

## ARTICLE 3

### DESIGN STANDARDS FOR SUBDIVISION REVIEW

#### **SECTION 300 - Introduction**

The following design standards are intended to assist a developer or property owner in creating a Subdivision and meeting the purposes of this Subdivision Control Ordinance. These standards are to be used in preparing a Primary Plat, Improvement Plan, Grading Plan, Secondary Plat and Certified Surveys.

The purpose of these standards is to establish minimum design and improvement standards for lots, streets, utilities, and other physical elements of a Subdivision or development. The developer's engineer or surveyor (Indiana Registered) shall design these aspects of the Subdivision or development and the Dearborn County Plan Commission Staff shall review them.

#### **SECTION 305 - Street Design**

##### **A. Street Names**

Proposed streets, which are in alignment with other existing streets, shall bear the names of existing streets unless separated by an intersecting collector or arterial street, or a legislative or fire district boundary. In no case shall the name of a proposed street duplicate an existing street name, irrespective of the use of the suffix street, road, lane, avenue, boulevard, way, place, or court, nor shall a proposed street name phonetically approximate the name of any existing or approved street name in Dearborn County. Proposed street names are added to a master list or index (maintained by the Plan Commission) in order to reserve these names when the Primary Plat is approved. Street names on Improvement Plans and Secondary Plats shall follow the approved names listed on the Primary Plat unless approved through a subsequent review by the Planning Department. If street names are changed in comparison with the approved Primary Plat, then a revised Plat shall be submitted within thirty (30) days of the name changes reflecting the approved changes for the Planning Commission's and the appropriate legislative unit's files.

Street names on previously recorded Secondary Plats can be changed but the applicant must verify the proposed street name with the Planning Department and then make a formal request to the appropriate legislative body for any public street name to be changed. Private road name changes shall be changed through the Planning Department by application. The Secondary Plat shall also be amended and submitted to the Planning Department to reflect the new street name.

##### **B. Building/House Addresses**

The Planning Department shall assign Building/House addresses, once a Secondary Plat has been approved by the Planning Department and upon an application for a Zoning Permit to the Planning Department.

### C. Transportation Management Regulations

All Subdivision proposals shall follow the requirements of Article 24 of the Dearborn County Zoning Ordinance. Article 24, describes in detail Transportation Management Regulations, which include classification of roadways, minimum spacing of driveways, minimum corner clearance of driveways, minimum sight distances, maintaining capacity of roadways, design of access points (e.g. number, location, coordination, consolidation, and spacing), turning lanes, frontage roads, the review procedure and waiver of requirements. The applicant or subdivider shall also meet the requirements of Section 2524 of the Dearborn County Zoning Ordinance, which describes frontage roads, setbacks.

### D. Access to Arterial or Collector Streets

Where a Subdivision borders on or contains an existing or proposed Arterial roadway—or an existing or proposed Collector roadway that exceeds 1000 vehicle trips per day—all new access points involving either three (3) or more residential units or thirty (30) vehicle trips per day (regardless of the proposed use) shall not be permitted access to such streets without approval of the Commission Projects involving access to either to a Category I Collector roadway or access to a proposed use that generates more than ten (10) but less than thirty (30) vehicle trips per day—*on all other types of Arterial and Collector roadways*—shall require approval of the Technical Review Committee. Direct access to an arterial or collector roadway shall only be permitted if the other access scenarios such as local street access, frontage roads, shared driveways and other forms of access control are unacceptable, unsafe or inappropriate as determined by the Commission. All shared driveway accesses shall be identified on the Subdivision's Secondary Plat along with the appropriate covenants and restrictions that shall also be placed on each affected lot's deed. All proposed driveway and road / street accesses in a Subdivision must also meet the rules and procedures set forth in Article 24 of the Dearborn County Zoning Ordinance.

### E. Street Lighting

Streetlights may be required at intersections if the Commission feels they are necessary for pedestrian and vehicle safety reasons. If the Subdivider intends, or is required, to install streetlights within the County street right-of-way, the location and installation of such lights shall not in anyway interfere with the County's use of the right-of-way as determined by the County Engineer. The Subdivider shall be responsible for the design, expense, installment, location, maintenance and operation of such street lights unless such responsibility is assigned to and accepted by a homeowners' association or other entity to include the County.

### F. Street or Road Classification

The Developer or Subdivider shall use **Table 3.1** to determine the design requirements and road classification type for existing or proposed streets. The Planning Director or designee shall determine the classification of streets where there is a discrepancy or the classification cannot be determined from the table. The classification shall be based on the Dearborn County Zoning Ordinance and the definition of this Subdivision Control Ordinance. In addition, the standards established by this table may be amended by the Commission if it determines that it is necessary for reasons of safety, efficiency, maintenance, anticipated problems or future growth as advised by the Planning Department and County Engineer.

## **Arterial System**

Arterials are categorized by their linkages to cities or larger towns and they generally provide interstate or intercounty service. They are capable of attracting travel over long distances and have a spacing that is consistent with the population density in the county. See Zoning Ordinance Article 24 for a listing of the Arterial Roadways in Dearborn County.

The roadways in this category are classified by sub-categories developed based on the ADT volumes on the facilities. As each sub-category serves a separate level of traffic, design criteria has been developed separately to accommodate these differences. For example, a high-volume arterial's design standards will be greater than that of a low-volume arterial. Example typical sections and criteria for each are illustrated in Appendix C of this Ordinance.

## **Collector System**

The collector system generally serves intracounty travel as opposed to statewide movements. The trips associated with a collector are predominantly shorter than those associated with arterial routes. Consequently, lesser design speeds are used and the design standards are generally less than that of arterial routes. Collector routes provide service to smaller communities and provide connections to the arterial system. They are categorized as serving the more important intracounty routes. In order to further define the collector system sub-categories have been developed based on the ADT volumes on the roadway.

## **Local Roadways**

The local roadway system in contrast to the arterial and collector system primarily provides access to adjacent land and to the wider network. It serves principally shorter trips and constitutes all roadways not classified as arterials or collector roads. To further designate this category and the design parameters required a set of sub-categories are defined based on the roadway traffic volumes. In some cases, as that of a subdivision for example, right of way is limited and numerous driveway cuts are needed. In these instances, a curb and gutter section may be required. An example curb and gutter section is illustrated in Appendix C.

**Table 3.1 - Street Classification & Requirements**

| Type of Street - Category | Average Daily Traffic (ADT)    | Min. Pavement Width | Min. Shoulder Width * | Rights -Of- Way Width ** | Max. Street Grade | Design Speed (mph) |
|---------------------------|--------------------------------|---------------------|-----------------------|--------------------------|-------------------|--------------------|
| <i>Local - I</i>          | <i>ADT &lt; 400</i>            | <i>20 ft.</i>       | <i>4 ft.</i>          | <i>50-60ft.</i>          | <i>12 %</i>       | <i>30</i>          |
| <i>Local - II</i>         | <i>400 &lt; ADT &lt; 3000</i>  | <i>22 ft.</i>       | <i>4 ft.</i>          | <i>50-60ft.</i>          | <i>11 %</i>       | <i>40</i>          |
| <i>Local - III</i>        | <i>ADT &gt; 3000</i>           | <i>24 ft.</i>       | <i>4 ft.</i>          | <i>50-60ft.</i>          | <i>10 %</i>       | <i>45</i>          |
| <i>Collector - I</i>      | <i>ADT &lt; 1000</i>           | <i>24 ft.</i>       | <i>4 ft.</i>          | <i>60-70ft.</i>          | <i>10 %</i>       | <i>40</i>          |
| <i>Collector - II</i>     | <i>1000 &lt; ADT &lt; 3000</i> | <i>24 ft.</i>       | <i>8 ft.</i>          | <i>60-70ft.</i>          | <i>9 %</i>        | <i>45</i>          |
| <i>Collector - III</i>    | <i>ADT &gt; 3000</i>           | <i>24 ft.</i>       | <i>10 ft.</i>         | <i>60-70ft.</i>          | <i>8 %</i>        | <i>45</i>          |
| <i>Arterial - I</i>       | <i>ADT &lt; 5000</i>           | <i>24 ft.</i>       | <i>10 ft.</i>         | <i>80 ft.</i>            | <i>6 %</i>        | <i>45</i>          |
| <i>Arterial - II</i>      | <i>ADT &gt; 5000</i>           | <i>24 ft.</i>       | <i>12 ft.</i>         | <i>80 ft.</i>            | <i>5.5 %</i>      | <i>45</i>          |

**NOTES:** \* Minimum shoulder widths will vary depending on the need and size of pavement section(s).

\*\* Right-of-way widths will vary depending on the need and size of sidewalks, on-street parking areas, turning lanes, and the presence of utility lines.

See Appendix C for Street Sections and Geometric Design Criteria

The standards established by this table can be amended by the Plan Commission if determined necessary for safety, efficiency, maintenance, anticipated problems or future growth as advised by the Planning Department and County Engineer.

## **G. Public Right-of-Way Width**

The minimum width of right-of-way for a public street shall be as listed in **Table 3.1**. (See Definitions section for Type of Street) Additional right-of-way width shall be required whenever, due to topography or turn lanes, additional width is necessary to provide adequate earth slopes, accommodate additional pavement width and afford maintenance. Easements may be provided in lieu of additional right-of-way dedication for maintenance or construction in locations where additional right-of-way dedication would be problematic to lot development.

NOTE: Generally, signs, (other than street signs and traffic control signs) walls, fences, sprinkler systems and other obstructions shall not be located in public street right-of-ways unless approved within the Subdivision plans.

## **H. Additional Right-of-Way**

Subdivisions that adjoin existing public street rights-of-way shall dedicate additional right-of-way according to the **Table 3.1** if the minimum right-of-way does not exist along the property road frontage. The entire right-of-way shall be provided where any part of the Subdivision is on both sides of the existing street; and one half of the right-of-way shall be provided, as measured from the centerline, for Subdivisions that are located only on one side of the existing street.

## **I. Pavement Width**

No public street shall be constructed except in conformance with the minimum pavement widths as listed above in **Table 3.1**. (See Definitions Section for Type of Street)

## **J. Street Grades**

Grades of both public and private streets in proposed Subdivisions or developments shall not be greater than as listed in **Table 3.1**. (See Definitions Section for Type of Street) The maximum grade may be waived however, upon request of the Applicant to the County Engineer, if, due to topographic conditions, access is prohibited or requires excessive grading. The County Engineer shall determine whether a waiver will be granted. To determine the waiver the County Engineer shall review the slope percent proposed, length of slope, lot access, vertical curve at landing and drainage to determine if the waiver request can be permitted safely. The County Engineer shall forward a letter indicating whether to approve the waiver and any conditions that are necessary for safety to the Planning Director.

## **K. Horizontal Curves**

Central angles of horizontal curves shall be kept to a minimum unless there is sufficient radius length to minimize the severity of the curve. At no time shall the radius of the centerline of a proposed street be less than three hundred (300) feet for collector streets, and one hundred fifty (150) feet for local streets, except at intersections or divided roadways.

The tangent distance between horizontal curves of proposed street centerlines shall not be less than one hundred (100) feet for all streets.

## **L. Vertical Curves**

Any change in grade of proposed streets shall be transitioned by a vertical curve. The minimum length for a vertical curve shall be fifteen (15) times the absolute value of the algebraic difference of the grades (in percent) of the two tangents for collector streets. The minimum length for a vertical curve shall be ten (10) times the absolute value of the algebraic difference of the grades (in percent) of the two tangents for sub-collector, local, cul-de-sac, and court streets.

## **M. Intersections**

The two centerlines of proposed streets at their intersection shall be as nearly to a right angle as possible and that angle at no time shall be less than seventy-five (75) degrees. For Residential Subdivisions, the radius of the curve at the intersection of the two right-of-way lines shall not be less than twenty five (25) feet, and for the intersection of the two pavement edges, the radius curve shall not be less than twenty-five (25) feet.

For industrial and Commercial Subdivisions, the radius of the curve at the intersection of the two right-of-way lines shall not be less than forty (40) feet, and for the intersection of two pavement edges, the radius curve shall not be less than forty-five (45) feet. The Commission may, in certain situations, increase the minimum radii based upon existing road conditions and traffic patterns. (See Appendix C)

There shall be no greater than four basic street legs at any proposed intersection unless the intersection is divided. Merging lanes, deceleration lanes, "Y" intersections, etc. are considered as being parts of one street leg or approach.

Proposed new intersections along one side of an existing-street shall, wherever practicable, coincide with any existing intersection on the opposite side of such street. Street jogs with centerline offsets of less than one hundred fifty (150) feet shall not be permitted. Where a local street is proposed to intersect with an arterial street, the alignment of the streets shall be mandatory. Proposed street intersections with arterials shall be at least eight hundred (800) feet apart and at least eight hundred (800) feet from any existing street intersection(s) along the arterial. Proposed intersections with existing streets shall not be closer than one hundred and seventy-five (175) feet to an intersection of two existing streets as measured from edge of pavement.

Intersections shall be designed with a flat grade wherever practical. In hilly or rolling areas, at the approach to an intersection a leveling area shall be provided having not greater than a two percent (2%) grade at a distance of sixty (60) feet for collector or arterial streets and three percent (3%) for local streets as measured from the nearest right-of-way line of the intersecting street.

Where any street intersection will involve earth banks or existing vegetation inside any lot corner that would create a traffic hazard by limiting visibility, the developer shall cut such ground and/or vegetation (including trimming trees) in connection with the grading of the public right-of-way to the extent deemed necessary by the County Engineer to provide an adequate sight distance.

## **N. Dead-end Streets**

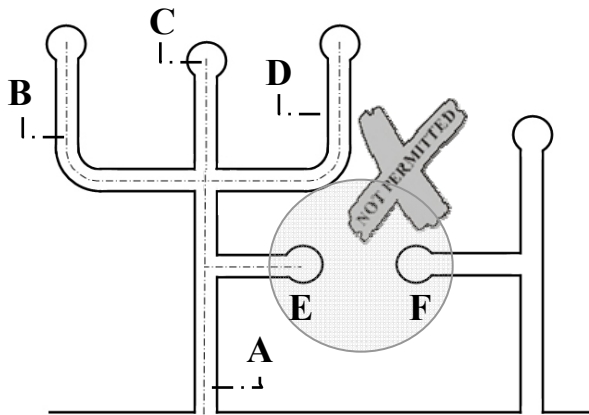
A dead-end street is a street, or a portion of a street, or a system of streets that is connected to other public streets from only one point of access. The regulations set forth in this Section shall apply to dead-end streets, portions of streets, or street systems—as created following the effective date of this Ordinance (April 7<sup>th</sup>, 2009). Proposed streets or street systems that do not conform with this Section shall require a Waiver, as outlined in Article 1.

Dead-end streets or street systems shall not serve more than 30 dwelling units for residential Subdivisions unless an acceptable alternative access is approved by the Plan Commission. An acceptable access alternative may include, but is not necessarily limited to: connectivity to an existing or planned open street or street system, wider streets, navigable sidewalks or medians, stub streets or an emergency access—as set forth later in this Section.

A dead-end street or street system shall not be more than twelve hundred (1200) feet in length. The length of a dead-end street or street system shall be the cumulative distance measured from the intersection of the centerlines of the dead-end street and the intersecting public street to the center of the radial turnaround(s) provided at the terminus of the street or street system. Please refer to Figures 3.1 & 3.2. This 1200-foot length requirement may be waived by the Plan Commission.

All turnarounds for dead-end streets must be approved through the Technical Review Committee and shall generally conform to the standards set forth in Appendix C. The radius of all turnarounds shall consist of fifty (50) feet of right-of-way and forty (40) feet of pavement for residential uses and sixty (60) feet of right-of-way and fifty (50) feet of pavement for commercial and industrial uses.

**Figure 3.1**



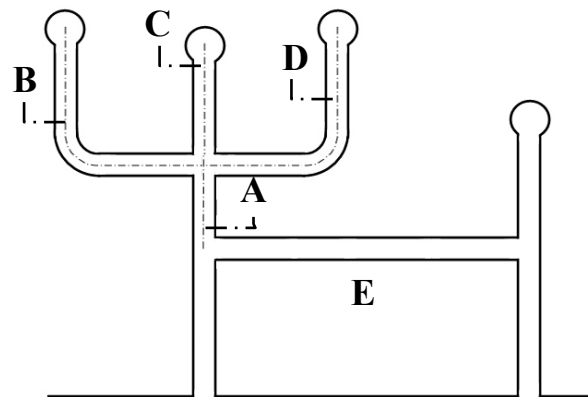
**Improper Use of Dead-end Streets**

Sum of A + B, C, D & / or E  $\geq$  1200 feet

A + B + C + D + E  $\geq$  30 units / lots

*Second form of access required.*

**Figure 3.2**



**Proper Use of Dead-end Streets**

Sum of A + B  $\leq$  1200 feet

Sum of A + C  $\leq$  1200 feet

Sum of A + D  $\leq$  1200 feet

A + B + C + D  $\leq$  30 units / lots\*

*\*Excludes corner lots at the intersection of A*

**Stub Streets as Future Accesses**

Stub streets may be approved by the Plan Commission to eliminate the need for Waivers for a dead-end street system and to facilitate future street extensions and connectivity. When a stub street is indicated on the Preliminary Subdivision Plan or Improvement Plan as a future second access, the maximum number of residential lots permitted from one access shall be as follows:

- One access and one stub: 60 Lots
- One access and two stubs: 90 Lots
- One access and three stubs: 120 Lots

**O. Street Connections to Adjoining Tracts or Areas**

Street connections to adjoining developed or undeveloped tracts, or to existing or planned street systems, shall be required by the Plan Commission as outlined below. The purpose of this requirement includes the layout of the Subdivision, the staging of development, the opportunity for reasonable access alternatives to adjoining tracts, the necessity of providing through connections between collector or arterial streets, to distribute traffic patterns by providing alternative routes, and to provide convenient and efficient access for emergency vehicles, street maintenance, school buses, postal delivery, and other essential services. The street connection with adjoining property shall be constructed upon Secondary Plat recording of seventy five percent (75%) of the Subdivision lots as approved on the Primary Plat, or if the designated street in the Subdivision is within five hundred (500) feet of the required connection point.



The Commission shall consider the following criteria for requiring street connections or the provision of stub streets:

1. Street connections—or the provision of stub streets—to adjoining properties, or existing or planned street systems, must be feasible and practical. Connections will not be required if significant grading (slopes over twenty percent (20%) for several hundred feet) and/or the construction of a bridge structure would be necessary to make such connections;
2. The adjoining land should be compatible with the subject development as determined by current zoning and the current Comprehensive Plan;
3. Future desired transportation patterns as described by the current Comprehensive Plan and special funding projects recommended in the Transportation Plan shall be considered;
4. The Commission may require the connection of local streets, or the provision of stub streets, to adjoining tracts or areas in order to prevent the local street from becoming a cul-de-sac street which exceeds the maximum length permitted for a dead-end street;
5. Proposed street connections or stub streets to adjoining properties, or existing or planned street systems, shall be constructed in accordance to the same standards as their corresponding local public ‘Street Type’ (see Appendix C);
6. “Future Street Extension” & "No Outlet" signage must be placed at the entrances of future street extensions or stub streets and a barricade must be placed at their ends. These features must be identified on the Improvement Plans;
7. A notation must be included on the final plat to acknowledge that a street connection or stub street shall be extended during subsequent phases of adjacent development;
8. All temporary turnarounds must be provided in accordance with the terms set forth in Article 3, Section 305 and Appendix C of this order;
9. All street connections and stub street right-of-ways shall extend to the limits of the proposed subdivision. All stub streets shall be improved and extended at least twenty-five feet (25’) into the right-of-way provided;
10. The end of any right-of-way that results in a connection or stub street shall not be used for frontage to individual lots.

#### Extension of Existing Streets or Stubs

An existing dead-end street or a stub street adjoining a proposed subdivision shall be extended if one (1) of the following applies:

1. A proposed subdivision provides a second point of access required for an adjacent subdivision;
2. The extension provides a second point of access required for the proposed subdivision;
3. Overall circulation of the surrounding neighborhood is improved by providing potential extension to multiple points of access;
4. To provide adjacent landlocked parcels with access without exceeding the maximum number of lots permitted on a dead-end street system in this Section.

## **P. Private Streets or Roads**

### Intent & Purpose

Private streets may be permitted in any zoning district. The intent of the private street standard is to allow limited lot splits without requiring public streets that are costly or inefficient to maintain. Private streets are not intended to be a method for reducing development costs, but rather a method of reducing maintenance costs to the public. Private streets serving six (6) or less units may be approved through the Minor Subdivision process if all necessary specifications have been submitted and reviewed by the Technical Review Committee and have been determined to be compliant with this Ordinance. All other applications or plans involving the establishment of a private street shall follow the Subdivision review process as outlined in Section 200(1).

### Design Standards

All private streets must be centered within the easement and the easement must be a minimum of fifty (50) feet in width. A reduction of the easement width can be granted by the Planning Director for Minor Subdivisions for lots of record created prior to the adoption of this Ordinance that have limited road frontage along a public road or have other limiting width restrictions. The Commission can also reduce the easement width for Major Subdivisions for the reasons described above.

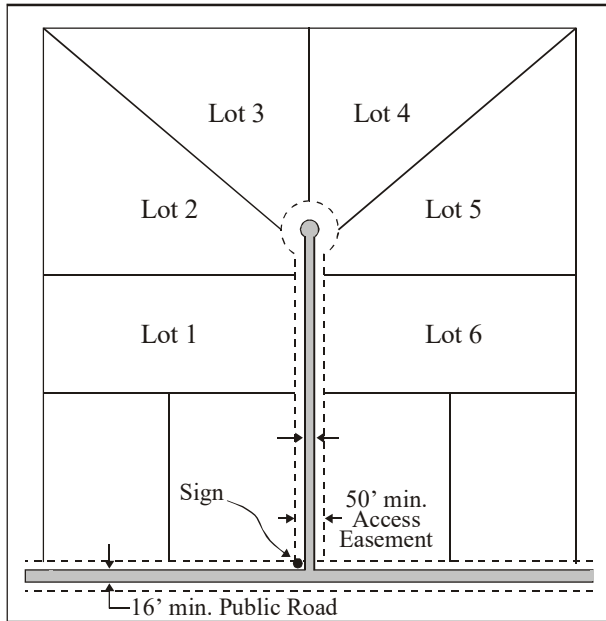
Private streets shall only be granted if the (existing) public street in which the private street has access to is at least 16 feet in width or allows sufficient two way travel. The Technical Review Committee must also find that the proposed private street will not have a detrimental affect to the public street's level of service and safety.

The private street shall consist of a deeded access easement and maintenance agreement tied to each lot that is accessed by or uses the private street as road frontage. The statement "Private Street NOT Publicly Maintained" shall be provided in a conspicuous location on the Subdivision Plat and shall also be contained within the legal description of the deed for each lot served by the private street. In addition, a street sign with the statement above shall be located conspicuously at the entrance of the private street from the adjacent public roadway. This sign and the street sign shall be installed according to the Dearborn County Department of Transportation standards, at the Subdivider's expense.

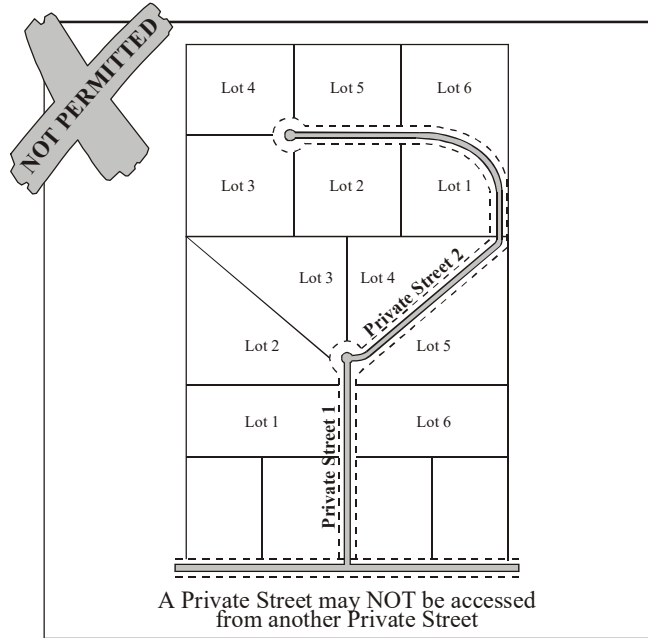
A private street must maintain a height clearance of at least 14 feet and may not serve more than six (6) additional buildable lots—unless a Concept Development Plan involving a rezone has been submitted and approved as outlined in Article 5 of the Dearborn County Zoning Ordinance. A private street cannot access another private street unless both individually connect with a public street. For Major Subdivisions in which multiple private streets are proposed the Commission shall have discretion in granting approval of the private streets. The private street(s) shall not be granted if the Commission believes that the property can be more efficiently, effectively and safely divided with a public street(s). Private streets cannot be used during a re-platting of a recorded Subdivision unless approved by the Commission.

A private street shall be constructed, at minimum, to the same standard as its corresponding local public ‘Street Type’ (see Appendix C)—except for maximum allowable grade (15%) and pavement design, which shall consist of a minimum of eight (8) inches of No. 53 Compacted Aggregate Stone. A private street that dead-ends shall terminate with a cul-de-sac—unless it serves an agricultural residential use. A private street will require a permit from the entity with jurisdiction over the public street with which it connects. Street names for private streets shall be proposed and approved as outlined in Section 305 A. See **Figures 3.2 & 3.3.**

**Figure 3.2 - Proper Use of a Private Street**



**Figure 3.3 - Improper Use of a Private Street**



**Q. Extension of Non-Platted Existing Public Street**

There exist within Dearborn County many publicly maintained roads which are not platted and are maintained at a standard which is less than the required standard for newly constructed county roads. In some situations the road inventory maintained by the County Engineer may contradict with the physical or the perceived termination of a public road. In these situations the county road can be extended by the Applicant if the following standards are met:

1. The extended road must have a minimum platted right-of-way of fifty (50) feet or a minimum twenty five (25) feet half right-of-way;
2. Application must be made to the County Engineer to have the maintenance of the road extended;
3. The road must be installed at a standard that is consistent with the existing road at the applicant’s expense and must provide an adequate public turnaround. This standard shall be determined by the County Engineer;

4. Property owners who adjoin the portion of the road to be extended shall be notified by certified mail at the applicant's expense ten (10) days prior to the hearing of the proposed extension if different than the applicant/owner;
5. The Dearborn County Commissioners shall determine if the road extension shall be granted at a public meeting. The Commission can use the following standards to assist in their determination of the road extension:
  - a. Would the extension of the road create a safety, maintenance or cost issue to the County?
  - b. Would the extension have a detrimental effect to the existing public street's level of service and safety as proposed or if additional lot splits were created?
  - c. Does the extension of the street provide for a needed street connection?
  - d. Does the extension provide legal road frontage for a land locked parcel(s)?
  - e. Can access be provided to the parcel(s) in question with a private streets?

## **R. Sidewalks**

All Subdivisions or developments shall have sidewalks constructed according to the following standards:

- a. Sidewalks shall be required along both sides of all local streets in new residential Subdivisions that have an average density of two (2) dwelling units per acre or greater. However, sidewalks are not required along cul-de-sac streets serving 6 lots or less and are only required on one side if it serves 12 lots or less but more than 6 lots. The Commission can require sidewalks as described in this item if the Subdivision contains a large lot or lots that might skew the density calculations;
- b. Sidewalks shall be required along one side of all local streets in new Residential Subdivisions that have an average density of one (1) dwelling unit per acre or greater but less than two dwelling units per acres. The Commission can require sidewalks as described in Item A or B above if the Subdivision contains a large lot or lots that might skew the density calculations. Sidewalks are not required along cul-de-sac streets serving 6 lots or less;
- c. Sidewalks are not required for new Residential Subdivisions if the average density is less than one (1) dwelling unit per acre. The Commission can require sidewalks as described in Item A or B above if the Subdivision contains a large lot or lots that might skew the density calculations;
- d. Sidewalks may be required between blocks when determined by the Commission to be appropriate;
- e. A subdivider can propose paths or trails as substitutes for conventional sidewalks if the alternative system provides the same or better level of pedestrian access, upon approval by the Commission;
- f. Commercial and office Subdivisions shall provide sidewalks on both sides of all streets;

- g. The Commission in Industrial Subdivisions may require sidewalks if the Subdivision contains a mixture of office and commercial uses that will likely generate pedestrian traffic;
- h. The Commission, upon request of the subdivider can grant waivers of the sidewalk requirements, if extreme grading or construction techniques would be necessary to accommodate the sidewalks. In addition, the Commission can grant a waiver upon request, if the Average Daily Traffic (ADT) for the Subdivision is less than 250 trips per day;
- i. The Commission can require sidewalks to be placed along existing public streets where the Subdivision fronts if the Subdivision adjoins or is near other community services such as a school, library or existing sidewalks;
- j. Sidewalks shall be required along both sides of all new Subdivisions that require sub-collector, collector or arterial streets. Sidewalks shall only be required on one side if these streets do not have direct lot access.
- k. Sidewalks shall be constructed of a stable, firm, consistent, and slip resistant surface. Construction should consist of Portland Cement concrete on compacted subgrade and have a minimum depth of four (4) inches, except at driveways—unless an equal or better alternative is approved by the Dearborn County Technical Review Committee. The minimum depth shall be the same thickness as the driveway where the sidewalk passes through the driveway. In commercial or industrial zones, driveways shall have the same depth as the road leading to the parking area.
- l. Sidewalks must be at least (5) feet in width along all types / classes of streets and shall be located at least five (5) feet from the curb or the edge of the pavement if the sidewalk system is situated within a public right-of-way. The cross slopes associated with sidewalks shall not be permitted to exceed two (2) percent—in any portion of the sidewalk system, including driveway aprons and associated improvements. The running slopes associated with sidewalks shall not exceed the adjacent roadway gradient(s). Sidewalk systems that do not meet all of the construction standards set forth in this Section must be situated outside of the County’s right-of-way and must be privately-constructed and maintained.
- m. At intersections and pedestrian crosswalks, curb ramps shall be installed. (See Appendix C.) Curb ramp assembly should include top and bottom landings, the ramp run itself, and an edge treatment.

The Developer of the Subdivision shall be responsible for the installation of sidewalks, to ensure continuity and compliance to ADA standards. Sidewalks must meet all applicable requirements and approved standards and shall be subject to inspections by: 1) the Dearborn County Department of Transportation & Engineering—prior to the acceptance of any application for public improvements to be reviewed by the Board of Commissioners; and 2) the Dearborn County Building Department—prior to the County’s issuance of a Certificate of Occupancy. Roadways and their associated required improvements—including sidewalks—that have not been built to meet the standards set forth herein will not be accepted into the County’s maintenance system.

## **S. Combination Bicycle/Pedestrian Paths**

A path for joint use by bicycles and pedestrians may be provided within a public street right-of-way in accordance with the following standards:

- a. Combination bicycle/pedestrian paths shall be provided only on subcollector, collector, or arterial streets that have no vehicular access points for individual lots, that connect between other subcollector, collector, and/or arterial streets, or a public facility such as a school, park, library, etc.
- b. A combination bicycle/pedestrian path shall be provided on one side of the street. Where combination bicycle/pedestrian paths are provided, sidewalks are not required on the other side of the street as per Section 305R.
- c. Combination bicycle/pedestrian paths must be at least eight (8) feet wide and shall be paved in accordance with the requirements of the appropriate legislative body. At intersections and pedestrian crosswalks, wheelchair ramps shall be installed. (See Appendix C) Traffic control signage or signage for safety purposes shall be installed along the path in accordance with the requirements of the appropriate legislative body.

## **T. Street Paving and Street Signage**

Street paving for Subdivisions or developments shall be carried out in conformance with the current County Street Specifications as maintained by the County Department of Transportation and the provisions stated in this document. Street signage installation, maintenance, and replacement shall be the responsibility of the developer until the appropriate legislative body has accepted the streets. New roadways shall be signed in accordance with the Indiana Manual of Uniform Traffic Control Devices for regulatory and warning signs.

## **U. Street Trees**

Street trees, when provided, shall be installed in accordance with the current County Street Specifications, and shall not be located in a manner that would conflict with either underground or overhead utility lines or easements. The minimum width of street rights-of-way which are planned to include street trees shall be increased a minimum of ten (10) feet above the minimum requirements stated in Section 305, Item F, "Public Right-of-Way Width." The spacing and arrangement of street trees shall be subject to approval by the Planning Commission Staff. Street tree species shall be subject to approval by the Planning Commission Staff.

## **V. Existing Public Streets**

No Major Subdivision shall be permitted that is accessed from an existing public street which does not enable two-way travel, unless said public street is upgraded to the County specification. In situations where the existing rights-of-way prohibit or restrict the street from complying with new road specifications in Table 3 in this Ordinance, the County Engineer shall determine an acceptable street standard and width that affords safe two-way travel. All improvements shall be made at the Subdivider's expense from the entrance of the Subdivision to the nearest two-way public street. The Subdivider can be required to improve the ditch and drainage along an existing public street where the Major Subdivision adjoins if the County Engineer determines the Subdivision will negatively impact the drainage of the public street.

The Commission can require road improvements to existing public streets when the level of service is increased due to the development of large Subdivisions that significantly add to the Average Daily Traffic (ADT) of the public street(s) they access. These improvements can include deceleration and turn lanes, road widening or intersection improvements if determined necessary by the County Engineer. The intent of this requirement is to have improvements made to public streets that are needed, due directly to the impact of the new development and not fix problems that are in existence before the proposed development. If the Commission or the County Engineer believe it is necessary, a traffic study as outlined in Article 24, Section 2448 of the Dearborn County Zoning Ordinance can be required to determine the impacts and remedies of the proposed Subdivision. If the required street improvements cannot be accomplished within the existing public rights-of-way the applicant/owner shall work with the Dearborn County Commissioners and the County Engineer to secure additional rights-of-way necessary to facilitate the improvements.

Subdivisions that connect with existing public streets that do not comply with the sight distance requirements can be required by the Commission, as part of Subdivision approval, to make necessary sight distance improvements to the existing public street at the subdivider's expense. See Article 24, Section 2410 of the Dearborn County Zoning Ordinance sight distance standards.

#### **W. Curb and Gutter Requirements**

All residential streets that have an average lot frontage of one hundred (100) feet or less shall be required to install curb and gutter according to Appendix C. All commercial, office and Industrial Subdivisions that have an average lot frontage of two hundred fifty (250) feet or less shall be required to provide curb and gutter according to Appendix C. Residential collector streets shall not be required to provide curb and gutter unless determined to be necessary by the County Engineer because of drainage, maintenance or safety concerns.

#### **X. Emergency Accesses**

All Subdivisions will be evaluated individually to determine the type of emergency entry that may be appropriate to the access interior lots of a dead-end street or street system. The Plan Commission may permit the use of emergency accesses to address issues associated with dead-end streets or street systems that exceed the length, dwelling unit, and use requirements set forth in this Order—although no emergency access may be used for lot frontage. All final emergency access designs and materials shall be reviewed and approved by the Technical Review Committee and should generally conform to the following performance standards:

Surface:

Any approved all-weather driving surface that is designed to support the weight of up to 40,000 lbs. may be permitted. This may include asphalt, concrete, grass-crete, paving blocks, etc.

Width:

The minimum width shall be 12 feet.

Slope:

The maximum slope shall not exceed 15 percent.

Signage:

Approved signs or other approved notices shall be provided for emergency access to identify such and to prohibit the obstruction thereof. All signage shall be installed according to the Dearborn County Department of Transportation standards, at the Subdivider's expense.

Point of Entry:

Automatic or manual gates or alternative mechanisms may be required to restrict traffic movements onto emergency accesses. These items, if applicable, shall be installed according to the Dearborn County Department of Transportation standards, at the Subdivider's expense.

Turning Radius:

The minimum (centerline) turning radius shall be forty feet (40').

Vertical Clearance:

The minimum vertical clearance shall be 14 feet.

Maintenance of Emergency Accesses:

Right-of-way for all emergency accesses must be dedicated to the County in accordance with approved design standards. During the Primary Plat review process, a Subdivider must indicate his intent to maintain the access as a private improvement—or whether these improvements are proposed to be maintained by the County, once completed as required.

The Subdivider shall maintain all emergency accesses until such time that the required improvements are accepted by either a Homeowners' Association or the County.

For privately-maintained emergency accesses, a deeded access easement and maintenance agreement shall be tied to each lot that is accessed by or abuts the emergency lane(s). All "Emergency Access" easements shall be noted in a conspicuous manner on the Subdivision Plat and shall also be contained within the legal description of the deed for each lot served by the emergency access.

If improved as required and accepted as a public improvement, the County shall maintain the emergency access only to the extent that access will not be encroached, obstructed, or closed. Snow and ice removal maintenance will not be provided.

**SECTION 310 - Blocks**

Intersecting streets, which determine block length and width shall be provided at intervals that include existing street patterns, topography, and requirements for safe and convenient vehicular and pedestrian circulation. Blocks of proposed Subdivisions or developments shall not be less than two hundred forty (240) feet or more than twelve hundred (1200) feet in length.



## **SECTION 315 - Lot Arrangement and Sizes**

The size, shape, and arrangement of lots in proposed Subdivisions shall be such as set forward in the current Dearborn County Zoning Regulations and these Subdivision regulations. Rectangular shaped lots shall be encouraged in all zoning districts. Extremely irregularly shaped lots shall be avoided. Consideration of additional lot depth should be made when lots adjoin railroads, major utility easements, commercial or industrial areas or other conflicting land uses.

Side lot lines shall be as close to right angles with the street centerline as possible, or radial to curve street centerlines. Lot lines not at right angles with the street centerline, and lot lines intersecting with curved right-of-ways shall have a reference tie to the tangent line of that centerline curve. Lot lines of a Subdivisions should display an organized and uniform development pattern.

- a. Lot Size - The minimum size, width and area of a lot in a proposed Subdivision or development depends on the current zoning district that said Subdivision or section thereof lies in. The minimum size for the respective zone is contained in the current Dearborn County Zoning Ordinance;
- b. Irregular Lots - Corner lots should be sufficiently large enough to allow building frontage on either street. Double frontage lots shall be avoided except where essential to provide separation of a residential development from arterial streets or to overcome specific disadvantages of topography and orientation. Double frontage lots can be restricted to one driveway in Residential Subdivisions;
- c. Flag Lots - Flag lots can be used in those locations where because of limited road frontage or geometric, topographic, or other natural features, it would be impractical to extend a public street. Flag lots shall have a panhandle extending to a publicly dedicated street for the purpose of access, and shall have two conforming, independently buildable lots adjoining the flag lot along contiguous road frontage.

Single flag lots shall have a minimum of thirty feet (30') and a maximum of sixty feet (60') of panhandle width on a publicly maintained street. A second, contiguous flag lot may be accessed by the panhandle established for the initial flag lot land division; however, for two contiguous panhandle lots, an (equal) deeded strip of land for each lot is required for a common unobstructed access easement to the public street. The area of the access driveway of the flag lot shall not be included in computing minimum lot area requirements, as referenced in Article 25, Table 25.1 of the Dearborn County Zoning Ordinance. The minimum front yard setback shall be thirty feet (30')—as measured from the lot line that is most parallel and closest to the public street, excluding the panhandle portion of the flag lot.

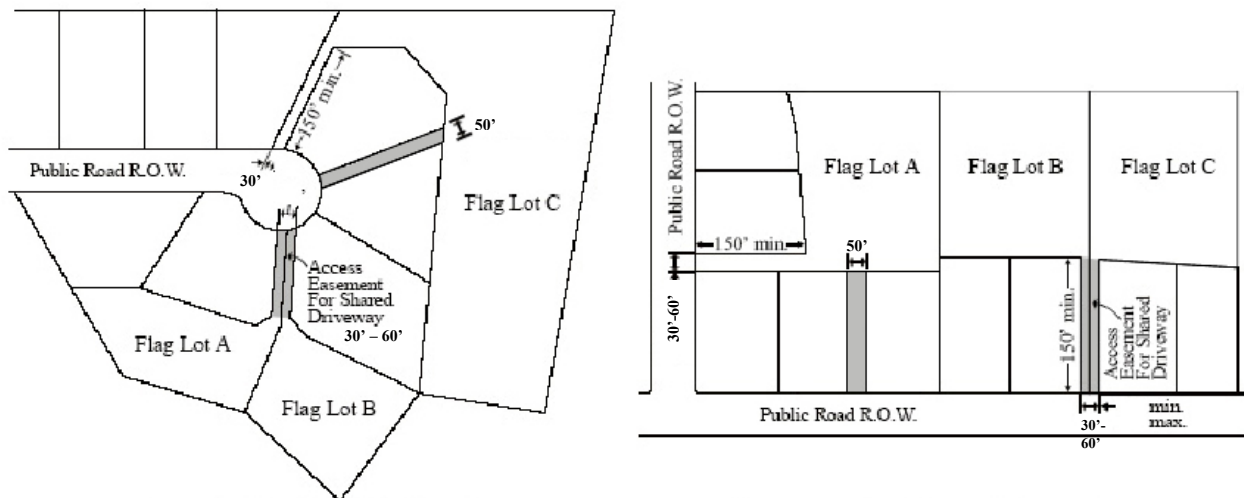
All proposed access points on the land division plat shall contain the Land Surveyor’s certification that indicates the approximate number of feet of sight distance that exists for both directions at the intersection with the public road—or the conditions that must be addressed to meet the requirements set forth in Article 24, Section 2410 of the Dearborn County Zoning Ordinance. All flag lots shall have a panhandle for a minimum distance of one hundred fifty (150) feet from a publicly dedicated street—which can include where the panhandle turns, bends, opens, or increases in size. In no case shall more than two flag lots be contiguous to each other at the publicly dedicated street. The maximum number of flag lots permitted for each phase of a Major Subdivision (Improvement Plan submittal) shall not exceed fifteen percent (15%) of the total number of lots.

A driveway must be located within the panhandle of the deeded property for a flag lot, except in the following conditions, where this requirement may be exempted by the both the Planning Director and County Engineer or their assigned designees:

- The driveway may be located within an access easement across an adjoining conforming lot provided: 1) the access easement is at least fifty feet (50’) wide; and 2) the access easement serves no more than two new lots in addition to the adjoining, conforming lot on which it is located or exists.

Unless an exemption is granted as noted above, a driveway for a flag lot shall be located at a minimum of five (5’) feet from each lot line. For all contiguous flag lots involving a common driveway, a joint access easement shall be shown across the entire width of both panhandles containing the common driveway on the final plat. All record plats and corresponding deed documentation shall contain an appropriate written agreement to assure the perpetual maintenance of the common driveway.

**Figure 3.4: Proper Use of Flag Lots**



- d. Lot Frontage - All lots in a Subdivision shall have the minimum frontage on a public or private street as stated for their respective zone under the current Dearborn County Zoning Ordinance;

- e. Cemeteries - An Applicant, property owner or Subdivider has the option either to relocate an existing private family cemetery or preserve it and develop around an existing cemetery. In relocating a private family cemetery, an applicant, property owner or developer shall be required to follow applicable local and state laws. In preserving a cemetery, while at the same time developing a parcel, an applicant, property owner or developer has the following options:
  - 1. Transfer the existing cemetery as part of a buildable lot. Ownership and maintenance of the cemetery would be left to the individual lot owner.
  - 2. Make the existing cemetery a separate lot. Ownership and maintenance of the cemetery would be assigned by written agreement with either of Subdivision Homeowners Association, the developer of a Subdivision, a local legislative unit, or an historical organization.

See Section 2570 of the Dearborn County Zoning Ordinance for specific requirements regulating private cemeteries.

### **SECTION 320 - Water and Sanitary Sewer, and Private On Site Waste Disposal**

The following shall be the minimum standards for utilities (with the exception of storm water drainage; See Section 325). These standards are minimum requirements and more stringent local, county, state, or federal regulations may apply. In general, water and sanitary sewer service shall be designed to tie into a public system. It is recommended that utility construction doesn't occur until permission has been granted by the appropriate utility company or organization.

- a. Water Systems and Fire Hydrants - Connection into either an existing or planned public water supply system shall be required if the system is sufficient or can be expanded in order to provide an adequate amount of water to a proposed Subdivision. Where appropriate water supply lines shall be designed to loop back to existing or proposed systems. Fire hydrants shall be provided in all Subdivisions where public water systems are provided. Fire hydrants should be located with a maximum spacing of five hundred (500) feet, as measured along the street right-of-way. Fire hydrants should be located no further than two hundred fifty (250) feet from any building site, as determined by the applicable setbacks set forth by the Dearborn County Zoning Ordinance if the specific building footprint is unknown at the time of platting. Additional hydrants are not required to serve a flag lot if a hydrant is located within 100 feet of the vehicular entrance to the flag lot and the panhandle is not more than three hundred (300) feet long.

Where existing public water mains that have existing fire hydrants are to serve a proposed Subdivision and no public water main construction is necessary, no additional fire hydrants are required unless the standards in this Paragraph (a.) above are not met. Fire hydrants shall be designed and constructed in accordance with the appropriate water and fire department district specifications. Public water supply systems shall be designed and constructed in accordance with the water utility provider. Individual on-site water supply systems (wells and cisterns) shall be constructed in accordance with the current standards and specifications of the state or local health department/district.

**Major Subdivisions shall provide access to a public water system unless public water is not available within 1000 or more feet of the Subdivision property line, or the Subdivision is a low density with large lot sizes and a viable alternative water supply is available. In addition, if water capacity is not adequate for fire protection, an alternative fire protection system (i.e. dry hydrant) shall be required. The type of system shall be reviewed and approved by the Commission and applicable Fire Department;**

- b. Sanitary Sewer Systems - Connection into either an existing or planned public sanitary sewer system shall be required if the system is sufficient or can be expanded in order to accommodate the additional flow from the proposed Subdivision. Sanitary sewer systems shall be designed and constructed in accordance with the sanitary sewer provider. Private lateral lines may only occupy the lot it is serving, except where approved by the appropriate utility.
- c. Private On Site Waste Disposal - Individual septic tank systems and package treatment plants shall be constructed in accordance with the current standards and specification of the State of Indiana and the local health department. Where package sewage treatment plants are proposed, the sewage collection system shall be designed for ultimate connection to the public system. No sanitary sewage treatment plant for any Subdivision shall be located nearer than four hundred (400) feet to any residence. In calculating this distance, the applicant can specify the location of any residence to be constructed on lots affected by the treatment plant or the Commission shall calculate this distance based upon the minimum setback and side yard requirements of the particular zoning district;
- d. Utilities - Utilities such as electric, telephone, natural gas, and cable television shall be placed underground whenever possible, within minimum ten (10) feet platted easements, and must be constructed per applicable standards and specifications, which includes inspections by the appropriate legislative units, permit requirements and compaction requirements if necessary.

### **SECTION 325 - Stormwater Management, Drainage and Residential Lot Grading**

Storm sewer systems are designed to collect and convey stormwater runoff from street inlets, runoff control structures, and other locations where the accumulation of stormwater is undesirable. The objective is to remove runoff from an area to avoid unacceptable amounts of ponding damage and inconvenience. No storm sewer shall be permitted to run into a sanitary sewer system within a proposed Subdivision. The design of the stormwater system in general, shall produce the same rate of stormwater runoff at post-development as the pre-development rate. Stormwater runoff from a site or Subdivision shall not adversely impact natural drainage from an uphill drainage basin or to a downhill drainage basin or adjacent properties. The property owner shall be responsible for stormwater drainage facilities located on private property where runoff will be principally collected within that property and be minimally discharged over a larger area before the stormwater naturally drains on adjacent properties, unless a large drainage basin exists or is being planned. Stormwater drainage easements shall be required if stormwater is directly discharging from a pipe to an adjoining property and not being dispersed on the subject property.

All storm sewer systems shall be designed and constructed per flows calculated on the 10-year storm frequency. Overflows shall be designed on the 100-year storm frequency. No living area shall be affected by the 100-year storm. Safety swales shall be designed to carry all runoff away from any residential structure.

For all areas of stormwater control that are not addressed by this ordinance or in which a conflict may exist, the current HERPICO Stormwater Drainage Manual shall be used as the regulatory source to address the conflict or provide the requirements for stormwater control as determined by the Planning Director.

**Section 325.1 - Basic Design Criteria for a Storm Drainage System**

A. Degree of Protection Required

The storm drainage system shall be adequate to handle the runoff from storms having various frequencies of occurrence for various degrees of site development, in accordance with the following general categories:

***Table 3.3 - Frequencies of Occurrence***

|  |                                    |
|--|------------------------------------|
| Conservation, agricultural and low density residential (2 acre lots or larger) | 5 year frequency                   |
| All other residential and commercial   | 10 year frequency                  |
| Industrial areas   | 25 year frequency                  |
| For concentrated high value areas  | 50 year frequency                  |
| For flood control facilities   | 50 design 100 check year frequency |

The runoff computed from these storm frequencies shall be from the area within the Subdivision and all other areas draining thereto.

B. Determination of Quantity of Runoff for Design of Storm Water Collection System

Each portion of the stormwater drainage collection system shall be capable of handling the peak flow of runoff. For drainage areas less than two hundred (200) acres, the method that shall be used is the "Rational Method." For areas greater than two hundred (200) acres, either the "Soil Conservation Service (SCS) Method" or the "Regional Method" of the Kentucky Transportation Cabinet, Bureau of Highways shall be used:

1. "Rational Method" where  $Q = CiA$

$Q$  = peak runoff quantity in cubic feet per second;

$C$  = runoff coefficient varying with perviousness and other characteristics of the drainage area;

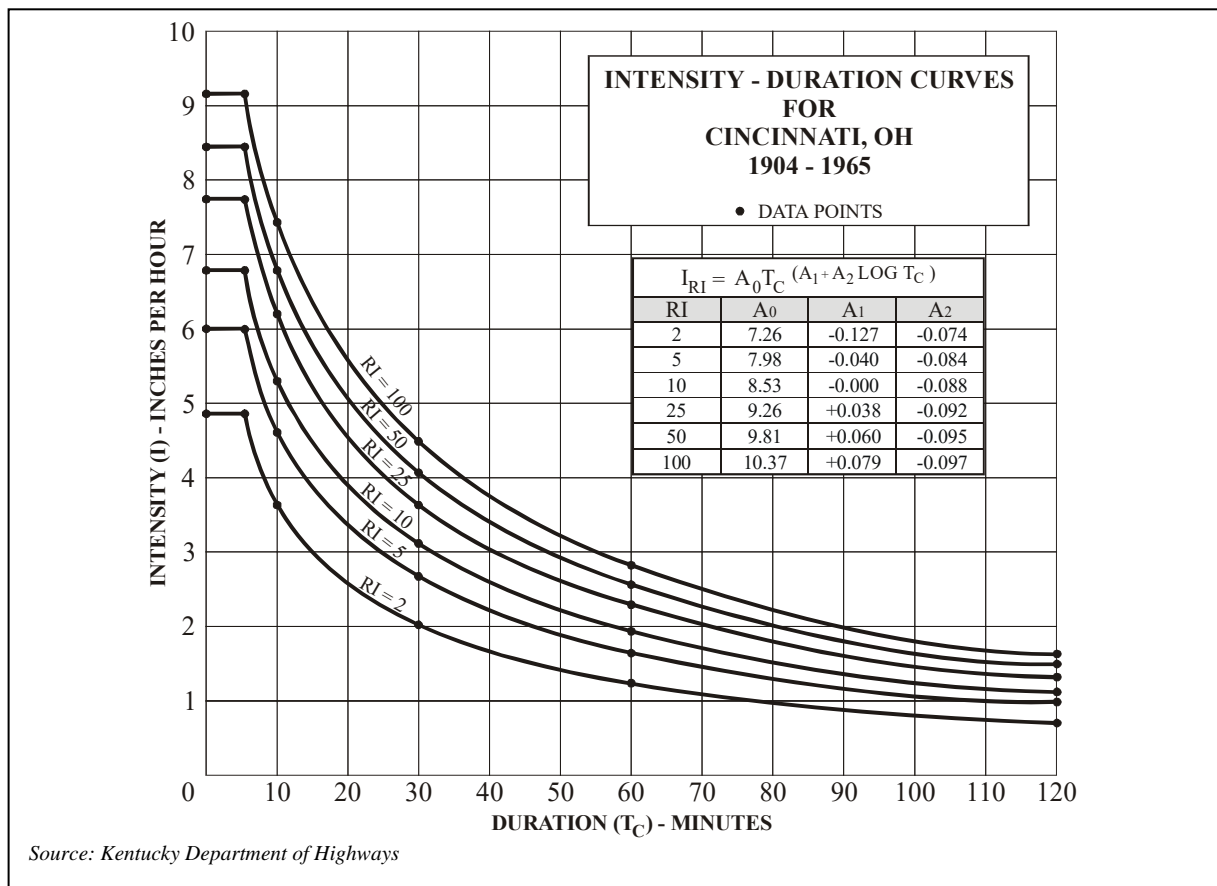
$i$  = average intensity of precipitation in inches per hour, varying with frequency of storm occurrence, duration or concentration time, and area of the tributary watershed;

$A$  = area in acres of the tributary watershed.

2. Runoff Coefficients: The runoff coefficient is the portion of the precipitation, expressed as a decimal, that will reach a given storm water facility. Each lot within a Subdivision contributes runoff from the roof, driveway, sidewalk and street. Generally, the smaller the

**Figure 3.5 - Intensity - Duration Curves Chart**

lot width, the less impervious area. As the lot increases in width so does the impervious area. Weighted coefficients shall be used with the impervious areas  $C = 0.90$ , for all other areas see **Table 3.4a**. Residential developments shall be calculated using lot impervious areas as shown on **Table 3.4b**.



**Table 3.4a - Runoff Coefficient/Undeveloped Land**

| VEGETATION & TOPOGRAPHY |                         | SOIL TEXTURE    |                  |            |
|-------------------------|-------------------------|-----------------|------------------|------------|
|                         |                         | Open Sandy Loam | Clay & Silt Loam | Tight Clay |
| <b>WOODLAND</b>         |                         |                 |                  |            |
|                         | Flat (0 - 5% Slope)     | 0.10            | 0.30             | 0.40       |
|                         | Rolling (5 - 10% Slope) | 0.25            | 0.35             | 0.50       |
|                         | Hilly (10 - 30% Slope)  | 0.30            | 0.50             | 0.60       |
| <b>PASTURE</b>          |                         |                 |                  |            |
|                         | Flat (0 - 5% Slope)     | 0.10            | 0.30             | 0.40       |
|                         | Rolling (5 - 10% Slope) | 0.16            | 0.36             | 0.55       |
|                         | Hilly (10 - 30% Slope)  | 0.22            | 0.42             | 0.60       |
| <b>CULTIVATED</b>       |                         |                 |                  |            |
|                         | Flat (0 - 5% Slope)     | 0.30            | 0.50             | 0.60       |
|                         | Rolling (5 - 10% Slope) | 0.40            | 0.60             | 0.70       |
|                         | Hilly (10 - 30% Slope)  | 0.52            | 0.72             | 0.82       |

**Table 3.4b - Runoff Coefficients / Land Imperviousness**

| <i>LAND USE</i>  | <i>AVERAGE PERCENT IMPERVIOUS</i> | <i>HARD SURFACE AREA</i> |
|--|-----------------------------------|--------------------------|
| Pervious and/or existing pre-developed areas               | Varies                            | Varies                   |
| Residential Uses Average Lot Size/Width                    |                                   |                          |
| 3 Acre / 300 feet  | 6                                 | 8000                     |
| 2 Acre / 200 feet  | 7                                 | 6750                     |
| 1 Acre / 100 feet  | 12                                | 5500                     |
| ½ Acre / 100 feet  | 23                                | 5500                     |
| 12500 S.F. / 80 feet                                       | 34                                | 5000                     |
| 9000 S.F. / 70 feet  | 42                                | 4500                     |
| 7500 S.F. / 60 feet  | 44                                | 4000                     |
| 6000 S.F. / 50 feet  | 48                                | 3500                     |
| 6000 S.F. / 50 feet  | 65                                | 3250                     |
| Multi-Family Residential                                   | 75                                | To be calculated         |
| Commercial/Office  | 85                                | To be calculated         |
| Industrial   | 72                                | To be calculated         |
| Impervious Areas including: Streets, Roofs, Flatwork, etc. | 72                                | To be calculated         |

3. Intensity of Precipitation: The "point" values of average precipitation intensity in inches per hour, at Cincinnati can be extrapolated from **Figure 3.5**. For any given storm duration (concentration time of runoff) the curves show the average precipitation intensity of

**Table 3.5 - Time of Concentration**

| <i>CHARACTERISTICS</i>                | <i>CONCENTRATION TIME</i>  |                             |
|---------------------------------------|----------------------------|-----------------------------|
|                                       | <b>Flat (Less than 2%)</b> | <b>Steep (More than 7%)</b> |
| For Residential and Undeveloped areas | 15 minutes.                | 10 minutes.                 |
| Residential on 1 acre or more lots    | 10 minutes.                | 8 minutes.                  |

storms having 2, 5, 10, 25, 50, and 100-year frequencies.



4. Concentration Time ( $T_c$ ): The time of concentration ( $T_c$ ) in minutes, is the estimated time it will take the storm runoff from the most remote part of the area to reach the point of the storm drainage system under consideration. This includes the time for water to flow over roofs, thru roof gutters and downspouts, over ground, turfed areas, streets, through street gutters to the nearest inlet of the drainage system plus the time of flow in the sewer pipes to the point under consideration.

Unless otherwise determined by overland flow charts (**Table 3.5**) or nomographs, the Time of Concentration ( $T_c$ ) for inlets of storm water collection systems may be used as follows:

- a. At no time shall the Time of Concentration be greater than thirty (30) minutes for design of storm inlets.
- b. "Soil Conservation Service (SCS) Method" - All formulas, constants and data shall be used with regard to the current Manual from the U.S. Natural Resources Conservation Service.
- c. "Regional Method" of Bureau of Highways - All formulas, constants and data shall be used with regard to the "Regional Method" from the current Manual of Instruction of Drainage and Design, Kentucky Transportation Cabinet, Bureau of Highways.

C. Stormwater System Facilities

1. Flow times in sewers or conduits to the point of design may be determined from the hydraulic properties of the sewers upstream of that point, assuming average flow-full velocity at the proposed sewer slopes;
2. Pipe Capacities - Public storm sewer pipes shall be designed and constructed to carry peak flows as determined by the methods previously described. At the design storm the drainage system shall be designed and constructed as open channel (non-surcharged) flow. Sizes shall be determined by Manning's Formula.
3. Minimum Pipe Size - The minimum diameter for public storm sewer pipe shall be fifteen (15) inches for inlet headwalls and twelve (12) inches for systems with a catch basin at the initial point;
4. Minimum and Maximum Velocities - Velocities in public storm sewer pipes, when flowing full at average peak flows, shall not be less than two (2) feet per second. Velocities shall not exceed fifteen (15) feet per second at the flow's re-entrance into the natural stream, unless approved by the Planning Commission's Engineer. The outlet velocities of all headwalls shall be shown on the profiles of the storm water system;
5. Gradients of Pipe - The sewer pipe shall be laid on gradients so that the velocity (flowing full) shall be kept within the foregoing stated minimum and maximum unless other special provisions are made. Pipe sizes shall be so selected as to avoid large differences in velocities between consecutive reaches;

6. Hydraulic Grades - To ensure against surface ponding or street flooding due to surcharging, the hydraulic grade line (HGL) in any inlet or manhole shall not be higher than the inlet grade. The HGL shall be shown on all profiles of the storm water system.

Design and construction of all public storm sewer appurtenances shall consider the balance of energy plus the loss due to entrance in all structures having a critical change in horizontal or vertical alignment. In no case shall the difference in invert elevations be less than the result of equal crowns when a smaller pipe empties into a larger one. In no case shall storm sewer pipe sizes be reduced more than one standard increment of pipe diameter due to an increase in invert gradient after balancing the energy losses within the structure.

7. Manholes (Junction Boxes) - Manholes shall be constructed in accord with Standard Construction Drawings as shown in the current city/county street specifications. Drop manholes may be required to reduce the slope of any sewer that has a velocity that exceeds twenty (20) feet per second. Pipes shall not extend more than two (2) inches into the side of the manhole, and the invert of the outlet pipe shall be at the bottom;

8. Inlets (Catch Basins) -

Capacity: The capacity of the grate on the inlet should not be less than the quantity of flow tributary to the inlet. Inlets at low points or sags should have extra capacity as a safeguard for street flooding from flows overtopping the street curb. A safety swale designed for the 100-year storm shall be placed at all low points or sags. Curb openings on combination inlets shall be used for overflows in the event that the grate is clogged. Special inlets may be required for streets with steep gradients to provide the extra capacity such situations require. Inlets shall not be placed along the frontage of flag lots. Pipes shall not extend more than two (2) inches into the side of the manhole, and the invert of the outlet pipe shall be at the bottom.

Location: Inlet spacing shall be based upon gutter and inlet capacity, street slope and contributing drainage area. The spacing of inlets should ensure that street drainage generated along continuous grades or in sags will not damage and flood private properties or residential basements. For the design storm, no more than 5 cfs shall enter any grade inlet; no more than 8 cfs shall enter any sump inlet; and no more than 2.5 cfs is permitted to flow in side yards between houses.

- a. Along continuous grades (less than two percent (2%)) - 400 feet maximum;
- b. Along continuous grades (two percent (2%) and over) - 600 feet maximum;
- c. At sag locations (draining less than 2 percent (2%) grades) - 400 feet maximum between inlets or from a high point;
- d. At sag locations (draining 2 percent (2%) and over grades) - 600 feet maximum between inlets or from a high point.

Special consideration should be given to storm drainage entering cul-de-sacs. Additional inlets shall be required when drainage areas and/or street slopes are excessive. In addition to an inlet provided near the low point within the cul-de-sac two (2) additional inlets shall be required along each curb prior to the entrance of the cul-de-sac in accordance with the following criteria:

- a. For street slopes **less** than eight percent (8%) and draining more than four hundred (400) feet of pavement; and
  - b. For street slopes eight percent (8%) or greater and draining more than three hundred (300) feet of pavement.
9. Intersections - Storm water runoff crossing the intersection of a street shall be kept to a minimum;
  10. Outfalls - When a storm sewer system outfalls into a flood plain of any major watercourse, the outfall shall not be subject to frequent floods or backwaters. Standard headwalls and/or headwalls with wingwalls including rock channel protection as aprons as erosion control, shall be constructed for all outfalls. Suitable baffles or other energy dissipaters shall be provided if maximum velocities are exceeded. The invert of the first storm sewer appurtenance upstream of the outfall structure shall be above the elevation of the calculated 100 year flood plain. The calculated 100 year flood plain for all channels with a drainage area of more than 50 acres within the project shall be shown on the Improvement Plan;
  11. Culverts and Bridges - Culverts and bridges shall be designed in accordance with the methods given by the Indiana Department of Transportation as modified from time to time; except that storm water quantities to be handled by the culverts and bridges shall be determined on the basis described in these standards. The allowable headwater (AHW) shall not be greater than  $HW/D = 2.+$ ;
  12. Headwalls - Standard headwalls for pipe sizes twelve (12) inch thru twenty-four (24) inch and headwalls including wingwalls and aprons for pipes larger than twenty-four (24) inch, shall be constructed at the outfall of all storm sewers;
  13. Other Drainage Improvement Measures - Other drainage improvement measures may be undertaken to provide the necessary hydraulic characteristics required for adequate drainage. These other measures include stream bed clearing, removal or obstructions, stabilization of banks or areas to eliminate erosion, widening, deepening or realignment of streams, construction of ponds behind dams, or other measures for adequate drainage;
  14. Specifications for Construction and Materials - See Appendices.

## **Section 325.2 - Basic Design and Construction Criteria for Stormwater Drainage Channels, Water Courses**

Open channels provide many advantages in the management and control of stormwater runoff. Such channels provide for natural infiltration of stormwater into ground water supply and extend the Time of Concentration ( $T_c$ ) helping to maintain the runoff rate nearer to that which existed prior to development. The objective of open channel flow design is: (a) to determine a channel slope and size that will have sufficient capacity to prevent undue flooding damage during the anticipated peak runoff period; and (b) to determine the degree of protection based on stream velocity to prevent erosion in the drainage channel. Existing drainage channels, which will remain undisturbed, shall not be required to be reconstructed unless additional capacity and erosion control is required.

- A. Degree of Protection - The Subdivider shall ensure that stormwater drainage channels and water courses shall be adequate to handle runoff from storms of the frequencies of occurrence shown for the degrees of site development as follows:
  1. For all Subdivisions and developments 25 year frequency;
  2. For main flood control channels - 100 year frequency. The runoff computed from these storms shall be that from the area within the Subdivision and from all other areas considered as fully developed in accord with development planned in the County's Comprehensive Plan.
- B. Determination of Quantity of Runoff - Each portion of the stormwater system of drainage channels and water courses shall be capable of handling the peak flows as determined by the proper method previously described in Section 1.
- C. Drainage Channel Capabilities - Drainage channels shall be designed to carry peak flows as determined by the methods previously described. Channel cross-section areas shall be determined by Manning's formula, using a value of  $n = 0.030$  for earth sections,  $n = 0.020-0.025$  for aggregate linings, and  $n = 0.015$  for paved sections.
- D. When open drainage channels require various lining types to attain ultimate design capacity, the earth sections of the drainage channel and its structure shall be designed and constructed to the ultimate design required.

Lining will not be required in the initial construction and may be delayed until development of the area produces runoff quantities large enough to result in erosive channel flows, unless drainage channel velocities are excessive initially.

- E. Erosion Control for Drainage Channels - Runoff flows in open channels may cause accelerated erosion. Such erosion can be controlled by limiting velocities, changing the channel lining, and reshaping the channel to spread the flow of runoff. Methods of controlling erosion in open channels include the following: (1) grass covers or sod; (2) Type II channel lining; and (3) reinforced concrete or precast paving. Erosion control for newly created or disturbed drainage channels shall be provided as follows:
  1. Velocities of less than two (2) feet per second (fps). Design velocities should generally be greater than 1.5 fps to avoid excessive deposition of sediments. When flat slopes are unavoidable, concrete paving should be used to accelerate runoff;

2. Velocities between one and one-half (1.5) feet and four (4) feet per second. The bottom and sides of the earth channel shall be seeded, mulched and fertilized to an elevation of three (3) feet above the design water surface. Seeding shall be a perennial or annual mixture of grass seeds at a rate of seventy-five (75) pounds per acre. Acceptable whole fertilizer shall be applied at a rate of seventy-five (75) pounds per one thousand (1000) feet. On slopes over five percent (5%), the bottom and sides of the earth channel shall be sodded and pegged to remain in place. Where seeding or sodding is required and the soil is not capable of supporting vegetation (such as, sandy soil or other clay types), appropriate action shall be taken to bring the soil to an acceptable condition which will support the growth of seed or sod;
  3. Velocities over four (4) feet per second. The bottom and sides of the earth channel shall be protected from erosion with an application of stone rip-rap, coarse aggregate and/or dumped rock channel linings. The type of application thickness and quantities shall be designed by the County's engineer to ensure maintenance free permanent stabilization. Reinforced concrete pavement at least four (4) inches thick may also be used at bends, changes in alignment, junctions with other ditches, and at other locations where erosion is likely to occur. On slopes over ten percent (10%), consideration should be given to the construction of larger sized channel linings, gabions (wire boxes) or paved channels with energy blocks or dissipaters to reduce excessive velocities and damage to receiving streams;
  4. Consideration shall be given for the construction of other methods of lining for erosion control including check dams, drop structures, gabions, etc. subject to approval of the Planning Commission's duly authorized representative.
- F. Drainage Channel or Water Course Relocations - In order to minimize hillside slippage near relocated drainage channels or water courses due to drainage channel depth or character of the earth in the drainage channel fill and side slopes, precautions shall be taken to compact the fill and side slopes, provision of under drainage, bank protection or reinforcing or other measures. Additional easement width shall be provided at such possible slide areas as determined by the Technical Review Committee.

## **Section 325.3 - Basic Design and Construction Criteria for Stormwater Runoff Control Facilities**

These regulations affect all Subdivisions :

- A. General- In order to minimize runoff damage to downstream properties, sediment pollution of public and private waters and hydraulic overloading of existing drainage facilities, the stormwater runoff from a Subdivision after development shall not exceed the pre-development discharge from that Subdivision calculated by using a undeveloped runoff coefficient as detailed on Table 3.4a. Detention/retention basins shall be provided for all Subdivisions . These basins may be designed and constructed for each individual lot but regional basins are encouraged throughout the Subdivision or development. Such facilities shall be designed and constructed so that no standing water will remain in detention basins during dry weather, or the design of retention basins that will not allow standing water to stagnate and present health hazards. In certain cases, other non-basin detention/retention techniques such as underground vault storage may be utilized when approved by the Planning Department. The amount of water to be detained shall be determined by the method described in the following paragraphs using the design criteria as referenced in **Tables 3.1 thru 3.5**.

Stormwater Control Facility Volume Calculations Estimated Runoff shall be calculated by an accepted method that generates an inflow/outflow hydrograph such as the Soil Conservation Service (SCS) Method or Modified Rational Method (MRM). It is recommended that these methods are used through a computer program. All documentation shall be submitted for review by the Planning Commission Staff.

- B. Pre-Development Calculations - Calculate the Subdivision or development site runoff based on a 2 and 50 year storm frequency. The entire acreage contributing to the runoff shall be included in the calculations.
- C. Post-Development Runoff Calculations - Calculate the proposed ultimate development runoff based on a 2, 50 and 100-year storm frequency curve. The entire acreage contributing to the runoff shall be included in the calculations.
- D. Storage Requirement - The amount of detention/retention required for a shall be the amount determined from the inflow/outflow hydrograph as previously outlined based on the 50 year storm frequency. If the MRM is used by computer program, the storm duration used shall be the one that produces the maximum storage, if calculating by hand the duration shall be greater than the time of concentration.
- E. Discharge from Detention Basin - The discharge from the detention/retention basin shall be controlled by a multi-stage release outlet structure and not be greater than a pre-developed runoff rate based on a 2 and 50 year storm frequency at that particular point where the discharge occurs. The routing of an emergency spillway shall be shown based on the 100-year storm frequency. Trash racks shall be installed on the low flow outlet in detention basins.

## **Section 325.4 - Detention Basins/Retention Basins - Standards and Specifications**

- A. Definition and Scope - These standards apply to permanent and temporary stormwater runoff, sediment and debris basins formed by an embankment, or excavation. These standards shall be used for the installation of basins on sites where:
1. Failure of the structure will not result in loss of life, damage to homes, or interruption of use or service of public utilities;
  2. Drainage area does not exceed two hundred (200) acres unless approved by the Commission;
  3. The water surface at the crest of the emergency spillway does not exceed five (5) acres;
  4. All detention basins shall be designed and built with side-slopes no greater than 3:1 (three feet horizontal per one foot vertical), paved channel bottoms and proper outlet structures to insure no standing water during dry periods;
  5. All retention ponds shall have dams that conform to all current State and Federal Regulations if applicable. In cases when the top of the dam is also a publicly dedicated street right-of-way, the developer shall have a geotechnical report prepared for and submitted to the County Engineer with recommendation on the design and construction of the dam. If the County Engineer believes that this dam would create maintenance or expense burden on the County due to repairs or replacement, the Subdivider shall be required to place a permanent guaranty in an amount established by the County Engineer or some other acceptable funding mechanism such as a Home Owners Association.

### NOTES:

- a. All computations in this Section shall be prepared by a Registered Professional Engineer or Surveyor licensed in Indiana;
- b. All detention areas and methods shall be reviewed by the engineer or surveyor of the Commission and if applicable the County Engineer to ensure compliance with the appropriate regulations of the County;
- c. Fencing may be required when the location of the detention area is not easily observed or in the opinion of the inspector a safety problem would exist.

## **Section 325.5 - Residential Lot Grading and Drainage**

- A. Lot Grading - Lot grading shall be accomplished as follows:

Within the limits of the public right-of-way adjacent to street pavements, all final grading for grass strip, sidewalk, and yards to the building structure, shall comply with minimum and maximum grades in accord with typical sections for streets as shown in the Appendix C. For lots that drain toward the street, the areas between the right-of-way line and the curb shall be graded so that water drains to the street at a minimum grade of 1 inch per foot (approximately 8 percent) except where sidewalks are required. All grading behind the street shall be done in a fashion that does not allow ponding of water adjacent to the paved street. For lots that drain away from the street, the area between the right-of-way line and the curb shall be graded so that water drains away from the street at a minimum grade of ½ inch per foot (approximately 4 percent) except where sidewalks are required.

Top Soil: If grading results in the stripping of topsoil, topsoil shall be uniformly spread over the lots as grading is finished. Temporary silt barriers should be installed around stockpiled topsoil for erosion and sediment control.

Trees: As many trees as can be reasonably utilized in the final development plan shall be retained by the Subdivider and the grading adjusted to the existing grade of the trees where practicable.

- B. Swales - Swales carry surface runoff from roofs, yards, and other areas to the rear of lots or along common property lines to streets or other drainage areas to prevent ponding of water near building structures or other portions of the lot. Surface drainage swales shall have a minimum grade of two percent (2%) and shall be constructed so that the surface water will drain onto a street, storm inlet, or natural drainage area. Swales for handling lot drainage shall be constructed as a part of final lot grading and be seeded and mulched or sodded as soon as possible to prevent erosion.
- C. Roof and Subsurface Drains - Roof downspouts, footing or foundation drains shall be discharged onto the same parcel of land from which the water is generated. Roof downspouts should be piped to natural drainage areas away from the street or onto concrete splash blocks, which direct water away from the building structure into swales, or other natural drainage areas. Downspouts constructed toward the street shall be discharged on the surface as far back onto the lot as possible and in no case be closer than twenty (20) feet from the nearest edge of right-of-way (property line). All subsurface drains shall be constructed toward the rear of the lot or connected into the storm sewer system. Any connection into a storm sewer system must be approved by the inspector. Outlets for roof drains shall have erosion control in place at the outlet areas to minimize erosion on site.



## **Section 325.6 - Maintenance of Retention/Detention Areas**

Unless dedicated to and accepted by a legislative body, the owner of each lot and/or the Subdivider shall be responsible for properly maintaining each retention/detention areas in order for such facility to function according to its design and purpose. Maintenance for the retention/detention areas shall be noted on the Improvement Plan, including access roads. If publicly dedicated, the area shall be included within the right-of-way and shown on the Secondary Plat. In Residential Subdivisions, all Detention Basins shall be deeded to the appropriate legislative body and the area shall be shown as a lot on the Secondary Plat. For any Retention Basin, only the appropriate inlets and outlet structures shall be dedicated to the appropriate legislative body. The area of the pond or lake shall be owned and maintained by the adjoining residents. This shall include maintaining the shoreline and removing sedimentation, and shall be included in the Subdivision's Restrictions and Covenants.

## **SECTION 330 - Soil Erosion and Slope Control**

The developer of a proposed Subdivision or development shall be required to submit to the Planning Department a detailed plan for erosion and/or sedimentation control as part of the Improvement Plan, Grading Plan or Site Plan review for all sites that do not require a Rule 5 Permit from the Department of Environmental Management. For sites that do require a Rule 5 Permit, a copy of the approved plan review from the Dearborn County Soil and Water Conservation District will be required to be submitted for review. Any time the requirements listed below conflict with the Rule 5 requirements, the more restrictive requirement shall be followed. The plan shall contain proposed methods for slope stabilization, erosion control and water pollution abatement and shall be reviewed by the Planning Department. The Commission shall require that such a plan, or part thereof, be submitted with the Improvement Plan, Grading Plan or Site Plan.

- a. Prior Grading or Disturbed Site - No Improvement Plan, Grading Plan or Site Plan may be approved where the site has been graded, stripped, excavated, devegetated or otherwise disturbed so that slipping, erosion and/or water pollution has or may reasonably be expected to occur until such conditions are corrected to the satisfaction of the Commission;
- b. Soil Survey - The current "Soil Survey of Dearborn and Ohio Counties, Indiana" issued by the United States Department of Agriculture Soil Conservation Service in cooperation with the Purdue University Agricultural Experiment Station is hereby made a part of these regulations and will be used for informational and reference purposes;
- c. Erosion Control Measures - *(To the extent inconsistent, this Ordinance shall supercede the Erosion Control Ordinance of the Code of Ordinances.)* Per the current "Indiana Handbook for Erosion Control in Developed Areas" the following shall be followed:
  1. All exposed and graded land will be covered by mulch, permanent seeding, or temporary seeding, or a combination of seeding and mulch (hay, straw, or other natural fiber - spread for a seventy-five percent (75%) or greater ground coverage) within 45 days of exposure. Seeding rates, dates, and materials may be obtained from the local Natural Resources Conservation Field Office;

2. All exposed and graded land will be mulched at seventy-five percent (75%) or greater coverage;
3. Sediment basins (debris basins, desilting basins, or silt traps) shall be properly designed according to runoff and sedimentation load calculations and installed during initial grading at locations which will provide the best protection from off-site damages. The construction of diversions to direct runoff from disturbed areas into sedimentation basin(s) shall be installed at the earliest possible time before larger site grading occurs whenever possible. A multi-purpose basin used for a silt trap then converted to a detention/retention basin is encouraged if properly designed and located. This combination structure will need to be dredged periodically during construction activities and after stabilization in order to provide adequate storage;
4. Concentrated flow areas, including storm sewer entrances, will need proper water control barriers to slow the runoff for rill and gully erosion control. These barriers shall include rock check dams and a series of pegged straw bales or properly installed silt fence where needed;
5. Suitable site perimeter protection shall be provided below all bare areas regardless of slope percentage. In addition, silt fence or straw bale barriers shall be installed at all toe slopes eight percent (8%) or greater in slope;
6. Individual building sites will need erosion control barriers (silt fence or straw bales) below all bare land;
7. Individual building sites will be seeded (temporary or permanent) and mulched within 45 days of disturbance where land is void of grass vegetation;
8. Until all lot and street improvements in the Subdivision have been completed, the Subdivider shall take such measures as are necessary to prevent erosion of graded surfaces, and to prevent the deposit of soil and debris from graded surfaces onto public streets, into drainage channels or sewers, or onto adjoining land.

### **SECTION 335 - Rights-of-way Disturbance Requirements**

Prior to placing any object within or disturbing Dearborn County Right-of-way, a permit shall be obtained from Dearborn County. Failure to obtain a permit shall be construed as an encroachment and shall be subject to removal by Dearborn County at the expense of the responsible party. The approved Improvement Plans shall serve as the required permit for right-of-way disturbance within Subdivisions but individual developments shall be required to obtain a permit from the Dearborn County Department of Transportation. The County Engineer shall determine a financial guaranty as described in Section 410, depending on the proposed right-of-way disturbance or the bond amounts listed below.

No headwalls or other obstructions shall be allowed within the right-of-way that is higher than four (4) inches unless designed and approved as breakaway or mountable. Utilities shall install breakaway or flexible markers for utility location signs.

- a. Driveway Permit - Anyone wishing to connect a private driveway or new roadway on to a public road within Dearborn County shall be required to obtain a Driveway Permit. It is the intent of this regulation to adopt the same driveway permit standards as established in the "Indiana Department of Transportation Driveway Permit Handbook." Plans shall be submitted that provide the details as outlined within INDOT Permit Handbook or as required by the Driveway Permit application. A financial guaranty shall be established as necessary by the County Engineer and remain in effect until released upon inspection by the County Engineer. Traffic control shall be provided and the County shall be held harmless from any and all claims, which are related to construction activities within the right-of-way. All ditches shall be set back from the edge of pavement as shown in Appendix C, unless otherwise directed by the County. Ditches shall be seeded, sodded, have gutter installed or have Rip-rap installed as required. Mailboxes shall be installed with a minimum three (3) feet wide apron and the front face of mailbox shall be a minimum of three feet six inches (3'-6") from edge of pavement along existing public streets.

The Driveway Apron shall be constructed of consistent material as the existing roadway.

- b. Utility Installation - All construction and utility installations within Dearborn County rights-of-way shall require a permit from the Dearborn County Department of Transportation. The permit is to be accompanied by a financial guaranty as identified in Section 410 of the Subdivision Control Ordinance. The financial guaranty amount shall be as established by the County Engineer. A minimum amount of \$500.00 is established per permit with a minimum of \$2,500.00 per major road right-of-way cut. A yearly renewable guaranty may be obtained for an aggregate amount of \$12,000.00. The renewal date shall be January 1 for a yearly bond. Bonds on major road right-of-way cuts shall remain in effect for not less than one year after final inspection by the County Engineer. A major road right-of-way cut shall be defined as any cut within the County right-of-way where:

1. The surface width of cut is twenty-four (24) inches or greater, or
2. A cut that is parallel to the road surface or close proximity of the surface where the bottom of the trench is lower than a line running at a 45 degree angle from the edge of pavement where the pavement surface may be damaged by future settlement of the cut area. Cuts outside of the edge of pavement with a width of six (6) inches or less shall not be considered a major cut.

Plans or drawings of the proposed work shall accompany all requests for permits. The intent of this permit is to regulate construction within the right-of-way to limit damages to the highway system and maintain a safe highway system. It is not intended to establish a permanent location for utilities within the right-of-way. Utilities shall continue to be responsible for relocation as necessitated by future use of right-of-way.

- c. Road Cuts - It is the intent of the Dearborn County Board of Commissioners to limit the number of open cuts allowed across public roads. Care should be taken to limit the required road cuts necessary within a given project. Open or trench cuts will not be allowed across any paved roadway unless special permission is granted by the County

Engineer on a per cut basis. All road cuts shall be made expeditiously as possible to cause a minimal amount of delay or inconvenience to the traveling public.

No more than two hundred (200) LF of trench is to be open at one time. Maintenance on road cuts shall be required for one (1) year from date of patching. Any settlement during this period shall be repaired to the satisfaction of the County Engineer. Ditches shall be re-established to the satisfaction of the Engineer. Ditches shall be repaired by seeding, sodding, or rip-rap as required by the Engineer.

- d. Trench Excavation and Backfill - Utility excavations in the right-of-way shall be backfilled to subgrade level according to Section 211 of the INDOT Standard Specifications with grade "B" Borrow. On steep grades (6% or greater), cuts that run parallel with the roadway surface either under, or within two (2) feet of the paved surface, shall be backfilled with clay material at its optimum moisture content and compacted to one hundred percent (100%) modified proctor. A lean concrete filler such as low strength mortar or flowable fill, must be used as trench backfill under any pavement.

The road surface shall be repaired to the minimum requirements for new construction or of the same thickness and type of materials as was existing whichever would provide the greatest structural capacity. Road cuts made through concrete pavements shall be repaired as directed by the County Engineer.