



# Stormwater Management Manual

**Bureau of Environmental Services**

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## Summary of Reorganization, Changes and Clarifications from the 2014 Manual

### Chapter 1

**1.1.1. Regulatory Mandates** - Added Combined Sewer compliance as a regulatory driver.

**1.1.3. Relationships to Other Requirements and Standards** –

- Added the new BES Source Control Manual (previously Chapter 4 of the 2014 SWMM).
- Consolidated and added other regulatory requirements that may impact design and construction of stormwater management systems, including:
  - Public Works Improvements,
  - Title 10 (Erosion Control),
  - Title 11 (Trees),
  - Title 21 (Water),
  - Titles 24 and 25 (Building and Plumbing Regulations),
  - Title 33 (Planning and Zoning).
  - References to the Port of Portland Stormwater Design Standards Manual (SDSM) (adopted January 2014).

**1.2. Applicability** – Consolidated applicability sections from throughout the 2014 SWMM.

- Clarified definitions of development and redevelopment.
- Separated and expanded specific exemptions from meeting stormwater management requirements (e.g. standalone safety improvement projects, maintenance activities, Port of Portland where their SDSM applies).

**1.3. Stormwater Management Requirements** - A shift from citywide flow control and pollution reduction requirements to system-specific requirements.

- Category 2- Under certain criteria, allow runoff from the following areas to discharge to compliant UICs without the installation of new or additional vegetated stormwater management facilities
  - Small parking lots that have less than 50 uncovered parking spaces and receive less than 1,000 trips per day;
  - Residential public rights-of-way and private streets that receive less than 1,000 trips per day;
  - Residential driveways
  - Runoff from pedestrian-only plaza areas, is allowed to discharge directly to UICs without additional water quality treatment, similar to rooftops.

- Category 4 – changed focus to require only flow-control when discharging to a public combined sewer system; vegetated facilities must still be used to the maximum extent practicable according to the Infiltration and Discharge Hierarchy.
- Moved policy requirements regarding Drainage Reserves from 2014 SWMM Appendix A to 2016 Chapter 1.

**1.4. Operations and Maintenance Requirements** – Clarify maintenance responsibilities for drainage reserves and for public facilities during the establishment period.

**1.4.1 Exemptions to the O&M Submittal Requirements** moved from 2014 chapter 3

**1.5 Special Circumstances Submittal Guide and Form** - moved from 2014 Appendix D into Chapter 1.

**1.6. Administrative Reviews and Appeals** – Revised to conform with new citywide standards for administrative reviews and appeals.

## Chapter 2

- Incorporated language from 2014 SWMM Appendix A regarding Drainage Reserves into Chapter 2 site planning and facility design criteria.

**2.3.1 and 2.3.2. Facility Types and Facility Configurations** - separated into two different sections.

- The term “flow through” has been removed throughout.
- More robust discussion of discharge configurations.

**2.3.3. Standard Landscape Requirements** - Facility specific requirements were removed from this section to avoid repeated information in 2.3.4. This section provides general intent only.

**2.3.4. Facility and Conveyance Design Criteria** –

- separated into right-of-way, private property or specific design approach when applicable.
- Added rain garden as a stormwater facility including typical details.
- Removed Operations and Maintenance (O&M) references from design and placed them in Chapter 3 (O&M requirements).

**2.3.5 Typical Details** –

- Moved from 2014 SWMM Appendix G to Chapter 2
- Expanded typical details for private property stormwater facilities:
  - simplified approach (SW-100’s) and
  - presumptive and performance approach (SW-200’s).
  - Public stormwater facilities included as Green Street typical details (SW-300’s).

**2.3.6 Infiltration and Soil Requirements** -

- Moved requirements relating to depth to groundwater investigation, soil specifications, and infiltration testing from 2014 SWMM Appendix F into Chapter 2.

**2.4 Submittal Requirements** –

- Moved submittal requirements and forms from 2014 SWMM Appendices B & D into Chapter 2.
- New submittal guide created for drainage reserves in 2.4.7.
- All submittal guides and forms were updated to reflect clarifications and updates found in Chapters 1 and 2.
- Plant Lists - Updated and reformatted for ecoroofs, private stormwater facilities, and public stormwater facilities. Moved from 2014 SWMM Appendix F to Chapter 2 (pgs. 233-242).

## Chapter 3

- Shift O&M submittal requirements for the Presumptive design approach to mimic that of the Simplified approach.
- Require standard O&M Plans for all non-performance designed facilities, including green streets.

### 3.1.3 Stormwater Conveyance Features –

- Clarified O&M responsibilities and standard O&M Plans for culverts, outfalls, drainageways and drainage reserves, drainage reserve and channel encroachments,
- Long-term operations and maintenance used to be accomplished via a deed notice; now requiring an O&M similar to that of stormwater facilities.

### 3.2 O&M for Future Public Facilities –

- Clarified maintenance responsibilities for construction contractors building vegetated stormwater facilities under Public Works Permits.
- Developed a Public Works O&M Form and Green Street Standard O&M Plan to help streamline required submittals.
- All O&M submittal requirements from 2014 SWMM Appendix D were moved into 2016 Chapter 3.
- All submittal guides and forms were updated to reflect clarifications and updates found in Chapter 1 through 3.

## Source Controls

- Previously Chapter 4 in the 2014 SWMM, has been adopted as a separate *BES Source Control Manual* to differentiate site-related activities from site development.
- Typical details for source control facilities (i.e. spill control manhole, Oil and Water separator) from chapter 2 of the 2014 SWMM moved to the *BES Source Control Manual*.
- O&M forms for source control facilities moved from chapter 3 of 2014 SWMM to *BES Source Control Manual*.

## Appendices

### Appendix A –

- Consolidated stormwater methodologies into 2016 SWMM Appendix A.
- Includes Santa Barbara Urban Hydrograph Method
- Simplified Approach Sizing (previous Appendix C);
- Pollution Reduction Methodology (previous Appendix E) and
- Presumptive Approach Calculator Technical Framework (previously the PAC User's Guide).

**Appendix B** - Recommended guidance for culverts and outfalls (previously Appendix A.4) has been updated and is now in Appendix B.

**Appendix C** – Resources and References (previously unassigned in the 2014 SWMM).

## Definitions

- Removed definitions specific to the BES Source Control Manual (see Source Controls update above).
- Consolidated definitions previously found in 2014 SWMM Appendices.

## Presumptive Approach Calculator

- The Excel Presumptive Approach Calculator (PAC) will be replaced with an online Presumptive Approach Calculator when the 2016 Manual is in full effect November 21, 2016.
- The online PAC is accessed through PortlandOnline (POL), which allows users to save projects under their POL account. Similar to the Excel PAC, there is export/import functionality, so users can share PAC-designed projects. The calculations and assumptions remain the same, with a few minor exceptions. The conversion process uncovered a few bugs that were fixed; the fixes were small refinements resulting in changes of less than 10%. Both enhancements and fixes are outlined below.

### Enhancements:

- Incorporates Stormwater Hierarchy Category 3 and 4 pre and post peak matching. The Excel PAC required staff to run the PAC twice in order to compare results. The work flow has been modified and logic added to incorporate this into the online PAC.
- Allows different discharge points for Stormwater Hierarchy Category 3 and 4 to be selected.
- Allows entry of more than 20 sloped facility segments.
- Provides accurate, perspective images of facilities.
- Labels facility configurations by function, not just letter.

### Fixes:

- The Excel PAC was inconsistent with the SWMM regarding infiltration testing factor of safety. Safety factors are now consistent for private and public projects: Open Pit Falling Head: (2), Encased Falling Head (2), Double Ring Infiltrometer (1).
- Change the term “void ratio” to “porosity” to be congruent with volume calculations.
- Accurately calculates the volume and infiltration area for Configuration E Sloped Planters and Swales where one side of the facility has a different side slope. The previous calculation only looked at one side slope instead of utilizing both.
- More accurately calculates the infiltration area for amoeba, user defined basin and rectangular basin. The previous calculation used a generic solution to calculate the infiltration area that did not differentiate between shapes.
- Stormwater overflow for configuration C and D now includes the below-grade overflow to an underdrain for the pollution reduction storm. The previous calculation did not accurately calculate the total overflow volume that included both surface overflow and underdrain overflow.
- Allows different underdrain depths for configuration C. Previous calculation used a default value and did not allow user entry of the underdrain depth.
- More accurate storage overflow and lag time calculations (consistent rounding and precision).