

Chapter 5.4

Stormwater Control Measures (SCMs)

This section provides engineering design specifications and management protocols for individual SCMs that can be used in stormwater management systems to achieve Smart Site Design goals for runoff reduction and pollutant removal control.

The design specifications presented in the subsequent sections of this chapter were created based on a synthesis of information from the best available sources across the country. Critical design specifications are emphasized for each SCM. The TNRRAT is the preferred method to determine the needed size of SCMs. Some sizing information on contributing areas and maximum allowable SCM sizes are included here to provide a guide for designers and plan reviewers in SCM siting and design. Often times, “rules of thumb” are commonly used to size SCMs based on contributing area size or impervious surface ratios. This approach does not take into account specific site characteristics and circumstances. TNRRAT sizing results are produced from specific user inputs and tailored to a unique application. Because of this, TNRRAT results may differ from those found using general “rules of thumb.” It is up to the designer to provide sufficient justification to use sizing tools other than the TNRRAT in SCM design.

Certain SCMs are sized to capture and treat a “runoff reduction volume” and “treatment volume,” respectively. These volumes can be easily determined for specific project plans using the TNRRAT. See chapter 6 for guidance. Alternatively, use the methodology supported by local municipal programs in determining these values.

Please note: While this manual makes reference to flood control aspects of stormwater management for larger storms, this is not its intended use. In Tennessee, flood control remains under the purview of local government codes, ordinance, and policy. Flooding is not regulated through MS4 permits. As such, it should be understood that the practices in this manual are not intended to solve existing flooding and drainage issues in Tennessee communities. The practices identified here may provide additional benefit of mitigating water quantity issues, but only when they are used in conjunction with other stormwater control and floodplain management measures.

The following outline of information is used in subsequent sections, one for each individual SCM:

1. A “quick page” that includes a brief description of the SCM and bulleted breakdown of key considerations during the design process; including site constraints, key design criteria, maintenance recommendations, relative advantages and disadvantages, and a design checklist.
2. Following each summary page is detailed information on the SCM which includes:
 - a. **Section 1: Design** – Technical procedures to be followed for site-specific SCM design.
 - i. **Application and Major design elements** – Feasibility and applicability depended on the project land use and natural conditions.
 - ii. **Design criteria** – Key elements of the SCM from inflow to outflow, including materials specifications and management requirements.
 - iii. **Calculation** – Detail guidance on sizing criteria, both within the TNRRAT and using manual calculation.
 - iv. **Typical detail drawings**
 - b. **Section 2: Construction** – Details of pre-construction, construction and inspections. However, this section does not specifically address erosion prevention and sediment control methods. Users should refer to TDEC’s Tennessee Erosion and Sediment Control Handbook in addition to this manual.
 - c. **Section 3: Maintenance** – Recommendations on agreements and schedules needed to properly maintain SCM performance.

The following SCMs are approved for use as runoff reduction and/or pollutant removal technologies based on their wide acceptance and implementation in stormwater management systems

- 5.4.1 Dry Detention
- 5.4.2 Wet Ponds
- 5.4.3 Vegetated Swale (Water Quality Swale)
- 5.4.4 Managed Vegetated Areas (Urban Forest, Grassland and Riparian Buffers)
- 5.4.5 Filter Strips
- 5.4.6 Bioretention
- 5.4.6a Urban Bioretention
- 5.4.7 Infiltration Areas (Impervious Area Disconnection)
- 5.4.8 Permeable Pavement
- 5.4.9 Green Roofs
- 5.4.10 Rainwater Harvesting
- 5.4.11 Stormwater Treatment Wetlands
- 5.4.12 Manufactured/Proprietary Treatment Devices