

STORMWATER, EROSION AND SEDIMENT CONTROL REGULATIONS 32-1-1

CHAPTER 32

STORMWATER, EROSION AND SEDIMENT CONTROL REGULATIONS

ARTICLE I – STORMWATER REGULATIONS

DIVISION I - GENERALLY

32-1-1 **AUTHORITY AND PURPOSE.** This Code is enacted pursuant to the police powers granted to Monroe County, Illinois by the **Illinois Compiled Statutes, 65 ILCS Sec. 5/1-2-1, 5/11-12-12, 5/11-30-2, and 5/11-31-2.**

The purpose of this Code is to diminish threats to public health and safety, protect property, prevent damage to the environment and promote public welfare by guiding, regulating and controlling the design, construction, use and maintenance of any new development or redevelopment or other activity which disturbs or breaks the topsoil or otherwise results in the movement of earth and/or changes the stormwater drainage pattern and/or stormwater flows from that which would have occurred if the land had been left in its natural state. This stormwater runoff and resulting soil erosion could result in the inundation of damageable properties, the erosion and destabilization of downstream channels, and the pollution of valuable stream and lake resources. One cause of increases in stormwater runoff quantity or rate and impairment of quality, and loss of valuable topsoil is the new development or redevelopment of the land. This ordinance regulates these activities to minimize adverse impacts. **(See Section 32-2-2 for Definitions.)**

This Code is adopted to accomplish the following objectives:

- (A) To assure that new commercial and industrial development or redevelopment does not increase the drainage or flood hazards, or create unstable conditions susceptible to soil erosion;
- (B) To protect new buildings and major improvements to buildings from flood damage due to increased stormwater runoff and soil erosion;
- (C) To protect human life and health from the hazards of increased flooding and soil erosion on a watershed basis;
- (D) To lessen the burden on the taxpayer for flood control projects, repairs to flood-damaged public facilities and utilities, correction of channel erosion problems, and flood rescue and relief operations caused by stormwater runoff and soil erosion quantities from new development or redevelopment;
- (E) To protect, conserve, and promote the orderly development of land and soil, water, air, animal, and plant resources;
- (F) To preserve the natural hydrologic and hydraulic functions of watercourses and flood plains and to protect water quality and aquatic habitats;
- (G) To preserve the natural characteristics of stream corridors in order to manage flood and stormwater impacts, improve water and groundwater quality, reduce soil erosion, protect aquatic and riparian habitat, maintain quality forest resources, provide recreational opportunities, provide aesthetic benefits, enhance community and economic development.

32-1-2 **OTHER RELEVANT PERMITTING.** Other permits may be required from State and Federal Agencies when land disturbance activity occurs. It shall be the developers' responsibility to obtain these permits.

DIVISION II – PLAN SUBMITTAL

32-1-3 **INFORMATION REQUIRED BY APPLICANT.** Each applicant shall submit the following information, to ensure that the provisions of this Code are met. The submittal shall include sufficient information to evaluate the environmental characteristics of the property, the potential adverse impacts and benefits of the development on water resources both on-site and off-site, and the effectiveness of the proposed drainage plan in managing stormwater runoff and meet the provisions of **Section 32-1-2**. The applicant shall certify on the drawings that all clearing, grading, drainage, and construction shall be accomplished in strict conformance with the drainage plan. The following information shall be submitted for both existing and proposed property conditions for all new developments or re-developments.

32-1-4 **IMPROVEMENT PLANS REQUIREMENTS.** A stormwater, erosion and sediment control plan meeting the following requirements shall be submitted with the improvement plans:

(A) The predominant soil types on the site, their location, and their limitations for the proposed use as defined by the U.S.D.A., Natural Resources Conservation Service shall be shown;

(B) The proposed use of the site, including present and planned development, areas of clearing, stripping, grading, excavation and filling; proposed contours, finished grades, and street profiles; the stormwater plan as required; kinds and locations of utilities; areas and acreage proposed to be paved, sodded or seeded, vegetatively stabilized, or left undisturbed; and the existing and proposed tree line;

(C) The erosion and sediment control plan shall show all measures necessary to meet the requirements of this Code throughout all phases of construction and those remaining permanently after completion of the development of the site, including:

- (1) Location and description, including standard details, of all sediment control measures, runoff control measures, including diversions, waterways and outlets, and design specifics of sediment basins and traps including outlet details;
- (2) Location and description of all soil stabilization and erosion control measures, including seeding mixtures and rates, types of sod, method of seed bed preparation, expected seeding dates, type and rate of lime and fertilizer application, kind and quantity of mulching for both temporary and permanent vegetative control measures, and types of non-vegetative stabilization measures;
- (3) Location and description of methods to prevent tracking of sediment off site including construction entrance details, as appropriate;
- (4) Description of dust and traffic control measures;
- (5) Locations of stockpiles and description of stabilization methods;
- (6) Provisions for maintenance of control measures, including type and frequency of maintenance, easements, and estimates of the cost of maintenance;
- (7) The proposed phasing of development of the site, including stripping and clearing, rough grading and construction, and final grading and landscaping. Phasing should identify the expected date on which clearing will begin, the estimated duration of exposure of cleared area, and the sequence of installation of temporary sediment control measures (including perimeter controls), installation of stormwater drainage, paving streets and parking areas, final grading and the establishment of permanent vegetative cover, and the removal of temporary measures. It shall be the responsibility of the applicant to notify the County Engineer of any significant changes which occur in the site development schedule after the initial erosion and sediment control plan has been approved.
- (8) The location of shoreline of lakes, ponds, and detention basins with normal water level elevation;
- (9) The location of farm drains and tile;

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- (10) Location, size, and slope of stormwater conduits and drainage swales;
- (11) The location of depressed storage areas;
- (12) Proposed detention facilities with storage volumes and release rates;
- (13) Direction of storm flows;
- (14) Both existing and proposed flow rates and velocities at critical points in the drainage system;
- (15) Cross section data for open channel flow paths and designated overland flow paths;
- (16) A statement as to the basis of design for the final drainage network components, giving any applicable engineering assumptions and calculations; and
- (17) A statement by the design engineer of the drainage system's provision for handling critical storm event. A drainage statement should be signed by a Registered Professional Engineer, and the owner of the land or a duly authorized attorney, to the effect that the drainage of surface waters will not be changed by the construction of such development or any part thereof, or, that if such surface water drainage will be changed, reasonable provision has been made for collection and diversion of such surface waters into public areas, or drains which the owner/developer has a right to use, and that such surface waters will be planned for in accordance with generally accepted engineering practices so as to reduce the likelihood of damage to the adjoining property because of construction.

32-1-5 DRAINAGE STANDARDS. An acceptable drainage plan which meets the criterion presented herein is required before any site work is commenced:

(A) **Minimization of Increases in Runoff Volumes and Rates.** In the selection of a drainage plan for a new development the developer shall evaluate and implement site design features which minimize the increase of runoff volumes and rates from the site. The developers drainage plan submittal shall use site design features which are consistent with the following hierarchy:

- (1) Preservation of regulatory floodplains, flood prone and wetland areas;
- (2) Minimize impervious surfaces on the property, consistent with the needs of the project;
- (3) Attenuate flows by use of open vegetated swales and natural depressions to preserve the existing natural stream channel;
- (4) Infiltration of runoff on site;
- (5) Provide stormwater retention structures;
- (6) Provide wet or wetland detention structures;
- (7) Provide dry detention structures; and
- (8) Construct storm sewers.

(B) The drainage system should be designed to minimize adverse surface and groundwater quality impacts off site and on the property itself. Detention basins shall incorporate design features to capture stormwater runoff and sediment. In particular, designers shall give preference to wet bottom and wetland type designs and all flows from the development shall be routed through the basin (i.e., low flows shall not be bypassed). Detention of stormwater shall be promoted throughout the property's drainage system utilizing channels and impervious surface reduction to reduce the volume of stormwater runoff and erosion.

The drainage system should incorporate multiple uses where practicable. Uses considered compatible with stormwater management include open space, aesthetics, aquatic habitat, recreation (boating, fishing, trails, playing fields), wetlands and water quality mitigation.

(C) Drainage plan design criteria, standards, and methods are as follows:

- (1) **Release Rates.** The drainage system for new developments or redevelopments shall be designed to control the peak rate of discharge from the property for the critical storm event to levels which will not cause an increase in flooding or channel instability downstream when considered

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in aggregate with other developed properties and downstream drainage capacities. For new developments or redevelopments, the Illinois Department of Transportation (IDOT) "Drainage Manual" will be used to calculate release rates.

- (2) **Detention Storage Requirements.** The design maximum storage to be provided in the detention basin shall be based on the runoff from the runoff difference before and after development from the critical storm event. All detention basin storage shall be computed using Hydrographic Methods utilizing reservoir routing (also called modified pools or level pool) or equivalent method.
- (3) **Drainage System Design and Evaluation.** The following criteria should be used in evaluating and designing the drainage system:
 - (a) The design will provide capacity to pass the critical storm event flow in the minor drainage system and an overload flow path for flows in excess of the design capacity.
 - (b) Whenever practicable, the stormwater systems shall not result in the inter-basin transfer of drainage unless no other alternative exists and said transfer does not create a hardship on any downstream landowner.
 - (c) **Design Methodologies.** Major and minor conveyance systems as well as detention basins shall be designed as specified in **Section 32-1-5(C)(1)** of the Drainage Standards.
 - (d) **Positive Drainage.** Whenever practicable, all developments should be provided an overland flow path that will pass the critical storm event flow at a stage at least **one (1) foot** below the lowest foundation grade in the vicinity of the flow path. Overland flow paths designed to handle flows in excess of the minor drainage system capacity shall be provided drainage easements. Street ponding and flow depths shall not exceed curb heights.
- (4) **Rainfall.** Unless a continuous simulation approach to drainage system hydrology is used, all design rainfall events shall be based on the Illinois State Water Survey's Bulletin 70. The first quartile point rainfall distribution shall be used for the design and analysis of conveyance systems with critical durations less than or equal to **twelve (12) hours**. The third quartile point rainfall distribution shall be used for the design and analysis of detention basins and conveyance system with critical durations greater than **twelve (12)** and less than or equal to **twenty-four (24) hours**. The fourth quartile distribution shall be used in the design and analysis of systems with durations greater than **twenty-four (24) hours**. The first, third, and fourth quartile distributions described by Huff are presented in Table 37 of Bulletin 70. Refer to Table 13 of Bulletin 70 for rainfall depth, duration, and frequency.
- (5) **Antecedent Moisture.** Computations of runoff hydrographs which do not rely on a continuous accounting of antecedent moisture conditions shall use wet antecedent moisture condition as a minimum.
- (6) **Wet Detention Basin Design.** Wet detention basins shall be designed to remove stormwater sediment, to be safe, to be aesthetically pleasing, and as much as feasible to be available for recreational use. The following requirements should also be met:
 - (a) **Wet Basin Depths.** Wet basins shall be at least **three (3) feet** deep, excluding near shore banks and safety ledges. If fish habitat is to be provided, they should be at least **eight (8) feet** deep over **twenty-five percent (25%)** of the bottom area to prevent winterkill.

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- (b) **Wet Basin Shoreline Slopes.** The side slopes of wet basins at the normal pool elevation shall not be steeper than **three to one (3:1)** horizontal to vertical. It is recommended that aquatic vegetation be established around the perimeter to provide protection from shoreline erosion.
 - (c) **Permanent Pool Volume.** The permanent pool volume in a wet basin at normal depth shall be equal to the runoff volume from its watershed for the critical storm event as a minimum.
 - (d) **Wet Basin Inlet and Outlet Orientation.** The distance between detention inlets and outlets shall be maximized. Inlets and outlets should be at opposite ends of the basin providing that the orientation does not create undue hardship based on topography or other natural constraints. Designers are encouraged to use baffles or berms in the basin bottom to prevent short circuiting. There shall be no low flow bypass between the inlet and outlet. Paved low flow channels shall not be used. The minimum flow length shall be **ten (10) feet** with a recommended minimum ratio of **two to one (2:1)** for width.
- (7) **Dry Detention Basin Design.** In addition to the other requirements of this Code, dry basins shall be designed to remove stormwater pollutants, to be safe, to be aesthetically pleasing and as much as feasible to be available for multiple uses. The following requirements should also be met:
- (a) **Dry Basin Drainage.** Dry basins shall be designed so that **eighty percent (80%)** of their bottom area shall have standing water no longer than **seventy-two (72) hours** for any runoff event less than the critical storm event. Grading plans shall clearly distinguish the wet portion of the basin bottom. Underdrains directed to the outlet may be used to accomplish this requirement.
 - (b) **Velocity Dissipation.** Velocity dissipation measures shall be incorporated into dry basin designs to minimize erosion at inlets and outlets and to minimize re-suspension of pollutants.
 - (c) **Dry Basin Inlet and Outlet Orientation** shall be the same as **Section 32-1-5(C)(6) – Wet Detention Basin Design.**
 - (d) **Temporary Stilling/Sedimentation Basin.** A stilling/sedimentation basin should be constructed at each major inlet to a dry basin during construction. The volume of the basin shall be a minimum if **five hundred (500) cubic feet** per acre of impervious surface in the drainage area. Side slopes shall be no steeper than **three (3) feet to one (1) foot** and basin depths shall be a minimum of **three (3) feet** to minimize resuspension.
- (8) **Existing Depressional Areas.** Existing depressional storage volume will be maintained, and the volume of detention storage provided to meet the requirements of this Code shall be in addition to existing storage.
- (9) **Minimum Detention Outlet Size.** Where a single pipe outlet or orifice plate is to be used to control discharge, it shall have a minimum diameter of **twelve (12) inches**. If this minimum orifice size permits release rates greater than those specified in this Section, and regional detention is not a practical alternative, outlets, structures such as perforated risers, or flow control orifices shall be used.
- (10) **Detention in Flood Plains.** The developer shall be responsible for obtaining all required State and Federal permits. The placement of detention basins within the Special Flood Hazard Area is strongly discouraged because of questions about their reliable operation during flood events. However, the stormwater detention requirements of this

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Code may be fulfilled by providing detention storage within flood fringe areas on the project site provided the following provisions are met:

- (a) **Detention in Flood Fringe Areas.** The placement of a detention basin in a flood fringe area shall require compensatory storage for **one and one-half (1 ½) times** the volume below the base flood elevation occupied by the detention basin including any berms. The release from the detention storage provided shall still be controlled consistent with the requirements of this Section. The applicant shall demonstrate its operation for all streamflow and floodplain backwater conditions. Excavations for compensatory storage along watercourses shall be opposite or adjacent to the area occupied by detention. All floodplain storage lost below the existing **ten (10) year** flood elevation shall be replaced below the existing **ten (10) year** elevation. All floodplain storage lost above the existing **ten (10) year** flood elevation shall be replaced above the existing **ten (10) year** flood elevation. All compensatory storage excavations shall be constructed to drain freely and openly to the watercourse.
- (b) **On-Stream Detention.** On-stream detention basins are discouraged but allowable if they provide regional public benefits and if they meet the other provisions of this Code with respect to water quality and control of the **two (2) year** and **one hundred (100) year, twenty-four (24) hour** events from the property. Further criteria are presented in **Section 32-1-5(C)(11)** of this Code. If on-stream detention is used in watersheds larger than **one (1) square mile**, the applicant will use hydrographic modeling to demonstrate that the design will not increase the water level for any properties upstream or downstream of the property. Also, impoundment of the stream as part of on-stream detention:
- (i) shall not prevent the migration of indigenous fish species, which require access to upstream areas as part of their life cycle, such as for spawning;
 - (ii) shall not cause or contribute to the degradation of water quality or stream aquatic habitat;
 - (iii) shall include a design calling for gradual bank slopes, appropriate bank stabilization measures, and a pre-sedimentation basin;
 - (iv) shall not involve any stream channelization or the filling of wetlands;
 - (v) shall require the implementation of an effective non-point source management program throughout the upstream watershed which shall include as a minimum: runoff reduction "Best Management Practices" (BMP's) consistent with Section (A) and critical storm event detention/ sedimentation basins for all developments;
 - (vi) shall not occur downstream of a wastewater discharge; and
 - (vii) shall not contribute to the duration or flood frequency of any adjacent land.
- (c) **Detention in Floodways.** Detention basins shall be placed in the floodway only in accordance with **Section 32-1-5(C)(10)(b) – On-Stream Detention.**

- (11) **Drainage into Wetlands, Rivers, Streams, Lakes, Ponds, and Depressional Storage Areas.** Wetlands, lakes, ponds and depressional storage areas shall be protected from damaging modifications and adverse changes in runoff quality and quantity associated with land developments. In addition to the other requirements of this Code, the following requirements shall be met for all developments whose drainage flows into wetlands, rivers, streams, lakes, ponds or depressional storage areas:
- (a) **Detention in Wetlands, Rivers, Streams, Lakes, Ponds, or Depressional Storage Areas.** Existing wetlands, rivers, streams, lakes, ponds or depressional storage areas shall not be modified for the purposes of stormwater detention unless it is demonstrated that the proposed modifications will maintain or improve its habitat and ability to perform beneficial functions. Existing storage and release rate characteristics of wetlands, rivers, streams, lakes, ponds or depressional storage areas shall be maintained, and the volume of detention storage provided to meet the requirements of this Section shall be in addition to this existing storage.
 - (b) **Sediment Control.** The existing wetlands, rivers, streams, lakes, ponds, or depressional storage areas shall be protected during construction and shall not be filled.
 - (c) **Alteration of Drainage Patterns.** Site drainage patterns shall not be altered to substantially decrease or increase the existing area tributary to the wetlands, rivers, streams, lakes, ponds or depressional storage areas.
 - (d) **Detention/Sedimentation.** If a detention/ sedimentation basin is required, it shall be designed to capture the critical storm event and hold it for a minimum of **twenty-four (24) hours**. This basin shall be maintained throughout the construction process.
 - (e) **Vegetated Buffer Strip.** A buffer strip of at least **twenty-five (25) feet** in width, preferably vegetated with native plant species, shall be maintained or restored around the periphery of a wetland, river, stream, lake, pond or depressional storage area.
 - (f) **Loessal Soils.** Care should be taken to avoid open flow discharges of stormwater over silt (loessal) soils due to high potential for erosion.
 - (g) **Sinkholes, Karst Areas.** Shall be considered as receiving waterways and all pre-detention and erosion requirements shall apply. The filling, grading, and excavation of sinkholes is prohibited unless the plan for work is submitted by the owner or subdivider to the County Soil and Water Conservation District who will make recommendations to the County Engineer. If, after the review of the stormwater drainage plan, the County Engineer determines that more detailed information is required, a sinkhole evaluation may be required. A sinkhole evaluation which addresses the geologic, engineering and environmental factors resulting from a new development or redevelopment is to be performed by a professional with expertise in karst topography, who shall certify the results of the evaluation. This evaluation shall be the responsibility of the applicant and performed at no cost to the County. After a review of this evaluation and with the consultation of the County Soil and Water Conservation District, the County Engineer may either approve or disapprove the drainage plan as submitted.

- (12) **Street Detention, Parking Lot Detention, and Culvert Drainage.**
- (a) **Street Detention.** If streets are to be used as part of the minor or major drainage system, ponding depths shall not exceed curb heights and shall not remain flooded for more than **eight (8) hours** for any event less than or equal to the **one hundred (100) year, twenty-four (24) hour** event.
 - (b) **Parking Lot Detention.** The maximum stormwater ponding depth in any parking area shall not exceed **six (6) inches** for more than **four (4) hours**.
 - (c) **Culvert, Road and Driveway Crossings.** Sizing of culvert crossings shall consider entrance and exit losses as well as tailwater conditions on the culvert.
- (13) **Infiltration Practices.** To effectively reduce runoff volumes, infiltration practices including basins, trenches, and porous pavement should be located in hydrologic soil groups "A" and "B" as designated by the U.S.D.A., Natural Resources Conservation Service. Infiltration basins and trenches designed to recharge groundwater shall not be located within **seventy-five (75) feet** of a water supply well or building foundation. A sediment settling basin shall be provided to remove coarse sediment from stormwater flows before they reach infiltration basins or trenches. Stormwater shall not be allowed to stand more than **seventy-two (72) hours** over **eighty percent (80%)** of the dry basin's bottom area for the maximum design event to be exfiltrated. The bottom of infiltration basins or trenches shall be a minimum of **four (4) feet** above the seasonally high groundwater and bedrock level. Engineering calculations demonstrating U.S.D.A., Natural Resources Conservation Service infiltration rates shall be included with the application.
- Vegetated Filter Strips and Swales.** To effectively filter stormwater pollutants and promote infiltration of runoff, sites should be designed to maximize the use of vegetated filter strips and swales. Whenever practicable, runoff from impervious surfaces should be directed onto filter strips and swales comprised of native grasses and forbs before being routed to a storm sewer or detention basin.
- (14) **Safety Considerations.** The drainage system components, especially all detention basins, shall be designed to protect the safety of any children or adults coming in contact with the system during runoff events.
- (a) **Side Slopes.** The side slopes of all detention basins at critical storm event capacity shall be as level as practicable to prevent accidental falls into the basin and for stability and ease of maintenance. Side slopes of detention basins and open channels shall not be steeper than **three to one (3:1)** horizontal to vertical.
 - (b) **Safety Ledge.** All wet detention basins shall have a level safety ledge at least **four (4) feet** in width **two and one-half (2 ½)** to **three (3) feet** below the normal water depth.
 - (c) **Velocity.** Velocities throughout the surface drainage system shall be controlled to safe levels taking into consideration rates and depths of flow.
 - (d) **Overflow Structures.** All stormwater detention basins shall be provided with an overflow structure capable of safely passing excess flows at a stage at least **one (1) foot** below the lowest foundation grade in the vicinity of the detention basin. The design flow rate of the overflow structure shall be equivalent to the critical storm event flow rate.

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(15) **Maintenance Considerations.** The stormwater drainage system shall be designed to minimize and facilitate maintenance. Turfed side slopes shall be designed to allow lawn mowing equipment to easily negotiate them. Wet basins should be provided with alternate outflows which can be used to completely drain the pool for sediment removal. Pumping may be considered if drainage by gravity is not feasible. Pre-sedimentation basins shall be included, where feasible, for localizing sediment deposition and removal. Site access for heavy equipment shall be provided.

(16) **Supplementary Drainage Design and Erosion Control Provisions.**

(a) **Setbacks.**

(i) Detention and retention outlet structures are to be set back from adjoining property lines and the outlet velocity controlled within that distance per Code requirements. The minimum setback shall be:

Outlet Size (inches diameter)	Setback (feet)
To 18 or equivalent	15
19 to 24	20
25 to 30	25
Larger than 30	30

(ii) Distances may be decreased if a drainage maintenance easement is obtained from the adjoining landowner. Highway/street right-of-way shall be considered as a property line.

(b) The following note shall be included on all improvement plans: "There shall be no ground disturbance on site other than that necessary for construction of the stormwater detention facility until such time that the detention structure is fully completed, including permanent or temporary seeding and written approval given to proceed by the County of Monroe. Violation of this provision will result in a stop-work order and daily fines as prescribed in the County Code.

(c) The detention outlet structure inlet shall be protected with a riprap situation collection berm (**five (5) inch** clean stone – RAP 6) set at **fifteen (15) foot** radius around the inlet. The height shall be equal to the top elevation of the lowest structure inlet with an **eighteen (18) inch** minimum height. The detention pond storage volume shall not include that area below the top of the riprap berm unless plans specify that upon establishment of **ninety percent (90%)** ground cover on the development site that the detention area is to be cleared of siltation design grade, area seeded, and that riprap shall be removed. Alternate permanent concrete drop structures providing siltation collection in advance of the inlet may be considered.

(d) When designing for the post-construction outlet flows from the site, the total post-construction discharges shall provide for a reduction of **ten percent (10%)** in the flow rate from the site. (Off-site pass-through flow does not need to be reduced in outlet rate.)

(e) There shall be a complete set of drainage calculations submitted with the project improvement plans, also including a certified summary, typical to the Monroe County Subdivision Code Attachment No. 6, Drainage Design Summary Format which provides the following information:

(i) Before and after site condition.

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- (ii) Flow rate factors.
- (iii) Pre- and post-discharge flow and velocity.
- (iv) Detention retention summary.
- (v) Pre- and post-drainage area map.
- (f) All lots adjacent to detention/retention facilities shall be graded to final plan elevations at the time of pond construction if existing ground line of lot is below detention berm top elevation.
- (g) The out letting of flow which constitutes a diversion of waters to a watercourse to which they are not naturally a tributary will be permitted only when the developer demonstrates that there is no reasonable alternative to such diversion and that the necessary flood or drainage easements have been secured from all property owners who will be affected by such diversion.
- (h) Drainage structures and pipes, out letting to public roadways, having a 10-year design outlet flow rate that exceeds the capacity of the down stream highway drainage ditch and/or structure, shall be additionally provided with a 2-year design outlet control structure.
- (i) Unless specific written direction is given by the County allowing variable storm water runoff coefficients, the following values will be used for all surface conditions.

Impermeable – C = 0.90
Permeable – C = 0.30

RATIONAL METHOD

If varied coefficients are proposed, the developer's engineer shall make written request to the County, in advance of drainage plan submittal, stating existence of special site conditions or use of specially designed materials.

When methods other than the Rational Method are employed, surface runoff characteristics similar to those required herein for the Rational Method shall be utilized.

(Ord. No. 06-04; 04-17-06)

(D) **Accommodating Flows from Upstream Tributary Areas.** Stormwater runoff from areas tributary to the property shall be considered in the design of the property's drainage system. Whenever practicable, flows from upstream areas that are not to be detained should be routed around the basin being provided for the site being developed. The following requirements should also be met:

- (1) **Upstream Areas Not Meeting Code Requirements.** When there are areas not meeting the storage and release rates of this Code, tributary to the applicant's property, regionalized detention on the applicant's property shall be explored by the applicant. The following steps shall be followed:
 - (a) The applicant shall compute the storage volume needed for his property using the release rates of **Section 32-1-5(C)(1)**, the applicant's property area, and the procedures described previously.
 - (b) Areas tributary to the applicant's property, not meeting the storage and release rate requirements of this Code, shall be identified.
 - (c) Using the areas determined previously plus the applicant's property area, total storage needed for the combined properties shall be computed.

Allowable release rates shall be computed using the combined property areas. Storage shall be computed as described in **Section 32-1-5(C)(16)**. If tributary areas are not developed, a reasonably fully developed land cover, based on local zoning, shall be used for the purposes of computing storage.

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Once the necessary combined storage is computed the County may choose to pay for over sizing the applicant's detention basin to accommodate the regional flows. The applicant's responsibility will be limited to the storage for his property as computed previously. If regional storage is selected by the County then a design produced utilizing these adopted standards, shall be implemented. If regional storage is rejected by the County the applicant shall bypass all tributary area flows around the applicant's basin whenever practicable. If the applicant should route upstream flows through his basin and the upstream areas exceed **one (1) square mile** in size, the applicant should meet the provision for on-stream detention.

- (2) **Upstream Areas Meeting Code Requirements.** When there are areas which meet the storage and release rate requirements of this Code, tributary to the applicant's property, the upstream flows shall be bypassed around the applicant's detention basin if this is the only practicable alternative. Storage needed for the applicant's property shall be computed as described in **Section 32-1-5(C)(16)**. However, if the County decides to route tributary area flows through an applicant's basin, the final design stormwater releases shall be based on the combined total of the applicant's property plus tributary areas. It should be shown that at no time will the runoff rate from the applicant's property exceed the allowable release rate for his/her property alone.

(E) **Early Completion of Detention Facilities.** Where detention, retention, or depressional storage areas are to be used as part of the drainage system for a property, they shall be constructed as the first element of the initial earthwork program. Any eroded sediment captured in these facilities shall be removed by the applicant on a regular basis and before project completion in order to maintain the design volume of the facilities.

(F) **Fee in Lieu of Detention.** At the discretion of the County all new development or redevelopment may pay a fee of **Ten Thousand Dollars (\$10,000.00)** for each acre foot of detention which would be required under this Code rather than installing detention facilities on the property, unless specifically directed to do otherwise by the appropriate local official.

In instances where regional benefits and economies of scale can be achieved, it will be permissible for adjacent properties to utilize a common regional detention basin. Applicants shall have the option of paying a fee of **Ten Thousand Dollars (\$10,000.00)** for each acre foot of detention required so that the County can build regional facilities, or they can jointly build the necessary facilities themselves.

ARTICLE II – EROSION AND SEDIMENT REGULATIONS

32-2-1 **EROSION AND SEDIMENT CONTROL.** The preparation of soil erosion and sediment control plans shall follow the principles outlined in the “Illinois Procedures and Standards for Urban Soil Erosion and Sedimentation Control”, excepting Chapter Six (6) published by the Urban Committee of the Association of Illinois Soil and Water Conservation Districts. The design criteria, standards, and methods shall be prepared in accordance with the requirements of this Code and the standards and specifications contained in “Illinois Urban Manual” prepared for the Illinois Environmental Protection Agency by the U.S.D.A., Natural Resources Conservation Service, which standards and methods are hereby incorporated into this Code by reference. In the event of conflict between the provisions of said manuals and of this Code, this Code shall govern. The following requirements should also be met:

(A) **Erosion and Sediment Control Design Requirements.** New developments or redevelopments shall comply with and meet the following:

- (1) Control measures shall be constructed to control runoff from the property to such an extent possible that sediment is retained on site.
- (2) Temporary on-site control measures required shall be constructed and functional prior to initiating clearing, grading, stripping, excavating or fill activities on site.
- (3) Disturbed areas shall be stabilized with permanent measures within **seven (7) calendar days** following the end of active disturbance, or re-disturbance consistent with the following criteria:
 - (a) Appropriate permanent stabilization measures shall include seeding, mulching, or sodding, with non-vegetative measures as a last resort.
 - (b) Areas having slopes greater than **three to one (3:1)** shall be stabilized with sod, mat, or blanket in combination with seeding or equivalent.
- (4) All temporary and permanent erosion and sediment control practices should be maintained and repaired as needed to assure effective performance of their intended function.
- (5) All temporary erosion and sediment control measures shall be disposed in a proper manner within **thirty (30) days** after final site stabilization is achieved with permanent soil stabilization measures. Trapped sediment and other disturbed soils resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation.
- (6) **Site Development Requirements.** On site sediment control measures, as specified by the following criteria, shall be constructed as specified in the referenced handbooks, and be functional prior to initiating clearing, grading, stripping, excavating or fill activities on site.
 - (a) For drainage areas less than **one (1) acre**, filter barriers including filter fences, straw bales, or equivalent control measures shall be constructed to control all onsite runoff. Vegetated filter strips, with a minimum width of **twenty-five (25) feet**, may be used as an alternative only where runoff in sheet flow is expected.
 - (b) For drainage areas more than **one (1) acre** but less than **five (5) acres**, a sediment trap or equivalent control measure shall be constructed at the downslope point of the disturbed area.
 - (c) For drainage areas greater than **five (5) acres**, a sediment basin or equivalent control measure shall be constructed at the downslope point of the disturbed area.
 - (d) Sediment basin and sediment trap designs shall provide for both dry detention and wet detention sediment storage. The detention storage shall be composed of equal volumes of wet detention

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- storage and dry detention storage and each shall be sized as specified in **Section 32-1-5(B)**. The release rate of the basin shall be that rate as specified in **Section 32-1-5(B)**. The elevation of the outlet structure shall be placed such that it only drains the dry detention storage.
- (e) The sediment storage shall be sized to store the estimated sediment load generated from the site over the duration of the construction period with a minimum storage equivalent to the volume or sediment generated in **one (1) year**. For construction periods exceeding **one (1) year**, the **one (1) year** sediment load and a sediment removal schedule may be substituted.
 - (f) For erosion and sediment control measures the alteration of sinkholes by filling, grading or excavation is prohibited.
 - (g) To the extent possible or as otherwise regulated in this Code all desirable trees **eight (8) inches** in diameter and larger shall be protected for their present and future value for erosion protection and other environmental benefits. Trees that have been selected for preservation shall be marked prior to the beginning of any clearing, grading, stripping, excavation, or filling of the site. A "no construction zone" shall be established and marked at the perimeter of the dripline of each tree which is to be preserved.
- (7) Stormwater conveyance channels, including ditches, swales, and diversions, and the outlets of all channels and pipes shall be designed and constructed as specified in **Section 32-1-5(B)**. All constructed or modified channels shall be stabilized within **forty-eight (48) hours**, consistent with the following standards and as required in the referenced handbooks:
- (a) For grades of **four to one (4:1) to eight to one (8:1)**, an erosion blanket or equivalent control measure shall be applied in the channel.
 - (b) For grades greater than **eight to one (8:1)**, rock, riprap, or an equivalent control measure shall be applied over filter fabric or other type of soil protection, or the grade shall be effectively reduced using drop structures.
- (8) Land disturbance activities in stream channels shall be avoided, where possible, or as specified in **Section 32-1-5(B)**. If disturbance activities are unavoidable, the following requirements shall be met:
- (a) Construction vehicles shall be kept out of the stream channel to the maximum extent practicable. Where construction crossings are necessary, temporary crossings shall be constructed of nonerosive material, such as riprap or gravel.
 - (b) The time and area of disturbance of stream channels shall be kept to a minimum. The stream channel, including bed and banks, shall be stabilized within **forty-eight (48) hours** after channel disturbance is completed, interrupted, or stopped.
 - (c) Whenever channel relocation is necessary, the new channel shall be constructed under dry conditions and fully stabilized before flow is diverted, incorporating meanders, pool and riffle sequence, and riparian planting.
- (9) Storm sewer inlets and culverts shall be protected by sediment traps or filter barriers meeting accepted design standards and specifications.
- (10) Soil storage piles containing more than **ten (10) cubic yards** of material shall not be located with a downslope drainage length of less than **twenty-five (25) feet** to a roadway, drainage channel, or sinkhole. Filter barriers, including straw bales, filter fence, or equivalent, shall be installed immediately on the downslope side of the piles.

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- (11) If dewatering devices are used, discharge locations shall be protected from erosion. All pumped discharges shall be routed through appropriately designed sediment traps or basins, or equivalent, and shall not be deposited into a sinkhole.
- (12) Each site shall have graveled or equivalent entrance roads, access drives, and parking areas of sufficient length and width to prevent sediment from being tracked onto public or private roadways. Any sediment reaching a public or private road shall be removed by shoveling or street cleaning, not flushing, before the end of each workday and transported to a controlled sediment disposal area.

(B) **Maintenance of Control Measures.** All soil erosion and sediment control measures necessary to meet the requirements of this Code shall be maintained periodically by the applicant or subsequent landowner during the period of land disturbance and development of the site in a satisfactory manner to ensure adequate performance.

32-2-2 DEFINITIONS.

Critical Storm Event. The critical storm event shall be considered as the **one hundred (100) year, twenty-four (24) hour** event unless engineering evaluation shows that the rainfall for an event of lesser duration creates more runoff for any specific watershed. The storm event, including, but not limited to, rainfall amount and duration, that the County in consultation with the applicant's Licensed Professional Engineer during the preliminary plat stage, will be required for calculations pertaining to the development of stormwater and erosion control plans.

Drainage Plan. A plan, including engineering drawings and supporting calculations, which describes the existing stormwater drainage system and environmental features, including grading, as well as proposed alterations or changes to the drainage system and environment of the property.

Drainageway. A watercourse, gully, dry stream, creek or ditch which carries stormwater sewers, or which serves the purpose of draining water from the lands adjacent to such watercourse, gully, dry stream, creek or ditch.

Floodplain. That land adjacent to a body of water with ground surface elevations at or below the base flood or the **one hundred (100) year** frequency flood elevation which is subject to inundation. The flood plain as designated by the Federal Emergency Management Agency (FEMA) is also known as the Special Flood Hazard Area (SFHA). This area is the collective combination of the regulatory floodway and the flood fringe. **(See Chapter 14 in County Code)**

Modified Rational Method. As described in the Illinois Department of Transportation's "Drainage Manual" is based on the principal that the maximum rate of runoff from a given drainage area occurs at that point in time when all parts of the watershed are contributing to the flow. The rainfall generating the peak flow is assumed to be of uniform intensity of the entire watershed with a rainfall duration equal to the time of concentration.

One Hundred Year Event. A rainfall, runoff, or flood event having a **one percent (1%)** chance of occurring in any given year. A **twenty-four (24) hour** storm duration is assumed unless otherwise noted.

Retention. A facility natural or man-made, that provides permanent or long-term storage of surface runoff accompanied by a low release rate.

Retention Basin. A facility, designed to completely retain a specified amount of stormwater runoff without release except by means of evaporation, infiltration, emergency bypass or pumping.

Sinkhole. Any natural depression formed as a result of subsurface removal of soil or rock materials and causing the formation of a collapse feature that exhibits internal drainage. The existence of a sinkhole shall be indicated by the uppermost closed depression contour lines on the USGS **seven and one-half (7 1/2) minute** quadrangle topographic maps or as determined by field investigations.

Two-Year Event. A runoff, rainfall, or flood event having a **fifty percent (50%)** chance of occurring in any given year. A **twenty-four (24) hour** storm duration is assumed unless otherwise noted.

Watershed. All land area drained by, or contributing water to, the same stream, creek, ditch, lake, marsh, stormwater facility, groundwater or depressional area.

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Wet Basin. A detention basin designed to maintain a permanent pool of water after the temporary storage of stormwater runoff.

Wetlands. Wetlands are defined by regulation as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. For general, but inclusive locations of designated wetlands, refer to mapping prepared jointly by the U.S. Department of Interior, Fish and Wildlife Service and the Illinois Department of Natural Resources, Office of Resource Conservation; National Wetlands Inventory Mapping, 1987.

32-2-3 FEES. By ordinance, the County Board of Commissioners shall establish (and may periodically amend) a schedule of fees for the various permits and procedures listed in this Code. Said fees are intended to defray the administrative costs connected with the processing/reviewing of such permits or procedures; the fees do not constitute a tax or other revenue-raising device. All such fees shall be paid by the applicant to the County and are non-refundable. A current schedule of filing fees shall be maintained in the Code Official's office and on file with the County Clerk.

32-2-4 PENALTIES. Any person, partnership or corporation violating any of the provisions of this Code shall be deemed guilty of a misdemeanor, and each day during which any violation of any of the provisions of this Code is committed, continued, or permitted shall constitute a separate offense. Upon conviction of any such violation, such person, partnership or corporation shall be punished by a fine of not more than **One Thousand Dollars (\$1,000.00)** for each offense. In addition to any other penalty authorized by this Section, any person, partnership, or corporation convicted of violating any of the provisions of this Code shall be required to restore the site to the condition existing prior to commission of the violation, or to bear the expense of such restoration. Failure on the part of the subdivider to comply forthwith with any order made under the provisions of this Code will result in injunctive action, notwithstanding the penalty provisions of this Section.