

SECTION 9

STORMWATER MANAGEMENT

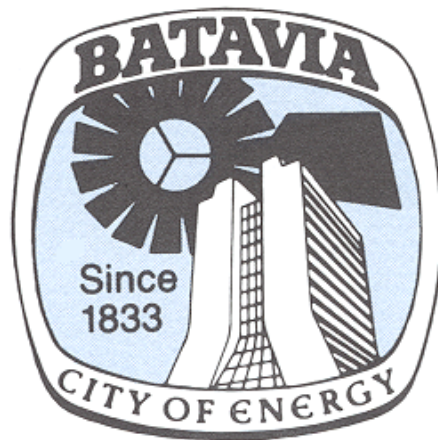


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SECTION 9

STORMWATER MANAGEMENT

9.1 STORMWATER STORAGE

9.1.1 Functional Classification

Existing floodplain storage will be preserved and maintained for the post-development condition. For streams with mapped FEMA Zone AE floodplain (base floodplain elevations determined and subsequently approved by FEMA), the floodplain will consist of the base flood elevation(s) set onto the approved site topography. For streams with mapped FEMA Zone A floodplain (no base floodplain elevations determined), the floodplain will need to be determined with hydrologic and hydraulic modeling acceptable to the IDNR and the City of Batavia.

9.1.2 Natural Depressional Storage

Isolated depressional areas can provide a significant amount of natural stormwater storage in a watershed. Therefore, they shall be included in determining the natural release rate to be compared to the allowable release rate.

9.2 STORMWATER DETENTION

9.2.1 General

Detention requirements within the City of Batavia are subject to review under the applicable Kane County Stormwater ordinance and the City's amendments. The stormwater release rate is the lesser value of the applicable County release rate or as adopted and modified by the City of Batavia.

The Restrictor Manhole shall be located where it can be accessed by heavy vehicles. Preferably, the access shall be from a paved surface. However, in the event that the restrictor is off pavement, it may be requested that a 10 ft. wide paved path be installed from the closest hard surface to the restrictor manhole to allow heavy vehicular access by the City Engineer and / or Streets Division of Public Works.

9.2.2 Basins

A detention basin is a facility that normally drains completely between runoff events. The maximum side-slopes of a detention basin shall be 4 to 1 (4:1, or 4 feet horizontally for every 1 foot drop in elevation). The maximum depth of stormwater storage in a detention basin shall be 6 feet. This depth is measured from the lowest point in the basin (located at the invert of the outlet pipe or at the rim elevation of an inlet grate) to the design high water elevation as illustrated

below.

The bottom of a detention basin must be sloped toward the outlet or inlet grate(s) to provide drainage after it has stored stormwater. The bottom slope will be a recommended 2 percent with an allowable range of 1.5 percent minimum and 25 percent maximum. The proposed grading conditions shall not result in conditions that will cause water to pond (high water elevation) on adjacent property or to rise within (2) feet of any existing or proposed top of foundation elevations or low opening of a structure.

Flared end sections shall be required in any areas where a storm sewer discharges into a detention basin. Trash grates shall be provided on all flared end sections 12 inches in diameter and greater. Permanent erosion control shall be provided with riprap at all flared end sections. Temporary erosion control in the form of coir logs / coconut rolls or approved equal shall be provided at all outlet flared end sections, and shall be maintained until the topsoil has been adequately stabilized with vegetative cover. All flared end sections greater than or equal to 12 inches that will receive or discharge storm water, shall have a removable grate system to prevent entry. This grate system shall be made from steel stock that is hot-dipped galvanized after fabrication.

9.2.3 Ponds

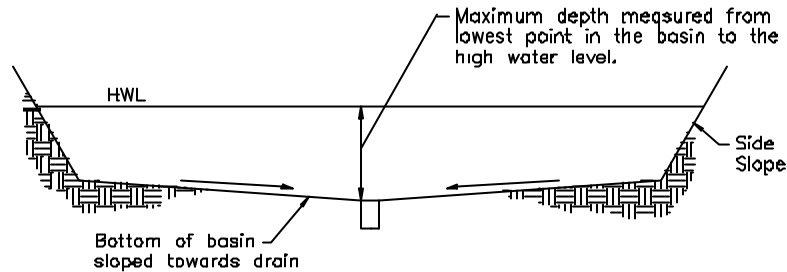
A detention pond is a facility that maintains a fixed minimum water elevation between runoff events. This definition excludes the water volume losses due to infiltration, evaporation, or de-watering due to periodic maintenance. The maximum side-slopes of a detention pond adjacent to a residential area, including multi-family developments, commercial and industrial areas shall be 4 to 1 (4:1, or 4 feet horizontally for every 1 foot drop in elevation). The maximum depth of stormwater storage in a detention pond shall be 6 feet. This depth is measured from the normal water level elevation to the design high water elevation.

9.2.4 Aeration Facilities

Aeration facilities to prevent pond stagnation shall be provided. Design calculations to substantiate the effectiveness of these aeration facilities shall be submitted with final engineering plans. Agreements for the perpetual operation and maintenance of aeration facilities shall be prepared to the satisfaction of the municipality.

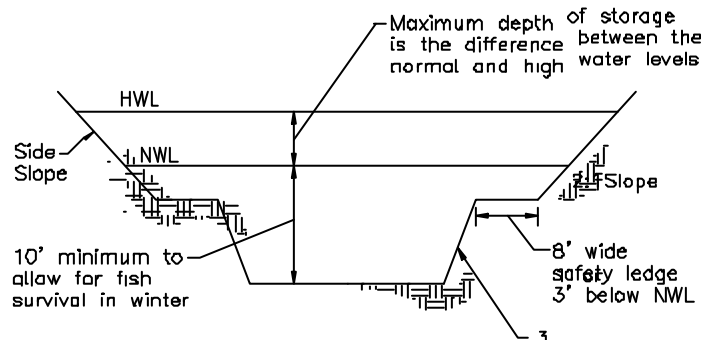
Types of Detention Basins

When detention ponds have been designed to promote the growth of a riparian environment, the use of aeration devices may be waived with approval from the City Engineer.



TYPICAL DRY DETENTION BASIN

At least one quarter of the detention pond area (as measured at the normal water level) shall have a minimum depth of 10 feet below the normal water level to provide a refuge for fish to survive during the winter.



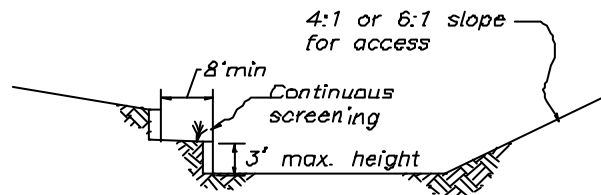
TYPICAL WET (RETENTION) BASIN

A detention pond must have an 8 foot wide safety ledge located 3 feet below the normal water level where emergent plants are not desired, unless a justification is otherwise provided and approved by the City Engineer. This safety ledge provides a stopping point for someone who may have inadvertently fallen into the water.

9.2.5 Retaining Walls Used for Detention Facilities

Retaining walls will be permitted for detention/retention facilities only if it can be demonstrated that there is no practical alternative that would allow the detention/retention facility to be constructed without such walls. Where permitted,

these retaining walls shall not exceed three feet (3') in height. If retaining walls greater than three feet (3') are required, the wall must be terraced after the first three foot (3') lift. A horizontal space of not less than five feet (5') will be required between wall lifts. A landscape buffer will be required around the back of the bottom retaining wall as illustrated below.



PROPOSED RETAINING WALL SECTION

Portland cement concrete walls of any height shall be designed and sealed by a registered professional structural engineer licensed in the State of Illinois. Modular block retaining walls shall be designed and constructed in accordance with the manufacturer's specifications. The appropriate individual(s) licensed and/or certified in the State of Illinois shall provide engineering seals and certifications for modular block wall designs in accordance with the manufacturer's requirements.

9.2.6 Parking Lot Detention

No stormwater storage will be allowed on parking lot surfaces.

9.2.7 Underground Detention

Underground detention/retention facilities will be permitted only if it can be demonstrated that there is no practical alternative that would allow a surface facility to be constructed. The owner of an underground detention/retention facility shall have a qualified engineer, licensed in the state of Illinois, inspect the facility annually and subsequently submit a signed and sealed inspection report to the city engineer. The report shall include any operational and maintenance deficiencies with the facility. If identified, the owner shall append the inspection report with a signed letter that provides a plan and schedule for correcting such deficiencies. Once any deficiencies are corrected, a final signed and sealed inspection report shall be submitted to the city engineer that includes a certification statement that the underground detention/retention facility is operating in full conformance with the original design intent and parameters. The Plat of Dedication and/or Plat of Easement for the development will include specific language to cover this requirement.

9.2.8 Fee-in-Lieu-of Detention

A fee may be paid in lieu of a detention basin or pond if it can be demonstrated that site conditions are such that there is no practical means of constructing such a facility and that there will be no adverse impacts to areas downstream of the site if a detention facility is not provided. The Batavia City Council must approve this alternative before it can be implemented. The fee is the verifiable cost of otherwise providing the required storage, including the value of the land required and all construction costs. For this purpose the land required shall be valued according to the use to which it will ultimately be put if not used to provide the required storage.

9.2.9 Location of Detention Facilities

The minimum separation between the right-of-way of a public street and the high water level of a detention basin or pond is 10 feet plus one and one half times the maximum design depth of the detention facility.

9.2.10 Use of Public Streets for Detention Prohibited

Public street pavements shall not be used for stormwater detention storage.

9.2.11 Fences in Detention Basins and Overflow Routes

Fences are expressly prohibited at any major overflow route locations. Fences shall not be located where they will impede the flow of storm water or drainage. Fences may not be installed in a floodplain as determined by FEMA and designated on the NFIP/FIRM determination maps.

Fences located within a drainage easement must be 50% opaque when water flows through the fence perpendicularly, such as a split rail fence. In the instance where the water runs parallel it may have less openings. Fences that lie within a drainage easement shall have a minimum vertical clearance of 4" from the ground surface to the bottom of the fence to allow free flow of water. The vertical clearance shall be maintained for the entire length of that portion of the fence that is installed in or across the Easement.

9.2.12 Basement Floors

Basement floors shall be a minimum of two feet above the Normal Water Level of any nearby stormwater detention facility.

9.2.13 Letter of Credit

The City of Batavia follows the Kane County Stormwater Ordinance and if a stormwater facility is required the applicant shall provide a letter of credit for 110% of the approved estimated cost to complete the construction of any required stormwater facilities.

The letter can be reduced by up to 90% prior to approval of record drawings and final inspections. A minimum of 10% of the original amount of the security shall be retained for a period of one year after completion of all required stormwater facilities and the facility has been finally inspected and approved by the City Engineer or designee.

9.3 FLOODPLAIN MANAGEMENT

9.3.1 Development Standards

For streams with mapped FEMA Zone AE floodplain (base floodplain elevations determined and subsequently approved by FEMA), the floodplain will consist of the base flood elevation(s) set onto the approved site topography. For streams with mapped FEMA Zone A floodplain (no base floodplain elevations determined), the floodplain will need to be determined with hydrologic and hydraulic modeling acceptable to the IDNR and the City of Batavia with the resulting floodplain delineation based on the approved site topography.

9.3.2 LOMR Requirements

For streams with mapped FEMA Zone A floodplain, there will be, in most cases, a discrepancy between the FEMA delineated Zone A floodplain and the newer, refined delineation. Both delineations need to be shown on the final engineering master grading plan. New development will be allowed in FEMA delineated Zone A floodplain areas that are not part of the approved refined delineation. The developer will be required to apply for and receive a FEMA Letter of Map Revision (LOMR) before the City will issue building permits for the habitable structures proposed for these areas. The City of Batavia will require that the builder submit a FEMA Elevation Certificate for these structures at the time that the Final Grading Survey (FGS) is submitted.

9.4 DRAINAGE & STORMWATER MANAGEMENT REPORT SUBMITTALS

9.4.1 General

All projects that require a stormwater report shall include Form 1 (Flowchart), Form 2 (Permit Application) and Form 3 (Tab 1 Overview) with original signatures and any other applicable Tabs as deemed necessary by Form 1. All reports shall follow the Tabbed format as denoted on the City of Batavia Stormwater forms and any reports that do not will be returned to be revised to follow said format.

The drainage and stormwater report shall including engineering drawings and supporting calculations describing the existing and proposed drainage system as required by the Kane County Stormwater Ordinance.

The following shall be submitted in addition to the information required under the Kane County Stormwater Ordinance:

- A drainage area map indicating the tributary areas and sub-basins within the development. This shall include amount of flows entering the site from off-site upstream tributaries.
- A schematic showing the locations of the Structures and Reaches numbered according to the input data.
- A list of input data, runoff volume, and summary tables.
- A disk shall be submitted containing all input and output files.
- Time of concentration calculations following the TR-55 methodology.
- Supporting documentation for the “CN” value, including a soils map indicating the soils type.
- Input and output data proving that the proposed detention facility will not release more than the existing condition release rate when the restrictor is clogged.