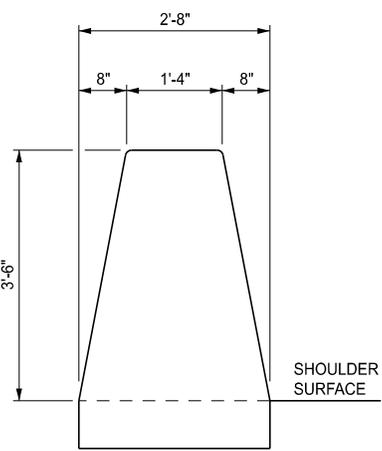
01/06/2026  
PLAN DATE

R-67-G

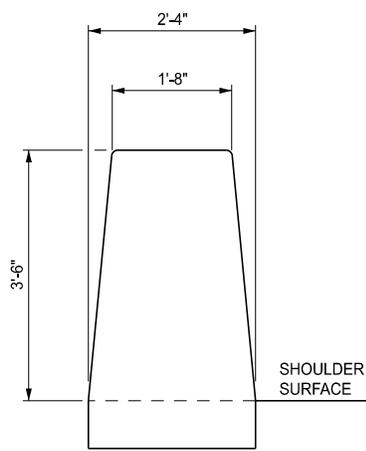
SHEET  
11 OF 16



PLAN VIEW

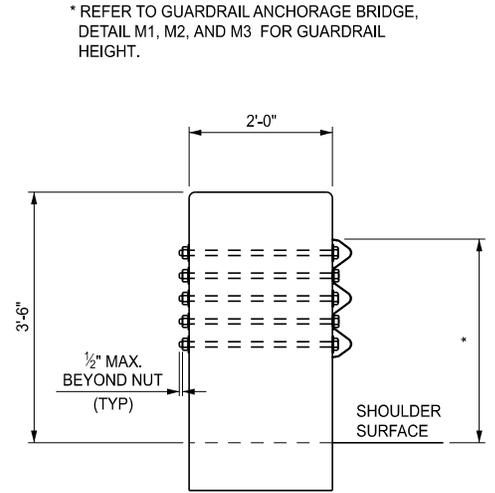


SECTION A-A



SECTION B-B

UNIFORMLY TRANSITION THE BARRIER FACES FROM SINGLE SLOPE SHAPE TO VERTICAL WALL



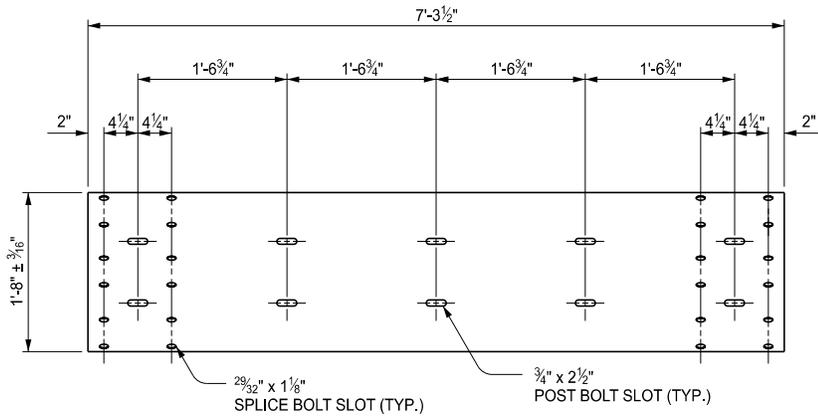
SECTION C-C

\* REFER TO GUARDRAIL ANCHORAGE BRIDGE, DETAIL M1, M2, AND M3 FOR GUARDRAIL HEIGHT.

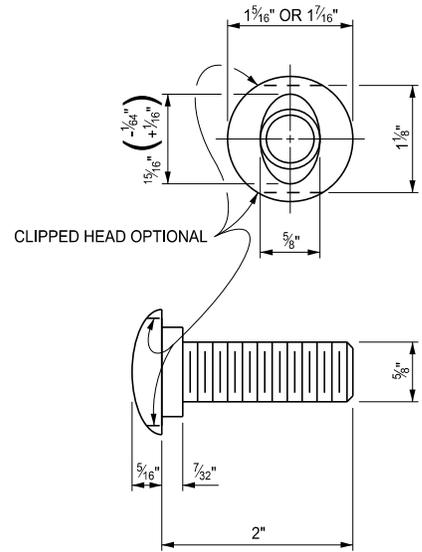
USE HIGH STRENGTH 7/8" DIAMETER x 26" LONG HEX HEAD BOLTS WITH 2" MINIMUM THREAD LENGTH AND NUTS WITH ROUND WASHERS FRONT AND BACK TO CONNECT GUARDRAIL TO CONCRETE BARRIER, SINGLE FACE TRANSITION SECTION.

DETAILS FOR CONNECTING GUARDRAIL TO CONCRETE BARRIER, SINGLE FACE

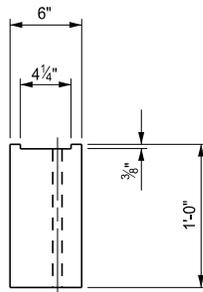
<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR GUARDRAIL ANCHORAGE, BRIDGE, DETAILS</p>			<p>R-67-G</p>	<p>SHEET 12 OF 16</p>
	<p>(SPECIAL DETAIL) FHWA APPROVAL</p>	<p>01/06/2026 PLAN DATE</p>			



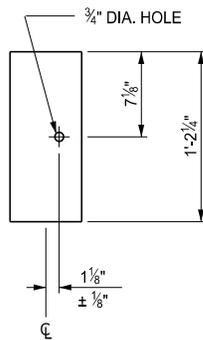
6'-3" THRIE BEAM SECTION



**SPLICE BOLT**  
FOR USE WITH NESTED  
GUARDRAIL BEAM ELEMENTS

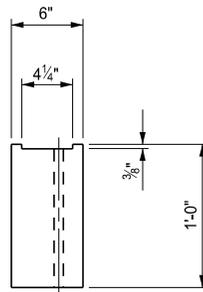


TOP

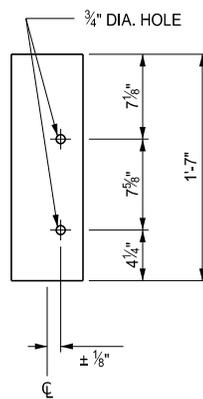


FRONT

OFFSET BLOCK FOR  
W BEAM GUARDRAIL



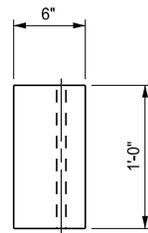
TOP



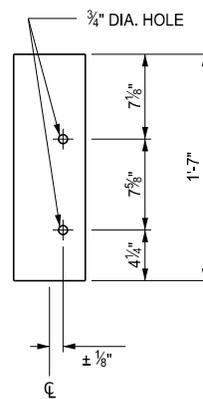
FRONT

OFFSET BLOCK FOR  
THRIE BEAM GUARDRAIL

USE WITH W6 x 8.5 OR W6 x 9 POSTS



TOP



FRONT

OFFSET BLOCK FOR  
THRIE BEAM GUARDRAIL

USE WITH W6 x 15 POSTS



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

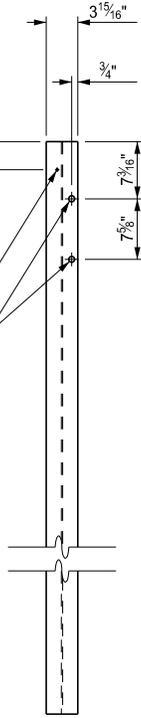
01/06/2026  
PLAN DATE

R-67-G

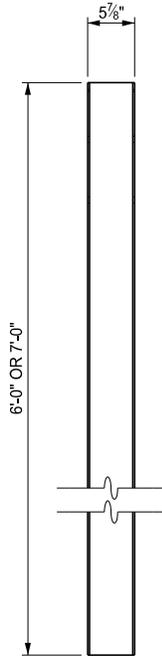
SHEET  
13 OF 16



TOP



FRONT

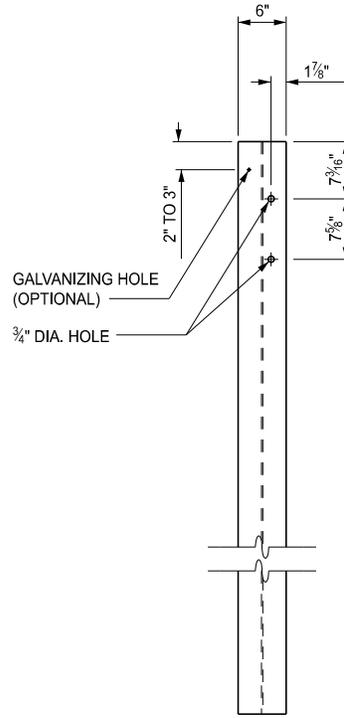


SIDE

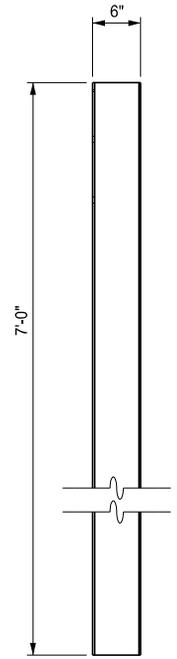
W6 x 9 OR  
W6 x 8.5 POST



TOP



FRONT



SIDE

W6 x 15 POST

GALVANIZING HOLE (OPTIONAL)  
3/4" DIA. HOLE  
\* USE BOTTOM HOLE WITH THRIE BEAM GUARDRAIL



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

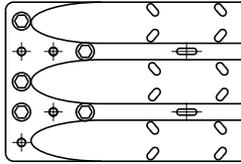
STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

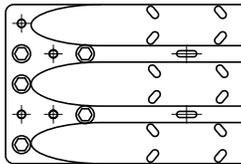
01/06/2026  
PLAN DATE

R-67-G

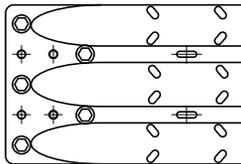
SHEET  
14 OF 16



THRIE BEAM TERMINAL CONNECTOR  
 BOLT LOCATION FOR  
 GUARDRAIL ANCHORAGE TYPE M1, M3, M4, M6  
 ◎ = REQUIRED BOLT LOCATION TO ANCHOR INTO CONCRETE



THRIE BEAM TERMINAL CONNECTOR  
 BOLT LOCATION FOR  
 GUARDRAIL ANCHORAGE TYPE M2, M5  
 ◎ = REQUIRED BOLT LOCATION TO ANCHOR INTO CONCRETE



THRIE BEAM TERMINAL CONNECTOR  
 BOLT LOCATION FOR  
 GUARDRAIL ANCHORAGE TYPE M7, M8, M9  
 ◎ = REQUIRED BOLT LOCATION TO ANCHOR INTO CONCRETE

NOTES:

ENSURE ALL POSTS, OFFSET BLOCKS, BEAM ELEMENTS, REFLECTORS, AND HARDWARE (INCLUDING BOLTS, NUTS, AND WASHERS) CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND TO STANDARD PLAN R-60-SERIES, WHERE APPLICABLE, EXCEPT AS SPECIFIED ON THIS STANDARD.

ENSURE BEAM ELEMENTS IDENTIFIED AS 12 GAUGE MEET CLASS A REQUIREMENTS PER AASHTO M 180. ENSURE BEAM ELEMENTS IDENTIFIED AS 10 GAUGE MEET CLASS B REQUIREMENTS PER AASHTO M 180.

ENSURE THE THRIE BEAM TERMINAL CONNECTOR AND SPECIAL END SHOE ARE THE SAME MATERIAL AS THE ADJACENT RUN OF GUARDRAIL AND ARE NOT LIGHTER THAN 10 GAUGE (0.138").

FIELD BEND SECTIONS OF THE THRIE BEAM ELEMENT REQUIRED TO BE TWISTED FOR USE IN ANCHORAGE.

LAP GUARDRAIL BEAM ELEMENTS IN THE DIRECTION OF TRAFFIC EXCEPT FOR THE THRIE BEAM TERMINAL CONNECTOR WHICH MAY BE LAPPED IN EITHER DIRECTION.

USE SPLICE BOLTS WHEN SPLICING THE THRIE BEAM TERMINAL CONNECTOR TO THE THRIE BEAM EXPANSION SECTION AND WHEN SPLICING THE SPECIAL END SHOE TO THE TRANSITION SECTION. INSTALL THE SPLICE BOLT NUT FINGER-TIGHT AND FULLY ENGAGE THE SPLICE BOLT A MINIMUM OF ONE THREAD EXTENDING BEYOND THE NUT. THEN UPSET THE FIRST THREAD ON THE OUTSIDE OF THE NUT WITH A CENTER PUNCH OR COLD CHISEL SO THAT IT WILL NOT LOOSEN.

SEE STANDARD PLAN R-32-SERIES FOR APPROACH CURB AND GUTTER AND DOWNSPOUT HEADER.

SEE APPROPRIATE PLANS TO DETERMINE WHETHER GUARDRAIL ANCHORAGE, BRIDGE SPANS A BRIDGE EXPANSION JOINT.

SEE APPROPRIATE PLANS FOR PIER BASE WALL OR PIER STRUT.

SEE STANDARD PLAN R-55-SERIES FOR FILLER WALLS AND FILLER WALL END BLOCK.

SEE STANDARD PLAN R-54-SERIES FOR CONCRETE BARRIER, SINGLE FACE, TYPE \_\_\_.

INCLUDE CONCRETE BARRIER, SINGLE FACE TRANSITION SECTION IN THE PAY ITEM "CONC BARRIER, SINGLE FACE, TYPE \_\_\_".



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

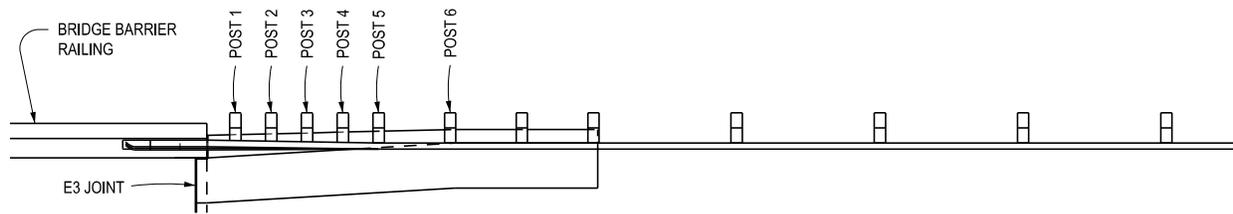
STANDARD PLAN FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS

(SPECIAL DETAIL)  
FHWA APPROVAL

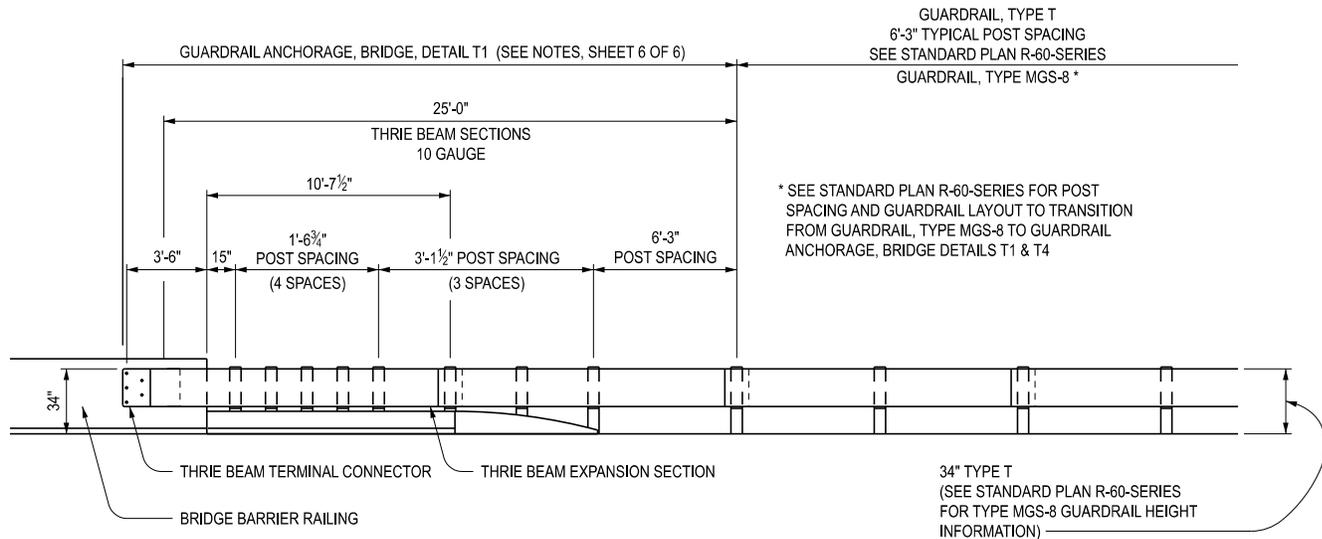
01/06/2026  
PLAN DATE

R-67-G

SHEET  
16 OF 16

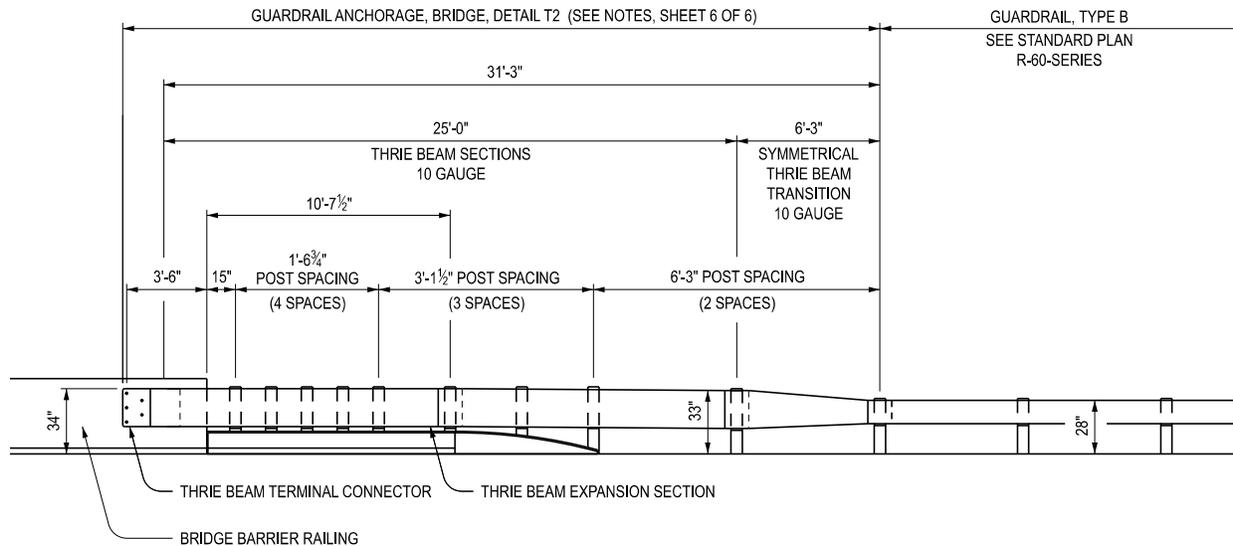


PLAN VIEW



ELEVATION VIEW

(USE WITH GUARDRAIL, TYPE T & TYPE MGS-8)



ELEVATION VIEW

(USE WITH GUARDRAIL, TYPE B)

DETAILS FOR CONNECTING GUARDRAIL TO  
 BRIDGE BARRIER RAILINGS, TYPE 4, 2-TUBE, 4-TUBE,  
 AESTHETIC PARAPET TUBE, OR 3 TUBE WITH PICKETS  
 (WITHOUT EXPANSION AT BACKWALL)

APPROVED BY: \_\_\_\_\_  
 DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: \_\_\_\_\_  
 DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR  
 BRADLEY C. WIEFERICH, PE

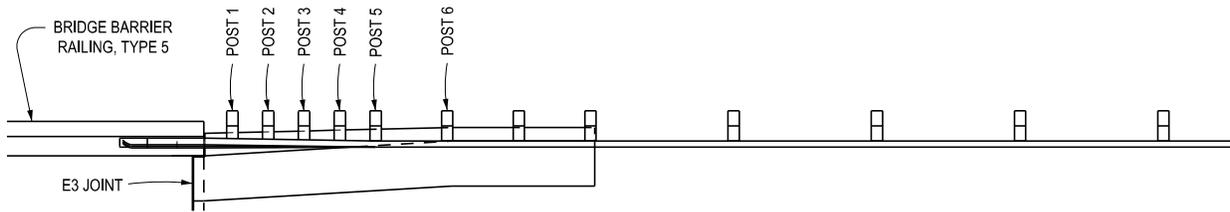
SPECIAL DETAIL FOR  
 GUARDRAIL ANCHORAGE, BRIDGE, DETAILS  
 (FOR SAFETY SHAPE BRIDGE BARRIERS & RAILINGS)

(SPECIAL DETAIL)  
 FHWA APPROVAL

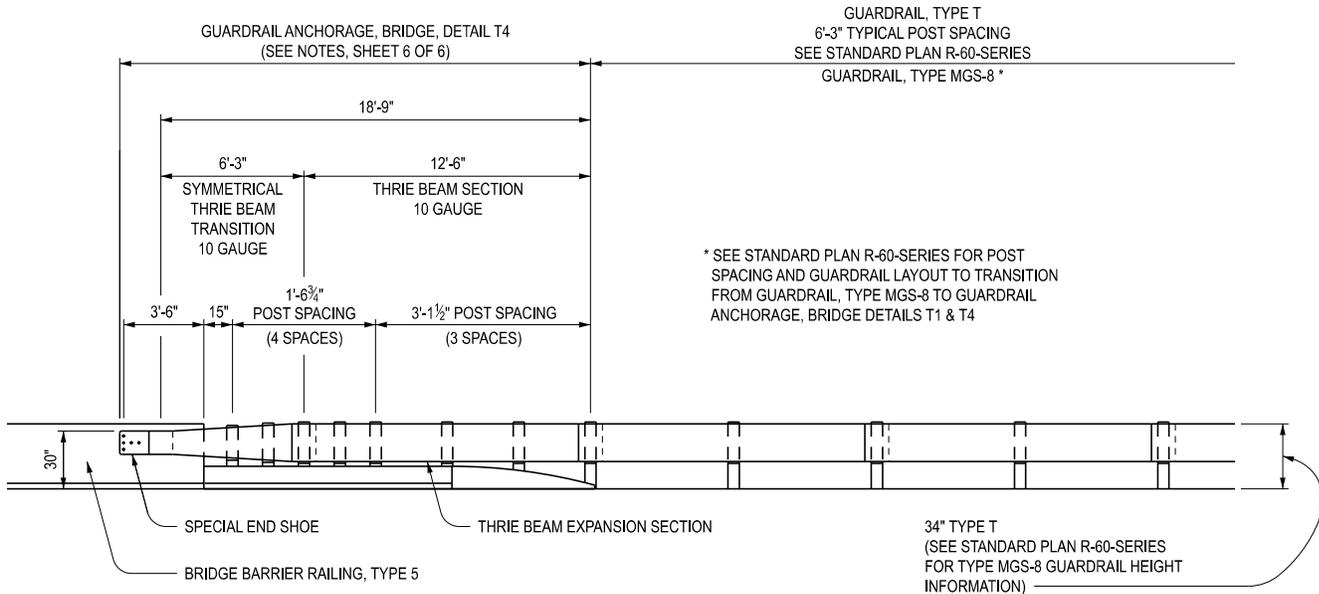
01/06/2026  
 PLAN DATE

R-67-SD

SHEET  
 1 OF 6

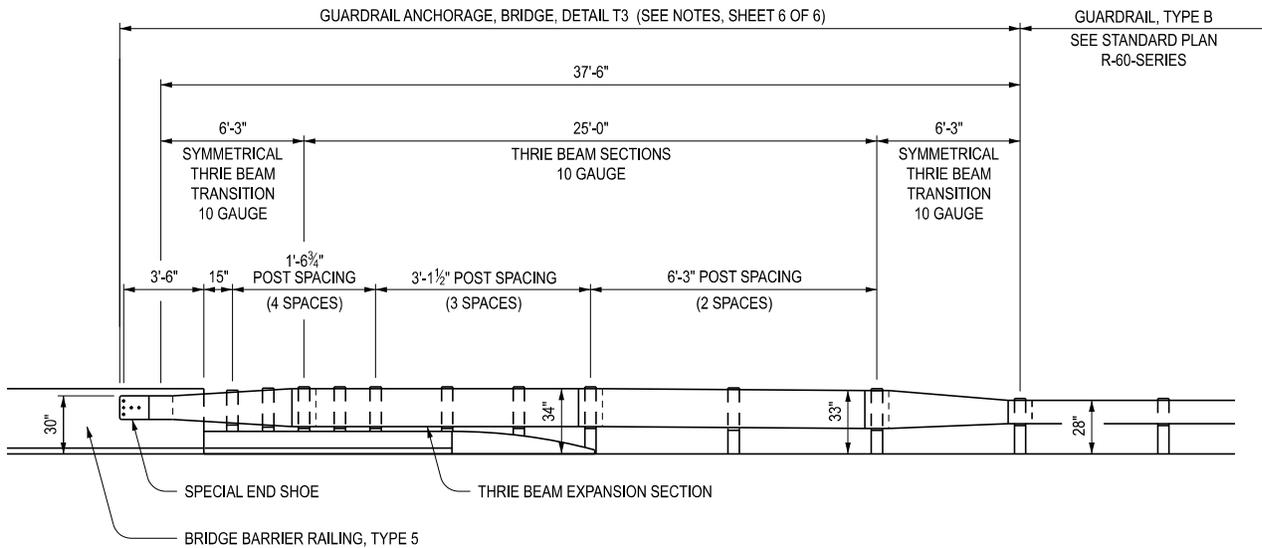


PLAN VIEW



ELEVATION VIEW

(USE WITH GUARDRAIL, TYPE T & TYPE MGS-8)



ELEVATION VIEW

(USE WITH GUARDRAIL, TYPE B)

DETAILS FOR CONNECTING GUARDRAIL TO BRIDGE BARRIER RAILINGS, TYPE 5

(WITHOUT EXPANSION AT BACKWALL)



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

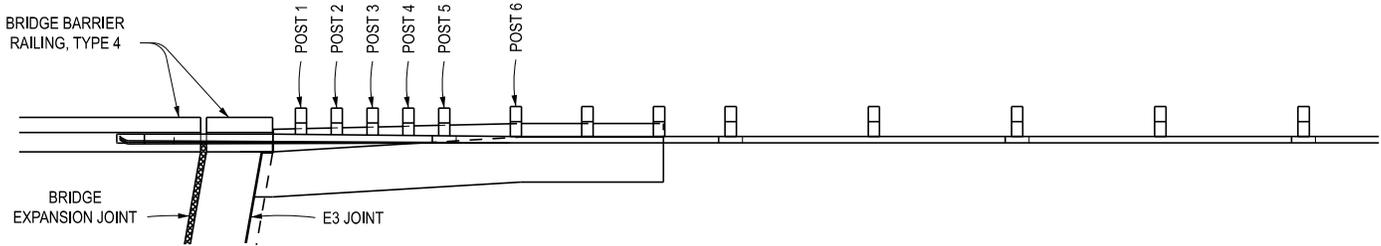
SPECIAL DETAIL FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS  
(FOR SAFETY SHAPE BRIDGE BARRIERS & RAILINGS)

(SPECIAL DETAIL)  
FHWA APPROVAL

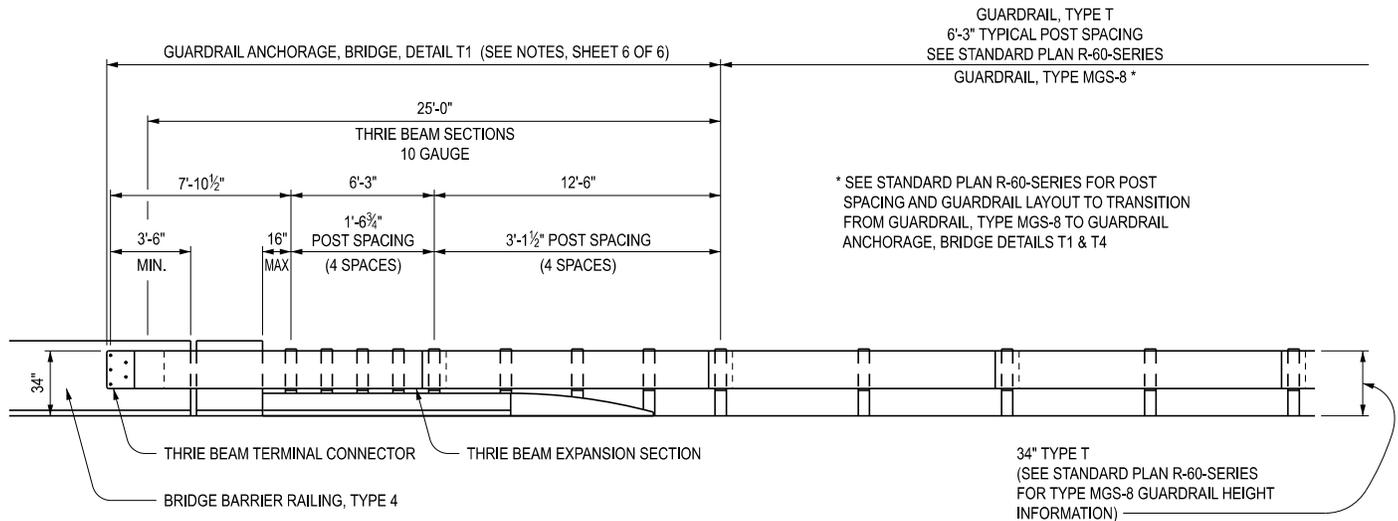
01/06/2026  
PLAN DATE

R-67-SD

SHEET  
2 OF 6

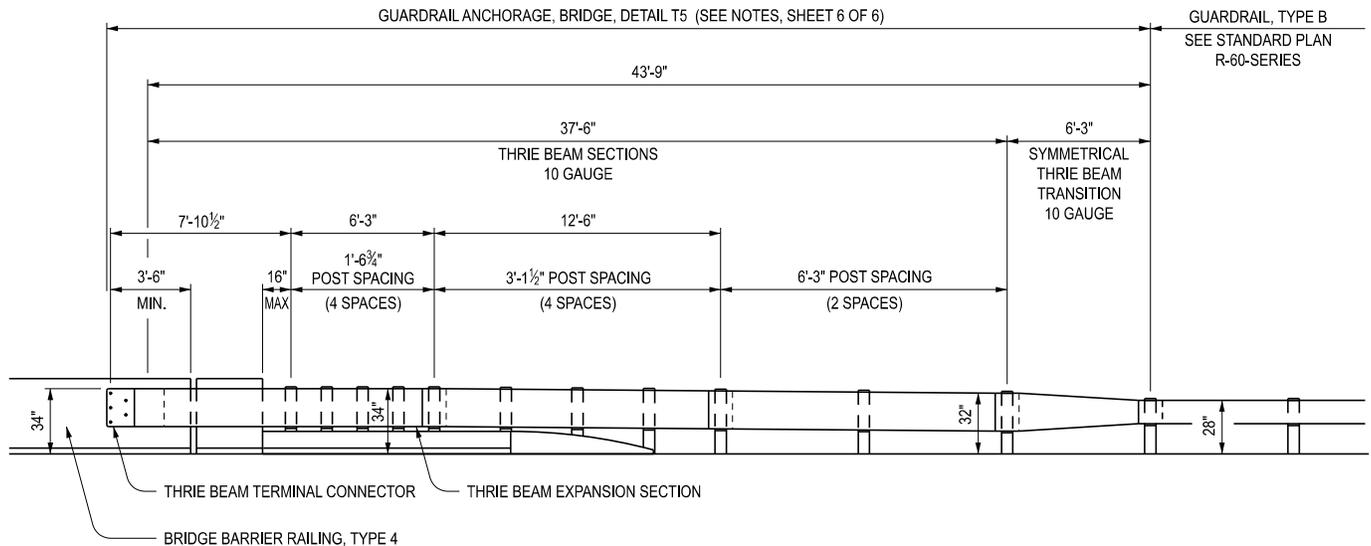


PLAN VIEW



ELEVATION VIEW

(USE WITH GUARDRAIL, TYPE T & TYPE MGS-8)



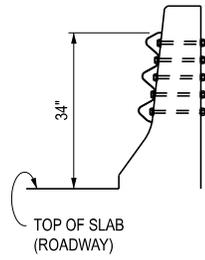
ELEVATION VIEW

(USE WITH GUARDRAIL, TYPE B)

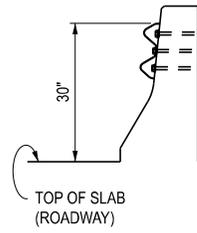
DETAILS FOR CONNECTING GUARDRAIL TO  
BRIDGE BARRIER RAILINGS, TYPE 4, 2-TUBE, 4-TUBE,  
AESTHETIC PARAPET TUBE, OR 3 TUBE WITH PICKETS  
(WITH EXPANSION AT BACKWALL/END WALL OR SLEEPER SLAB)

<p>MDOT Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	SPECIAL DETAIL FOR <b>GUARDRAIL ANCHORAGE, BRIDGE, DETAILS</b> <b>(FOR SAFETY SHAPE BRIDGE BARRIERS &amp; RAILINGS)</b>		<b>R-67-SD</b>	SHEET 3 OF 6
	(SPECIAL DETAIL) FHWA APPROVAL	01/06/2026 PLAN DATE		

USE HIGH STRENGTH 7/8" DIA. HEX HEAD BOLT AND NUTS TO CONNECT GUARDRAIL TO BRIDGE RAILINGS WITH ROUND WASHERS ON FRONT AND SQUARE WASHERS ON BACK. (SEE CHART BELOW FOR LENGTHS AND NUMBER REQUIRED.) WASHER DETAILS ARE SHOWN ON SHEET 5 OF 6.

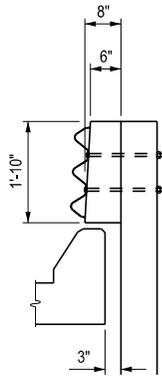


BRIDGE BARRIER RAILING TYPE 4

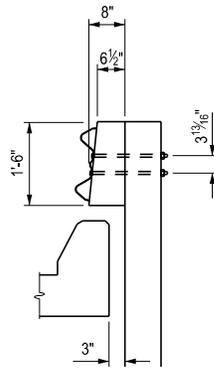


BRIDGE BARRIER RAILING TYPE 5

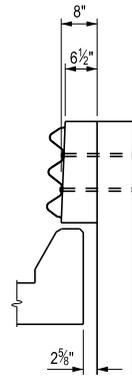
SECTIONS AT BRIDGE RAILINGS



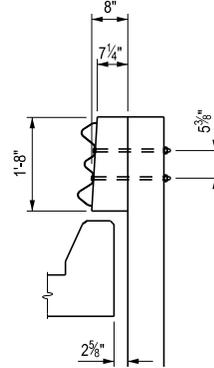
POST 1 FOR BRIDGE BARRIER RAILING, TYPE 4



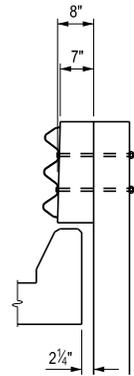
POST 1 FOR BRIDGE BARRIER RAILING, TYPE 5



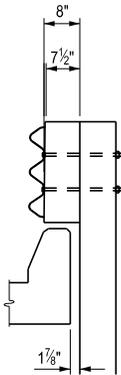
POST 2 FOR BRIDGE BARRIER RAILING, TYPE 4



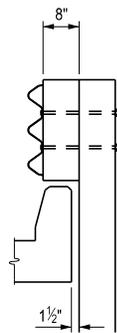
POST 2 FOR BRIDGE BARRIER RAILING, TYPE 5



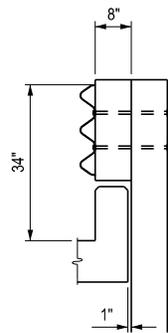
POST 3



POST 4



POST 5



POST 6

BOLT REQUIREMENTS FOR CONNECTING GUARDRAIL TO BRIDGE RAILINGS & FILLER WALLS			
BRIDGE RAILING	BOLT LENGTH	MINIMUM THREAD LENGTH	NUMBER REQUIRED
TYPE 4	12 1/2"	4"	5
TYPE 5	11 1/2"	4"	4
SHORTER BOLT LENGTHS MAY BE USED PROVIDED THE BOLT EXTENDS 1/4" BEYOND THE NUT WHEN TIGHTENED.			

GUARDRAIL POST SECTIONS FOR GUARDRAIL ANCHORAGE, BRIDGE



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

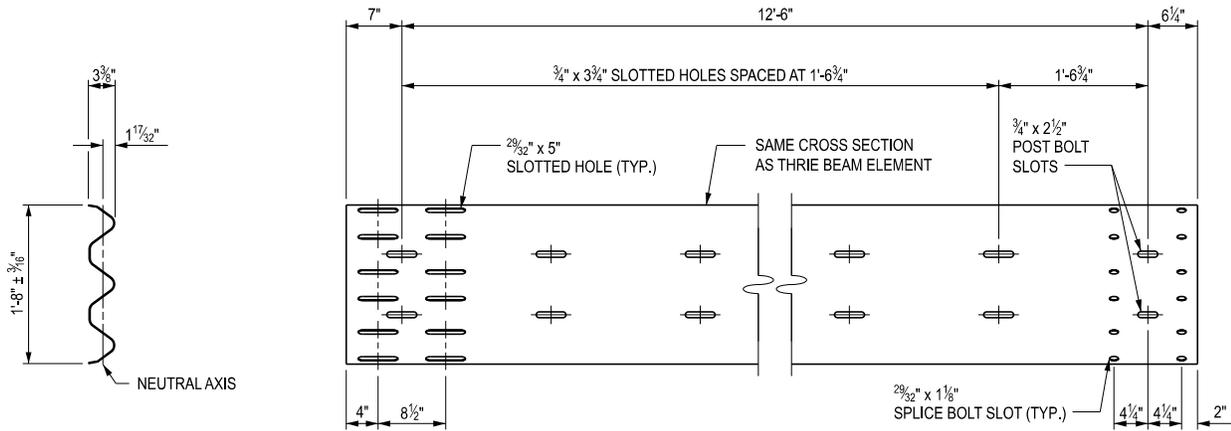
SPECIAL DETAIL FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS  
(FOR SAFETY SHAPE BRIDGE BARRIERS & RAILINGS)

(SPECIAL DETAIL)  
FHWA APPROVAL

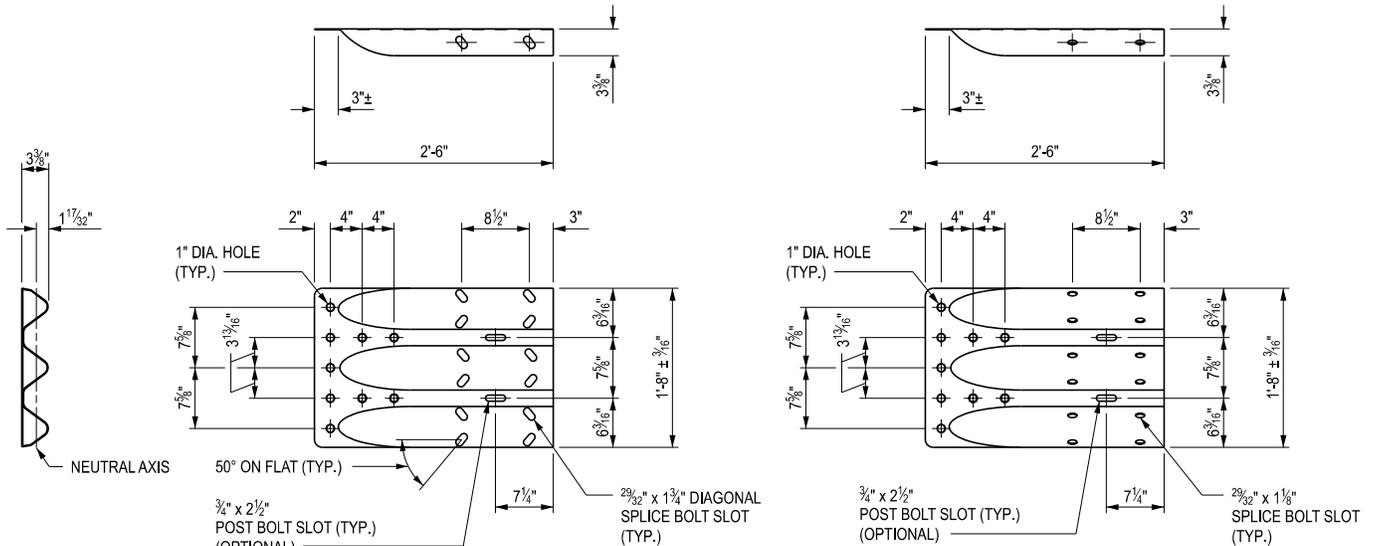
01/06/2026  
PLAN DATE

R-67-SD

SHEET  
4 OF 6



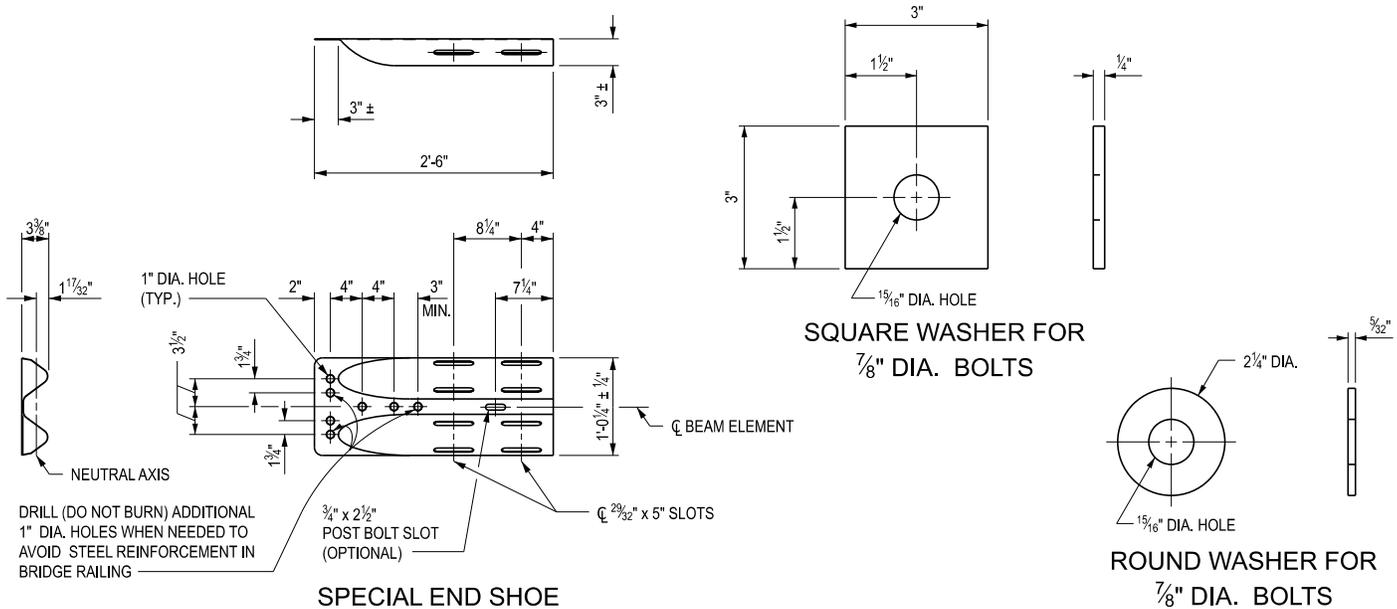
THRIE BEAM EXPANSION SECTION



OPTION 1

OPTION 2

THRIE BEAM TERMINAL CONNECTOR

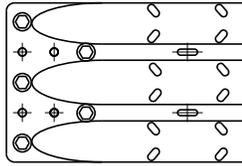


SPECIAL END SHOE

SQUARE WASHER FOR 7/8" DIA. BOLTS

ROUND WASHER FOR 7/8" DIA. BOLTS

<p>MDOT Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>SPECIAL DETAIL FOR GUARDRAIL ANCHORAGE, BRIDGE, DETAILS (FOR SAFETY SHAPE BRIDGE BARRIERS &amp; RAILINGS)</p>		<p>R-67-SD</p>	<p>SHEET 5 OF 6</p>
	<p>(SPECIAL DETAIL) FHWA APPROVAL</p>	<p>01/06/2026 PLAN DATE</p>		



**THRIE BEAM TERMINAL CONNECTOR  
BOLT LOCATION FOR  
GUARDRAIL ANCHORAGE TYPE T1, T2, T5**

⊙ = REQUIRED BOLT LOCATION TO ANCHOR INTO CONCRETE

**NOTES:**

ENSURE ALL POSTS, OFFSET BLOCKS, BEAM ELEMENTS, REFLECTORS, AND HARDWARE (INCLUDING BOLTS, NUTS, AND WASHERS) CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND TO STANDARD PLAN R-60-SERIES, WHERE APPLICABLE, EXCEPT AS SPECIFIED ON THIS STANDARD.

ENSURE BEAM ELEMENTS IDENTIFIED AS 12 GAUGE MEET CLASS A REQUIREMENTS PER AASHTO M 180. ENSURE BEAM ELEMENTS IDENTIFIED AS 10 GAUGE MEET CLASS B REQUIREMENTS PER AASHTO M 180.

USE 7'-0" LONG POSTS, STEEL (W6 x 8.5 OR W6 x 9) OR WOOD (6" x 8") TO CONSTRUCT GUARDRAIL ANCHORAGE, BRIDGE, DETAILS T1 THROUGH T5.

ENSURE THE THRIE BEAM TERMINAL CONNECTOR AND SPECIAL END SHOE ARE THE SAME MATERIAL AS THE ADJACENT RUN OF GUARDRAIL AND ARE NOT LIGHTER THAN 10 GAUGE (0.138").

FIELD BEND SECTIONS OF THE THRIE BEAM ELEMENT REQUIRED TO BE TWISTED FOR USE IN ANCHORAGE.

LAP GUARDRAIL BEAM ELEMENTS IN THE DIRECTION OF TRAFFIC EXCEPT FOR THE THRIE BEAM TERMINAL CONNECTOR WHICH MAY BE LAPPED IN EITHER DIRECTION.

USE SPLICE BOLTS WHEN SPLICING THE THRIE BEAM TERMINAL CONNECTOR TO THE THRIE BEAM EXPANSION SECTION AND WHEN SPLICING THE SPECIAL END SHOE TO THE TRANSITION SECTION. INSTALL THE SPLICE BOLT NUT FINGER-TIGHT AND FULLY ENGAGE THE SPLICE BOLT A MINIMUM OF ONE THREAD EXTENDING BEYOND THE NUT. THEN UPSET THE FIRST THREAD ON THE OUTSIDE OF THE NUT WITH A CENTER PUNCH OR COLD CHISEL SO THAT IT WILL NOT LOOSEN.

SEE STANDARD PLAN R-32-SD FOR APPROACH CURB AND GUTTER AND DOWNSPOUT HEADER.

FOR GUARDRAIL ANCHORAGE, BRIDGE, DETAILS T1, T2, AND T5, ENSURE THE THRIE BEAM TERMINAL CONNECTOR IS ATTACHED TO THE 29/32" X 5" LONG SLOTTED HOLES IN THE THRIE BEAM EXPANSION SECTION.

SEE APPROPRIATE PLANS TO DETERMINE WHETHER GUARDRAIL ANCHORAGE, BRIDGE SPANS A BRIDGE EXPANSION JOINT.

SEE STANDARD PLAN R-55-SERIES FOR FILLER WALLS AND FILLER WALL END BLOCK.

SEE STANDARD PLAN R-54-SERIES FOR CONCRETE BARRIER, SINGLE FACE, TYPE \_\_.

INCLUDE CONCRETE BARRIER, SINGLE FACE TRANSITION SECTION IN THE PAY ITEM "CONC BARRIER, SINGLE FACE, TYPE \_\_".



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

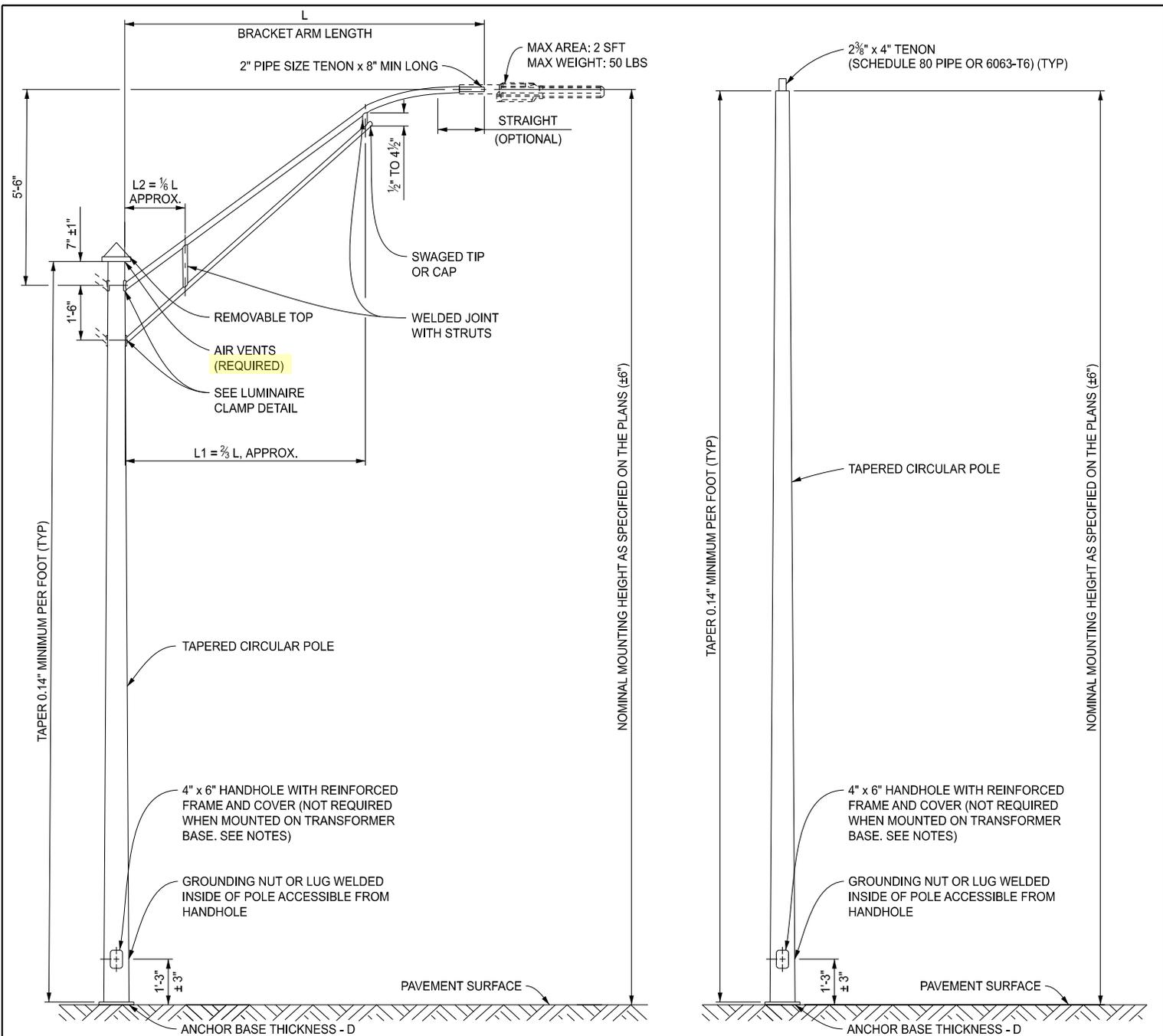
**SPECIAL DETAIL FOR  
GUARDRAIL ANCHORAGE, BRIDGE, DETAILS  
(FOR SAFETY SHAPE BRIDGE BARRIERS & RAILINGS)**

(SPECIAL DETAIL)  
FHWA APPROVAL

01/06/2026  
PLAN DATE

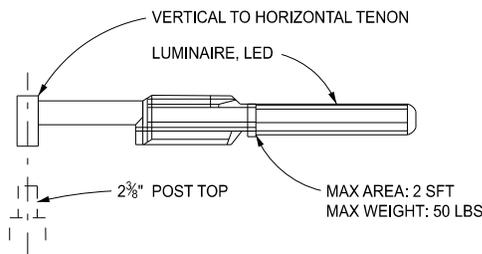
**R-67-SD**

SHEET  
6 OF 6



LIGHT STANDARD DETAIL (WITH ARM)

LIGHT STANDARD DETAIL (WITH TENON)



LUMINAIRE DETAIL

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

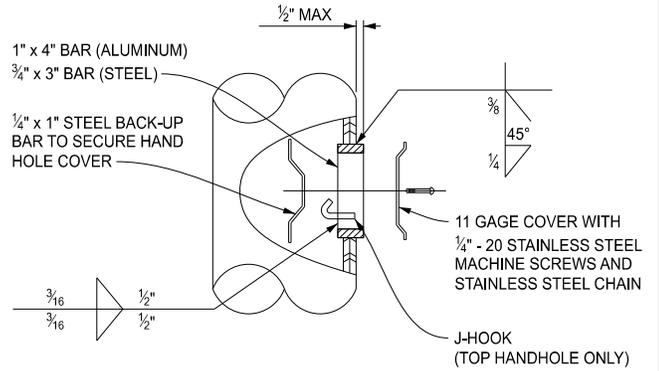
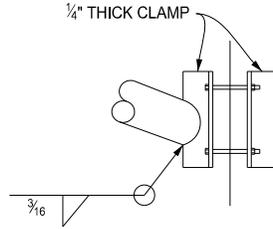
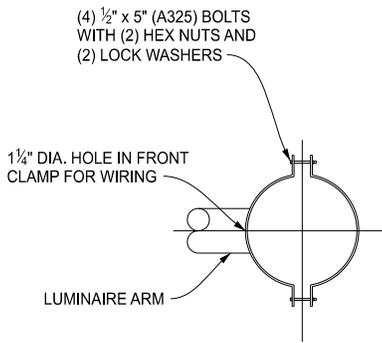
STANDARD PLAN FOR  
LIGHT STANDARD DETAILS

SPECIAL DETAIL  
FHWA APPROVAL

01/06/2026  
PLAN DATE

R-130-A

SHEET  
1 OF 6



LUMINAIRE CLAMP DETAILS

4" x 6" HAND HOLE DETAIL

NOTES:

- CAST LIGHT STANDARD FOUNDATIONS IN PLACE. DO NOT USE PRECAST FOUNDATIONS.
- ENSURE ALL MATERIALS AND WORKMANSHIP COMPLY WITH THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- SUPPLY EACH BRACKET ARM WITH ITS OWN POLE CONNECTION AND STAINLESS STEEL HARDWARE, WHICH INCLUDES LOCK WASHERS THAT MEET ANSI B18.21.1.
- ENSURE BOLT CIRCLE DIMENSION IS EXACT. SET ANCHOR BOLTS WITH A TEMPLATE, CENTERED ON THE FOUNDATION.
- IF THE FOUNDATION IS LOCATED WITHIN 30' OF A HANDHOLE, CONDUIT MAY BE RUN DIRECTLY TO THE HANDHOLE.
- IF THE FOUNDATION IS LOCATED MORE THAN 30'-0" FROM THE POLE, PROVIDE A SECOND DEDICATED HANDHOLE ASSEMBLY ADJACENT TO THE POLE.
- FACE THE HANDHOLE AWAY FROM THE ROADWAY, EXCEPT WHEN MOUNTED ON A BRIDGE OR A MEDIAN WALL WHERE IT WILL FACE THE ROADWAY. USE STAINLESS STEEL HEX HEAD MACHINE SCREWS. PLACE HANDHOLES SO THEY DO NOT INTERSECT THE LONGITUDINAL SEAM WELD ON THE POLE.
- DO NOT USE NUT COVERS.
- WHEN A FRANGIBLE TRANSFORMER BASE IS CALLED FOR ON THE PLANS, DO NOT USE A LEVELING NUT. MOUNT FRANGIBLE TRANSFORMER BASES FLUSH WITH TOP OF THE FOUNDATION.
- ENSURE LIGHT STANDARDS MOUNTED ON FRANGIBLE TRANSFORMER BASES HAVE THE SAME DIMENSIONS AS OTHER BASE TYPES, EXCEPT FOR THE SHAFT LENGTH. LIGHT STANDARDS 45' IN HEIGHT ARE NOT PERMITTED ON FRANGIBLE BASES.
- THE FOUNDATION LENGTHS PROVIDED ARE BASED ON TWO SOIL TYPES: LOOSE COHESIONLESS SOILS WITH A MINIMUM BLOW COUNT OF 5 BLOWS/FT AND MEDIUM STIFF COHESIVE SOILS WITH A MINIMUM UNDRAINED SHEAR STRENGTH OF 750 PSF. THE CONTRACTOR MUST VERIFY THE SOIL STRENGTH DURING DRILLING FOR THE SHAFT FOUNDATIONS. THE CONTRACTOR MUST NOTIFY THE ENGINEER IF VERY LOOSE COHESIONLESS SOIL OR SOFT TO VERY SOFT COHESIVE SOIL WITH AN UNDRAINED SHEAR STRENGTH OF LESS THAN 750 PSF IS ENCOUNTERED.
- THIS STRUCTURE IS DESIGNED FOR THE SPECIFIED LUMINAIRE ONLY. PERFORM ADDITIONAL ANALYSIS FOR ANY DEVIATIONS FROM THIS STANDARD.
- THIS STRUCTURE IS DESIGNED FOR A HEIGHT ABOVE GROUND EQUAL TO THE STRUCTURE'S MOUNTING HEIGHT. PROVIDE A UNIQUE DESIGN FOR STRUCTURES PLACED AT A HIGHER ELEVATION.
- DO NOT BURY FOUNDATIONS. REMOVE FOUNDATIONS IF NO LONGER IN USE.
- ALTER THE SHAFT LENGTHS MOUNTED ON TRANSFORMER BASES TO COMPENSATE FOR THE HEIGHT OF THE TRANSFORMER BASE. USE THE SAME BOLT CIRCLE ON TOP OF THE TRANSFORMER BASE AS ON THE LIGHT STANDARD ANCHOR BASE.
- SEAT THE ENTIRE BOTTOM OF THE FRANGIBLE TRANSFORMER BASE ON THE FOUNDATION. ALTER THE DIAMETER OF THE FOUNDATION AS NECESSARY TO MEET THIS REQUIREMENT.
- INSTALL ALL HARDWARE COMPONENTS (INCLUDING FLAT AND LOCK WASHERS) AS SHOWN IN THE DETAILS ON THIS SHEET.
- MATCH THE COLOR OF THE LUMINAIRE ASSEMBLY TO THE COLOR OF THE FRANGIBLE TRANSFORMER BASE.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

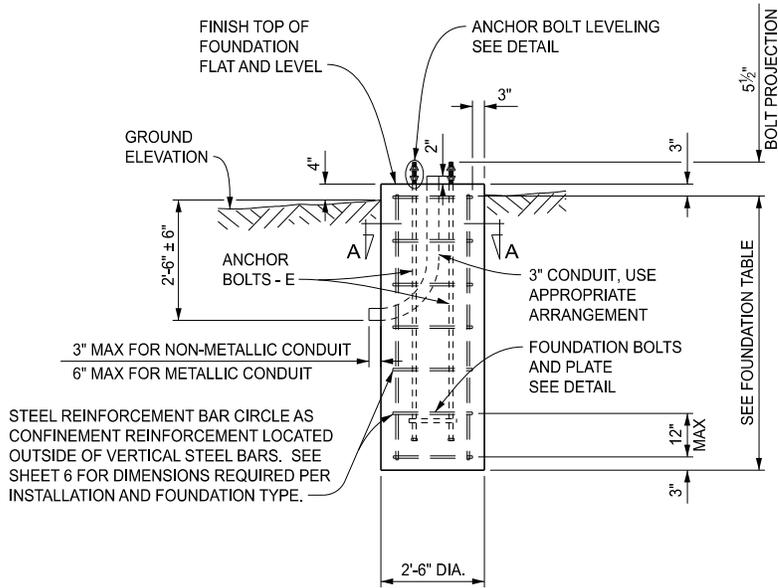
STANDARD PLAN FOR  
LIGHT STANDARD DETAILS

SPECIAL DETAIL  
FHWA APPROVAL

01/06/2026  
PLAN DATE

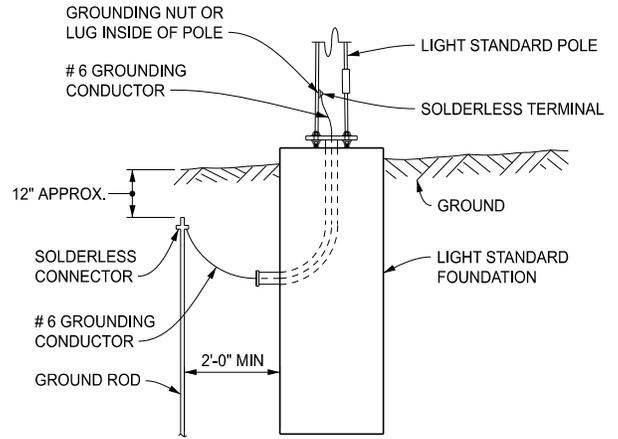
R-130-A

SHEET  
2 OF 6



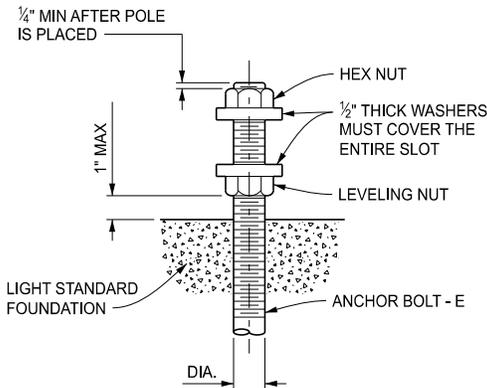
**LIGHT STANDARD FOUNDATION DETAIL**

STEEL REINFORCEMENT BAR CIRCLE AS CONFINEMENT REINFORCEMENT LOCATED OUTSIDE OF VERTICAL STEEL BARS. SEE SHEET 6 FOR DIMENSIONS REQUIRED PER INSTALLATION AND FOUNDATION TYPE.



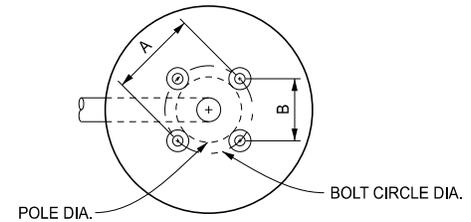
**LIGHT STANDARD GROUNDING DETAIL**

NOTE:  
IF CONDUIT EXTENDS TO HAND HOLE, DRIVE GROUND ROD IN OR NEAR HANDHOLE.



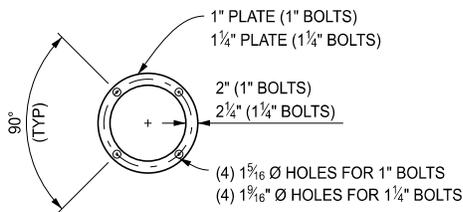
**ANCHOR BOLT LEVELING DETAIL**

DO NOT APPLY THIS DETAIL WHEN USING FRANGIBLE TRANSFORMER BASE. SEE FRANGIBLE TRANSFORMER BASE DETAIL ON SHEET 4.

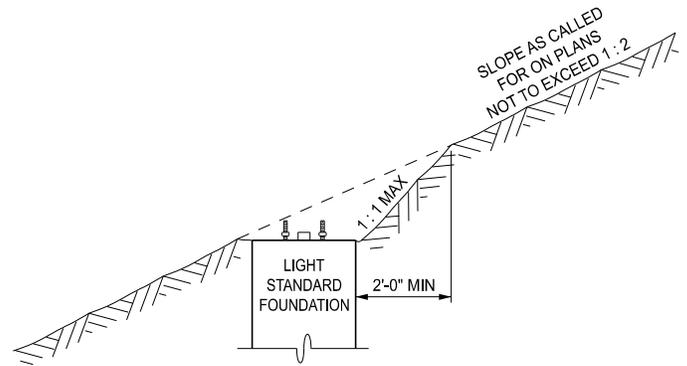


**TOP OF FOUNDATION DETAIL**

NOTE:  
KEEP STEEL TEMPLATE LEVEL AT ALL TIMES  
(CONTRACTOR TO DETERMINE TEMPLATE SIZE AND DIMENSIONS)



**FOUNDATION PLATE DETAIL**



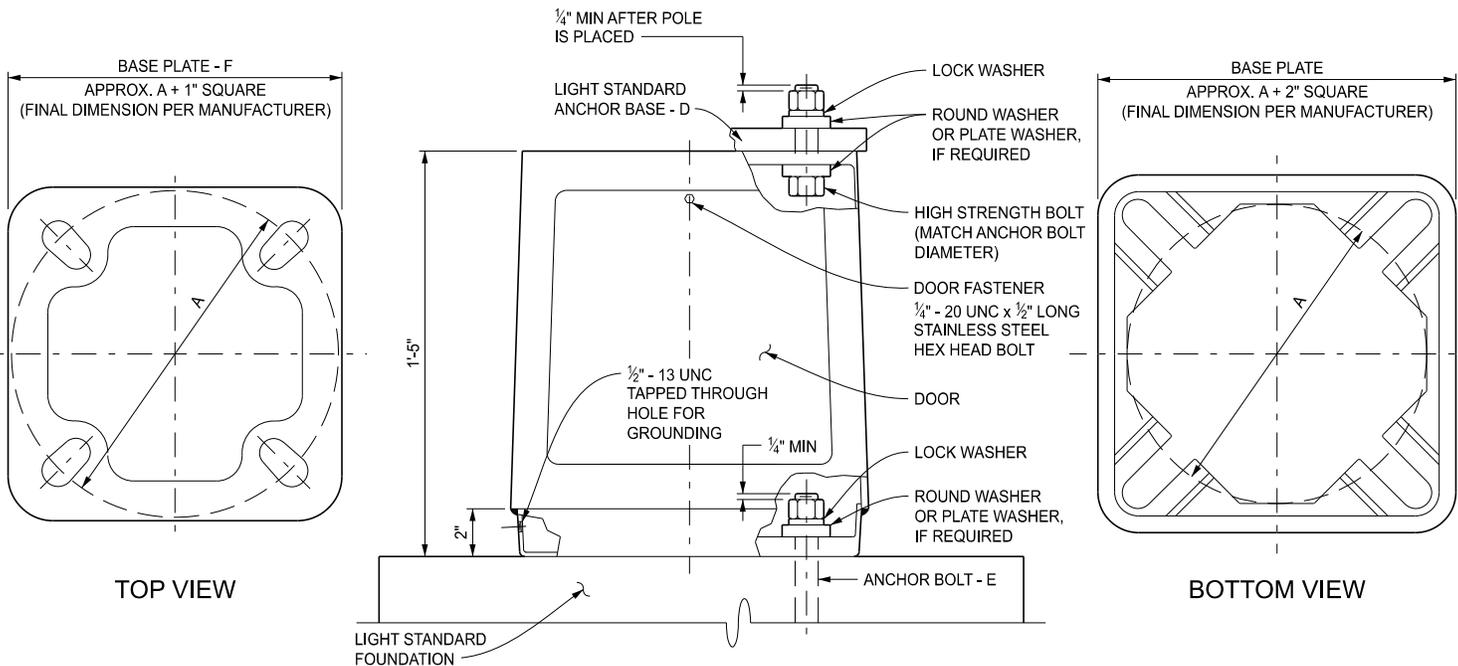
**SLOPE DETAIL AT FOUNDATION**

ON FILL OR CUT SLOPE

NOTE:  
DO NOT COVER HANDHOLES. PLACE PERPENDICULAR TO SLOPE AT SAME ELEVATION AS FOUNDATION.

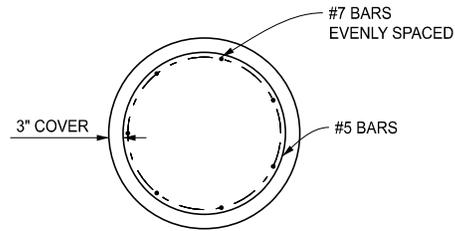
DO NOT PLACE SOIL ABOVE TOP OF FOUNDATION.

<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR <b>LIGHT STANDARD DETAILS</b></p>		<p><b>R-130-A</b></p>	<p>SHEET 3 OF 6</p>
	<p>SPECIAL DETAIL FHWA APPROVAL</p>	<p>01/06/2026 PLAN DATE</p>		

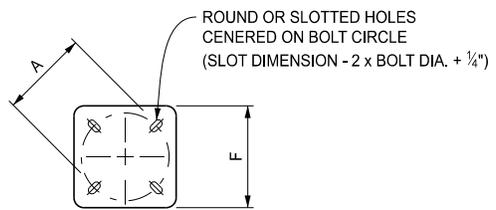


ELEVATION

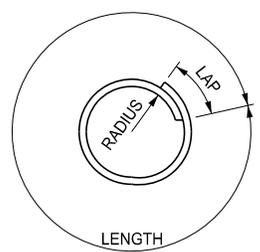
FRANGIBLE TRANSFORMER BASE FOR POLES WITH BOLT CIRCLE DIAMETER - A



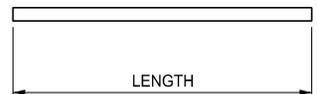
SECTION A-A  
ANCHOR RODS NOT SHOWN FOR CLARITY



ANCHOR BASE DETAIL



CONFINEMENT REINFORCEMENT



VERTICAL REINFORCEMENT

REINFORCEMENT DETAILS

<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR LIGHT STANDARD DETAILS</p>			<p>SHEET 4 OF 6</p>
	<p>SPECIAL DETAIL FHWA APPROVAL</p>	<p>01/06/2026 PLAN DATE</p>	<p>R-130-A</p>	

### BASE AND POLE DATA TABLE

LIGHT STANDARD FOR	A	B	D	STEEL POLES GAGE (MIN)	E	ALUM. POLES GAGE (MIN)	POLE DIAMETER AT BASE	F
20 FT NOMINAL MOUNTING HEIGHT (WITHOUT TRANSFORMER BASE)	11"	7 $\frac{3}{4}$ "	2"		1" $\emptyset$ x 3'-4"	0.188"		12.2"
20 FT NOMINAL MOUNTING HEIGHT (WITH TRANSFORMER BASE)	* 11"	7 $\frac{3}{4}$ "	2"		1" $\emptyset$ x 3'-4"	0.188"		12.2"
30 FT MOUNTING HEIGHT WITH 4 OR 6 FT SINGLE OR DOUBLE BRACKET ARM	1'-3"	10 $\frac{5}{8}$ "	2"	7	1" $\emptyset$ x 3'-4"	0.188"	9" $\pm$ $\frac{1}{2}$ "	15.38" **
30 FT MOUNTING HEIGHT WITH 8, 10 OR 12 FT SINGLE OR DOUBLE BRACKET ARM	1'-3"	10 $\frac{5}{8}$ "	2"	7	1" $\emptyset$ x 5'-0"	0.188"	9" $\pm$ $\frac{1}{2}$ "	15.38" **
30 FT MOUNTING HEIGHT WITH 15 FT SINGLE OR DOUBLE BRACKET ARM	1'-3"	10 $\frac{5}{8}$ "	2"	7	1" $\emptyset$ x 5'-0"	0.25"	9" $\pm$ $\frac{1}{2}$ "	15.73" **
30 FT MOUNTING HEIGHT WITH 17 FT SINGLE OR DOUBLE BRACKET ARM	1'-3"	10 $\frac{5}{8}$ "	2"	7	1" $\emptyset$ x 5'-0"	0.25"	9" $\pm$ $\frac{1}{2}$ "	15.73" **
40 FT MOUNTING HEIGHT WITH 4, 6, 8, 10, 12, 15 OR 17 FT SINGLE OR DOUBLE BRACKET ARM	1'-4" (A) 1'-3" (S)	11 $\frac{3}{8}$ " (A) 10 $\frac{5}{8}$ " (S)	2"	7	1 $\frac{1}{4}$ " $\emptyset$ x 5'-0"	0.313"	10" $\pm$ $\frac{1}{2}$ "	16.79" (A) ** 16.09" (S)
45 FT MOUNTING HEIGHT WITH 4, 6, 8, 10, 12, 15 OR 17 FT SINGLE OR DOUBLE BRACKET ARM (WITHOUT FRANGIBLE BASE)	1'-5" (A) 1'-6" (S)	1'-0" (A) 1'-0 $\frac{3}{4}$ " (S)	2" (A) 2 $\frac{3}{8}$ " (S)	7	1 $\frac{1}{4}$ " $\emptyset$ x 5'-0"	0.375"	11" $\pm$ $\frac{1}{2}$ " (A) 10" $\pm$ $\frac{1}{2}$ " (S)	17.5" (A) ** 18.21" (S)

\* THE 11" BOLT CIRCLE APPLIES FOR BOTH THE POLE TO TRANSFORMER BASE AND FOR THE TRANSFORMER BASE TO FOUNDATION.

\*\* FINAL BASEPLATE WIDTHS FOR ALUMINUM STRUCTURES ARE PER MANUFACTURER

(A) = DIMENSION CORRESPONDS TO ALUMINUM

(S) = DIMENSION CORRESPONDS TO STEEL

### FOUNDATION DATA TABLE

GROUND SLOPE	SINGLE ARM MAXIMUM LUMINAIRE STRUCTURE SIZE	30 FT MOUNTING HEIGHT, 6 FT ARM	30 FT MOUNTING HEIGHT, 17 FT ARM	45 FT MOUNTING HEIGHT, 17 FT ARM
		L (FT)	L (FT)	L (FT)
GROUND SLOPE	HORIZONTAL	8.5	9	10
	SLOPED	16.5	17.5	18.5

GROUND SLOPE *	DOUBLE ARM MAXIMUM LUMINAIRE STRUCTURE SIZE	30 FT MOUNTING HEIGHT, 6 FT ARM	30 FT MOUNTING HEIGHT, 17 FT ARM	45 FT MOUNTING HEIGHT, 17 FT ARM
		L (FT)	L (FT)	L (FT)
GROUND SLOPE *	HORIZONTAL	9	10	11

L = EMBEDDED LENGTH OF THE SHAFT FOUNDATION

\* SLOPED GROUND SLOPE CASE NOT TO BE USED FOR DOUBLE ARM LUMINAIRE STRUCTURE.

### BRACKET ARM TABLE

	BRACKET LENGTH, L	6'-0"	12'-0"	15'-0"	17'-0"
STEEL	TOP MEMBER O.D.	2" DIA.	2 $\frac{1}{2}$ " DIA.	2 $\frac{1}{2}$ " DIA.	3 $\frac{1}{4}$ " DIA.
	BOTTOM MEMBER O.D.	1 $\frac{1}{2}$ " DIA.	1 $\frac{1}{2}$ " DIA.	2" DIA.	2" DIA.
ALUMINUM	TOP MEMBER O.D.	2" DIA.	3" DIA.	3" DIA.	3" DIA.
	BOTTOM MEMBER O.D.	1 $\frac{1}{2}$ " DIA.	2" DIA.	2 $\frac{1}{4}$ " DIA.	2 $\frac{1}{4}$ " DIA.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

### STANDARD PLAN FOR LIGHT STANDARD DETAILS

SPECIAL DETAIL  
FHWA APPROVAL

01/06/2026  
PLAN DATE

R-130-A

SHEET  
5 OF 6

## REINFORCEMENT DATA TABLE

MAXIMUM LUMINAIRE STRUCTURE SIZE	FOUNDATION DIAMETER	VERTICAL REINFORCEMENT				CONFINEMENT REINFORCEMENT			
		BAR SIZE	NUMBER OF BARS	BAR LENGTH		BAR RADIUS	BAR SIZE	BAR SPACING	BAR LENGTH
				HORIZONTAL	SLOPED				
30 FT MOUNTING HEIGHT, 6 FT ARM	30"	7	12	8'-0" (SINGLE ARM)	16'-0"	12"	5	12" (MAX)	6'-4"
30 FT MOUNTING HEIGHT, 17 FT ARM				8'-6" (SINGLE ARM)	17'-0"				
45 FT MOUNTING HEIGHT, 17 FT ARM				9'-6" (SINGLE ARM)	18'-0"				

PROVIDE A 2'-8" LAP FOR #5 BAR CIRCLES.

## MATERIALS TABLE (ANCHOR BASE)

MATERIAL	SPECIFICATION	DIMENSIONS	QUANTITY (PER FOUNDATION)
ANCHOR BOLTS	MDOT 908.14	DETERMINED BY LIGHT STANDARD CHART	4
ANCHOR NUTS	MDOT 908.14	DETERMINED BY ANCHOR BOLT DIAMETER	8
FLAT WASHERS *** (1" DIA. ANCHOR BOLT)	MDOT 908.14	2" O.D. x 1 $\frac{1}{16}$ " I.D. x $\frac{3}{8}$ " THICK	4
PLATE WASHERS *** (1" DIA. ANCHOR BOLT)	MDOT 908.14	1 $\frac{1}{16}$ " I.D. x $\frac{1}{2}$ " THICK	4
FLAT WASHERS *** (1 $\frac{1}{4}$ " DIA. ANCHOR BOLT)	MDOT 908.14	2 $\frac{1}{2}$ " O.D. x 1 $\frac{5}{16}$ " I.D. x $\frac{3}{8}$ " THICK	8 (IF REQUIRED ***)
PLATE WASHERS *** (1 $\frac{1}{4}$ " DIA. ANCHOR BOLT)	ASTM A1018	1 $\frac{5}{16}$ " I.D. x $\frac{1}{2}$ " THICK	8 (IF REQUIRED ***)

## MATERIALS TABLE (FRANGIBLE BASE)

MATERIAL	SPECIFICATION	DIMENSIONS	QUANTITY (PER FOUNDATION)
ANCHOR BOLTS	MDOT 908.14	DETERMINED BY LIGHT STANDARD CHART	4
ANCHOR NUTS	MDOT 908.14	DETERMINED BY ANCHOR BOLT DIAMETER	4
FLAT WASHERS *** (1" DIA. ANCHOR BOLT)	MDOT 908.14	2" O.D. x 1 $\frac{1}{16}$ " I.D. x $\frac{3}{8}$ " THICK	4
FLAT WASHERS *** (1 $\frac{1}{4}$ " DIA. ANCHOR BOLT)	MDOT 908.14	2 $\frac{1}{2}$ " O.D. x 1 $\frac{5}{16}$ " I.D. x $\frac{3}{8}$ " THICK	12 OR 14 (***)
LOCK WASHERS	ANSI B18.21.1	$\frac{1}{4}$ " THICK	8
HIGH STRENGTH BOLTS	MDOT 906.07	LENGTH DETERMINED BY THE CONTRACTOR DIAMETER TO BE SAME AS ANCHOR BOLT	4
CONNECTING NUTS	MDOT 906.07	DETERMINED BY HIGH STRENGTH BOLT DIAMETER	4
PLATE WASHERS *** (1" DIA. ANCHOR BOLT)	MDOT 908.14	1 $\frac{1}{16}$ " I.D. x $\frac{1}{2}$ " THICK	4
PLATE WASHERS *** (1 $\frac{1}{4}$ " DIA. ANCHOR BOLT)	ASTM A1018	1 $\frac{5}{16}$ " I.D. x $\frac{1}{2}$ " THICK	8 (IF REQUIRED)
FRANGIBLE TRANSFORMER BASE	SELECT FROM THE MDOT QUALIFIED PRODUCTS LIST	ACCESS DOOR OPENING: 8 $\frac{1}{2}$ " x 9" x 11"	1

\*\*\* IF LIGHT STANDARDS BASE PLATE HAS SLOTTED HOLES, USE PLATE WASHERS THAT COVER THE ENTIRE SLOT IN LIEU OF CIRCULAR WASHERS.

HOT DIP GALVANIZE ALL ANCHOR BOLTS, NUTS, WASHERS AND PLATE WASHERS ACCORDING TO AASHTO M232.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

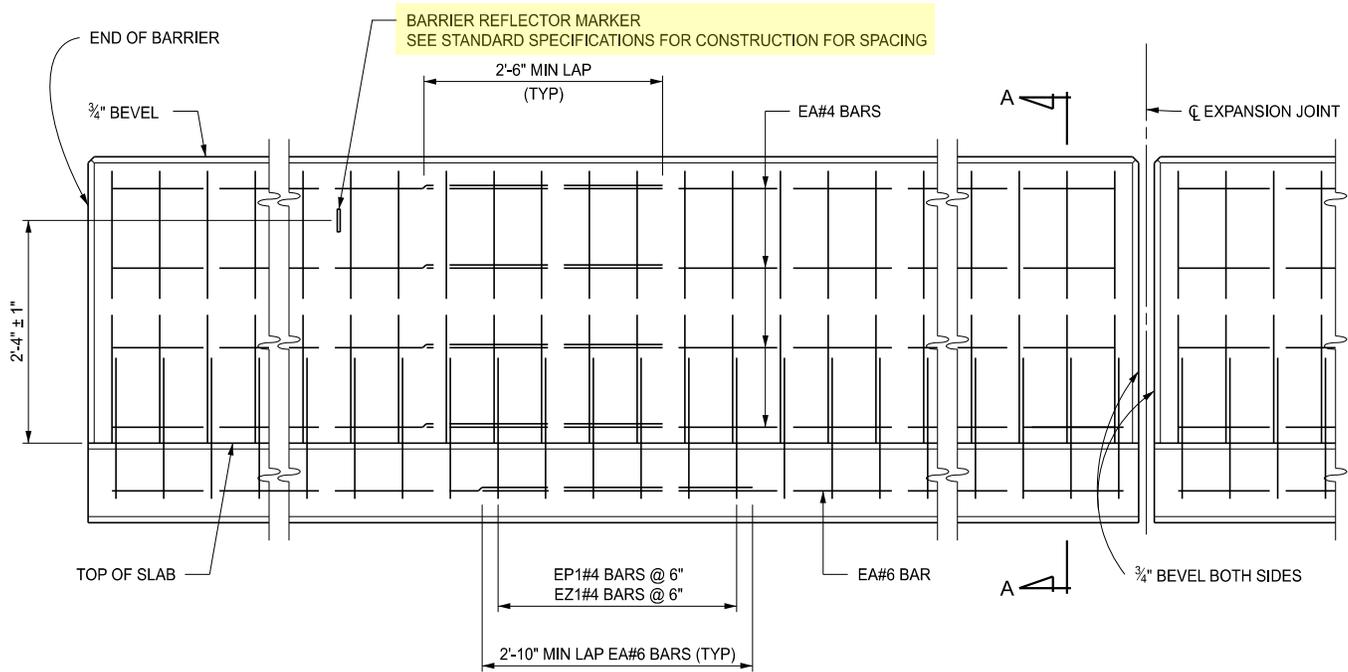
### STANDARD PLAN FOR LIGHT STANDARD DETAILS

SPECIAL DETAIL  
FHWA APPROVAL

01/06/2026  
PLAN DATE

R-130-A

SHEET  
6 OF 6



BRIDGE BARRIER RAILING, TYPE 7 OUTSIDE ELEVATION

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF BRIDGES AND STRUCTURES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT



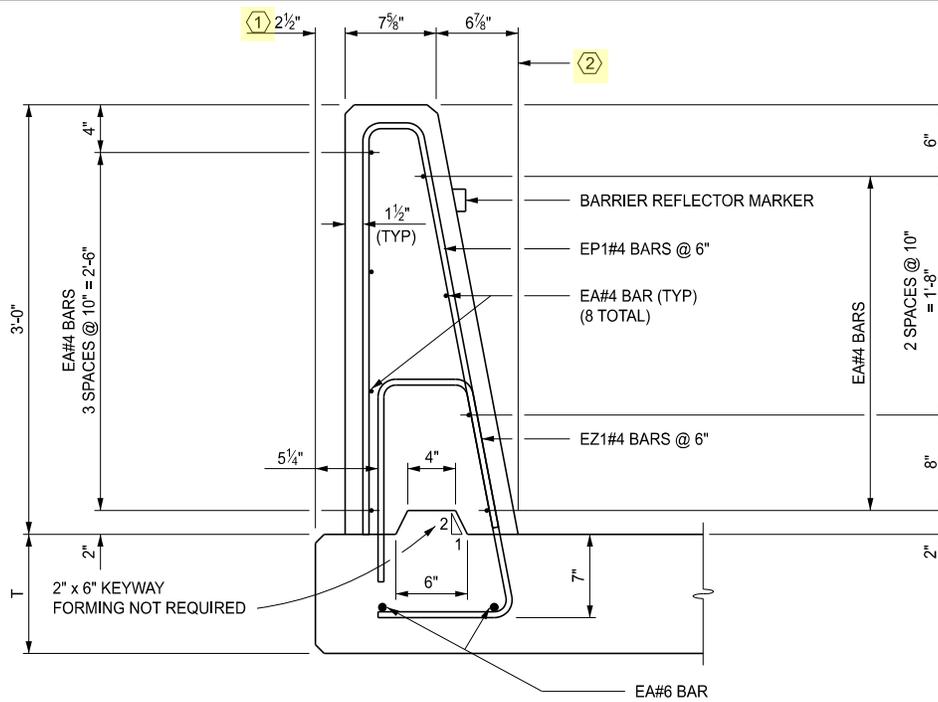
DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
BRIDGE BARRIER RAILING, TYPE 7

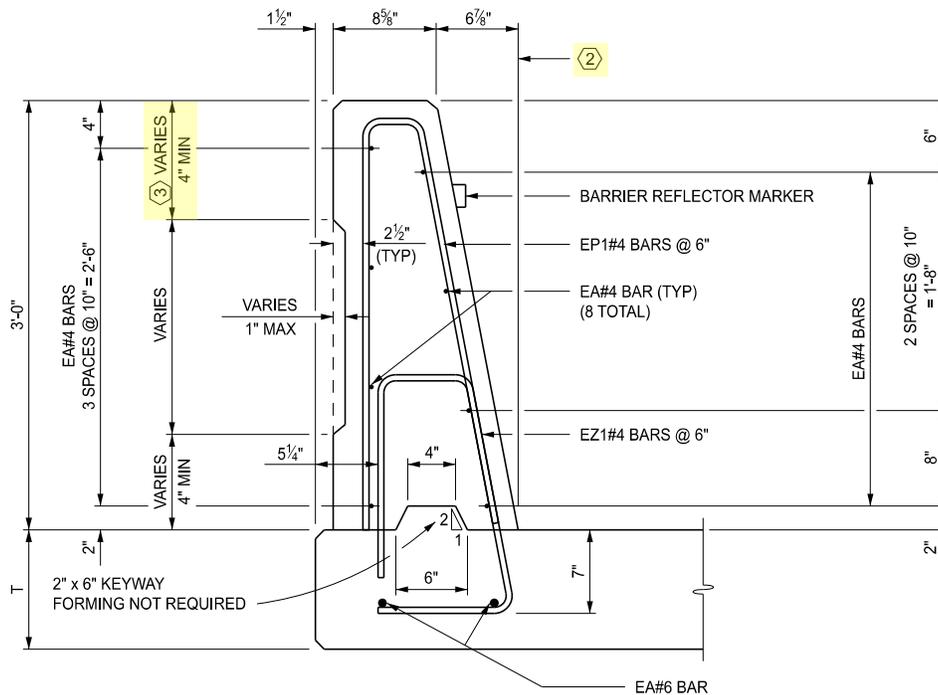
(SPECIAL DETAIL) 12/17/2025  
FHWA APPROVAL PLAN DATE

B-28-A

SHEET  
1 OF 7



**SECTION A-A**  
NO AESTHETIC TREATMENT



**SECTION A-A**

BRIDGE BARRIER RAILING, AESTHETIC, TYPE 7, DET 2  
( THE TYPE AND LIMITS OF THE AESTHETIC TREATMENT, )  
( IF APPLICABLE, ARE AS DETAILED ON THE PLANS. )

- ① BACK OF BARRIER TO SLAB FASCIA MAY BE DECREASED TO 1 1/2" (FROM 2 1/2") AND TOE OF BARRIER SHIFTED ACCORDINGLY TO ACCOMMODATE THE NEED FOR INCREASED OR MAINTAINING SHOULDER WIDTHS. DISTANCE TO BE DETAILED ON THE PLANS.
- ② BRIDGE BARRIER ORIENTATION :  
PERPENDICULAR TO PLANE OF SLAB ON NORMAL CROWN SECTION AND HIGH SIDE OF SUPERELEVATION SECTION.  
VERTICAL ON LOW SIDE OF SUPERELEVATED SECTION.
- ③ USE 10" MINIMUM WHEN PEDESTRIAN FENCE IS INSTALLED TO ACCOMMODATE THE DEPTH OF ANCHOR BOLTS. DISTANCE TO BE DETAILED ON THE PLANS.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

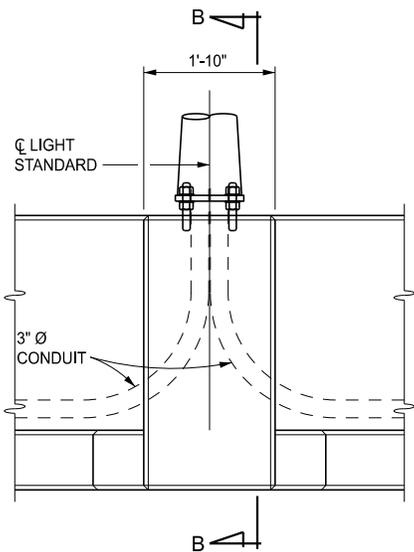
STANDARD PLAN FOR  
BRIDGE BARRIER RAILING, TYPE 7

(SPECIAL DETAIL)  
FHWA APPROVAL

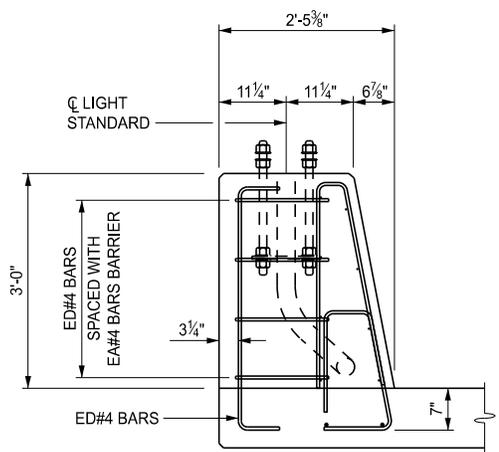
12/17/2025  
PLAN DATE

**B-28-A**

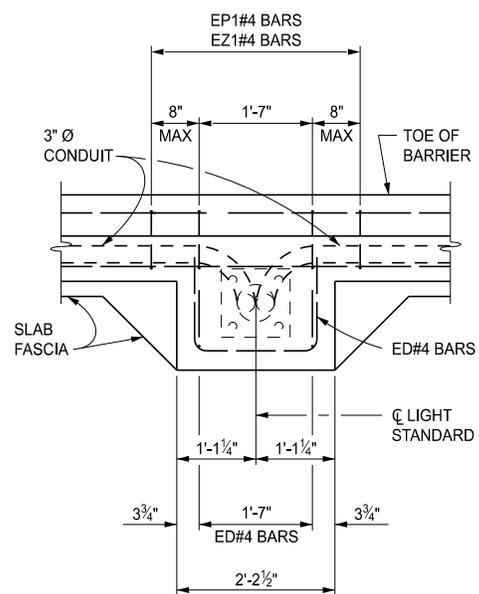
SHEET  
2 OF 7



ELEVATION VIEW



SECTION B-B



PLAN VIEW

LIGHT STANDARD DETAILS

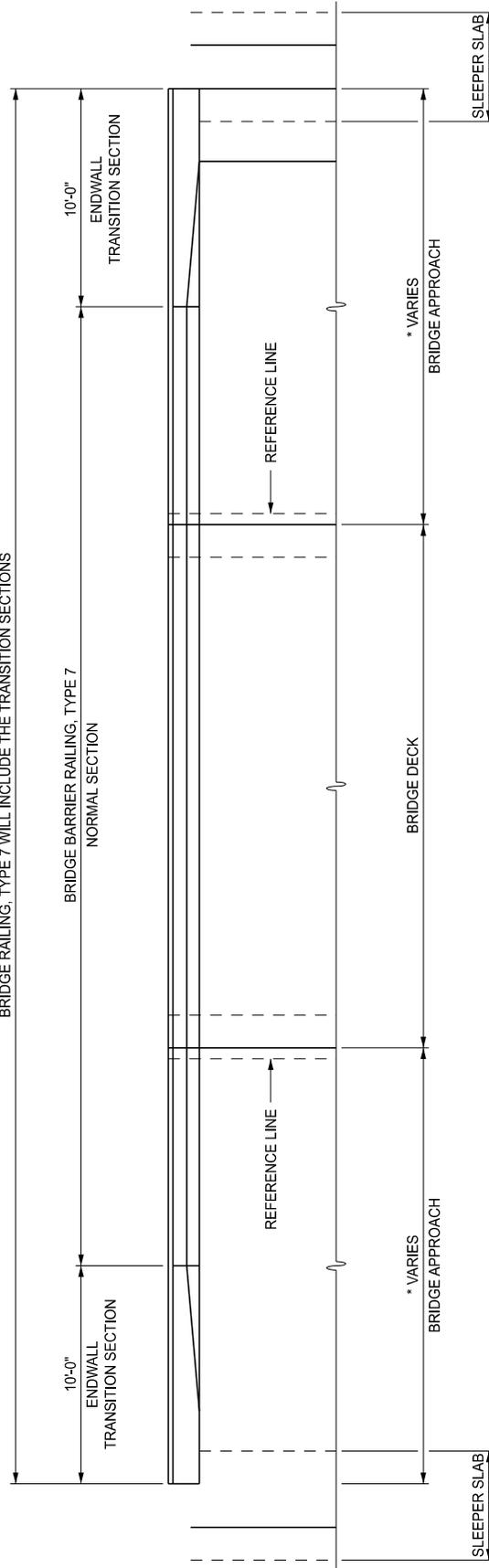
NO AESTHETIC TREATMENT ON LIGHT STANDARD 2'-2 1/2" x 1'-2 7/8" PROTRUSION

**MDOT**  
Michigan Department of Transportation

DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR BRIDGE BARRIER RAILING, TYPE 7			
(SPECIAL DETAIL)	12/17/2025	<b>B-28-A</b>	SHEET 3 OF 7
FHWA APPROVAL	PLAN DATE		

BRIDGE RAILING, TYPE 7 WILL INCLUDE THE TRANSITION SECTIONS



**BRIDGE BARRIER RAILING, TYPE 7  
PLAN VIEW**

\* DEPENDANT UPON BRIDGE APPROACH LENGTH, THE TRANSITION SECTION CAN BE PARTLY ON BRIDGE DECK OR IF NO APPROACH SLAB IS PRESENT, ENTIRELY ON THE BRIDGE DECK.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

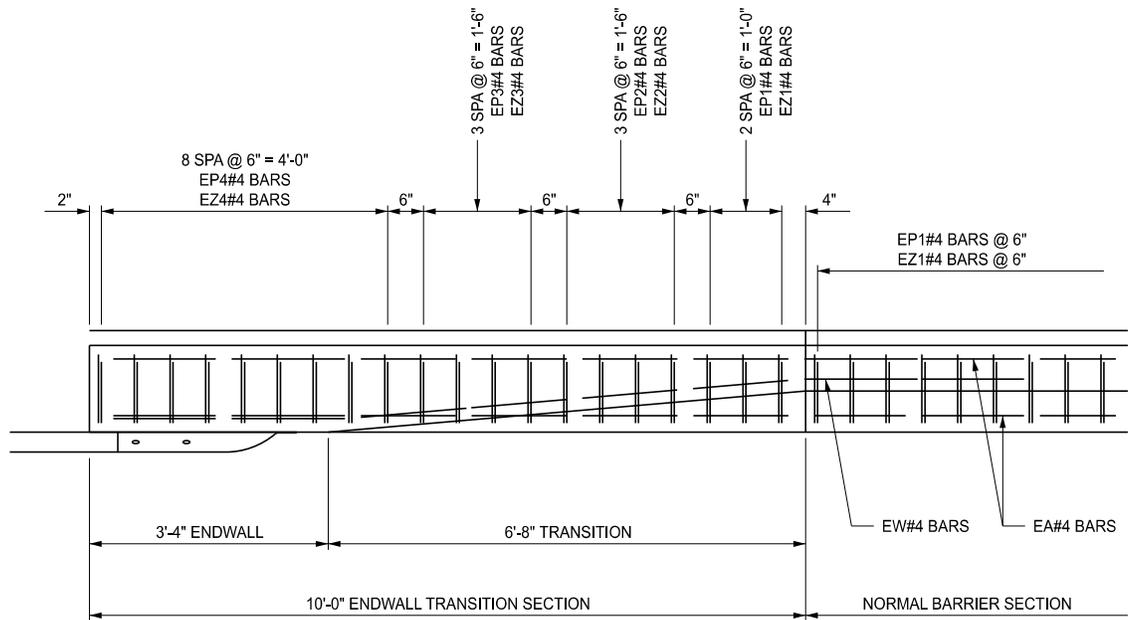
STANDARD PLAN FOR  
**BRIDGE BARRIER RAILING, TYPE 7**

(SPECIAL DETAIL)  
FHWA APPROVAL

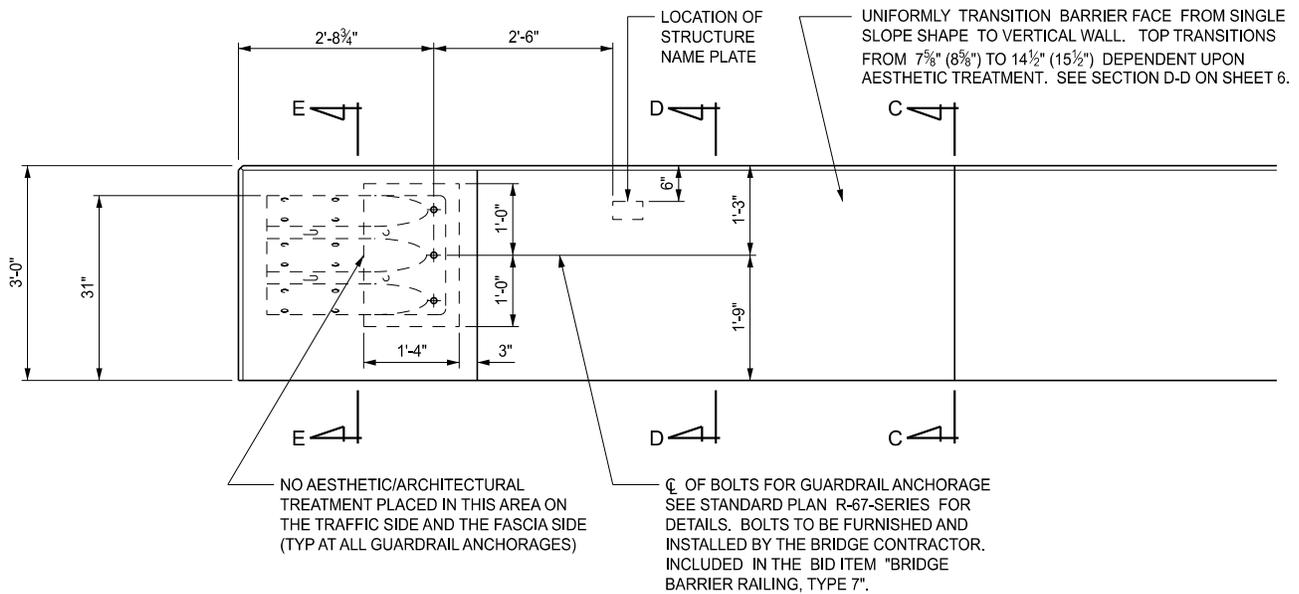
12/17/2025  
PLAN DATE

**B-28-A**

SHEET  
4 OF 7

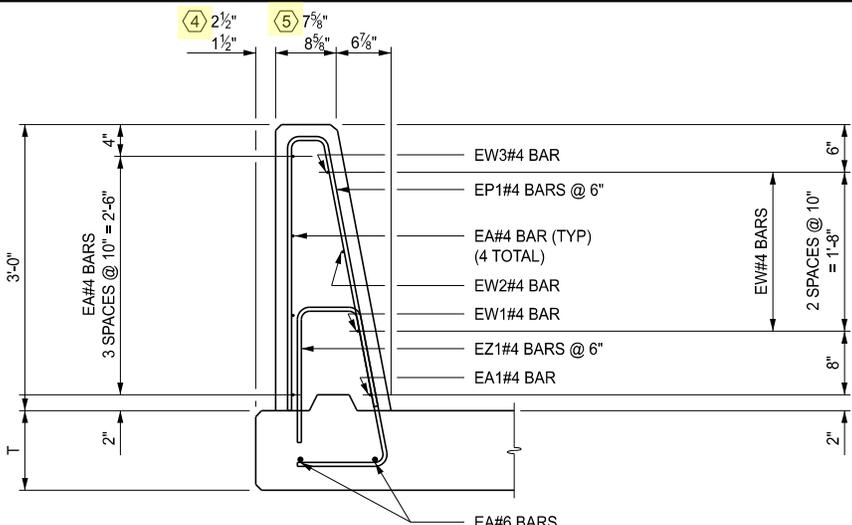


PLAN VIEW

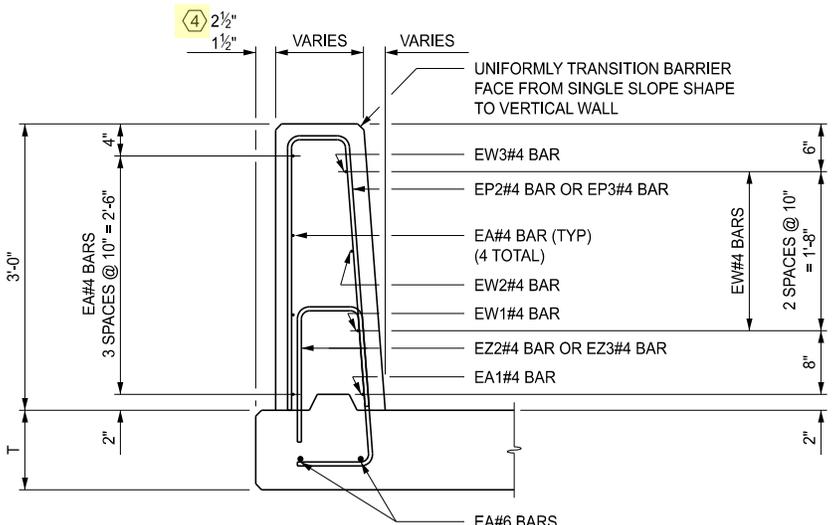


ELEVATION VIEW

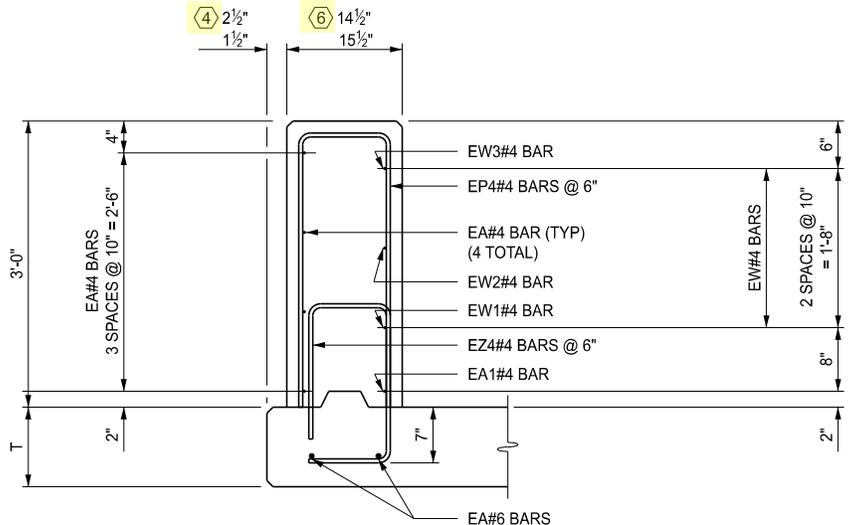
 DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR <b>BRIDGE BARRIER RAILING, TYPE 7</b>		<b>B-28-A</b>	SHEET 5 OF 7
	(SPECIAL DETAIL) FHWA APPROVAL	12/17/2025 PLAN DATE		



SECTION C-C

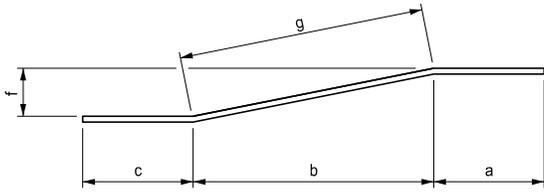


SECTION D-D



SECTION E-E

- (4) 2½" BRIDGE BARRIER RAILING, TYPE 7 (+ SEE NOTES)  
1½" BRIDGE BARRIER RAILING, AESTHETIC, TYPE 7, DET 2
- (5) 7¾" BRIDGE BARRIER RAILING, TYPE 7 (+ SEE NOTES)  
8¾" BRIDGE BARRIER RAILING, AESTHETIC, TYPE 7, DET 2
- (6) 14½" BRIDGE BARRIER RAILING, TYPE 7 (+ SEE NOTES)  
15½" BRIDGE BARRIER RAILING, AESTHETIC, TYPE 7, DET 2

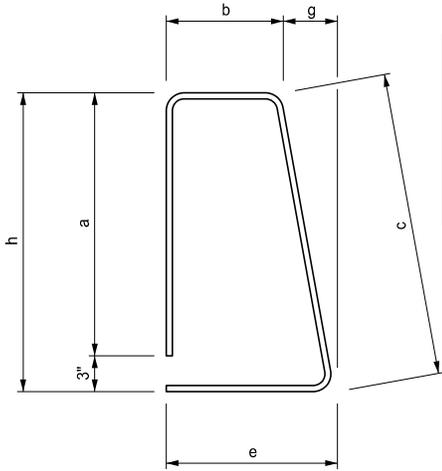


ENDWALL TRANSITION SECTION BARS							
	# of bars	c	b	a	g	j	
EA1	1	—	—	11'-11"	--	--	EA041111
EW1	1	3'-0"	5'-6"	3'-5"	5'-6"	1 <sup>7</sup> / <sub>8</sub> "	EW041111
EW2	1	3'-0"	5'-6"	3'-5 <sup>7</sup> / <sub>8</sub> "	5'-6 <sup>1</sup> / <sub>8</sub> "	3 <sup>7</sup> / <sub>8</sub> "	EW041200
EW3	1	3'-0"	5'-6"	3'-6 <sup>3</sup> / <sub>4</sub> "	5'-6 <sup>1</sup> / <sub>4</sub> "	5 <sup>3</sup> / <sub>4</sub> "	EW041201

$$L = c + a + g$$

BARRIER SECTION BARS									
	# of bars	a	b	c	e	g	h	h - a	
EZ1	--	1'-5"	7 <sup>3</sup> / <sub>8</sub> "	1'-8 <sup>3</sup> / <sub>8</sub> "	11 <sup>1</sup> / <sub>4</sub> "	3 <sup>5</sup> / <sub>8</sub> "	1'-8"	3"	EZ040408

$$L = a + b + c + e$$

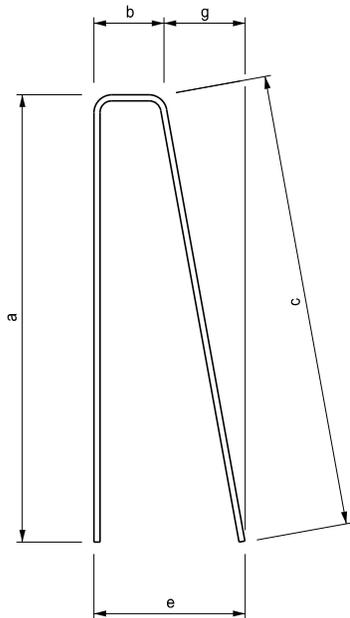


ENDWALL TRANSITION SECTION BARS									
	# of bars	a	b	c	e	g	h	h - a	
EZ1	3	1'-5"	7 <sup>3</sup> / <sub>8</sub> "	1'-8 <sup>3</sup> / <sub>8</sub> "	11 <sup>1</sup> / <sub>4</sub> "	3 <sup>5</sup> / <sub>8</sub> "	1'-8"	3"	EZ040408
EZ2	4	1'-5"	7 <sup>7</sup> / <sub>8</sub> "	1'-8 <sup>1</sup> / <sub>2</sub> "	10 <sup>7</sup> / <sub>8</sub> "	2 <sup>7</sup> / <sub>8</sub> "	1'-8"	3"	EZ040408
EZ3	4	1'-5"	8 <sup>3</sup> / <sub>4</sub> "	1'-8"	10 <sup>1</sup> / <sub>4</sub> "	1 <sup>1</sup> / <sub>2</sub> "	1'-8"	3"	EZ040408
EZ4	9	1'-5"	10 <sup>1</sup> / <sub>2</sub> "	1'-8"	10 <sup>1</sup> / <sub>2</sub> "	—	1'-8"	3"	EZ040410

$$L = a + b + c + e$$

BARRIER SECTION BARS							
	# of bars	a	b	c	e	g	
EP1	—	2'-10 <sup>1</sup> / <sub>4</sub> "	4 <sup>3</sup> / <sub>4</sub> "	2'-11"	11"	6 <sup>1</sup> / <sub>4</sub> "	EP040602

$$L = a + b + c$$



ENDWALL TRANSITION SECTION BARS							
	# of bars	a	b	c	e	g	
EP1	3	2'-10 <sup>1</sup> / <sub>4</sub> "	4 <sup>3</sup> / <sub>4</sub> "	2'-11"	11"	6 <sup>1</sup> / <sub>4</sub> "	EP040602
EP2	4	2'-9 <sup>9</sup> / <sub>8</sub> "	6 <sup>1</sup> / <sub>4</sub> "	2'-10 <sup>7</sup> / <sub>8</sub> "	11"	4 <sup>3</sup> / <sub>4</sub> "	EP040603
EP3	4	2'-10 <sup>5</sup> / <sub>8</sub> "	8 <sup>1</sup> / <sub>4</sub> "	2'-10 <sup>5</sup> / <sub>8</sub> "	11"	2 <sup>3</sup> / <sub>4</sub> "	EP040605
EP4	9	2'-10 <sup>1</sup> / <sub>2</sub> "	11"	2'-10 <sup>1</sup> / <sub>2</sub> "	11"	--	EP040608

$$L = a + b + c$$

NOTES:

DETAILS SHOWN ARE ACCORDING TO AASHTO SPECIFICATIONS.

SEE STANDARD PLAN B-103-SERIES FOR LIGHT STANDARD ANCHOR BOLT ASSEMBLY DETAILS,

ALL WORK AND MATERIAL ARE ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
BRIDGE BARRIER RAILING, TYPE 7

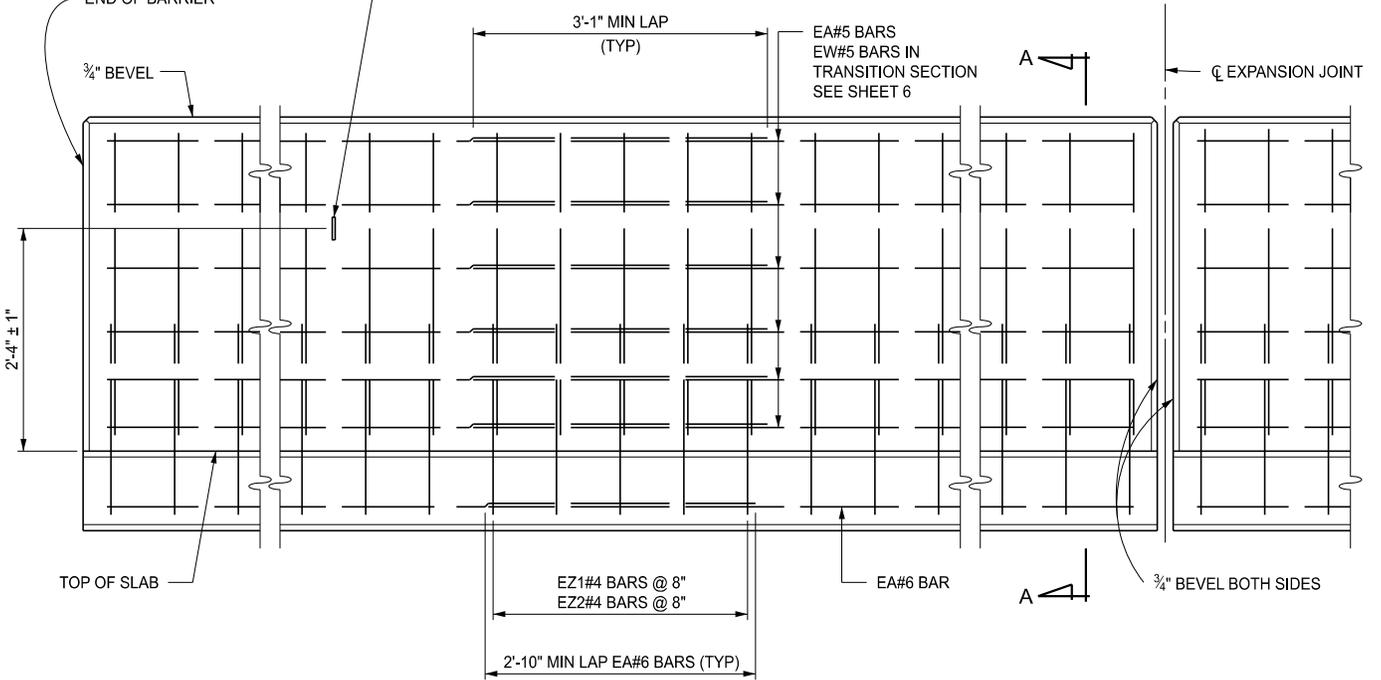
(SPECIAL DETAIL)  
FHWA APPROVAL

12/17/2025  
PLAN DATE

B-28-A

SHEET  
7 OF 7

BARRIER REFLECTOR MARKER  
SEE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR SPACING



BRIDGE BARRIER RAILING, TYPE 6 OUTSIDE ELEVATION

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF BRIDGES AND STRUCTURES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT



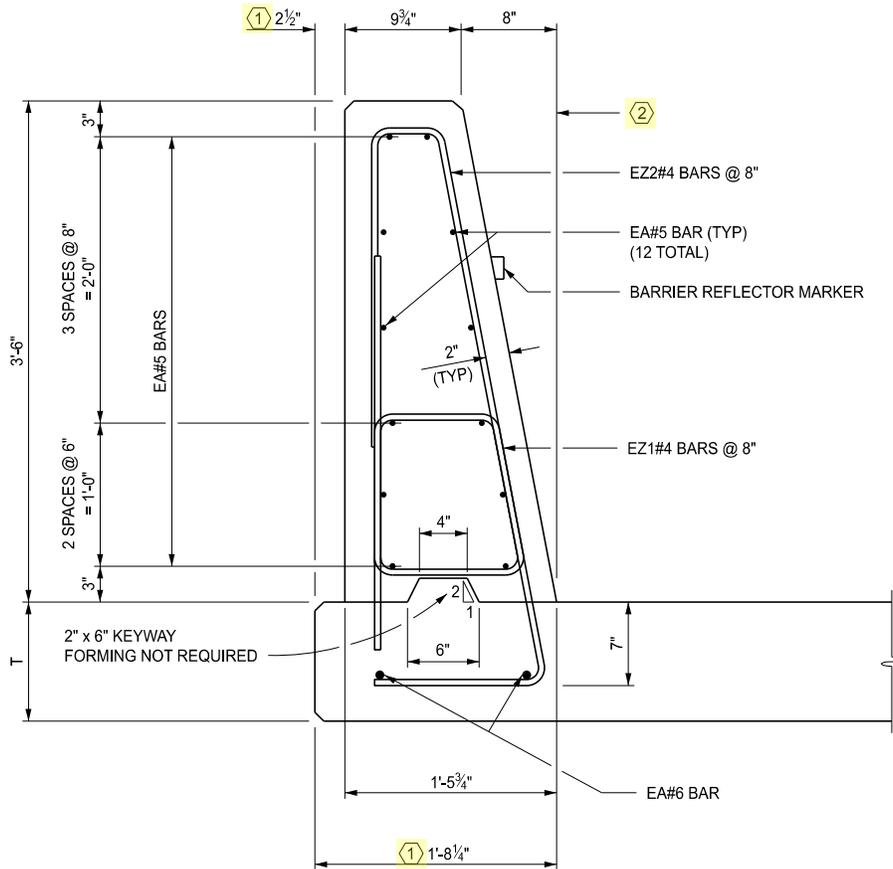
DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
BRIDGE BARRIER RAILING, TYPE 6

(SPECIAL DETAIL) 12/17/2025  
FHWA APPROVAL PLAN DATE

B-29-A

SHEET  
1 OF 8



SECTION A-A  
NO AESTHETIC TREATMENT

① BACK OF BARRIER TO SLAB FASCIA MAY BE DECREASED TO 1½" (FROM 2½") AND TOE OF BARRIER SHIFTED ACCORDINGLY TO ACCOMMODATE THE NEED FOR INCREASED OR MAINTAINING SHOULDER WIDTHS. DISTANCE TO BE DETAILED ON THE PLANS.

② BRIDGE BARRIER ORIENTATION :

PERPENDICULAR TO PLANE OF SLAB ON NORMAL CROWN SECTION AND HIGH SIDE OF SUPERELEVATION SECTION. VERTICAL ON LOW SIDE OF SUPERELEVATED SECTION.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
BRIDGE BARRIER RAILING, TYPE 6

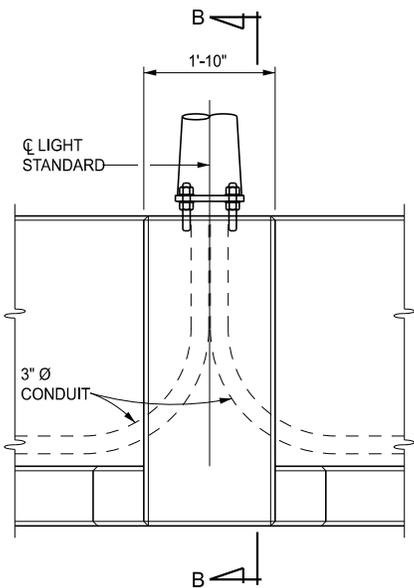
(SPECIAL DETAIL)  
FHWA APPROVAL

12/17/2025  
PLAN DATE

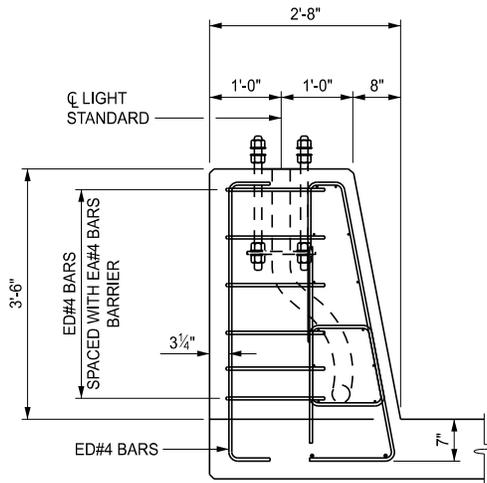
B-29-A

SHEET  
2 OF 8

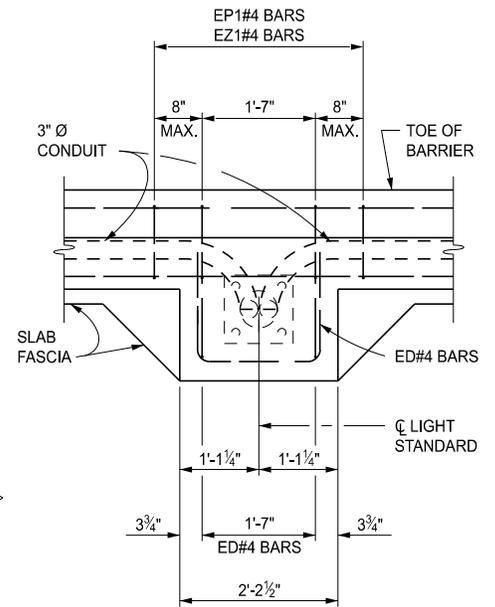




ELEVATION VIEW



SECTION B-B



PLAN VIEW

LIGHT STANDARD DETAILS

NO AESTHETIC TREATMENT ON LIGHT STANDARD 2'-2 1/2" x 1'-2 1/4" PROTRUSION



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
BRIDGE BARRIER RAILING, TYPE 6

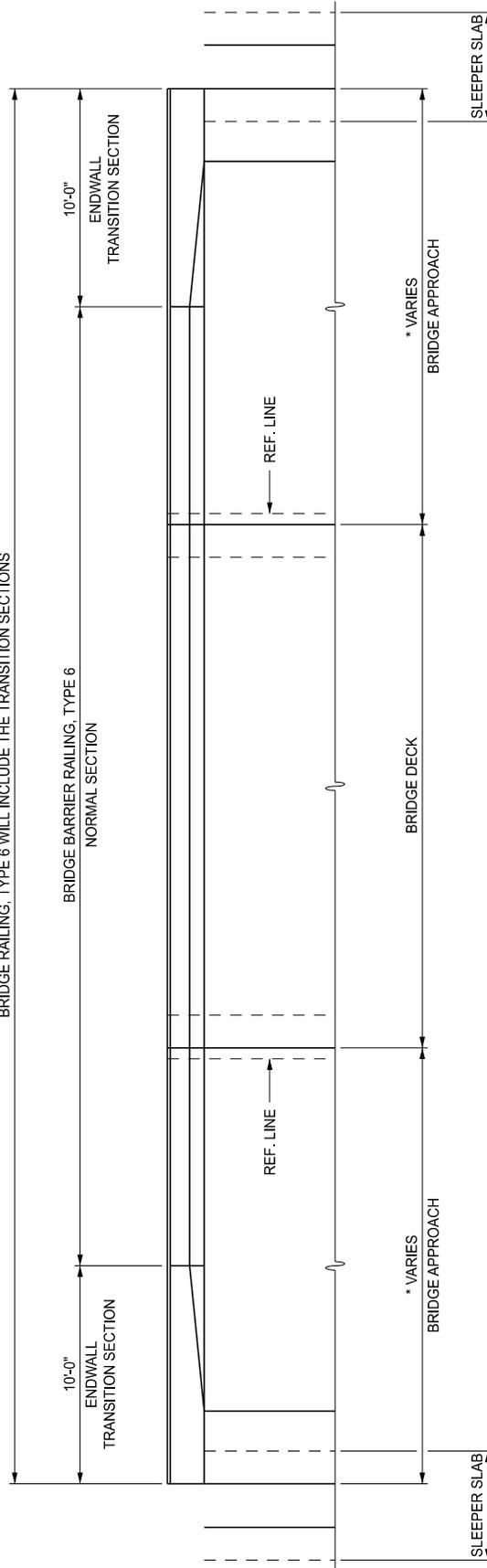
(SPECIAL DETAIL)  
FHWA APPROVAL

12/17/2025  
PLAN DATE

B-29-A

SHEET  
4 OF 8

BRIDGE RAILING, TYPE 6 WILL INCLUDE THE TRANSITION SECTIONS



**BRIDGE BARRIER RAILING, TYPE 6  
PLAN VIEW**

\* DEPENDANT UPON BRIDGE APPROACH LENGTH, THE TRANSITION SECTION CAN BE PARTLY ON BRIDGE DECK OR IF NO APPROACH SLAB IS PRESENT, ENTIRELY ON THE BRIDGE DECK.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

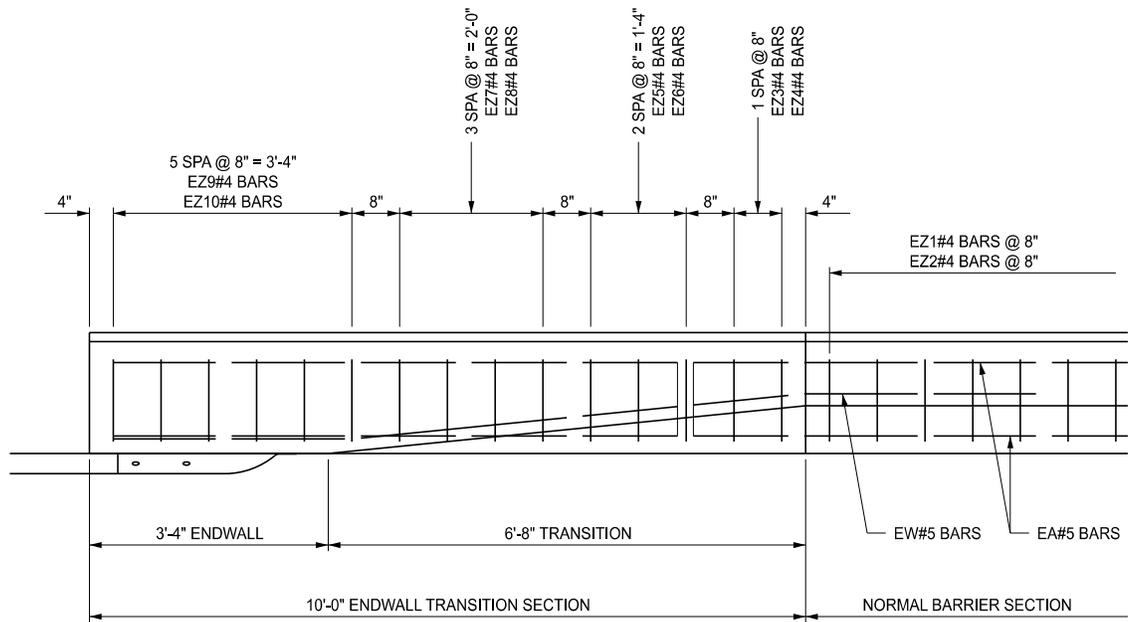
STANDARD PLAN FOR  
**BRIDGE BARRIER RAILING, TYPE 6**

(SPECIAL DETAIL)  
FHWA APPROVAL

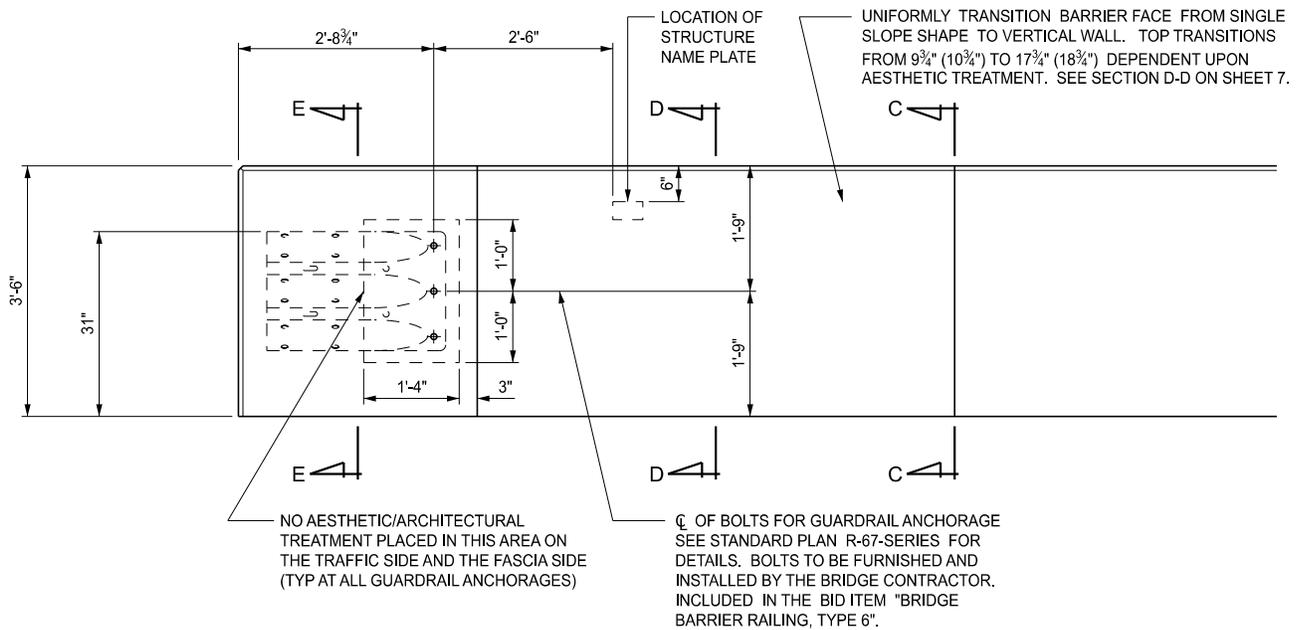
12/17/2025  
PLAN DATE

**B-29-A**

SHEET  
5 OF 8



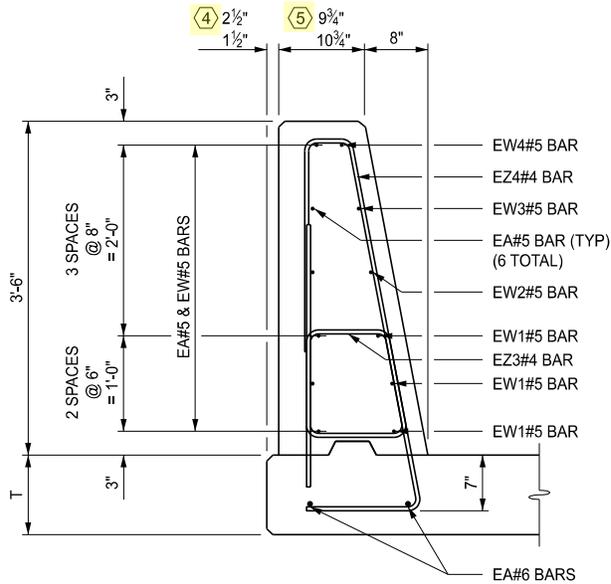
PLAN VIEW



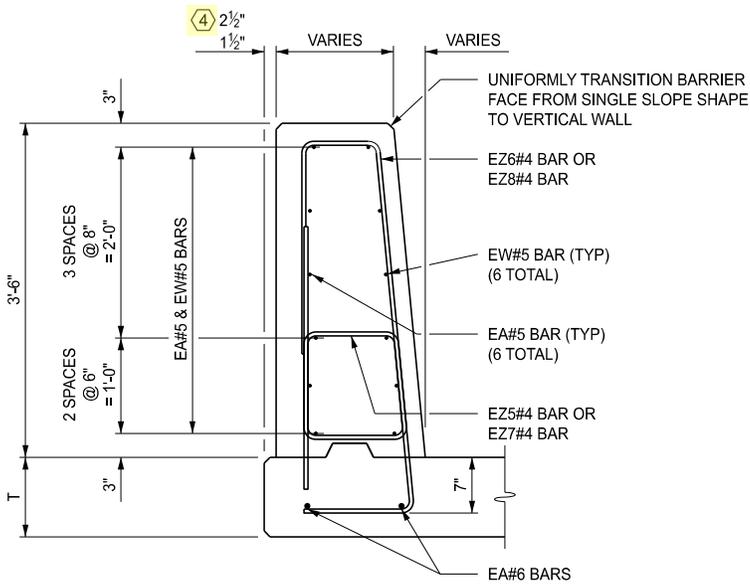
ELEVATION VIEW

  
 Michigan Department of Transportation  
 DEPARTMENT DIRECTOR  
 BRADLEY C. WIEFERICH, PE

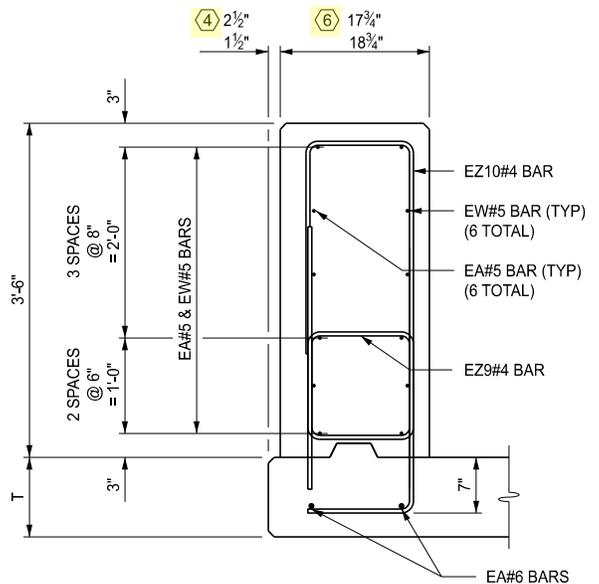
STANDARD PLAN FOR BRIDGE BARRIER RAILING, TYPE 6		B-29-A	SHEET 6 OF 8
(SPECIAL DETAIL) FHWA APPROVAL	12/17/2025 PLAN DATE		



SECTION C-C



SECTION D-D



SECTION E-E

- ④ 2 1/2" BRIDGE BARRIER RAILING, TYPE 6 (+ SEE NOTES)  
1 1/2" BRIDGE BARRIER RAILING, AESTHETIC, TYPE 6, DET 2
- ⑤ 9 3/4" BRIDGE BARRIER RAILING, TYPE 6 (+ SEE NOTES)  
10 3/4" BRIDGE BARRIER RAILING, AESTHETIC, TYPE 6, DET 2
- ⑥ 17 3/4" BRIDGE BARRIER RAILING, TYPE 6 (+ SEE NOTES)  
18 3/4" BRIDGE BARRIER RAILING, AESTHETIC, TYPE 6, DET 2



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

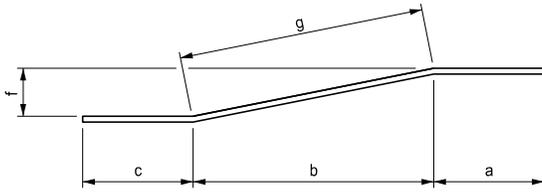
STANDARD PLAN FOR  
BRIDGE BARRIER RAILING, TYPE 6

(SPECIAL DETAIL)  
FHWA APPROVAL

12/17/2025  
PLAN DATE

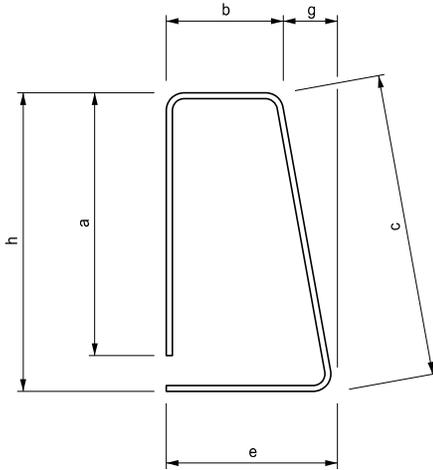
B-29-A

SHEET  
7 OF 8



ENDWALL TRANSITION SECTION BARS							
	# of bars	c	b	a	g	f	
EW1	3	2'-2"	2'-8"	7'-6"	2'-8"	1 <sup>5</sup> / <sub>8</sub> "	EW051204
EW2	1	2'-2"	6'-0"	4'-2 <sup>7</sup> / <sub>8</sub> "	6'-0 <sup>1</sup> / <sub>8</sub> "	4 <sup>1</sup> / <sub>4</sub> "	EW051205
EW3	1	2'-2"	6'-0"	4'-3 <sup>3</sup> / <sub>4</sub> "	6'-0 <sup>1</sup> / <sub>4</sub> "	5 <sup>3</sup> / <sub>4</sub> "	EW051206
EW4	1	2'-2"	6'-0"	4'-4 <sup>5</sup> / <sub>8</sub> "	6'-0 <sup>3</sup> / <sub>8</sub> "	6 <sup>7</sup> / <sub>8</sub> "	EW051207

$$L = c + a + g$$

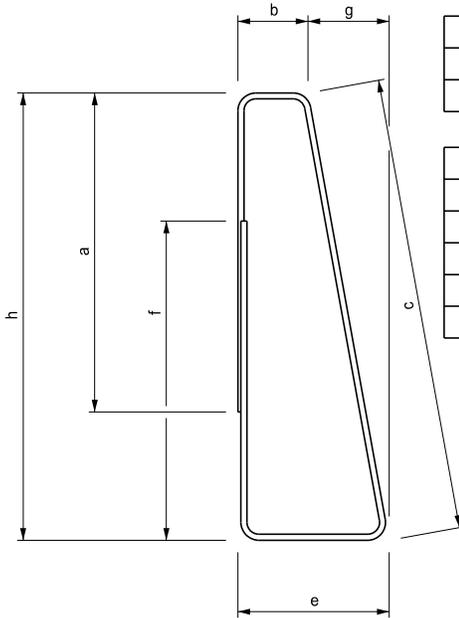


BARRIER SECTION BARS							
	# of bars	a	b	c	e	g	h
EZ1	--	1'-8 <sup>1</sup> / <sub>8</sub> "	10 <sup>3</sup> / <sub>4</sub> "	1'-11 <sup>1</sup> / <sub>8</sub> "	1'-3"	4 <sup>1</sup> / <sub>4</sub> "	1'-10 <sup>3</sup> / <sub>4</sub> "

$$L = a + b + c + e$$

ENDWALL TRANSITION SECTION BARS							
	# of bars	a	b	c	e	g	h
EZ3	2	1'-8"	10 <sup>3</sup> / <sub>8</sub> "	1'-11 <sup>1</sup> / <sub>8</sub> "	1'-2 <sup>1</sup> / <sub>2</sub> "	4 <sup>1</sup> / <sub>8</sub> "	1'-10 <sup>3</sup> / <sub>4</sub> "
EZ5	3	1'-7 <sup>3</sup> / <sub>4</sub> "	11"	1'-11"	1'-2 <sup>1</sup> / <sub>4</sub> "	3 <sup>1</sup> / <sub>4</sub> "	1'-10 <sup>3</sup> / <sub>4</sub> "
EZ7	4	1'-7 <sup>1</sup> / <sub>2</sub> "	11 <sup>3</sup> / <sub>4</sub> "	1'-10 <sup>7</sup> / <sub>8</sub> "	1'-1 <sup>7</sup> / <sub>8</sub> "	2 <sup>1</sup> / <sub>8</sub> "	1'-10 <sup>3</sup> / <sub>4</sub> "
EZ9	6	1'-7 <sup>3</sup> / <sub>4</sub> "	1'-1 <sup>3</sup> / <sub>4</sub> "	1'-10 <sup>3</sup> / <sub>4</sub> "	1'-1 <sup>3</sup> / <sub>4</sub> "	--	1'-10 <sup>3</sup> / <sub>4</sub> "

$$L = a + b + c + e$$



BARRIER SECTION BARS							
	# of bars	a	b	c	e	f	g
EZ2	--	2'-3 <sup>3</sup> / <sub>8</sub> "	6 <sup>1</sup> / <sub>8</sub> "	3'-2 <sup>1</sup> / <sub>4</sub> "	1'-1 <sup>1</sup> / <sub>4</sub> "	2'-3"	7 <sup>1</sup> / <sub>8</sub> "

$$L = a + b + c + e + f$$

ENDWALL TRANSITION SECTION BARS							
	# of bars	a	b	c	e	f	g
EZ4	2	2'-3 <sup>1</sup> / <sub>2</sub> "	6 <sup>1</sup> / <sub>2</sub> "	3'-2"	1'-1"	2'-3"	6 <sup>1</sup> / <sub>2</sub> "
EZ6	3	2'-3 <sup>7</sup> / <sub>8</sub> "	8 <sup>1</sup> / <sub>8</sub> "	3'-1 <sup>7</sup> / <sub>8</sub> "	1'-1 <sup>1</sup> / <sub>8</sub> "	2'-3"	5"
EZ8	4	2'-3 <sup>5</sup> / <sub>8</sub> "	10 <sup>1</sup> / <sub>2</sub> "	3'-1 <sup>5</sup> / <sub>8</sub> "	1'-1 <sup>1</sup> / <sub>4</sub> "	2'-3"	2 <sup>3</sup> / <sub>4</sub> "
EZ10	6	2'-3 <sup>1</sup> / <sub>2</sub> "	1'-1 <sup>1</sup> / <sub>2</sub> "	3'-1 <sup>1</sup> / <sub>2</sub> "	1'-1 <sup>1</sup> / <sub>2</sub> "	2'-3"	--

$$L = a + b + c + e + f$$

**NOTES:**

DETAILS SHOWN ARE ACCORDING TO AASHTO SPECIFICATIONS.

SEE STANDARD PLAN B-103-SERIES FOR LIGHT STANDARD ANCHOR BOLT ASSEMBLY DETAILS.

ALL WORK AND MATERIAL ARE ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

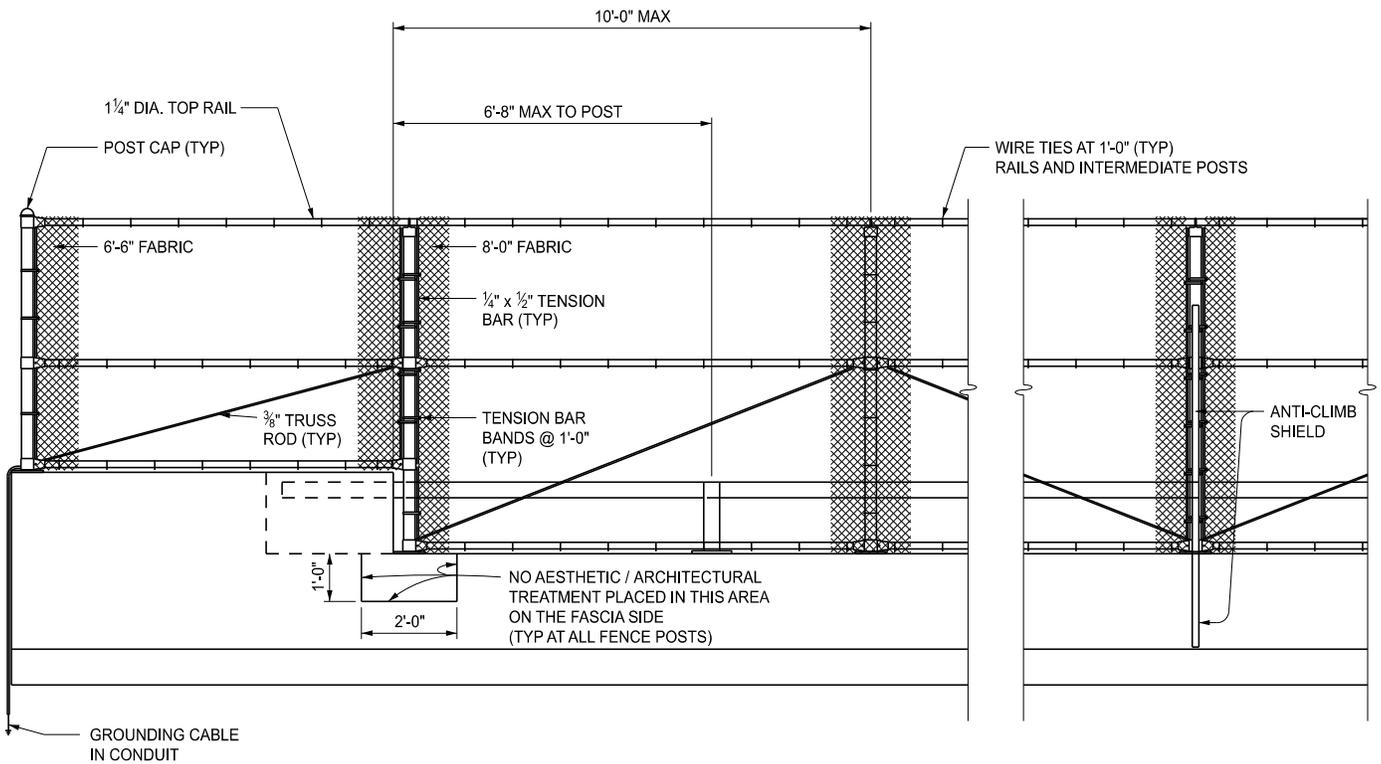
STANDARD PLAN FOR  
BRIDGE BARRIER RAILING, TYPE 6

(SPECIAL DETAIL)  
FHWA APPROVAL

12/17/2025  
PLAN DATE

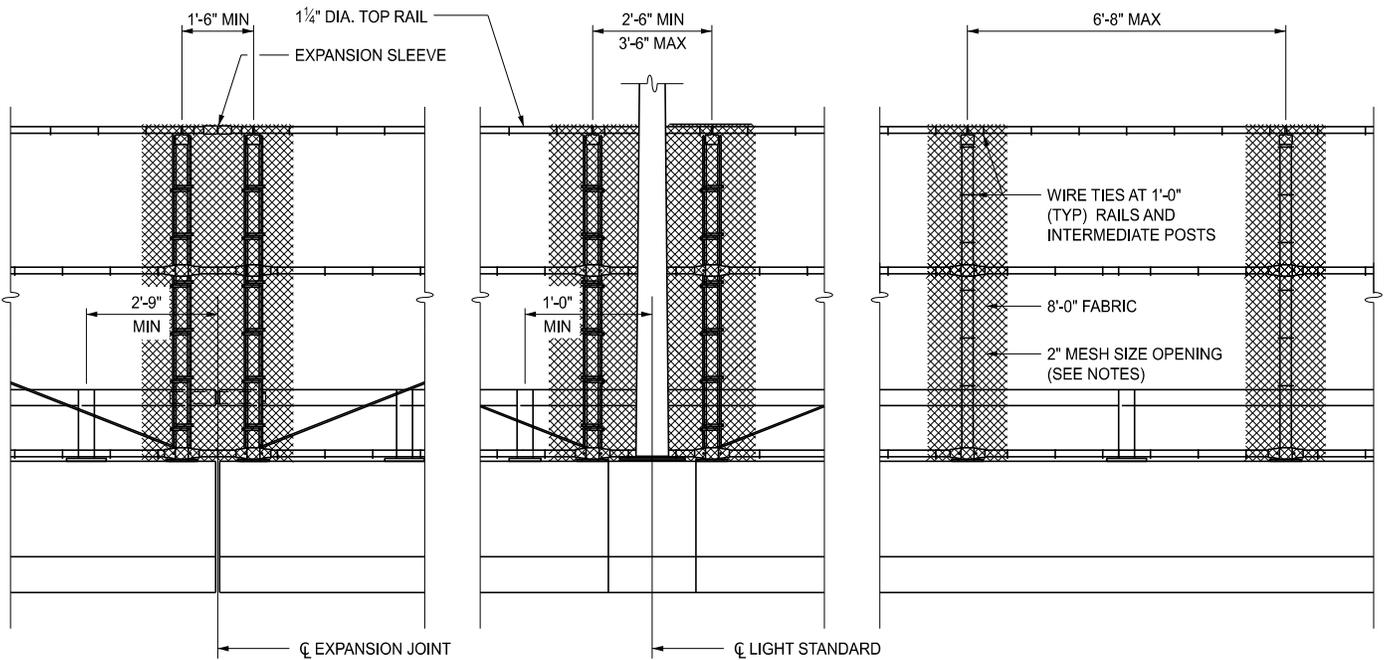
**B-29-A**

SHEET  
8 OF 8



AT END PANEL

AT ANTI-CLIMB SHIELD



AT EXPANSION JOINT

AT LIGHT STANDARD

AT TYPICAL PANEL

TYPICAL ELEVATIONS

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF BRIDGES AND STRUCTURES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

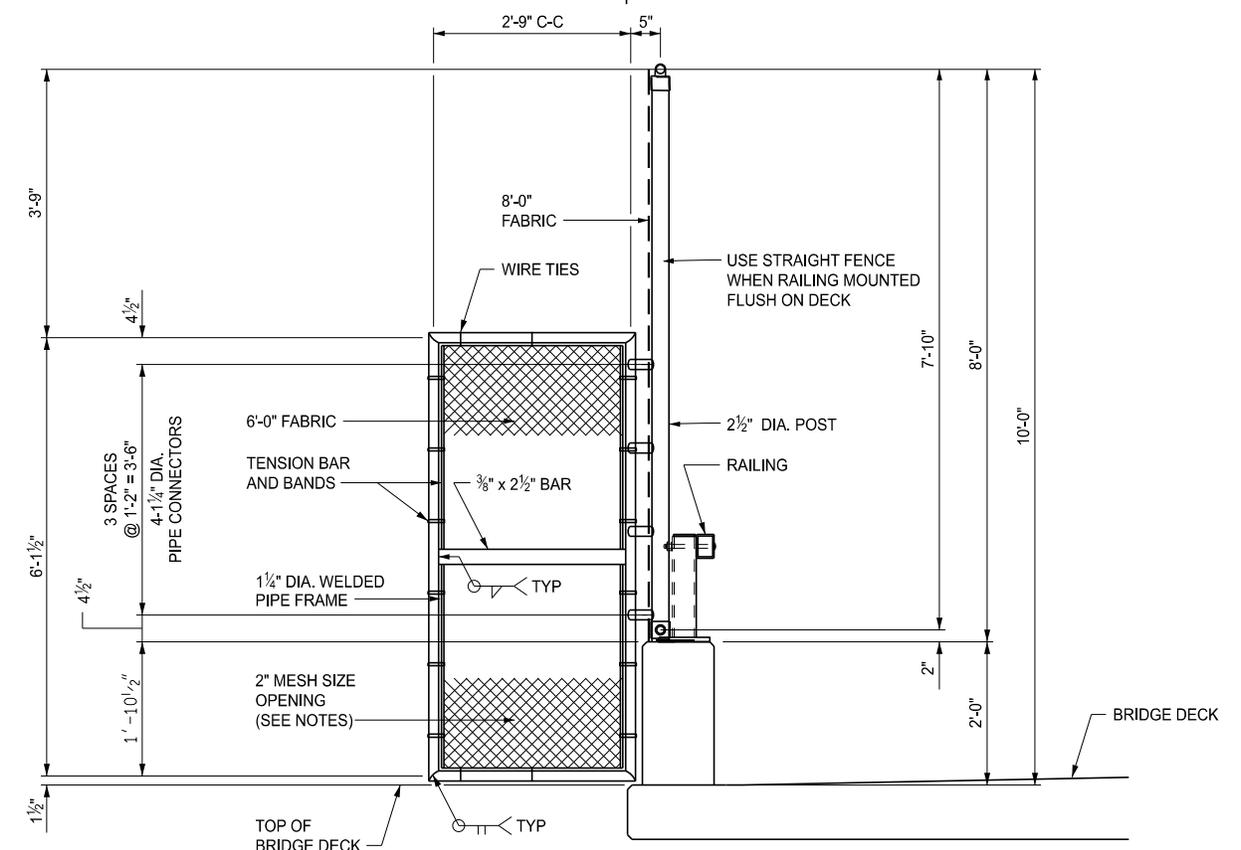
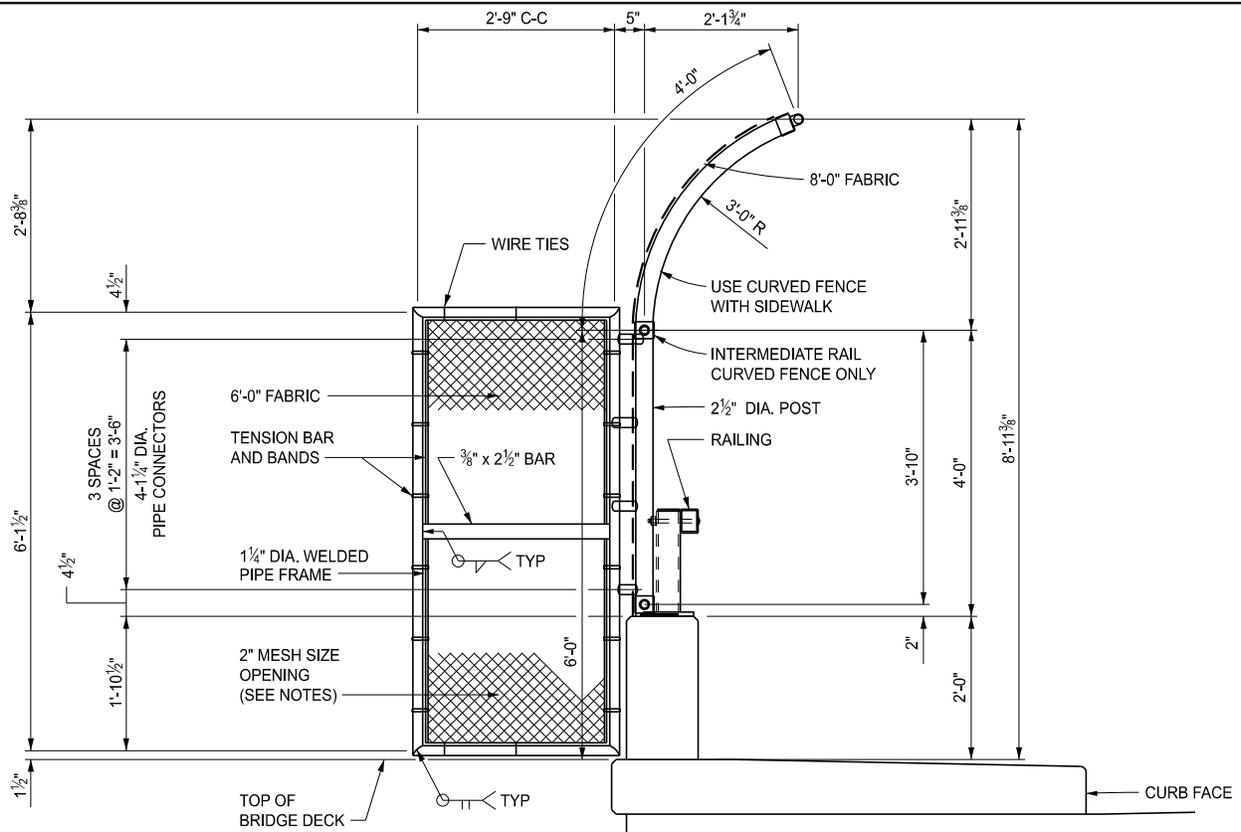
STANDARD PLAN FOR  
FENCING FOR BRIDGE RAILING,  
AESTHETIC PARAPET TUBE

(SPECIAL DETAIL)  
FHWA APPROVAL

12/10/2025  
PLAN DATE

B-41-D

SHEET  
1 OF 3



### ANTI-CLIMB / POST DETAIL

INSTALL ANTI-CLIMB SHIELD AT THE SECOND POST FROM THE END, AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

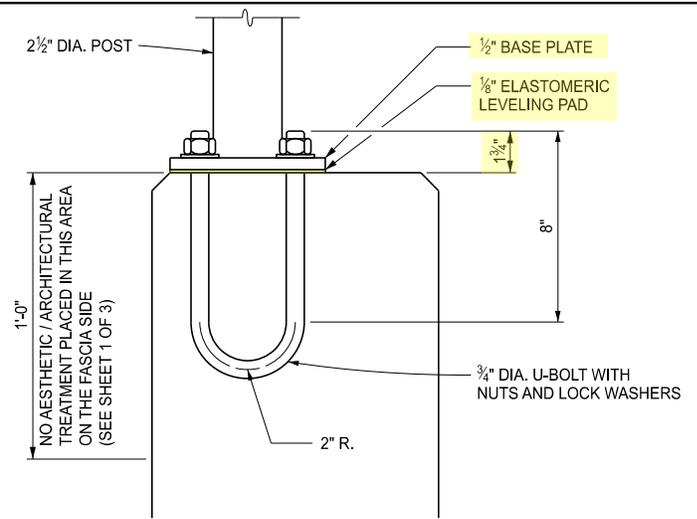
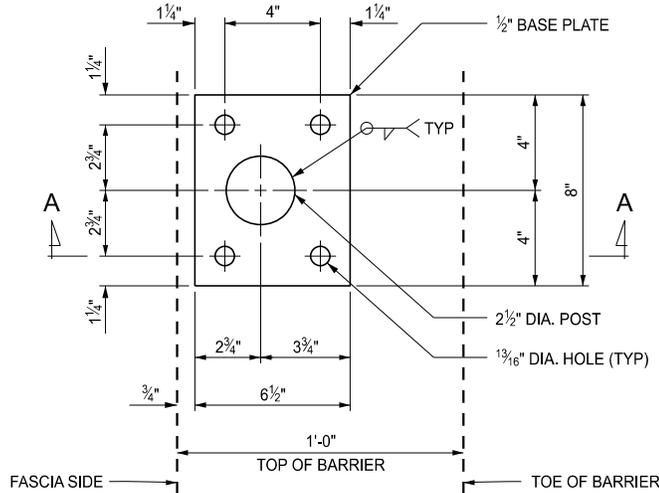
STANDARD PLAN FOR  
FENCING FOR BRIDGE RAILING,  
AESTHETIC PARAPET TUBE

(SPECIAL DETAIL)  
FHWA APPROVAL

12/10/2025  
PLAN DATE

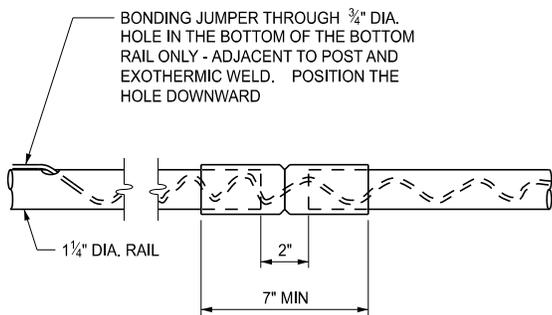
B-41-D

SHEET  
2 OF 3

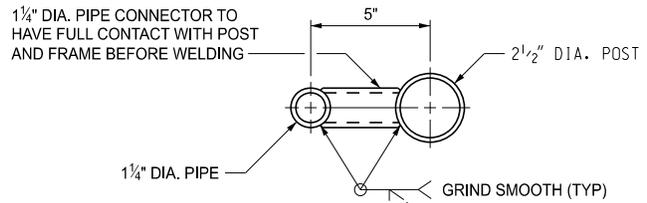


SECTION A - A

BASE PLATE DETAILS



EXPANSION SLEEVE DETAIL



PIPE CONNECTION DETAIL

USE AT ANTI-CLIMB SHIELD ONLY

NOTES

USE 2 1/2" NOMINAL (2.875" O.D.) PIPE FOR ALL FENCE POSTS. USE 1 1/4" NOMINAL (1.66" O.D.) PIPE FOR ANTI-CLIMB SHIELD FRAMES, ACCORDING TO ASTM F669, CLASS 1C.

USE 1 1/4" NOMINAL (1.66" O.D.) PIPE FOR HORIZONTAL RAILS, ACCORDING TO ASTM F669, CLASS 1C OR ASTM F1083.

GALVANIZE ALL FENCE COMPONENTS, UNLESS OTHERWISE INDICATED, ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

FURNISH ALL POSTS, ANTI-CLIMB SHIELDS, AND OTHER FABRICATED COMPONENTS AS "BLACK" PIPE, THEN GALVANIZE THEM AFTER FABRICATION.

REPAIR DAMAGED GALVANIZED SURFACES (NEW AND EXISTING) ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

USE #9 GAUGE MESH FOR FENCE FABRIC. GALVANIZE OR ALUMINUM-COAT THE FABRIC ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. PROVIDE A 2" MESH SIZE OPENING UNLESS THE TRAFFIC AND SAFETY DIVISION APPROVES A 1" MESH SIZE OPENING AND NOTES IT ON THE DESIGN PLANS. APPLY ALL DETAILS FROM THE STANDARD PLAN REGARDLESS OF MESH SIZE.

INSTALL GALVANIZED 3/8" DIAMETER TRUSS RODS DIAGONALLY FROM THE TOP CONNECTION CLIP AT EACH TENSION BAR TO THE ADJACENT POST, EXCEPT ACROSS EXPANSION JOINTS AND AT LIGHT STANDARDS WITH A CURVED FENCE DETAIL. INSTALL TRUSS RODS WHEN TWO OR MORE CONTINUOUS PANELS OF FABRIC ARE PRESENT.

INSTALL ALL POSTS PLUMB AND IF NEEDED, SHIM THEM USING NON-METALLIC SHIMS APPROVED BY THE ENGINEER. INCLUDE ALL SHIMMING COSTS IN THE PAY ITEM "FENCE, STRUCTURE."

PLACE THE GROUNDING CABLE IN A NON-METALLIC CONDUIT, FROM THE END POST CONNECTION TO THE GROUND ROD CONNECTION. SECURE THE CONDUIT TO THE STRUCTURE USING EITHER EXPANSION BOLTS OR ADHESIVE-ANCHORED BOLTS WITH GALVANIZED METAL STRIPS, AS APPROVED BY THE ENGINEER.

IF INSTALLING A GROUND ROD IS IMPRACTICAL, CONNECT THE GROUNDING CABLE TO THE NEAREST LIGHT STANDARD USING A MECHANICAL CLIP. OBTAIN PERMISSION FROM THE LOCAL PUBLIC LIGHTING AUTHORITY BEFORE MAKING THIS CONNECTION.

USE THE MANUFACTURER'S STANDARD OVERSIZED SLEEVES, CRIMPED IN THE MIDDLE, FOR HORIZONTAL RAIL EXPANSION JOINTS.

DO NOT USE SLIP FORMING FOR BRIDGE RAILING, AESTHETIC PARAPET TUBE. CAST ALL RAILINGS IN PLACE.

POSITION U-BOLTS FOR FENCING BASE PLATES ACCURATELY ACCORDING TO THE PLANS. HOLD THEM FIRMLY IN PLACE USING A TEMPLATE.

DO NOT INSTALL THE HSS 2" x 2" x 1/8" RAIL ON BRIDGE RAILING, AESTHETIC PARAPET TUBES USED IN COMBINATION WITH PEDESTRIAN FENCING.

INCLUDE ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO INSTALL PEDESTRIAN FENCING IN THE PAY ITEM "FENCE, STRUCTURE."



DEPARTMENT DIRECTOR  
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR  
FENCING FOR BRIDGE RAILING,  
AESTHETIC PARAPET TUBE

(SPECIAL DETAIL)  
FHWA APPROVAL

12/10/2025  
PLAN DATE

B-41-D

SHEET  
3 OF 3

DRAWN BY: BLT  
 CHECKED BY: CWC  
 APPROVED BY: KCK

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT  
 FACTORS FOR BRIDGE ESTIMATES

ISSUED: 01/26/26  
 SUPERSEDES: 12/16/19

**STEEL REINFORCEMENT WEIGHTS**

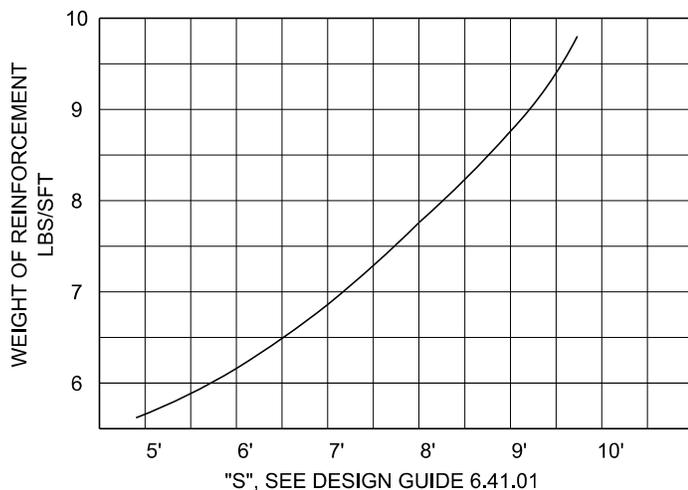
SUBSTRUCTURE UNIT	LBS/CYD OF CONC.
CANTILEVER ABUTMENT	50
COUNTERFORT ABUTMENT	100
GRAVITY ABUTMENT	15
CURTAIN WALL ABUTMENT	50
COLUMN & GIRDER PIER (HWY.)	120
COLUMN & GIRDER PIER (R.R.)	160
GRAVITY PIER	15
PILE CAP	70
SUBSTRUCTURE UNIT	LBS/CONC. UNIT
STANDARD SLAB (ON STRINGERS)	SEE GRAPH BELOW
SIMPLE SPAN T-BEAM	250/CYD
CONTINUOUS SLAB	260/CYD
CONTINUOUS T-BEAM	350/CYD
SIMPLE SPAN SLAB	170/CYD
BURIED T-BEAM	200/CYD
RIGID FRAME	175/CYD
SOLID PARAPET RAILING	14/FT
BARRIER RAILING, TYPE 4	25/FT
BARRIER RAILING, TYPE 5	21/FT

**RAILING WEIGHTS**

RAILING TYPE	LBS/FT
SOLID PARAPET RAILING	① 357
BRIDGE BARRIER RAILING, TYPE 4	475
BRIDGE BARRIER RAILING, TYPE 5	392
BRIDGE BARRIER RAILING, TYPE 6	601
BRIDGE BARRIER RAILING AESTHETIC TYPE 6, DET 2	615
BRIDGE BARRIER RAILING, TYPE 7	414
BRIDGE BARRIER RAILING AESTHETIC TYPE 7, DET 2	428
BRIDGE RAILING, 1 TUBE	10
BRIDGE RAILING, 2 TUBE (TUBE & POST ONLY)	② 51
BRIDGE RAILING, 2 TUBE (WITH BRUSHBLOCK)	② 185
BRIDGE RAILING, 3 TUBE WITH PICKETS (SIDEWALK)	② 86
BRIDGE RAILING, 3 TUBE WITH PICKETS (BRUSHBLOCK)	② 270
BRIDGE RAILING, 4 TUBE (BICYCLE)	② 265
BRIDGE RAILING, 4 TUBE (PEDESTRIAN)	② 80
BRIDGE RAILING, 5 TUBE	② 70
BRIDGE RAILING, AESTHETIC PARAPET TUBE	② 320

① INCLUDES WEIGHT OF BRIDGE RAILING, 1-TUBE.

② VARIES BASED UPON VERTICAL POST SPACING.



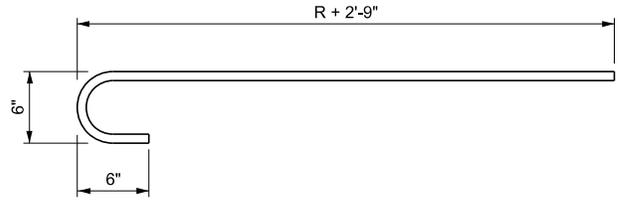
PREPARED BY  
DESIGN DIVISION

1.21.01

DRAWN BY: BLT  
 CHECKED BY: CWC  
 APPROVED BY: KCK

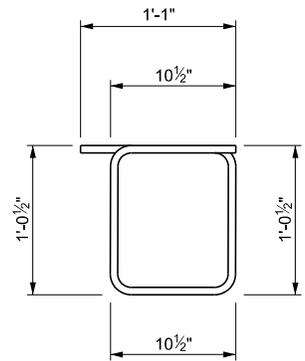
MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT  
 BRIDGE RAILING, 2 TUBE

ISSUED: 01/26/26  
 SUPERSEDES: 03/27/23

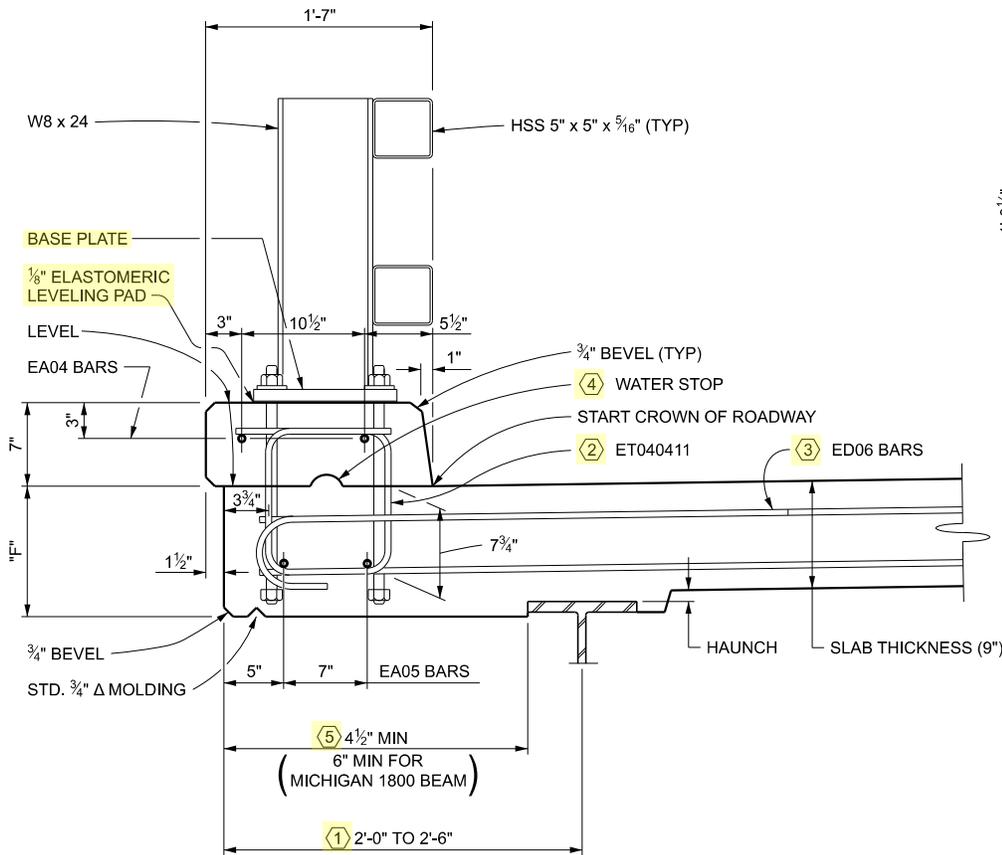


**ED06 BAR**

R =  $\phi$  BEAM TO SLAB FASCIA DISTANCE



**ET040411 BAR**



**NOTES:**

"F" CONSTANT EQUALS SLAB THICKNESS PLUS THICKEST FASCIA BEAM FLANGE PLUS 1/2" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN MINIMUM SLAB THICKNESS AT CURB PLUS HAUNCH (1").

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

THE DETAILED REINFORCEMENT IN THE SLAB (EA05 & ED06 BARS) IS THE MINIMUM FOR THE RAILING. THE DESIGN OF THE SLAB OVERHANG MAY REQUIRE ADDITIONAL REINFORCEMENT (OR INCREASING THE REINFORCEMENT AREA (DIAMETER) SHOWN). BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-21-SERIES.

① IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE ET BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

② SPACE AT ALTERNATE TRANSVERSE SLAB BARS (1'-6" MAX). PLACE ADDITIONAL ET040411 BARS 9" EACH SIDE OF  $\phi$  RAILING POST.

③ AT EACH POST PLACE 7 - ED060409 BARS SPACED AT 9".

④ 2" HIGH x 4" LONG ( $\pm$ ), FORMING NOT REQUIRED.

⑤ 4 1/2" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

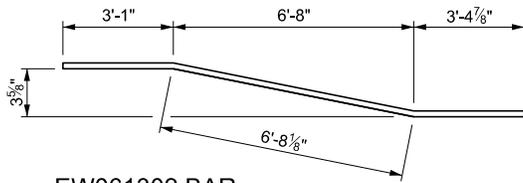
PREPARED BY  
 DESIGN DIVISION

**6.29.06**

DRAWN BY: BLT  
 CHECKED BY: CWC  
 APPROVED BY: KCK

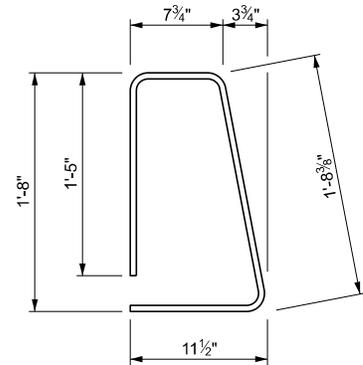
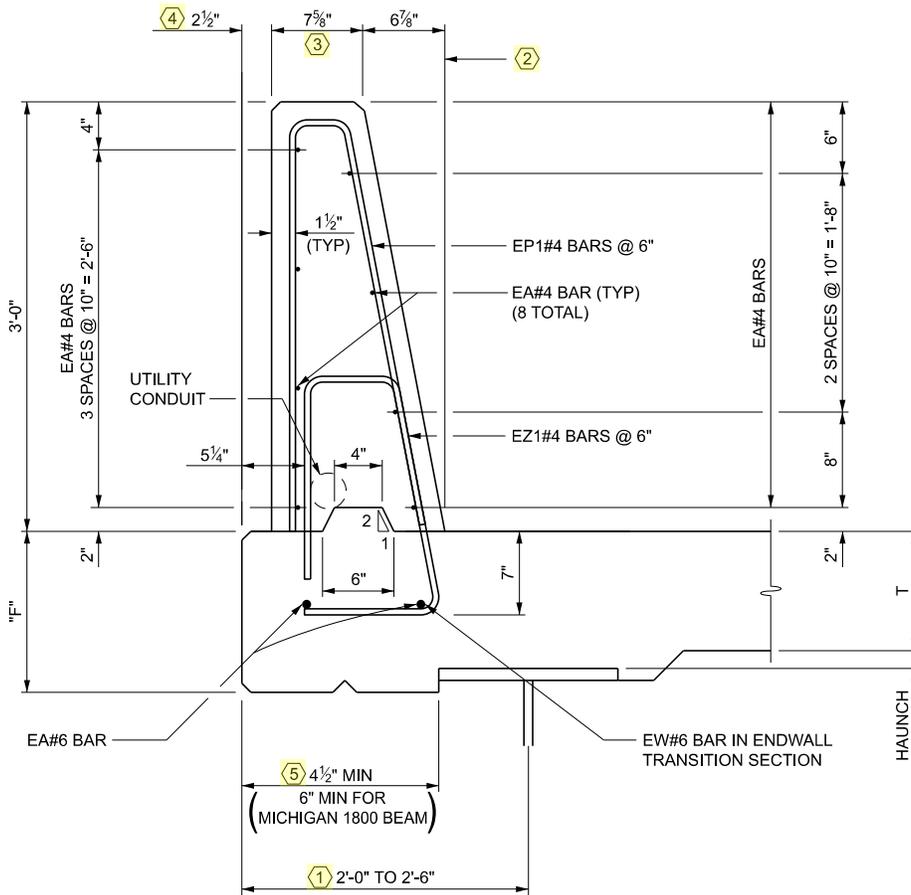
MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT  
 BRIDGE BARRIER RAILING TYPE 7

ISSUED: 01/26/26  
 SUPERSEDES: 12/16/19

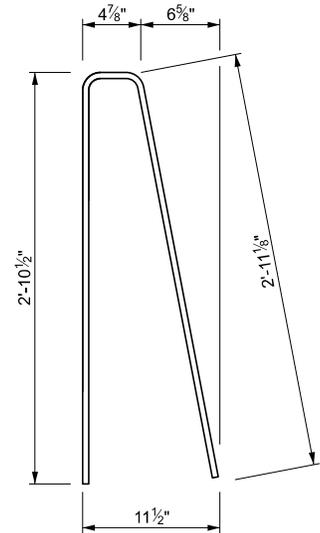


EW061302 BAR

WEIGHT =  
 414 LBS/LFT (BRIDGE BARRIER RAILING TYPE 7)  
 428 LBS/LFT (BRIDGE BARRIER RAILING AESTHETIC TYPE 7, DET 2)



EZ1#4 BAR



EP1#4 BAR

NOTE:

"F" EQUALS SLAB THICKNESS PLUS THICKEST FASCIA BEAM FLANGE PLUS 1/2" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN MINIMUM SLAB THICKNESS AT CURB PLUS HAUNCH (1").

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-28-SERIES.

DO NOT PLACE MORE THAN ONE 3" Ø UTILITY CONDUIT IN THE BARRIER.

(1) IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE EZ BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

(2) PERPENDICULAR TO PLANE OF SLAB - NORMAL CROWN SECTION AND HIGH SIDE OF SUPERELEVATED SECTIONS. VERTICAL - LOW SIDE OF SUPERELEVATED SECTIONS.

(3) 8 5/8" BRIDGE BARRIER RAILING AESTHETIC TYPE 7, DET 2.

(4) BACK OF BARRIER TO SLAB FASCIA MAY BE DECREASED TO 1 1/2" (FROM 2 1/2") AND TOE OF BARRIER SHIFTED ACCORDINGLY TO ACCOMMODATE THE NEED FOR INCREASED OR MAINTAINING SHOULDER WIDTHS. DISTANCE TO BE DETAILED ON THE PLANS.

(5) 4 1/2" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

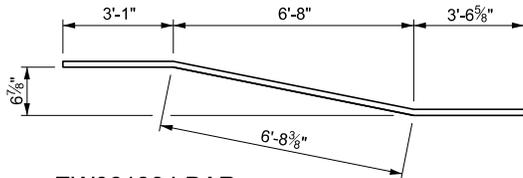
PREPARED BY  
 DESIGN DIVISION

6.29.08

DRAWN BY: BLT  
 CHECKED BY: CWC  
 APPROVED BY: KCK

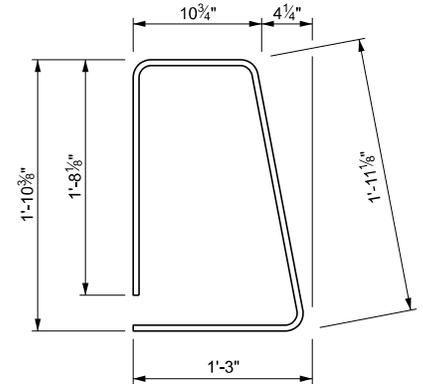
MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT  
 BRIDGE BARRIER RAILING TYPE 6

ISSUED: 01/26/26  
 SUPERSEDES: 12/16/19

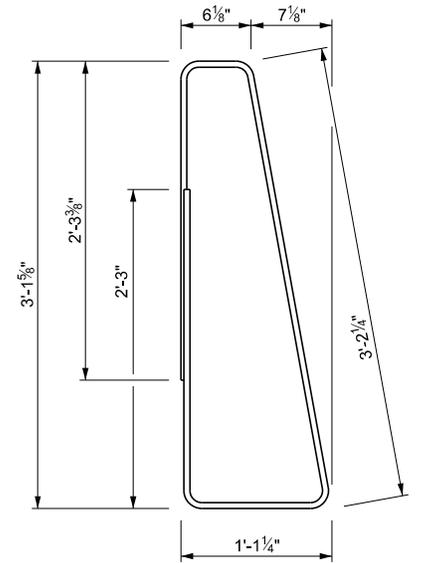
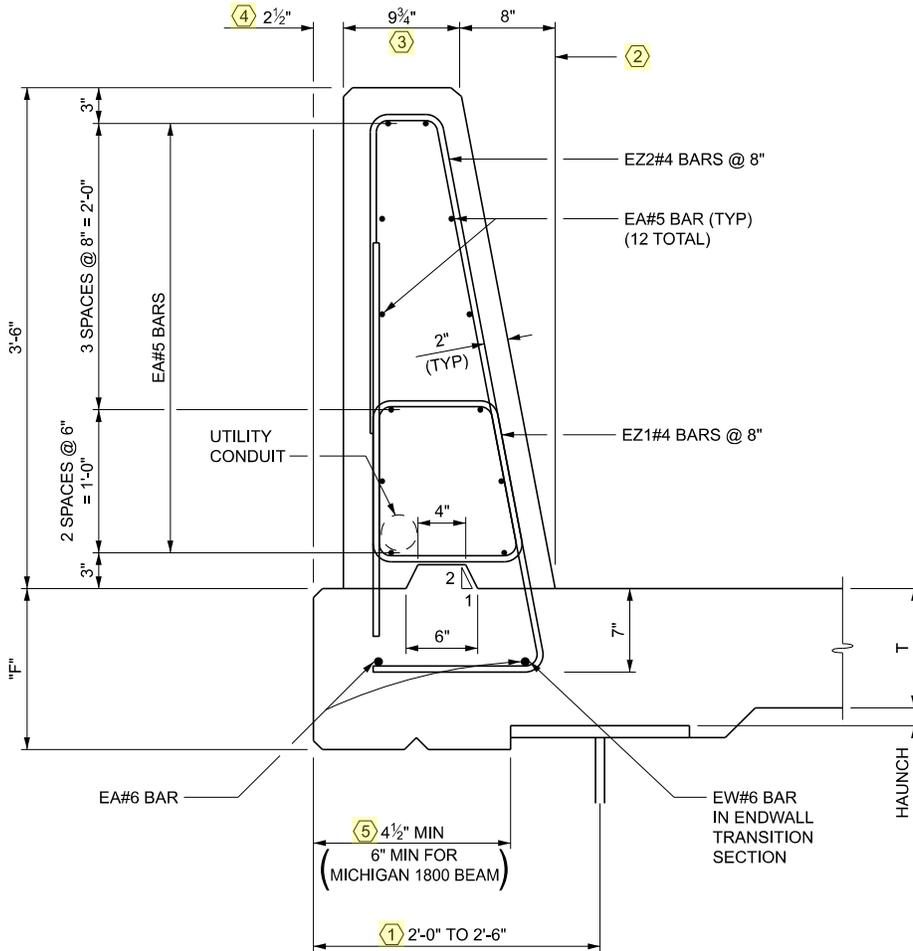


EW061304 BAR

WEIGHT =  
 601 LBS/LFT (BRIDGE BARRIER RAILING TYPE 6)  
 615 LBS/LFT (BRIDGE BARRIER RAILING AESTHETIC TYPE 6, DET 2)



EZ1#4 BAR



EZ2#4 BAR

NOTE:

"F" EQUALS SLAB THICKNESS PLUS THICKEST FASCIA BEAM FLANGE PLUS 1/2" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN MINIMUM SLAB THICKNESS AT CURB PLUS HAUNCH (1").

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-29-SERIES.

DO NOT PLACE MORE THAN ONE 3" Ø UTILITY CONDUIT IN THE BARRIER.

(1) IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE EZ BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

(2) PERPENDICULAR TO PLANE OF SLAB - NORMAL CROWN SECTION AND HIGH SIDE OF SUPERELEVATED SECTIONS. VERTICAL - LOW SIDE OF SUPERELEVATED SECTIONS.

(3) 10 3/4" BRIDGE BARRIER RAILING AESTHETIC TYPE 6, DET 2.

(4) BACK OF BARRIER TO SLAB FASCIA MAY BE DECREASED TO 1 1/2" (FROM 2 1/2") AND TOE OF BARRIER SHIFTED ACCORDINGLY TO ACCOMMODATE THE NEED FOR INCREASED OR MAINTAINING SHOULDER WIDTHS. DISTANCE TO BE DETAILED ON THE PLANS.

(5) 4 1/2" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

PREPARED BY  
 DESIGN DIVISION

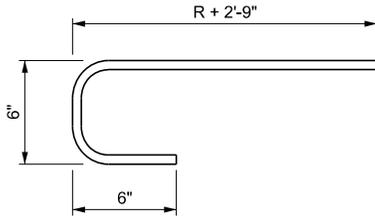
6.29.09

DRAWN BY: BLT  
 CHECKED BY: CWC  
 APPROVED BY: KCK

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT  
 BRIDGE RAILING, AESTHETIC PARAPET TUBE

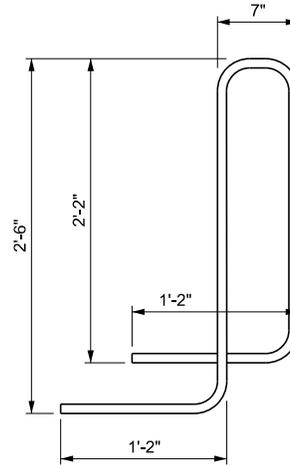
ISSUED: 01/26/26  
 SUPERSEDES: 03/27/23

WEIGHT = 320 LBS/FT

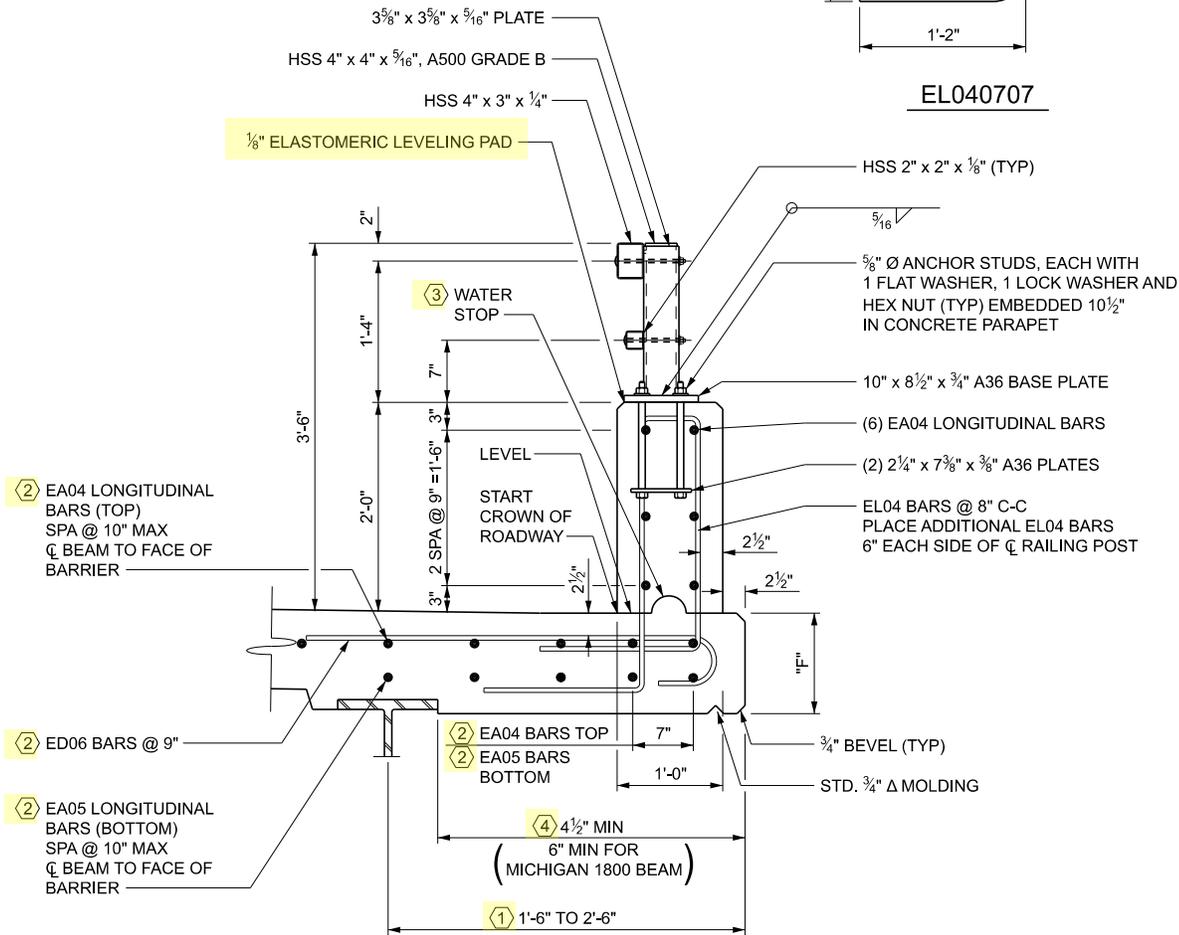


**ED06 BAR**

R =  $\bar{C}$  BEAM TO SLAB FASCIA DISTANCE



**EL040707**



**FLUSH MOUNT BRIDGE RAILING**

NOTES:

- ① IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE EL BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.
- ② THE DETAILED REINFORCEMENT IN THE SLAB (EA04, EA05 & ED06 BARS) IS THE MINIMUM FOR THE RAILING IN ADDITION TO STANDARD BRIDGE SLAB REINFORCEMENT. THE DESIGN OF THE SLAB OVERHANG MAY REQUIRE ADDITIONAL REINFORCEMENT (OR INCREASING THE REINFORCEMENT AREA (DIAMETER) SHOWN). ALL TOP TRANSVERSE BRIDGE SLAB REINFORCEMENT IS HOOKED SIMILAR TO THE ED06 BAR DETAILED ON THIS SHEET. BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.
- ③ 2" HIGH x 4" WIDE (±). FORMING NOT REQUIRED.
- ④ 4 1/2" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

FOR ADDITIONAL DETAILS ON RAILING, SEE STANDARD PLAN B-25-SERIES AND GUIDES 6.29.10A & 6.29.10B.

DO NOT PLACE UTILITY CONDUITS IN THE BARRIER.

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

PREPARED BY  
 DESIGN DIVISION

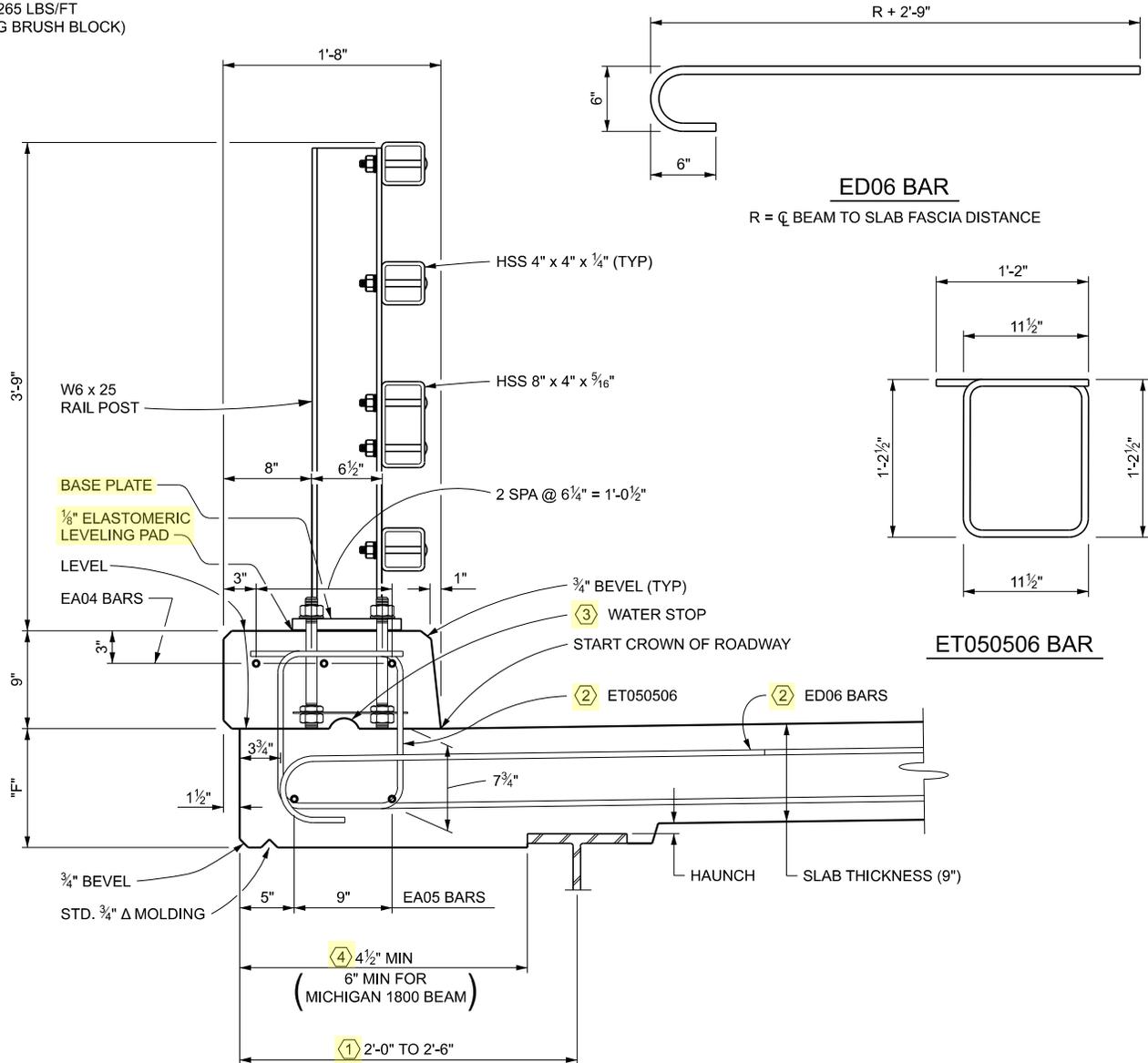
**6.29.10**

DRAWN BY: BLT  
 CHECKED BY: CWC  
 APPROVED BY: KCK

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT  
 BRIDGE RAILING, 4 TUBE  
 BICYCLE RAILING OPTION

ISSUED: 01/26/26  
 SUPERSEDES: 03/27/23

WEIGHT = 265 LBS/FT  
 (INCLUDING BRUSH BLOCK)



NOTES:

"F" CONSTANT EQUALS SLAB THICKNESS PLUS THICKEST FASCIA BEAM FLANGE PLUS 1/2" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN MINIMUM SLAB THICKNESS AT CURB PLUS HAUNCH (1").

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

THE DETAILED REINFORCEMENT IN THE SLAB (EA05 & ED06 BARS) IS THE MINIMUM FOR THE RAILING. THE DESIGN OF THE SLAB OVERHANG MAY REQUIRE ADDITIONAL REINFORCEMENT (OR INCREASING THE REINFORCEMENT AREA (DIAMETER) SHOWN). BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-26-SERIES.

- ① IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE ET BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.
- ② AT EACH POST PLACE 7 - ET050506 BARS SPACED AT 6" AND ED06 BARS WITH ALTERNATE ET05 BARS. PLACE ET05 AND ED06 BARS AT 12" MAX IN REMAINING AREAS.
- ③ 2" HIGH x 4" LONG (±). FORMING NOT REQUIRED.
- ④ 4 1/2" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

PREPARED BY  
 DESIGN DIVISION

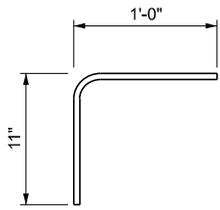
6.29.17

DRAWN BY: BLT  
 CHECKED BY: CWC  
 APPROVED BY: KCK

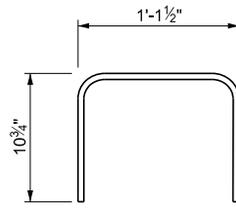
MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT  
 BRIDGE RAILING, 4 TUBE - SIDEWALK SECTION  
 PEDESTRIAN RAILING OPTION

ISSUED: 01/26/26  
 SUPERSEDES: 02/26/24

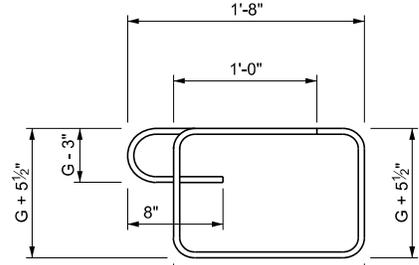
WEIGHT = 80 LBS/FT



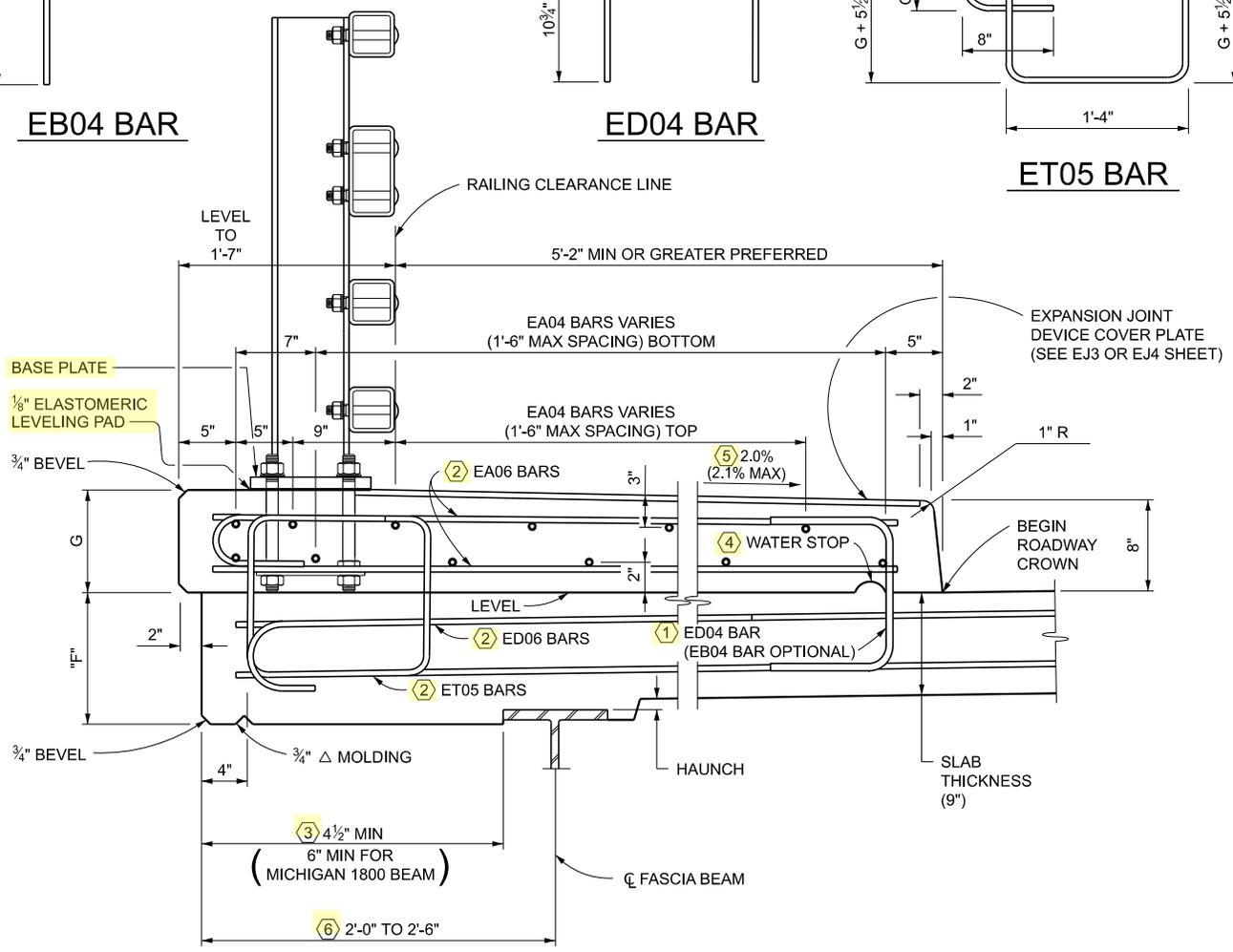
**EB04 BAR**



**ED04 BAR**



**ET05 BAR**



**NOTES:**

"F" CONSTANT EQUALS SLAB THICKNESS PLUS HAUNCH PLUS THICKEST FASCIA BEAM FLANGE PLUS 1/2" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN SLAB THICKNESS AT CURB LINE.

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

THE DETAILED REINFORCEMENT IN THE SLAB (ED06 BARS) IS THE MINIMUM FOR THE RAILING. THE DESIGN OF THE SLAB OVERHANG MAY REQUIRE ADDITIONAL REINFORCEMENT (OR INCREASING THE REINFORCEMENT AREA (DIAMETER) SHOWN). BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

- ① EB04 BAR MAY BE ADHESIVE ANCHORED INTO 6" DEEP HOLE INSTEAD OF ED04 BAR. SPACE WITH ALTERNATE TRANSVERSE SLAB BARS (1'-6" MAX).
- ② AT EACH POST PLACE 7 - ET05 BARS SPACED AT 6", ED06 BARS (SEE GUIDE 6.29.17) AND EA06 BARS WITH ALTERNATE ET05 BARS. PLACE ET05 BARS, ED06 BARS AND EA06 BARS AT 12" MAXIMUM IN REMAINING AREAS.
- ③ APPLIES TO CURVED BRIDGES ONLY.
- ④ 2" HIGH x 4" LONG (±). FORMING NOT REQUIRED.
- ⑤ USE A TARGET CROSS SLOPE (2.0%) LESS THAN THE MAXIMUM TO ACCOUNT FOR INCONSISTENCIES IN CONCRETE FINISHING.
- ⑥ IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE ET BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

PREPARED BY  
 DESIGN DIVISION

**6.29.17E**

**MICHIGAN DESIGN MANUAL  
BRIDGE DESIGN**

**CHAPTER 12**

**REHABILITATION PROJECTS**

**12.00 REHABILITATION PROJECTS**

**12.01 SCOPE OF REHABILITATION PROJECTS**

12.01.01 Structures Carrying Pedestrian Traffic

12.01.02 Historic Bridges

**12.02 GEOMETRIC CRITERIA (5-1-2000)**

12.02.01 Vertical Clearance (5-1-2000)

**12.03 DESIGN EXCEPTIONS / DESIGN VARIANCES (1-26-2026)**

12.03.01 Requests for Traffic Volumes and Crash Histories (9-1-88)

**12.04 STRUCTURE RESURFACING**

12.04.01 Origin of Projects

12.04.02 Bridges Within Road Project Limits

12.04.03 Concrete Removal

12.04.04 Hydrodemolishing (8-6-92)

12.04.05 Hand Chipping

12.04.06 Concrete Overlays (5-1-2000)

12.04.07 Hot Mix Asphalt (HMA) Overlays (5-1-2000)

12.04.08 Approaches (5-1-2000)

12.04.09 Metal Mesh Panels (2-22-2021)

# MICHIGAN DESIGN MANUAL BRIDGE DESIGN

## CHAPTER 12 REHABILITATION PROJECTS (continued)

### 12.08 MISCELLANEOUS REHABILITATION

12.08.01 Field Inspections

12.08.02 Concrete Repair - General (10-24-2001)

12.08.03 Substructure Repairs

12.08.04 Repair of Overhead Concrete Surfaces

12.08.05 Expansion Anchored Bolts

12.08.06 Deck Patching (5-1-2000)

12.08.07 Temporary Support Systems (8-6-92)

12.08.08 Protection of Existing Piers in the Clear Zone (7-24-2023)

12.08.09 Rocker Realignment (7-25-2022)

### 12.09 BRIDGE DECK REPAIR STRATEGY (8-6-92) (3-26-2012)

12.09.01 Deck Restoration

12.09.02 Bridge Deck Preservation Matrix (10-24-2001)

Appendix 12.01.01 Detroit Metropolitan Area (8-6-92)

Appendix 12.02 Clear Roadway Widths and Design Loading Structural Capacity  
(9-1-88) (2-21-2017)

Appendix 12.02.01A. Design Exception Requirements - Vertical Clearance (5-1-2000)

Appendix 12.02.01B. Projects Requiring Design Exception/Design Variance (1-26-2026)

Appendix 12.03.01 B. Sample request for Accident Analysis and Safety Review (5-1-2000)

# MICHIGAN DESIGN MANUAL

## BRIDGE DESIGN

### 12.02

#### GEOMETRIC CRITERIA

While it is desirable to improve all structures to current design standards, upgrading to this extent may not be considered cost effective where a project is otherwise programmed for only rehabilitation. Criteria for roadway widths and design loading structural capacity have been established in *A Policy on Design Standards - Interstate System*, 2005, and the 7th Edition of AASHTO's *Policy on Geometric Design of Highways and Streets* ("Green Book" or "GB7"). These criteria are based on the type of roadway carried by the structure and are summarized in [Appendix 12.02](#). Criteria for structures carrying interstate freeways are provided in AASHTO's 2005 edition of *A Policy On Design Standards - Interstate System*. The policy states: "The standards used for horizontal alignment, vertical alignment, and widths of median, traveled way, and shoulders for resurfacing, restoration and rehabilitation projects may be the AASHTO interstate standards that were in effect at the time of the original construction or inclusion into the interstate system." Non Interstate structures shall adhere to the **GB7** design criteria (standards). Therefore, if a bridge on a road project is not altered it is subject to design exceptions or design variances for full new/reconstruction standards. (1-26-2026)

### 12.02.01

#### Vertical Clearance (1-26-2026)

For Design Exception Requirements for Vertical Clearance see [Appendix 12.02.01A](#).

For Construction on Existing Roads (3R) freeway projects, if the existing vertical clearance is not reduced and a crash pattern involving high load hits does not exist, the vertical clearance may be retained without a design exception. However, if the vertical clearance is reduced to a value less than the standard (table value in Section [7.01.08](#)), a design exception will be required. The format for the design exception does not require a detailed evaluation but should include the basis for the request and review of the accident history and high load hits for the structures in the immediate vicinity of the structure.

For the remaining Construction on Existing Roads (3R) route classifications (Section [7.01.08](#)), existing vertical clearances greater than or equal to the minimums shown may be retained without a design exception. Vertical clearance reductions that fall below the minimums for new construction require a design exception.

# MICHIGAN DESIGN MANUAL

## BRIDGE DESIGN

### 12.03

#### DESIGN EXCEPTIONS / DESIGN VARIANCES

The **GB7** classification of a project as defined by Section 3.08 of the Road Design Manual will determine whether a geometric review is required for a bridge project. The **GB7** categorizes projects into three different project types, with the historic 3R/4R classifications following in parentheses:

- New Construction (4R)
- Reconstruction (4R)
- Construction on Existing Roads (3R)

If the project classification calls for a Design Exception/Design Variance, identify it during the Scope Verification Process or at Project Scoping. The table in Appendix 12.02.01B includes common bridge projects and their associated project types. Submittals of Design Exceptions / Variances on a timely basis are essential to maintain the project schedule and provide an approved design where conditions may inhibit designers from meeting the required design criteria.

Additionally, Urgent Needs and Request for Action projects as defined in Section 8.03, do not require geometrics review for design exceptions / design variances. (1-26-2026)

**Design Exception (DE)** - Design Exception requests are submitted on [Form DE26](#) and require approval by the Engineer of Design. With the exception of low speed (< 50 mph) vertical clearance DE's, subsequent FHWA approval is required for DE elements specifically designated for federal approval in the [Risk Based Project Involvement Stewardship and Oversight \(RBPI S&O\) plan](#). (12-27-2021)

Along with the justification for not meeting MDOT and/or AASHTO standards the design exception includes a site-specific Highway Safety Manual (HSM) Crash Analysis (if applicable) and the estimated total cost required to attain full standards compliance. If a specific HSM model does not exist for that roadway type, then perform a crash analysis using crash data for the existing conditions.

### 12.03 (continued)

Utilize the most recent 5 years of crash data available on RoadSoft for the requested Geometric element. The project Crash Analysis or Road Safety Audit (if required) are not applicable for design exceptions. See Road Design Manual Section [14.11](#) for design exception submittal procedures.

**Design Variance (DV)** – Design Variances are submitted on [Form DV26](#). The procedures and conditions of design variances are as follows:

- Crash analysis review on the element in question.
- Simple justification for not meeting standards (cost, ROW, environmental, etc.)
- If the DV involves a geometric element affected by a bridge, coordination with the Bridge Design Supervising Engineer is required.
- The DV is signed by the Associate Region Engineer of Development affirming that the DV is appropriate.
- The signed DV in ProjectWise completes the DV process.

During QA review of final plan package, if a DV is needed and not provided, the project will not proceed to letting until a DV is provided. If the DV is provided, then the project proceeds. Verification must be indicated on the Milestone Checklist and the Certification & Acceptance (CA) form.

See Road Design Manual Section [14.11](#) for additional information on design variances.

When a proposed road rehabilitation project contains a bridge not conforming to minimum standards, and no work is proposed for the bridge, AASHTO “bridges to remain in place” criteria apply to the bridges. See AASHTO publication, *A Policy on Design Standards- Interstate System*, 2005 or [the GB7](#). The road Design Engineer/Project Manager will prepare the design exception / variance request and shall be responsible for submitting any necessary design exceptions or design variances for the bridge. (1-26-2026)

**MICHIGAN DESIGN MANUAL  
BRIDGE DESIGN**

**Design Exception Requirements - Vertical Clearance (8-20-2009) (1-14-2013)**

Design Exceptions are needed where proposed vertical clearance does not meet the minimum clearance requirements provided in Section [7.01.08](#)

<b>Type of Project</b>	<b>Design Exception Required</b>	<b>Coordination with SDDCTEA Required</b>	<b>MDOT approval required by Engineer of Design Programs</b>	<b>FHWA Approval Required</b>
New and 4R reconstruction work on Interstate greater than \$1,000,000	Yes	Yes	Yes	Yes
New and 4R reconstruction work on Interstate less than \$1,000,000	Yes	Yes	Yes	No
New and 4R reconstruction work on Non Interstate Freeways greater than \$1,000,000	Yes	No	Yes	Yes
New and 4R reconstruction work on Non Interstate Freeways less than \$1,000,000	Yes	No	Yes	No
New and 4R reconstruction work on NHS Routes other than Freeways greater than \$1,000,000	Yes	No	Yes	Yes
New and 4R reconstruction work on NHS Routes other than Freeways less than \$1,000,000	Yes	No	Yes	No
New and 4R Reconstruction on Non-NHS Routes	Yes	No	Yes	No
3R Work on Interstate System	Yes	Yes	Yes	Only if negotiated oversight is assigned to FHWA on NHS projects > \$5 million.
3R Work on Non Interstate Freeways	Yes	No	Yes	
3R Work on Non-Freeway Routes	Yes	No	Yes	
Preventative Maintenance Work	No	No	No	No

**SDDCTEA - Surface Deployment and Distribution Command Transportation Engineering Agency**

**MICHIGAN DESIGN MANUAL  
BRIDGE DESIGN**

**PROJECTS REQUIRING DESIGN EXCEPTION/DESIGN VARIANCE**

Major Project Scope of Work	AASHTO Green Book (7 <sup>th</sup> Edition) Project Classification	DE/DV Required
New Bridge	New Construction	Yes
Bridge Replacement	Reconstruction	Yes
Complete Superstructure Replacement	Reconstruction	Yes
Partial Superstructure Replacement without Additional Lanes	Construction on Existing Roadway	Yes
Partial Superstructure Replacement with Additional Lanes	Reconstruction	Yes
Bridge Widening to Accommodate Additional Lanes	Reconstruction	Yes
Deck Replacement with Bridge Widening to Accommodate Additional Lanes	Reconstruction	Yes
Bridge Widening without Additional Lanes	Construction on Existing Roadway	Yes
Deck Replacement without Additional Lanes	Construction on Existing Roadway	Yes
Partial Substructure Replacement (can include the complete removal of an entire substructure element but not the replacement of all the substructure elements)	Construction on Existing Roadway	Yes
Barrier Replacement <sup>1</sup>	Construction on Existing Roadway	Yes
Deep Overlay <sup>2</sup>	Preventive Maintenance	No
Shallow Overlay <sup>2</sup>	Preventive Maintenance	No
Epoxy Overlay	Preventive Maintenance	No
Deck Patching	Preventive Maintenance	No
Healer/Sealer	Preventive Maintenance	No
Sealing Cracks in the Bridge Deck	Preventive Maintenance	No
Installing Cathodic Protection on the Bridge Deck	Preventive Maintenance	No
Joint Replacement or Joint Resealing	Preventive Maintenance	No
Elimination of an Existing Joint on the Bridge	Preventive Maintenance	No
Cleaning Joints	Preventive Maintenance	No
Repair or Replacement of Deck Drains	Preventive Maintenance	No
Cleaning or Flushing Deck Drains	Preventive Maintenance	No
Replacing Bridge Approach Slabs	Preventive Maintenance	No
Barrier Patching or Repair	Preventive Maintenance	No
Sealing Cracks in Barrier	Preventive Maintenance	No
Silane Treatment of Concrete	Preventive Maintenance	No
Structural Steel Repairs	Preventive Maintenance	No
Fatigue Crack Mitigation	Preventive Maintenance	No

**MICHIGAN DESIGN MANUAL  
BRIDGE DESIGN**

**PROJECTS REQUIRING DESIGN EXCEPTION/DESIGN VARIANCE**

Major Project Scope of Work	AASHTO Green Book (7th Edition) Project Classification	DE/DV Required
Retrofitting Non-Redundant Steel Tension Members (formerly known as Fracture Critical Members)	Preventive Maintenance	No
Cleaning and Coating Structural Steel	Preventive Maintenance	No
Pin and Hanger Replacement	Preventive Maintenance	No
Bearing Realignment or Replacement	Preventive Maintenance	No
Heat Straightening of Existing Steel Superstructure	Preventive Maintenance	No
Concrete Beam Repairs or Overcasting	Preventive Maintenance	No
Coating/Sealing Concrete Beams	Preventive Maintenance	No
Repair or Maintenance of Moveable Bridge Machinery	Preventive Maintenance	No
Repair or Maintenance of Movable Bridge Electrical Components	Preventive Maintenance	No
Cleaning or Washing of the Bridge	Preventive Maintenance	No
Substructure Patching	Preventive Maintenance	No
Coating/Sealing Substructure Concrete	Preventive Maintenance	No
Installing Cathodic Protection on the Substructure	Preventive Maintenance	No
Foundation Pile Preservation (Jackets/Wraps/Cathodic Protection)	Preventive Maintenance	No
Channel Clearing or Debris Removal in the Channel	Preventive Maintenance	No
Installing Scour Countermeasures	Preventive Maintenance	No
Request for Action Project	Preventive Maintenance	No
Urgent Need Project	Preventive Maintenance	No

<sup>1</sup> Barrier replacement projects involve the removal and replacement of the barrier along the full length of the bridge. Removal and replacement of a portion of the bridge barrier are considered barrier repair. The guidance included in Section 12.05.05 of the Bridge Design Manual must be considered when deciding between a barrier replacement project and a barrier repair project. Appropriate judgement must also be used to ensure that limits of a barrier replacement do not leave a short section of the existing bridge railing that will warrant a barrier replacement project in the future.

<sup>2</sup> A safety review must be completed as part of projects where the major project scope of work includes either a deep overlay or a shallow overlay. Examine the existing cross slope or superelevation and follow the guidance in Section 3.08.01 of the Road Design Manual to determine whether a Design Exception/Design Variance Request must be prepared and submitted.