### City of Rochester Hills

**Standard Detail For:**

**Residential Driveway Approach**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
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<td>32 C 10 B C</td>
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<td>32 C 10 B C</td>
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<tr>
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<tr>
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<td>36 C 9 B C</td>
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<td>8</td>
<td>36 C 8 B C</td>
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<tr>
<td></td>
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<td>7,5</td>
<td>36 C 7.5 B C</td>
<td>7,5</td>
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<td></td>
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<td>36 C 7 B C</td>
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<td></td>
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<td>36 C 6.5 B C</td>
<td>6,5</td>
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<tr>
<td></td>
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<td>Max. Width</td>
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<td>5.5</td>
<td>36 C 5.5 B C</td>
<td>5.5</td>
</tr>
</tbody>
</table>

1. Drive approach to be a minimum of 5' from all utility structures (fire hydrant, electrical or cable boxes, etc.).
2. All manholes within 5' of the approach to be at approach grade.
3. If a storm catch basin is in an approach contact City Engineering Department prior to construction of approach.
4. If a manhole is in a drive or within 18" of a drive approach, contact City Engineering Department prior to construction of drive approach.
5. If road is paved, approach must be paved.
6. If road is gravel, approach must be gravel.
NOTES:
1. Reinforcement is not required unless specified on the plans.
2. When area between curb and gutter and property line is more than 300 sq. ft. cast driveway approach in two or more pours.
1. Reinforcement is not required unless specified on the plans.
2. When area between curb and gutter and property line is more than 300 sq. ft. cast driveway approach in two or more pours.
LOCATION OF JOINTS IN CONCRETE SIDEWALK

SIDEWALK INTERSECTIONS SHALL BE CAST MONOLITHICALLY WITH JOINT LINES PLACED AS NEAR TO PERPENDICULAR AS POSSIBLE WITH SIDEWALKS EDGE, TO AVOID NARROW OR POINTED PIECES OF CONCRETE.

WHERE A PERMANENT STRUCTURE IS LOCATED IN SIDEWALK, PLACE EXPANSION MATERIAL AROUND STRUCTURE AND ADJUST JOINT PATTERN TO INTERSECT STRUCTURE AS ILLUSTRATED.

TYPICAL SIDEWALK JOINT LAYOUTS

4" CONCRETE SIDEWALK
CONCRETE DRIVEWAY OPENING LAYOUT

SECTION A - A
CONCRETE DRIVEWAY OPENING, DETAIL L

NOTE:
- **TO FRONT EDGE OF GUTTER PAN**
- **USE "W" JOINT IF THE DRIVEWAY AND CURB ARE Poured MONOLITHICALLY OR SYMBOL "b" JOINT IF THEY ARE Poured IN STAGES.
- **1" EXPANSION JOINT (FOR CURB & GUTTER NOT TIED TO CONCRETE PAVEMENT)

SECTION B - B
CONCRETE DRIVEWAY OPENING, DETAIL M

NOTE:
- For roadways with concrete pavements, longitudinal lane ties will be continuous through the driveway opening and the spacing of the 
  #5 bars in concrete driveways shall be adjusted to avoid conflict 
  with the longitudinal lane ties.
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.

CONCRETE DRIVEWAY APPROACH
(TO BE USED WITH DETAIL L OR M)

THICKENED CONCRETE SIDEWALK

REINFORCEMENT FOR CONCRETE DRIVEWAYS

<table>
<thead>
<tr>
<th>CONCRETE DRIVEWAY THICKNESS</th>
<th>WIRE SIZE (6&quot; x 6&quot; WASH)</th>
<th>AVERAGE WEIGHT (LBS/100 SQ FT)</th>
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<tbody>
<tr>
<td>LESS THAN 6&quot;</td>
<td>W-1.4</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>W-2.9</td>
<td>42</td>
</tr>
<tr>
<td>8&quot; OR GREATER</td>
<td>USE WIRE FABRIC REINFORCEMENT SPECIFIED ON STANDARD PLAN R-37-SERIES</td>
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</tbody>
</table>

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT

DRIVEWAY OPENINGS & APPROACHES,
AND CONCRETE SIDEWALK

INTERMEDIATE DRIVEWAY JOINT DETAILS

ADJUST DRIVEWAY JOINTS AS NEEDED TO ALIGN WITH ANY COINCIDING TRANSVERSE PAVEMENT JOINTS.
JOIN LAYOUT IS AS INDICATED OR AS DIRECTED BY THE ENGINEER.
**LOW VOLUME COMMERCIAL OR RESIDENTIAL DRIVEWAY SLOPES**

- 12% maximum change in slope at 10' intervals (sag)
- 0% maximum change in slope at 10' intervals (crest)
- 8% maximum slope
- 2.0% maximum slope
- 10% maximum slope

Approximately 10'

**COMMERICAL DRIVEWAY PROFILE FOR MAJOR TRAFFIC GENERATORS**

- Maximum grade 8%
- Maximum grade 1.5%
- Maximum grade 4%

**NOTES:**

For driveway design refer also to "Administrative Rules Regulating Driveways, Easements, and Pedestrian Routes Over Highways" and Geometric Design 0-660-Series, Commercial Driveways.

For curb and gutter details, see standard plan R-30-series.

Transverse sidewalk slopes are typically 1.5% (2.0% 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.

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Michigan Department of Transportation
Bureau of Highway Development Standard Plan for

**DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK**

<table>
<thead>
<tr>
<th>DATE</th>
<th>FHWA Approval</th>
<th>Plan Date</th>
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<td>9-30-2014</td>
<td>7-1-2014</td>
<td>R-29-I</td>
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</table>
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:

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

Adopted July 21, 2008
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 (90º).

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. Requirements for Commercial Driveway Approaches

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.

Adopted July 21, 2008
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.