



Road & Bridge Design Publications

Monthly Update – June 2023

Revisions for the month of **June** are listed and displayed below and will be included in projects submitted for the **October** letting. The special detail index from **April** will remain in effect.

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

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

Road Design Manual

11.02.02A: Exempt Special Provisions: Added rest area buildings, pump house buildings, and operator house buildings on bridges to the list of special provisions exempt from Central Office Review. (They will be reviewed by an as needed consultant.)

Bridge Design Manual

8.07.01 J.: Note is deleted. The standard plan detail for the joint in bridge railings is being modified to show the 1" joint filler extending through the bevels and to the inside face of the forms, which will no longer require the application of joint sealant.

8.07.01 K. & M.: Notes are updated to encompass the joint size requirement for the polyurethane and the Special Provision for Polyurethane Joint Sealant for Structures. Include the Special Provision with projects using polyurethane at joints.

Bridge Design Guides

Table of Contents: Added guide 6.60.11B related to Pier Diaphragm....Continuous for Live Load. More details were added and facilitated another guide.

6.20.03A, 6.20.04, 6.23.01, 6.44.01A: Updated notes/details to match polyurethane joint sealant requirements. See Bridge Design Manual Notes 8.07.01 K. & M. Include the Special Provision for Polyurethane Joint Sealant for Structures in projects when using the details/notes. Note that the notes don't match exactly, it is allowed to alter notes to project specific details. See Bridge Design Manual Section 8.01.



Road & Bridge Design Publications

Monthly Update – June 2023

6.60.11, .11A & .11B.: Polyurethane note is updated, see above. EA08 bars are updated to match a previous requirement for epoxy coating. More detail is given to EW bars to get proper embedment and development into the deck slab. A secondary optional construction joint is added for MI 1800 beams and Bulb Tee beams. The joint is lowered to minimize the risk of cracks developing in the wide top flanges when the diaphragm is cast prior to the bridge deck. The optional joint for Box Beams and PCI beams will remain at the bottom of the 6" bevels.

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.

MICHIGAN DESIGN MANUAL ROAD DESIGN

11.02.02 (revised 6-26-2023)

Special Provision Development

Designers are asked to always check for a template, recommended and/or previously approved special provision to use first. If you are not able to find one suitable on the web site, send an email to;

MDOT-SpecialProvision@michigan.gov

to request a search for a suitable special provision.

Many approved provisions are posted to the web in Microsoft Word (rtf) format and may be reused or revised (and in some instances **must** be revised) to include project specific details. Already approved special provisions must be reviewed carefully to make sure all requirements are applicable to the project.

If no changes are required, simply insert the approved special provision in the proposal package. Do not change the [source code](#), [approval code](#), or [identification code](#).

If any change is required then the special provision must be resubmitted for review and approval. Use the track changes feature of Microsoft Word to make any revisions being sure to leave the source code, approval code and the identification code for the previously approved version, to allow the reviewer to check the original version.

It is **unacceptable** to make any changes to a document without resubmitting for review and approval.

11.02.02 (continued)

A. Exempt Special Provisions

Due to the nature of certain special provisions, review and approval by Lansing central office staff engineers is not always a value added process. These documents are instead reviewed and approved at the Region/TSC level or as identified in the listing below. The approved format and organization of content, as described herein, **must** still be followed and the appropriate source code and approval code and approval date is required. At this time only, the following types of special provisions are exempt from the Lansing central office review and approval process:

- Maintaining Traffic, except as modified in [Section 11.06.01](#)
- Maintaining Waterways
- Intelligent Transportation System are reviewed by the ITS Program Area but should be submitted like any other special provision
- Municipal Water or Sewer System (when developed with input from the Municipal Utilities Unit of the Design Division), submit like all other Special Provisions and the Municipal Utilities Unit will ensure they have been approved
- Railroad Insurance, will be approved by the Office of Rail
- Rest Area Buildings, Pump House Buildings, and Operator House Buildings on Bascule bridges and Lift bridges will be reviewed by an as needed consultant. Submit all special provisions through ProjectWise for the project and they will be assigned to the Project Manager of the as needed consultant.

MICHIGAN DESIGN MANUAL BRIDGE DESIGN

8.07

SUPERSTRUCTURE

8.07.01

Miscellaneous Notes

- A. Alphabetical designation of deck pours is not to be construed as a pour sequence. [Use for simple spans.]
- B. Place deck pours according to the following sequence ____, ____, and _____. Do not begin placement of subsequent pours for a minimum of 15 hours after completing placement of adjacent pours. This includes sections separated by longitudinal as well as transverse joints. [Use with continuous steel spans.] (8-20-2009)
- C. Alphabetical designation of deck pours is not a pour sequence. Cast deck pours over piers after other deck pours have been cast. Do not begin placement of subsequent pours for a minimum of 15 hours after completing placement of adjacent pours. This includes sections separated by longitudinal as well as transverse joints. [Use for prestressed concrete beams that are continuous for live load.] (8-20-2009)
- D. Apply low temperature protection of concrete according to Section 706.03 J. of the Standard Specifications for Construction. Low temperature protection of concrete is included in the related items of work. [Use when possibility of pouring concrete during cold weather. With known cold weather pours use the pay item for cold weather protection.] (4-19-2021)
- E. Over active roadbeds, maintain formwork above the bottom of beams. [Use where bridge deck is to be cast over traffic.] (4-19-2021)

8.07.01 (continued)

- F. Notify the utility company one week prior to beginning installation of the ducts in the (sidewalk) (barrier). [Use when ducts are to be installed by others.] (9-18-1998)
- G. The contractor may use permanent metal deck forms. If used, corrugations must be filled with polystyrene foam. [Use when metal stay in place forms are permitted.] (4-19-2021)
- H. Do not use permanent metal deck forms. Remove all materials used to form the deck prior to opening the bridge to traffic. [Use where beam spacing or form loads preclude the use of stay-in-place forms.] (9-2-2003)
- I. Saw-cut the deck on both the top and bottom surface prior to deck removal procedures. [Use with bridge widening or with removal procedures required for stage construction.] (8-20-2009)
- J. **Note Deleted. (6-26-2023)**
- K. Provide a sawed joint 1½" deep by ¼" wide (minimum) in the top of slab at the locations shown in section(s)_____. Saw the joint within 24 hours of placing the curing and fill to ½" below top of concrete with polyurethane or polyurethane hybrid sealant. (Included in the bid item "Superstructure Conc, Form, Finish, and Cure, Night Casting (Structure Identification)"). [Use at all locations shown for continuous for live load slabs (generally at piers).] **(6-26-2023)**

MICHIGAN DESIGN MANUAL BRIDGE DESIGN

8.07.01(continued)

Miscellaneous Notes

- L. In order to maintain the integrity of the existing structure during Stage ____ construction, saw cut entirely through the (abutment) (pier) and a minimum of 4" into the top of footing for removal purposes. [Used with part width construction]. (12-17-2012)
- M. Provide a sawed joint 1 1/8" deep by 1/4" wide (minimum) in the top of slab at [transverse] [and longitudinal] [construction joints] [and] [reference joints] [and at fixed pin & hanger joints] . Saw the joint within 24 hours of placing the curing and fill to 1/2" below top of concrete with polyurethane or polyurethane hybrid sealant. (Included in the bid item "Superstructure Conc, Form, Finish, and Cure, Night Casting (Structure Identification)"). [Use at all bridge deck slab construction joints and reference joints over integral and semi-integral backwalls.] (6-26-2023)
- N. Apply (Concrete Surface Coating) (Silane) to the (entire concrete portion of bridge railing (including brush block),)(front face and top of concrete bridge barrier) (back face of concrete bridge barrier) (slab fascia,) (sidewalk fascia,) (underside of deck from slab fascia to fascia beam flange,) (exterior face and bottom of bottom flange of fascia beam). (See Special Provision for coating color.) (Use concrete surface coating [AMS-STD-595](#) color number [insert number], [insert color].) * The estimated area of coating is ____ syd. [Include any and all parts that are to be coated. Add sketch to plans for clarity if desired. Use note twice if applying silane and surface coating to differing faces of barriers. *Specify color in note if Frequently Used Special Provision is not used.] (4-19-2021)

8.07.01(continued)

- O. Salvage and reuse the existing stud type shear developers. See the Special Provision for Bridge Deck Removal and Salvaging Shear Developers on Steel Beams for limitations on the equipment that may be used during demolition of the existing bridge deck. Remove and replace damaged shear developers identified by the Engineer. [Install additional shear developers at the locations shown on the plans.] [Use on full and partial deck removal projects with existing stud type shear developers.] (4-19-2021) (11-28-2022)

8.07.02

Elastomeric Bearings

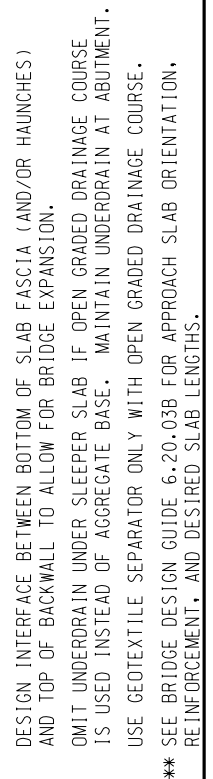
- A. If the position dowels at (Abutment ____ (Pier ____)) are misaligned, in relationship to the centerline of bearings, due to temperature effects on the (beams) (girders), place elastomeric bearings with holes centered on the dowels. [Use for elastomeric expansion bearings. See Design Guide [8.43.01](#) and [8.43.01A](#).] (9-1-1988)
- B. The design of the bearings at (Abutment ____ (and Pier ____)) is based on AASHTO LRFD Method _____. [Use on all projects with plain or laminated elastomeric bearings. Method B shall not be used unless approved by MDOT Structural Fabrication Engineer. This note is not required for elastomeric leveling pads.] (9-26-2022)

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ISSUED: 06/26/23
SUPERSEDES: 07/25/22



*** SEE BRIDGE DESIGN GUIDE 6.20.03B FOR APPROACH SLAB ORIENTATION, REINFORCEMENT, AND DESIRED SLAB LENGTHS.

6.20.03A

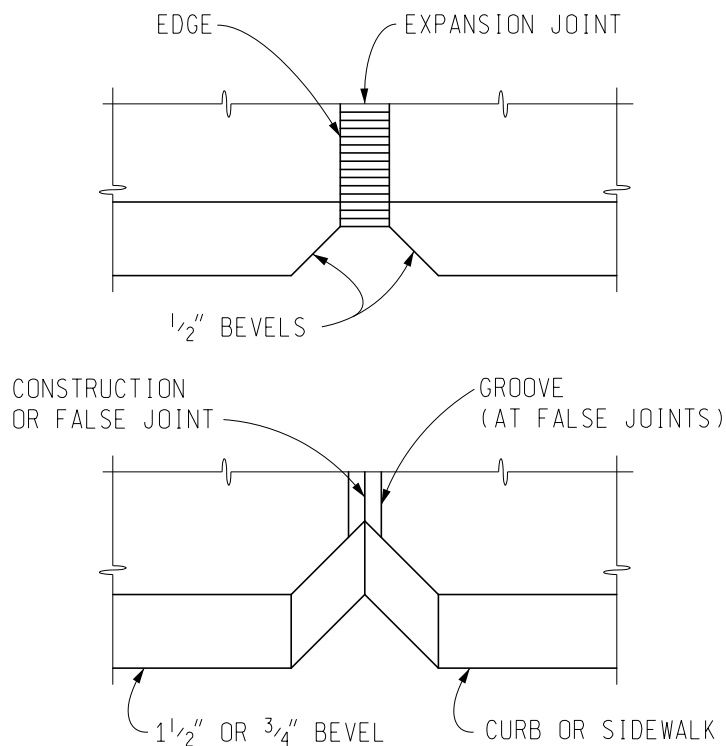
ISSUED: 06/26/23
SUPERSEDES: 01/24/22

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 CHECKED BY: VZ
 APPROVED BY: KCK

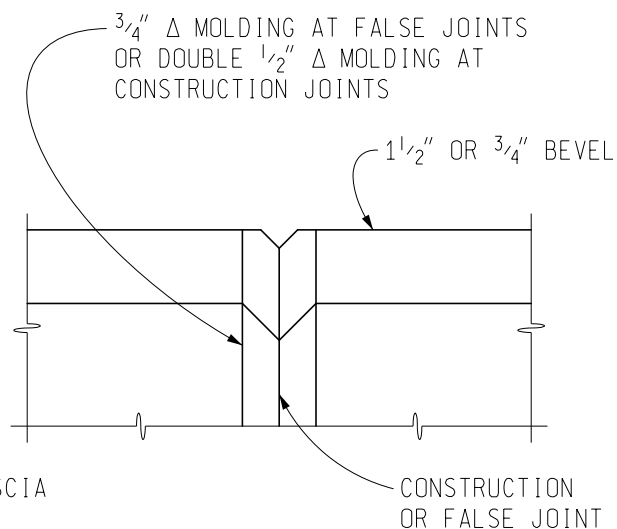
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT

CONSTRUCTION, EXPANSION AND
 FALSE JOINT DETAILS

ISSUED: 06/26/23
 SUPERSEDES: 11/27/01



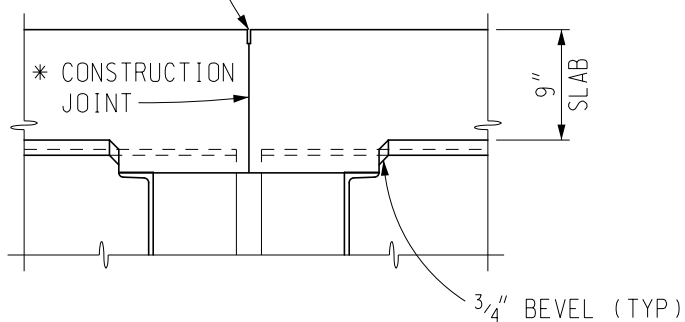
PLAN



ELEVATION

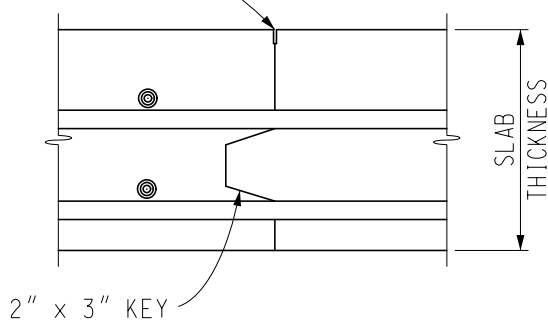
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CONSTRUCTION JOINT IN
 SLAB OVER PIER OR
 AT FIXED HANGER

* DO NOT EXTEND SLAB REINFORCEMENT THROUGH CONSTRUCTION JOINT



LONGITUDINAL
 CONSTRUCTION
 JOINT IN SLAB

PREPARED BY
 DESIGN DIVISION

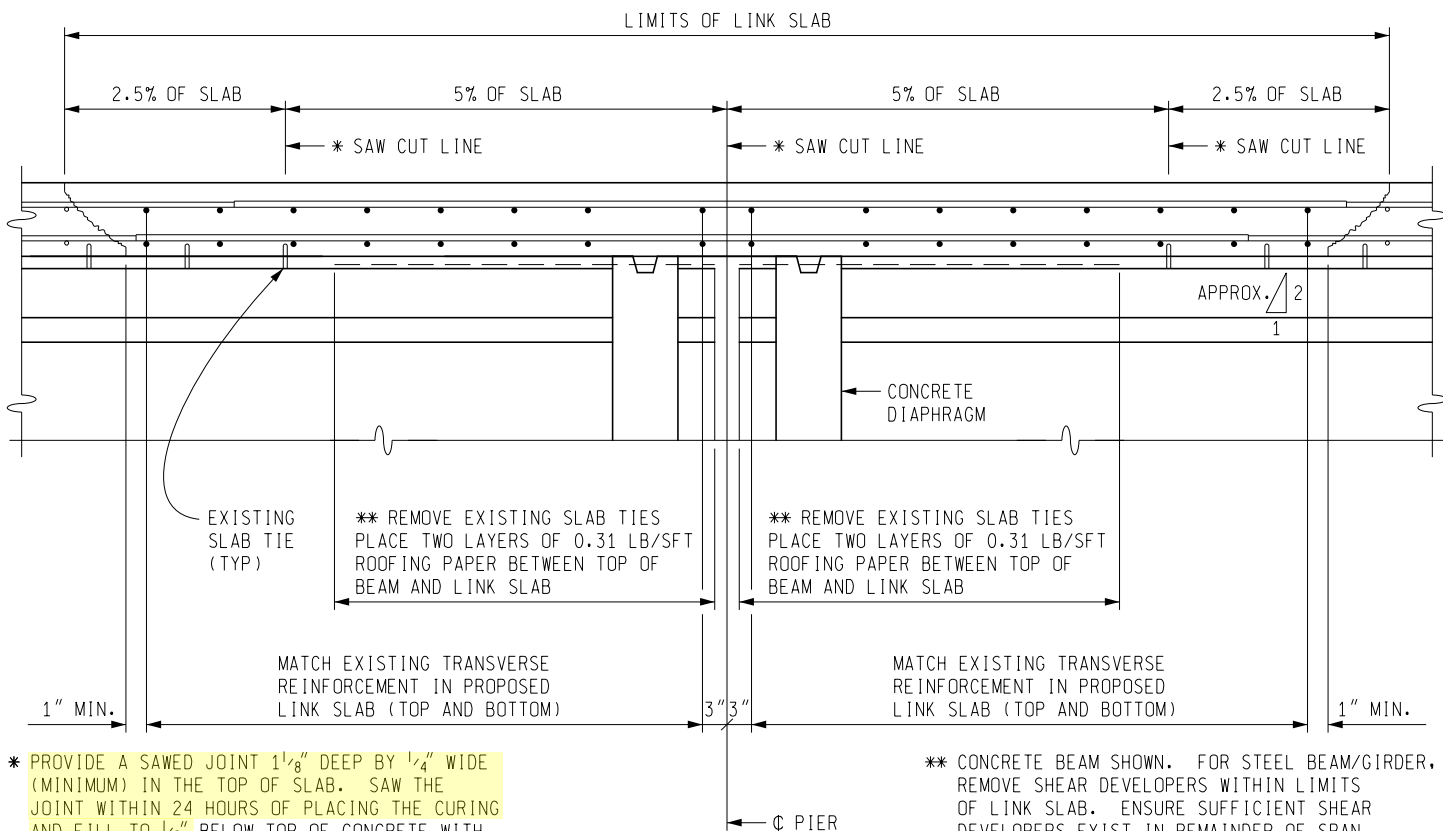
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APPROVED BY: KCK

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ISSUED: 06/26/23
SUPERSEDES: 01/25/21

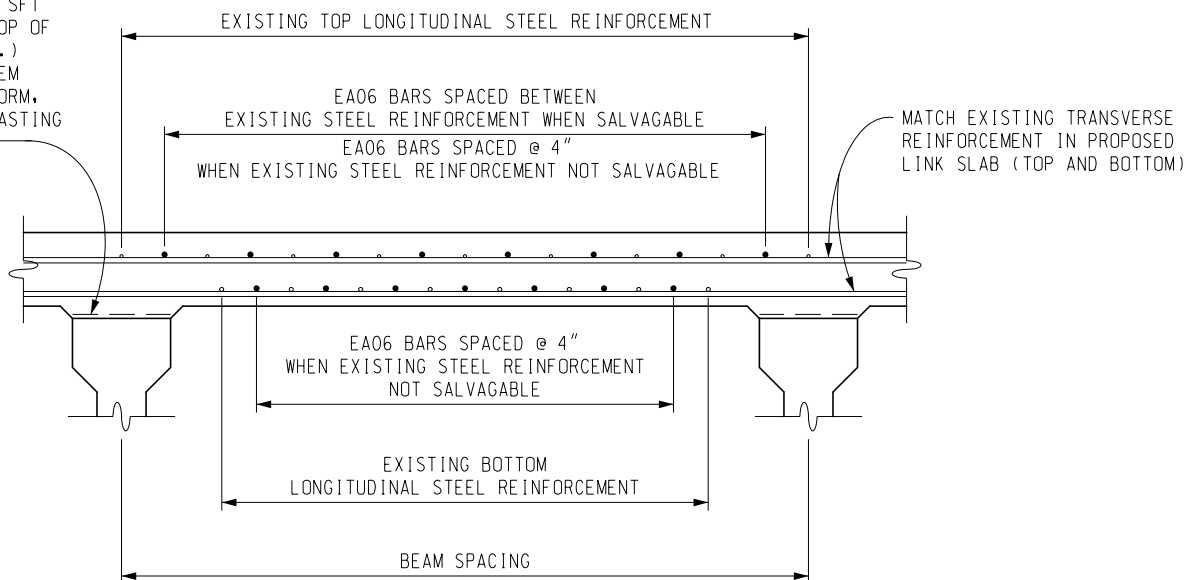
LINK SLAB DETAILS



SECTION A-A

(CONCRETE BEAM SHOWN STEEL BEAM SIMILAR)

TWO LAYERS OF 0.31 LB / SFT
ROOFING PAPER BETWEEN TOP OF
BEAM AND LINK SLAB (TYP.)
(INCLUDED IN THE PAY ITEM
"SUPERSTRUCTURE CONC. FORM,
FINSH AND CURE, NIGHT CASTING
(STRUCTURE NO.)".)



SECTION B-B

(CONCRETE BEAM SHOWN STEEL BEAM SIMILAR)

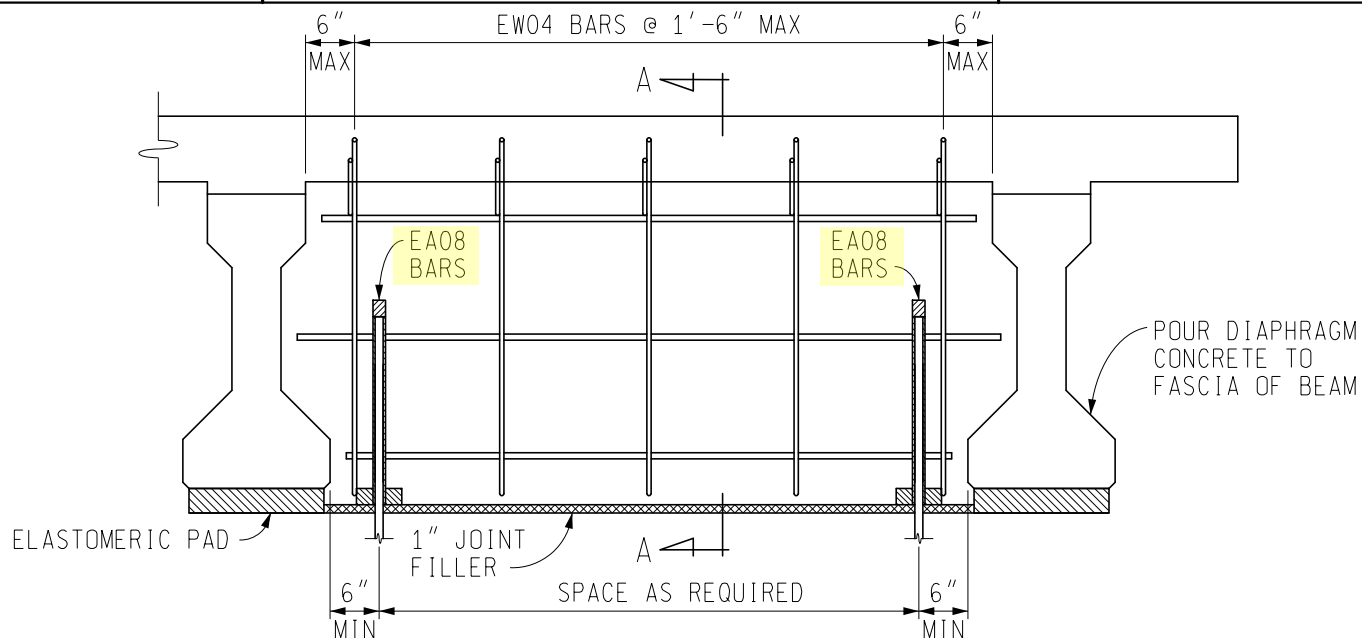
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6.44.01A

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CHECKED BY: VZ
APPROVED BY: KCK

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT
PIER DIAPHRAGMS FOR PRESTRESSED CONCRETE
BEAMS CONTINUOUS FOR LIVE LOAD

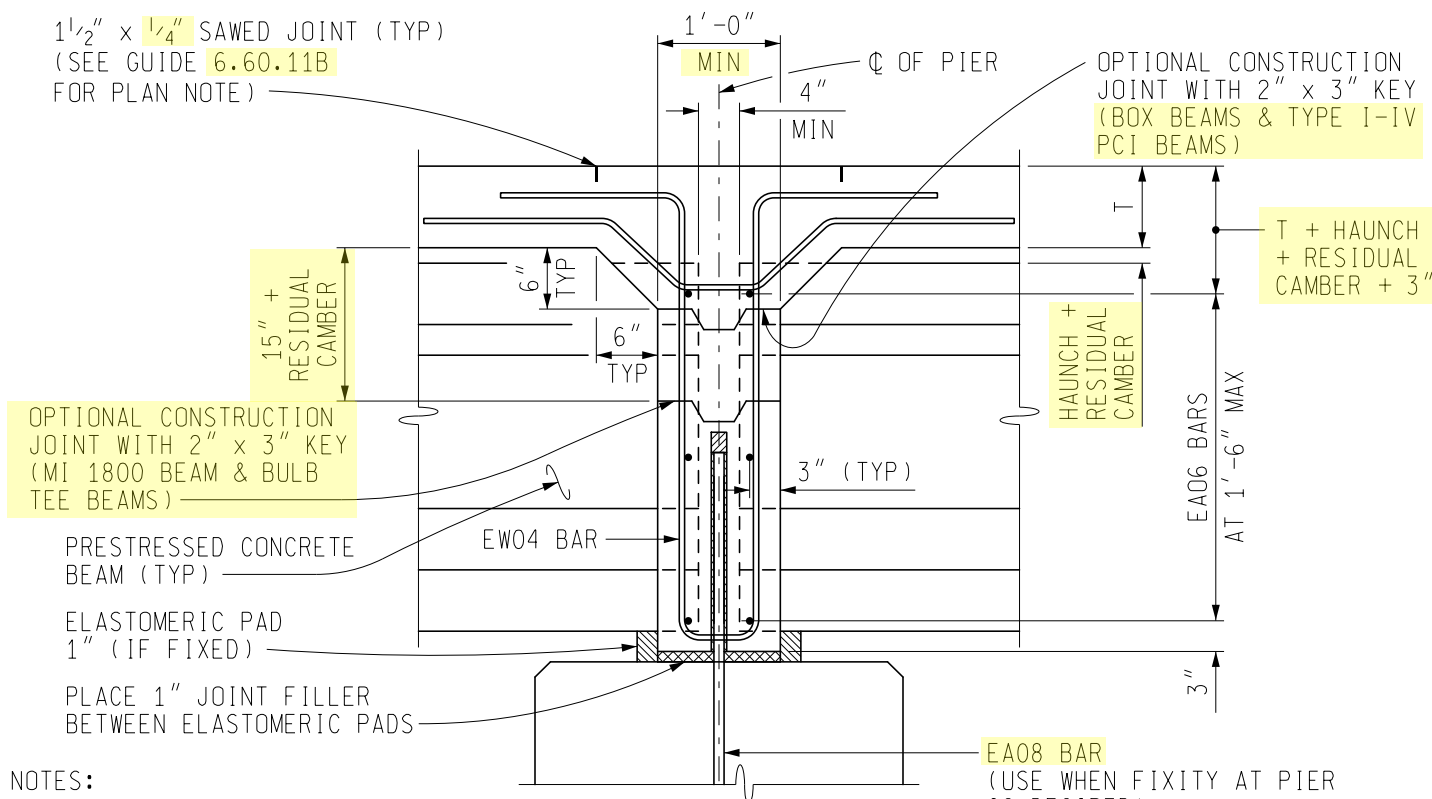
ISSUED: 06/26/23
SUPERSEDES: 11/27/01



PIER DIAPHRAGM ELEVATION

PCI BEAMS SHOWN. SPREAD BOX BEAMS, MICHIGAN 1800 BEAMS, AND BULB TEE BEAMS ARE SIMILAR.

1½" x ¼" SAWED JOINT (TYP)
(SEE GUIDE 6.60.11B
FOR PLAN NOTE)



NOTES:

RESIDUAL CAMBER IS DEFINED AS THE ESTIMATED REMAINING CAMBER IN PRESTRESSED CONCRETE BEAMS AFTER ANY DEFLECTION FROM THE DEAD LOAD OF STRUCTURAL COMPONENTS, NON-STRUCTURAL ATTACHMENTS, WEARING SURFACES AND UTILITIES HAVE BEEN ACCOUNTED FOR.

PRESTRESSED CONCRETE BEAMS SHALL BE DESIGNED AS SIMPLE SPAN BEAMS FOR DEAD LOAD AND LIVE LOAD. THE BRIDGE SLAB SHALL BE DESIGNED CONTINUOUS FOR LIVE LOAD OVER PIERS.

SECTION A-A

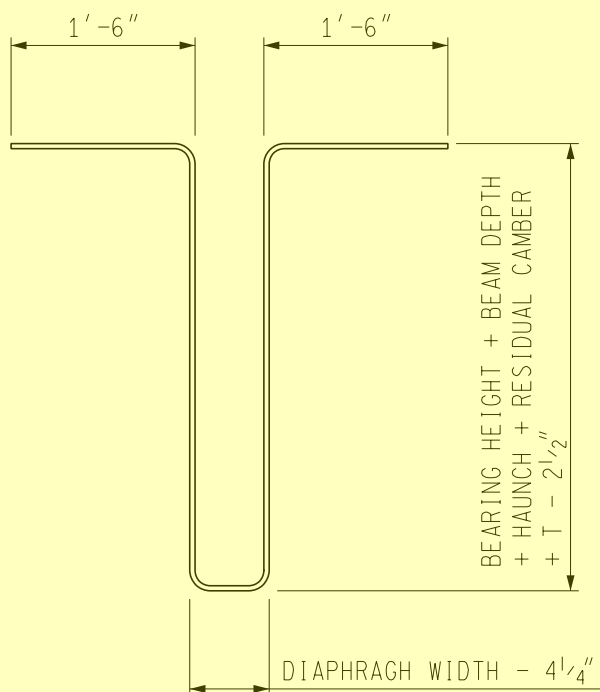
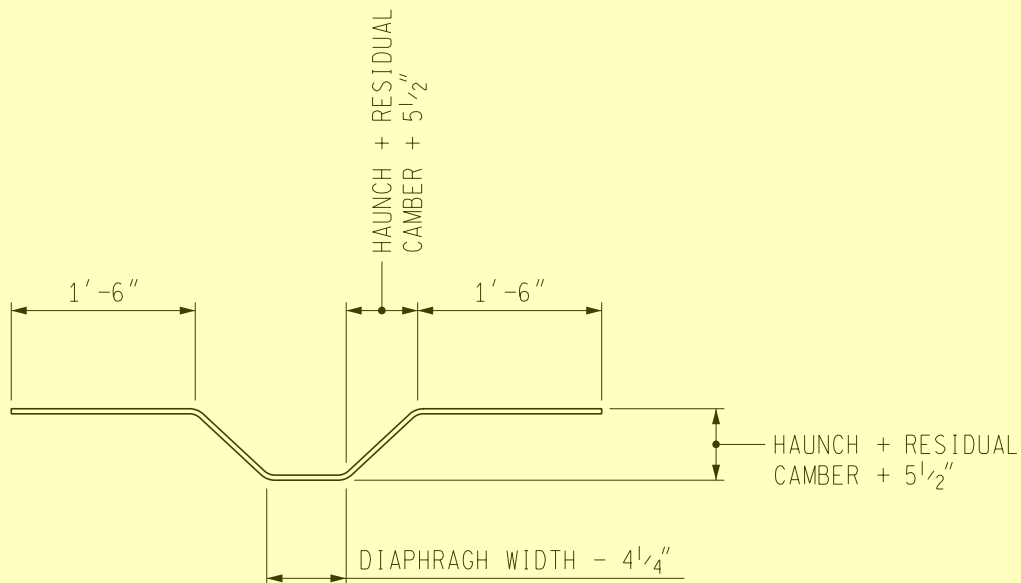
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DESIGN DIVISION

6.60.11

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CHECKED BY: VZ
APPROVED BY: KCK

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT
PIER DIAPHRAGMS FOR PRESTRESSED CONCRETE
BEAMS CONTINUOUS FOR LIVE LOAD

ISSUED: 06/26/23
SUPERSEDES: 01/25/21

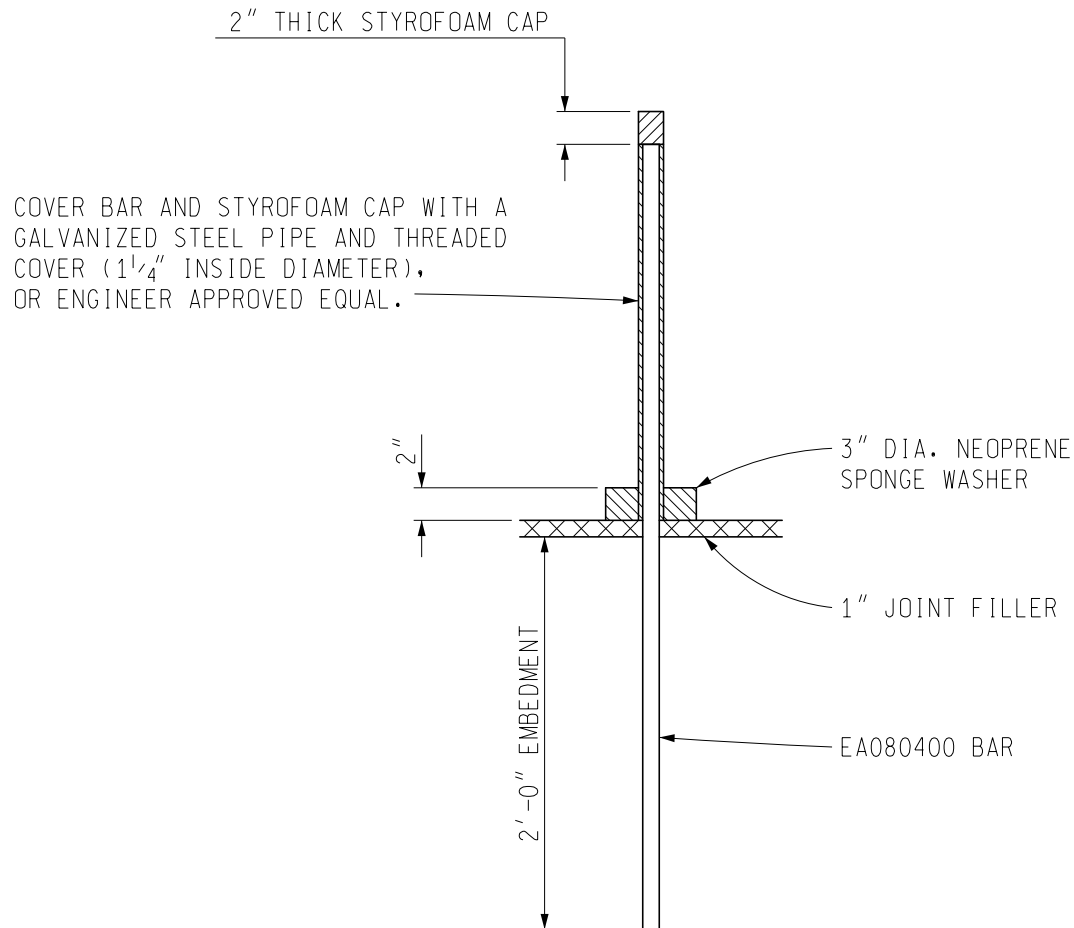


EW04 BARS

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APPROVED BY: KCK

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT
PIER DIAPHRAGMS FOR PRESTRESSED CONCRETE
BEAMS CONTINUOUS FOR LIVE LOAD

ISSUED: 06/26/23
SUPERSEDES: 01/25/21



DETAIL B

ALL WORK AND MATERIAL FOR THE STYROFOAM CAP, METAL SLEEVE AND NEOPRENE SPONGE WASHER SHALL BE INCLUDED IN THE BID ITEM "SUPERSTRUCTURE CONC. NIGHT CASTING."

PLAN NOTES:

BLOCK OUT CONCRETE AT ELASTOMERIC BEARINGS. ATTACH NO. 30 ASPHALT FELT WITH ROOFING TAR/ASPHALT TO SIDES OF BEAMS FROM BEAM END TO 1" PAST EDGE OF PIER DIAPHRAGM. REMOVE 1" EXCESS ON OUTSIDE OF FASCIA BEAMS AFTER DIAPHRAGM FORM REMOVAL. ALL LABOR, MATERIALS AND CLEANUP/REMOVAL ARE INCLUDED IN THE BID ITEM "SUPERSTRUCTURE CONC. NIGHT CASTING."

JOINT BETWEEN BEAM ENDS SHALL BE FILLED WITH CONCRETE.

PROVIDE A SAWED JOINT 1 1/2" DEEP BY 1/4" WIDE (MINIMUM) IN THE TOP OF SLAB AT THE LOCATIONS SHOWN IN SECTION(S) _____. SAW THE JOINT WITHIN 24 HOURS OF PLACING THE CURING AND FILL TO 1/2" BELOW TOP OF CONCRETE WITH POLYURETHANE OR POLYURETHANE HYBRID SEALANT. (INCLUDED IN THE BID ITEM "SUPERSTRUCTURE CONC. FORM, FINISH, AND CURE, NIGHT CASTING (STRUCTURE NO.)").

PREPARED BY
DESIGN DIVISION

6.60.11B