Road & Bridge Design Publications

Special Update – July 2013

Revisions for this update are listed and displayed below. The new special detail will be included in projects submitted for the **September** letting as is stated on the special detail index sheets. Contact Wayne Pikka (pikkaw@michigan.gov) for questions related to these changes.

Special Details

R-110-A: Pavement Safety Edge: This is a new special detail covering the Pavement Safety Edge, which is a beveled pavement edge designed to reduce the severity of vehicle roadway departures and provide increased driver control for re-entering the pavement.

Road Design Manual

6.05.13: Safety Edge: This is a new section for the Pavement Safety Edge which provides details on location and inclusion in the plans.

Appendix 6A: Typical Freeway Cross Sections: Typicals were updated to include the Pavement Safety Edge. Also, several sketches were deleted since they pertained to reinforced concrete pavement.

Updates to MDOT Cell Library, Bridge Auto Draw Program, etc., may be required in tandem with some of this month's updates. Until such updates to automated tools 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

7-3-2013

⑥

SPECIAL DETAIL NUMBER	NUMBER OF SHEETS	TITLE	CURRENT DATE
21	2	GUARDRAIL AT INTERSECTIONS	5-24-01
24	5	GUARDRAIL ANCHORED IN BACK SLOPE TYPES 4B & 4T	7-22-02
99	2	CHAIN LINK FENCE WITH WIRE ROPE	11-1-00
* R-110-A	3	PAVEMENT SAFETY EDGE	6-21-13
R-126-I	5	PLACEMENT OF TEMPORARY BARRIER	3-26-12

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

Note: 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 Municipal Utilities Unit will provide these full sized special details for inclusion in construction plans for MDOT jobs. To assure prompt delivery, requests ***must*** be made in advance.

Former Standard Plans IV-93 and IV-94 series have been replaced with precast concrete box & three-sided culverts as per the 2012 Standard Specifications for Construction.

Index to Bridge Detail Sheets

7-3-2013

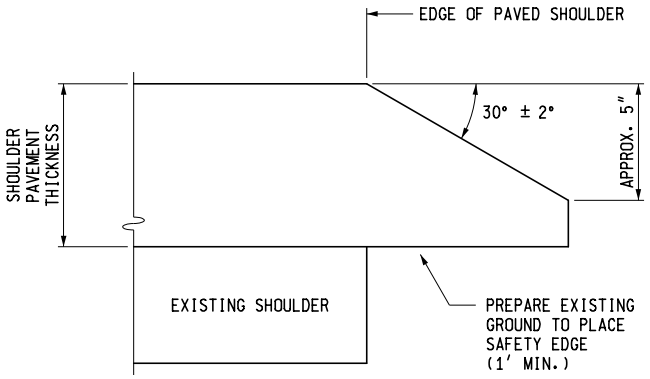
⑦

DETAIL NUMBER	NUMBER OF SHEETS	TITLE	CURRENT DATE
EJ3Z	1 or 2	EXPANSION JOINT DETAILS	6-8-11
EJ4M	1 or 2	EXPANSION JOINT DETAILS	6-8-11
PC-2G	1	70" PRESTRESSED CONCRETE I-BEAM DETAILS	3-31-06
PC-4E	1	PRESTRESSED CONCRETE 1800 BEAM DETAILS	3-31-06
PC-1L	1	PRESTRESSED CONCRETE I-BEAM DETAILS	7-12-06

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

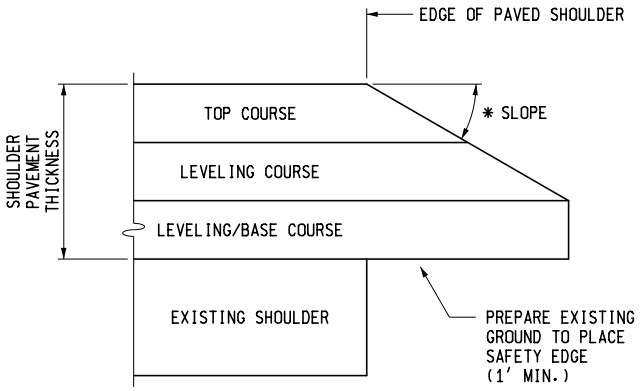
Note: Details EJ3Z & EJ4M are interactive, i.e. designers and detailers choose details based upon railing type and angle of crossing. Place all details appropriate for the project, structure specific information, and the Expansion Joint Device quantity on the sheet. The sheet shall then be added to the plans as a normal plan sheet.

Detail PC-1L, PC-2G and PC-4E 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.

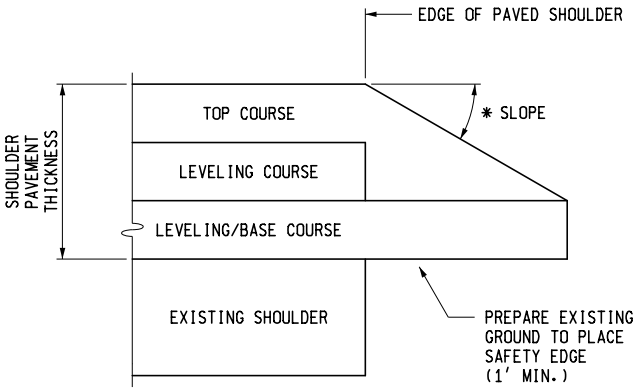


SAFETY EDGE FOR CONCRETE PAVEMENT

OVERLAY



CONFIGURATION 1 FOR
PAVEMENT THICKNESS GREATER THAN 5"



CONFIGURATION 2 FOR
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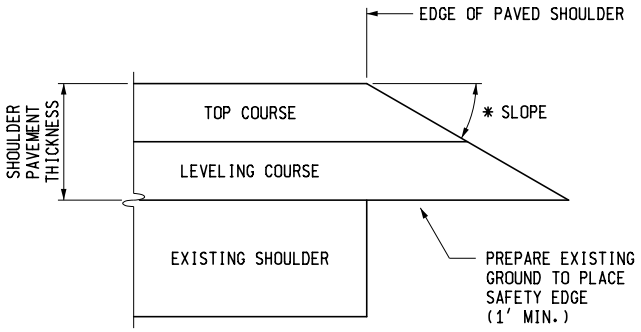

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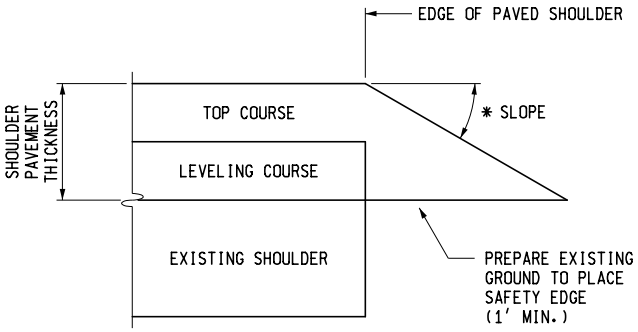


CONFIGURATION 2 FOR
PAVEMENT THICKNESS 5" OR LESS

* THE RANGE FOR SLOPE IS:
29° MINIMUM
30° DESIREABLE
40° MAXIMUM

SAFETY EDGE FOR HMA PAVEMENT

OVERLAY

MDOT Michigan Department of Transportation

PREPARED BY DESIGN DIVISION

DRAWN BY: B.L.T.

CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR
Kirk T. Steudle

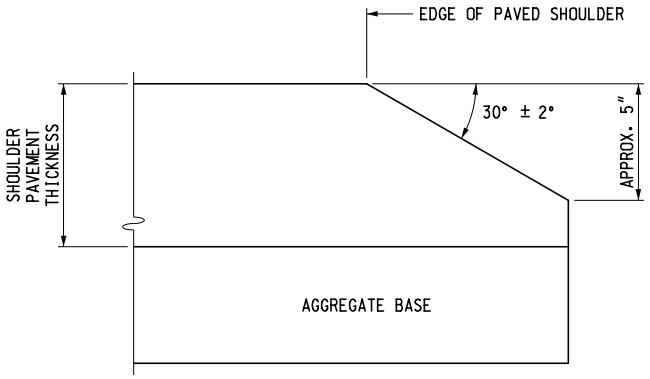
APPROVED BY: _____
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: _____
DIRECTOR, BUREAU OF HIGHWAY DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

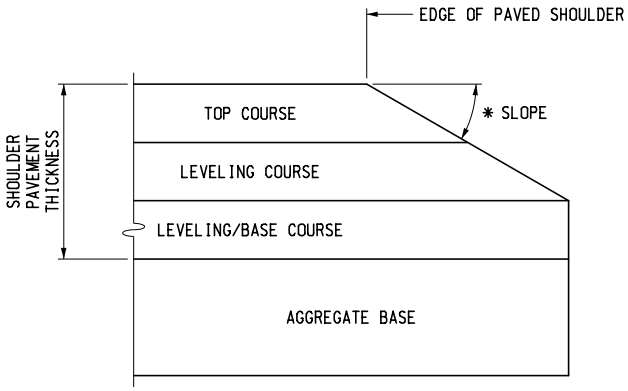
PAVEMENT SAFETY EDGE

F.H.W.A. APPROVAL	6-21-2013 PLAN DATE	R-110-A	SHEET 1 OF 3

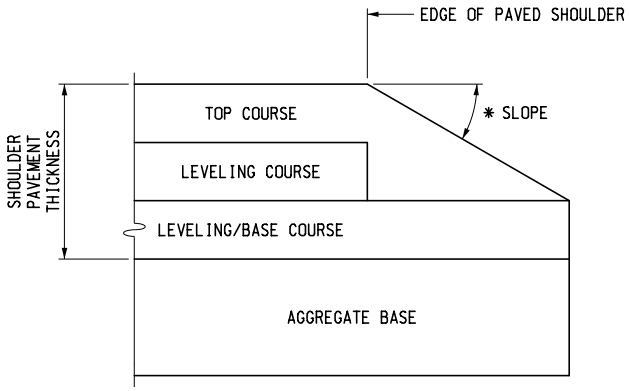


SAFETY EDGE FOR CONCRETE PAVEMENT

NEW CONSTRUCTION / RECONSTRUCTION



CONFIGURATION 1 FOR
PAVEMENT THICKNESS GREATER THAN 5"



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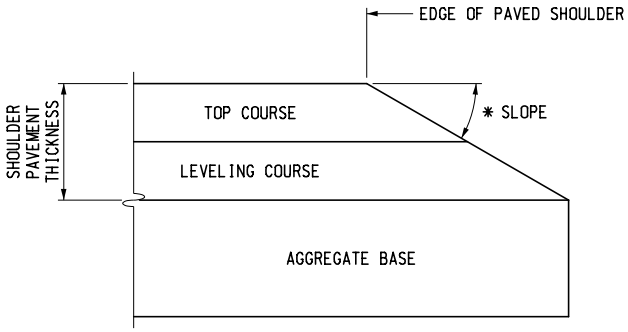
PAVEMENT THICKNESS GREATER THAN 5"



CONFIGURATION 1 FOR
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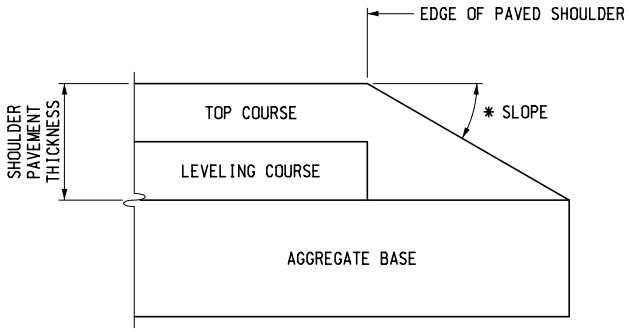


CONFIGURATION 2 FOR
PAVEMENT THICKNESS 5" OR LESS

* THE RANGE FOR SLOPE IS:
29° MINIMUM
30° DESIREABLE
40° MAXIMUM

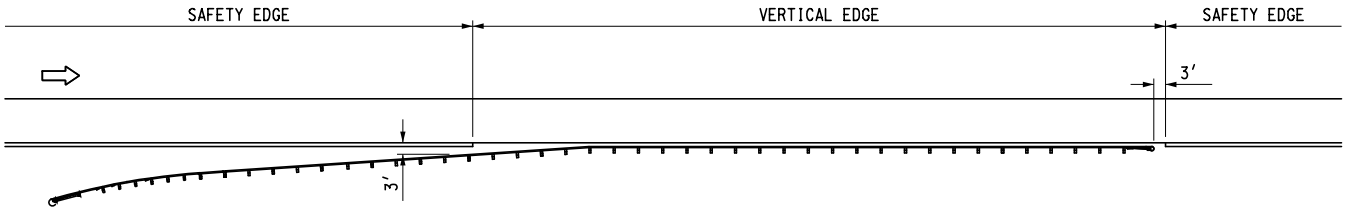
SAFETY EDGE FOR HMA PAVEMENT

NEW CONSTRUCTION / RECONSTRUCTION

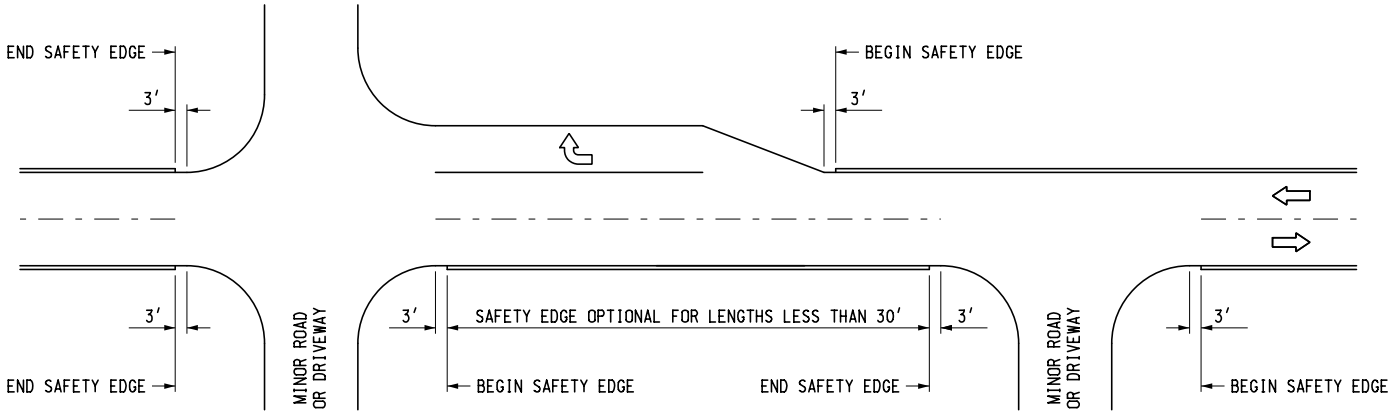
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

PAVEMENT SAFETY EDGE

F.H.W.A. APPROVAL	6-21-2013 PLAN DATE	R-110-A	SHEET 2 OF 3



SAFETY EDGE TREATMENT AT GUARDRAIL



SAFETY EDGE TREATMENT AT INTERSECTIONS AND DRIVEWAYS

NOTES:

WHEN CALLED FOR, SAFETY EDGE ON FREEWAY OUTSIDE SHOULDERS WILL END PRIOR TO RAMP SHOULDER TRANSITIONS AND CONTINUE WHERE FULL MAINLINE SHOULDER RESUMES.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

PAVEMENT SAFETY EDGE

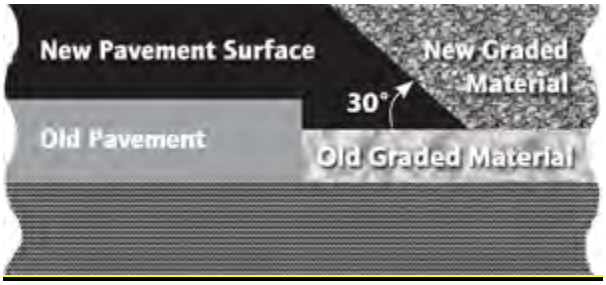
F.H.W.A. APPROVAL	6-21-2013 PLAN DATE	R-110-A	SHEET 3 OF 3

6.05.13 (added 7-3-2013)

Safety Edge

The safety edge is a beveled pavement edge designed to reduce the severity of vehicle roadway departures and provides increased driver control on re-entry.

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



The Safety Edge will be used on shoulders for the following conditions on all pavement types:

1. All temporary pavements will incorporate the Safety Edge including all permanent shoulders that will be used as temporary lanes with construction speeds of 45 mph or greater.

2. The Safety Edge should be omitted in those locations where the shoulder is separated by curb and gutter or valley gutter.

3. Freeway to freeway ramp shoulders that do not have shoulder corrugations will incorporate the Safety Edge. Regular freeway off and on ramps should not incorporate the Safety Edge.

4. Narrow freeway shoulders (4' paved or less.)

6.05.13 (continued)

5. Shoulders on all rural multi-lane and divided trunkline roadways where the posted speed is 45 mph or greater and there are no shoulder corrugations will use the Safety Edge.

6. If safety concerns are known then the Safety Edge can be considered for use on any roadway or ramp.

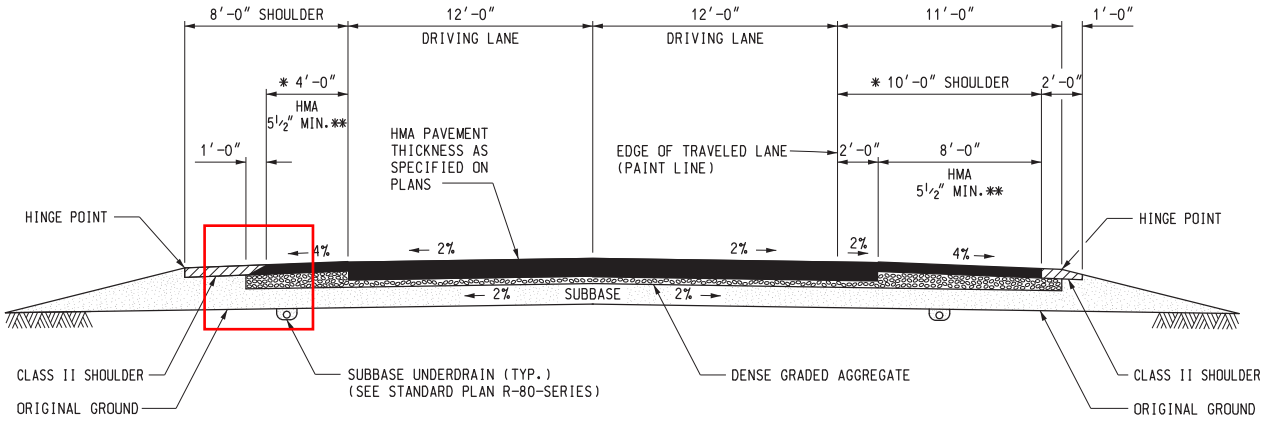
7. In developed rural areas where driveway density exceeds 30 access points within ½ mile, the Safety Edge may be omitted.

Details of the safety edge are shown on Standard Plan R-110-Series. Specifications require that the safety edge be constructed monolithically with the shoulder pavement and that there will be no separate payment for constructing it. Designers should provide additional concrete pay item quantities used for concrete shoulder to construct the safety edge adjacent to concrete shoulder.

The locations where the safety edge applies should be identified where appropriate on the typical cross sections or maintaining traffic details.

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

APPENDIX 6-A (revised 7-3-2013)

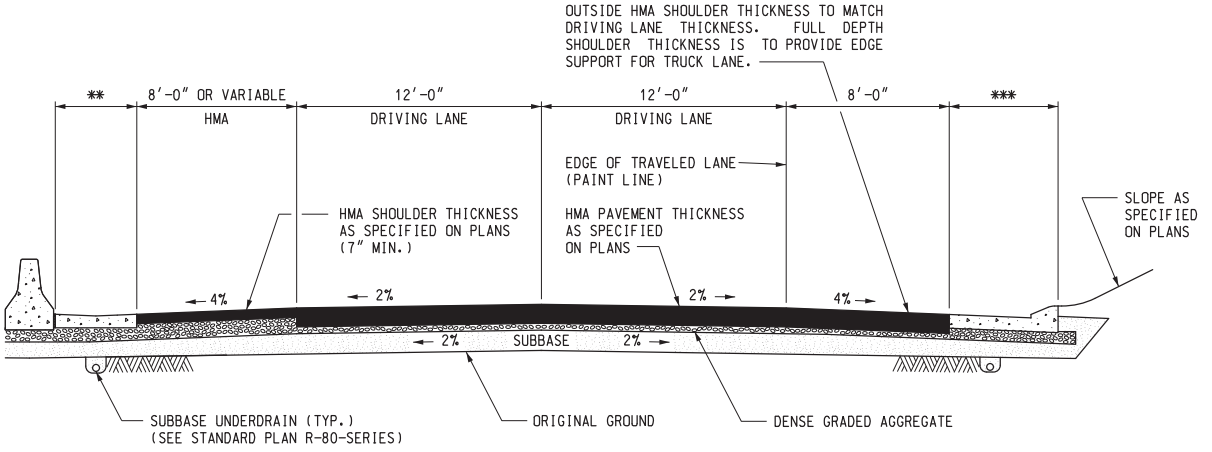


* RIGHT (OUTSIDE): CONSIDER 12′ PAVED SHOULDER WHERE TRUCK TRAFFIC EXCEEDS 250 DDHV.

* LEFT (MEDIAN): FOR THREE OR MORE DRIVING LANES, USE A 10′ PAVED SHOULDER SECTION. CONSIDER 12′ PAVED SHOULDER WHERE TRUCK TRAFFIC EXCEEDS 250 DDHV AND THREE OR MORE DRIVING LANES EXIST.

** SHOULDER THICKNESS DETERMINATION MUST ALSO FOLLOW OTHER DEPARTMENT GUIDELINES INCLUDING THE HMA MIXTURE AND SELECTION GUIDELINES.

RURAL FREEWAY WITH HMA PAVEMENT



** CONCRETE VALLEY GUTTER
(SEE STANDARD PLAN R-33-SERIES)

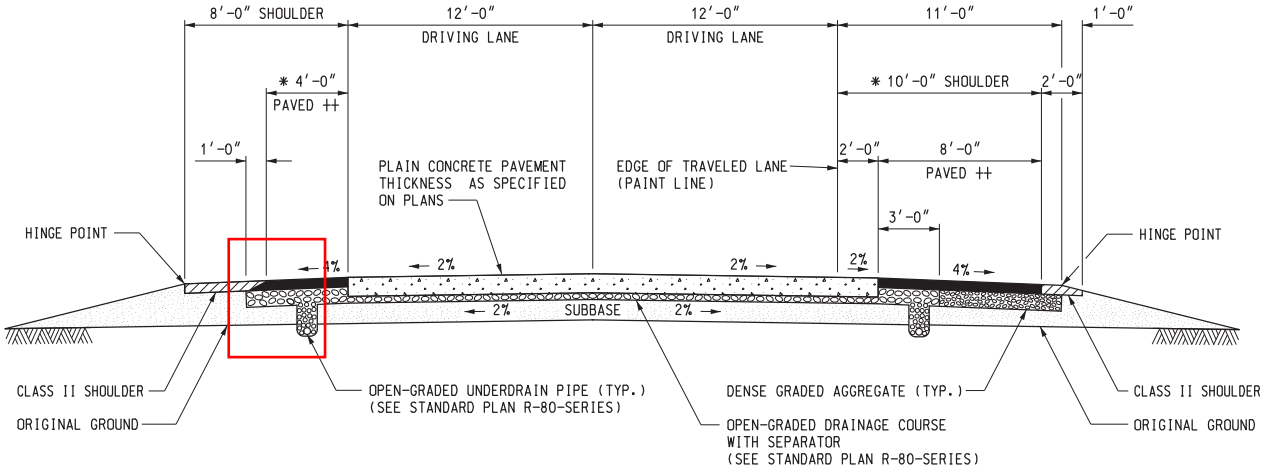
*** CONCRETE VALLEY GUTTER
OR URBAN FREEWAY CURB
(SEE STANDARD PLAN R-33-SERIES)

URBAN FREEWAY WITH HMA PAVEMENT

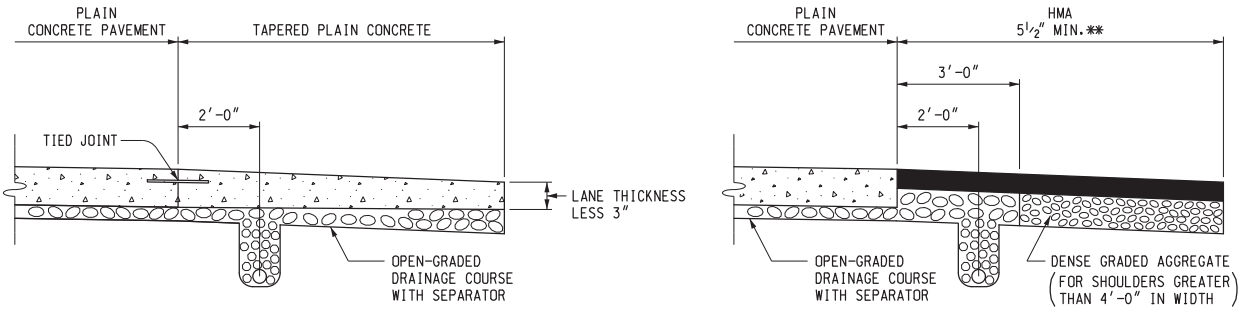
(SHOWN WITH CONCRETE MEDIAN BARRIER INSIDE AND URBAN FREEWAY CURB OUTSIDE)

MICHIGAN DESIGN MANUAL
ROAD DESIGN

APPENDIX 6-A



RURAL FREEWAY WITH PLAIN CONCRETE PAVEMENT



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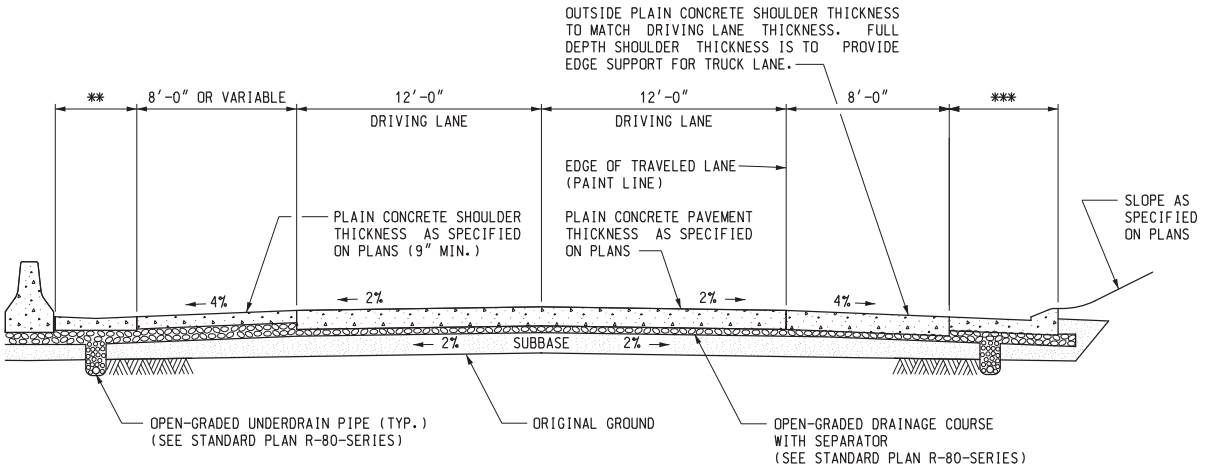
FREEWAY SHOULDER OPTIONS

(OUTSIDE SHOULDER ILLUSTRATED)

++ FREEWAY SHOULDERS CAN BE HMA OR PLAIN CONCRETE AT THE CONTRACTOR'S OPTION



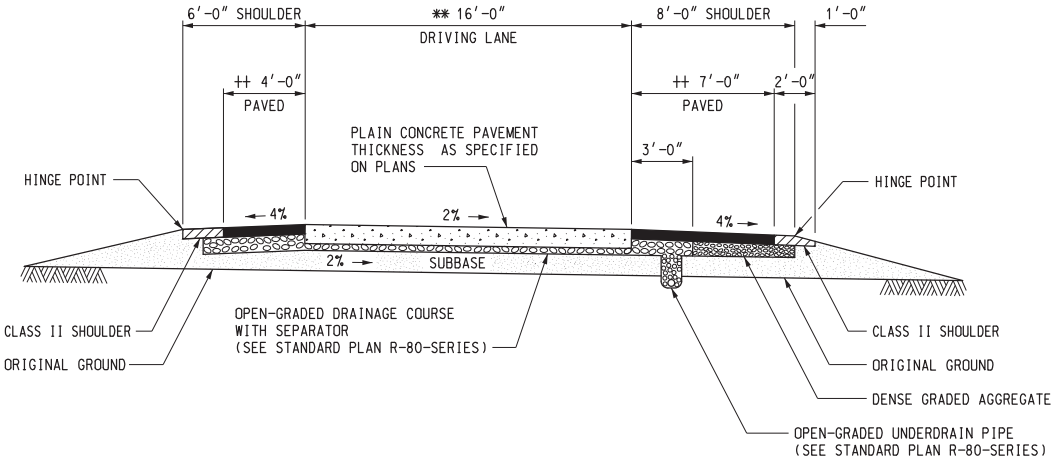
** CONCRETE VALLEY GUTTER
(SEE STANDARD PLAN R-33-SERIES)

*** CONCRETE VALLEY GUTTER
OR URBAN FREEWAY CURB
(SEE STANDARD PLAN R-33-SERIES)

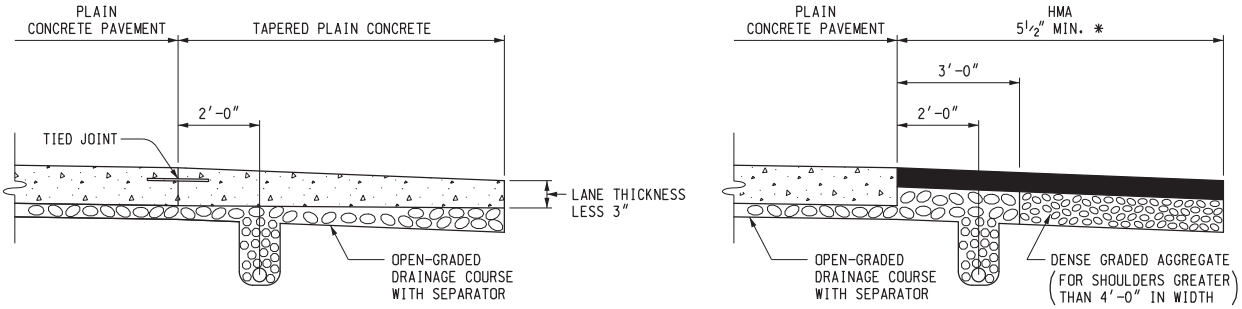
URBAN FREEWAY WITH PLAIN CONCRETE PAVEMENT

(SHOWN WITH CONCRETE MEDIAN BARRIER INSIDE AND URBAN FREEWAY CURB OUTSIDE)

APPENDIX 6-A



RAMP WITH PLAIN CONCRETE PAVEMENT
(RURAL AND URBAN)

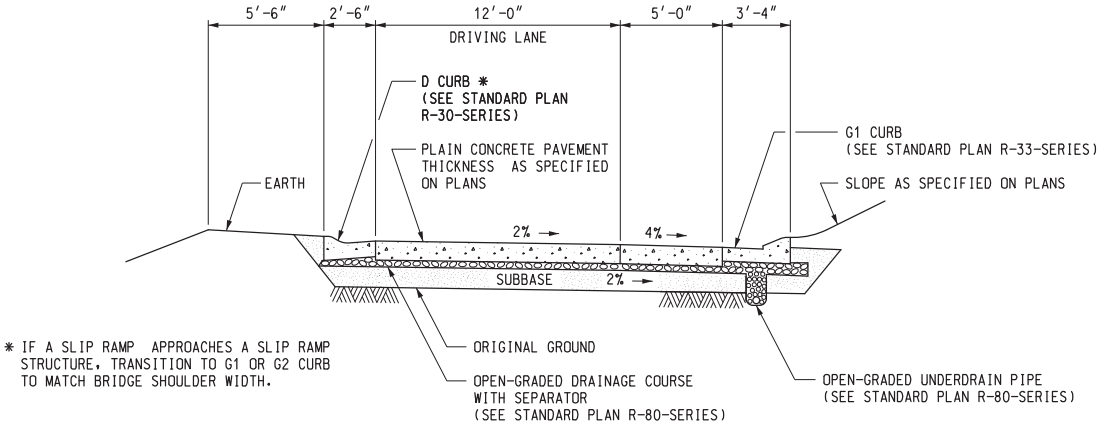


* SHOULDER THICKNESS DETERMINATION MUST ALSO FOLLOW OTHER DEPARTMENT GUIDELINES INCLUDING THE HMA MIXTURE AND SELECTION GUIDELINES

** FOR LOCATION OF LONGITUDINAL JOINT, SEE STANDARD PLAN R-42-SERIES

FREEWAY SHOULDER OPTIONS
(OUTSIDE SHOULDER ILLUSTRATED)

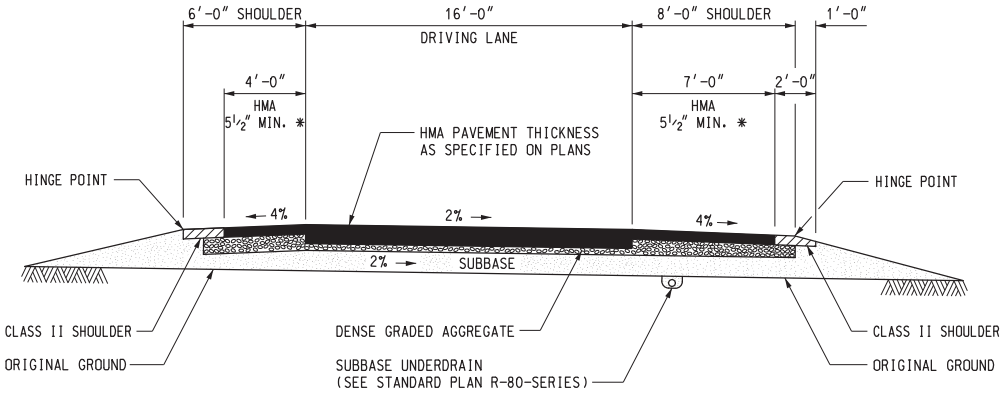
++ FREEWAY SHOULDERS CAN BE HMA OR PLAIN CONCRETE AT THE CONTRACTOR'S OPTION



URBAN SLIP RAMP WITH PLAIN CONCRETE PAVEMENT

MICHIGAN DESIGN MANUAL
ROAD DESIGN

APPENDIX 6-A



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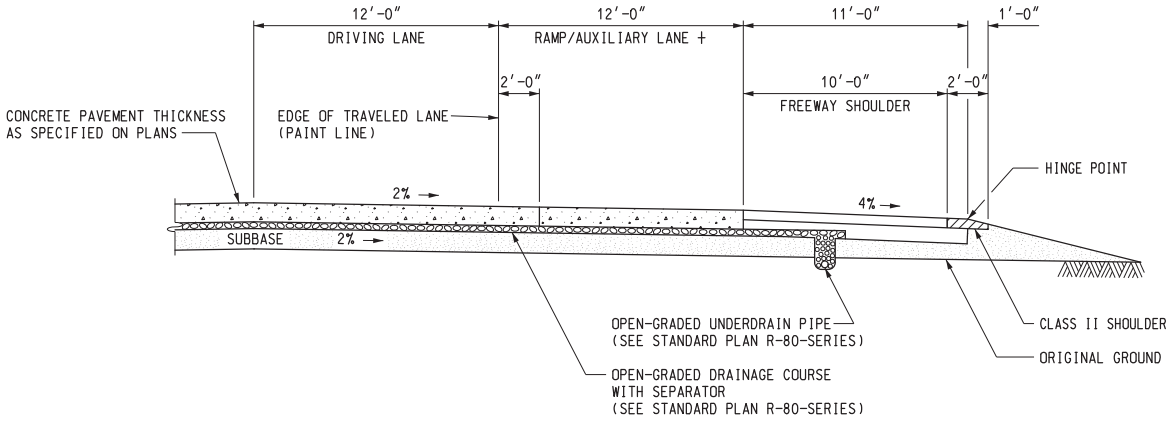
RAMP WITH HMA PAVEMENT
(RURAL AND URBAN)



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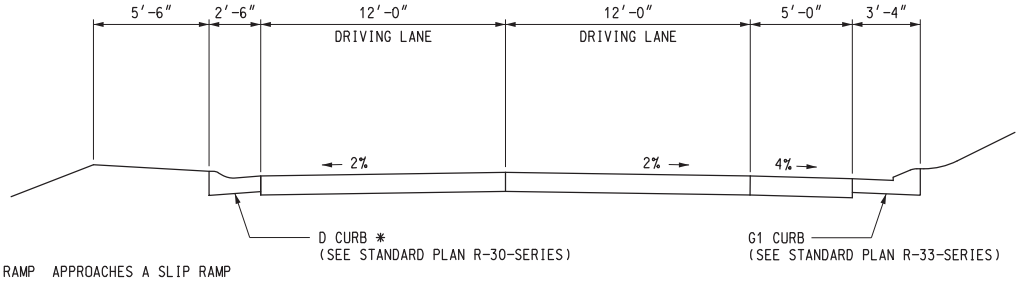
* LEFT (MEDIAN): FOR THREE OR MORE DRIVING LANES, USE A 10′ PAVED SHOULDER SECTION. CONSIDER 12′ PAVED SHOULDER WHERE TRUCK TRAFFIC EXCEEDS 250 DDHV AND THREE OR MORE DRIVING LANES EXIST.

** SHOULDER THICKNESS DETERMINATION MUST ALSO FOLLOW OTHER DEPARTMENT GUIDELINES INCLUDING THE HMA MIXTURE AND SELECTION GUIDELINES.

RURAL FREEWAY WITH PLAIN CONCRETE PAVEMENT AND RAMP/AUXILIARY LANE

+ RAMP/AUXILIARY (ACCELERATION / DECELERATION) LANES ARE DESIGNED ACCORDING TO THE DEPARTMENT'S GEOMETRIC DESIGN GUIDES. THE RIGHT EDGE OF THE FREEWAY DRIVING LANE IS CONSIDERED TO BE THE EDGE OF TRAVELED LANE (PAINT LINE) WHEN REFERRING TO THE GEOMETRIC DESIGN GUIDELINES.

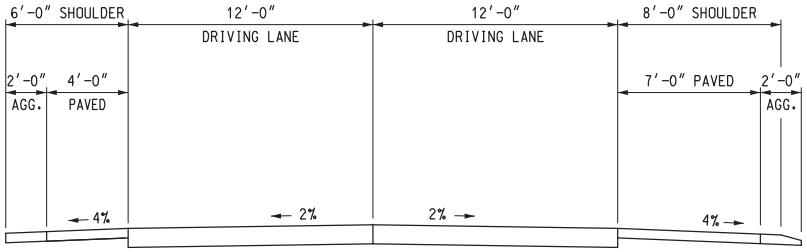
APPENDIX 6-A



* IF A SLIP RAMP APPROACHES A SLIP RAMP STRUCTURE, TRANSITION TO G1 OR G2 CURB TO MATCH BRIDGE SHOULDER WIDTH.

DIMENSIONS FOR A TWO LANE SLIP RAMP

(SEE SINGLE LANE SLIP RAMP DRAWING OF APPROPRIATE PAVEMENT TYPE FOR OTHER DETAILS)



DIMENSIONS FOR A TWO LANE RAMP
(RURAL AND URBAN)

(SEE SINGLE LANE RAMP DRAWING OF APPROPRIATE PAVEMENT TYPE FOR OTHER DETAILS)

NOTES:

THIS GUIDE FOR FREEWAYS SETS GUIDELINES FOR FREEWAY CROSS SECTIONS. THE ACTUAL DESIGN AND MATERIAL USED TO CONSTRUCT THE COMPLETE ROADWAY SECTION WILL BE ACCORDING TO THE PLANS AND CURRENT SPECIFICATIONS.

SEE STANDARD PLAN R-107-SERIES FOR SHOULDER SLOPES.

SHOULDER CORRUGATION CROSS-SECTIONS AND LOCATION SHALL BE AS DETAILED ON STANDARD PLAN R-112-SERIES.

FOR URBAN ROADWAYS, IF THE CURB & GUTTER IS RESTRAINED ON THE OUTSIDE BY A RETAINING WALL, ABUTMENT, OR SLOPE PAVING HEADER, PLACE A 1″ EXPANSION JOINT FILLER BETWEEN THE CURB & GUTTER OR VALLEY GUTTER AND THE STRUCTURE. SEE STANDARD PLAN R-33-SERIES.

WHEN CONCRETE SHOULDERS ARE CAST SEPARATELY FROM MAINLINE CONCRETE PAVEMENT, A KEYWAY MAY BE USED TO FACILITATE THE PLACING OF LANE TIES. WHEN A KEYWAY GROOVE IS USED, IT SHALL BE CONTINUOUS AND UNIFORM.

THE LOCATION OF TRANSVERSE JOINTS IN CONCRETE SHOULDERS SHALL MATCH THE LOCATION OF ADJACENT TRANSVERSE PAVEMENT JOINTS.

CORRESPONDING TRANSVERSE JOINTS IN PLAIN CONCRETE SHOULDERS TIED TO PLAIN CONCRETE PAVEMENT SHALL BE (C3p) SHOULDER WITH (Cp) PAVEMENT, (C4) SHOULDER WITH (C2) PAVEMENT, (E4) SHOULDER WITH (E2) PAVEMENT, AND (E3) BEING THE SAME IN BOTH SHOULDER AND PAVEMENT.

SEE STANDARD PLAN R-39-SERIES FOR DETAILS OF TRANSVERSE PAVEMENT JOINTS.

ALL CONCRETE SHOULDER SLABS ADJACENT TO BRIDGE STRUCTURES SHALL BE REINFORCED AS SPECIFIED ON STANDARD PLAN R-45-SERIES.