



## MODEL ORDINANCE FOR STORM WATER MANAGEMENT

### PLEASE NOTE:

- This model was developed for communities to meet their storm water management needs. The model also addresses applicable requirements of the Ohio Environmental Protection Agency’s NPDES Storm Water Regulations, referred to as “Phase II”. These requirements include:
  1. Minimum Control Measure #4 of the Phase II program requires designated communities to develop and implement a program to control construction site storm water runoff on sites disturbing 1 acre or more, or on sites disturbing less than 1 acre that are part of a larger common plan of development.
  2. Minimum Control Measure #5 of the Phase II program requires designated communities to develop and implement a program to control post-construction storm water runoff from new development & redevelopment activities. In response to Minimum Control Measure #5, this model focuses on long-term storm water control, including flood control and channel stability, through a combination of structural and nonstructural storm water management practices.
- While this model is designed to be comprehensive, each community must tailor it to their needs and do the necessary research to support implementation of the model. Text throughout the model indicates decision points with a + symbol. Please contact the Chagrin River Watershed Partners, Inc. (CRWP), your county Soil and Water Conservation District (SWCD), or the Northeast Ohio Areawide Coordinating Agency (NOACA) for assistance in tailoring this model to your community.
- Throughout the model duties and authorities are provided for the “community”. In implementing this ordinance, assign these duties and authorities to specific staff and departments.
- Please contact CRWP (440-975-3870) to confirm that you are working with the most current version of this model.

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Whereas, flooding is a significant threat to public health and safety and public and private property in the *[watersheds to which community drains]*, and storm water quantity control lessens flood damage by holding runoff and releasing it slowly over time; and,

Whereas, streambank erosion in the *[watersheds to which community drains]* is a significant threat to public health and safety and public and private property, and storm water



quantity control slows runoff and reduces its erosive force; and,

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

Whereas, there is a watershed-wide effort to reduce the flooding and erosion within the *[watersheds to which community drains]* and to protect and enhance the water resources and wetlands of the *[rivers to which community drains]* and *[community]* recognizes its obligation as a part of these watersheds to reduce flooding and erosion and to protect water quality by controlling runoff within its borders; and,

Whereas, communities throughout the *[watersheds to which community drains]* have experienced and continue to experience significant costs associated with inadequate storm water management including legal fees, engineering services, construction costs, and increased state and federal regulation; and,

Whereas, to promote public health and safety and sound economic development in the *[community]* and throughout the *[watersheds to which community drains]*, it is important to provide homebuilders, developers, and landowners with consistent, technically feasible, and economically reasonable standards for storm water management; and,

Whereas, 40 C.F.R. Parts 9, 122, 123, and 124, referred to as NPDES Storm Water Phase II, require designated communities, including *[community]* to develop a Storm Water Management Program to address, among other components, 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 adopt rules to abate soil erosion and water pollution by soil sediments; and,

Whereas Chapter 1511 of the Ohio Revised Code grants municipalities the legal authority to adopt sediment and erosion control practices; and,

Now, therefore, be it ordained by the Council of *[community]*, State of Ohio,

## **SECTION 100.01 PURPOSE AND SCOPE**

- A. The intent of this regulation is to establish feasible and economically reasonable standards to achieve a level of storm water control that will minimize damage to public and private property and degradation of water resources and wetlands, and will promote and maintain the health, safety, and welfare of the residents of *[community]*.
- B. This regulation will:



1. Control storm water runoff resulting from soil disturbing activities.
  2. Assure that property owners control the volume and rate of storm water runoff originating from their property so that surface water and ground water are protected, soil erosion is controlled, and flooding potential is not increased.
  3. Preserve to the maximum extent practicable the natural drainage characteristics of the site and minimize the need to construct, repair, and replace enclosed, below-grade storm drain systems.
  4. Preserve to the maximum extent practicable natural infiltration and ground recharge, and maintain subsurface flow which replenishes water resources, wetlands, and wells.
  5. Assure that storm water controls are incorporated into site planning and design at the earliest possible stage.
  6. Prevent unnecessary stripping of vegetation and loss of soil, especially adjacent to water resources and wetlands.
  7. Reduce the need for costly maintenance and repairs to roads, embankments, ditches, water resources, wetlands, and storm water management practices that are the result of inadequate storm water control.
  8. Reduce the long-term expense of remedial projects needed to address problems caused by inadequate storm water control.
  9. Encourage the construction 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.
  10. Ensure that all storm water management practices are properly designed, constructed, and maintained.
- C. This regulation applies to and requires a Storm Water Management Plan from soil disturbing activities on land used or being developed, either wholly or partially, for new or relocated projects involving highways, underground cables, pipelines, subdivisions, commercial or industrial areas, building activities on farms, redevelopment of urban areas, and all other uses that are not specifically exempted in Section 100.01(D)
- D. This regulation applies to, but does not require a Storm Water Management Plan from,



development areas on less than one (1) acre of land that are not part of a larger common plan of development on one (1) or more acres of land. These minimal areas shall be developed in accordance with all other provisions of this regulation.

- A. *Section 100.01(D) represents the minimum development area (1 acre) to be consistent with Phase II. Communities should determine the appropriate development area from which they want to require a Storm Water Management Plan. Because of the lot sizes in many communities, this may often be less than 1 acre.*
- E. Storm Water Management Plans are not required increases in impervious cover of up to 5000 square feet at existing commercial or industrial developments. This exemption shall apply one time per commercial or industrial parcel.
- A. *Section 100.01(E) is designed to allow minor increases in impervious cover at commercial or industrial areas while preventing piecemeal expansions that will significantly increase storm water volumes.*

## **SECTION 100.02 WORDS AND TERMS DEFINED**

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

- A. **ACRE:** A unit of measure equaling 43,560 square feet.
- B. **BEST MANAGEMENT PRACTICES:** Structural or nonstructural facilities or activities that control soil erosion and/or storm water runoff at a development site. Includes treatment requirements, operating and maintenance procedures, or other practices to control site runoff, leaks, or waste disposal.
- C. **CHANNEL:** A natural bed that conveys water or a ditch excavated for the flow of water.
- D. **CLEAN WATER ACT:** Pub. L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, Pub. L. 97-117, and Pub. L. 100-4, 33 U.S.C. 1251 et. seq. Formally referred to as the Federal Water Pollution Control Act or the Federal Water Pollution Control Act Amendments of 1972.
- E. **COMMUNITY:** Throughout this regulation, this shall refer to [*community*] or its designated representatives.
- F. **CRITICAL STORM:** A storm which 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.



- G. CUT: An excavation that reduces an existing elevation, as in road or foundation construction.
- H. DEVELOPMENT AREA: A contiguous area 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 which changes the runoff characteristics of a parcel of land.
- I. DISTURBED AREA: An area of land subject to erosion due to the removal of vegetative cover and/or soil disturbing activities.
- J. DITCH: An open channel, either human made or natural, for the purpose of drainage or irrigation with intermittent flow.
- K. DRAINAGE: The removal of excess surface water or groundwater from land by surface or subsurface drains.
- L. 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.
- M. 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% cover for the area has been established or equivalent stabilization measures, such as the use of mulches or geotextiles, have been employed.
- N. 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.
- O. 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 (OEPA, NPDES Permit #OH100000).
- P. 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.
- Q. 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.
- R. NONSTRUCTURAL STORM WATER MANAGEMENT PRACTICE: Storm water



- runoff control and treatment techniques that use natural measures to control runoff and/or reduce pollution levels, and do not require extensive construction efforts and/or do promote runoff control and/or pollutant reduction by eliminating the runoff and/or pollutant source.
- S. **PERSON:** 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.
- T. **POST-DEVELOPMENT:** The conditions which exist following the completion of soil disturbing activity in terms of topography, vegetation, land use, and the rate, volume, or direction of storm water runoff.
- U. **PRE-DEVELOPMENT:** The conditions which exist prior to the initiation of soil disturbing activity in terms of topography, vegetation, land use, and the rate, volume, or direction of storm water runoff.
- V. **PROFESSIONAL ENGINEER:** A Professional Engineer registered in the State of Ohio with specific education and experience in water resources engineering, acting in strict conformance with the Code of Ethics of the Ohio State Board of Registration for Engineers and Surveyors.
- W. **RAINWATER AND LAND DEVELOPMENT:** Ohio's standards for storm water management, land development, and urban stream protection. Developed by the Ohio Department of Natural Resources, the U.S. Department of Agriculture Natural Resource Conservation Service, and the Ohio Environmental Protection Agency. The most recent version of these standards shall be used in this regulation.
- X. **RUNOFF:** The portion of rainfall, melted snow, or irrigation water that flows across the ground surface and is eventually returned to water resources or wetlands.
- Y. **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.
- Z. **SEDIMENTATION:** The deposition of sediment in water resources or wetlands.
- AA. **SETBACK:** A designated transition area around water resources or wetlands left in a natural, usually vegetated, state so as to protect the water resources or wetlands from runoff pollution. Construction activities in this area are restricted or prohibited as required in this regulation.
- BB. **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 which may result in, or contribute to, erosion and sediment pollution.

- CC. SOIL & WATER CONSERVATION DISTRICT: An entity organized under Chapter 1515 of the Ohio Revised Code referring to either to the Soil and Water Conservation District Board or its designated employee(s).
- DD. STABILIZATION: The use of Best Management Practices that reduce or prevent soil erosion by storm water runoff, wind, ice, gravity, or a combination thereof.
- EE. STORM WATER MANAGEMENT PLAN: The written document meeting the requirements of this regulation that sets forth the plans and practices to be used to minimize storm water runoff from a development area and to safely convey or temporarily store and release post-development storm water runoff at an allowable rate to minimize flooding and erosion.
- FF. STRUCTURAL STORM WATER MANAGEMENT PRACTICE: Any human made facility, structure, or device that is constructed to provide temporary storage and/or treatment of storm water runoff.
- GG. UNSTABLE SOILS: A portion of land surface or area which is identified by the Community Engineer as prone to slipping, sloughing, or landslides, or is identified by the U.S. Department of Agriculture Natural Resource Conservation Service methodology as having a low soil strength.
- HH. WATER RESOURCE: Any public or private body of water including lakes or ponds, and streams, gullies, swales, or ravines having banks, a defined bed, and a definite direction of course, either continuously or intermittently flowing.
- II. WATERSHED: The total drainage area contributing storm water runoff to a single point.
- JJ. 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).

### **SECTION 100.03 DISCLAIMER OF LIABILITY**

Neither submission of a Storm Water Management Plan under the provisions herein, nor compliance with this regulation, shall 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 and safety of the public and are not designed for the benefit of any individual or for



the benefit of any particular parcel of property.

#### **SECTION 100.04 CONFLICTS, SEVERABILITY, NUISANCES & RESPONSIBILITY**

- A. Where this regulation is in conflict with existing provisions of law, ordinance, contract, or deed, whichever imposes the more stringent restriction shall prevail.
- B. If any clause, section, or provision of this regulation is declared invalid or unconstitutional by a court of competent jurisdiction, validity of the remainder shall not be affected thereby.
- C. This regulation shall not be construed as authorizing any person to maintain a private or public 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 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.

#### **SECTION 100.05 APPLICATION PROCEDURES FOR STORM WATER MANAGEMENT PLANS**

- A. The Community shall administer this regulation, shall be responsible for determination of compliance with this regulation, and shall issue such notices and orders as may be necessary. The Community may consult with the *[county]* Soil and Water Conservation District or other technical experts as necessary in reviewing the Storm Water Management Plan required by this regulation.
- B. Four (4) sets of the Storm Water Management Plan and necessary data required by this regulation shall be submitted to the Community Engineer as follows:
  - 1. For subdivisions: After the approval of the preliminary plat and prior to the approval of improvement plans or drawings by the Community Planning Commission.
  - 2. For other construction projects: Concurrently with the submittal of construction drawings to the Community Engineer.
  - 3. For general clearing projects: Thirty (30) working days prior to any soil disturbing activities.



- C. The Community Engineer shall review the Storm Water Management Plan for conformance with the provisions of this regulation, and approve or return for revisions with comments and recommendations for revisions, within twenty-one (21) working days after receipt of the Storm Water Management Plan as described above. A Storm Water Management Plan rejected because of deficiencies shall receive a narrative report stating specific problems and the procedures for filing a revised Plan. At the time of receipt of a revised Plan, another twenty-one (21) day review period shall begin.
- D. Approved Storm Water Management Plans shall remain valid for two (2) years from the date of approval. A copy of the approved Plan and its review report shall be forwarded by the Community Engineer to the [county] Soil and Water Conservation District.

#### **SECTION 100.06 COMPLIANCE WITH STATE AND FEDERAL REGULATIONS**

- A. Storm Water Management Plans issued in accordance with this regulation do not relieve the site owner of responsibility for obtaining all other necessary permits and/or approvals from federal, state, and/or county agencies. If requirements vary, the most stringent shall be followed.
- B. Storm Water Management Plans shall be accompanied by other permits and documentation relevant to the project, including, but not limited to, those listed below. No soil disturbing activity shall begin before all necessary state and federal permits have been granted to the owner or operator.
  - 1. Proof of compliance with the OEPA General NPDES Storm Water Permit. Proof of compliance shall be, but is not limited to, a copy of the NPDES General Storm Water Permit Notice of Intent; the NPDES General Storm Water Permit Number; and/or the OEPA Director's Acceptance Letter for the NPDES Permit.
  - 2. Proof of compliance with Section 404 of the Clean Water Act administered by the U.S. Army Corps of Engineers relating to waters of the United States under its jurisdiction. Proof of compliance shall be, but is not limited to, a copy of the U.S. Army Corps of Engineers Individual Permit, if an Individual Permit is required for the development project, showing project approval and any restrictions that apply to site activities. 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, but is not limited to, one of the following:
    - a. A letter from the site owner verifying that a qualified professional has surveyed the site and found no waters of the United States. Such a letter shall be noted on site plans submitted to the Community.



- b. A site plan showing that any proposed fill of waters of the United States conforms with the general and specific conditions specified in the applicable Nationwide Permit. Wetlands, and other waters of the United States, shall be delineated by protocols accepted by the US Army Corps of Engineers at the time of application of this regulation.
3. Proof of compliance with the Ohio Dam Safety Law administered by ODNR Division of Water. Proof of compliance shall be, but is not limited to, a copy of the ODNR Division of Water permit number, a copy of the project approval letter from the ODNR Division of Water, or a letter from the site owner explaining why the Ohio Dam Safety Law is not applicable.

### **SECTION 100.07 STORM WATER MANAGEMENT PLAN**

- A. In order to control flooding and erosion, the owner or operator shall be responsible for developing a Storm Water Management Plan. If applicable, the owner or operator shall also obtain an OEPA General NPDES Storm Water Permit and shall abide by its requirements in addition to an approved Storm Water Management Plan from the Community. In situations of conflict between OEPA requirements and Community requirements, the most stringent shall apply.
- B. If the construction site is subject to OEPA's General NPDES Storm Water Permit, a copy of all the required inspection sheets shall be submitted to the Community within two (2) working days of the date that the inspection was conducted.
- C. The Storm Water Management Plan shall be certified by a professional engineer registered in the State of Ohio.
- D. The Storm Water Management Plan shall incorporate measures as recommended by the most current edition of *Rainwater and Land Development* and shall include the following information:
  1. A project description including the type and purpose of soil disturbing activities and a description of the larger common plan of development if applicable.
  2. A vicinity sketch locating the site, and the larger common plan of development if applicable, and all pertinent surrounding features including wetlands, streams, steep slopes, and other sensitive areas receiving runoff from the development area on or within 200 feet of the site.
  3. The name and location of the immediate receiving water resource and the first subsequent named receiving water resource and the major watershed(s) in which



the project is located.

4. The existing and proposed topography shown in 1' contour intervals for flat areas and 2' contour intervals in steeper areas.
5. 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. Drainage patterns during major phases of construction shall also be shown as appropriate.
6. Existing and proposed watershed boundary lines, direction of flow, and watershed acreage.
7. The types and locations of soils in or affected by the development area, including unstable soils as determined by the most recent edition of the [county] Soil Survey and/or field investigations performed by NRCS/SWCD personnel, a professional engineer, or a professional soil scientist. The Soil Survey and interpretive assistance can be obtained from the [county] SWCD.
8. The scheduling, phasing, and coordination of construction operations and erosion and sediment control practices, including vegetative plantings and mulch.
9. Storm water management practices to be employed on the development area both during and after soil disturbing activities, including:
  - a. Their location and size, including detail drawings, maintenance requirements during and after construction, and design calculations, all where applicable.
  - b. Limits of clearing and of soil disturbing activities.
  - c. The name, address, and contact information of the person responsible for the continued operation and maintenance of storm water management practices.
  - d. A calculation of the percent impervious cover for both the pre-development and post-development site conditions.
  - e. Final site conditions including storm water inlets and permanent nonstructural and structural storm water management practices. Details of storm water management basins shall be drawn to scale and shall show volumes and sizes of contributing drainage areas.



- f. Any other structural and/or non-structural storm water management practices necessary to meet the design criteria in this regulation.
- g. Description of maintenance procedures needed to assure the continued performance of storm water management practices as required in this regulation.
- h. All other runoff information or supporting information required to conform with the storm water management design criteria detailed in this regulation.

### SECTION 100.08 PERFORMANCE STANDARDS

- A. Storm Water Management Plans required by this regulation shall meet the following design criteria:
  - 1. Practices designed for final use: Storm water management practices shall be designed for the ultimate use of the site and to function safely and with minimal maintenance.
  - 2. Storm water management for all lots: Areas developed for a subdivision, as defined in [*community subdivision code*], shall provide storm water management for the development of all subdivided lots.
  - 3. Redevelopment projects: To the extent that site characteristics allow, proposed redevelopment project designs shall include nonstructural and structural storm water management practices that are designed to result in a net equivalent reduction in impervious cover of at least 20 percent (20%) at the site. The following shall apply to all redevelopment projects:
    - a. “Redevelopment” refers to alterations of a property that change the footprint of a site or building so as to result in greater than 1 acre of land disturbance. This does not include activities that are not expected to negatively impact storm water quality and/or quantity and offer no new opportunities for storm water management practices, all as determined by the Community Engineer.
    - b. Where the Community Engineer determines that site constraints prevent a reduction in impervious cover, practical alternatives may be used to result in an improvement of water quality and/or a reduction of storm water runoff from the site. Practical alternatives shall include, but are not limited to:



- 1) Fees paid in an amount specified by the Community. These fees shall be applied by the Community to storm water management practices.
  - 2) Implementation of off-site storm water management practices.
  - 3) Watershed or stream restoration.
  - 4) Retrofitting of an existing storm water management practice.
  - 5) Other practices approved by the Community Engineer.
- c. When possible, all practical alternatives permitted above shall be implemented within the drainage area of the proposed redevelopment project.
- Λ *Phase II requires designated communities to control post-construction storm water from new development and redevelopment. Section 100.08(A)(3) provides communities with the flexibility to work with owners of currently built sites to comply with storm water regulations and take advantage of best management practices that may not have been available when the site was originally developed.*
4. Easements: All storm water management practices shall have easements sufficient to provide access to the Community for inspections and maintenance. The following conditions shall apply to all easements:
- a. Easements and covenants 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.
  - b. Unless otherwise required by the Community Engineer, access easements to all storm water management practices shall be no less than 20 feet wide, plus the width of the storm water management practice.
  - c. Unless otherwise required by the Community Engineer, storm water management practices in subdivisions, including basins, ponds, and wetlands, shall be on separate lots held and maintained by an entity of common ownership.
  - d. Those lots crossed by an easement are restricted against the planting in said easement of trees, shrubbery, or other woody growth; 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.

5. Nonstructural practices preferred: When developing a Storm Water Management Plan, a combination of nonstructural and structural storm water management practices shall be used to control storm water quantity and protect water quality. In meeting this requirement, the following shall apply:
    - a. Nonstructural storm water management practices shall be used to the maximum extent practicable.
    - b. Nonstructural and structural storm water management practices shall be designed in accordance with the most recent version of the *Rainwater and Land Development Manual* and/or in accordance with specifications provided by the Community Engineer.
    - c. The Community may allow modifications in the design of a development project from those requirements established in [*the community's building and zoning code*] when nonstructural storm water management practices are incorporated into site design.
    - d. Nonstructural storm water management practices shall be recorded on all property deeds and shall remain unaltered by subsequent property owners.
    - e. In designing storm water basins, properly designed retention basins with water quality benefits shall be used to the maximum extent practicable. Retention basins shall not be constructed in water resources. The applicant must demonstrate the water quality benefits achieved to the Community Engineer.
- Λ *Section 100.08(A)(5) allows Storm Water Management Plans to reflect a comprehensive review by site developers of the various structural and nonstructural options for preventing storm water pollution and controlling storm water quantity. This section also provides communities with the flexibility to alter site requirements to incorporate nonstructural storm water management practices. This flexibility may include modifications of lot sizes, setback requirements, or driveway and street widths to reduce impervious cover and to promote the maintenance of natural retention areas such as wetlands and riparian areas on development sites.*
- Λ *Rainwater and Land Development Manual is Ohio's standard for storm water management and is a good starting point for nonstructural and structural storm water management practices. Its current edition, however, does not provide a great deal of*



information on nonstructural practices. Other manuals are available nationally that explore these practices in greater detail. CRWP continues to work in this area to determine the applicability of practices used in other states to Northeast Ohio and to assist Members in determining appropriate storm water management practices for specific development projects. Please contact CRWP for further information.

- 6. Calculation requirements: Calculations submitted for the design of nonstructural and structural storm water management practices shall demonstrate the following:
  - a. The peak rate of runoff from the Critical Storm and all more frequent storms occurring on the development drainage area does not exceed the peak rate of runoff from a one (1) year frequency, twenty-four (24) hour storm occurring on the same area under pre-development conditions.
  - b. Storms of less frequent occurrence (longer return periods) than the Critical Storm, up to the 100 year storm, have peak runoff rates no greater than the peak runoff rates from equivalent storms under pre-development conditions. Consideration of the 1, 2, 5, 10, 25, 50, and 100 year storms in design and construction will be considered meeting this standard.
  
- 7. Determination of Critical Storm: The Critical Storm for a specific development drainage area shall be determined as follows:
  - a. Determine, by appropriate hydrologic methods, the total volume of runoff from a one (1) year frequency, 24-hour storm occurring on the development drainage area before and after development.
  - b. From the volume determined in (a), determine the percent increase in runoff volume due to development.
  - c. Using the percentage increase determined in (b), select the 24-hour Critical Storm from the following table:

| If the Percentage of Increase in Volume of Runoff is: |                | The Critical Storm for Peak Rate Control 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 |

8. Calculation Methods

- a. The selection of a calculation method shall be based on the size of the development drainage area and the output information required.
- b. The engineer selecting the calculation method and/or performing the calculations shall do so with full knowledge of the method's limitations, applicable conditions, and degree of accuracy and shall state these in the calculations submitted to the Community Engineer for review.
- c. The Community Engineer may reject any calculation method he/she deems inappropriate for the given situation. The "rational method" shall not be considered an appropriate calculation method in determining the Critical Storm.

B. Maintenance of Storm Water Management Practices

- 1. Community acceptance required: The Community Engineer shall approve an inspection and maintenance agreement binding on all subsequent owners of land served by the planned storm water management practices before the Community accepts the final plat of the proposed project.
- 2. All inspection and maintenance agreements shall do the following:
  - a. Designate the party responsible for maintenance of structural and nonstructural storm water management practices including mowing and ensuring outlet structures are clear and in good repair. Unless otherwise approved by the Community, this shall be an entity of common ownership within the proposed subdivision or the owner of an industrial or commercial site. Each deed sold in the proposed subdivision shall require continued membership in this entity of common ownership.
  - b. Prohibit unauthorized alterations of structural and nonstructural storm water management practices.
  - c. Provide access to storm water management practices for inspection by the



Community to document the condition of the practices.

3. The location, dimensions, and bearing (including the depth of capacity) of all storm water management practices shall be incorporated on the final plat, prior to approval by the Community, and reference thereon shall be made to the entity or individual(s) responsible for maintenance.
4. An as-built survey must be completed by qualified personnel and submitted to the Community.

C. Inspection of Storm Water Management Practices

1. The Community shall inspect storm water management practices periodically.
2. Upon finding a malfunction or other need for maintenance, the Community shall notify the responsible party of the need for maintenance.
3. Upon notification, the responsible party shall have five (5) working days, or other mutually agreed upon time, to makes repairs.
4. Should repairs not be made within this time, or a plan approved by the Community for these repairs not be in place, the Community may undertake necessary repairs and assess the responsible party.

**SECTION 100.09 BOND AND PERMIT**

- A. Funds shall be deposited with the Community prior to review by the Community and/or its consultants to cover professional services of the Community Engineer and/or other experts required by the Council or Review Boards.
- B. No soil disturbing activities shall be permitted until a bond has been posted to the satisfaction of the Community Engineer sufficient for the Community to perform the obligations otherwise to be performed by the owner or as stated in this regulation and to allow all work to be performed as needed in the event that the owner or operator fails to comply with the provisions of this regulation. The bond shall be released after all work required by this regulation has been completed to the satisfaction of the Community Engineer.
- C. No project subject to this regulation shall commence without a Storm Water Management Plan approved by the Community Engineer.

**SECTION 100.10 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.

### **SECTION 100.11 PENALTY**

- A. Whoever 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. Upon notice from the Community Engineer, or designated representative, that work is being done contrary to this regulation, such work shall immediately stop. Such notice shall be in writing and shall be given to the owner or operator, and shall state the conditions under which such work may resume; provided, however, in instances where immediate action is deemed necessary for the public safety or the public interest, the Community Engineer may require that work be stopped upon verbal order pending issuance of the written order.
- C. The imposition of any other penalties provided herein shall not preclude the Community, by or through its Law Director and/or any of its assistants, from 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 Engineer.

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### **The Following Individuals Participated in CRWP's Storm Water Management Committee to Develop this Model Regulation:**

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- t Tom Denbow, Executive Director, Chagrin River Watershed Partners, Inc.
- t Dan Donaldson, District Administrator, Lake Soil and Water Conservation District.
- t Kyle Dreyfuss-Wells, Associate Director, Chagrin River Watershed Partners, Inc.
- t Jack Hawthorne, P.E., Executive Vice President Director of Operations, Ralph Tyler Companies and Trustee, CRWP Board of Trustees.
- t Keith McClintock, Deputy Director Geauga Park District, formally District Administrator Geauga Soil and Water Conservation District.
- t Sally Jo Reemsnyder, Manager of Engineering Services, City of Solon.



- t Matt Scharver, Resource Protection Technician, Lake Soil and Water Conservation District.
- t Jim Storer, District Conservationist, Natural Resources Conservation Service assisting the Cuyahoga Soil and Water Conservation District
- t Andy Vidra, Senior Environmental Planner, Northeast Ohio Areawide Coordinating Agency

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*December 2001*

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