July 2021

MODEL ORDINANCE FOR COMPREHENSIVE STORMWATER MANAGEMENT

PLEASE NOTE

This model was developed to assist communities in implementing stormwater control measures 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 Stormwater Management requirements for post-construction stormwater-management under Minimum Control Measure #5. Please note that additional requirements related to riparian setbacks and groundwater recharge applicable to the Big Darby Creek watershed or within certain HUC-12 units of the Olentangy River watershed, as specified in the Ohio EPA's construction storm water general permit, are not reflected within this model code. Communities in those watersheds wishing to adopt this ordinance will need to make additions or modifications to this code to ensure compliance with Ohio EPA requirements.

Phase II designated communities must implement ordinances for erosion and sediment control and stormwater management. This model ordinance only addresses post-construction stormwater quality and quantity management. CRWP and partners have developed a separate model ordinance for erosion and sediment control. The stormwater 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 stormwater administrator, service director, or other staff may actually perform these duties.

This model was a collaborative effort of CRWP, the Cuyahoga SWCD, Lake County SWCD, Geauga SWCD, and CRWP member communities. Additional technical support was provided by Ohio Department of Natural Resources-Division of Soil and Water Resources. John Aldrich, Camp Dresser and McKee, Inc. contributed to early versions of this model. Funding for revisions to create the 2020 version of this model code was provided by the Central Lake Erie Basin Collaborative service agreement with the Northeast Ohio Regional Sewer District.

WHEREAS, flooding is a significant threat to property and public health and safety and stormwater 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 stormwater management slows runoff and reduces its erosive force; and,

WHEREAS, insufficient control of stormwater 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 stormwater runoff rates and volumes, flooding, stream channel erosion, and sediment transport and deposition; and,

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

WHEREAS, stormwater 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 stormwater 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 stormwater within its borders; and

WHEREAS, 40 C.F.R. Parts 122, 123, and 124, and Ohio Administrative Code 3745-39 require designated communities, including the ***[community]*** to develop a Stormwater Management Program that, among other components, requires the ***[community]*** to implement standards, principles, and procedures to regulate the quality of stormwater 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 Stormwater Management***, is hereby adopted to read in total as follows:

CHAPTER XXXX
COMPREHENSIVE STORMWATER MANAGEMENT

XXXX.01 PURPOSE AND SCOPE

A. The purpose of this regulation is to establish technically feasible and economically reasonable stormwater management standards to achieve a level of stormwater 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 stormwater runoff from their property and ensure that all Stormwater Control Measures (SCMs) 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 stormwater runoff originating from their property so that surface water and groundwater 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 groundwater recharge, and maintain subsurface flow that replenishes water resources, except in slippage prone soils**.**

6. Incorporate stormwater 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 stormwater management.

8. Maximize use of SCMs 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]***'s 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 linear projects within public rights-of way (e.g. roadway and sidewalk projects).

E. This regulation does not require a Comprehensive Stormwater 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]*** or Ohio EPA. 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

The definitions contained in Ohio Environmental Protection Agency ("Ohio EPA")'s Construction General Permit entitled "Authorization for Storm Water Discharges Associated with Construction Activity under the National Pollutant Discharge Elimination System" and Ohio EPA's Municipal Separate Storm Sewer (MS4) Permit entitled "Authorization for Small Municipal Separate Storm Sewer Systems to Discharge Stormwater Under the National Pollutant Discharge Elimination System" in effect at the time a permit is applied for under this chapter shall apply to this chapter and the following definitions shall also apply:

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 Professional 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. COMMUNITY: The ***[community]***, its designated representatives, boards, or commissions.

D. COMPREHENSIVE STORMWATER MANAGEMENT PLAN: The written document and plans meeting the requirements of this regulation that sets forth the plans, practices, and SCMs to minimize stormwater 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 stormwater quality and stream channels.

E. CONSTRUCTION GENERAL PERMIT: The most recent General National Pollutant Discharge Elimination System (NPDES) permit for authorization of storm water discharges associated with construction activities issued by Ohio EPA (Ohio EPA Permit #OHC000005 and its successors).

F. CRITICAL STORM: A storm that is determined by calculating the percentage increase in volume of runoff by a proposed development area for the 1-year 24-hour event. The critical storm is used to calculate the maximum allowable stormwater discharge rate from a developed site.

G. 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.

H. DEVELOPMENT DRAINAGE AREA: A combination of each hydraulically unique watershed with individual outlet points on the development area.

I. DISTURBED AREA: An area of land subject to erosion due to the removal of vegetative cover and/or soil disturbing activities.

J. DRAINAGE: The removal of excess surface water or groundwater from land by surface or subsurface drains.

K. 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

L. GRADING: The process in which the topography of the land is altered to a new slope.

M. 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.

N. 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 Stormwater Phase II, must meet.

O. 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 stormwater runoff.

P. 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 submitted and approved.

Q. 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 stormwater runoff.

R. 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.

S. RUNOFF: The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and is eventually returned to water resources.

T. 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.

U. SITE OWNER: 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.

V. SOIL DISTURBING ACTIVITY: Clearing, grading, excavating, filling, or other alteration of the earth's surface where natural or human made ground cover is destroyed that may result in, or contribute to, increased stormwater quantity and/or decreased stormwater quality.

W. STORMWATER CONTROL MEASURE (SCM): A structure or area designed to remove pollutants from stormwater and/or reduce stormwater flow rates. SCMs are a subset of Best Management Practices (BMPs) as defined in the Construction General Permit.

X. WATER RESOURCE: Any stream, lake, reservoir, pond, marsh, wetland, or waterway 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

Y. 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.

Z. WATERSHED: The total drainage area contributing stormwater runoff to a single point.

AA. 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 Stormwater Management Plan under this regulation, the ***[community]*** does not accept responsibility for the design, installation, and operation and maintenance of SCMs.

XXXX.04 CONFLICTS, SEVERABILITY, NUISANCES & RESPONSIBILITY

A. Where this regulation is in conflict with other provisions of law or ordinance or requirements in the Construction General Permit, 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 STORMWATER MANAGEMENT PLANS

A. This regulation requires that a Comprehensive Stormwater Management Plan be developed and implemented for all 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. A Comprehensive Stormwater Management Plan must be developed and implemented for all commercial and industrial site development disturbing more than ***two-tenths*** (***0.2) of an acre***. The ***[community engineer]*** may require a Comprehensive Stormwater Management Plan for any soil

disturbing activity.

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, state agencies, private engineers, stormwater districts, or other technical experts in reviewing the Comprehensive Stormwater 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 Stormwater Management Plan: The applicant shall submit two (2) sets of a Preliminary Comprehensive Stormwater Management and the applicable fees to the ***[community engineer]*** and/or the ***[stormwater administrator]***. The Preliminary Plan shall show the proposed property boundaries, setbacks, dedicated open space, public roads, water resources, SCMs, 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 SCMs 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 where the development or redevelopment plan will result in the installation of impervious area, artificial turf or permeable pavement systems: In conjunction with the application for a ***[zoning or building]*** permit.

C. Final Comprehensive Stormwater Management Plan: The applicant shall submit two (2) sets of a Final Comprehensive Stormwater Management Plan and the applicable fees to the ***[community engineer]*** and/or the ***[Stormwater Management District]*** in conjunction with the submittal of the final plat, improvement plans, or application for a building or zoning permit for the site. Final Comprehensive Stormwater Management Plans 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 ***[stormwater 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: The ***[Building Commissioner]*** shall not issue a **[*building permit*]** without an approved Comprehensive Stormwater 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 or as stipulated in the Construction General Permit.

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 Environmental Protection Agency (Ohio EPA) National Pollutant Discharge Elimination System (NPDES) Permits authorizing stormwater 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), a copy of the Ohio EPA Director's Authorization Letter with NPDES Facility Permit number 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 or Ephemeral Stream Permit: Proof of compliance shall be a copy of Ohio EPA's Isolated Wetland Permit or Ephemeral Stream 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 or Ephemeral Stream 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 Resources permit application tracking number, a copy of the project approval letter from the ODNR Division of Water Resources, or a letter from the site owner certifying and explaining why the Ohio Dam Safety Law is not applicable.

XXXX.08 COMPREHENSIVE STORMWATER MANAGEMENT PLAN

Comprehensive Stormwater Management Plan Required: The applicant shall develop a Comprehensive Stormwater Management Plan describing how the quantity and quality of stormwater will be managed after construction is completed for every discharge from the site and/or into a water resource or small municipal separate storm sewer system (MS4). Comprehensive Stormwater Management Plans must meet the requirements in the Construction General Permit and these regulations.

A. Preparation by Professional Engineer: The Comprehensive Stormwater 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.

B. Community Procedures: The ***[community engineer]*** shall prepare and maintain procedures providing specific criteria and guidance to be followed when designing the stormwater 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 SCMs proposed in the Comprehensive Stormwater Management Plan meet the requirements of this regulation.

C. Contents of Comprehensive Stormwater Management Plan: The Comprehensive Stormwater Management Plan must contain all elements and meet all requirements specified in the Construction General Permit. It shall also meet the following requirements.

1. Location information: The application shall note the phase, if applicable, of the overall development plan and list sublot numbers if project is a subdivision.

2. Site maps and SCM design plans: It is preferred that all SCMs and 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. Existing and proposed drainage patterns and any relevant offsite SCMs should be depicted. For each SCM, include the following:

    a. An individual identification number
    b. Location and size
    c. Final site conditions and detail drawings of stormwater inlets and permanent SCMs. Details of SCMs shall be drawn to scale and shall show relevant volumes, elevations and sizes of contributing drainage areas.
    d. A completed Ohio EPA WQv Calculator Spreadsheet and/or Runoff Reduction Spreadsheet or other equivalent compliance tools provided by Ohio EPA.
    e. Any supplemental information requested by the ***[community engineer]***.

3. Required Calculations: The applicant shall submit calculations for projected stormwater runoff flows, volumes, and timing into and through all SCMs for flood control, channel protection, water quality, and the condition of the habitat, stability, and incision of each water resource and its floodplain. 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 offsite areas have been considered in the calculations. For each SCM, identify the drainage area and size in acres, percent impervious cover within the drainage area, volumetric runoff coefficient, peak discharge, and the time of concentration for each subwatershed. Pervious and impervious areas should be treated as separate subwatersheds unless allowed at the discretion of the ***community engineer***. Identify the SCM surface area, discharge and dewatering time, outlet type and dimensions.

4. Inspection and Maintenance Agreement. The Inspection and Maintenance Agreement required for SCMs under this regulation is a stand-alone document between the ***[community]*** and the applicant. This agreement shall be recorded with the County.

5. Inspection and Maintenance Plan. This plan will meet the requirements of the Construction General Permit and will be developed by the applicant and reviewed by the ***[City Engineer].*** Maintenance requirements of each SCM during and after construction should be included. Once the Inspection and Maintenance Plan is approved, a recorded copy of the Plan must be provided to the property owner or association that will be responsible for long-term operation and maintenance of the BMP and submitted to the ***[City Engineer]*** as part of the final inspection

approval as described in ***XXXX.12***.

***XXXX*.09 PERFORMANCE STANDARDS**

A. General: The stormwater system, including SCMs 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; to meet the requirements of the Construction General Permit; and to meet the following criteria:

1. Integrated SCMs that address degradation of water resources. The SCMs shall function as an integrated system that controls flooding and minimizes the degradation of the water resources receiving stormwater discharges from the site. Acceptable SCMs shall:

   a. Not disturb riparian areas, unless the disturbance is intended to support a watercourse restoration project and complies with Chapter ***XXXX.XX [community's riparian setback requirements if applicable]***.

   b. Maintain predevelopment hydrology and groundwater recharge on as much of the site as practicable. Where feasible, bioretention, permeable pavement with infiltration, underground storage with infiltration, infiltration trenches, infiltration basins, and/or rainwater harvesting must be the water quality SCMs used. Separate SCMs may be used for peak discharge control and water quality treatment.

   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 stormwater peak flows to less than predevelopment levels.

   e. Be designed according to the methodology included in the most current edition of *Rainwater and Land Development* or another design manual acceptable for use by the ***[community]*** and Ohio EPA.

2. Practices designed for final use: SCMs shall be designed to achieve the stormwater 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 routine maintenance.

3. Stormwater management for all lots: Areas developed for a subdivision, as defined in Chapter ***XXXX [community subdivision code],*** shall provide stormwater 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 each lot.

4. Stormwater facilities in water resources: SCMs 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. Stormwater ponds and surface conveyance channels: All stormwater pond and surface conveyance designs must provide a minimum of two (2) foot freeboard above the projected peak stage within the facility during the 100-year, 24-hour storm. When designing stormwater 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 stormwater management requirements for the site are provided by an existing SCM, or if the stormwater management requirements for the site are provided by SCMs defined in a regional or local stormwater management plan approved by the ***[community engineer]***.

7. Maintenance: All SCMs shall be maintained in accordance with the Inspection and Maintenance Plan and Agreements approved by the ***[community engineer]***.

8. Ownership: Unless otherwise required by the ***[community]***, SCMs 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]***. SCMs 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 and/or restoring water resources, riparian areas, and existing vegetation and vegetative buffer strips; phasing of construction operations in order to minimize the amount of disturbed land at any one time, and designation of tree preservation areas or other protective clearing and grubbing practices; and maintaining unconcentrated stormwater runoff to and through these areas.

10. Post-Construction Soil Restoration: Except for areas that will be covered by impervious surface or have been incorporated into an SCM, the soil moisture-holding capacity of areas that have been cleared and graded must be restored to that of the original, undisturbed soil to the maximum extent practicable. Areas that have been compacted or had the topsoil or duff layer removed should be amended using the soil profile restoration design criteria in *Rainwater and Land Development*.

B. Stormwater Conveyance Design Criteria: All SCMs shall be designed to convey stormwater to allow for the maximum removal of pollutants and reduction in flow velocities. This shall include but not be limited to:

1. Surface water protection: The ***[community engineer]*** may allow modification to streams, rivers, lakes, wetlands or other surface waters 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 stormwater discharges: Off-site stormwater runoff that discharges to or across the applicant's development site shall be conveyed through the stormwater conveyance system planned for the development site at its existing peak flow rates during each design storm. Off-site flows shall be diverted around stormwater quality control facilities or the stormwater quality control facility shall be sized to treat the off-site flow. Comprehensive Stormwater 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. The sheet flow length shall not exceed 75 feet from impervious area or 150 feet from pervious areas. Flow shall be directed into an open channel, storm sewer, or other SCMs 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 SCMs shall be provided by an open channel with vegetated

banks and designed to carry the 10-year, 24-hour stormwater runoff from upstream contributory areas.

5. Open drainage systems: Open drainage systems shall be preferred on all new development sites to convey stormwater 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 stormwater conveyance design criteria. Either use these criteria or include the pertinent sections of your existing stormwater 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 contributing drainage 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. The conduit or conveyance must be sized to carry the 25-year storm under these conditions.

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 stormwater runoff from the 100-year, 24-hour storm event to an adequate receiving water resource or SCM 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 two feet below the finished grade elevation of

all structures**.** 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 providing an equivalent storage volume. 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. Stormwater Quality Control: The site shall be designed to direct runoff to one or more SCMs that meet or exceed the criteria in the Construction General Permit.

D. Stormwater Quantity Control: The Comprehensive Stormwater Management Plan shall describe how the proposed SCMs are designed to meet the following requirements for stormwater 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 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) Model pervious, directly connected impervious and disconnected impervious areas as separate subwatersheds.

      (4) Drainage area maps shall include area, curve number, and time of concentrations. Time of concentration shall also show the flow path and the separation in flow type.

      (5) Use the Precipitation-Frequency Atlas of the United States, NOAA Atlas 14, Vol 2(3). ***[available online: http://hdsc.nws.noaa.gov/hdsc/pfds/]*** for rainfall depth data for stormwater design.

      (6) Use the SCS Type II rainfall distribution for all design events with a recurrence interval greater than 1 year. Include lot coverage assumptions used for full build out of the proposed condition.

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

         i. Pre-development Curve Numbers – For wooded or brushy areas, use listed values from TR-55 NRCS USDA Urban Hydrology for Small Watersheds, 1986 in good hydrologic condition. For meadows, use listed values. For all other areas (including all types of agriculture), use pasture, grassland, or range in good hydrologic condition.

         ii. Post-development Curve Numbers - Open space areas shall use post-construction hydrologic soil groups from *Rainwater and Land Development* unless the soil is amended using the soil profile restoration design criteria in *Rainwater and Land*

Development. All undisturbed areas or open space with amended soils shall be treated as "open space in good condition."

(8) Time of Concentration - Use velocity-based methods from (TR-55 NRCS USDA Urban Hydrology in Small Watersheds, 1986) to estimate travel time (Tt) for overland (sheet) flow, shallow concentrated flow and channel flow.

i. Maximum sheet flow length is 100 ft.

ii. Use the appropriate "unpaved" velocity equation for shallow concentrated flow from Soil Conservation Service National Engineer Handbook Section 4 – Hydrology (NEH-4).

(9) The volume reduction provided by runoff reduction SCMs may be subtracted from the post-development stormwater volume. Volume reductions for these SCMs may be demonstrated using methods outlined in *Rainwater and Land Development* or a hydrologic model acceptable to the ***[community engineer]***.

b. 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 except in instances of engineered permeable pavement systems. 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. Stormwater Management for Previously Developed Areas

1. SCMs on previously developed sites must meet the criteria in the Construction General Permit.

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 stormwater quantity. Such alternatives shall meet the standards in the Construction General Permit and shall achieve the same level of stormwater quantity control that would be achieved by the on-site controls required under this regulation. The ***[Community Engineer]*** may require proof of Ohio EPA review and approval for any alternative action proposed.

XXXX.11 EASEMENTS

Access to SCMs 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 Stormwater 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 SCMs shall be no less than 25-feet wide. The easement shall also incorporate the entire SCM plus an additional 25-foot wide band around the perimeter of the SCM.

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 SCMs shall be restricted against the construction therein of buildings, fences, walls, and other structures that may obstruct the free flow of stormwater 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 by the applicant and provided to the ***[community engineer]***:

A. Final stabilization must be achieved and all permanent SCMs must be installed and made functional, as determined by the ***[community engineer]*** and per the approved Comprehensive Stormwater Management Plan.

B. An As-Built Certification, including As-Built Survey and Inspection, must be sealed, signed and dated by a Professional Engineer and a Professional Surveyor with a statement certifying that the SCMs, as designed and installed, meet the requirements of the Comprehensive Stormwater Management Plan approved by the ***[community engineer].*** In evaluating this certification, the ***[community engineer]*** may require the submission of a new set of SCM calculations if he/she determines that the design was altered significantly from the approved Comprehensive Stormwater Management Plan. The As-Built Survey must provide the location, dimensions, and bearing of such SCMs 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 Plan and Inspection and Maintenance Agreement as specified in Section ***XXXX***.08 must be provided to the ***[community engineer].***

XXXX.13 ON-GOING INSPECTIONS

The owner shall inspect SCMs regularly as described in the Inspection and Maintenance Plan and Inspection and Maintenance Agreement. The ***[community]*** has the authority to enter upon the property to conduct inspections as necessary, with prior notification of the property owner, to verify that the SCMs are being maintained and operated in accordance with this regulation. Upon finding a malfunction or other need for maintenance or repair, 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 ***ten (10) 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 in place, the ***[community]*** may undertake the necessary repairs and assess the responsible party.

XXXX.14 FEES

The Comprehensive Stormwater 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 Stormwater Management Plan is required by this regulation, soil-disturbing activities shall not be permitted until a cash bond ***of 10% 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. The site has been stabilized, temporary BMPs have been removed, and the sediment settling basin has been converted to or replaced with post-construction SCM(s) and one of the following conditions are met:

   a. 100% of the total project has achieved permanent stabilization.

   b. Less than one (1) acre of lots remain unbuilt.

   c. No development activities have occurred for one (1) year.

2. An As-Built Certification of all SCMs is approved by the ***[community engineer]***.

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

B. 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 stormwater 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 STORMWATER CONTROL MEASURES

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 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 SCMs, all disturbed areas and/or exposed soils caused by the installation of these practices must be stabilized within two (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 ***[Board of Zoning Appeals or 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.19 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]***.