Road & Bridge Design Publications

Monthly Update – June 2024

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

E-mail road related questions to MDOT-Road-Design-Standards@michigan.gov.
E-mail bridge related questions to MDOT-Bridge-Design-Standards@michigan.gov.

Special Details
B-25-L: Bridge Railing, Aesthetic Parapet Tube: On sheet 4, decreased the length of the 5/8" slotted round head bolts to 1'- 0 ¾" to reduce the projection past the nut and still allow fabrication tolerances.

Road Design Manual
6.05.13: Safety Edge: Updated the detail and added a paragraph to clarify payment for the safety edge when the unit of measure for the pavement surface and/or aggregate shoulder is square yards.

13.04.05: Vertical Exploratory Investigation for Relocation: Added a new section regarding the use of the Special Provision for Vertical Exploratory Investigation for Relocation.

Bridge Design Manual
7.03.05: Subfootings: Subfootings are now required for all projects with footings. They will assure that formwork for footings is kept in position, rebar is on a solid base and that footing concrete is not contaminated during placement/pouring.

8.09.07: Temporary Support Notes: Added 48 hour notification requirement for temporary support foundation inspection by MDOT Soils Engineer.

Bridge Design Guides
6.20.01: Typical Section thru Dependent Backwall & 6.20.03: Typical Section thru Independent Backwall: Decreased height of joint waterproofing on vertical face of pavement seat by 3" to allow for adhesion of E3 joint or other possible joints.

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.

Index to Special Details

6-24-2024

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SPECIAL DETAIL NUMBER	NUMBER OF SHEETS	TITLE	CURRENT DATE
21	2	GUARDRAIL AT INTERSECTIONS	6-6-22
24	8	GUARDRAIL ANCHORED IN BACKSLOPE TYPES 4B, 4T, & 4MGS-8	12-6-22
99	2	CHAIN LINK FENCE WITH WIRE ROPE	12-6-22
R-28-K	7	CURB RAMP AND DETECTABLE WARNING DETAILS	11-8-23
R-29-J	4	DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK	11-8-23
R-32-F	8	APPROACH CURB & GUTTER DOWNSPOUTS	9-20-22
R-32-SD	6	APPROACH CURB & GUTTER DOWNSPOUTS (FOR SAFETY SHAPES)	4-24-23
R-43-J	2	LOCATION OF TRANSVERSE JOINTS IN PLAIN CONCRETE PAVEMENT	1-4-22
R-44-G	7	CONCRETE PAVEMENT REPAIR	9-18-23
R-45-K	2	PAVEMENT REINFORCEMENT FOR BRIDGE APPROACH	1-4-22
R-50-H	6	LIGHT STANDARD FOUNDATION (CONCRETE BARRIER, DOUBLE FACE)	12-12-23
R-53-A	22	TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION	8-14-15
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	4	GUARDRAIL APPROACH TERMINAL TYPE 2M	6-16-22
R-63-C	3	GUARDRAIL APPROACH TERMINAL TYPE 3M	10-2-23
R-66-E	4	GUARDRAIL DEPARTING TERMINAL TYPES B, T, & MGS	9-14-23
R-67-G	16	GUARDRAIL ANCHORAGE, BRIDGE, DETAILS	4-3-24
R-67-SD	6	GUARDRAIL ANCHORAGE, BRIDGE, DETAILS (FOR SAFETY SHAPES)	4-4-23
R-72-D	6	GUARDRAIL LONG SPAN INSTALLATIONS	8-23-22
R-73-F	3	GUARDRAIL OVER BOX OR SLAB CULVERTS	8-1-19
R-80-F	8	GRANULAR BLANKETS, UNDERDRAINS, OUTLET ENDINGS, & BULKHEADS	6-28-21
R-88-E	4	STEEL END SECTION	3-7-23
R-100-I	4	SEEDING AND TREE PLANTING	12-8-23
R-110-B	3	PAVEMENT SAFETY EDGE	6-14-21
R-112-J	10	SHOULDER AND CENTER LINE CORRUGATIONS	8-2-23
R-126-I	5	PLACEMENT OF TEMPORARY CONCRETE & STEEL BARRIER	8-25-15
R-127-H	8	DELINEATOR INSTALLATIONS	8-11-23
R-130-A	6	LIGHT STANDARD DETAILS	1-4-24

***Denotes New or Revised Special Detail to be included in projects for (beginning with) the October 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 assure prompt delivery, requests ***must*** **be made in advance.** Contact: 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 Detail Sheets

6-24-2024

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DETAIL NUMBER	NUMBER OF SHEETS	TITLE	CURRENT DATE
B-21-K	4	BRIDGE RAILING, 2 TUBE	4-16-24
*B-25-L	8	BRIDGE RAILING, AESTHETIC PARAPET TUBE	6-24-24
B-26-G	8	BRIDGE RAILING, 4 TUBE	4-16-24
B-27-B	7	BRIDGE RAILING, 3 TUBE WITH PICKETS	4-16-24
B-28-A	7	BRIDGE BARRIER RAILING, TYPE 7	1-22-24
B-29-A	8	BRIDGE BARRIER RAILING, TYPE 6	1-22-24
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
EJ3AF	1 to 4	EXPANSION JOINT DETAILS (See Notes)	1-23-23
EJ4S	1 to 4	EXPANSION JOINT DETAILS (See Notes)	1-23-23
PC-1N	2	PRESTRESSED CONCRETE I-BEAM DETAILS (See Notes)	11-28-22
PC-2I	2	70" PRESTRESSED CONCRETE I-BEAM DETAILS (See Notes)	11-28-22
PC-4G	2	PRESTRESSED CONCRETE 1800 BEAM DETAILS (See Notes)	11-28-22
PC-5A	2	PRESTRESSED CONCRETE BULB-TEE BEAM DETAILS (See Notes)	11-28-22

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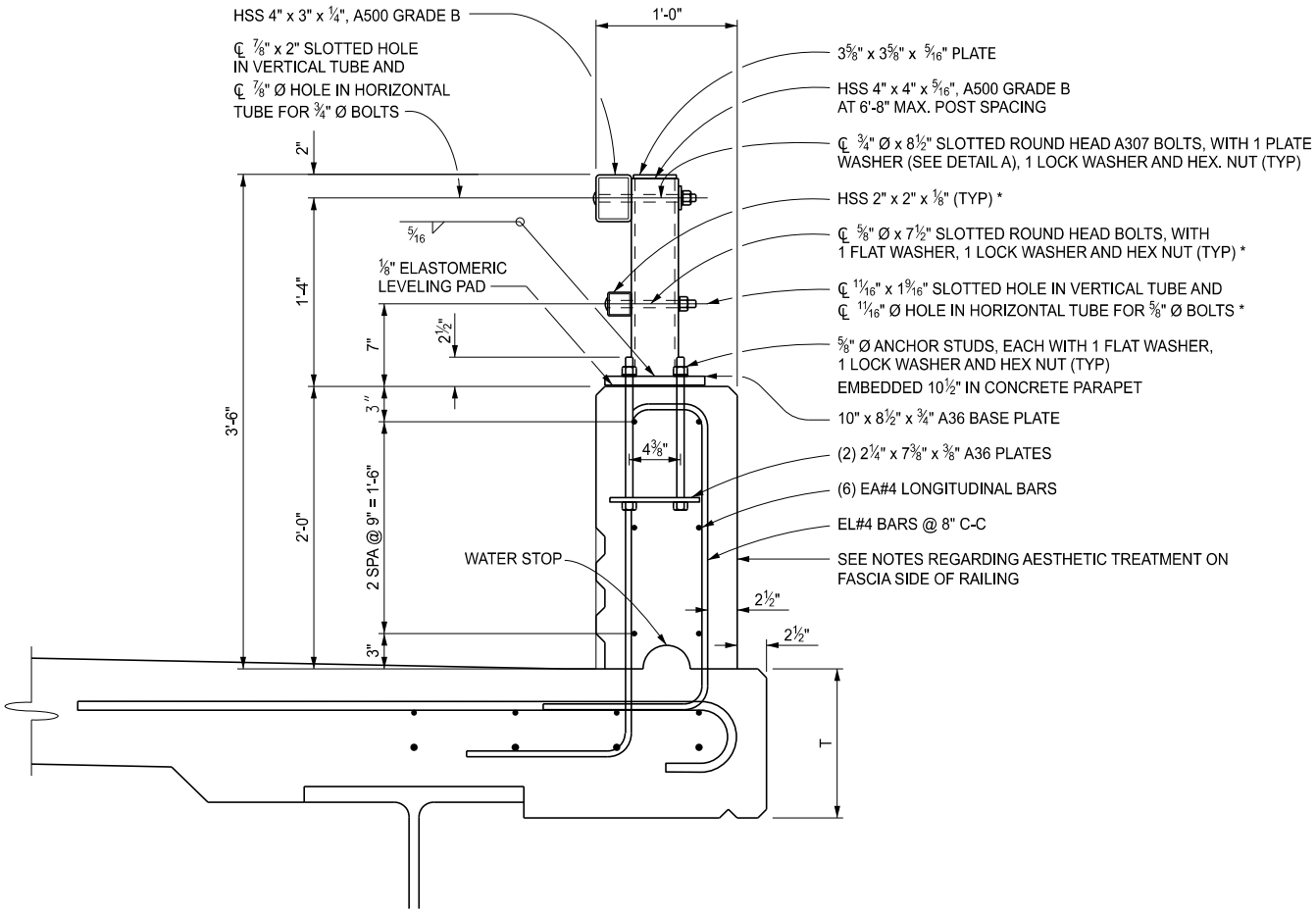
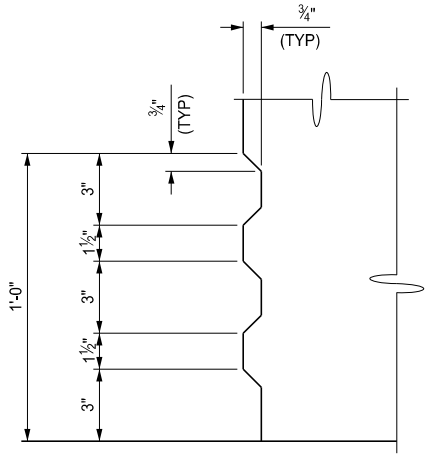
Notes:

Details EJ3AF & EJ4S 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. Add the sheet to the plans as a normal plan sheet. Call out and designate the location of the expansion joint device and the end plate on the Superstructure Sheet in the plan set.

Details PC-1N, PC-2I, PC-4G, and PC-5A 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.



FLUSH MOUNT BRIDGE RAILING



AESTHETIC TREATMENT DETAIL

NOTES:

ALL WORK AND MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

DETAILS SHOWN ARE IN ACCORDANCE WITH AASHTO SPECIFICATIONS.

BRIDGE RAILING USED WITH SIDEWALK SHALL BE USED ONLY WITH THE SIDEWALK CONFIGURATION (PROFILE) SHOWN ON THIS STANDARD PLAN.

NO SLIP FORMING OF "BRIDGE RAILING, AESTHETIC PARAPET TUBE" SHALL BE ALLOWED. RAILING SHALL BE CAST IN PLACE.

THE LIGHT STANDARD ANCHOR BOLT ASSEMBLY IS INCLUDED IN THE BID ITEM "BRIDGE RAILING, AESTHETIC PARAPET TUBE". SEE STANDARD PLAN B-103-SERIES.

FOR LIGHT STANDARD ANCHOR BOLT ASSEMBLY DETAILS, IF BRIDGE RAILING, AESTHETIC PARAPET TUBE IS PLACED FLUSH ON THE BRIDGE DECK (WITHOUT SIDEWALK), THE LIGHTING CONDUIT SHALL NOT BE PLACED IN THE RAILING.

A RUBBED FINISH ON THE VERTICAL AND TOP CONCRETE SURFACES OF THE PARAPET RAILING IS REQUIRED.

AESTHETIC TREATMENT AS DETAILED ON THIS SHEET SHALL BE ADDED TO THE FASCIA SIDE OF RAILING IF NO AESTHETIC TREATMENT IS DETAILED ON THE PLAN SHEETS AND SHALL BE INCLUDED IN THE BID ITEM "BRIDGE RAILING, AESTHETIC PARAPET TUBE". AESTHETIC TREATMENT DETAILED ON THE PLAN SHEETS MAY BE UP TO 1" IN CONCRETE DEPTH WITHOUT MODIFICATION TO THE RAILING WIDTH AND SHALL BE INCLUDED IN THE BID ITEM "BRIDGE RAILING, AESTHETIC PARAPET TUBE". AESTHETIC TREATMENT REQUIRING ADDITIONAL RAILING WIDTH OR THE USE OF ELASTOMERIC FORM LINERS SHALL BE PAID FOR SEPARATELY.

* THE HSS 2" x 2" x ⅛" RAIL, SLOTTED HOLE, AND ⅝" BOLT ARE NOT REQUIRED WHEN RAILING IS USED IN COMBINATION WITH PEDESTRIAN FENCING (SEE STANDARD PLAN B-41-SERIES).

APPROVED BY: _____
DIRECTOR, BUREAU OF BRIDGES AND STRUCTURES

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

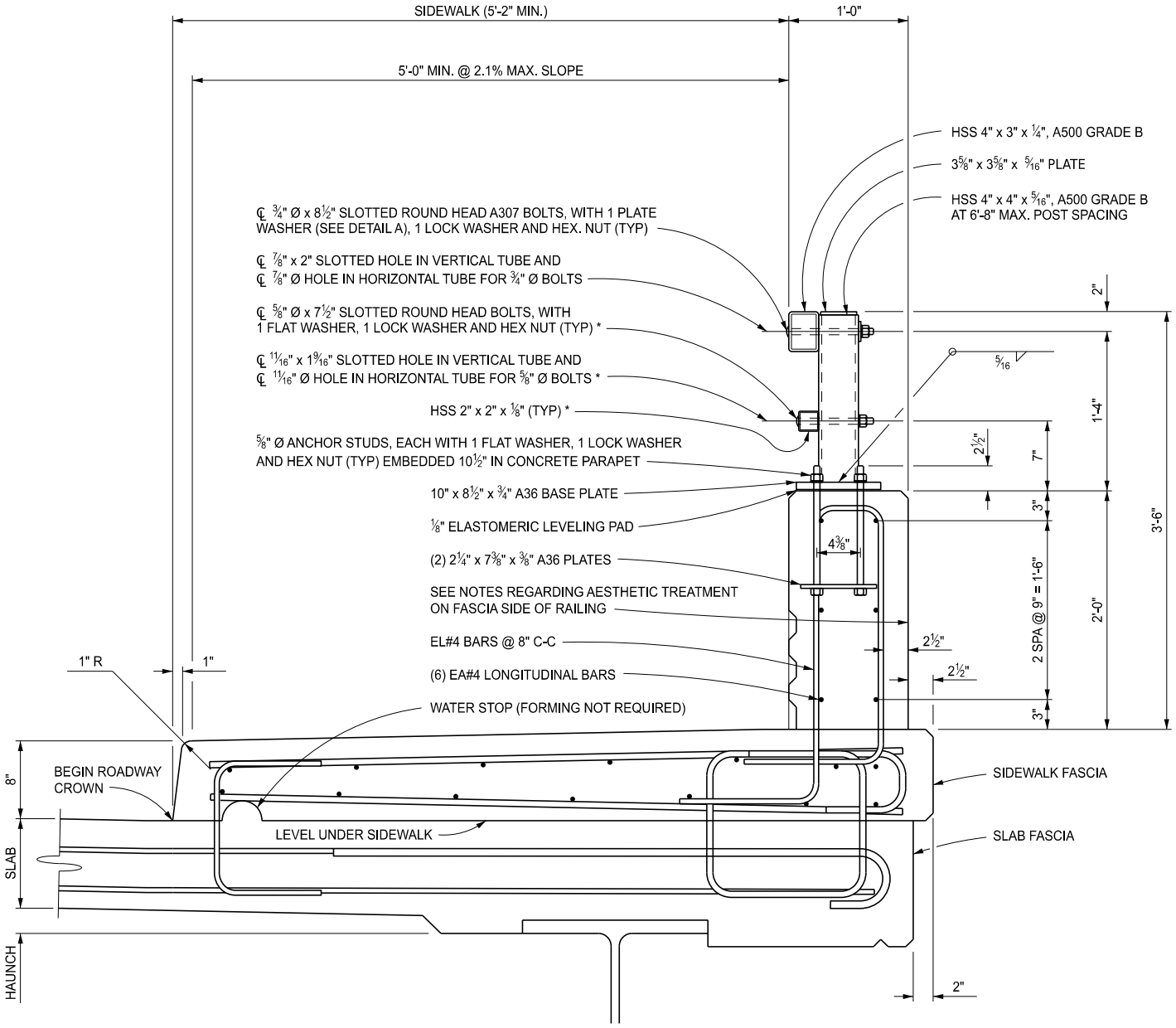
APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT

MDOT
Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
BRIDGE RAILING, AESTHETIC PARAPET TUBE

(SPECIAL DETAIL) FHWA APPROVAL	06/24/2024 PLAN DATE	B-25-L	SHEET 1 OF 8



BRIDGE RAILING WITH SIDEWALK

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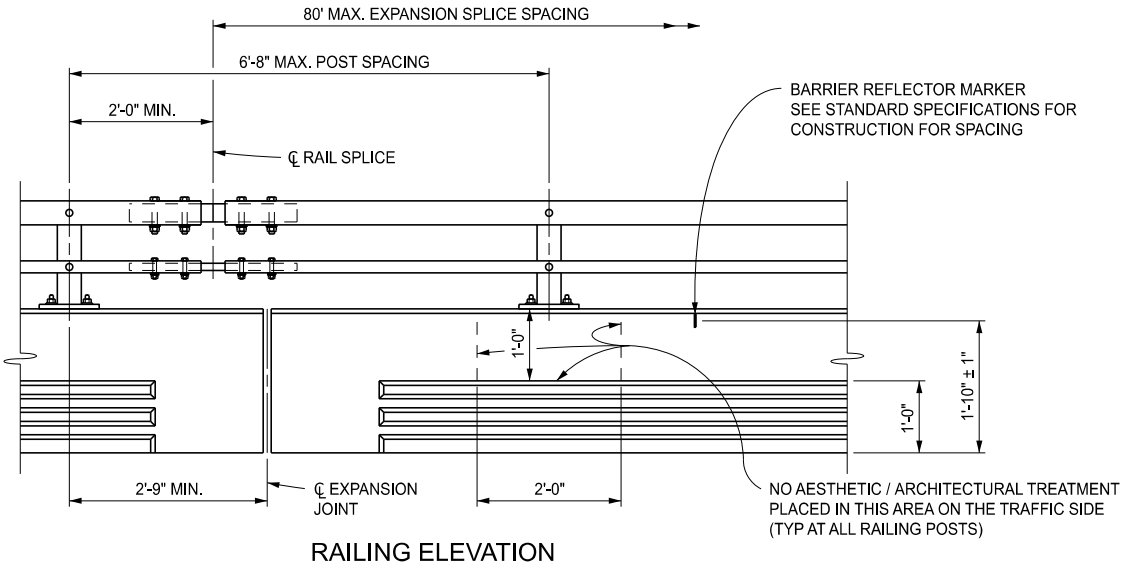
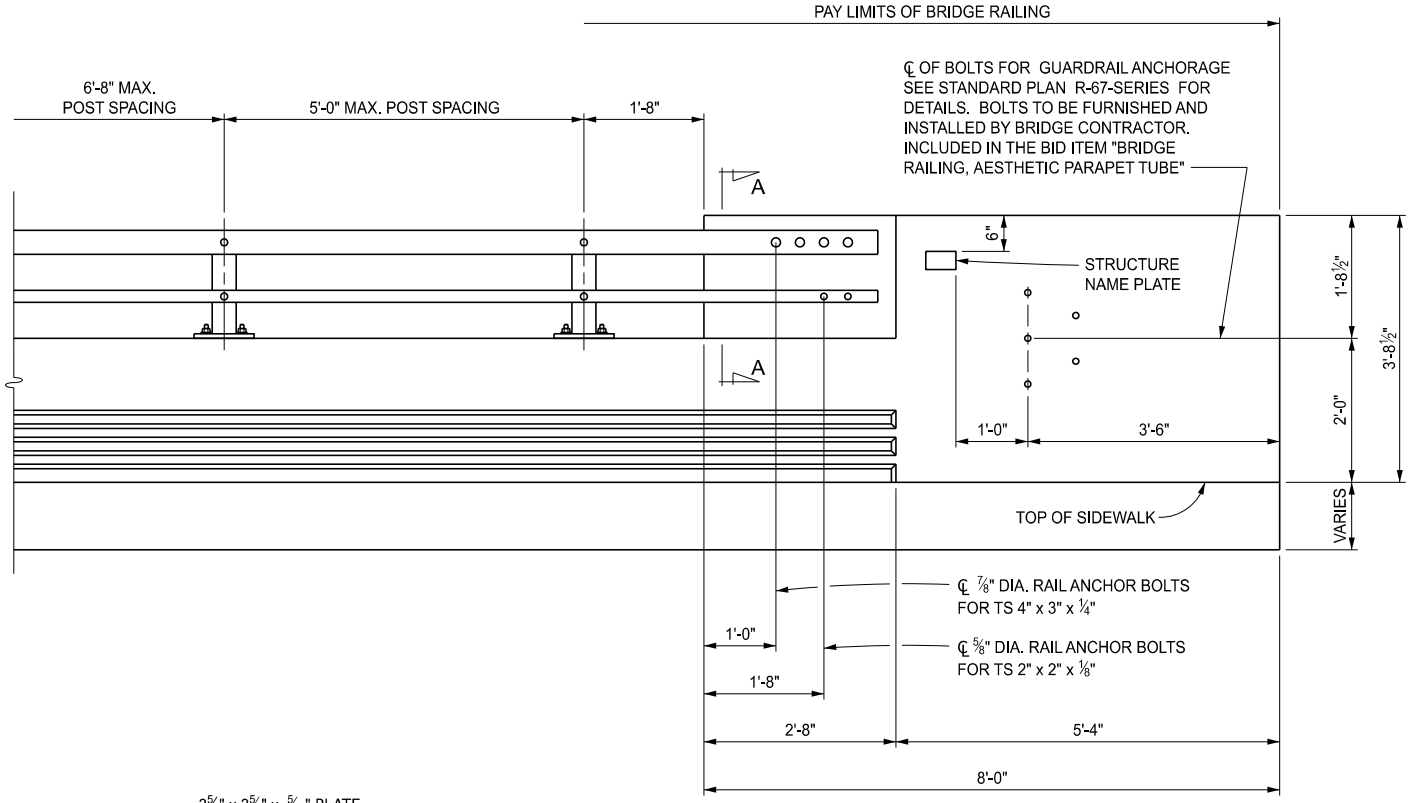
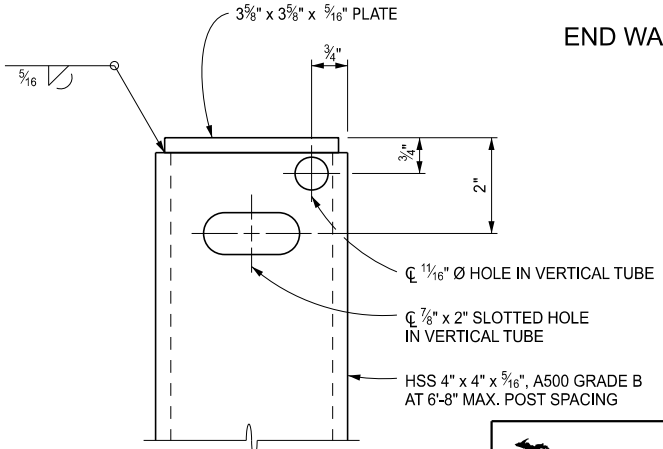
(SPECIAL DETAIL) FHWA APPROVAL	06/24/2024 PLAN DATE	B-25-L	SHEET 2 OF 8



RAILING ELEVATION



END WALL ELEVATION



VERTICAL TUBE DETAIL
FRONT VIEW

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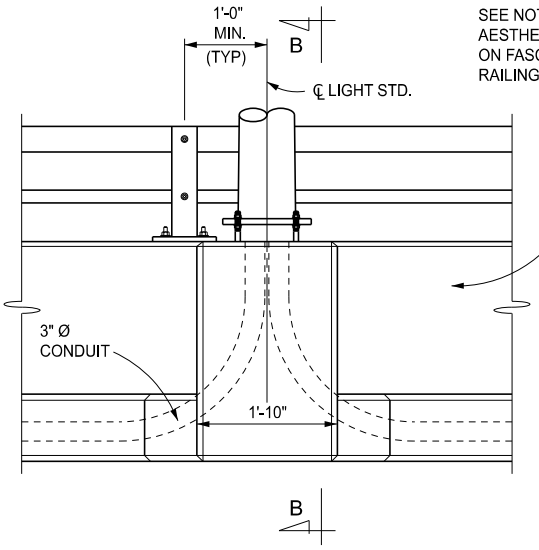
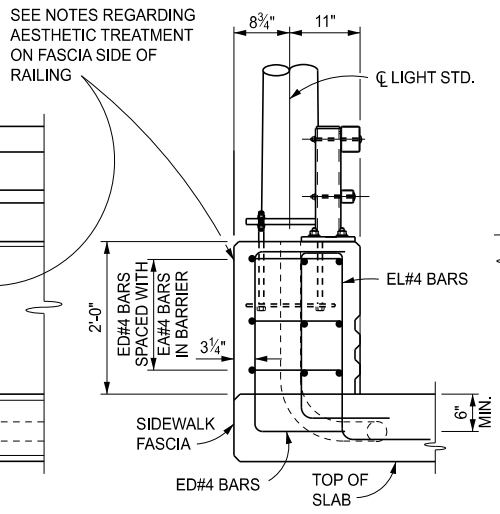
STANDARD PLAN FOR
BRIDGE RAILING, AESTHETIC PARAPET TUBE

(SPECIAL DETAIL)	06/24/2024	B-25-L	SHEET
FHWA APPROVAL	PLAN DATE		3 OF 8



ELEVATION VIEW



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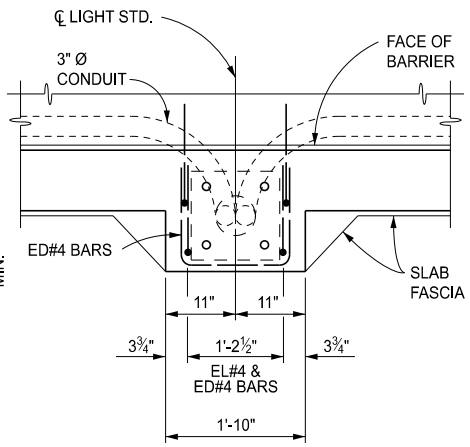
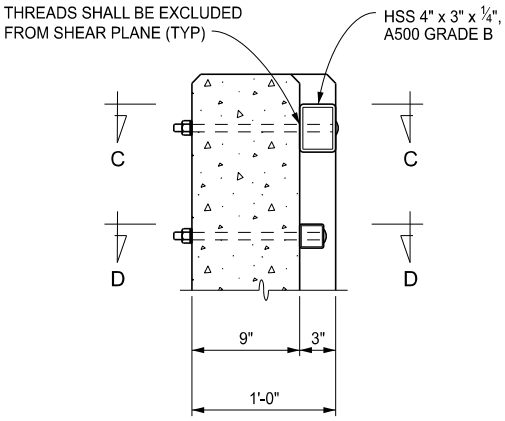
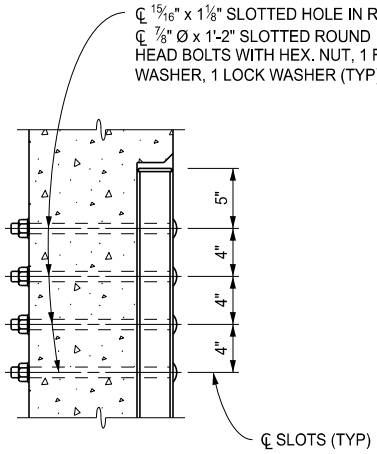


PLAN VIEW

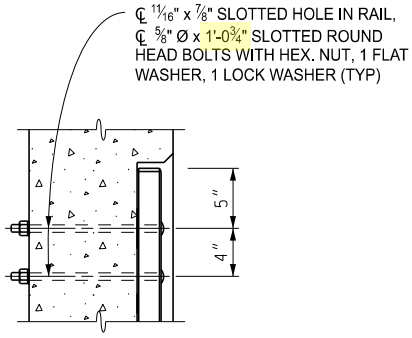
LIGHT STANDARD DETAILS



SECTION A-A



SECTION C-C



SECTION D-D

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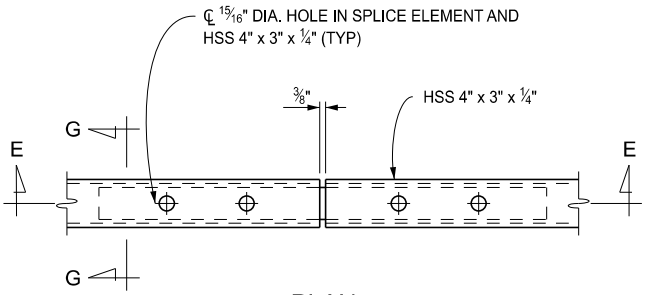
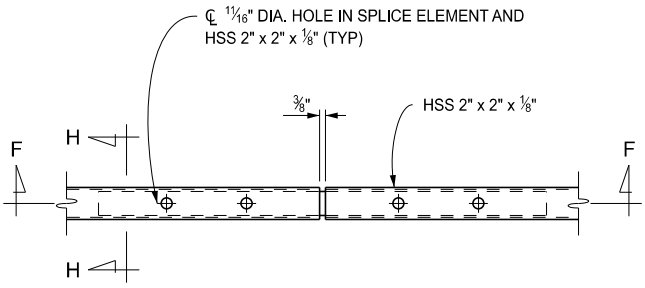
STANDARD PLAN FOR
BRIDGE RAILING, AESTHETIC PARAPET TUBE

(SPECIAL DETAIL)	06/24/2024	B-25-L	SHEET
FHWA APPROVAL	PLAN DATE		4 OF 8



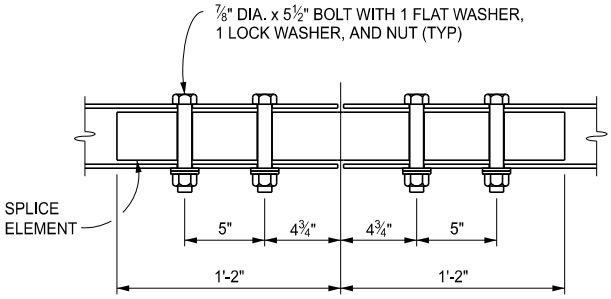
PLAN

HSS 4" x 3" x 1/4"



PLAN

HSS 2" x 2" x 1/8"



SECTION E-E

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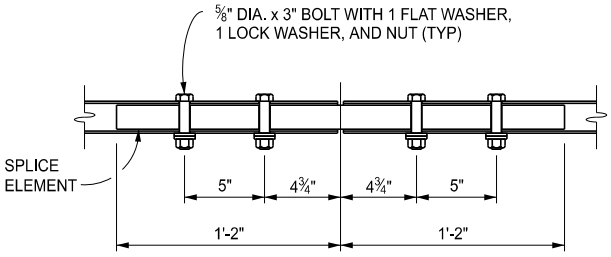
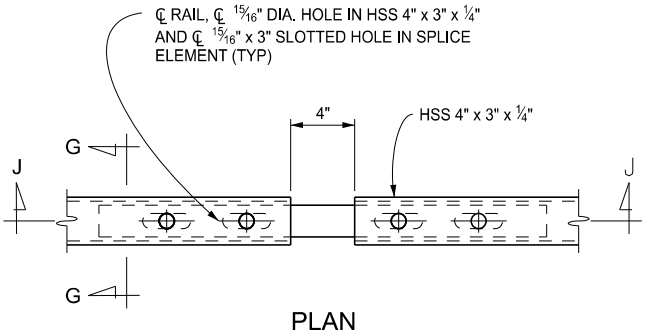


SECTION F-F

HSS 2" x 2" x 1/8"

FIXED SPLICE DETAILS



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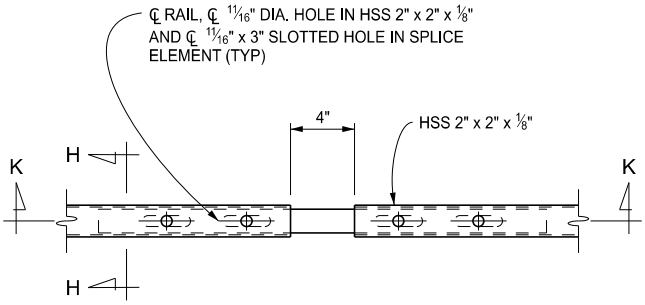

PLAN

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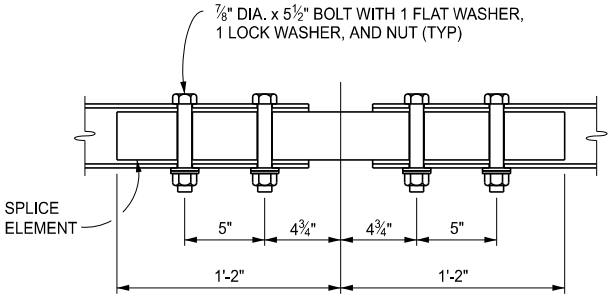

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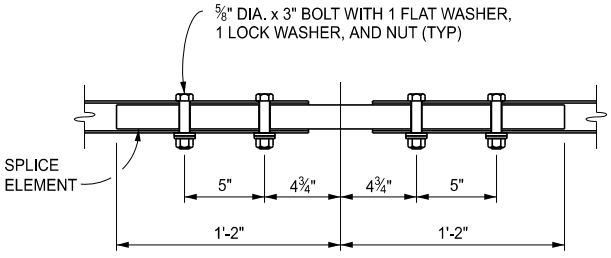

SECTION K-K

HSS 2" x 2" x 1/8"

EXPANSION SPLICE DETAILS

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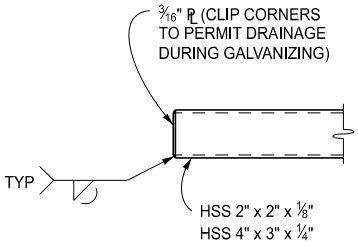
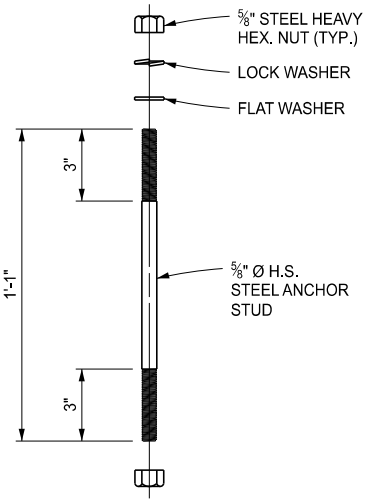
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
BRIDGE RAILING, AESTHETIC PARAPET TUBE

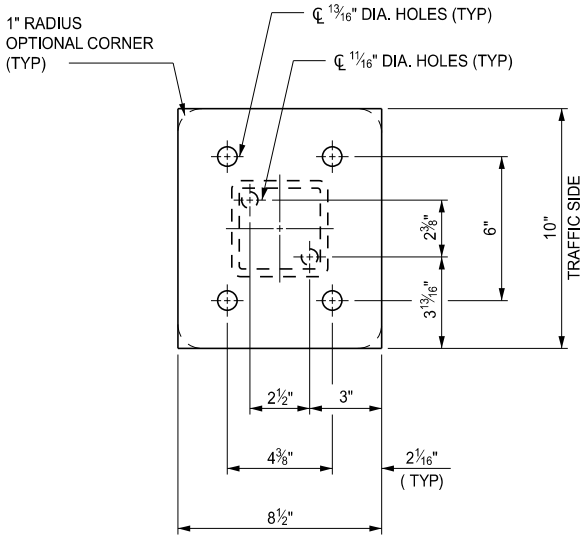
(SPECIAL DETAIL)	06/24/2024	B-25-L	SHEET
FHWA APPROVAL	PLAN DATE		5 OF 8



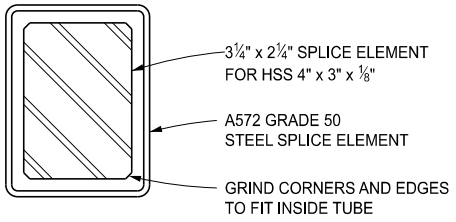
END OF RAIL



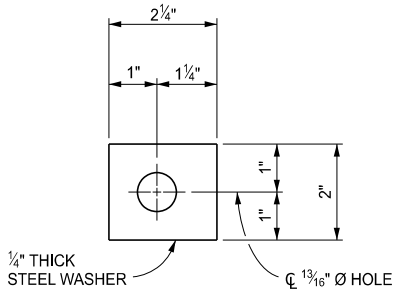
ANCHOR STUD DETAIL



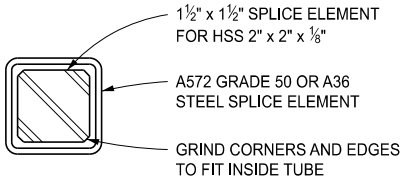
EXTERIOR BASE PLATE



SECTION G-G



DETAIL A



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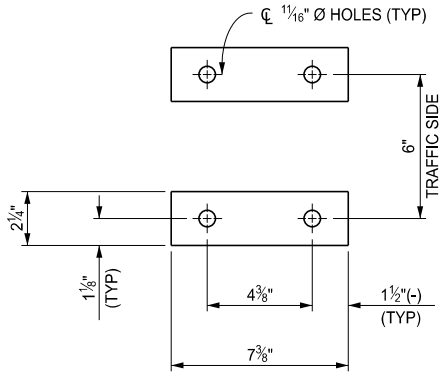
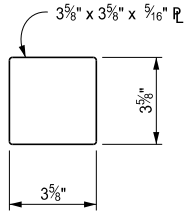


EMBEDDED ANCHOR STUD PLATES



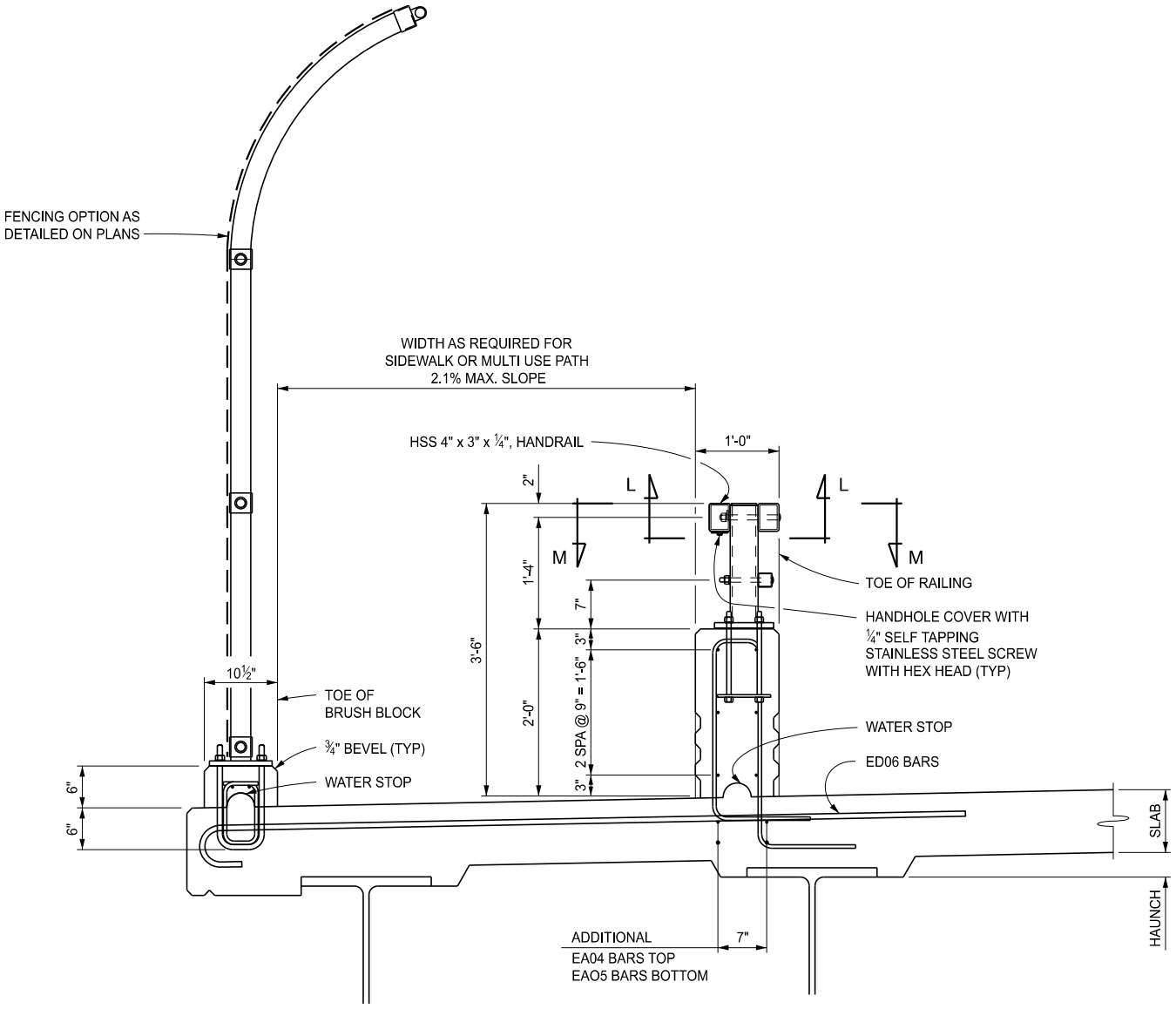
POST COVER PLATE

MDOT Michigan Department of Transportation

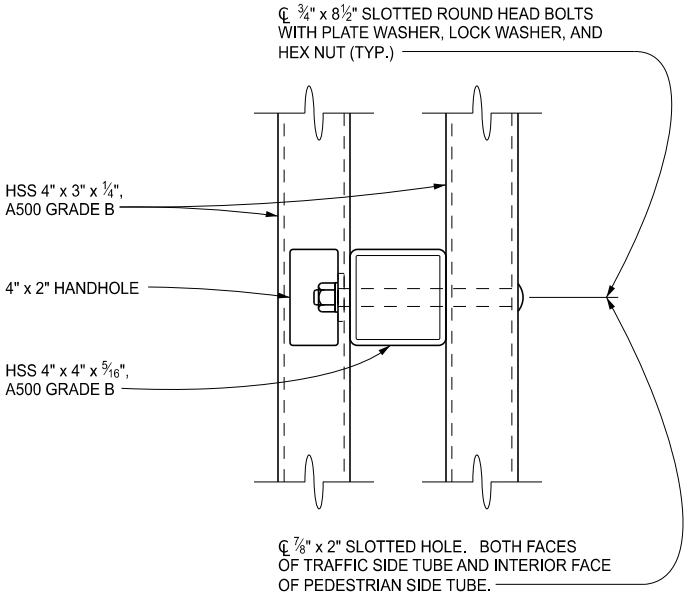
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
BRIDGE RAILING, AESTHETIC PARAPET TUBE

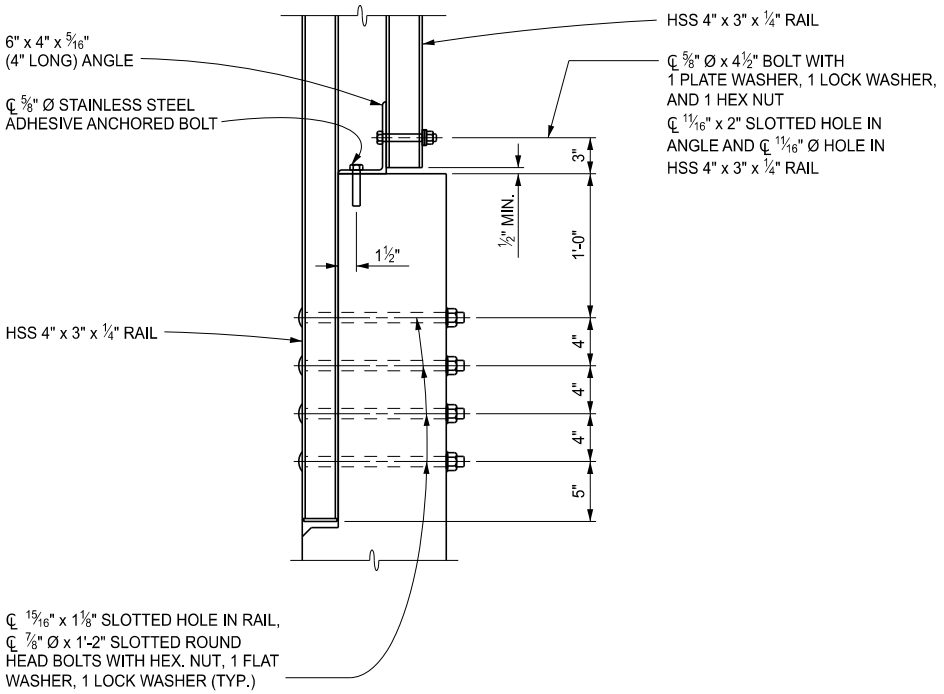
(SPECIAL DETAIL) FHWA APPROVAL	06/24/2024 PLAN DATE	B-25-L	SHEET 6 OF 8

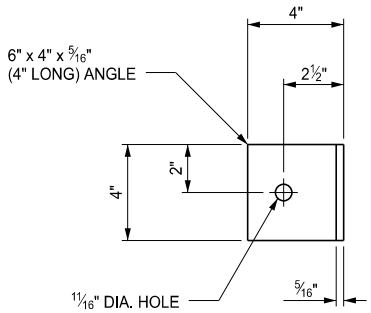


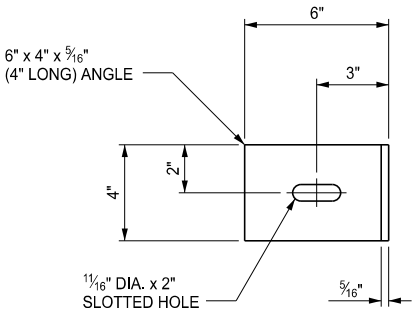
SECTION WITH PEDESTRIAN / MULTI USE PATH



SECTION L-L







SECTION M-M

MDOT Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
BRIDGE RAILING, AESTHETIC PARAPET TUBE

(SPECIAL DETAIL)	06/24/2024	B-25-L	SHEET
FHWA APPROVAL	PLAN DATE		8 OF 8

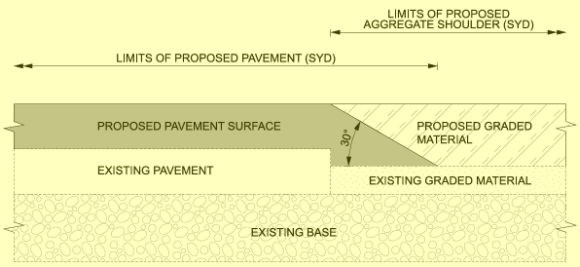
6.05.13 (revised 6-24-2024)

Safety Edge

The safety edge is a beveled pavement edge designed to reduce the severity of vehicle roadway departures and provides increased driver control on re-entry. It is a safer design for motorcyclists and bicyclists, as well as motorists.

On February 6, 2013 the Engineering Operations Committee adopted a policy to incorporate the safety edge.

When the proposed pavement surface and/or proposed graded aggregate shoulder uses square yards as units of measurement, the limits of the respective pay item are to the maximum width of placed material, regardless of depth. This can result in overlap on the plan view between the proposed pavement and proposed graded shoulder at the sloped area of the safety edge. There is no deduction in quantities for either pay item at this location to account for the varying depth at the sloped area when using square yards as the unit of measurement.



The safety edge will be applied as follows for all pavement types:

Temporary Pavements - All newly constructed temporary pavements will be constructed with a safety edge. This includes permanent shoulders that are newly constructed, resurfaced (1½" minimum) or widened, and fully or partially used in the course of the same project as temporary lanes with construction speeds of 45 mph or greater. When a safety edge is installed in conjunction with temporary widening that is subsequently staged for removal, construction of a replaced safety edge against the remaining finished shoulder is not required.

6.05.13 (continued)

Confined Edges - The safety edge should be omitted in those locations where the shoulder is terminated or separated by curb and gutter or valley gutter.

Freeway Ramps - Freeway to freeway ramp shoulders constructed, resurfaced (1½" minimum), or widened without shoulder corrugations will be constructed, resurfaced or widened with a safety edge. Regular freeway off and on ramps should not incorporate the safety edge.

Narrow freeway shoulders (4' paved or less) that are constructed, resurfaced (1½" minimum), or widened will be constructed, resurfaced or widened with a safety edge.

Rural Trunkline – Trunkline shoulders that are newly constructed, resurfaced (1½" minimum) or widened without shoulder corrugations will be constructed, resurfaced or widened with a safety edge where the posted speed is 45 mph or greater .

The safety edge may be omitted in developed rural areas where driveway density exceeds 30 access points within ½ mile.

Safety Application - If safety concerns are known, the Safety Edge can be considered for use on any roadway or ramp.

Details of the safety edge are shown on Standard Plan R-110-Series. Specifications require that the safety edge be constructed monolithically with the shoulder pavement and that there will be no separate payment for constructing it. Designers should provide additional concrete pay item quantities used for concrete shoulder to construct the safety edge adjacent to concrete shoulder. The locations where the safety edge applies should be identified where appropriate on the typical cross sections or maintaining traffic details.

The designer should review existing field conditions to identify areas where berming may have developed that would impede positive drainage. Additional details and sperate payment such as station grading modified may be needed to remove the berm.

CHAPTER 13 MISCELLANEOUS PAY ITEMS (continued)

13.04.03 Removing Culverts and Sewers
- A. Removing Pipe Culverts
- B. Removing Culverts Other Than Pipe
- C. Removing Culvert Ends
- D. Removing Sewers
- E. Salvaging Culvert End Sections

13.04.04 Removing Miscellaneous Structures & Materials
- A. Pay Items
- B. Removing Pavement

13.04.05 Vertical Exploratory Investigation for Relocation

13.05 OTHER COMMONLY USED MISCELLANEOUS ITEMS

13.05.01 Obliterating Roadway

13.05.02 Project Cleanup

13.05.03 Field Offices and Laboratories

13.05.04 Transporting Salvaged MDOT Material

13.05.05 Mobilization

13.05.06 Escalator Clauses - Fuel, Asphalt, Cement, and Steel

13.05.07 Section deleted

13.04.04 (revised 12-22-2011)

Removing Miscellaneous Structures & Materials

A. Pay Items

Pay items for removing miscellaneous structures include the following:

Pavt, Rem
Curb, Rem
Gutter, Rem
Curb and Gutter, Rem
Sidewalk, Rem
Basement Cleanout
Track, Rem
Utility Pole, Rem
Structures, Rem
Structures, Rem Portions
Culv, Other than Pipe, Rem
Masonry and Conc Structure, Rem
Guardrail, Rem
Fence, Rem
Concrete Barrier, Rem
Glare Screen, Rem

B. Removing Pavement

Removal of HMA pavements and concrete or masonry pavements is covered in the ***Standard Specifications for Construction***. The specifications for HMA pavements are somewhat confusing as they include both removing pavement and removing HMA surface items. The table in Section 6.03.04B(6) shows clearly the proper pay items for different situations.

13.04.05 (added 6-24-2024)

Vertical Exploratory Investigation for Relocation

If the designer has reason to believe that proposed work may require relocation because of a conflict with existing features (abandoned facilities, foundations, etc.) during construction operations, the Special Provision for Vertical Exploratory Investigation for Relocation should be used.

Use of this special provision includes, but is not limited to, the following situations.

- Exposing culverts, sewers, etc.
- Exploratory situations (moving planned work and a utility conflict is uncertain)
- When existing survey information may be incomplete
- When drainage patterns may be unknown
- When SUE is unable to be performed because of existing traffic constraints
- Areas of congested utilities where identification of all probable conflicts could not be reasonably identified per our design process

The pay item will compensate the Contractor to locate and expose underground infrastructure and obstructions, such as culverts, sewers and utilities, as needed. The special provision is not to compensate the Contractor for the Contractor's responsibilities in subsection 107.12 of the Standard Specifications for Construction. The special provision and pay item are not to be used to expose existing marked utilities as that is a requirement in subsection 107.12.

7.03.04

Cofferdams (8-6-92)

Cofferdams shall be used on all substructure units where tremie concrete is required for water control. When shallow water is present; i.e., less than 2'-0", other methods of water control that allow the contractor maximum flexibility may be appropriate. The Geotechnical Services Section should be contacted in this case to determine if a cofferdam is required. (2-26-2018)

The driving line for cofferdam sheet piling shall be 1'-6" outside the footing outline or at the edge of the tremie concrete. Deep excavations may use driving line greater than 1'-6" outside the footing outline to allow for more efficient bracing schemes. Consult with Geotechnical Services Section.
(8-20-2009)

Since a cofferdam is generally a sheeted enclosure, the plans should show and note the limits of the enclosure. The contractor must know if he will be required to completely enclose the excavation or whether sheeting on three sides will suffice.

Often, a portion of a sheet pile cofferdam is to remain in place. On these projects, there will be two bid items. "Steel Sheet Piling, Temp, Left in Place" will be measured and paid for in the specified manner. The remainder of the enclosure along with dewatering, etc., will be paid for as "Cofferdams." This division of pay items should be clarified by a plan note.
(9-27-2021)When cofferdams are not used on structures crossing streams or encroaching on water courses, Plan Note 8.05 Q shall be used. (8-23-2021)

Where a sheet piling enclosure is required for lateral soil support but not for the exclusion of water, "Steel Sheet Piling, Temporary" should be called for.

For additional information see Subsection 7.01.10.

7.03.05

Subfootings

Use subfootings under footings for all substructure units regardless of their location unless a differing means to support forming, reinforcement and concrete during placement is specified by the geotechnical engineer. Extend subfootings 1'-3" outside of footing lines and in general provide a thickness of 3½"; subfootings may be 5½" thick where water and/or soil conditions are such that unsuitable conditions might arise. Maintain foundation excavation limits of 1'-6" outside of footings in all cases. Concrete for subfootings is to be bid separately as "Conc, Grade 3500, Subfooting" and has the material properties of Concrete, Grade 3500.
(6-24-2024)

7.03.06

Tremie Seal Design

Generally, tremie seals should be called for on all structures where it is expected that difficulty will be encountered in pumping the water down below the bottom of footing. Do not include weight of tremie when computing pile loads except when the estimated scour depth is below the bottom of tremie. (5-6-99)

A. Design

The tremie seal shall be designed to resist the hydrostatic pressure at the bottom of the tremie by a combination of its weight, plus the bond on the cofferdam and piles. The allowable bond stress is 10 psi on the piles and 5 psi on the cofferdam, providing the piles and the sheeting have sufficient resistance from dead weight and soil friction to resist the load thereby induced. Where shells are used or permitted as an option, the total resistance available will be the weight of the shell plus soil friction less any buoyancy force exerted on the shell. Allowable tension in bending on the tremie seal is 30 psi.

B. Hydrostatic Head

Hydrostatic head should be figured from bottom of tremie seal to ordinary water surface elevation. Include note 8.05 R. on plans. (8-23-2021) (5-6-1999)

8.09.05

Hanger Assembly Replacement Notes

A. Clean and coat the area within 3 feet each side of the centerline of the hanger assembly prior to installing the new link plates and pins. Shop coat proposed link plates. (Field coat proposed stiffeners.) (12-5-2005)

B. Repair the end diaphragm after installation of the new hanger assembly as shown on the plans. [Use if diaphragm repair is required.]

8.09.06 (4-19-2021)

Existing Plan Sheet Notes

A. Do not work from this sheet. The information shown here is for reference only. No pay items are shown. [Use on existing plan sheets used for information only.] (9-18-1998)

B. The only items of work to be done from this sheet are identified by the legend box below, labeled with this project's job number. [Use on existing plan sheets used for removal and proposed work. Add the legend box below.] (9-18-1998)

JOB NO. <New Number>
Proposed Work Denotes Removal Portions

C. Only the hatched areas, indicating removals, are to be used for bidding purposes. [Use if just removals are shown, with no legend box.] (9-18-1998)

D. The bridge paint may contain lead. [Use on all projects with existing painted structural steel regardless of work type.] (8-20-2009)

8.09.07 (4-19-2021)

Temporary Support Notes

A. Contact the Region Soils Engineer at least 48 hours in advance to request a foundation inspection prior to the placement of the temporary support footing (or the "Embankment, Structure, CIP"). (6-24-2024)

B. Use structural grade timber with a minimum flexural strength of 1,200 psi and a minimum horizontal shear strength of 100 psi.

C. Do not load temporary supports for a continuous period greater than four weeks. [Use when footing is placed on soil or paved surface.]

D. Use temporary concrete barrier to protect the temporary support as shown on the plans or as directed by the Engineer. [Use when protection of temporary support is not covered in maintaining traffic.]

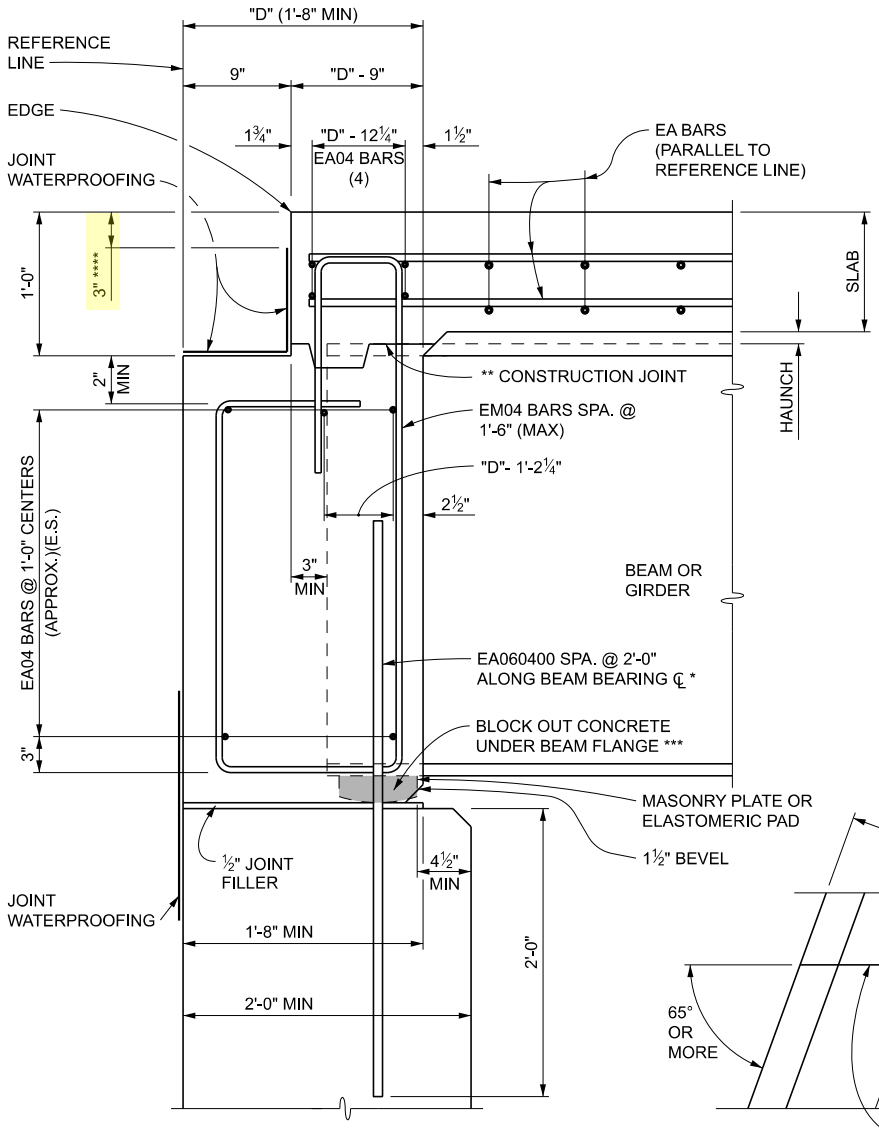
E. Submit alternative design of the temporary support shown to the Engineer according to the Standard Specifications when any plan dimension, detail, or material is changed. Base alternate designs of the temporary support on loads as follows:

____ tons vertical girder load (Dead Load).
____ tons vertical girder load (Live Load).
____ psf allowable soil pressure.

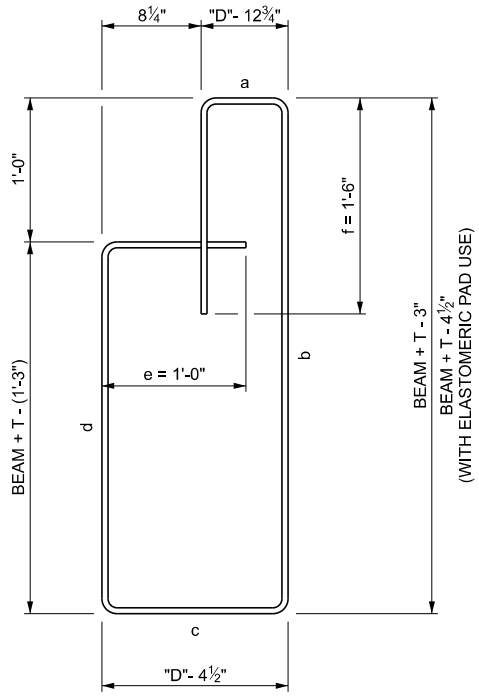
(7-25-2022)

F. The temporary support design does not include the weight of construction equipment. If construction equipment is to be used on the span while the temporary support is in place, submit an alternative design and working drawings to the Engineer in accordance with the Standard Specifications for Construction. The alternative design must include a check of the existing superstructure that accounts for the current condition of bridge members and must include details for any strengthening of the existing structure required to prevent damage from the temporary support loads. (9-26-2022)

DRAWN BY: BLT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED: 06/24/24
CHECKED BY: VZ	TYPICAL SECTION THRU DEPENDENT BACKWALL	SUPERSEDES: 01/23/23
APPROVED BY: KCK		

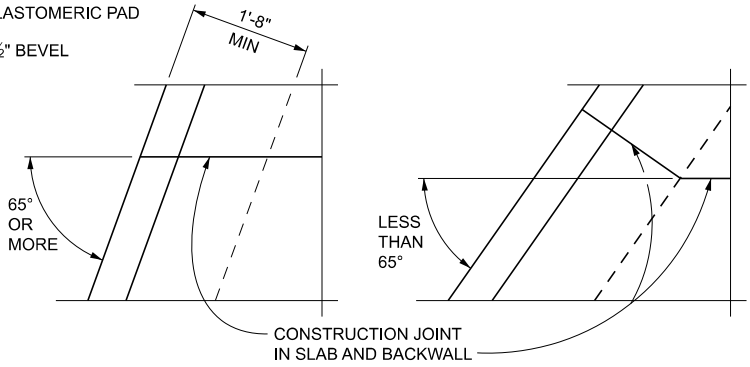


BACKWALL SECTION



EM04 BAR

NOTE: USE AN EK04 BAR WHERE THE BACKWALL DOES NOT INCLUDE A PAVEMENT SEAT.



BACKWALL JOINTS

PLAN NOTES:

CAST LOWER PORTION OF THE BACKWALL PRIOR TO PLACING DECK REINFORCEMENT. (USE WITH MANDATORY JOINT) (JOINT WATERPROOFING IS A PAY ITEM WHEN A CONSTRUCTION JOINT IS MANDATORY)

IF A CONSTRUCTION JOINT IS USED, CAST THE LOWER PORTION OF THE BACKWALL PRIOR TO PLACING DECK REINFORCEMENT. THERE WILL BE NO PAYMENT FOR THE REQUIRED JOINT WATERPROOFING. (USE WITH OPTIONAL JOINT).

**** ON THE VERTICAL FACE OF THE PAVEMENT SEAT, STOP THE JOINT WATERPROOFING 3" BELOW THE TOP OF DECK.

NOTE:

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

THE BACKWALL THICKNESS "D" IS THE GREATER OF:

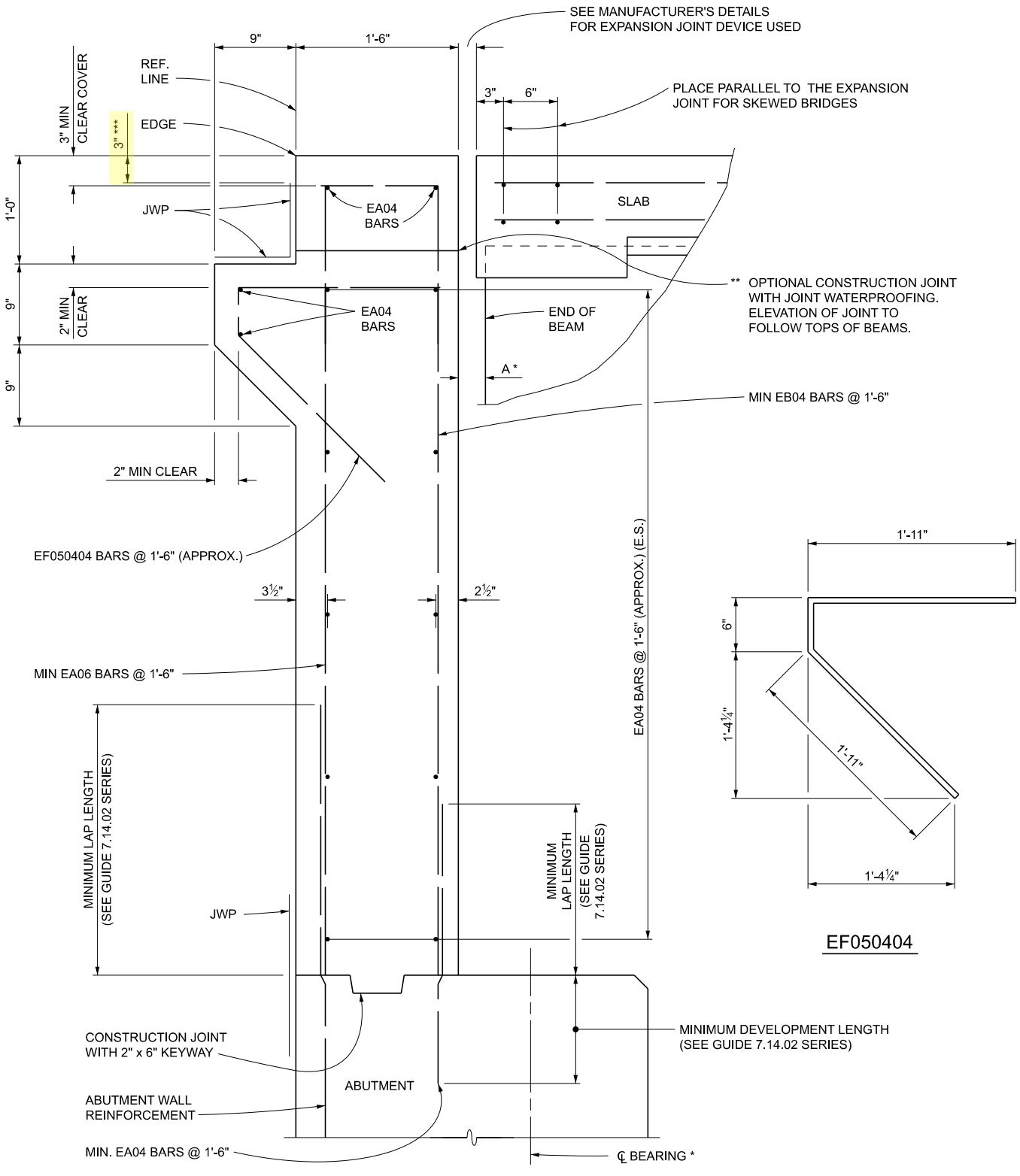
1) 1'-8" OR THE BEARING DIMENSION PLUS ½ THE BEARING WIDTH -- (FOR 90° CROSSINGS).
2) 1'-8" OR THE BEARING DIMENSION PLUS THE PRODUCT OF ½ FLANGE WIDTH AND COSINE ANGLE OF CROSSING –- (FOR SKEWED CROSSINGS)

HOLES IN WEB OF STRINGERS FOR BACKWALL REINFORCEMENT ON 90° JOBS SHOULD BE 1"Ø. INCREASE HOLE SIZE TO ACCOMMODATE REINFORCEMENT IN SKEWED BACKWALLS.

* USE FOR STEEL BEAM BRIDGES ONLY.
** THIS JOINT IS MANDATORY WHEN PLATE GIRDERS WITHOUT BEARING STIFFENERS ARE USED.OTHERWISE THE JOINT IS OPTIONAL.
*** USE FOR SKEWED BRIDGES.

PREPARED BY DESIGN DIVISION	6.20.01

DRAWN BY: BLT CHECKED BY: VZ APPROVED BY: KCK	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT TYPICAL SECTION THRU INDEPENDENT BACKWALL	ISSUED: 06/24/24 SUPERSEDES: 12/26/23



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

PLAN NOTE:
*** ON THE VERTICAL FACE OF THE PAVEMENT SEAT, STOP THE JOINT WATERPROOFING 3" BELOW THE TOP OF BACKWALL.

** IF CONSTRUCTION JOINT IS USED, THERE WILL BE NO PAYMENT FOR THE REQUIRED JOINT WATERPROOFING.

* TO ESTABLISH ℄ BEARING, USE "A"= ½ TOTAL MOVEMENT PARALLEL TO ℄ BEAM PLUS 1". FOR SKEWED BRIDGES, "A" IS MEASURED AT CORNER OF FLANGE.

PREPARED BY DESIGN DIVISION	6.20.03