

## **600.0 STORMWATER MANAGEMENT**

The Water Department, as authorized by Section 14-1603.1 of the Philadelphia Code, requires the following specifications for stormwater detention and retention systems as of January 1, 2006.

### **600.1 Definitions**

For the purposes of these Regulations, the following words and phrases shall mean and be interpreted pursuant to the below definitions. Whenever any of these words appear in these Regulations in the singular or plural form, the opposite shall also hold as applicable.

(a) **Buffer:** The area of land immediately adjacent to any surface water body measured perpendicular to and horizontally from the top-of-bank on both sides of a stream that must remain or be restored to native plants, trees, and shrubs.

(b) **Design Professional:** A licensed professional engineer registered in the Commonwealth of Pennsylvania.

(c) **Design Storm:** The magnitude and temporal distribution of precipitation from a storm event defined by probability of occurrence (e.g., five-year storm) and duration (e.g., 24-hours), used in the design and evaluation of stormwater management systems.

(d) **Developer:** Any landowner, agent of such landowner, or tenant with the permission of such landowner, who makes or causes to be made a subdivision of land or land development project prior to issuance of the Certificate of Occupancy.

(e) **Development:** Any human-induced change to improved or unimproved real estate, whether public or private, including but not limited to land development, construction, installation, or expansion of a building or other structure, land division, street construction, and site alteration such as embankments, dredging, grubbing, grading, paving, parking or storage facilities, excavation, filling, stockpiling, or clearing. As used in these Regulations, development encompasses both new development and redevelopment. It includes the entire development site, even when the project is performed in stages.

(f) **Development Site:** The specific tract of land where any Earth Disturbance activities are planned, conducted, or maintained.

(g) **Diffused Drainage Discharge:** Drainage discharge not confined to a single point location or channel, such as sheet flow or shallow concentrated flow.

(h) **Directly Connected Impervious Area (DCIA):** An impervious or impermeable surface, which is directly connected to the drainage system as defined in the Manual.

(i) **Earth Disturbance:** Any human activity which moves or changes the surface of land, including, but not limited to, clearing and grubbing, grading, excavation, embankments, land development, agricultural plowing or tilling, timber harvesting activities, road maintenance activities, mineral extraction, and the moving, depositing, stockpiling, or storing of soil, rock or earth materials.

(j) Erosion and Sediment Control Plan: A plan for a project site that identifies stormwater detention and retention structures that will minimize accelerated erosion and sedimentation during the construction phase.

(k) Groundwater Recharge: The replenishment of existing natural underground water supplies without degrading groundwater quality.

(l) Management District: Sub-area delineations that determine peak rate attenuation requirements, as defined in the Manual. Sites located in more than one management district shall conform to the requirements of the district into which the site discharges.

(m) Manual: The most recent version of the Philadelphia Stormwater Management Guidance Manual.

(n) New Development: Any development project that does not meet the definition of redevelopment as defined in these Regulations or any development project at a site where structures or impervious surfaces were removed before January 1, 1970.

(o) Post Construction Stormwater Management Plan (PCSMP): A complete stormwater management plan as described in these regulations and in the Manual.

(p) Predevelopment Condition: For new development, the predevelopment condition shall be the existing condition of the site, and for redevelopment, predevelopment shall be defined according to the procedures found in the Manual.

(q) Redevelopment: Any development on a site that requires demolition or removal of existing structures or impervious surfaces and replacement with new impervious surfaces. This includes replacement of impervious surfaces that have been removed on or after January 1, 1970, with new impervious surfaces. Maintenance activities such as top-layer grinding and re-paving are not considered redevelopment. Interior remodeling projects are also not considered redevelopment.

(r) Stormwater Management Practice (SMP): Any man-made structure that is designed or constructed to convey, store, or otherwise control stormwater runoff quality, rate, or quantity. Typical SMPs include, but are not limited to, detention and retention basins, swales, storm sewers, pipes, and infiltration structures.

(s) Stormwater Pretreatment: Techniques employed to remove pollutants before they enter the SMP, limited to techniques defined and listed as pretreatment in the Manual.

## **600.2 Regulated Activities**

(a) Regulated activities under these Regulations include any development, including new development and redevelopment, that results in an area of earth disturbance greater than or equal to 15,000 square feet. The area of Earth Disturbance during the construction phase determines requirements for both the erosion and sediment controls and the post-construction stormwater management.

(b) The applicability of these Regulations is summarized in the Table of Applicable Stormwater Regulations in Philadelphia.

(c) These Regulations shall apply to the entire development site even if development on that site is to take place in phases.

(d) Existing SMPs may be used on sites where development occurs as long as they meet all of the requirements of these Regulations.

### **600.3 Exemptions**

#### **(a) General Exemptions**

The following cases are exempt from the specified requirements of these Regulations.

(1) Development, including new development and redevelopment, that results in an area of Earth Disturbance less than fifteen thousand (15,000) square feet is exempt from all requirements of these Regulations;

(2) Redevelopment that results in an area of Earth Disturbance greater than or equal to fifteen thousand (15,000) square feet, but less than one (1) acre, is exempt from the requirements of Section 600.5(b), Channel Protection Requirement.

(3) Redevelopment that results in an area of Earth Disturbance greater than or equal to one (1) acre and reduces the predevelopment DCIA on the site by at least twenty percent (20%) is exempt from the Channel Protection and Flood Control Requirements of this Regulation.

#### **(b) Exemption Responsibilities**

An exemption shall not relieve the Developer from implementing such measures as are necessary to protect public health and safety.

#### **(c) Emergency Exemption**

Emergency maintenance work performed for the protection of public health and safety is exempt from the requirements of these Regulations. A written description of the scope and extent of any emergency work performed shall be submitted to the Water Department within two (2) calendar days of the commencement of the activity. If the Water Department finds that the work is not an emergency, then the work shall cease immediately and the requirements of these Regulations shall be addressed as applicable.

#### **(d) Special Circumstances**

If conditions exist that prevent the reasonable implementation of water quality and /or quantity control practices on site, upon written request by the owner, the Philadelphia Water Department may at its sole discretion accept off-site stormwater management practices, retrofitting, stream restorations, or other practices that provide water quality and /or quantity control equal or greater than onsite practices for the volume which the owner has demonstrated to be infeasible to manage and treat on site.

**Table of Applicable Stormwater Regulations in Philadelphia**

		Earth Disturbance Associated with Development		
		0-15,000 sq. ft.	15,000 sq. ft.-1 acre	> 1 acre
Section 600.5(a) Water Quality Requirement	New Development	N/A**	Yes	Yes
	Redevelopment	N/A**	Yes	Yes
Section 600.5(b) Channel Protection Requirement	New Development	N/A**	Yes	Yes
	Redevelopment	N/A**	Exempt	Yes (Alternate Criteria)
Section 600.5(c) Flood Control Requirement	New Development	N/A**	Yes	Yes
	Redevelopment	N/A**	Yes (Alternate Criteria)	Yes (Alternate Criteria)
Section 600.6 Nonstructural Project Design Requirement	New Development	N/A**	Yes	Yes
	Redevelopment	N/A**	Yes	Yes
Section 600.8 Post-Construction Stormwater Management Plan Requirement	New Development	N/A**	Yes	Yes
	Redevelopment	N/A**	Yes	Yes

Yes (Alternate Criteria) – requirements of section may be waived depending on post-development site conditions (See Sections 600.3(a)(3), 600.5(b) and 600.5(c) for further details).

N/A - Not Applicable, development project is not subject to requirements of indicated Regulations section. Voluntary controls are encouraged.

Exempt – Development project is not subject to requirements of indicated Regulations section.

\*\*– If the proposed development results in stormwater discharge that exceeds stormwater system capacity, causes a combined sewer overflow, or degrades receiving waters, the design specifications presented in these Regulations may be applied to proposed development activities as warranted to protect public health, safety, or property.

**600.4 Erosion and Sediment Control during Earth Disturbance**

(a) All Earth Disturbance must comply with the Erosion and Sediment Control requirements of the Pennsylvania Department of Environmental Protection (PADEP) as specified in 25 Pa. Code § 102.4(b).

(b) No Earth Disturbance greater than or equal to fifteen thousand (15,000) square feet and less than 1 acre shall commence until the Water Department approves an Erosion and Sediment Control Plan conforming to the regulations of the PADEP.

**600.5 Post-Construction Stormwater Management Criteria**

(a) Water Quality Requirement: The Water Quality Requirement is designed to recharge the groundwater table and to provide water quality treatment for stormwater runoff.

(1) The following formula shall be used to determine the water quality volume, (WQv), in cubic feet of storage for the development site.

$$WQ_v = \left(\frac{P}{12}\right) * (I) \quad \text{Eqn: 600.1}$$

Where:

WQv = Water Quality Volume (cubic feet)

P = 1.0 inch

I = DCIA within the limits of earth disturbance (square feet)

(2) Groundwater Recharge Requirement: In order to preserve or restore a more natural water balance on

new development and redevelopment sites, the water quality volume shall be infiltrated on site. A list of acceptable practices for infiltration is provided in the Manual.

(A) The infiltration volume shall be equal to one (1.0) inch of rainfall over all DCIA within the limits of Earth Disturbance.

(B) The Design Professional is required to follow the Hotspot Investigation, Subsurface Stability, and Suitability of Infiltration procedures in the Manual to determine whether the proposed infiltration on the Development Site is appropriate.

(C) If soil investigation reports demonstrate that the soil is unsuitable for infiltration, the Design Professional shall be responsible for providing written documentation to the Water Department showing that the required volume cannot physically be infiltrated within the required time period.

(3) Water Quality Treatment Requirement.

(A) Where it has been demonstrated, in accordance with section 600.5(a)(2) of these Regulations, that a portion or all of the water quality volume cannot be infiltrated on site, the water quality volume which cannot be infiltrated on site must be treated for water quality.

(B) Water quality treatment is attained differently in separate sewer areas than in combined sewer areas. Separate sewer areas achieve water quality treatment through approved stormwater management practices. Combined sewer areas achieve water

quality treatment by detaining and releasing stormwater at a specified maximum rate as stated in the Manual.

(b) Channel Protection Requirement: The Channel Protection Requirement is designed to minimize accelerated channel erosion resulting from stormwater runoff from Development Sites.

(1) To meet the Channel Protection Requirement, SMPs shall retain or detain the runoff from all DCIA within the limits of Earth Disturbance from a one-year, 24-hour Natural Resources Conservation Service (NRCS) Type II design storm in the proposed site condition such that the runoff takes a minimum of 24 hours and a maximum of 72 hours to drain from the facility.

(2) Redevelopment sites with less than one (1) acre of Earth Disturbance or redevelopment sites that demonstrate a twenty percent (20%) reduction in DCIA from predevelopment conditions as described in the Manual are exempt from this requirement.

(3) The infiltration and water quality volumes may be incorporated into the channel protection portion of the design provided the design meets all requirements concurrently.

(4) Design criteria and a list of SMPs for channel protection are included in the Manual.

(c) Flood Control Requirement

(1) To prevent flooding caused by extreme events, the City of Philadelphia is divided into Management Districts that require different levels of stormwater attenuation depending on

their location. Design Professionals shall determine the appropriate Management District for the development site using the maps provided in the Manual.

(A) The Table of Peak Runoff Rates for Management Districts lists the attenuation requirements for each Management District.

(B) Sites located in more than one Management District shall conform to the requirements of the district where the discharge point is located.

(2) Redevelopment sites that can demonstrate a twenty percent (20%) reduction in DCIA from predevelopment conditions as described in the Manual are exempt from this requirement.

(3) Predevelopment Conditions for Redevelopment are specified in the Manual.

**Table of Peak Runoff Rates for Management Districts**

<b>District</b>	<b>Column A NRCS Type II 24-hour Design Storm applied to Proposed Condition</b>	<b>Column B NRCS Type II 24 –hour Design Storm applied to Predevelopment Condition</b>
A	2 – year	1 - year
A	5 – year	5 - year
A	10 – year	10 - year
A	25 – year	25 - year
A	100-year	100-year
B-1	2 – year	1- year
B-1	10 – year	5 - year
B-1	25 – year	10 - year
B-1	50- year	25- year
B-1	100-year	100-year
B-2	2 – year	1- year
B-2	5 – year	2 - year
B-2	25 – year	5 - year
B-2	50- year	10- year
B-2	100 – year	100 - year

C\*      Conditional Direct Discharge District

SMPs shall be designed such that peak rates from Column B are less than or equal to Peak Rates from Column A.

\* In District C, development sites that can discharge directly to the Delaware River main channel or Tidal Schuylkill River major tributary without use of City infrastructure may do so without control of proposed conditions peak rate of runoff. When adequate capacity in the downstream system does not exist and will not be provided through improvements, the proposed conditions peak rate of runoff must be controlled to the Predevelopment Conditions peak rate as required in District A provisions for the specified Design Storms.

The Predevelopment Condition for new development is the existing condition. For redevelopment purposes, the Predevelopment Condition is determined according to the procedures found in the Manual.

## **600.6 Nonstructural Project Design and Sequencing to Minimize Stormwater Impacts**

(a) A Developer is required to find practicable alternatives to the surface discharge of stormwater, the creation of impervious surfaces, and the degradation of Waters of the Commonwealth.

(b) All development shall include the following steps in sequence to comply with water quality requirements of §14.1603.1 of the Philadelphia Code. The goal of the sequence is to minimize the increases in stormwater runoff and impacts to water quality resulting from the proposed regulated activity.

(1) Prepare an Existing Resource and Site Analysis (ERSA) map and worksheet, showing environmentally sensitive areas including, but not limited to: steep slopes, ponds, lakes, streams, suspected wetlands, hydric soils, vernal pools, land development, any existing recharge areas, and any other requirements of the worksheet available in the Manual;

(2) establish a Buffer by preserving or restoring native plants, trees, and shrubs to the area of land immediately adjacent to any surface water body.

(A) The Buffer shall be a minimum of ten (10) feet on both sides of the stream, measured perpendicular to and horizontally from the top-of-bank.

(B) In the Wissahickon Watershed, there shall be no new impervious ground cover constructed or erected within 200 feet of the bank of a surface water body or within 50 feet of the centerline of a swale.

(3) prepare a draft project layout avoiding the sensitive areas identified in ERSA;

(4) evaluate nonstructural stormwater management alternatives as described in the Manual;

(5) minimize Earth Disturbance during the construction phase;

(6) use site design techniques described in the Manual to minimize the impervious surfaces within the limits of Earth Disturbance;

(7) use techniques in the Manual to minimize DCIA within the limits of Earth Disturbance;

(8) design appropriate detention and retention structures according to the Manual;

(A) meet Water Quality Requirement and provide for Stormwater Pretreatment prior to infiltration or water quality treatment in accordance with the Manual

(B) meet Channel Protection Requirement in accordance with Section 600.5(b) of these Regulations;

(C) meet Flood Control Requirement for the appropriate Management District in accordance with Section 600.5(c) of these Regulations; and

(9) adjust the site design as needed to meet all requirements of the Regulations concurrently.

## **600.7 Requirements for the Design of SMPs**

### **(a) General Requirements**

(1) In order to provide for the protection of public health and safety and to more effectively manage stormwater in Philadelphia, all SMPs shall meet the requirements of these Regulations.

(2) The existing points of concentrated drainage that discharge onto adjacent land shall not be altered in any manner that could cause property damage without written permission of the owner of the adjacent land.

(3) The design of all SMPs shall incorporate sound engineering principles and practices as detailed in the Manual. The Water Department reserves the right to disapprove any design that would result in the creation or continuation of a stormwater problem area.

(4) All stormwater runoff in excess of any volume infiltrated on site must be routed through a dedicated stormwater pipe and conveyed up to the approved connection or point of discharge.

(5) When the Development Site is located within a combined sewer area and adjacent to a receiving water body, stormwater shall be discharged directly to receiving waters after requirements of these Regulations and any applicable state or federal requirements are met.

(6) Areas of existing diffused drainage discharge shall be subject to any applicable discharge criteria in the general direction of existing discharge, whether proposed to be concentrated or maintained as diffused drainage areas, except as otherwise provided by these

Regulations. If diffused drainage discharge is proposed to be concentrated and discharged onto adjacent land, the Developer must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding or other impacts will result from the concentrated discharge.

(7) All SMPs shall incorporate maximum ponding and/or draw down requirements consistent with the Manual.

(8) Calculation Methodology: Acceptable calculation methods for the design of SMPs are provided in the Manual.

## **600.8. PCSMP Requirements**

### **(a) General Requirements**

For any activities regulated by these Regulations and the Philadelphia Code Section §14.1603.1:

(1) No zoning permit may be applied for until the Water Department has approved a conceptual site plan.

(2) No Earth Disturbance may commence or Zoning Permit be issued until the Water Department has approved a PCSMP.

### **(b) Preliminary Approval**

In order to obtain preliminary approval from the Water Department, the owner must complete the ERSA worksheet and map and Site Plan Review Meeting with the City as described in the Manual.

(c) PCSMP Approval

(1) The PCSMP shall include a general description of the project, project sequence, calculations, maps and plans as described in Section 600.6(b) of these Regulations. A list of required contents of the PCSMP is located in the Manual.

(2) For any activities that require one or more state or federal permits, proof of application for said permit(s) or approvals shall be part of the plan.

(3) All PCSMP materials shall be submitted to the Water Department in a format that is clear, concise, legible, neat, and well organized; otherwise, the PCSMP shall not be accepted for review and shall be returned to the Developer for revision.

**600.9 Permit Requirements by Other Government Entities**

(a) Other government entities may require permits for certain regulated Earth Disturbance activities.

(b) Requirements for these permits must be met prior to commencement of Earth Disturbance.

**600.10 Inspections**

(a) The Water Department or its designee may inspect any phase of the installation of the SMPs.

(b) During any stage of the work, if the Water Department or its designee determines that the SMPs are not being installed in accordance with the approved PCSMP, the Water Department shall issue a “Stop Work Order” until a revised PCSMP is submitted and approved and the deficiencies are corrected.

(c) As-built drawings for all SMPs must be submitted to the Water Department prior to final inspection.

(d) A final inspection of all SMPs shall be conducted by the Water Department or its designee to confirm compliance with the approved PCSMP prior to the issuance of any Certificate of Occupancy.

**600.11 Responsibilities for Operations and Maintenance of SMPs**

(a) No regulated Earth Disturbance activities shall commence until the Water Department has approved a PCSMP and SMP Operations and Maintenance Plan (O & M Plan), prepared in accordance with the requirements set forth in the Manual, which describes how the post-construction SMPs will be properly operated and maintained.

(b) The O & M Plan must include a signed agreement between the owner and the City to maintain the SMPs in accordance with the O & M Plan.

(c) There shall be no alteration or removal of any SMP required by an approved PCSMP and O & M Plan, and the owner must not allow the property to remain in a condition which does not conform to an approved PCSMP and O & M Plan.

(d) The Water Department reserves the right to accept or reject the operations and maintenance responsibility for any or all of the stormwater controls and SMPs.

## **600.12 Stormwater Management Easements**

(a) Stormwater management easements or right-of-ways are required for all areas used for off-site SMPs or stormwater conveyance, unless a waiver is granted by the Water Department.

(b) Stormwater management easements shall be provided by the owner if necessary for access for inspections and maintenance, or for the preservation of stormwater runoff conveyance, infiltration, detention areas and/or other stormwater controls and SMPs, by persons other than the property owner.

(c) The stormwater management easement and its purpose shall be specified when recorded in accordance with section 600.13 of these Regulations.

## **600.13 Recording of O & M Plans**

(a) The owner of any land upon which SMPs will be placed, constructed or implemented as described in the PCSMP and Operation and Maintenance Plan (O & M Plan), shall record the following documents with the Philadelphia Department of Records, within fifteen (15) calendar days of approval of the PCSMP by the Water Department:

(1) The O & M Plan, or a summary thereof, and

(2) Operations and Maintenance Agreements as included as part of the PCSMP submitted under Section 600.8 and Easements under Section 600.12 of these Regulations.

(b) The Water Department may suspend or revoke any approvals granted for the project site upon discovery of the failure

of the owner to comply with these Regulations.

## **600.14. Prohibited Discharges**

(a) No person shall allow, or cause to allow, stormwater discharges into the City's separate storm sewer system which are not composed entirely of stormwater.

(b) In the event that the Water Department determines that any discharge to a storm sewer is not composed entirely of stormwater, the Water Department will notify the responsible person to immediately cease the discharge.

(c) Nothing in this Section shall affect a discharger's responsibilities under state law.

## **600.15 Prohibited Connections**

(a) The following connections are prohibited, except as provided in Section 600.14(a)(1) of these Regulations.

(1) Any drain or conveyance, whether on the surface or subsurface, which allows any non-stormwater discharge including sewage, groundwater, process wastewater, and wash water, to enter the separate storm sewer system.

(2) Any connections to the storm drain system from indoor drains and sinks.

(3) Any drain or conveyance connected from a commercial or industrial land use to the separate storm sewer system that has not been documented in plans, maps, or equivalent records, and approved by the City.

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Bernard Brunwasser  
Water Commissioner

Approved as to Form,  
Romulo L. Diaz, Jr., City Solicitor

Per: \_\_\_\_\_  
Keith J. Jones  
Deputy City Solicitor