

New Jersey Stormwater Best Management Practices Manual

February 2004

C H A P T E R 9 . 0

Structural Stormwater Management Measures

This chapter presents specific planning, design, construction, and maintenance information about a range of structural stormwater management measures that may be used to address the groundwater recharge and stormwater quality and quantity requirements of the NJDEP Stormwater Management Rules at N.J.A.C. 7:8. The specific structural measures, also known as structural Best Management Practices (BMPs), included in this chapter are:

- 9.1 – Bioretention Systems
- 9.2 – Constructed Stormwater Wetlands
- 9.3 – Dry Wells
- 9.4 – Extended Detention Basins
- 9.5 – Infiltration Basins
- 9.6 – Manufactured Treatment Devices
- 9.7 – Pervious Paving Systems
- 9.8 – Rooftop Vegetated Cover (Reserved)
- 9.9 – Sand Filters
- 9.10 – Vegetative Filters
- 9.11 – Wet Ponds

Information regarding each BMP is presented in a separate subchapter, which consists of the following sections.

Definition – Most if not all BMPs are actually rather complex stormwater management systems that have multiple components and utilize several physical, chemical, and biological processes. In addition, many of these components and processes are shared by multiple BMPs. This can often cause confusion over where in the manual users can find information regarding a specific BMP. To prevent this confusion, the

Definition section provides a definitive description of the BMP, including its major components and processes. It also presents the BMP's adopted TSS removal rate.

Purpose – This section describes the uses for which the BMP is particularly suited. This includes groundwater recharge and runoff quality and quantity control as well as ancillary uses such as recreation, wildlife habitat, and open space preservation. This information is intended to help manual users decide whether a particular BMP is capable of meeting their project needs.

Conditions Where Practice Applies – In addition to sharing many components and processes, all BMPs also have unique features and requirements. These must be recognized and met during a BMP's planning, design, and review phases if the BMP is to provide effective, efficient, and enduring service. This section concisely presents these BMP features and requirements so that manual users can decide whether a particular BMP is appropriate for their project

Design Criteria – This section presents specific BMP design criteria that must be met for a particular BMP to achieve the TSS removal rates adopted in the Stormwater Management Rules at N.J.A.C. 7:8. The design criteria also provides the information necessary to address groundwater recharge and stormwater quantity performance standards. The criteria presented in this section vary with each BMP and can range from required runoff storage volumes to maximum drainage area size to minimum soil permeabilities.

Maintenance – Effective BMP performance requires regular and effective maintenance. In addition, the NJDEP Stormwater Management Rules require that all structural BMPs have a specific maintenance plan that must be followed by those responsible for its operation and maintenance. This section provides specific maintenance information which, in combination with *Chapter 8: Maintenance and Retrofit of Stormwater Management Measures*, can be used to develop such a plan and to help ensure the effective, efficient, and enduring service envisioned by the BMP designer.

Considerations – This section presents valuable information that should be considered during a particular BMP's planning, design, review and/or construction phases. While not mandatory, this information is intended to promote BMPs that comprehensively meet the expectations of their designers, reviewers, owners, and maintenance personnel.

Recommendations – As noted above, all BMPs have unique features, requirements, ancillary functions, and maintenance needs. This section identifies various factors that, while not necessarily a mandatory design criteria, should nevertheless be included in the development of a BMP's design whenever possible.

References – This section identifies the major published sources of technical information that were used by the NJDEP in the development of each BMP's subchapter.

Regarding references, it is important to note that the information presented in each BMP subchapter was developed not only from published sources, but also through detailed technical discussions held at numerous BMP Manual Technical and Advisory Committee meetings hosted by the NJDEP. The information and conclusions developed at these meetings reflect the technical knowledge of the committee members, which was derived, in part, from numerous published and unpublished sources.

In recognition of the continued growth of our stormwater management knowledge, it should also be noted that compliance with the NJDEP Stormwater Management Rules is not limited to the BMPs presented in this chapter. Other BMPs that possess similar levels of effectiveness, efficiency, and endurance may also be utilized provided that such levels can be similarly demonstrated.