

**RULES AND REGULATIONS
OF THE
HAMILTON COUNTY STORM WATER DISTRICT
ISSUED BY THE
BOARD OF COUNTY COMMISSIONERS
HAMILTON COUNTY, OHIO**

ARTICLE V

POST-CONSTRUCTION STORM WATER QUALITY REGULATIONS

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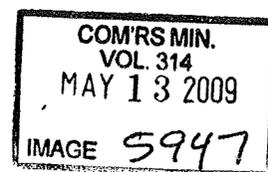
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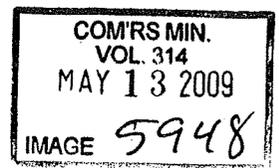
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501 PURPOSE, SCOPE AND APPLICABILITY

- A. The purpose of these Post-Construction Storm Water Quality Regulations ("Post-Construction Regulations") is to promote and maintain the health, safety, and welfare of the citizens of Hamilton County by establishing standards for storm water best management practices (BMPs) that minimize the degradation of the water resources of Hamilton County by
- a. Reducing the discharge of pollutants from the municipal separate storm sewer systems (MS4s) owned or operated by Hamilton County and member Local Jurisdictions of the Hamilton County Storm Water District ("HCSWD") to the maximum extent practicable,
 - b. Protecting water quality, and
 - c. Satisfying the appropriate water quality requirements of the Clean Water Act, Ohio Law, and the Ohio Revised Code (ORC), including Section 6111.
- B. These Post-Construction Regulations require implementation of the following measures during development or redevelopment of property within the Hamilton County Storm Water District (HCSWD):
1. Control storm water runoff from property and ensure that all Post-Construction BMPs are properly designed, permitted, 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 quality of storm water runoff, consistent with controls in these Post-Construction Regulations as well as applicable water quantity control regulations, originating from their property so that surface water and ground water are protected and erosion potential is not increased.
 4. Preserve and enhance where practicable natural infiltration and ground water recharge, and maintain subsurface flow that replenishes water resources, except in slippage prone soils.
 5. Incorporate storm water controls into conceptual site layout, site planning and design at the earliest possible stage/step in the development process.
 6. Incorporate the use of Post-Construction BMPs that serve multiple purposes including, but not limited to, quantity/flood control, erosion control, and water quality protection.
 7. Design sites to minimize the number of stream crossings and the work area associated with the disturbance.

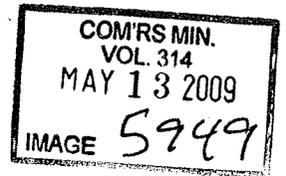


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- C. These Post-Construction Regulations are adopted under authority of Ohio Law and the Ohio Revised Code, including Chapters 307 and 6117 and implement the requirements of the latest discharge permit issued by Ohio EPA to Hamilton County and the member Local Jurisdictions of the HCSWD under the Phase II Program.
- D. The Board of County Commissioners of Hamilton County ("Board") shall designate the **Enforcing Official** within the unincorporated areas and townships of Hamilton County for the enforcement of these Post-Construction Regulations, except to the extent that a home rule township has the authority to designate another entity as its **Enforcing Official** and exercises such authority. The **Enforcing Official** for each of the participating member municipalities and authorized home rule townships of the HCSWD shall be the chief administrative officer of the Local Jurisdiction unless the legislative body of the Local Jurisdiction legally authorizes another qualified party to fulfill all required responsibilities of the **Enforcing Official** under these Post-Construction Regulations.
- E. Where authorized by law, the responsibilities of the Local Jurisdiction under these Post-Construction Regulations may be delegated by the Local Jurisdiction to any persons or entities acting in the beneficial interest of, or in the employment of the participating member Local Jurisdiction, including but not limited to, the HCSWD or the HCSWD's designated representative provided there is a lawfully enacted Resolution or Ordinance authorizing delegation of said responsibilities.
- F. These Post-Construction Regulations apply as follows:
 - 1. In unincorporated portions of Hamilton County, these Post-Construction Regulations apply to any property where Earthwork disturbing one (1) acre of land or larger, or to any property where Earthwork disturbing less than one (1) acre but part of a larger common plan of development that will disturb more than one (1) acre of land has been conducted since the time of passage of these Post-Construction Regulations.
 - 2. In incorporated member municipalities within the HCSWD, these Post-Construction Regulations apply to any property where Earthwork disturbing one (1) acre of land or larger, or to any property where Earthwork disturbing less than one (1) acre but part of a larger common plan of development that will disturb more than one (1) acre of land has been conducted since the time of passage of these Post-Construction Regulations, unless the legislative body of the member municipality or authorized home rule township establishes a smaller applicable area and specific requirements for these areas.

502 DEFINITIONS

The words and phrases defined in Article I of the Rules and Regulations of the HCSWD shall have the same meaning herein unless otherwise provided.



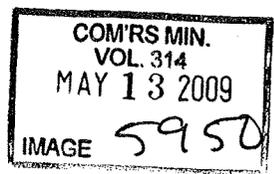
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503 COMPLIANCE WITH OTHER LAWS AND DISCLAIMER OF LIABILITY

- A. Compliance with these Post-Construction Regulations does not relieve the Owner from the duty to comply with any other federal, state or local laws, regulations or ordinances or from responsibility otherwise imposed by law for damage to any person or property
- B. Neither the submission, approval, or disapproval of an Improvement Plan under these Post-Construction Regulations; nor the Issuance or denial of a Permit, nor compliance or lack of compliance with these Post-Construction Regulations; nor any action or lack of action by the **Enforcing Official** shall relieve the Owner from responsibility for injury or damage to any person or property otherwise imposed by law, nor create or impose any liability upon Hamilton County, any participating jurisdiction in the Hamilton County Storm Water District, or their respective officers, agents, or employees for injury or damage to any person or property.
- C. Storm water control practices authorized under these Post-Construction Regulations and maintained according to an approved Maintenance Agreement shall not be considered to be a nuisance under these Post-Construction Regulations. The **Enforcing Official** will address conditions that may contribute to the creation of a nuisance according to pertinent local regulations when reviewing Improvement Plans and conducting facility inspections.
- D. Failure of the **Enforcing Official** to observe or recognize hazardous or unsightly conditions or to recommend appropriate corrective measures shall not relieve the Owner from the responsibility for any resulting condition or damage or injury, or result in any liability on the part of the Local Jurisdiction, the **Enforcing Official**, Hamilton County, or their officers, employees, or agents for any resulting condition or damage or injury.
- E. These Post-Construction Regulations do not create a duty upon the **Enforcing Official**, the Board, the HCSWD, or participating member Local Jurisdictions of the HCSWD to persons adversely impacted by any Post-Construction BMPs required by these Post-Construction Regulations.

504 CONFLICTS AND SEVERABILITY

- A. In the event that any of these Post-Construction Regulations may conflict with other applicable provisions of law or ordinance, the most restrictive provisions, as determined by the **Enforcing Official**, shall prevail where permitted by law.
- B. Should any article, section, subsection, clause, or provision of these Post-Construction Regulations be declared by a court of applicable jurisdiction to be unconstitutional or invalid, such decision shall not affect the validity of the remainder of these Post-Construction Regulations, in whole or in part.



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505 MANAGEMENT OF STORM WATER AND IMPROVEMENT PLANS REQUIRED

- A. Storm water shall be managed in accordance with these Post-Construction Regulations.
- B. In each case where these Post-Construction Regulations apply, the Owner shall submit an Improvement Plan addressing the requirements of these Post-Construction Regulations prior to initiating any Earthwork.
- C. The Improvement Plans shall describe how storm water will be managed and shall be prepared in accordance with sound engineering and/or conservation practices by a professional experienced in the design and implementation of standard erosion and sediment controls and storm water management practices addressing all phases of construction. The Improvement Plans shall not be implemented until all required approvals are obtained.
- D. The Improvement Plans shall also comply with all drainage, flood control, floodplain management, and related storm water quantity control requirements of the Local Jurisdiction.
- E. The **Enforcing Official** shall have the authority to administer these Post-Construction Regulations and issue such notices and orders as may be necessary. The **Enforcing Official** may consult with the Hamilton County Storm Water District, the Hamilton County Engineer, the Metropolitan Sewer District of Greater Cincinnati, the Hamilton County Soil and Water Conservation District (HCSWD), private engineers, or other technical experts in administering these Post-Construction Regulations.

506 EXEMPTIONS

- A. These Post-Construction Regulations do not apply to activities regulated by the Ohio Department of Natural Resources Animal Waste and Agricultural Pollution Abatement Rules, Ohio Administrative Code Chapter 1501:15-5.
- B. These Post-Construction Regulations do not apply to linear construction projects, such as pipeline or utility line installation, that do not result in the installation of additional impervious surfaces as determined by the **Enforcing Official**. 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 the Earthwork Regulations (Article III of the Rules and Regulations of the HCSWD).
- C. Application and enforcement of the exemptions under Section 506 Exemptions of these Post-Construction Regulations shall be conducted by the **Enforcing Official**



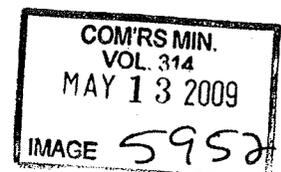
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507 COORDINATION WITH LOCAL, STATE, AND FEDERAL REGULATIONS AND PERMITS

- A. Approvals issued in accordance with these Post-Construction Regulations do not relieve the Owner of responsibility for obtaining all other necessary permits and/or approvals from federal, state, and/or local governments and compliance with other legal requirements. If requirements vary, the most restrictive shall prevail. Other permits and requirements may include, but are not limited to, those listed below.
1. Ohio EPA NPDES Permit authorizing storm water discharges associated with construction activity;
 2. Section 401 and 404 of the Clean Water Act;
 3. Ohio EPA Section 401 Water Quality Certification General Isolated Wetland Permit;
 4. Ohio Dam Safety Law Section 1501.21 OAC; and
 5. Applicable Flood Plain Regulations.
- B. Compliance with other applicable regulations and permits shall be demonstrated (e.g., copies of permits, authorizations, letters of exemption, or submitted applications) before the Local Jurisdiction will approve an Improvement Plan.
- C. The Improvement Plan shall be coordinated with local utility providers to allow any necessary adjustment, relocation, addition or other modification to an existing utility, including overburden loading.

508 SUBMITTAL PROCEDURES

- A. An Owner wishing shall submit an Improvement Plan to the **Enforcing Official** of the appropriate Local Jurisdiction prior to undertaking Earthwork covered by these Post-Construction Regulations and the Earthwork Regulations (Article III of the Rules and Regulations of the HCSWD). This Improvement Plan shall describe how storm water will be managed pursuant to these Post-Construction Regulations. No Earthwork shall be undertaken until such Improvement Plan has been reviewed, and approved through the established submittal and review process of the Local Jurisdiction.
- B. Pre-Submittal Meeting: A Pre-Submittal Meeting with the **Enforcing Official** may be requested to discuss the proposed project, review requirements, identify unique aspects of the project that must be addressed during the review process, and establish a preliminary review and approval schedule.
- C. Concept Plan: The Owner of a project requiring a preliminary Record Plat or equivalent submittal shall submit Improvement Plans that illustrate the proposed storm water management approach concept (Concept Plan), and the applicable fees to the



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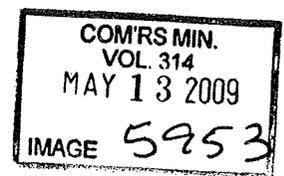
Enforcing Official. Concept Plans shall show approximate preliminary locations of the proposed parcel boundaries, setbacks, dedicated open space, public roads, water resources, existing topography, on-site and off-site areas vulnerable to erosion and sediment damage, drainage facilities, Post-Construction BMPs, and easements to allow the **Enforcing Official** to determine if the site is laid out in a manner that meets the intent of these Post-Construction Regulations and if the proposed Post-Construction BMPs are capable of controlling runoff from the site in compliance with these Post-Construction Regulations. The **Enforcing Official** shall review the Concept Plans and provide comments and recommendations for revisions if any.

A Concept Plan is required:

1. For all subdivisions
2. For all non-residential development that will disturb five (5) acres of land or more

For other construction projects, Concept Plans are encouraged to be submitted for review by the **Enforcing Official** in advance of submitting an Improvement Plan in order to avoid subsequent delays caused by the submittal of Improvement Plans which do not comply with these Post-Construction Regulations.

- D. Improvement Plans: The Improvement Plan submission shall consist of construction drawings and specifications along with such fees as may be required. The Improvement Plans shall meet the requirements of these Post-Construction Regulations and must be approved by the **Enforcing Official** prior to approval of an Earthwork Permit and/or before issuance of a building permit by the Building Department. Any revised Improvement Plans shall be submitted to the **Enforcing Official** for approval prior to implementing the proposed modification.
- E. Consent to Enter Private Property: Submittal of a Concept Plan and/or Improvement Plan shall be deemed to provide consent to the **Enforcing Official** to enter a property subject to these Post-Construction Regulations for the purpose of gathering information necessary for review of and comment to a Concept Plan or Improvement Plans.
- F. Review and Comment: The **Enforcing Official** shall review and comment on any Concept and/or Improvement Plans submitted within a reasonable period of time. The final Improvement Plans submitted may be either approved or disapproved. If the Improvement Plans are disapproved, they shall be returned with comments stating the reasons for disapproval and requirements for revisions if any.
- G. Approval Required: Earthwork shall not begin and building permits shall not be issued without approved Improvement Plans consistent with these Post-Construction Regulations.
- H. Individual Lot Construction Will Not Proceed: Improvement Plans for individual lots in a subdivision will not be approved and building permits will not be issued unless the larger



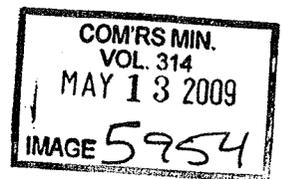
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common plan of development or sale containing the individual lot is in compliance with these Post-Construction Regulations.

- I. Approval Valid for Two (2) Years / Modification of Plans: If Earthwork has not commenced within two years of approval, Improvement Plans must be re-submitted for review and approval in accordance with rules in effect at the time of re-submittal. Modifications to the project require submittal and approval of a revised Improvement Plan before work may proceed.
- J. Stopped or Abandoned Earthwork: Earthwork stopped or abandoned for a period of two (2) consecutive years from the date of discontinuation of Earthwork shall cause the approval of the Improvement Plans to expire and become invalid. For site work to continue either the previously approved plans must be submitted if the scope of the Earthwork has not changed, **or** an updated set of plans will need to be submitted for approval by the **Enforcing Official**.

509 STORM WATER MANAGEMENT REQUIREMENTS FOR IMPROVEMENT PLANS

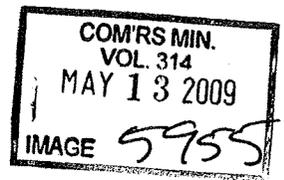
- A. Storm Water Management: The Improvement Plans shall describe in detail how the quantity and quality of storm water will be managed after construction is complete for discharge from the site and/or into a water resource. The Improvement Plans will illustrate the type, location, and dimensions of structural and non-structural storm water management practices incorporated into the site design to address the requirements of these Post-Construction Regulations, and provide the rationale for their selection. The rationale must identify how these Post-Construction BMPs will be integrated with appropriate drainage and flood control facilities proposed for the site and will not cause flooding of development upstream and downstream of the site, as required under the storm water quantity control regulations of the Local Jurisdiction. The rationale must demonstrate that these Post-Construction BMPs minimize degradation to the water resource and its floodplain. The Improvement Plans shall also include a maintenance agreement and long-term plan for the storm water management facilities serving the site. Electronic and hard copies of improvement plans shall be submitted in a format acceptable to the **Enforcing Official**.
- B. Preparation by Professional Engineer: The Improvement Plans shall be prepared and sealed by a Professional Engineer and include supporting calculations, plan sheets, and design details. To the extent necessary, as determined by the **Enforcing Official**, a site survey shall be performed by a Professional Surveyor to establish boundary lines, measurements, or land surfaces.
- C. Storm Water Design Manual: The HCSWD and/or the **Enforcing Official** may prepare and maintain design criteria manuals or procedures that provide guidance for designing the storm water management system for the site, including a description of acceptable Post-Construction BMPs that meet the criteria of these Post-Construction Regulations. The design manual or procedures may be updated from time to time based on improvements in engineering, science, monitoring, and local maintenance experience.



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D. Contents of Improvement Plans: The Improvement Plans shall include the following:

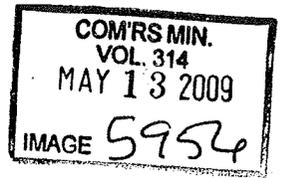
1. Site Location Map: USGS 1:24,000 or equivalent map showing the Project Name, the boundary of the project site, the name and location of major existing roadways, and the name and location of the immediate receiving water resource(s) within 500 feet of the boundary of the project site and the first subsequent named receiving water resource(s).
2. Site description and Information: The following information shall be included in the general notes, project specifications and/or an attached narrative report:
 - a. The Project Name and the location of the project, including complete site address or Parcel Identification Number, and individual lot addresses if known and applicable.
 - b. Contact information: Provide the Company name and contact information and the contact names, addresses, phone numbers, facsimile numbers, and e-mail address for the following:
 - i. The Professional Engineer responsible for the preparation of the Improvement Plans.
 - ii. The site Owner, and if applicable the agent or designee.
 - iii. The Earthwork Contractor and all applicable subcontractors, when identified.
 - c. A description of the nature and type of the construction activity (e.g. residential, shopping mall, etc.).
 - d. Total area of the site and the area of the site that is expected to be disturbed (i.e. grubbing, clearing, excavation, filling or grading, including off-site borrow areas, excavated material disposal areas and off-site project construction support activities).
 - e. A calculation of the area-weighted runoff coefficients for each catchment tributary to an Erosion Prevention & Sediment Control (EP&SC) BMP, Post-Construction BMP, storm water conveyance facility, and storm water detention facility under both pre-construction and post construction site conditions.
 - f. An estimate of the impervious area and percent imperviousness of the site and areas draining to the site at the beginning and at the conclusion of the project.
 - g. Existing data describing the soils throughout the site, including the soil series, soil association, and hydrologic soil group. Additional geotechnical



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data to support the design of the proposed Earthwork and Post-Construction BMPs (e.g. infiltration, extended conveyance, media filtration, or other BMP) whose effectiveness depends upon site-specific data about the porosity, infiltration characteristics, depth to groundwater, depth to bedrock, and any impermeable layers.

- h. Existing data, if available, describing the quality of any discharge from the site.
 - i. A description of prior land uses at the site.
 - j. An implementation schedule which describes the sequence of major construction operations (i.e., grubbing, excavating, grading, utilities and infrastructure installation) and the implementation of erosion, sediment and storm water management practices or facilities to be employed during each operation of the sequence.
 - k. The name and/or location of the immediate receiving water resource(s) and the first subsequent named receiving water resource(s) and the aerial extent and description of wetlands or other special aquatic sites at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project.
 - l. Location and description of any storm water discharges associated with asphalt and concrete plants on or contiguous with the project site and dedicated to the project, and the best management practices to address pollutants in these storm water discharges.
3. Project Site Map(s): One or more site maps of the project shall be created. The map or series of maps shall be drawn at a scale of at least 1-inch equals 50-feet. The site is to be referenced using the State Plane coordinates and shall indicate the datum used. It is preferred that the entire site be shown on a single 24"x36" (architectural D-size drawing) plan sheet to allow a complete view of the site during plan review. Each map shall identify the phase of the project, if applicable, in relation to the overall development plan and include a north arrow, elevation datum and date of preparation. The map or series of maps shall extend 200 feet beyond the project boundary and shall indicate for that area, at a minimum the following:
- a. Limits of Earthwork on the site for each phase of the project.
 - b. Soils types for the entire site, including the location and extent of visibly evident existing excavations or fills, slope instability, erosion and water seepage or wet conditions, unstable or highly erodible soils, or other areas with potentially serious existing or future erosion problems.
 - c. Existing and proposed two-foot (2') contours, unless site conditions



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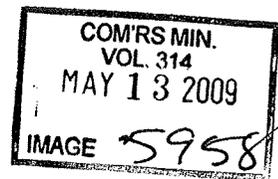
require more detailed topography to depict site drainage conditions.

- d. Drainage patterns and Post-Construction BMPs within, entering, and exiting the site during each phase of the project, including any existing and/or constructed combined and separate storm water drainage conveyance and drainage inlet facilities within the site, beyond the site, and/or within the larger common plan of development if utilized by the project. These maps shall include a delineation of drainage watersheds at the site expected before, during, and after major grading activities as well as the total off-site and on-site size of each drainage watershed in acres, and the pre-construction and post-construction runoff coefficient for each area.
 - e. Location of existing and proposed utilities including appurtenances, structures and outfalls. The approximate depths of all utilities shall be indicated.
 - f. Water resource locations including known springs, wetlands, streams, lakes, water wells, and associated Stream Corridor Protection Zones as defined under the Stream Corridor Regulations (Article IV of the Rules and Regulations of the HCSWD) and/or other setbacks on or within 200 feet of the site, including the boundaries of wetlands or streams and any first subsequent named receiving water resource(s) intending to be filled or relocated under an approval from the Army Corps of Engineers and/or Ohio EPA.
 - g. Existing and proposed locations of buildings, roads, parking facilities
 - h. The location of any in-stream activities including stream crossings.
 - i. Existing and proposed property boundaries, and individual lot numbers.
 - j. The location of any existing or proposed easements or other restrictions placed on the use of the property and the responsible party(ies) under such easement or restriction.
 - k. On-site and off-site areas vulnerable to erosion and sediment damage.
4. Information Regarding Post-Construction BMPs: For each non-structural and structural Post-Construction BMP to be employed on the site, the Improvement Plan shall include the following:
- a. Location and size, including maps showing the location of Post-Construction BMPs and other storm water facilities, detailed drawings with dimensions and elevations, and design calculations. Details of Post-Construction BMPs shall be drawn to scale and shall show volumes and sizes of contributing drainage areas.



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- b. Soil and subsurface conditions, including tests of infiltration rates for native and amended soils underlying each Post-Construction BMP, and borings or equivalent data indicating seasonal high groundwater levels, top of bedrock elevations, and perched groundwater elevations.
 - c. Specifications for materials used to construct each Post-Construction BMP, including vegetation, amended soil composition, and structural materials.
 - d. Post-construction BMP operations and maintenance requirements during and after construction.
 - e. Any supplemental information requested by the **Enforcing Official**.
 5. Other Approvals and Permits:
 - a. Ohio EPA NPDES Permit Number and other applicable state and federal permit numbers or approvals shall be provided if available, or the status of permit applications shall be provided if final approvals have not been received.
 - b. The parcel number, address, contact information, and Earthwork Approval shall be provided for any off-site borrow areas and excavated material disposal areas.
 6. Inspection and Maintenance Plan: An Inspection and Maintenance Plan (I&M Plan) shall be prepared for the system of Post-Construction BMPs designed and constructed on the property. Such I&M Plans shall include all Post-Construction BMPs and shall address the inspection and maintenance frequency and requirements listed in Section 516 Maintenance And Inspections of these Post-Construction Regulations.
 7. Calculations: Calculations shall be provided as part of the Improvement Plans for projected storm water runoff flows, volumes, and timing into and through all Post-Construction BMPs, and the underlying assumptions and hydrologic and hydraulic methods and parameters, under pre- and post-construction land use conditions, for flood control, water resource protection, and water quality, as required in Section 510 Performance Standards of these Post-Construction Regulations. Calculations shall demonstrate compliance with local storm water quantity management requirements, demonstrate that the runoff from upper watershed areas have been considered in the calculations and indicate that no adverse impacts are conveyed downstream of the proposed project. An investigation of immediate downstream conditions as defined by the **Enforcing Official** is required to support development of a rationale for Post-Construction BMP selection addressing anticipated impacts on the water resource and floodplain morphology, hydrology, and water quality. If the downstream property



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owner(s) refuse to allow access a letter must be submitted by the downstream property owner(s) stating the refusal.

- E. Changes in Site Conditions: The **Enforcing Official** shall be notified whenever unforeseen site conditions are discovered (e.g., unforeseen water resources such as unknown springs) during the course of construction that affects storm water management.
- F. Improvement Plan Updates Required. The approved Improvement Plans shall be modified whenever there is a change in design, construction, operation or maintenance which has a significant effect on the potential for the discharge of pollutants, or if the recommended controls prove to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity. Revised Improvement Plans shall be provided to the **Enforcing Official** for review and approval prior to implementing the suggested changes.

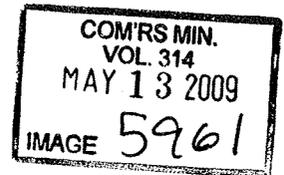
510 PERFORMANCE STANDARDS

- A. General: All components of the storm water system, including Post-Construction BMPs for storage, treatment and control, and conveyance facilities, shall be designed in accordance with the performance standards of these Post-Construction Regulations as well as with the storm water quantity control and floodplain management regulations of the Local Jurisdiction. Earthwork BMPs compliant with the Earthwork Regulations (Article III of the Rules and Regulations of the HCSWD) must be maintained in good operational condition until Post-Construction BMPs are installed and operational. Improvement Plans shall clearly document through drawings, specifications, narrative, and calculations how the design addresses each applicable performance standard in this section.
1. Direct runoff to a Post-Construction BMP: Runoff from all areas disturbed during construction shall be directed to one or more Post-Construction BMPs designed in accordance with the performance standards in this section.
 2. Integrated Practices that Minimize Degradation of Water Resources: The Post-Construction BMPs shall function as an integrated system that controls flooding within, upstream, and downstream of the site, and minimizes to the maximum extent practicable the degradation of the water resources receiving storm water discharges from the site. Integrated practices shall:
 - a. Maintain pre-construction hydrology and groundwater recharge on as much of the site as practicable.
 - b. Compact soil and install new impervious surfaces only where necessary to support the future land use.
 - c. Compensate for increased water quality volumes caused by soil



compaction and new impervious surfaces by reducing storm water peak flows to less than pre-construction levels, as calculated under Section 510 (C)(2) of these Post-Construction Regulations.

3. Post-Construction BMPs designed for final use: Post-Construction BMPs shall be designed to achieve the storm water management objectives of these Post-Construction Regulations, to be compatible with the proposed post-construction use of the site, to protect the public health, safety, and welfare, and to function safely with minimal maintenance.
 4. Storm water management for all lots: Areas developed as a subdivision, as defined by the Local Jurisdiction, shall provide storm water management for the development of all subdivided lots.
 5. Post-Construction BMPs in Water Resources: Post-Construction BMPs shall not be constructed in water resources unless all appropriate permits allowing such construction are obtained from the Ohio EPA, the U.S. Army Corps of Engineers, and all other applicable federal, state, and local agencies. In addition, the Post-Construction BMP construction shall be in compliance with the HCSWD erosion and sediment control requirements under the Earthwork Regulations (Article III of the Rules and Regulations of the HCSWD) and the Stream Corridor Regulations (Article IV of the Rules and Regulations of the HCSWD).
 6. Freeboard requirements for Post-Construction BMPs: Where applicable, Post-Construction BMPs must provide a minimum of one (1) foot freeboard above the projected peak stage within the Post-Construction BMP facility.
 7. Preservation of Existing Natural Drainage and Vegetation: Practices that preserve and/or improve the existing natural drainage or vegetation 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 prevention of concentrated storm water runoff to and through these areas.
- B. Exemption: A site where soil-disturbing activities are conducted may be exempt from the requirements of Section 510 Performance Standards if:
1. The site is part of a larger common plan of development and it is demonstrated to the satisfaction of the **Enforcing Official** that the storm water quality management requirements for the site are satisfied by an existing storm water management practice, or
 2. If the storm water quality management requirements for the site are provided by practices in a regional or local storm water management plan approved by the **Enforcing Official**.



C. Criteria Applying to all Post-Construction BMPs:

1. Written documentation shall be provided in the Improvement Plans describing the Post-Construction BMPs that will be installed during construction for the site and the rationale for the selection of each Post-Construction BMP. Practices chosen must be sized to treat the water quality volume (WQv) and to ensure compliance to the maximum extent practicable with Ohio EPA Water Quality Standards (Ohio Administrative Code Chapter 3745-1) and Ohio EPA Construction General Storm Water NPDES discharge permit requirements applicable to the property.
2. The WQv shall be equal to the volume of runoff from a 0.75 inch rainfall event and shall be determined according to one of the following methods:
 - a. A site hydrologic study approved by the **Enforcing Official** that uses continuous hydrologic simulation; site-specific hydrologic parameters, including impervious area, soil infiltration characteristics, slope, and surface routing characteristics; proposed Post-Construction BMPs controlling the amount and/or timing of runoff from the site; and local long-term hourly records, or
 - b. Use of the following equation:

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

where terms have the following meanings:

WQV= water quality volume in acre-feet

C = runoff coefficient appropriate for storms less than 1 in.

P= 0.75 inch precipitation depth

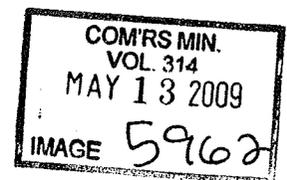
A = area draining into the storm water practice, in acres.

The runoff coefficients appropriate for storms less than one (1) inch are listed by land use category in **Table 510-A** of these Post-Construction Regulations. When the land use will be mixed, a weighted average runoff coefficient should be calculated. Alternatively, the **Enforcing Official** may allow use of the following equation to calculate the runoff coefficient if it can be documented that appropriate controls are in place to limit the proposed impervious area of the site to a value less than that listed in Table 510-A of these Post-Construction Regulations:

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

where:

i = fraction of the drainage area that is impervious

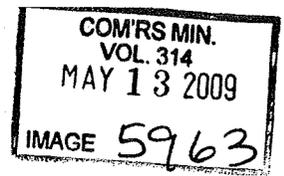


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Table 510-A: Runoff Coefficients Based on the Type of Land Use

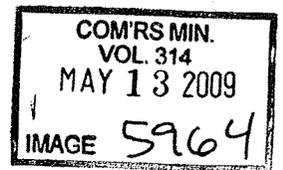
County Zoning District (or Equivalent)		Imperviousness Fraction	Water Quality Runoff Coefficient (C)
Name	Characteristics		
----	Parks, cemeteries, golf courses, lawns, playgrounds or unimproved land	0.05	0.08
"AA"	Residence District > 43,561 sq. ft. lot	0.20	0.17
"A"	Residence District 17,501 to 43,560 sq. ft. lot	0.25	0.20
"A-2"	Residence District 12,001 to 17,500 sq. ft. lot	0.33	0.24
"B"	Residence District 9,001 to 12,000 sq. ft. lot	0.45	0.31
"B-2"	Residence District 6,001 to 9,000 sq. ft. lot	0.58	0.40
"C"	Residence District 5,001 to 6,000 sq. ft. lot	0.65	0.45
"D"	Residence District up to 5,000 sq. ft. lot	0.75	0.54
"DD"	Planned Multiple Residence District	0.80	0.60
"O"	Office District	0.85	0.66
"OO"	Planned Office District	0.85	0.66
"E"	Retail Business District	0.85	0.66
"EE"	Planned Business District	0.85	0.66
"EF"	Excavation and Landfill District	0.10	0.11
"F"	Light Industrial District	0.88	0.70
"FF"	Planned Light Industrial District	0.92	0.76
"FPM"	Flood Plain Management District	Established on Case-by-Case Basis	
"G"	Heavy Industrial District	0.95	0.81
"GG"	Planned Heavy Industrial District	0.95	0.81
"H"	Riverfront District	Established on Case-by-Case Basis	
"MHP"	Mobile Home Park District	0.85	0.66
-----	Parking lots (paved), roofs, driveways	1.00	0.89

Where land use will be mixed, the runoff coefficient should be calculated using a weighted average. For example, if 60% of the contributing drainage area to the storm water treatment structure is Residence District 10,500 sq. ft. lot, 30% is Planned Multiple Residence District, and 10% is unimproved land, the runoff coefficient is calculated as follows
 $(0.6)(0.31)+(0.3)(0.6)+(0.1)(0.08) = (0.37)$



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3. An additional volume equal to 20% of the WQv shall be incorporated into the storm water practice for sediment storage.
4. Post-Construction BMPs shall be designed such that the drain time is long enough to treat the storm water and release it at a rate that minimizes degradation of the water resources, but short enough to provide storage available for successive rainfall events and avoid the creation of nuisance conditions, as defined in **Table 510-B** of these Post-Construction Regulations. The outlet structure for the Post-Construction BMP must not discharge more than the first half of the WQv or extended detention volume (EDv) in less than one-third of the drain time. The EDv is the volume of storm water runoff that must be detained by a Post-Construction BMP. The EDv is equal to 75 percent of the WQv for wet extended detention basins, but is equal to the WQv of all other Post-Construction BMPs listed in Table 510-B of these Post-Construction Regulations.
5. Post-Construction BMPs shall not be located where infiltrating groundwater could adversely impact slope stability based upon a geotechnical evaluation satisfying the requirements of Section 311 of the Earthwork Regulations (Article III of the Rules and Regulations of the HCSWD) or equivalent regulations of the Local Jurisdiction.
6. An as-built landscaping plan based on field observation shall be prepared for each vegetated Post-Construction BMP to indicate how vegetation will be used to establish aquatic and/or terrestrial areas.
7. Each Post-Construction BMP shall be designed to facilitate sediment removal, vegetation management, debris control, and other maintenance activities defined in the I&M Plan for the site. The following criteria apply:
 - a. The maximum slope for any vehicle access way shall be 10 (H) to 1 (V), unless the I&M Plan approved by the **Enforcing Official** demonstrates that a steeper slope is appropriate for the planned maintenance activities.
 - b. The access way shall be designed for expected maintenance equipment and shall extend from a public roadway to each location within the Post-Construction BMP designed for sediment accumulation.
 - c. Portions of Post-Construction BMPs that are underground shall include a monitoring port to allow inspection without entry. Any lids, covers, or access openings shall be of such size, weight, and other characteristics to allow them to be opened in the manner described in the I&M Plan.



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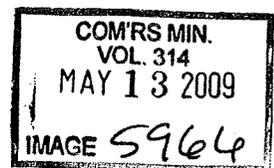
Table 510-B: Structural Post-Construction BMPs & Associated Drain (Drawdown) Times

Best Management Practice	Drain Time of WQv
Infiltration <ul style="list-style-type: none"> ▪ Basins, Trenches, Pervious Pavement[^] 	24 - 48 hours
Swales and Strips <ul style="list-style-type: none"> ▪ Detention Design ▪ Flow Through Design 	24 hours *
Basins <ul style="list-style-type: none"> ▪ Extended Dry Detention Basins^{**} ▪ Wet Detention Basins ^{***} ▪ Constructed Wetlands (above permanent pool) ⁺ ▪ Pocket Wetland[#] 	48 hours 24 hours 24 hours 24 hours
Filters <ul style="list-style-type: none"> ▪ Media Filtration, Bioretention, Vegetated Roof 	40 hours
<p>[^] The WQv shall completely infiltrate within 48 hours so there is no standing or residual water in the BMP.</p> <p>* Size to convey a volume equal to the WQv, a duration of two (2) hours, and peak rainfall intensity of one (1) inch/hour at a depth of no more than three (3) inches. The use of this criterion is limited to sites where the total area disturbed is five (5) acres or less.</p> <p>** Dry basins shall split the sediment storage volume between forebays at basin inlets and in a lowered area around the outlet designed to prevent outlet clogging.</p> <p>***Provide both a permanent pool and an extended detention volume above the permanent pool, each sized with at least 0.75*WQv</p> <p>+ Extended detention shall be provided for the full WQv above the permanent water pool.</p> <p># Pocket wetlands must have a wet pool equal to the WQv, with 25% of the WQv in a pool and 75% in marshes. The EDv above the permanent pool must be equal to the WQv</p>	



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- d. Post-Construction BMPs shall be provided with an emergency drain, where practicable, so that the basin may be emptied if the primary outlet becomes clogged and/or to drain the permanent pool to facilitate maintenance. A gravity drain shall be provided where site conditions allow. Post-Construction BMPs that are not provided with an emergency gravity drain must be able to be pumped in a manner described in the I&M Plan.
 - e. To the maximum extent practicable Post-Construction BMPs shall be designed to incorporate provisions for mosquito management.
 - f. The **Enforcing Official** may require that additional design features be incorporated into the Post-Construction BMP as necessary to assure that the facility is properly maintained and addresses public safety concerns.
8. Each Post-Construction BMP shall be designed to drain toward the outlet and/or permanent pool in order to minimize standing water and saturated soil conditions that impede maintenance of the facility.
- D. Integration with Storm Water Quantity Conveyance Design Criteria: All Post-Construction BMPs shall be integrated into the storm water conveyance and detention system for the site. This system shall be designed according to the storm water quantity control regulations of the Local Jurisdiction. The Improvement Plans shall describe how the proposed Post-Construction BMPs are designed to meet the requirements of the Local Jurisdiction for storm water quantity control. The storm water quantity conveyance system shall be designed to address the following criteria for effective integration of the storm water conveyance facilities and Post-Construction BMPs:
1. Conveyance into a Post-Construction BMP: The surface and subsurface storm water quantity conveyance system for the site shall direct storm water less than or equal to the water quality volume into one (1) or more Post-Construction BMPs prior to discharge into any water resource or into off-site county, township or municipal owned/operated storm water conveyance systems.
 2. Storm Water in Excess of the Water Quality Volume (WQv): Flows in excess of the WQv shall either be diverted around the Post-Construction BMPs or shall safely pass through the Post-Construction BMP without re-suspending the accumulated pollutants to a level that reduces the Post-Construction BMP's average annual pollutant removal capability.
 3. Off-site storm water discharges: Off-site storm water runoff that discharges to or across the site shall either be routed around the Post-Construction BMP or, if this is not possible, the Post-Construction BMP shall be sized to treat all off-site incoming flow. Diversion of storm water runoff around a site or Post-Construction BMP shall not contribute to increases in flows, erosion, or water quality problems downstream.



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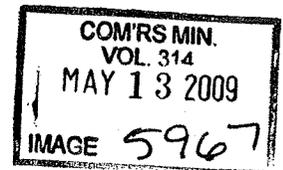
4. Velocity dissipation: Devices shall be placed at discharge locations and along the length of any outfall ditch to provide non-erosive flow velocity from the structure to a water resource according to criteria contained in the Hamilton County Public Works Department Storm Drainage System Rules and Regulations or equivalent local municipal regulations.
5. Floatable Control: The storm water system shall be designed, to the maximum extent practicable, to prevent floating materials that enter storm water as a result of human activity, such as litter, debris, trash, and yard waste, from discharging into receiving waters.

E. Integration with Stream Corridor Protection Zones:

1. Storm water discharges from the site must flow into and through Post-Construction BMPs designed according to these Post-Construction Regulations prior to entering a Stream Corridor Protection Zone delineated according to criteria in the Stream Corridor Regulations (Article IV of the Rules and Regulations of the HCSWD).
2. The **Enforcing Official** may determine that the Stream Corridor Protection Zone is the only practical Post-Construction BMP for the portion of the site both upslope of and adjacent to the Stream Corridor Protection Zone. In this case, sites must be graded in a manner that maximizes sheet flow through the Stream Corridor Protection Zone. Storm water discharges through the Stream Corridor Protection Zone must also comply with the Earthwork Regulations (Article III of the Rules and Regulations of the HCSWD), and the storm water drainage rules and regulations of the Hamilton County Department of Public Works or equivalent local municipal regulations.
3. Pipes or ditches discharging storm water from a Post-Construction BMP may pass through the Stream Corridor Protection Zone if adequately stabilized from erosion. Sites must be graded in a manner that maximizes sheet flow through any Stream Corridor Protection Zone designated as the Post-Construction BMP for this portion of the site.

F. Additional Criteria for Basin Post-Construction BMPs:

1. The drainage area tributary to a basin shall be at least ten (10) acres, to avoid outlets with extremely small orifices prone to clogging. This requirement may be varied if documentation is provided to the satisfaction of the **Enforcing Official** that the outlet is designed to withstand clogging.
2. Either an adequate water source must exist to maintain any permanent pool or the facility must be designed as an extended dry detention basin.
3. The minimum length-to-width ratio for a basin shall be 2:1 to avoid short-circuiting and to increase travel time to the outlet. Where necessary, the length-to-width

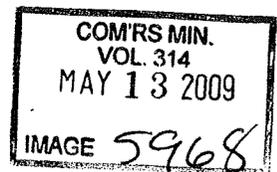


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ratio may be increased to achieve this criterion by relocating the basin inlet or outlet, or by installing berms or baffles within the basin to the full depth of the WQv.

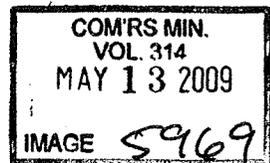
4. Wet detention basins, constructed wetlands, and pocket wetlands shall only be allowed under the following conditions:
 - a. Where existing soils are suitable as determined by a geotechnical engineer,
 - b. Where gravelly sands or fractured bedrock are not present, or
 - c. Where the permanent pool of water will be sustained year-round under normal climatic conditions.
 - d. The facility may seasonally dry if it is also designed to meet the performance standards for an extended dry detention basin.

5. The following additional criteria shall apply to constructed wetlands:
 - a. The permanent pool of any constructed wetland shall be at least two (2) times the volume of evapotranspiration during a thirty (30) day drought at summer evaporation rates or 0.75WQv, whichever is greater. In cases where subsurface infiltration into and exfiltration out of the wetland are negligible, the summer evapotranspiration rates may be estimated as 0.75 times a summer pan evaporation rate of 0.2 inches/day. More rigorous water balance calculations may be required by the **Enforcing Official** where these simplifying assumptions are not valid and/or in all cases where the drainage area to the wetland is less than twenty (20) acres.
 - b. Approximately 50 percent of the permanent pool volume, plus a sediment storage volume equal to at least 20 percent of the WQv, shall be placed in deep water zones (areas with depths between 4- and 12-feet) to sustain fish communities and provide wave action to control mosquito populations. At a minimum, deep water zones shall be placed within the forebay and around the primary outlet to minimize disruption of wetland vegetation during sediment removal operations.
 - c. The remainder of the constructed wetland shall consist of shallow water zones. Dry weather depths in shallow water zones (i.e., areas less than 18 inches deep) should vary depending on the vegetation selected. Permanent pool depths shall be six (6) inches or less within at least 35 percent of the shallow water zone.
 - d. The bottom of the permanent pool between the deep and shallow water zones shall be sloped no steeper than 4 (H) to 1 (V).



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- e. The maximum depth of the extended detention zone above the permanent pool shall not exceed two (2) feet to reduce stress on herbaceous wetland plants.
 - f. Vegetated side slopes of the basin to minimize slope erosion.
6. Additional storage equal to at least twenty (20) percent of the WQv shall be provided within the basin to account for sediment deposition. This sediment storage volume shall be placed as follows:
- a. For extended dry detention basins, the sediment storage volume shall be divided between the forebays and a lower stage surrounding the outlet control structure of the basin. These areas shall be designed to minimize aesthetic and other impacts associated with sediment and debris accumulation and saturated soils in these portions of the basin. Design features to address these concerns include a micropool or other treatments that obscure sediments and debris accumulation.
 - b. For wet detention basins, constructed wetlands, and pocket wetlands, the permanent pool volume shall be increased by 20 percent of the WQv to provide sediment storage.
7. The outlet shall be designed according to the following criteria to achieve the drawdown time requirements and minimize clogging, vandalism, and maintenance:
- a. The outlet of an extended dry detention basin shall be designed to release 50 percent of the WQv in 18 to 24 hours, and 100 percent of the WQv in 48 hours.
 - b. If a single orifice outlet is used as the water quality outlet for extended dry detention basins without a micropool, the outlet shall have a diameter of at least four (4) inches, and an external trash rack and hood that protects against clogging shall be provided.
 - c. For wet detention basins, constructed wetlands, pocket wetlands, and extended dry detention basins with micropools, the outlet shall consist of a submerged reverse-slope pipe that extends downward from the riser to an inflow point one (1) foot below the normal pool elevation of the permanent pool.
 - d. If a perforated riser is used as the water quality outlet control facility for the basin, then the perforations shall be designed according to criteria in the Ohio Department of Transportation's (ODOT's) Location and Design (L&D) Manual.
 - e. The **Enforcing Official** will consider alternative outlet designs if



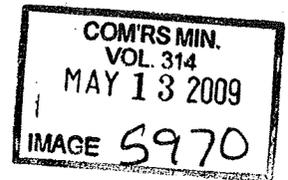
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supporting calculations and documented implementation experience is provided to demonstrate that the proposed outlet will achieve the intent of these Post-Construction Regulations.

8. The basin design shall incorporate the following features to maximize multiple uses, aesthetics, safety, and maintainability:
 - a. Basin side slopes above the permanent pool shall have a run to rise ratio of 3 (H):1 (V) or flatter.
 - b. The permanent pool shall be no deeper than twelve (12) feet below the basin's normal water elevation unless equipped with practices (e.g. aeration) that prevent thermal stratification. The perimeter of all permanent pool areas deeper than four (4) feet shall be surrounded by an aquatic bench that extends at least eight (8) feet and no more than fifteen (15) feet inward from the normal water edge. Unless aeration is provided, the eight- (8-)foot wide portion of the aquatic bench closest to the shoreline shall have an average depth of six (6) inches below the permanent pool and planted with hearty plants comparable to wetland vegetation that are able to withstand prolonged inundation. The remainder of the aquatic bench shall be no more than fifteen (15) inches below the permanent pool to limit growth of dense vegetation in a manner that allows waves and mosquito predators to pass through the vegetation. The maximum slope of the aquatic bench shall be 10 (H) to 1 (V).
 - c. A forebay designed to allow larger sediment particles to settle shall be placed at each basin inlet. The total forebay volume shall be equal to at least 10% of the water quality volume (WQv). Each forebay shall consist of a separate cell, formed by an acceptable barrier such as a rock and/or vegetated weir. A fixed vertical sediment depth marker shall be installed in each forebay to measure sediment deposition over time.

G. Additional Criteria Applying To Filter Post-Construction BMPs:

1. The following additional criteria shall apply to sand filters, bioretention filters, and other surface or subsurface media filters :
 - a. Bioretention facilities shall not be allowed in areas where the seasonal high water table or bedrock is above the invert of the underdrain system.
 - b. Runoff from the tributary area of the filtration facility shall be directed into a pretreatment unit sized to control the entire WQv. Acceptable pretreatment units include concrete or earthen chambers in advance of the filter bed, swales overlaying or surrounding the filter bed, a manufactured control device able to remove 50 percent of the average annual sediment load, or other surface or underground storage areas.



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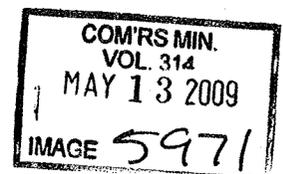
- c. Runoff from the pretreatment unit shall be directed into a filter bed consisting of sand, soil, peat, and/or other media that filters particulate matter and/or absorbs the trapped pollutants. The media shall have a minimum permeability of at least 1 foot/day for soil and 3.5 feet/day for sand. The surface area of the filter bed shall be determined based on the following equation:

$$A = (WQ_v \cdot d) / [K \cdot T \cdot (h + d)]$$

where:

- A = surface area of the filter media bed (acre)
- WQ_v = water quality volume (acre-ft)
- d = depth of the filter media bed (ft)
- T = 1.67 days (drawdown time)
- K = saturated hydraulic conductivity of the filter media (ft/day)
- h = average depth of water above filter bed (ft)
= half the maximum depth of water

- d. The depth of a sand filter media bed shall be 18 inches. The depth of the soil filter media bed within a bioretention facility shall be 30 inches or the depth of the root zone of the vegetation planted within the facility, whichever is greater.
 - e. The maximum depth of water over a sand filter bed shall be 18 inches. The maximum depth of water over a soil filter bed within a bioretention facility shall be between 6 inches and 12 inches, as defined in the Improvement Plans based on the type of vegetation used.
 - f. A perforated pipe underdrain shall be provided beneath the filter bed unless the WQ_v is completely infiltrated into the underlying soil within forty (40) hours. The underdrain shall have a minimum grade of 0.5 percent, with a diameter of four (4) or six (6) inches. A granular backfill of durable No. 57 aggregate shall be provided up to a minimum of four (4) inches above the outside diameter of the pipe.
 - g. An overflow designed to convey all storms larger than the WQ_v up to and including the 100-year event shall be provided. Use of a vertical stand pipe or catch basin is recommended.
2. The following additional criteria shall apply to vegetated roofs:
- a. The vegetated roof shall be composed of drought and extreme weather tolerant vegetation and lightweight soil mixtures able to retain at least forty (40) percent of the average annual precipitation in Hamilton County (at least sixteen (16) inches per year), absorb, filter, and detain the remaining average annual precipitation, and safely drain runoff from the roof to an



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appropriate storm water conveyance system.

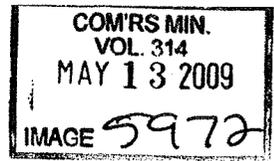
- b. The vegetated roof shall be underlain by a waterproof membrane, root barrier, and drainage layer, protected by protection boards or materials composed of soft fibrous materials.
- c. Roof supports shall be designed to support the saturated weight of vegetated roof in addition to meeting all applicable design load requirements.

H. Additional Criteria Applying To Swale and Strip Post-Construction BMPs:

- 1. Facilities designed according to the detention design drain time criteria shall:
 - a. Not be located in areas where the depth to bedrock and/or seasonal high water table is less than 3 feet below the final grade elevation.
 - b. Only be allowed where the underlying soil consists of hydrologic soil group (HSG) A or B, unless the underlying soil is replaced by at least a 2.5 foot deep layer of soil amendment with a permeability equivalent to a HSG A or B soil and an underdrain system is provided.
- 2. Facilities designed according to the flow through design drain time shall:
 - a. Only be allowed on sites where the total tributary area to the swale is 5 acres or less.
 - b. Be designed to slow and filter runoff during the WQv event by flowing through the turf grasses with a maximum depth of flow no greater than 3 inches, a peak flow of no more than 1 cubic feet per second, and a peak velocity of 0.9 feet per second.
 - c. Be lined with fine turf-forming, flood tolerant grasses or other approved vegetation able to effectively remove pollutants as water flows through it.
- 3. Use a level spreader or similar device to convert concentrated runoff to sheet flow before entering the facility.

I. Additional Criteria Applying To Infiltrator Post-Construction BMPs:

- 1. Infiltrators shall only be allowed where soil borings and infiltration tests of the in-situ soils indicate that the entire WQv will infiltrate within 48 hours and where the seasonal high water table and any underlying bedrock are at least four (4) feet below the final grade elevation of the bottom of the infiltrator. If soil amendments are used to increase infiltration rates, then the facility shall be considered to be a bioretention filter and designed according to Section 510(G) of these Post-Construction Regulations.

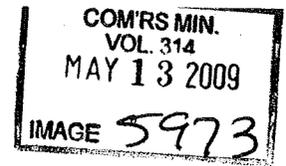


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2. All runoff directed into an infiltrator from unvegetated pervious areas must receive pretreatment (e.g., flow through a swale or strip) to remove coarser sediments that could cause a loss of infiltration capacity and increase maintenance frequencies.
3. During construction, all runoff from disturbed areas of the site shall be diverted away from the proposed infiltrator. No construction equipment shall be permitted within the infiltrator site to avoid increased soil compaction.
4. The Infiltrator will be clearly marked during construction to minimize unnecessary entrance.
5. Permeable pavements shall be composed of a load-bearing, durable surface together with an underlying layered structure that temporarily stores water prior to infiltration to the soil and/or a controlled outlet. The pavement shall be designed to rapidly pass storm water to the underlying subgrade and/or a rock-filled reservoir which provides storage until the storm water can infiltrate into the underlying soil. If soils are not suitable to infiltrate the entire design capture volume, then an underdrain system shall be provided within the rock reservoir to provide flow attenuation and protect the pavement. Runoff from unvegetated pervious areas surrounding permeable pavement systems must receive pretreatment prior to draining onto the pavement in order to minimize sediment loading.

J. Alternative Post-Construction BMPs: The **Enforcing Official** may approve the use of alternative Post-Construction BMPs if documentation is provided that demonstrates, to the satisfaction of the **Enforcing Official** and with prior written approval from Ohio EPA, that these Post-Construction BMPs are equivalent in pollutant removal and runoff flow/volume reduction effectiveness to those listed in Table 510-B of these Post-Construction Regulations. The WQv discharge rates from the alternative practice must be reduced to minimize degradation of the receiving water resource unless there will be negligible hydrological impact to the stream. WQv discharge rates are considered to have a negligible hydrological impact if one (1) of the following four (4) conditions can be demonstrated:

1. The alternative Post-Construction BMP is able to recharge the entire WQv to groundwater.
2. The larger common plan of development or sale will create less than one (1) acre of impervious surface.
3. The project is a redevelopment project within an existing ultra-urban setting (i.e., a downtown area or on a site where 100 percent of the project area is already impervious surface and the storm water discharges directly into a storm sewer system), or.



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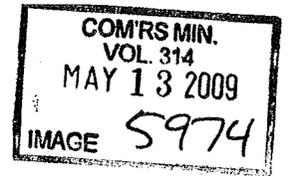
4. The storm sewer system discharges directly into a large river (fourth order or greater) or to a lake and where the site is less than five (5) percent of the watershed area that is upstream of the site, unless a TMDL identified water quality problems in the receiving surface waters of the State.

K. Storm Water Management on Redevelopment Sites:

1. Sites that have been previously developed where no Post-Construction BMPs were installed are required to provide the following level of control:
 - a. A 20 percent net reduction of the site's current impervious area, achieved by either removing the impervious surface or through use of pervious pavement and/or green roofs.
 - b. Treatment of at least 20 percent of the WQv.
 - c. A combination of (a) and (b).
2. Where sites are a combination of redevelopment and new development, the total WQv must be treated as calculated through a weighted average based on area:
 - a. New development – Must treat 100 percent of the WQv
 - b. Redevelopment – Must treat 20 percent of the WQv.
3. Local communities or sanitary sewer districts may establish a larger percentage of the WQv for redevelopment sites if necessary to meet combined sewer overflow objectives or other storm water management objectives of the community.
4. The **Enforcing Official** may approve one or more of the practical alternatives as detailed in Section 511 Off Site Alternatives And Alternative Actions of these Post-Construction Regulations where conditions prevent impervious area reduction or on-site storm water management for redevelopment projects.

511 OFF SITE ALTERNATIVES AND ALTERNATIVE ACTIONS

- A. Off-site alternatives may be considered on a case-by-case basis where none of the Post-Construction BMPs listed in Table 510-B of these Post-Construction Regulations are determined to be feasible. The following criteria must be met to accept an off-site alternative Post-Construction BMP:
 1. A maintenance agreement is established that satisfies the requirements of Section 516 Maintenance And Inspections.
 2. The off-site Post-Construction BMP discharges to the same Hydrologic Unit Code (HUC)-14 watershed unit or a smaller subwatershed as defined by the **Enforcing**



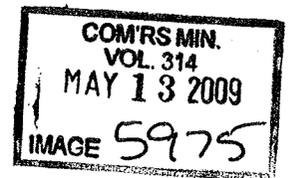
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3. The size of the drainage area draining into the off-site Post-Construction BMP is at least 1.5 times the size of the uncontrolled on-site drainage.
 4. The off-site Post-Construction BMP meets all applicable requirements of these Post-Construction Regulations.
- B. All alternative actions are subject to the approval of the **Enforcing Official**. Alternative actions may include, but are not limited to the following:
1. Implementation of off-site Post-Construction BMPs and/or the retrofit of an existing practice to increase quality and quantity control.
 2. Stream, floodplain, or wetland restoration.
 3. Acquisition or conservation easements on protected open space contributing to storm water control such as wetland complexes.
- C. The **Enforcing Official** may request that additional measures not required by these Post-Construction Regulations be taken to correct existing degradation of water resources or to minimize future degradation of water resources. The Property Owner and the **Enforcing Official** shall mutually determine equitable compensation for these additional measures.

512 ACCESS TO POST-CONSTRUCTION BMPs – LEGAL INSTRUMENT REQUIRED

- A. Access to and entrance into Post-Construction BMPs as required by the **Enforcing Official** for inspections and maintenance shall be secured by a recordable real property Legal Instrument, such as an easement, a Deed of Easement, a Deed, or covenant recorded as part of the legal chain of title of the property. The following conditions shall apply to such instrument:
1. The proposed instrument in final form shall be included in the I&M Plan submitted with the proposed Improvement Plans and shall include the parcel identification number for the property and any parcel contributing storm water to and/or required to install the system of Post-Construction BMPs addressed by the Legal Instrument.
 2. The instrument shall be approved by the **Enforcing Official** prior to approval of a Record Plat and/or Improvement Plan.
 3. Unless otherwise allowed by the **Enforcing Official**, access to Post-Construction BMPs as provided by the instrument shall be from a public right-of-way. The access shall be no less than 15 feet wide. The instrument shall also incorporate the entire Post-Construction BMP plus an additional 15-foot wide band around



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the perimeter of the Post-Construction BMP.

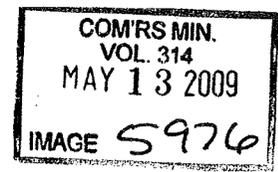
4. The access to the Post-Construction BMP shall be graded and/or stabilized as necessary to allow maintenance equipment to access and manipulate around and within each facility, as defined in the I&M Plan for the site.
5. Instruments for structural Post-Construction BMPs and access thereto shall include restrictions against the planting 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 or any other activity or structure that is inconsistent with or interferes with the use, performance or function of the Post-Construction BMP and purpose of the Legal Instrument; and against the changing of final grade from that described by the final grading plan approved by the **Enforcing Official**. Any re-grading may be performed or obstruction removed by the **Enforcing Official** consistent with the Legal Instrument and charged to the appropriate Legal Entity and/or property owners.

513 SITE STABILIZATION REQUIRED PRIOR TO OPERATION OF STORM WATER BMPS

- A. No storm water shall be directed through any Post-Construction BMP, if required under Article V of these Regulations, or portions thereof, until the entire area tributary to the Post-Construction BMP has reached final stabilization. Final stabilization occurs after the completion of the final grade at the site, after all of the utilities are installed, and the site is stabilized with vegetation or other appropriate methods. Documentation acceptable to the **Enforcing Official** shall be submitted to demonstrate that the site has reached final stabilization. Upon a satisfactory demonstration, the Post-Construction BMPs or structure(s) may be completed and placed into service. Upon completion of installation of the Post-Construction BMPs or structures, stabilization measures (e.g., seeding and mulching) must be installed on all disturbed areas and/or exposed soils caused by such installation within 7 days, weather permitting.

514 FINAL INSPECTION APPROVAL

- A. To receive final inspection and acceptance of any project, or portion thereof, the following must be completed and provided to the **Enforcing Official**:
 1. Final stabilization must be achieved and all Post-Construction BMPs must be installed and made functional per the approved Improvement Plan, as determined by the **Enforcing Official**.
 2. An As-Built Certification, including a Survey where applicable, must be sealed, signed and dated by a Professional Engineer and a Professional Surveyor, respectively. The **Enforcing Official** may require the submission of a new set of Post-Construction BMP calculations if he/she determines that the design was altered significantly from the approved Improvement Plans. The As-Built Survey



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must provide the location, dimensions, and bearing of such practices and include the entity responsible for long-term maintenance as detailed in the I&M Plan.

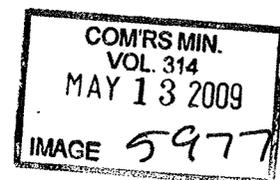
3. A copy of the complete and recorded I&M Plan as specified in Section 509 Storm Water Management Requirements For Improvement Plans must be provided to the **Enforcing Official**.

515 OWNERSHIP OF POST-CONSTRUCTION BMPS

- A. Unless otherwise required by the **Enforcing Official**, Post-Construction BMPs shall be owned, controlled, and maintained by a Legal Entity, as follows:
 1. If the Post-Construction BMP serves a single property, then the property owner shall be the Legal Entity.
 2. If the Post-Construction BMP serves multiple lots in residential, commercial, industrial and/or condominium developments, then the Post-Construction BMP either shall be on a separate lot or located within an easement as specified in these Post-Construction Regulations. The Legal Entity shall be one of the following:
 - a. A validly created owners association under Ohio law,
 - b. A local unit of government, or
 - c. A property owner with a valid contract with the property owners served by the Post-Construction BMP.

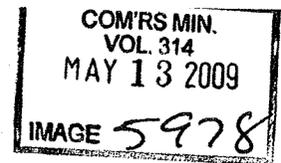
516 MAINTENANCE AND INSPECTIONS

- A. All Post-Construction BMPs shall be maintained in accordance with the I&M Plan, which is included in the Legal Instrument approved by the **Enforcing Official** as provided in Section 512 ACCESS TO POST-CONSTRUCTION Bmps – LEGAL INSTRUMENT Required of these Post-Construction Regulations. The Legal Entity defined in Section 515 Ownership Of Post-Construction Bmps of these Post-Construction Regulations shall be responsible for maintenance of the Post-Construction BMP(s).
- B. If the Post-Construction BMP serves multiple lots in residential, commercial, industrial, and/or condominium developments, then the Legal Entity shall be responsible for the maintenance of all Post-Construction BMPs within the subdivision and/or condominium development.
- C. In the event the relationship between the Legal Entity and the property owners is dissolved, or if the Legal Entity fails to perform required maintenance, responsibility for such maintenance shall be proportionally distributed to each property owner contributing storm water to and/or required to install the system of Post-Construction BMPs.



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- D. The **Enforcing Official** shall not authorize any Earthwork covered by these Post-Construction Regulations prior to approving an I&M Plan meeting the requirements of this Section. The I&M Plan shall be submitted for review as part of the Improvement Plans as a Legal Instrument in recordable form, capable of being recorded in the legal chain of title for lands in the County Recorder's office.
- E. A draft of this I&M Plan shall be provided as part of the Improvement Plan submittal. Once a draft is approved, a final copy of the Plan fully executed and in recordable form for the Hamilton County Recorder's Office, must be submitted to the **Enforcing Official** to receive final inspection approval of the site.
- F. The owners of real property contributing storm water to and/or required to install a system of Post-Construction BMPs required by these Post-Construction Regulations and approved by the **Enforcing Official** shall be mutually responsible for the inspection and maintenance of these Post-Construction BMPs as specified in this section and further defined in the I&M Plan unless a public agency or other entity, as approved by the **Enforcing Official**, assumes the inspection and maintenance responsibility.
- G. The I&M Plan shall provide at least the following:
1. The name and contact information for the Legal Entity that owns each Post-Construction BMP and (if known) the Maintenance Provider representing the Legal Entity.
 2. The parcel numbers of each property served by the Post-Construction BMP.
 3. The parcel number and location of each Post-Construction BMP.
 4. The method of funding long-term maintenance and inspections of the system of Post-Construction BMPs.
 5. Features of the design that facilitate maintenance of the system of Post-Construction BMPs.
 6. A description of the on-going procedures and additional standards, as required by the **Enforcing Official** which will ensure continual proper operation and performance of Post-Construction BMPs.
 7. An inspection schedule and reporting requirements, including acceptable inspection checklists appropriate for each Post-Construction BMP and proof of inspection certification requirements.
 8. A prohibition on alteration of the Post-Construction BMP without prior written approval from the **Enforcing Official**.
 9. The location of and management practices for all instruments established under Section 512 ACCESS TO POST-CONSTRUCTION Bmps – LEGAL



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INSTRUMENT Required of these Post-Construction Regulations that provide for access to and work on the system of Post-Construction BMPs.

10. A approvable document indemnifying the **Enforcing Official** and related public officials and public entities (the "indemnified officials") from and against any and all losses, costs, claims or liabilities whatsoever, including legal fees and other defense costs, whether from personal injury, property damages, or other losses of any kind or character asserted or threatened against the indemnified parties, and which are in any way related to the existence, construction, operation, maintenance, or failure of the system of Post-Construction BMPs.

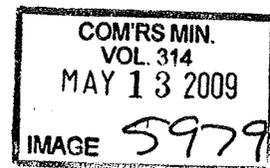
- H. Alteration or termination of the I&M Plan is prohibited unless amended or replaced by an equivalent approved plan compliant with these Post-Construction Regulations. Any changes in the I&M Plan must be approved in advance by the **Enforcing Official** and recorded in the same manner as the Original I&M Plan prior to becoming effective.. The **Enforcing Official** shall be notified in writing immediately whenever a new Maintenance Provider is designated.

- I. The Legal Entity shall either serve as or contract with a Maintenance Provider who shall be responsible for managing any easements established under Section 512 ACCESS TO POST-CONSTRUCTION BMPs – LEGAL INSTRUMENT REQUIRED of these Post-Construction Regulations and for maintaining the system of Post-Construction BMPs. The Maintenance Provider shall maintain the system of Post-Construction BMPs in good working condition acceptable to the **Enforcing Official** and in accordance with the schedule of long-term maintenance activities defined in the approved I&M Plan. Adequate maintenance is herein defined as good working condition so that the system of Post-Construction BMPs is performing its design functions.

- J. The Maintenance Provider shall submit to the **Enforcing Official** an annual inspection report composed of completed inspection checklists and proof of annual inspection by **Qualified Inspection Personnel**. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire system of Post-Construction BMPs, including berms, inlet structures, outlet structures, pond areas, access roads, etc. Deficiencies shall be noted in the inspection form.

- K. Sediment accumulation resulting from the normal operation of the system of Post-Construction BMPs shall be removed and disposed of appropriately. Disposal of accumulated sediments may be onsite in a reserved area(s) for this purpose or off site. Sediment removal activities shall be conducted when 75 percent of the sediment storage volume becomes filled with sediment.

- L. The **Enforcing Official** bearing proper credentials and identification shall be permitted at all reasonable times to enter upon any property or to gain access to any easements established under Section 512 ACCESS TO POST-CONSTRUCTION BMPs – LEGAL INSTRUMENT REQUIRED as necessary to inspect, observe, maintain, and repair, as required by the enforcement and penalty provisions of these Post-Construction



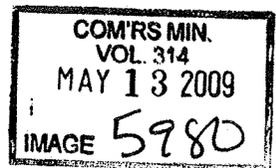
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Regulations, the system of Post-Construction BMPs whenever the **Enforcing Official** deems necessary. When practical, the **Enforcing Official** shall provide written notice to the Legal Entity, property owners and Maintenance Provider prior to entry. The **Enforcing Official** shall be granted access without unreasonable delay. Any obstruction preventing safe and easy access to the system of Post-Construction BMPs shall be promptly removed or cleared upon request of the **Enforcing Official** and shall not be replaced or allowed to reoccur. The cost of removing or clearing obstructions shall be the responsibility of the Legal Entity. The **Enforcing Official** shall be entitled to examine and copy any records required to be prepared and maintained under these Post-Construction Regulations.

- M. The **Enforcing Official** may inspect Post-Construction BMPs periodically and determine if maintenance is required according to criteria in the I&M Plan and/or Design Manual. If the **Enforcing Official** identifies a maintenance need, the **Enforcing Official** will provide written notification to the Legal Entity, as detailed in the I&M Plan. Upon notification, the Legal Entity shall have **thirty (30) working days**, to make repairs or submit a plan for the approval of the **Enforcing Official**, with details regarding the necessary repairs, action items and established timelines.

- N. If the Legal Entity and/or designated Maintenance Provider fails to maintain a Post-Construction BMP, the **Enforcing Official** may enter the property, perform the required maintenance or remediation, and bill the Legal Entity or Maintenance Provider, or, in the event there is no then currently viable Legal Entity or Maintenance Provider, the property owner(s) contributing storm water to the BMP (the "Responsible Owner(s)") for such costs, together with a 50% additional charge for administrative costs, charges and penalties, where allowed by law. In the event of nonpayment by the Legal Entity, Maintenance Provider, or Responsible Owners, the legislative body of the Local Jurisdiction or the Enforcing Official may cause the proportional cost of such required maintenance or remediation, together with any administrative costs and charges and allowable penalties to be collected from any and all responsible parties by any means allowable either at law or in equity, including, where authorized by law, the placement of a lien against the properties of the Responsible Owners or the collection of such costs, charges and penalties through the real estate tax duplicate to be paid with the real estate taxes of such benefitted properties.

- O. In the event the Post-Construction BMPs as shown on the approved plans and specifications are not maintained in good working order in accordance with the standards of these Post-Construction Regulations and in accordance with the I&M Plan, the Local Jurisdiction, with due notice, may enter the property and take whatever steps it deems necessary to return the Post-Construction BMPs to good working order. This provision shall not be construed to allow the Local Jurisdiction to erect any permanent structure on the property. Neither the **Enforcing Official** nor any Local Jurisdictions shall be under any obligation to maintain or repair the system of Post-Construction BMPs and in no event shall these Post-Construction Regulations be construed to impose any such obligations upon those entities.

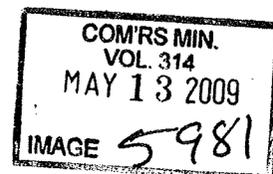


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- P. In the event the **Enforcing Official** or Local Jurisdiction performs any work or expends any funds to return any BMP facilities back to good working order, the Legal Entity and/or the Maintenance Provider shall reimburse the Local Jurisdiction within thirty (30) days receipt of an invoice from the **Enforcing Official** or Local Jurisdiction identifying the costs incurred in the repair or remediation plus an additional 50% for administrative costs and charges. If not paid within the prescribed time period, the **Enforcing Official** or Local Jurisdiction may cause the proportional cost of such required maintenance or remediation together with any administrative costs and charges and allowable penalties to be collected by any means allowable under the law or in equity, including, where authorized by law, the placement of a lien on the benefitted properties contributing storm water, or the collection of such costs, charges and penalties through the real estate tax duplicate of such benefitting Responsible Property owners contributing storm water to and/or required to install and maintain a system of BMPs. Where permitted by law, those charges shall become a lien against the benefitted Responsible Owners property or where authorized by law may be collected through the tax duplicate in the same manner as other taxes. The actions described in this section shall be in addition to and not in lieu of any legal remedies which may otherwise be available to the Local Jurisdiction or the **Enforcing Official**.
- Q. Except as to the **Enforcing Official** and the Indemnified Officials, nothing in these Post-Construction Regulations shall be construed to limit or affect any liability for damage which the Legal Entity, Maintenance Provider or Responsible Owners may have and which is alleged to have resulted from or been caused by storm water runoff where the system of Post-Construction BMPs fails to operate properly.

517 FEES

- A. Where applicable, plan review, filing, and inspection fees are required to be submitted to the **Enforcing Official**.
- B. For projects in the unincorporated areas of Hamilton County the cost of concept plan review, revisions, site inspection and detailed construction drawing review performed by the **Enforcing Official** shall be at a rate established and published from time to time by the Board of County Commissioners (BOCC). Checks shall be made payable to the "Treasurer of Hamilton County" and mailed to the Department of Public Works, Room 800, County Administration Building, 138 East Court Street, Cincinnati, Ohio 45202. The check must make reference to the Project Title, Hamilton County Public Works Project Number and Invoice Numbers. A delinquent notice shall be issued in the event that any bill has not been paid in full within thirty (30) days. If payment is not made within thirty (30) days thereafter, inspection of construction and any further review on the project will be stopped and the claim will be forwarded to the Prosecuting Attorney for collection.
- C. For projects within municipalities, fees shall be established according to the appropriate provisions of the municipality's code and levied according to pertinent administrative procedures of the **Enforcing Official**.



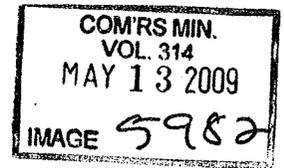
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518 PERFORMANCE SURETY

- A. The **Enforcing Official** shall require the submittal of a performance bond or surety prior to approval of the Improvement Plan in order to insure that the Post-Construction BMPs are properly installed in accordance with the approved Improvement Plans and these Post-Construction Regulations. The amount of the installation performance surety shall be the total estimated construction cost of the approved Post-Construction BMPs, plus 25%. The performance surety shall conform to the following requirements:
1. For subdivision development in unincorporated Hamilton County, the performance surety shall follow requirements of Section 702 of the *Rules and Regulations of the Office of the Hamilton County Engineer Governing the Surface Physical Improvements for Private Developments within the Unincorporated Areas of Hamilton County*.
 2. For all other development in unincorporated Hamilton County and for all development in municipal members of the Hamilton County Storm Water District, the following requirements shall apply:
 - a. A performance contract and bond or surety shall be submitted to the **Enforcing Official** or designee. It shall be delivered on a form as outlined in the Design Manual.
 - b. The surety shall remain in force until the Post-Construction BMPs or related physical improvements have been satisfactorily completed and accepted by the **Enforcing Official** or designee. When an "Irrevocable Letter of Credit" is used, it shall contain a clause guaranteeing automatic one year extensions beyond the expiration date thereof, until the work is completed and accepted. Provisions for a partial pro-rata release of the performance bond based on the completion of various construction stages can be done at the discretion of the **Enforcing Official**. The installation performance bond shall be released in full within five (5) business days of an acceptable final inspection by the **Enforcing Official**, approval of acceptable as-built plans, and a written certification by a registered Professional Engineer that the storm water practice has been installed in accordance with the approved plan and other applicable provisions of these Post-Construction Regulations.

519 ENFORCEMENT

- A. No person shall violate or cause to be violated any of the provisions of these Post-Construction Regulations, or fail to comply with any lawful order, request or other requirements of any **Enforcing Official** or authorized public authority having jurisdiction which is made or issued pursuant to these Post-Construction Regulations, or knowingly use, or cause to be used, lands in violation of these Post-Construction Regulations, or in violation of any order approving or denying an activity or authorization granted under



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these Post-Construction Regulations. The Enforcing Official shall have the authority to enforce these Post-Construction Regulations, including to the extent authorized by law the power to levy a fine and issue stop work orders (with or without a penalty) where authorized by law or in equity which is reasonably necessary and appropriate when the Enforcing Official determines that a violation of these Post-Construction Regulations has occurred or is occurring.

- B. The **Enforcing Official** shall have all such rights and powers in interpreting and enforcing these Earthwork Regulations as may be accorded to such officials by law, rule, or regulation.

520 APPEALS

- A. Any Owner who believes that there is an error in any order, requirement, decision or determination of the Enforcing Official in relation to these Post-Construction Regulations may file a written appeal with the Hamilton County Board of Storm Drainage Variances and Appeals not later than fifteen (15) days after the occurrence of the order, requirement, decision or determination concerning lands within the unincorporated area of the County, or to the appropriate designated local council, appellate board, commission or other authority of the municipal corporation concerning lands within a municipality. A copy of the appeal shall be served on the Enforcing Official. The appeal shall proceed and be reviewed in accordance with the rules of the relevant appellate body processing the appeal.

521 PENALTIES

- A. Any Person who knowingly violates any provision of these Post-Construction Regulations shall be subject to such fines, penalties, or other civil or criminal penalties as may be allowable under applicable law. Each day of violation shall be deemed a separate offense during any continuing period of noncompliance.
- B. The imposition of any penalties or the use of other enforcement mechanisms shall not preclude the **Enforcing Official** from instituting an action in a Court of proper jurisdiction to prevent an unlawful development, or to restrain, enjoin, correct, or abate a violation, or to require compliance with the provisions of these Post-Construction Regulations or other applicable laws, ordinances, rules, or regulations, or the orders of the **Enforcing Official** where authorized by applicable law..
- C. A lawfully issued Stop Work Order issued under these Post-Construction Regulations shall remain in effect until (1) all required local, state, and or federal permits are issued, (2) the hazardous condition and/or water quality degradation is remedied to the satisfaction of the **Enforcing Official**, or (3) the faulty work is remedied and executed in full accordance with the Permit and these Post-Construction Regulations, or for such other period as may be allowed by applicable law, rule or regulation.