

4.0 Introduction

Chapter 4, Stormwater Management Practice Guidance, provides detailed guidance to the designer regarding stormwater management practices (SMPs) as well as pretreatment, inlet and outlet control systems, and landscaping that support SMP functions.

4.0.1 How to Use This Chapter

Before using this Chapter, the designer should first review the Philadelphia Water Department (PWD) Stormwater Regulations (Stormwater Regulations) outlined in [Chapter 1](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-1 to assess what level of stormwater management a project will need to achieve compliance. It is also important for the designer to have made a preliminary determination of an appropriate Review Path for their project, which is covered in [Chapter 2](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-2. Chapter 4 is only applicable for projects that fall under the Development Compliance Review Path ([Section 2.2.1](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-2/2-2-review-paths#2.2.1) and Stormwater Retrofit Review Path ([Section 2.2.4](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-2/2-2-review-paths#2.2.4).

For a project meeting Stormwater Regulations, the designer should have arrived at Chapter 4 after confirming, through a review of [Chapter 3](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3, that the project cannot show compliance with the Stormwater Regulations solely through use of non-structural design strategies ([Section 3.1.4](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3/3-1-site-assessment#3.1.4) and disconnected impervious cover (DIC; [Section 3.1.5](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3/3-1-site-assessment#3.1.5) and that SMPs are required. Before designing SMPs using the detailed guidance in Chapter 4, the designer should follow the SMP selection, layout, and design guidance in [Section 3.2](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3/3-2-stormwater-management-design and review the requirements for infiltration testing and soil assessment for SMP design in [Section 3.3](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3/3-3-infiltration-testing-and-soil-assessment-for-smp-design. The designer is also referred to [Section 3.4](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3/3-4-how-to-show-compliance for detailed guidance on how to show compliance with the Stormwater Regulations or applicable design criteria, and to [Section 3.5](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3/3-5-integrated-stormwater-management-examples for examples of stormwater management strategies that include SMPs. After the designer has selected the type(s) of SMP(s) needed on the project site, the designer can then refer to individual sections within Chapter 4 as needed to develop detailed designs of SMP(s) that comply with PWD requirements and standards.

4.0.2 Chapter Organization

The SMPs in this Chapter are presented in order of PWD preference according to the SMP Hierarchy ([Section 3.2.2](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3/3-2-stormwater-management-design#3.2.2). Several SMPs in this Chapter are on PWD's list of acceptable non-infiltrating pollutant-reducing practices ([Section 3.1.7](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-3/3-1-site-assessment#3.1.7).

This chapter consists of guidance and requirements for the following SMPs:

- [Section 4.1](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-1-bioinfiltration-bioretenion – Bioinfiltration/Bioretenion
- [Section 4.2](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-2-porous-pavement – Porous Pavement
- [Section 4.3](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-3-green-roofs – Green Roofs
- [Section 4.4](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-4-subsurface-infiltration – Subsurface Infiltration
- [Section 4.5](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-5-cisterns – Cisterns
- [Section 4.6](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-6-blue-roofs – Blue Roofs
- [Section 4.7](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-7-ponds-and-wet-basins – Ponds and Wet Basins
- [Section 4.8](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-8-subsurface-detention – Subsurface Detention
- [Section 4.9](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-9-media-filters – Media Filters

Additionally, this chapter contains guidance and requirements for the following types of systems that support SMP function:

- [Section 4.10](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-10-pretreatment – Pretreatment
- [Section 4.11](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-11-inlet-controls – Inlet Controls
- [Section 4.12](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-12-outlet-controls – Outlet Controls
- [Section 4.13](#) water.phila.gov/development/stormwater-plan-review/manual/chapter-4/4-13-landscaping – Landscaping

Each SMP section in this chapter is organized into subsections that contain the following information:

- *Introduction* – Introduces the SMP; gives examples of when the SMP can be used; and describes key advantages, limitations, and design considerations.
- *Components* – Describes the typical SMP pretreatment, inlet control, storage area, outlet control, and inspection and maintenance access components, as applicable.
- *Design Standards* – Lists all SMP design requirements, denoted by easy-to-reference numerals.
- *Material Standards* – List all SMP material specifications and requirements, denoted by easy-to-reference numerals.
- *Construction Guidance* – Provides guidance related to SMP construction.
- *Maintenance Guidance* – Provides guidance on SMP maintenance activities and frequencies, including a recommended SMP maintenance schedule.

4.0.3 Design Innovation

SMPs contained in this Chapter are by no means exclusive. PWD encourages the development of innovative practices that meet the intent of the Stormwater Regulations. PWD recognizes that new stormwater management systems and products are being developed continuously and is in support of innovative approaches to management. The designer is encouraged to request a pre-application meeting with PWD Stormwater Plan Review early in the approval process to discuss PWD’s standard SMP design requirements or if the designer wishes to use new or non-standardized technologies to meet the Stormwater Regulations.