

## **CHAPTER 6 STORMWATER**

### **600.0 STORMWATER MANAGEMENT**

Water Department review of stormwater management plans is authorized by section 14-704 of the Philadelphia Code.

#### **600.1 Definitions**

(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) Conceptual Stormwater Management Plan: A preliminary stormwater management plan as described in these Regulations and in the Manual.

(c) Demolition: To tear down, raze, or remove an existing structure or impervious surface, whether in whole or in part.

(d) 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.

(e) 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.

(f) Development: Any human-induced change to improved or unimproved real estate, whether public or private. As used in these Regulations, Development encompasses, but is not limited to, New Development, Redevelopment, Demolition, and Stormwater Retrofit. It includes the entire development site, even when the project is performed in phases.

(g) Development Site: The specific tract of land where any Development activities are planned, conducted, or maintained. It refers to a contiguous area of disturbance including across streets and other rights of way, regardless of individual parcel ownership, where lots are developed as one common project.

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

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

(j) 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 or as otherwise defined in the Manual.

(k) Erosion and Sediment Control Plan: A site specific plan consisting of both

drawings and a narrative that identifies measures to minimize accelerated erosion and sedimentation before, during and after Earth Disturbance.

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

(m) 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.

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

(o) New Development: Development project on an unimproved tract of land where structures or impervious surfaces were removed before January 1, 1970.

(p) Operations & Maintenance Agreement (O & M Agreement): Agreement between the Property Owner and the City which outlines the maintenance requirements as referenced within the O & M Plan.

(q) SMP Operation and Maintenance Plan (O & M Plan): A plan approved by the Department for the continued operation and maintenance of SMPs which have been approved by the Department as part of the PCSMP.

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

(s) Predevelopment Condition: For New Development and, Redevelopment, Predevelopment shall be defined according to the procedures found in the Manual.

(t) Redevelopment: Development on an improved tract of land that includes but is not limited to the 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.

(u) Stormwater Management Practice (SMP): Any man-made structure that is designed and constructed to detain, infiltrate, or otherwise control stormwater runoff quality, rate, or quantity.

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

(w) Stormwater Retrofit: The voluntary rehabilitation and/or installation of SMPs on a property to better manage stormwater runoff.

## **600.2 Regulated Activities**

(a) Regulated activities under these Regulations include any Development that results in an area of Earth Disturbance greater than or equal to 15,000 square feet, or as otherwise required by local, state, and federal requirements. 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) 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.

(2) Redevelopment that results in an area of Earth Disturbance greater than or equal to fifteen thousand (15,000) square feet that can demonstrate a twenty percent (20%) reduction in DCIA from Predevelopment Conditions as described in the Manual, is exempt from the requirements of Section 600.5(b), Channel Protection Requirement and 600.5(c), Flood Control Requirement.

#### **(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 Department within two (2) calendar days of the commencement of the activity. If the 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 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 Developer has demonstrated to be infeasible to manage and treat on site.

<b>Table of Applicable Stormwater Regulations in Philadelphia</b>				
		Earth Disturbance Associated with Development		
		0-14,999 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
<p>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).</p> <p>N/A - Not Applicable, development project is not subject to requirements of indicated Regulations section. Voluntary controls are encouraged. <i>Any local, state, or federal requirements still apply.</i></p> <p>Exempt – Development project is not subject to requirements of indicated Regulations section.</p> <p>**– 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.</p>				

**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) No Earth Disturbance greater than or equal to fifteen thousand (15,000) square feet and less than one (1) acre shall commence until the 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 (WQ<sub>v</sub>) in cubic feet of storage for the development site:

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

Where:

WQ<sub>v</sub> = 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) inch of rainfall over all DCIA within the limits of Earth Disturbance.

(B) To determine if infiltration is appropriate on the Development site, follow the Hotspot Investigation, Subsurface Stability, and Suitability of Infiltration procedures found in the Manual.

(C) If the soil investigation report demonstrates that the soil is unsuitable for infiltration, the applicant shall follow the Infiltration Waiver Request procedure requirements as defined in the Manual.

(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 and in combined sewer areas. Projects in separate sewer areas achieve water quality treatment through stormwater management practices. Projects in 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) The infiltration and water quality volumes may be incorporated into the channel protection portion of the design provided the design meets all requirements concurrently.

(3) 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 location. Management Districts shall be determined 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) Predevelopment Conditions for New Development and 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 A are less than or equal to Peak Rates from Column B.

\* 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 and Redevelopment shall be defined 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 the required Buffer in accordance with federal, state and/or local law;

(3) prepare a Conceptual Stormwater Management Plan 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 Section 600.5(c) of these Regulations and 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 these Regulations.

## **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 Department reserves the right to reject 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 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) 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 issued until the Water Department has approved a Conceptual Stormwater Management Plan.

(2) No Earth Disturbance may commence and no building permit will be issued until the Department has approved a PCSMP.

#### **(b) Conceptual Approval**

In order to obtain conceptual approval from the Department, the Developer must complete the ERSA worksheet, and prepare an ERSA map and Conceptual Stormwater Management Plan.

#### **(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 state or federal permits, proof of application or approval of those permit(s) shall be included as part of the plan.

(3) All PCSMP materials shall be submitted to the Department in accordance with submittal procedures as outlined in the Manual.

(d) Miscellaneous Stormwater Management Charges

Applicability and requirements for Stormwater Plan Review Fees and Stormwater Management in Lieu are described in Section 308.0 of these Regulations.

**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 Department or its designee may inspect any phase of the installation of the SMPs.

(b) The Developer must arrange a meeting with the Department prior to the start of construction.

(c) During any stage of the work, if the Department or its designee determines that any component of the PCSMP is not being installed as approved by the Department, the Department shall issue a “Stop Work Order” preventing other on-site construction from proceeding until the deficiencies are corrected.

(d) As-built drawings for all PCSMP components must be submitted to the Department prior to final inspection.

(e) A final inspection of all PCSMP components shall be conducted by the Department or its designee to confirm compliance with the approved PCSMP prior to the issuance of Certificate of Occupancy, or other equivalent issuance,

or use of the Development Site.

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

(a) No regulated Earth Disturbance activities shall commence until the Department has approved a PCSMP and O & M Plan prepared in accordance with the requirements set forth in the Manual.

(b) The O & M Plan must include a signed O & M Agreement between the Property Owner and the City to maintain the SMPs in accordance with the O & M Plan is required.

(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) Department reserves the right to accept or reject the operations and maintenance responsibility for any SMPs.

(e) The Department or its designee may inspect the long term operation of the SMPs.

**600.12 Stormwater Management Easements**

(a) Stormwater management easements or right of way are required for all areas used for off-site SMPs or stormwater conveyance, unless a waiver is granted by the 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 shall be responsible for the recording of 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 Agreement included as part of the PCSMP submitted under Section 600.8, and

(2) Easements under Section 600.12 of these Regulations. Recordings shall be at the Property Owner's expense.

(b) The 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 that is not composed entirely of stormwater.

(b) In the event that the Department determines that any discharge to a storm sewer is not composed entirely of stormwater, the 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.