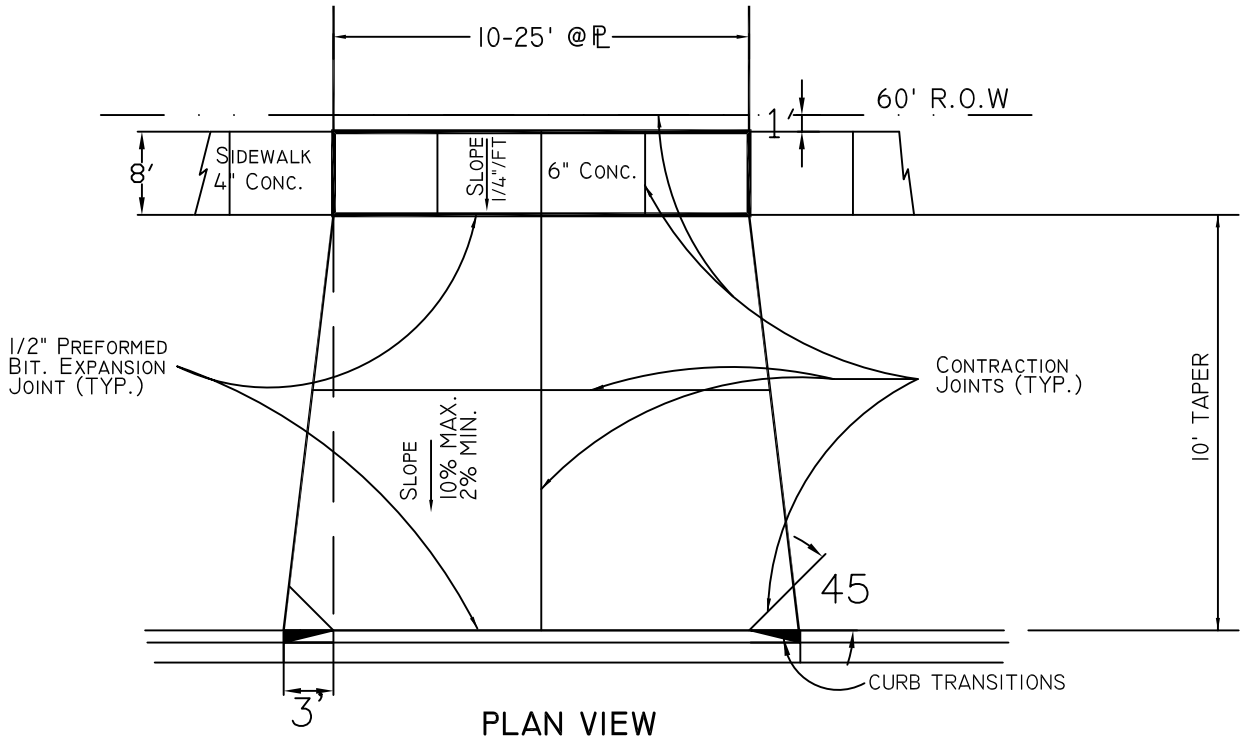
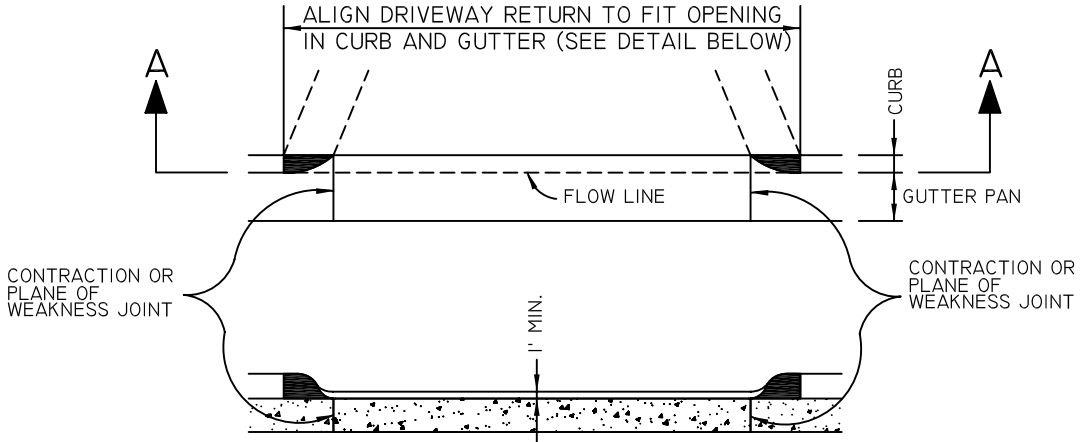
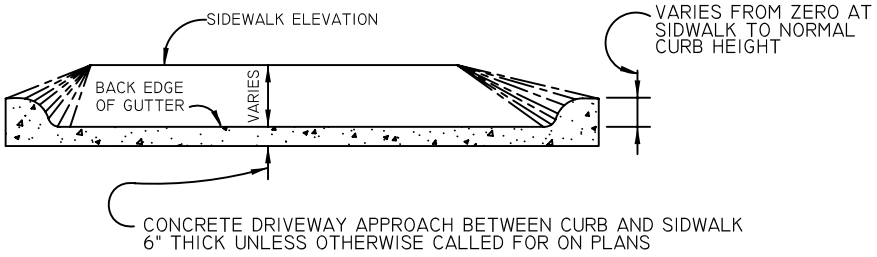


PLAN VIEW



SECTION A-A

CONCRETE DRIVEWAY OPENING - DETAIL



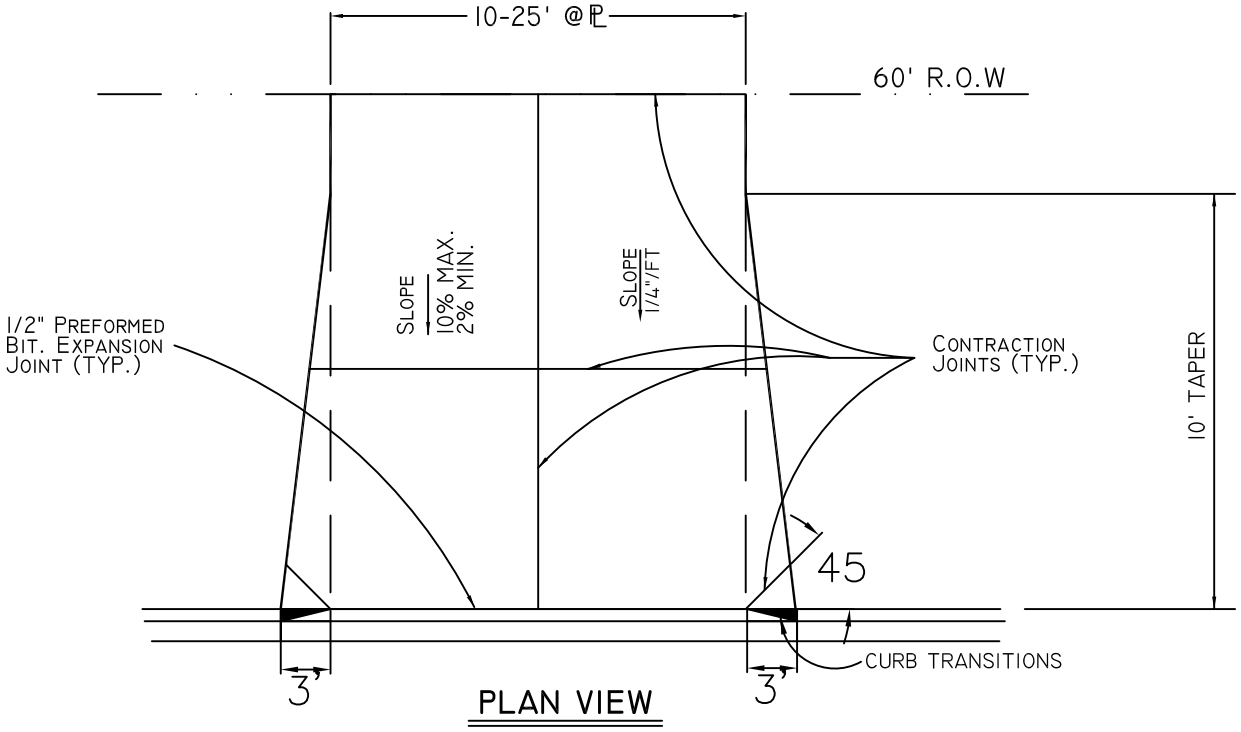
FRONT VIEW - DRIVEWAY

NOTES:

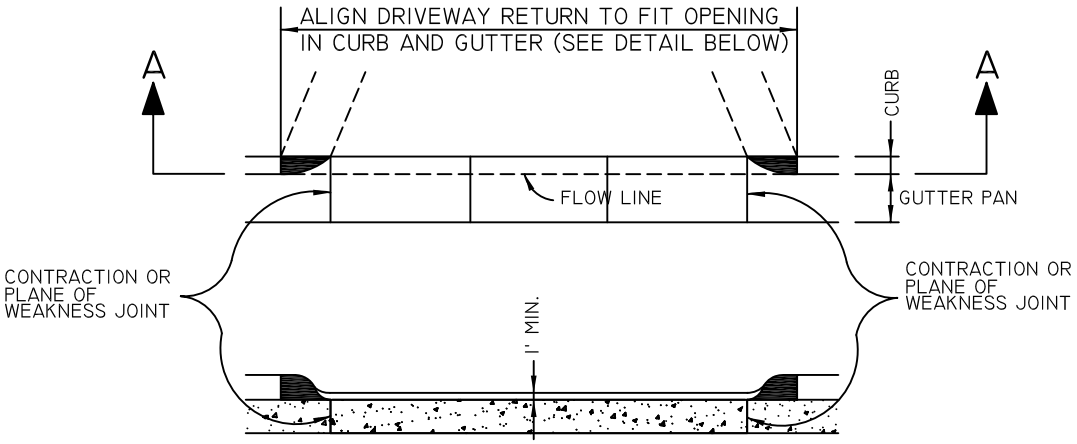
REINFORCEMENT IS NOT REQUIRED UNLESS SPECIFIED ON THE PLANS.
WHEN AREA BETWEEN CURB AND GUTTER AND PROPERTY LINE IS MORE THAN 300 SQ. FT., CAST DRIVEWAY APPROACH IN TWO OR MORE POURS.

I:\ENG\TRAF\DWG\DETAILS\ROADS\DRV APPRCH RES-WITH SDWLK.DWG

CITY OF ROCHESTER HILLS STANDARD DETAIL FOR: Residential Sidewalk/Driveway Opening & Approach				ROCHESTER HILLS MICHIGAN
DRAWN BY: M. RADULSKI	FILE NAME: DRVAPRCH	PLAN DATE: 1/15/99	REV. 4/12/2012	REV.
APPROVED BY: PAUL SHUMEJKO CITY TRAFFIC ENGINEER		NOT TO SCALE		SHEET 1 OF 1

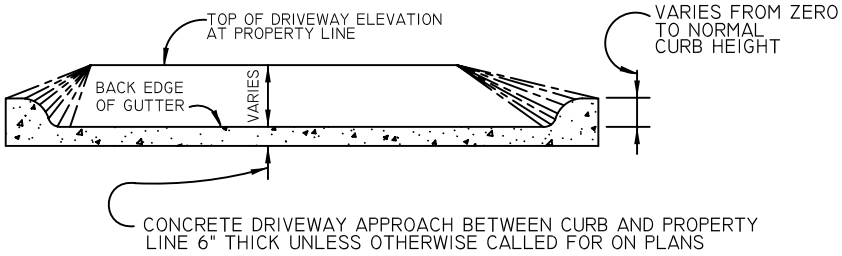


PLAN VIEW



SECTION A-A

CONCRETE DRIVEWAY OPENING - DETAIL



FRONT VIEW - DRIVEWAY

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CITY OF ROCHESTER HILLS

STANDARD DETAIL FOR:

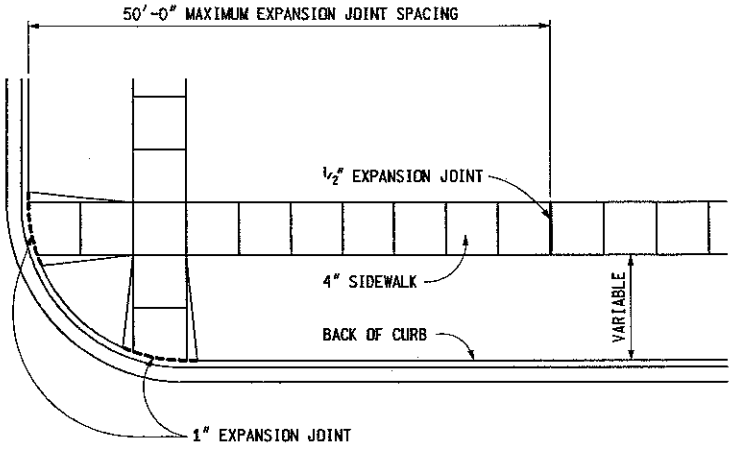
Residential Driveway Opening & Approach

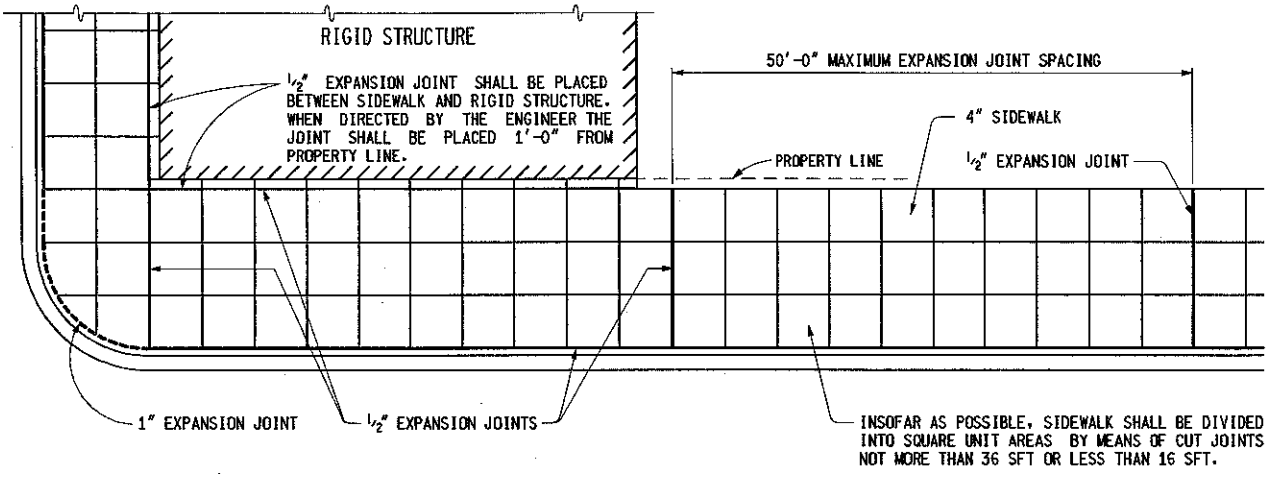
ROCHESTER HILLS MICHIGAN

DRAWN BY:	FILE NAME:	PLAN DATE:	REV.	REV.
M. RADULSKI	DRVAPRCH RES NO SDWLK	1/15/99		

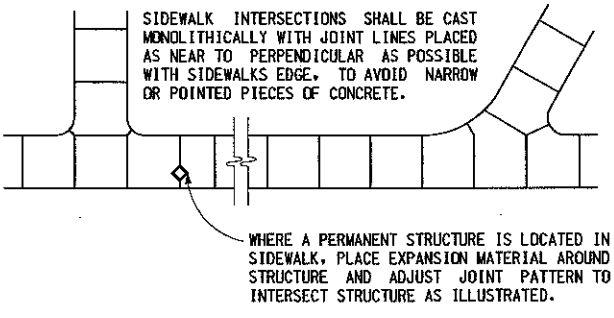
APPROVED BY:		SHEET
PAUL SHUMEJKO, P.E., PTOE CITY TRAFFIC ENGINEER	NOT TO SCALE	1 OF 1

I:\ENG\TRAF\DWG\DETAILS\DRVAPRCH-RES-NO SDWLK

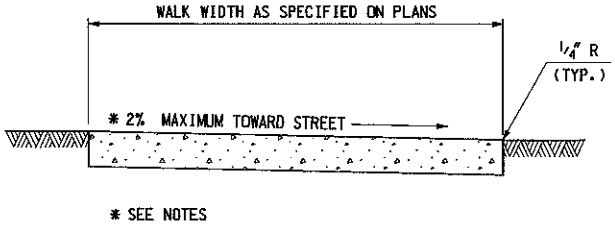




LOCATION OF JOINTS IN CONCRETE SIDEWALK



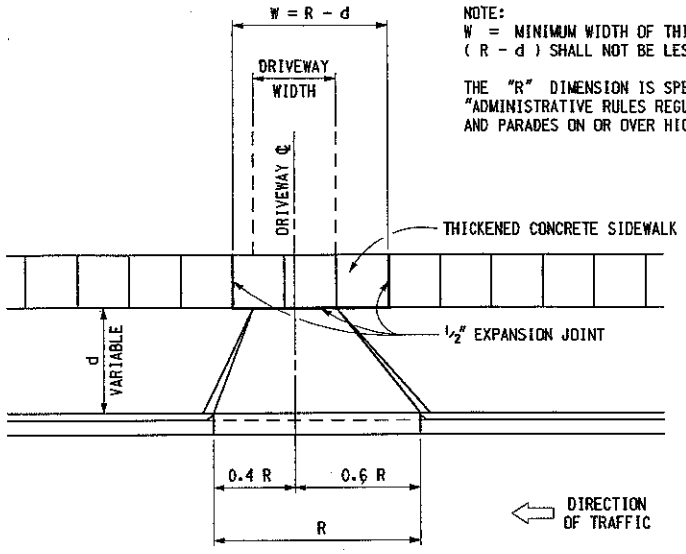
TYPICAL SIDEWALK JOINT LAYOUTS



4" CONCRETE SIDEWALK

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: John C Friend ENGINEER OF DELIVERY APPROVED BY: John W. Pickel ENGINEER OF DEVELOPMENT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK		
		4-26-2007 F.H.W.A. APPROVAL	2-28-2007 PLAN DATE	R-29-E	SHEET 1 OF 4

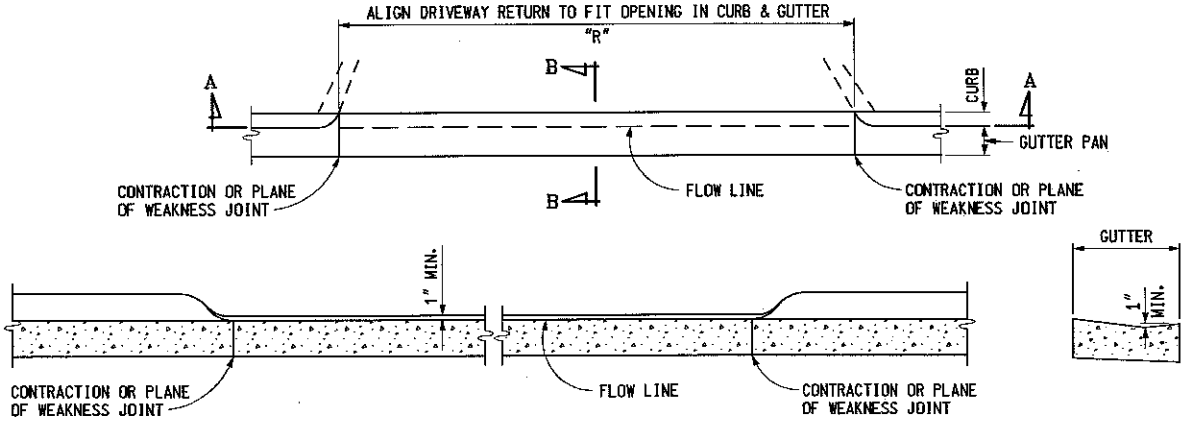
NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL SIGNED COPY APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



NOTE:
W = MINIMUM WIDTH OF THICKENED CONCRETE SIDEWALK.
(R - d) SHALL NOT BE LESS THAN DRIVEWAY WIDTH.

THE "R" DIMENSION IS SPECIFIED IN THE PUBLICATION "ADMINISTRATIVE RULES REGULATING DRIVEWAYS, BANNERS AND PARADES ON OR OVER HIGHWAYS".

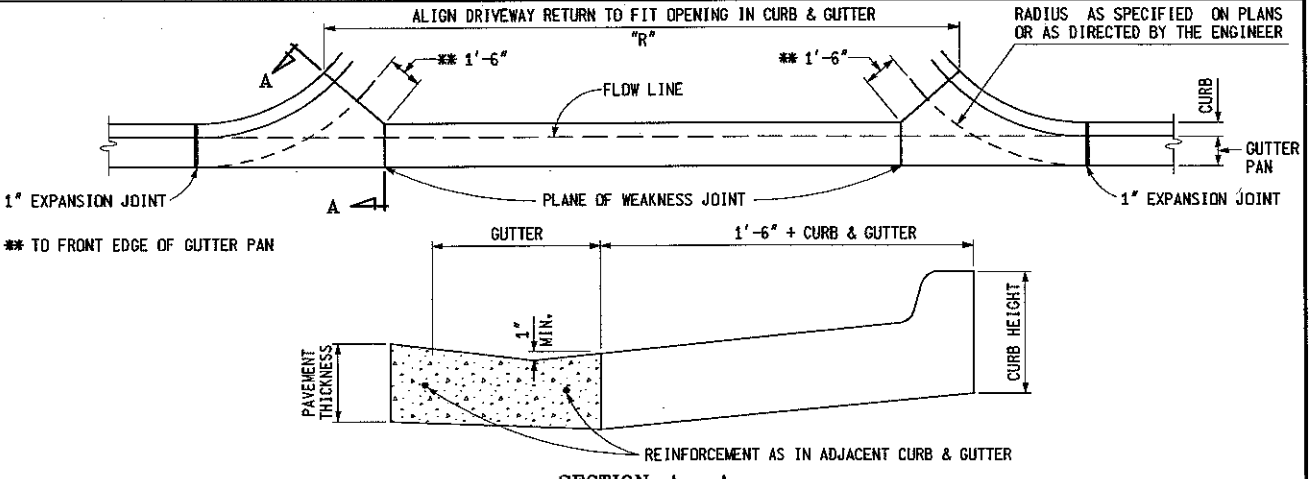
CONCRETE DRIVEWAY OPENING LAYOUT



SECTION A - A

SECTION B - B

CONCRETE DRIVEWAY OPENING, DETAIL L



** TO FRONT EDGE OF GUTTER PAN

SECTION A - A

CONCRETE DRIVEWAY OPENING, DETAIL M

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK

4-26-2007	2-28-2007	R-29-E	SHEET
F.H.W.A. APPROVAL	PLAN DATE		2 OF 4

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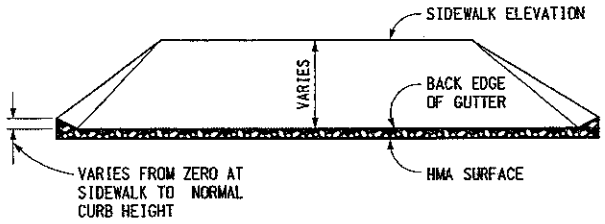
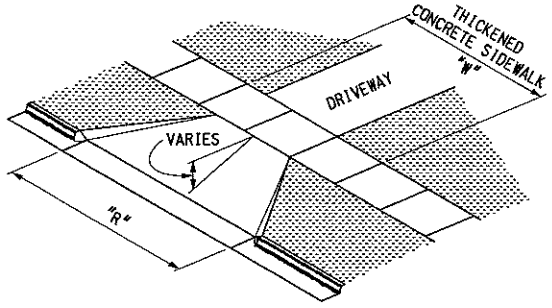
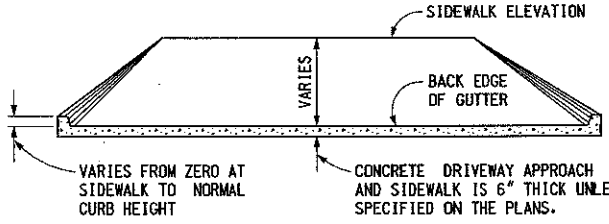
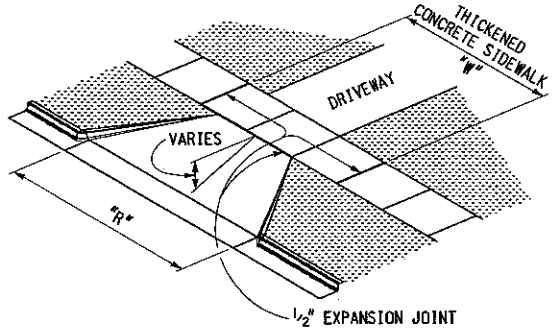




HMA DRIVEWAY APPROACH

(TO BE USED WITH DETAIL L)





NOTES:

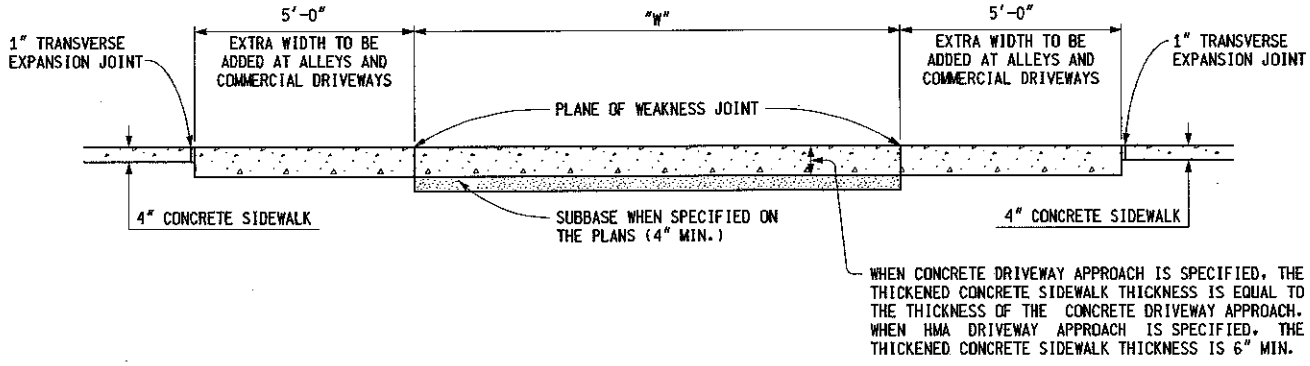
MONOLITHIC CURB IS INCLUDED IN THE CONCRETE DRIVEWAY APPROACH QUANTITY.

REINFORCEMENT IS NOT REQUIRED UNLESS SPECIFIED ON THE PLANS. WHEN REINFORCEMENT IS SPECIFIED, SEE CHART ON THIS SHEET.

WHEN AREA BETWEEN CURB & GUTTER AND SIDEWALK IS MORE THAN 300 SFT, PLACE A CONTRACTION JOINT IN LINE WITH CENTERLINE OF DRIVEWAY AND PERPENDICULAR TO ROADWAY.

CONCRETE DRIVEWAY APPROACH

(TO BE USED WITH DETAIL L OR M)



THICKENED CONCRETE SIDEWALK

REINFORCEMENT FOR CONCRETE DRIVEWAYS		
CONCRETE DRIVEWAY THICKNESS	WIRE SIZE (6" x 6" MESH)	AVERAGE WEIGHT (LBS/SFT)
LESS THAN 8"	W1.4	21
	W2.9	42
8" OR GREATER	USE WIRE FABRIC REINFORCEMENT SPECIFIED ON STANDARD PLAN R-45-SERIES	

MICHIGAN DEPARTMENT OF TRANSPORTATION

BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK

4-26-2007 F.H.W.A. APPROVAL	2-28-2007 PLAN DATE	R-29-E	SHEET 3 OF 4

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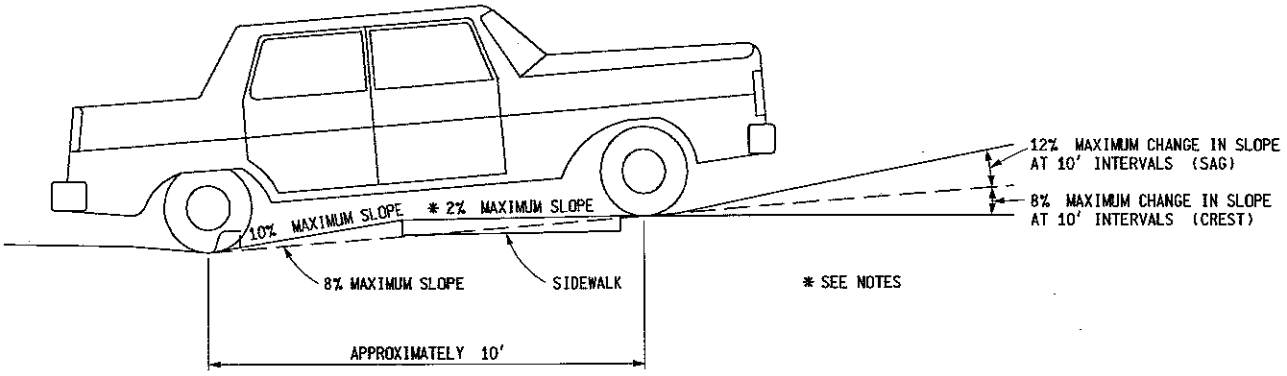
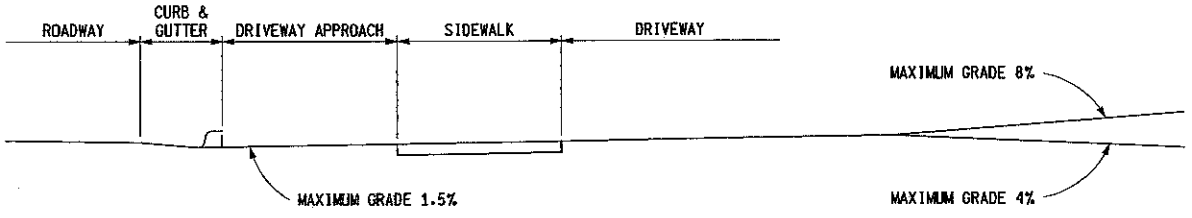


LOW VOLUME COMMERCIAL OR RESIDENTIAL DRIVEWAY SLOPES



COMMERCIAL DRIVEWAY PROFILE FOR MAJOR TRAFFIC GENERATORS

NOTES:

FOR DRIVEWAY DESIGN REFER ALSO TO "ADMINISTRATIVE RULES REGULATING DRIVEWAYS, BANNERS, AND PARADES ON OR OVER HIGHWAYS" AND GEOMETRIC DESIGN G-680-SERIES, COMMERCIAL DRIVEWAYS.

FOR CURB AND GUTTER DETAILS, SEE STANDARD PLAN R-30-SERIES.

TRANSVERSE SIDEWALK SLOPES ARE TYPICALLY 1.5% OR 2% MAXIMUM. IN ORDER TO MEET SITE CONDITIONS, IF THE TRANSVERSE SLOPE IS REQUIRED TO BE LESS THAN 1.5%, LONGITUDINAL DRAINAGE MUST BE PROVIDED.

WHEN SETTING GRADES FOR COMMERCIAL DRIVES, THE TYPES OF VEHICLES USING THE DRIVE SHOULD BE CONSIDERED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK

4-26-2007	2-28-2007	R-29-E	SHEET
F.H.W.A. APPROVAL	PLAN DATE		4 OF 4

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CITY OF ROCHESTER HILLS

ENGINEERING DESIGN STANDARDS

CHAPTER 8

Driveway Approaches and Drainage Ditches

A. Plans and Specifications – Submittal Procedure

1. The plans and specifications shall be prepared in accordance with Chapter 1, *General Requirements and Submittals*.

B. Requirements for Residential Driveway Approaches

1. Pavement cross-sections shall conform to the following requirements:

   a. Concrete driveway approaches shall be six inches (6") 3,500 psi concrete over four inches (4") 21AA aggregate base coarse materials (crushed limestone or crushed concrete). Alternate recycled asphalt product (RAP) base course materials may be considered upon approval of the City Engineer. Alternate RAP materials must meet equivalent structural strength of 21AA aggregate (crushed limestone or concrete).

   b. Asphalt driveway approaches shall be six inches (6") hot mix asphalt (HMA) over four inches (4") 21AA aggregate base coarse materials (crushed limestone or crushed concrete). Alternate recycled asphalt product (RAP) base course materials may be considered upon approval of the City Engineer. Alternate RAP materials must meet equivalent structural strength of 21AA aggregate (crushed limestone or concrete). The cross-section shall consist of two inches (2") HMA 13A wearing course over four inches (4") HMA 3C leveling course (two (2) two inch (2") lifts.

2. Driveway approach dimensions shall conform to the following requirements:

Garage Size	Approach Width At ROW	Local/Collector Approach Width at Street	Flare Width	Major Street Approach Width at Street	**Radius**
1 Car	12 Ft	18 Ft	3 Ft	32 Ft	10 Ft
	13 Ft	19 Ft	3 Ft	33 Ft	10 Ft
	14 Ft	20 Ft	3 Ft	34 Ft	10 Ft
	15 Ft	21 Ft	3 Ft	35 Ft	10 Ft
2 or More Cars	16 Ft	22 Ft	3 Ft	36 Ft	5 Ft to 10 Ft
	18 Ft	24 Ft	3 Ft	36 Ft	5 Ft to 10 Ft
	20 Ft	25 Ft	2.5 Ft	36 Ft	5 Ft to 10 Ft
	22 Ft	25 Ft	1.5 Ft	36 Ft	5 Ft to 10 Ft
	24 Ft	25 Ft	0.5 Ft	36 Ft	5 Ft to 10 Ft
	25 Ft	25 Ft	0.0 Ft	36 Ft	5 Ft to 10 Ft

3. Circular Driveways

   a. The property shall have a minimum of eighty feet (80') of road frontage.

   b. The minimum spacing between driveway approaches shall be forty-five feet (45') from centerline to centerline.

   c. Entering driveway approach angle from street shall be ninety degrees (90°).

4. Proposed driveways shall be shown with grades called out at the house and at the street. Driveway slopes shall be shown in percent (%). The minimum allowable slope is two percent (2%) with maximum allowable slopes of eight percent (8%) along roads with posted speed limits of 40 MPH or greater and ten percent (10%) along roads with a posted speed limit of 35 MPH or less. Note: driveway slopes shall not exceed two percent (2%) through the portion of the driveway that is to be utilized for existing and/or proposed pedestrian facilities, i.e., pathways and sidewalks, in order to meet American with Disabilities Act (ADA) requirements.

5. Additional requirements shall be in accordance with the City Standard Details.

C. <u>Requirements for Commercial Driveway Approaches</u>

1. Pavement cross-sections shall conform to the following requirements:

   a. Concrete driveway approaches shall be eight inches (8") 3,500 psi concrete over four inches (4") 21AA aggregate base coarse materials (crushed limestone or crushed concrete). Alternate recycled asphalt product (RAP) base course materials may be considered upon approval of the City Engineer. Alternate RAP materials must meet equivalent structural strength of 21AA aggregate (crushed limestone or concrete).

   b. Asphalt driveway approaches shall be nine inches (9") hot mix asphalt (HMA) over six inches (6") 21AA aggregate base coarse materials (crushed limestone or crushed concrete). Alternate recycled asphalt product (RAP) base course materials may be considered upon approval of the City Engineer. Alternate RAP materials must meet equivalent structural strength of 21AA aggregate (crushed limestone or concrete). The cross-section shall consist of two inches (2") HMA 13A wearing course over two inches (2") HMA 3C leveling course over five inches (5") HMA base course two (2) two inch (2") lifts.

2. Driveway locations and geometrics shall at a minimum meet the Road Commission for Oakland County (RCOC) *Permit Rules, Specifications & Guidelines*, Michigan Department of Transportation (MDOT) *Administrative Rules Regulating Driveways Banners & Parades,* and MDOT *Access Management Guidebook.* City requirements may exceed those of RCOC and MDOT.

3. Driveway grades shall not exceed six percent (6%) within the right-of-way. Note: driveway slopes shall not exceed two percent (2%) through the portion of the driveway that is to be utilized for existing and/or proposed pedestrian facilities, i.e., pathways and sidewalks, in order to meet American with Disabilities Act (ADA) requirements.

4. Additional requirements shall be in accordance with the City Standard Details.

D. Drive Culverts and Drainage Ditches

1. Drive culverts shall meet the following requirements:

   a. Minimum of twelve inches (12") in diameter.

   b. Material shall be sixteen (16) Gauge Galvanized Corrugated Metal Pipe (CMP).

   c. A minimum of one foot (1') of cover must be provided between top of culvert pipe and top of driveway pavement.

   d. The culvert shall extend a minimum of three feet (3') beyond driveway width and shall meet the minimum side slopes of 1 on 2 for local streets, and 1 on 3 for major roads.

2. Ditches shall meet the following requirements:

   a. The maximum ditch depth shall be two feet (2') from bottom of centerline of ditch to top of road pavement.

   b. The maximum roadside ditch slope shall be 1 on 4.

   c. The maximum property side ditch slope shall be 1 on 3.

3. Ditch-enclosures shall meet the following requirements:

   a. The minimum depth required for enclosure is two and a half feet (2.5') from the top of road pavement to bottom of ditch centerline.