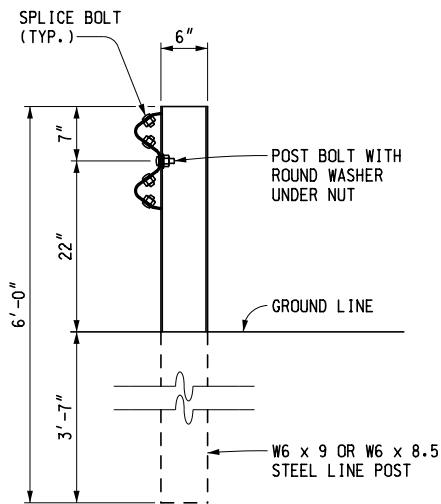
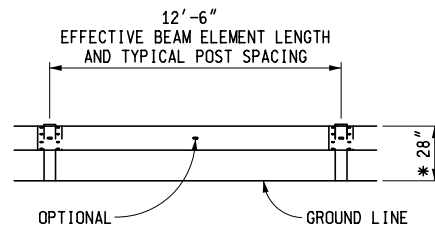


WOOD POST

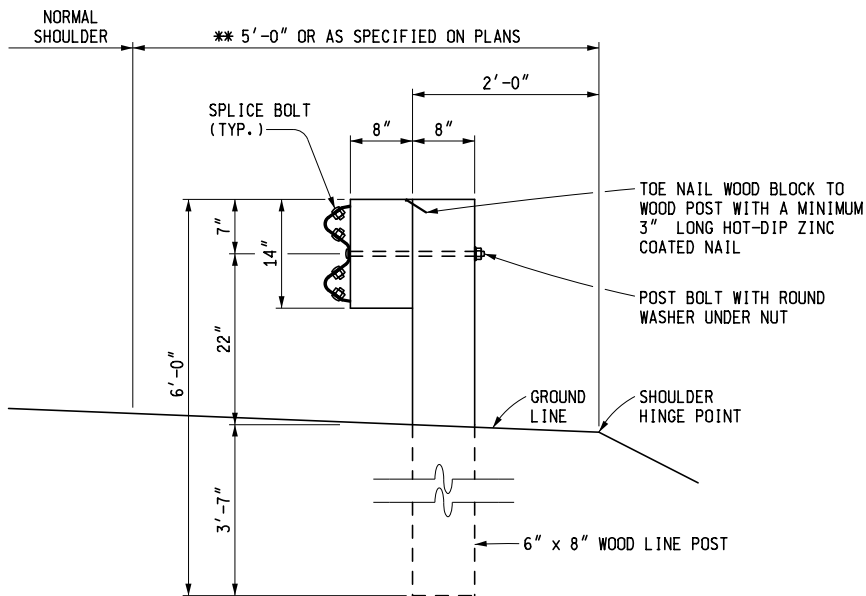


STEEL POST

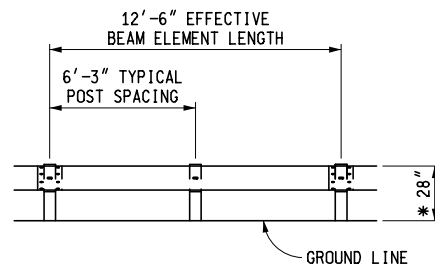


ELEVATION SHOWING POST SPACING
* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE A



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



ELEVATION SHOWING POST SPACING
* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE B
(WOOD POST)



PREPARED BY
DESIGN DIVISION

DRAWN BY: B.L.T.

CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR
Kirk T. Stuedle

APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

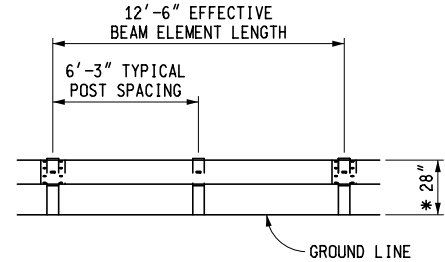
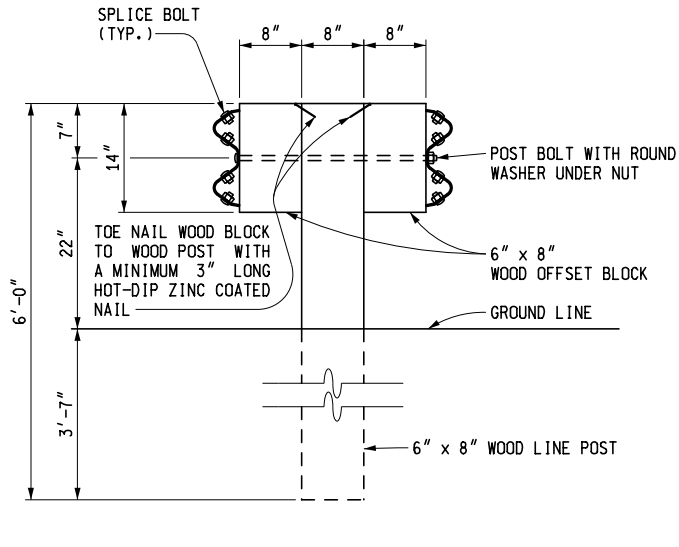
GUARDRAIL,
TYPES A, B, BD, T, TD,
MGS-8, MGS-8D, MGS-0 & MGS-0D

F.H.W.A. APPROVAL

2-1-2016
PLAN DATE

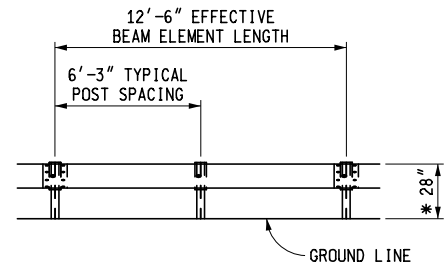
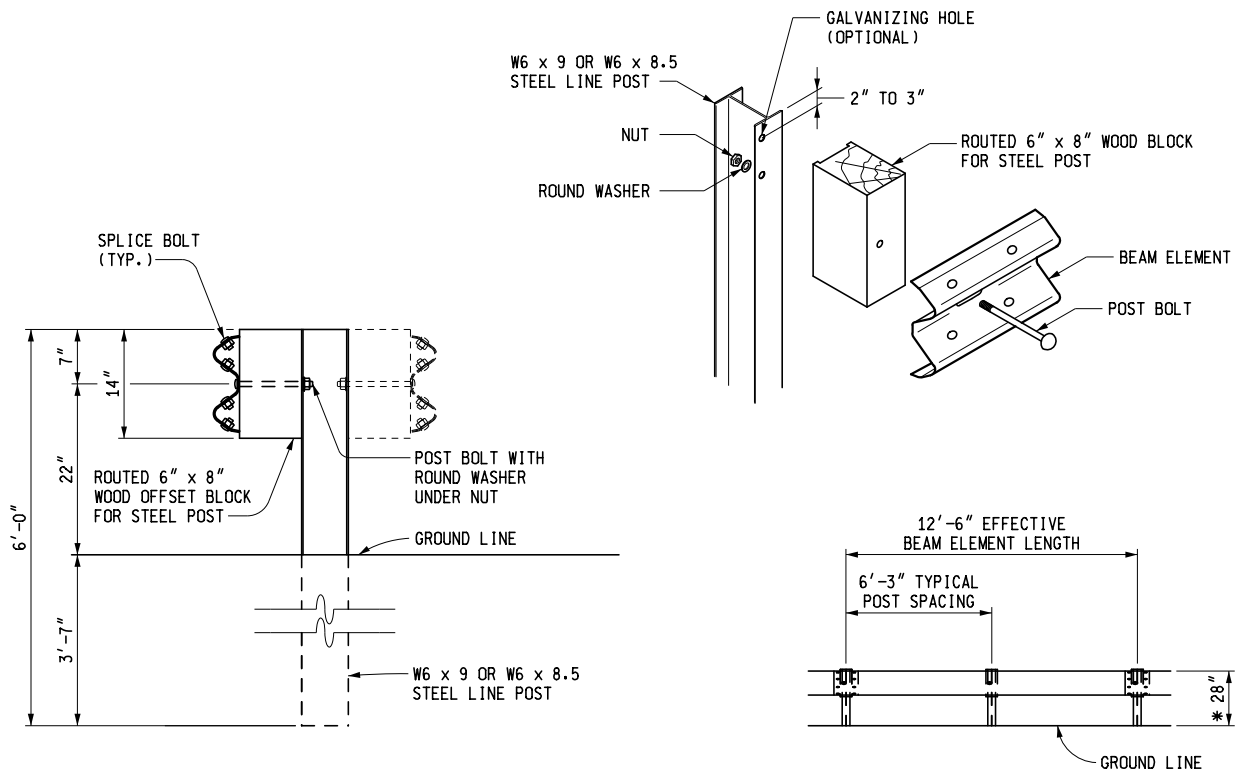
R-60-J

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1 OF 16



ELEVATION SHOWING POST SPACING
 * SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE BD
 (WOOD POST)



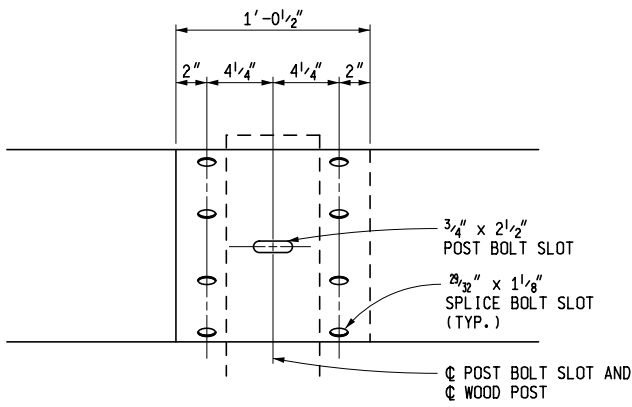
ELEVATION SHOWING POST SPACING
 * SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

GUARDRAIL, TYPE B (OR BD)
 (STEEL POST)

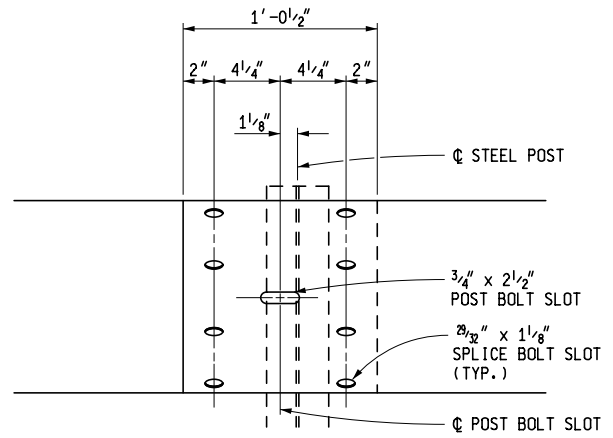
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR

**GUARDRAIL,
 TYPES A, B, BD, T, TD,
 MGS-8, MGS-8D, MGS-0 & MGS-0D**

F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J	SHEET 2 OF 16
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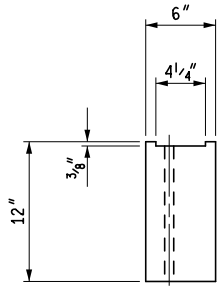


WOOD POST

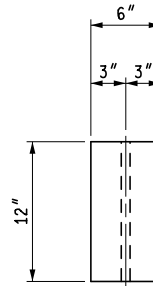


STEEL POST

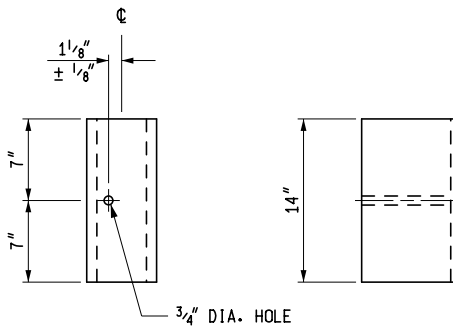
BEAM ELEMENT SPLICE DETAILS



TOP



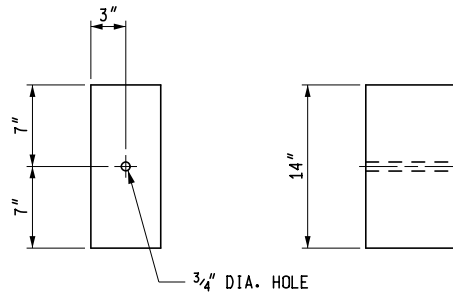
TOP



FRONT

SIDE

FOR USE ON STEEL POSTS



FRONT

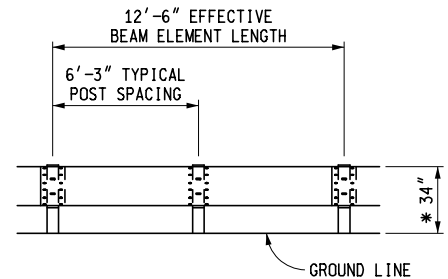
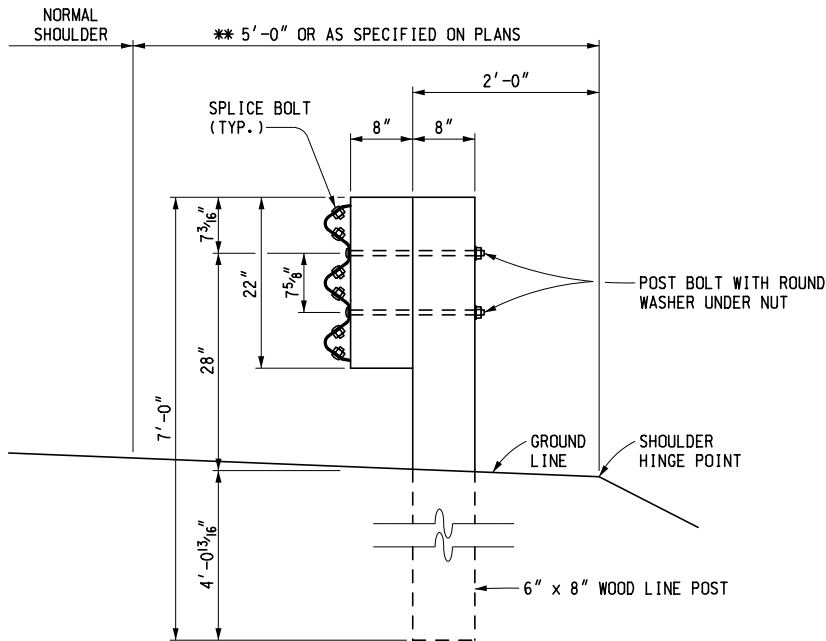
SIDE

FOR USE ON WOOD POSTS

(SEE NOTES ON SHEET 16 OF 16)

WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE B AND TYPE BD

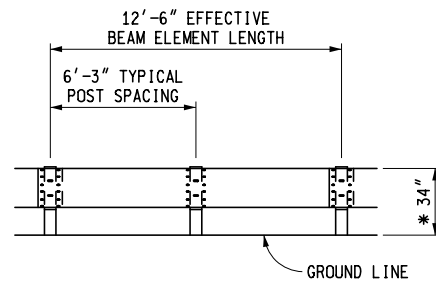
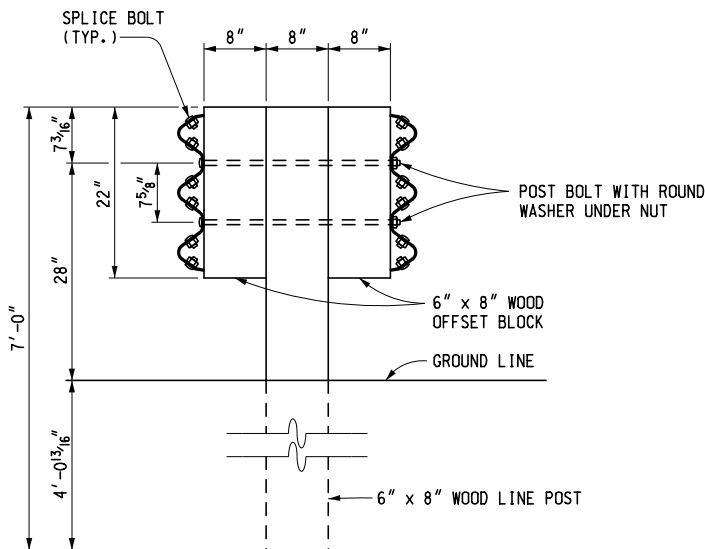
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D		
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J
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ELEVATION SHOWING POST SPACING
 * SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

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

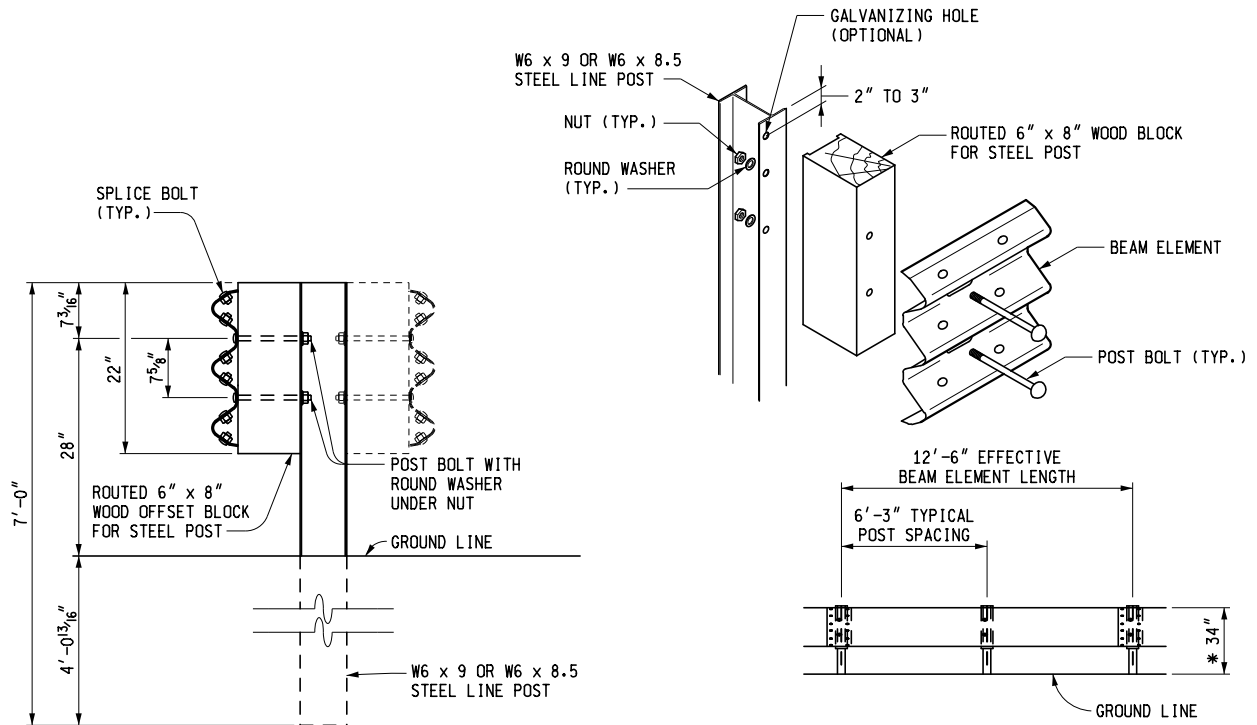
GUARDRAIL, TYPE T
(WOOD POST)



ELEVATION SHOWING POST SPACING
 * SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

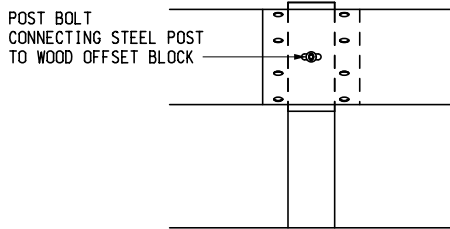
GUARDRAIL, TYPE TD
(WOOD POST)

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D			
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J	SHEET 4 OF 16

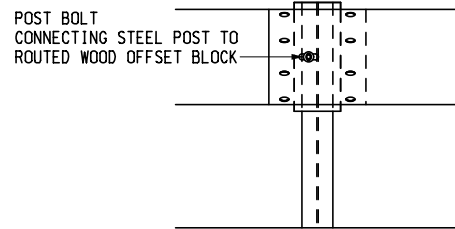


ELEVATION SHOWING POST SPACING
 * SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

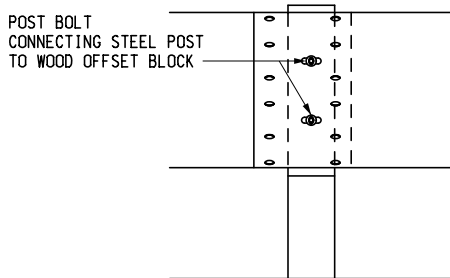
GUARDRAIL, TYPE T OR TD
 (STEEL POST)



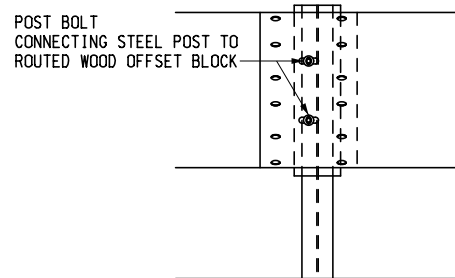
GUARDRAIL, TYPE B
 WOOD POST



GUARDRAIL, TYPE B
 STEEL POST



GUARDRAIL, TYPE T
 WOOD POST



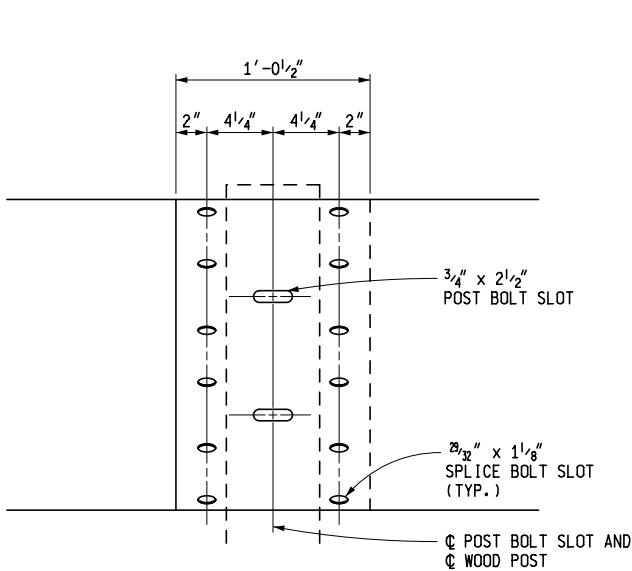
GUARDRAIL, TYPE T
 STEEL POST

BLOCK AND POST CONNECTION DETAILS

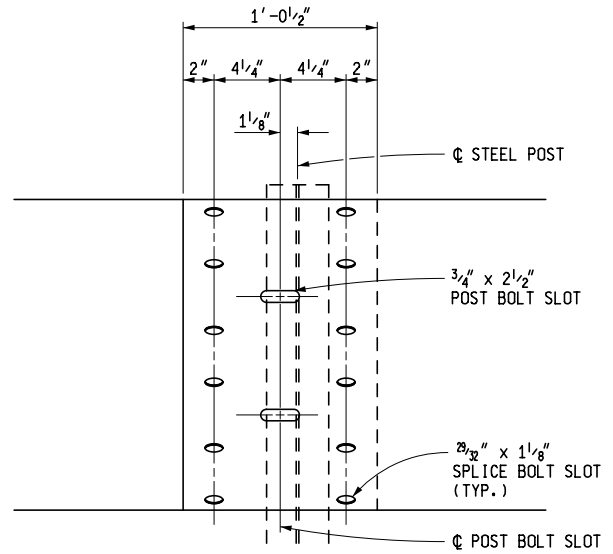
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR

**GUARDRAIL,
 TYPES A, B, BD, T, TD,
 MGS-8, MGS-8D, MGS-0 & MGS-0D**

F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J	SHEET 5 OF 16
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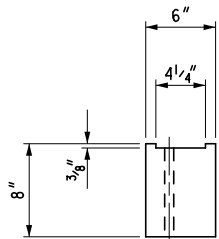


WOOD POST

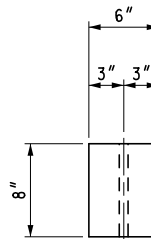


STEEL POST

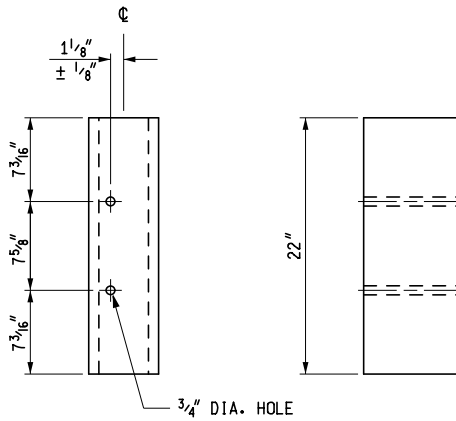
THREE BEAM ELEMENT SPLICE DETAILS



TOP



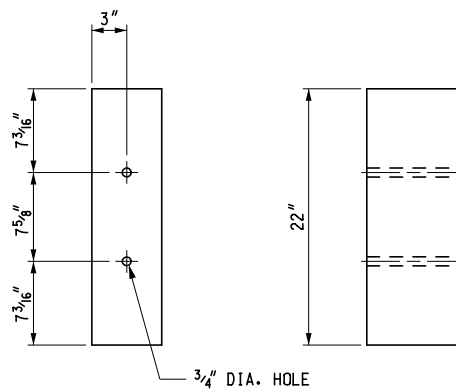
TOP



FRONT

SIDE

FOR USE ON STEEL POSTS



FRONT

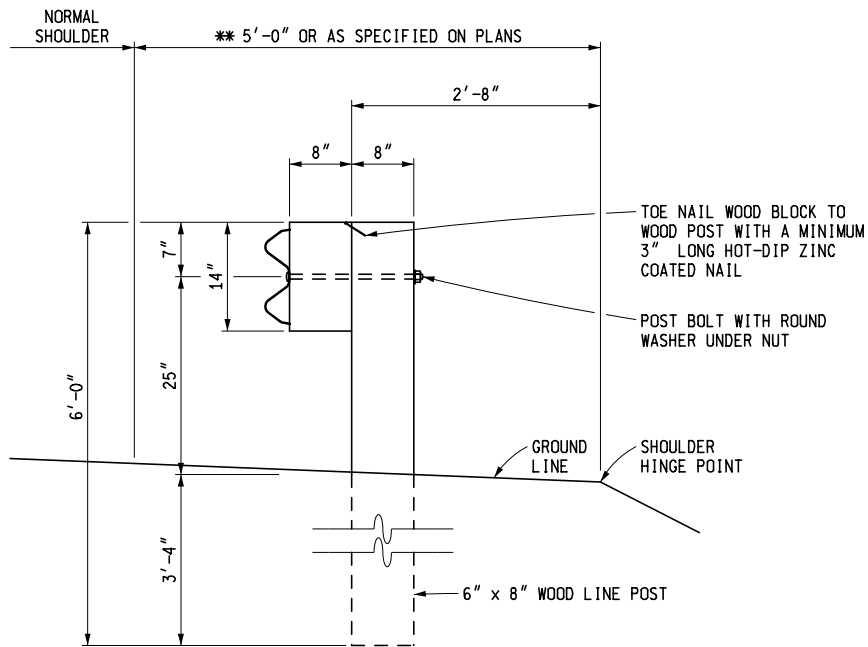
SIDE

FOR USE ON WOOD POSTS

(SEE NOTES ON SHEET 16 OF 16)

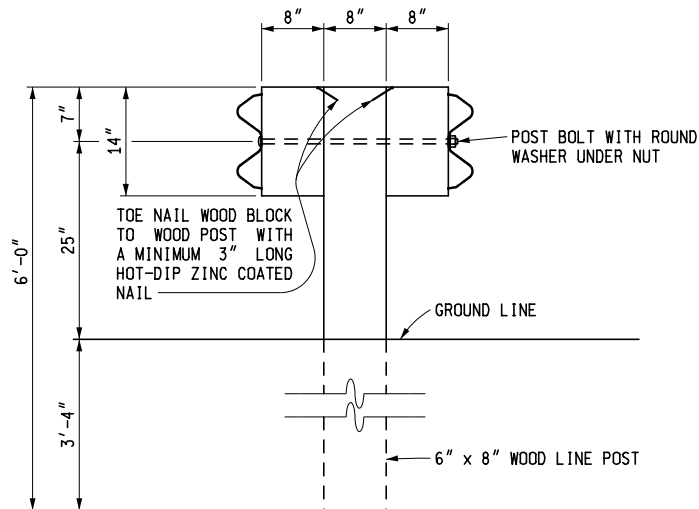
WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE T AND TYPE TD

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D			
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J	SHEET 6 OF 16



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

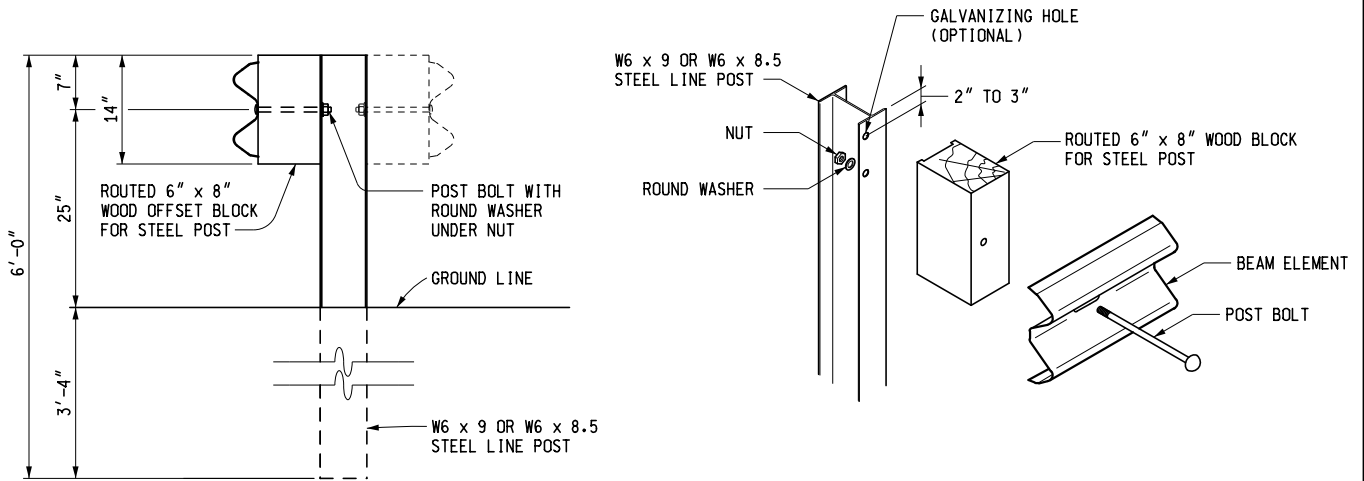
GUARDRAIL, TYPE MGS-8
(WOOD POST)



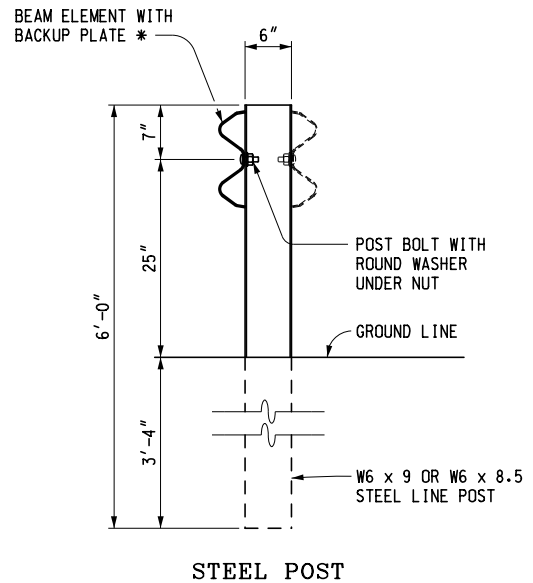
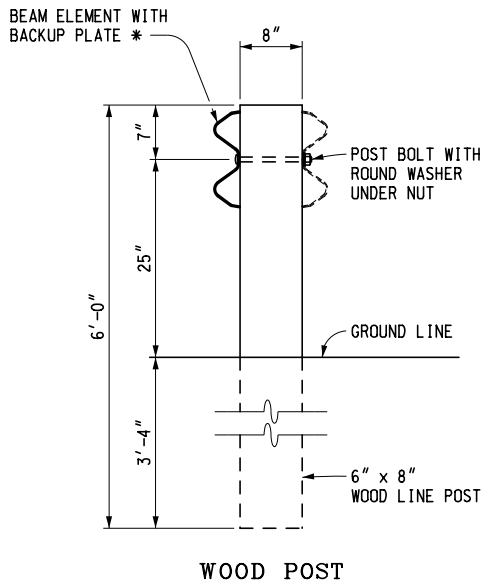
** FOR PAVED SHOULDER WIDTHS OF AT LEAST 12', USE 3'-0".

GUARDRAIL, TYPE MGS-8D
(WOOD POST)

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D		
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J
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GUARDRAIL, TYPE MGS-8 (OR MGS-8D)
(STEEL POST)

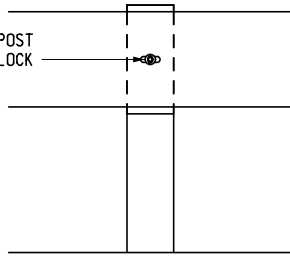


GUARDRAIL, TYPE MGS-0 (OR MGS-0D)

* NOTE: BACKUP PLATE MUST BE PLACED BEHIND THE BEAM ELEMENT (BETWEEN THE BEAM ELEMENT AND THE POST).

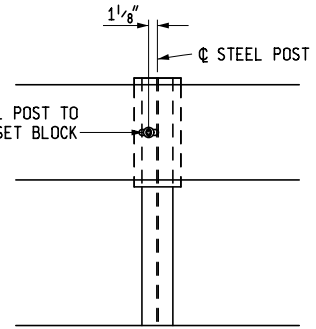
MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D		
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J
		SHEET 8 OF 16

POST BOLT
CONNECTING WOOD POST
TO WOOD OFFSET BLOCK



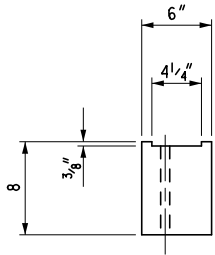
WOOD POST

POST BOLT
CONNECTING STEEL POST TO
ROUTED WOOD OFFSET BLOCK

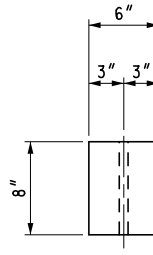


STEEL POST

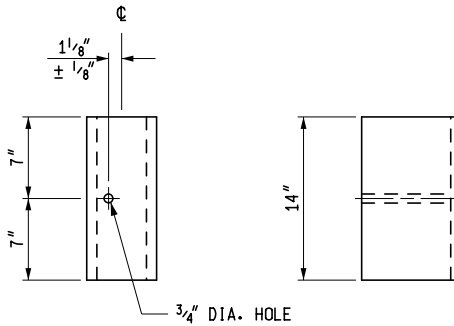
BLOCK AND POST CONNECTION DETAILS



TOP



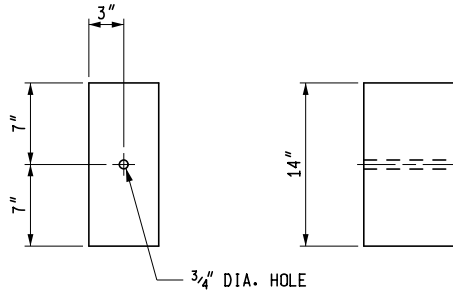
TOP



FRONT

SIDE

FOR USE ON STEEL POSTS



FRONT

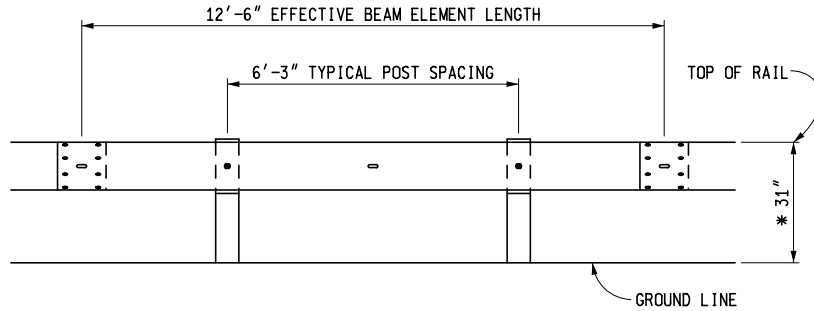
SIDE

FOR USE ON WOOD POSTS

(SEE NOTES ON SHEET 16 OF 16)

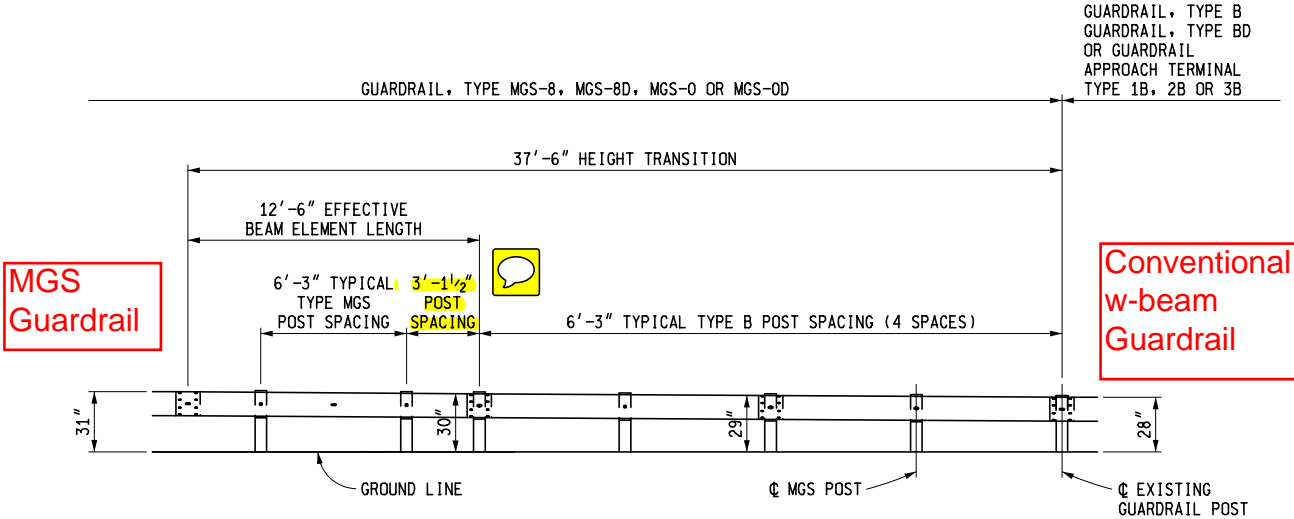
WOOD OFFSET BLOCKS FOR GUARDRAIL, TYPE MGS-8 AND TYPE MGS-8D

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D		
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J
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ELEVATION SHOWING POST SPACING FOR
 GUARDRAIL, TYPE MGS-8, MGS-8D, MGS-0 OR MGS-0D

* SEE NOTES FOR GUARDRAIL IN CONJUNCTION WITH CURB

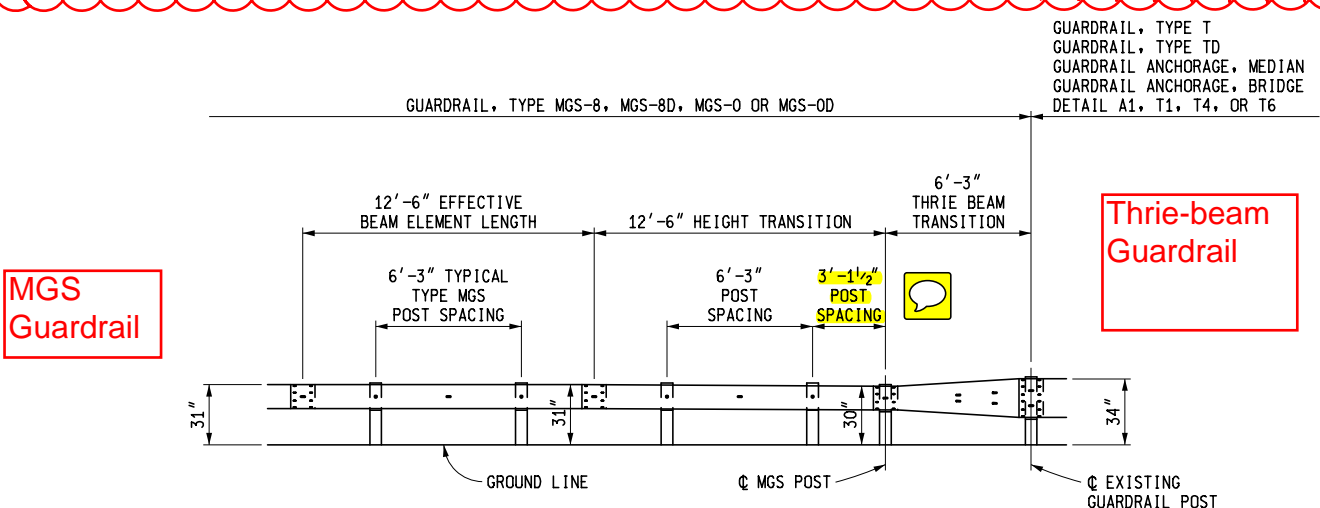


MGS
Guardrail

Conventional
w-beam
Guardrail

ELEVATION SHOWING POST SPACING CONNECTING
 GUARDRAIL, TYPE MGS-8, MGS-8D, MGS-0 OR MGS-0D
 TO GUARDRAIL, TYPE B, GUARDRAIL, TYPE BD, OR
 GUARDRAIL APPROACH TERMINAL TYPE 1B, 2B, OR 3B

GUARDRAIL, TYPE B
 GUARDRAIL, TYPE BD
 OR GUARDRAIL
 APPROACH TERMINAL
 TYPE 1B, 2B OR 3B



MGS
Guardrail

Thrie-beam
Guardrail

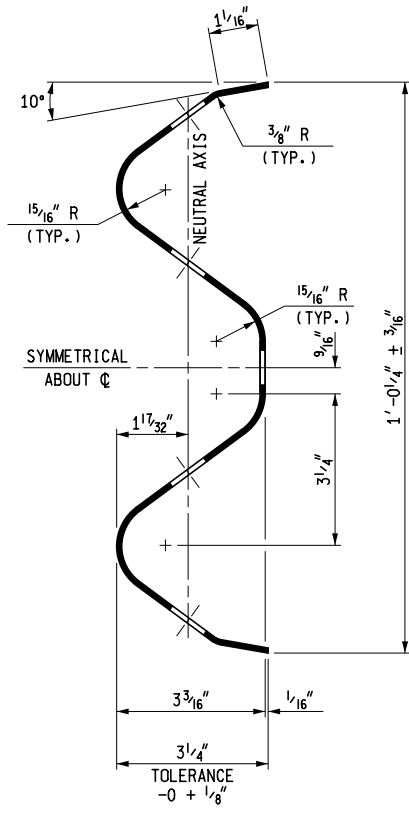
ELEVATION SHOWING POST SPACING CONNECTING
 GUARDRAIL, TYPE MGS-8, MGS-8D, MGS-0 OR MGS-0D
 TO GUARDRAIL, TYPE T, GUARDRAIL, TYPE TD,
 GUARDRAIL ANCHORAGE, MEDIAN,
 GUARDRAIL ANCHORAGE, BRIDGE DETAIL A1, T1, T4 OR T6

GUARDRAIL, TYPE T
 GUARDRAIL, TYPE TD
 GUARDRAIL ANCHORAGE, MEDIAN
 GUARDRAIL ANCHORAGE, BRIDGE
 DETAIL A1, T1, T4, OR T6

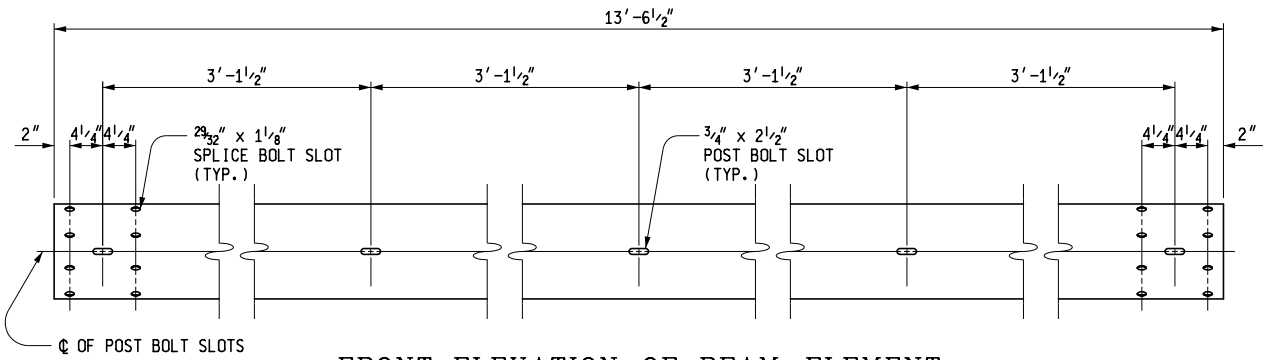
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR

**GUARDRAIL,
 TYPES A, B, BD, T, TD,
 MGS-8, MGS-8D, MGS-0 & MGS-0D**

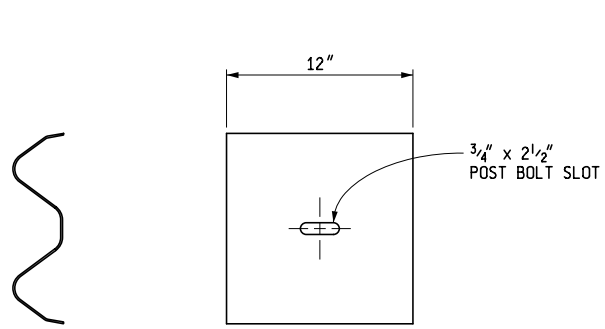
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J	SHEET 10 OF 16
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SECTION THROUGH BEAM ELEMENT

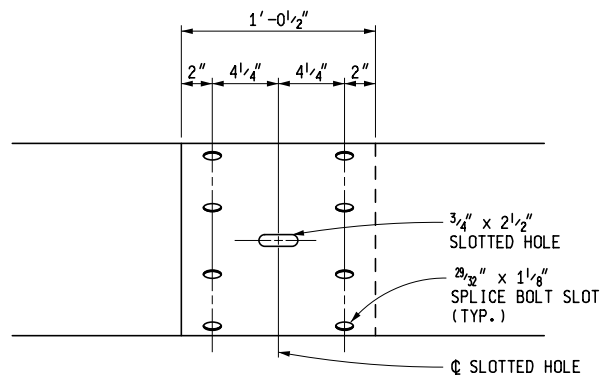


FRONT ELEVATION OF BEAM ELEMENT



SECTION THROUGH BACKUP PLATE

BACKUP PLATE
USE WITH MGS-0 AND MGS-0D POSTS

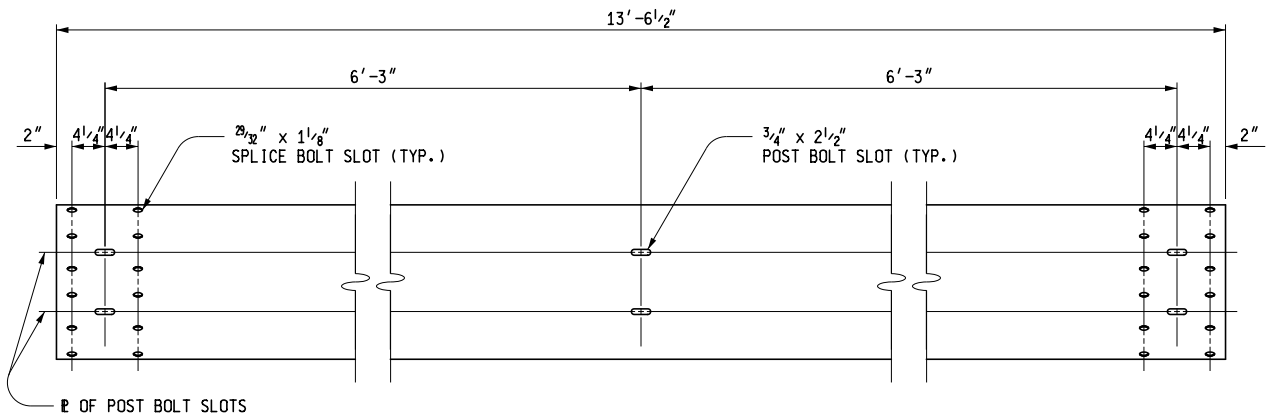


BEAM ELEMENT SPLICE DETAILS

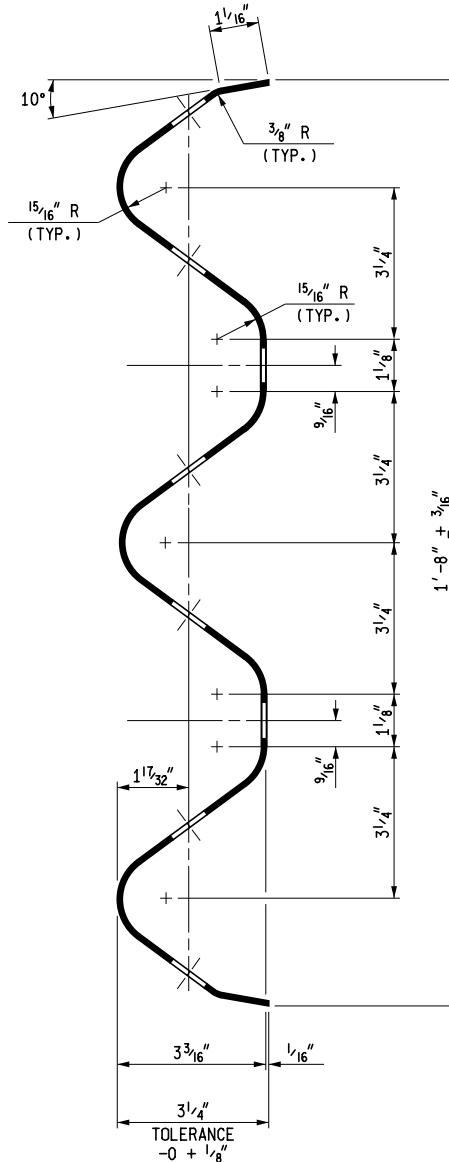
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

GUARDRAIL,
TYPES A, B, BD, T, TD,
MGS-8, MGS-8D, MGS-0 & MGS-0D

F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J	SHEET 11 OF 16
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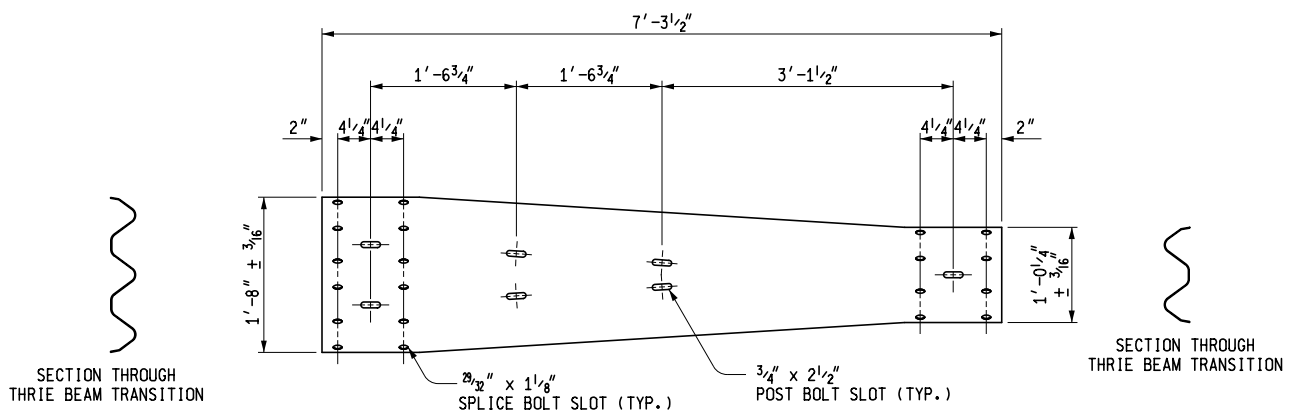


FRONT ELEVATION OF THRIE BEAM ELEMENT

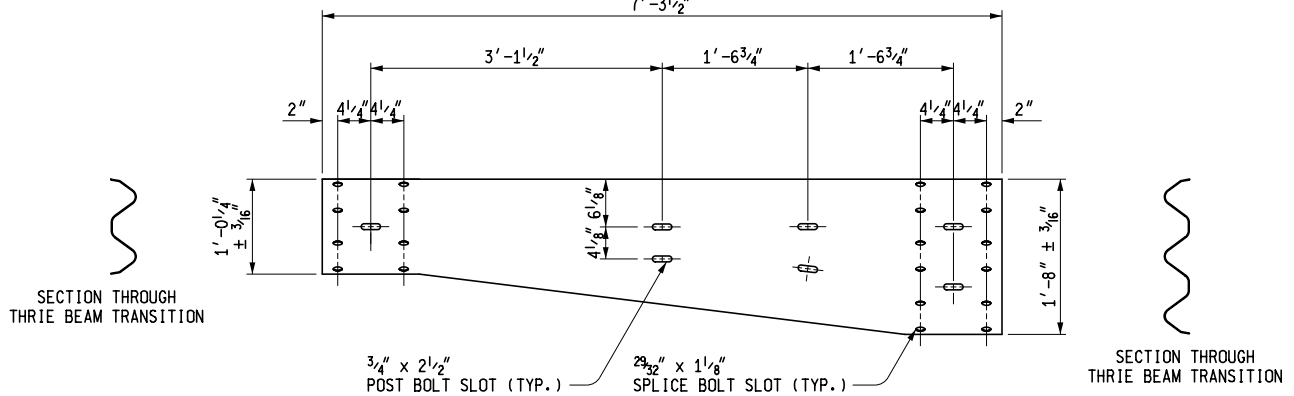
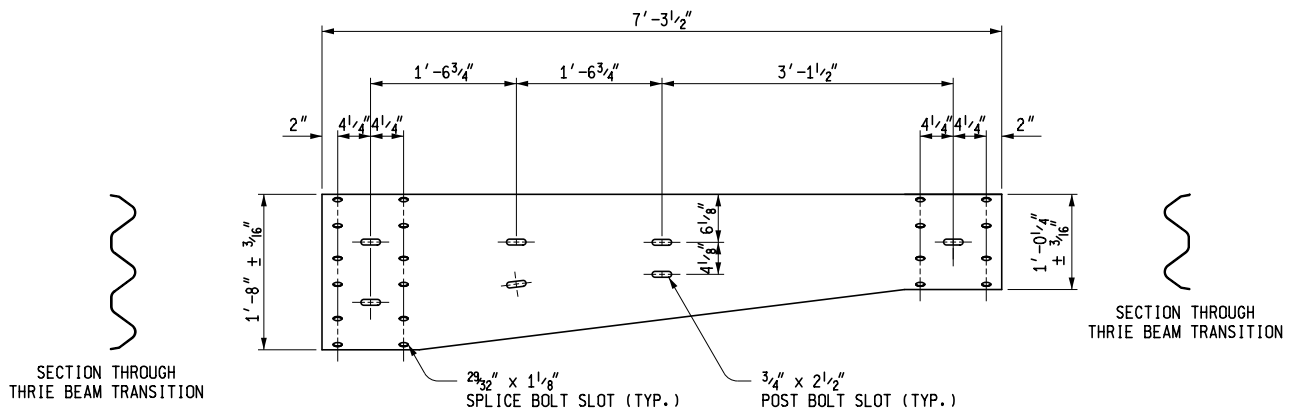


SECTION THROUGH THRIE BEAM ELEMENT
(FOR GUARDRAIL, TYPE T AND TD)

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D		
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J
		SHEET 12 OF 16



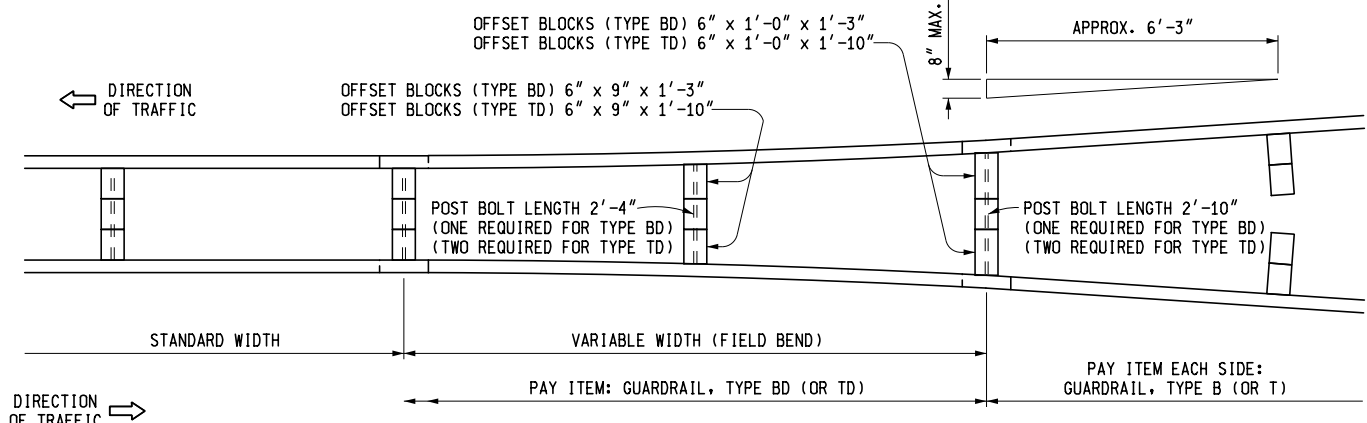
THRIE BEAM TRANSITION



ASYMMETRICAL THRIE BEAM TRANSITIONS

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

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR		
GUARDRAIL, TYPES A, B, BD, T, TD, MGS-8, MGS-8D, MGS-0 & MGS-0D		
F.H.W.A. APPROVAL	2-1-2016 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

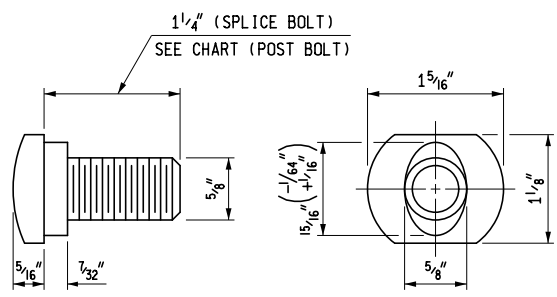
GUARDRAIL TYPE	POST	OFFSET BLOCK	POST BOLTS		SPLICE BOLTS (1 1/4" LONG) (NO. REQ'D)	WASHERS (ROUND) (NO. REQ'D)		
			NO. REQ'D	LENGTH				
A	WOOD	N/A	1	9 1/2"	8	1		
	STEEL	N/A	1	2"		1		
B	WOOD	WOOD	1	18"		8	1	
	STEEL	WOOD	1	9 1/2"			1	
BD	WOOD	WOOD	1	*26 1/2"			16	2
	STEEL	WOOD	2	9 1/2"				2
T	WOOD	WOOD	2	18"	12			2
	STEEL	WOOD	2	9 1/2"				2
TD	WOOD	WOOD	2	*26 1/2"		24		4
	STEEL	WOOD	4	9 1/2"				4

MINIMUM POST BOLT THREAD LENGTH

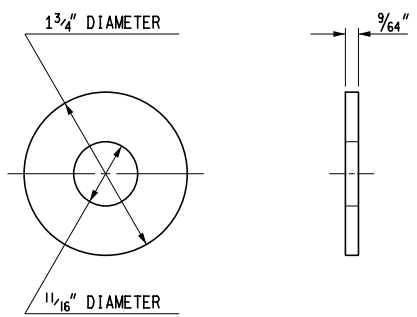
BOLT LENGTH	MINIMUM THREAD LENGTH
9 1/2"	1 3/4"
18"	2 1/2"
26 1/2"	3"

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

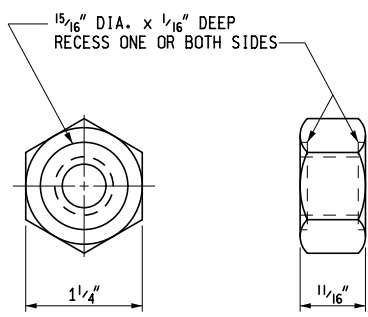
* EXCEPT AS SPECIFIED ON DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE B (OR TYPE T) TO GUARDRAIL, TYPE BD (OR TYPE TD). POST BOLTS SHALL NOT EXTEND MORE THAN 1/2" BEYOND NUT.



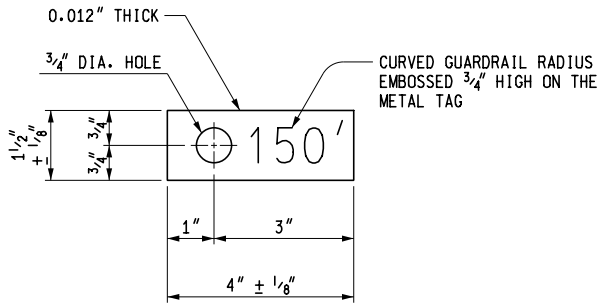
SPLICE BOLT AND POST BOLT



ROUND WASHER



NUT

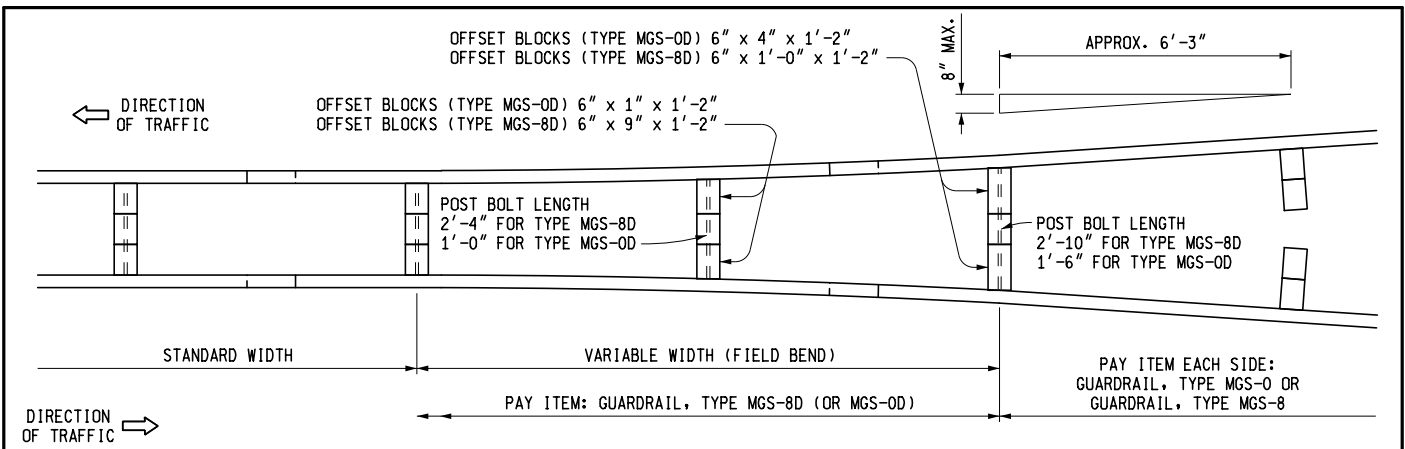


METAL TAG

FOR CURVED GUARDRAIL WITH RADIUS OF 150' OR LESS

MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR
GUARDRAIL,
 TYPES A, B, BD, T, TD,
 MGS-8, MGS-8D, MGS-0 & MGS-0D

F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J	SHEET 14 OF 16
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**DETAIL SHOWING TRANSITION FROM
 GUARDRAIL, TYPE MGS-8 (OR MGS-O) TO GUARDRAIL, TYPE MGS-8D (OR MGS-OD)**
 (NOTE: DEPICTED ABOVE AS GUARDRAIL, TYPES MGS-8D AND MGS-8 RESPECTIVELY)

POST BOLTS, SPLICE BOLTS AND WASHERS AT BEAM ELEMENT SPLICE POSTS AND AT INTERMEDIATE POSTS						
GUARDRAIL TYPE	POST	OFFSET BLOCK	POST BOLTS		SPLICE BOLTS (1 1/4" LONG) (NO. REQ'D)	WASHERS (ROUND) (NO. REQ'D)
			NO. REQ'D	LENGTH		
MGS-0	WOOD	N/A	1	9 1/2"	8	1
	STEEL	N/A	1	2"		1
MGS-OD	WOOD	N/A	1	9 1/2"	16	1
	STEEL	N/A	2	2"		1
MGS-8	WOOD	WOOD	1	18"	8	1
	STEEL	WOOD	1	9 1/2"		1
MGS-8D	WOOD	WOOD	1	*26 1/2"	16	—
	STEEL	WOOD	2	9 1/2"		2

MINIMUM POST BOLT THREAD LENGTH	
BOLT LENGTH	MINIMUM THREAD LENGTH
9 1/2"	1 3/4"
18"	2 1/2"
26 1/2"	3"

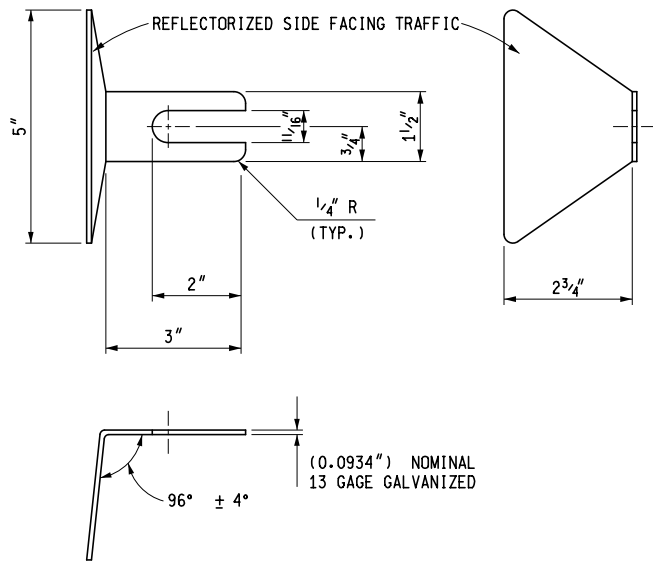
THREE BEAM TRANSITIONS REQUIRE 20 SPLICE BOLTS EACH (12 ON TYPE T END AND 8 ON TYPE MGS END).

* EXCEPT AS SPECIFIED ON DETAIL SHOWING TRANSITION FROM GUARDRAIL, TYPE MGS-8 (MGS-0) TO GUARDRAIL, TYPE MGS-8D (MGS-OD), POST BOLTS SHALL NOT EXTEND MORE THAN 1/2" BEYOND NUT.

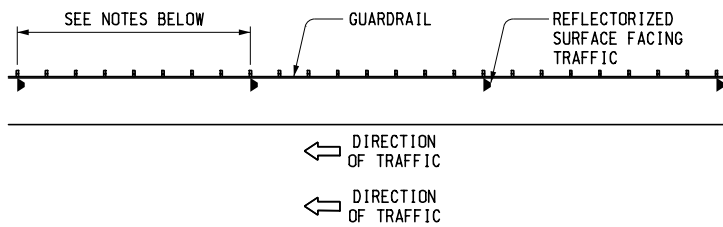
MICHIGAN DEPARTMENT OF TRANSPORTATION
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR

**GUARDRAIL,
 TYPES A, B, BD, T, TD,
 MGS-8, MGS-8D, MGS-0 & MGS-OD**

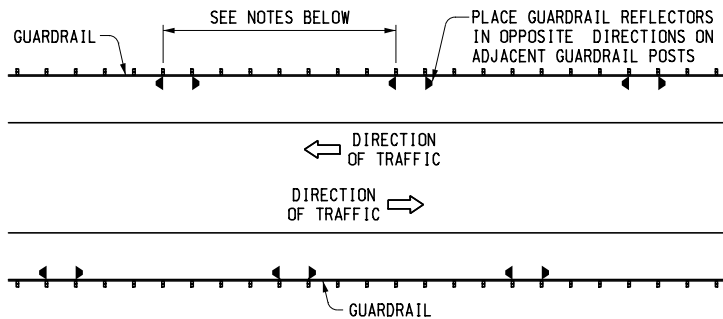
F.H.W.A. APPROVAL	2-1-2016 PLAN DATE	R-60-J	SHEET 15 OF 16
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GUARDRAIL REFLECTOR



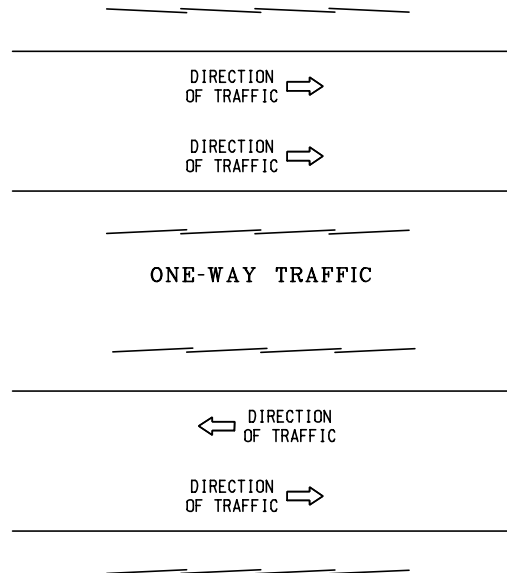
ONE-WAY TRAFFIC



TWO-WAY TRAFFIC

PLACEMENT OF GUARDRAIL REFLECTORS

NOTES GOVERNING THE USE OF GUARDRAIL REFLECTORS



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-61-SERIES, 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.

WHEN THE PLANS SPECIFY GUARDRAIL (TYPE B OR T) TO BE PLACED ON THE SHOULDER HINGE POINT, RATHER THAN AS SPECIFIED ON THIS PLAN, 8'-0" POSTS SHALL BE PROVIDED, WITH THE ADDITIONAL LENGTH EMBEDDED FOR ADDED STABILITY. (NOT NECESSARY WHEN THE SLOPE IS REASONABLY LEVEL BEYOND THE SHOULDER HINGE POINT, AS DETERMINED BY THE ENGINEER.)

WHEN THE PLANS SPECIFY GUARDRAIL (TYPE MGS-8 OR MGS-0) TO BE PLACED ON THE SHOULDER HINGE POINT, RATHER THAN AS SPECIFIED ON THIS PLAN, 9'-0" POSTS SHALL BE PROVIDED, WITH THE ADDITIONAL LENGTH EMBEDDED FOR ADDED STABILITY. (NOT NECESSARY WHEN THE SLOPE IS REASONABLY LEVEL BEYOND THE SHOULDER HINGE POINT, AS DETERMINED BY THE ENGINEER.)

WOOD POSTS WITH 1/2" 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 1/2" 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.

MICHIGAN DEPARTMENT OF TRANSPORTATION
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**GUARDRAIL,
TYPES A, B, BD, T, TD,
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F.H.W.A. APPROVAL

2-1-2016
PLAN DATE

R-60-J

SHEET
16 OF 16