



**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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501 PURPOSE, SCOPE AND APPLICABILITY

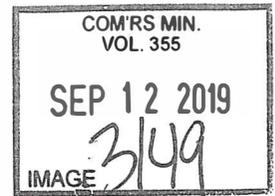
- A. The purpose of these Post-Construction Storm Water Quality Regulations (“Post-Construction Regulations”) is to promote and maintain the health, safety, and welfare of the citizens of Hamilton County by establishing standards for storm water controls that minimize the degradation of the water resources of Hamilton County by:
1. 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 extent practicable;
 2. Protecting the physical, chemical, and biological characteristics of the water resources of Hamilton County; and
 3. 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 HCSWD:
1. Structural and non-structural controls that encourage, where applicable and feasible, the preservation, enhancement, and restoration of:
 - a. Water resources, associated riparian areas, natural drainage patterns, uncompacted soils, vegetation, and other natural resources, including Stream Corridor Protection Zones designated under Article IV of these Regulations.
 - b. Natural infiltration and ground water recharge to maintain subsurface flow and replenish water resources, except in slippage prone soils.
 - c. Stable stream bank and bed conditions within natural or constructed drainage systems and slopes.
 - d. Water resources on or adjacent to the Site through designs that minimize the number of stream crossings and the work area associated with the disturbance.
 2. Post-Construction Controls, associated Pre-Treatment Practices, and Runoff Reduction Practices designed, permitted, constructed, and maintained to manage storm water runoff from newly developed or redeveloped property to reduce impacts to stream channels, stream stability, and water quality.
 3. Incorporate storm water controls into initial layout, Site planning, and design at the earliest possible stage/step in the development process.



- C. Incorporate the use of Post-Construction Controls that serve multiple purposes including, but not limited to, quantity/flood control, erosion control, and water quality protection. 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.



503 COMPLIANCE WITH OTHER LAWS AND DISCLAIMER OF LIABILITY

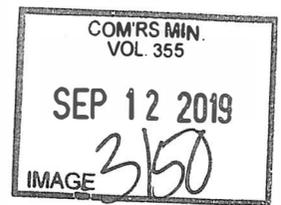
- A. Compliance with these Post-Construction Regulations does not relieve the Owner from the duty to comply with any other federal, state or local laws, regulations or ordinances or from responsibility otherwise imposed by law for damage to any person or property.
- B. Neither the submission, approval, 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 HCSWD, 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 Controls 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.

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 to the **Enforcing Official** addressing the requirements of these



Post-Construction Regulations, receive approval of the Improvement Plan from the **Enforcing Official** prior to submittal of a Notice of Intent (NOI) to Ohio EPA, and provide an Ohio EPA-approved NOI to the **Enforcing Official**.

- C. The Improvement Plan will include many of the elements required by Ohio EPA to be incorporated into the Site Storm Water Pollution Prevention Plan (SWP3) – a stand-alone document containing all information required by the Ohio EPA Construction General Permit Part III.G and these Post-Construction Regulations. An SWP3 must be developed for each site to be covered by this permit. For a multi-phase construction project, a separate NOI shall be submitted when a separate SWP3 will be prepared for subsequent phases.

The SWP3 shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with construction activities. In addition, the SWP3 shall describe and ensure the implementation of storm water controls that reduce the pollutants and impact of storm water discharges during construction and pollutants associated with the post-construction land use. Those permit-required elements that are included in the Improvement Plan may be incorporated by reference into the SWP3.

- D. 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.
- E. The Improvement Plans shall also comply with all drainage, flood control, floodplain management, and related storm water quantity control requirements of the Local Jurisdiction.
- F. 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 HCSWD, the Hamilton County Engineer, the Hamilton County Soil and Water Conservation District (HCSWCD), private engineers, or other technical experts in administering these Post-Construction Regulations.

506 EXEMPTIONS

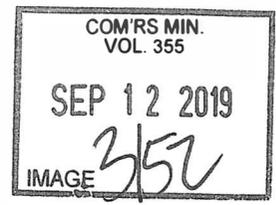
- A. These Post-Construction Regulations do not apply to the following:
1. Activities regulated by the Ohio Department of Natural Resources Animal Waste and Agricultural Pollution Abatement Rules, Ohio Administrative Code Chapter 1501.
 2. Surface mining, strip mining, and abandoned mine reclamation activities regulated by the Ohio Department of Natural Resources;



3. Stream and wetland restoration activities;
 4. Wetland mitigation activities;
 5. Linear construction Sites, such as pipeline or utility line installation, that do not result in the installation of additional impervious surfaces as determined by the **Enforcing Official**, are designed to minimize the number of stream crossings and the width of disturbance, and comply with the requirements of the Earthwork Regulations (Article III of the Rules and Regulations of the HCSWD); and
 6. Other Sites that do not include the installation of an impervious surface.
- B. Application and enforcement of the exemptions under Section 506 "Exemptions" of these Post-Construction Regulations shall be conducted by the **Enforcing Official**.

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. The latest Ohio EPA General Permit Authorization for Storm Water Discharges Associated with Construction Activity under the NPDES (CGP Permit) authorizing storm water discharges associated with construction activity;
 2. The latest applicable Ohio EPA NPDES Permit authorizing storm water discharges associated with industrial activities;
 3. U.S. Army Corps of Engineers permits under Section 404 of the Clean Water Act;
 4. Ohio EPA Section 401 Water Quality Certification General Isolated Wetland Permit and/or non-jurisdictional wetland/stream program approvals;
 5. Ohio Dam Safety Law Section 1501.21 OAC;
 6. Applicable Flood Plain Regulations; and
 7. Applicable ground water protection laws.
- 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 **Enforcing Official** 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.

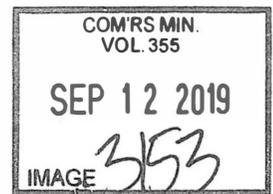
508 SUBMITTAL PROCEDURES

- A. In each case where these Post-Construction Regulations apply, the Owner shall submit an Improvement Plan to the **Enforcing Official** addressing the requirements of 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 **Enforcing Official**, and Local Jurisdiction where applicable, a Notice of Intent (NOI) has been submitted and approved by the Ohio EPA, and an Earthwork and/or Building Permit is issued by the **Enforcing Official**.
- B. Pre-Submittal Meeting: A Pre-Submittal Meeting with the **Enforcing Official** may be requested to discuss the proposed construction for the Site, review requirements, identify unique aspects of the Site construction that must be addressed during the review process, and establish a preliminary review and approval schedule.
- C. Initial Plan: The Owner of a Site shall submit a preliminary or initial plan that illustrates the proposed storm water management approach concept (Initial Plan), and the applicable fees to the **Enforcing Official**. Initial Plans shall show approximate preliminary locations of the proposed parcel boundaries, setbacks, stream protection corridor delineations (if applicable), dedicated open space, and preserved vegetation areas, conservation areas, public roads, water resources, receiving storm water discharge, flood plains, existing topography, on-site and off-site areas vulnerable to erosion and sediment damage, drainage facilities, existing and proposed Post-Construction Controls, 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 Controls are capable of controlling runoff from the Site in compliance with these Post-Construction Regulations. The **Enforcing Official** shall review the Initial Plans and provide comments and recommendations for revisions if any.

An Initial Plan is required:

1. For all subdivisions.
2. For all non-residential development that will disturb one (1) acre of land or more.

For other construction Sites, Initial 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 an Initial 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 an Initial 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:
1. The **Enforcing Official** shall provide approval of Improvement Plans for Post-Construction Controls covered by these Post-Construction Regulations.
 2. The **Enforcing Official** shall issue final approval of Improvement Plans for Post-Construction Controls covered by these Post-Construction Regulations to allow the Owner to submit a complete and accurate NOI to the director of the Ohio EPA at least 21 days prior to the commencement of construction activities.
 3. Earthwork shall not begin and building permits shall not be issued without final approval of Improvement Plans consistent with these Post-Construction Regulations and an authorization to begin construction has been received from the director of Ohio EPA.
- 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 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 for the Site must be re-submitted for review and approval in accordance with rules in effect at the time of re-submittal. Site modifications 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

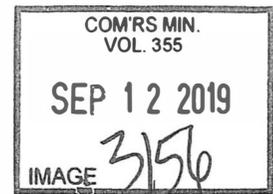
- A. **Storm Water Management:** The Improvement Plans shall describe in detail how the quantity and quality of storm water will be managed within the Site before, during and after construction is complete for discharges from the Site and/or into a water resource. The Improvement Plans shall:
1. Describe in detail, the type, location, and dimensions of each structural and non-structural Post-Construction Controls and storm water management practices – including applicable pre-treatment, outlets, inlets, and associated protection - incorporated into the Site design to address the requirements of these Post-Construction Regulations, and provide the rationale for their selection:
 - a. The rationale must identify how these Post-Construction Controls 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.
 - b. The rationale must demonstrate that these Post-Construction Controls will minimize anticipated impacts on the channel and floodplain morphology, hydrology, and water quality of the water resource and its floodplain.
 2. Include a maintenance agreement and a stand-alone long-term plan for operating, inspecting and maintaining the storm water management facilities serving the site. This plan shall meet all requirements established under Section 516 (G) of this regulation. 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, procedures, calculation worksheets, and drawing templates that provide guidance for designing the storm water management system for the Site, including a description of acceptable Post-Construction Controls that meet the criteria of these Post-Construction Regulations. HCSWD and/or the **Enforcing Official** may allow use of design criteria, procedures, calculation worksheets, and drawing templates from the Ohio EPA's Rainwater and Land Development Manual (RLDM) where not in conflict with these Post-Construction Regulations and/or other applicable regulations. The design manual, procedures, calculation worksheets, and drawing



templates may be updated from time to time based on improvements in engineering, science, monitoring, and local maintenance experience.

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 Site Name, the boundary of the 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 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, specifications and/or an attached narrative report:
 - a. The Name and the location of the Site, 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 construction support activities).
 - e. Tables showing the on-site and off-site catchments tributary to the Erosion and Sediment Pollution Controls and Post-Construction Controls for each construction phase including construction start, construction completion, and any significant points during construction where drainage patterns/components change significantly. Each catchment listed on the table shall be delineated on the Site Map(s) required per Section 510 (D)(3) of Article V Post-Construction, including catchments tributary to each Erosion and Sediment Pollution Control (per Section 310 of Article III Earthwork Regulations), and Post-Construction Control (per Section 510 of Article V Post-Construction Regulations), storm water conveyance



facility, and storm water detention facility under both pre-construction and post- construction site conditions (per the storm water quantity control regulations of the Local Jurisdiction).

Each Table shall provide the following information:

- i. A measure of the on-site and off-site catchment area;
- ii. A measure of the existing impervious area;
- iii. A measure of the impervious area to be constructed by the Owner;
- iv. An estimate of the impervious area that may be constructed by subsequent Owners under current zoning; and
- v. The overall imperviousness of the catchment.

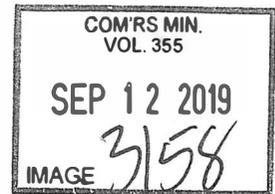
The tables, Project Site Map(s) and associated Improvement Plans will need to be modified or supplemented if changes in drainage areas and/or impervious areas affect the size of Erosion and Sediment Pollution Controls, and/or Post-Construction Controls.

- f. Existing data describing the soils throughout the Site, including the soil series, soil association, and hydrologic soil group. At the request of the **Enforcing Official**, additional geotechnical data to support the design of each proposed Erosion and Sediment Pollution Control and Post-Construction Control whose effectiveness depends upon Site-specific data about the porosity, infiltration characteristics, depth to groundwater, depth to bedrock, and any impermeable layers may be required.
- g. Existing data, if available, describing the quality of any discharge from the Site as well as a description or other documentation of the condition of any on-site streams.
- h. A description of prior land uses at the Site. (e.g., zoning, land use codes).
- i. A description of the methods, locations, size and extent of practice used to preserve, enhance, and/or restore natural conditions as much as feasible, including but not limited to desired vegetation; permeable, uncompacted soil profiles and topsoil; designated tree preservation areas; protective grubbing and clearing practices; and suitable locations and types of Runoff Reduction Practices.
- 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, including the phasing of construction operations to minimize disturbed land at any one time.

- 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 features at or near the Site which will be disturbed or which will receive discharges from disturbed areas of the Site.
 - l. Location and description of any storm water discharges associated with asphalt and concrete plants on or contiguous with the Site III.G.1.h and dedicated to Site construction, and the best management practices to address pollutants in these storm water discharges.
3. Project Site Map(s): One or more Site maps 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 construction, 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 Site boundary and shall indicate for that area, at a minimum the following:
- a. Limits of Earthwork on the Site for each phase of construction, including any off-site borrow or spoil areas.
 - 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, areas with known contaminated soils; and/or areas where soils will be protected, enhanced, or restored.
 - c. Existing and proposed two-foot (2') contours, unless Site conditions require more detailed topography to depict Site drainage conditions.
 - d. Drainage patterns, location of Erosion and Sediment Pollution Controls, new and existing Post-Construction Controls and associated Pre-Treatment Practices and 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 for the Site. Also include locations of existing and planned drainage features to include, but not limited to, catch basins, culverts, ditches, swales, surface inlets and outlet structures.

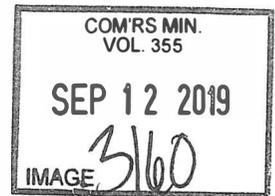


- e. A delineation of on-site and off-site drainage catchments tributary to each storm water management control present during each phase of construction, including before, during, and after major grading activities as well as the total off-site and on-site size of each drainage watershed in acres, and the pre-construction and post-construction runoff coefficient for each area.
 - f. Location of existing and proposed utilities including appurtenances, structures and outfalls. The approximate depths of all utilities shall be indicated.
 - g. Water resource locations including known springs, wetlands, streams, lakes, water wells, and locations of delineated associated Stream Corridor Protection Zones as defined under the Stream Corridor Regulations (Article IV of the Rules and Regulations of the HCSWD).
 - h. Other setbacks, conservation easements or areas designated as open space, preserved vegetation, or otherwise protected from earth disturbing activities on or within 200 feet of the Site, and a description of any associated temporary or permanent fencing or signage designating the boundary of these areas.
 - i. The location of any in-stream activities including known temporary or permanent stream crossings, floodplain fill, floodplain excavation, and stream restoration, 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.
 - j. Existing and proposed locations of buildings, roads, and parking facilities.
 - k. Existing and proposed property boundaries, and individual lot numbers.
 - l. 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.
 - m. On-site and off-site areas vulnerable to erosion and sediment damage.
 - n. Areas designated for the storage or disposal of solid, sanitary, and toxic wastes, including dumpster areas, areas designated for cement truck washout, and vehicle fueling.
 - o. The location of designated construction entrances where the vehicles will access the construction site.
4. Detailed drawings shall be provided for each Post-Construction Control and associated Pre-Treatment Practice and Runoff Reduction Practice to be



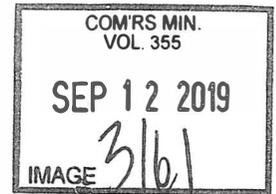
employed on the Site. Each detailed drawing shall be to scale with dimensions and elevations, showing storage volumes, sizes of contributing drainage areas, outlet details – plan and profile views, drain times, outlet protection devices, and velocity dissipation devices/practices. The use of Ohio EPA data sheets is recommended (see Ohio's Rainwater and Land Development manual and Ohio EPA resources for examples).

5. Calculations: Calculations shall be presented as a separate report provided with the Improvement Plans for projected storm water runoff flows, volumes, and timing into and through all Post-Construction Controls and associated Pre-Treatment Practices, and Runoff Reduction Practices. Calculations shall address the following topics:
 - a. Each calculation shall describe 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.
 - b. 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 Site.
 - c. An investigation of immediate downstream conditions as defined by the **Enforcing Official** is required to support development of a rationale for Post-Construction Control selection addressing anticipated impacts on the water resource and floodplain morphology, hydrology, and water quality. If the downstream property owner(s) refuse to allow access a letter must be submitted by the downstream property owner(s) stating the refusal.
 - d. Storm water calculations shall include the area weighted volumetric runoff coefficients and resulting water quality volume (WQv) under both pre-construction and post-construction Site conditions and resulting WQv for the catchment tributary to an Erosion and Sediment Pollution Control (per section 310 of the Article III Earthworks Regulations), and Post-Construction Control (per Section 510 of Article V Post-Construction Regulations), storm water conveyance facility,
 - e. Soil and subsurface conditions, including tests of infiltration rates for native, amended, and restored soils; borings or equivalent data indicating seasonal high groundwater levels, top of bedrock elevations, and perched groundwater elevations; and an assessment of the suitability of soil and subsurface conditions.
 - f. Specifications for materials used to construct each Post-Construction Control, including vegetation, amended/restored soil composition,



bioretention media and structural materials.

- g. If applicable, an explanation of the use of existing Post-Construction Controls including documentation of ability to meet current water quality and quantity requirements and provision for long-term maintenance.
 - h. Identification of any proposed Alternative Post-Construction Controls – those practices not identified in Article V, Table 510-B – with a rationale for their selection; all related information required under Article III, Section 309.D including calculations and detailed drawings; and that meet the minimum treatment criteria and testing requirements in Article V, Section 511.
 - i. Post-Construction Control operations and maintenance requirements during and after construction.
 - j. Any supplemental information requested by the **Enforcing Official**.
 - k. The **Enforcing Official** may require calculations to be presented in specific formats and/or incorporated into spreadsheets with embedded, pre-checked calculations to facilitate **Enforcing Official** review and Ohio EPA approvals.
6. 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.
7. Inspection and Maintenance Plan: An Inspection and Maintenance Plan (I&M Plan) shall be prepared for the Post-Construction Controls designed and constructed on the property. Such I&M Plans shall include all Post-Construction Controls, associated Pre-Treatment Practices, and Runoff Reduction Practices; and shall address the inspection and maintenance frequency and all other requirements listed in Section 516 Maintenance And Inspections of these Post-Construction Regulations.
- E. Substantial 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 or is likely to have a significant effect on the design or maintenance of a Post-Construction Control, Pre-Treatment Practice, or Runoff Reduction Practice. 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:

1. All components of the storm water system 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. The components must include:
 - a. All Runoff Reduction Practices.
 - b. Post-Construction Controls and associated Pre-Treatment Practices.
 - c. Storm water collection, conveyance and detention facilities.
2. Integrated Practices that Minimize Degradation of Water Resources: The Controls shall function as an integrated system that controls flooding within, upstream, and downstream of the Site, and minimizes degradation of the water resources receiving storm water discharges from the Site, as defined in Section 501(B) of these Post-Construction Regulations. 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 WQv' s 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. 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. Post-Construction Controls that will be located within an individual lot must be shown on the Improvement Plan and comply with all applicable requirements of these regulations to be accepted by the **Enforcing Official**.
4. Earthwork Controls: Erosion and Sediment Pollution Controls 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 Controls are installed, operational, and demonstrated to function as designed.

5. Performance Compliance Documentation: Improvement Plans shall clearly document through drawings, specifications, narrative, and calculations how the design addresses each applicable performance standard in this section.

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 an existing Post-Construction Control meets the requirements of these Post-Construction Regulations, or
2. If the storm water quality management requirements for treating the WQv from the Site are provided by practices in a regional or local storm water management plan approved by the **Enforcing Official** and a legal agreement is established through which the regional control owner agrees to provide this service in the long term. Design information for such facilities such as contributing drainage areas, capacities, elevations, outlet details and drain times shall be included in the Improvement Plan. The regional practice must be demonstrated to address its associated portion of the Site WQv.

C. Water Quality Volume (WQv) and Runoff Reduction Volume Calculations

1. A WQv shall be calculated for each storm water control practice (i.e., Post-Construction Controls, associated Pre-Treatment Practices, and Runoff Reduction Practices) according to one of the following methods:
 - a. A site hydrologic study approved by the **Enforcing Official** that determines the volume necessary to capture and treat 90 percent of the average annual runoff volume using continuous hydrologic simulation; site-specific hydrologic parameters, including impervious area, soil infiltration characteristics, slope, and surface routing characteristics; proposed Controls controlling the amount and/or timing of runoff from the site; and local long-term hourly records, or
 - b. Use of the following equation:

$$WQ_v = R_v * P * A / 12 \quad \text{(Equation 1)}$$

where terms have the following meanings:

WQ_v = water quality volume in acre-feet

P = 0.9-inch precipitation depth

A = area draining to/raining on the storm water control practice, in acres



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

County Zoning District (or Equivalent)		Imperviousness Fraction	Volumetric Runoff Coefficient (Rv)
Name	Characteristics		
----	Parks, cemeteries, golf courses, lawns, playgrounds or unimproved land	0.05	0.10 0.08
"AA"	Residence District > 43,561 sq. ft. lot	0.20	0.23 0.17
"A"	Residence District 17,501 to 43,560 sq. ft. lot	0.25	0.28 0.20
"A-2"	Residence District 12,001 to 17,500 sq. ft. lot	0.33	0.35 0.24
"B"	Residence District 9,001 to 12,000 sq. ft. lot	0.45	0.46 0.34
"B-2"	Residence District 6,001 to 9,000 sq. ft. lot	0.58	0.57 0.40
"C"	Residence District 5,001 to 6,000 sq. ft. lot	0.65	0.64 0.45
"D"	Residence District up to 5,000 sq. ft. lot	0.75	0.73 0.54
"DD"	Planned Multiple Residence District	0.80	0.77 0.60
"O"	Office District	0.85	0.82 0.66
"OO"	Planned Office District	0.85	0.82 0.66
"E"	Retail Business District	0.85	0.82 0.66
"EE"	Planned Business District	0.85	0.82 0.66
"EF"	Excavation and Landfill District	0.10	0.14 0.11
"F"	Light Industrial District	0.88	0.84 0.70
"FF"	Planned Light Industrial District	0.92	0.88 0.76
"FPM"	Flood Plain Management District	Established on Case-by-Case Basis	
"G"	Heavy Industrial District	0.95	0.91 0.84
"GG"	Planned Heavy Industrial District	0.95	0.91 0.84
"H"	Riverfront District	Established on Case-by-Case Basis	

Rv = the volumetric runoff coefficient,

Where

$$Rv = 0.05 + 0.9*i \quad \text{(Equation 2)}$$

i = fraction of post-construction impervious surface

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.



2. Storm Water Management on Previously Developed Sites:

- a. Sites that have been previously developed, paved or built upon and where no Post-Construction Controls were installed are required to provide one or a combination of the following two conditions:
 - i. A 20 percent net reduction of the site's volumetric runoff coefficient impervious area with soil restoration or replacing impervious roof area with green roofs area (for these purposes green roofs shall be considered pervious surface).
 - ii. Treatment of at least 20 percent of the WQv for the previously developed area using a practice meeting **Table 510-C** criteria.

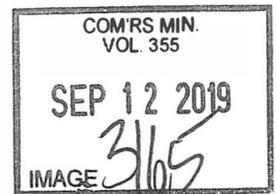
- b. Where there is a combination of redeveloped areas and new development, a weighted approach shall be used with the following equation:

$$WQv = P * A * [(Rv_1 * 0.2) + (Rv_2 - Rv_1)] / 12 \quad \text{(Equation 3)}$$

Where

P= 0.90-inch precipitation depth
A= Area draining into the control, in acres
Rv₁= volumetric runoff coefficient for existing conditions (current site impervious area)
Rv₂= volumetric runoff coefficient for proposed conditions (post-construction site impervious area)

- c. Where a Site includes one or more properties that do not contain previous development, then these properties shall be considered new development and the total WQv must be calculated through a weighted average based on area of Equation 1 (for the properties considered new developed) and Equation 3 (for the properties considered previous development).
- d. The drainage area tributary to a Post-Construction Control for previous development shall be a fraction of the total area of the previous development located to treat impervious area most likely to generate the highest pollutant load, such as parking lots or roadways, rather than areas predicted to be cleaner such as rooftops.
- e. Local communities or sanitary sewer districts may establish a larger percentage of the WQv for previously developed sites if necessary to meet combined sewer overflow objectives or other storm water management objectives of the community.
- f. 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 previously developed Sites.

3. Flow-Through Design Storm Water Control Practices:

- a. Certain storm water control practices utilize treatment processes such as filtering or centrifugal separation rather than a detention and settling volume. These control practices must be designed to ensure treatment of 90 percent of the average annual runoff volume. For the design of these control practices, the water quality flow rate (WQ_f) considered equivalent to the WQ_v shall be determined utilizing the Rational Method (Equation 4) with an intensity (i) appropriate for the water quality precipitation event and the time of concentration (t_c) of runoff to the control practice, determined using the table given in Appendix C of the latest version of Ohio EPA's Construction General Permit:

$$WQ_f = C * i * A \quad \text{(Equation 4)}$$

where

WQ_f = Water Quality Flow Rate in cubic feet per second (cfs)
 C = Rational Method Coefficient of Runoff
 i = Intensity for the t_c to the Alternative control (in/hr.)
 A = Area draining to the control practice (acres)

- b. The **Enforcing Official** may allow certain flow-through stormwater control practices to be used as Alternative Post-Construction Controls, Pre-Treatment Practices, or Runoff Reduction Practices. Such practices may include, but are not limited to: vegetation swales, vegetated filter strips, hydrodynamic separators, high-flow media filters, cartridge filters, membrane filters, subsurface flow wetlands, multi-chamber treatment trains, road shoulder media filter drains, and wetland channels.

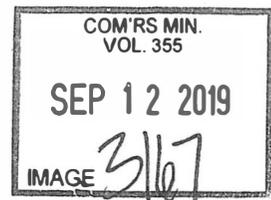
D. Criteria Applying to Preservation/Conservation of Natural Conditions:

1. Designation of and Integration with Stream Corridor Protection Zones: A Stream Corridor Protection Zone shall be delineated and appropriately managed for every waterbody adjacent to and/or lying within the Site according to criteria in the Stream Corridor Regulations (Article IV of the Rules and Regulations of the HCSWD). The following additional criteria shall be followed to integrate the Stream Corridor Protection Zone and the Post-Construction Controls:
- a. Post-Construction Controls in Water Resources: Post-Construction Controls 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



Control 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).

- b. Storm water discharges from the Site must flow into and through Post-Construction Controls designed according to these Post-Construction Regulations prior to entering a Stream Corridor Protection Zone.
 - c. The **Enforcing Official** may determine that the Stream Corridor Protection Zone is the only practical Post-Construction Control 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 all other applicable county or local municipal rules and regulations.
 - d. Pipes or ditches discharging storm water from a Post-Construction Control may pass through the Stream Corridor Protection Zone if adequately stabilized from erosion using Post-Construction Erosion Control Practices. Sites must be graded in a manner that maximizes sheet flow through any Stream Corridor Protection Zone designated as the Post-Construction Control for this portion of the site.
2. Preservation, Enhancement, and Restoration of Existing Natural Drainage, Soils and Vegetation: Practices that preserve, enhance, or restore existing natural drainage, soils or vegetation shall be used to the extent practicable.
- a. All areas designated for resource protection shall be designated on the Improvement Plan and clearly marked in the field with fencing or other appropriate methods. Resource protection 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. • Soil Preservation and Post-Construction Soil Restoration: To the extent practicable leave native soil undisturbed and protect from compaction during construction. Except for areas that will be covered by impervious surface or where infiltration must be limited due to unstable slopes and/or contaminated soils, the soil moisture-holding capacity of areas that have been cleared and graded must be restored to that of the original, undisturbed soil to the extent practicable. Areas that have been compacted or had the topsoil or duff layer removed should be amended using the following steps:
 1. Till subsoil to a depth of 15-18 inches;



2. Incorporate compost through top 12 inches; and
 3. Replace with stockpiled site or imported suitable topsoil to a minimum depth of 4 inches.
- c. The Improvement Plan shall include a planting plan for vegetation that will be restored within the Site, with rationale for the selection of the vegetation, its storm water management benefits, and its long-term maintenance and sustainability requirements. Particular attention will be given to restoration of vegetation within areas designated under Article IV as Stream Corridor Protection Zones.
 - d. The physical, biological, geomorphic, and hydraulic function of impaired water resources and associated floodplain storage within the Site shall be restored where practicable. The Improvement Plans will designate such areas and provide grading plans and adequate details to support such measures and facilitate review by the **Enforcing Official**.
3. Integration with Storm Water Quantity Conveyance Design Criteria: All Post-Construction Controls and associated Pre-Treatment Practices 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 Controls 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 Controls:
- a. Conveyance into a Post-Construction Control: The surface and subsurface storm water quantity conveyance system for the site shall direct storm water less than or equal to the WQv into one (1) or more Post-Construction Controls prior to discharge into any water resource or into off-site county, township or municipal owned/operated storm water conveyance systems.
 - b. Storm Water in Excess of the WQv: Flows in excess of the WQv shall either be diverted around the Post-Construction Controls or shall safely pass through the Post-Construction Control without re-suspending the accumulated pollutants to a level that reduces the Post-Construction Control's average annual pollutant removal capability.
 - c. 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 Control or, if this is not possible, the Post-Construction Control shall be sized to treat all off-site incoming flow. Diversion of storm water runoff around a site or Post-Construction Control shall not contribute to increases in flows, erosion, or water quality problems



downstream.

4. Post-Construction Runoff Control Practices: Practices or features (e.g., level spreader, vegetated or rock-lined channels, rock outlet protection, energy dissipation structures, terrace drainage, subsurface drainage systems) shall be employed throughout the site's drainage system and at each inlet to a Post-Construction Control in order to provide non-erosive flow velocity from the structure to a water resource according to applicable criteria contained county or equivalent local municipal regulations.

5. General Requirements for Runoff Reduction Practices: The WQv used to size Post-Construction Controls may be reduced by incorporating Runoff Reduction Practices (**Table 510-B**) into the design of the site's surface and subsurface drainage system:

Table 510-B. Runoff Reduction Practices & Associated Drain (Drawdown) Times

Runoff Reduction Practice	Drain Time of WQv		Runoff Reduction Credit (% of WQv _{RR})
	Minimum	Maximum	
Impervious surface disconnection	N/A	48 hours	TBD
Rainwater harvesting and reuse	N/A	48 hours	Min (V_{RR} / WQv_{RR} , 100%)
Vegetated Swales: Detention Design	24-hours	48 hours	Min (V_{RR} / WQv_{RR} , 100%)
Vegetated Swales: Flow Through	1	N/A	22% 11%
Vegetated Strips: Turf Grass	24 hours	48 hours	72% 36%
Vegetated Strips: Conservation Areas			100% 53%
Vegetated Roof	24 hours	48 hours	Min (V_{RR} / WQv_{RR} , 100%)
Partial Infiltration	24 hours	48 hours	Min (V_{RR} / WQv_{RR} , 100%)
Notes:			
1. 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.			



- a. A Runoff Reduction Volume shall be calculated as a fraction of the water quality volume draining into and/or raining upon each Runoff Reduction Practice (WQv_{RR}) based on the water retention properties of the Practice:

$$RRv = WQv_{RR} * RR_{Credit} \quad (\text{Equation 5})$$

where

- RRv = Runoff Reduction Volume, acre-feet
 WQv_{RR} = Water quality volume draining into and/or raining onto the Runoff Reduction Practice, acre-feet
 RR_{Credit} = Fraction of the WQv_{RR} retained by the Runoff Reduction Practice (%)

The RR_{Credit} is determined for a Runoff Reduction Practice using the equation or value listed on **Table 510-B**. V_{RR} in the equation is defined as:

$$V_{RR} = \text{Volume retained by the Runoff Reduction Practice, acre-feet}$$

- b. Additional guidance for determining the Runoff Reduction Volume may be found in the RLDM, Storm Water Design Manual prepared by HCSWD or the **Enforcing Official** under Section 509(C) of these Regulations, or an alternative methodology proposed by the Owner and approved by the **Enforcing Official**.
- c. The **Enforcing Official** may approve use of Runoff Reduction Practices as a Post-Construction Control for areas of the site not draining into a common drainage system of the site (e.g., sheet flow from perimeter areas such as the rear yards of residential lots, low density development scenarios, areas draining through a stream corridor protection area established under Article IV of these regulations). The Improvement Plans shall demonstrate that the intent of pollutant removal and stream protection is being addressed by the selected Runoff Reduction Practices.
6. Additional Criteria Applying to Rainwater Harvesting and Reuse Runoff Reduction Practices:
- a. Pre-Treatment Practices shall be provided in advance of the Rainwater Harvesting system to manage any first flush pollutants generated by the collection area.
- b. The Runoff Reduction Volume credited to a Rainwater Harvesting System must be fully available within 48 hours after the end of the precipitation event. A water budget shall be included with the Improvement Plans and the Inspection and Maintenance Plan to support these volume use and draw down time criteria.



7. Additional Criteria Applying to Swale and Strip Runoff Reduction Practices:

- a. Swales/strips designed according to the detention design drain time criteria shall:
 - i. 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.
 - ii. 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 an HSG A or B soil and an underdrain system is provided.
- b. Swales/strips designed according to the flow through design drain time shall:
 - i. Only be allowed on sites where the total tributary area to the swale is 5 acres or less.
 - ii. 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.
 - iii. Be lined with fine turf-forming, flood tolerant grasses or other approved vegetation able to effectively remove pollutants as water flows through it.
 - iv. Swales should have a trapezoidal cross-sectional shape with a 4-foot to 8-foot bottom width and a minimum side slope of 3:1.
 - v. Swales receiving all or 90% of their inflow from a single inlet at the top of the swale shall be a minimum of 50 feet in length. Swales receiving flow along one or both edges shall be a minimum of 100 feet in length such that the average flow length is 50 feet.
- c. Use a level spreader or similar device to convert concentrated runoff to sheet flow before entering the swale/strip.

8. Additional Criteria Applying to Vegetated Roof Runoff Reduction Practices:

- 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 appropriate storm water conveyance system.



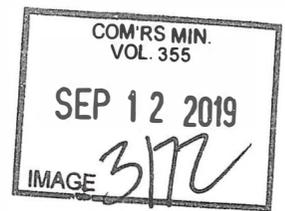
- b. The vegetated roof shall be underlain by a waterproof membrane, root barrier, and drainage layer, protected by protection boards or materials composed of soft fibrous materials.
- c. Roof supports shall be designed to support the saturated weight of vegetated roof in addition to meeting all applicable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

9. Additional Criteria for Partial Infiltration Runoff Reduction Practices:

- a. An infiltration practice listed on **Table 510-C** that is unable to meet the entire required maximum drawdown times may be used as a Runoff Reduction Practice if approved by the **Enforcing Official**.
- b. The Runoff Reduction Credit of a Partial Infiltration Runoff Reduction Practice equals the percentage of the WQv that may be infiltrated during the maximum drawdown time in **Table 501-C**.
- c. Partial Infiltration Runoff Reduction Practices may be proposed at any appropriate location within the Site and associated Post-Construction Controls, including within the footprint of an extended detention Post-Construction Control. Final approval of a Runoff Reduction Practice is at the discretion of the **Enforcing Official**.
- d. When a Partial Infiltration Runoff Reduction Practice is proposed, one of the following options may be considered to maximize runoff reduction while meeting the requirements of these Post-Construction Regulations:
 - i. Bioretention areas/cells without underdrains, created by adding soil amendments to increase surface infiltration rates, designed according to Section 510(F) of these Post-Construction Regulations.
 - ii. A combined infiltration/extended detention practice with an extended detention outlet placed at an elevation that allows a portion of the WQv to infiltrate into the ground within the maximum subsurface drain time and the remainder of the WQv to discharge through the extended detention outlet in no less than the minimum subsurface drain time. The extended detention storage may be placed on the surface and/or in an underground chamber with an underdrain.

E. Criteria Applying to all Post-Construction Controls and Associated Pre-Treatment Practices:

- 1. Post-Construction Controls Designed for Final Use: Post-Construction Controls shall be designed to achieve the purpose and intent 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.

2. Direct Runoff to a Post-Construction Control: Runoff from all areas disturbed during construction shall be directed to one or more Post-Construction Controls and associated Pre-Treatment Practices designed in accordance with the performance standards in this section.
3. The Post-Construction Controls listed in **Table 510-C** are considered standard Controls approved for general use. Post-Construction Controls 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-C** of these Post-Construction Regulations.
4. The Post-Construction Controls chosen must be sized to treat 100% of the WQv associated with their contributing drainage area, less any Runoff Reduction Volume attributable to the Runoff Reduction Practices upstream of the Post-Construction Control, and to ensure compliance to the 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.



Table 510-C: Post-Construction Controls & Associated Drain (Drawdown) Times

Extended Detention Practices	Drain Time of WQv		
	Minimum	Maximum	
<ul style="list-style-type: none"> ▪ Dry Extended Detention Basins^{1,2,3} ▪ Wet Extended Detention Basins^{1,2,4} ▪ Constructed Extended Detention Wetlands^{1,2,4,5} ▪ Permeable Pavement with underdrain^{1,2,6} ▪ Underground Storage with underdrain^{1,2,6,7} 	48 hours 24 hours 24 hours 24 hours 24 hours	72 hours 48 hours 48 hours 48 hours 48 hours	
Infiltration Practices	Maximum Drain Time of WQv		
	Surface	Subsurface	
<ul style="list-style-type: none"> ▪ Bioretention Area/Cell, no underdrain^{2,7,8} ▪ Infiltration Basin, no underdrain^{2,9} ▪ Infiltration Trench, no underdrain^{2,9,10} ▪ Permeable Pavement, no underdrain^{2,9,10} ▪ Underground Storage, no underdrain^{2,9,10,11} 	24 hours 24 hours 24 hours 2 hours N/A	48 hours 48 hours 48 hours 48 hours 48 hours	
Filtration Practices	Drain Time of WQv		
	Surface	Subsurface	
	Maximum	Minimum	Maximum
<ul style="list-style-type: none"> ▪ Sand and Other Media Filtration with underdrain^{1,2,6} ▪ Bioretention Area/Cell with underdrain^{1,2,6,8} 	12 hours 24 hours	24 hours 36 hours	48 hours 48 hours

Notes- The following criteria and those additional criteria listed throughout Section 510(E) of these Regulations apply to specific Post-Construction Controls:

1. The outlet structure shall not discharge more than the first half of the WQv in less than one-third of the drain time.
2. A Pre-Treatment Practice, designed according to the criteria listed in Section 510(E)(5) shall be located at every point where storm water enters a Post-Construction Control. Underground storage systems with infiltration must have adequate pretreatment of suspended sediments included in the design to minimize clogging of the infiltrating surface. This pretreatment shall concentrate sediment in a location where it can be readily removed.
3. Dry basins must include a forebay and a micropool each sized at a minimum of 0.1 x WQv, or include acceptable pretreatment and a protected outlet.
4. Provide a permanent wet pool with a minimum volume equal to the WQv and an extended detention volume above the permanent pool equal to 1.0 x WQv.
5. Constructed Extended Detention Wetlands must have a permanent wet pool equal to the WQv, with 25% of the WQv in a pool and 75% in marshes.
6. The underdrain shall be sized with a restricted outlet to achieve the minimum drawdown time.
7. Pretreatment of non-infiltrating underground storage systems must be 50% effective in capturing total suspended solids using the protocols established for the Alternative Post-Construction Control Testing Protocol – or for systems that have demonstrated testing by the NJDEP.
8. Bioretention soil media shall have a permeability that retains sufficient moisture to sustain vegetation within the facility while achieving the maximum surface drain time listed in Table 510-B. Meeting the soil media specifications in a Storm Water Design Manual approved by HCSWD and/or the **Enforcing Official** under Section 509 (C) is considered compliant with this requirement. Bioretention cells must have underdrains unless in-situ conditions allow for the WQv (surface ponding) plus the bioretention soil (to a depth of 24 inches) to drain completely within 48 hours.
9. Infiltrating practices with the WQv stored above ground (bioretention, infiltration basin) shall fully drain the WQv within 24 hours to minimize nuisance effects of standing water and to promote vigorous communities of appropriate vegetation.
10. Subsurface practices designed to fully infiltrate the WQv (infiltration trench, permeable pavement with infiltration, underground storage with infiltration) shall empty within 48 hours to recover storage for subsequent storm events.
11. For infiltrating underground systems, pretreatment shall be 80% effective at capturing total suspended solids according to the testing protocol established in the Alternative Post-Construction Control Testing Protocol or for systems that have demonstrated testing by the New Jersey Department of Environmental Protection.

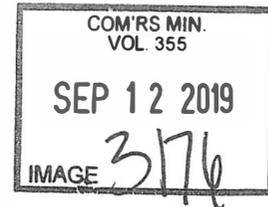


5. Pre-Treatment and Floatable Control:
 - a. Pre-Treatment Practices shall be employed at each inlet to a Post-Construction Control and may be placed at other locations within the Site, where practicable, to prevent floating materials and coarse sediment, such as litter, debris, trash, oil, and yard waste, from discharging into a Post-Construction Control.
 - b. Pre-Treatment Practices are intended to preserve the infiltration and storage capacity of the Post-Construction Control, increase its functional life, prevent scour/erosion at inlet structures, and simplify removal of collected sediment, debris and other materials.
 - c. Acceptable Pre-Treatment Practices include:
 - i. Forebays and micropools;
 - ii. Vegetated swales;
 - iii. Vegetated filter strips (sheet flow runoff only);
 - iv. Manufactured treatment devices; and
 - v. Deep sump trap or catch basin.
 - d. Pre-Treatment Practices shall be at least 50% effective at capturing average annual total suspended solids loads (or 80 % effective when used in association with an underground storage infiltration practice).
6. An additional volume for sediment storage equal to 20% of the WQv shall be incorporated into the Post-Construction Control and/or associated Pre-Treatment Practices.
7. Written documentation shall be provided in the Improvement Plans per Section 509 describing the Post-Construction Controls and associated Pre-Treatment Practices that will be installed during construction for the site, the rationale for the selection of each Post-Construction Control and associated Pre-Treatment Practices, and how each Post-Construction Control will minimize anticipated impacts on the channel and floodplain morphology, hydrology, and water quality.
8. Infiltration Practice Post-Construction Controls 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.
9. An as-built landscaping plan based on field observation shall be prepared for each vegetated Post-Construction Control to define vegetation that is sustainable



under the anticipated frequency of inundation within the Control.

10. Each Post-Construction Control and associated Pre-Treatment Practice 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 Control/Pre-Treatment Practice designed for sediment accumulation.
 - c. Portions of Post-Construction Controls/Pre-Treatment Practices 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.
 - d. Post-Construction Controls shall be provided with an emergency drain, where practicable, so that they 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 Controls 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. Post-Construction Controls/Pre-Treatment Practices shall be designed, where feasible, to incorporate provisions for mosquito management.
 - f. The **Enforcing Official** may require that additional design features be incorporated into the Post-Construction Control/Pre-Treatment Practices as necessary to assure that the facility is properly maintained and addresses public safety concerns.
11. Freeboard requirements for Post-Construction Controls: Where applicable, Post-Construction Controls must provide a minimum of one (1) foot freeboard above the projected peak stage within the Post-Construction Control facility.
12. Each Post-Construction Control/Pre-Treatment Practice 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.
13. Permeable pavements incorporated into Post-Construction Control 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 an underdrain with a controlled extended detention 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 and/or be discharged through an underdrain. Runoff from unvegetated pervious areas surrounding permeable pavement systems must receive pretreatment prior to draining onto the pavement in order to minimize sediment loading.

F. Additional Criteria for Extended Detention Practice Post-Construction Controls:

1. The following additional criteria shall apply to Dry Extended Detention Basins, Wet Extended Detention Basins, and Constructed Extended Detention Wetlands:
 - a. The tributary drainage area 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.
 - b. A forebay designed to allow larger sediment particles to settle shall be placed at each basin inlet, unless an alternative Pre-Treatment Practice is approved by the **Enforcing Official**. The total forebay volume shall be equal to at least 10% of the 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.
 - c. Acceptable alternatives for pretreatment of extended dry detention basins include grass swales, grass filter strips, manufactured treatment devices, deep sump basins or traps and dry forebays. Note that some devices, while acceptable, may require frequent maintenance to remain functional.

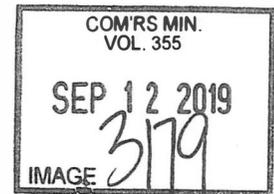
Maintenance requirements for these pretreatment practices should be included in the inspection and maintenance plans.

2. The primary outlet of a Dry Extended Detention Basin must be provided with protection from blockage by silt or debris. A micropool sized at a minimum of 0.1 x WQv, designed to minimize aesthetic and other impacts associated with sediment and debris accumulation and saturated soils, is considered an acceptable outlet protection practice. An alternative means of outlet protection may be used if approved by the **Enforcing Official**.
3. Additional Criteria applying to Wet Extended Detention Basins and Constructed Extended Detention Wetlands:
 - a. Include a permanent pool with a minimum volume equal to the WQv and an extended detention volume above the permanent pool equal to 1.0 x WQv.



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 25 percent of the permanent pool volume, plus the portion of the sediment storage volume not provided by a pretreatment practice, 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 Extended Detention Wetland shall consist of marshes. Dry weather depths in marshes (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 marsh.
 - d. The bottom of the permanent pool between the deep-water zone and the marsh shall be sloped no steeper than 4 (H) to 1 (V).
 - 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.
8. Additional Criteria Applying to Underground Detention/Storage Structures:
- a. Should include a separate sediment basin with access to simplify cleanout.
 - b. Must include regional pretreatment verified to achieve 50% TSS removal and be designed to treat water quality flow.
9. Additional Criteria Applying to Extended Detention Outlets:
- The extended detention outlet shall be designed according to the following criteria to achieve the drawdown time requirements and minimize clogging, vandalism, and maintenance:
- a. The outlet structure shall not discharge more than the first half of the WQv in less than one-third of the drain time.
 - b. A perforated pipe underdrain may be provided beneath the extended

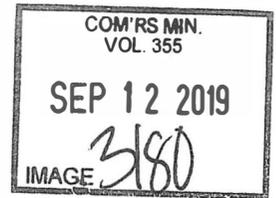


detention volume with an extended detention outlet, a minimum grade of 0.5 percent, a diameter of four (4) or six (6) inches, and granular backfill of durable No. 57 aggregate up to a minimum of four (4) inches above the outside diameter of the pipe.

- c. Underdrains shall be sized with a restricted outlet to achieve minimum drawdown time requirements.
- d. If a single orifice outlet is used as the water quality outlet for Dry Extended 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.
- e. For Wet Extended Detention Basins, Constructed Extended Detention Wetlands, and Dry Extended 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.
- f. If a perforated riser and/or horizontal perforated pipe 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.
- g. The **Enforcing Official** will consider alternative outlet designs if supporting calculations and documented implementation experience is provided to demonstrate that the proposed outlet will achieve the intent of these Post-Construction Regulations.

G. Additional Criteria Applying to Infiltration Practices:

- 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.
- 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.



H. Additional Criteria Applying to Filtration Practices:

1. The following additional criteria shall apply to sand or other media filters, bioretention areas/cells, and other surface or subsurface media filters:
 - a. Filtration practices 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 practice 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, filter strips, 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.
 - 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 1 to 4 inches per hour (2 to 8 feet per day). 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 areas/cells 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 areas/cells 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 with an extended detention outlet, a minimum grade of 0.5 percent, a diameter of four (4) or six (6) inches, and granular backfill of durable No. 57 aggregate up to a minimum of four (4) inches above the outside diameter



of the pipe.

- g. An overflow and/or bypass designed to convey all storms larger than the WQv up to and including the 100-year event shall be provided. Use of a vertical stand pipe or catch basin is recommended.

I. Alternative Post-Construction Controls: The **Enforcing Official** may approve the use of alternative Post-Construction Controls if documentation is provided that demonstrates, to the satisfaction of the **Enforcing Official** and with subsequent written approval from Ohio EPA, that these Post-Construction Controls are equivalent in pollutant removal and runoff flow/volume reduction effectiveness to those listed in **Table 510-B** of these Post-Construction Regulations.

1. Use of Alternative Post-Construction Controls may only be allowed if:
 - a. The permittee can demonstrate that a Control listed as an approved Post-Construction Control in **Table 510 C** is not feasible, and
 - b. That the proposed Control can meet the treatment criteria ~~identified in this section of Article V Post-Construction Regulation.~~ in the current version of the Ohio EPA General Permit Authorization for Storm Water Discharges Associated with Construction Activity under the National Discharge Elimination System (i.e., Construction General Permit).
2. Testing specifications for Alternative Post-Construction Controls may include laboratory testing, field testing, or both, as defined in the most recent version of the Ohio EPA General Permit for Storm Water Discharges Associated with Construction Activity. Testing results for storm water Manufactured Treatment Devices (MTD) certified by the New Jersey Department of Environmental Protection are acceptable to the **Enforcing Official**.
3. The WQv discharge rates and/or the WQ_f from the Alternative Post-Construction Control must be reduced to minimize stream bed erosion and protect the physical and biological integrity of the receiving water resource unless there will be negligible hydrological impact to the water resource. WQv discharge rates and the WQ_f are considered to have a negligible hydrological impact if one (1) of the following three (3) conditions can be demonstrated:
 - a. The alternative Post-Construction Control is able to recharge the entire WQv to groundwater.
 - b. The larger common plan of development or sale will create less than one (1) acre of impervious surface.
 - c. 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.



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 Controls 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:
1. A maintenance agreement is established that satisfies the requirements of Section 516 Maintenance And Inspections.
 2. The off-site alternative discharges to the same Hydrologic Unit Code (HUC)-4412 watershed unit or a smaller subwatershed as defined by the **Enforcing Official**.
 3. The size of the drainage area draining into the off-site alternative is at least 1.5 times the size of the uncontrolled on-site drainage.
 4. The off-site alternative meets all applicable requirements of these Post-Construction Regulations.
- B. All off-site alternatives are subject to the approval of the **Enforcing Official** and the Director of the Ohio EPA. Off-site alternatives may include, but are not limited to the following:
1. Implementation of off-site Post-Construction Controls 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 CONTROLS – LEGAL INSTRUMENT REQUIRED

- A. Access to and entrance into Post-Construction Controls 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 Controls addressed by the Legal Instrument.

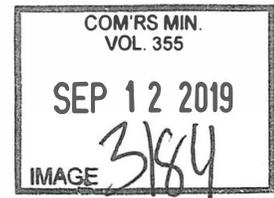
2. The instrument shall be approved by the **Enforcing Official** prior to approval of a Record Plat and/or Improvement Plan.
3. Unless otherwise allowed by the **Enforcing Official**, access to Post-Construction Controls as provided by the instrument shall be from a public right-of-way. The access shall be no less than 15 feet wide. The instrument shall also incorporate the entire Post-Construction Control plus an additional 15-foot wide band around the perimeter of the Post-Construction Control.
4. The access to the Post-Construction Control 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 Control 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 Control 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 CONTROLS

- A. No storm water shall be directed through any Post-Construction Control, if required under Article V of these Regulations, or portions thereof, until the entire area tributary to the Post-Construction Control 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, Post-Construction Controls may be completed and placed into service. Upon completion of installation of the Post-Construction Controls, 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 post-construction 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 Controls 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 Control calculations if he/she determines that the design was altered significantly from the approved Improvement Plans. The As-Built Survey must provide the location, dimensions, and bearing of such practices and include the entity responsible for long-term maintenance as detailed in the 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 CONTROLS

- A. Unless otherwise required by the **Enforcing Official**, Post-Construction Controls shall be owned, controlled, and maintained by a Legal Entity, as follows:
 1. If the Post-Construction Control serves a single property, then the property owner shall be the Legal Entity.
 2. If the Post-Construction Control serves multiple lots in residential, commercial, industrial and/or condominium developments, then the Post-Construction Control 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 Control.

516 MAINTENANCE AND INSPECTIONS

- A. Controls 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 Controls – Legal Instrument Required of these Post-Construction Regulations. The Legal Entity defined in Section 515 Post-Construction Controls of these Post-Construction Regulations shall be responsible for maintenance of the Post-Construction Control.
- B. If the Post-Construction Control serves multiple lots in residential, commercial, industrial, and/or condominium developments, then the Legal Entity shall be responsible for the

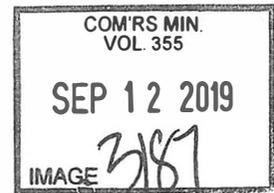


maintenance of all Post-Construction Controls within the subdivision and/or condominium development.

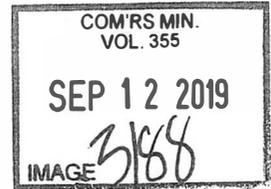
- C. In the event the relationship between the Legal Entity and the property owners is dissolved, or if the Legal Entity fails to perform required maintenance, responsibility for such maintenance shall be proportionally distributed to each property owner contributing storm water to and/or required to install the system of Post-Construction Controls.
- D. The **Enforcing Official** shall not authorize any construction 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 Controls 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 Controls 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 Control and (if known) the Maintenance Provider representing the Legal Entity.
 - 2. Any necessary legally binding maintenance easements and agreements;
 - 3. The parcel numbers of each property served by the Post-Construction Control.
 - 4. The parcel number and location of each Post-Construction Control.
 - 5. A map showing all access and maintenance easements for each Post-Construction Control.
 - 6. Features of the design that facilitate maintenance of the system of Post-Construction Controls including construction drawings or excerpts showing the plan view, profile and details of the outlet(s);
 - 7. Relevant elevations and associated volumes that dictate when removal of accumulated sediments must occur.



8. 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 Controls.
 9. An inspection schedule and reporting requirements, including acceptable inspection checklists appropriate for each Post-Construction Control and proof of inspection certification requirements.
 10. A prohibition on alteration of the Post-Construction Control without prior written approval from the **Enforcing Official**.
 11. The location of and management practices for all instruments established under Section 512 Access To Post-Construction Controls- Legal Instrument Required of these Post-Construction Regulations that provide for access to and work on the system of Post-Construction Controls.
 12. 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 Controls.
- 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 CONTROLS – LEGAL INSTRUMENT REQUIRED of these Post-Construction Regulations and for maintaining the system of Post-Construction Controls. The Maintenance Provider shall maintain the system of Post-Construction Controls 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 Controls 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 Controls, 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 Controls 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 to 50 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 CONTROLS – LEGAL INSTRUMENT REQUIRED as necessary to inspect, observe, maintain, and repair, as required by the enforcement and penalty provisions of these Post-Construction Regulations, the system of Post-Construction Controls 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 Controls 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 Controls 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 Control, 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 control (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 Controls as shown on the approved plans and specifications is not maintained in good working order in accordance with the standards

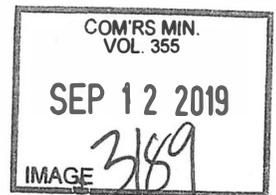


of these Post-Construction Regulations and in accordance with the I&M Plan, the Local Jurisdiction, with due notice, may enter the property and take whatever steps it deems necessary to return the Post-Construction Controls to good working order. This provision shall not be construed to allow the Local 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 Controls and in no event shall these Post-Construction Regulations be construed to impose any such obligations upon those entities.

- P. In the event the **Enforcing Official** or Local Jurisdiction performs any work or expends any funds to return any Control 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 Controls. 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 Controls 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 Sites in the unincorporated areas of Hamilton County the cost of initial 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

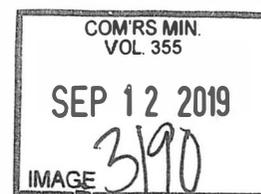


(30) days thereafter, inspection of construction and any further review on the Site will be stopped and the claim will be forwarded to the Prosecuting Attorney for collection.

- C. For Sites 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**.

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 ensure that the Post-Construction Controls 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 Controls, 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 Controls 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 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.