Road & Bridge Design Publications

Monthly Update – August 2023

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

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

Special Details

Please Note: All details currently on the special detail index have been reformatted with Arial font compatible with Bentley (GEOPAK) and Microsoft Office applications. Also, sheet borders were revised to match the dimensions in MDOT log jobs. The former plan dates on these details have been retained as the content has not changed.

R-60-J: Guardrail Types A, B, BD, T, TD, MGS-8, & MGS-8D: Added optional galvanizing holes at the bottom of steel guardrail posts greater than 6' in length. Added the size and location of the optional galvanizing hole at the top of all steel guardrail posts.

R-112-J: Shoulder and Center Line Corrugations: Eliminated centerline corrugation gaps at commercial drives.

R-127-H: Delineator Installations: Revised the location of the beginning of red-backed delineators along the outside shoulders of weave/merge lanes to the location of the red-backed delineators on the median side of the roadway or to the prior ramp's 2' gore point, whichever requires fewer delineators. Also, added median-side (yellow) delineators across from and matching the outside shoulder (white) delineators on freeways and divided highways where the posted speed is at least 55 mph.

Road Design Manual

5.16.05: Temporary Breach in Limited Access Right of Way: New section.

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

Index to Special Details

8-28-2023

⑥

SPECIAL DETAIL NUMBER	NUMBER OF SHEETS	TITLE	CURRENT DATE
21	2	GUARDRAIL AT INTERSECTIONS	6-6-22
24	8	GUARDRAIL ANCHORED IN BACKSLOPE TYPES 4B, 4T, & 4MGS-8	12-6-22
99	2	CHAIN LINK FENCE WITH WIRE ROPE	12-6-22
R-32-F	8	APPROACH CURB & GUTTER DOWNSPOUTS	9-20-22
R-32-SD	6	APPROACH CURB & GUTTER DOWNSPOUTS (FOR SAFETY SHAPES)	4-24-23
R-43-J	2	LOCATION OF TRANSVERSE JOINTS IN PLAIN CONCRETE PAVEMENT	1-4-22
R-44-G	7	CONCRETE PAVEMENT REPAIR	3-14-23
R-45-K	2	PAVEMENT REINFORCEMENT FOR BRIDGE APPROACH	1-4-22
R-53-A	22	TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION	8-14-15
R-56-F	6	GUARDRAIL MEDIAN OBJECT PROTECTION	4-11-23
*R-60-J	16	GUARDRAIL TYPES A, B, BD, T, TD, MGS-8, & MGS-8D	8-15-23
R-62-H	4	GUARDRAIL APPROACH TERMINAL TYPE 2M	6-16-22
R-63-C	17	GUARDRAIL APPROACH TERMINAL TYPES 3B & 3T	3-7-23
R-66-E	4	GUARDRAIL DEPARTING TERMINAL TYPES B, T, & MGS	9-28-18
R-67-G	16	GUARDRAIL ANCHORAGE, BRIDGE, DETAILS	12-6-22
R-67-SD	6	GUARDRAIL ANCHORAGE, BRIDGE, DETAILS (FOR SAFETY SHAPES)	4-4-23
R-72-D	6	GUARDRAIL LONG SPAN INSTALLATIONS	8-23-22
R-73-F	3	GUARDRAIL OVER BOX OR SLAB CULVERTS	8-1-19
R-80-F	8	GRANULAR BLANKETS, UNDERDRAINS, OUTLET ENDINGS, & BULKHEADS	6-28-21
R-88-E	4	STEEL END SECTION	3-7-23
R-100-I	4	SEEDING AND TREE PLANTING	8-3-21
R-110-B	3	PAVEMENT SAFETY EDGE	6-14-21
*R-112-J	10	SHOULDER AND CENTER LINE CORRUGATIONS	8-2-23
R-126-I	5	PLACEMENT OF TEMPORARY CONCRETE & STEEL BARRIER	8-25-15
*R-127-H	8	DELINEATOR INSTALLATIONS	8-11-23

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

Notes:

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

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

Index to Bridge Detail Sheets

8-28-2023

⑦

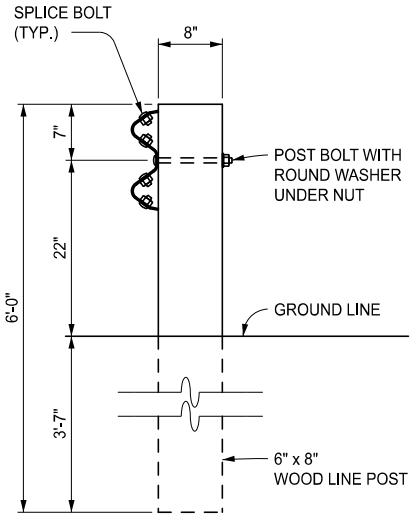
DETAIL NUMBER	NUMBER OF SHEETS	TITLE	CURRENT DATE
B-28-A	7	BRIDGE BARRIER RAILING, TYPE 7	9-2-20
B-29-A	8	BRIDGE BARRIER RAILING, TYPE 6	9-2-20
EJ3AF	1 to 4	EXPANSION JOINT DETAILS (See Notes)	1-23-23
EJ4S	1 to 4	EXPANSION JOINT DETAILS (See Notes)	1-23-23
PC-1N	2	PRESTRESSED CONCRETE I-BEAM DETAILS (See Notes)	11-28-22
PC-2I	2	70" PRESTRESSED CONCRETE I-BEAM DETAILS (See Notes)	11-28-22
PC-4G	2	PRESTRESSED CONCRETE 1800 BEAM DETAILS (See Notes)	11-28-22
PC-5A	2	PRESTRESSED CONCRETE BULB-TEE BEAM DETAILS (See Notes)	11-28-22

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

Notes:

Details EJ3AF & EJ4S are interactive, i.e., designers and detailers choose details based upon railing type and angle of crossing and fill in the project specific dimensions for the end plate. Place all details appropriate for the project (including the end plate), structure specific information, and the Expansion Joint Device quantity on the sheet. Add the sheet to the plans as a normal plan sheet. Call out and designate the location of the expansion joint device and the end plate on the Superstructure Sheet in the plan set.

Details PC-1N, PC-2I, PC-4G, and PC-5A shall have structure specific information and quantities added to the sheet. The sheet shall then be added to the plans as a normal plan sheet.



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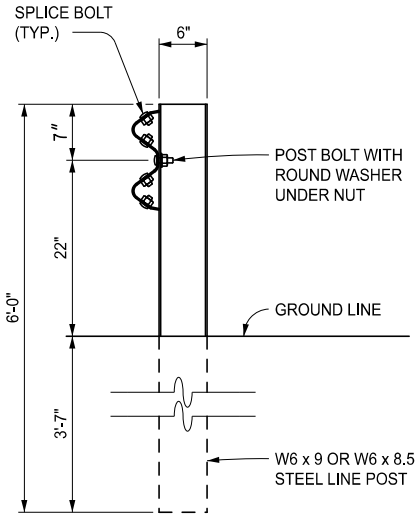

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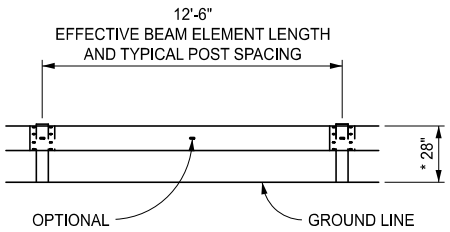


ELEVATION SHOWING POST SPACING

* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE A

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

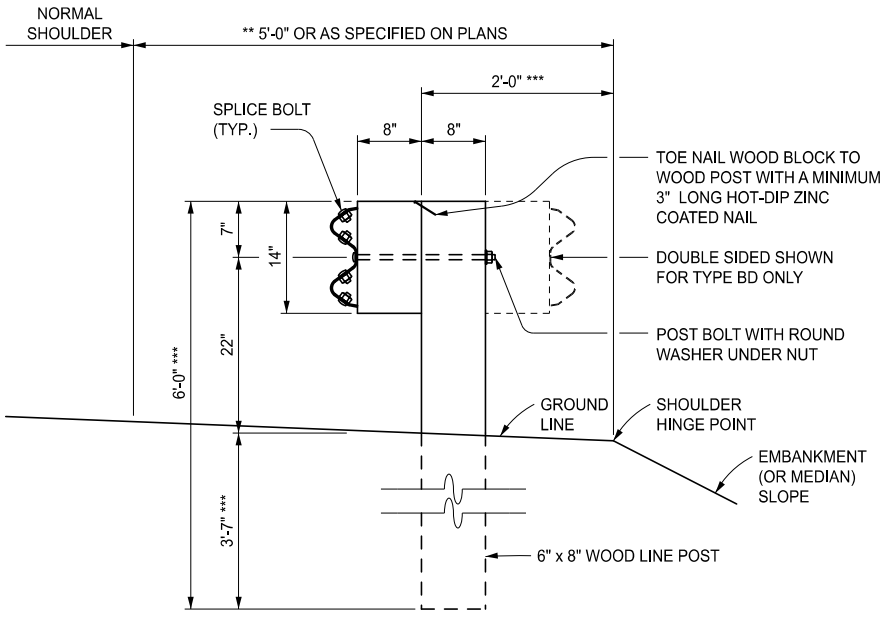
APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT

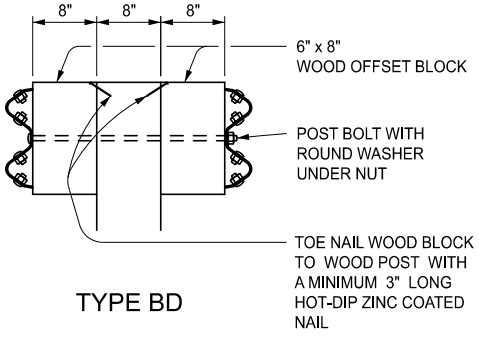
MDOT
Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

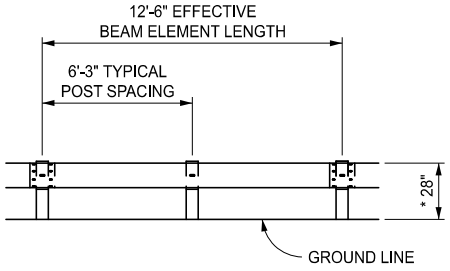
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 1 OF 16





TYPE BD



ELEVATION SHOWING POST SPACING

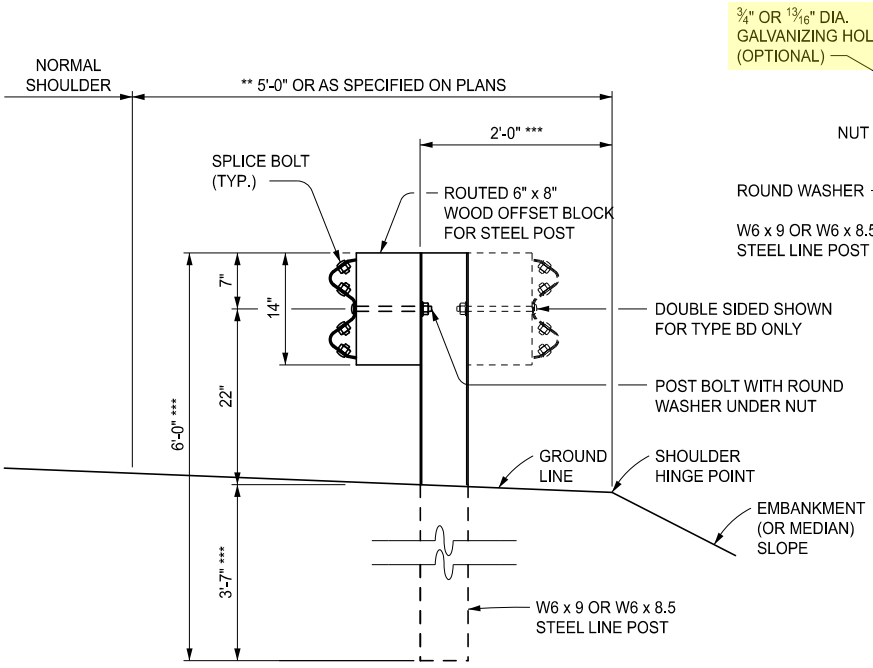
* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

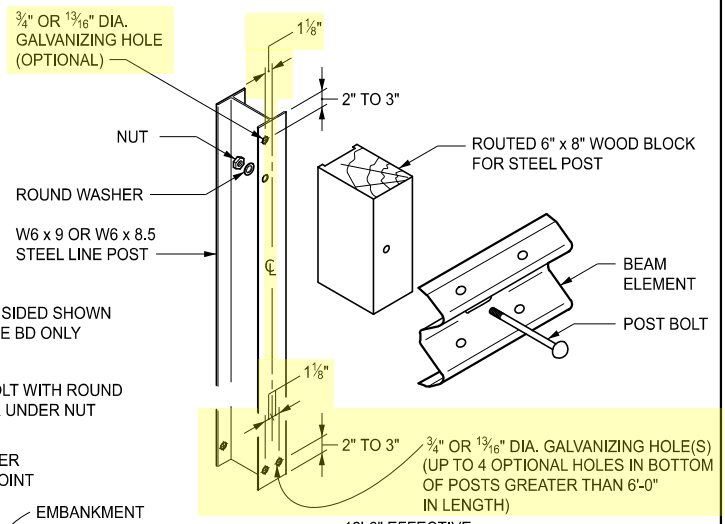
** FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-0".

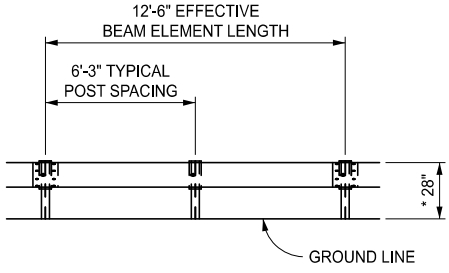
*** IF THE OFFSET FROM THE FACE OF POST TO THE SHOULDER HINGE POINT IS LESS THAN 2'-0" AND THE EMBANKMENT (OR MEDIAN) SLOPE IS STEEPER THAN 1:10, USE 8'-0" POST WITH THE ADDITIONAL LENGTH EMBEDDED.

GUARDRAIL, TYPE B (OR BD)

(WOOD POST)







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GUARDRAIL, TYPE B (OR BD)

(STEEL POST)

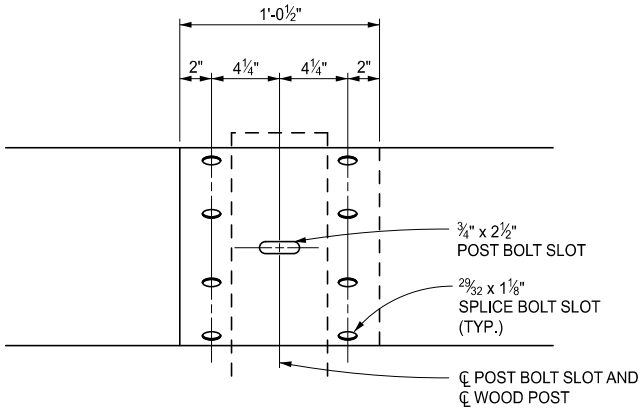
MDOT Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR

GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL)	08/15/2023	R-60-J	SHEET
FHWA APPROVAL	PLAN DATE		2 OF 16



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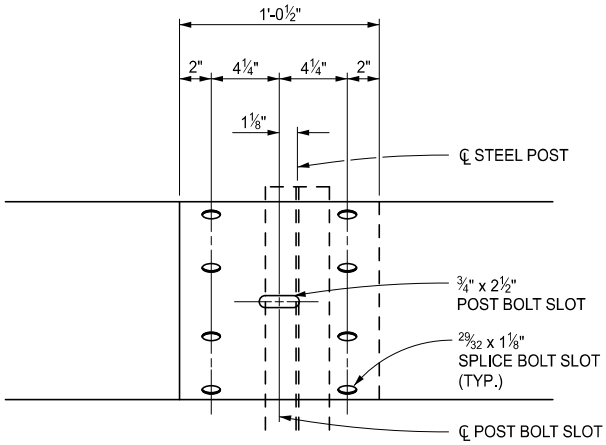
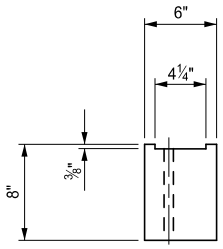


STEEL POST

BEAM ELEMENT SPLICE DETAILS



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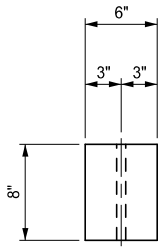

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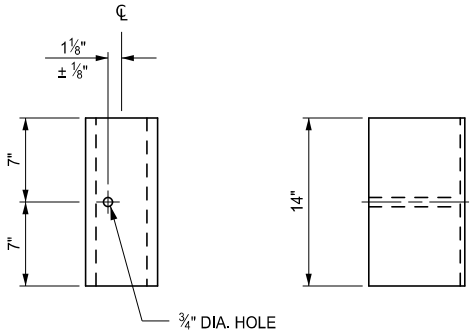
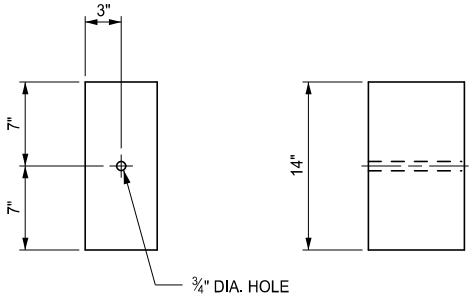


FRONT SIDE

FOR USE ON STEEL POSTS



FRONT SIDE

FOR USE ON WOOD POSTS

(SEE NOTES ON SHEET 16 OF 16)

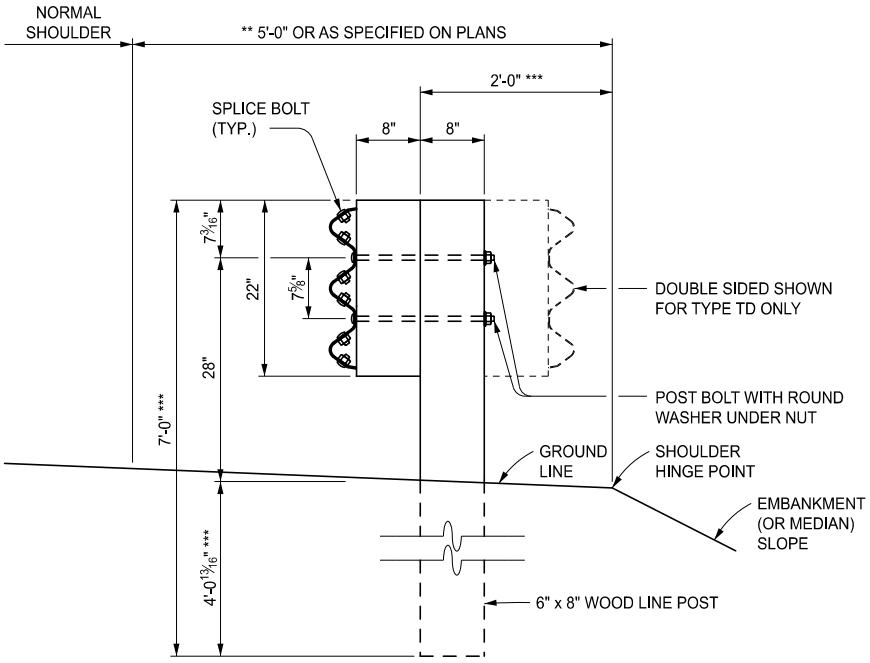
WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE B AND TYPE BD

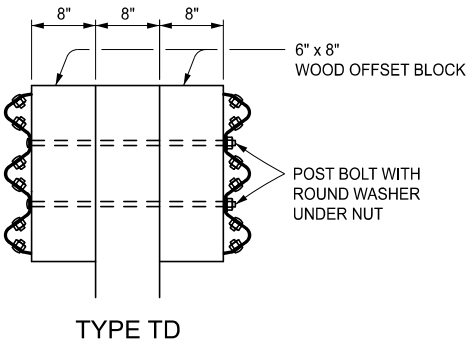
MDOT Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

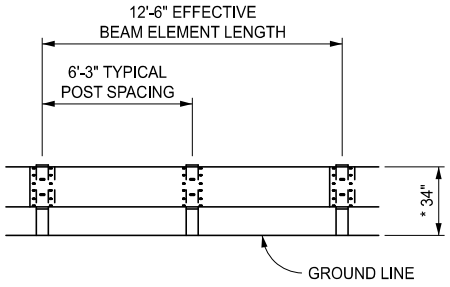
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) / FHWA APPROVAL	08/15/2023 / PLAN DATE	R-60-J	SHEET 3 OF 16





TYPE TD



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** FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-0".

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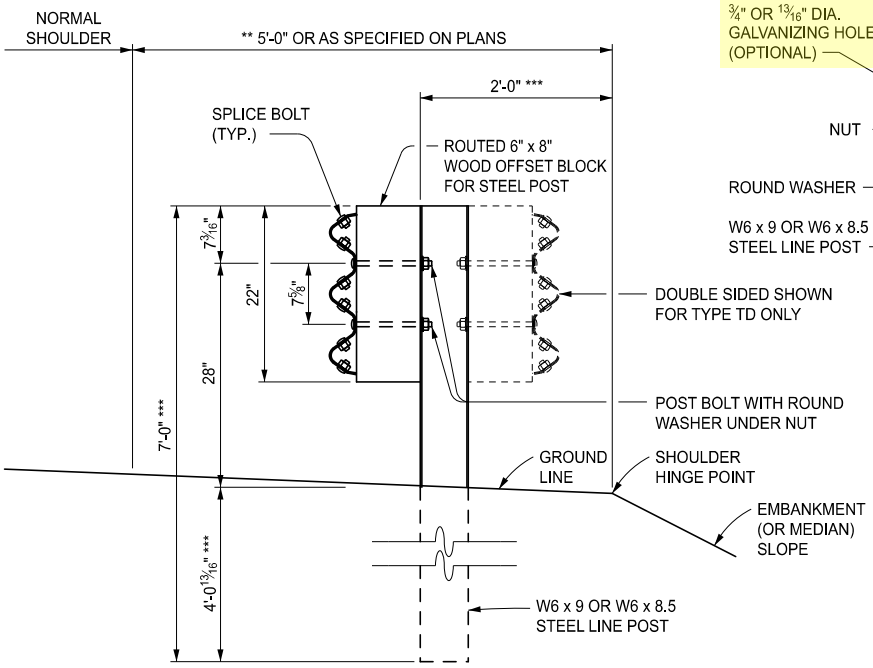
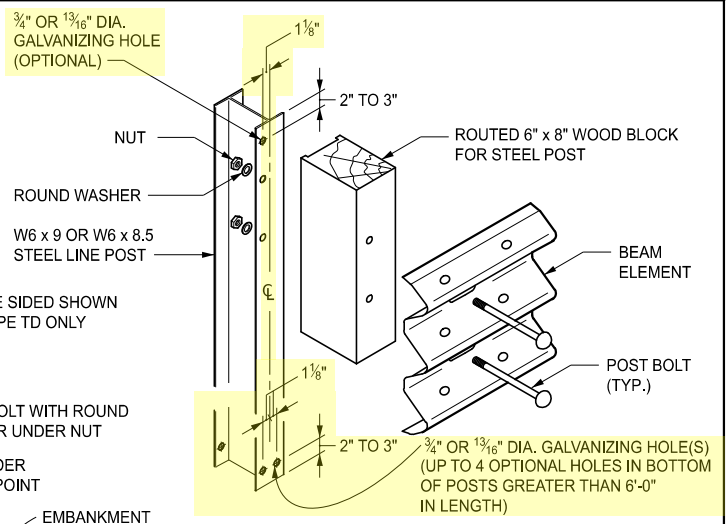
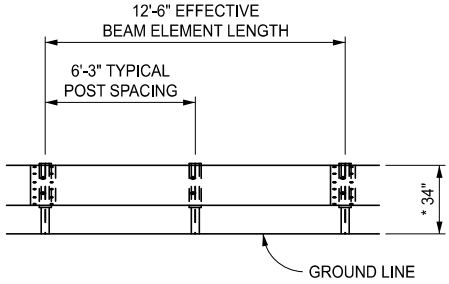
GUARDRAIL, TYPE T (OR TD)

(WOOD POST)







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GUARDRAIL, TYPE T OR TD

(STEEL POST)

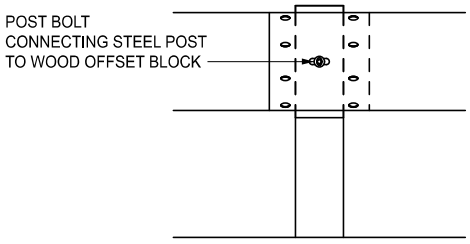
MDOT Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR

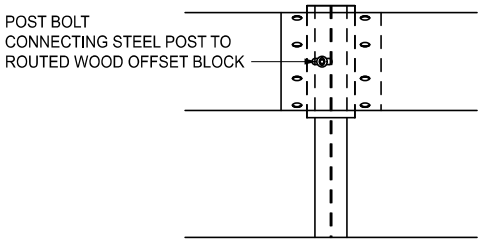
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) / FHWA APPROVAL	08/15/2023 / PLAN DATE	R-60-J	SHEET 4 OF 16



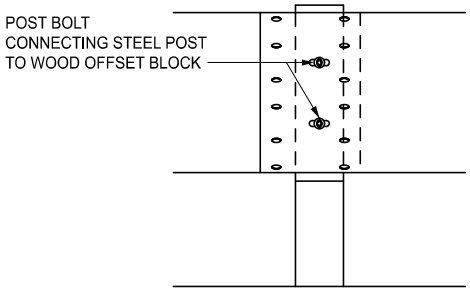
GUARDRAIL, TYPE B

WOOD POST



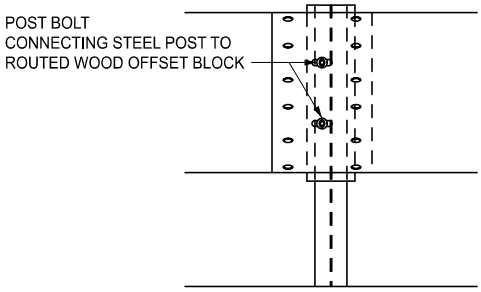
GUARDRAIL, TYPE B

STEEL POST



GUARDRAIL, TYPE T

WOOD POST



GUARDRAIL, TYPE T

STEEL POST

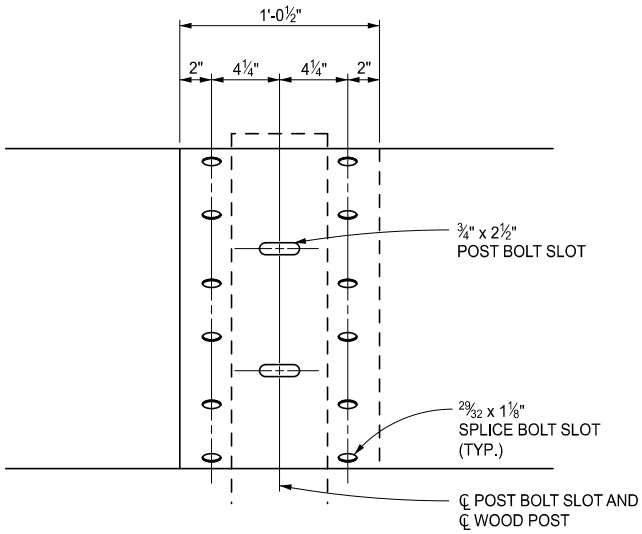
BLOCK AND POST CONNECTION DETAILS

MDOT
Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 5 OF 16



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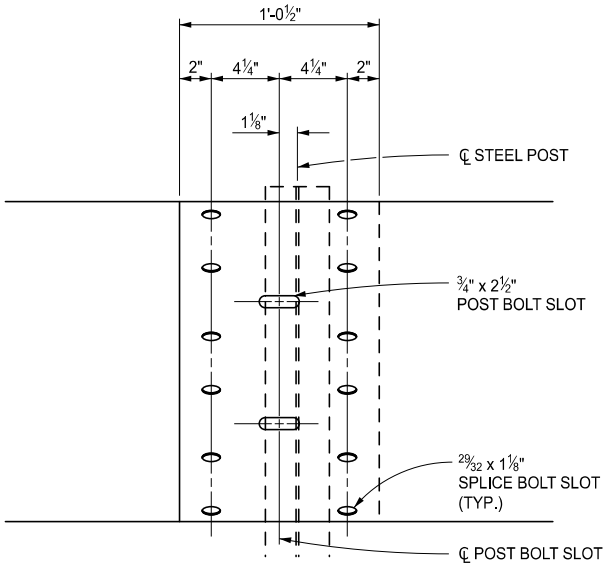
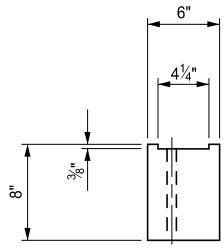


STEEL POST

THRIE BEAM ELEMENT SPLICE DETAILS



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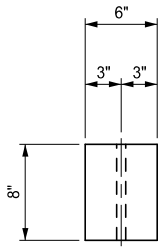

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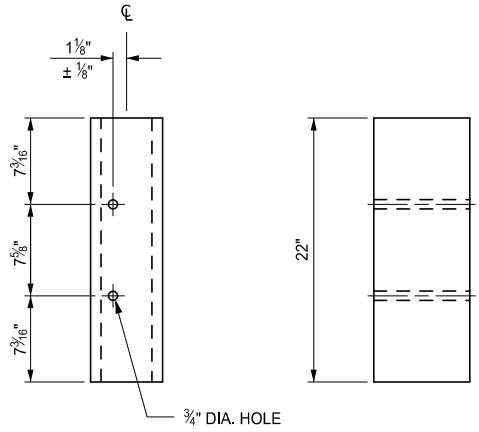
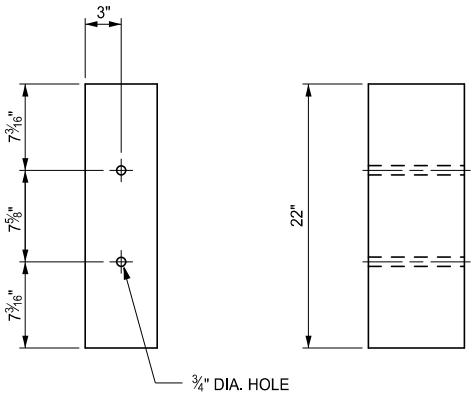


FRONT SIDE

FOR USE ON STEEL POSTS



FRONT SIDE

FOR USE ON WOOD POSTS

(SEE NOTES ON SHEET 16 OF 16)

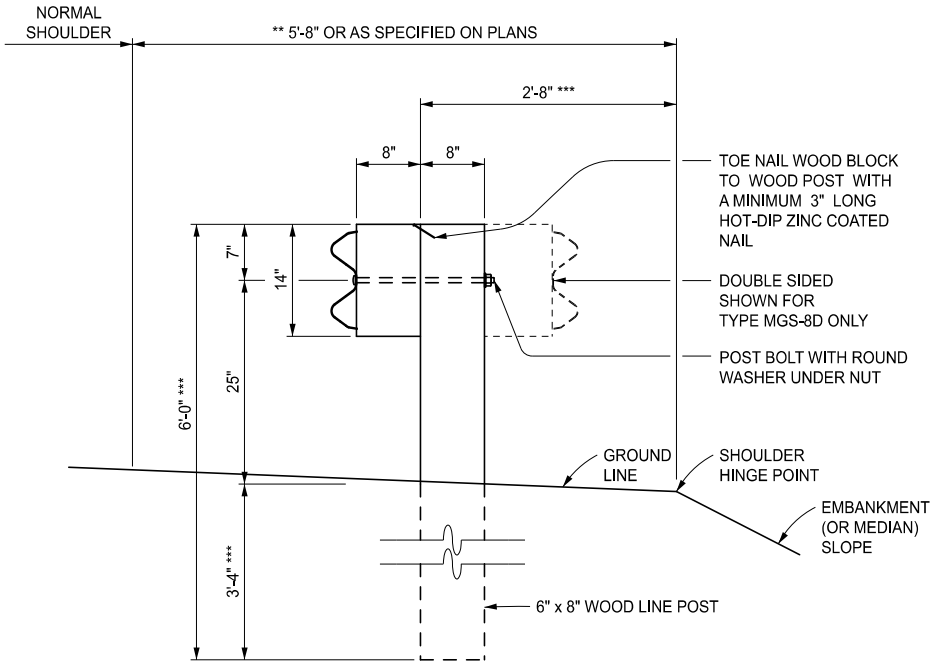
WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE T AND TYPE TD

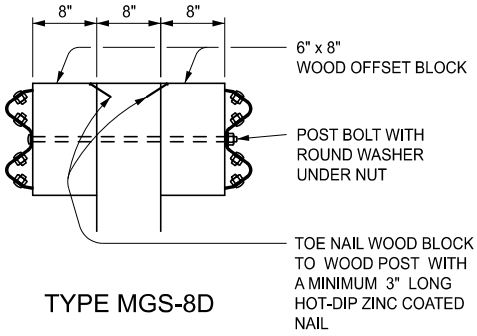
MDOT Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 6 OF 16





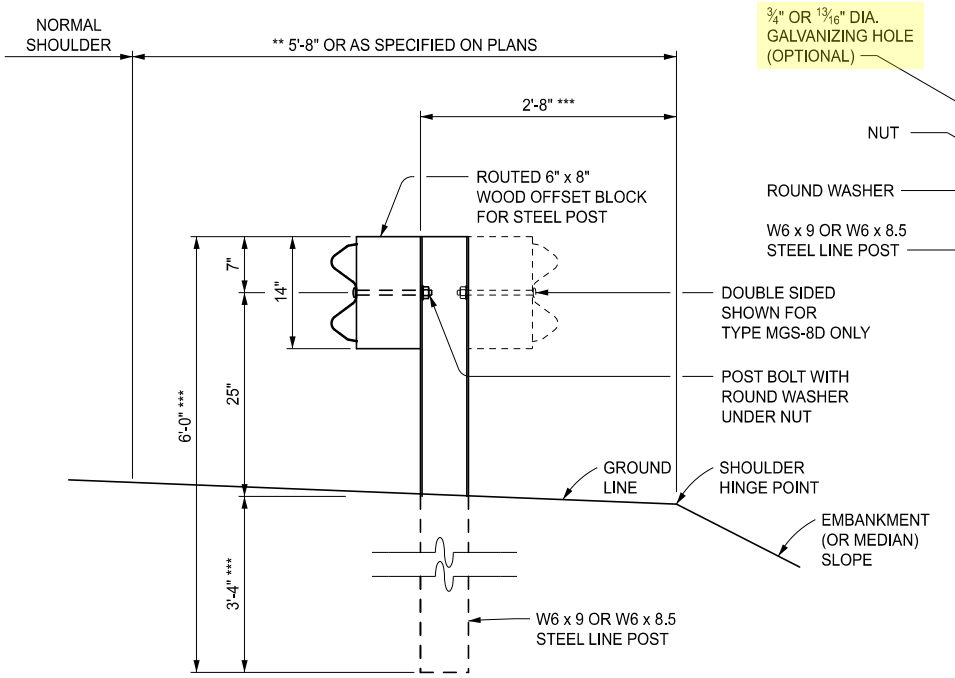
TYPE MGS-8D

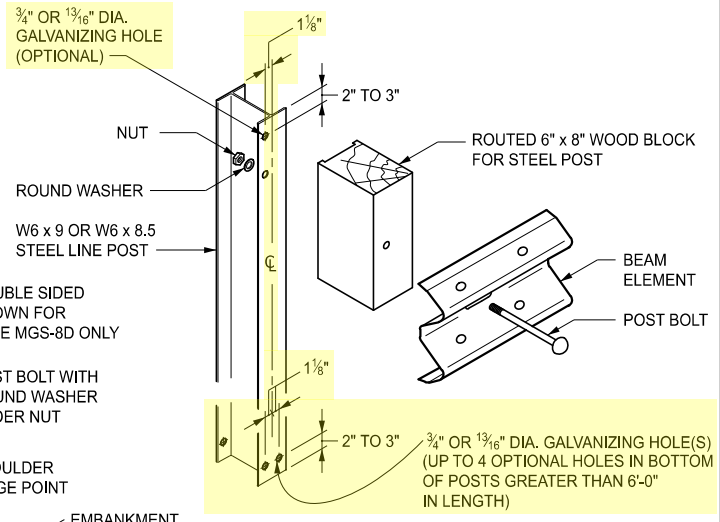
** FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-8".

*** IF THE OFFSET FROM THE FACE OF POST TO THE SHOULDER HINGE POINT IS LESS THAN 2'-8" AND THE EMBANKMENT (OR MEDIAN) SLOPE IS STEEPER THAN 1:10, USE 9'-0" POST WITH THE ADDITIONAL LENGTH EMBEDDED.

GUARDRAIL, TYPE MGS-8 (OR MGS-8D)

(WOOD POST)





** FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-8".

*** IF THE OFFSET FROM THE FACE OF POST TO THE SHOULDER HINGE POINT IS LESS THAN 2'-8" AND THE EMBANKMENT (OR MEDIAN) SLOPE IS STEEPER THAN 1:10, USE 9'-0" POST WITH THE ADDITIONAL LENGTH EMBEDDED.

GUARDRAIL, TYPE MGS-8 (OR MGS-8D)

(STEEL POST)

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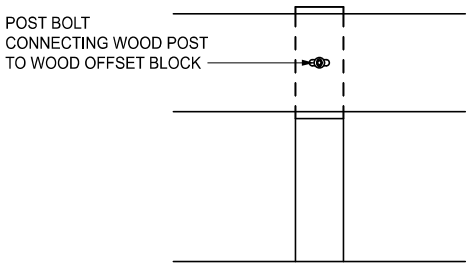
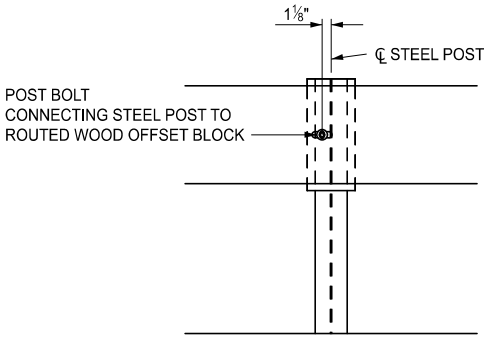
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) / FHWA APPROVAL	08/15/2023 / PLAN DATE	R-60-J	SHEET 7 OF 16

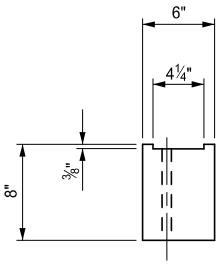


WOOD POST

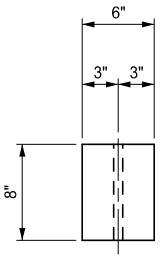


STEEL POST

BLOCK AND POST CONNECTION DETAILS



TOP



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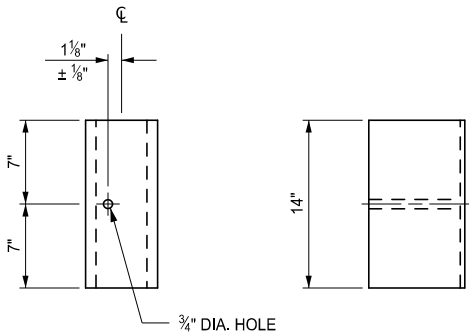
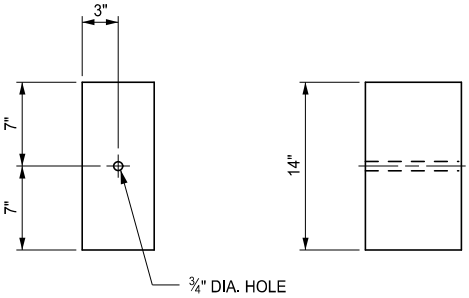


FRONT SIDE

FOR USE ON STEEL POSTS



FRONT SIDE

FOR USE ON WOOD POSTS

(SEE NOTES ON SHEET 16 OF 16)

WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE MGS-8 AND TYPE MGS-8D

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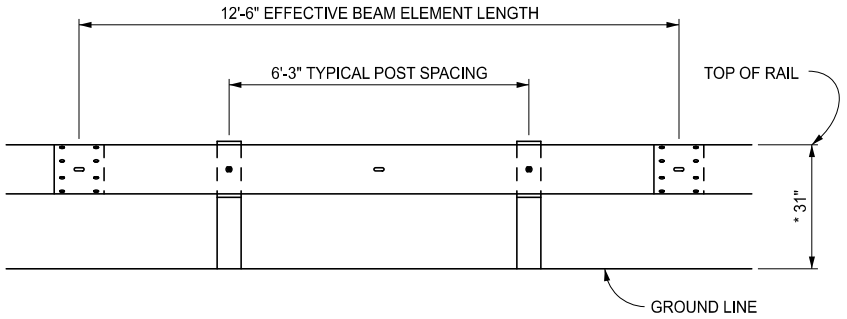
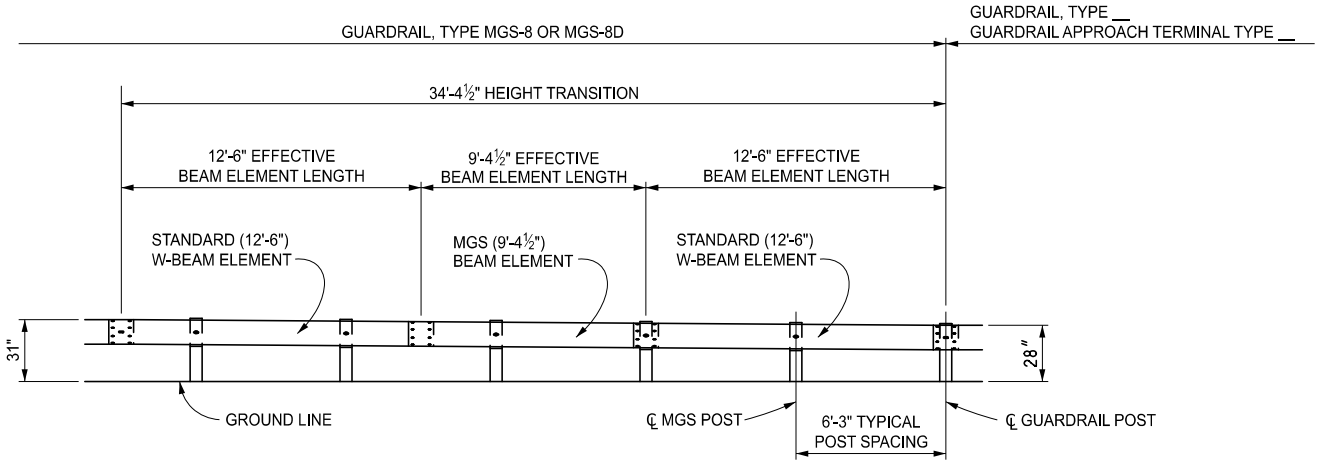
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 8 OF 16

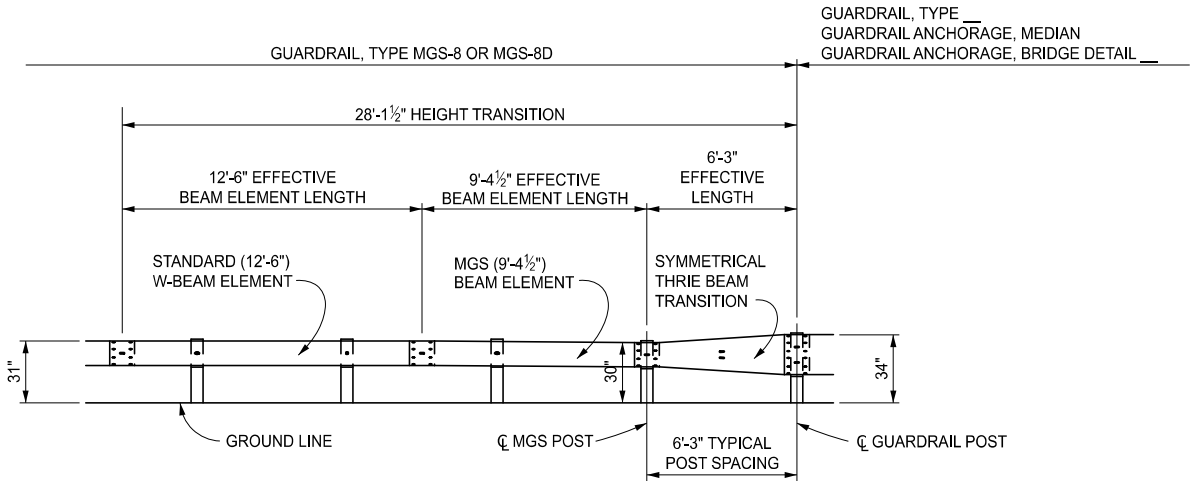


ELEVATION SHOWING POST SPACING FOR
GUARDRAIL, TYPE MGS-8 OR MGS-8D

* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB



ELEVATION SHOWING TRANSITION DETAIL FOR CONNECTING
GUARDRAIL, TYPE MGS-8 OR MGS-8D TO
GUARDRAIL, TYPE B, GUARDRAIL, TYPE BD, OR
GUARDRAIL APPROACH TERMINAL TYPE 1B, 2B, OR 3B



ELEVATION SHOWING TRANSITION DETAIL FOR CONNECTING
GUARDRAIL, TYPE MGS-8 OR MGS-8D TO
GUARDRAIL, TYPE T, GUARDRAIL, TYPE TD,
GUARDRAIL ANCHORAGE, MEDIAN,
GUARDRAIL ANCHORAGE, BRIDGE DETAIL A1, T1, T4 OR T6

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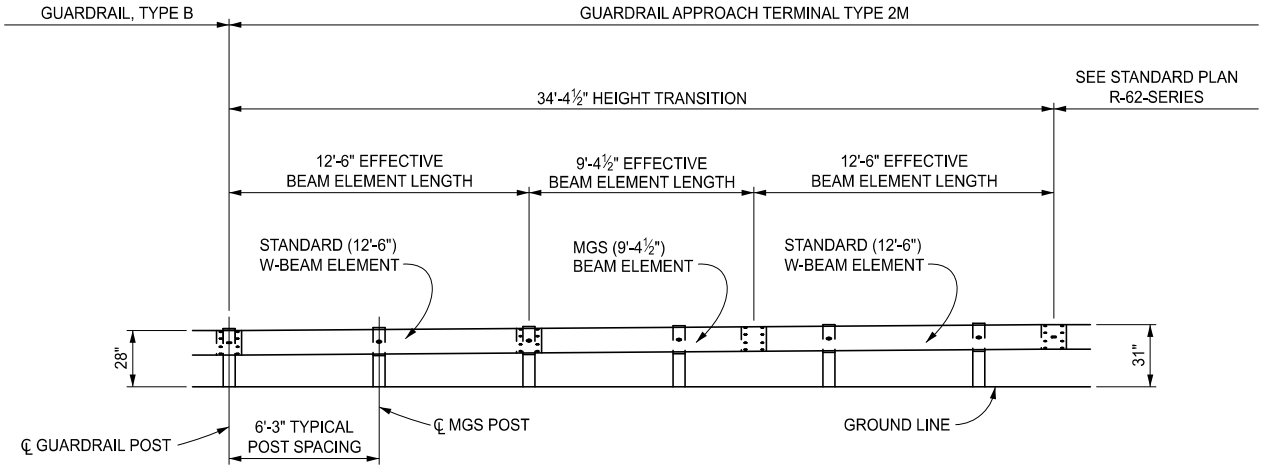
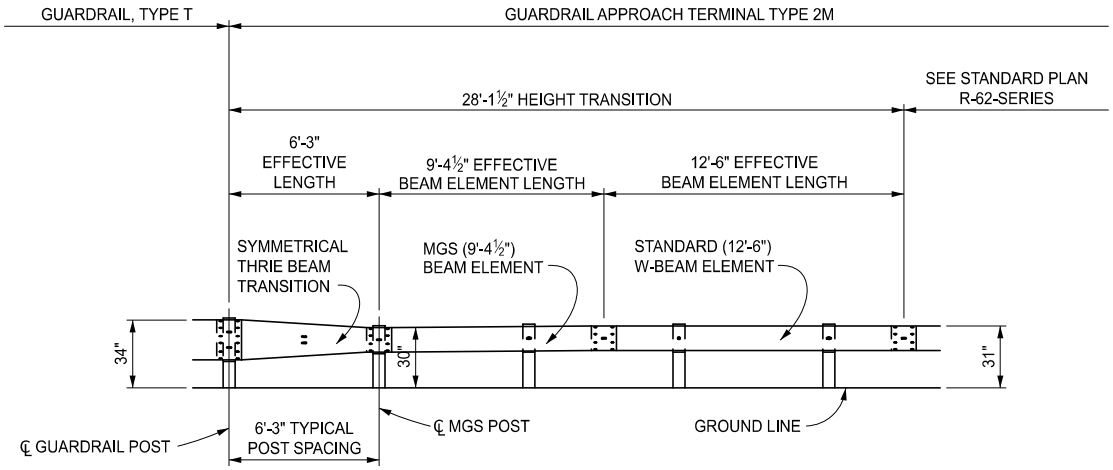
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 9 OF 16

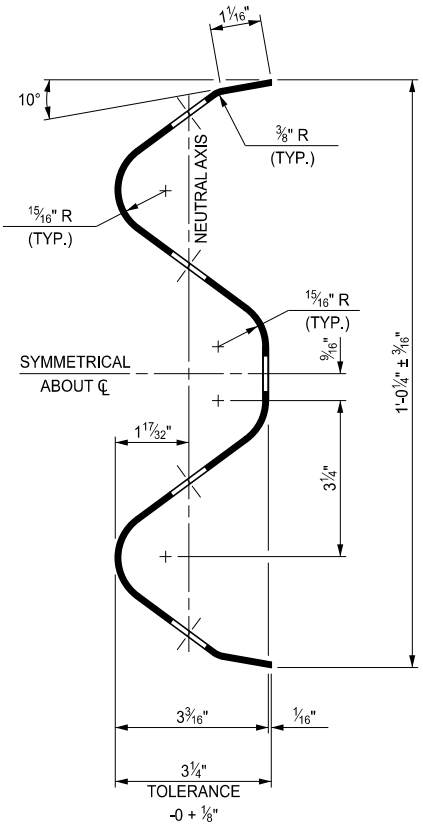


ELEVATION SHOWING TRANSITION DETAIL FOR CONNECTING
GUARDRAIL, TYPE B TO
GUARDRAIL APPROACH TERMINAL TYPE 2M

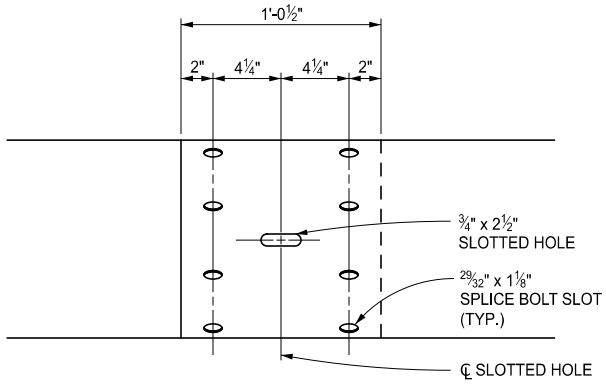


ELEVATION SHOWING TRANSITION DETAIL FOR CONNECTING
GUARDRAIL, TYPE T TO
GUARDRAIL APPROACH TERMINAL TYPE 2M

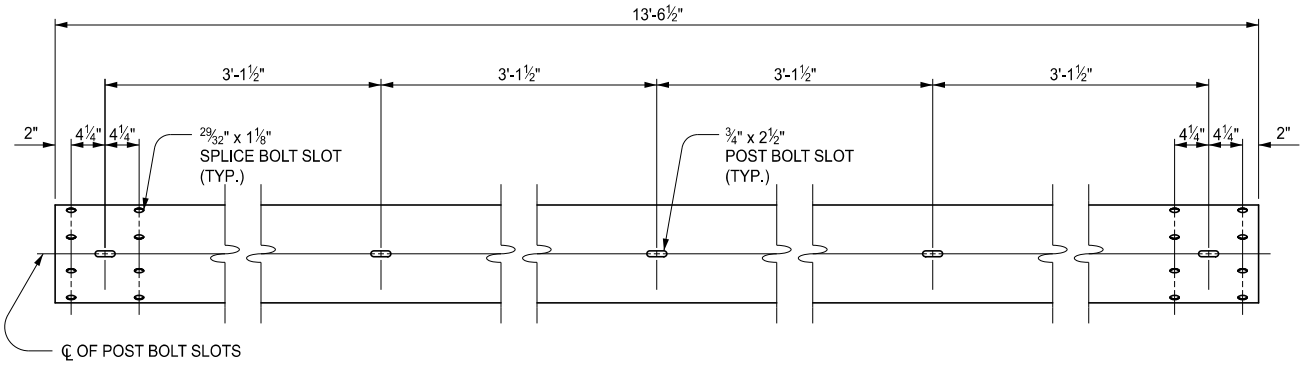
MDOT Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D			
	(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 10 OF 16



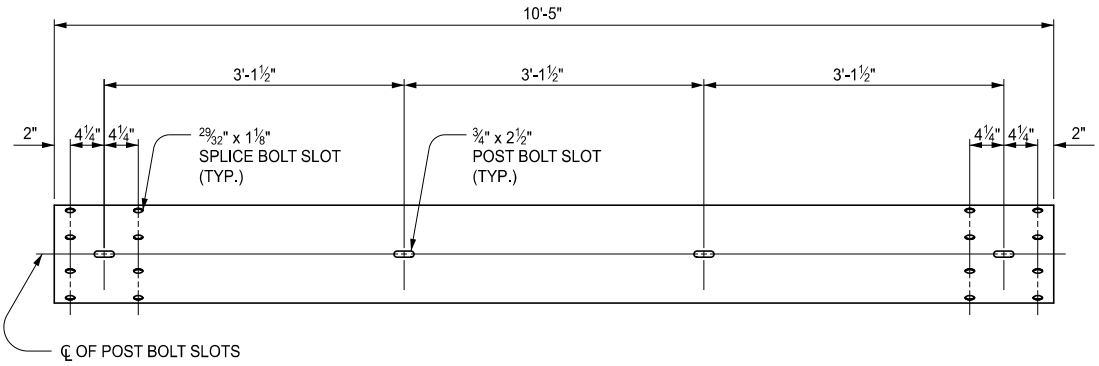
SECTION THROUGH BEAM ELEMENT



BEAM ELEMENT SPLICE DETAILS



FRONT ELEVATION OF BEAM ELEMENT



FRONT ELEVATION OF MGS (9'-4 1/2") BEAM ELEMENT

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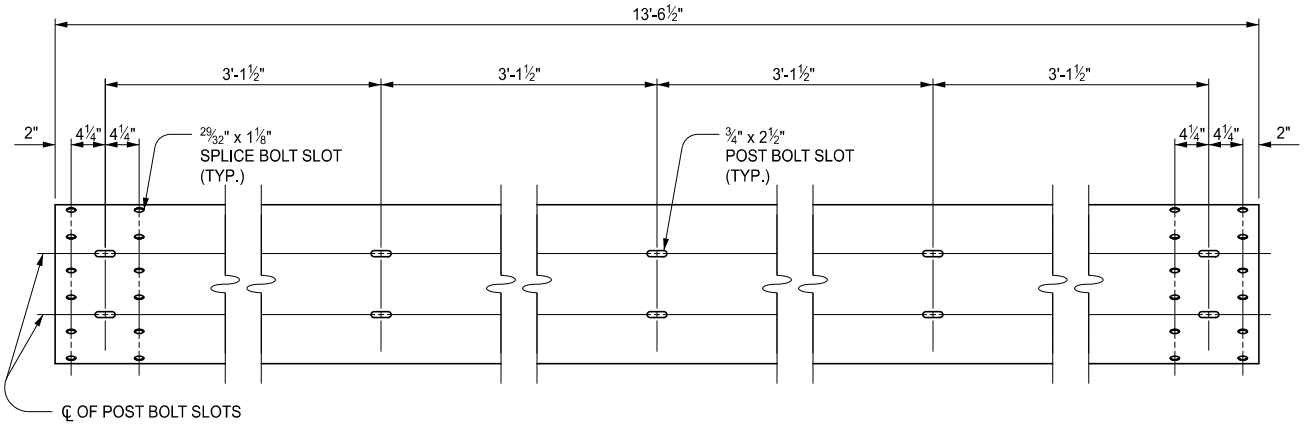
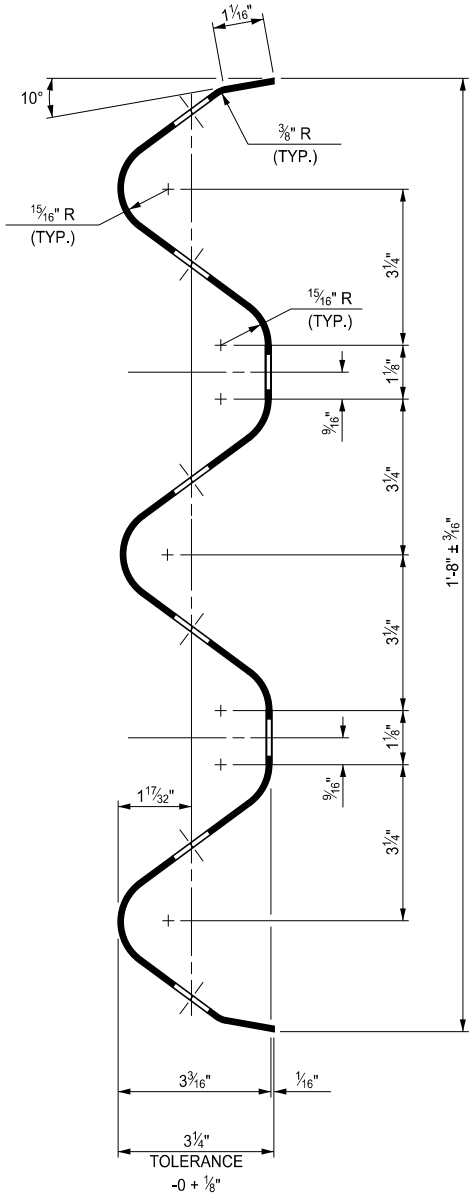
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL)	08/15/2023	R-60-J	SHEET
FHWA APPROVAL	PLAN DATE		11 OF 16



FRONT ELEVATION OF THRIE BEAM ELEMENT



SECTION THROUGH THRIE BEAM ELEMENT

(FOR GUARDRAIL, TYPE T AND TD)

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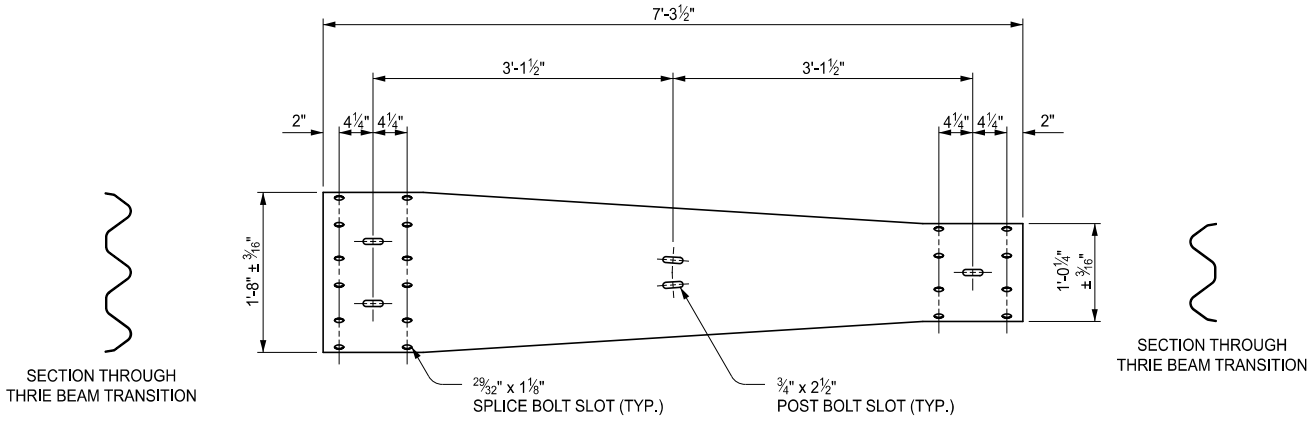
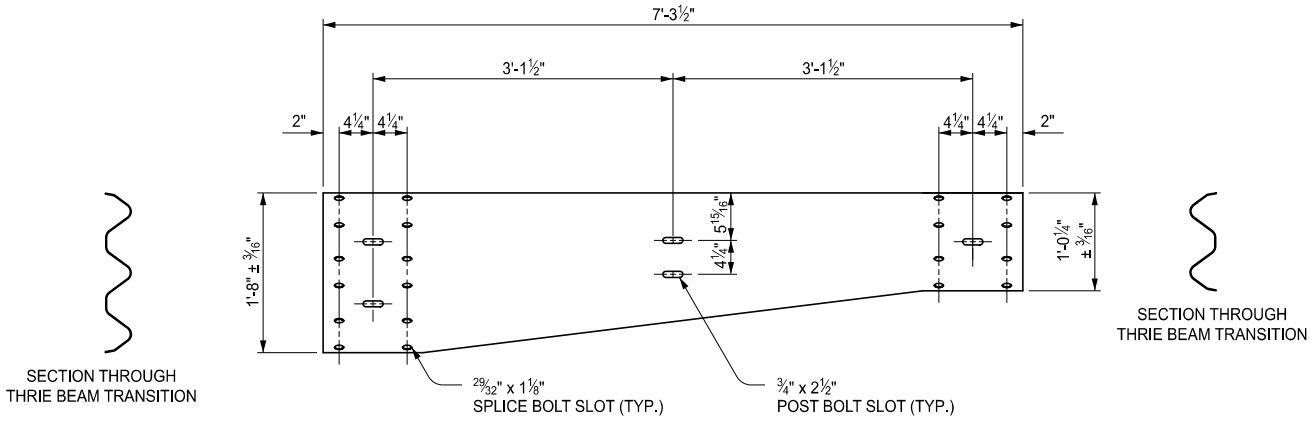
STANDARD PLAN FOR

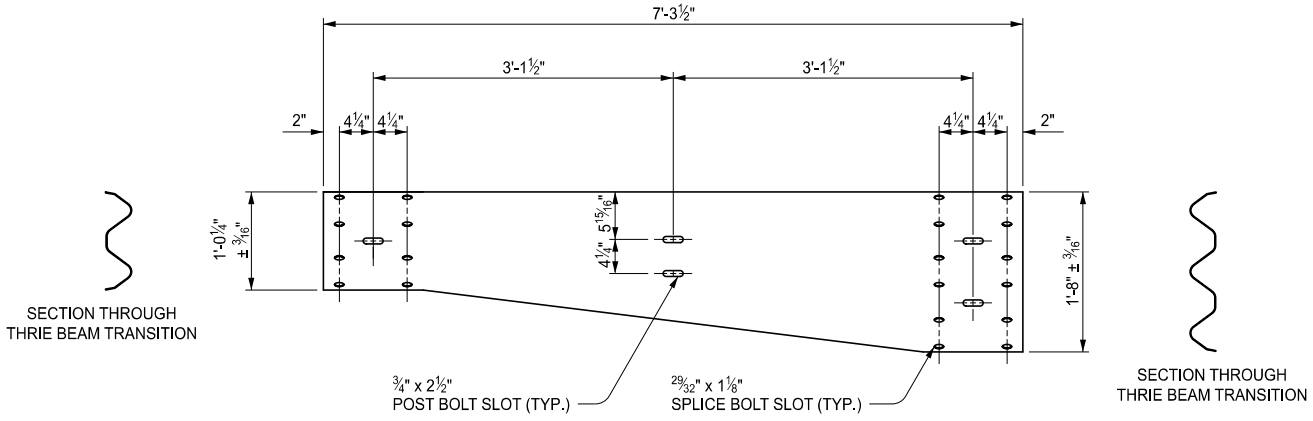
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL)	08/15/2023	R-60-J	SHEET
FHWA APPROVAL	PLAN DATE		12 OF 16



SYMMETRICAL THRIE BEAM TRANSITIONS





ASYMMETRICAL THRIE BEAM TRANSITIONS

NOTE: ASYMMETRICAL TRANSITION TYPE WILL VARY BY LOCATION DEPENDING ON GUARDRAIL LAYOUT

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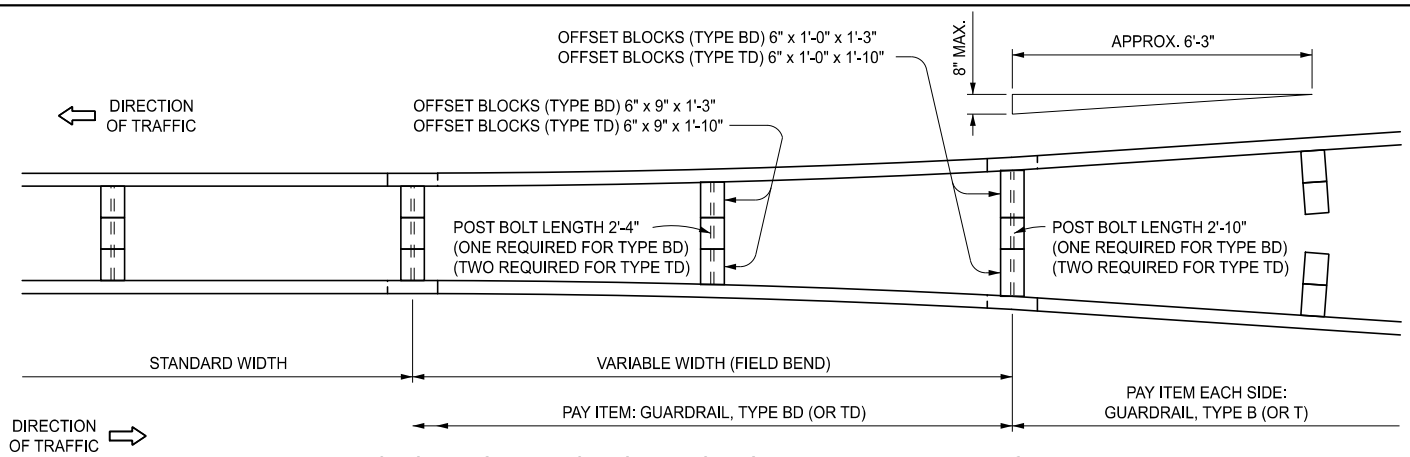
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 13 OF 16



DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE B (OR TYPE T) TO GUARDRAIL, TYPE BD (OR TYPE TD)

POST BOLTS, SPLICE BOLTS AND WASHERS AT BEAM ELEMENT SPLICE POSTS AND AT INTERMEDIATE POSTS

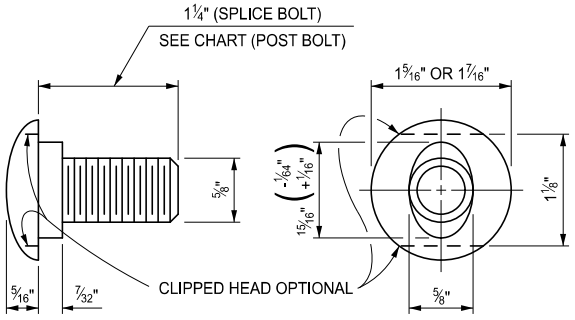
GUARDRAIL TYPE	POST	OFFSET BLOCK	POST BOLTS		SPLICE BOLTS (1¼" LONG) (NO. REQ'D)		WASHERS (ROUND) (NO. REQ'D)
			NO. REQ'D	LENGTH			
A	WOOD	N/A	1	9½"	8	NOT NEEDED AT INTERMEDIATE POSTS	1
	STEEL	N/A	1	2"			1
B	WOOD	WOOD	1	18"	8		1
	STEEL	WOOD	1	9½"			1
BD	WOOD	WOOD	1	* 26½"	16		———
	STEEL	WOOD	2	9½"			2
T	WOOD	WOOD	2	18"	12		2
	STEEL	WOOD	2	9½"			2
TD	WOOD	WOOD	2	* 26½"	24		———
	STEEL	WOOD	4	9½"			4

THRIE BEAM TRANSITIONS REQUIRE 20 SPLICE BOLTS EACH (12 0N TYPE T END AND 8 ON TYPE B END).

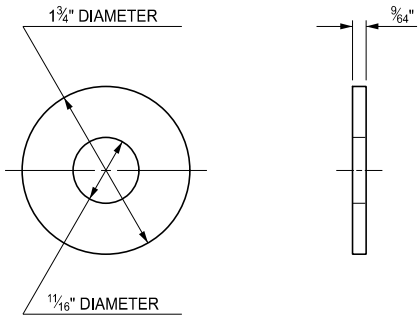
* EXCEPT AS SPECIFIED ON DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE B (OR TYPE T) TO GUARDRAIL, TYPE BD (OR TYPE TD). POST BOLTS SHALL NOT EXTEND MORE THAN ½" BEYOND NUT.

MINIMUM POST BOLT THREAD LENGTH

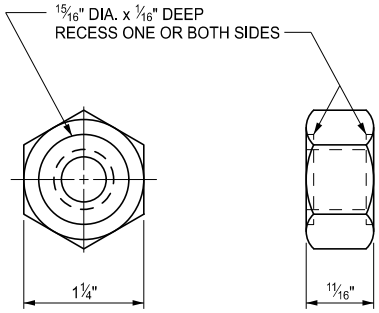
BOLT LENGTH	MINIMUM THREAD LENGTH
9½"	1¾"
18"	2½"
26½"	3"



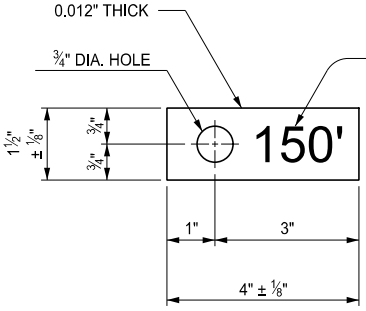
SPLICE BOLT AND POST BOLT



ROUND WASHER



NUT



METAL TAG
FOR CURVED GUARDRAIL WITH RADIUS OF 150' OR LESS

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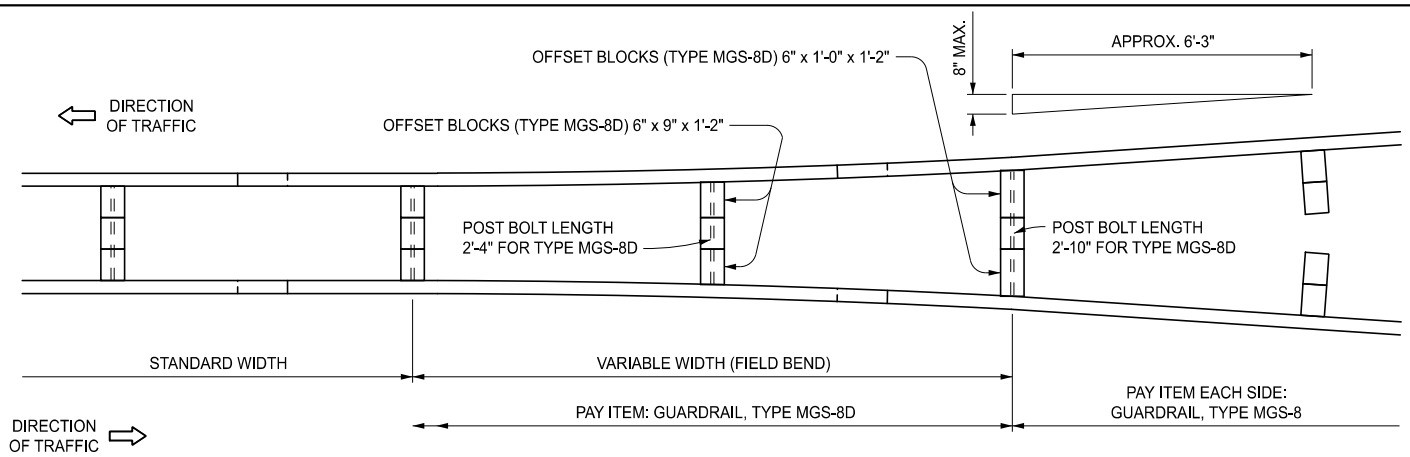
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 14 OF 16



DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE MGS-8 TO GUARDRAIL, TYPE MGS-8D

POST BOLTS, SPLICE BOLTS AND WASHERS AT BEAM ELEMENT SPLICE POSTS AND AT INTERMEDIATE POSTS						
GUARDRAIL TYPE	POST	OFFSET BLOCK	POST BOLTS		SPLICE BOLTS	WASHERS
			NO. REQ'D	LENGTH	(1¼" LONG) (NO. REQ'D)	(ROUND) (NO. REQ'D)
MGS-8	WOOD	WOOD	1	18"	8	1
	STEEL	WOOD	1	9½"		1
MGS-8D	WOOD	WOOD	1	* 26½"	16	———
	STEEL	WOOD	2	9½"		2

THRIE BEAM TRANSITIONS REQUIRE 20 SPLICE BOLTS EACH (12 0N TYPE T END AND 8 ON TYPE MGS END).

* EXCEPT AS SPECIFIED ON DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE MGS-8 TO GUARDRAIL, TYPE MGS-8D POST BOLTS SHALL NOT EXTEND MORE THAN ½" BEYOND NUT.

MINIMUM POST BOLT THREAD LENGTH	
BOLT LENGTH	MINIMUM THREAD LENGTH
9½"	1¾"
18"	2½"
26½"	3"

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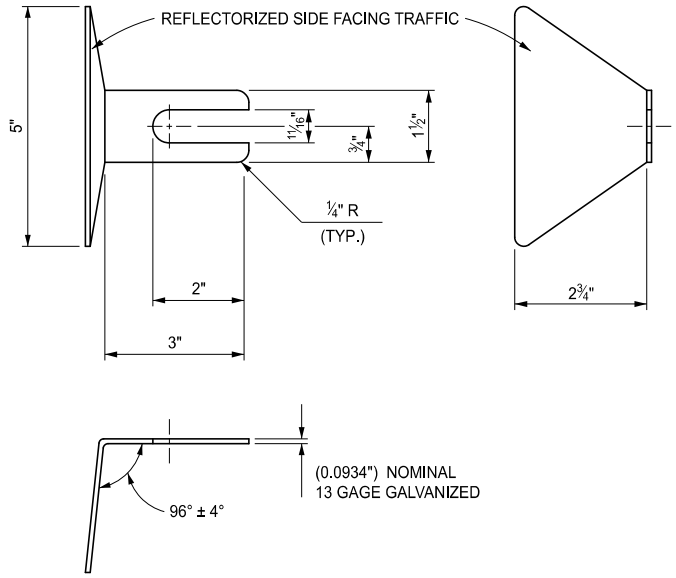
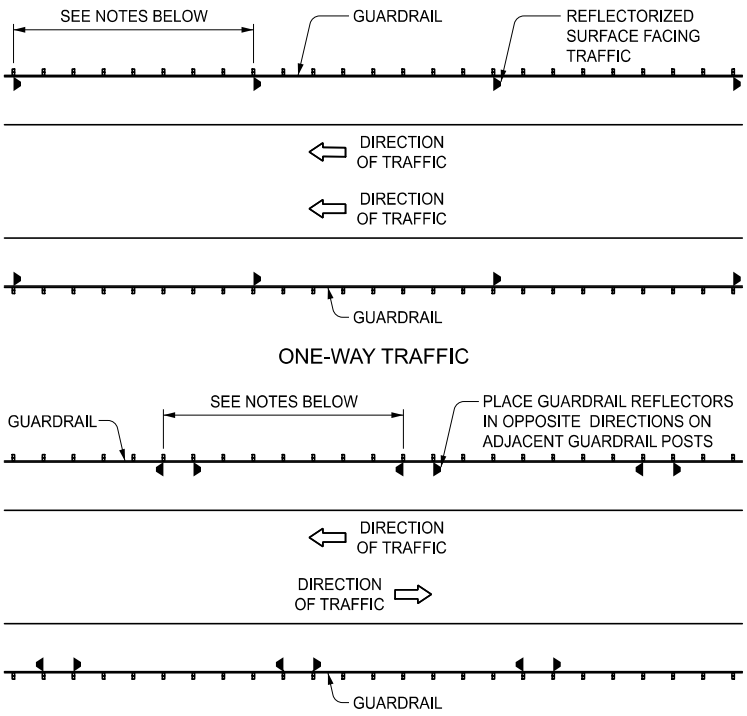
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 15 OF 16



GUARDRAIL REFLECTOR



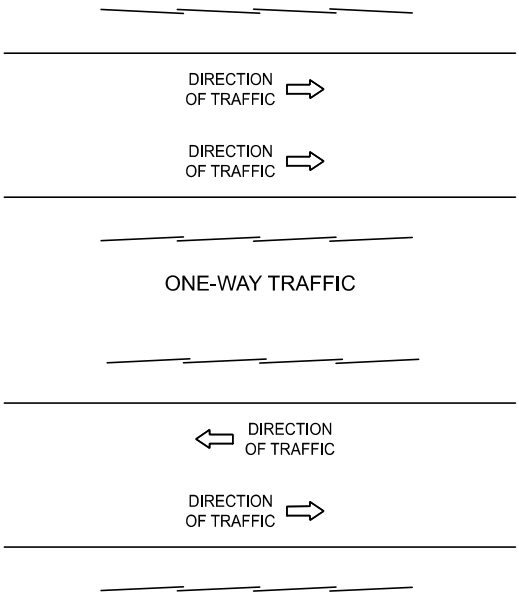
ONE-WAY TRAFFIC

TWO-WAY TRAFFIC

PLACEMENT OF GUARDRAIL REFLECTORS

NOTES GOVERNING THE USE OF GUARDRAIL REFLECTORS

1. GUARDRAIL REFLECTORS SHALL BE USED ON ALL STANDARD GUARDRAIL RUNS, REGARDLESS OF ROADWAY LIGHTING.
2. GUARDRAIL REFLECTORS ARE TO BE SPACED AT THE FOLLOWING INTERVALS:
   a) 50'-0" ON TANGENT SECTIONS AND CURVES WITH A RADIUS OF 1150' OR MORE.
   b) 25'-0" ON CURVES WITH A RADIUS LESS THAN 1150'.
3. FOR GUARDRAIL REFLECTOR PLACEMENT ON APPROACH TERMINALS, SEE THE APPROPRIATE GUARDRAIL APPROACH TERMINAL STANDARD PLAN.
4. A GUARDRAIL REFLECTOR IS TO BE PLACED ON THE SECOND POST FROM THE GUARDRAIL DEPARTING TERMINAL.
5. ON GUARDRAIL, TYPE T AND TYPE TD GUARDRAIL REFLECTORS ARE TO BE PLACED ON THE UPPER POST BOLT.
6. GUARDRAIL REFLECTORS SHALL MATCH COLOR OF EDGE LINE.



TWO-WAY TRAFFIC

DIRECTION OF RAIL LAP

NOTES:

DETAILS SPECIFIED ON THIS STANDARD ARE ACCORDING TO THE AASHTO-AGC-ARTBA JOINT COMMITTEE, TASK FORCE 13 PUBLICATION TITLED "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE."

BEAM ELEMENTS SHALL BE SHOP BENT TO PLAN RADIUS FOR CURVE RADII 150' OR LESS. A TAG IDENTIFYING THE CURVATURE OF THE SHOP BENT SECTION WILL BE REQUIRED FOR EACH CURVED ELEMENT.

SEE STANDARD PLAN R-62-SERIES OR R-63-SERIES FOR GUARDRAIL APPROACH TERMINALS, STANDARD PLAN R-66-SERIES FOR GUARDRAIL DEPARTING TERMINALS AND STANDARD PLAN R-67-SERIES FOR GUARDRAIL ANCHORAGE, BRIDGE.

WOOD POSTS WITH ½" BEVELS AT THE TOP MAY BE USED IN LIEU OF WOOD POSTS WITHOUT BEVELS SPECIFIED. THE LENGTH, WIDTH AND DEPTH OF THE POST SHALL BE AS SPECIFIED ON THIS STANDARD AND THE POST BOLT HOLES SHALL BE LOCATED TO ENSURE PROPER RAIL HEIGHT.

WOOD OFFSET BLOCKS WITH ½" BEVELS AT THE TOP AND BOTTOM OR A 1" BEVELED TOP MAY BE USED IN LIEU OF WOOD BLOCKS WITHOUT BEVELS SPECIFIED. THE LENGTH (FRONT AND BACK FACE), WIDTH AND DEPTH OF THE BLOCK SHALL BE AS SPECIFIED ON THIS STANDARD AND THE POST BOLT HOLES SHALL BE LOCATED TO ENSURE PROPER RAIL HEIGHT AND COMPATIBILITY WITH POST HOLES.

WHEN THE FACE OF GUARDRAIL IS PLACED FLUSH WITH FACE OF CURB, THE RAIL HEIGHT SHOULD BE MEASURED FROM THE FRONT EDGE OF THE GUTTER PAN, WHICH IS THE POINT ON THE GUTTER PAN THAT IS CLOSEST TO THE EDGE OF THE TRAVELED LANE. WHEN THE FACE OF THE GUARDRAIL PANEL IS LOCATED BEHIND THE CURB THE RAIL HEIGHT SHOULD BE MEASURED FROM THE GROUND JUST IN FRONT OF THE GUARDRAIL.

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Michigan Department of Transportation

DEPARTMENT DIRECTOR
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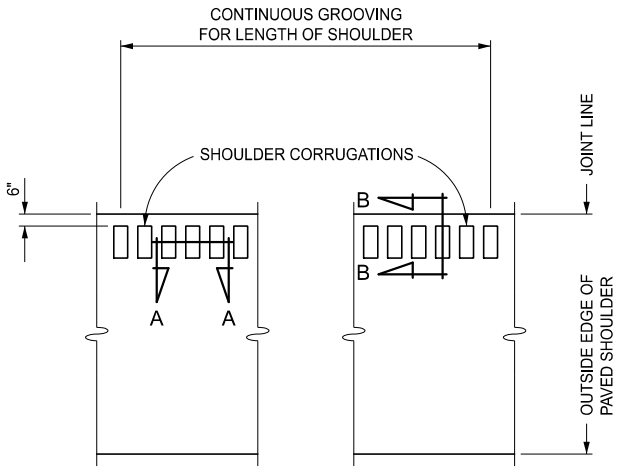
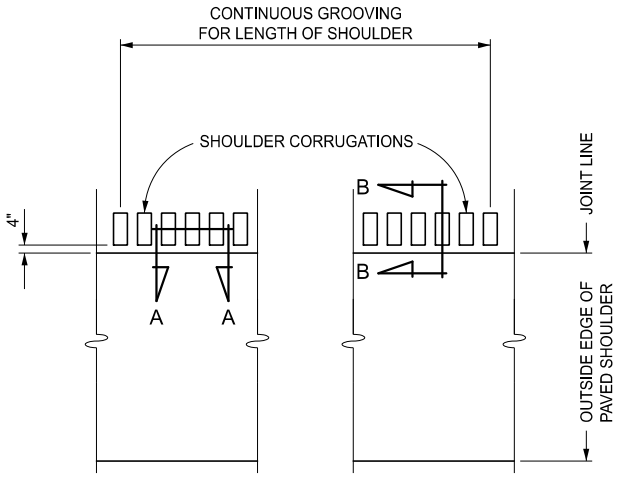
STANDARD PLAN FOR
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, & MGS-8D

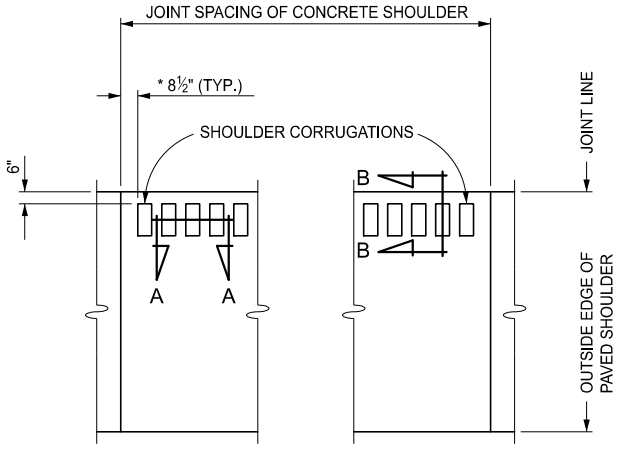
(SPECIAL DETAIL) FHWA APPROVAL	08/15/2023 PLAN DATE	R-60-J	SHEET 16 OF 16



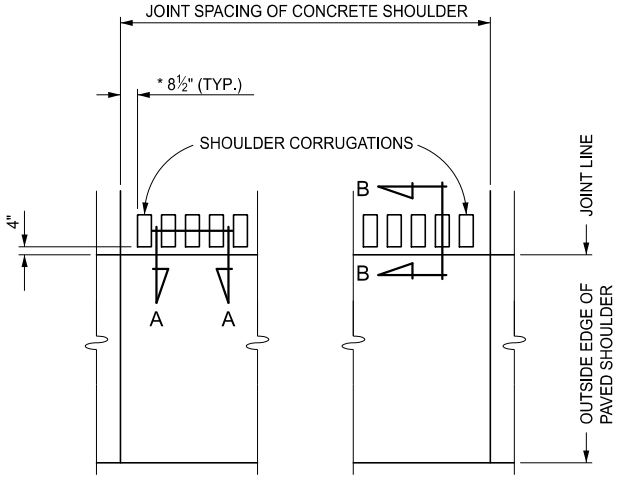
HMA SHOULDER PLAN
ADJACENT TO 12' LANE



HMA SHOULDER PLAN
ADJACENT TO 14' LANE



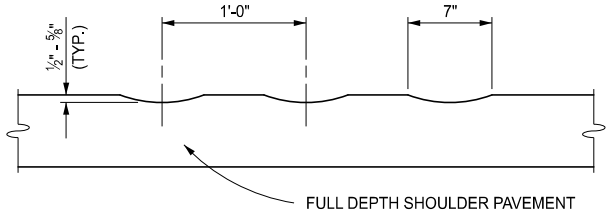
CONCRETE SHOULDER PLAN
ADJACENT TO 12' LANE



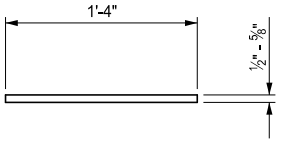
CONCRETE SHOULDER PLAN
ADJACENT TO 14' LANE

* THE DISTANCE FROM THE CORRUGATION TO THE TRANSVERSE JOINT SHALL BE AT LEAST 6" BUT LESS THAN 12".

* THE DISTANCE FROM THE CORRUGATION TO THE TRANSVERSE JOINT SHALL BE AT LEAST 6" BUT LESS THAN 12".



SECTION A - A



SECTION B - B

FREEWAY SHOULDER CORRUGATIONS

(FOR FREEWAY SHOULDERS PAVED 4 FEET OR GREATER)

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

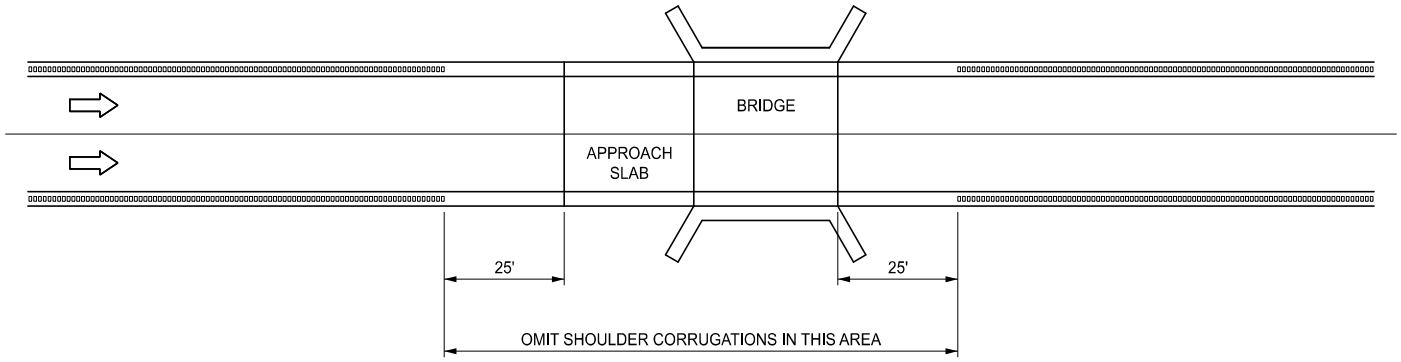
APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT

MDOT
Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
SHOULDER AND CENTER LINE CORRUGATIONS

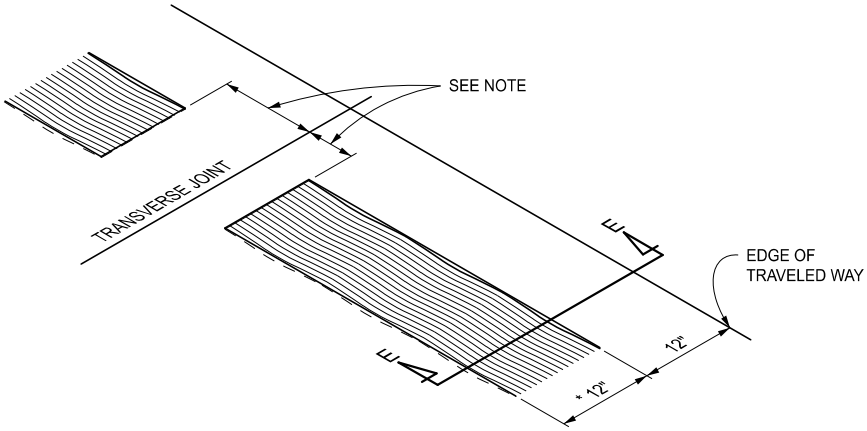
(SPECIAL DETAIL)	08/02/2023	R-112-J	SHEET
FHWA APPROVAL	PLAN DATE		1 OF 10



SHOULDER CORRUGATIONS AT BRIDGES

FREEWAY SHOULDER CORRUGATIONS

(FOR FREEWAY SHOULDERS PAVED 4 FEET OR GREATER)

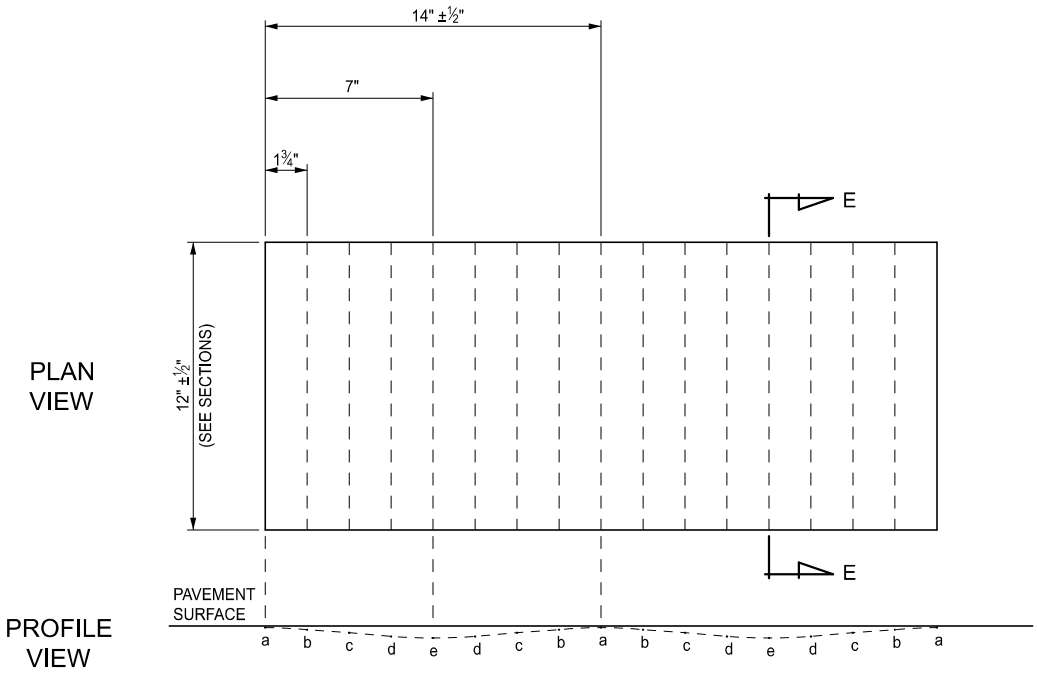


TYPICAL NON-FREEWAY
SHOULDER CORRUGATION INSTALLATION

* LATERAL DEVIATION SHALL NOT EXCEED 1" IN 100'.

NOTE:

ON CONCRETE PAVEMENTS, THE DISTANCE FROM A SHOULDER CORRUGATION TO A TRANSVERSE JOINT SHALL BE AT LEAST 6" BUT LESS THAN 12".

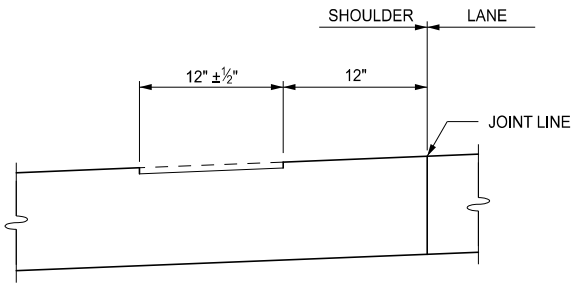


PLAN VIEW

PROFILE VIEW

	DEPTH AT EDGE	
LOCATION	MILS	INCHES *
a	62.5	1/16
b	156	5/32
c	281	9/32
d	438	7/16
e	500	½

* +⅛"



SECTION E-E

CONCRETE & HMA
SHOULDER

SINUSOIDAL CORRUGATIONS

MDOT Michigan Department of Transportation

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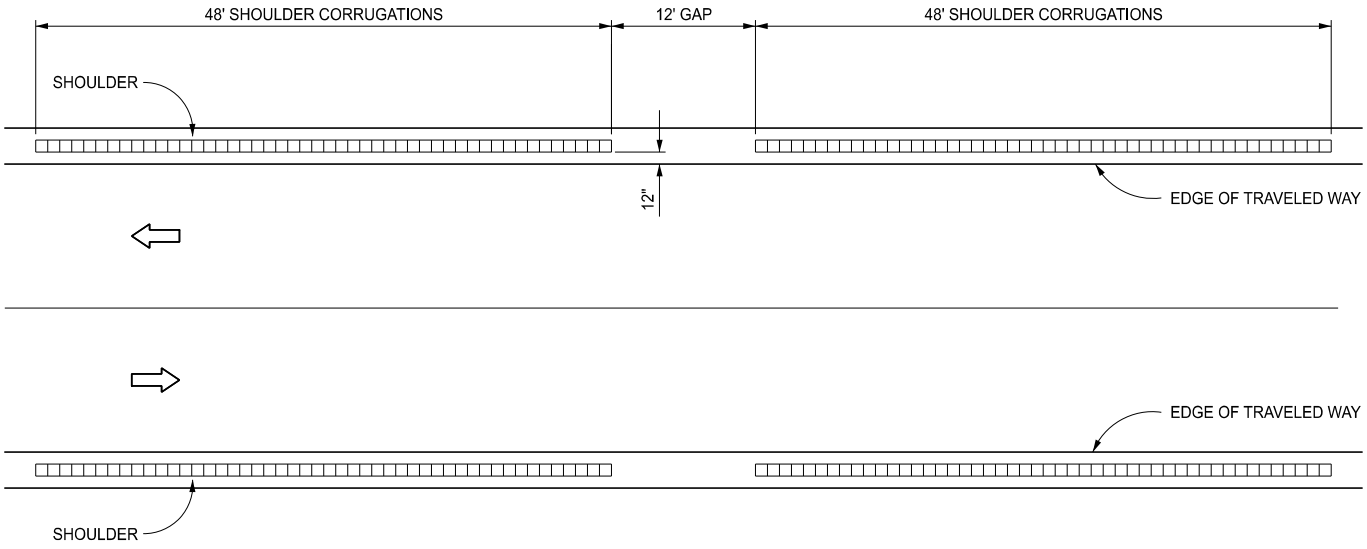
STANDARD PLAN FOR
SHOULDER AND CENTER LINE CORRUGATIONS

(SPECIAL DETAIL) / FHWA APPROVAL	08/02/2023 / PLAN DATE	R-112-J	SHEET 3 OF 10

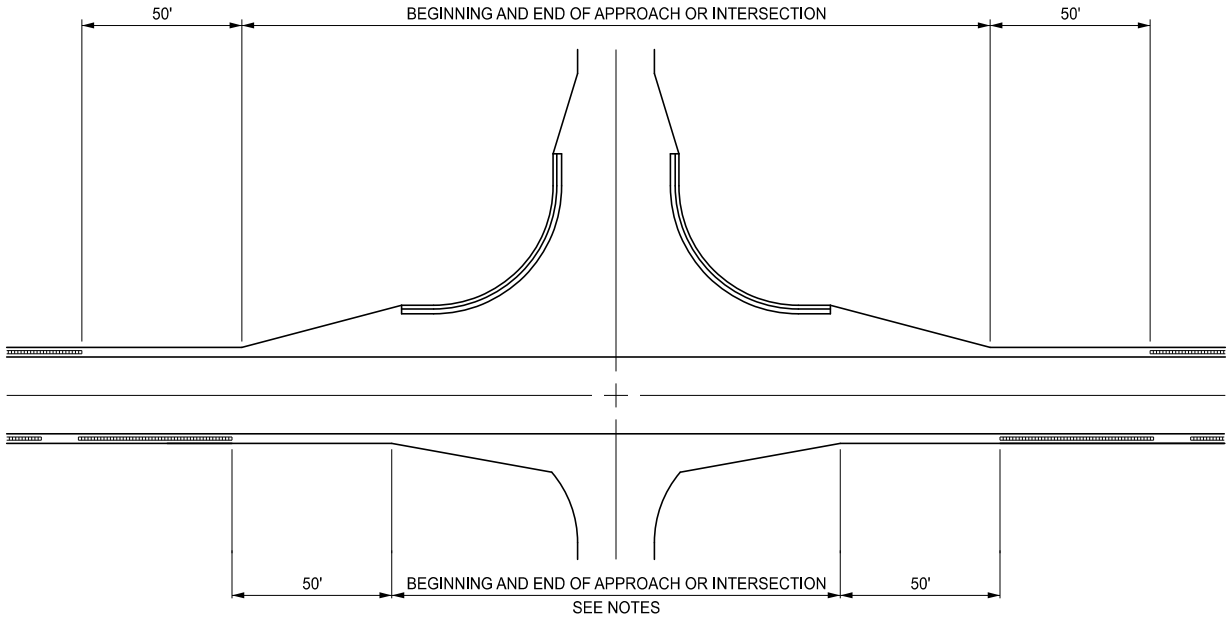


SHOULDER CORRUGATIONS ON TWO-WAY ROADWAYS

NON-FREEWAY SHOULDER CORRUGATIONS

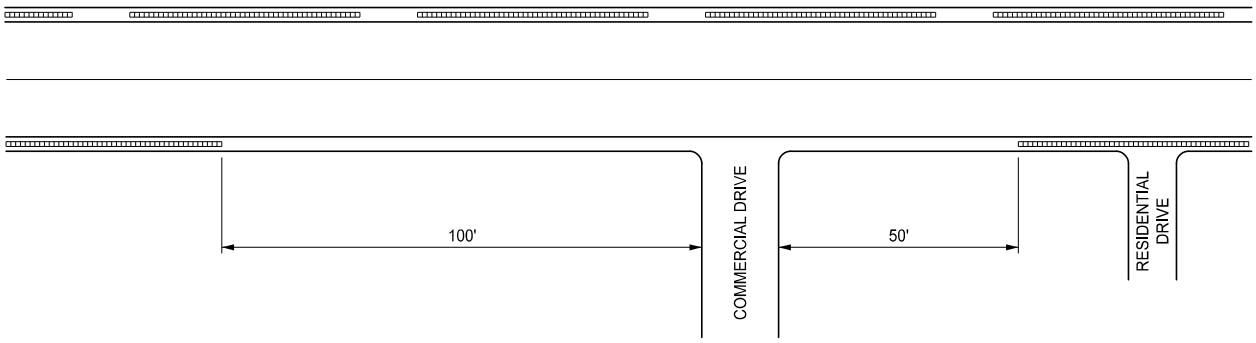
(FOR NON-FREEWAY SHOULDERS PAVED 6 FEET OR GREATER)

MDOT Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR SHOULDER AND CENTER LINE CORRUGATIONS			
	(SPECIAL DETAIL) FHWA APPROVAL	08/02/2023 PLAN DATE	R-112-J	SHEET 4 OF 10

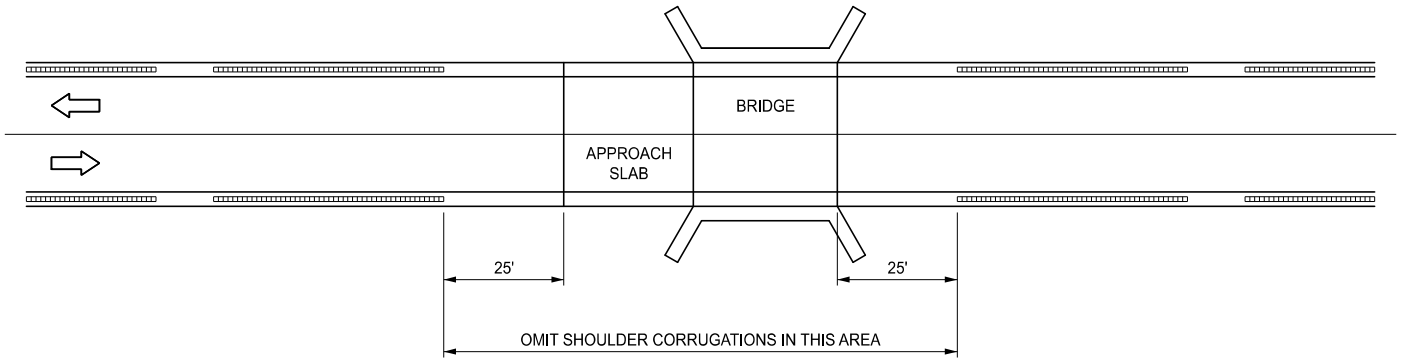


NOTE:

SHOULDER CORRUGATIONS MAY BE OMITTED IN AREAS WITH HIGH CONCENTRATIONS OF DRIVES, WHEN DIRECTED BY THE ENGINEER.



SHOULDER CORRUGATIONS AT INTERSECTIONS



SHOULDER CORRUGATIONS AT BRIDGES

NON-FREEWAY SHOULDER CORRUGATIONS

(FOR NON-FREEWAY SHOULDERS PAVED 6 FEET OR GREATER)

MDOT Michigan Department of Transportation

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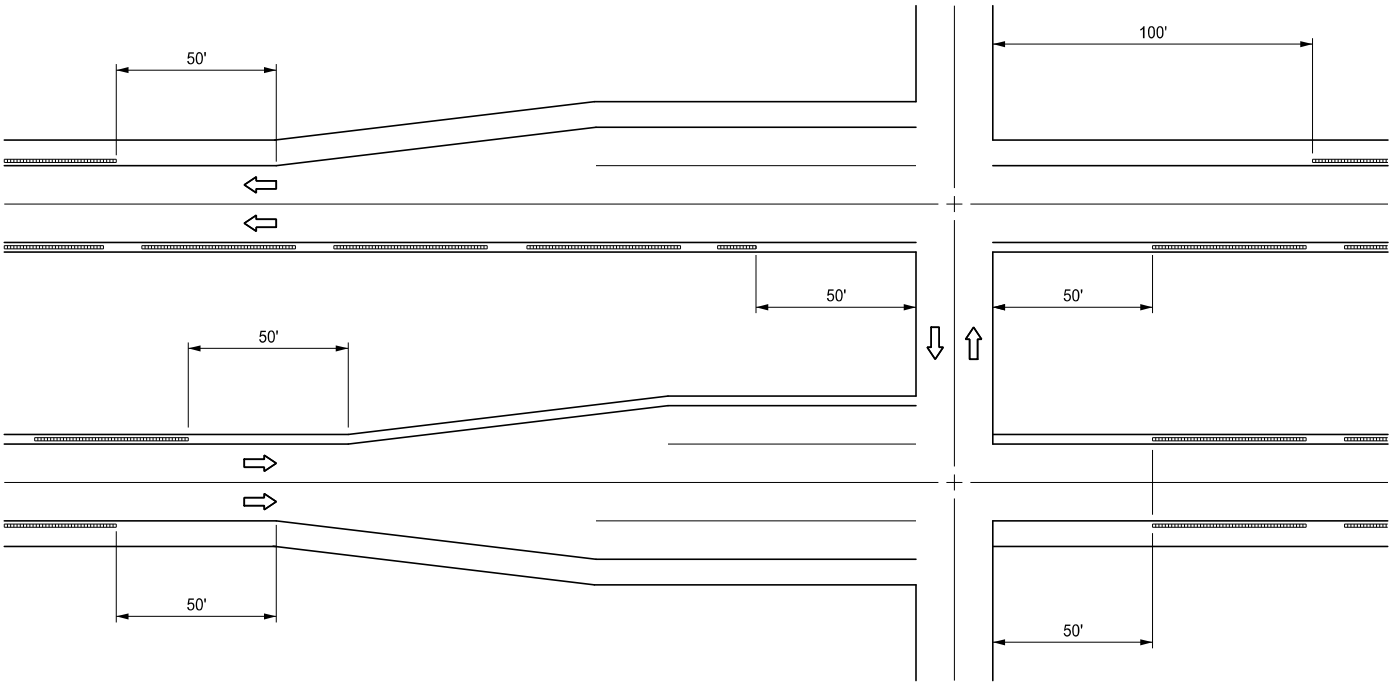
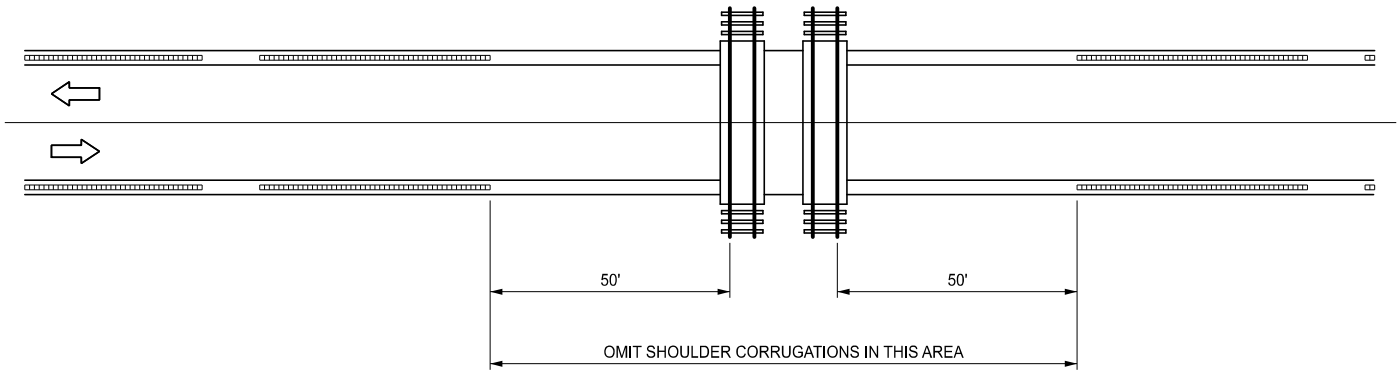
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
SHOULDER AND CENTER LINE CORRUGATIONS

(SPECIAL DETAIL) FHWA APPROVAL	08/02/2023 PLAN DATE	R-112-J	SHEET 5 OF 10



SHOULDER CORRUGATIONS AT INTERSECTIONS

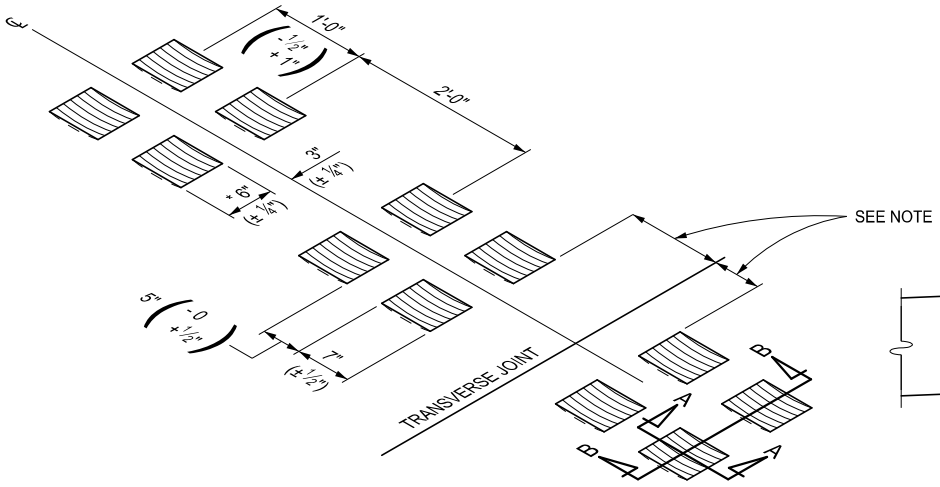


SHOULDER CORRUGATIONS AT RAILROADS

NON-FREEWAY SHOULDER CORRUGATIONS

(FOR NON-FREEWAY SHOULDERS PAVED 6 FEET OR GREATER)

MDOT Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR SHOULDER AND CENTER LINE CORRUGATIONS			
	(SPECIAL DETAIL) FHWA APPROVAL	08/02/2023 PLAN DATE	R-112-J	SHEET 6 OF 10



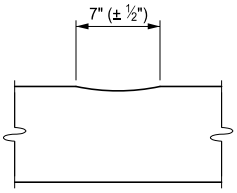
TYPICAL NON-FREEWAY CENTER LINE CORRUGATION INSTALLATION FOR CONCRETE PAVEMENT

* LATERAL DEVIATION SHALL NOT EXCEED 1" IN 100'.

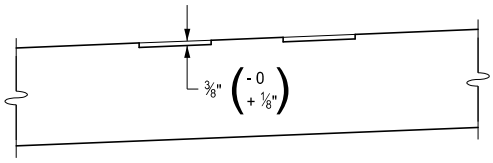
NOTES:

ON CONCRETE PAVEMENTS, THE DISTANCE FROM A CENTER LINE CORRUGATION TO A TRANSVERSE JOINT SHALL BE AT LEAST 6" BUT LESS THAN 12".

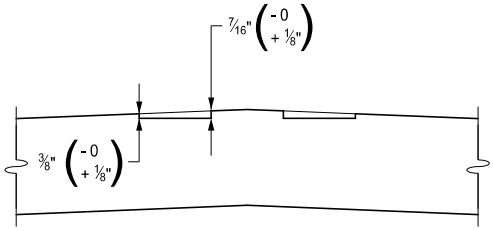
ON CONCRETE PAVEMENTS, CORRUGATIONS MAY BE CONSTRUCTED IN TWO PASSES AND THEREFORE NOT BE SYMMETRICAL ACROSS THE CENTER LINE.



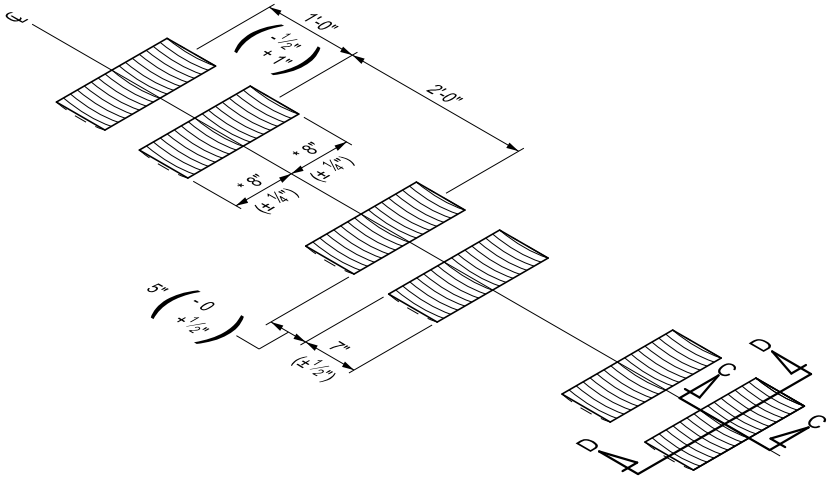
SECTION A-A



SECTION B-B
SUPERELEVATED ROADWAY

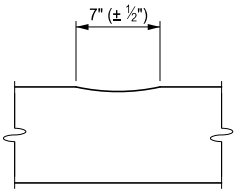


SECTION B-B
CROWNED ROADWAY

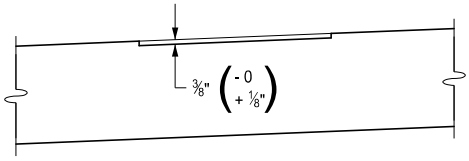


TYPICAL NON-FREEWAY CENTER LINE CORRUGATION INSTALLATION FOR HMA PAVEMENT

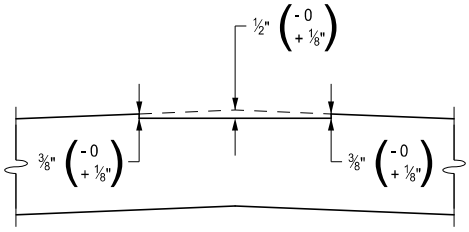
* LATERAL DEVIATION SHALL NOT EXCEED 1" IN 100'.



SECTION C-C



SECTION D-D
SUPERELEVATED ROADWAY



SECTION D-D
CROWNED ROADWAY

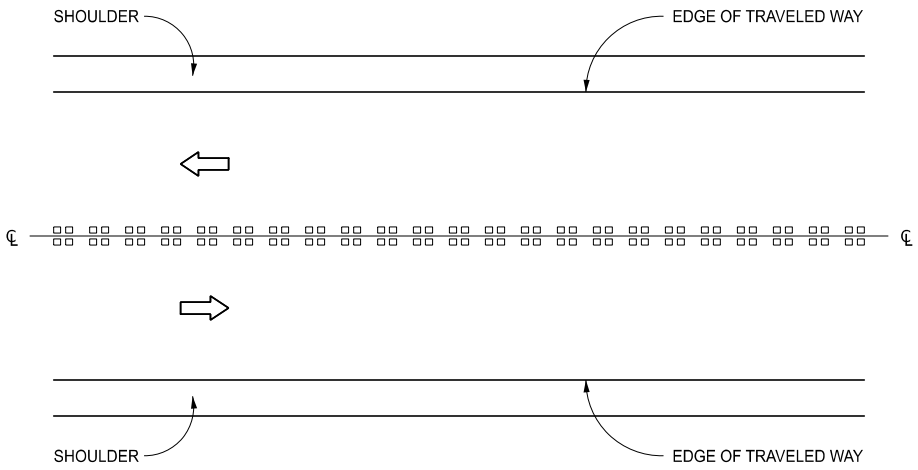
NON-FREEWAY CENTER LINE CORRUGATIONS

MDOT Michigan Department of Transportation

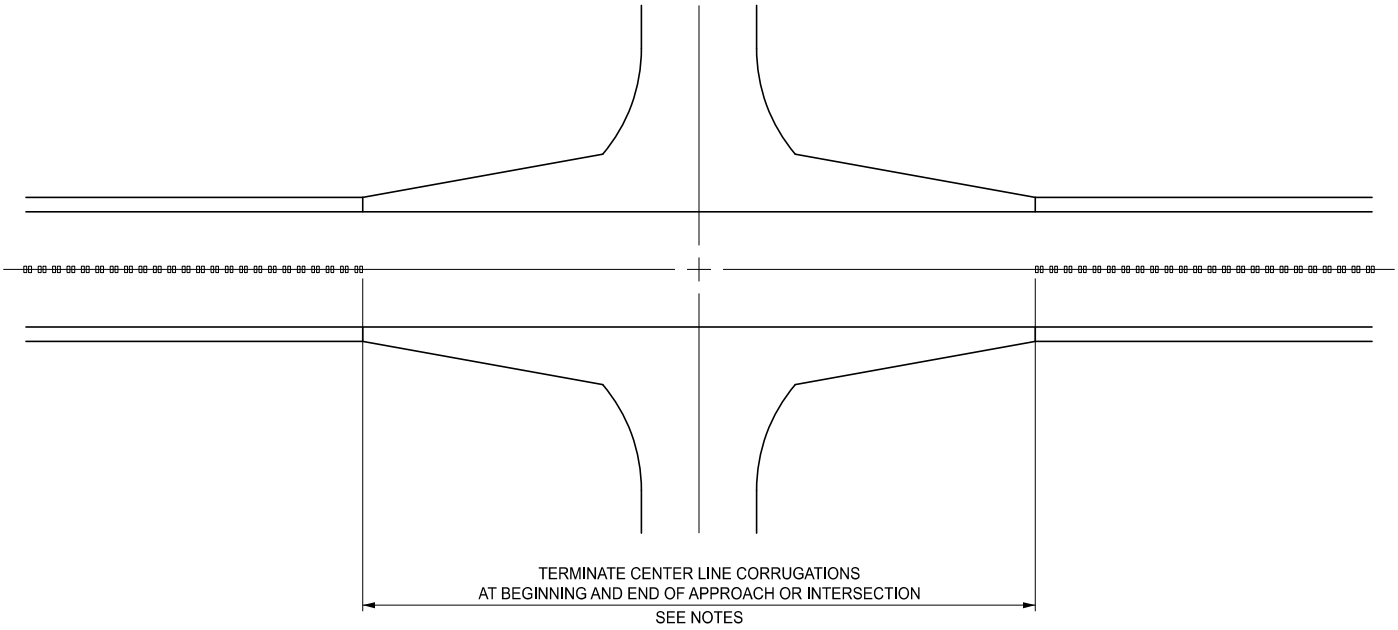
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
SHOULDER AND CENTER LINE CORRUGATIONS

(SPECIAL DETAIL) FHWA APPROVAL	08/02/2023 PLAN DATE	R-112-J	SHEET 7 OF 10



CENTER LINE CORRUGATIONS ON TWO-WAY ROADWAYS



CENTER LINE CORRUGATIONS AT INTERSECTIONS

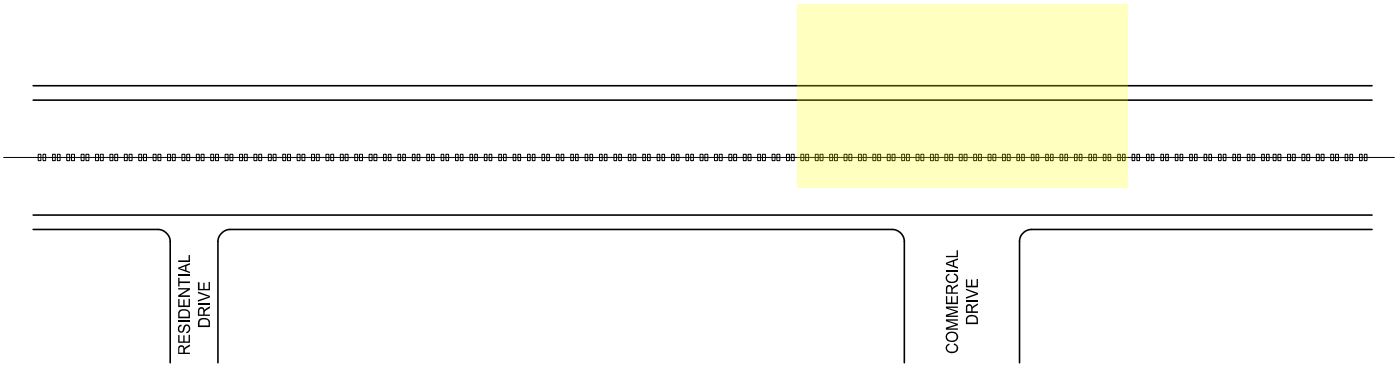
NON-FREEWAY CENTER LINE CORRUGATIONS

MDOT Michigan Department of Transportation

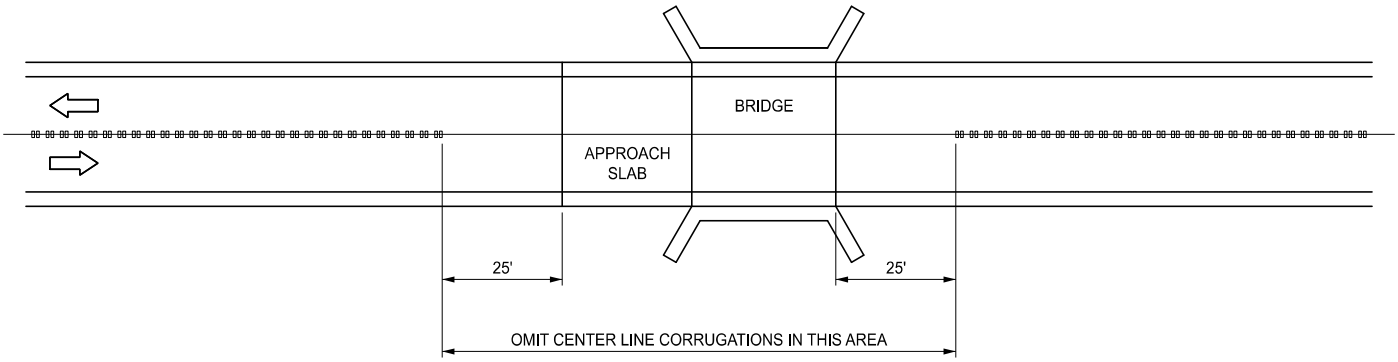
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
SHOULDER AND CENTER LINE CORRUGATIONS

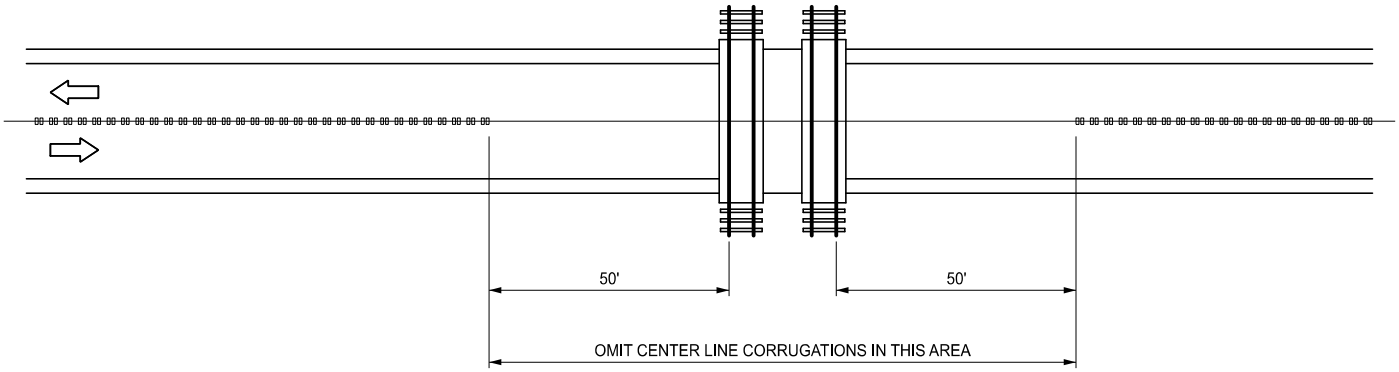
(SPECIAL DETAIL) FHWA APPROVAL	08/02/2023 PLAN DATE	R-112-J	SHEET 8 OF 10



CENTER LINE CORRUGATIONS AT DRIVEWAYS



CENTER LINE CORRUGATIONS AT BRIDGES



CENTER LINE CORRUGATIONS AT RAILROADS

NON-FREEWAY CENTER LINE CORRUGATIONS

MDOT Michigan Department of Transportation

DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
SHOULDER AND CENTER LINE CORRUGATIONS

(SPECIAL DETAIL) / FHWA APPROVAL	08/02/2023 / PLAN DATE	R-112-J	SHEET 9 OF 10

NOTES: (NON-FREEWAY)

SHOULDER CORRUGATION CROSS-SECTIONS AND LOCATIONS SHALL BE AS DETAILED ON THIS STANDARD. CORRUGATIONS ON NON-FREEWAYS SHALL BE IN CONCRETE AND HMA SHOULDERS PAVED AT LEAST 6'-0" WIDE WITH A POSTED SPEED OF 55 MPH. CORRUGATIONS CAN BE USED IN OTHER SITUATIONS WHERE THEY HAVE BEEN PREVIOUSLY APPROVED USING CURRENT GUIDELINES.

CORRUGATIONS SHALL NOT BE PLACED OVER A TRANSVERSE SHOULDER JOINT.

DO NOT MILL SHOULDER OR CENTER LINE CORRUGATIONS THROUGH ANY INTERSECTION, MARKED CROSSWALK, NON-MOTORIZED PATH CROSSING, OR SNOWMOBILE CROSSING.

NOTES: (FREEWAY)

SHOULDER CORRUGATION CROSS-SECTIONS AND LOCATIONS SHALL BE AS DETAILED ON THIS STANDARD. CORRUGATIONS ON FREEWAYS SHALL BE IN CONCRETE AND HMA SHOULDERS PAVED 4'-0" OR WIDER OR WHERE THE SHOULDER LIES BETWEEN THE PAVEMENT AND VALLEY GUTTER OR CURB AND GUTTER. CORRUGATIONS WILL NOT BE USED IN FREEWAY EXIT/ENTRANCE RAMP SHOULDERS OR WHERE SHOULDERS ARE SEPARATED FROM THE PAVEMENT BY VALLEY GUTTER OR CURB AND GUTTER. EXCEPT FOR LOOP RAMPS, CORRUGATIONS WILL BE USED ON FREEWAY TO FREEWAY RAMPS.

CORRUGATIONS SHALL NOT BE PLACED OVER A TRANSVERSE SHOULDER JOINT.

CORRUGATION LOCATION IN THE AREA OF FREEWAY RAMPS WILL BE AS FOLLOWS: THE TYPICAL OFFSET WILL BE INCREASED TO 24" AND BE LOCATED ON THE SHOULDER SIDE OF THE JOINT BEGINNING 300' IN ADVANCE OF THE EXIT RAMP TAPER. THIS OFFSET WILL CONTINUE UNTIL THE 2' POINT OF THE GORE. FOR EXIT/ENTRANCE RAMPS AND LOOPS RAMPS THE CORRUGATIONS WILL END ALONG THE RAMP AT THIS POINT AND SIMULTANEOUSLY RESUME ON THE MAINLINE SHOULDER AND GORE WITH THE NORMAL OFFSET. THE CONFIGURATION FOR ENTRANCE RAMPS WILL BE IN THE REVERSE ORDER OF THE EXIT RAMPS. FOR FREEWAY TO FREEWAY RAMPS, IN ADDITION TO RESUMING THE MAINLINE SHOULDER CORRUGATION AT THIS POINT, RETURN TO THE NORMAL MAINLINE OFFSET ALONG THE LENGTH OF THE RAMP SHOULDER.

WITHIN AN URBAN FREEWAY AREA OR OTHER LIMITED FREEWAY AREA, SHOULDER CORRUGATIONS MAY BE OFFSET UP TO 12" FROM THE EDGE OF THE TRAVEL LANE, AS SHOWN IN THE PLANS, OR AS DIRECTED BY THE ENGINEER. IF NEEDED, THE CORRUGATION MAY BE LOCATED ON THE OPPOSITE SIDE OF THE JOINT FOR 14' LANES TO MAINTAIN THE MINIMUM OFFSET TO THE JOINT LINE.

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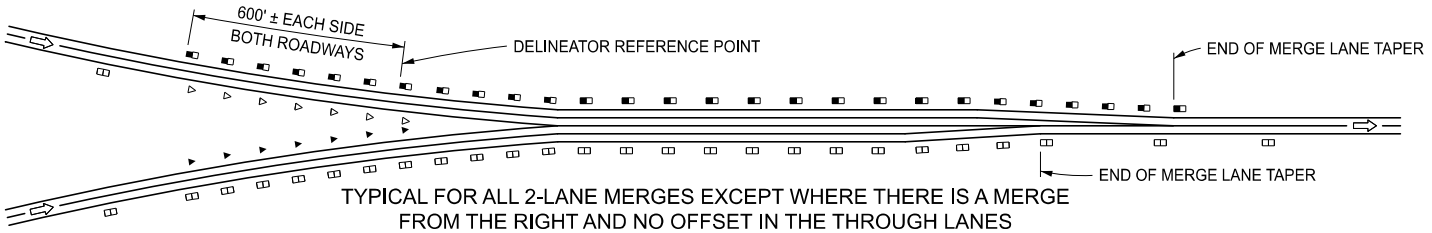
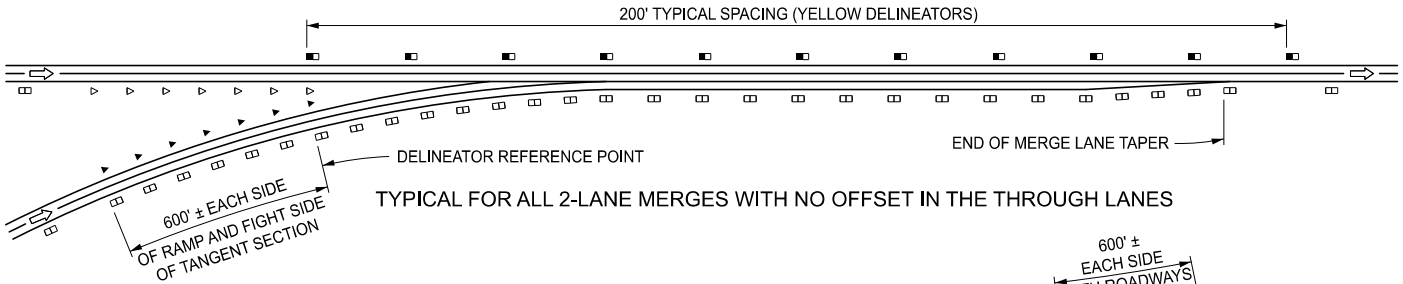
STANDARD PLAN FOR
SHOULDER AND CENTER LINE CORRUGATIONS

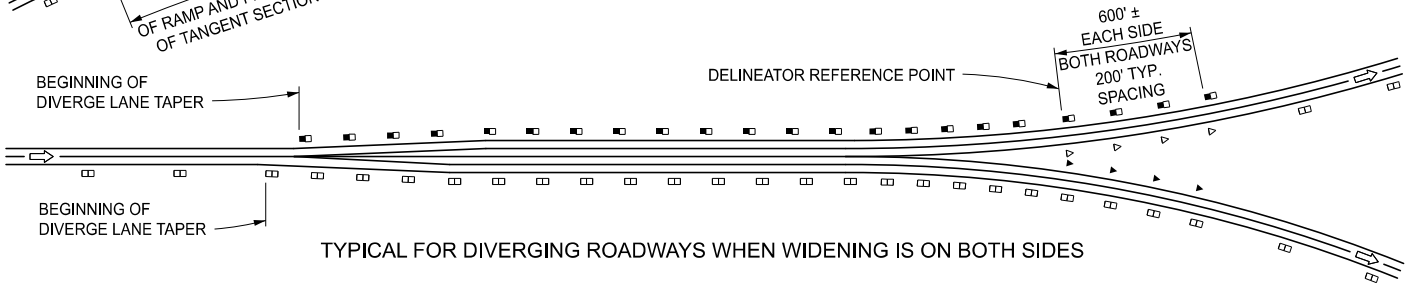
(SPECIAL DETAIL) / FHWA APPROVAL	08/02/2023 / PLAN DATE	R-112-J	SHEET 10 OF 10



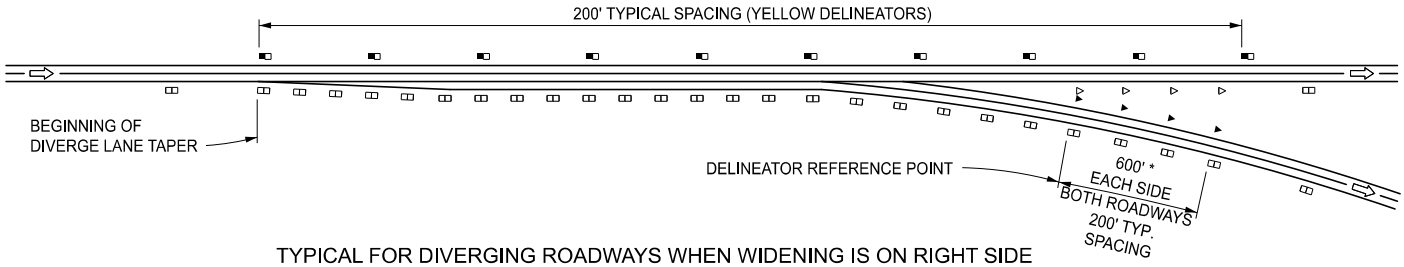
TYPICAL FOR ALL 2-LANE MERGES EXCEPT WHERE THERE IS A MERGE FROM THE RIGHT AND NO OFFSET IN THE THROUGH LANES



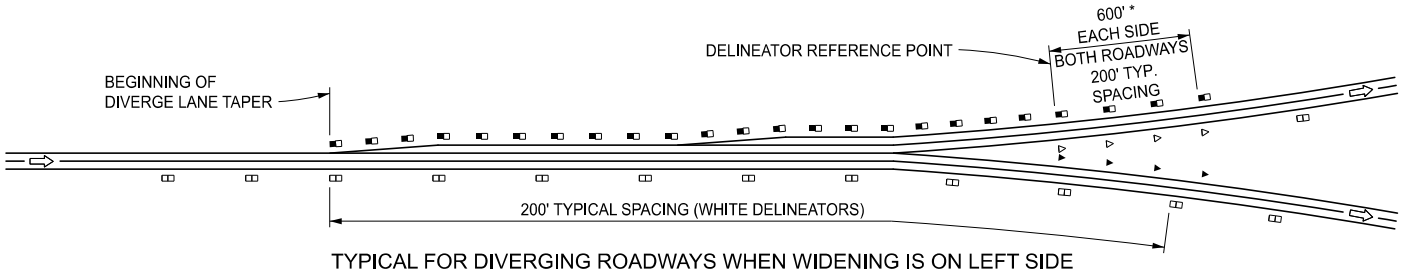
TYPICAL FOR ALL 2-LANE MERGES WITH NO OFFSET IN THE THROUGH LANES



TYPICAL FOR DIVERGING ROADWAYS WHEN WIDENING IS ON BOTH SIDES



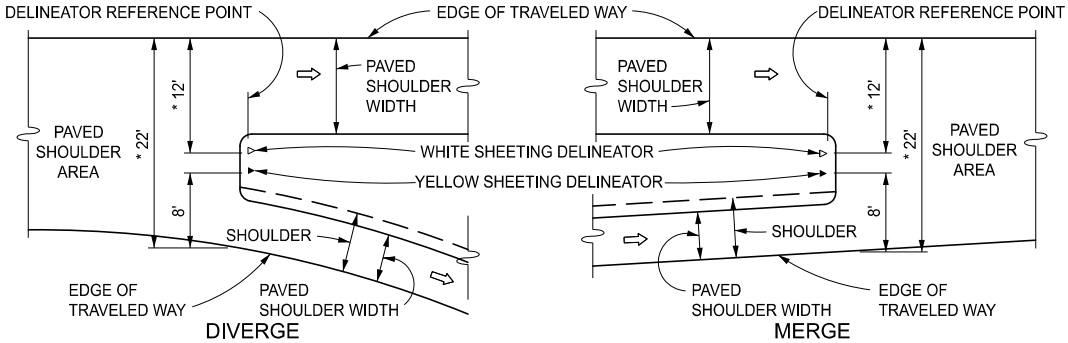
TYPICAL FOR DIVERGING ROADWAYS WHEN WIDENING IS ON RIGHT SIDE



TYPICAL FOR DIVERGING ROADWAYS WHEN WIDENING IS ON LEFT SIDE

DELINEATION OF FREEWAY TO FREEWAY CONNECTIONS

* WHEN THE PAVED SHOULDER WIDTH IS 12', PLACE DELINEATOR 14' FROM THE EDGE OF TRAVELED WAY. THE WIDTH OF THE PAVED GORE WILL BE INCREASED TO 24'.



DELINEATOR REFERENCE POINTS FOR NORMAL 10' SHOULDERS
(9' OR 10' PAVED)

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT

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Michigan Department of Transportation

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STANDARD PLAN FOR
DELINEATOR INSTALLATIONS

(SPECIAL DETAIL)	08/11/2023	R-127-H	SHEET
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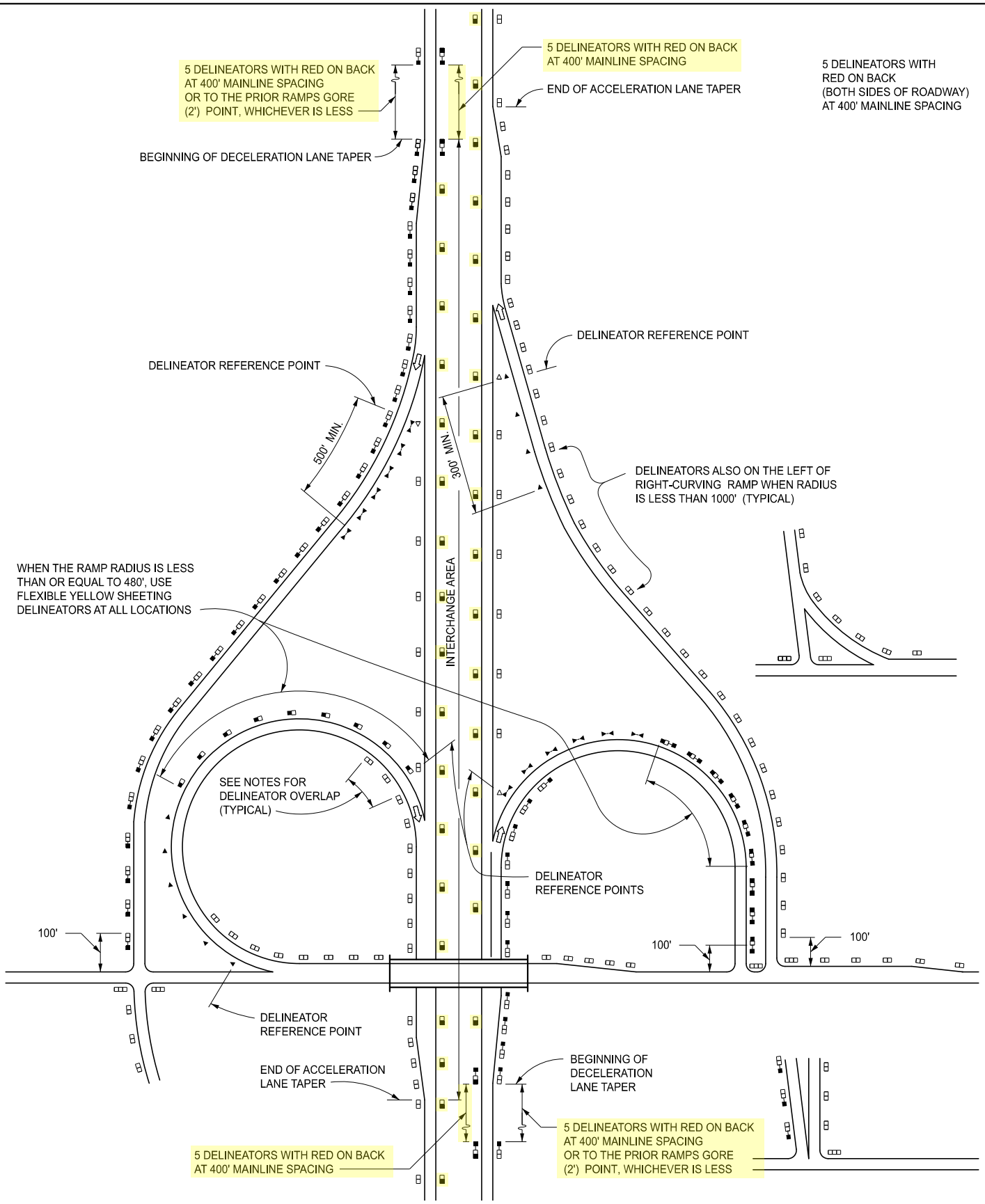


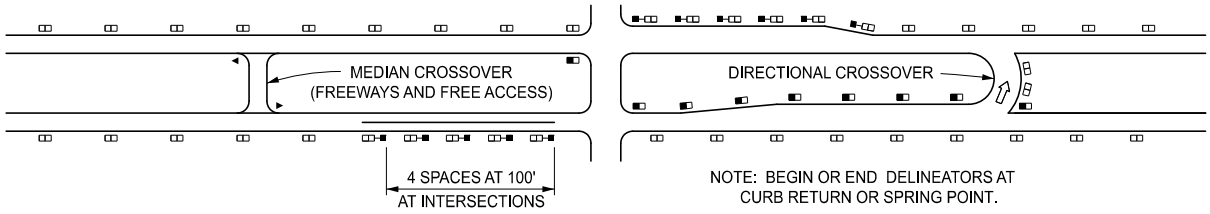
INTERCHANGE DELINEATION

MDOT Michigan Department of Transportation

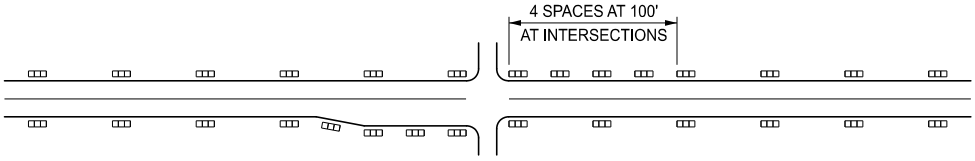
DEPARTMENT DIRECTOR
BRADLEY C. WIEFERICH, PE

STANDARD PLAN FOR
DELINEATOR INSTALLATIONS

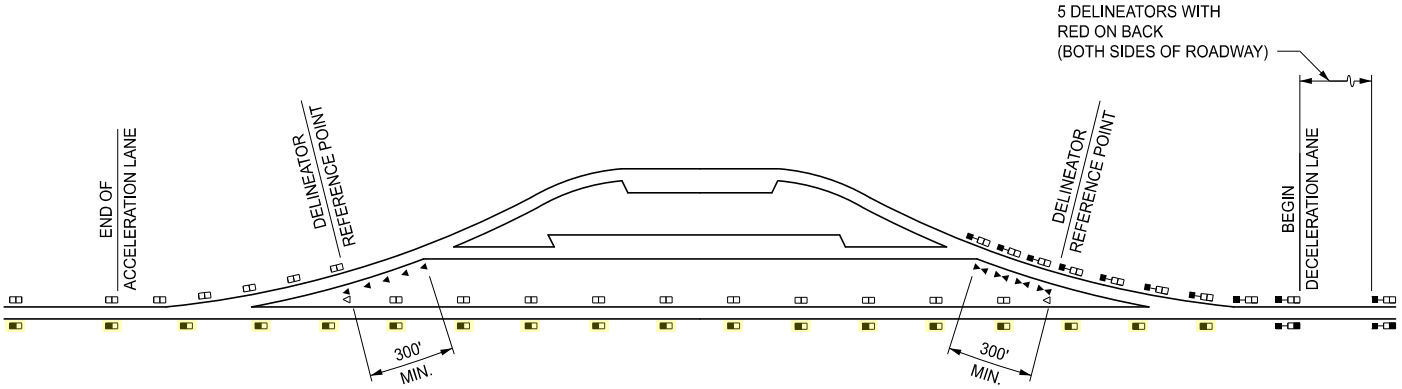
(SPECIAL DETAIL) FHWA APPROVAL	08/11/2023 PLAN DATE	R-127-H	SHEET 2 OF 8



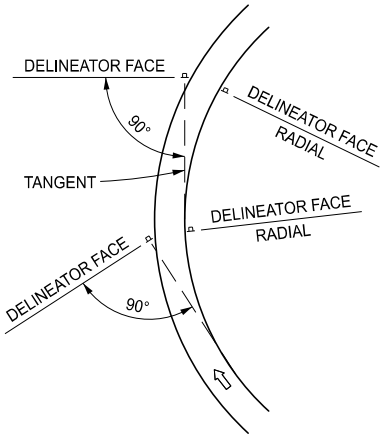
DIVIDED HIGHWAY & MEDIAN CROSSOVER



RURAL TWO-LANE TWO-WAY ROADWAYS (OPTIONAL)



REST AREA & WEIGH STATION



DELINEATOR ORIENTATION
ON HORIZONTAL CURVES
FOR ONE WAY TRAFFIC

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STANDARD PLAN FOR
DELINEATOR INSTALLATIONS

(SPECIAL DETAIL)	08/11/2023	R-127-H	SHEET
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LEGEND

DELINEATORS INSTALLED ON RIGID STEEL POSTS

WHITE PANEL DELINEATORS:
- 400' MAXIMUM SPACING ON TANGENT AND CURVES WITH A RADIUS GREATER THAN 3500'
- 200' MAXIMUM SPACING IN INTERCHANGE AREAS
- 100' MAXIMUM SPACING ON INTERCHANGE RAMPS

YELLOW PANEL DELINEATORS:
- 200' MAXIMUM SPACING IN MERGE OR DIVERGE AREAS OF MAJOR ROADWAYS
- 100' MAXIMUM SPACING ON INTERCHANGE RAMPS
- 400' MAXIMUM SPACING ON TANGENT & CURVES WITH A RADIUS >3500' (FREEWAYS & DIVIDED HIGHWAYS WITH POSTED SPEEDS ≥ 55 MPH)
- 200' MAXIMUM SPACING IN INTERCHANGE AREAS (FREEWAYS & DIVIDED HIGHWAYS WITH POSTED SPEEDS ≥ 55 MPH)

BACK TO BACK WHITE PANEL DELINEATORS:
- 400' MAXIMUM SPACING ON TANGENT AND CURVES WITH A RADIUS GREATER THAN 3500'
- 100' MAXIMUM SPACING ALONG RIGHT TURN LANES

RED PANEL DELINEATORS ON BACK OF WHITE PANEL DELINEATORS

RED PANEL DELINEATORS ON BACK OF YELLOW PANEL DELINEATORS

GREEN PANEL DELINEATORS

DELINEATORS INSTALLED ON FLEXIBLE POSTS

3" x 12" WHITE SHEETING DELINEATORS:
- 200' MAXIMUM SPACING IN INTERCHANGE AREAS
- 100' MAXIMUM SPACING ON INTERCHANGE RAMPS

3" x 12" YELLOW SHEETING DELINEATORS:
- 200' MAXIMUM SPACING IN MERGE OR DIVERGE AREAS OF MAJOR ROADWAYS
- 100' MAXIMUM SPACING ON INTERCHANGE RAMPS
- 200' MAXIMUM SPACING IN INTERCHANGE AREAS (FREEWAYS & DIVIDED HIGHWAYS WITH POSTED SPEEDS ≥ 55 MPH)

3" x 12" RED SHEETING ON BACK OF 3" x 12" WHITE SHEETING DELINEATORS

3" x 12" RED SHEETING ON BACK OF 3" x 12" YELLOW SHEETING DELINEATORS

BACK TO BACK 3" x 12" WHITE SHEETING DELINEATORS

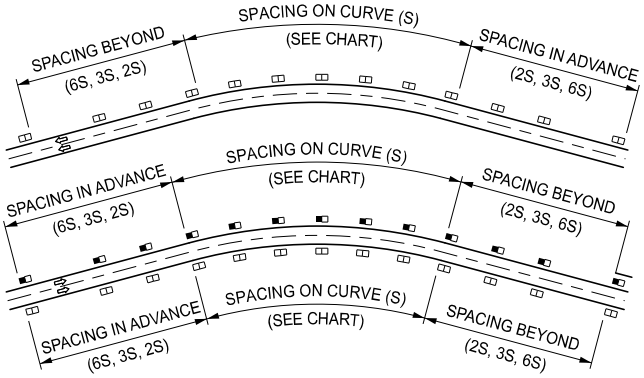
NOTE:
WHEN THE ABOVE SPACING CONFLICTS WITH THE CURVE CHARTS ON SHEET 5, USE WHICHEVER VALUE RESULTS IN THE CLOSER SPACING.

CURVE RADIUS KNOWN				
MIN. RADIUS (R) OF CURVE (FT)	SPACING (S) ON CURVE (FT)	SPACING BEFORE/AFTER CURVE		
		2S	3S	6S
50	20	40	60	120
150	30	60	90	180
230	40	80	120	240
325	50	100	150	300
450	60	120	180	300
595	70	140	210	300
760	80	160	240	300
950	90	180	270	300
1160	100	200	300	300
1395	110	220	300	300
1650	120	240	300	300
1930	130	260	300	300
2230	140	280	300	300
2550	150	300	300	300
2895	160	300	300	300
3260	170	300	300	300
3650	180	300	300	300
4060	190	300	300	300
4495	200	300	300	300
4950	210	300	300	300
5430	220	300	300	300
5930	230	300	300	300
6450	240	300	300	300
6995	250	300	300	300
7560	260	300	300	300
8150	270	300	300	300
8760	280	300	300	300
9395	290	300	300	300
10,050 - 17,830	300	300	300	300
> 17,830	NORMAL SPACING			

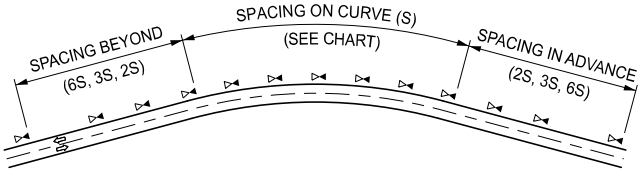
THE SPACING "S" IS FOUND USING THE FORMULA $S = 3\sqrt{R - 50}$ WHERE "R" IS THE RADIUS OF THE CURVE IN FEET.

CURVE RADIUS UNKNOWN				
CURVE ADVISORY SPEED (MPH)*	SPACING (S) ON CURVE (FT)	SPACING BEFORE/AFTER CURVE		
		2S	3S	6S
< 25	25	50	75	150
25	40	80	120	240
30	50	100	150	300
35	60	120	180	300
40	70	140	210	300
45	80	160	240	300
50	90	180	270	300
55	100	200	300	300
60	115	230	300	300
65	130	260	300	300
70	140	280	300	300
75	160	300	300	300

* POSTED OR STATUTORY SPEED LIMIT IF NO ADVISORY POSTED



DELINEATOR LOCATION ON
FREEWAY AND DIVIDED ROADWAY CURVES



NOTE:
DELINEATORS SHALL BE PLACED ON TWO LANE TWO WAY ROADWAY HORIZONTAL CURVES WITH A RADIUS OF 1900' OR LESS, OR AS DIRECTED BY THE REGION/TSC TRAFFIC AND SAFETY ENGINEER.

DELINEATOR FACE SHALL BE INSTALLED PERPENDICULAR (OR RADIAL) TO ROADWAY.

DELINEATOR LOCATION ON
TWO LANE TWO WAY ROADWAY CURVES

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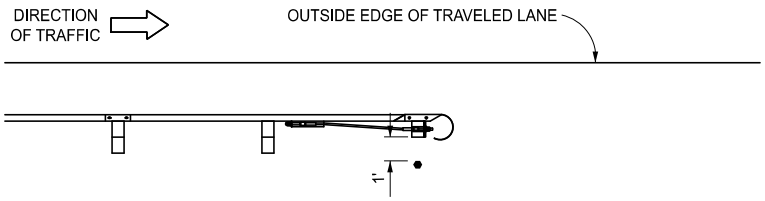
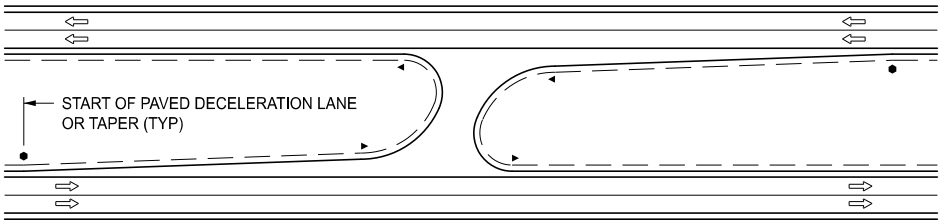
GUARDRAIL APPROACH TERMINAL	DELINEATOR LOCATED 1 FOOT BEHIND
TYPE 1	LAST POST (FROM APPROACH END)
TYPE 2	FIRST POST (FROM APPROACH END)

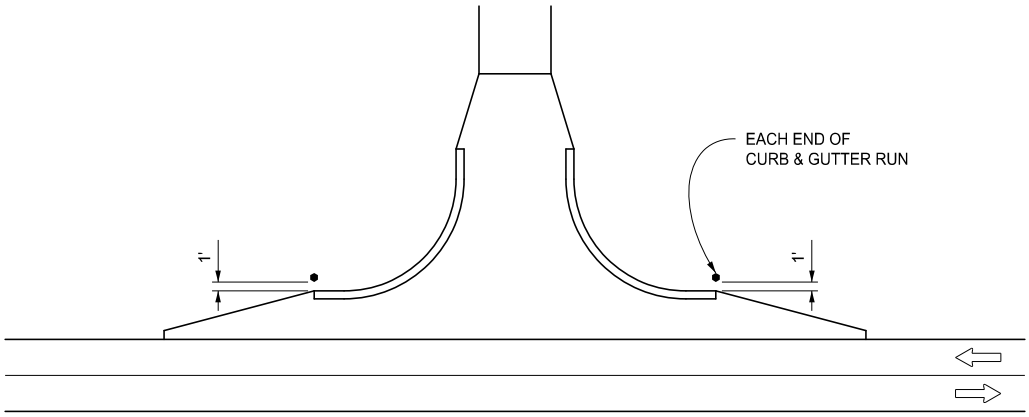


GUARDRAIL DEPARTING TERMINAL TYPES B, T, & MGS

GREEN DELINEATORS AT GUARDRAIL INSTALLATIONS

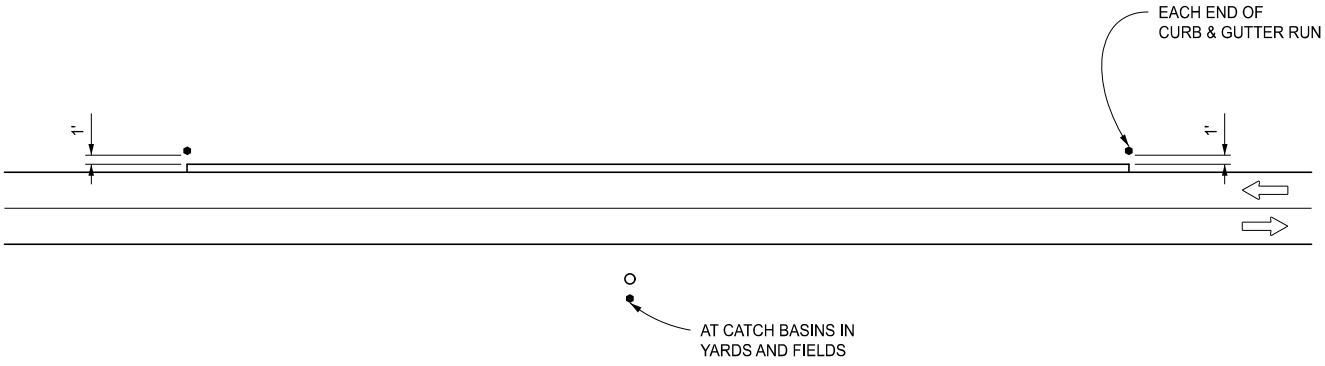


MAINTENANCE CROSSOVER



INTERSECTION

NOTE: MAY BE OMITTED AT FREEWAY RAMP TERMINALS DUE TO THE PRESENCE OF OTHER DELINEATORS



CURB & GUTTER AND CATCH BASINS

GREEN DELINEATOR LOCATIONS

MDOT Michigan Department of Transportation DEPARTMENT DIRECTOR BRADLEY C. WIEFERICH, PE	STANDARD PLAN FOR DELINEATOR INSTALLATIONS			
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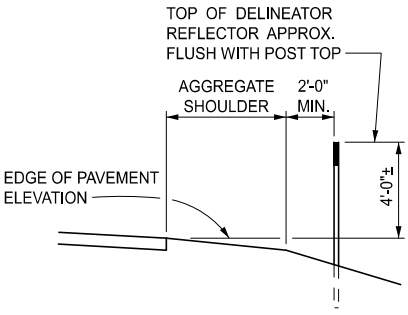
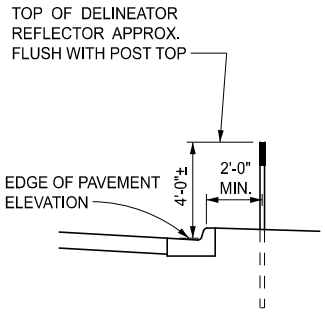
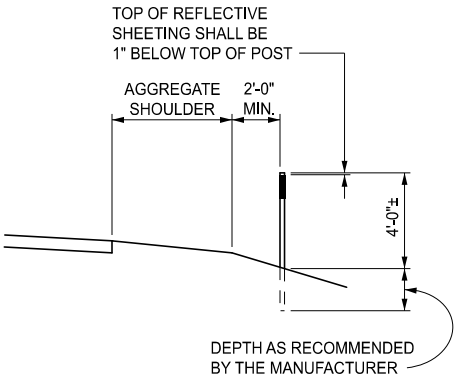


SHOULDER

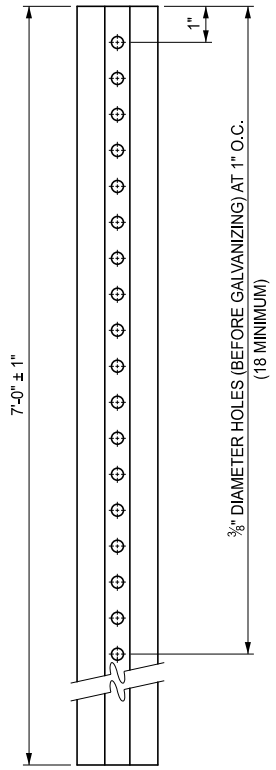


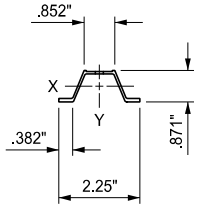
CURB

INSTALLATION OF DELINEATOR REFLECTORS ON RIGID STEEL POST



INSTALLATION OF REFLECTIVE SHEETING ON FLEXIBLE POST

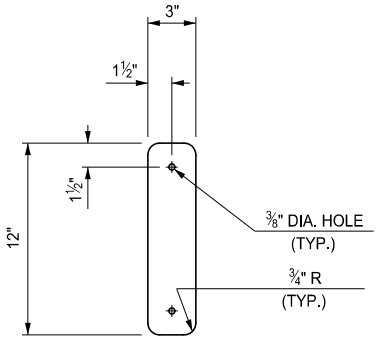




NOMINAL WEIGHT = 1.12 LBS/FT

MINIMUM MOMENT OF INERTIA ABOUT
X-X AXIS = 0.031 in.^{4}

RIGID STEEL POST DETAIL



DELINEATOR REFLECTOR DETAIL

NOTES:

DELINEATORS SHOULD BE PLACED 2'-0" BEYOND THE AGGREGATE SHOULDER, 2'-0" BEYOND THE FACE OF A BARRIER CURB, IMMEDIATELY BEHIND THE GUARDRAIL POST, OR AS NEAR AS POSSIBLE BEHIND CONCRETE BARRIER. DELINEATORS INSTALLED ON FLEXIBLE POSTS SHALL NOT BE PLACED BEHIND GUARDRAIL.

FLEXIBLE POST DELINEATORS SHALL BE INSTALLED ACCORDING TO THE CURRENT SPECIFICATIONS AND INSTALLED AT ALL LOCATIONS SPECIFIED ON THIS STANDARD PLAN, OR WHERE DIRECTED BY THE ENGINEER.

ON RAMPS, WHITE DELINEATORS SHALL BE PLACED ON THE RIGHT AND YELLOW DELINEATORS SHALL ALSO BE PLACED ON THE LEFT FOR A RIGHT-CURVING RAMP WITH A RADIUS OF 1000' OR LESS.

WHERE DELINEATION ON ONE SIDE OF THE ROADWAY OR RAMP ENDS AND DELINEATION ON THE OTHER SIDE APPEARS, AN OVERLAP OF TWO DELINEATOR INSTALLATIONS SHALL BE USED.

DELINEATORS SHALL BE PLACED ON ALL RAMPS AT RURAL INTERCHANGES WHETHER OR NOT THE INTERCHANGES ARE LIGHTED. DELINEATORS SHALL BE OMITTED ALONG THE THROUGH ROADWAY BETWEEN INTERCHANGES WHERE FIXED SOURCE LIGHTING EXISTS.

DELINEATOR PLACEMENT SHOULD CONTINUE WHERE GUARDRAIL OR CONCRETE BARRIER IS PRESENT. DO NOT PLACE DELINEATORS BEHIND GUARDRAIL APPROACH TERMINALS EXCEPT AS SHOWN ON SHEET 6 OF THIS STANDARD. IF TERRAIN OR OTHER FACTORS PROHIBIT POST MOUNTED DELINEATOR PLACEMENT, INSTALLATION OF GUARDRAIL OR BARRIER MOUNTED ENHANCED DELINEATORS IS RECOMMENDED.

ALTERNATE DELINEATOR LOCATION METHOD:
THE FIRST DELINEATOR ON EACH SIDE OF THE ROADWAY IS LOCATED FROM THE AGGREGATE SHOULDER. A NEW OFFSET REFERENCE IS GENERATED BY MEASURING FROM THE LOCATED DELINEATOR TO THE STRIPED EDGELINE. THIS MEASUREMENT CAN BE USED TO LOCATE THE OTHER DELINEATORS IN A CORRIDOR OF SIMILAR CROSS SECTION.

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CHAPTER 5 RIGHT OF WAY INDEX (continued)

5.16.05 (added 8-28-2023)

Temporary Breach in Limited Access Right of Way

Occasionally, a designer may propose to temporarily breach limited access R.O.W. Such reasons may include work occurring around wetlands or other environmental constraints, providing access to the site, equipment and material storage, haul routes, portable plants, etc. In this scenario, an Engineering Review is not required, and no property rights are conveyed within MDOT R.O.W.

Interstate requests for temporary breaches will be submitted by the Associate Region Development Engineer to the FHWA Area Engineer containing all reasons and supporting documentation pertinent to this request. FHWA must grant written approval before the project is advertised.

Non-interstate requests can be coordinated directly between the Associate Region Development Engineer and the Development Services Division Administrator.

All breaches in limited access R.O.W. require inclusion in the environmental classification/certification process and approval by the Environmental Services Section (ESS) is required prior to submitting the request. The designer is responsible for accumulating all justification and supporting documentation as may be required by ESS staff. The proposed breach must not negatively impact environmentally sensitive resources such as threatened and endangered species, cultural resources, or public recreational properties. Additionally, the proposed breach must not negatively modify roadway drainage or storm water features. An analysis of present and future drainage is required if the request modifies or crosses a drainage feature or storm water management feature.

5.16.05 (continued)

Conditions requested by FHWA, the Development Services Division, or the Environmental Services Section must be adhered to and included in the design and proposal, as required. Conditions could involve the replacement of the R.O.W. fencing, restoration requirements, temporary road work items, temporary paving, traffic control modifications, etc. Conditions may require the addition or modification of project quantities and the designer is responsible for including those quantities in the project. All conditions must be met or the request for the limited access R.O.W breach will not be approved.

All temporary access through limited access R.O.W. will expire at the conclusion of the project construction and the right of way must be fully restored, including replacement of all fencing as applicable and as outlined in any approval or real estate documents.