

**CHAPTER 913**  
**Comprehensive Storm Water Management**

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**913.01 PURPOSE AND SCOPE.**

(a) The purpose of this regulation is to establish technically feasible and economically reasonable storm water management standards to achieve a level of storm water quality and quantity control that will minimize damage to property and degradation of water resources and will promote and maintain the health, safety, and welfare of the citizens of the City of Eastlake.

(b) This regulation requires owners who develop or re-develop their property within the City of Eastlake to:

- (1) Control storm water runoff from their property and ensure that all storm water management practices are properly designed, constructed, and maintained.
- (2) Reduce water quality impacts to receiving water resources that may be caused by new development or redevelopment activities.
- (3) Control the volume, rate, and quality of storm water runoff originating from their property so that surface water and ground water are protected and flooding and erosion potential are not increased.

- (4) Minimize the need to construct, repair, and replace subsurface storm drain systems.
- (5) Preserve natural infiltration and ground water recharge, and maintain subsurface flow that replenishes water resources, except in slippage prone soils.
- (6) Incorporate storm water quality and quantity controls into site planning and design at the earliest possible stage in the development process.
- (7) Reduce the expense of remedial projects needed to address problems caused by inadequate storm water management.
- (8) Maximize use of storm water management practices that serve multiple purposes including, but not limited to, flood control, erosion control, fire protection, water quality protection, recreation, and habitat preservation.
- (9) Design sites to minimize the number of stream crossings and the width of associated disturbance in order to minimize the City of Eastlake future expenses related to the maintenance and repair of stream crossings.

(c) This regulation shall apply to all parcels used or being developed, either wholly or partially, for new or relocated projects involving highways and roads; subdivisions or larger common plans of development; industrial, commercial, institutional, or residential projects; building activities on farms; redevelopment activities; grading, and all other uses that are not specifically exempted in Section 913.01.

(d) Public entities, including the State of Ohio, Lake County, and the City of Eastlake shall comply with this regulation for roadway projects initiated after March 10, 2006 and, to the maximum extent practicable, for projects initiated before that time.

(e) This regulation does not apply to activities regulated by, and in compliance with, the Ohio Agricultural Sediment Pollution Abatement Rules.

(f) This regulation does not require a Comprehensive Storm Water Management Plan for linear construction projects, such as pipeline or utility line installation, that do not result in the installation of impervious surface as determined by the City Engineer. Such projects must be designed to minimize the number of stream crossings and the width of disturbance. Linear construction projects must comply with the requirements of Chapter 906 Erosion and Sediment Control. (Ord. 2005-040. Passed 4-12-05.)

### **913.02 DEFINITIONS.**

For the purpose of this regulation, the following terms shall have the meaning herein indicated:

- (a) **ACRE:** A measurement of area equaling 43,560 square feet.
- (b) **AS-BUILT SURVEY:** A survey shown on a plan or drawing prepared by a Registered Surveyor indicating the actual dimensions, elevations, and locations of any structures, underground utilities, swales, detention facilities, and sewage treatment facilities after construction has been completed.
- (c) **BEST MANAGEMENT PRACTICES (BMPs):** Schedule of activities, prohibitions of practices, operation and maintenance procedures, treatment requirements, and other practices to reduce the pollution of water resources and to control storm water volume and rate.

- (d) CLEAN WATER ACT. Pub. L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, Pub. L. 97-117, and Pub. L. 100-4, 33 U.S.C. 1251 et. seq. Formally referred to as the Federal Water Pollution Control Act or the Federal Water Pollution Control Act Amendments of 1972.
- (e) COMMUNITY: The City of Eastlake, its designated representatives, boards, or commissions.
- (f) COMPREHENSIVE STORM WATER MANAGEMENT PLAN: The written document and plans meeting the requirements of this regulation that sets forth the plans and practices to minimize storm water runoff from a development area, to safely convey or temporarily store and release postdevelopment runoff at an allowable rate to minimize flooding and stream bank erosion, and to protect or improve storm water quality and stream channels.
- (g) CRITICAL STORM: A storm that is calculated by means of the percentage increase in volume of runoff by a proposed development area. The critical storm is used to calculate the maximum allowable storm water discharge rate from a developed site.
- (h) DETENTION FACILITY: A basin, pond, oversized pipe, or other structure that reduces the peak flow rate of storm water leaving the facility by temporarily storing a portion of the storm water entering the facility.
- (i) DEVELOPMENT AREA: A parcel or contiguous parcels owned by one person or persons, or operated as one development unit, and used or being developed for commercial, industrial, residential, institutional, or other construction or alteration that changes runoff characteristics.
- (j) DEVELOPMENT DRAINAGE AREA: A combination of each hydraulically unique watershed with individual outlet points on the development area.
- (k) DISTURBED AREA: An area of land subject to erosion due to the removal of vegetative cover and/or soil disturbing activities.
- (l) DRAINAGE: The removal of excess surface water or groundwater from land by surface or subsurface drains.
- (m) EROSION: The process by which the land surface is worn away by the action of wind, water, ice, gravity, or any combination of those forces.
- (n) EXTENDED CONVEYANCE: A storm water management practice that replaces and/or enhances traditional open or closed storm drainage conduits by retarding flow, promoting percolation of runoff into the soil, and filtering pollutants during the storm water quality event.
- (o) EXTENDED DETENTION: A storm water management practice that replaces and/or enhances traditional detention facilities by releasing the runoff collected during the storm water quality event over at least 24 to 48 hours, retarding flow and allowing pollutants to settle within the facility.
- (p) FINAL STABILIZATION: All soil disturbing activities at the site have been completed and a uniform perennial vegetative cover with a density of at least 80% coverage for the area has been established or equivalent stabilization practices, such as the use of mulches or geotextiles, have been employed.
- (q) GRADING: The process in which the topography of the surface of the land is altered to a new slope.

- (r) **HYDROLOGIC UNIT CODE:** A cataloging system developed by the United States Geological Survey and the Natural Resource Conservation Service to identify watersheds in the United States.
- (s) **IMPERVIOUS COVER:** Any surface that cannot effectively absorb or infiltrate water. This may include roads, streets, parking lots, rooftops, sidewalks, and other areas not covered by vegetation.
- (t) **INFILTRATION:** A storm water management practice that does not discharge to a water resource during the storm water quality event, requiring collected runoff to either infiltrate into the groundwater and/or be consumed by evapotranspiration, thereby retaining storm water pollutants in the facility.
- (u) **LARGER COMMON PLAN OF DEVELOPMENT:** A contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan.
- (v) **MAXIMUM EXTENT PRACTICABLE:** The level of pollutant reduction that operators of small municipal separate storm sewer systems regulated under 40 C.F.R. Parts 9, 122, 123, and 124, referred to as NPDES Storm Water Phase II, must meet.
- (w) **NPDES:** National Pollutant Discharge Elimination System. A regulatory program in the Federal Clean Water Act that prohibits the discharge of pollutants into surface waters of the United States without a permit.
- (x) **NONSTRUCTURAL STORM WATER MANAGEMENT PRACTICE:** Storm water runoff control and treatment techniques that use natural practices to control runoff and/or reduce pollution levels.
- (y) **POST-DEVELOPMENT:** The conditions that exist following the completion of soil disturbing activity in terms of topography, vegetation, land use, and the rate, volume, quality, or direction of storm water runoff.
- (z) **PRE-CONSTRUCTION MEETING:** Meeting prior to construction between all parties associated with the construction of the project including government agencies, contractors and owners to review agency requirements and plans as approved and submitted.
- (aa) **PRE-DEVELOPMENT:** The conditions that exist prior to the initiation of soil disturbing activity in terms of topography, vegetation, land use, and the rate, volume, quality, or direction of storm water runoff.
- (bb) **PROFESSIONAL ENGINEER:** A Professional Engineer registered in the State of Ohio with specific education and experience in water resources engineering, acting in conformance with the Code of Ethics of the Ohio State Board of Registration for Engineers and Surveyors.
- (cc) **REDEVELOPMENT:** A change to previously existing, improved real estate, including but not limited to the demolition or building of structures, fillings, grading, paving, or excavating.
- (dd) **RIPARIAN AREA:** Naturally vegetated land adjacent to any brook, creek, river, or stream having a defined bed and bank that, if appropriately sized, helps to stabilize streambanks, limit erosion, reduce flood size flows, and/or filter and settle out runoff pollutants, or performs other functions consistent with the purposes of this regulation.
- (ee) **RIPARIAN AND WETLAND SETBACK:** A designated transition area around water resources left in a natural, usually vegetated, state so as to protect the water resources from runoff pollution.

- (ff) **RUNOFF:** The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and is eventually returned to water resources.
- (gg) **SEDIMENT:** The soils or other surface materials that can be transported or deposited by the action of wind, water, ice, or gravity as a product of erosion.
- (hh) **SEDIMENTATION:** The deposition of sediment in water resources.
- (ii) **SITE OWNER/OPERATOR:** Any individual, corporation, firm, trust, commission, board, public or private partnership, joint venture, agency, unincorporated association, municipal corporation, county or state agency, the federal government, other legal entity, or an agent thereof that is responsible for the overall construction site.
- (jj) **SOIL DISTURBING ACTIVITY:** Clearing, grading, excavating, filling, or other alteration of the earth's surface where natural or human made ground cover is destroyed and that may result in, or contribute to, increased storm water quantity and/or decreased storm water quality.
- (kk) **STABILIZATION:** The use of Best Management Practices that reduce or prevent soil erosion by storm water runoff, trench dewatering, wind, ice, gravity, or a combination thereof.
- (ll) **STRUCTURAL STORM WATER MANAGEMENT PRACTICE:** Any constructed facility, structure, or device that provides storage, conveyance, and/or treatment of storm water runoff.
- (mm) **SURFACE WATERS OF THE STATE:** All streams, lakes, reservoirs, marshes, wetlands, or other waterways situated wholly or partly within the boundaries of the state, except those private waters which do not combine or affect a junction with surface water. Waters defined as sewerage systems, treatment works or disposal systems in Section 6111.01 of the Ohio Revised Code are not included.
- (nn) **TOTAL MAXIMUM DAILY LOAD:** The sum of the existing and/or project point source, nonpoint source, and background loads for a pollutant to a specified watershed, water body, or water body segment. A TMDL sets and allocates the maximum amount of a pollutant that may be introduced into the water and still ensures attainment and maintenance of water quality standards.
- (oo) **WATER RESOURCE:** Any public or private body of water; including wetlands; the area within the ordinary high water level of lakes and ponds; as well as the area within the ordinary high water level of any brook, creek, river, or stream having a defined bed and bank (either natural or artificial) which confines and conducts continuous or intermittent flow.
- (pp) **WATER RESOURCE CROSSING:** Any bridge, box, arch, culvert, truss, or other type of structure intended to convey people, animals, vehicles, or materials from one side of a watercourse to another. This does not include private, non-commercial footbridges or pole mounted aerial electric or telecommunication lines, nor does it include below grade utility lines.
- (qq) **WATERSHED:** The total drainage area contributing storm water runoff to a single point.
- (rr) **WETLAND:** Those areas that are inundated or saturated by surface or ground water 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, including swamps, marshes, bogs, and similar areas (40 CFR 232, as amended).  
(Ord. 2011-111. Passed 8-23-11.)

**913.03 DISCLAIMER OF LIABILITY.**

Compliance with the provisions of this regulation shall not relieve any person from responsibility for damage to any person otherwise imposed by law. The provisions of this regulation are promulgated to promote the health, safety, and welfare of the public and are not designed for the benefit of any individual or any particular parcel of property.  
(Ord. 2005-040. Passed 4-12-05.)

**913.04 CONFLICTS, SEVERABILITY, NUISANCES AND RESPONSIBILITY.**

(a) Where this regulation is in conflict with other provisions of law or ordinance, the most restrictive provisions, as determined by the City Engineer, shall prevail.

(b) If any clause, section, or provision of this regulation is declared invalid or unconstitutional by a court of competent jurisdiction, the validity of the remainder shall not be affected thereby.

(c) This regulation shall not be construed as authorizing any person to maintain a nuisance on their property, and compliance with the provisions of this regulation shall not be a defense in any action to abate such a nuisance.

(d) Failure of the City of Eastlake to observe or recognize hazardous or unsightly conditions or to recommend corrective measures shall not relieve the site owner from the responsibility for the condition or damage resulting therefrom, and shall not result in the City of Eastlake, its officers, employees, or agents being responsible for any condition or damage resulting therefrom.  
(Ord. 2005-040. Passed 4-12-05.)

**913.05 DEVELOPMENT OF COMPREHENSIVE STORM WATER MANAGEMENT PLANS.**

(a) This regulation requires that a Comprehensive Storm Water Management Plan be developed and implemented for all commercial and industrial site development plans and soil disturbing activities disturbing one (1) or more acres of total land, or less than one (1) acre if part of a larger common plan of development or sale disturbing one (1) or more acres of total land, and on which any regulated activity of Section 913.01(c) is proposed.

(b) The City of Eastlake shall administer this regulation, shall be responsible for determination of compliance with this regulation, and shall issue such notices and orders as may be necessary. The City of Eastlake may consult with the Lake SWCD, private engineers, storm water districts, or other technical experts as necessary in reviewing the Comprehensive Storm Water Management Plan.  
(Ord. 2007-037. Passed 4-10-07.)

**913.06 APPLICATION PROCEDURES.**

(a) Pre-Application Meeting. The applicant shall attend a Pre-Application Meeting with the City Engineer to discuss the proposed project, review the requirements of this regulation, identify unique aspects of the project that must be addressed during the review process, and establish a preliminary review and approval schedule.

(b) Preliminary Comprehensive Storm Water Management Plan. The applicant shall submit two (2) sets of a Preliminary Comprehensive Storm Water Management Plan (Preliminary Plan) and the applicable fees to the City Engineer. The Preliminary Plan shall show the proposed property boundaries, setbacks, dedicated open space, public roads, water resources, storm water control facilities, and easements in sufficient detail and engineering analysis to allow the City Engineer to determine if the site is laid out in a manner that meets the intent of this regulation and if the proposed storm water management practices are capable of controlling runoff from the site in compliance with this regulation. The applicant shall submit two (2) sets of the Preliminary Plan and applicable fees as follows:

- (1) For subdivisions: in conjunction with the submission of the preliminary subdivision plan.
- (2) For other construction projects: In conjunction with the application for a zoning permit.
- (3) For general clearing projects: In conjunction with the application for a zoning permit.

(c) Final Comprehensive Storm Water Management Plan. The applicant shall submit two (2) sets of a Final Comprehensive Storm Water Management Plan (Final Plan) and the applicable fees to the City Engineer in conjunction with the submittal of the final plat, improvement plans, or application for a building or zoning permit for the site. The Final Plan shall meet the requirements of Section 913.08 and shall be approved by the City Engineer prior to approval of the final plat and/or before issuance of a building permit by the Chief Building Official.

(d) Review and Comment. The City Engineer shall review the Preliminary and Final Plans submitted, and shall approve or return for revisions with comments and recommendations for revisions. A Preliminary or Final Plan rejected because of deficiencies shall receive a narrative report stating specific problems and the procedures for filing a revised Preliminary or Final Plan.

(e) Approval Necessary. Land clearing and soil-disturbing activities shall not begin and zoning and/or building permits shall not be issued without an approved Comprehensive Storm Water Management Plan.

(f) Sublots Will Not Proceed. Comprehensive Storm Water Management Plans for individual sublots in a subdivision will not be approved and building permits will not be issued unless the larger common plan of development or sale containing the subplot is in compliance with this regulation.

(g) Valid for Two Years. Approvals issued in accordance with this regulation shall remain valid for two (2) years from the date of approval.  
(Ord. 2005-040. Passed 4-12-05.)

### **913.07 COMPLIANCE WITH STATE AND FEDERAL REGULATIONS.**

Approvals issued in accordance with this regulation do not relieve the applicant of responsibility for obtaining all other necessary permits and/or approvals from other federal, state, and/or county agencies. If requirements vary, the most restrictive shall prevail. These permits may include, but are not limited to, those listed below. Applicants are required to show proof of compliance with these regulations before the City of Eastlake will issue a building or zoning permit.

- (a) Ohio EPA NPDES Permits authorizing storm water discharges associated with construction activity or the most current version thereof: Proof of compliance with these requirements shall be the applicant's Notice of Intent (NOI) number from Ohio EPA, a copy of the Ohio EPA Director's Authorization Letter for the NPDES Permit, or a letter from the site owner certifying and explaining why the NPDES Permit is not applicable.
- (b) Section 401 of the Clean Water Act. Proof of compliance shall be a copy of the Ohio EPA Water Quality Certification application tracking number, public notice, project approval, or a letter from the site owner certifying that a qualified professional has surveyed the site and determined that Section 401 of the Clean Water Act is not applicable. Wetlands, and other waters of the United States, shall be delineated by protocols accepted by the U.S. Army Corps of Engineers at the time of application of this regulation.
- (c) Ohio EPA Isolated Wetland Permit. Proof of compliance shall be a copy of Ohio EPA's Isolated Wetland Permit application tracking number, public notice, project approval, or a letter from the site owner certifying that a qualified professional has surveyed the site and determined that Ohio EPA's Isolated Wetlands Permit is not applicable. Isolated wetlands shall be delineated by protocols accepted by the U.S. Army Corps of Engineers at the time of application of this regulation.
- (d) Section 404 of the Clean Water Act. Proof of compliance shall be a copy of the U.S. Army Corps of Engineers Individual Permit application, public notice, or project approval, if an Individual Permit is required for the development project. If an Individual Permit is not required, the site owner shall submit proof of compliance with the U.S. Army Corps of Engineer's Nationwide Permit Program. This shall include one of the following:
  - (1) A letter from the site owner certifying that a qualified professional has surveyed the site and determined that Section 404 of the Clean Water Act is not applicable.
  - (2) A site plan showing that any proposed fill of waters of the United States conforms to the general and special conditions specified in the applicable Nationwide Permit. Wetlands, and other waters of the United States, shall be delineated by protocols accepted by the U.S. Army Corps of Engineers at the time of application of this regulation.
- (e) Ohio Dam Safety Law. Proof of compliance shall be a copy of the ODNR Division of Water permit application tracking number, a copy of the project approval letter from the ODNR Division of Water, or a letter from the site owner certifying and explaining why the Ohio Dam Safety Law is not applicable.  
(Ord. 2005-040. Passed 4-12-05.)



**913.08 COMPREHENSIVE STORM WATER MANAGEMENT PLANS.**

(a) Comprehensive Storm Water Management Plan Required: The applicant shall develop a Comprehensive Storm Water Management Plan describing how the quantity and quality of storm water will be managed after construction is complete for every discharge from the site and/or into a water resource. The Plan will illustrate the type, location, and dimensions of every structural and non-structural storm water management practice incorporated into the site design, and the rationale for their selection. The rationale must address how these storm water management practices will address flooding within the site as well as flooding that may be caused by the development upstream and downstream of the site. The rationale will also describe how the storm water management practices minimize impacts to the physical, chemical, and biological characteristics of on-site and downstream water resources.

(b) Preparation by Professional Engineer: The Comprehensive Storm Water Management Plan shall be prepared by a registered professional engineer and include supporting calculations, plan sheets, and design details. To the extent necessary, as determined by the City Engineer, a site survey shall be performed by a Registered Professional Surveyor to establish boundary lines, measurements, or land surfaces.

(c) Community Procedures: The City Engineer shall prepare and maintain procedures providing specific criteria and guidance to be followed when designing the storm water management system for the site. These procedures may be updated from time to time, at the discretion of the City Engineer based on improvements in engineering, science, monitoring, and local maintenance experience. The City Engineer shall make the final determination of whether the practices proposed in the Comprehensive Storm Water Management Plan meet the requirements of this regulation. The City Engineer may also maintain a list of acceptable Best Management Practices that meet the criteria of this ordinance to be used in the City of Eastlake.

(d) Contents of Comprehensive Storm Water Management Plan: The Comprehensive Storm Water Management Plan shall contain an application, narrative report, construction site plan sheets, a long-term Inspection and Maintenance Agreement, and a site description with the following information provided:

(1) Site description:

- A. A description of the nature and type of the construction activity (e.g. residential, shopping mall, highway, etc.).
- B. Total area of the site and the area of the site that is expected to be disturbed (i.e. grubbing, clearing, excavation, filling or grading, including off-site borrow areas).
- C. A description of prior land uses at the site.
- D. An estimate of the impervious area and percent of imperviousness created by the soil-disturbing activity at the beginning and at the conclusion of the project.
- E. Existing data describing the soils throughout the site, including the soil series and association, hydrologic soil group, porosity, infiltration characteristics, depth to groundwater, depth to bedrock, and any impermeable layers.
- F. If available, the quality of any known pollutant discharge from the site such as that which may result from previous contamination caused by prior land uses.
- G. The location and name of the immediate water resource(s) and the first subsequent water resource(s).

- H. The aerial (plan view) extent and description of water resources at or near the site that will be disturbed or will receive discharges from the project.
- (2) Site map showing:
- A. Limits of soil-disturbing activity on the site.
  - B. Soils types for the entire site, including locations of unstable or highly erodible soils.
  - C. Existing and proposed one-foot (1') contours. This must include a delineation of drainage watersheds expected before, during, and after major grading activities as well as the size of each drainage watershed in acres.
  - D. Water resource locations including springs, wetlands, streams, lakes, water wells, and associated setbacks on or within 200 feet of the site, including the boundaries of wetlands or streams and first subsequent named receiving water(s) the applicant intends to fill or relocate for which the applicant is seeking approval from the Army Corps of Engineers and/or Ohio EPA.
  - E. Existing and planned locations of buildings, roads, parking facilities, and utilities.
  - F. The location of any in-stream activities including stream crossings.
- (3) Contact information: Company name and contact information as well as contact name, addresses, and phone numbers for the following:
- A. The Professional Engineer who prepared the Comprehensive Storm Water Management Plan.
  - B. The site owner.
- (4) Phase, if applicable, of the overall development plan.
- (5) List of subplot numbers if project is a subdivision.
- (6) Ohio EPA NPDES Permit Number and other applicable state and federal permit numbers, if available, or status of various permitting requirements if final approvals have not been received.
- (7) Location, including complete site address and subplot number if applicable.
- (8) Location of any easements or other restrictions placed on the use of the property.
- (9) A site plan sheet showing:
- A. The location of each proposed post-construction storm water management practice.
  - B. The geographic coordinates (latitude and longitude) of the site AND each proposed practice.
- It is preferred that the entire site be shown on one plan sheet to allow a complete view of the site during plan review. If a smaller scale is used to accomplish this, separate sheets providing an enlarged view of areas on individual sheets should also be provided.
- (10) An Inspection and Maintenance Agreement binding on the owner and all subsequent owners of lands served by the system of storm water management practices designed for the site. Such Agreements shall be a stand alone document and include all post-construction BMPs, shall be recorded with the deed of the property(s) within the site, and shall provide and stipulate the following:
- A. The location of each storm water management practice, including those practices permitted to be located in, or within 50 feet of, water resources, and identification of the drainage area served by each storm water management practice.

- B. A schedule for regular maintenance for each aspect of the storm water management system and description of routine and non-routine maintenance tasks to ensure continued performance of the system as is detailed in the approved Comprehensive Storm Water Management Plan. This schedule may include additional standards, as required by the City Engineer, to ensure continued performance of storm water management practices permitted to be located in, or within 50 feet of, water resources.
- C. The location and documentation of all access and maintenance easements on the property.
- D. Identification of the landowner(s), organization, or municipality responsible for long-term maintenance, including repairs, of the storm water management practices.
- E. The landowner(s), organization, or municipality shall maintain storm water management practices in accordance with this regulation.
- F. An easement that allows the City of Eastlake access to the storm water management practice at reasonable times for inspections and to document the condition of the practice and ensure that it is functioning as designed and approved.
- G. The landowner(s) organization or municipality shall submit an annual report to the City noting the site inspection and maintenance performed by the landowner(s), organization or municipality. The City of Eastlake shall maintain public records of the annual reports and the results of the City of Eastlake's own inspection results, and shall specifically indicate any corrective actions required to bring the storm water practices into proper working condition.
- H. If the City of Eastlake notifies the landowner(s), organization, or municipality responsible for maintenance of the maintenance problems that require correction, the specific corrective actions shall be taken within a reasonable time frame as determined by the City of Eastlake.
- I. Permission for the City of Eastlake to enter upon the property and to perform the corrective actions identified in the inspection report if the landowner(s), organization, or municipality responsible for maintenance does not make the required corrections in the specified time period. The City of Eastlake shall be reimbursed by the landowner(s), organization, or municipality responsible for maintenance for all expenses incurred within 10 days of receipt of invoice from the City of Eastlake.
- J. The method of funding long-term maintenance and inspections of all storm water management practices.
- K. A release of the City of Eastlake from all damages, accidents, casualties, occurrences, or claims that might arise or be asserted against the City of Eastlake from the construction, presence, existence, or maintenance of the storm water management practices.

Alteration or termination of these stipulations is prohibited. The applicant must provide a draft of this Inspection and Maintenance Agreement as part of the Comprehensive Storm Water Management Plan submittal. Once a draft is approved, a recorded copy of the Agreement must be submitted to the City of Eastlake to receive final inspection approval of the site.

- (11) Calculations required: Projected storm water runoff flows, volumes, and timing into and through all storm water management practices, and the underlying assumptions and hydrologic and hydraulic methods and parameters, under pre- and post-development land use conditions, for flood control, channel protection, and water quality as required in Section 913.09 of this regulation. Include critical storm determination and demonstrate that the runoff from upper watershed areas have been considered in the calculations.
- (12) List of all contractors and subcontractors before construction: Prior to construction or before the pre-construction meeting, provide the list of all contractors and subcontractors names, addresses, and phones involved with the implementation of the Comprehensive Storm Water Management Plan including a written document containing signatures of all parties as proof of acknowledgment that they have reviewed and understand the requirements and responsibilities of the Comprehensive Storm Water Management Plan.
- (13) Existing and proposed drainage patterns: The location and description of existing and proposed drainage patterns and storm water management practices, including any related storm water management practices beyond the development area and the larger common development area.
- (14) For each storm water management practice to be employed on the development area, include the following:
  - A. Location and size, including detail drawings, maintenance requirements during and after construction, and design calculations, all where applicable.
  - B. Final site conditions including storm water inlets and permanent nonstructural and structural storm water management practices. Details of storm water management practices shall be drawn to scale and shall show volumes and sizes of contributing drainage areas.
  - C. Any other structural and/or non-structural storm water management practices necessary to meet the design criteria in this regulation and any supplemental information requested by the City Engineer.  
(Ord. 2011-112. Passed 8-23-11.)

#### **913.09 PERFORMANCE STANDARDS.**

(a) General: All components of the storm water system, including storm water management practices for storage, treatment and control, and conveyance facilities, shall be designed to prevent structure flooding during the 100-year, 24-hour storm event; to maintain predevelopment runoff patterns, flows, and volumes; and to meet the following criteria:

- (1) Integrated practices that minimize degradation of water resources. The storm water management practices shall function as an integrated system that controls flooding and minimizes the degradation of the physical, biological, and chemical integrity of the water resources receiving storm water discharges from the site. Acceptable practices shall:
  - A. Not disturb riparian areas.
  - B. Maintain predevelopment hydrology and groundwater recharge on as much of the site as practicable.
  - C. Only install new impervious surfaces and compact soils where necessary to support the future land use.

D. Compensate for increased runoff volumes caused by new impervious surfaces and soil compaction by reducing storm water peak flows to less than predevelopment levels.

Storm water management practices that meet the criteria in this regulation, and additional criteria required by the City Engineer, shall comply with this regulation. Applicants may propose alternative practices if they demonstrate to the satisfaction of the City Engineer that these practices also meet the above criteria.

- (2) Practices designed for final use: Storm water management practices shall be designed to achieve the storm water management objectives of this regulation, to be compatible with the proposed post-construction use of the site, to protect the public health, safety, and welfare, and to function safely with minimal maintenance.
- (3) Storm water management for all lots: Areas developed for a subdivision, as defined in Chapter 1113 - Subdivision Regulations Ordinance, shall provide storm water management and water quality controls for the development of all subdivided lots. This shall include provisions for lot grading and drainage that prevent structure flooding during the 100-year, 24-hour storm; and maintain, to the extent practicable, the pre-development runoff patterns, volumes, and peaks from the lot.
- (4) Storm water facilities in water resources: Storm water management practices shall not be constructed in water resources unless the applicant obtains all appropriate permits from the Ohio EPA, the U.S. Army Corps, and other applicable federal, state, and local agencies, and the activity is in compliance with Chapter 906 Erosion and Sediment Control Requirements, all as determined by the City Engineer.
- (5) Storm water ponds and surface conveyance channels: All storm water pond and surface conveyance designs must provide a minimum of one (1) foot freeboard above the projected peak stage within the facility during the 100-year, 24-hour storm. When designing storm water ponds and conveyance channels, the applicant shall consider public safety as a design factor and alternative designs must be implemented where site limitations would preclude a safe design.
- (6) Exemption: The site where soil-disturbing activities are conducted shall be exempt from the requirements of Section 913.09 if it can be shown to the satisfaction of the City Engineer that the site is part of a larger common plan of development where the storm water management requirements for the site are provided by an existing storm water management practice, or if the storm water management requirements for the site are provided by practices defined in a regional or local storm water management plan approved by the City Engineer.
- (7) Maintenance: All storm water management practices shall be maintained in accordance with Inspection and Maintenance Agreements approved by the City Engineer as detailed in Section 913.08.
- (8) Ownership: Unless otherwise required by the City of Eastlake, storm water management practices serving multiple lots in subdivisions shall be on a separate lot held and maintained by an entity of common ownership or, if compensated by the property owners, by the City of Eastlake. Storm water management practices serving single lots shall be placed on these lots, protected within an easement, and maintained by the property owner.

- (9) Preservation of existing natural drainage. Practices that preserve the existing natural drainage shall be used to the maximum extent practicable. Such practices may include minimizing site grading and compaction; protecting water resources, riparian areas, and existing vegetation; and maintaining unconcentrated storm water runoff to and through these areas.
- (10) Preservation of wetland hydrology: Concentrated storm water runoff from BMPs to wetlands shall be converted to diffuse flow before the runoff enters a wetland in order to protect the natural hydrology, hydroperiod, and wetland flora. The flow shall be released such that no erosion occurs down slope. Practices such as level spreaders, vegetative buffers, infiltration basins, conservation of forest covers, and the preservation of intermittent streams, depressions, and drainage corridors may be used to maintain the wetland hydrology.

If the applicant proposes to discharge to natural wetlands, a hydrological analysis shall be performed to demonstrate that the proposed discharge matches the pre-development hydroperiods and hydrodynamics.

(b) Storm Water Conveyance Design Criteria: All stormwater management practices shall be designed to convey storm water to allow for the maximum removal of pollutants and reduction in flow velocities. This shall include but not be limited to:

- (1) Stream relocation or enclosure: The City Engineer may allow the enclosure or relocation of water resources only if the applicant obtains all appropriate permits from the Ohio EPA, the U.S. Army Corps, and other applicable federal, state, and local agencies and the activity is in compliance with Chapter 906 Erosion and Sediment Control Ordinance, all as determined by the City Engineer. At a minimum, stream relocation designs must show how the project will minimize changes to the vertical stability, floodplain form, channel form, and habitat of upstream and downstream channels on and off the property.
- (2) Off-site storm water discharges: Off-site storm water runoff that discharges to or across the applicant's development site shall be conveyed through the storm water management practices planned for the development site at its existing peak flow rates during each design storm. Comprehensive Storm Water Management Plans will not be approved until it is demonstrated to the satisfaction of the City Engineer that off-site runoff will be adequately conveyed through the development site in a manner that does not exacerbate upstream or downstream flooding and erosion.
- (3) Open channels: Unless otherwise allowed by the City Engineer, drainage tributary to storm water management practices shall be provided by an open channel with landscaped banks and designed to carry within these banks the 10 year, 24 hour storm water runoff from upstream contributory areas. Design of the channels shall follow the guidance in the ODNR's Raw Water and Land Development Manual and Standard Engineering practice. Channels that cannot be designed to meet the maximum velocity limitation shall be stabilized with materials other than vegetation. Such materials include crushed rock, concrete, gabions, etc.

- (4) Open drainage systems: Open drainage systems may be used on all new development sites to convey storm water at locations as determined by the City of Eastlake Engineer. Storm sewer systems shall be used typically for all locations and where the use of an open drainage system affects public health or safety, all as determined by the City Engineer. The following criteria shall be used to design storm sewer systems when necessary:
- A. Storm sewers shall be designed such that they do not surcharge from runoff caused by the 5 year, 24 hour storm, and that the hydraulic grade line of the storm sewer stays below the gutter flow line of the overlying roadway, or below the top of drainage structures outside the roadway during a 10 year, 24 hour storm.
  - B. The system shall be designed to meet these requirements when conveying the flows from the contributory area within the proposed development and existing flows from offsite areas that are upstream from the development.
  - C. The minimum inside diameter of pipe to be used in public storm sewer systems is 12 inches. Smaller pipe sizes may be used in private systems, subject to the approval of the City Engineer.
  - D. All storm sewer systems shall be designed taking into consideration the tailwater of the receiving facility or water resource. The tailwater elevation used shall be based on the design storm frequency. The hydraulic grade line for the storm sewer system shall be computed with consideration for the energy losses associated with entrance into and exit from the system, friction through the system, and turbulence in the individual manholes, catch basins, and junctions within the system.
  - E. The inverts of all curb inlets, manholes, yard inlets, and other structures shall be formed and channelized to minimize the incidence of quiescent standing water where mosquitoes may breed.
  - F. The site shall be graded in a manner that maintains sheet flow over as large an area as possible. The maximum area of sheet flow shall be determined based on the slope, the uniformity of site grading, and the use of easements or other legally-binding mechanisms that prohibit re-grading and/or the placement of structures within sheet flow areas. In no case shall the sheet flow length be longer than 300 feet, nor shall a sheet flow area exceed 1.5 acres. Flow shall be directed into an open channel, storm sewer, or other storm water management practice from areas too long and/or too large to maintain sheet flow, all as determined by the City Engineer.
  - G. Headwalls shall be required at all storm sewer inlets or outlets to and from open channels or lakes.
- (5) Water resource crossings. The following criteria shall be used to design structures that cross a water resource within the City of Eastlake:
- A. Water resource crossings other than bridges shall be designed to convey the stream's flow for the minimum 25 year, 24 hour storm.
  - B. Bridges, open bottom arch or spans are the preferred crossing technique and shall be considered in the planning phase of the development. Bridges and open spans should be considered for all State Scenic Rivers, coldwater habitat, exceptional warmwater habitat, seasonal salmonid habitat streams, and Class III headwater streams.

- C. If a culvert or other closed bottom crossing is used, twenty-five (25) percent of the cross-sectional area or a minimum of 1 foot of box culverts and pipe arches must be embedded below the channel bed.
  - D. The minimum inside diameter of pipes to be used for crossings shall be 12 inches.
  - E. The maximum slope allowable shall be a slope that produces a 10 fps velocity within the culvert barrel. Erosion protection and/or energy dissipaters shall be required to properly control entrance and outlet velocities.
  - F. All culvert installations shall be designed with consideration for the tailwater of the receiving facility or water resource. The tailwater elevation used shall be based on the design storm frequency.
  - G. Headwalls shall be required at all culvert inlets or outlets to and from open channels or lakes.
  - H. Streams with a drainage area of 5 square miles or larger should incorporate floodplain culverts at the bankfull elevation to restrict head loss differences across the crossing to no more than 1 foot during the 100-year, 24-hour storm.
  - I. Bridges shall be designed such that the hydraulic profile through a bridge shall be below the bottom chord of the bridge for either the 100 year, 24 hour storm, or the 100 year flood elevation as determined by FEMA, whichever is more restrictive.
- (6) Overland flooding: Overland flood routing paths shall be used to convey storm water runoff from the 100 year, 24 hour storm event to an adequate receiving water resource or storm water management practice such that the runoff is contained within the drainage easement for the flood routing path and does not cause flooding of buildings or related structures. Refer to Chapter 1367 for finished floor elevations in the flood plain. 100-year water surface elevation along flood routing paths shall be one. When designing the flood routing paths, the conveyance capacity of the site's storm sewers shall be taken into consideration.
- (7) Velocity dissipation: Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel to provide non-erosive flow velocity from the structure to a water resource so that the natural physical and biological characteristics and functions of the water resource are maintained and protected.
- (c) Storm Water Quality Control:
- (1) Direct runoff to a BMP: The site shall be designed to direct runoff from areas disturbed during construction to one or more of the following storm water management practices. These practices are listed in Table 2 of this regulation:
    - A. Extended conveyance facilities that slow the rate of storm water runoff; filter and biodegrade pollutants in storm water; promote infiltration and evapotranspiration of storm water; and discharge the controlled runoff to a water resource.
    - B. Extended detention facilities that detain storm water; settle or filter particulate pollutants; and release the controlled storm water to a water resource.



- C. Infiltration facilities that retain storm water; promote settling, filtering, and biodegradation of pollutants; and infiltrate all captured storm water into the ground based on the findings of the soil engineering report prepared for the site.
  - D. For sites less than five (5) acres, but greater than one (1) acre and not part of a common plan of development, where (1) or more acres are disturbed, the City Engineer may approve other BMPs if the applicant demonstrates to the City Engineer's satisfaction that these BMPs meet the objectives of this regulation as stated in Table 2.
  - E. For sites greater than five (5) acres, or less than five (5) acres but part of a larger common plan of development or sale which will disturb five (5) or more acres, the City Engineer may approve other BMPs if the applicant demonstrates to the City Engineer's satisfaction that these BMPs meet the objectives of this regulation as stated in Table 2 and has prior written approval from the Ohio EPA.
  - F. For the construction of new roads and roadway improvement projects by public entities (i.e. the state, counties, townships, cities, or villages), the City Engineer may approve BMPs not included in Table 2 of this regulation, but must show compliance with the current version of the Ohio Department of Transportation's "Location and Design Manual, Volume Two Drainage Design".
- (2) Criteria applying to all storm water management practices. Practices chosen must be sized to treat the water quality volume (WQv) and to ensure compliance with Ohio Water Quality Standards (OAC Chapter 3745-1).
- A. The WQv shall be equal to the volume of runoff from a 0.75 inch rainfall event and shall be determined according to one of the following methods:
    - Through a site hydrologic study approved by the City Engineer that uses continuous hydrologic simulation; site-specific hydrologic parameters, including impervious area, soil infiltration characteristics, slope, and surface routing characteristics; proposed best management practices controlling the amount and/or timing of runoff from the site; and local long-term hourly
- (1) Using the following equation:

$$WQV = C * P * A / 12$$

where terms have the following meanings:

- WQV = water quality volume in acre-feet
- C = runoff coefficient appropriate for storms less than 1 in.
- P = 0.75 inch precipitation depth
- A = area draining into the storm water practice, in acres.

Runoff coefficients required by the Ohio Environmental Protection Agency (Ohio EPA) for use in determining the water quality volume are listed in Table 1. Alternatively, the following equation may be used to calculate the runoff coefficient based on the proposed impervious area of the development:

$$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$$

where:

i = fraction of the drainage area that is impervious

**Table 1: Runoff Coefficients Based on the Type of Land Use**

Land Use	Runoff Coefficient
Industrial & Commercial	0.8
High Density Residential (> 8 dwellings/acre)	0.5
Medium Density Residential (4 to 8 dwellings/acre)	0.4
Low Density Residential (< 4 dwellings/acre)	0.3
Open Space and Recreational Areas	0.2
Where land use will be mixed, the runoff coefficient should be calculated using a weighted average. For example, if 60% of the contributing drainage area to the storm water treatment structure is Low Density Residential, 30% is High Density Residential, and 10% is Open Space, the runoff coefficient is calculated as follows $(0.6)(0.3) + (0.3)(0.5) + (0.1)(0.2) = (0.35)$	

- B. An additional volume equal to 20% of the WQv shall be incorporated into the storm water practice for sediment storage. This volume shall be incorporated into the sections of storm water practices where pollutants will accumulate.
- C. Storm water quality management practices shall be designed such that the drain time is long enough to provide treatment and protect against downstream bank erosion, but short enough to provide storage available for successive rainfall events as defined in Table 2.

**Table 2: Draw Down Times for Storm Water Management Practices**

Best Management Practice	Drain Time of WQv
Infiltration Facilities *	24 - 48 hours
Extended Conveyance (Vegetated Swales, Filter Strips)	*
<ul style="list-style-type: none"> <li>▪ Vegetated Filter Strip with Berm</li> </ul>	24 hours
<ul style="list-style-type: none"> <li>▪ Enhanced Water Quality Swale</li> </ul>	24 hours
<ul style="list-style-type: none"> <li>▪ Flow Through Design</li> </ul>	**
Extended Detention Facilities	
<ul style="list-style-type: none"> <li>▪ Extended Dry Detention Basins ***</li> </ul>	48 hours
<ul style="list-style-type: none"> <li>▪ Wet Detention Basins ** +</li> </ul>	24 hours
<ul style="list-style-type: none"> <li>▪ Pocket Wetland^</li> </ul>	24 hours
<ul style="list-style-type: none"> <li>▪ Constructed Wetlands (above permanent pool)</li> </ul>	24 hours
<ul style="list-style-type: none"> <li>▪ Bioretention *</li> </ul>	40 hours
<ul style="list-style-type: none"> <li>▪ Sand and other Media Filtration</li> </ul>	40 hours
<p>* The WQv shall completely infiltrate within 48 hours so there is no standing or residual water pool.</p> <p>** Size to pass a hydrograph with a volume equal to the WQv, a duration of 2 hours, and peak rainfall intensity of 1 inch/hour at a depth of no more than 3 inches and have a minimum hydraulic residence time of 5 minutes. The use of this criterion is limited to sites where the total area disturbed is 5 acres or less. Prior approval from the City Engineer is necessary to use this practice. For sites greater than five (5) acres or less than five (5) acres but part of a larger common plan of development or sale which will disturb five (5) or more acres, prior written approval is required from the Ohio EPA.</p> <p>*** The use of a forebay and micropool is required on all extended dry detention basins. Each is to be sized with a minimum 10% of the WQv.</p> <p>+** Provide both a permanent pool and an extended detention volume above the permanent pool, each sized with at least 0.75*WQV</p> <p>^ Pocket wetland must have a wet pool equal to the WQv, with 25% of the WQv in a pool and 75% in marshes. The EDV above the permanent pool must be equal to the WQv.</p>	

D. Each practice shall be designed to facilitate sediment removal, vegetation management, debris control, and other maintenance activities defined in the Inspection and Maintenance Agreement for the site.

- (3) Additional Criteria for Extended Detention Facilities:
- A. The outlet shall be designed to not release more than the first half of the water quality volume in less than 1/3 rd of the drain time. A valve shall be provided to drain any permanent pool volume for removal of accumulated sediments. The outlet shall be designed to minimize clogging, vandalism, maintenance, and promote the capture of floatable pollutants. At the discretion of the City Engineer the water quality volume (WQv) orifice must be equal to 2.5 inches in size or larger.
  - B. The basin design shall incorporate the following features to maximize multiple uses, aesthetics, safety, and maintainability:
    - 1. Basin side slopes above the permanent pool shall have a run to rise ratio of 4:1 or flatter.
    - 2. The perimeter of all permanent pool areas deeper than 4 feet shall be surrounded by an aquatic bench that extends at least 8 feet and no more than 15 feet outward from the normal water edge. The portion of the aquatic bench closest to the shoreline shall have an average depth of 6 inches below the permanent pool to promote the growth of aquatic vegetation. The remainder of the aquatic bench shall be no more than 15 inches below the permanent pool to minimize drowning risk to individuals who accidentally or intentionally enter the basin, and to limit growth of dense vegetation in a manner that allows waves and mosquito predators to pass through the vegetation. The maximum slope of the aquatic bench shall be 10 (H) to 1 (V). The aquatic bench shall be planted with hearty plants comparable to wetland vegetation that are able to withstand prolonged inundation.
    - 3. A forebay designed to allow larger sediment particles to settle shall be placed at basin inlets. The forebay and micropool volume shall be equal to approximately 10% of the water quality volume (WQv).
    - 4. When post-construction detention/water quality basin are to be used as temporary sediment trapping BMPs, a skimmer discharge device consistent with the Ohio Rainwater Manual shall be utilized during construction phase and until the site is deemed permanently stabilized by the administrator.
- (4) Additional criteria applying to extended conveyance facilities.
- A. Facilities shall be lined with fine turf-forming, flood tolerant grasses.
  - B. Facilities designed according to the extended conveyance detention design drain time shall:
    - 1. Not be located in areas where the depth to bedrock and/or seasonal high water table is less than 3 feet below the final grade elevation.