# MODEL ORDINANCE FOR COMPREHENSIVE STORM WATER MANAGEMENT

**PLEASE NOTE**

This model was developed to assist communities in implementing practices to control water quantity as well as protect water quality.

This model was reviewed by Ohio EPA and complies with Ohio EPA's Phase II Storm Water Management requirements for post-construction storm water management under Minimum Control Measure #5. This model was updated to reflect changes to Ohio EPA's post-construction storm water requirements in Ohio EPA Permit #OHC000003 effective April 21, 2008.

Phase II designated communities must implement ordinances for erosion and sediment control, and storm water management. This model ordinance only addresses post-construction storm water quality and quantity management. CRWP and partners have developed a separate model ordinance for erosion and sediment control. The storm water management model is drafted with the assumption that communities also adopt the erosion and sediment control ordinance.

All areas highlighted in ***bold/italics*** must be adjusted for your community. For example, the Community Engineer is identified throughout as a responsible party and your storm water adminstrator, service director, or other staff may actually perform these duties.

This model is a collaborative effort of CRWP, the Cuyahoga SWCD, Lake County SWCD, Geauga SWCD, and CRWP member communities. Additional technical support was provided by John Aldrich, Camp Dresser and McKee, Inc.

**WHEREAS**, flooding is a significant threat to property and public health and safety and storm water management lessens flood damage by reducing and holding runoff and releasing it slowly; and,

**WHEREAS**, streambank erosion is a significant threat to property and public health and safety and storm water management slows runoff and reduces its erosive force; and,

**WHEREAS**, insufficient control of storm water can result in significant damage to receiving water resources, impairing the capacity of these areas to sustain aquatic systems and their associated aquatic life use designations; and,

**WHEREAS,** land development projects and associated increases in impervious cover alter the hydrologic response of local watersheds and increase storm water runoff rates and volumes, flooding, stream channel erosion, and sediment transport and deposition; and,

**WHEREAS,** storm water runoff contributes to increased quantities of pollutants to water resources; and,

**WHEREAS**, storm water runoff, stream channel erosion, and nonpoint source pollution can be controlled and minimized through the regulation of runoff from land development projects; and,

**WHEREAS**, there are watershed-wide efforts to reduce flooding, erosion, and water quality problems in the ***[rivers to which community drains]*** and to protect and enhance the water resources of the ***[rivers to which community drains]***; and,

**WHEREAS,** the ***[community]*** finds that the lands and waters within its borders are finite natural resources and that their quality is of primary importance in promoting and maintaining public health and safety within its borders; and,

**WHEREAS,** the ***[community]*** desires to establish standards, principles, and procedures for the regulation of soil disturbing activities that may increase flooding and erosion and may cause adverse impacts to water resources, resulting from storm water runoff; and,

**WHEREAS,** the ***[community]*** is a member of the ***[watershed organizations or utilities in which the community is participating]*** and recognizes its obligation as a part of these ***[watersheds/organizations]*** to manage storm water within its borders; and

**WHEREAS**, 40 C.F.R. Parts 9, 122, 123, and 124, and Ohio Administrative Code 3745-39 require designated communities, including the ***[community]*** to develop a Storm Water Management Program that, among other components, requires the ***[community]*** to implement standards, principles, and procedures to regulate the quality of storm water runoff during and after soil disturbing activities; and,

**WHEREAS**, Article XVIII, Section 3 of the Ohio Constitution grants municipalities the legal authority to exercise all powers of local self-government and to adopt and enforce within their limits such local police, sanitary, and other similar regulations, as are not in conflict with general laws.

**NOW, THEREFORE, BE IT ORDAINED** by the Council of the ***[community],*** County of ***[county],*** State of Ohio, that:

**SECTION 1:**Codified Ordinance ***Chapter XXXX Storm Water Management***, is hereby adopted to read in total as follows:

## *CHAPTER XXXX*
## COMPREHENSIVE STORM WATER MANAGEMENT

### *XXXX*.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 ***[community]***:

B. This regulation requires owners who develop or re-develop their property within the ***[community]*** 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 ***[community]*** future expenses related to the maintenance and repair of stream crossings.

10. Maintain, promote, and re-establish conditions necessary for naturally occurring stream processes that assimilate pollutants, attenuate flood flows, and provide a healthy water resource.

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 ***XXXX.***01.

D. Public entities, including the State of Ohio, ***[county]*** County, and the ***[community]*** 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 ***[community 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 ***XXXX*** Erosion and Sediment Control.

## ***XXXX*.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. Referred to as the Federal Water Pollution Control Act or the Federal Water Pollution Control Act Amendments of 1972.

E. COMMUNITY: The ***[community]***, 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 post-development 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 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 construction project on land where impervious cover has previously been developed and where the new land use will not increase the runoff coefficient. If the new land use will increase the runoff coefficient, then the project is considered to be a new development project rather than a redevelopment project. (Refer to Table 1 in Section XXXX.09)

DD. RIPARIAN AREA: 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: The real property adjacent to a water resource on which soil disturbing activities are limited, all as defined by the ***[community's riparian and wetland setback regulation].***

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 projected 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 QUALITY VOLUME: The volume of runoff from a contributing watershed that must be captured and treated, equivalent to the maximized capture volume as defined in the American Society of Civil Engineers (ASCE) Manual and Report on Engineering Practice No. 87 and Water Environment Federation Manual of Practice No. 23 titled *Urban Runoff Quality Management*.

PP. 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.

QQ. 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.

RR. WATERSHED: The total drainage area contributing storm water runoff to a single point.

SS. 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).

### ***XXXX*.03 DISCLAIMER OF LIABILITY**

A. 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.

B. By approving a Comprehensive Storm Water Management Plan under this regulation, the ***[community]*** does not accept responsibility for the design, installation, and operation and maintenance of storm water management practices.

### ***XXXX*.04 CONFLICTS, SEVERABILITY, NUISANCES & RESPONSIBILITY**

A. Where this regulation is in conflict with other provisions of law or ordinance, the most restrictive provisions, as determined by the ***[community 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 ***[community]*** 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 ***[community]***, its officers, employees, or agents being responsible for any condition or damage resulting therefrom.

## *XXXX*.05 DEVELOPMENT OF COMPREHENSIVE STORM WATER MANAGEMENT PLANS

A. This regulation requires that a Comprehensive Storm Water Management Plan be developed and implemented for 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 XXXX.01 (C) is proposed.

B. The ***[community]*** shall administer this regulation, shall be responsible for determination of compliance with this regulation, and shall issue notices and orders as may be necessary. The ***[community]*** may consult with the ***[county]*** SWCD, private engineers, storm water districts, or other technical experts in reviewing the Comprehensive Storm Water Management Plan.

## *XXXX*.06 APPLICATION PROCEDURES

A. Pre-Application Meeting: The applicant shall attend a Pre-Application Meeting with the ***[community 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 ***[community engineer]*** and/or the ***[storm water administrator]***. 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 ***[community 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 ***[community engineer]*** and/or the ***[storm water administrator]*** 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 ***XXXX***.08 and shall be approved by the ***[community engineer]*** prior to approval of the final plat and/or before issuance of a ***[zoning permit by the Zoning Inspector]*** or ***[building permit by the Building Inspector]***.

D. Review and Comment: The ***[community engineer]*** and/or the ***[storm water administrator]*** 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. Valid for Two Years: Approvals issued in accordance with this regulation shall remain valid for two (2) years from the date of approval.

## ***XXXX*.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 ***[community]*** 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.

## *XXXX*.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 and, if necessary, correct current degradation of water resources that is occurring or take measures to prevent predictable degradation of 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 ***[community engineer],*** a site survey shall be performed by a Registered Professional Surveyor to establish boundary lines, measurements, or land surfaces.

C. Community Procedures***:*** The ***[community 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 ***[community engineer]*** based on improvements in engineering, science,

monitoring, and local maintenance experience. The ***[community 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 ***[community engineer]*** may also maintain a list of acceptable Best Management Practices that meet the criteria of this regulation to be used in the ***[Community].***

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.

   i. Describe the current condition of water resources including the vertical stability of stream channels and indications of channel incision that may be responsible for current or future sources of high sediment loading or loss of channel stability.

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 sublot 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 sublot 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 of the site AND each proposed practice in North American Datum Ohio State Plan North.

   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. The Inspection and Maintenance Agreement

required for storm water management practices under this regulation shall be a stand alone document between the ***[community]*** and the applicant and shall contain the following information and provisions:

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 ***[community]*** 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. The ***[community]*** has the authority to enter upon the property to conduct inspections as necessary to verify that the storm water management practices are being maintained and operated in accordance with this regulation.

g. The ***[community]*** shall maintain public records of the results of site inspections, shall inform the landowner(s), organization, or municipality responsible for maintenance of the inspection results, and shall specifically indicate any corrective actions required to bring the storm water practices into proper working condition.

h. If the ***[community]*** 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 ***[community]***.

i. The ***[community]*** is authorized 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 ***[community]*** 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 ***[community]***.

j. The method of funding long-term maintenance and inspections of all storm water management practices.

k. A release of the ***[community]*** from all damages, accidents, casualties, occurrences, or claims that might arise or be asserted against the ***[community]*** 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 ***[community]*** to receive final inspection approval of the site.

***Note: Please review the above requirements for Inspection and Maintenance Agreements to ensure they are acceptable to your community. Please also review the coordination of these requirements with provisions for Easements to storm water management practices in Section XXXX.11 and Ownership of storm water management practices in Section XXXX.09 (A)(8)***

11. Calculations required: The applicant shall submit calculations for projected storm water runoff flows, volumes, and timing into and through all storm water management practices for flood control, channel protection, water quality, and the condition of the habitat, stability, and incision of each water resource and its the floodplain, as required in Section ***XXXX.***09 of this regulation. These submittals shall be completed for both pre- and post-development land use conditions and shall include the underlying assumptions and hydrologic and hydraulic methods and parameters used for these calculations. The applicant shall also 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 ***[community engineer]***.

## *XXXX*.09 PERFORMANCE STANDARDS

A. General: 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 address 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, unless the disturbance is intended to support a watercourse restoration project and complies with Section XXXX ***[community's riparian setback requirements]***.

   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 ***[community engineer]***, shall comply with this regulation.

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 ***XXXX [community subdivision code],*** 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 and related activities shall not be constructed in water resources unless the applicant shows proof of compliance with all appropriate permits from the Ohio EPA, the U.S. Army Corps, and other applicable federal, state, and local agencies as required in Section XXXX.07 of this regulation, and the activity is in compliance with Chapter XXXX ***[community's erosion and sediment control requirements]*** and Chapter XXXX ***[community's riparian setback requirements]***, all as determined by the ***[community 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 ***XXXX.***09 if it can be shown to the satisfaction of the ***[community 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 ***[community engineer]***.

7. Maintenance: All storm water management practices shall be maintained in accordance with Inspection and Maintenance Agreements approved by the ***[community engineer]*** as detailed in Section ***XXXX.***08.

8. Ownership: Unless otherwise required by the ***[community]***, 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 ***[community]***. 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 and/or improve the existing natural drainage shall be used to the maximum extent practicable. Such practices may include minimizing site grading and compaction; protecting and/or restoring 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 preformed to demonstrate that the proposed discharge matches the pre-development hydroperiods and hydrodynamics.

B. Storm Water Conveyance Design Criteria: All storm water 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 ***[community engineer]*** may allow the enclosure or relocation of water resources only if the applicant shows proof of compliance with all appropriate permits from the Ohio EPA, the U.S. Army Corps, and other applicable federal, state, and local agencies as required in Section XXXX.07 of this regulation, and the activity is in compliance with Section XXXX ***[community's erosion and sediment control requirements]*** and Section XXXX ***[community's riparian setback requirements]***, all as determined by the ***[community 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 conveyance system planned for the development site at its existing peak flow rates during each design storm. Off-site flows shall be diverted around storm water quality control facilities or, if this in not possible, the storm water quality control facility shall be sized to treat the off-site flow. Comprehensive Storm Water Management Plans will not be approved until it is demonstrated to the satisfaction of the ***[community 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. Sheet flow. 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 ***[community engineer].***

4. Open channels: Unless otherwise allowed by the ***[community engineer],*** drainage tributary to storm water management practices shall be provided by an open channel with landscaped banks and designed to carry the 10-year, 24-hour storm water runoff from upstream contributory areas.

5. Open drainage systems: Open drainage systems shall be preferred on all new development sites to convey storm water where feasible. Storm sewer systems shall be allowed only when the site cannot be developed at densities allowed under ***[community]***

zoning or where the use of an open drainage system affects public health or safety, all as determined by the ***[community engineer]***. The following criteria shall be used to design storm sewer systems when necessary:

***NOTE: The following sections are typical storm water conveyance design criteria. Either use these criteria or include the pertinent sections of your existing storm water conveyance design criteria.***

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. 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.

b. 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 ***[community engineer]***.

c. 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.

d. 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.

e. Headwalls shall be required at all storm sewer inlets or outlets to and from open channels or lakes.

6. Water Resource Crossings. The following criteria shall be used to design structures that cross a water resource in the ***[community]***:

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. The footers or piers for these bridges and open spans shall not be constructed below the ordinary high water mark.

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 under design flow conditions. 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 shall incorporate floodplain culverts at the bankfull elevation to restrict head loss differences across the crossing so as to cause no rise in the 100-year storm event.

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.

7. 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. The peak 100-year water surface elevation along flood routing paths shall be at least one foot below the finished grade elevation at the structure**.** When designing the flood routing paths, the conveyance capacity of the site's storm sewers shall be taken into consideration.

8. Compensatory flood storage mitigation: In order to preserve floodplain storage volumes and thereby avoid increases in water surface elevations, any filling within floodplains approved by the ***[Community]*** must be compensated by removing an equivalent volume of material. First consideration for the location(s) of compensatory floodplain volumes should be given to areas where the stream channel will have immediate access to the new floodplain within the limits of the development site. Consideration will also be given to enlarging existing or proposed retention basins to compensate for floodplain fill if justified by a hydraulic analysis of the contributing watershed. Unless otherwise permitted by the ***[Community],*** reductions in volume due to floodplain fills must be mitigated within the legal boundaries of the development. Embankment slopes used in compensatory storage areas must reasonably conform to the natural slopes adjacent to the disturbed area. The use of vertical retaining structures is specifically prohibited.

***NOTE: The Section #8 above should be coordinated with the community's riparian setback ordinance. The requirement for compensatory floodplain storage is only in effect when the riparian setback does not include the entire 100-year floodplain, when the community grants a variance that allows filling in the floodplain due to site constraints, or when the Community Engineer determines that stream or floodplain restoration is needed to meet the objectives of this regulation.***

9. Velocity dissipation: Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall 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 to one or more of the following storm water management practices. These practices are listed in Table 2 of this regulation and shall be designed to meet the following general performance standards:

   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 captured storm water into the ground. The ***[community engineer]*** may require a soil engineering report to be prepared for the site to demonstrate that any proposed infiltration facilities meet these performance standards.

   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 ***[community engineer]*** may approve other BMPs if the applicant demonstrates to the ***[community engineer's]*** satisfaction that these BMPs meet the objectives of this regulation as stated in Section XXXX.09.C.6.

   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 ***[community engineer]*** may approve other BMPs if the applicant demonstrates to the ***[community engineer's]*** satisfaction that these BMPs meet the objectives of this regulation as stated in Section XXXX.09.C.6, 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 ***[community***

***engineer]*** may approve BMPs not included in Table 2 of this regulation, but must show compliance with the current version of the Ohio Departments of Transportations "*Location and Design Manual, Volume Two Drainage Design*".

***NOTE: In Section (2) below the size of the water quality volume (WQv) orifice can be limited to 2.5 inches in extended detention ponds when drainage areas are too small to allow a practical WQv orifice size.***

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:

(1) Through a site hydrologic study approved by the ***[community 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 records, or

(2) Using the following equation:

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

where terms have the following meanings:

$WQ_V$ = 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 can be determined using the list in Table 1 or using the following equation to calculate the runoff coefficient, if the applicant can demonstrate that appropriate controls are in place to limit 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 Facilities (Vegetated Swales, Filter Strips) | |
| ▪ Vegetated Filter Strip with Berm | 24 hours |
| ▪ Enhanced Water Quality Swale | 24 hours |
| ▪ Flow Through Design | ** |
| Extended Detention Facilities | |
| ▪ Extended Dry Detention Basins*** | 48 hours |
| ▪ Wet Detention Basins + | 24 hours |
| ▪ Pocket Wetland^ | 24 hours |
| ▪ Constructed Wetlands (above permanent pool) | 24 hours |
| ▪ Bioretention* | 40 hours |
| ▪ Sand and other Media Filtration | 40 hours |

* The WQv shall completely infiltrate within 48 hours so there is no standing or residual water pool.
** Sized to pass a hydrograph with a volume equal to the WQv, a duration of 2 hours, 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 ***[Community 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.
*** The use of a forebay and micropool is required on all extended dry detention basins. Each is to be sized at a minimum 10% of the WQv.
+Provide both a permanent pool and an extended detention volume above the permanent pool, each sized with at least $0.75*WQ_v$.
^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.

***NOTE: This table is similar to that found in the Ohio EPA Construction General Permit. It has been re-ordered to match CRWP's recommended BMP categories and additional description of the "drain time" for vegetated swales and filter strips has been added. The "Flow Through Design" BMP is an Ohio EPA alternative practice and does require additional approvals from the Community Engineer and Ohio EPA depending the development site size, and can be removed from the table if necessary.***

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 applying to infiltration facilities.

a. Infiltration facilities shall only be allowed if the soils of the facility fall within hydrologic soil groups A or B, if the seasonal high water table is at least three (3) feet below the final grade elevation, and any underlying bedrock is at least six feet below the final grade elevation.

b. All runoff directed into an infiltration basin must first flow through a pretreatment practice such as a grass channel or filter strip to remove coarser sediments that could cause a loss of infiltration capacity.

c. During construction, all runoff from disturbed areas of the site shall be diverted away from the proposed infiltration basin site. No construction equipment shall be allowed within the infiltration basin site to avoid soil compaction.

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.

(2) Only be allowed where the underlying soil consists of hydrologic soil group (HSG) A or B, unless the underlying soil is replaced by at least a 2.5 foot deep layer of soil amendment with a permeability equivalent to a HSG A or B soil and an underdrain system is provided.

c. Facilities designed according to the flow through design drain time shall:

(1) Only be allowed on sites where:
   a. The total area disturbed is 5 acres or less
   b. The discharge rate from the BMP will have negligible hydrologic impacts to received waters as described in Chapter **XXXX.**09.C. 6.b.
   c. Prior written approval is given by the ***[community engineer]***; and
   d. 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 has been

given by the Ohio EPA.

(2) Be designed to slow and filter runoff flowing through the turf grasses with a maximum depth of flow no greater than 3 inches.

(3) Be designed to have a minimum hydraulic residence time of 5 minutes.

d. Concentrated runoff shall be converted to sheet flow, or a diffuse flow using a plunge pool, flow diffuser or level spreader, before entering an extended conveyance facility designed according to the flow through drain time.

5. 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.

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 8 feet wide 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 at least 10% of the water quality volume (WQv).

***Note: The section below identifies the criteria that are currently be used by the Ohio EPA to assess the equivalency of alternative practices that are not listed in Table 2. This section can be modified to meet the needs of the Community.***

6. Criteria for the Acceptance of Alternative post-construction BMPs: The applicant may request approval from the ***[community engineer]*** for the use of alternative structural post-construction BMPs if the applicant shows to the satisfaction of the ***[community engineer]*** that these BMPs are equivalent in pollutant removal and runoff flow/volume reduction effectiveness to those listed in Table 2. If the site is 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 approval from the Ohio EPA is necessary. To demonstrate the equivalency, the applicant must show:

   a. The alternative BMP has a minimum total suspended solid (TSS) removal efficiency of 80 percent, using the Level II Technology Acceptance Reciprocity Partnership (TARP) testing protocol.

   b. The water quality volume discharge rate from the selected BMP is reduced to prevent stream bed erosion, unless there will be negligible hydrologic impact to the receiving surface water of the State. The discharge rate from the BMP will have negligible impacts if the applicant can demonstrate one of the following conditions:
      (1) The entire water quality volume is recharged to groundwater.

      (2) The development will create less than one acre of impervious surface.

      (3) The development project is a redevelopment project with an ultra-urban setting, such as a downtown area, or on a site where 100 percent of the project area is already impervious surface and the storm water discharge is directed into an existing storm sewer system.

      (4) The storm water drainage system of the development discharges directly into a large river of fourth order or greater or to a lake, and where the development area is less than 5 percent of the water area upstream of the development site, unless a Total Maximum Daily Load (TMDL) has identified water quality problems in the receiving surface water of the State.

D. Storm Water Quantity Control: The Comprehensive Storm Water Management Plan shall describe how the proposed storm water management practices are designed to meet the following requirements for storm water quantity control for each watershed in the development:

1. The peak discharge rate of runoff from the Critical Storm and all more frequent storms occurring under post-development conditions shall not exceed the peak discharge rate of runoff from a 1-year, 24-hour storm occurring on the same development drainage area under pre-development conditions.

2. Storms of less frequent occurrence (longer return periods) than the Critical Storm, up to the 100-year, 24-hour storm shall have peak runoff discharge rates no greater than the peak runoff rates from equivalent size storms under pre-development conditions. The 1, 2, 5, 10, 25, 50, and 100-year storms shall be considered in designing a facility to meet this requirement.

3. The Critical Storm for each specific development drainage area shall be determined as follows:

   a. Determine, using a curve number-based hydrologic method that generates hydrographs, or other hydrologic method approved by the ***[community engineer],*** the total volume (acre-feet) of runoff from a 1-year, 24-hour storm occurring on the development drainage area before and after development. These calculations shall meet the following standards:

      (1) Calculations shall include the lot coverage assumptions used for full build out as proposed.

      (2) Calculations shall be based on the entire contributing watershed to the development area.

      (3) Curve numbers for the pre-development condition must reflect the average type of land use over the past 10 years and not only the current land use.

      (4) To account for future post-construction improvements to the site, calculations shall assume an impervious surface such as asphalt or concrete for all parking areas and driveways, regardless of the surface proposed in the site description.

   b. From the volume determined in Section ***XXXX.***09(D)(3)(a), determine the percent increase in volume of runoff due to development. Using the percentage, select the 24-hour Critical Storm from Table 3.

**Table 3: 24-Hour Critical Storm**

| **If the Percentage of Increase in Volume of Runoff is:** | | **The Critical Storm will be:** |
|---|---|---|
| Equal to or Greater Than: | and Less Than: | |
| ---- | 10 | 1 year |
| 10 | 20 | 2 year |
| 20 | 50 | 5 year |
| 50 | 100 | 10 year |
| 100 | 250 | 25 year |
| 250 | 500 | 50 year |
| 500 | --- | 100 year |

For example, if the percent increase between the pre- and post-development runoff volume for a 1-year storm is 35%, the Critical Storm is a 5-year storm. The peak discharge rate of runoff for all storms up to this frequency shall be controlled so as not to exceed the peak discharge rate from the 1-year frequency storm under pre-development conditions in the development drainage area. The post-development runoff from all less frequent storms need only be controlled to meet pre-development peak discharge rates for each of those same storms.

E. Storm Water Management on Redevelopment Projects: Comprehensive Storm Water Management Plans for redevelopment projects shall reduce existing site impervious areas by at least 20 percent. A one-for-one credit towards the 20 percent net reduction of impervious area can be obtained through the use of pervious pavement and/or green roofs.

1. Where site conditions prevent the reduction of impervious area, stormwater management practices shall be implemented to provide storm water quality control facilities for at least 20 percent of the site's impervious area.

2. When a combination of impervious area reduction and storm water quality control facilities are used, the combined area shall equal or exceed 20 percent of the site.

3. Where projects are a combination of new development and redevelopment, the total water quality volume that must be treated shall be calculated by a weighted average based on acreage, with the new development at 100 percent water quality volume and redevelopment at 20 percent.

4. Where conditions prevent impervious area reduction or on-site stormwater management for redevelopment projects, practical alternatives as detailed in Section XXXX.10 may be approved by the ***[Community Engineer].***

## *XXXX*.10 ALTERNATIVE ACTIONS

A. When the ***[community]*** determines that site constraints compromise the intent of this regulation, off-site alternatives may be used that result in an improvement of water quality and a reduction of storm water quantity. Such alternatives shall meet the following standards:

1. Shall achieve the same level of storm water quantity and quality control that would be achieved by the on-site controls required under this regulation.

2. Implemented in the same Hydrologic Unit Code (HUC) 14 watershed unit as the proposed development project.

3. The mitigation ratio of the water quality volume is 1.5 to 1 or the water quality volume at the point of retrofit, whichever is greater.

4. An inspection and maintenance agreement as described in Chapter XXXX.08.D.10 is established to ensure operations and treatment in perpetuity.

5. Obtain prior written approval from Ohio EPA.

B. Alternative actions may include, but are not limited to the following. All alternative actions shall be approved by the ***[community engineer]***:

1. Fees, in an amount specified by the ***[community]*** to be applied to community-wide storm water management practices.

2. Implementation of off-site storm water management practices and/or the retrofit of an existing practice to increase quality and quantity control.

3. Stream, floodplain, or wetland restoration.

4. Acquisition or conservation easements on protected open space significantly contributing to storm water control such as wetland complexes.

## *XXXX*.11 EASEMENTS

Access to storm water management practices as required by the ***[community engineer]*** for inspections and maintenance shall be secured by easements. The following conditions shall apply to all easements:

A. Easements shall be included in the Inspection and Maintenance Agreement submitted with the Comprehensive Storm Water Management Plan.

B. Easements shall be approved by the ***[community]*** prior to approval of a final plat and shall be recorded with the ***[county]*** Auditor and on all property deeds.

C. Unless otherwise required by the ***[community engineer]***, access easements between a public right-of-way and all storm water management practices shall be no less than 25-feet wide. The easement shall also incorporate the entire practice plus an additional 25-foot wide band around the perimeter of the storm water management practice.

D. The easement shall be graded and/or stabilized as necessary to allow maintenance equipment to access and manipulate around and within each facility, as defined in the Inspection and Maintenance Agreement for the site.

E. Easements to structural storm water management practices shall be restricted against the construction therein of buildings, fences, walls, and other structures that may obstruct the free flow of storm water and the passage of inspectors and maintenance equipment; and against the changing of final grade from that described by the final grading plan approved by the ***[community]***. Any re-grading and/or obstruction placed within a maintenance easement may be removed by the ***[community]*** at the property owners' expense.

## *XXXX*.12 MAINTENANCE AND FINAL INSPECTION APPROVAL

To receive final inspection and acceptance of any project, or portion thereof, the following must be completed and provided to the ***[community engineer]***:

A. Final stabilization must be achieved and all permanent storm water management practices must be installed and made functional, as determined by the ***[community engineer]*** and per the

approved Comprehensive Storm Water Management Plan.

B. An As-Built Certification, including a Survey and Inspection, must be sealed, signed and dated by a Professional Engineer and a Professional Surveyor with a statement certifying that the storm water management practices, as designed and installed, meet the requirements of the Comprehensive Storm Water Management Plan approved by the ***[community engineer].*** In evaluating this certification, the ***[community engineer]*** may require the submission of a new set of storm water practice calculations if he/she determines that the design was altered significantly from the approved Comprehensive Storm Water Management Plan. The As-Built Survey must provide the location, dimensions, and bearing of such practices and include the entity responsible for long-term maintenance as detailed in the Inspection and Maintenance Agreement.

C. A copy of the complete and recorded Inspection and Maintenance Agreement as specified in Section ***XXXX.***08 must be provided to the ***[community engineer].***

### ***XXXX*.13 ON-GOING INSPECTIONS**

The ***[community]*** shall inspect storm water management practices periodically. Upon finding a malfunction or other need for maintenance, the ***[community]*** shall provide written notification to the responsible party, as detailed in the Inspection and Maintenance Agreement, of the need for maintenance. Upon notification, the responsible party shall have ***five (5) working days***, or other mutually agreed upon time, to makes repairs or submit a plan with detailed action items and established timelines. Should repairs not be made within this time, or a plan approved by the ***[community engineer]*** for these repairs not be in place, the ***[community]*** may undertake the necessary repairs and assess the responsible party.

### ***XXXX*.14 FEES**

The Comprehensive Storm Water Management Plan review, filing, and inspection fee is part of a complete submittal and is required to be submitted to the ***[community]*** before the review process begins. The ***[community engineer]*** shall establish a fee schedule based upon the actual estimated cost for providing these services.

### ***XXXX*.15 BOND**

A. If a Comprehensive Storm Water Management Plan is required by this regulation, soil-disturbing activities shall not be permitted until a cash bond ***of 5% of the total project cost***, has been deposited with the ***[community]*** Finance Department. This bond shall be posted for the ***[community]*** to perform the obligations otherwise to be performed by the owner of the development area as stated in this regulation and to allow all work to be performed as needed in the event that the applicant fails to comply with the provisions of this regulation. The stormwater bond will be returned, less ***[community]*** administrative fees as detailed in Chapter ***XXXX*** of the ***[community]*** Codified Ordinances, when the following three criteria are met:

1. After 80% of the lots of the project have been complete or 100% of the total project has been permanently stabilized or three (3) years from the time of permanent stabilization have passed.

2. An As Built Inspection of all water quality practices is conducted by the ***[community***

***engineer]***.

3. A Inspection and Maintenance Agreement signed by the developer, the contractor, the ***[community]***, and the private owner or homeowners association who will take long term responsibility for these BMPs, is accepted by the ***[community engineer]***.

C. Once these criteria are met, the applicant shall be reimbursed all bond monies that were not used for any part of the project. If all of these criteria are not met after three years of permanent stabilization of the site, the ***[community]*** may use the bond monies to fix any outstanding issues with all storm water management structures on the site and the remainder of the bond shall be given to the private lot owner/ homeowners association for the purpose of long term maintenance of the project.

**XXXX.16 INSTALLATION OF WATER QUALITY BEST MANAGEMENT PRACTICES**

The applicant may not direct runoff through any water quality structures or portions thereof that would be degraded by construction site sediment until the entire area tributary to the structure has reached final stabilization as determined by the ***[community engineer].*** This occurs after the completion of the final grade at the site, after all of the utilities are installed, and the site is subsequently stabilized with vegetation or other appropriate methods. The developer must provide documentation acceptable to the ***[community engineer]*** to demonstrate that the site is completely stabilized. Upon this proof of compliance, the water quality structure(s) may be completed and placed into service. Upon completion of installation of these practices, all disturbed areas and/or exposed soils caused by the installation of these practices must be stabilized within 2 days.

**XXXX.17 VIOLATIONS**

No person shall violate or cause or knowingly permit to be violated any of the provisions of this regulation, or fail to comply with any of such provisions or with any lawful requirements of any public authority made pursuant to this regulation, or knowingly use or cause or permit the use of any lands in violation of this regulation or in violation of any permit granted under this regulation.

***XXXX*.18 APPEALS**

Any person aggrieved by any order, requirement, determination, or any other action or inaction by the ***[community]*** in relation to this regulation may appeal to the court of common pleas. Such an appeal shall be made in conformity with ***[insert appropriate Ohio Revised Code sections]***. Written notice of appeal shall be served on the ***[community]***.

***XXXX*.99 PENALTY**

A. Any person, firm, entity or corporation; including but not limited to, the owner of the property, his agents and assigns, occupant, property manager, and any contractor or subcontractor who violates or fails to comply with any provision of this regulation is guilty of a misdemeanor of the third degree and shall be fined no more than five hundred dollars ($500.00) or imprisoned for no more than sixty (60) days, or both, for each offense. A separate offense shall be deemed committed each day during or on which a violation or noncompliance occurs or continues.

B. The imposition of any other penalties provided herein shall not preclude the ***[community]*** instituting an appropriate action or proceeding in a Court of proper jurisdiction to prevent an unlawful development, or to restrain, correct, or abate a violation, or to require compliance with the provisions of this regulation or other applicable laws, ordinances, rules, or regulations, or the orders of the ***[community]***.