

Post-Construction Storm Water Management

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STORM WATER MANAGEMENT AUTHORITY, INC. POST-CONSTRUCTION ORDINANCE

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STORMWATER MANAGEMENT POST-CONSTRUCTION ORDINANCE

RECITALS

WHEREAS, the City of _____ operates under the requirements of the Alabama Department of Environmental Management (ADEM) National Pollutant Discharge Elimination System (NPDES) Permit; and

WHEREAS, this permit authorizes stormwater discharges from regulated small municipal separate storm sewer systems (MS4); and

WHEREAS, the City of _____ must be compliant with the ADEM NPDES Permit by developing, implementing, and enforcing a program to address post-construction stormwater management; and

WHEREAS, the City of _____ finds it necessary to enact an ordinance to address and enforce post-construction stormwater management standards on Qualifying Sites to prevent or minimize water quality impacts and ensure that the volume and velocity of pre-construction stormwater runoff is not significantly exceeded for the life of the property's use to the maximum extent practical (MEP).

NOW, THEREFORE BE IT ORDAINED by the City Council of the City of _____, Alabama, as follows:

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Section 1 DEFINITIONS

For the purposes of this ordinance, the following words and terms shall have the meaning assigned to them in this section.

Best Management Practices - (herein abbreviated as "BMP") - activities, prohibitions of practices, maintenance procedures and management practices designed to prevent or reduce the pollution of waters to the MS4. Best Management Practices also include treatment requirements, operating procedures and practices to control facility site runoff, spillage or leaks, sludge or waste disposal or drainage from raw material storage and construction sites.

Non-structural BMPs - Non-structural BMPs may include but not be limited to the following: preservation of open spaces and vegetation, establishment of conservation easements, establishment of buffers along streams and other waters, maintenance of vegetation, BMP inspection and maintenance, planning for future development or redevelopment.

Qualifying Site - Qualifying Site is any new development site or re-development site that results in a total land disturbance of one or more acres and sites that disturb less than one acre but are a part of a larger common development or sale that would disturb one or more acres.

Structural BMPs - Structural BMPs may include, but not be limited to the following: detention/ retention devices, check dams, drainage swales, lined ditches, infiltration basins, porous pavement, outlet protection, velocity dissipation devices, slope protection, constructed wetlands, rain gardens, catch basin inserts, vegetated filter strips, and rain barrels.

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Section 2 ADMINISTRATION

The municipal engineer for the City, the municipal official or employee who is a qualified credentialed professional, such other municipal official or municipal employee who has had sufficient experience dealing with BMP design to enable them to enforce the provisions of this ordinance, an individual or agency contracted to provide such service, shall be responsible, on behalf of the City, to enforce the provisions of this ordinance.

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Section 3 POST-CONSTRUCTION BMP DESIGN

Section 3.1 Design Standards.

The post-construction BMPs for qualifying sites, which may include a combination of structural BMPs and/or non-structural BMPs, must be designed to ensure that the volume and velocity of pre-construction stormwater runoff, to the maximum extent practicable, is not significantly exceeded.

The current Post Construction Stormwater Management Technical Memorandum (Addendum A) details acceptable design criteria meeting the requirement of the current NPDES Permit No. _____ and shall be the basis for the design and implementation of post- construction BMPs.

Section 3.2 Design References.

By reference in this Section, the City adopts the following as design references to meet the design standards:

- a) The latest version of the "Alabama Handbook for Erosion Control, Sedimentation Control and Stormwater Management on Construction Sites and Urban Areas", Volumes 1 and 2.
- b) The latest version of the "Low Impact Development Handbook for the State of Alabama".
- c) Any storm water design manual approved by the city that meets the design requirement of this ordinance.

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Section 4 APPLICATION REQUIREMENTS

As part of the Land Disturbance Application, all Qualifying Sites shall include the following components:

Section 4.1 Post-Construction BMP Design Description.

Procedures and strategies of the structural BMPs and/or non-structural BMPs that meet the design standards for Qualifying Sites found in Section 3.1 of this ordinance. Submittal to the City of a certified as-built of the BMPs and a letter of substantial compliance from the design engineer are required within 120 days of construction completion.

Section 4.2 Post-Construction BMP Inspection Plan Description.

Procedures and strategies that will address inspections of the BMPs to confirm proper function, require corrective actions to poorly functioning or inadequately maintained BMPs, and require record keeping of maintenance activities, inspections, and corrective actions. The City shall perform or require the performance of an inspection by the developer/ owner/ operator at least once per year. Records of these inspections shall be made available to ADEM upon request and copies shall be provided to the City on an annual basis. The minimum documentation requirements for inspections are as follows:

- a) Facility type
- b) Inspection date
- c) Name and signature of inspector
- d) Site location
- e) Owner information (name, address, phone number, fax, and email)
- f) Description of the storm water BMP condition that may include the quality of: vegetation and soils, inlet and outlet channels and structures, embankments, slopes, and safety benches; spillways, weirs, and other control structures; and sediment and debris accumulation in storage and forebay areas as well as in and around inlet and outlet structures;
- g) Photographic documentation of all critical storm water BMP components;
- h) Specific maintenance items or violations that need to be corrected by the owner/operator of the storm water control or BMP; and
- i) Maintenance agreements for long-term BMP operations and maintenance.

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Section 4.3 Post-Construction BMP Operation and Maintenance Plan Description.

Procedures and strategies that will address adequate long-term operation and maintenance of the BMPs. One or more of the following shall be applicable (as determined by the City) to establish the responsible party for long-term operation and maintenance. The document(s) shall be provided to the City for review. Upon approval, an executed copy shall be put on file in the _____ Department:

- a) The developer's signed statement accepting responsibility for maintenance until the maintenance responsibility is legally transferred to another part.
- b) Written conditions in the sales or lease agreement that require the recipient to assume responsibility for maintenance.
- c) Written conditions in project conditions, covenants, and restrictions for residential properties assigning maintenance responsibilities to a home owner's association or other appropriate group for maintenance of structural and treatment control management practices.
- d) Any other legally enforceable agreement that assigns permanent responsibility for maintenance.

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Section 5 ENFORCEMENT AND ABATEMENT

If a responsible party fails or refuses to meet the design, operation, or maintenance standards required by this ordinance, the City, after reasonable notice, may correct a violation of the design standards, operation, or maintenance needs by performing all necessary work to place the measures in proper working condition. In the event that the BMPs become a danger to public safety or public health, the City shall notify in writing the responsible party for changes to design, operation, maintenance, and repairs of the BMP. Upon receipt of that notice, the responsible party shall have 14 calendar days, or such additional time as the City shall determine to be reasonably necessary to complete the action, to make changes to design, operation, maintenance, and repairs of the measures in an approved manner. In the event that corrective action is not undertaken within that time, the City may take necessary corrective action. The cost of any action by the City under this Section shall be billed to the responsible party. If the responsible party refuses to pay the bill, the City is entitled to bring an action against the responsible party to pay, file a lien against the property, or both. Costs shall include interest, collection fees, and reasonable attorney fees.

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Section 6 MISCELLANEOUS

Section 6.1 Notices.

Whenever the City is required or permitted to:

- (a) give a notice to any party, such notice must be in writing; or
- (b) deliver a document to any party; such notice or document may be delivered by personal delivery, certified mail (return receipt requested), registered mail (return receipt requested) or a generally recognized overnight carrier, to the address of such party which is in the records of the City or is otherwise known to the City.

Section 6.2 References.

Whenever a Section is referred to in this ordinance, unless the context clearly indicates the contrary, such reference shall be to a section of this ordinance.

Section 6.3 Severability.

The provisions of this ordinance are severable. If any part of this ordinance is determined by a court of law to be invalid, unenforceable or unconstitutional, such determination shall not affect any other part of this ordinance.

Section 6.4 Captions.

The captions of Sections and sections are for the purpose of reference only, and such captions shall not affect the meaning of any provision of this ordinance.

Section 6.5 Ultimate Responsibility.

The standards set forth herein and promulgated pursuant to this ordinance are minimum standards; therefore, this ordinance does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

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Section 6.6 Effective Date.

This ordinance shall be published as required by law and shall become effective at _____ on _____.

ADOPTED: This ____ day of _____, XXXX.

APPROVED: This ____ day of _____, XXXX.

Mayor

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ADDENDUM A



SWMA MS4 Program

Post-Construction Stormwater Management Technical Memorandum

Overview

In 1990, the U.S. Environmental Protection Agency (EPA) promulgated regulations establishing Phase I of the National Pollutant Discharge Elimination Systems (NPDES) stormwater program. The Phase I program for municipal separate storm sewer systems (MS4s) require operators of “medium” and “large” MS4s that generally serve populations of 100,000 or greater to implement a stormwater management program as a means to control to the maximum extent practicable (MEP) polluted discharges from certain municipal, industrial and construction activities into the MS4.

The Alabama Department of Environmental Management (ADEM) presently has primary jurisdiction over permitting and enforcement of the Stormwater Program for Alabama. The City of _____ (City) was issued NPDES Permit Number ALS0000__ on **DATE**. This NPDES Permit became effective on **DATE** and will expire on **DATE**. The City is required to develop and implement a Stormwater Management Program (SWMP) in accordance with the NPDES Permit requirements.

In accordance with the NPDES Permit, the City is required to develop and implement a Post Construction Stormwater Program to address stormwater runoff from qualifying new development and re-development projects by **DATE**. This memorandum provides technical guidance regarding the City’s updated post construction stormwater management requirements in accordance with the City’s NPDES Permit.

Applicable Developments

The City’s updated post construction stormwater management requirements are only applicable to “Qualifying New Development or Redevelopment” projects as defined below:

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“Qualifying New Development and Redevelopment” means any site that results from the disturbance of one acre or more of land or the disturbance of less than one acre of land if part of a larger common plan of development or sale that is greater than one acre. Qualifying new development and redevelopment does not include land disturbances conducted by entities under the jurisdiction and supervision of the Alabama Public Service Commission.

Since stormwater detention and retention facilities are the primary Best Management Practices (BMPs) that have historically been used for post-construction stormwater management, this technical memorandum has been developed to address stormwater detention and retention facilities. However, this does not preclude the use of other generally accepted engineering practices.

Implementation

Effective **DATE**, all qualifying new development and redevelopment projects shall be designed in accordance with this technical memorandum.

Waiver Request

The City recognizes that there are existing project sites that have been constructed or previously approved, prior to the effective **DATE** of this technical memorandum, that may qualify for a waiver from the updated post construction stormwater management requirements. As a result, the City has developed an Existing Development, Post Construction Stormwater Management Waiver Request Form (Figure 1) to address existing project sites. In order for an existing project site to be considered for a waiver, the waiver request form shall be completed and submitted to the City for review and approval. If a waiver has been submitted for a development that has not been completed and the density of the development is increased and/or modified, the developer shall resubmit a waiver request for this development.

Water Quality Requirements

Post-construction stormwater runoff quality is an important component of the City's SWMP. In order to meet the requirements of the City's NPDES Permit, a Water Quality Volume (WQ_v) must be accounted for on each project site and BMPs must be utilized to store and treat the WQ_v. The required WQ_v is based upon the first 1.1 inches of rainfall that occurs on the project site. The WQ_v can be estimated as described below.

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$WQ_v = 1.1$ inches / acre of additional impervious area.

For example: An existing 12.5 acre site planned for re-development contains 3 acres of existing impervious area. The proposed development will contain 7 total acres of impervious area in the post-development condition. The required WQ_v shall be calculated as follows:

$$\begin{aligned} WQ_v &= 1.1 \text{ inches} * 4 \text{ acres of additional impervious area} \\ &= 1.1 \text{ inches} * (1 \text{ foot} / 12 \text{ inches}) * 4 \text{ acres} * (43,560 \text{ sq.ft.} / 1 \text{ acre}) \\ &= 15,972 \text{ cubic feet of storage required} \end{aligned}$$

The WQ_v that is required for each project site may be provided in multiple ways to allow greater flexibility during design. There are a number of post-construction BMPs such as detention ponds, retention ponds, bioretention swales, proprietary stormwater quality treatment devices, sand filters, etc. that may be utilized by the Owner and their Engineer-of-Record to meet the water quality requirements.

Low Impact Development (LID)

As an option for meeting the updated post-construction stormwater management requirements, the City encourages Owners and Developers to incorporate the use of low impact development (LID) practices into qualifying development and redevelopment projects. The latest version of the Alabama Low Impact Development is incorporated into this technical memorandum by reference.

Design Standards

For detention and retention ponds, the calculation methodology shall utilize the National Resource Conservation Resources (NRCS) Urban Hydrology for Small Watersheds Technical Release 55 (TR-55) or equivalent. For the determination of pre-construction and post-construction stormwater runoff hydrology, the 24-hour rainfall depths from National Oceanic and Atmospheric Administration (NOAA) Atlas14, Volume 9, Version 2 included in Table 1 shall be used:

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Table 1. Design Storms

Storm Event (24 hour)	Rainfall (inches) (Bessemer)	Rainfall (inches) (Bham WSFO)	Rainfall (inches) (Bham AP ASOS)	Rainfall (inches) (Pinson)
2-year	4.09	4.1	4.12	4.11
5-year	4.97	4.99	5.02	4.99
10-Year	5.82	5.83	5.85	5.8
25-Year	7.18	7.15	7.13	7.02
100-Year	9.71	9.56	9.39	9.15



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As a part of the City's requirements for post-construction stormwater runoff management, all project sites shall be responsible for ensuring, to the MEP, that post-development runoff mimics pre-development hydrology for the 2-year, 5-year, 10-year, and 25-year rainfall depths listed in Table 1. All stormwater detention or retention facilities must be able to convey the peak flow rate associated with a 100-year, 24-hour storm event. The Owner and/or Developer shall ensure, to the MEP, that installation of post-construction BMPs shall not adversely impact and/or cause flooding of properties located upstream and downstream of post-construction BMPs.

Detention and Retention Ponds

As a part of this technical memorandum, two structural BMPs (detention and retention ponds) have been highlighted as design options to assist in meeting the post-construction stormwater management requirements of the City's NPDES permit. Both detention ponds and retention ponds are fairly simple to design, construct and maintain. However, other structural BMPs may be selected by the Owner and Engineer-of-Record for review and approval by the City and are welcomed to be incorporated into the overall stormwater management plan for each project site.

A Design Form, Detention / Retention Ponds (Figure 2) has been developed by the City to aid in the design, review, and approval of detention and retention facilities. The design form provides a standard format for the Engineer-of-Record to provide information concerning pre-development conditions, post-development conditions, pond outlet configurations, pond storage, and pond peak flow discharges. For a project that contains multiple detention facilities, the Engineer-of-Record may simply provide a Design Form for each facility. While a detention pond can be utilized to meet the stormwater management requirements, some type of filtration system is needed for a detention pond to meet the stormwater quality requirements. The filtration system must allow the volume of water associated with the WQ_v to drain slowly out of the pond, but should drain within a forty-eight (48) hour period. Figure 3 provides some basic examples of filtering systems that may be applicable to detention ponds.

As-Built Certification

As a part of the NPDES permit, the City must insure the BMPs that have been designed and approved are constructed and operated in accordance with their original design and intent. In an effort to confirm that the constructed BMPs meet the designer's intent, an As-Built Evaluation and Certification form (Figure 4) has been developed. It shall be the Owner's responsibility to have as-built information, such as pond volume, embankment size and elevations, invert size and elevations, and spillway elevations, field surveyed by a Professional Land

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Surveyor. It shall be the Engineer-of-Record's responsibility to utilize the field surveyed information to fill out the As-Built Evaluation and Certification Form. The Owner has two options for completing the As-Built Evaluation and Certification:

Option 1 The As-Built Evaluation and Certification form shall be submitted and approved by the City prior to the issuance of a Certificate of Occupancy (CO) and/or prior to the recording of the final subdivision plat.

Option 2 If the Owner would like to obtain a CO and/or record the final subdivision plat prior to the City's approval of the As-Built Evaluation and Certification form, the Owner may post a bond or other forms of surety acceptable to the City in the amount of 100% of the construction cost associated with post-construction stormwater management BMPs and the cost associated with the effort required to complete the As-Built Evaluation and Certification. The As-Built Evaluation and Certification form shall be submitted to the City within 120 days of receipt of a CO and/or recording of the final subdivision plat.

Annual Inspections

In order for post-construction BMPs to continue to function in accordance with their original design and installation, annual inspections are required by the City's NPDES permit. The Owner of the project is required to have these annual inspections performed and must then submit the required Annual Inspection Form (Figure 5) to the City. The Annual Inspection Form shall provide documentation concerning the condition of each facility in terms of vegetative cover, erosion that may be occurring, the condition of inlets into the pond and the pond outlet, embankment conditions and any maintenance required and/or performed. The City shall evaluate the documentation submitted to confirm that the stormwater management facilities are continuing to function as designed.

The Annual Inspection Form shall be submitted to the City each year by 30 September.

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Operation and Maintenance

It is the responsibility of the Owner to operate and maintain the stormwater management facility and/or BMPs in accordance with the original design intent and approval. If the original Owner or Developer has sold the project or passed ownership on to a Homeowner's Association, then it is the new Owner or HOA's responsibility to maintain the facility and provide any required inspection and maintenance.

Should maintenance be needed at a facility as a result of the Annual Inspection, the Owner shall provide the City documentation of the maintenance required and a schedule for completing all maintenance activities. Once all maintenance activities are completed, the Owner shall provide documentation to the City of the maintenance performed and that the BMP operates as it was designed.

A summary of maintenance activities shall be submitted to the City each year by 30 September. The summary shall cover the previous fiscal year beginning 1 October through 30 September.

List of Figures

Figure 1 – Existing Development Post Construction Stormwater Management Waiver Request Form

Figure 2 – Design Form, Detention / Retention Ponds

Figure 3 – Detention Pond Outlet Structure Example

Figure 4 – As-Built Evaluation and Certification Form

Figure 5 – Annual Inspection Form