



Road & Bridge Design Publications

Monthly Update – April 2026

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

Email road related questions to MDOT-Road-Design-Standards@Michigan.gov.
Email bridge related questions to MDOT-Bridge-Design-Standards@Michigan.gov.

Special Announcement Regarding Geometric Design

Roundabout Aid:

Provided additional guidance in the general notes section along with some minor wording changes.

Also, all of the documents under the Geometrics, Correspondence/Guidelines link/webpage are now in PDF format. [MDOT - Transportation Standards and Special Details](#)

Special Announcement Regarding MDOT Load Ratings

2026 Bridge Analysis Guide (BAG):

MDOT has released the Bridge Analysis Guide (BAG) 2026 Edition ([MDOT Bridge Analysis Guide](#)). The 2026 BAG replaces the 2009 Version. A link to the document is located at MDOT's Load Rating website, [Load Rating](#), under the Guides and Manuals section. Email Bridge Analysis Guide related questions to MDOT-Load-Rating@Michigan.gov.

Special Details

R-44-G: Concrete Pavement Repair:

Converted notes and callouts to active voice.

R-53-A: Temporary Concrete Barrier Limited Deflection:

Converted notes and callouts to active voice.



Road & Bridge Design Publications

R-73-F: Guardrail Over Box or Slab Culverts:

Modified notes on the “Alternate Construction Method” detail to remove information now covered in a frequently used special provision (recently approved) which necessitates pull testing requirements for the adhesive anchoring of the threaded rods which secure the base plate to the box or slab culvert.

R-80-F: Granular Blanket, Underdrains, Outlet Endings for Underdrains, and Sewer Bulkheads:

Added details for a new underdrain outlet ending (CIP). This ending is required when installing new or upgrading existing endings at all locations unless the site conditions do not allow for proper installation. If the CIP ending cannot be installed, the other endings on this standard are acceptable for use. A FUSP and a standard pay item have been created for use in conjunction with this ending.

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

Adjusted dimension for bridge barrier wall bar EZ1.

Road Design Manual

Chapter 4: Drainage:

Reformatted the full chapter to comply with ADA accessibility which includes changing from a two column format to a single column. Only sections with content changes are included in this update.

4.06.01: Purpose of Underdrains:

Added a detail and a description which specifies the minimum freeboard (at least 1'-0") required for underdrain design.

4.06.05: Underdrain Outlets & Outlet Endings:

Updated section to conform to changes made to Standard Plan R-80-series. Also, converted to active voice.



Road & Bridge Design Publications

Bridge Design Guides

6.29.08: Bridge Barrier Railing Type 7:

Revised bridge barrier wall reinforcement dimensions to match Special Detail B-28-A for Bridge Barrier, Type 7.

6.29.09: Bridge Barrier Railing Type 6:

Revised bridge barrier wall reinforcement dimensions to match Special Detail B-29-A for Bridge Barrier, Type 6.

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.

Index to Road Special Details

⑥

4-27-2026

SPECIAL DETAIL NUMBER	NUMBER OF SHEETS	TITLE	PLAN DATE
21	2	GUARDRAIL AT INTERSECTIONS	3-17-26
24	8	GUARDRAIL ANCHORED IN BACKSLOPE TYPES 4B, 4T, 7 4MGS-8	3-17-26
99	2	CHAIN LINK FENCE WITH WIRE ROPE	3-17-26
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	2-23-26
*R-44-G	7	CONCRETE PAVEMENT REPAIR	3-30-26
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	3-30-26
R-54-J	5	CONCRETE BARRIER, SINGLE FACE	12-15-25
R-55-H	5	FILLER WALLS AT BRIDGE PIER COLUMNS	2-23-26
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	2-23-26
R-63-C	3	GUARDRAIL APPROACH TERMINAL TYPE 3M	1-6-26
R-66-E	4	GUARDRAIL DEPARTING TERMINAL TYPES B, T, & MGS	2-23-26
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	3-30-26
R-76-F	4	CONCRETE GLARE SCREEN	11-4-25
*R-80-F	9	GRANULAR BLANKETS, UNDERDRAINS, OUTLET ENDINGS, & BULKHEADS	2-5-26
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 August 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

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

4-27-2026

⑦

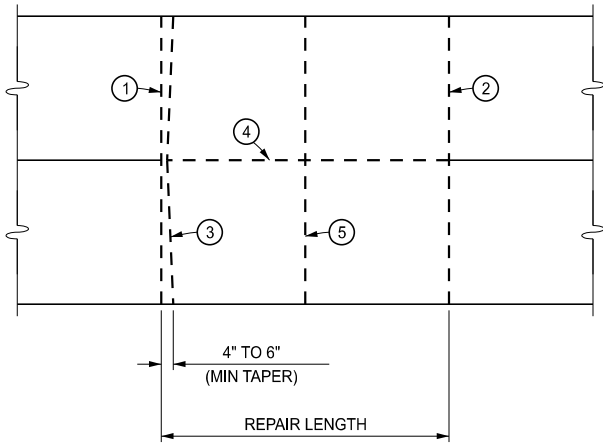
SPECIAL DETAIL NUMBER	NUMBER OF SHEETS	TITLE	PLAN DATE
B-21-K	4	BRIDGE RAILING, 2 TUBE	9-10-24
B-25-L	8	BRIDGE RAILING, AESTHETIC PARAPET TUBE	9-9-24
B-26-G	8	BRIDGE RAILING, 4 TUBE	9-6-24
B-27-B	7	BRIDGE RAILING, 3 TUBE WITH PICKETS	9-11-24
B-28-A	7	BRIDGE BARRIER RAILING, TYPE 7	12-17-25
*B-29-A	8	BRIDGE BARRIER RAILING, TYPE 6	4-22-26
B-41-D	3	FENCING FOR BRIDGE RAILING, AESTHETIC PARAPET TUBE	12-10-25
B-42-A	3	FENCING FOR BRIDGE RAILING, 3 TUBE WITH PICKETS	1-5-26
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 August letting.**

Notes:

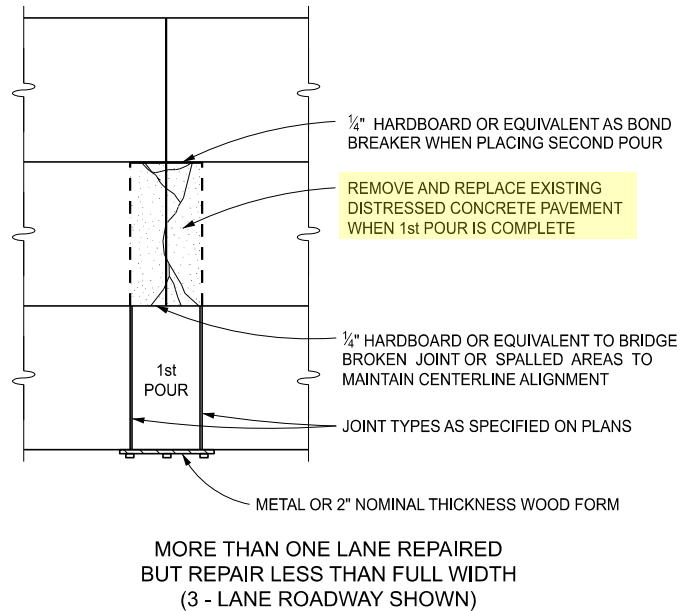
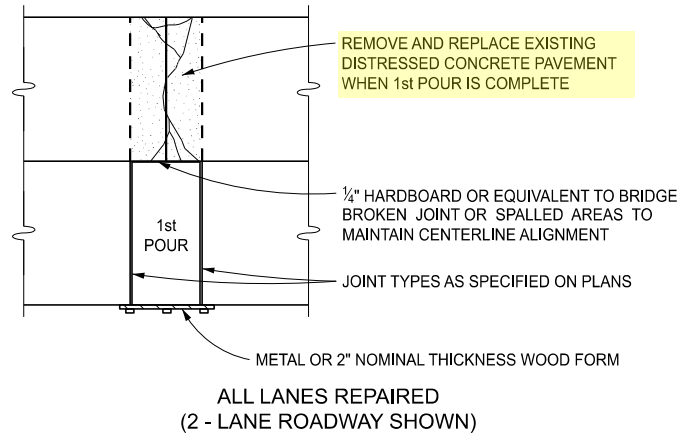
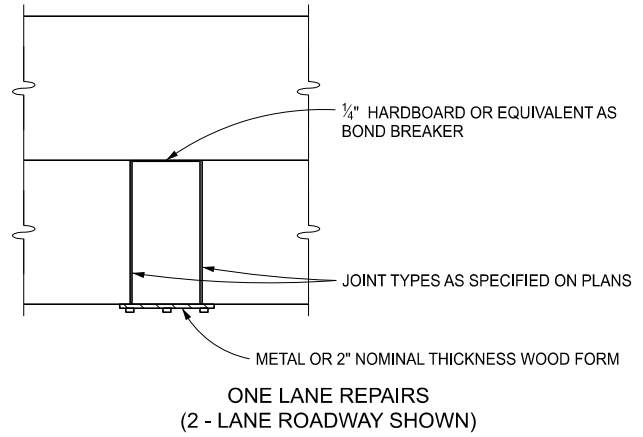
Details EJ3AG & EJ4T are interactive, i.e., designers and detailers choose details based upon railing type and angle of crossing and fill in the project specific dimensions for the end plate. Place all details appropriate for the project (including the end plate), structure specific information, and 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.



SAWING DIAGRAM FOR FULL DEPTH CAST IN PLACE REPAIRS

- ① & ② THESE SAW CUTS ARE FULL DEPTH AND PERPENDICULAR TO THE EDGE OF THE ROADWAY, WITHIN A TOLERANCE OF 1". OVERCUTTING IS ALLOWED INTO ADJACENT SHOULDERS AND WITHIN THE LIMITS OF A SUBSEQUENT REPAIR TO THE ADJACENT LANE. OUTSIDE THESE LIMITS, OVERCUTTING IS NOT ALLOWED INTO ADJACENT NON-REINFORCED CONCRETE PAVEMENTS AND IS RESTRICTED TO 3" INTO ADJACENT REINFORCED CONCRETE PAVEMENTS.
 - ③ THIS FULL DEPTH SAW CUT IS MADE TO FACILITATE OPENING A TRENCH ACROSS THE SLAB TO RELIEVE COMPRESSION IN THE PAVEMENT PRIOR TO REMOVAL OF THE FAILED AREA. THIS SAW CUT MAY BE OMITTED PROVIDED NO SPALLING OF THE REMAINING CONCRETE OCCURS. IF SPALLING DOES OCCUR, THE CONTRACTOR WILL BE REQUIRED TO MAKE THIS SAW CUT ON SUBSEQUENT REPAIRS. WHEN THIS SAW CUT IS USED AND THE ADJACENT LANE IS NOT REPAIRED, NO OVERCUTTING INTO THAT LANE IS ALLOWED.
 - ④ THIS LONGITUDINAL FULL DEPTH SAW CUT IS MADE BETWEEN LANES OR BETWEEN ANY COMBINATION OF THE FOLLOWING: LANE, RAMP, CURB, CONCRETE SHOULDER, OR PARTIAL LANE WIDTH REPAIR.
 - ⑤ IF REQUIRED, INTERMEDIATE SAW CUTS MAY BE MADE TO REMOVE A SECTION OF PAVEMENT LANE WHICH IS OVER 5'-0" IN LENGTH, TO PERMIT LOADING INTO THE HAULING UNITS.
- ADDITIONAL SAW CUTS, AT CONTRACTOR'S EXPENSE, MAY BE MADE INSIDE THE REPAIR LIMITS TO REDUCE 5'-0" BY 12'-0" OR LESS SLABS INTO SMALLER PIECES TO FACILITATE REMOVAL.



FORMING NOTES:

REMOVE STAKES USED TO HOLD HMA FILLER OR HARDBOARD IN PLACE DURING CONCRETE PLACEMENT BEFORE SCREEDING THE CONCRETE.

ADJACENT LANE REPAIRS MAY BE CAST INTEGRALLY, WHEN APPROVED BY THE ENGINEER.

FORMING REQUIREMENTS FOR CAST-IN-PLACE REPAIRS 12'-0" OR LESS

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
CONCRETE PAVEMENT REPAIR

(SPECIAL DETAIL)
FHWA APPROVAL

03/30/2026
PLAN DATE

R-44-G

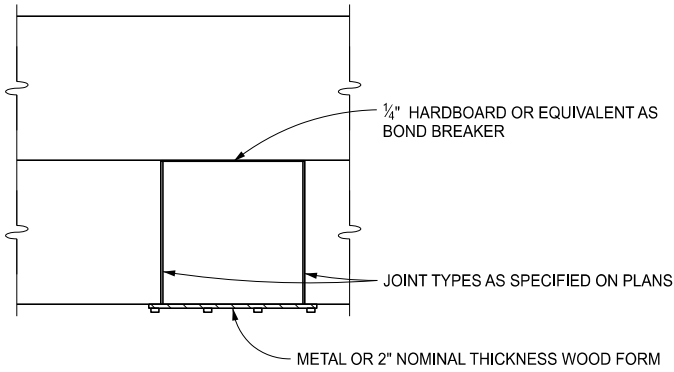
SHEET
1 OF 7

FORMING NOTES:

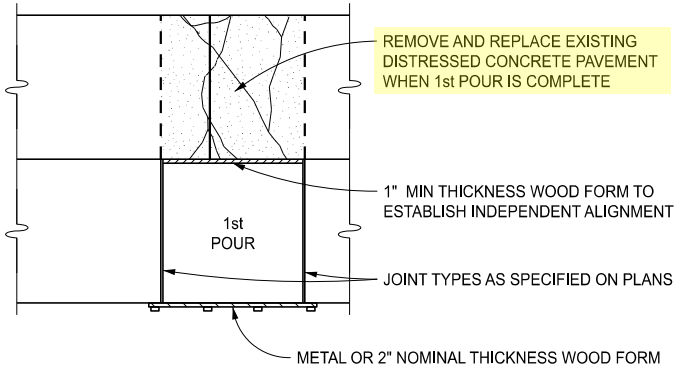
WHERE REPAIRS LONGER THAN 12'-0" ARE REQUIRED, ESTABLISH A NEW GRADE ALONG THE OLD PAVEMENT INNER JOINT LINE, INDEPENDENT OF THE OLD PAVEMENT SURFACE, TO SCREED PERPENDICULAR TO THE CENTERLINE AND INDEPENDENT OF THE OLD PAVEMENT GRADE.

REMOVE STAKES USED TO HOLD HMA FILLER OR HARDBOARD IN PLACE DURING CONCRETE PLACEMENT BEFORE SCREEDING THE CONCRETE.

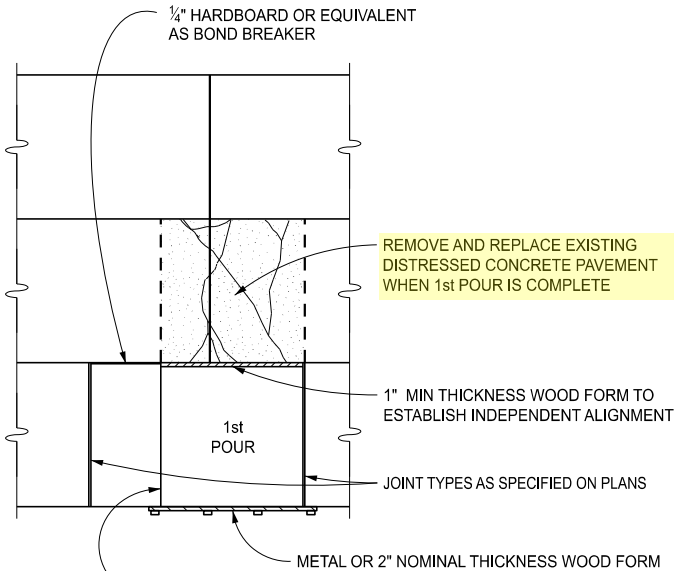
ADJACENT LANE REPAIRS MAY BE CAST INTEGRALLY, WHEN APPROVED BY THE ENGINEER.



ONE LANE REPAIRS
(2 - LANE ROADWAY SHOWN)




ALL LANES REPAIRED
(2 - LANE ROADWAY SHOWN)

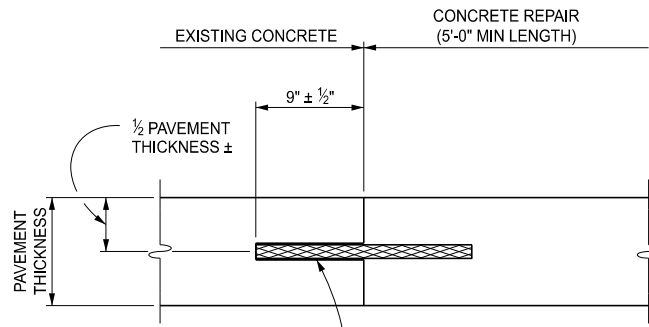


WHEN OFFSET IS GREATER THAN 6'-0" PLACE (C2) JOINT IN LINE WITH ADJACENT LANE REPAIR JOINT.

MORE THAN ONE LANE REPAIRED
BUT REPAIRS ARE OFFSET
(3 - LANE ROADWAY SHOWN)

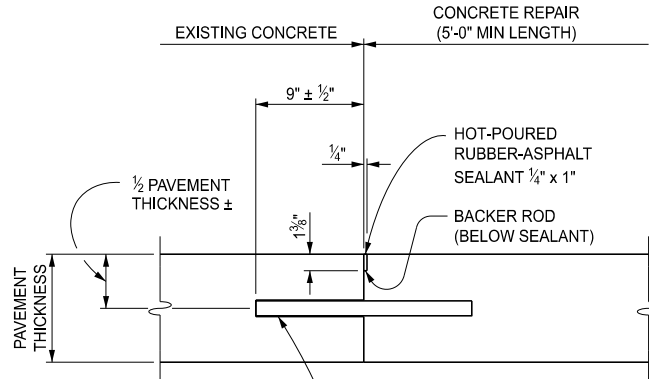
FORMING REQUIREMENTS FOR
CAST-IN-PLACE REPAIRS GREATER THAN 12'-0"

 DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR CONCRETE PAVEMENT REPAIR		R-44-G	SHEET 2 OF 7
	(SPECIAL DETAIL) FHWA APPROVAL	03/30/2026 PLAN DATE		



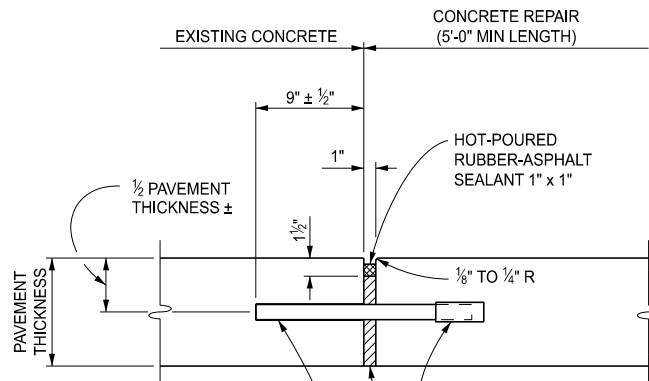
* DRILL 1 $\frac{3}{8}$ " DIAMETER HOLE INTO EXISTING CONCRETE PAVEMENT AND GROUT-IN-PLACE #9 x 1'-6" LONG EPOXY COATED DEFORMED BARS

TIED JOINT, Trg



* DRILL 1 $\frac{3}{8}$ " DIAMETER HOLE INTO EXISTING CONCRETE PAVEMENT AND GROUT-IN-PLACE 1 $\frac{1}{4}$ " DIAMETER x 1'-6" LONG EPOXY COATED BARS

CONTRACTION JOINT, Crg



* DRILL 1 $\frac{3}{8}$ " DIAMETER HOLE INTO EXISTING CONCRETE PAVEMENT AND GROUT-IN-PLACE 1 $\frac{1}{4}$ " DIAMETER x 1'-6" LONG EPOXY COATED BARS

* EXPANSION CAP
* FIBER JOINT FILLER

EXPANSION JOINT, Erg

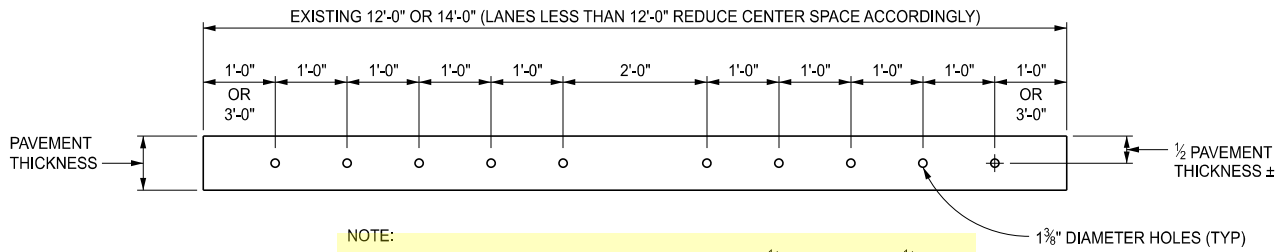
* SEE SHEET 4 OF 7 FOR BAR SPACING AND SHEET 7 OF 7 FOR NOTES.

CAST-IN-PLACE REPAIR JOINTS USING GROUTED DOWEL OR DEFORMED BARS

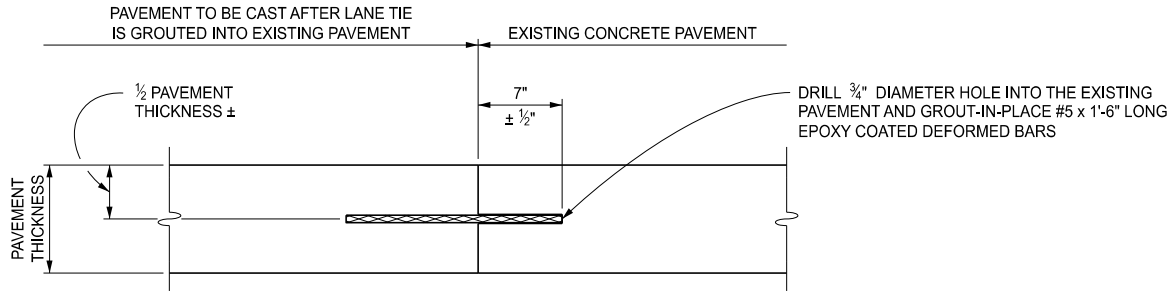
MDOT
Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

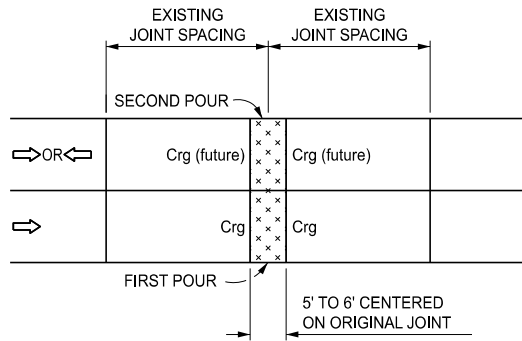
STANDARD PLAN FOR CONCRETE PAVEMENT REPAIR		R-44-G	SHEET 3 OF 7
(SPECIAL DETAIL) FHWA APPROVAL	03/30/2026 PLAN DATE		



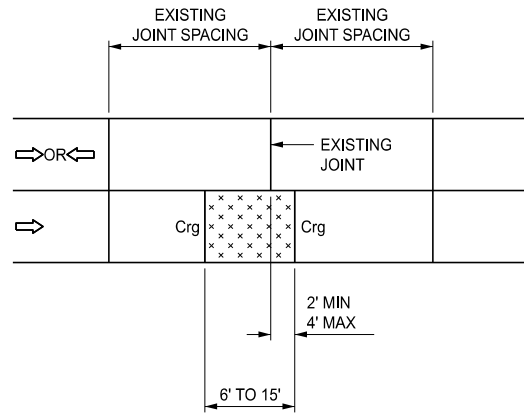
DOWEL OR DEFORMED BAR SPACING FOR CONCRETE REPAIRS



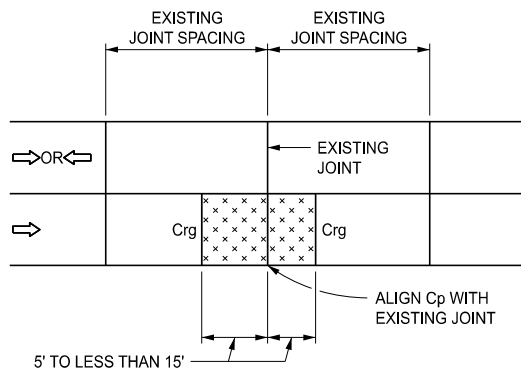
EPOXY ANCHORED LANE TIE



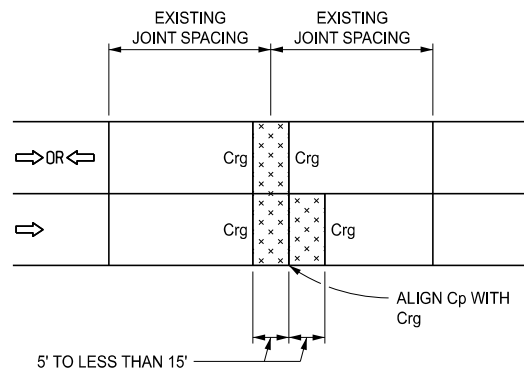
SINGLE LANE OR FULL WIDTH REPAIR



REPAIR LENGTH 6' - 15' WITH ONE JOINT NEAR AN EXISTING JOINT (SINGLE LANE REPAIR)



REPAIR LENGTHS OVER 15' WITH Cp JOINT (SINGLE LANE REPAIR)



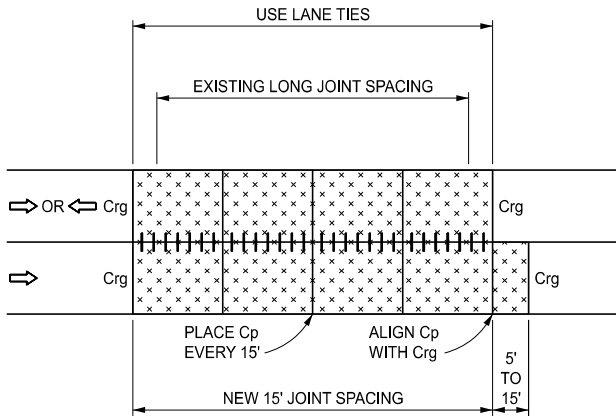
OFFSETTING LANE REPAIRS WITH Cp JOINT

MDOT
Michigan Department of Transportation

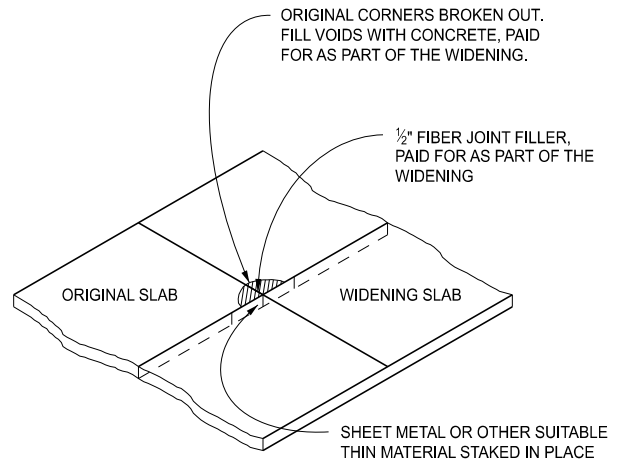
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
CONCRETE PAVEMENT REPAIR

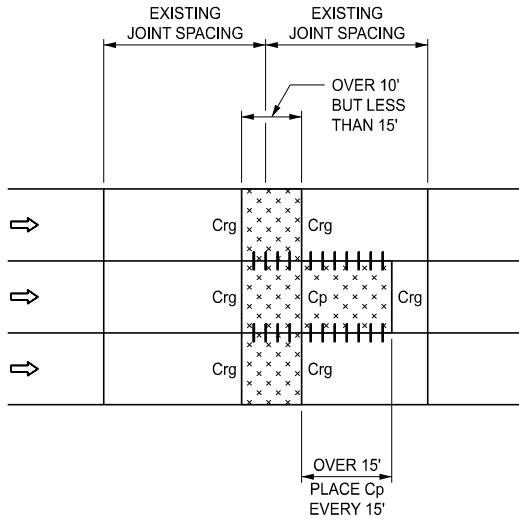
(SPECIAL DETAIL)	03/30/2026	R-44-G	SHEET 4 OF 7
FHWA APPROVAL	PLAN DATE		



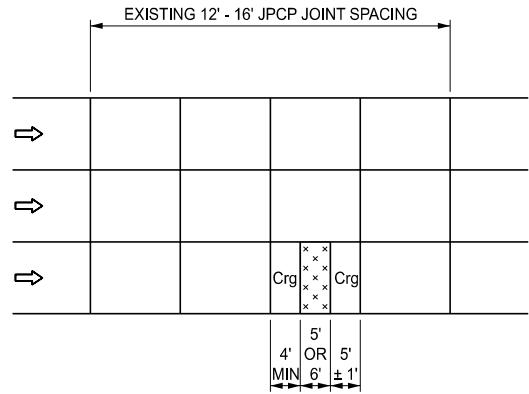
LONG REPAIR SHOWING Cp JOINT ALIGNMENTS AND LANE TIES



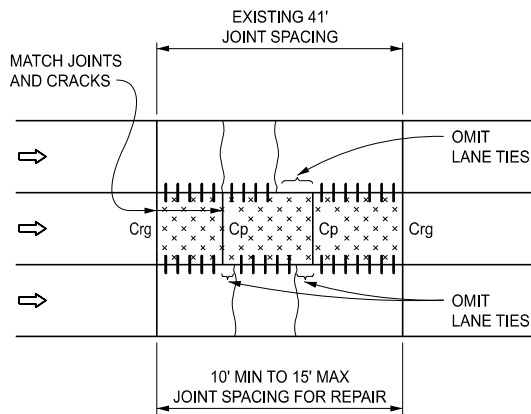
JOINT PATCH ADJACENT TO WIDENING SLAB



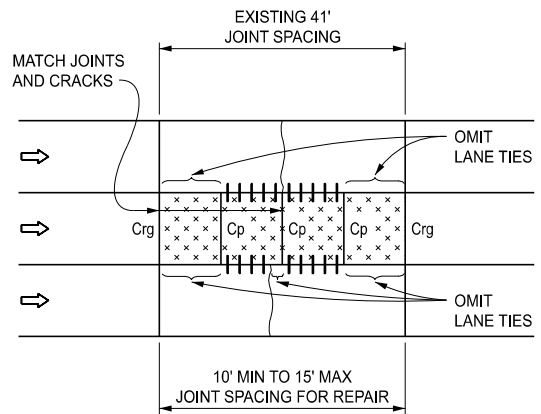
FULL WIDTH MULTI-LANE REPAIRS WITH OFFSET IN ONE LANE



REPAIR OF 12' - 16' JPCP WITH ONLY ONE MID-PANEL CRACK
 (IF THE PANEL HAS MORE THAN ONE MID-PANEL CRACK OR IF THE JOINT SPACING IS 12' REPLACE ENTIRE PANEL) (SINGLE LANE OR FULL WIDTH REPAIR)



TWO CRACK PANEL REPAIR



MID PANEL CRACK REPAIR



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

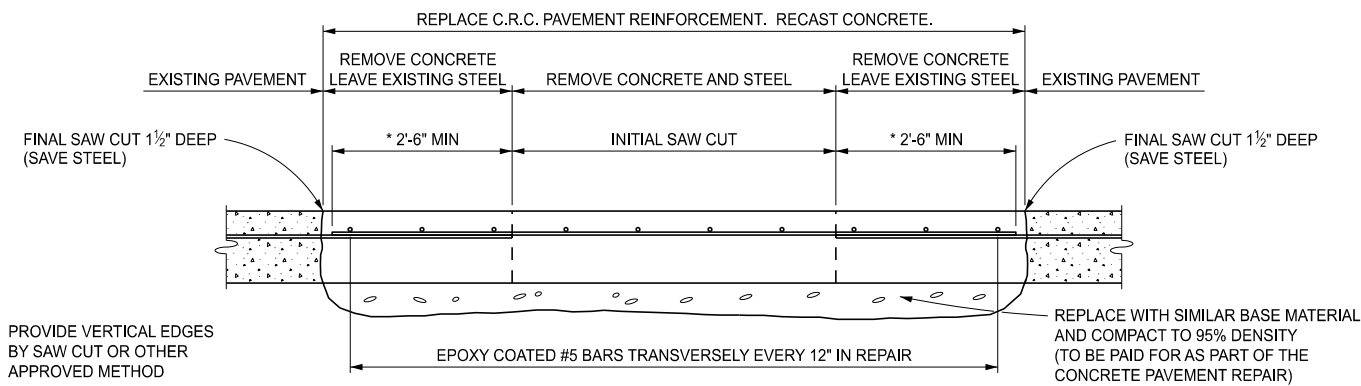
STANDARD PLAN FOR
CONCRETE PAVEMENT REPAIR

(SPECIAL DETAIL)
FHWA APPROVAL

03/30/2026
PLAN DATE

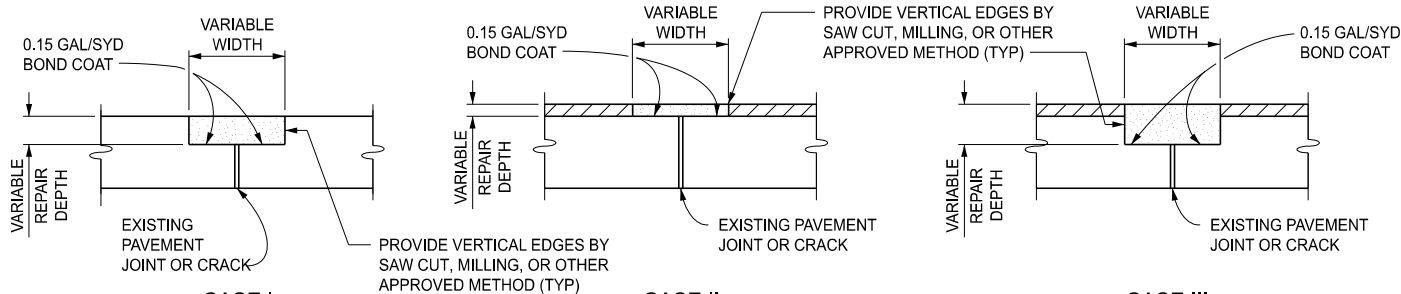
R-44-G

SHEET
5 OF 7



* NOTE: IF EXISTING REINFORCEMENT LAPS ARE ENCOUNTERED IN THIS AREA, MOVE FINAL SAW CUT BACK TO PROVIDE MINIMUM 2'-6" LAP OF PAVEMENT REINFORCEMENT.

REPAIRING CONTINUOUSLY REINFORCED CONCRETE



CASE I
HMA REPAIR OF CONCRETE PAVEMENT
REMOVE LOOSE DETERIORATED CONCRETE. (NOT TO EXCEED PAVEMENT THICKNESS)

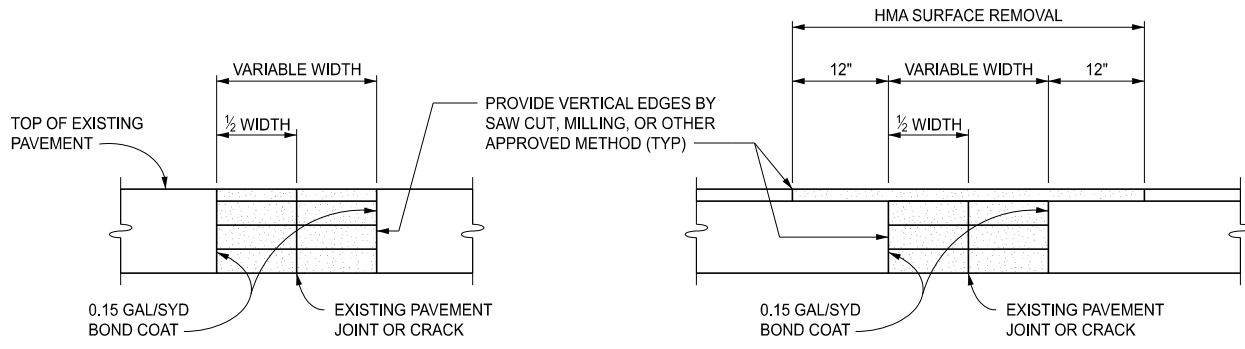
CASE II
HMA REPAIR OF CONCRETE PAVEMENT WITH HMA SURFACE
REMOVE HMA OVERLAY TO CONCRETE SURFACE.

CASE III
HMA REPAIR OF CONCRETE PAVEMENT WITH HMA SURFACE
REMOVE HMA OVERLAY AND LOOSE DETERIORATED CONCRETE. (NOT TO EXCEED PAVEMENT THICKNESS)

FOR CASES I, II, & III, REPLACE THE REMOVED MATERIAL WITH A HMA TOP COURSE MIXTURE, OR OTHER APPROVED MIXTURE. COMPACT THE HMA WITH A MACHINE VIBRATOR OR APPROVED ROLLER WITH BASE LIFT THICKNESSES NOT TO EXCEED 3" AND WITH THE TOP LIFT THICKNESS NOT TO EXCEED 2". ENSURE THE FINAL SURFACE OF THE REPAIR IS FLUSH WITH THE EXISTING PAVEMENT SURFACE.

SURFACE REPAIR FOR JOINT OR CRACK (TRANSVERSE OR LONGITUDINAL)

DETAIL 7



CASE IV
FULL DEPTH HMA REPAIR OF CONCRETE PAVEMENT
REMOVE THE DETERIORATED CONCRETE FULL DEPTH. COMPACT LOOSE EXISTING BASE. REPLACE AND COMPACT WITH HMA ANY LOST BASE.

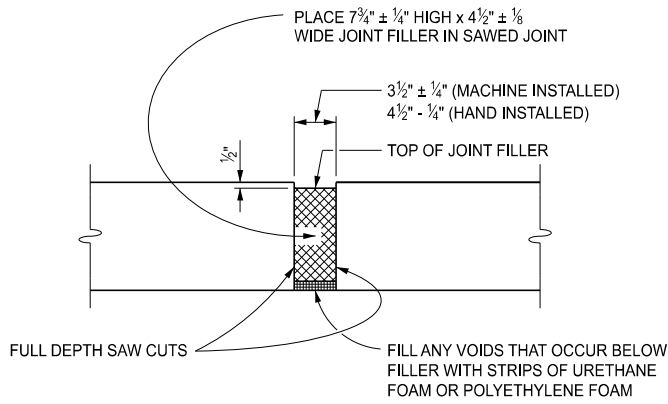
CASE V
FULL DEPTH HMA REPAIR OF CONCRETE PAVEMENT WITH HMA SURFACE
REMOVE EXISTING HMA DETERIORATED CONCRETE PAVEMENT FULL DEPTH. COMPACT LOOSE EXISTING BASE. REPLACE AND COMPACT WITH HMA ANY LOST BASE.

FOR CASES IV & V, REPLACE THE REMOVED MATERIAL WITH A HMA TOP COURSE MIXTURE, OR OTHER APPROVED MIXTURE. COMPACT THE HMA WITH A MACHINE VIBRATOR OR APPROVED ROLLER WITH BASE LIFT THICKNESSES NOT TO EXCEED 3" AND WITH THE TOP LIFT THICKNESS NOT TO EXCEED 2". ENSURE THE FINAL SURFACE OF THE REPAIR IS FLUSH WITH THE EXISTING PAVEMENT SURFACE.

FULL DEPTH REPAIR FOR JOINT OR CRACK (TRANSVERSE OR LONGITUDINAL)

DETAIL 8

<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR CONCRETE PAVEMENT REPAIR</p>		<p>R-44-G</p>	<p>SHEET 6 OF 7</p>
	<p>(SPECIAL DETAIL) FHWA APPROVAL</p>	<p>03/30/2026 PLAN DATE</p>		

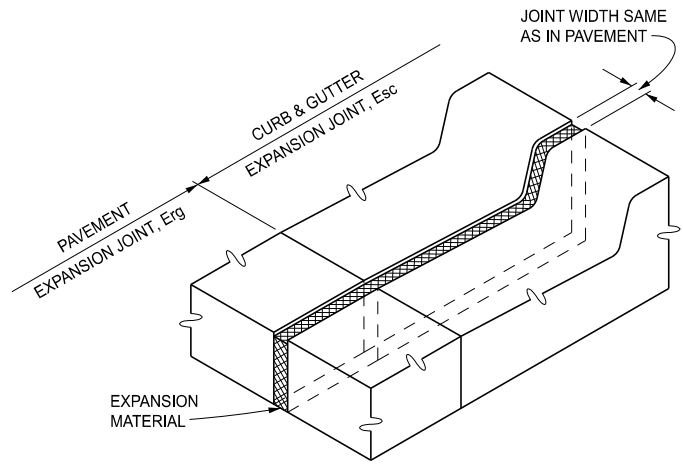


NOTES:

WHEN CONSTRUCTING A PRESSURE RELIEF JOINT THROUGH A CONCRETE SHOULDER, TRENCH BELOW THE CONCRETE AS NEEDED TO ALLOW ROOM FOR THE $\frac{7}{8}''$ FILLER.

PRESSURE RELIEF JOINT

THIS DETAIL ALSO APPLIES TO HMA SURFACED CONCRETE PAVEMENT REQUIRING PRESSURE RELIEF JOINTS



SAW CURB, GUTTER, AND CURB FACE AS DEEP AS THE EXISTING PAVEMENT THICKNESS. CHIP OUT THE REMAINING CONCRETE AND PLACE A SUFFICIENT THICKNESS OF EXPANSION MATERIAL IN SAWED JOINT TO FILL THE GAP, AS DIRECTED BY THE ENGINEER.

EXPANSION JOINT, Esc

NOTES:

ENSURE CONCRETE PAVEMENT REPAIRS (INCLUDING JOINT TYPES) OR PRESSURE RELIEF DETAILS ARE AS SPECIFIED ON THE PLANS OR IN THE LOG OF PROJECT.

IF THE EXISTING PAVEMENT HAS AN HMA SURFACE, EXTEND THE SAW CUTS THROUGH THE UNDERLYING PORTLAND CEMENT CONCRETE.

CLEAN SAW OVERCUTS IN ADJACENT LANE, SHOULDER, RAMP, AND GUTTERS THAT WILL REMAIN IN PLACE AND THEN SEAL WITH HOT-POURED RUBBER-ASPHALT.

WHEN THE CONCRETE PAVEMENT REPAIR IS CONSTRUCTED IN PREPARATION FOR AN OVERLAY, OMIT Crg JOINT RESERVOIRS AND SEALANTS AND KEEP EXPANSION JOINT (Erg) FIBER FILLER FLUSH TO THE PAVEMENT SURFACE.

ENSURE EXPANSION CAPS ARE ACCORDING TO STANDARD PLAN R-40-SERIES.

ENSURE TRANSVERSE CONTRACTION (Cp) AND EXPANSION (E2) JOINTS ARE ACCORDING TO STANDARD PLAN R-39-SERIES.

EPOXY COAT DOWEL AND DEFORMED BARS USED IN Trg, Crg, AND Erg JOINTS ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

GROUT DOWEL BARS AND DEFORMED BARS FOR TIED JOINTS INTO EXISTING PAVEMENT WITH A GROUT SELECTED FROM THE PREQUALIFIED MATERIALS LISTED IN THE DEPARTMENT'S "MATERIALS SOURCE GUIDE" UNDER ADHESIVE SYSTEMS FOR GROUTING DOWEL BARS AND TIE BARS FOR FULL-DEPTH CONCRETE PAVEMENT REPAIRS.

ENSURE THE BACKER ROD MEETS THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

ENSURE THE SAME JOINT TYPE EXTENDS ACROSS ADJACENT LANE REPAIRS.

AFTER GROUTING IN-PLACE, APPLY RC-250 OR AN APPROVED BOND BREAKER TO THAT PORTION OF Crg AND Erg DOWEL BARS THAT EXTEND INTO THE CAST CONCRETE.

DISTRIBUTE 1" OF Erg EXPANSION JOINTS THROUGHOUT A 1000' SECTION OF REPAIRED CONCRETE PAVEMENTS.

WHERE THERE ARE NO REPAIR LOCATIONS WITHIN A 1000' LENGTH, NO EXPANSION SPACE WILL BE PROVIDED.

EXTEND EXPANSION JOINT FILLER THE FULL DEPTH OF THE REPAIR AND ENSURE IT IS FLUSH WITH THE EXISTING PAVEMENT SURFACE. PRIOR TO SEALING, REMOVE THE JOINT FIBER FILLER AT THE PAVEMENT SURFACE BY CUTTING 1" WIDE AND $1\frac{1}{2}''$ DEEP TO PERMIT THE PLACEMENT OF THE HOT-POURED RUBBER ASPHALT SEALANT. ENSURE HOLES IN EXPANSION JOINT FILLER HAVE A $1\frac{1}{2}''$ MAXIMUM DIAMETER AND ARE ALIGNED TO FIT DRILLED HOLES IN CONCRETE.

CONSTRUCT Erg JOINTS ONLY WHEN THEY EXTEND ACROSS ALL LANES, RAMPS, OR SHOULDERS.

WHEN Erg JOINTS ARE PLACED ADJACENT TO CONCRETE CURB AND GUTTER THAT IS NOT REQUIRED TO BE REMOVED, CONSTRUCT AN Esc JOINT IN THE CURB AND GUTTER.

BLAST CLEAN (ABRASIVE) JOINT RESERVOIRS FOR THE HOT-POURED RUBBER-ASPHALT SEALANT, FOLLOWED BY A FINAL CLEANING OF OIL-FREE COMPRESSED AIR PRIOR TO SEALING.

SPACE LANE TIES (TO ADJACENT PAVEMENT LANE, WHEN REQUIRED) ACCORDING TO STANDARD PLAN R-41-SERIES, EXCEPT THAT THE FIRST LANE TIE ADJACENT TO A TRANSVERSE JOINT IS INSTALLED AT A DISTANCE OF 1'-8" FROM THE JOINT. WHEN BOTH SIDES OF A LONGITUDINAL JOINT ARE POURED INTEGRALLY, ENSURE LANE TIES ARE STRAIGHT DEFORMED EPOXY COATED BARS AND CAST-IN-PLACE AS SPECIFIED ON STANDARD PLAN R-41-SERIES. WHEN ADJACENT LANES ARE CAST SEPARATELY, GROUT-IN-PLACE LANE TIES AS SPECIFIED ON THIS PLAN. SELECT GROUT FROM THE PREQUALIFIED MATERIALS LISTED IN THE DEPARTMENT'S "MATERIALS SOURCE GUIDE", UNDER LANE TIES.

STENCIL THE MONTH AND YEAR OF CASTING AND STATION NUMBER (IF REMOVED) ON EACH CONCRETE REPAIR.

USE JOINTED PLAIN CONCRETE PAVEMENT FOR ALL REPAIRS.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
CONCRETE PAVEMENT REPAIR

(SPECIAL DETAIL)
FHWA APPROVAL

03/30/2026
PLAN DATE

R-44-G

SHEET
7 OF 7

**ACCEPTABLE TEMPORARY CONCRETE BARRIER (TCB) TYPES AND ANCHORING DETAILS
BASED ON UNDERLYING SURFACE TYPE AND BARRIER OFFSET FROM DROP-OFF**

UNDERLYING SURFACE	BARRIER OFFSET							
	0" ≤ A < 6"		6" ≤ A < 12"		12" ≤ A < 26"		A ≥ 26"	
	TCB TYPE	DETAIL	TCB TYPE	DETAIL	TCB TYPE	DETAIL	TCB TYPE	DETAIL
BRIDGE DECK (CONCRETE)	L OR S *	3A OR 4A * **	L OR S *	3A OR 4A * **	L	1	***	N/A
BRIDGE DECK (CONCRETE WITH HMA OVERLAY)	L OR S *	3B *	L OR S *	3B *	L	1	***	N/A
ROADWAY (CONCRETE)	L OR S	4A	L OR S	4A	L	1	***	N/A
ROADWAY (HMA)	****	****	L OR S	2	L	1	***	N/A
ROADWAY (CONCRETE WITH HMA OVERLAY)	L OR S	4B	L OR S	4B	L	1	***	N/A

IN REGARDS TO BARRIER OFFSET, "A" IS THE DISTANCE FROM THE OUTSIDE EDGE OF THE TCB TO THE DROP OFF OR THE EDGE OF SLAB.

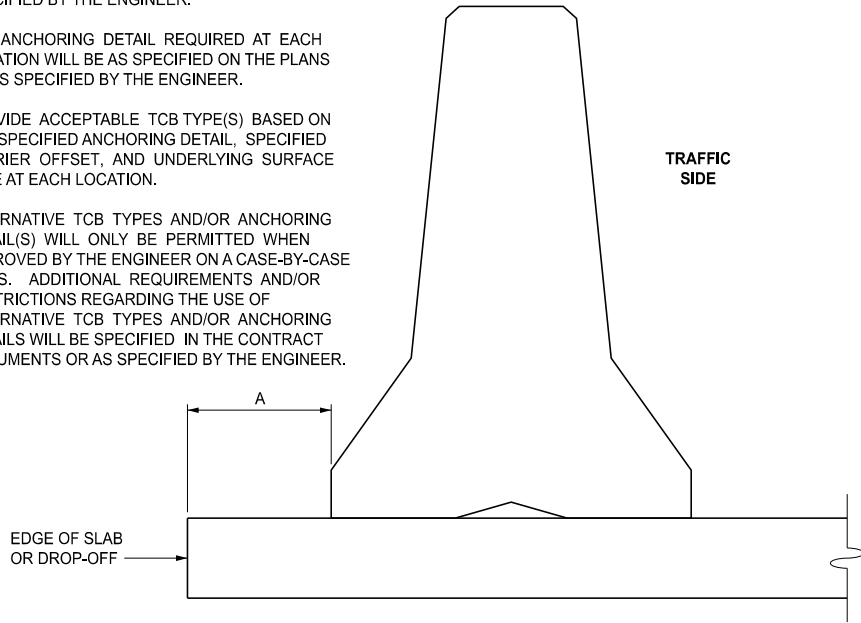
NOTES:

THE CLEAR DIMENSION, A, BETWEEN THE TOE OF THE TCB AND THE DROP-OFF OR EDGE OF SLAB WILL BE AS SPECIFIED ON THE PLANS OR AS SPECIFIED BY THE ENGINEER.

THE ANCHORING DETAIL REQUIRED AT EACH LOCATION WILL BE AS SPECIFIED ON THE PLANS OR AS SPECIFIED BY THE ENGINEER.

PROVIDE ACCEPTABLE TCB TYPE(S) BASED ON THE SPECIFIED ANCHORING DETAIL, SPECIFIED BARRIER OFFSET, AND UNDERLYING SURFACE TYPE AT EACH LOCATION.

ALTERNATIVE TCB TYPES AND/OR ANCHORING DETAIL(S) WILL ONLY BE PERMITTED WHEN APPROVED BY THE ENGINEER ON A CASE-BY-CASE BASIS. ADDITIONAL REQUIREMENTS AND/OR RESTRICTIONS REGARDING THE USE OF ALTERNATIVE TCB TYPES AND/OR ANCHORING DETAILS WILL BE SPECIFIED IN THE CONTRACT DOCUMENTS OR AS SPECIFIED BY THE ENGINEER.



SHEET INDEX	
ITEM	SHEET NUMBER
TYPE L	10
TYPE S	18
TYPE J1	13
TYPE J2	14
DETAIL 1	2, 3, 4
DETAIL 2	5, 8
DETAIL 3A & 3B	6, 8, 9, 11
DETAIL 4A & 4B	7, 8, 9, 11

* USE TYPE J1 AND J2 TCB SECTIONS OVER BRIDGE DECK EXPANSION JOINTS WITH THERMAL EXPANSION FROM 1½" TO 4". DO NOT USE DETAILS 3A, 3B, OR 4A, OVER BRIDGE DECK EXPANSION JOINTS WITH THERMAL EXPANSION GREATER THAN 4". INSTEAD, USE DETAIL 1 AND TYPE L TCB SECTIONS (WITH "A" NOW BEING ≥ 12") OVER THE ENTIRE BRIDGE SPAN WHEN PLACING LIMITED DEFLECTION TCB SECTIONS OVER BRIDGE DECK EXPANSION JOINTS WITH THERMAL EXPANSION GREATER THAN 4". REFER TO TCB SECTION OVER BRIDGE EXPANSION JOINT DETAILS. FOR ADDITIONAL INFORMATION CONTACT THE TRAFFIC AND SAFETY CRASH BARRIER ENGINEER.

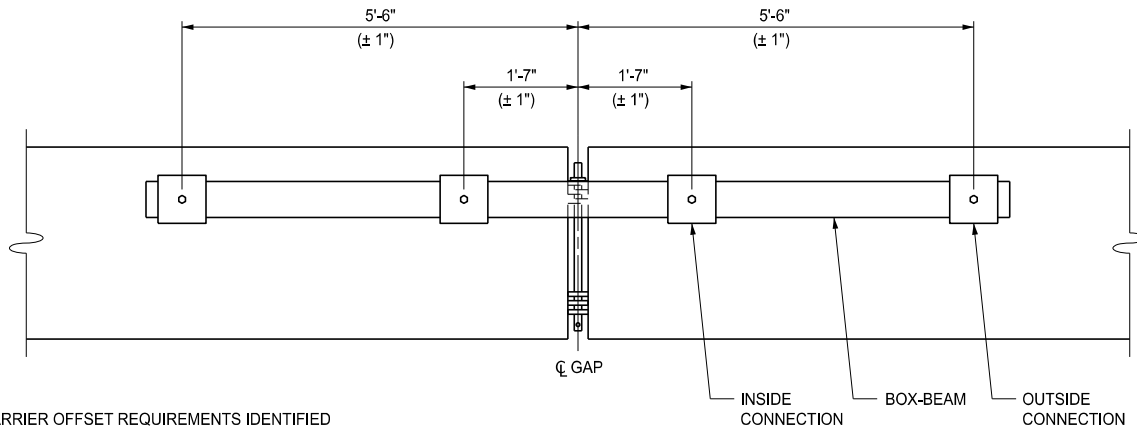
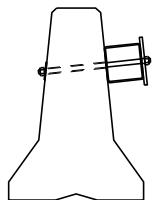
** PROVIDE THE ANCHORING DETAIL SPECIFIED ON THE PLANS OR AS SPECIFIED BY THE ENGINEER.

*** USE OF LIMITED DEFLECTION TCB IS NOT REQUIRED WHEN "A" ≥ 26". TYPE L OR TYPE S TCB MAY BE USED WITHOUT ANCHORING TO THE UNDERLYING SURFACE OR BOX-BEAM STIFFENERS. OTHER MDOT APPROVED STANDARD TEMPORARY BARRIER TYPES MAY ALSO BE USED WHEN "A" ≥ 26"

**** DO NOT INSTALL LIMITED DEFLECTION TCB ON HMA ROADWAYS WHEN "A" < 6".

APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES	 DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION		
APPROVED BY: _____ DIRECTOR, BUREAU OF DEVELOPMENT		(SPECIAL DETAIL) FHWA APPROVAL	03/30/2026 PLAN DATE	R-53-A

BOX BEAM STIFFENED METHOD DETAIL 1



SIDE VIEW
(CONSTRUCTION SIDE)

NOTES:

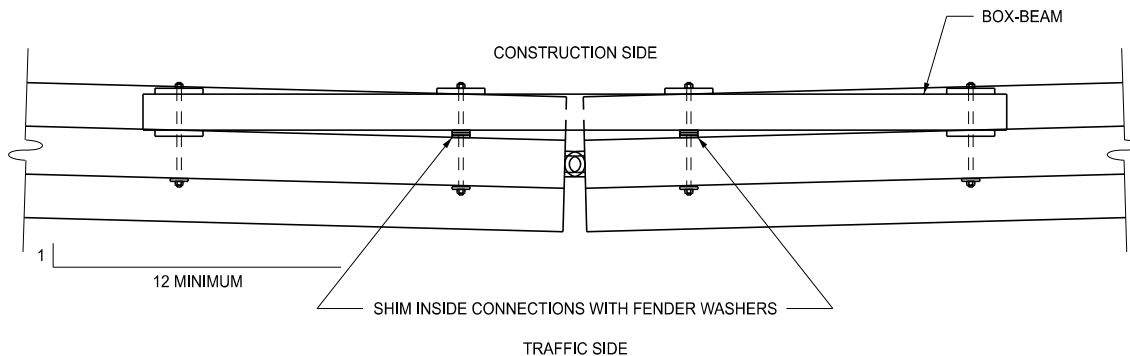
FOLLOW TCB TYPE AND BARRIER OFFSET REQUIREMENTS IDENTIFIED IN TABLE ON SHEET 1.

WHERE TCB WITH BOX-BEAM STIFFENERS (DETAIL 1) IS FLARED OR PLACED ON A RADIUS, SHIM THE RESULTING GAPS BETWEEN THE BOX-BEAM AND TCB.

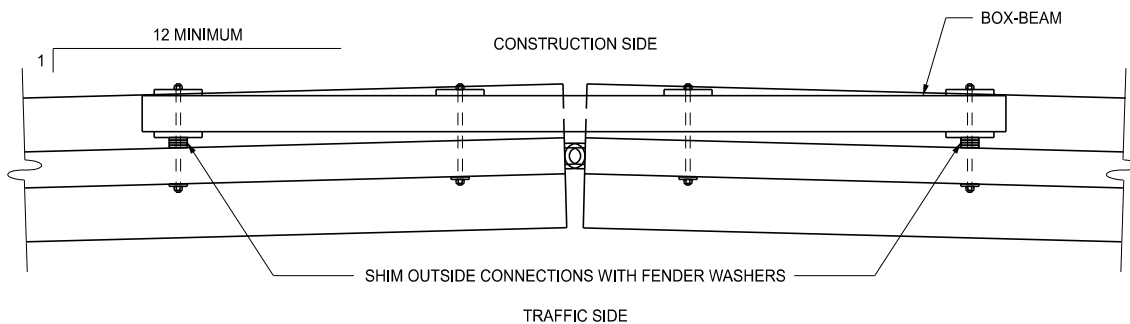
TO SNUG THE BOX-BEAM STIFFENER TO THE TCB, SHIM AS NECESSARY WITH 8" x 8" x 1/2" SQUARE PLATE AND FENDER WASHERS.

ENSURE FENDER WASHERS ARE 3" NOMINAL O.D.


INSTALL CONNECTION PINS BETWEEN TCB SECTIONS IN ADDITION TO BOX-BEAM STIFFENERS.



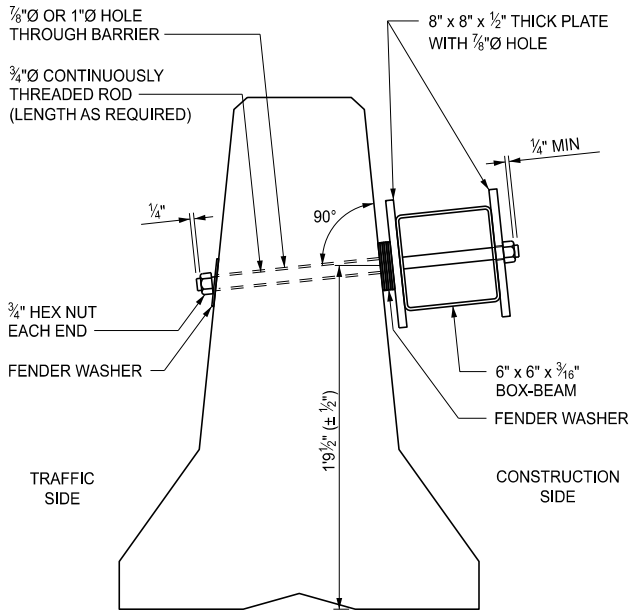
PLAN VIEW TCB CURVING AWAY FROM TRAFFIC



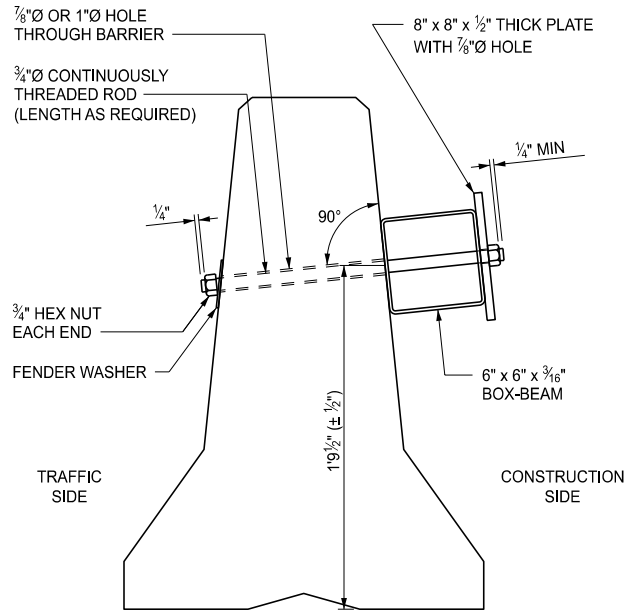
PLAN VIEW TCB CURVING TOWARD TRAFFIC

 DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION			R-53-A	SHEET 2 OF 22
	(SPECIAL DETAIL) FHWA APPROVAL	03/30/2026 PLAN DATE			

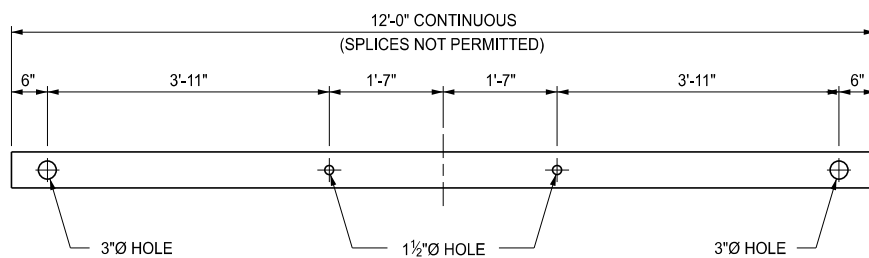
BOX BEAM STIFFENED METHOD DETAIL 1




SECTION WITH SHIMMING



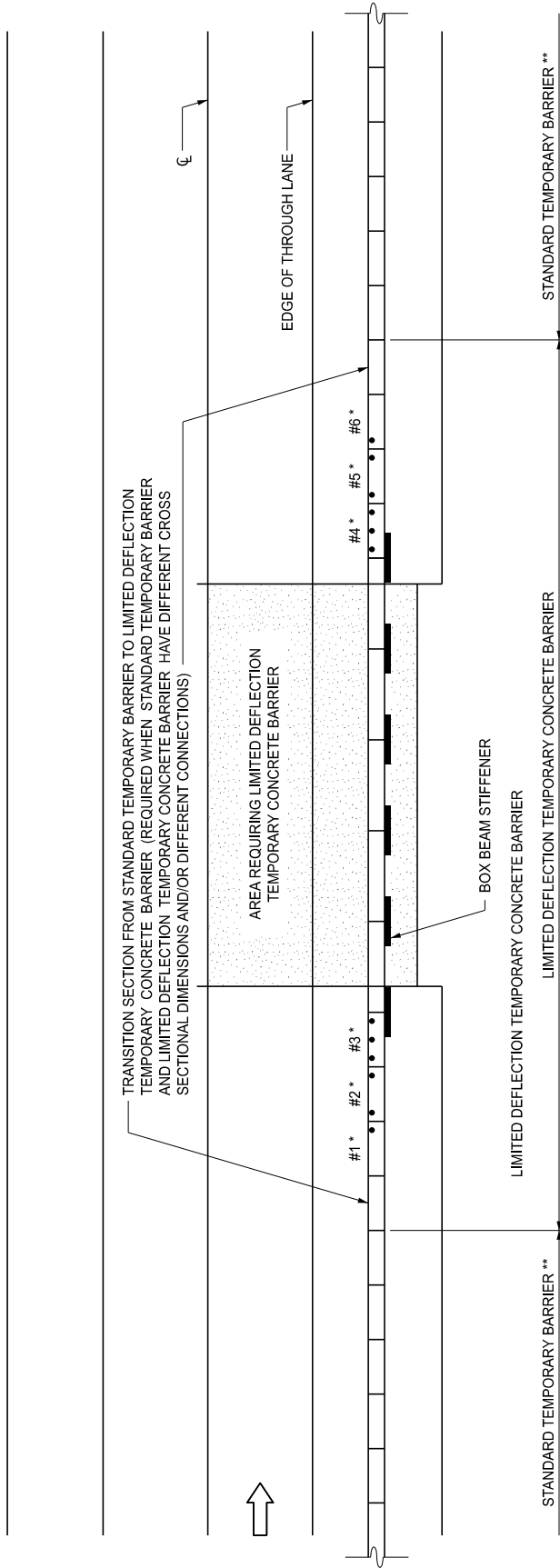
SECTION WITHOUT SHIMMING



BOX-BEAM HOLE LAYOUT DETAIL

 DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION		R-53-A	SHEET 3 OF 22
	(SPECIAL DETAIL) FHWA APPROVAL	03/30/2026 PLAN DATE		

TRANSITION FROM LIMITED DEFLECTION TEMPORARY CONCRETE BARRIER TO STANDARD TEMPORARY BARRIER WHEN USING DETAIL 1



* INSTALL THE FOLLOWING NUMBER OF ANCHORS OR STAKES EVENLY SPACED (ON THE TRAFFIC SIDE OF THE BARRIER) ON THE FOLLOWING TEMPORARY CONCRETE BARRIER SECTIONS:

	#1	#2	#3	#4	#5	#6
TYPE L OR TYPE S	1	2	3	3	2	1

** STANDARD TEMPORARY BARRIER CONSISTS OF ANY TEMPORARY BARRIER MEETING MDOT SPECIFICATIONS.

NOTES:

LOCATE TCB SECTIONS #3 AND #4 OUTSIDE THE AREA REQUIRING LIMITED DEFLECTION TEMPORARY CONCRETE BARRIER.

ANY DEVIATIONS FROM THIS DETAIL REQUIRE APPROVAL FROM THE ENGINEER PRIOR TO INSTALLATION.

INSTALL BOX-BEAM STIFFENERS BETWEEN TCB SECTIONS AS DEPICTED IN THIS DETAIL.

USE EITHER TYPE L OR TYPE S TCB FOR SECTIONS #1, #2, #3, #4, #5, AND #6. ALL OTHER LIMITED DEFLECTION TCB SECTIONS, EXCLUDING TRANSITION SECTIONS, MUST CONSIST OF TYPE L TCB WHEN USING DETAIL 1.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

03/30/2026
PLAN DATE

R-53-A

SHEET
4 OF 22

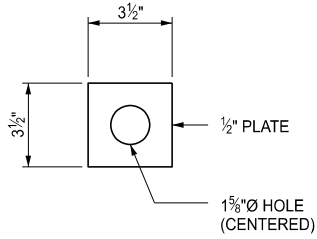
STAKED METHOD DETAIL 2

NOTES:

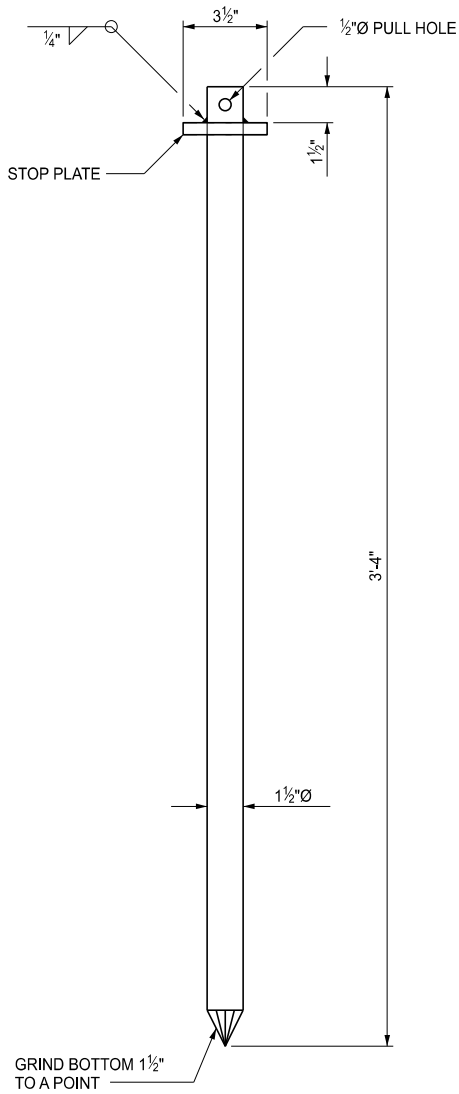
FOLLOW TCB TYPE AND BARRIER OFFSET REQUIREMENTS IDENTIFIED IN TABLE ON SHEET 1.

INSTALL CONNECTION PINS BETWEEN TCB SECTIONS IN ADDITION TO STAKES.

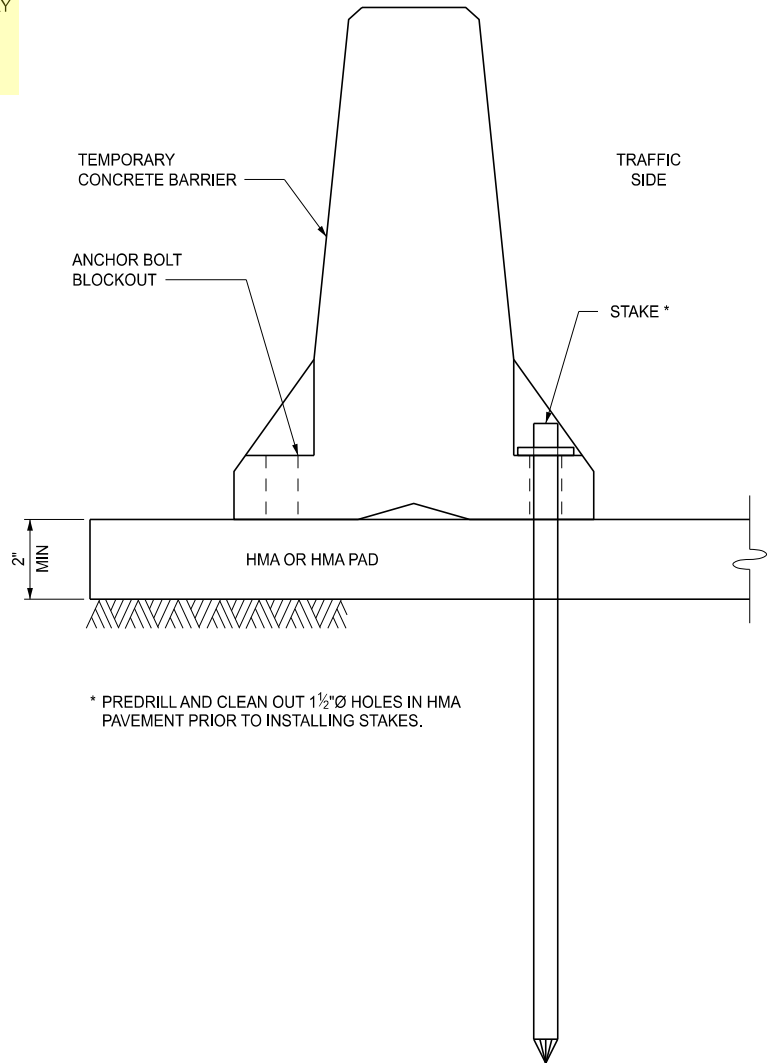
OMIT A MAXIMUM OF TWO STAKES IN A SINGLE TCB SECTION WHEN NECESSARY TO AVOID IMPACTING UNDERGROUND UTILITIES OR OBSTRUCTIONS WITHIN STAKE DEPTH. HOWEVER, FULLY STAKE ADJACENT TCB SECTIONS ON BOTH ENDS OF THE PARTIALLY STAKED TCB SECTION WITH STAKES IN ALL ANCHOR BOLT BLOCKOUTS ON THE TRAFFIC SIDE OF THE BARRIER.




STOP PLATE DETAIL



STAKE DETAIL



* PREDRILL AND CLEAN OUT 1 1/2"Ø HOLES IN HMA PAVEMENT PRIOR TO INSTALLING STAKES.

 DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION		R-53-A	SHEET 5 OF 22
	(SPECIAL DETAIL) FHWA APPROVAL	03/30/2026 PLAN DATE		

THROUGH BOLT METHOD DETAILS 3A AND 3B

NOTES:

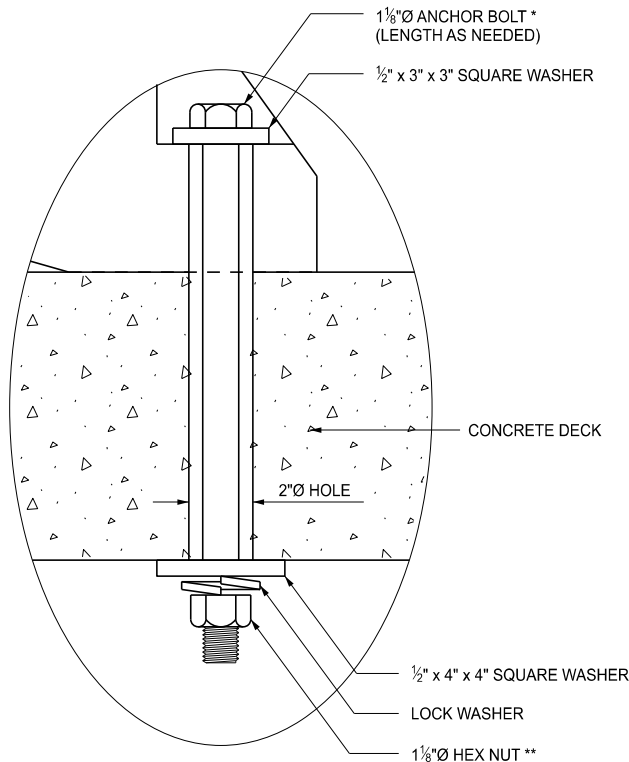
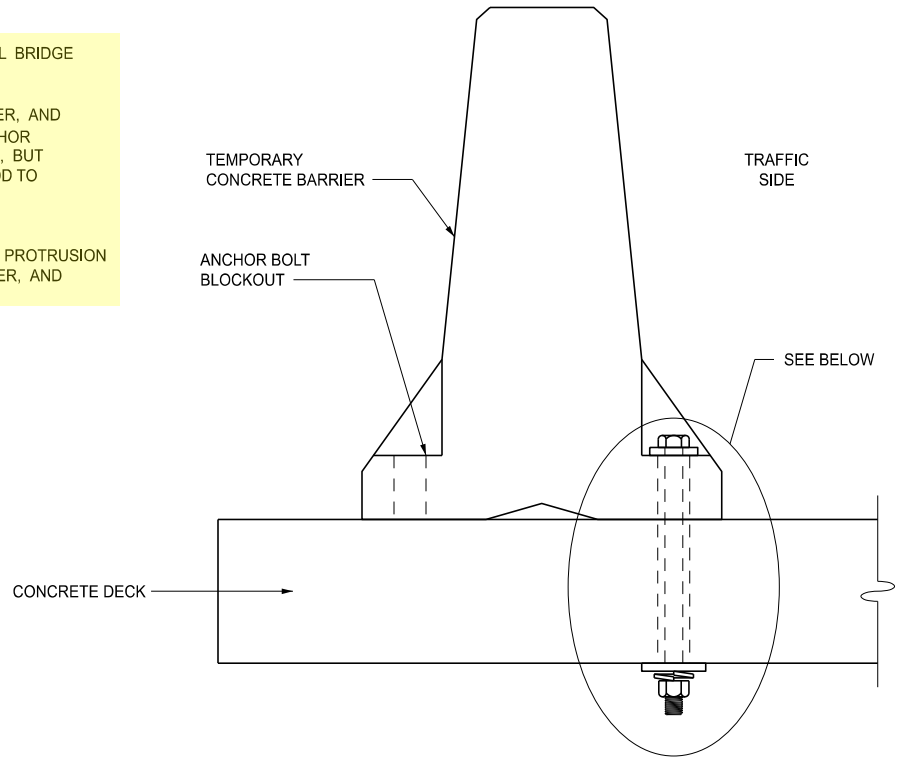
FOLLOW TCB TYPE AND BARRIER OFFSET REQUIREMENTS IDENTIFIED IN TABLE ON SHEET 1.

INSTALL CONNECTION PINS BETWEEN TCB SECTIONS IN ADDITION TO ANCHOR BOLTS / THREADED RODS.

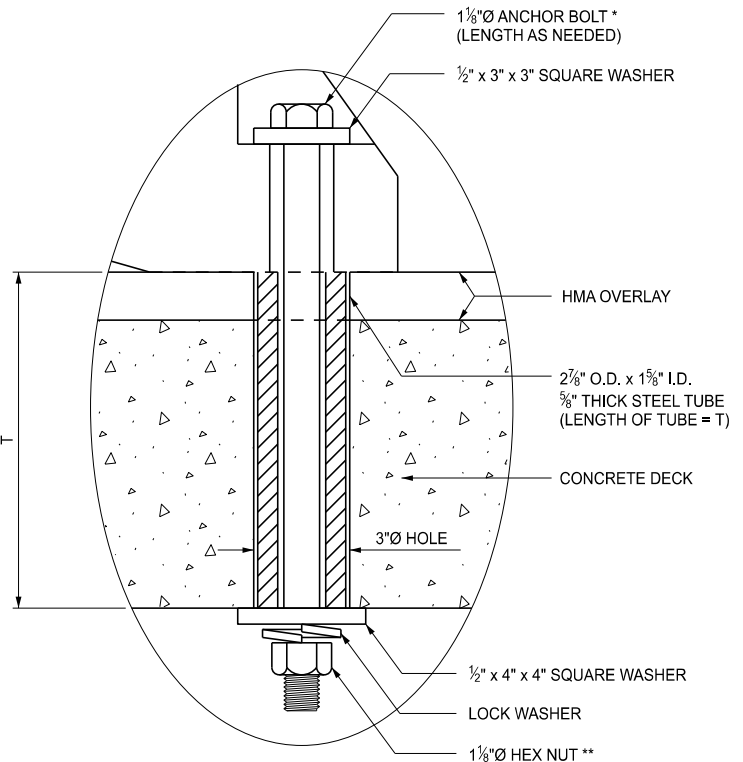
DO NOT USE DETAILS 3A AND 3B WHEN CORRUGATED METAL BRIDGE DECKING IS PRESENT.

* 1 1/8" DIAMETER THREADED ROD WITH HEX NUT, LOCK WASHER, AND 1/2" x 3" x 3" SQUARE WASHER MAY BE USED IN LIEU OF ANCHOR BOLT. FULLY ENGAGE HEX NUT WITH THE THREADED ROD, BUT DO NOT CREATE A SNAGGING HAZARD BY ALLOWING THE ROD TO PROTRUDE ABOVE THE SLOPED TOE OF THE TCB SECTION.


** FULLY ENGAGE HEX NUT WITH ANCHOR BOLT / THREADED ROD. MAXIMUM ALLOWABLE ANCHOR BOLT/THREADED ROD PROTRUSION BELOW THE HEX NUT WILL BE AS SPECIFIED BY THE ENGINEER, AND MAY VARY BY LOCATION.



DETAIL 3A



DETAIL 3B

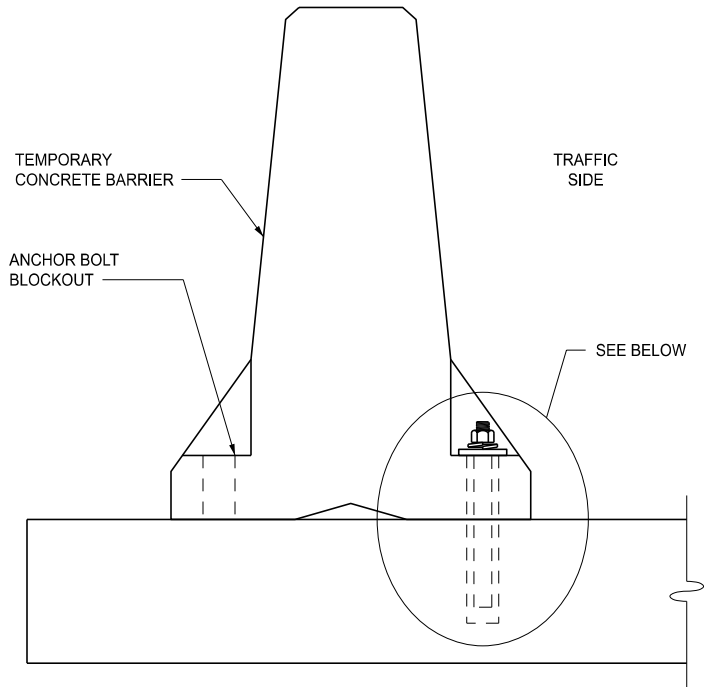
 DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION		R-53-A	SHEET 6 OF 22
	(SPECIAL DETAIL) FHWA APPROVAL	03/30/2026 PLAN DATE		

DRILLED AND GROUTED METHOD DETAILS 4A AND 4B

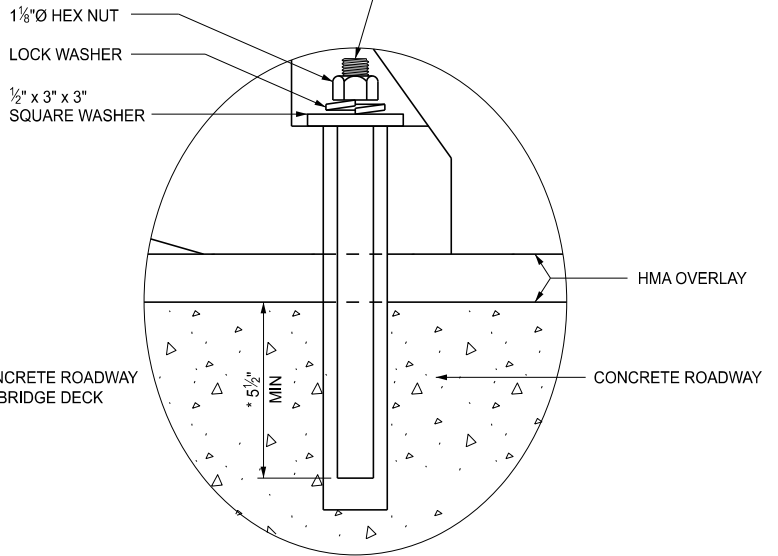
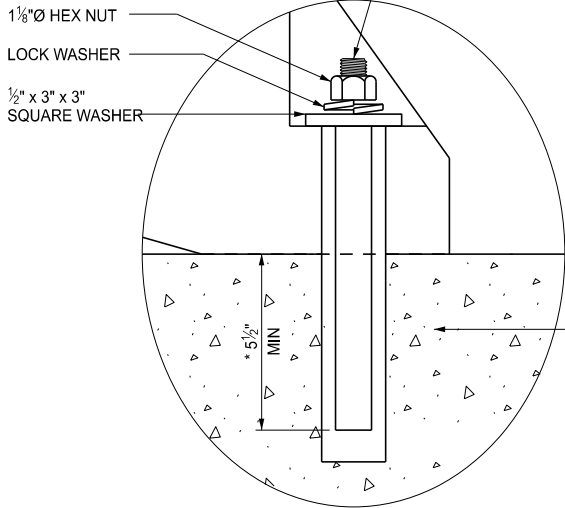
NOTES:

FOLLOW TCB TYPE AND BARRIER OFFSET REQUIREMENTS IDENTIFIED IN TABLE ON SHEET 1.

INSTALL CONNECTION PINS BETWEEN TCB SECTIONS IN ADDITION TO THREADED RODS.



1 1/8" DIAMETER THREADED ROD WITH HEX NUT, LOCK WASHER, AND 1/2" x 3" x 3" SQUARE WASHER. FULLY ENGAGE HEX NUT WITH THE THREADED ROD, BUT DO NOT CREATE A SNAGGING HAZARD BY ALLOWING THE THREADED ROD TO PROTRUDE ABOVE THE SLOPED TOE OF THE TCB SECTION.



* EMBEDMENT DEPTH, ALONG WITH DIAMETER AND DEPTH OF HOLE PER (ADHESIVE) MANUFACTURER'S SPECIFICATIONS

DETAIL 4A

CONCRETE ROADWAY OR CONCRETE BRIDGE DECK

(DO NOT USE THIS DETAIL ON CONCRETE BRIDGE DECKS WITH HMA OVERLAY)

DETAIL 4B

CONCRETE ROADWAY WITH HMA OVERLAY

(DO NOT USE THIS DETAIL ON CONCRETE BRIDGE DECKS WITH HMA OVERLAY)



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

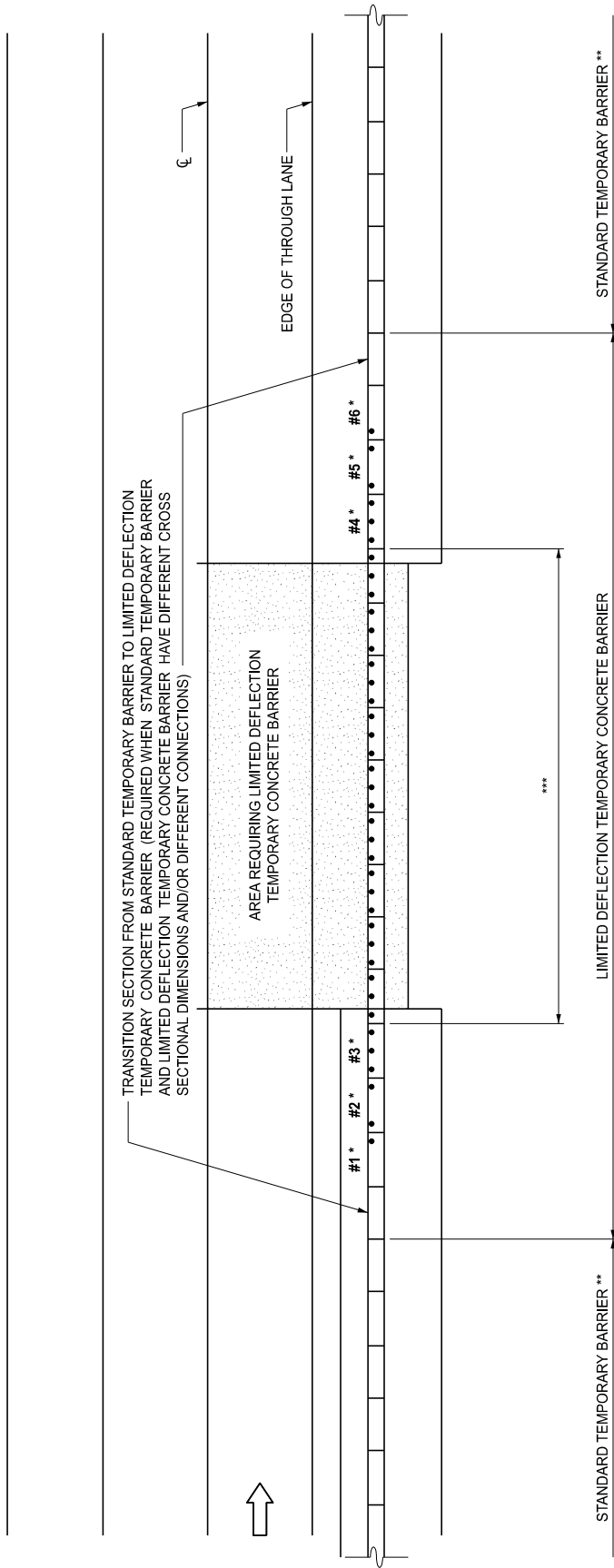
(SPECIAL DETAIL)
FHWA APPROVAL

03/30/2026
PLAN DATE

R-53-A

SHEET
7 OF 22

TRANSITION FROM LIMITED DEFLECTION TEMPORARY CONCRETE BARRIER TO STANDARD TEMPORARY BARRIER WHEN USING DETAIL 2, 3A, 3B, 4A, OR 4B



* INSTALL TYPE L OR TYPE S TEMPORARY CONCRETE BARRIER WITH THE FOLLOWING NUMBER OF ANCHORS OR STAKES (EVENLY SPACED ON THE TRAFFIC SIDE OF THE BARRIER) ON THE FOLLOWING SECTIONS:

	#1	#2	#3	#4	#5	#6
TYPE L OR TYPE S	1	2	3	3	2	1

** STANDARD TEMPORARY BARRIER CONSISTS OF ANY TEMPORARY BARRIER MEETING MDOT SPECIFICATIONS.

*** INSTALL STAKES, ANCHOR BOLTS, OR RODS IN ALL ANCHOR BOLT BLOCKOUTS ON THE TRAFFIC SIDE OF THE BARRIER EXCEPT AS NOTED IN STAKED METHOD DETAIL 2 (SHEET 5 OF 22) AND THE BRIDGE DECK EXPANSION JOINT DETAILS (SHEET 9 AND 11 OF 22).

NOTES:

LOCATE TCB SECTIONS #3 AND #4 OUTSIDE THE AREA REQUIRING LIMITED DEFLECTION TEMPORARY CONCRETE BARRIER.

ALL LIMITED DEFLECTION TCB SECTIONS, EXCLUDING TRANSITION SECTIONS AND SECTIONS OVER EXPANSION JOINTS WITH THERMAL EXPANSION 1 1/2" OR GREATER, MAY BE TYPE L OR TYPE S. INTERMIXING TYPE L AND TYPE S TCB SECTIONS WILL BE PERMITTED.

ANY DEVIATIONS FROM THIS LAYOUT REQUIRE APPROVAL FROM THE ENGINEER PRIOR TO INSTALLATION.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

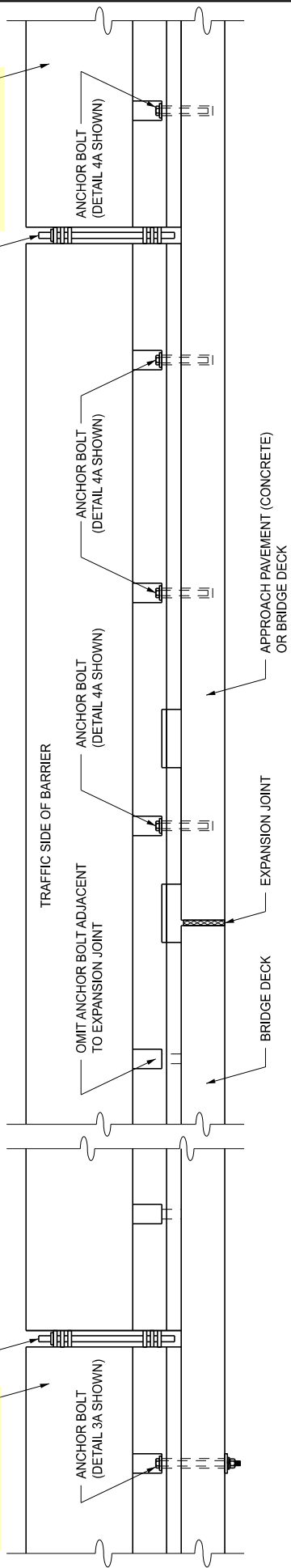
03/30/2026
PLAN DATE

R-53-A

SHEET
8 OF 22

FULLY ANCHOR ADJACENT TCB SECTION ON TRAFFIC SIDE

FULLY ANCHOR ADJACENT TCB SECTION ON TRAFFIC SIDE

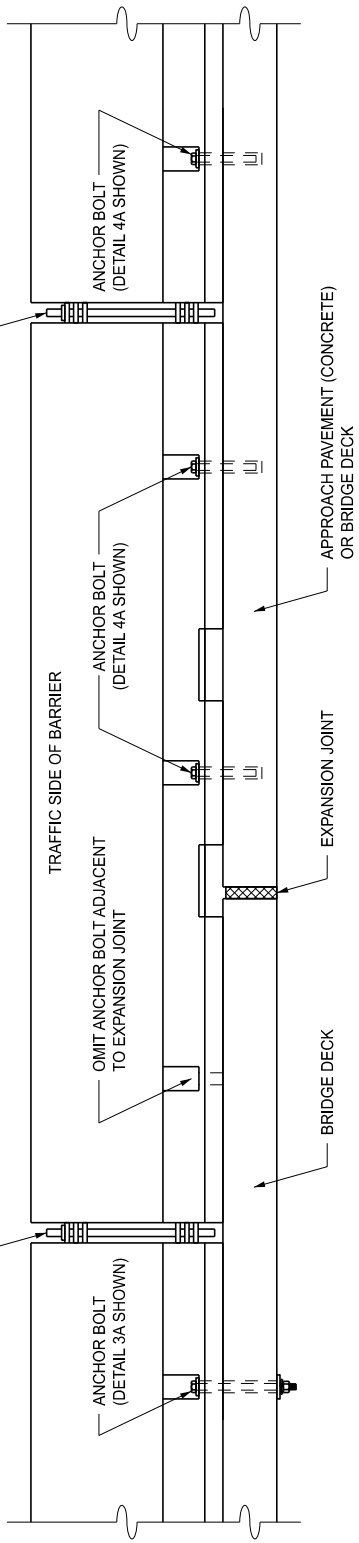


ELEVATION VIEW
TYPE L TCB PLACED OVER BRIDGE EXPANSION JOINT WITH THERMAL EXPANSION LESS THAN 1 1/2"

CONNECTION PIN

CONNECTION PIN

ANCHOR BOLT (DETAIL 3A SHOWN)



ELEVATION VIEW
TYPE S TCB PLACED OVER BRIDGE EXPANSION JOINT WITH THERMAL EXPANSION LESS THAN 1 1/2"

TCB SECTION OVER BRIDGE DECK EXPANSION JOINT WITH THERMAL EXPANSION LESS THAN 1 1/2" WHEN USING DETAIL 3A, 3B, OR 4A



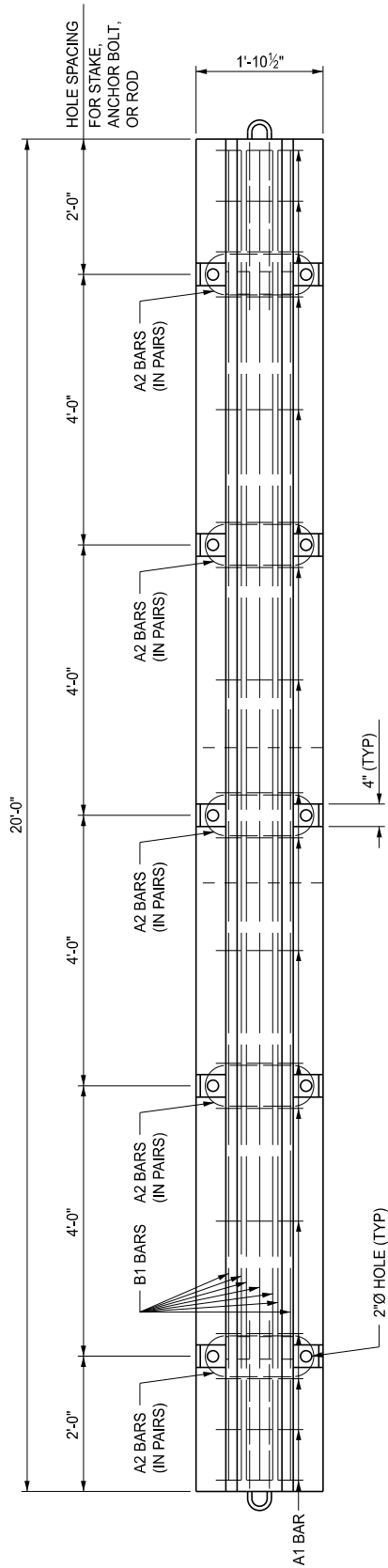
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

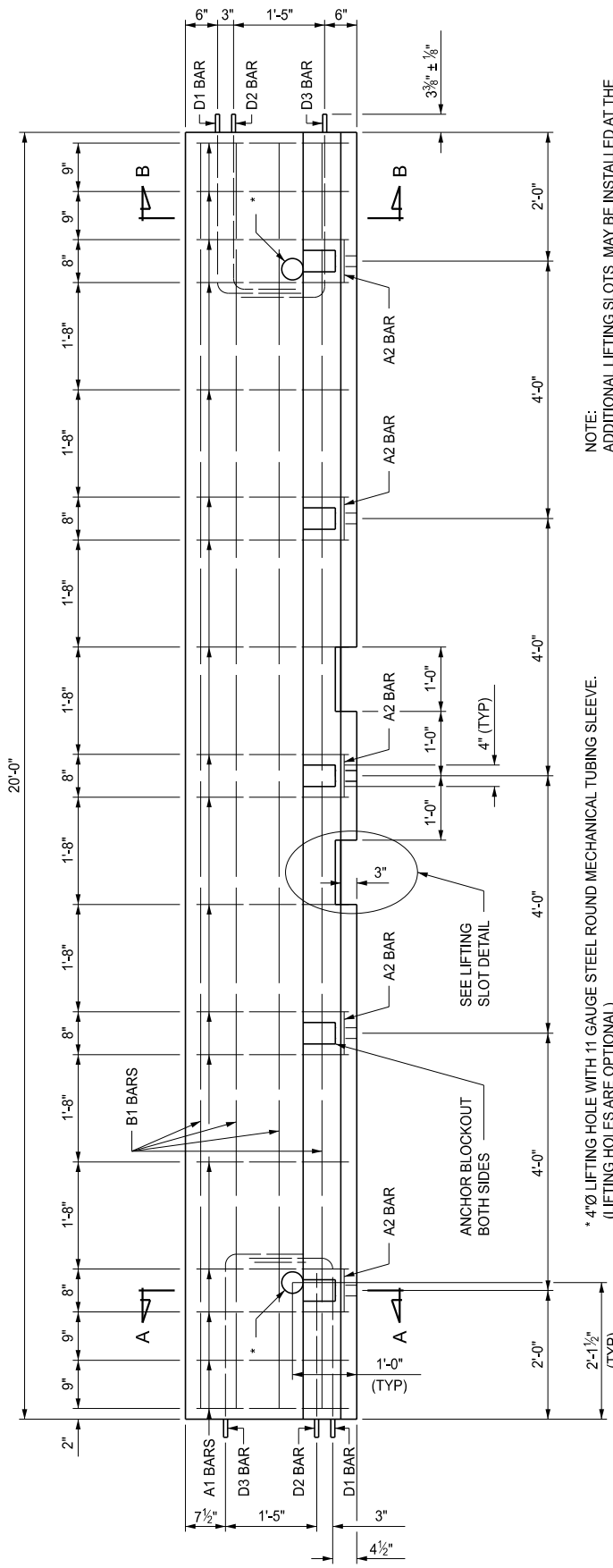
(SPECIAL DETAIL) 03/30/2026
FHWA APPROVAL PLAN DATE

R-53-A

SHEET
9 OF 22



PLAN VIEW
TEMPORARY CONCRETE BARRIER TYPE L



ELEVATION VIEW
TEMPORARY CONCRETE BARRIER TYPE L

NOTE:
ADDITIONAL LIFTING SLOTS MAY BE INSTALLED AT THE
CONTRACTOR'S OPTION PROVIDED THE ADDITIONAL SLOTS
DO NOT INTERFERE WITH ANCHOR BLOCKOUTS OR STEEL
REINFORCEMENT IN THE TEMPORARY CONCRETE BARRIER
SECTION.

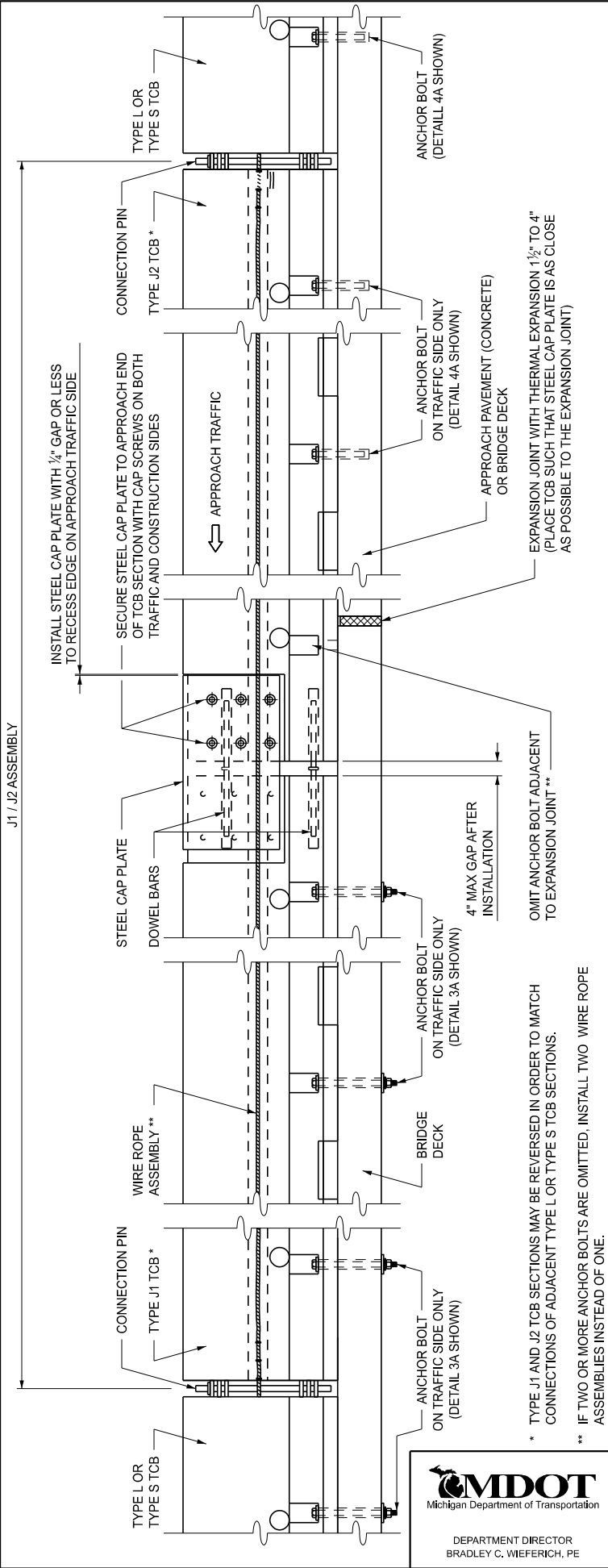
* 4"Ø LIFTING HOLE WITH 11 GAUGE STEEL ROUND MECHANICAL TUBING SLEEVE.
(LIFTING HOLES ARE OPTIONAL)

MDOT
Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

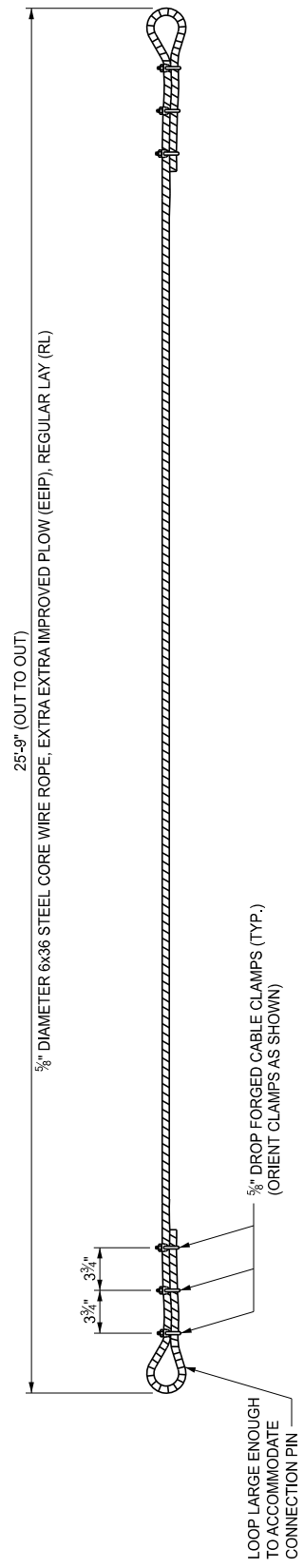
STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL) FHWA APPROVAL	03/30/2026 PLAN DATE	R-53-A	SHEET 10 OF 22



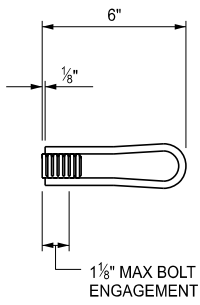
ELEVATION VIEW

TCB SECTION OVER BRIDGE DECK EXPANSION JOINT WITH THERMAL EXPANSION 1 1/2" TO 4" WHEN USING DETAIL 3A, 3B, OR 4A

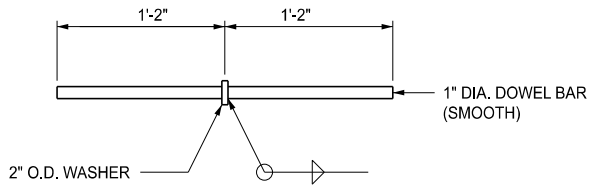


WIRE ROPE ASSEMBLY DETAIL

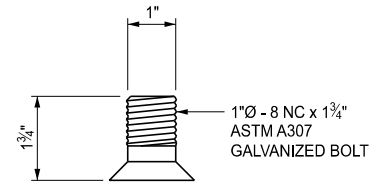
<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION</p>		<p>R-53-A</p>	<p>SHEET 11 OF 22</p>
	<p>(SPECIAL DETAIL) FHWA APPROVAL</p>	<p>03/30/2026 PLAN DATE</p>		



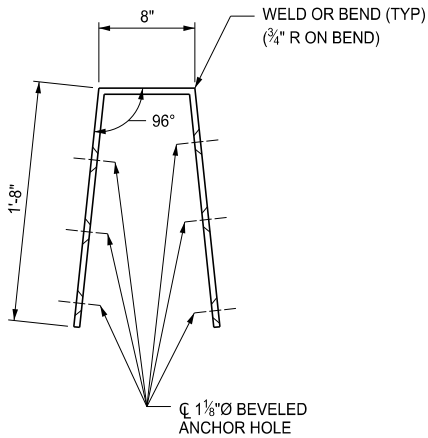
1" DIA. (8-NC) GALVANIZED
LOOP FERRULE DETAIL



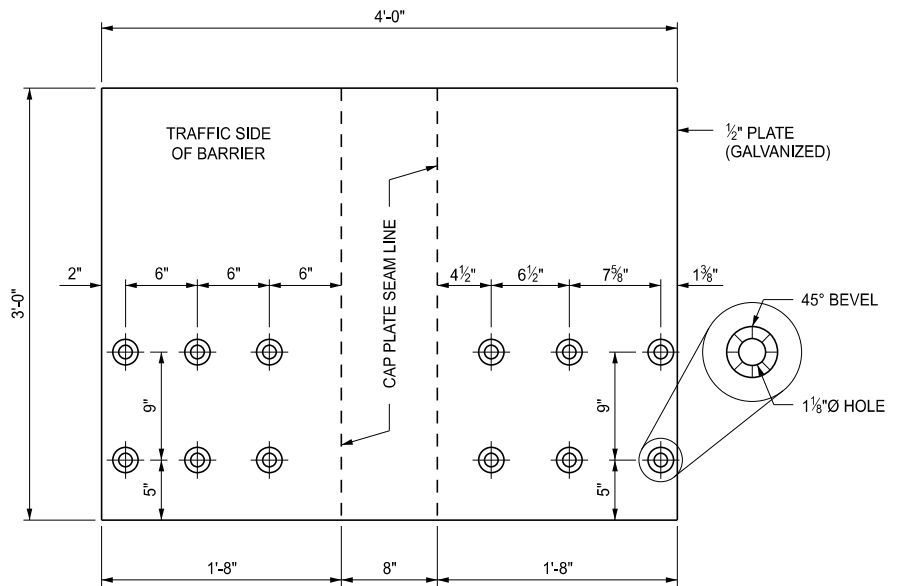
DOWEL BAR DETAIL



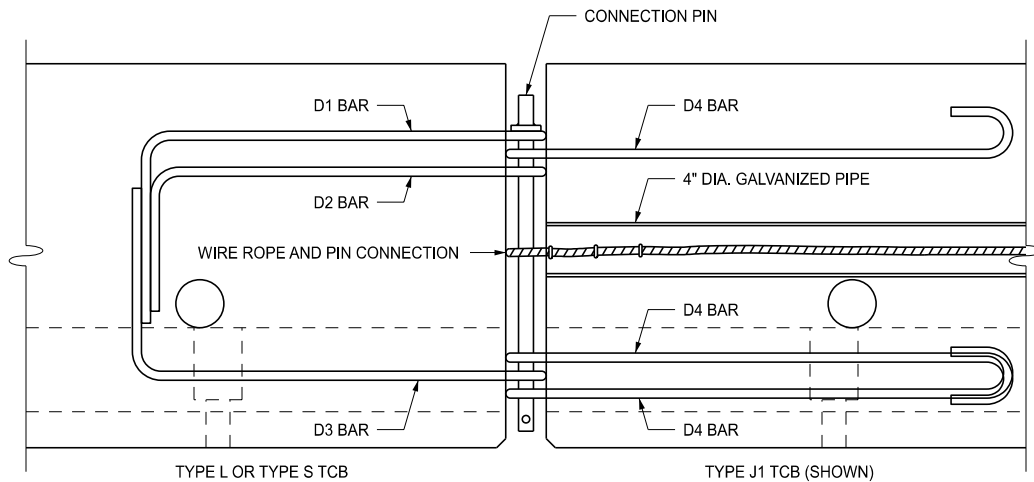
FLAT HEAD
SOCKET CAP SCREW DETAIL



END VIEW



STEEL CAP PLATE DETAILS



WIRE ROPE AND PIN CONNECTION DETAIL



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

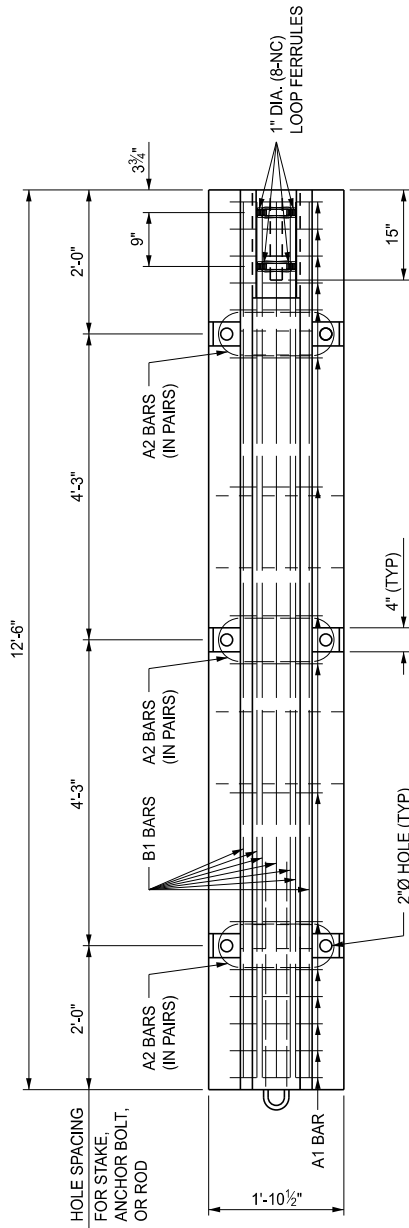
STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

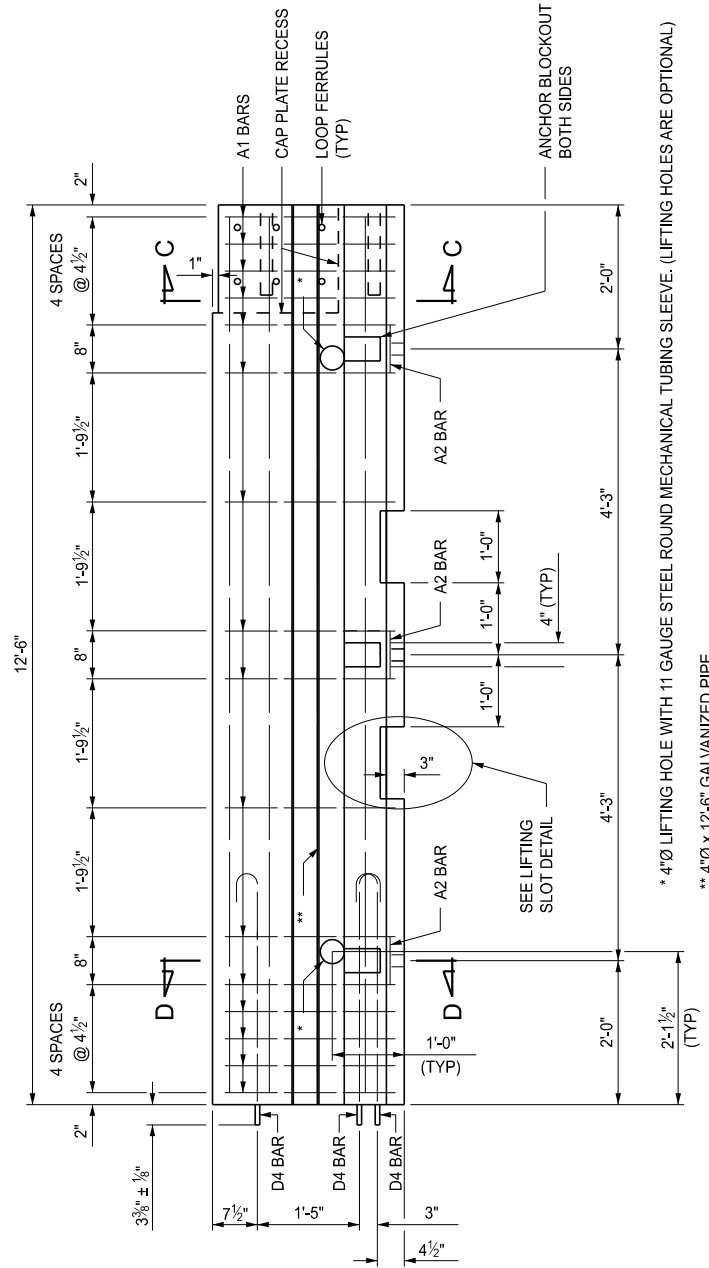
03/30/2026
PLAN DATE

R-53-A

SHEET
12 OF 22



PLAN VIEW
TEMPORARY CONCRETE BARRIER TYPE J1



ELEVATION VIEW
TEMPORARY CONCRETE BARRIER TYPE J1

* 4"Ø LIFTING HOLE WITH 11 GAUGE STEEL ROUND MECHANICAL TUBING SLEEVE (LIFTING HOLES ARE OPTIONAL)
** 4"Ø x 12'-6" GALVANIZED PIPE



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

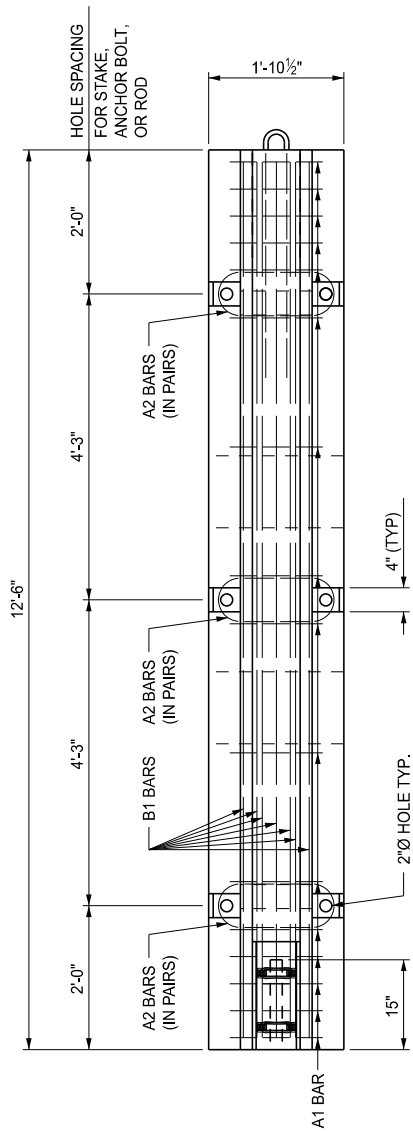
STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

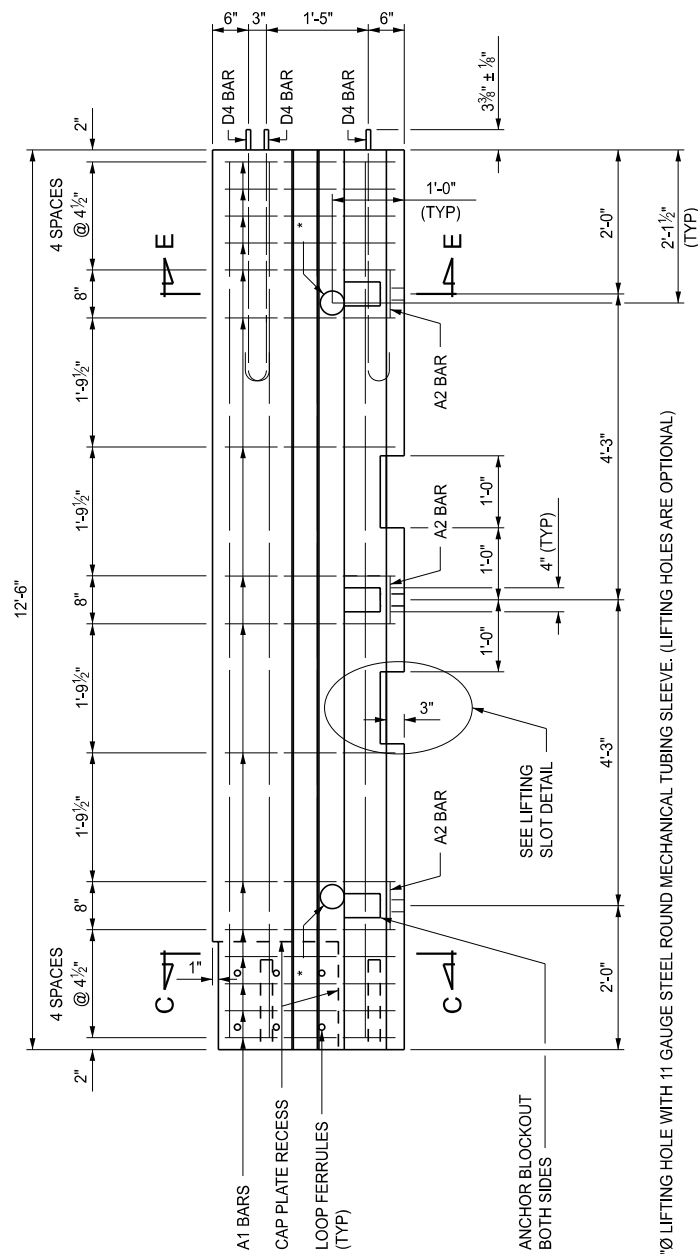
03/30/2026
PLAN DATE

R-53-A

SHEET
13 OF 22



PLAN VIEW
TEMPORARY CONCRETE BARRIER TYPE J2



ELEVATION VIEW
TEMPORARY CONCRETE BARRIER TYPE J2

* 4"Ø LIFTING HOLE WITH 11 GAUGE STEEL ROUND MECHANICAL TUBING SLEEVE. (LIFTING HOLES ARE OPTIONAL)

** 4"Ø x 12'-6" GALVANIZED PIPE



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

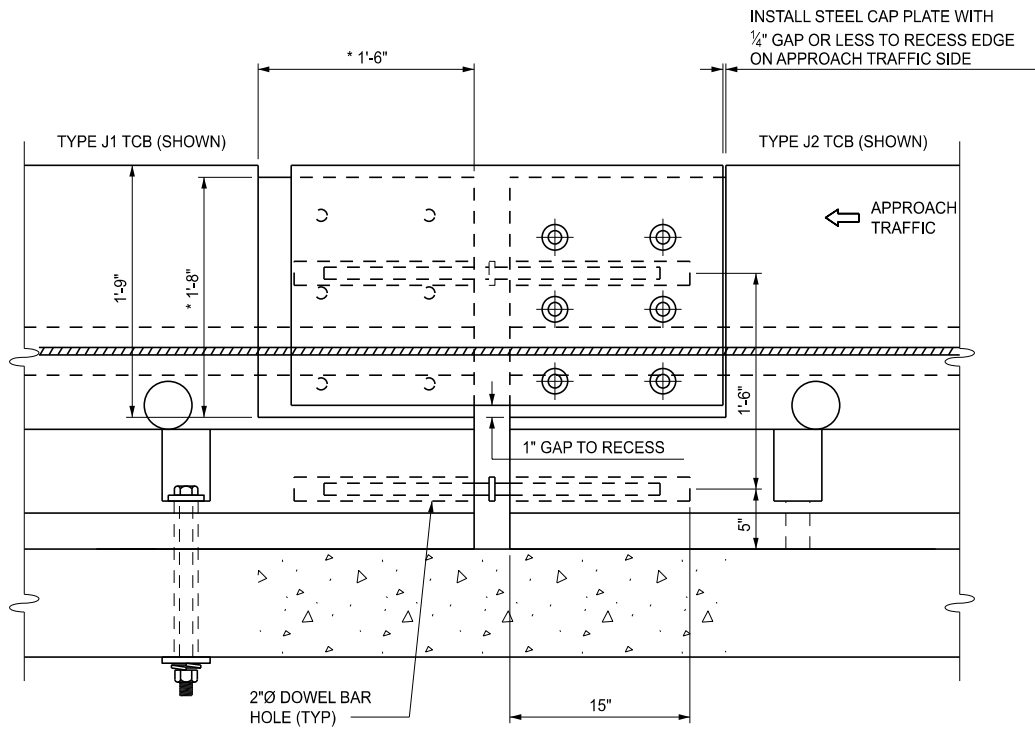
STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

03/30/2026
PLAN DATE

R-53-A

SHEET
14 OF 22



* 1'-6" x 1'-9" x 5/8" BARRIER RECESS TO ACCOMODATE 1/2" STEEL CAP PLATE

CAP PANEL RECESS DETAILS

TEMPORARY CONCRETE BARRIER TYPES J1 AND J2



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

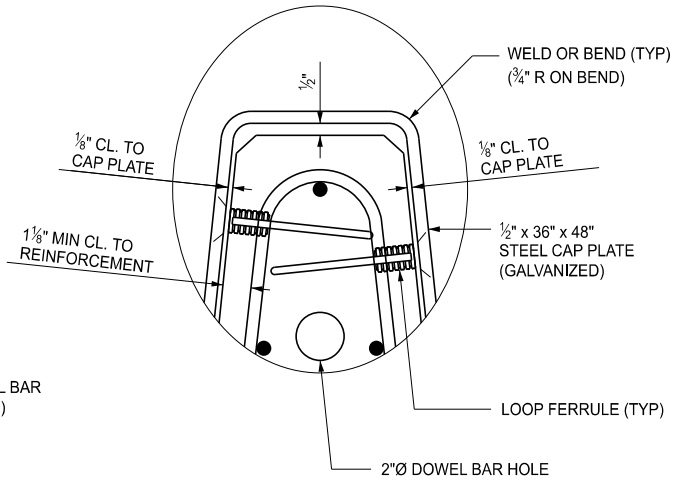
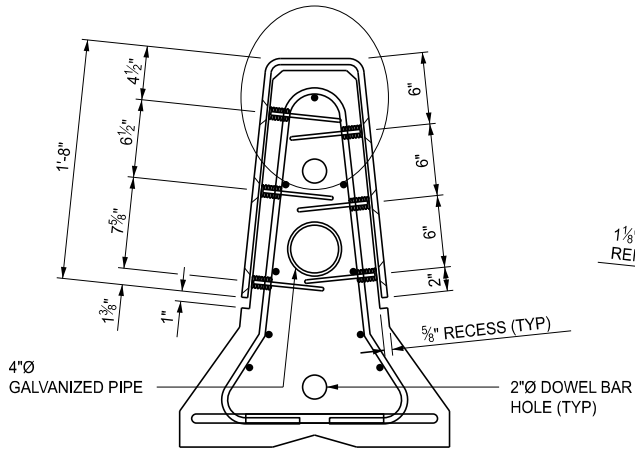
STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

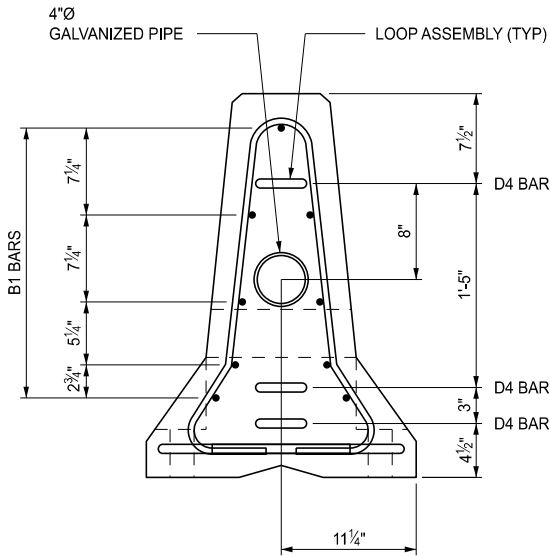
03/30/2026
PLAN DATE

R-53-A

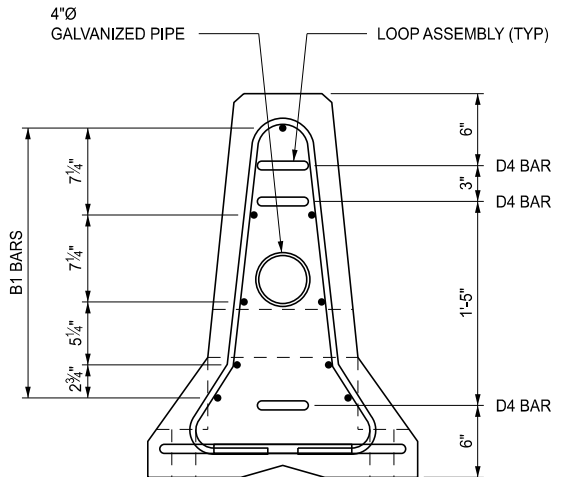
SHEET
15 OF 22



SECTION C-C
TEMPORARY CONCRETE BARRIER TYPE J1 AND J2



SECTION D-D
TEMPORARY CONCRETE BARRIER TYPE J1 OR TYPE J2



SECTION E-E
TEMPORARY CONCRETE BARRIER TYPE J1 OR TYPE J2



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE



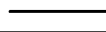

STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

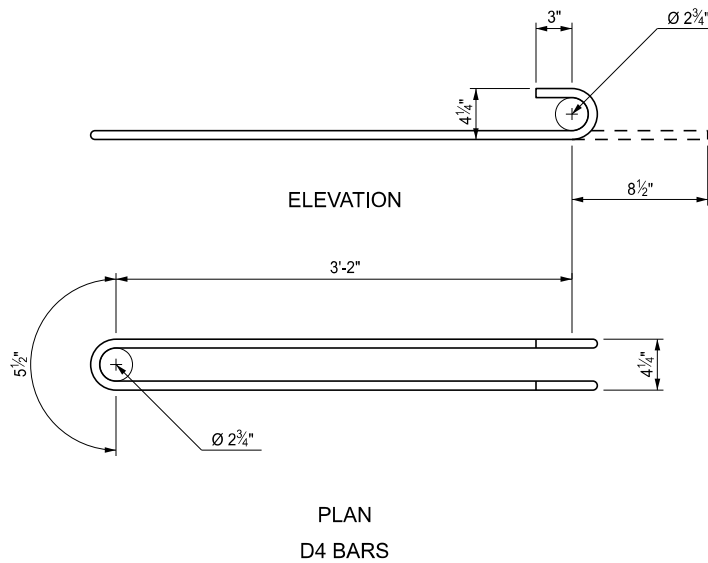
03/30/2026
PLAN DATE

R-53-A

SHEET
16 OF 22

STEEL REINFORCEMENT FOR TEMPORARY CONCRETE BARRIER TYPES J1 & J2				
BAR	BAR SIZE	SHAPE	NUMBER OF BARS	LENGTH (PER BAR)
REINFORCING				
A1	#4		16	6'-0"
A2	#6		6	2'-11"
B1	#5		9	12'-2"
LOOP ASSEMBLY				
D4	#6		3	8'-2"

NOTE: NUMBER OF BARS SPECIFIED ARE PER TEMPORARY CONCRETE BARRIER SECTION.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

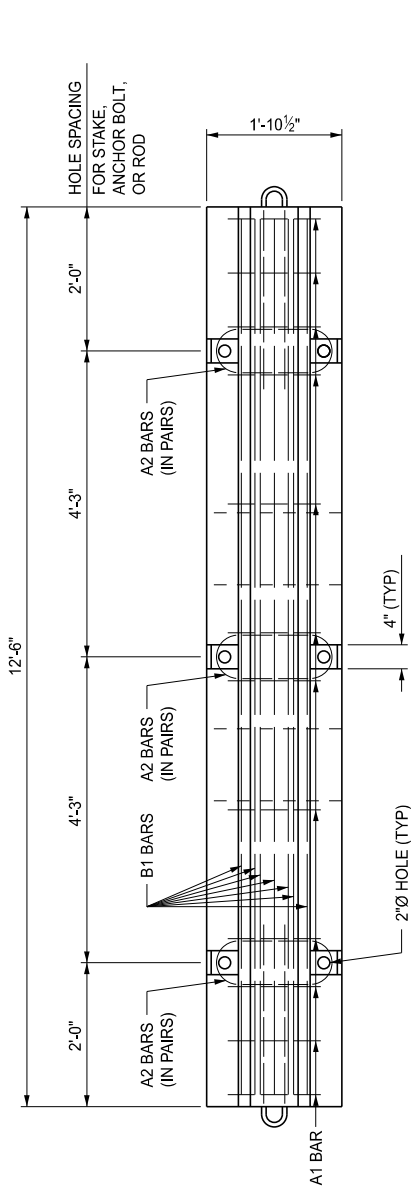
STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

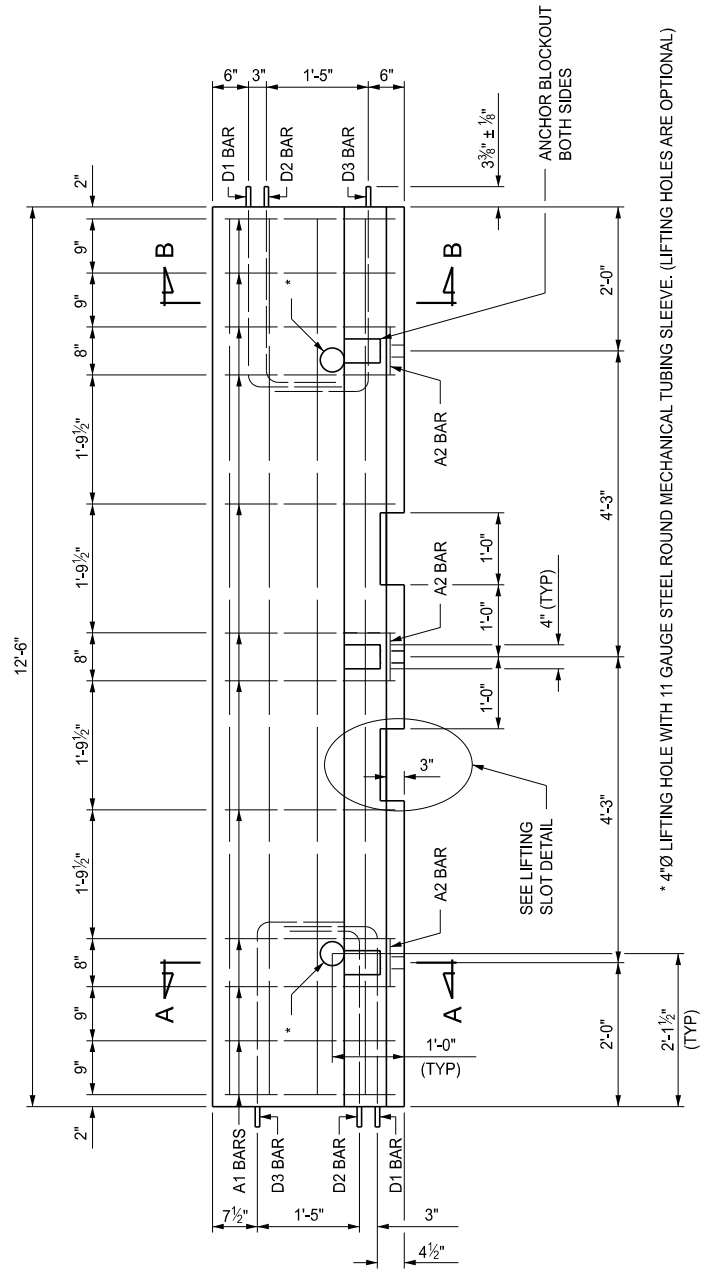
03/30/2026
PLAN DATE

R-53-A

SHEET
17 OF 22



PLAN VIEW
TEMPORARY CONCRETE BARRIER TYPE S



ELEVATION VIEW
TEMPORARY CONCRETE BARRIER TYPE S



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

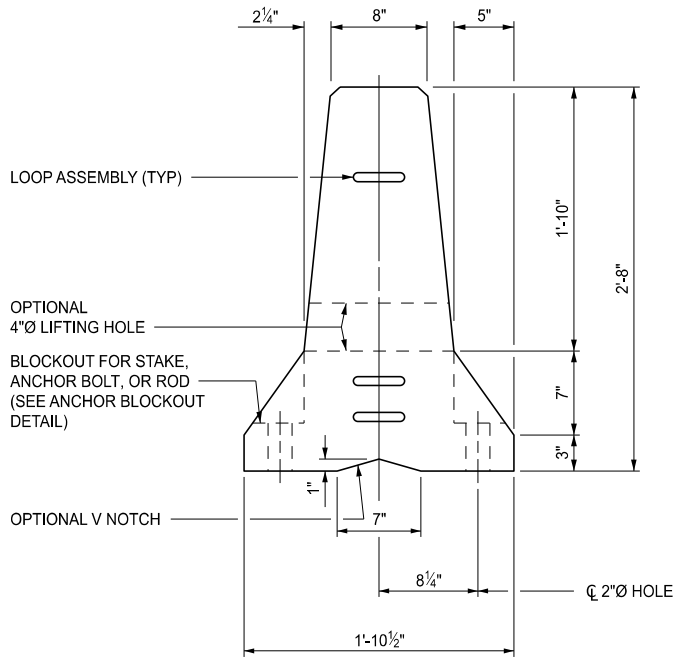
STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

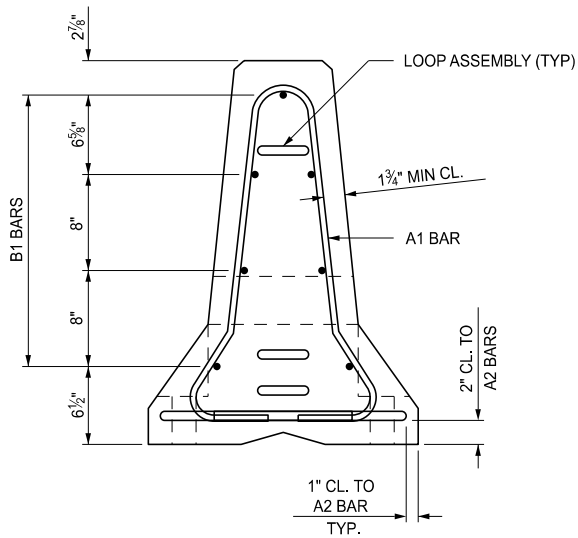
03/30/2026
PLAN DATE

R-53-A

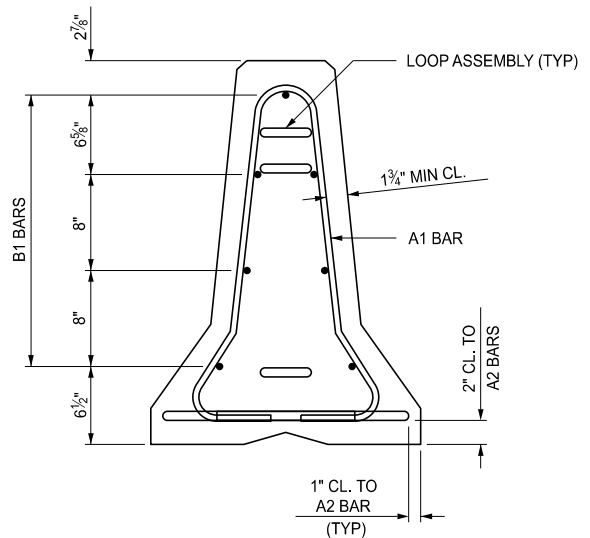
SHEET
18 OF 22



END VIEW
 TEMPORARY CONCRETE BARRIER TYPE L OR TYPE S



SECTION A-A
 TEMPORARY CONCRETE BARRIER TYPE L OR TYPE S



SECTION B-B
 TEMPORARY CONCRETE BARRIER TYPE L OR TYPE S

MDOT
 Michigan Department of Transportation

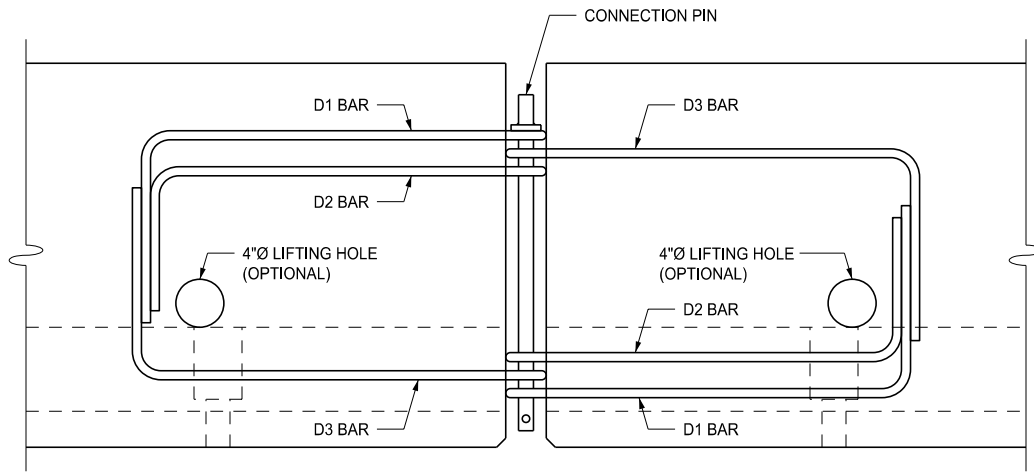
DEPARTMENT DIRECTOR
 BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
 TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

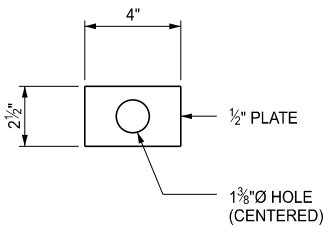
(SPECIAL DETAIL) 03/30/2026
 FHWA APPROVAL PLAN DATE

R-53-A

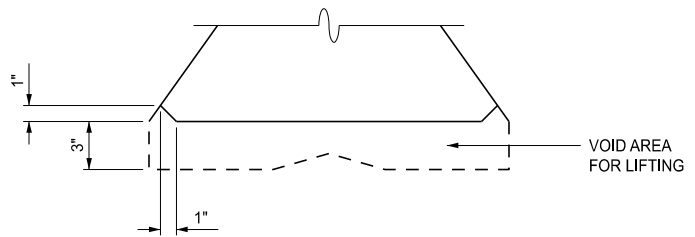
SHEET
 19 OF 22



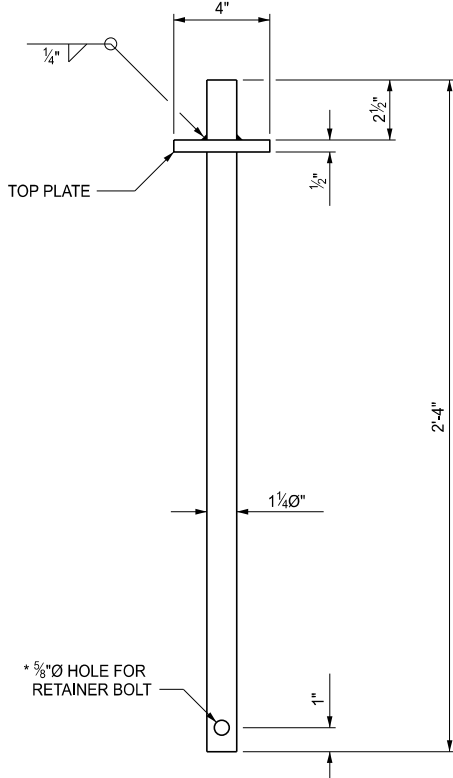
BARRIER CONNECTION DETAIL
 TEMPORARY CONCRETE BARRIER TYPE L OR TYPE S



TOP PLATE DETAIL

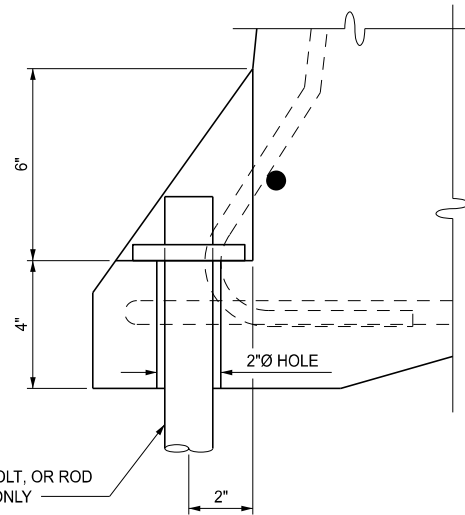


LIFTING SLOT DETAIL
 1" CHAMFER TO PREVENT SPALLING



CONNECTION PIN DETAIL

* RETAINER BOLT AND NUT ARE INSTALLED AT THE CONTRACTOR'S OPTION.



ANCHOR BLOCKOUT DETAIL

SEE TYPE L / TYPE S TCB PLAN AND ELEVATION VIEWS FOR WIDTH AND LOCATION OF ANCHOR BLOCKOUTS



DEPARTMENT DIRECTOR
 BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
 TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
 FHWA APPROVAL

03/30/2026
 PLAN DATE

R-53-A

SHEET
 20 OF 22

**STEEL REINFORCEMENT FOR
TEMPORARY CONCRETE BARRIER TYPE S**

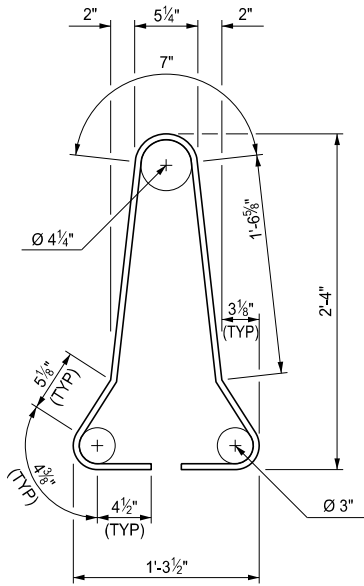
BAR	BAR SIZE	SHAPE	NUMBER OF BARS	LENGTH (PER BAR)
REINFORCING				
A1	#4		12	6'-0"
A2	#6		6	2'-11"
B1	#5		7	12'-2"
LOOP ASSEMBLY				
D1	#6		2	8'-5"
D2	#6		2	7'-7"
D3	#6		2	8'-6"

NOTE: NUMBER OF BARS SPECIFIED ARE PER TEMPORARY CONCRETE BARRIER SECTION.

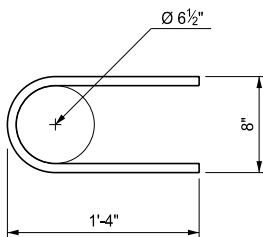
**STEEL REINFORCEMENT FOR
TEMPORARY CONCRETE BARRIER TYPE L**

BAR	BAR SIZE	SHAPE	NUMBER OF BARS	LENGTH (PER BAR)
REINFORCING				
A1	#4		18	6'-0"
A2	#6		10	2'-11"
B1	#5		7	19'-8"
LOOP ASSEMBLY				
D1	#6		2	8'-5"
D2	#6		2	7'-7"
D3	#6		2	8'-6"

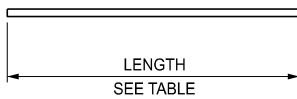
NOTE: NUMBER OF BARS SPECIFIED ARE PER TEMPORARY CONCRETE BARRIER SECTION.



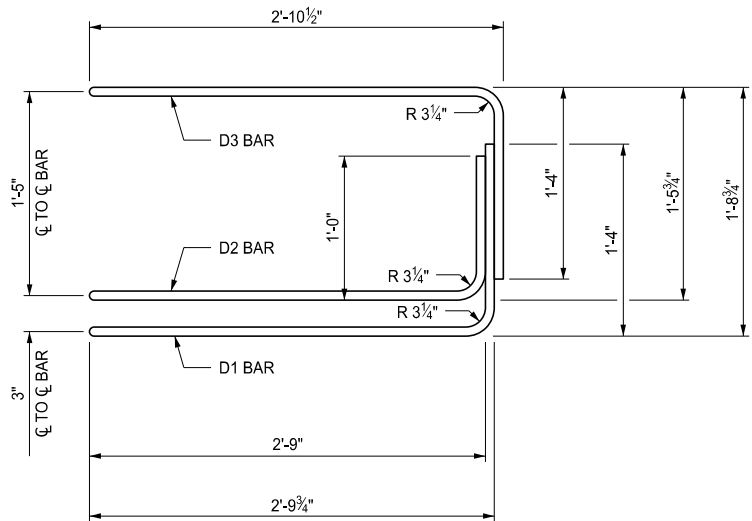
A1 BAR



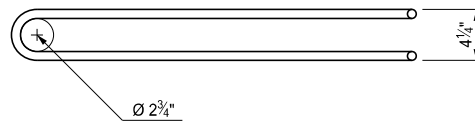
A2 BAR



B1 BAR



ELEVATION



PLAN

LOOP BAR ASSEMBLY (D1, D2 AND D3 BARS)
INVERT ASSEMBLY FOR OPPOSITE END OF BARRIER



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

03/30/2026
PLAN DATE

R-53-A

SHEET
21 OF 22

NOTES:

DO NOT LIFT OR MOVE THE TCB SECTIONS BY USE OF THE CONNECTING LOOP BARS; D1, D2, D3 OR D4. DO NOT APPLY EXCESSIVE FORCE TO THE CONNECTING LOOP BARS; D1, D2, D3 OR D4.

ENSURE CONCRETE CLEAR COVER FOR REINFORCING BARS IS 1½" (MIN) EXCEPT WHERE OTHERWISE SPECIFIED.

CONSTRUCT LIFTING SLOTS AS SPECIFIED TO FACILITATE THE DRAINAGE OF WATER AFTER INSTALLATION ON THE ROADWAY.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

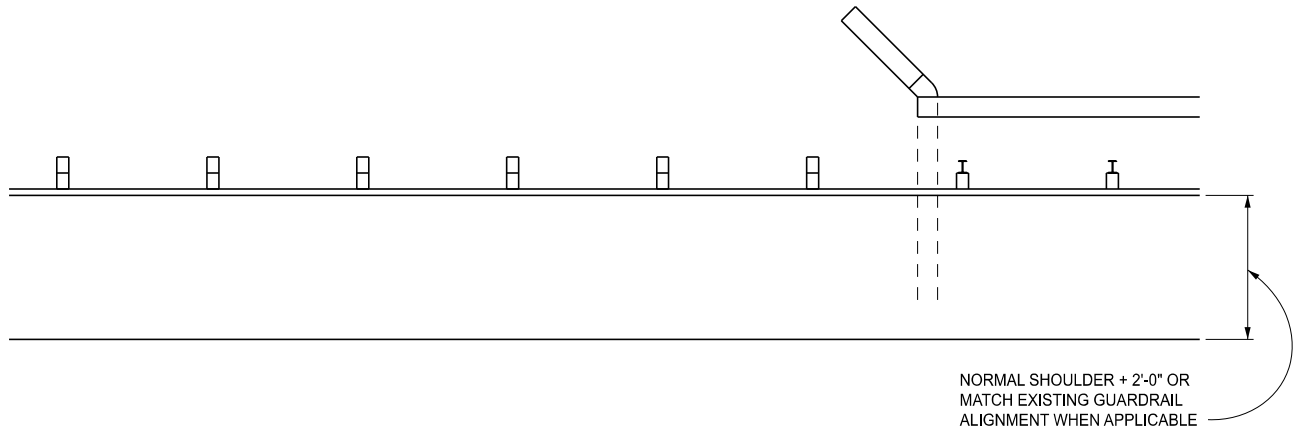
STANDARD PLAN FOR
TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION

(SPECIAL DETAIL)
FHWA APPROVAL

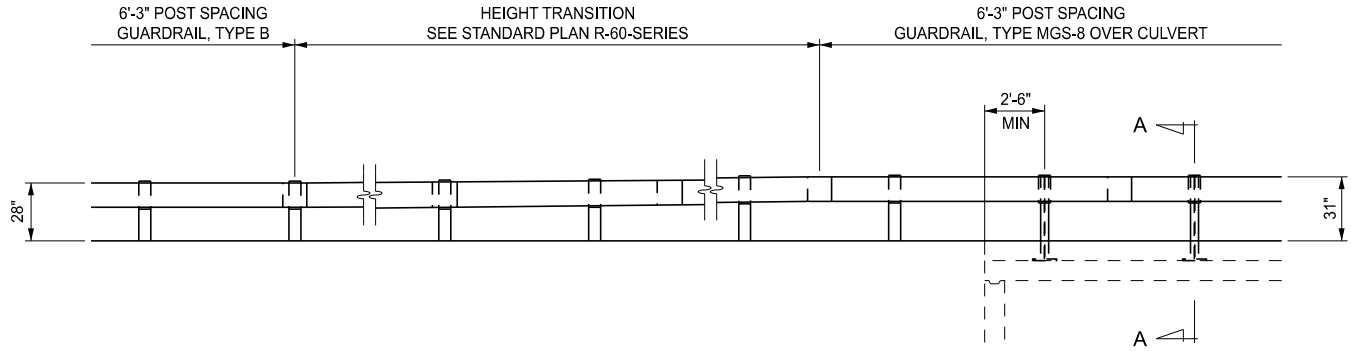
03/30/2026
PLAN DATE

R-53-A

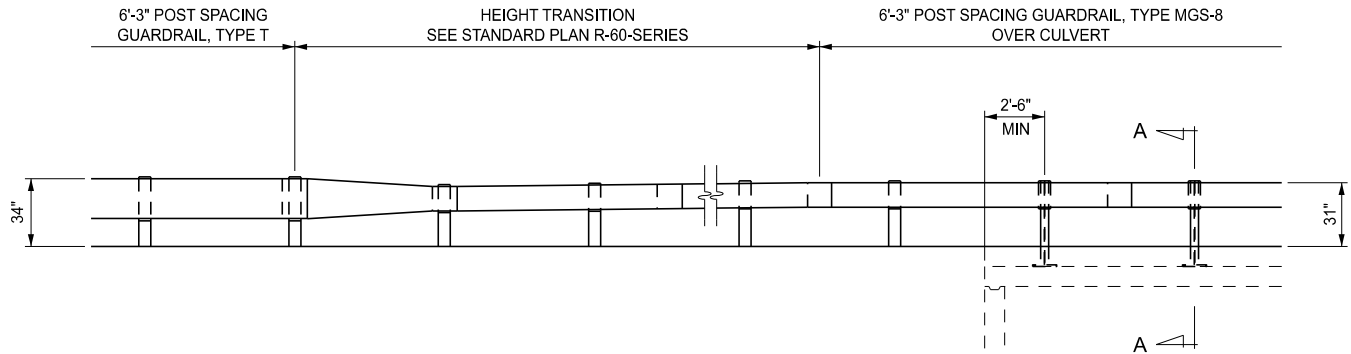
SHEET
22 OF 22



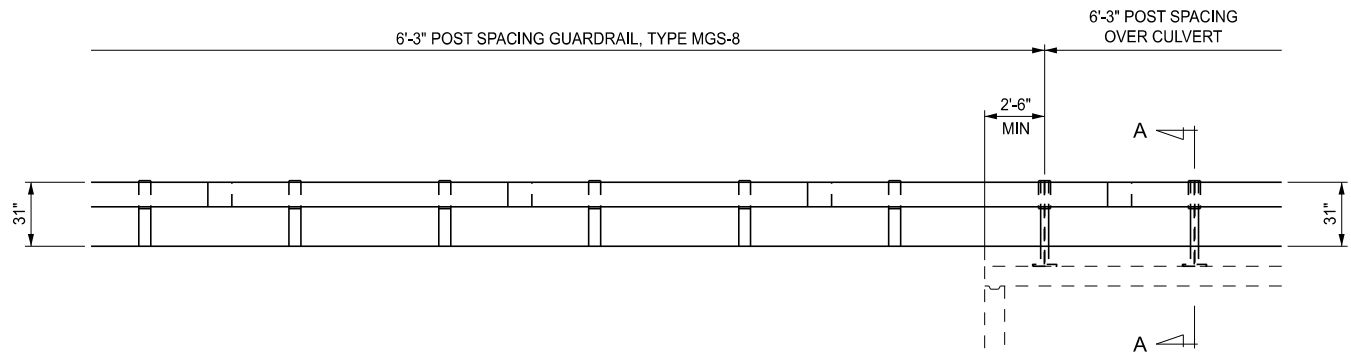
PLAN VIEW



ELEVATION SHOWING GUARDRAIL, TYPE B



ELEVATION SHOWING GUARDRAIL, TYPE T



ELEVATION SHOWING GUARDRAIL, TYPE MGS-8

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

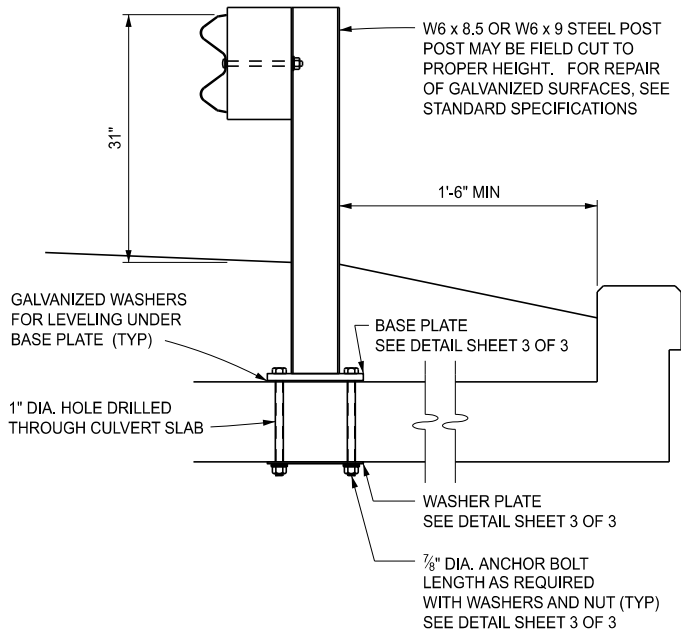
STANDARD PLAN FOR
GUARDRAIL OVER BOX OR SLAB CULVERTS

(SPECIAL DETAIL)
FHWA APPROVAL

03/30/2026
PLAN DATE

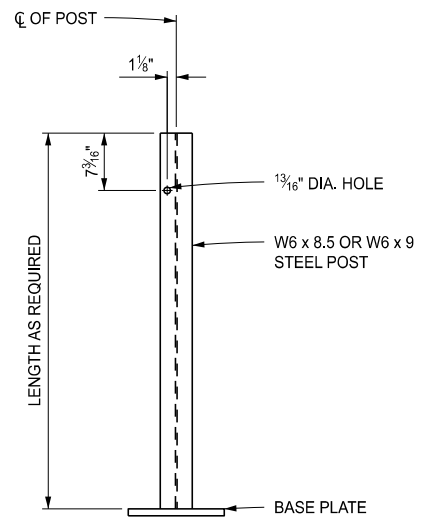
R-73-F

SHEET
1 OF 3

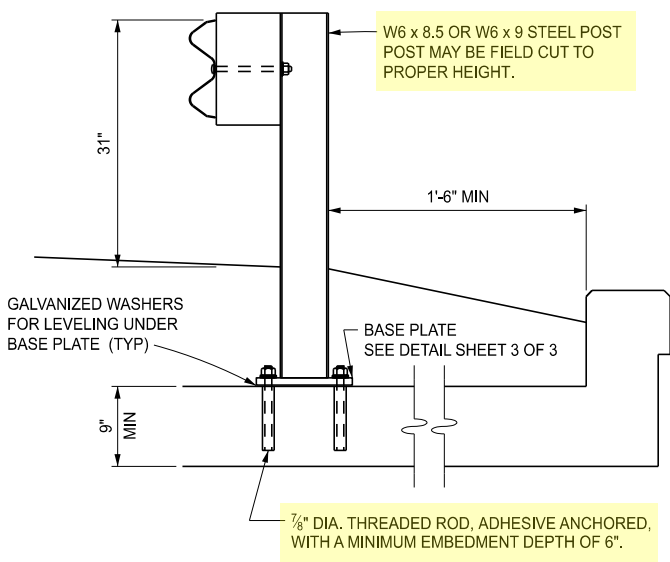


SECTION A - A

PREFERRED CONSTRUCTION METHOD

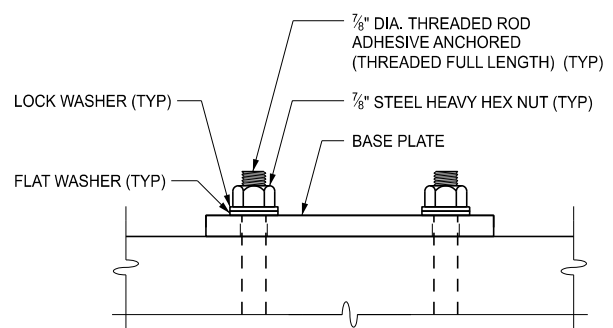


STEEL POST DETAIL FOR GUARDRAIL, TYPE MGS-8



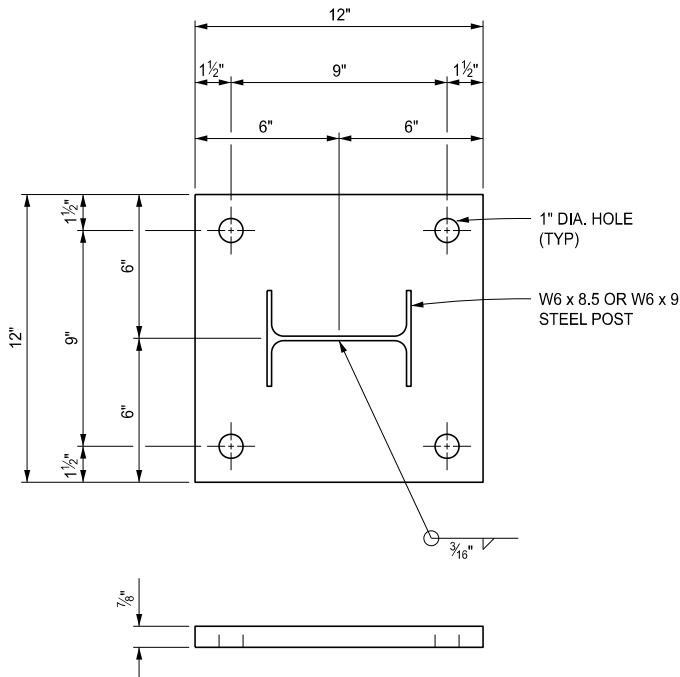
SECTION A - A

ALTERNATE CONSTRUCTION METHOD

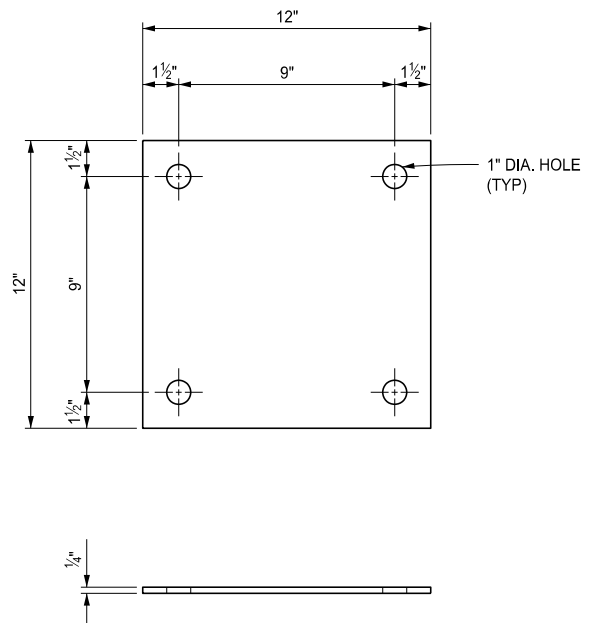


ANCHOR DETAIL

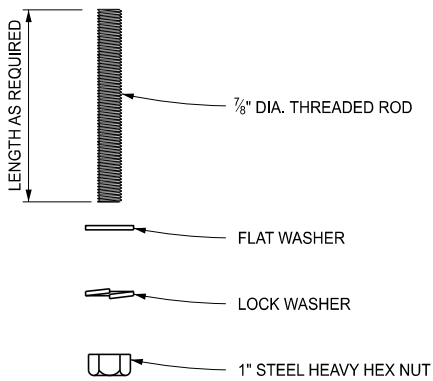
<p>MDOT Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR GUARDRAIL OVER BOX OR SLAB CULVERTS</p>		<p>R-73-F</p>	<p>SHEET 2 OF 3</p>
	<p>(SPECIAL DETAIL) FHWA APPROVAL</p>	<p>03/30/2026 PLAN DATE</p>		



BASE PLATE DETAIL



WASHER PLATE DETAIL



THREADED ROD DETAIL

NOTES:

CONSTRUCT AND PAY FOR GUARDRAIL ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND STANDARD PLAN R-60-SERIES. IN ADDITION, PAY FOR POSTS ANCHORED TO THE CULVERT SLAB AS "GUARDRAIL POST, CULV", WHICH INCLUDES ALL LABOR AND MATERIALS REQUIRED TO CONSTRUCT THE POST AS DETAILED ON THIS PLAN.

ENSURE ALL MATERIALS FOR GUARDRAIL POST, CULVERT CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR BRIDGE RAILINGS.

ENSURE ALL WORK AND MATERIALS CONFORM TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

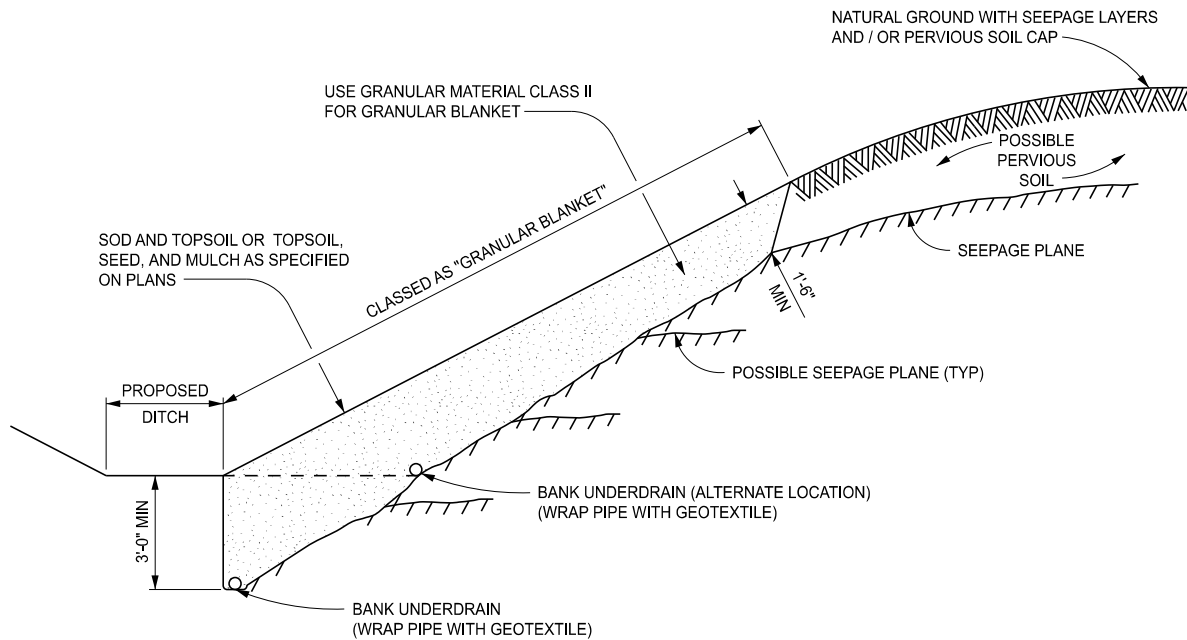
STANDARD PLAN FOR
GUARDRAIL OVER BOX OR SLAB CULVERTS

(SPECIAL DETAIL)
FHWA APPROVAL

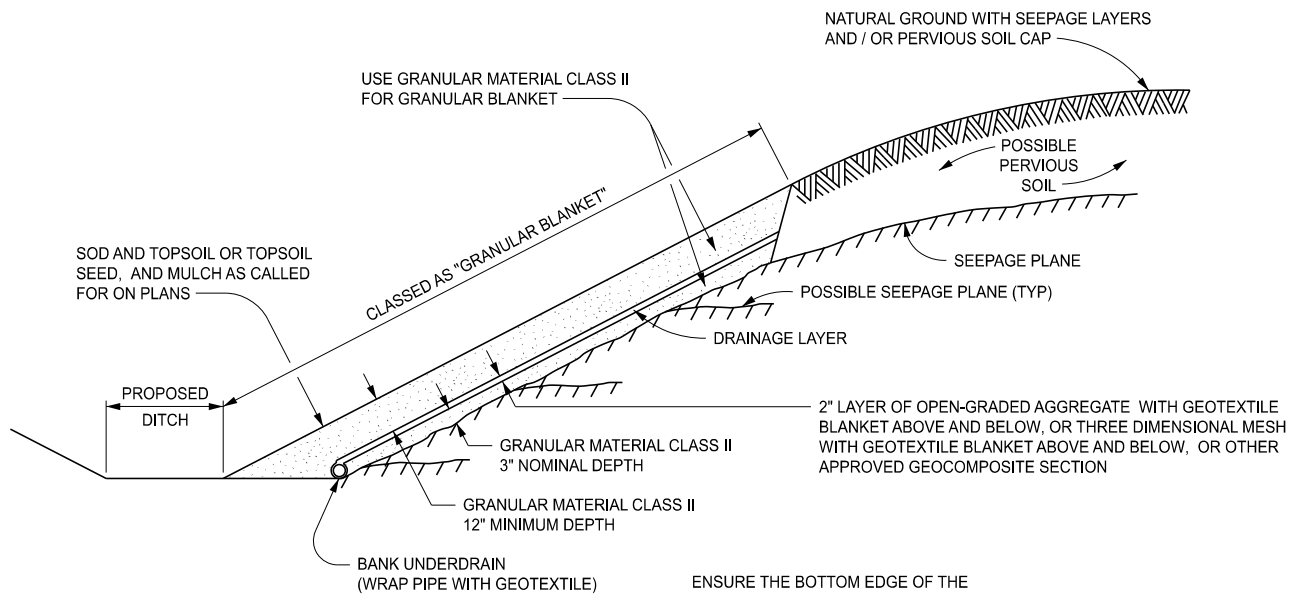
03/30/2026
PLAN DATE

R-73-F

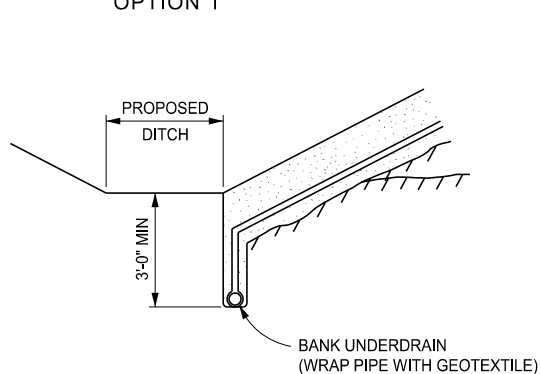
SHEET
3 OF 3



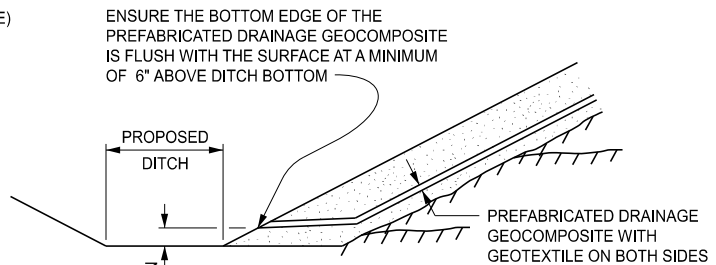
GRANULAR BLANKET TYPE 1



OPTION 1



OPTION 2



OPTION 3

NOTE: OPTION 1, 2, OR 3 WILL BE DETERMINED BY THE ENGINEER BASED ON THE PROJECT CONDITIONS.

GRANULAR BLANKET TYPE 2

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

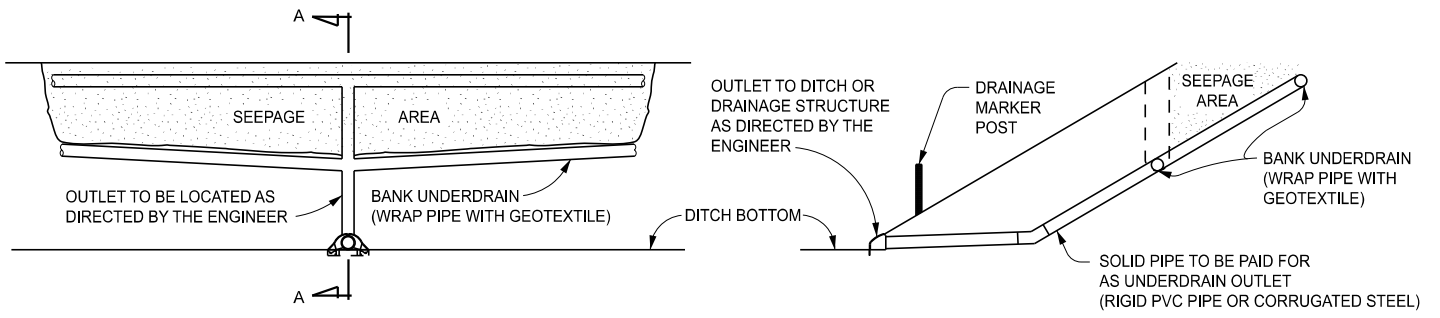
STANDARD PLAN FOR
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS
FOR UNDERDRAINS, AND SEWER BULKHEADS

SPECIAL DETAIL
FHWA APPROVAL

02/05/2026
PLAN DATE

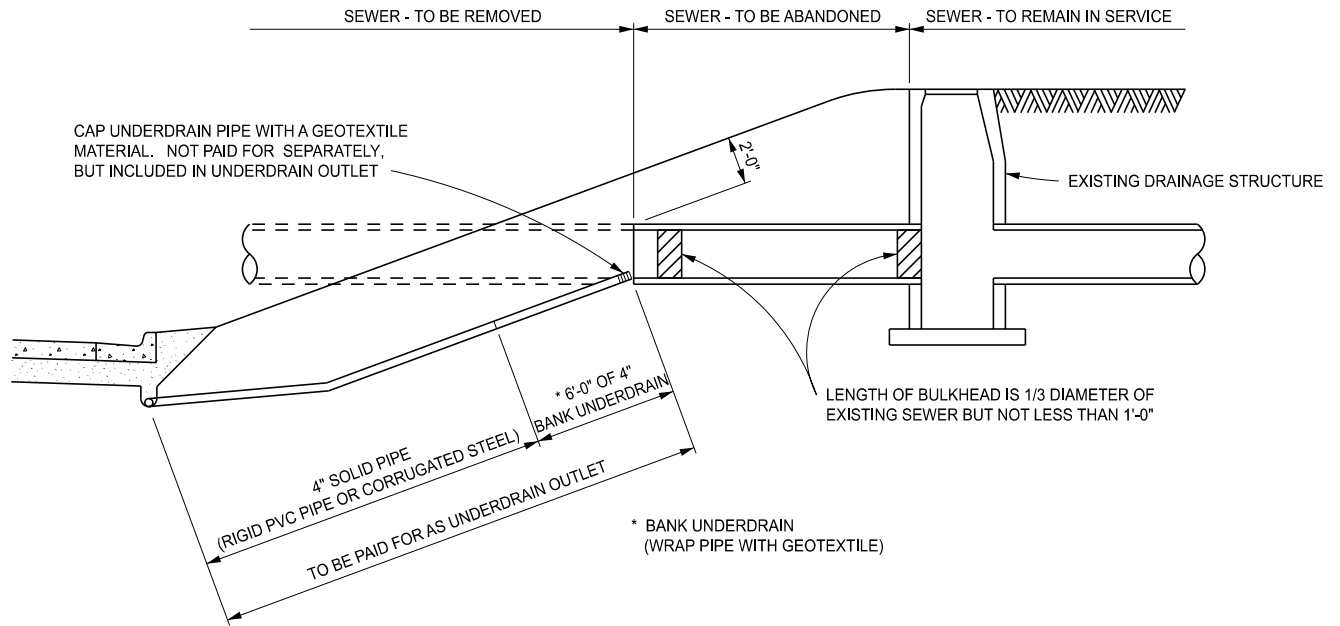
R-80-F

SHEET
1 OF 9



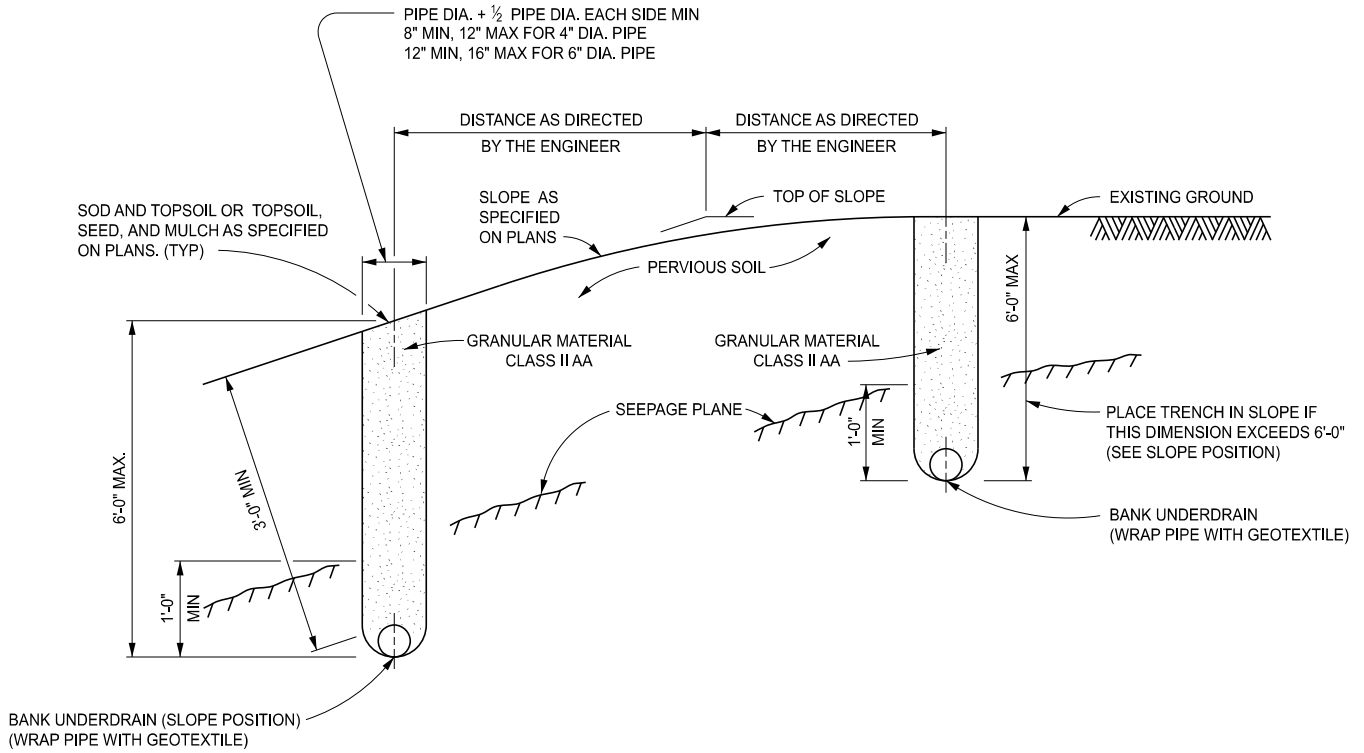
SECTION A - A

BANK UNDERDRAIN OUTLET

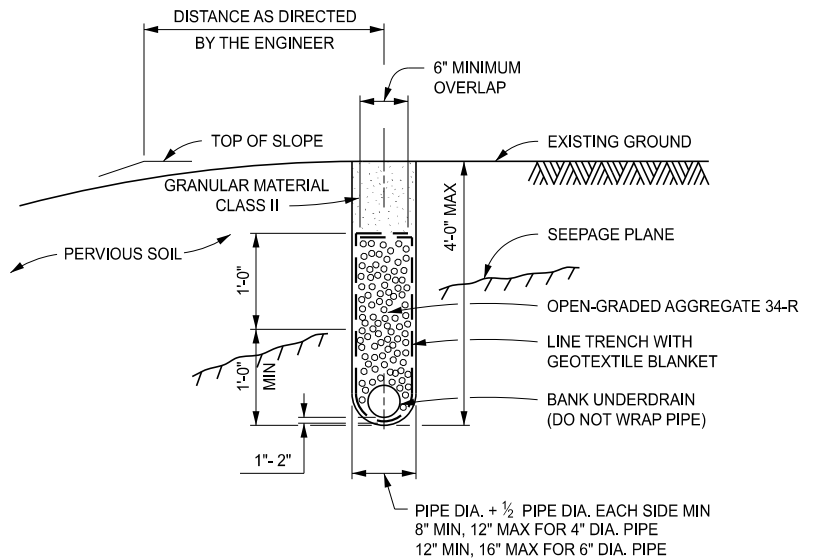


WEEPER UNDERDRAIN AND BULKHEADING SEVERED SEWER

<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS		R-80-F	SHEET 2 OF 9
	SPECIAL DETAIL FHWA APPROVAL	02/05/2026 PLAN DATE		



BANK UNDERDRAINS

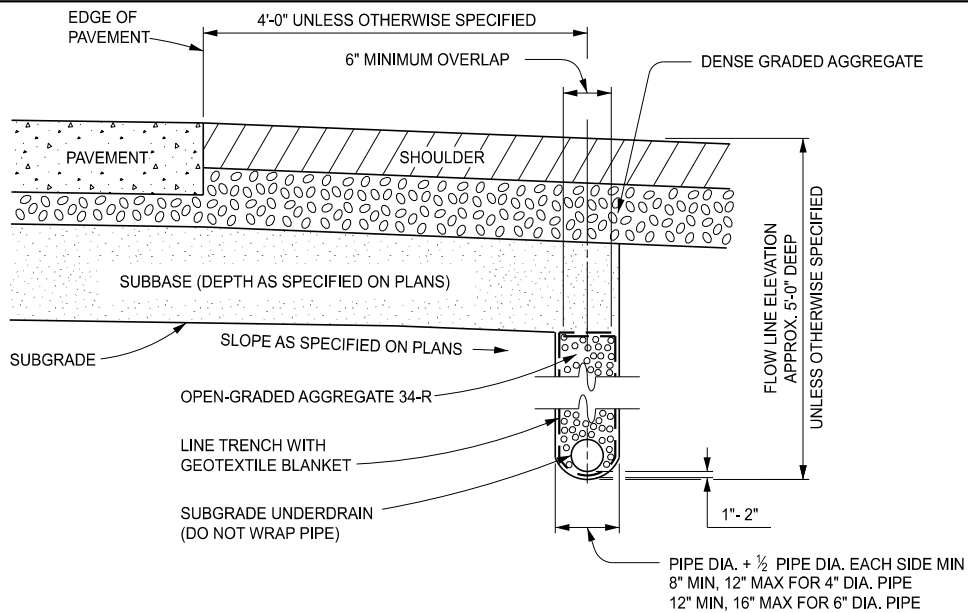


BANK UNDERDRAIN, OPEN-GRADED

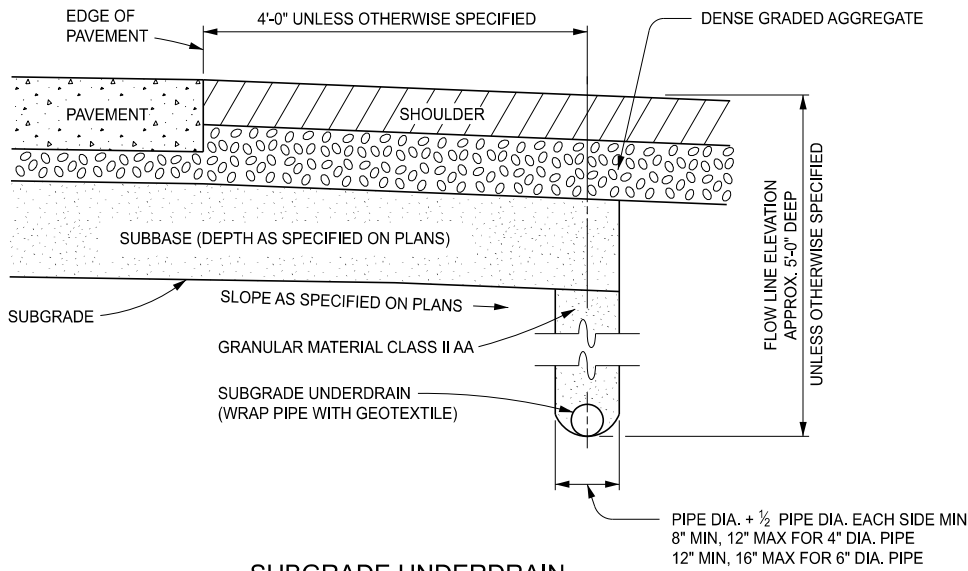
MDOT
Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

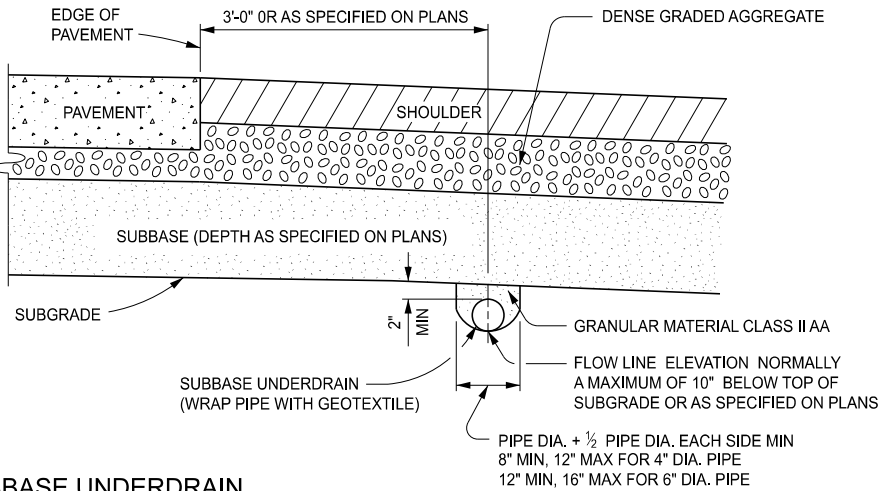
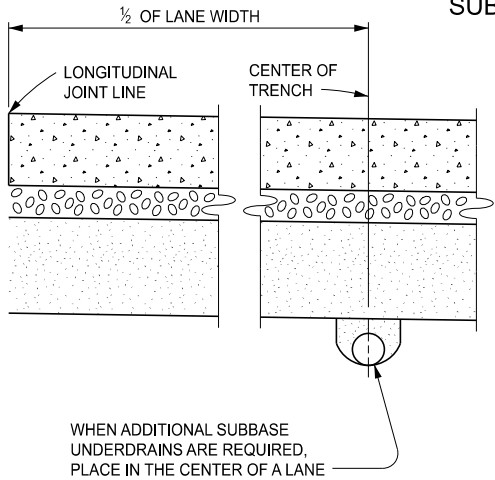
STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS			
SPECIAL DETAIL	02/05/2026	R-80-F	SHEET 3 OF 9
FHWA APPROVAL	PLAN DATE		



SUBGRADE UNDERDRAIN - OPEN-GRADED

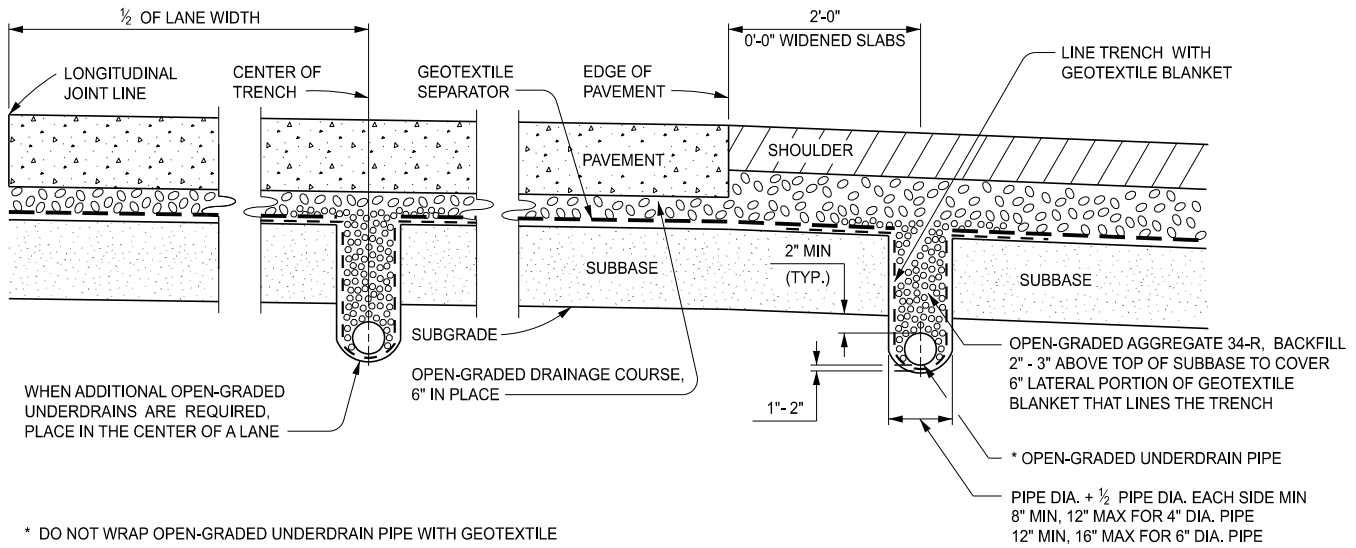


SUBGRADE UNDERDRAIN

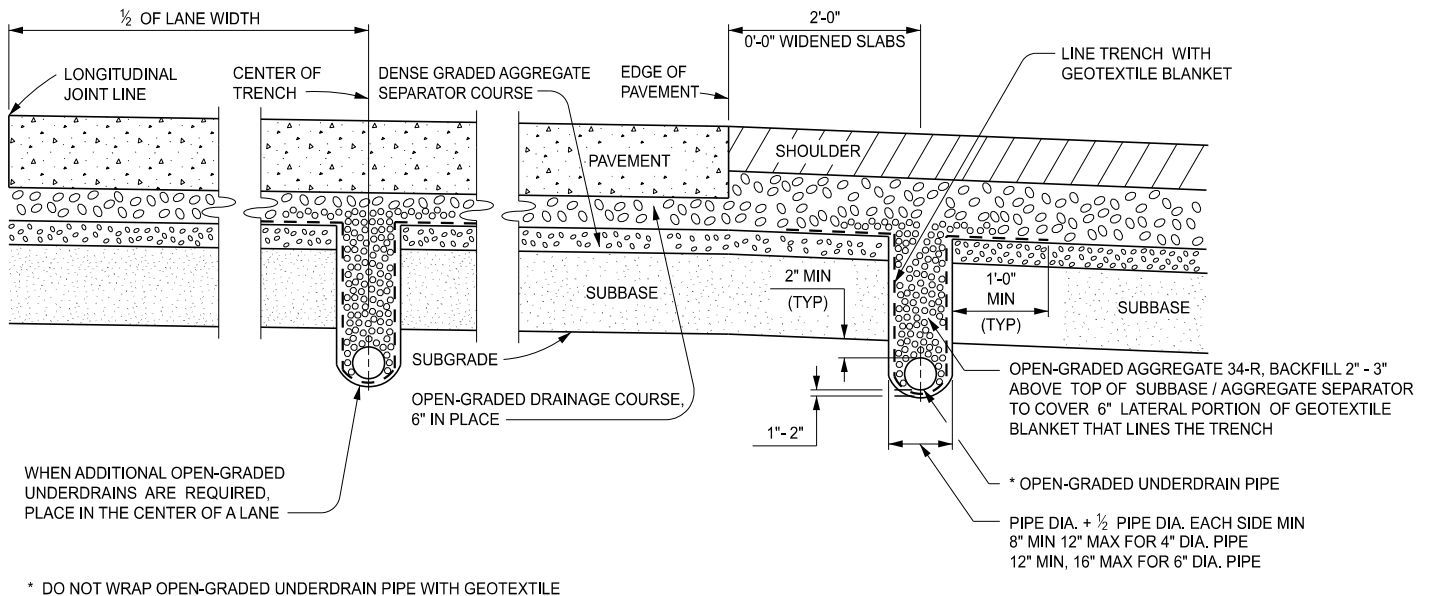


SUBBASE UNDERDRAIN

<p>MDOT Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS</p>			<p>SHEET 4 OF 9</p>
	<p>SPECIAL DETAIL FHWA APPROVAL</p>	<p>02/05/2026 PLAN DATE</p>	<p>R-80-F</p>	

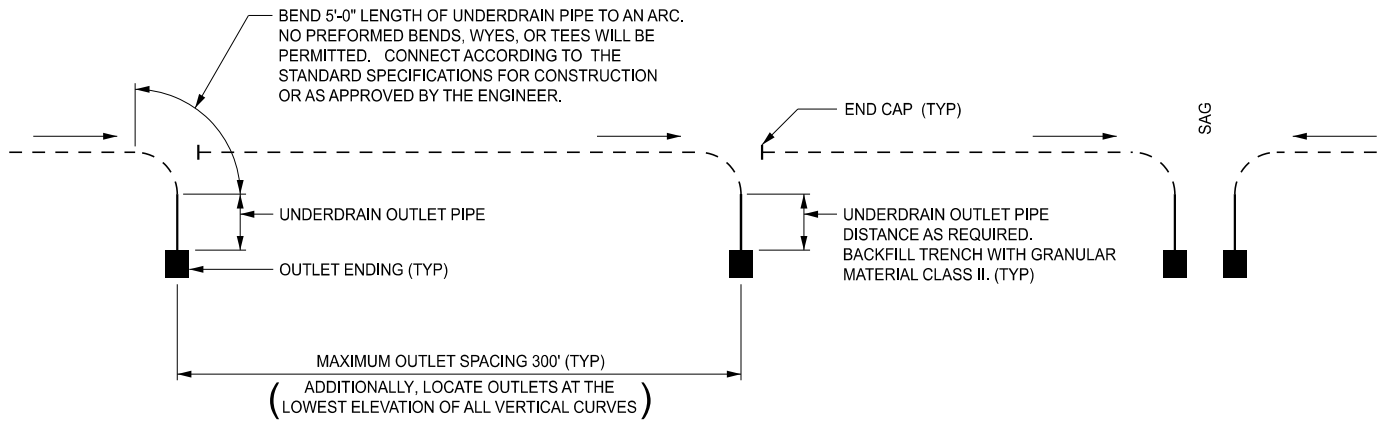


OPEN-GRADED UNDERDRAIN PIPE
WITH GEOTEXTILE SEPARATOR

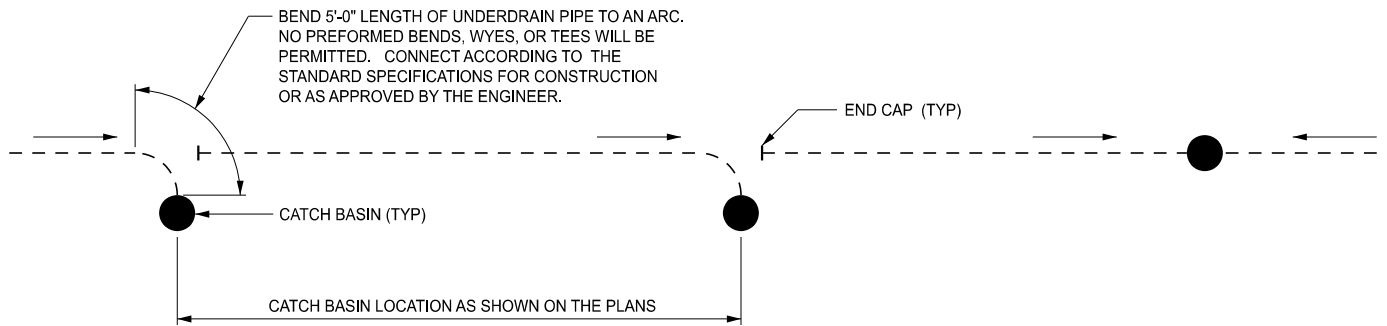


OPEN-GRADED UNDERDRAIN PIPE
WITH DENSE GRADED AGGREGATE SEPARATOR COURSE

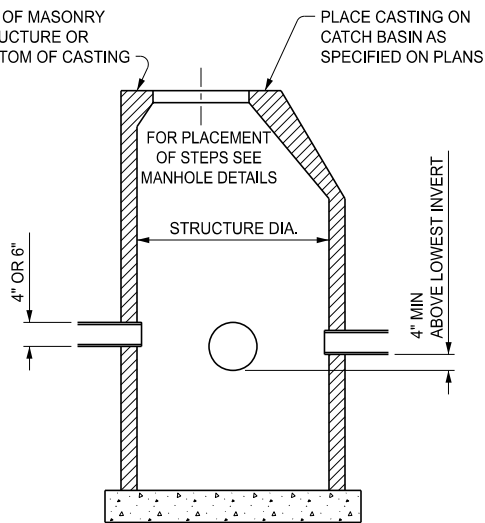
<p>MDOT Michigan Department of Transportation</p> <p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	<p>STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS</p>			<p>SHEET 5 OF 9</p>
	<p>SPECIAL DETAIL FHWA APPROVAL</p>	<p>02/05/2026 PLAN DATE</p>	<p>R-80-F</p>	



PLAN SHOWING OUTLETS FOR UNDERDRAINS



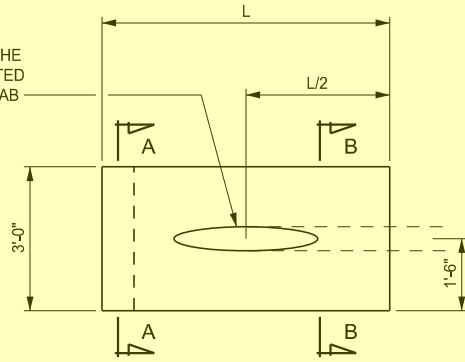
PLAN SHOWING UNDERDRAINS TAPPED INTO CATCH BASINS



PROFILE VIEW

<p>DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE</p>	STANDARD PLAN FOR GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS		R-80-F	SHEET 6 OF 9
	SPECIAL DETAIL FHWA APPROVAL	02/05/2026 PLAN DATE		

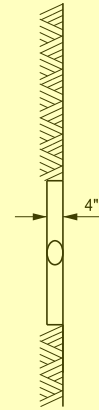
ENSURE THE CENTER OF THE OUTLET OPENING IS LOCATED AT THE CENTER OF THE SLAB



PLAN VIEW
SINGLE OUTLET



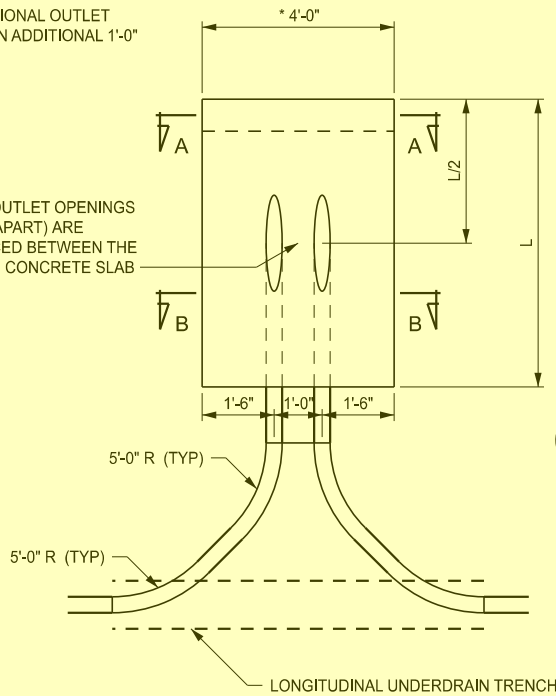
SECTION A - A



SECTION B - B

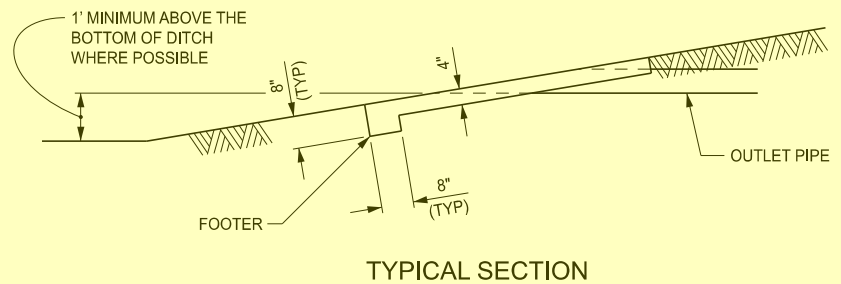
* EVERY ADDITIONAL OUTLET REQUIRES AN ADDITIONAL 1'-0"

ENSURE THE OUTLET OPENINGS (SPACED 1'-0" APART) ARE EQUALLY SPACED BETWEEN THE EDGES OF THE CONCRETE SLAB



PLAN VIEW
TWIN OUTLET

SLOPE	LENGTH (L)	CONCRETE (CYD) FOR SINGLE OUTLET	CONCRETE (CYD) FOR TWIN OUTLET	CONCRETE (CYD) FOR EACH ADDITIONAL OUTLET
STEEPER THAN 1:6	4'-0"	0.17	0.23	0.06
1:6 OR FLATTER	6'-0"	0.25	0.33	0.08



TYPICAL SECTION

UNDERDRAIN OUTLET ENDING (CIP)

USE FIBER REINFORCED CONCRETE

NOTES:

PROVIDE POSITIVE DRAINAGE (AS SPECIFIED IN THE STANDARD SPECIFICATIONS FOR CONSTRUCTION) FOR UNDERDRAINS AND UNDERDRAIN OUTLETS.

UNDERDRAIN PIPE SIZES ARE AS SPECIFIED ON THE PLANS.

ENSURE OUTLET CONNECTIONS TO DRAINAGE STRUCTURES ARE ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

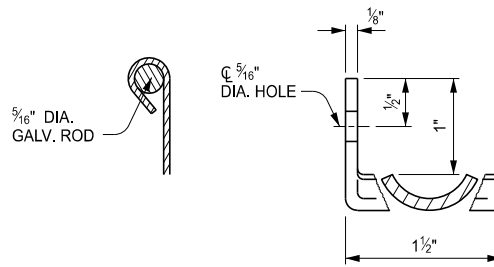
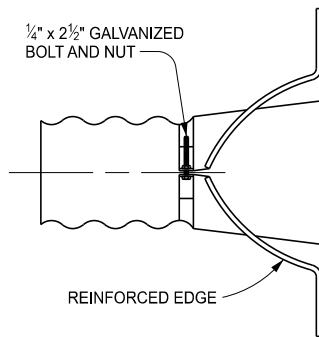
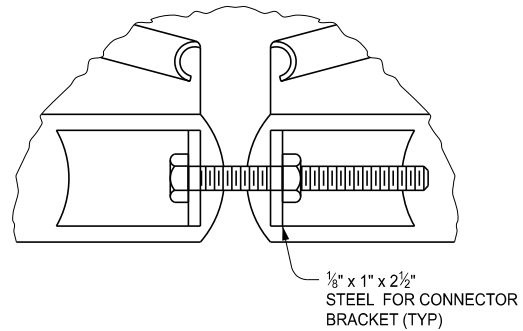
STANDARD PLAN FOR
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS
FOR UNDERDRAINS, AND SEWER BULKHEADS

SPECIAL DETAIL
FHWA APPROVAL

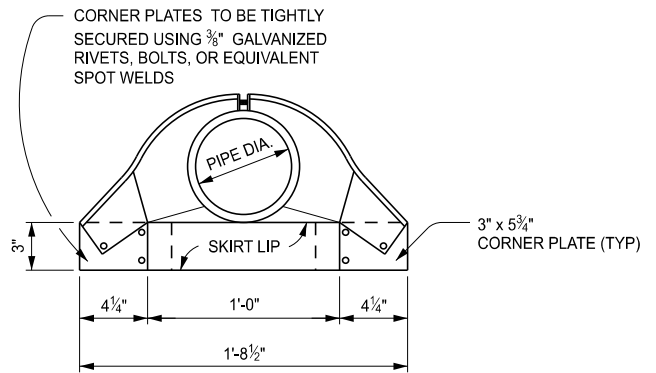
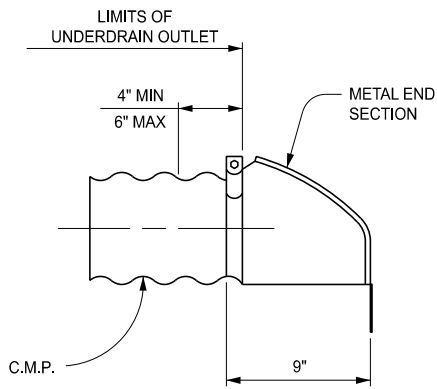
02/05/2026
PLAN DATE

R-80-F

SHEET
7 OF 9



REINFORCED EDGE DETAIL CONNECTOR BRACKET DETAIL



STEEL END SECTION FOR 4" OR 6" PIPE

USE ONLY WHEN SITE CONDITIONS WILL NOT ALLOW PROPER PLACEMENT OF UNDERDRAIN OUTLET ENDING (CIP). HOWEVER, DO NOT USE ON PVC OUTLET PIPE. SEE NOTES.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

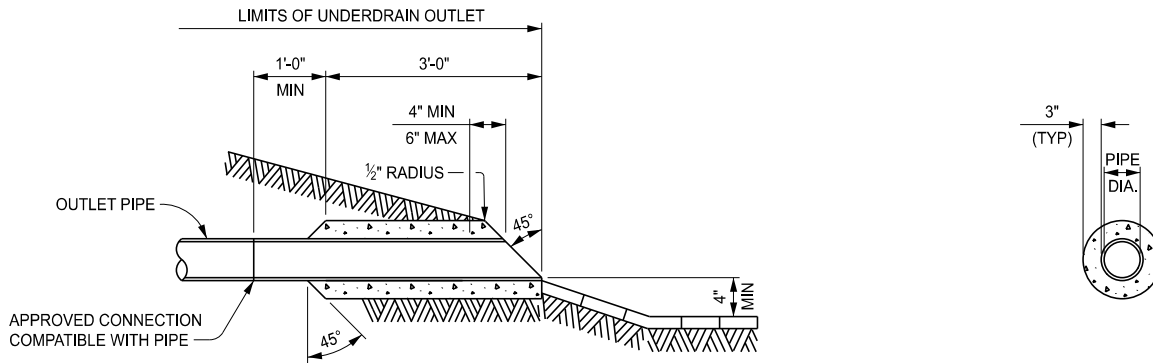
STANDARD PLAN FOR
**GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS
FOR UNDERDRAINS, AND SEWER BULKHEADS**

SPECIAL DETAIL
FHWA APPROVAL

02/05/2026
PLAN DATE

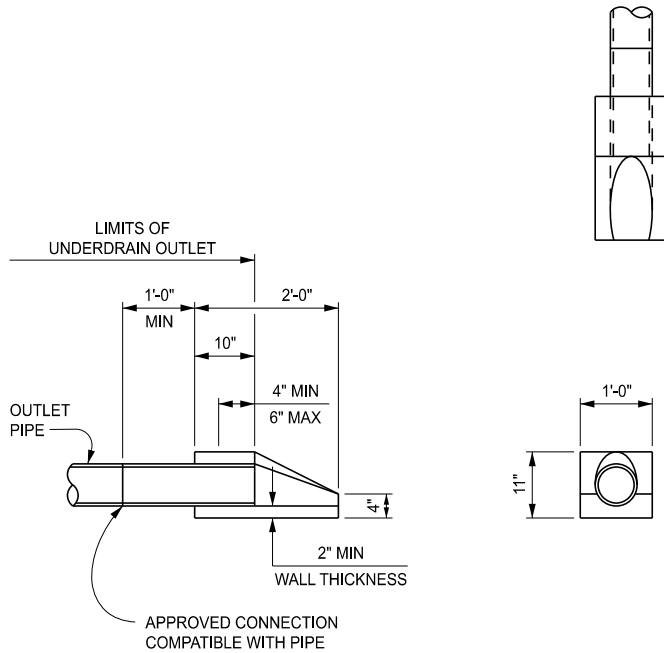
R-80-F

SHEET
8 OF 9



CONCRETE RING FOR 4" OR 6" PIPE

USE ONLY WHEN SITE CONDITIONS WILL NOT ALLOW PROPER PLACEMENT OF UNDERDRAIN OUTLET ENDING (CIP)



CONCRETE END SECTION FOR 4" OR 6" PIPE

USE ONLY WHEN SITE CONDITIONS WILL NOT ALLOW PROPER PLACEMENT OF UNDERDRAIN OUTLET ENDING (CIP)

NOTES:

- PROVIDE POSITIVE DRAINAGE FOR UNDERDRAINS AND UNDERDRAIN OUTLETS.
- ENSURE UNDERDRAIN PIPE SIZES ARE AS SPECIFIED ON THE PLAN.
- CONSTRUCT CONNECTIONS BETWEEN UNDERDRAIN PIPE AND UNDERDRAIN OUTLET PIPE ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND AS APPROVED BY THE ENGINEER.
- ENSURE CONNECTIONS, IF REQUIRED WITHIN THE OUTLET PIPE, ARE ACCORDING TO APPLICABLE ASTM SPECIFICATIONS REFERENCED IN THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, ARE WATER TIGHT, AND OF THE SAME MATERIAL AS THE OUTLET PIPE.
- ENSURE OUTLET CONNECTIONS TO DRAINAGE STRUCTURES ARE ACCORDING TO THE STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR DRAINAGE STRUCTURES.
- USE ONLY RIGID PVC OR CORRUGATED METAL FOR UNDERDRAIN OUTLET PIPE .
- CAST THE CONCRETE RING OR CONCRETE END SECTION AROUND THE SAME TYPE OF PIPE THAT IS USED FOR UNDERDRAIN OUTLET PIPE.
- ATTACH STEEL END SECTIONS TO THE ENDS OF CORRUGATED METAL PIPE AS SPECIFIED ON THIS STANDARD PLAN, BY STANDARD METAL BANDS OR BY OTHER CONNECTING DEVICES AS APPROVED BY THE ENGINEER.
- DO NOT USE STEEL END SECTIONS ON PVC OUTLET PIPE. USE CONCRETE SECTIONS.**
- REROLL THE ENDS OF HELICALLY CORRUGATED PIPE (EXCEPT PERFORATED PIPE) TO FORM ANNULAR CORRUGATIONS FOR CONNECTING THE END SECTION.
- DO NOT USE GRANULAR MATERIAL PRODUCED FROM CRUSHED PORTLAND CEMENT CONCRETE FOR ANY BACKFILL MATERIAL.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

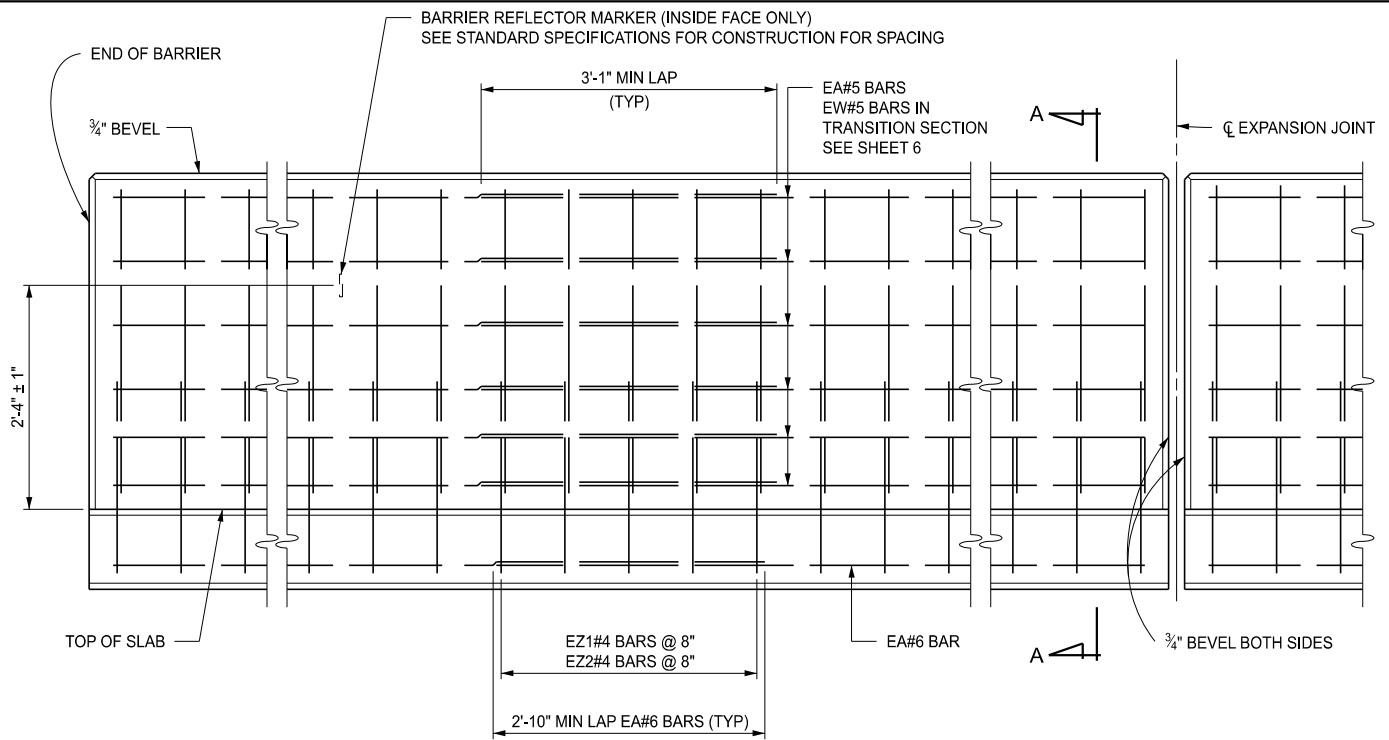
STANDARD PLAN FOR
GRANULAR BLANKET, UNDERDRAINS, OUTLET ENDINGS FOR UNDERDRAINS, AND SEWER BULKHEADS

(SPECIAL DETAIL)
FHWA APPROVAL

02/05/2026
PLAN DATE

R-80-F

SHEET
9 OF 9



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



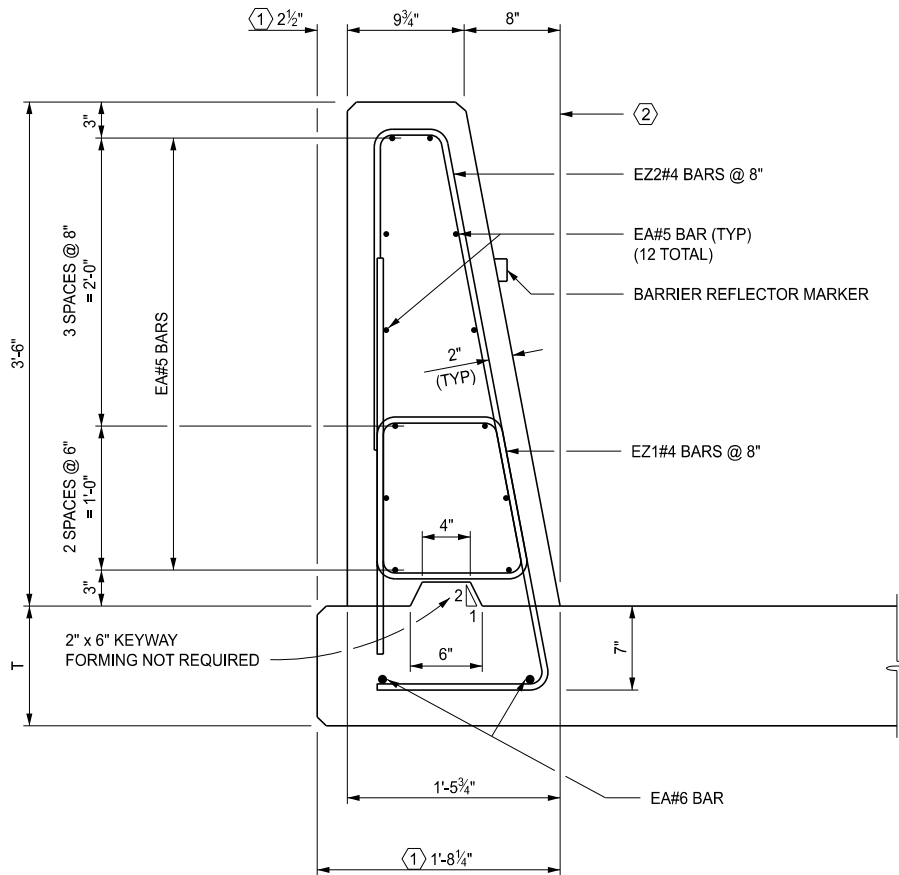
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
BRIDGE BARRIER RAILING, TYPE 6

(SPECIAL DETAIL) 04/22/2026
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 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.



DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

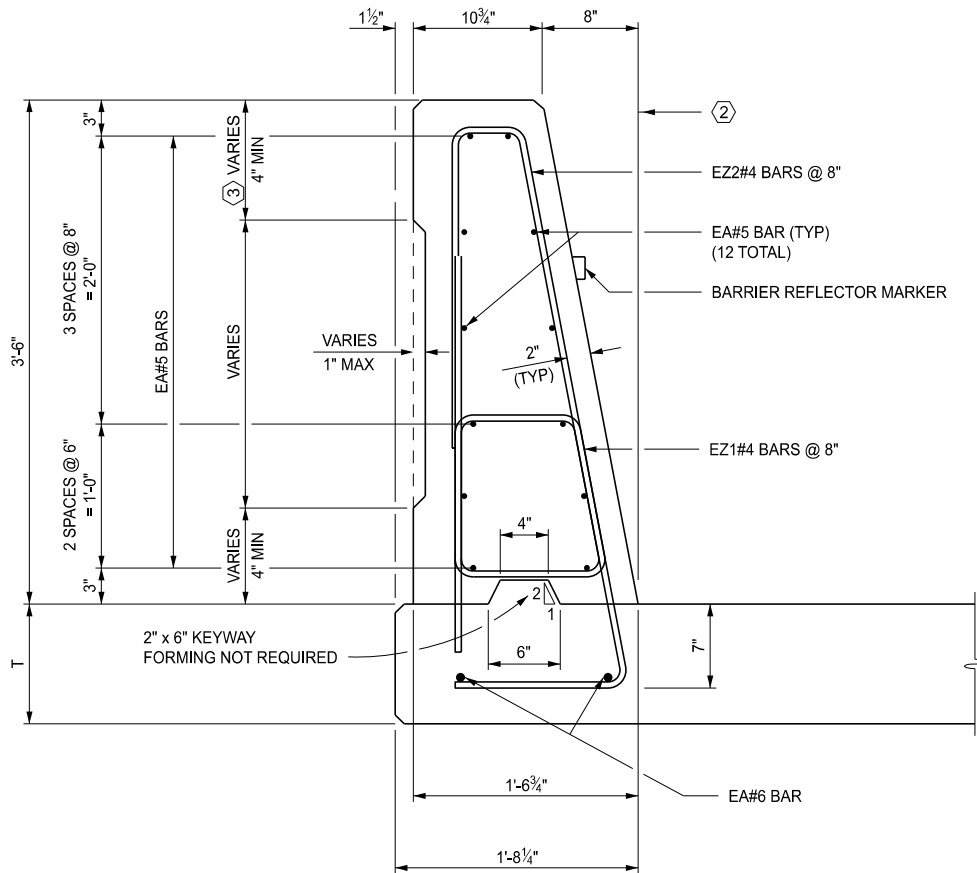
STANDARD PLAN FOR
BRIDGE BARRIER RAILING, TYPE 6

(SPECIAL DETAIL)
FHWA APPROVAL

04/22/2026
PLAN DATE

B-29-A

SHEET
2 OF 8



SECTION A-A

BRIDGE BARRIER RAILING, AESTHETIC, TYPE 6, DET 2

(THE TYPE AND LIMITS OF THE AESTHETIC TREATMENT,)
 (IF APPLICABLE, ARE AS 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

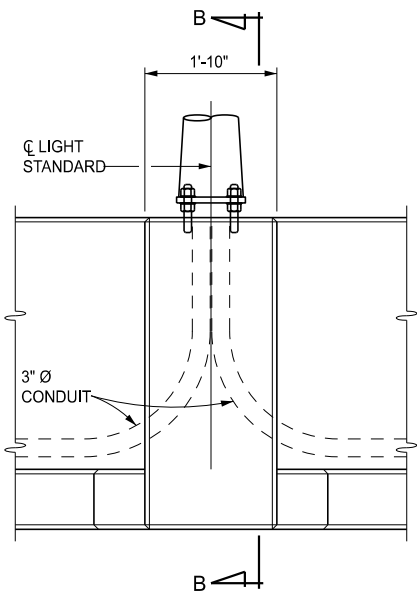
STANDARD PLAN FOR
 BRIDGE BARRIER RAILING, TYPE 6

(SPECIAL DETAIL)
 FHWA APPROVAL

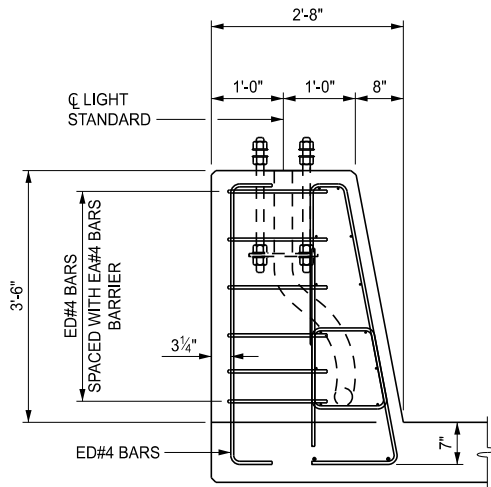
04/22/2026
 PLAN DATE

B-29-A

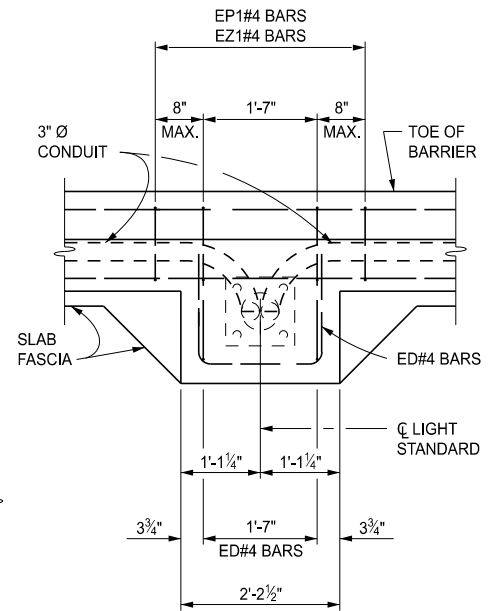
SHEET
 3 OF 8



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

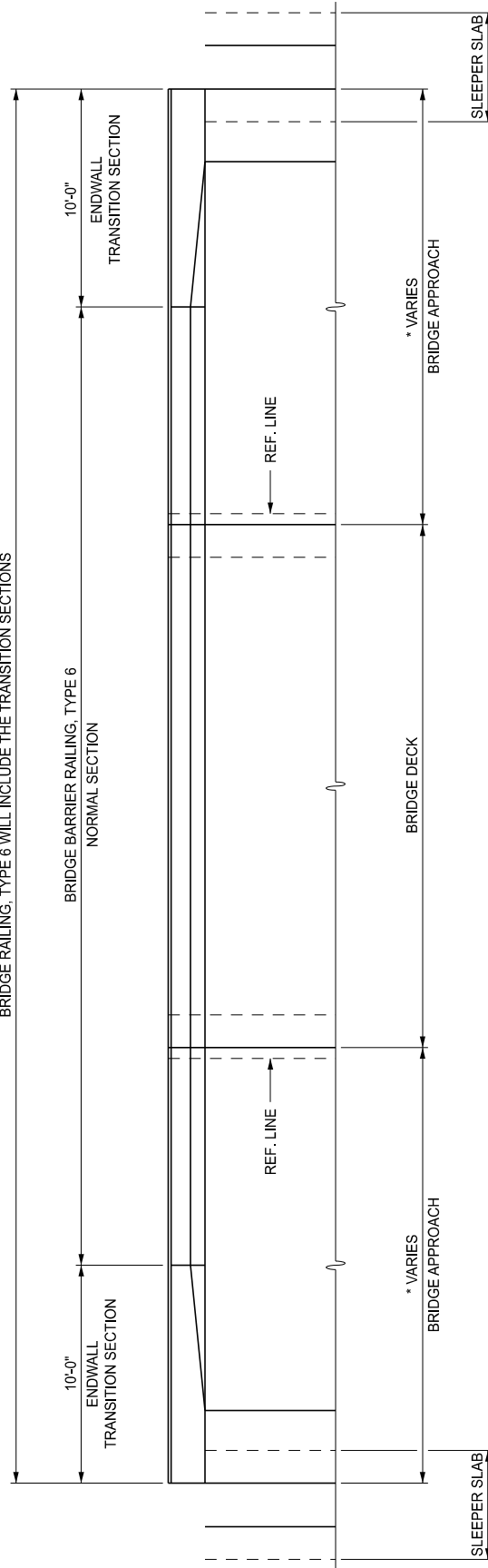
(SPECIAL DETAIL)
FHWA APPROVAL

04/22/2026
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

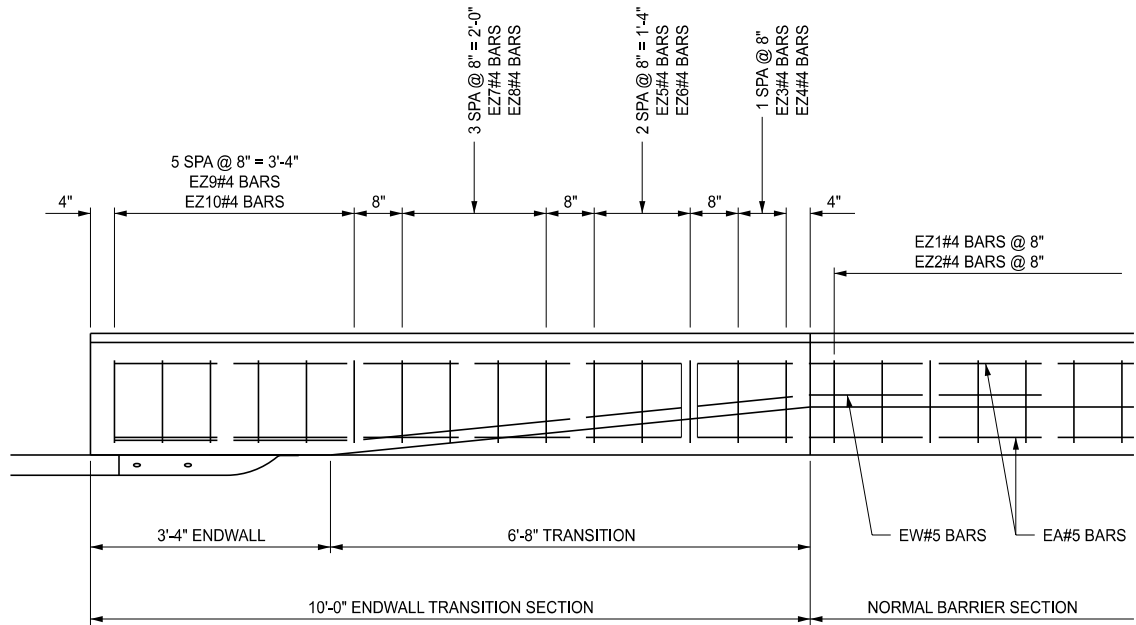
STANDARD PLAN FOR
BRIDGE BARRIER RAILING, TYPE 6

(SPECIAL DETAIL)
FHWA APPROVAL

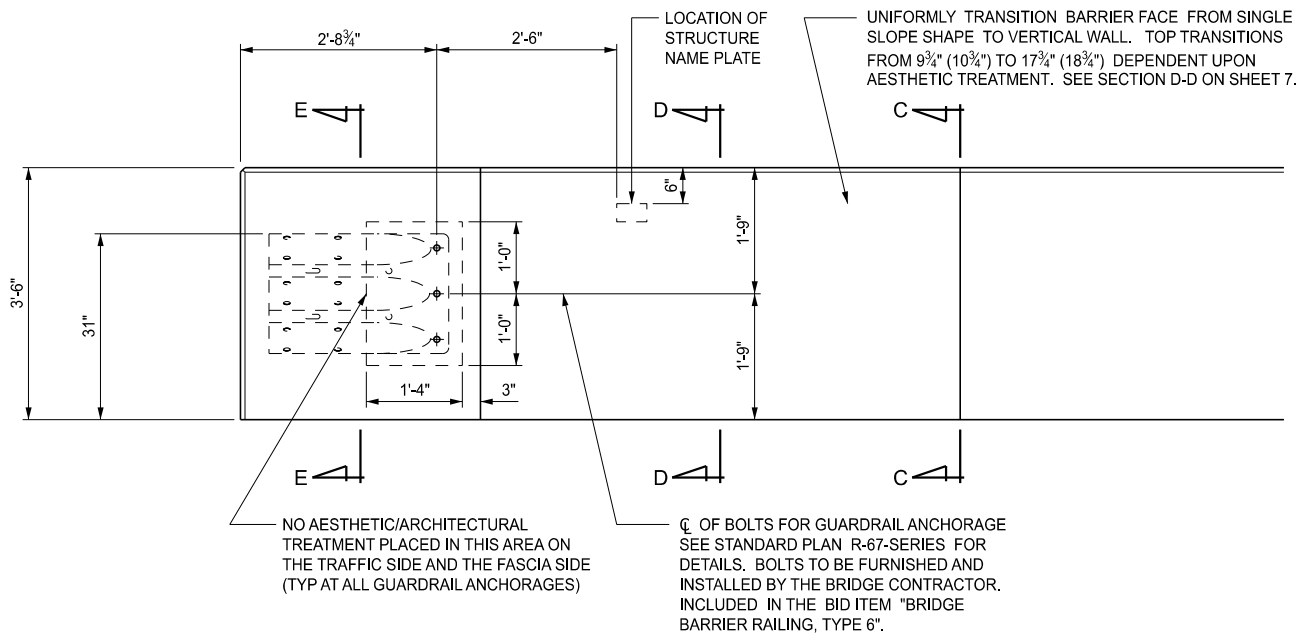
04/22/2026
PLAN DATE

B-29-A

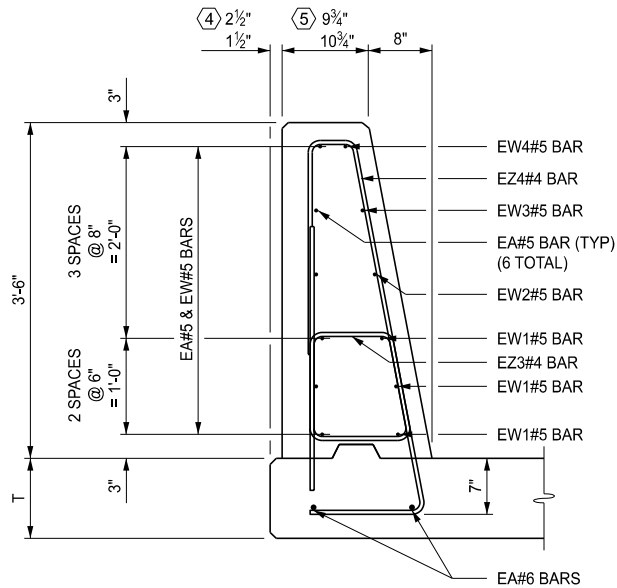
SHEET
5 OF 8



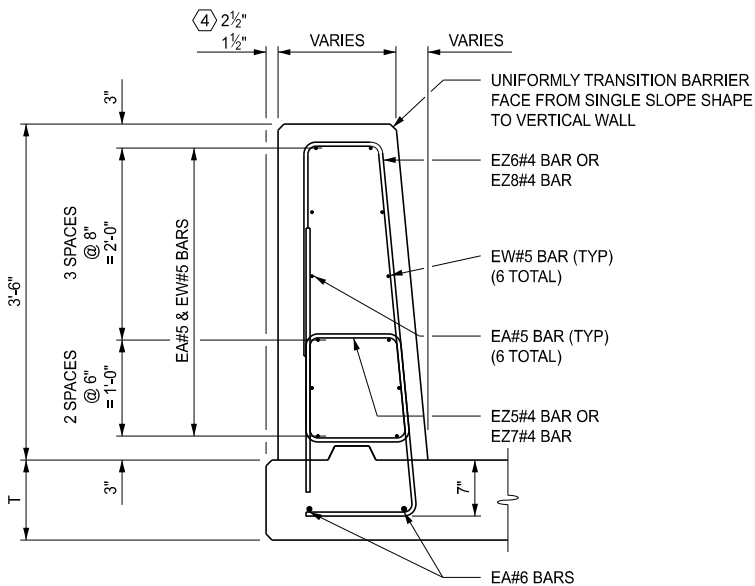
PLAN VIEW



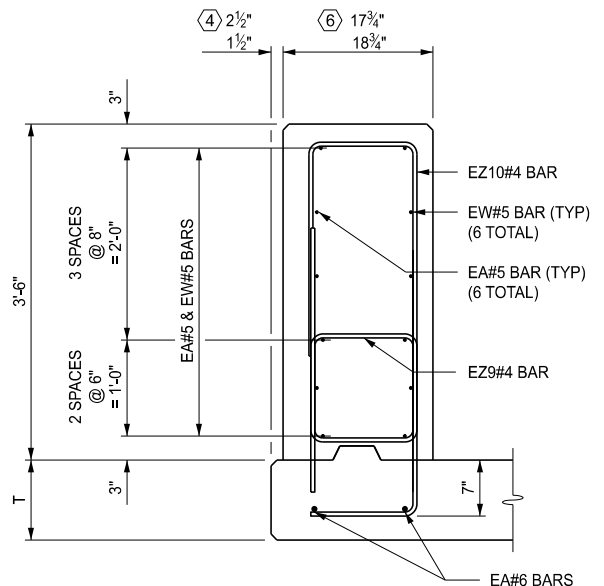
ELEVATION VIEW



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

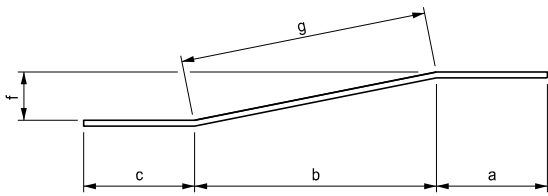
STANDARD PLAN FOR
BRIDGE BARRIER RAILING, TYPE 6

(SPECIAL DETAIL)
FHWA APPROVAL

04/22/2026
PLAN DATE

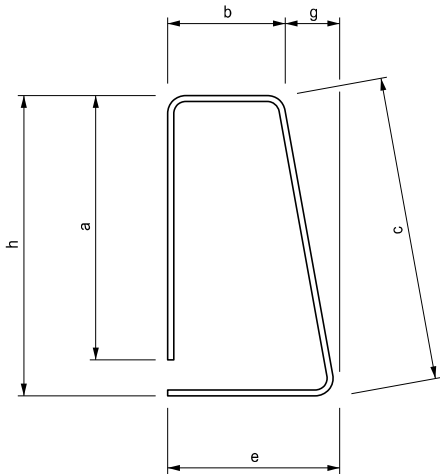
B-29-A

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 ⁵ / ₈ "	EW051204
EW2	1	2'-2"	6'-0"	4'-2 ⁷ / ₈ "	6'-0 ¹ / ₈ "	4 ¹ / ₄ "	EW051205
EW3	1	2'-2"	6'-0"	4'-3 ³ / ₄ "	6'-0 ¹ / ₄ "	5 ³ / ₄ "	EW051206
EW4	1	2'-2"	6'-0"	4'-4 ⁵ / ₈ "	6'-0 ³ / ₈ "	6 ⁷ / ₈ "	EW051207

$$L = c + a + g$$

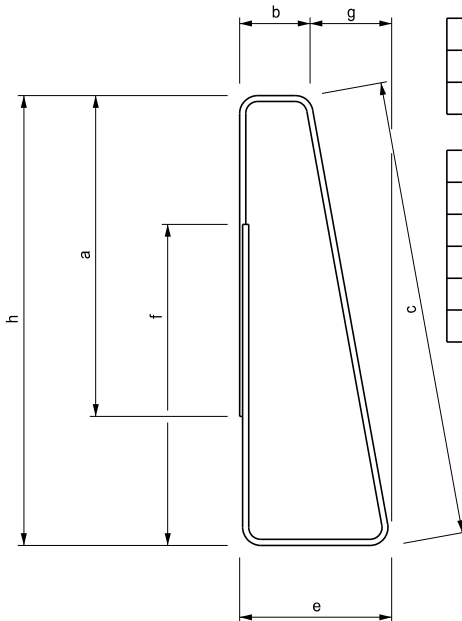


BARRIER SECTION BARS								
	# of bars	a	b	c	e	g	h	
EZ1	--	1'-8 ¹ / ₈ "	10 ³ / ₄ "	1'-11 ¹ / ₈ "	1'-3"	4 ³ / ₈ "	1'-10 ³ / ₄ "	EZ040509

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

ENDWALL TRANSITION SECTION BARS								
	# of bars	a	b	c	e	g	h	
EZ3	2	1'-8"	10 ³ / ₈ "	1'-11 ¹ / ₈ "	1'-2 ¹ / ₂ "	4 ¹ / ₈ "	1'-10 ³ / ₄ "	EZ040508
EZ5	3	1'-7 ³ / ₄ "	11"	1'-11"	1'-2 ¹ / ₄ "	3 ¹ / ₄ "	1'-10 ³ / ₄ "	EZ040508
EZ7	4	1'-7 ¹ / ₂ "	11 ³ / ₄ "	1'-10 ⁷ / ₈ "	1'-1 ⁷ / ₈ "	2 ¹ / ₈ "	1'-10 ³ / ₄ "	EZ040508
EZ9	6	1'-7 ³ / ₄ "	1'-1 ³ / ₄ "	1'-10 ³ / ₄ "	1'-1 ³ / ₄ "	--	1'-10 ³ / ₄ "	EZ040510

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



BARRIER SECTION BARS									
	# of bars	a	b	c	e	f	g		
EZ2	--	2'-3 ³ / ₈ "	6 ¹ / ₈ "	3'-2 ¹ / ₄ "	1'-1 ¹ / ₄ "	2'-3"	7 ¹ / ₈ "	3'-1 ⁵ / ₈ "	EZ040904

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

ENDWALL TRANSITION SECTION BARS									
	# of bars	a	b	c	e	f	g		
EZ4	2	2'-3 ¹ / ₂ "	6 ¹ / ₂ "	3'-2"	1'-1"	2'-3"	6 ¹ / ₂ "	3'-1 ¹ / ₂ "	EZ040904
EZ6	3	2'-3 ⁷ / ₈ "	8 ¹ / ₈ "	3'-1 ⁷ / ₈ "	1'-1 ¹ / ₈ "	2'-3"	5"	3'-1 ¹ / ₂ "	EZ040906
EZ8	4	2'-3 ⁵ / ₈ "	10 ¹ / ₂ "	3'-1 ⁵ / ₈ "	1'-1 ¹ / ₄ "	2'-3"	2 ³ / ₄ "	3'-1 ¹ / ₂ "	EZ040908
EZ10	6	2'-3 ¹ / ₂ "	1'-1 ¹ / ₂ "	3'-1 ¹ / ₂ "	1'-1 ¹ / ₂ "	2'-3"	--	3'-1 ¹ / ₂ "	EZ040911

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

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

04/22/2026
PLAN DATE

B-29-A

SHEET
8 OF 8

MICHIGAN DESIGN MANUAL

ROAD DESIGN

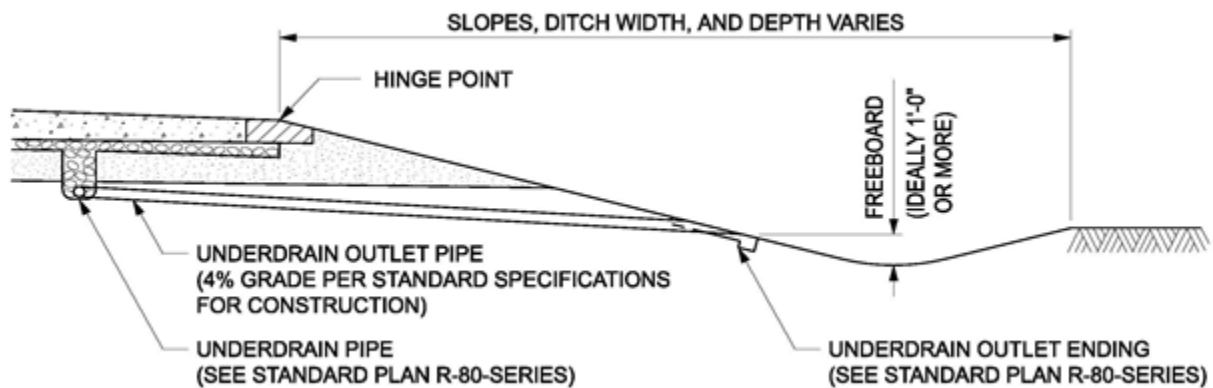
4.06 UNDERDRAINS

4.06.01 Purpose of Underdrains

(revised 4-27-2026)

Current methods of installing underdrains are shown on Standard Plan R-80-Series. In order to protect a roadway surface from early deterioration, a stable base must be built for the roadway. Water in subbase materials weakens the foundation soils, therefore a good roadway requires good drainage. Underdrains intercept and remove seepage from the subbase, eliminating springy or bad subsoil conditions. Underdrains are used on both enclosed and daylighted drainage systems.

The various underdrains either capture and drain the water trapped below the pavement surface or intercept seepage water before it enters the space below the pavement and then convey the seepage to either an outlet ditch or a storm sewer system. The designer should design the depth of ditch or storm sewer to accommodate the underdrain depth below the pavement section and the fall of the outlet pipe to ideally provide 1' (or more) of freeboard from the bottom of the outlet to the ditch bottom.



Where underdrain is required to facilitate subbase or open graded aggregate base drainage, there should be a minimum of two underdrains per roadway located per Standard Plan R-80-Series and not under wheel loads. Additional underdrains should be placed to ensure lateral spacing does not exceed 30 feet center-to-center.

4.06.02 Bank Underdrains

Bank underdrains are sometimes placed in the back slopes to intercept seepage planes before they reach the roadway to minimize erosion or sloughing. Two basic methods of installing bank underdrains are shown on the standard plan. One method backfills the trench with a granular material and wraps the underdrain pipe with a geotextile. The other method envelopes both the open-graded material and the underdrain pipe by lining the trench with a geotextile.

4.06.03 Subgrade and Subbase Underdrains

Subgrade underdrains are meant to drain both the subbase and subgrade under the pavement. Currently, two methods of constructing subgrade underdrains are shown on the standard plan. One method lines the trench with a geotextile that envelopes both the open-graded material and the underdrain pipe. The other method uses granular material and wraps the underdrain pipe with a geotextile.

MICHIGAN DESIGN MANUAL ROAD DESIGN

4.06.05 Underdrain Outlets & Outlet Endings

(revised 4-27-2026)

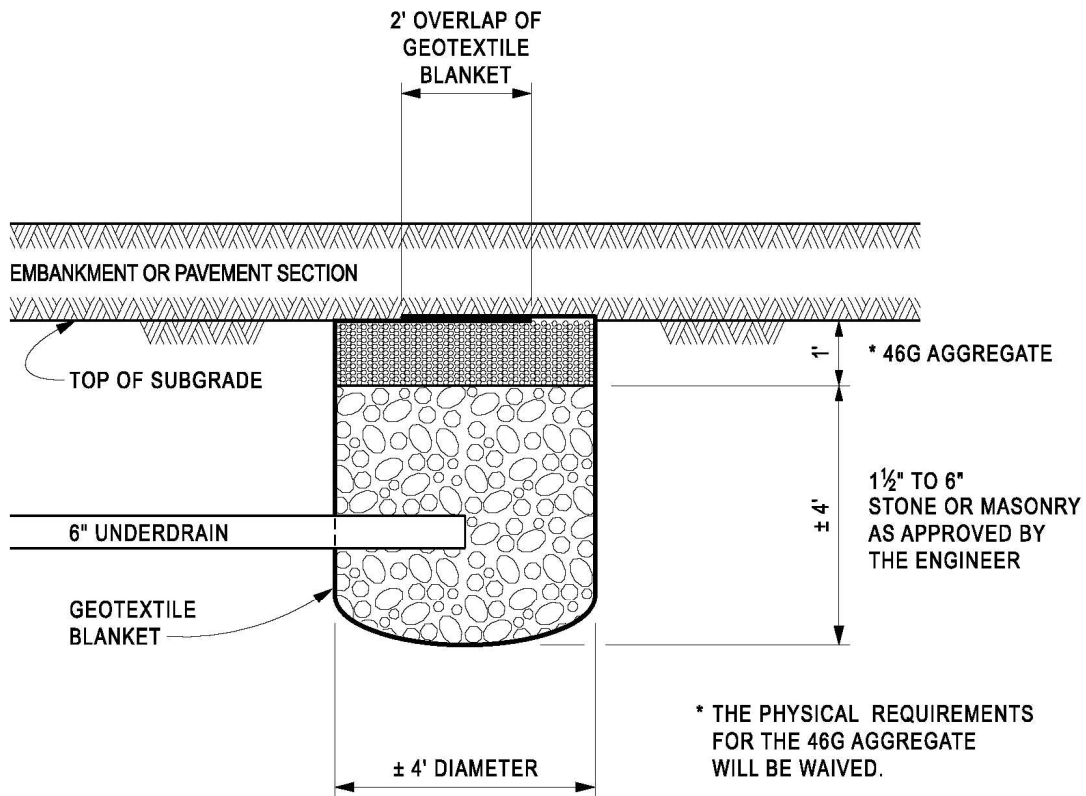
Underdrain outlets are used to connect underdrains to the outlet endings. To resist crushing from heavy construction and maintenance vehicles and to ensure positive flow, use rigid PVC or corrugated steel pipe for underdrain outlets.

Currently four approved outlet endings are shown on Standard Plan R-80-Series. Use the Underdrain Outlet Ending (CIP) option when site conditions allow proper placement. When site conditions do not allow proper placement, the other options are available for use. Other designs may be used when approved by the Engineer.

4.06.06 Stone Baskets

(revised 2-23-2026)

Use stone baskets to drain springs that occur below the roadway. Construct the stone basket by making an excavation at the spring head 4' in diameter and approximately 5' below the bottom of embankment or pavement section. Place geotextile blanket in the excavated hole and backfill with 1½" to 6" stone or masonry, and a 1' thick layer of 46G open graded aggregate. Use a 6" diameter underdrain to dissipate water from the stone basket. Show the location of the stone basket on the typical cross section and detail the following sketch on the plans.

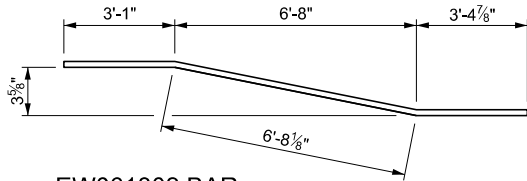


TYPICAL STONE BASKET SECTION

DRAWN BY: BLT
 CHECKED BY: CWC
 APPROVED BY: BMW

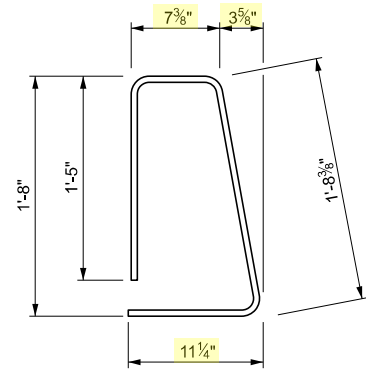
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT
 BRIDGE BARRIER RAILING TYPE 7

ISSUED: 04/27/26
 SUPERSEDES: 01/26/26

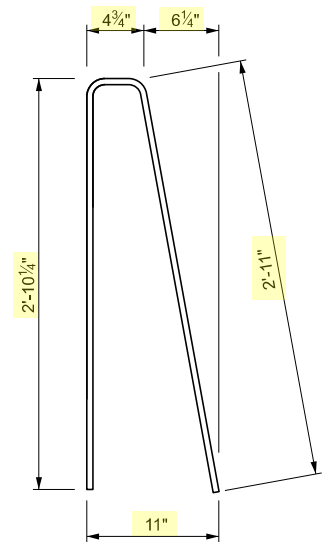
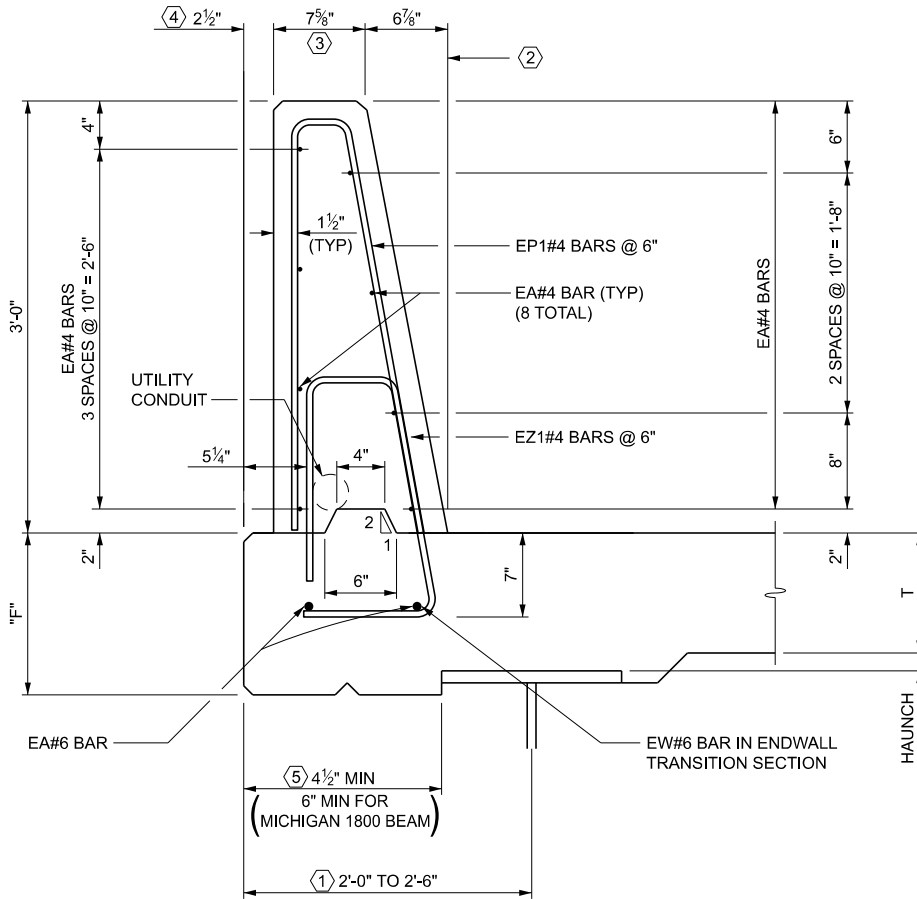


EW061302 BAR

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.

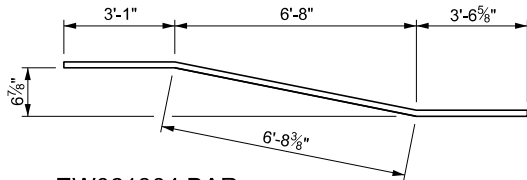
PREPARED BY
 DESIGN DIVISION

6.29.08

DRAWN BY: BLT
 CHECKED BY: CWC
 APPROVED BY: BMW

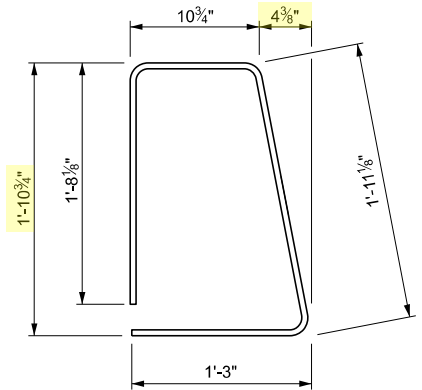
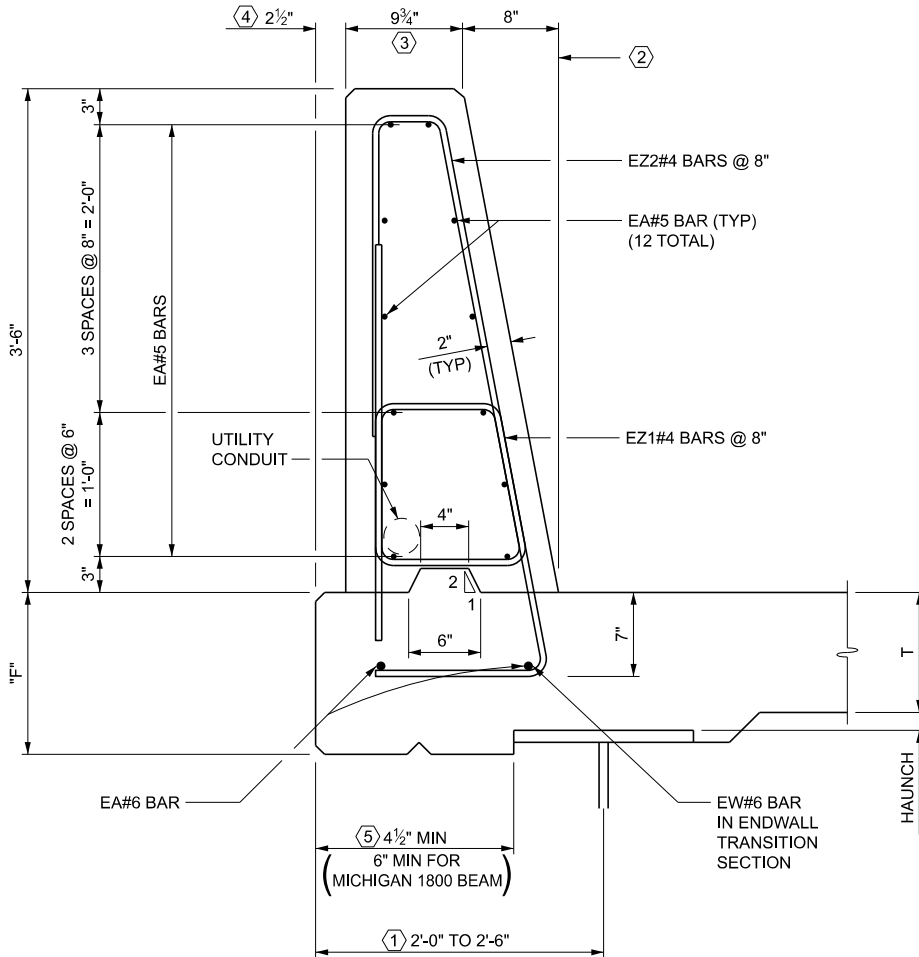
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT
 BRIDGE BARRIER RAILING TYPE 6

ISSUED: 04/27/26
 SUPERSEDES: 01/26/26

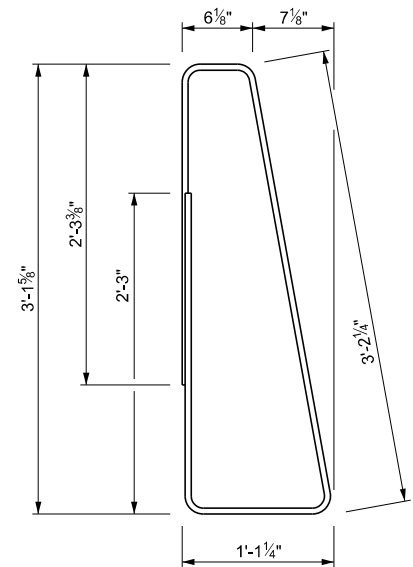


EW061304 BAR

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