

VILLAGE OF DOWNERS GROVE
Report for the Village Council Meeting

5/8/2018

SUBJECT:	SUBMITTED BY:
Discussion of Potential Amendments to Stormwater Management Regulations	Naneil Newlon Director of Public Works

SYNOPSIS

Staff is requesting Village Council discussion of potential amendments to stormwater management regulations.

STRATEGIC PLAN ALIGNMENT

Consider Amendments to Stormwater Regulations was identified as a Priority Action Item for 2017-2019. As part of this item, the Village Council directed staff to consider more stringent stormwater management regulations to lessen the negative impacts of increased runoff generated by construction activity.

FISCAL IMPACT

N/A

RECOMMENDATION

Provide direction to staff on the proposed changes to the stormwater regulations.

BACKGROUND

Priority Action Item Issue & Objectives

Issue: Code-compliant development activity generates stormwater runoff which sometimes negatively impacts adjacent properties.

Objectives:

- Reduce the negative impacts of runoff caused by development activities
- Permitting process should accommodate residential renovation & redevelopment

The Village Council previously discussed this issue at their [October 10, 2017](#), [December 5, 2017](#), [February 13, 2018](#) and [April 3, 2018](#) meetings.

Meeting with Real Estate Development Stakeholders

On April 24, 2018, Village staff presented a summary of the proposed regulations to local home builders, engineers and architects. The purpose of the meeting was to inform these key

stakeholders about the potential regulation changes, obtain their feedback and encourage their participation in the review and approval process. A summary of this meeting can be found [here](#).

The key comments from these stakeholders generally fall into three overarching comments:

- Because stormwater management is a long standing, Village-wide issue, the Village should construct and maintain a properly sized, modern stormwater management system uniformly serving all areas of the Village funded by all residents.
- Due to poor soils with low infiltration rates, the lack of availability of stormwater infrastructure and limited space for the basins (high water tables and small yard spaces), the basins will not effectively manage stormwater
- The high cost of the regulations will reduce the value of residential properties Village wide and the number of new houses and major additions constructed will decrease

Proposed Stormwater Regulations

Based on Village Council direction provided at previous meetings and staff analysis of the identified options, staff prepared a draft ordinance (attached) with the following regulations:

Require Stormwater Detention for All New Single Family Houses and Major Additions - Stormwater detention shall be provided for all new single family houses and major additions to existing houses. Storage volume must be equal to or greater than the storage required for a 100-year rain event as determined by the unit area site runoff storage nomograph from the Northeastern Illinois Planning Commission (now known as Chicago Metropolitan Agency for Planning CMAP) publication “Investigation of Hydrologic Methods for Site Design in Northeastern Illinois.”

The proposed definition of a “major addition” is an addition which:

- Expands the footprint of the house (excluding porches, stoops, patios, etc.)
AND
- Alters a total of 600 square feet or more (inclusive of the size of the addition and any remodeling of the existing house)

In 2016 and 2017, there were approximately 330 house additions/remodels. Twenty-seven of these additions, about 8%, would have qualified as a major addition under the proposed definition.

Connect the Detention Basin to the Public Drainage System - Detention basins must be connected to the public drainage system, provided that the drainage system is located within 200 feet of the subject property and that the connection is a gravity based system (no pumps required).

Provide Additional Stormwater Detention when Connection to the Public Drainage System is not Feasible/Practical - In cases where the connection of the detention basin to the public drainage system is not feasible or practical because the system is more than 200 feet away from the subject property or a gravity based connection cannot be made, detention in the amount of 110% to 150% of required volume must be provided. The volume required is based on the performance

characteristics of the basin due to infiltration rates (draw down times). The longer the draw down time, the more storage volume is required, up to a maximum of 150%.

Provide Post Construction Best Management Practice (PCBMP's) When Net New Impervious Area Increases by 2,500 Square Feet - In 2014 the Village amended the stormwater ordinance to require the installation of BMP's such as rain gardens and dry wells when the net new impervious area on a parcel increases by 700 square feet or more. The DuPage County ordinance requires installation of PCBMP's at 2,500 square feet of net new impervious area. The draft ordinance returns the threshold for PCBMP's to 2,500 square feet of net new impervious area.

Provide Detention for All Other Developments When Net New Impervious Area Increases by 5,000 Square Feet - The current Village ordinance requires that detention be provided when the net new impervious area on a development site increases by 25,000 square feet or more. This is consistent with the DuPage County ordinance. The draft ordinance reduces the threshold for providing detention to 5,000 square feet of net new impervious area.

Effectiveness & Estimated Cost

The proposed regulations are intended to achieve the two project objectives noted above. No stormwater improvement or regulation will "solve" all stormwater issues. Even in cases where detention basins are functioning properly, runoff may negatively impact an adjacent property.

How Effective Will the Detention Basins Be?

Staff prepared a model estimating the effectiveness of the detention basins during a typical spring/summer. Using actual rainfall data from April 1 through September 1, 2014, actual soil infiltration rates from 21 properties which submitted soils reports as part of stormwater PCBMP permit requirements and detention volume required under the draft ordinance, staff determined that:

- Approximately 60% of the residential properties in the Village are likely to have soils with infiltration rates sufficient to effectively drain a detention basin.
- Approximately 40% of the residential properties in the Village are likely to have soils with infiltration rates which are insufficient to effectively drain a detention basin.

Applying these findings to the two types of basins to be constructed under the draft ordinance, staff projects that:

About 60% of the detention basins will function as designed and intended and will effectively manage stormwater runoff. These will be basins, both connected to the public stormwater system and not connected to the public system, which have infiltration rates sufficient to effectively drain.

About 25% of the detention basins will function at less than the designed capacity. These will be the basins connected to the public stormwater system and will have infiltration rates insufficient to drain. They are likely to partially fill with water which will not drain. The amount of the water not draining from these basins will be determined by the design and location of the pipe connecting the basin to the public stormwater system. The lower the

elevation of the connection pipe, the more runoff will be effectively managed.

About 15% of the detention basis will not function as designed and intended and will fill up with water which will not drain out. These basins will not be connected to the public stormwater system and will have infiltration rates insufficient to drain. These basins are likely to overflow in most rain events.

See the attached reports for more information

*Table 1
Proposed Regulations Summary*

Requirement	Permits Affected	Estimated Cost of Compliance
Provide On-Site Detention with a Connection to the Public Drainage System within 200 feet of Site	+/- 67% of New Houses +/- 5% of House Additions/Remodels	\$15-\$30k without Drainage System Extension \$35-\$80k with 200' Drainage System Extension
Provide On-Site Detention with 110 - 150% of Required Volume	+/- 33% of New Houses +/- 3% of House Additions/Remodels	\$22-\$45k

*Table 2
Existing Regulations Summary*

Requirement	Permits Affected	Estimated Cost of Compliance
Provide a Post-Construction Best Management Practice Storage Feature	+/-25% of New Houses Less than 1% of House Additions	\$2-\$12K

There are conditions or factors which may reduce the effectiveness of the required improvements and/or limit the ability to comply with the regulations.

High Seasonal Groundwater Table - To be effective, detention storage must be provided above the seasonal high groundwater table. In cases where the seasonal groundwater table is high, the amount of space available to provide stormwater storage may be reduced (detention basins will become partially or completely filled with groundwater,

reducing the amount of space available for runoff to be stored). In these situations, detention basins are likely to be shallow and take up more surface area on the property. There may not be enough space on the property to construct a detention basin large enough to provide the required storage volume.

Low Infiltration Rates - Where there is not a connection to the public drainage system detention basins will rely on infiltration to empty after rain events. In cases where infiltration rates are low, water will remain in the basins for extended periods of time, sometimes measured in weeks. When this situation occurs, the effectiveness of the detention basins during periods of multiple rain events in a series of days will be reduced.

Presence of Special Management Areas - The presence of Special Management Areas such as wetlands, floodplains and Localized Poor Drainage Areas may reduce the effectiveness of the required improvements and/or limit the ability to comply with the regulations. These Special Management Areas store runoff. It is often difficult to provide additional runoff storage in these areas.

ATTACHMENTS

Draft Ordinance Amendments
Basin Effectiveness Calculations

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ORDINANCE NO. _____

**AN ORDINANCE AMENDING
STORMWATER AND FLOOD PLAIN PROVISIONS**

BE IT ORDAINED by the Village Council of the Village of Downers Grove in DuPage County, Illinois, as follows: (Additions are indicated by shading/underline; deletions by ~~strikeout~~):

Section 1. That Section 26.301 is hereby amended to read as follows:

26.301 Definitions.

Within the context of this Ordinance, the following words and terms shall have the meanings set forth except where otherwise specifically indicated. Words and terms not defined shall have the meaning indicated by common dictionary definition.

Accessory Structure. A structure which is on the same parcel of property as a principal structure also referred to as an appurtenant structure, and;

- (a) is subordinate to and serves a principal structure; and,
- (b) is subordinate in area, extent, and purpose to the principal structure; and,
- (c) contributes to the comfort, convenience, or necessity of occupants of the principal structure.

Administrator. The person designated by the Village Manager to administer the implementation and enforcement of this Ordinance.

Adverse Hydraulic Impact. An increase of 0.10' or more to the modeled flood profile for a given storm event due to a proposed development activity.

Alternatives Analysis. The process of comparing and evaluating two or more courses of action of the various technical aspects of a development with the intent of selecting the action that best meets the stated Basic Development Purpose, while minimizing environmental effects and costs. A practicable alternatives study should consider possible alternative sites, a reduction in the scale of the development and rearrangement of the proposed facilities. This study assesses actions such as fill site locations, partial and full avoidance of habitats, restoration and enhancement of habitats and development economics.

Applicable Engineering Practice. Procedures, methods, or materials recommended in standard engineering textbooks or references as suitable for the intended purpose.

Applicant. A person applying for a Stormwater Management Permit, which person must be either the owner or the developer of the land specified in the application.

Appropriate Use. The only uses of the regulatory floodway that may be considered for a Stormwater Management Permit.

Authorization. A notice issued by the County to the Village that those aspects submitted to the County for review have been found to be in compliance with this Ordinance.

Base Flood. The flood having a one percent probability of being equaled or exceeded in a given year. It is also known as the 1% chance or 100-year flood. It has been adopted by the NFIP as the basis for

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mapping, insurance rating, and regulating new construction. Within an LPDA it is the elevation as established by the WIIP or as approved by the Administrator.

Base Flood Elevation (BFE). The height of the base flood in relation to the North American Vertical Datum of 1988 (NAVD 88).

Basic Development Purpose. The fundamental, essential function of the proposed activity.

Best Management Practices (BMPs). Design, construction, and maintenance practices and criteria for stormwater facilities that minimize the impact of stormwater runoff rates and volume, prevent erosion, and capture pollutants.

Buffer. The predominately vegetated area with a defined width adjacent to those areas that meet the definition of wetland and waters of DuPage for the purpose of eliminating or minimizing adverse impacts to those areas. Buffer may function to:

- reduce flood flow rates, velocity and volume,
- promote bank stability, filter sediment, nutrients and other pollutants,
- insulate and moderate daily water temperatures,
- promote groundwater infiltration,
- provide habitat corridors for aquatic and terrestrial fauna and flora.

Building. A structure that is constructed or erected partially or wholly above ground and is enclosed by walls and a roof. The term "building" includes manufactured homes and includes both the above-ground and the below-ground portions of the structure. Free standing signs or structures, such as kiosks are not considered to be buildings regulated in this Ordinance.

Channel. Any river, stream, creek, brook, branch, natural or artificial depression, ponded area, lake, flowage, slough, ditch, conduit, culvert, gully, ravine, swale, wash, or natural or man-made drainageway, in or into which surface or groundwater flows, either perennially or intermittently.

Committee. See Stormwater Committee.

Compensatory Storage. An excavated hydrologically and hydraulically equivalent volume of storage created to offset the loss of existing flood storage.

CLOMA. A Conditional Letter of Map Amendment. A FEMA comment letter on a development proposed to be located in, and affecting only that portion of, the area of flood plain outside the regulatory floodway and having no impact on the existing regulatory floodway or base flood elevations.

CLOMR. A Conditional Letter of Map Revision. A letter that indicates that FEMA will revise base flood elevations, flood insurance rate zones, flood boundaries, or floodways as shown on an effective FIRM or FBFM, after the record drawings are submitted and approved.

County. The County of DuPage, Illinois.

Critical Duration. The duration of a storm event that results in the greatest peak runoff.

Critical Wetlands. Wetlands of the highest value by virtue of one or more high ranking characteristics that result in a uniquely valuable environment.

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Dam. Any obstruction, wall, embankment, or barrier, together with any abutments and appurtenant works, constructed to store or direct water or to create a pool (not including underground water storage tanks).

Department. The DuPage County Department of Economic Development and Planning, or successor department or agency.

Detention. A prescribed storage volume specified for detention systems.

Developer. Any person who undertakes development or certifies permits development on such person's behalf.

Development. Any activity, excavation or fill, alteration, removal of vegetation, subdivision, change in land use, or practice, undertaken by private or public entities that affects the discharge of stormwater; or any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials in flood plain, flood way, wetland, waters or buffer areas. The term "development" does not include maintenance.

Development Site. The contiguous parcels of land under the Ownership or Control of the land owner or developer who is making Application for a Stormwater Management Permit. When the development includes subdivision of a parcel, the development site includes all land prior to subdivision. When the owner or developer controls only a portion of a larger development which has already been constructed, the Administrator may consider the larger, previously developed site as the "development site" if it was developed under a Stormwater Management Permit issued after February 15, 1992.

Director. The DuPage County Director of Stormwater Management or his or her designee. The Director of Stormwater Management shall be a Professional Engineer.

Direct Impact. Physical impact within wetland, waters or buffer.

Drainage Control Map. The Administrator shall prepare, and as necessary update maps, listings and other information, to be collectively known as the Drainage Control Map, setting forth regulatory flood plains and known Localized Poor Drainage Areas within the Village. The Drainage Control Map, as well as any proposed amendments, shall be submitted to the Oversight Committee for review and approval.

Dry Land. Land that is not a waters of the DuPage, which does not contain hydric soil, or can be shown through a review of historic aerial photos spanning at least 4 decades leading up to development that an area in question did not contain wetland area, but for an incidental construction activity that caused the area to become wet.

Elevation Certificates. A form published by FEMA, or its equivalent, that is used to certify the base flood elevation and the lowest elevation of usable space to which a building has been constructed.

Environmental Scientist: A professional with a four-year degree in an earth or life science curriculum and four years of professional experience in which the scientist has spent more than 50% of their work time on wetland/environmental related tasks with an emphasis on wetland delineation, ecology, restoration and botany.

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FBFM. A Flood Boundary and Floodway Map. A flood plain management map issued by FEMA that depicts, based on detailed analysis, the boundaries of the base flood, the two tenth percent (0.2%) probability flood, and the floodway.

FEMA. The Federal Emergency Management Agency.

FEMA Map Change. Any one or more of the following: CLOMR, LOMR, LOMA, CLOMR-F, LOMR-F and physical map changes and other designations of map change as developed under the NFIP.

FHBM. A Flood Hazard Boundary Map. An official map of a community, issued by FEMA, on which the boundaries of the flood, mudslide or mudflow, or related erosion areas having special hazards have been designated as Zones A, M, or E.

Filter Barrier. A temporary barrier installed below disturbed areas to intercept and retain sediment.

Final Stabilization. A condition when all soil disturbing activities at a site has been completed and a uniform, evenly distributed perennial vegetative cover with a density of seventy-five (75) percent of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.

FIRM. A Flood Insurance Rate Map. A map issued by FEMA that is an official community map, on which map FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. This map may or may not depict floodways.

FIS. Flood Insurance Study. An examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations.

Flood or Flooding. A general and temporary condition of partial or complete inundation of normally dry land areas from the unusual and rapid accumulation or runoff of surface waters from any source.

Flood Plain. The area typically adjacent to and including a body of water where ground surface elevations are at or below a specified flood elevation.

Floodproof. Additions, changes, or adjustments to structures or property that prevent the entry of flood water in order to protect property from flood damage.

Floodproofing Certificate. A form published by FEMA that is used to certify that a structure is floodproofed to a minimum one foot above the base flood elevation.

Flood Protection Elevation (FPE). The base flood elevation plus three (3) feet of freeboard. If an approved FEQ watershed plan model produces a higher elevation than the regulatory BFE, the FPE shall be the FEQ flood of record elevation plus one (1) foot of freeboard. For detached garages and accessory buildings the FPE is the base flood elevation plus one (1) foot of freeboard.

Floodway. The channel and that portion of the flood plain adjacent to a stream or watercourse that is needed to convey the base flood without cumulatively increasing the water surface elevation more than 0.1 feet.

Floodway Conveyance. The measure of the flow carrying capacity of the floodway section and is defined using Manning's equation as,

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$K = \frac{1.49}{n} AR^{2/3}$ where "n" is Manning's roughness factor,
 "A" is the effective area of the cross-section, and "R" is ratio of the wetted area to the wetted perimeter.

Floristic Quality Index (FQI). A quantitative measure to determine the quality of a plant community as calculated by the methodology contained in Plants of the Chicago Region (Swink, F. and G. Wilhelm. The Morton Arboretum, Lisle, Illinois).

Hydrology. The science of the behavior of water, including its dynamics, composition, and distribution in the atmosphere, on the surface of the earth, and underground.

IDNR-OWR. Illinois Department of Natural Resources - Office of Water Resources.

IEPA. Illinois Environmental Protection Agency.

Indirect Wetland Impact. A change in hydraulics or hydrology that causes a change in plant community that reduces or eliminates wetland function without directly filling or excavating wetland.

Impervious Area. Land cover that is, including, but not limited to, non-porous asphalt or asphalt sealants, non-porous concrete, roofing materials except planted rooftops designed to reduce runoff, and gravel surfaces used as roadways, driveways or parking lots. Graveled surfaces with high porosity used for storage of materials and wood decks may be counted as only 60% impervious for purpose of Stormwater Management Calculation. Pondered water shall be considered impervious area (at its normal water elevation), but vegetated wetlands or constructed wetland basins shall not be considered impervious area. The impervious area of a development site pre-development is the maximum extent of the impervious surfaces that existed on the development site at the same time in any of the 3 -years pre-dating the date of the application.

Interim Watershed Plan. A portion of a watershed plan adopted by the County Board that does not yet contain all of the elements in Chapter 3 of the Plan.

Lake. A natural or artificial body of water encompassing an area of two or more acres that retains water throughout the year.

Land Disturbing Activities. Any manmade change to improved or unimproved real estate including, but not limited to, construction of or improvements to buildings or other structures, filling, grading, paving, excavating or demolition of buildings, structures or pavement.

Land Surveyor. A person licensed under the laws of the State of Illinois to practice land surveying.

Letter of Permission (LOP). A request for approval to proceed with an action that is believed to have met certain specified criteria as defined within the Ordinance.

Localized Poor Drainage Area (LPDA): An area, determined to meet the criteria established in Section 26.1302 of this Ordinance and shown on the Drainage Control Map, which, based on historical information and generally accepted engineering practices and principles, has poor or otherwise inadequate drainage resulting in periods of flooding.

LOMA. A Letter of Map Amendment. The official determination by FEMA that a specific structure is not in a regulatory flood plain. A LOMA amends the effective FHBM, FBFM, or FIRM.

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LOMC. A Letter of Map Change. A Letter of Map Amendment or a Letter of Map Revision.

LOMR. A Letter of Map Revision. A letter from FEMA that revises base flood elevations, flood insurance rate zones, flood boundaries, or floodway as shown on an effective FHBM, FBFM, or FIRM.

Lowest Floor. The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usage solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirement of the *Code of Federal Regulations (CFR) 44, Part 60.3*.

Maintenance. The selective removal of woody material and accumulated debris from, or repairs to, a stormwater facility so that such facility will perform the functions for which it was designed and constructed. Partial reconstruction or any resurfacing of existing roadways, walkways, trails and bicycle routes will be considered a form of maintenance.

Major Residential Addition Development. An addition to an existing detached or attached dwelling unit that:

1. Expands the footprint of the house, excluding front porches, stoops, decks, and patios; and
2. Alters a total of six hundred (600) square feet or more of the detached or attached dwelling unit, inclusive of the size of the addition and any remodeling of the house.

Major Stormwater System. That portion of a stormwater facility needed to store and convey flows beyond the capacity of the minor stormwater system.

Manufactured Home. A building, transportable in one or more sections, that is built on a permanent chassis and is designated for use with or without a permanent foundation when connected to the required utilities. The term "manufactured home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for more than 180 consecutive days.

— **Minor Development.** The following parameters define Minor Development. The area proposed to be disturbed by the development activities can be defined and limited in the field to three acres or less, and;

- (i) Does not involve any work within a wetland, buffer or within 100 feet of a wetland boundary; and
- (ii) Does not involve any work within a regulatory flood plain or LPDA; and
- (iii) Does not involve 2,500 square feet or more of net new impervious area. A development may also qualify as minor, with the prior concurrence of the Administrator if it exceeds 2,500 square feet of net new impervious area but does not meet the thresholds for providing site runoff storage; and
- (iv) Does not contain a stormwater facility.

— **Minor Stormwater System.** That portion of a stormwater facility consisting of street gutters, storm sewers, small open channels, swales, and similar facilities designed to convey runoff from the 10-year flood event or less.

Mitigation. Measures taken to offset negative impacts by development to wetland, buffer or flood plain areas. When a development unavoidably requires impact or loss of natural resources, that impact must be

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offset (compensated or mitigated) by replacing or providing substitute resources or environments. Mitigation shall take into consideration functions wetlands and buffers may provide.

Native Vegetation. Plants indigenous to northeastern Illinois as defined within *Plants of the Chicago Region* (Swink and Wilhelm. The Morton Arboretum, Lisle, Illinois).

Natural Areas Restoration Development. A development for which the basic development purpose is the restoration or creation of natural areas including streambank or shoreline restoration.

Net New Impervious Area. The difference between the Impervious Areas associated with an application for a Stormwater Management Permit, and the Impervious Area existing on the pre-development site.

New Construction. For the purposes of determining insurance rates, structures for which the “start of construction” commenced on or after the effective date of an initial FIRM or after December 31, 1974, whichever is later, and included any subsequent improvements to such structures. For flood plain management purposes, new construction means structures for which the start of construction commenced on or after the effective date of the flood plain management regulation adopted by a community and includes any subsequent improvements to such structures.

New Impervious Areas. Impervious areas constructed under the set of plans associated with an application for Stormwater Management Permit.

New Manufactured Home Park. A manufactured home park for which the construction of facilities for servicing homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of flood plain management regulation adopted by a community.

New Single Family Residential Development. A development of a detached or attached dwelling unit.

NFIP. The National Flood Insurance Program. The requirements of the NFIP are codified in Title 44 of the Code of Federal Regulations, Subchapter B.

NRCS. The United States Department of Agriculture, Natural Resources Conservation Service.

Open Space Development. Developments which create only incidental amounts of impervious area, such as trails, picnic shelters or playgrounds, involve grading and vegetation removal but do not alter significantly the pattern of stormwater runoff compared to the pre-development site. Open space developments are limited to 20% impervious coverage in the With-Development Site condition.

Ordinary High Water Mark (OHWM). The line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank (scour line), shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Oversight Committee. The Downers Grove Stormwater and Flood Plain Oversight Committee.

OWR. The Illinois Department of Natural Resources, Office of Water Resources.

Parcel. Contiguous land under single ownership or control.

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Performance Standards. A set of criteria which a wetland buffer natural areas development must meet in order to obtain approval as outlined in a Stormwater Management Permit.

Permanent Wetland Impact. The permanent conversion of wetland to non-wetland through direct or indirect activities.

Permit. A statement that a proposed development meets the requirements of this Ordinance.

Person. Any individual, partnership, firm, school district, company, corporation, association, joint stock company, trust, estate, unit of local government, special taxing district, public utility, political subdivision, state agency, or any other legal entity, or owner, or any legal representative, agent, or assign thereof.

Plan. The DuPage County Stormwater Management Plan, adopted by the DuPage County Board in September 1989, as amended from time to time.

Post Construction BMPs (PCBMPs). Features or infrastructure permanently installed onsite to treat stormwater runoff for pollutants of concern and to reduce runoff volume, following construction, for the life of the development.

Practicable Alternative. A development that is available and capable of being completed after taking into consideration cost, existing technology, and logistics in light of the overall basic development purpose. A study of practicable alternatives should consider possible alternative sites, a reduction in the scale of the development and rearrangement of the proposed facilities. This study assesses actions such as fill site locations, partial and full avoidance of habitats, and restoration and enhancement of habitats and development economics. See also **Alternatives Analysis**.

Pre-Development Site. On the date of application, the Pre-Development site consists of those existing site features that were either permitted or did not require permits at the time of their construction, or were constructed prior to February 15, 1992. Specifically, such features as pervious and impervious (paved or roof) surfaces, and existing drainage facilities, as well as Wetlands, flood plains/floodways, LPDAs and buffers are important pre-development site features.

Professional Engineer. A person licensed under the laws of the State of Illinois to practice professional engineering.

Professional Engineering. The application of science to the design of engineering systems and facilities, using the knowledge, skills, ability, and professional judgment developed through professional engineering education, training, and experience.

Public Flood Easement. An easement acceptable to the appropriate jurisdictional body that meets the regulation of the OWR, the Department, and the community, that provides legal assurances that all areas subject to flooding in the created backwater of the development will remain open to allow flooding.

Record Drawings. Drawings prepared, signed, and sealed by a Professional Engineer or land surveyor representing the final "as-built" record of the actual in-place elevations, location of structures, and topography.

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Recreational Vehicle. Any camping trailer, motor home, mini-motor home, travel trailer, truck camper and van camper as those terms are defined in the Illinois Motor Vehicle Code, or any other habitable vehicle used primarily for recreational purposes.

Regulatory Flood Map (RFM). The flood plain map panels maintained and published by DuPage County which reflect the current effective flood zone boundaries as shown on the FIRM and all effective Letters of Map Change issued by FEMA.

Regulatory Flood Plain. The flood plain as determined by the base flood elevation used as the basis for regulation in this Ordinance.

Regulatory Floodway. The floodway that is used as the basis for regulation in this Ordinance.

Regulatory Wetlands. All wetlands other than critical wetlands.

Repetitive Loss. Flood related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each flood event, on the average, equals or exceeds twenty-five percent (25%) of the market value of the structure before the damage occurred.

Residential Stormwater Detention System. A system constructed to temporarily store stormwater for New Single Family Residential Developments and Major Residential Addition Developments.

Riparian Environment: Land bordering a waterway that provides habitat or amenities dependent on the proximity to water.

Roadway Development. A development on an essentially linear property holding including easements, not a part of a larger development project involving adjacent land holdings, and for the purpose of building a new roadway, expanding the impervious footprint of an existing roadway, or completely reconstructing an existing roadway.

Runoff. The waters derived from melting snow or rain falling within a tributary drainage basin that exceeds the infiltration capacity of the soils of that basin.

Sediment Basin. Settling ponds with pipe outlet, which have both a permanent pool (dead storage) and additional volume (live and sediment storage) component, to detain sediment-laden runoff from disturbed areas to allow sediment and debris to settle out.

Sediment Trap. A small, temporary ponding basin formed by the construction of an embankment or excavated basin to detain sediment-laden runoff from disturbed areas to allow sediment and debris to settle out.

Silt Fence. A temporary filter barrier of entrenched geotextile fabric (filter fabric) stretched across and attached to supporting posts.

Soil Scientist. A person with a four-year degree in which the core curriculum included course work in a minimum of two of the following fields: soil science, pedology, edaphology, and geomorphology, and which person has a minimum of two years of field experience in classifying soils.

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Special Flood Hazard Area (SFHA). An area having special flood, mudslide or mudflow, or flood-related erosion hazards, and which area is shown on an FHBM or FIRM as Zone A, AO, A1-30, AE, A99, AH, VO, V1-30, VE, V, M, or E.

Start of Construction. The date the permit was issued provided the actual start of construction, repair, reconstruction, rehabilitation, addition placement or other improvement was within 180 days of the permit date. The actual start date includes the first day of any land preparation, including clearing, grading, filling, or excavation. For substantial improvements, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building whether or not that alteration affects the external dimensions of the building.

Stormwater Committee. The Stormwater Management Planning Committee of the DuPage County Board, authorized by Public Act 85-905.

Stormwater Facility. All ditches, channels, conduits, bridges, culverts, levees, ponds, natural and man-made impoundments, field tiles, swales, sewers, Residential Stormwater Detention Systems, site run-off storage facilities, BMPS or other structures or measures which serve as a means of draining surface and subsurface water from land.

Stormwater Management Permit. A permit established by this Ordinance; and issued by the Village signifying acceptance of measures identified for proposed development to comply with this Ordinance and the Plan.

Structure. The term “structure” includes, without limitation: buildings, manufactured homes, tanks and dams.

Structural Engineer. A person licensed under the laws of the State of Illinois as a structural engineer.

Substantial Damage. Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial Improvement. Any reconstruction, rehabilitation, addition, or improvement of a structure taking place during a 10-year period in which the cumulative percentage of improvements equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. "Substantial Improvement" is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the building. This term includes structures which have incurred repetitive loss or substantial damage, regardless of the actual work done. The term does not, however, include either: any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions, or any alteration of a “historic structure” listed on the National Register of Historic Places or the Illinois Register of Historic Places, provided that the alteration will not preclude the structure’s continued designation as a historic structure.

Temporary Wetland Impact. A wetland impact that would result in a short-term loss of wetland function. Temporary wetland impacts do not result in a permanent conversion of wetland to non-wetland. Temporary impacts do not include relocation of wetland, or conversion of a vegetated community to open water, unless the conversion is part of an overall wetland restoration/creation program that is submitted for review and approved. Additionally, for the impact to be considered temporary, wetland soil profiles

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shall be able to be restored to a similar pre-disturbance condition and elevation, vegetative communities shall have the capability of being restored to same or higher quality, function; and the restoration must occur within one year of the disturbance.

Total Impervious Area. The sum of the impervious area on a site.

Usable Space. Space used for dwelling, storage, utilities, or other beneficial purposes, including without limitation basements.

USACE. United States Army Corps of Engineers.

USEPA. United States Environmental Protection Agency.

Variance. An Authorization recommended by the Oversight Committee, and granted by the Village Council, that varies certain requirements of this Ordinance in a manner in harmony with the application of the Ordinance's general purpose and intent, which variance shall be granted only in a case where there are practical difficulties or particular hardships.

Violation. Failure of a structure or other development to be fully compliant with the regulations identified by Ordinance.

Water and Sewer Improvement Development. A development to construct, replace or upgrade infrastructure to meet current IEPA requirements for public water supply or pollution control (water or sewer system improvements). This definition does not include buildings, substations, pads, parking lots or other associated utility support facilities.

Water Quality Best Management Practices Technical Guidance. This document is a standalone guidance on file with DuPage County. The Guidance was published in March 2008.

Watershed. All land area drained by, or contributing water to, the same stream, lake, or stormwater facility.

Watershed Basin Committee. A technical committee established within a watershed planning area.

Watershed Benefit. A decrease in flood elevations or flood damages or an improvement in water quality, upstream or downstream of the development site.

WIIP. The Watershed Infrastructure Improvement Plan as approved by the Village Council in September 2007, and all subsequent revisions, which identifies areas in the Village where drainage and flooding issues exist and recommends specific solutions.

Watershed Plan. A plan adopted by the County for stormwater management within a watershed consistent with the requirements in Chapter 3 of the Plan.

Watershed Planning Area. That area considered in a specific watershed plan, adopted as part of the Plan.

Watershed Plan Model. The hydrologic and hydraulic model meeting the standards of the Plan and used in developing a watershed plan.

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Waters of DuPage. All waters such as lakes, rivers, streams (including intermittent streams), mudflats, wetlands, sloughs, wet meadows, or natural ponds.

Tributaries of waters identified above.

For clarification, waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not Waters of DuPage.

The following are generally not considered to be Waters of DuPage. However, the Administrator, reserves the right on a case-by-case basis to determine that a particular waterbody within these categories of waters is a Waters of DuPage.

- _ Drainage, irrigation and roadside ditches excavated on dry land.
- _ Artificially irrigated areas that would revert to upland if the irrigation ceased.
- _ Artificial lakes, ponds or wetlands created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stormwater storage, stock watering, irrigation, settling basins, or sediment traps.
- _ Artificial bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons.
- _ Water filled depressions created in dry land incidental to construction activity and pits or quarries excavated in dry land for the purpose of obtaining fill, stone, aggregate, sand, or gravel unless and until the construction or excavation operation is abandoned for a period of 5 years or more and the resulting body of water meets the definition of waters of DuPage.

Wetlands. Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wetland Buffer: Area within 50 feet of a regulatory wetland boundary or 100 feet of a critical wetland boundary.

Wetland Impact. Development affecting the long term function of any wetland.

With-Development Site. The site features illustrated on the final certified plans for a development, including unchanged areas or facilities of the pre-development site.

Section 2. That Section 26.610 is hereby amended to read as follows:

26.610 Permit Application Requirements and Submittals.

The specific applicable technical requirements and the extent of documentation required to be submitted may vary depending on existing conditions of the development site. The Applicant shall combine the separate "submittals" referenced in each article into a single application package of materials. Unless superseded by application under either a General Certification or a Letter of Permission, or the Administrator specifically allows a modification of the submittal requirements in writing, the following shall guide the determination that an application for Stormwater Management Permit is complete.

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- A. Stormwater Submittal. All developments requiring a Stormwater Management Permit are required to submit the information required in (Section 26.700.A, B). The requirement for Record Drawings (Section 26.700.B) applies to all developments that construct stormwater facilities, or include wetland, buffer or flood plain onsite. Unless the development fits the definition of Minor Development, the plans and calculations listed in Section 26.700.C will also be required (as relevant to the specific development).
- B. Maintenance Plan. When the development includes construction of a Site Runoff Storage Facility, a Residential Stormwater Detention System and/or Post Construction Best Management Practices, a maintenance plan specifying tasks and frequency shall be submitted.
- C. The provisions of Section 26.801 shall apply to all developments except:
1. Developments classified as Minor Developments; or
 2. Developments which do not include site stormwater storage facilities and which do not include any Best Management Practices ~~with a design drainage area greater than 1-acre.~~
- D. Performance Security. Performance Security in accordance with Section 26.800 may be combined into a single instrument and is required as follows.
1. Development Security or a Stormwater Bond, in accordance with Section 26.800.B, is required for all developments requiring a Stormwater Management Permit.
 2. Erosion and Sediment Control Security in accordance with Section 26.800.C is required for any development disturbing more than 1-acre, or which disturbs the bed and banks of a channel draining more than 100-acres, or when an Erosion and Sediment Control Plan is required because of impact to wetlands, buffers or flood plains.
 3. A Natural Area, Wetland and Buffer Mitigation Area Security shall be posted per Section 26.800.D. Whenever a natural area is being restored or a wetland of buffer is impacted and mitigated, unless mitigation is provided by fee-in-lieu.
- E. Soil Erosion and Sediment Control. All developments must provide both temporary and permanent Soil Erosion and Sediment Control; however, plans for these measures must be submitted for review only where the development is required to obtain a Stormwater Management Permit (Section 26.600). Developments required to make application may obtain a Letter of Permission (Section 26.601), even if it is not a Minor Development, as long as no other aspect of the development requires review under Articles X, XI, XIII or XIV. All other applications shall include the following based on area of land disturbance of the proposed development:
1. If the land disturbance is less than 1 acre and does not disturb the bed and banks of a channel draining more than 100-acres, and the development does not involve impact to buffer or wetland or flood plain, and is not part of a larger common plan, then the submittal shall be per Section 26.703.B.
 2. If the land disturbance is one 1-acre or greater or disturbs the bed or banks of a channel draining more than 100-acres, or the development includes impact to buffers or wetlands or flood plains, then the requirements of Sections 26.703.C and 26.703.D shall apply.
- F. Post Construction Best Management Practices. When the impervious coverage of the development site is increased by ~~seven hundred (700)~~ two thousand five hundred (2,500) square feet or more compared to the pre-development site, then PCBMPs, designed in accordance with Section 26.1000 through 26.1003, are required and submittals, in accordance with Section 26.702, are required with the Application, unless one of the exceptions or exclusions listed in Section 26.1000 applies.
- G. Flood Plains, LPDAs and Floodways. All developments shall check the requirements of Section 26.1301 to determine if a flood plain or LPDA exists on a development site. If a flood plain or LPDA does exist on the development site, a BFE shall be established as outlined in Section 26.1301C and shall be drawn on the site topographic map. If the proposed work is outside of the BFE, there shall be no additional requirements from Article XIII that need to be met. Applicants shall determine if floodway exists following Section 26.1301.D. For developments that involve work within the flood plain or, where there is floodway within the disturbed area, the flood plain and floodway shall be delineated on the site plan.

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1. For Developments within the flood plain, document that Section 26.1302 requirements are being met with a narrative and appropriate calculations, modeling, cross-sections and plans.
 2. For Developments within the floodway, document that Section 26.1303 requirements are being met with a narrative and appropriate calculations, modeling, cross-sections and plans per Section 26.704.
- H. Wetlands. Stormwater Management Permits are required for developments where the area being disturbed, or developed, is within 100 feet of a wetland located either on-site or off-site. The application shall include the following.
1. A wetland delineation and report will be required unless the wetland is determined to be greater than 100 feet away from the development's limit of disturbance, and Section 26.1400.A and 26.1400.B is applied with the concurrence of the Administrator.
 2. If the development's proposed limit of disturbance is within 100 feet of a wetland, then,
 - a. A wetland delineation and report will be required Section 26.1400, unless the wetland has clearly defined boundaries and there are no proposed wetland or buffer direct impacts or indirect wetland hydrologic impacts that exceed the thresholds found in Section 26.1402.
 - b. If there are direct impacts to the wetland, then the wetland submittal in accordance with Section 26.701 will be required.
 - c. If the thresholds development will cause an indirect impact to a wetland, an indirect impact analysis shall be included in the Wetland Submittal.
 - d. If the development has a direct or indirect permanent wetland impact a hydrologic analysis of the mitigation area (Section 26.1403.L) and a maintenance and monitoring plan (Section 26.1403.M) are required to be submitted, unless Fee in Lieu of mitigation is provided.
- I. Buffers. Direct impacts to buffers (Section 26.1500) will require a Buffer Submittal in accordance with Section 26.701.

Section 3. That Section 26.700SEC. is hereby amended to read as follows:

26.700SEC. Stormwater Submittals.

A. Drainage Plan. All developments that include between five hundred (500) square feet and one thousand five hundred (1,500) square feet of land disturbing activities shall require the submittal and approval of a drainage plan indicating the direction of existing and proposed stormwater flow on the site. If the development site is located within or adjacent to a flood plain, LPDA or wetland, a Grading and Site Restoration Plan may be required. Other information, as necessary and as determined by the Administrator, may be required to verify compliance with this ordinance.

B. Grading and Site Restoration Plan. All developments that include more than one thousand five hundred (1,500) square feet of land disturbing activities shall require the submittal and approval of a grading and site restoration plan. The Administrator, may approve, in writing, an application without some or all of the following items based on the extent and complexity of the development or the development is eligible for permit under a General Certification or Letter of Permission. The following constitutes a Grading and Site Restoration Plan submittal:

1. A standard engineering scaled drawing that includes or addresses:
 - a. The name and legal address of the applicant and of the owner of the land.
 - b. The common address and legal description of the site where the development will take place.
 - c. Site drainage showing the existing and proposed grades for a particular parcel and for adjoining properties (affected) with a minimum of one foot (1') contour intervals in sufficient detail to clearly indicate drainage flows.

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- d. Extent of existing impervious area, proposed developed impervious area, itemized calculations of the total net new impervious area, and extent of area to be disturbed in the construction of the development.
- e. Cross-sections of drainage swales, including one at each window well, as applicable.
- f. Foundation elevation, including the top of foundation and any openings below top of the foundation on all new or existing structures or portions thereof.
- g. Any proposed PCBMPs, Residential Stormwater Detention System or minor and major stormwater facilities using topography and spot elevations and depicting any offsite upstream drainage area and the characteristics of the downstream facilities receiving discharge from the development.
- h. Size, type, length and inverts of conveyance structures including drainage pipes, culverts, manholes, catch basins, inlets, and drain tiles
- i. The parcel drainage shall be designed to flow away from the top of foundations. Storm water being directed to the side yard of the parcel shall be directed into a formed drainage swale, having a minimum slope of two percent (2%) and a maximum slope of five percent (5%) where practical. In the event that conditions dictate that some parts of the lot be higher than the structure foundation, the grading must show specific drainage configurations for the parcel specifying that all drainage is to be directed to flow away from the foundation. At a minimum, spot grades shall be shown along the foundation and at all window well, their rims and ~~and~~-adjacent grade. Cross-section shall be provided for all swales, at a minimum at all window wells or other constrictions. A note shall be added that all swales shall be constructed of sod, subject to Village approval.
- j. Construction and work such as walkways, driveways, parking lots, landscaping or any structure shall be installed so that the construction of same will not interfere with drainage. All sidewalks, driveways, parking lots, patios and other flat work shall be at an elevation relative to the foundation wall so that water will drain away from the structure on all sides and off the lot in a manner which will provide reasonable freedom from erosion and permanently pocketed surface water.
- k. The flow from off-site tributary areas that are tributary to an intermittent stream or overflow route that must pass through the parcel must be identified on the grading plan and must be designed in such a way to adequately handle the flow of all water to accommodate a 100-year storm frequency.
- l. All overflow routes for the 100-year storm and for accumulated storm water runoff from several lots or from off-site catchment areas must be clearly designated on the grading plan with the total width of the flow route contained within an easement for drainage purposes.
- m. The location of, and direction of, any sump pump or downspout discharge onto the site from the subject property and from adjoining properties. Note if the discharge will splash to grade or show any associated piping. The distance between the discharge and the property line shall be maximized and any piped discharge must terminate no closer than 20 feet from the downstream property line and in accordance with Section 13.7.(f).
- n. The distance between the property and any regulatory floodplain or LPDA, including as necessary the base flood elevation.
- o. Areas to be graded and prepared for seeding or sod shall indicate a minimum of four (4) inches of topsoil.
- p. The following Erosion Control Notes shall be added to the site plan:
 - (1) The sediment and erosion control devices shall be functional before any land is disturbed on the site.
 - (2) Stockpiles of soil shall not be located within any drainageways, floodplains, wetlands, buffers or LPDAs.

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- (3) Sediment and erosion control shall be provided for any soil stockpile if it is to remain in place for more than three days including a double row of silt fence.
 - (4) Properties downstream from the site shall be protected from erosion if the volume, velocity, sediment load, or peak flow rates of stormwater runoff are temporarily increased during construction.
 - (5) Storm sewer inlets shall be protected with sediment trapping or filter control devices during construction.
 - (6) The surface of stripped areas shall be permanently or temporarily protected from soil erosion within fifteen days after final grade is reached. Stripped areas that will remain undisturbed for more than fifteen days after initial disturbance shall be protected from erosion.
 - (7) Water pumped or otherwise discharged from the site during construction dewatering shall be filtered.
 - (8) A stabilized construction entrance shall be provided to prevent the deposition of soil onto public or private roadways. Any soil reaching a public or private roadway shall be removed before the end of each workday.
 - (9) All temporary erosion control measures necessary to meet the requirements of the Village of Downers Grove Stormwater and Flood Plain Ordinance shall be kept operational and maintained continuously throughout the period of land disturbance until permanent sediment and erosion and control measures are operational.
- q. Any additional information as necessary to show compliance with the Downers Grove Municipal Code.
2. Affidavits signed by the land owner and the developer attesting to their understanding of the requirements of this Ordinance and their intent to comply therewith, including the submittal of a record drawing in accordance with Section 26.700.B; and
3. A listing of all other required stormwater related permits, a brief description of how the other permits apply to the development, and when requested by the Administrator, complete copies of the applications for the permits; and
4. A statement of opinion by a qualified professional either acknowledging or denying the presence of flood plain in accordance with Section 26.1301, wetlands in accordance with Section 26.1400, and buffers in accordance with Section 26.1500; and
5. A statement from the applicant acknowledging that all stormwater submittals shall be made available for inspections and copying notwithstanding any exemption from inspection and copying for such materials under the Freedom of Information Act, upon the written request of either (1) the applicant, (2) any subsequent owner of the subject property, or (3) any governmental unit having planning or drainage jurisdiction within one and one half (1 and ½) mile of the subject property.
- C. Record Drawings. For projects with a stormwater facility other than a PCBMP (as required in Section 26.1000), or a Residential Stormwater Detention System (as required in Section 26.1101(B) and (E)), prior to the issuance of a building permit, the associated stormwater facilities must be completed, and a Record Drawing of such must be submitted for approval. The Record Drawing must depict the as-constructed size, rim and invert elevations of pipes, stormwater structures and culverts, and contours and flood storage volumes of all required basins of the major and minor stormwater systems.

After the completion of the Development, a complete set of Record Drawings must be submitted prior to

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the return of remaining securities or acceptance of public improvements. The following items must be included in the Record Drawings unless the Administrator, in writing, waives the requirements based on the extent and complexity of the development:

1. All plans and drawings shall be at standard engineering scale.
2. Size, type, length and inverts of conveyance structures including drainage pipes, culverts, manholes, catch basins, inlets, and drain tiles.
3. An impervious area table listing all impervious areas or a drawing with all impervious areas labeled and totaled shall also be included on the As-Built drawings.
4. Calculations that establish the required site runoff storage or Residential Stormwater Detention System volume, along with calculations confirming that the as-built system proposed plan achieves either the required volume site runoff storage or the modified required volume site runoff storage.
5. Location and details for any required compensatory storage and supporting calculations.
6. Site drainage showing the as-built grades with a minimum of one foot (1') contour intervals in sufficient detail to clearly indicate drainage flows.
7. All boundaries of LPDAs, flood plain, wetlands and buffers shall be labeled.
8. Top of foundation elevations of all new structures and spot grades adjacent to the foundations of all new structures.
9. Stoops outside of doorways and window well locations, rim elevations, and the adjacent grade.
10. An accurate as-built location of and details for any PCBMPs and Residential Stormwater Detention Systems, including location of all utilities, such as: outlet pipes, observation wells and overflow pipes.
11. Sump Pump discharge location, discharge path, and the location, size, and material of any associated piping.
12. Downspout location, discharge path, and the location, size, and material of any associated piping.
13. All existing and proposed improvements within the right-of-way, including sanitary and water mains and service locations.
14. An Elevation Certificate is required to be submitted for all additions and new construction within SFHA's or LPDA's.
15. A notice acknowledging the presence of on-site wetlands, buffers, flood plains, Residential Stormwater Detention Systems and PCBMPs with draining areas one (1) acre or greater shall will be recorded against the title of the property by the Village to alert all future owners and shall reference the stormwater management permit. All administrative and recording fees will be borne by the permit applicant as established in the Village User-Fee, License and Fine Schedule Regulation.

Section 4. That Section 26.801 is hereby amended to read as follows:

26.801 Long-Term Access for Maintenance and Inspections.

- A. Access to privately-owned land for inspection and maintenance of site runoff storage facilities, Residential Stormwater Detention Systems, major stormwater system, compensatory storage facilities, and storm sewers covered by the permit shall be through a grant of easement in a form approved by the Administrator. Other instruments may be accepted by the Administrator, provided that the access and maintenance rights granted runs with the land and survives title transfers.
- B. Subdivision site runoff storage areas, compensatory storage facilities, major stormwater system and storm sewers not already located in dedicated rights-of-way or easements, shall be located either: (i) on a parcel granted or dedicated to, and accepted by, a public entity; or, (ii) on a parcel, or parcels, conveyed by plat as undivided equal interests to each lot in the subdivision or otherwise conveyed or dedicated to conservation or land preservation entities approved by the Administrator.
- C. When title to the land underlying site runoff storage areas and storm sewers is conveyed in undivided equal interests to the owner(s) of each of the lots within the subdivision the following apply:

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1. A covenant shall appear on the face of the plat of subdivision, and on each deed conveying ownership of a subdivision lot, which states that title to such site runoff storage facilities and storm sewers shall be held in undivided equal interests by each lot owner within the subdivision.
 2. A covenant shall appear on the face of the plat of subdivision, and on each deed conveying ownership of the subdivision lots, which states that in the event the Village having easement rights under Section 26.801.A exercises its right to perform maintenance to such subdivision runoff storage facilities, Residential Stormwater Detention Systems and/or storm sewers, ~~that~~then the Village may lien each lot within the subdivision for the costs of any maintenance work performed.
 3. An owners' association may be established to provide for the maintenance of the facilities, payment of property taxes, and the assessment and collection of owner dues or fees to fund said activities. Such associations shall be duly incorporated and the property owners' association's declaration of covenants and bylaws shall be recorded against the title for all lots in that subdivision.
- D. When title to the land underlying the site runoff storage areas, Residential Stormwater Detention Systems and storm sewers are located on privately-owned land not falling within the scope of Section 26-801.C, the following shall apply:
1. The applicant shall reserve an easement for access for maintenance and inspection purposes to the Village having drainage and/or stormwater management jurisdiction over the property; and
 2. The applicant shall acknowledge and record a covenant against title stating that in the event the Village having easement rights under Section 26-801.A exercises its right to perform maintenance to site runoff storage facilities, Residential Stormwater Detention Systems, and/or storm sewers on that property, it may lien the property for the costs of any maintenance work performed.

Section 5. That Section 26.1000SEC. is hereby amended to read as follows:

26.1000SEC. Post Construction Best Management Practices.

A. PCBMPs (Post Construction Best Management Practices), are required to treat the stormwater runoff for pollutants of concern and reduce runoff volume for all developments, with the exceptions and exclusions noted below. Upon a documented finding by the Administrator that providing PCBMPs is impractical, then the appropriate PCBMP fee-in-lieu shall be paid by the applicant in lieu of providing full or partial PCBMPs. On-site PCBMPs are waived for the following developments:

1. When comparing the impervious area of the pre-development site to the with-development impervious area of the same development site, excluding any areas of the development site which PCBMPs have already been provided and maintained, and the net new impervious area is less than ~~seven hundred (700) square feet in the aggregate since January 1, 2015~~ or two thousand five hundred (2,500) square feet since April 23, 2013; or
2. The development is limited to the resurfacing of an existing roadway or reconstruction of an existing roadway with less than 2,500 square feet of net new impervious area per quarter mile being added compared to the pre-development condition or the replacement of an existing culvert or bridge; or
3. The development is a Regional Stormwater Management Development or a Flood Control development which are also considered to be PCBMPs; or
4. The development is a stream bank stabilization, natural area restoration, or wetlands mitigation bank development, or off-site wetland mitigation which in itself is considered a PCBMP; or
5. The development is limited to the construction, or re-construction, of a pedestrian walkway/bike path, in which the pedestrian walkway/bike path shall not exceed sixteen (16) feet in width, including shoulders; and is being constructed for general public use; or
6. The development is limited to the modification of an existing stormwater management facility to incorporate Best Management Practices which in itself is considered PCBMPs; or
7. The development is a Water or Sewer Improvement Development; or

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8. The development is limited to construction or maintenance of an underground or overhead utility conduit or line, with supports and appurtenances.
- B. The following are prohibited from the providing on-site infiltration PCBMPs.
1. Fueling and vehicle maintenance areas.
 2. Areas within four hundred (400) feet of a known community water system well as specified, or within one hundred (100) feet of a known private well, for runoff infiltrated from commercial, industrial and institutional land uses. The applicant shall use their best efforts to identify such zones from available information sources, which include the Illinois State Water Survey, IEPA, USEPA, DuPage County Health Department and the local municipality or water agency.
 3. Areas where contaminants of concern, as identified by the USEPA or the IEPA prior to development, are present in the soil through which infiltration would occur. For sites with a No Further Remediation (NFR) letter from the USEPA or IEPA, the applicant shall determine whether or not structural barriers are part of the mitigation strategy and account for such measures in the design.
 4. Development in soils classified as Hydrologic Soils Group A by the NRCS.
 5. Developments over soils with the seasonably high groundwater table within two (2) feet of the surface.

Section 6. That Section 26.1101 is hereby amended to read as follows:

26.1101 Site Runoff Storage and Residential Stormwater Detention Systems.

Site runoff storage facilities, consisting of site runoff storage and a control structure with an emergency overflow shall be required for all ~~d~~Developments, except as otherwise provided herein.

A. The following cases or special conditions represent exceptions to providing site runoff storage:

1. For all Developments other than those described in Section 26.1101(B), ~~W~~hen comparing the impervious area of the pre-development development site as it existed as of February 15, 1992 to the with-development impervious area of the same development site, excluding any areas of the development site for which detention has already been provided, and the impervious area has not increased by a minimum of five thousand (25,000) sq. ft. square feet cumulatively of permitted development; or
2. ~~e~~Comparing the highest percentage of impervious area of the same development site in the 3 years immediately prior to the date of the Stormwater Management Permit application to the with-development impervious area the percentage will decrease by a minimum of five percent (5%); or
3. The with-development impervious area of the same development site is less than or equal to ten percent (10%); or
4. The development is strictly limited to a roadway development intended for public use, and the with-development Impervious Area is less than five thousand (25,000) square feet compared to pre-development conditions.

B. Residential Stormwater Detention Systems.

Except for vacant lots in a subdivision with site runoff storage that has already been provided in accordance with DuPage County Stormwater Regulations after February 15, 1992, all New Single Family Residential and Major Residential Addition Developments shall provide detention in accordance with 26.1101(E) and the following:

I.

RESIDENTIAL STORMWATER DETENTION SYSTEMS

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	<p><u>IF SITE IS WITHIN TWO HUNDRED (200) FEET OF A PUBLIC MINOR STORMWATER SYSTEM AND CONNECTION CAN BE MADE VIA GRAVITY THEN RESIDENTIAL STORMWATER DETENTION SYSTEM MUST BE CONNECTED TO PUBLIC MINOR STORMWATER SYSTEM</u></p>		<p><u>IF SITE IS WITHIN TWO HUNDRED (200) FEET OF A PUBLIC MINOR STORMWATER SYSTEM BUT CANNOT DRAIN BY GRAVITY; OR THE SITE IS MORE THAN TWO HUNDRED (200) FEET FROM A PUBLIC MINOR STORMWATER SYSTEM THEN RESIDENTIAL STORMWATER DETENTION SYSTEM IS NOT REQUIRED TO CONNECT TO PUBLIC MINOR STORMWATER SYSTEM</u></p>
	<p><u>Closed bottom detention system (without infiltration)</u></p>	<p><u>Open bottom detention system (with infiltration)</u></p>	<p><u>Open bottom detention system with infiltration and no connection to public minor stormwater system</u></p>
<p><u>Detention Volume</u></p>	<p><u>100%</u></p>	<p><u>100%</u></p>	<p><u>If draw down time is less than 96 hours: between 110% - 150%*</u></p> <p><u>If draw down time is more than 96 hours: 150% maximum*</u></p>
<p><u>Provide Estimated Seasonal High Water Level (ESHWL) and infiltration rate</u></p>	<p><u>NO</u></p>	<p><u>YES</u></p>	<p><u>YES</u></p>
<p><u>Draw Down Time</u></p>	<p><u>N/A</u></p>	<p><u>48 hr min/ 96 hr max</u></p>	<p><u>See Detention Volume Above</u></p>
<p><u>Minimum % of detention provided above ESHWL</u></p>	<p><u>N/A</u></p>	<p><u>75%</u></p>	<p><u>75%</u></p>
<p><u>Restrictor</u></p>	<p><u>The outlet pipe must be restricted to slow the water from entering the public minor stormwater system. Must provide a standpipe made of perforated pipe or solid pipe with holes drilled or other restrictor approved by the Administrator.</u></p>		<p><u>N/A</u></p>
<p><u>Applicants must extend public minor stormwater system at their expense</u></p>	<p><u>YES</u></p>	<p><u>YES</u></p>	<p><u>NO</u></p>

*Applicant may choose to extend the public minor stormwater system and connect to the Residential Stormwater Detention System if it is more than two hundred (200) feet from the property, in lieu of

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providing extra detention volume.

II. When a Residential Stormwater Detention System is required to connect to a public minor stormwater system via an extension constructed by the applicant. The following shall apply:

- a. An extension of the public minor stormwater system within the adjacent right-of-way must be constructed across the entire length of the subject property and be extended to the most upstream end of the right-of-way frontage unless otherwise approved by the Administrator.
- b. The extended public minor stormwater system shall be sized for the two-year event with a minimum pipe size of twelve (12) inches.
- c. An approved structure must be provided where a transition is required.
- d. Any extension to the public minor stormwater system that results in a dead-end, must terminate with an approved structure.
- e. When there is more than one public minor stormwater system within two-hundred (200) feet of the property, the Administrator has the authority to determine which public minor stormwater system the applicant may connect to.

III. The Residential Stormwater Detention System shall include an accessible inspection/clean-out port.

IV. The Residential Stormwater Detention System shall include an emergency overflow, which must be located at least twenty (20) feet upstream from adjacent property lines.

V. The Residential Stormwater Detention System must be set back at least five (5) feet from adjacent property lines and at least ten (10) feet from a building foundation.

VI. The applicant shall be required to obtain a permit for all work in the right-of-way and shall comply with Village standards. Restoration of any driveway aprons within the project area shall include a full replacement of such apron.

VII. The applicant shall be required to submit all topographic information necessary to support a constructible plan set for the construction of a public minor stormwater system extension which shall at a minimum include:

- a. Detailed topography with one-foot contour intervals throughout the described project area, with elevations noted for key changes in grade, as well as high or low points between contours of the same elevation, and elevations of roadway and driveway pavement over culverts.
- b. Locations and identification of all above ground features; i.e., mailboxes, utility poles, driveways, culvert headwalls, culverts, sidewalks, sump pump outlets, etc.
- c. All utilities including but not limited to: water, storm sewer, sanitary sewer, electric, gas, and communications.
- d. Tree survey identifying location, species and size of parkway trees that may be impacted by extension. Removal of parkway trees is subject to the approval of the Village Forester per Chapter 24 of the Municipal Code.
- e. Limits of floodplains, floodways, wetlands or localized poor drainage areas (LPDA)
- f. Locations of all landscape materials; i.e., bushes, trees (2" diameter and larger), flower beds, etc. Tree sizes (2" diameter and larger) shall be measured four and one-half feet (diameter breast height) above the highest ground level at base of tree. Note locations of landscape timbers, flagstone paths or walls, brick pavers, etc.

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VIII. Private Outlet Pipe.

- a. An outlet pipe shall be provided for all Residential Stormwater Detention Systems that connects into the public minor stormwater system.
- b. Where a public minor stormwater system does not exist, the outlet pipe shall be extended to the right-of-way and capped, and include a clean-out port, unless otherwise approved by the Administrator.

IX. Prior to the issuance of a certificate of occupancy for the property, the following items must be completed:

- a. A five-foot (5') wide easement shall be granted to the Village over the private outlet pipe and over the limits of the Residential Stormwater Detention System. Both easements shall be recorded with DuPage County. All administrative and recording fees will be borne by the permit applicant as established in the Village User-Fee, License and Fine Schedule Regulation.
- b. The homeowner shall execute and record a stormwater facility agreement. The agreement shall identify the location of the system and the maintenance requirements. All administrative and recording fees will be borne by the permit applicant as established in the Village User-Fee, License and Fine Schedule Regulation.

X. Any reconstruction, rehabilitation, addition or improvement of a single family residential building that takes place during a three (3) year period in which the cumulative improvements equal the definition of a Major Residential Addition Development shall comply with all regulations prescribed in this Ordinance.

CB. When the development is either a Roadway Development or an Open Space Development, which are “Special Cases of Development” as noted in Section 26.611, then only “Site Runoff Storage Special” is required. Site Runoff Storage Special shall be only that volume of site runoff storage required such that pre-development peak discharges for the 2-year, 24-hour duration and the 100-year, 24-hour duration rainfall events are not increased.

DC. The following “Special Cases of Development” are not required to provide Site Runoff Storage or “Site Runoff Storage, Special”:

1. Bridge and culvert modification, repair, and replacement developments; or
2. Streambank stabilization developments; or
3. Natural area restoration developments; or
4. Wetland mitigation sites and wetland mitigation banks; or
5. Trails, bikeways and pedestrian walkways that shall not exceed sixteen (16) feet in width, including shoulders; and are constructed for general public use; or
6. Water and sewer improvement developments and all underground utilities.

ED. When site runoff storage or a Residential Stormwater Detention System is required, it will be calculated as a volume utilizing the following development parameters and procedures.

1. The area for which site runoff storage is to be calculated will be the limits of grading or land cover disturbance, or a combination, whichever encompasses the greatest area of the development site, and will also include any development area for which site stormwater storage was deferred in Section 26.1101.A.1. For a Residential Stormwater Detention System, the volume shall be calculated based on the total impervious area (existing, to remain and proposed).
2. The runoff characteristics of the area will be indexed by calculating a representative hydrologic parameter. This parameter will be the NRCS Curve Number unless the Administrator approves the use of some other generally accepted engineering practice. For a Residential Stormwater Detention System, the runoff characteristics will be indexed by utilizing a NRCS Curve Number

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- of 98 for all impervious area, unless the Administrator approves the use of an alternative, generally accepted engineering practice.
3. The design rainfall depth and duration will be the 100-year, 24-hour duration ISWS Bulletin 71 rainfall depth. Sectional statistics and rainfall distributions by Huff appropriate for a 100-year, 24-hour event shall be used unless some other rainfall and distribution is approved by the Administrator.
 4. For purposes of calculating the required volume for stormwater facilities other than Residential Stormwater Detention System, a control structure shall be assumed that limits the peak runoff from the site to 0.10 cfs/acre for the disturbed area.
 5. For sites less than five (5) acres in area, the unit area site runoff storage nomograph from the Northeastern Illinois Planning Commission (now known as Chicago Metropolitan Agency for Planning CMAP) publication "*Investigation of Hydrologic Methods for Site Design in Northeastern Illinois*" (Dreher and Price, 1991) will be considered an acceptable calculation methodology for determining the volume of site runoff storage required in lieu of modeling.
 6. For sites five (5) acres or greater, a hydrologic model that produces a runoff hydrograph shall be utilized, and the runoff hydrograph routed through a basin which provides sufficient storage such that the combination of control structure and runoff storage volume limits the discharge to the allowable peak runoff. The calculated volume is then the required site runoff storage volume. This volume may be reduced by any volume control BMP (see Article X) volume if such a volume is required, and is then referred to as the Modified Required Site Runoff Storage Volume.
 7. On development sites that have an existing site runoff storage facility, the volume of site runoff storage required, for a proposed development shall not be less than the volume on-site pre-development, regardless of the provisions of this section.
 8. The area for which on-site detention is required for Residential Stormwater Detention System shall include all the impervious area located on the site, except for vacant lots in a subdivision with site runoff storage that has already been provided in accordance with DuPage County Stormwater Regulations after February 15, 1992.
- FE. The details of the design of a site runoff storage facility, which includes a Site runoff storage control structure in accordance with Section 26.1102 (side slopes, depths, etc.), will be in accordance with this Ordinance.
- GF. If a development is granted a variance with respect to the required site runoff storage volume or the Residential Stormwater Detention System volume, then the applicant shall pay a fee-in-lieu of ~~site runoff storage~~ per Section 26.1600.
- HG. Small areas of the disturbed area of a development site (less than five percent (5%) cumulatively) that are impractical to drain to a site runoff storage facility (back slopes of landscaping berms for example) may be allowed to drain off-site without routing through a site runoff storage facility provided that the areas are primarily vegetated and contain only incidental amounts of impervious surfaces such as sidewalks, utility appurtenances, or trails. Such areas do not "penalize" the allowable release rate by subtracting the anticipated 100-year discharge from these areas from the release rate, but may not be included in the area used for calculating the allowable release rate.

Section 7. That Section 26.1102 is hereby amended to read as follows:

26.1102 Site Runoff Storage Control Structures.

A. A site runoff storage facility requires a control structure to meet the peak runoff rate requirements, except for Residential Stormwater Detention Systems provided in accordance with Section 28.1101(B). Its design will be as follows, unless an alternate design meeting the intent to provide site runoff storage of a determined volume is approved by the Administrator.

1. The structure shall be designed so that within the elevation range at which the site runoff storage volume is provided, the calculated discharge from the structure equals the product of 0.10 cfs/acre

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- multiplied by the disturbed site area, assuming a free discharge.
2. An overflow conveyance system shall also be designed to convey a minimum of 1-cfs/acre multiplied by the entire upstream drainage area without damaging any buildings on site with overbank flooding, and shall discharge at the same location as where water leaves the site pre-development. This location may be modified by the Administrator. This conveyance shall begin operation at the elevation at which the site runoff storage volume is met. If more than 100-acres drains to the emergency overflow then the overflow is part of the major drainage system and it also falls under the provisions of Article XIII.
 - B. For locations draining more than 10 acres, but less than 100-acres, the combination of control structure, site runoff storage and overflow conveyance shall be tested in a with-development hydrologic model and the design shall be further modified by adding additional site runoff storage, as necessary so that the pre-development site 2-year and 100-year, 24-hour duration peak discharges are not increased compared to the With- Development Site condition.
 - C. For site runoff storage facilities with a tributary area 100 acres or greater at the control structure, in addition to the above requirements, the combination of control structure, site runoff storage and overflow conveyance shall not exceed the pre-development site peak discharge in a 2-yr or 100-yr rainfall event of critical duration up to a 24-hour duration.
 - D. Unless approved by the Administrator, all site runoff storage control structure designs shall operate without human intervention and when requiring electric power, shall have at least two independent and flood resistant sources of power.

Section 8. That Section 26.1103 is hereby amended to read as follows:

26.1103 Storage Facilities in Regulatory Flood Plain.

Storage facilities, including Residential Stormwater Detention Systems, located within the regulatory flood plain shall:

- A. Conform to all applicable requirements specified in Article XIII of this Ordinance; and
- B. Store the required site runoff under all stream flow and backwater conditions up to the base flood elevation; and
- C. Not allow design release rates to be exceeded under any stream elevation less than the base flood elevation.

Section 9. That Section 26.1104 is hereby amended to read as follows:

26.1104 Storage facilities located within the regulatory floodway.

Storage facilities, including Residential Stormwater Detention Systems, located within the regulatory floodway shall:

- A. Meet the requirements for locating storage facilities in the regulatory flood plain; and
- B. Be evaluated by performing hydrologic and hydraulic analysis consistent with the standards and requirements for Watershed Plans; and
- C. Provide a watershed benefit.

Section 10. That Section 26.1105 is hereby amended to read as follows:

26.1105 Off-Site Storage Facilities.

Storage facilities, including Residential Stormwater Detention Systems, may be located off-site if the following conditions are met:

- A. The off-site storage facility meets all of the requirements of this Article and
- B. Adequate storage capacity in the off-site facility is dedicated to the development; and

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C. The development includes provisions to convey stormwater to the off-site storage facility.

Section 11. That Section 26.1600SEC. is hereby amended to read as follows:

26.1600SEC. Site Runoff Storage Variance Fee Program.

A. Where a variance to the site runoff storage ~~or Residential Stormwater Detention System~~ requirements of Section 26-1101 is granted, payment into a ~~site runoff storage~~-variance fee program shall be made prior to the issuance of a Stormwater Management Permit as a condition of the variance.

B. Payment of a ~~site runoff storage~~-variance fee for the varied storage shall be made to the Village and is determined by applying the first applicable criteria as follows:

1. Where the program has an established off-site storage facility(ies) the fee shall be calculated by multiplying the per acre-foot cost of the closest off-site storage facility times the varied storage where:
 - a. A design concept plan for the facility has been approved by the Oversight Committee and the Village Council containing an estimate of the per acre-foot cost of constructing the storage, including operation and maintenance costs; and
 - b. A formula has been developed to determine that any investment in the facility shall be at least equal to the cost of planning, acquiring of lands, constructing, operating, and maintaining the facility; and
 - c. The facility is located in the same watershed planning area as the variance.

The fee is calculated by multiplying the varied storage amount by the cost per-acre-foot for the watershed planning area where the development is located, in accordance with the following fee schedule:

Salt Creek: \$133,000 per acre foot

East Branch DuPage River: \$106,000 per acre foot

Sawmill Creek: \$87,000 per acre foot

The fee shall include the cost of planning, acquiring land, construction, operation and maintenance.

~~2. The variance fee for a Residential Stormwater Detention System shall be calculated by multiplying the varied storage amount by \$11 per cubic foot of the required storage. The variance fee for a Residential Stormwater Detention System may be adjusted based upon the impacts of other stormwater improvements made on the site.~~

~~23. Fee in lieu funds collected shall be accounted for in separate development or watershed planning area-accounts. When possible, Ffunds shall be used in the same community or watershed planning areas as collected to enhance existing site runoff storage facilities and related components, construct off-site facilities and related components, provide maintenance of stormwater facilities, or undertake other development that provides a watershed benefit.~~

~~34. The Administrator shall provide an annual accounting of all funds deposited in each development or watershed planning accounts and shall account for each fund on a first-in, first-out basis. The accounting records shall be made available to the Committee upon request.~~

~~45. The Administrator may prioritize and allocate funds on an annual basis within each watershed planning area account.~~

~~56. Detention variance fees shall be refunded to the person who paid the fee, or to that person's successor in interest, in accordance with Section 26.1601B.6, whenever the program administrator fails to encumber fees collected within 10 years from the date on which such fees were collected.~~

~~67. Refunds shall made provided that the appropriate party files a petition with the program administrator within one (1) year from the date on which such fees are required to be encumbered~~

Section 12. That all ordinances or parts of ordinances in conflict with the provisions of this ordinance are hereby repealed.

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Section 13. That this ordinance shall be in full force and effect from and after its passage and publication in the manner provided by law.

Mayor

Passed:

Published:

Attest: _____
Village Clerk

Total Lot Area	6805 sf	
As-built Impervious	3012 sf	
% Impervious	44.26%	
	0.27 ac-ft / ac	
	0.042179752 ac-ft	
	1837.35 cf	Drain down with no rain
Average infiltration	0.02 in/hour	1800 hours
		75 days

Provide 12 - 24" pipes @ 38' long
 Provide 1 foot of stone around pipes
 6" of stone above and below pipes
 Total: 40' x 26' x 3'
 Area of detention: 1040 sf

April 1, 2014 - September 1, 2014

Week #	Weekly Rainfall (in)	Ending Depth (in)	Ending % Full
Week 1	0.97	1.76	4.90%
Week 2	0.69	2.08	5.78%
Week 3	0.21	1.01	2.80%
Week 4	1.06	2.40	6.66%
Week 5	1.61	5.38	14.95%
Week 6	1.78	8.86	24.60%
Week 7	1.17	10.57	29.35%
Week 8	1.09	12.04	33.45%
Week 9	0.98	13.20	36.67%
Week 10	0.49	17.49	48.57%
Week 11	1.60	15.89	44.15%
Week 12	3.48	24.44	67.88%
Week 13	0.37	29.48	81.88%
Week 14	2.73	30.11	83.65%
Week 15	1.49	33.65	93.46%
Week 16	0.38	32.02	88.95%
Week 17	0.02	30.34	84.29%
Week 18	0.26	31.79	88.31%
Week 19	1.66	32.98	91.61%
Week 20	0.18	31.39	87.18%
Week 21	5.04	44.33	123.14%
Week 22	0.17	43.11	119.76%

65 Rainfall Events

Total Lot Area	6805 sf	
As-built Impervious	3012 sf	
% Impervious	44.26%	
	0.27 ac-ft / ac	
	0.042179752 ac-ft	
	1837.35 cf	drain down with no rain
Average infiltration	0.06 in/hour	600 hours
		25 days

Provide 12 - 24" pipes @ 38' long
 Provide 1 foot of stone around pipes
 6" of stone above and below pipes
 Total: 40' x 26' x 3'
 Area of detention: 1040 sf

April 1, 2014 - September 1, 2014

Week #	Weekly Rainfall (in)	Ending Depth (in)	Ending % Full
Week 1	0.97	0.00	0.00%
Week 2	0.69	1.97	5.47%
Week 3	0.21	0.00	0.00%
Week 4	1.06	1.48	4.10%
Week 5	1.61	1.10	3.06%
Week 6	1.78	3.00	8.32%
Week 7	1.17	1.34	3.73%
Week 8	1.09	0.00	0.00%
Week 9	0.98	0.09	0.24%
Week 10	0.49	4.55	12.63%
Week 11	1.6	0.00	0.00%
Week 12	3.48	5.90	16.40%
Week 13	0.37	7.58	21.06%
Week 14	2.73	4.86	13.50%
Week 15	1.49	5.03	13.98%
Week 16	0.38	0.06	0.16%
Week 17	0.02	0.00	0.00%
Week 18	0.26	1.65	4.60%
Week 19	1.66	1.43	3.96%
Week 20	0.18	0.00	0.00%
Week 21	5.04	10.31	28.63%
Week 22	0.17	7.17	19.91%

65 rainfall events