

ARTICLE III
GENERAL PROVISIONS

SECTION

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3.010 Scope (Amended 5/11/15)

For the purpose of this zoning resolution, there shall be certain general provisions that shall apply, except as specifically noted, to the county as a whole.

Neither the Board of Zoning Appeals nor the Planning Commission shall knowingly take action on any petition that is currently involved in litigation.

3.020 ONLY ONE (1) PRINCIPAL BUILDING ON ANY RESIDENTIAL LOT

Only one (1) principal building and its customary accessory buildings may hereafter be erected on any lot in a residential district. However, tracts fifteen (15) acres or greater would be allowed to have a maximum of four (4) principal buildings on that lot provided that all the principal buildings shall be able to be subdivided in the future in accordance with all requirements in this resolution.

3.030 LOT MUST ABUT A PUBLIC ROAD OR PERMANENT EASEMENT

No building permit or Certificate of Occupancy may be issued, nor any building erected on any lot within the planning region unless:

- A. The lot fronts for a continuous distance of at least fifty (50) feet upon a public road; except on a permanent dead-end road (cul-de-sac) where the minimum frontage may be forty (40) feet or if there is proof that the lot is a Lot of Record;
- B. The lot fronts for a continuous distance of at least fifty (50) feet upon a road shown on a subdivision plat approved by the regional planning commission; except on a permanent dead-end road (cul-de-sac) where the minimum frontage may be forty (40) feet;

- C. The lot fronts for a continuous distance of at least fifty (50) feet upon a permanent easement with access to an existing public highway or road. A setback of fifteen (15) feet from the easement is required, unless it is anticipated that the easement will be later developed into a county road, in which case the setback shall be thirty-five (35) feet.

3.040 REAR YARD ABUTTING A PUBLIC ROAD

When the rear yard of a lot abuts a public road, all structures built in the rear yard shall observe the same setback from the road right-of-way line, centerline of the road, or property line, as required for adjacent properties which front on that road. In addition, any structure located within twenty-five (25) feet of that setback line shall be no closer to any side property line than the distance required for side yards on adjoining properties fronting on that road.

3.050 CORNER LOTS

Corner lots shall have front yard setback requirements along all roads and rear yard setback requirements along all the remaining property lines.

3.060 FUTURE ROAD LINES

For the purpose of providing adequate space for the future widening of roads, required setbacks, or front yards shall be determined by the right-of-way as shown in the most current official Tipton County, Tennessee Transportation Plan (located in the Register of Deeds Office at the Tipton County Courthouse in Covington).

3.070 REDUCTION IN LOT AREA PROHIBITED

No lot, even though it may consist of one or more adjacent lots of record, shall be reduced in area so that yards, lot area per dwelling unit, lot width, building area, or other requirements of the zoning resolution are not maintained. This section shall not apply when a portion of a lot is acquired for a public purpose.

3.080 OBSTRUCTION TO VISION AT ROAD INTERSECTION PROHIBITED

On a corner lot, in any district, within the area formed by the center lines of intersecting roads and a line joining points on such center lines at a distance of one hundred (100) feet from their intersection, there shall be no obstruction to vision between a height of three (3) feet and a height of ten (10) feet above the average grade of each road at the center line thereof. The requirements of this section shall not be construed to prohibit any necessary retaining walls.

3.090 ACCESS CONTROL

In order to promote the safety of the motorist and pedestrian and to minimize traffic congestion and conflict by reducing the points of contact, the following regulations shall apply:

- A. A point of access for vehicles onto a road shall not exceed thirty (30) feet in width. All points of access shall be so constructed as to provide for proper drainage.

- B. There shall be no more than two (2) points of access to any one (1) public road for each three hundred (300) feet of lot frontage, or fraction thereof, provided, however, that lots less than one hundred (100) feet in width shall have no more than one (1) point of access to any one public road.
- C. No point of access shall be allowed within thirty (30) feet of the right-of-way line of any public intersection.
- D. No curbs or shoulders nor drainage ditches covered on county roads or rights-of-way shall be cut or altered for the purpose of access without written approval of the Director of Tipton County Public Works, or if a state highway, a permit must be obtained from the Tennessee Department of Transportation.
- E. When two (2) driveways are provided for one lot frontage, the clear distance between driveways shall not be less than twenty-five (25) feet.
- F. Cases requiring variances relative to the above provisions due to topographic limitations shall be heard and acted upon by the Tipton County Board of Zoning Appeals, provided, further, that no curb cuts for off-road automobile storage or parking space shall be permitted where the arrangement would require that vehicles back directly into a public road.

3.100 ACCESSORY USE REGULATIONS

The use of land, buildings, and other structures (including portable or stationary carports, with or without sides or ends) in each of the districts established by this resolution are defined by listing the principal uses. In addition to such principal uses, accessory uses that are customarily incidental to the permitted principal uses are also permitted in each district. Each accessory use shall:

- A. Be customarily incidental to the principal use established on the same lot.
- B. Be subordinate to and serve such principal use.
- C. Any individual or combination of structures be subordinate in area, intent and purpose to such principal use on parcels less than five (5) acres.
- D. Contribute to the comfort, convenience, or necessity of users of such principal use.
- E. Not include any mobile home units (single, double or triple-wides).
- F. Not include any truck trailers unless all wheels, axels and stands are removed, and the unit ventilated.
- G. Be setback a minimum of ten (10) feet from rear and side property lines.
- H. Be no closer to any road than the principal structure, with the exception of reverse frontage parcels, corner parcels and parcels fifteen (15) acres or greater.

3.110 BUFFER STRIPS

Where a use is established in areas zoned nonresidential (C-1, C-2, C-3, I-1) which abuts at any point upon property zoned residential (FAR, R-1, R-2, R-3), the developer of said use shall provide and maintain a buffer strip as defined herein along the point of abutment. See Definitions, Article II, Section 2.020.

3.120 SITE PLAN REQUIREMENT

The purpose of this provision is to prevent undesirable site development that would unduly create inadequate circulation and unnecessary congestion; to obtain maximum convenience, safety, economy and identity in relation to adjacent sites; and to provide maximum flexibility for expansion, change in use, and adaptation to individual needs. Thus, applicant's for Building Permits must submit scale drawings, according to the particular type of development proposals, to the Tipton County Regional Planning Commission in accordance with the following procedures. In addition, a fee established by the Tipton County Commission of \$50 shall be due and payable at the time of submittal along with ten (10) copies of the proposed site plan. A Site Plan Checklist is provided for reference in Appendix A, Form 1.

- A. Proposals for the construction or location of one (1) or more principal structures on any commercial or industrial lot (including accessory structures greater than 1,000 square feet) or more than one (1) principal residential structure on any lot, churches and other places of assembly on any lot, educational facilities on any lot, family and group day care homes and utility structures (such as, but not limited to, elevated storage tanks and wireless communication towers) shall be submitted at a scale no smaller than 1"-100', and must exhibit required automobile storage areas, loading and unloading spaces, maneuvering areas, openings for ingress and egress to public roads, and landscape treatment in accordance with Article III, Section 3.110, outlined in this resolution. (Amended 10/19/15)
- B. Proposal(s) for mobile home parks, Off Road ATV Tracks and Trails, Wireless Communications Towers, and Multi-Family Developments shall follow separate or additional provisions outlined in Article IV, Sections 4.090, 4.110, 4.150 and 4.220 respectively of this resolution.
- C. Aerial photography and Tax Maps shall not be used for any required site plan other than for Temporary Uses as regulated in 4.030 or Home Occupations as regulated in 4.040 or for any accessory structure that is greater than 1,000 square feet in size.
- D. Grading and Building permits are required before any work begins for any lot, tract, subdivision, commercial development or industrial development with the exception of agricultural activities (including timber crops). The penalty for grading prior to site plan approval or grading without a permit shall be \$100 per acre.
- E. Site plan approval shall be valid for a period not to exceed the criteria as regulated in Appendix B, Vested Property Rights. If work has not met the criteria set forth in Appendix B, the site plan shall be deemed void and applicant shall re-apply for approval. (Amended 5/11/15)

- F. Site plan denial by the Tipton County Regional Planning Commission shall require a one (1) year waiting period before reapplication, unless recommended otherwise by the Planning Commission. The above applications must be supported by any other information or data as might be deemed necessary by the Tipton County Regional Planning Commission.
- G. The site plan shall include (a checklist is provided as Form 1 in the Appendix):
1. Name and address of development, owner of record and applicant and names of all adjoining property owners.
 2. Present zoning classification of the site and all abutting properties.
 3. Nature of the proposed use of the site, and the Tax Map and Parcel Number.
 4. Date, scale, north point and all related dimensions and bearing of the lot.
 5. Courses and distances of centerlines of all roads.
 6. All building restriction lines (yard setbacks and right-of-ways) and easements.
 7. Acreage or square footage of the lot. Show the Flood Map number and date.
 8. Sufficient grade and elevation information to demonstrate that the property will drain properly, and show the topographic contours at intervals not to exceed five (5') feet. The location of any potential wetlands areas.
 9. Location of all utilities, including all outside lighting (existing and proposed), fire hydrants, fire lines, meters, valves and backflow preventers.
 10. All Commercial and Industrial zoned or use properties, apartment dwellings and condominiums shall require a stormwater runoff analysis including before and after volumes, grading plans and erosion control plans (if necessary) approved by the Director of Tipton County Public Works prior to Site Plan approval. These requirements also apply to all Assembly, Educational and Institutional classified occupancy construction (according to the current adopted Building Code) greater than two thousand five hundred (2,500) square feet. See Subsection 3.140 in this Resolution for requirements.
 11. Show location of property with respect to surrounding property and roads. Show location of septic tank and field lines on the property as well as a copy of the Permit for Construction of Subsurface Sewage Disposal System.

3.130 WIND AND SOLAR ORIENTATION (AMENDED 10/19/15)

Individual Wind and Solar energy devices shall be subject to the setback requirements affecting principal structures in the corresponding zoning district. The use of individual wind energy devices for the purpose of providing energy is a permitted use within Commercial (C-2 and C-3 only) and Industrial (I-1) zones, and as a Use Permitted as a Special Exception in Residential Zones (FAR and R-1 only), either as a part of a structure or as an independent structure. The use of individual solar energy devices for the purpose of providing energy is a permitted use within all zones, either as a part of a structure or as an independent structure. A building permit is required for all independent structures.

Wind and solar farms, as defined in Article II, Section 2.020 (Definitions), are considered as Uses Permitted as Special Exceptions in the I-1, Industrial Zoning District. All wind and solar farms shall be fenced and buffered (as required in Subsection 3.110). A building permit shall be required before any construction of a wind or solar farm shall begin. Said permit shall be based upon four percent (4%) of the actual total cost of construction, including all associated equipment. A document submitted by the developer shall be on company letterhead and submitted at the time of issuance of permit to establish cost of permit. Any wind or solar farm not in operation for a continuous period of thirty (30) months shall be considered abandoned and the parcel owner is responsible for removal of all systems, within ninety (90) days of receipt of notice. To ensure the removal and disposal of all systems, the applicant shall submit a performance bond (to be held by the Planning Commission) in the amount of \$1,000 per acre. The performance bond shall be released after removal and disposal of all systems are completed.

3.140 DRAINAGE AND DETENTION SYSTEM DESIGN AND REQUIREMENTS

The purpose of this provision is to provide guidelines to fulfill the Site Plan Requirements in Subsection 3.120. Detention systems are designed to intercept a volume of storm water runoff and temporarily impound the water for gradual release to the receiving stream or storm sewer system. Detention systems are designed to completely empty out between runoff events, and therefore provide mainly water quantity control as opposed to water quality control. Detention basins can provide limited settling of particulate matter, but a large portion of this material can be used to reduce the peak discharge of storm water to receiving streams to limit downstream flooding and to provide some degree of channel protection. There are several types of detention facilities used to manage storm water runoff, including detention basins and underground vaults, pipes and tanks.

A. Drainage and Storm Sewers

1. General Requirements

The Planning Commission shall not approve any site plan (other than incidental home occupations), which does not make adequate provision for storm water or floodwater run-off channels or basins. The storm water drainage system shall be separate and independent from any sanitary sewer system.

2. Nature of Storm Water Facilities

(a) Location

The developer may be required by the Planning Commission to transport by pipe or open ditch any spring or surface water that may exist prior to or as a result of the development. Such drainage facilities shall be located in the road right-of-way, where feasible, or in perpetual unobstructed easements of appropriate width and shall be constructed in accordance with the construction specifications contained in this subsection.

(b) Accessibility to Public Storm Sewers

Where a public storm sewer is accessible, the developer shall install storm sewer facilities, or if no outlets are within a reasonable distance, adequate provision shall be made for the disposal of storm waters, subject to the specifications of the appropriate governmental representative; inspection of facilities shall be conducted to assure compliance. The enforcing officer shall conduct inspection of facilities.

If a connection to a public storm sewer will be provided eventually, as determined by the Director of Tipton County Public Works, the developer shall make arrangements for future storm water disposal by a public system at the time the site plan receives final approval.

(c) Accommodation of Upstream Drainage Areas

A culvert or other drainage facility shall, in each case, be large enough to accommodate potential runoff from its entire upstream drainage area, whether inside or outside the development. Necessary facilities shall be sized based on the construction specifications and assuming conditions of maximum potential watershed development permitted, as approved by the Director of Public Works.

(d) Effect on Downstream Drainage Areas

The developer shall also prepare and submit to the Director of Tipton County Public Works a study of the effect of each site plan on existing downstream drainage facilities outside the area of the development.

Increased flow rates, volumes, and velocities of water generated by a development must be estimated and may be released if the increased runoff is conveyed to an adequate downstream watercourse or facility without adverse impact (as determined by the Director of Tipton County Public Works) upon the land over which the waters are conveyed or upon the watercourse or facility into which such waters are discharged.

Where it is anticipated that the additional runoff incidental to the construction of the development will overload an existing downstream drainage facility, the Planning Commission may withhold approval of the site plan until provisions have been made for adequate improvement of such drainage facilities. The developer may be required to construct adequate downstream facilities, contribute his pro-rata share toward the construction of adequate downstream facilities, or install onsite storm water detention to mitigate the downstream impacts. The Planning Commission reserves the right to require pro-rata share contributions or downstream improvements where storm water detention is not in the best interest of the overall drainage system and the county in general.

On site storm water detention proposed to reduce the peak rate of discharge to the off-site drainage system in lieu of downstream improvements shall not cause increased peak flows or velocities detrimental to downstream properties or facilities. When detention facilities are utilized, the peak rate of discharge after development shall not exceed the predevelopment peak rate with adequate provision made to prevent erosion due to increased velocities and adequate provision made for downstream accommodation of increased volumes of runoff.

Should it be determined by the Director of Tipton County Public Works that downstream conditions dictate additional control of lesser storms (up to the twenty-five (25) year design storm), the developer shall install flow control devices (weir, etc.), as approved by the Director of Tipton County Public Works.

Detention facilities shall be shown on the site plan as perpetual drainage easements and shall be maintained by the property owner(s). The government of Tipton County will in no way be responsible for maintenance of drainage facilities on private property. Estimated increases in discharge velocity shall be mitigated by energy dissipation devices, where required, to prevent erosion.

The drainage system shall be designed to honor natural drainage divides, where practical. Surface waters shall not be concentrated and discharged onto adjoining property at rates and/or velocities exceeding predevelopment conditions unless the owner of the affected land has granted an easement expressly authorizing such discharge or unless the discharge is into an adequate natural watercourse or drainage system.

(e) Areas of Poor Drainage

Whenever a site plan is submitted for an area which is subject to flooding, the Planning Commission may approve such development; provided, that the applicant fills the affected floodway fringe area of said development to place public way elevations at no less than twelve (12) inches above the regulatory flood elevation and first floor building elevations (including basements) at no less than one (1) foot above the regulatory flood elevation as determined by FEMA with respect to a 100 year event. The site plan of such development shall provide for a floodway along the bank of any stream or watercourse of width sufficient to contain or move the water of the regulatory flood, and no fill shall be placed in the floodway; neither shall any building nor flood-restrictive structure be erected or placed therein. In any area that is subject to flooding, FEMA shall be contacted before any earthwork begins in or reasonably near the floodway fringe due to possible changes in the floodway.

When sinkholes are encountered, the developer, based upon competent engineering, shall determine the limits of any standing water. The Planning Commission may prohibit construction in and around sinkholes. The Director of Tipton County Public Works and Planning Commission shall approve any alteration of a sinkhole or the drainage pattern.

(f) Floodplain Areas

The Planning Commission may, when it deems necessary for the health, safety, or welfare of the present and future population of the area or necessary to the conservation of water, drainage, and sanitary facilities, prohibit the development of any portion of the property, which lies within the floodplain of any stream or drainage course. The regulatory floodway shall be preserved from any and all destruction or damage resulting from clearing, grading, or dumping of earth, waste material, or stumps. Any site plan which contains flood prone land shall be subject to the special provisions set forth in Article VII, of these regulations.

(g) Storm Water Detention and Discharge Control

A Stormwater Runoff Analysis, is defined as a study using hydrologic engineering methods and principles to examine and propose changes to conveyances and structures required to handle incremental stormwater volumetric flow rate as a result of the proposed development based on a 25 year rainfall event. The analysis shall include the downstream impact on adjoining parcels, roads, culverts, bridges and other conveyances and structures and will continue to the point that incremental estimated flow rate as a result of the completed proposed development will result in no adverse impact to public or private property; the post development flow shall be no greater than pre-development flow in any specific conveyance at the point of study termination, shall be completed and submitted with the construction plans.

The intention of the Tipton County Planning Commission is to allow release of the increased volume of water generated by a development, but at a rate not to exceed the predevelopment rate, rather than detain it if the increased runoff can be conveyed to an adequate drainage way, which will not cause downstream flooding. The major factors in evaluating drainage designs will be the effect on downstream water levels, existing conveyances, proximity of any structures, and erosion of banks.

In order to prevent erosion at all outlet points, the design engineer will be required to design and submit for approval an outlet system that approximates the width and velocity of the flow which existed prior to development.

Whenever the calculated stormwater runoff, considering the fully developed basin at proposed zoning for the twenty-five (25) year storm, exceeds the capacity of the downstream pipes or channels, detention facilities shall be utilized.

3. Dedication of Drainage Easements

(a) General Requirements

Where a development is traversed by a watercourse, drainage way, channel, or stream, there shall be provided a storm water easement or drainage right-of-way conforming substantially to the lines of such watercourse and of such width and construction as will be adequate. Where open drainage ways are utilized they shall be designed for the twenty-five (25) year frequency flood.

(b) Drainage Easements

Where topography or other conditions are such as to make impracticable the inclusion of drainage facilities within a road right-of-way, perpetual unobstructed easements at least ten (10) feet in width for such facilities shall be provided across property outside the right-of-way or maintenance easement and with satisfactory access to roads. Easements shall be indicated on the final site plan. Drainage easements shall be carried from the road to a natural watercourse or to other drainage facilities.

When a new drainage system is to be constructed which will carry water across private land outside the development, appropriate drainage rights must be secured and indicated on the site plan.

The applicant shall dedicate to the appropriate entity, when required by the Planning Commission, by drainage or conservation easement through a declaration of covenants and restrictions, the land on both sides of an existing watercourse to a distance to be determined by the Director of Tipton County Public Works and approved by the Planning Commission.

Along watercourses, low-lying lands within any floodway, as determined by the Flood Insurance Rate Maps provided by FEMA pursuant to Section 3.120, of these regulations, whether or not included in areas for dedication, shall be preserved and retained in their natural state as drainage ways.

(c) Drainage Construction

All ditch, channelization, culvert, storm drain, or catch basin construction shall be governed by the Specifications for Drainage Construction, included in this section. These specifications are adopted and made a part of these regulations.

B. Drainage System Design

1. Ditching and Channelization

This work shall consist of the construction of ditches adjacent to roadway shoulders and feeding to and from culverts under or adjacent to the

roadway. All drainage ditches shall be graded in their entirety during the time the roadways are being graded; such grading shall be completed prior to final inspection of the roadways. All drainage conveyances that are not located within the road right-of-way, shall be indicated on the plans as private drainage easements.

2. Stabilization of Ditches

All open ditches shall be stabilized in accordance with the following requirements:

Size of Nearest Culvert (Upstream) Lined	Seeding Required	Sod Required	To Be Concrete
Exceeding 15"	Grades 1.00%-3.00% Grades	Grades 3.00%-12.00% Grades	Grades 12.00% Grades
Exceeding 18" thru 24"	1.00%-1.50% Grades	1.50%-7.00% Grades	7.00% Grades
Exceeding 30" thru 36"	1.00%-1.50% Grades	1.00%-4.00% Grades	4.00% Grades
Exceeding 42" thru 72"		2.50% or Less	2.50%

3. Concrete Ditch Pavings

Concrete ditch paving shall consist of the construction of paved ditches on a prepared subgrade. The subgrade shall be shaped and compacted to a firm even surface.

All soft materials shall be removed and replaced with acceptable materials and compacted as directed by the Director of Tipton County Public Works.

Concrete ditch pavement shall be four (4) inches in thickness throughout and shall be backfilled promptly after the concrete has set and the forms have been removed. All concrete used in ditch linings and detention basins shall be air entrained and have fiber reinforcement. The backfilled materials shall be thoroughly compacted. Expansion joints shall be located as directed by the Director of Tipton County Public Works.

4. Culverts and Storm Drains

All culverts shall be approved for size and gage by the Tipton County Public Works Department, and the installation of the culvert shall be inspected by the Tipton County Public Works Department prior to final driveway surface installation. Any culvert that does not meet the specifications of the Tipton County Public Works Department shall be removed and reinstalled prior to acceptance of the roadways within the section being developed.

This work shall consist of the construction of pipe culverts and storm sewers as shown on the plans.

Driveway culverts shall be a minimum diameter of fifteen (15) inches and a minimum length of twenty (20) feet; cross drains shall be a minimum diameter of eighteen (18) inches.

Reinforced concrete pipes shall conform to minimum standards for Class III, Reinforced Pipes, A.S.T.M. C76. Corrugated metal pipes shall conform to Section 915.02 or 915.04, Standard Specifications, and to gage as follows:

Rounded Corrugated Metal Pipes	
Size	Gage
15" - 24"	16
30"	14
36" - 48"	12
54" - 72"	10
78" - 84"	8

Arch Corrugated Metal Pipes	
Size	Gage
18" x 11" - 22" x 13"	16
25" x 16" - 36" x 22"	14
43" x 27" - 65" x 40"	12
72" x 44" or Larger	10

For pipes smaller than forty-eight (48) inches in diameter, a minimum cover of one (1) foot, exclusive of base and paving, is required from top of pipes to finished sub-grade. A minimum cover of two (2) feet is required for pipes forty-eight (48) inches in diameter and larger. All pipes shall be installed on straight line and grade and shall be laid with the spigot end pointing in the direction of the flow, with the ends fitted and matched to provide tight joints and smooth uniform invert.

Pipes shall be bedded on a six (6) inch thickness of Class B materials and backfilled to a depth of thirty (30) percent of the diameter of the pipes. Recesses shall be dug in the bedding materials to accommodate the fill. Class B, bedding shall be Size No. 7, as shown in Chart No. 903.23, Standard Specifications. Culverts and storm drains in existing roadways shall be backfilled to the depth of the cut.

5. Headwalls

Concrete headwalls shall be constructed at both ends of cross drains as approved by the Director of Public Works.

6. Catch Basins

This work shall consist of constructing catch basins complete within inlets, outlets, and inverts. Tops and inlets shall be constructed to conform to roadway grade so that drainage can easily be caught and no ponding created.

7. Box Culverts and Bridges

Design of box culverts and bridges shall be submitted to the Director of Tipton County Public Works for approval before construction is permitted.

8. Roadside Ditches

Roadside ditches, in conventional sections, shall be built to a grade that will permit good drainage, and in no case shall the slope of the ditch be less than one-half (0.50%) percent. All drainage ditches shall be stabilized, as indicated in these specifications.

9. Changes in Water Channels

Where the developer rechannelizes through a development, he will be responsible for replacing cross drains under roads, as directed by the Director of Tipton County Public Works. This work shall be done at the expense of the developer. Also, any alterations to existing channels or streams shall require the approval of the Tennessee Department of Environment and Conservation. An Aquatic Resource Alteration Permit (ARAP) shall be required for such activities and must be approved prior to the approval of the construction drawings.

10. Drainage Easements

All drainage easements are either private or public. The maintenance of Private drainage easements is the sole responsibility of the property owner or developer, and shall be noted as such on the site plan. The Director of Tipton County Public Works shall approve all public drainage easements through the construction plans and shall be noted as such on the site plan. All drainage easements prior to the passage of this amendment shall be considered as private unless the Director of Tipton County Public Works approves and accepts the dedication of the private drainage easement.

C. Detention Design and Requirements

1. Purpose and Design Process

The overall purpose of urban stormwater detention facilities is to control and utilize runoff in a sound manner such that the people and property of the areas, both upstream and downstream of changes in land use, experience no change to their normal activities of daily living. The effect of temporary storage of runoff on the shape of a hydrograph is pronounced and significant.

All stormwater detention facilities constructed within Tipton County shall be in accordance with the minimum design requirements and specifications as set forth in this section.

Any person, developer, firm, or corporation proposing to construct any stormwater detention facility within Tipton County shall apply to the Director of Tipton County Public Works for approval of the location, dimensions, design and construction methods, and materials of such facility. The application shall be in writing, and shall contain such information including maps, site plans, diagrams, design data, detailed drawings, specifications, and calculations as herein required.

If the Director of Tipton County Public Works finds that a proposed stormwater detention facility will conform to acceptable standards, the Director of Tipton County Public Works shall issue his approval in writing.

If the Director of Tipton County Public Works finds that a proposed stormwater detention facility will not conform to acceptable standards, the Director of Tipton County Public Works shall issue his notice of disapproval in writing.

The design of a detention basin involves the following steps:

- (a) Determine the purposes for which the basin will be used.
- (b) Determine the inflow hydrograph to the basin for the design storm.
- (c) Determine the maximum release rate.
- (d) Estimate the volume of storage needed.
- (e) Determine the depth-storage relationship for the basin.
- (f) Select the outlet structure(s) compatible with the basin uses and determine the depth-outflow relationship.
- (g) Determine the outflow hydrograph by performing the routing for the basin.

2. Definitions

For purposes of this section the following definitions of words and terms shall apply:

- (a) Catch Basin - A catch basin is a part of a storm drain or sewer system which is designed to trap debris so that it cannot enter the drainage pipes.
- (b) Dam – An artificial barrier or embankment having greater than six feet difference in elevation between the crest of the emergency spillway and the lowest point in the cross section taken along the centerline of the dam and which does or may impound water.
- (c) Detention Basin – Any man-made area or structure that serves as a means of temporarily storing stormwater runoff.
- (d) Detention Storage – The temporary detaining or storage of stormwater on or beneath the ground surface, on rooftops, parking lots, or by other means under predetermined or controlled conditions.
- (e) Detention Storage Volume - The volume of storage provided in detention basins shall be sufficient to store the stormwater runoff generated by the development during a 25-year storm, less the discharge as permitted in the maximum release rate section of this chapter. Storage volume shall be sufficient to store excess flows resulting from a 25-year storm using a 24-hour rainfall distribution or other approved methods.
- (f) Development – Any change in land use, or improvement on any parcel of land that increases stormwater runoff.
- (g) Discharge – The rate of outflow of water from detention storage.
- (h) Drainage Area – The geographical area contributing stormwater runoff to a point under consideration, i.e., a watershed, tributary area, or catchment area.
- (i) Dry Bottom Basin – A detention basin or facility not intended to have a permanent pool.
- (j) Freeboard – The difference in elevation between the design water surface in the detention facility and the elevation at which uncontrolled overtopping of the facility begins.
- (k) Hyetograph – Intensity distribution of a rainfall event with respect to time.
- (l) Hydrograph – Flow rate distribution of stormwater runoff with respect to time at the point under consideration, or of detention basin outflow.
- (m) Maximum Release Rate - The maximum allowable release rate of stormwater runoff originating within the proposed development shall be the quantity of flow computed using the allowable storm, as defined below, and the characteristics of the development drainage area, i.e., area, percent impervious, time of concentration, runoff coefficient, curve number and channel condition. The allowable storm is defined as the year storm which the controlling downstream

pipe or improved channel could facilitate considering a fully developed upstream drainage basin at present or proposed zoning. Drainage culverts or bridges installed by the State or County in connection with roadway projects that do not have improvements beyond the right-of-way lines shall not be considered in determining the maximum allowable release rate.

- (n) One Hundred Year Storm – A rainstorm of a given duration and depth of precipitation having a one percent chance of occurrence in any given year.
- (o) Project – Any development involving the construction, reconstruction, or improvement of structures and/or grounds.
- (p) Retention Pond - A retention pond is designed to hold a specific amount of water indefinitely. Usually the pond is designed to have drainage leading to another location when the water level gets above the pond capacity, but still maintains a certain capacity.
- (q) Stormwater Runoff Analysis – A study using hydrologic engineering methods and principles to examine and propose changes to conveyances and structures required to handle the incremental storm water volumetric flow rate as a result of the proposed development based on a 25 year rainfall event. The analysis shall include the downstream impact on adjoining parcels, roads, culverts, bridges and other conveyances and structures and will continue to the point that incremental estimated flow rate as a result of the completed proposed development will result in no adverse impact to public or private property; the incremental flow shall be less than ten percent (10%) of predevelopment flow in any specific conveyance at the point of study termination.
- (r) Stormwater Runoff – The waters derived from precipitation falling within a drainage area, flowing over the surface of the ground or collected in channels or conduits.
- (s) Stormwater Runoff Not Detained - The rate of discharge from a detention facility and the rate of discharge of stormwater runoff from areas of the development not controlled by the detention facility shall not collectively exceed the maximum release rate.
- (t) Twenty-five Year Storm – A rainstorm of a given duration and depth of precipitation having a twenty-five percent chance of occurrence in any given year.
- (u) Wet Bottom Basin – A detention basin intended to have a permanent pool.

3. Project Site Information

Detention basin storage type, capacity required and release rates are to be determined by the Design Engineer. To assist in the review of the proposed system, the following project information shall be provided to the Director of Tipton County Public Works by the Design Engineer:

- (a) A topographic map of the project site and immediately adjacent areas, of suitable scale and contour interval, which shall define the location of streams, extent of floodplains and calculated high water elevations, and shorelines of lakes and ponds.
- (b) The size, location, and flowline elevations of all existing sanitary and storm sewers, which fall within the project limits and within a distance of five hundred feet beyond the boundaries of said project.
- (c) A proposed grading plan and/or site plan showing existing and proposed contours, buildings, parking lots, and other development features.
- (d) Proposed areas and/or methods to be used for detention facilities. The Director of Tipton County Public Works shall approve the location, size, shape, or other desired design features of proposed detention basins.
- (e) Drainage area map showing upstream drainage area tributary to the development, and to each proposed detention facility along with the location and size of the controlling downstream drainage structures.
- (f) Special Study to determine effects of development, if required by the Director of Tipton County Public Works.

4. Plans, Specifications and Calculations

Based on design data furnished, plans and specifications for detention facilities and appurtenances shall be submitted to the Director of Tipton County Public Works for approval prior to construction.

The following plan and design information shall be provided.

- (a) Finalized site plan, development plan, and facilities information as furnished pursuant to the previous section;
- (b) Complete plans for grading, storm sewers, inlets, outflow structures, dams, emergency spillways, and other appurtenances;
- (c) Slope, type, size, and complete flow calculations (if requested) for all existing and proposed storm sewers, outlet structures, spillways, and waterways,
- (d) The grading plan shall show existing and final contours at intervals not to exceed five (5') feet, and a line defining the high water elevations to be expected during the one hundred year flood. Proposed cross sections and grades of overflow swales shall also be included;
- (e) Stage-outflow curves for proposed detention facilities plotted in units of detention facility water surface elevation (and depth).
- (f) Stage-outflow curves for outlet works plotted in units of detention facility water surface elevation (and depth).

- (g) Inflow and outflow hydrographs plotted in units of cubic feet per second of inflow and outflow as ordinates.
- (h) Inflow and outflow hydrographs, detention pond elevations, and storage in tabular form. The elevation at which the peak discharge occurs should be included.

5. Method of Detention

The following conditions and limitations shall be observed in selection and use of method of detention.

- (a) General Location – Detention facilities shall be located within the parcel limits of the project under consideration. No detention or ponding will be permitted within public road right-of-ways. Location of detention facilities immediately upstream or downstream of the project will be considered by special request if proper documentation is submitted with reference to practicality, feasibility, and proof of ownership or right-of-use of the area proposed. Conditions for general location of detention facilities are identified in the following sections.
- (b) Dry Reservoirs – Dry reservoirs shall be designed with proper safety, stability, and ease of maintenance facilities, and shall not exceed eight (8) feet in depth. Maximum side slopes for grass reservoirs shall not exceed one (1) foot vertical for three (3) feet horizontal (3:1) unless adequate measures are included to provide for the above noted features. Minimum bottom slope of the grass reservoirs shall be 1 %, unless a concrete swale is provided. In no case shall the limits of maximum ponding elevation (100 year storm) be closer than thirty (30) feet horizontally from any building and less than one (1) foot vertically below the lowest sill or floor elevation. The entire reservoir area shall be seeded, fertilized, mulched, sodded or paved as required prior to issuance of certificate of occupancy. Any area susceptible to, or designed as, overflow by higher design intensity rainfall (100 year frequency) shall be sodded.
- (c) Open Channels – Normally permitted open channels may be used as detention areas provided that the limits of the maximum ponding elevation (100 year storm) are not closer than thirty (30) feet horizontally from any buildings, and not less than one (1) foot below the lowest sill or floor elevation of any building. No ponding will be permitted within public road right-of-way unless approval is given by the Director of Tipton County Public Works.

For design of other typical channel sections, the features of safety, stability, and ease of maintenance shall be observed by the Design Engineer.

The entire reservoir area of the open channel shall be seeded, fertilized, mulched, sodded or paved as required in the original design. The hydraulic or water surface elevations resulting from channel detention shall not adversely affect adjoining properties.

- (d) Permanent Lakes – Existing permanent lakes with fluctuating volume controls may be used as retention areas provided that the limits of maximum ponding elevations (100 year storm) are no closer than thirty (30) feet horizontal from any building and not less than one (1) foot below the lowest sill or floor elevation of any building. Analyses to be based on post development flow rates.
- (e) Underground Systems – Underground storage systems may be used and shall be designed to provide storage for at least the 25-year storm. These systems shall be designed so that water surface from the 25-year storm; does not exceed the elevation of the top of the storage pipe or vault, or come within 6 inches of the bottom of any inlet grate, or exceed the top of any upstream pipes (unless these are privately maintained and the system and pipes are designed to operate as a pressure system).

These systems shall be designed to be relatively maintenance free by; using adequate trash screens at all inlets to the system and at the control structures; avoiding the use of moving parts; avoiding the use of small control pipes and narrow weir openings; maintaining a minimum low flow velocity of 4 FPS at a reasonable frequent reoccurring storm.

When an underground storage system is used in a public right-of-way or public maintenance easement it shall be constructed of the same material as all public maintained systems and the minimum pipe diameter shall be 15 inches. These systems are to be singular (not multiple or paralleling) in line pipe systems. When the underground storage system is to be privately maintained and located on private property it shall be constructed of materials that have a similar expected life as that of the project. Tanks, vaults, or oversized pipes and multiple paralleling pipes may be used in the private systems.

All underground storage systems shall be provided with a reasonable number and type of access locations to allow easy inspection and maintenance.

6. Construction

Standards for construction of inlets, pipes, manholes, paved ditches and other detention basin appurtenances shall be approved by the Director of Tipton County Public Works in accordance with the appropriate section of this manual and the County's construction specifications.

7. Emergency Spillways

Emergency spillways shall be sized to carry the one hundred year flood assuming the detention basin is already filled to design storage capacity.

Freeboard for earthen detention basins shall be a minimum of one-foot difference in elevation between the top of the settled embankment and the water surface, with the emergency spillway flowing at design depth.

8. Slopes

For wet or dry bottom basins, if side slopes exceed one foot vertical to three foot horizontal, both erosion control and safety measures shall be provided. In no case shall earthen slopes exceed one foot vertical to two foot horizontal at any point.

If vertical walls are used, the basin must be fenced, with steps, ramps or other means of egress provided.

9. Appearance

The use of detention facilities for purposes other than the temporary storage of runoff is encouraged. Whenever possible, the designer should incorporate detention basins in parking lots, playgrounds, ponds, private lots or common areas to enhance the esthetic appearance of a facility.

Pipes, drainage structures, outlet works, or other necessary structural features of detention ponds shall be devised so as to be minimum in number and inconspicuous.

10. Access

Provisions shall be made to permit access and use of auxiliary equipment to facilitate emptying, cleaning, maintenance, or for emergency purposes.

11. Control Structures

Detention facilities shall be provided with obvious and effective control structures. Plan view and section of the structure with adequate details shall be included in plans.

The maximum design discharge (Q) for the low-flow pipe shall not exceed the allowed maximum release rate when considering a 25-year storm.

Sizing of the low-flow pipe shall be by inlet control or hydraulic control or hydraulic gradient requirements as appropriate. Low-flow pipes or constrictions shall not be smaller than fifteen (15) inches in diameter on public maintained systems to minimize maintenance and operating problems. An adequately sized bar-screen on a minimum 2:1 slope to reduce blockage by debris is suggested on the low-flow pipe and control structures.

Detention basin outflow shall discharge into a downstream drainage system. Where a public conveyance is utilized, detention outflow may be connected without additional control if approved by the Director of Tipton County Public Works. Where no public conveyance is available, the outflow shall be adequately dissipated to prevent point source erosion and the design shall be approved as part of the construction plans.

12. Easements

Two types of easements shall be provided in plans for detention facilities.

- (a) Private Drainage Easements – Private drainage easements will be required on all portions of the detention system that are not incorporated in a public drainage easement. Such areas shall be denoted on the development site plan by “Reserved for Storm Water Detention”. The facilities located in these private easements shall be the responsibility of the property owner or owner’s association to maintain.
- (b) Public Drainage Easement – A public drainage easement will be accepted in writing by the Director of Tipton County Public Works for all components of the detention facilities which are standard Tipton County drainage structures; i.e., pipes, concrete channel lining, outlet structures and spillways.

13. Maintenance

Detention facilities, when mandatory, are to be built in conjunction with storm sewer installation and/or grading. Since these facilities are intended

to control increased runoff, they must be partially or fully operational soon after the clearing of the vegetation. Silt and debris connected with early construction shall be removed when necessary from the detention area and control structure in order to maintain maximum storage capacity.

Maintenance of the portion of the detention facilities not located in a public drainage easement is the responsibility of the property owners or association. Maintenance shall consist of but not be limited to the following items:

- (a) Outlet cleaning
- (b) Mowing
- (c) Herbicide spraying
- (d) Litter control
- (e) Removal of sediment from basin and outlet control structure.
- (f) Repair of drainage structures.

The responsibility of all maintenance of the detention facilities and subdivision projects shall remain with the developer until the County has accepted the project. Upon acceptance of the development by the County, maintenance responsibility shall transfer to the County for all components located in the public drainage easements and to the property owner or owner's association for all components of the detention system located in the private easement.

The following note shall be clearly placed on the final site plan of any development requiring on-site stormwater detention facilities.

The areas denoted by "Reserved for Stormwater Detention" shall not be used as a building site or filled without first obtaining written permission from the Director of Tipton County Public Works, as applicable. The stormwater detention systems located in these areas, except for those parts located in a public drainage easement, shall be owned and maintained by the property owner and/or owner's association. Such maintenance shall be performed so to ensure that the system operates in accordance with the approved plan located in the Tipton County Public Works Department.

14. VariANCES

Any variance of these regulations shall be submitted to and approved by the Tipton County Planning Commission with a written recommendation from the Director of Tipton County Public Works.