

## 2012-2014 SWMMWW Chart of Changes

See the 2012 to 2014 SWMMWW Redlines for full change details.

Location	Change	Reasoning or Comments
All Volumes	Updated date in footer	Date updated to reflect the manual's revision date
	Updated page numbers and Figure numbers as appropriate	Page and Figure numbers may have changed due to content insertion or deletion
	Updated Table of Contents as appropriate	Some page numbers may have changed due to content insertion or deletion
	Minor spelling corrections	examples include: groundwater changed to ground water; under-drain changed to underdrain
	Minor text clarifications	examples include: changing "the Department of Ecology" to "the Washington State Department of Ecology"; inserting and/or clarifying acronyms where appropriate
	Minor typographical errors	examples include changing "text" to test" and "lopers" to "loppers"
	Updates per previous errata	Updates per previously published errata to the 2012 SWMMWW have been incorporated
<b>Volume I - Minimum Technical Requirements and Site Planning</b>		
Volume I Acknowledgements	Minor language changes	Inserted text indicating the shorthand for "The Washington State Department of Ecology" is "Ecology", added Craig Doberstein to the acknowledgement list, reformatted the acknowledgement list
<b>Chapter 1 - Introduction</b>		
Section 1.1 - Objective	corrected "Ground Waters" to "Groundwaters"	Although the rest of the manual uses the spelling "ground water" (two separate words), the spelling here was updated to be consistent with the WAC title referenced
Section 1.6.4 - The Puget Sound Action Agenda	Revised this section	Revision of this section reflects changes from the Puget Sound Partnership's 2008 Action Agenda to the Puget Sound Partnership's 2014/2015 Action Agenda
<b>Chapter 2 - Minimum Requirements for New Development and Redevelopment</b>		
Section 2.2 - Exemptions	Deleted sentence: "They are considered redevelopment."	These practices are not restricted to redevelopment projects. The bullets that follow this sentence properly indicate that how the surfaces are considered within new or redevelopment projects.
	Restored formatting for second bullet regarding extending the pavement edge.	Formatting error correction
Section 2.3 - Definitions	definitions have been moved from section 2.3 to the Glossary	definitions have been moved in an effort to consolidate and organize the SWMMWW
Section 2.5.2 - Minimum Requirement #2: Construction Stormwater Pollution Prevention (SWPP)	revised wording to read "volumetric flow rate calculated using a 10-minute time step"	edit made to accurately describe the design criterion
	revised "with outfall to" to "that discharges to"	revision made per settlement agreement PCHB No. 12-097c
Section 2.5.5 - Minimum Requirement #5: On-Site Stormwater Management	Added Figure 2.5.1: MR5 Flow Chart	A flow chart to help determine MR5 requirements
<b>Chapter 3 - Preparation of Stormwater Site Plans</b>		
Section 3.1.1 - Step 1 - Site Analysis: Collect and Analyze Information on Existing Conditions	Added text: "Testing should occur between December 1 and April 1."	Clarification
	Under Projects required to meet MR 1-9: 2.c., revised cited clearances	Revised to be consistent throughout the manual
Section 3.1.2 - Step 2 - Prepare Preliminary Development Layout	Added text referring to LID manual for additional information	clarification
<b>Appendix I-G - Glossary and Notations</b>		
Glossary	Added a definition for "Biosolids"	Clarification
	Deleted the definition for "Commercial Agriculture"	The entry deleted was a duplicate entry and out of alphabetical order

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Glossary	Deleted the definition for "Converted Vegetation (areas)"	The entry deleted was a duplicate entry and out of alphabetical order
	Commercial Agriculture definition - replaced the word "wholesale" with "commercial" within the definition	Clarification
	Amended definition for compost. Deleted composted mulch and composting.	Updated to correct WAC reference.
	Added a definition for "Discharge Point"	Added for consistency with proposed permit modification as part of a settlement under PCHB No. 12-093c and - 097c
	Updated freeboard definition	Reworded for clarification
	revised "Low Permeable Liner" definition	revised to be consistent with other text within the manual
	Added a definition for "Mulch"	Clarification
	Added definition for "outfall"	Added for consistency with proposed permit modification as part of a settlement under PCHB No. 12-093c and - 097c
	Deleted reference to Rain Garden Handbook in "Rain Garden" definition.	Ecology prefers users to first refer to the guidance within the SWMMWW
Updated "receiving waters" definition	Revised for consistency with proposed permit modification as part of a settlement under PCHB No. 12-093c and - 097c	
<b>Volume II - Construction Stormwater Pollution Prevention</b>		
<b>Chapter 3 - Planning</b>		
Section 3.3.3 - Step 3 - Construction SWPPP Development and Implementation	revised wording to read "volumetric flow rate calculated using a 10-minute time step"	edit made to accurately describe the design criterion
	revised "sites larger than 1 acre" to "applies only to sites that have coverage under the Construction Stormwater General Permit"	revised to clarify the intent of the original wording
	added wording to clarify that the LID Technical Guidance Manual is for additional informational purposes only	Clarification that the SWMMWW guidance overrules the LID Technical Guidance Manual if discrepancies are found
<b>Chapter 4 - Best Management Practices Standards and Specifications</b>		
Section 4.1 - Source Control BMPs	Table 4.1.1 updated to match Errata, and reformatted as a word table for ease in future revisions	See 10/14/2013 Errata
BMP C121: Mulching	Added a specification for coarse compost for use when the option of Composted Material is selected	Clarification
BMP C121, Table 4.1.8	Replaced the terms "composted mulch and compost" with terms consistent with WAC 173-350	Clarification
BMP C125: Topsoiling/Composting	Updated for consistency with BMP T5.13	Clarification
BMP C151: Concrete Handling	Updated sentence to clarify that concrete washout cannot be discharged to ground	Clarification
BMP C154: Concrete Washout Area	Updated sentence to clarify that concrete washout cannot be discharged to ground	Correction
	Removed wording telling volume of wash water typically used	Clarification

Location	Change	Reasoning or Comments
Section 4.2 - Runoff Conveyance and Treatment BMPs	Table 4.2.1 updated to match Errata, and reformatted as a word table for ease in future revisions	Clarification
BMP C200: Interceptor Dike and Swale	revised wording to read "volumetric flow rate calculated using a 10-minute time step"	edit made to accurately describe the design criterion
BMP C201: Grass-Lined Channels	revised wording to read "volumetric flow rate calculated using a 10-minute time step"	edit made to accurately describe the design criterion
BMP C204: Pipe Slope Drains	revised wording to read "volumetric flow rate calculated using a 10-minute time step"	edit made to accurately describe the design criterion
<b>Volume III - Hydrologic Analysis and Flow Control BMPs</b>		
<b>Chapter 2 - Hydrologic Analysis</b>		
Section 2.2 - Western Washington Hydrology Model	updated sentence to state that low impact development modeling capabilities have been added to WWHM2012	wording was revised to reflect updates to WWHM since the last publishing of the SWMMWW
Section 2.2.1 - Limitation to the WWHM	Clarified that routing limitations in the earlier versions of WWHM (WWHM1 and WWHM2) have changed considerably. WWHM3 and WWHM2012 have much greater routing capability that allow them to model multiple facilities and wetlands	wording was revised to reflect updates to WWHM since the last publishing of the SWMMWW
Section 2.2.2 - Assumptions Made in Creating the WWHM	Clarified that WWHM2012 now uses over 50 years of precipitation time series from more than 17 stations. Precipitation time series are in 15-minute time steps.	wording was revised to reflect updates to WWHM since the last publishing of the SWMMWW
	Clarified that WWHM2012 now uses 15-minute precipitation time series in its computations to generate hydrographs and to calculate water quality design flows	wording was revised to reflect updates to WWHM since the last publishing of the SWMMWW
	Clarified that the advanced user may change coefficient <b>Precipitation multiplication factor</b> where justified and approved by reviewing jurisdiction	Clarification
	Clarified that the advanced user may change coefficient <b>Pan evaporation coefficient</b> justified and approved by reviewing jurisdiction	Clarification
Section 2.2.3 - Guidance for Flow-Related Standards	Noted the updated capability to model flows to wetlands and analyze the daily and monthly flow deviations per MR 8 in WWHM2012	wording was revised to reflect updates to WWHM since the last publishing of the SWMMWW
Section 2.3.2 - Runoff Parameters	Added footnote to Table 2.3.1 allowing modeling soils with a measured infiltration rate of less than 0.3 in/hr as Class C	Clarification

Location	Change	Reasoning or Comments
<b>Chapter 3 - Flow Control Design</b>		
Section 3.1 - Roof Downspout Controls	Updated wording that directs user to BMP design guidance within the SWMMWW instead of the Rain Garden handbook	Clarification
Section 3.1.1 - Downspout Full Infiltration Systems (BMP T5.10A)	Revised subsection title from "Flow Credit for Roof Downspout Full Infiltration" to "Runoff Modeling for Roof Downspout Full Infiltration"	Clarification
	revised sentence to clarify that clearance is measured to the seasonal high ground water table	Clarification
Section 3.1.2 - Downspout Dispersion Systems (BMP T5.10B)	Revised subsection title from "Flow Credit for Roof Downspout Dispersion" to "Runoff Modeling for Roof Downspout Dispersion"	Clarification
	Added modeling guidance where a dispersion trench is used with a vegetated flowpath of 25 to 50 feet.	Clarification
	removed footnote defining "Vegetative Flow Path"	
Section 3.2.1 - Detention Ponds	Added text to Emergency Overflow Spillway section to ensure a min 1 foot of freeboard in detention pond design	Clarification
	Updated Landscaping section to refer to BMP T5.13.	Clarification
	Added a reference to the Maintenance Tables in Volume V, removed the Maintenance Tables from this section	tables have been moved in an effort to consolidate and organize the SWMMWW
	revised wording to read "volumetric flow rate calculated using a 10-minute time step"	edit made to accurately describe the design criterion
Section 3.2.2 - Detention Tanks	Added a reference to the Maintenance Tables in Volume V, removed the Maintenance Tables from this section	tables have been moved in an effort to consolidate and organize the SWMMWW
Section 3.2.4 - Control Structures	Added a reference to the Maintenance Tables in Volume V, removed the Maintenance Tables from this section	tables have been moved in an effort to consolidate and organize the SWMMWW
Section 3.3.4 - Steps for the Design of Infiltration Facilities - Simplified Approach	Sentence added "Testing should occur between December 1 and April 1"	Clarification
Section 3.3.7 - Site Suitability Criteria (SSC)	Updated SSC-2 Ground Water Protection Areas per Errata	See 10/14/2013 Errata
	Corrected reference cited in SSC-6	Correction
Section 3.4.2 - Description	Removed reference to the LID Technical Guidance Manual for Puget Sound	Ecology wants users to first consider the design guidance within the SWMMWW.
	Revised wording to state design criteria "per BMP T5.14A" instead of the Rain Garden Handbook	Ecology wants users to first consider the design guidance within the SWMMWW.

Location	Change	Reasoning or Comments
Section 3.4.2 - Description	Added statement allowing infiltration through the side slopes to be modeled for facilities with side slopes 3H:1V or flatter	Clarification
<b>Appendix III-B - Western Washington Hydrology Model - Information, Assumptions, and Computation Steps</b>		
WWHM Information and Assumptions - Precipitation Data	Revised text to state that WWHM2012 uses 15-minutes precipitation time series	Clarification
WWHM Information and Assumptions - Soil Data	Added statement that soils tested at less than 0.3 in/hr may be modeled as Class C soil.	Clarification
	Clarified that type D soil is generally modeled as till and saturated soil category in WWHM is to be used for wetlands	Clarification
WWHM Information and Assumptions - Development Land Use Data	Updated text that conflicted with information elsewhere in the manual	Clarification
	Updated text that the Appendix C guidance was developed before WWHM2012 became available. WWHM2012 can model permeable pavements directly.	Clarification
WWHM Information and Assumptions - PERLND and IMPLND Parameter Values	Added statements concerning adjustment of LSUR, SLSUR, and NSUR by the model user	Clarification
	Added a paragraph explaining WWHM2012 and WWHM3 provides 2 additional land slopes, flat and steep, to the existing moderate land slope for modeling purposes	Clarification
<b>Appendix III-C - Washington State Department of Ecology Low Impact Development Flow Modeling Guidance</b>		
Appendix III-C	Added a "Note" that the guidance in Appendix C was developed for use with WWHM3 before WWHM2012 became available.	Clarification
Part 1 C.2.3 - Partial Dispersion on Residential Lots and Commercial Buildings	Clarified guidance for consistency with text regarding modeling of partial dispersion options.	Clarification
Part 1 C.10.1 - Runoff Model Representation	Added guidance regarding modeling bioretention that has an underdrain	Clarification
Part 1 C.11.1 - Instructions for Roads on Zero to 2% Grade	Added guidance regarding modeling permeable pavement that has underdrains at the bottom of base course	Clarification
Part 1 C.11.2 - Instructions for Roads on Grades above 2%	Added guidance regarding modeling permeable pavement that has underdrains at the bottom of base course	Clarification
Part 2 Downspout Dispersion - BMP T5.10B	Inserted guidance for downspout dispersion modeling	Clarification
Part 2 Bioretention - BMP T7.30	Added modeling guidance on Bioretention with underlying perforated drain pipes	Clarification

Location	Change	Reasoning or Comments
<b>Volume IV - Source Control BMPs</b>		
<b>Chapter 2 - Selection of Operational and Structural Source Control BMPs</b>		
S403 BMPs for Commercial Composting	revised text to reflect updated regulations and guidance	Clarification
S411 BMPs for Landscaping and Lawn/Vegetation Management	Revised S411 BMP bullet point to clarify use of pesticides in Landscaping	Clarification
S430 BMPs for Urban Streets	deleted reference to Vol. V, Ch. 12 which no longer has information on sweepers	Clarification
S431 BMPs for Washing and Steam Cleaning Vehicles/Equipment/Building Structures	Revised text to reference updated guidance	Clarification
<b>Appendix IV-G - Recommendations for Management of Street Wastes</b>		
Contamination in Street Waste Solids	Total Copper added to Table G.4	Copper overlooked in previous editions
	Added note that the Interim Compost Guidelines are no longer effective. Retained for background info.	Clarification
<b>Volume V - Runoff Treatment BMPs</b>		
<b>Chapter 2 - Treatment Facility Selection Process</b>		
Section 2.1 - Step-by-Step Selection Process for Treatment Facilities	Step 5: revised "urban growth management area" to "urban growth area"	Clarification
<b>Chapter 3 - Treatment Facility Menus</b>		
Section 3.4 - Enhanced Treatment Menu	Revised "urban growth management area" to "urban growth area"	Clarification
	Bioretention: removed text directing reader to LID Manual for bioretention guidance. Text now directs reader to Chapter 7 only. (Text within Chapter 7 refers to the LID manual for additional guidance)	Clarification
Section 3.5 - Basic Treatment Menu	Deleted: "The goal also applies on an average annual basis to the entire annual discharge volume (treated plus bypassed)."	Clarification - See 10/14/2013 Errata
	Bioretention: removed text directing reader to LID Manual for bioretention guidance. Text now directs reader to Chapter 7 only. (Text within Chapter 7 refers to the LID manual for additional guidance)	Clarification
<b>Chapter 4 - General Requirements for Stormwater Facilities</b>		
Section 4.1.2 - Water Quality Design Flow Rate	(last sentence of section) Deleted reference to an average annual performance goal	Indefinite determination.
Section 4.1.4 - Minimum Treatment Facility Size	New section re minimum treatment facility size	Additional guidance provided on the minimum treatment facility size.

Location	Change	Reasoning or Comments
Section 4.6 - Maintenance Standards for Drainage Facilities	Updated Tables 21&22 with information from LID O&M Guidance document, with note that inspection and routine maintenance frequencies are recommended only.	Guidance added per PCHB No. 12-093c and - 097c
<b>Chapter 5 - On-Site Stormwater Management</b>		
Section 5.1 - Purpose	Added text clarifying that LID manual is for additional guidance only.	Clarification
Section 5.3.1 - On-Site Stormwater Management BMPs	Added bullet under Competing Needs on local codes	Clarification
BMP T5.11: Concentrated Flow Dispersion	Added modeling guidance for use of dispersion trench with flowpath of 25-50 feet	Additional guidance for runoff modeling
BMP T5.12: Sheet Flow Dispersion	Added modeling guidance for use of dispersion trench with flowpath of 25-50 feet	Additional guidance for runoff modeling
BMP T5.13: Post-Construction Soil Quality and Depth	Updated the compost specification requirement to be consistent with the Bioretention compost specification but allowing use of biosolids	Corrected WAC reference, made clarifications
BMP T5.14A: Rain Gardens	Revised Rain Garden Handbook reference to specify 2013 version	Clarification per PCHB No. 12-093c and - 097c
	Added a design guideline concerning use of composts	Additional Guidance for rain gardens
	Provided guidance for sizing rain gardens serving lawn/landscape areas in addition to impervious surfaces	Additional Guidance for rain gardens
	Provided guidance for underdrains in rain gardens	Additional Guidance for rain gardens
	updated the maintenance section to refer to both the Rain Garden Handbook and the Western Washington LID O&M Guidance Document	Additional Guidance for rain gardens
BMP T5.14B: Bioretention	Provided guidance for sizing bioretention facilities serving lawn/landscape areas in addition to impervious surfaces	Additional Guidance for bioretention facilities
BMP T5.15: Permeable Pavements	Revised guideline regarding the amount of impervious area draining to a pervious area	Clarification
	Revised infeasibility criterion for permeable pavement and roads re PCHB decision	Revised to implement PCHB No. 12-093c and -097c
	Deleted the second sentence of the infeasibility criterion addressing road sanding for snow and ice, Per PCHB ruling	Deleted per PCHB No. 12-093c and - 097c
	New text in regard to municipalities designating areas as infeasible and the data required	Clarification and additional guidance as directed by PCHB No. 12-093c and - 097c

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BMP T5.15: Permeable Pavements	Revised 1st paragraph of "Design Guidelines" section to clarify that LID Manual is for additional guidance only, and that alternatives adopted by municipalities must not conflict with Ecology design criteria.	Clarification
	Removed reference to the LID manual in the "Base Material" section. The LID manual is already referenced as additional guidance in the opening paragraph.	Clarification
	"Wearing layer": updated infiltration rate in first sentence from 10 in/hr to 20 in/hr. The 10 in/hr rate was a typo and conflicted with information given later in this section.	Clarification
	Removed reference to the LID manual in the "Wearing Layer", "Pervious Concrete", and "Permeable Interlocking Concrete Pavement and Aggregate Pavers" sections. The LID manual is already referenced as additional guidance in the opening paragraph.	Clarification
	"Underdrains": Added a section regarding underdrains affecting the status of permeable pavements as LID BMPs	Additional Guidance for permeable pavements
	added a reference to Table 22 within Table 4.5.2 in Chapter 4 for maintenance guidance	Additional Guidance for permeable pavements
BMP T5.17: Vegetated Roofs	Added text clarifying that LID manual is for additional guidance only.	Clarification
BMP T5.30: Full Dispersion	Corrected section sub header name	Clarification, the guidance is not only for residential projects
	Corrected design requirements for residential projects text for clarity	Clarification
	Revised "urban growth management area" to "urban growth area"	Clarification
<b>Chapter 7 - Infiltration and Bioretention Treatment Facilities</b>		
BMP T7.30: Bioretention Cells, Swales, and Planter Boxes	Replaced Figure 7.4.1	Clarification
	Added Figure 7.4.1b	Clarification
	Added Figure 7.4.1c	Clarification
	New text in regard to municipalities designating areas as infeasible and the data required	Additional guidance to be consistent with directive of PCHB No. 12-093c and - 097c for permeable pavement
	Determining Bioretention soil mix infiltration rate: Updated Ksat Safety Factor language for consistency with WWHM.	Clarification



Location	Change	Reasoning or Comments
BMP T7.30: Bioretention Cells, Swales, and Planter Boxes	Design criteria for bioretention - updated text to clarify that LID manual is additional guidance only; under "curb cuts for roadside, driveway, and parking lot areas" - removed reference to LID manual because it is already referenced in the design criteria opening paragraph.	Clarification
	Added text to "ponding area" section describing surface areas when designing for MRS	For consistency w/Min. Requirement #5 and recommendation for size increase if draining pervious area
	Default Bioretention Soil Media: Multiple changes to the compost specification; and to incorporate a specification for fine compost	Changes needed to be consistent with updated WAC 173-350-220; Incorporated fine compost spec. to delete reference to LID Manual
	Design Criteria for Custom Bio Soil Mixes: Added text clarifying that custom mix does not need to meet gradation specification	Clarification
	Soil Depth: Removed guidance for 24" BSM depth	Additional Guidance for bioretention facilities. Local monitoring indicates phosphorus loss from media.
	Underdrain (optional): Added guidance for modeling bioretention with underdrains	Additional Guidance
	Added text to clarify that LID manual is additional guidance only.	Clarification
	Added statement that compost shall not include biosolids or manures	Clarification
BMP T7.40: Compost-Amended Vegetated Filter Strips	Soil Design Criteria: Emphasized exclusion of biosolids and manure from compost used for CAVFS	Clarification
	Maintenance: deleted bullets per Errata	Clarification - See 10/14/2013 Errata
BMP T8.30: Linear Sand Filter	Additional Design Criteria for Linear Sand Filters: corrected text	Correction
BMP T8.40: Media Filter Drain	Grass Strip: restricted compost to that used for Bioretention soil media	Clarification
<b>Chapter 9 - Biofiltration Treatment Facilities</b>		
BMP T9.10: Basic Biofiltration Swale	revised wording to read "volumetric flow rate calculated using a 10-minute time step"	edit made to accurately describe the design criterion
	Soil Criteria: SC-15: Restricted compost to that used for Bioretention soil media	Clarification
BMP T9.40: Basic Filter Strip	Corrected error in figure 9.4.9	Correction
<b>Chapter 11 - Oil and Water Separators</b>		
Section 11.6 - Design Criteria - General Considerations	Corrected Schueler citation from 1990 to 1992	Correction
BMP T11.11: Coalescing Plate (CP) Separator Bay	Clarification in design flowrate variable	Clarification