

GOVERNMENT OF THE DISTRICT OF COLUMBIA

District Department of the Environment



MEMORANDUM

TO: District of Columbia Stakeholders

FROM: Hamid Karimi
Deputy Director, Natural Resources Administration 

DATE: December 23, 2014

SUBJECT: Updated Errata for the 2013 Stormwater Management Guidebook

Attached are clarifications of issues that stakeholders or the District Department of the Environment (DDOE) have noted in the 2013 Stormwater Management Guidebook (2013 SWMG). The 2013 SWMG provides technical guidance on compliance with the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control (2013 SW Rule), which was published as final in the *D.C. Register* on July 19, 2013.

This document is an update to the errata published on May 5, 2014. Page 1 briefly identifies the new entries. The full list of errata begins on page 2. Entries are organized by the page number where the original text is located in the 2013 SWMG and include an explanation of the reason for the change and the date of publication to this document. Each entry is designated as an omission or an edit. An omission (denoted as **O**) publishes clarifying information that was inadvertently excluded from the original document. An edit (denoted as **E**) is a substitution or deletion to clarify original intent or improve consistency.

Note: Due to formatting limitations with the equation software, all edits to equations are shown as full revisions instead of strikethroughs and underlines and use a black font color instead of green.

DDOE will continue to update these errata as issues surface that require clarification and post the updated version at ddoe.dc.gov/swregs. DDOE will also send notifications about updates to its stormwater management email list. To be added to this list, please email Matthew Espie at matthew.espie@dc.gov (and mention stormwater management listserv), or call (202) 715-7644.

DDOE anticipates republishing the entire SWMG not more than once per year, and will include posted omissions and edits as well as any additional revisions. When republishing the entire SWMG, DDOE will notify the public through the stormwater management email list and the *D.C. Register*, and DDOE will provide an opportunity for public comment.



Errata for the 2013 Stormwater Management Guidebook

District Department of the Environment

December 23, 2014

Contents

New Entries.....	1
Errata	2
Contents	2
Chapter 2.....	4
Chapter 3.....	9
Chapter 5.....	22
Appendix A.....	43
Appendix H.....	47
Appendix O.....	48
Appendix Q.....	53

New Entries

For more detail, see the errata entries for these items.

Description	Page	Date Published	Type
Corrected typographical error in the equation for “Adjusted Curve Number.” Note: This is a second correction to this equation.	A-10	12/23/2014	E
Revised “Fuels and Oils” paragraph in the Good Housekeeping Stamp Notes.	Q-1	12/23/2014	O

Errata

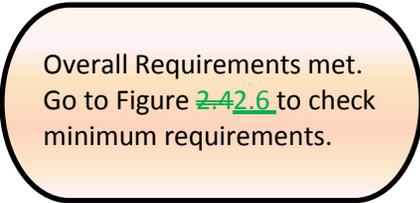
Entries are organized by the page number where the original text is located in the 2013 Stormwater Management Guidebook that is currently posted on DDOE’s website at <http://ddoe.dc.gov/swregs>.

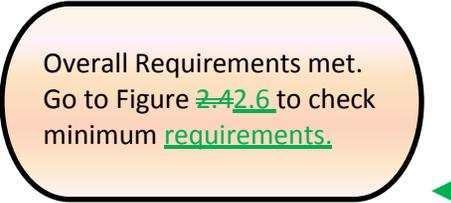
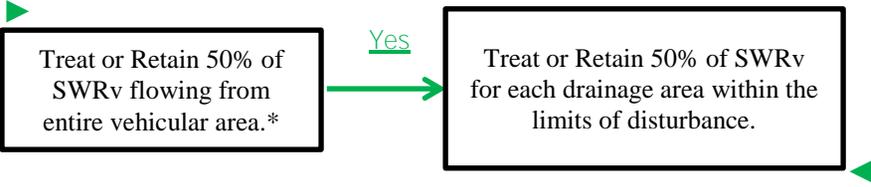
Each entry includes an explanation of the reason for the change and the date of publication to this document. Each entry is designated as an omission or an edit. An omission (denoted as **O**) publishes clarifying information that was inadvertently excluded from the original document. An edit (denoted as **E**) is a substitution or deletion to clarify original intent or improve consistency.

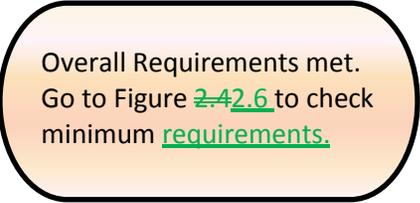
Note: Due to formatting limitations with the equation software, all edits to equations are shown as full revisions instead of strikethroughs and underlines and use a black font color instead of green.

Description of Change	Page	Date Published	Type
Contents			
<p>List of Figures</p> <p>►</p> <p>Figure 5.3 As-built certification stamp..... 282</p> <p>Figure 5.3.1 Professional Engineering Design stamp.....282a</p> <p>Figure 5.3.2 Maintenance Responsibility stamp..... 282b</p> <p>Figure 5..3.3 Statement by Person Responsible for Achieving Off-Site Retention stamp.282c</p> <p>Figure 5.4 Declaration of Covenants template 283 ◀</p> <p>Add entries in List of Figures for new figures 5.3.1 and 5.3.2 (pages 282a and 282b, respectively), which were inadvertently omitted from the text. Also add an entry for figure 5.3.3 (page 282c), which was developed to conform to the revised Declaration of Covenants template issued by the Real Estate Transactions Section of the D.C. Office of the Attorney General on April 23, 2014, which was updated to reflect the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control.</p>	xix	05/01/2014	O

Description of Change	Page	Date Published	Type
Contents			
<p>List of Equations</p> <p>►</p> <p>Equation 2.1 Stormwater Retention Volume 10</p> <p>Equation 2.2 Water Quality Treatment Volume 13</p> <p>Equation 3.1 Storage Volume for Green Roofs 35</p> <p>Equation 3.2 Reservoir Layer or Infiltration Sump Depth 88</p> <p>Equation 3.3 Drawdown Time 89</p> <p>Equation 3.4 Permeable Pavement Storage Volume 89</p> <p>Equation 3.5a Bioretention Storage Volume 117</p> <p>Equation 3.5b Bioretention Storage Volume 117a</p> <p>Equation 3.5c Bioretention Storage Volume 117a</p> <p>Equation 3.6 Minimum Filter Surface Area for Filtering Practices 143 ◀</p> <p>Add “a” after entry for Equation 3.5 (page 117). Add entries in List of Equations for new equations 3.5b and 3.5c (page 117a), which were inadvertently omitted from the text.</p>	xx	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 2			
<p>Figure 2.3 Determining the regulatory event used to calculate the SWRV.</p>  <p>Remove “2.2” and “2.3” and replace with “2.4” and “2.5” to correct typographical errors.</p>	15	05/01/2014	E
<p>Figure 2.4 Determining if overall retention requirements have been met, outside the AWDZ.</p>  <p>Remove “2.4...” and replace with “2.6” to correct a typographical error.</p>	16	05/01/2014	E

Description of Change	Page	Date Published	Type
Chapter 2			
<p>Figure 2.5 Determining if overall retention and water quality treatment requirements have been met, inside the AWDZ for regulated activity governed by the Anacostia Waterfront Environmental Standards Act of 2012.</p>  <p>Remove “2.4” and replace with “2.6” and “add “requirements.” to correct typographical errors.</p>	17	05/01/2014	E
<p>Figure 2.6 Determining if minimum retention and water quality treatment requirements have been met.</p>  <p>Add a “yes” arrow from “Treat or Retain 50% of SWRZ flowing from entire vehicular area.*” to “Treat or Retain 50% of SWRv for each drainage area within the limits of disturbance.” to correct an inadvertent omission.</p>	18	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 2 (continued)			
<p>Figure 2.7 Determining retention and water quality requirements for projects in the existing public right-of-way (PROW).</p>  <p>Remove “2.4” and replace with “2.6” and add “requirements.” to correct typographical errors.</p>	19	05/01/2014	E
<p>Section 2.8 Acceptable Urban BMP Options</p> <p>BMP Group 2 Rainwater Harvesting</p> <p>Rain water harvesting systems intercept, divert, store, and release rainfall for future use. Rainwater that falls on a rooftop is collected and conveyed into an above- or below-ground storage tank (also referred to as a cistern or rain tank), where it can be used for non-potable water uses and on-site stormwater disposal/infiltration. <u>The design includes:</u></p> <p><u>R-1 Rainwater harvesting for non-potable uses</u></p> <p>Add “The design includes: R-1 Rainwater harvesting for non-potable uses” to create consistent codes for incorporating the General Retention Compliance Calculator in DDOE’s new Stormwater BMP Tracking Database.</p>	24	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 2 (continued)			
<p>Section 2.8 Acceptable Urban BMP Options</p> <p>▶ BMP Group 9 Ponds</p> <p>Stormwater ponds are stormwater storage BMPs that consist of a combination of a permanent pool, micropool, or shallow marsh that promote a good environment for gravitational settling, biological uptake, and microbial activity. Design variants include:</p> <p>PC-1 Micropool extended detention pond PC-2 Wet pond PC-3 Wet extended detention (ED) pond ◀</p> <p>Remove “P-1,” “P-2,” and “P-3” and replace with “C-1,” “C-2,” and “C-3” to prevent duplication of the codes for BMP Group 4 when incorporating the General Retention Compliance Calculator in DDOE’s new Stormwater BMP Tracking Database.</p>	25	05/01/2014	E

Description of Change	Page	Date Published	Type
Chapter 2 (continued)			
<p>Section 2.8 Acceptable Urban BMP Options</p> <p>▶</p> <p>BMP Group 12 Proprietary Practices</p> <p>Proprietary practices are manufactured stormwater BMPs that utilize settling, filtration, absorptive/adsorptive materials, vortex separation, vegetative components, and/or other appropriate technology to manage the impacts of stormwater runoff. Proprietary practices may meet the SWRv value as well as the TSS removal value, provided they have been approved by DDOE through the process detailed in Appendix S. <u>The design includes:</u></p> <p><u>M-1 Proprietary practices</u></p> <p>BMP Group 13 Tree Planting and Preservation</p> <p>Trees can significantly reduce stormwater runoff by canopy interception and uptake of water from the soil. Trees are well documented in their ability to reduce stormwater runoff, particularly when the tree canopy covers impervious surface, such as in the case of street trees. <u>Design variants include:</u></p> <p><u>T-1 Tree planting</u> <u>T-2 Tree preservation</u> ◀</p> <p>To create consistent codes for incorporating the General Retention Compliance Calculator in DDOE’s new Stormwater BMP Tracking Database, add the following: “The design includes: M-1 Proprietary practices” and “Design variants include: T-1 Tree planting” and “T-2 Tree preservation.”</p>	26	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 3			
<p>Section 3.3 Rainwater Harvesting</p> <p>► Definition. Rainwater harvesting systems store rainfall and release it for future use. Rainwater that falls on a rooftop or other impervious surface is collected and conveyed into an above- or below-ground tank (also referred to as a cistern), where it is stored for non-potable uses or for on-site disposal or infiltration as stormwater. Cisterns can be sized for commercial as well as residential purposes. Residential cisterns are commonly called rain barrels. <u>The design includes:</u></p> <p><u>R-1 Rainwater harvesting for non-potable uses</u></p> <p>Non-potable uses of harvested rainwater may include the following:</p> <ul style="list-style-type: none"> ▪ Landscape irrigation, ▪ Exterior washing (e.g., car washes, building facades, sidewalks, street sweepers, and fire trucks), ▪ Flushing of toilets and urinals, ▪ Fire suppression (i.e., sprinkler systems), ▪ Supply for cooling towers, evaporative coolers, fluid coolers, and chillers, ▪ Supplemental water for closed loop systems and steam boilers, ▪ Replenishment of water features and water fountains, ▪ Distribution to a green wall or living wall system, <u>and</u> ▪ Laundry, and, ▪ Delayed discharge to the combined sewer system. ◀ <p>Add “The design includes: R-1 Rainwater harvesting for non-potable uses” to create consistent codes for incorporating the General Retention Compliance Calculator in DDOE’s new Stormwater BMP Tracking Database. Also, relocate “and” and remove “Delayed discharge to the combined sewer system.” to be consistent with the categories in the Rainwater Harvesting Retention Calculator.</p>	43	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 3 (continued)			
<p>Section 3.3.6 Rainwater Harvesting Construction Sequence</p> <p>▶ Construction Supervision. The following items should be inspected by a qualified professional <u>in the mechanical, electrical, or plumbing fields</u> prior to final sign-off and acceptance of a rainwater harvesting system:</p> <ul style="list-style-type: none"> ▪ Rooftop area matches plans ▪ Diversion system is properly sized and installed ▪ Pretreatment system is installed ▪ Mosquito screens are installed on all openings ▪ Overflow device is directed as shown on plans ▪ Rainwater harvesting system foundation is constructed as shown on plans ▪ Catchment area and overflow area are stabilized ▪ Secondary stormwater treatment practice(s) is installed as shown on plans ▪ <u>System commissioning</u> ◀ <p>Add “in the mechanical, electrical, or plumbing fields” to clarify the type of qualified professional. Also add “System commissioning,” which was inadvertently omitted from the text.</p>	63	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 3 (continued)			
<p>Equation 3.4 Permeable Pavement Storage Volume</p> <p>remove:</p> $Sv = (d_p \times \eta_r \times A_p) + \left(\frac{i \times t_f}{2} \right)$ <p>replace with:</p> $Sv = A_p \times \left[(d_p \times \eta_r) + \left(\frac{i \times t_f}{2} \right) \right]$ <p>Reorder Equation 3.4 to correct a typographical error.</p>	89	05/01/2014	E
<p>Section 3.5.6 Permeable Pavement Construction Sequence</p> <p>► Step 2: Install Soil Erosion and Sediment Control Measures for the <u>Permeable Pavement</u>. As noted above, temporary soil erosion and sediment controls are needed during installation to divert stormwater away from the permeable pavement area until it is completed. Special protection measures, such as erosion control fabrics, may be needed to protect vulnerable side slopes from erosion during the excavation process. The proposed permeable pavement area must be kept free from sediment during the entire construction process. Construction materials contaminated by sediment must be removed and replaced with clean material. ◀</p> <p>Remove “Bioretention” and replace with “Permeable Pavement” to correct a typographical error.</p>	91	05/01/2014	E

Description of Change	Page	Date Published	Type				
Chapter 3 (continued)							
<p>Table 3.17 Standard Permeable Pavement Value and Pollutant Removal</p> <table border="1" data-bbox="191 410 1169 537"> <tr> <td data-bbox="191 410 726 475">Retention Value</td> <td data-bbox="726 410 1169 475">▶ =Sv <u>4.5 ft³/100 ft²</u> ◀</td> </tr> <tr> <td data-bbox="191 475 726 537">Accepted TSS Treatment Practice</td> <td data-bbox="726 475 1169 537">▶ N/A <u>=Sv</u> ◀</td> </tr> </table> <p>Remove the Retention Value of “Sv” and replace with “4.5 ft³/100 ft².” Also, remove the Accepted TSS Treatment Practice value of “N/A” and replace with “=Sv.” These changes are needed for the table to correspond the text in Section 3.5.8.</p>	Retention Value	▶ =Sv <u>4.5 ft³/100 ft²</u> ◀	Accepted TSS Treatment Practice	▶ N/A <u>=Sv</u> ◀	98	05/01/2014	E
Retention Value	▶ =Sv <u>4.5 ft³/100 ft²</u> ◀						
Accepted TSS Treatment Practice	▶ N/A <u>=Sv</u> ◀						
<p>Section 3.6.4 Bioretention Design Criteria</p> <p>▶</p> <ul style="list-style-type: none"> <li data-bbox="191 1019 1495 1198">▪ Filter Media Depth. The filter media bed depth must be a minimum of 18 inches for the Standard Design. The media depth must be 24 inches or greater to qualify for the Enhanced Design, unless an infiltration-based design is used. The media depth must not exceed <u>6.5</u> feet. Turf, perennials, or shrubs should be used instead of trees to landscape shallower filter beds. See Table 3.23 and Table 3.24 for a list of recommended native plants. ◀ <p>Add “.5” after “6” to correspond with the updated values in Table 3.2.1 on page 111.</p>	110	05/01/2014	E				

Description of Change	Page	Date Published	Type
Chapter 3 (continued)			
<p>Section 3.6.4 Bioretention Design Criteria</p> <p>► During high intensity storm events, it is possible for the bioretention to fill up faster than the collected stormwater is able to filter through the soil media. This is dependent upon the surface area of the BMP (SA) relative to the contributing drainage area (CDA) and the runoff coefficient (R_v) from the CDA. To ensure that the design runoff volume is captured and filtered appropriately, a maximum filter media depth must not be exceeded (see Table 3.24). The maximum filter media depth is based on the runoff coefficient of the CDA to the BMP (R_{vCDA}) and the bioretention ratio of BMP surface area to the BMP CDA (SA:CDA) (in percent). <u>The R_{vCDA} is an average of runoff coefficients of land cover types in the BMP’s CDA. The land cover runoff coefficient types can be selected from Table H.1, Runoff Coefficient Factors for Typical District of Columbia Land Uses, or using the three categories established for calculating the SWR_v (natural, compacted, and impervious cover). The applicable filter media depth from Table 3.21 should be used as d_{media} in Equation 3.5. Note: In the gray cells, overflow is not likely to occur for the design storm, so no maximum filter media depth is specified.</u> ◀</p> <p>Add “The R_{vCDA} is an average of runoff coefficients of land cover types in the BMP’s CDA. The land cover runoff coefficient types can be selected from Table H.1, Runoff Coefficient Factors for Typical District of Columbia Land Uses, or using the three categories established for calculating the SWR_v (natural, compacted, and impervious cover).” to explain how to calculate R_{vCDA} and to refer to values provided in Table H.1. Also add “Note: In the gray cells, overflow is not likely to occur for the design storm, so no maximum filter media depth is specified.” to clarify the reason that some cells in Table 3.21 now have null values.</p>	111	05/01/2014	O

Description of Change										Page	Date Published	Type
Chapter 3 (continued)												
Table 3.21 Determining Maximum Filter Media Depth (feet)										111	05/01/2014	E
▶ SA:C DA (%)	RvCDA RvCDA											
	0.25	0.30	0.40	0.50	0.60	0.70	0.80	0.90	0.95			
0.5	6.0	6.5										
1.0	5.	5.5	6.0	6.0	6.5	6.0	6.5	6.0	6.5	6.0		
1.5	3.5	4.0	5.0	6.0	6.0	6.0	6.5	6.0	6.5	6.0		
2.0	2.5	3.0	4.0	5.0	5.5	6.0	6.0	6.0	6.5	6.0		
2.5	2.0	2.5	3.5	4.0	4.5	5.0	5.5	6.0	6.0			
3.0	1.5	2.0	3.0	3.5	4.0	4.5	5.0	5.5	5.5			
3.5	1.5	1.5	2.5	3.0	3.5	4.0	4.5	5.0	5.0			
4.0	1.5	1.5	2.0	2.5	3.0	3.5	4.0	4.5	4.5			
4.5	1.5	1.5	2.0	2.5	3.0	3.5	3.5	4.0	4.5	4.0		
5.0	1.5	1.5	1.5	2.0	2.5	3.0	3.5	4.0	4.0			
5.5	1.5	1.5	1.5	2.0	2.5	2.5	3.0	3.5	3.5			
6.0	1.5	1.5	1.5	1.5	2.0	2.5	3.0	3.0	3.5			
6.5	1.5	1.5	1.5	1.5	2.0	2.5	2.5	3.0	3.0			
7.0	1.5	1.5	1.5	1.5	1.5	2.0	2.5	3.0	3.0			
7.5	1.5	1.5	1.5	1.5	1.5	2.0	2.5	2.5	2.5			
8.0	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.5	2.5			
8.5	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.5			
9.0	1.5	1.5	1.5	1.5	1.5	1.5	2.0	2.0	2.0			
9.5	1.5	2.0	2.0									
10.0	1.5	2.0	2.0	▶								
<p>In the header of Table 3.21, remove “RvCDA” and replace with “RvCDA” to correct a typographical error. In the body of the table, remove or change several maximum filter media depth values (as indicated above), and shade the cells with null values. Further design event simulation looking at the relationship between effective storage depth and overflow supported less restrictive depths overall.</p>												

Description of Change	Page	Date Published	Type
Chapter 3 (continued)			
<p>Section 3.6.4 Bioretention Design Criteria</p> <p>► Underdrains. Many bioretention designs will require an underdrain (see Section 3.6.1 Bioretention Feasibility Criteria). The underdrain should be a 4- or 6-inch perforated schedule 40 PVC pipe, or equivalent corrugated HDPE for small bioretention BMPs, with 3/8-inch perforations at 6 inches on center. The underdrain must be encased in a layer of clean, double washed ASTM D448 No.57 or smaller (No. 68, 8, or 89) stone. <u>The maximum depth for the underdrain stone layer is 12 inches.</u> The underdrain must be sized so that the bioretention BMP fully drains within 72 hours or less. ◀</p> <p>► Underground Storage Layer (optional). For bioretention systems with an underdrain, an underground storage layer consisting of chambers, perforated pipe, stone, or other acceptable material can be incorporated below the filter media layer and underdrain to increase the infiltration sump volume or the storage for larger storm events. To qualify for the Enhanced Design, this storage layer must be designed to infiltrate in 72 hours, at ½ the measured infiltration rate. The <u>underground storage layer</u> may also be designed to provide detention for the 2-year, 15-year, or 100-year storms, as needed. The depth and volume of the storage layer will then depend on the target storage volumes needed to meet the applicable detention criteria. <u>Suitable conveyance must then be provided to ensure that the storage is fully utilized without overflow of the bioretention area.</u> ◀</p> <p>Add a sentence to the “Underdrains” paragraph stating that “The maximum depth for the underdrain stone layer is 12 inches.” to align the text with revisions to Table 3.21. In the “Underground Storage Layer” paragraph, add “underground storage layer” to clarify a concept that was implied but not fully stated and add “Suitable conveyance must then be provided to ensure that the storage is fully utilized without overflow of the bioretention area.” to clarify the engineering obligation associated with this choice.</p>	112	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 3 (continued)			
<p>Section 3.6.4 Bioretention Design Criteria</p> <p>▶</p> <p>BMP Sizing. Bioretention is typically sized to capture the SWRV or larger design storm volumes in the surface ponding area, soil media, and gravel reservoir layers of the BMP.</p> <p>Total storage volume of the BMP is calculated using Equation 3.5a.</p> <p>Equation 3.5a Bioretention Storage Volume</p> $Sv = SA_{bottom} \times [(d_{media} \times \eta_{media}) + (d_{gravel} \times \eta_{gravel})] + (SA_{average} \times d_{ponding})$ <p>where:</p> <ul style="list-style-type: none"> Sv = total storage volume of bioretention (ft³) SA_{bottom} = bottom surface area of bioretention (ft²) d_{media} = depth of the filter media (ft) η_{media} = effective porosity of the filter media (typically 0.25) d_{gravel} = depth of the underdrain and underground storage gravel layer (ft) η_{gravel} = effective porosity of the gravel layer (typically 0.4) $SA_{average}$ = average surface area of bioretention (ft²) (typically, where SA_{top} is the top surface area of bioretention, $SA_{average} = \frac{SA_{bottom} + SA_{top}}{2}$) $d_{ponding}$ = maximum ponding depth of bioretention (ft) <p style="text-align: center;">(continued on next page)</p>	117	05/01/2014	O

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p>Equation 3.5a can be modified if the storage depths of the filter media, gravel layer, or ponded water vary in the actual design or with the addition of any surface or subsurface storage components (e.g., additional area of surface ponding, subsurface storage chambers, etc.). The maximum depth of ponding in the bioretention must not exceed 18 inches. If storage practices will be provided off-line or in series with the bioretention area, the storage practices should be sized using the guidance in Section 3.12.</p> <p><u>For enhanced bioretention areas, the volume that will be infiltrated (the sump volume for underdrained designs or the entire volume for non-underdrained designs) must infiltrate within 72 hours. Measured infiltration rates must exceed 0.1 inches per hour to qualify for the enhanced design retention value. The depth of the infiltration sump for underdrained designs can be determined using Equation 3.5b.</u></p> <p><u>Equation 3.5b Bioretention Infiltration Sump Depth</u></p> $d_{sump} = \frac{\left(\frac{i}{2} \times t_d\right)}{\eta_r}$ <p><u>where:</u></p> <p><u>d_{sump}</u> = depth of the infiltration sump (in)</p> <p><u>i</u> = field-verified (actual) infiltration rate for the native soils (in./hr) (must exceed 0.1 in./hr)</p> <p><u>t_d</u> = drawdown time (hr) (within 72 hr)</p> <p><u>η_r</u> = available porosity of the stone reservoir (typically 0.4)</p> <p style="text-align: center;">(continued on next page)</p>			

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p><u>For non-underdrained designs, a check must be performed to ensure that the entire Sv infiltrates within 72 hours, as in Equation 3.5c.</u></p> <p><u>Equation 3.5c Bioretention Infiltration Rate Check</u></p> $Sv_{infiltrate} = \frac{SA_{bottom} \left(\frac{i}{2} \times t_d \right)}{12}$ <p><u>where:</u></p> <p><u>$Sv_{infiltrate}$ = storage volume that will infiltrate within 72 hours (ft³)</u> <u>SA_{bottom} = bottom surface area of bioretention (ft²)</u> <u>i = field-verified (actual) infiltration rate for the native soils (in./hr)</u> <u>t_d = drawdown time (hr) (within 72 hr)</u></p> <p><u>If $Sv_{infiltrate}$ is greater than or equal to Sv, then the entire Sv will infiltrate within 72 hours. If it is not, the storage volume of the bioretention area should be reduced accordingly. ◀</u></p> <p>Change “Equation 3.5” (Bioretention Storage Volume) to “Equation 3.5a” and add Equation 3.5b Bioretention Infiltration Sump Depth and Equation 3.5c Bioretention Infiltration Rate Check, which were inadvertently omitted from the text. Before equation 3.5b, add the following explanatory text: “For enhanced bioretention areas, the volume that will be infiltrated (the sump volume for underdrained designs or the entire volume for non-underdrained designs) must infiltrate within 72 hours. Measured infiltration rates must exceed 0.1 inches per hour to qualify for the enhanced design retention value. The depth of the infiltration sump for underdrained designs can be determined using Equation 3.5b.” Before Equation 3.5c, add the following explanatory text: “For non-underdrained designs, a check must be performed to ensure that the entire Sv infiltrates within 72 hours, as in Equation 3.5c.”</p>			

Description of Change	Page	Date Published	Type
Chapter 3 (continued)			
<p>Section 3.6.6 Bioretention Construction Sequence</p> <ul style="list-style-type: none"> ▶ <ul style="list-style-type: none"> ◆ Alternatively, if it is infeasible to keep the proposed permeable pavement <u>bioretention</u> areas outside of the limits of disturbance, and excavation of the area cannot be restricted, then infiltration tests will be required prior to installation of the bioretention to ensure that the design infiltration rate is still present. If tests reveal the loss of design infiltration rates then deep tilling practices may be used in an effort to restore those rates. In this case further testing must be done to establish design rates exist before the permeable pavement can be installed. ◀ <p>Remove “permeable pavement” and replace with “bioretention” to correct a typographical error.</p>	122	05/01/2014	E
<p>Section 3.10 Ponds</p> <ul style="list-style-type: none"> ▶ <ul style="list-style-type: none"> P<u>C</u>-1 Micropool extended detention pond P<u>C</u>-2 Wet pond P<u>C</u>-3 Wet extended detention pond ◀ ▶ Stormwater ponds do not receive any <u>receive only 10%</u> stormwater retention value and should be considered only <u>mainly</u> for management of larger storm events. Stormwater ponds have both community and environmental concerns (see Section 3.10.1 Pond Feasibility Criteria) that should be considered before choosing stormwater ponds for the appropriate stormwater practice on site. ◀ <p>Remove “P-1,” “P-2,” and “P-3” and replace with “C-1,” “C-2,” and “C-3” to prevent duplication of the codes for BMP Group 4 when incorporating the General Retention Compliance Calculator in DDOE’s new Stormwater BMP Tracking Database. Remove “do not receive any” and replace with “receive only 10%” and remove “only” and replace with “mainly” to be consistent with the value listed in Table 3.46 “Pond Retention Value and Pollutant Removal.”</p>	187	05/01/2014	E

Description of Change	Page	Date Published	Type
Chapter 3 (continued)			
<p>Section 3.11 Wetlands</p> <p>► Stormwater wetlands do not receive any <u>receive only 10%</u> stormwater retention value and should be considered only <u>mainly</u> for management of larger storm events. Stormwater wetlands have both community and environmental concerns (see Section 3.10.1 Pond <u>3.11.1 Wetland</u> Feasibility Criteria) that should be considered before choosing stormwater ponds for the appropriate stormwater practice on site. ◀</p> <p>Remove “do not receive any” and replace with “receive only 10%” and remove “only” and replace with “mainly” to be consistent with the value listed in Table 3.49 “Wetland Retention Value and Pollutant Removal.” Also, remove “3.10.1 Pond” and replace with “3.11.1 Wetland.” to correct a typographical error.</p>	205	05/01/2014	E
<p>Section 3.13 Proprietary Practices</p> <p>► 3.13 Proprietary Practices</p> <p>Definition. Proprietary practices are manufactured stormwater treatment practices that utilize settling, filtration, absorptive/adsorptive materials, vortex separation, vegetative components, and/or other appropriate technology to manage the impacts stormwater runoff. <u>The design includes:</u></p> <p><u>M-1 Proprietary practices</u> ◀</p> <p>Add “. The design includes: M-1 Proprietary practices” to create consistent codes for incorporating the General Retention Compliance Calculator in DDOE’s new Stormwater BMP Tracking Database.</p>	237	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 3 (continued)			
<p>Section 3.14 Tree Planting and Preservation</p> <p>► Definition. Existing trees can be preserved or new trees can be planted to reduce stormwater runoff. <u>The design includes:</u></p> <p><u>T-1 Tree planting</u> <u>T-2 Tree preservation</u> ◀</p> <p>Add “The design includes T-1 Tree planting” and “T-2 Tree Preservation” to create consistent codes for incorporating the General Retention Compliance Calculator in DDOE’s new Stormwater BMP Tracking Database.</p>	241	05/01/2014	O
<p>Section 3.14.1 Preserving existing Trees During Construction</p> <p>► Protect Trees and Soil During Construction. Physical barriers must be properly installed around the Critical Root Zone (CRZ) of trees to be preserved. The CRZ shall be determined by a licensed forester or ISA certified arborist, and in general includes a circular area with a radius (in feet) equal to 4<u>1.5</u> times the diameter of the trunk (in inches). The barriers must be maintained and enforced throughout the construction process. Tree protection barriers include highly visible, well-anchored temporary protection devices, such as 4-foot fencing, blaze orange plastic mesh fencing, or snow fencing (Greenfeld and others, 1991). ◀</p> <p>Remove “15” and replace with “1.5” to correct a typographical error.</p>	242	05/01/2014	E

Description of Change	Page	Date Published	Type
Chapter 5			
<p>Section 5.1.1 Submittal and Review Process of Stormwater Management Plans</p> <p>► The forms 1 and 2 are found in Section 5.6. Supporting <u>Forms</u>. Forms 3 through 10 are available at the DCRA intake counter, or they can be downloaded at http://dcra.dc.gov/DC/DCRA/Permits/Building+Permit+Application+Supplemental+Documentshttp://dcra.dc.gov/sites/default/files/dc/sites/dcra/publication/attachments/permitpackage_0.pdf. ◀</p> <p>Add “Forms” to correct an inadvertent omission. Also changed the link in the second sentence because the original link is no longer working. Remove “http://dcra.dc.gov/DC/DCRA/Permits/Building+Permit+Application+Supplemental+Documents” and replace with “http://dcra.dc.gov/sites/default/files/dc/sites/dcra/publication/attachments/permitpackage_0.pdf” to update a link that is no longer active.</p>	269	05/01/2014	O/E

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Section 5.6 Supporting Forms, first paragraph</p> <ul style="list-style-type: none"> ▪ Site Development Submittal Information Form ▪ DC Water DDOE WPD Storm Sewer Verification Form ▪ As-Built Certification Stamp ▪ ► Professional Engineering Design Stamp ▪ Maintenance Responsibility Stamp ▪ Off-Site Retention Responsibility Stamp ◀ ▪ Declaration of Covenants Template <p>Add “Professional Engineering Design Stamp” and “Maintenance Responsibility Stamp” as items in the bulleted list to include two forms that were inadvertently omitted from the text. Also add “Off-Site Retention Responsibility Stamp,” which was developed to conform to the revised Declaration of Covenants template issued by the Real Estate Transactions Section of the D.C. Office of the Attorney General on April 23, 2014, which was updated to reflect the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control.</p>	279	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.3 As-built Certification Stamp.</p> <p>► Within 21 days after completion of construction of the Stormwater discharge facility, <u>all stormwater best management practices (BMPs), stormwater infrastructure, and land covers (collectively the “Facility”)</u>, please send this page to the Watershed Protection Division of the District Department of the Environment. ◀</p> <p>1. Stormwater discharge <u>Facility information</u>: ◀</p> <p>► I hereby certify that Stormwater discharge facility has <u>all stormwater best management practices, stormwater infrastructure, and land covers (collectively the “Facility”)</u> have been built substantially in accordance with the approved plans and specifications and that any substantial deviations (noted below) will not prevent the system from functioning in compliance with the requirements of Section 526 through 535 of DCMR-21, Chapter 5 <u>of Title 21 of the District of Columbia Municipal Regulations</u> when properly maintained and operated. These determinations have been based upon on-site observation of construction, scheduled and conducted by me or by a project representative under my direct supervision. I have enclosed one set of as-built engineering drawings. ◀</p> <p>In the first paragraph, remove “Stormwater discharge facility” and replace with “all stormwater best management practices (BMPs), stormwater infrastructure, and land covers (collectively the “Facility”).” In the heading of item 1, remove “Stormwater discharge” and capitalize “Facility.” In the first sentence of item 2, remove “Stormwater discharge facility has” and replace with “all stormwater best management practices (BMPs), stormwater infrastructure, and land covers have” to be consistent with all types of compliance; remove “substantial” before deviations, since “substantial” changes will require a resubmission as stated in Chapter 5.1.2; and remove “Section 526 through 535 of DCMR-21,” and add “of Title 21 of the District of Columbia Municipal Regulations” to correctly cite the 2013 Rule on Stormwater Management and Soil Erosion and Sediment control, as amended on July 19, 2013. Note: A revised version of the full As-Built Certification Stamp document is available in PDF format on DDOE’s website at http://ddoe.dc.gov/node/610622.</p>	282	05/01/2014	E

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.3.1 Professional Engineering Design Stamp.</p> <p style="text-align: center;">► STATEMENT BY PROFESSIONAL ENGINEER REGISTERED IN THE DISTRICT OF COLUMBIA</p> <p>This is to certify that the engineering features of all stormwater best management practices (BMPs), stormwater infrastructure, and land covers have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of stormwater pollutants. I further certify that the stormwater system has been designed in accordance with the specification required under Chapter 5 of Title 21 of the District of Columbia Municipal Regulations. It is also stated that the undersigned has furnished the applicant with a set of instructions for the maintenance and operation of the site’s stormwater system.</p> <p>_____</p> <p>Name and Title (please type)</p> <p>_____</p> <p>Address</p> <p>_____</p> <p>Date _____ Phone No: _____</p> <p>Affix Seal:</p> <p style="text-align: center;">(continued on next page)</p>	282a	05/01/2014	O

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <div style="border: 1px solid black; width: 200px; height: 150px; margin-left: 20px; margin-bottom: 10px;"></div> <p style="margin-left: 20px;">▲</p> <p>Add a figure of the Professional Engineering Design Stamp, which is currently in use but was inadvertently omitted from the text. This version includes minor revisions for consistency with rule numbering and terminology. (Insert after page 282, as page 282a.) Note: This document is also available in PDF format on DDOE’s website at http://ddoe.dc.gov/node/610622.</p>			

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.3.2 Maintenance Responsibility Stamp.</p> <p style="text-align: center;">► STATEMENT BY PERSON RESPONSIBLE FOR MAINTENANCE</p> <p>The undersigned agrees to maintain and operate the stormwater best management practices (BMPs), stormwater infrastructure, and land covers in such a manner as to comply with the provisions of 21 DCMR Chapter 5. Responsibility for maintenance and operation may be transferred to another entity upon written notice to the Watershed Protection Division of the District Department of the Environment from the undersigned and the entity assuming responsibility, certifying that the transfer of responsibility for maintenance and operation in compliance with Chapter 5 of Title 21 of the District of Columbia Municipal Regulations has been accepted.</p> <p style="text-align: center;">_____ Signature of the person responsible for maintenance (it may be the applicant)</p> <p style="text-align: center;">_____ Name and Title (please type)</p> <p style="text-align: center;">_____ Address</p> <p style="text-align: center;">_____ Date _____ Phone No: _____ ◀</p> <p>Add a figure of the Maintenance Responsibility Stamp, which is currently in use but was inadvertently omitted from the text. This version includes minor revisions for consistency with rule numbering and terminology. (Insert after page 282, as page 282b.) Note: This document is also available in PDF format on DDOE’s website at http://ddoe.dc.gov/node/610622.</p>	282b	05/01/2014	O

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.3.3 Off-Site Retention Responsibility Stamp.</p> <p style="text-align: center;">▶ STATEMENT BY PERSON RESPONSIBLE FOR ACHIEVING OFF-SITE RETENTION</p> <p>This site has an off-site retention volume (Offv) obligation. The Offv for this site equals _____(gallons).</p> <p>The undersigned agrees to satisfy the obligation to achieve Offv, in such a manner as to comply with the provisions of Chapter 5 of Title 21 of the District of Columbia Municipal Regulations (DCMR).</p> <p>Responsibility for achieving Offv may be transferred to another entity upon written notice to the Watershed Protection Division of the District Department of the Environment from the undersigned and the entity assuming responsibility. This notice must certify that the transfer of responsibility for Offv is in compliance with 21 DCMR Chapter 5.</p> <p>_____ Signature of the person responsible for achieving Offv</p> <p>_____ Name and Title (please type)</p> <p>_____ Address</p> <p>_____ Date _____ Phone No: _____ ◀</p> <p style="text-align: center;">(continued on next page)</p>	282c	05/01/2014	O

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p>Add a figure of the Off-Site Retention Responsibility Stamp, which was developed to conform to the revised Declaration of Covenants template issued by the Real Estate Transactions Section of the D.C. Office of the Attorney General on April 23, 2014, which was updated to reflect the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control. (Insert after page 282, as page 282c.) Note: This document is also available in PDF format on DDOE’s website at http://ddoe.dc.gov/node/610622.</p>			

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.4 Declaration of Covenants template.</p> <p style="text-align: center;">► GOVERNMENT OF THE DISTRICT OF COLUMBIA Office of the Attorney General</p> <p style="text-align: center;">★ ★ ★ [Red Bar] [Red Bar]</p> <p>Commercial Division Real Estate Transactions Section</p> <p>Procedure for obtaining legal sufficiency review of the Declaration of Covenants from the Office of the Attorney General (OAG):</p> <p><u>DDOE must:</u></p> <ol style="list-style-type: none"> 1. Provide name and e-mail address of technical reviewer so that OAG may discuss technical issues. If necessary, OAG will provide a PDF of the signed Declaration of Covenants to the DDOE reviewer. 2. Provide attached template of the Declaration of Covenants to the owner/developer. <p>Review Engineer:</p> <p>E-mail address:</p> <p><u>Owner/developer must:</u></p> <ol style="list-style-type: none"> 1. Draft the Declaration of Covenants. 2. Subordinate all prior liens to the Declaration. <p style="text-align: center;">(continued on next page)</p>	283a	05/01/2014	O

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <ol style="list-style-type: none"> 3. Produce evidence of title and all liens on the property (i.e. copy of deed and full title search). 4. Provide a site plan (Exhibit B) as approved by DDOE, showing all required stormwater Best Management Practices (BMPs) and land covers and documenting any Off-Site Retention Volume (Offv). 5. Provide a maintenance plan of all storm-water best management practices (BMPs) for District approval pursuant to 21 DCMR § 519 (Exhibit C). 6. Submit all of the above to: Office of the Attorney General for the District of Columbia Real Estate Transaction Section, Commercial Division 441 4th Street, NW, Suite 1010 South Washington, DC 20001 7. Return OAG approved and signed original to DDOE for technical sufficiency review and approval. 8. Provide copy of recorded Declaration of Covenants to DDOE. <p>Contact Person:</p> <p>Jay Surabian Assistant Attorney General Real Estate Transactions Section D.C. Office of the Attorney General 441 4th Street, NW, Suite 1010 South Washington, DC 20001 Tel: (202) 442-9771 Fax: (202) 730-1844 jay.surabian@dc.gov ◀</p> <p style="text-align: center;">(continued on next page)</p>			

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p>Add an introductory page to include the document “Procedure for obtaining a legal sufficiency review of the Declaration of Covenants from the Office of the Attorney General, which is currently in use but was inadvertently omitted from the text. (Insert before page 283, as page 283a.) This version includes minor revisions for consistency with the rule terminology. Note: This document is also available in PDF format on DDOE’s website at http://ddoe.dc.gov/node/610622.</p>			

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.4 Declaration of Covenants template.</p> <p style="text-align: center;">► DECLARATION OF COVENANTS For a Storm Water Stormwater Management Facility ◀</p> <p>► THIS DECLARATION OF COVENANTS (the “Declaration”) is made as of this ____ day of _____, 20__, by and between LIST NAME OF PROPERTY OWNER, a LIST TYPE OF CORPORATION/PROPERTY OWNER, CORPORATE ENTITY (if applicable), and its successors and assigns (“Owner”), for the benefit of the DISTRICT OF COLUMBIA, a municipal corporation (the “District”). ◀</p> <p>► B. In order to accommodate and regulate changes in manage storm water flow conditions resulting from certain improvements Owner will make to the property Property, <u>the regulations of the District, found at Title 21, Chapter 5, of the District of Columbia Municipal Regulations (“DCMR”) require that</u> Owner shall construct develop and agrees to maintain, at its sole expense, a storm water management facility and sustainable design features <u>submit for approval a Stormwater Management Plan (“SWMP”) for the installation and maintenance of all stormwater best management practices (BMPs), stormwater infrastructure, and land covers on the Property (collectively, the “Facility”) identified as _____, pursuant to the plans approved by the District (and as the same may be amended after District’s approval) attached hereto as Exhibit B as the Site Plan and including any obligation to achieve Off-Site Retention Volume.</u></p> <p>C. <u>Section 529 of Title 21 of the District of Columbia Municipal Regulations (“DCMR”) Sections 534.2, 534.3, and 534.4 DCMR requires that an owner maintain any storm water management facility on its property in good condition, develop and submit for approval a maintenance schedule for any such storm water management facility, and Owner execute and record with the Recorder of Deeds of the District a covenant with the District of Columbia Recorder of Deeds, a declaration of covenants running with the land that set setting forth the owner’s aforementioned maintenance Owner’s responsibilities with specificity under the SWMP.</u></p> <p style="text-align: center;">(continued on next page)</p>	283	05/01/2014	O/E

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p style="color: green;">NOW, THEREFORE, for and in consideration of the issuance of construction <u>building</u> permits and approval of Owner’s plans by the District, and other good and valuable consideration the sufficiency of which is hereby acknowledged, for the benefit of and limitation upon Owner and all future owners of the Property, and for the benefit of the District, Owner for itself, its successors and assigns, does hereby acknowledge, represent, covenant, agree, and warrant to the District as follows: ◀</p> <p>In the document heading, change “Storm Water” to “Stormwater.” In the first paragraph, remove two occurrences of “LIST,” add “PROPERTY” before “OWNER,” and remove “CORPORATION/PROPERTY/OWNER” and replace with “CORPORATE ENTITY.” In Recital B, indent the paragraph; remove “accommodate and regulate changes in” and replace with “manage;” capitalize “Property;” add “the regulations of the District, found at Title 21, Chapter 5, of the District of Columbia Municipal Regulations (“DCMR”) require that;” remove “shall construct” and replace with “develop;” remove “agrees to maintain, at its sole expense, a storm water management facility and sustainable design features” and replace with “submit for approval a Stormwater Management Plan (“SWMP”) for the installation and maintenance of all stormwater best management practices (BMPs), stormwater infrastructure, and land covers on the Property;” and remove “identified as _____, pursuant to the plans approved by the District (and as the same may be amended after District’s approval) attached hereto as Exhibit B as the Site Plan” and replace with “and including any obligation to achieve Off-Site Retention Volume.” In Recital C, add “Section 529 of;” remove “District of Columbia Municipal Regulations (“DCMR”) Sections 534.2, 534.3, and 534.4” and replace with “DCMR;” add an “s” to “require;” remove “an owner maintain any storm water management facility on its property in good condition, develop and submit for approval a maintenance schedule for any such storm water management facility, and” and replace with “Owner;” remove “with the Recorder of Deeds of the District a covenant” and replace with “with the District of Columbia Recorder of Deeds, a declaration of covenants running with the land that set;” remove “setting;” remove “the aforementioned maintenance” and replace with “Owner’s;” and remove “with specificity” and replace with “under the SWMP.” In paragraph 5, remove “construction” and replace with “building.” These changes conform to the revised Declaration of Covenants template issued by the Real Estate Transactions Section of the D.C. Office of the Attorney General on April 23, 2014, which was updated to reflect the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control.</p>			

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.4 Declaration of Covenants template (continued).</p> <p>2. <u>2.</u> <u>The Facility and any responsibility to achieve Off-Site Retention Volume (Offv), as stated in gallons, is shown on the plans approved by the District attached hereto as Exhibit B, the Site Plan, as the same may be amended pursuant to the District’s approval.</u></p> <p>3. <u>3.</u> <u>Owner, at its sole expense, shall construct and perpetually operate and maintain the Facility in such manner as to comply with the provisions of Title 21, Chapter 5 of the DCMR at its sole expense and in strict accordance with the development and maintenance plan approved by SWMP, including the District. Specifically, Owner shall be responsible for the maintenance of the Facility in accordance with the maintenance standards Maintenance Plan, attached hereto as Exhibit C, as the same may be amended pursuant to the District’s approval.</u></p> <p>4. <u>4.</u> <u>Owner shall, at its sole expense, make such changes or modifications to the Facility as may, in the District’s, in its discretion, be determined necessary to insure ensure that the Facility is maintained in good condition and continues to operate as designed and approved.</u></p> <p>5. <u>5.</u> <u>The District and its agents, employees, and contractors shall have the right to enter the Property for the purpose of inspecting the Facility in accordance with established inspection procedures and Section 16 of the Water Pollution Control Act of 1984 (D.C. Law 5-188; 32 DCR 919; D.C. Official Code § 8-103.01, et seq. (2007 Supp. 2013 Repl.), as amended (the “Act”), at reasonable times and in a reasonable manner, in order to ensure that the Facility is being properly maintained and is continuing to perform in the manner approved by the District.</u></p> <p>6. <u>6.</u> <u>Should Owner fail to perform its maintenance responsibilities as set forth required herein and as contained in any and all plans submitted to and approved by the District, or fail to operate and, where necessary, restore the Facility in accordance with the approved design standards, as the same may be amended from time to time, and in accordance with all applicable laws and regulations, the District shall be entitled to pursue any and all enforcement actions available to it pursuant to the Act and Title 21, Chapter 22 of the DCMR, as the same may be amended or revised from time to time.</u></p> <p>(continued on next page)</p>	284	05/01/2014	O/E

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p>Without limiting the generality of the foregoing, in the event that a discharge or threat of discharge from the Facility poses an imminent and substantial danger to <u>the environment</u> or the public health or welfare, the District may take immediate action against Owner pursuant to either Section 21-2207 or Section 21-2211.2 of the DCMR <u>D.C. Official Code § 8-103.08(b)</u>.</p> <p>6.7. If Owner’s failure or refusal to maintain the Facility in accordance with the covenants and warranties contained in this Declaration ultimately results in duly authorized corrective action by the District, Owner shall bear all costs incurred by the District for such corrective measures, such costs may be assessed against the Property, and Owner may be fined in accordance with the Act and Title 21, Chapter 5 of the DCMR.</p> <p>7.8. The provisions of this Declaration shall be deemed warranties by the Owner and covenants running with the land and shall bind and inure to the benefit of Owner and the District, their respective heirs, successors and/or assigns. When Owner ceases to own an interest in the Property, the rights, warranties, and obligations under this Declaration shall become the rights, warranties, and obligations of the successor-in-ownership and interest as to the Property.</p> <p>8.9. Owner shall, at its cost and expense, properly record this Declaration with the Recorder of Deeds and furnish <u>provide</u> the District’s Department of the Environment and Office of the Attorney General with a copy of this Declaration, certified by the Recorder of Deeds as a true copy of the recorded instrument.</p> <p>9.10. Owner shall indemnify, save harmless, and defend the District, and all its officers, agents, and employees from and against all claims or liabilities that may arise out of or in connection with, either directly or indirectly, any of Owner’s actions or omissions with regard to the construction, operation, maintenance and/or restoration of the Facility. ◀</p> <p style="text-align: center;">(continued on next page)</p>			

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p>In the numbered list, create a new item 2, and renumber all of the items that follow. For the new item 2, add “The Facility and any responsibility to achieve Off-Site Retention Volume (Offv), as stated in gallons, is shown on the plans approved by the District attached hereto as Exhibit B, the Site Plan, as the same may be amended pursuant to the District’s approval.” In the first sentence of the new item 3, add “, at its sole expense,” after “Owner” and add “the” before “DCMR.” Also, remove “at its sole expense” after “DCMR;” remove development and maintenance plan approved by SWMP, including; and remove “District.” In the new item 4, remove “, may, in;” remove “s” from “the District’s” and replace with “, in its;” remove “be” and replace with “may,” remove the final “d” from “determined,” and remove “insure” and replace with “ensure.” In the new item 5, add a comma after “employees,” add a space between “§” and “8-103.01,” and remove “2007 Supp.” and replace with “2013 Repl.” In the first sentence of the new item 6, remove “maintenance;” remove “as set forth” and replace with “required;” remove “and as contained in any and all plans submitted to and approved by the District;” remove “, where necessary;” remove “the” before “approved design;” remove “, and in accordance with all applicable laws and regulations,” and remove “or revised.” In the last sentence of the new item 6, add “the environment” after “danger to” and remove “either Section 21-2207 or Section 21-2211.2 of the DCMR” and replace with “D.C. Official Code § 8-103.08(b).” In the new item 7, remove “duly authorized.” In the new item 8, remove “the” before “owner” and “as” after “interest.” In the new item 9, remove “furnish” and replace with “provide” and remove “and Office of the Attorney General.” These changes conform to the revised Declaration of Covenants template issued by the Real Estate Transactions Section of the D.C. Office of the Attorney General on April 23, 2014, which was updated to reflect the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control.</p>			

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.4 Declaration of Covenants template (continued).</p> <p>10.11. <u>11.</u> Owner <u>warrants, and</u> shall ensure, that all prior liens recorded against the Property are subordinate to this Declaration. Failure to subordinate any such liens may<u>shall, at the District's sole election,</u> give rise to termination of any building permits and/or invalidation of any certificate of occupancy relating to the Property.</p> <p>11.12. <u>12.</u> Owner shall, at its sole expense, comply with all provisions of this Declaration regardless of any conflicting requirements in any other covenant, easement, or other legal document recorded or unrecorded against the Property. Neither the entering into of this Declaration nor performance hereunder will constitute or result in a violation or breach by Owner of any other agreement or order that is binding on the Owner.</p> <p>12.13. <u>13.</u> To the extent the Owner is an entity, the Owner warrants that it is; (i) <u>is</u> duly organized, validly existing and in good standing under the laws of its state of jurisdiction and <u>organization</u>; (ii) is qualified to do business <u>in,</u> and is in good standing under, the laws of the District of Columbia, (ii); (iii); (iii) is authorized to perform under this Declaration; and (iii)<u>iv</u> has all necessary power to execute and deliver this Declaration.</p> <p>13.14. <u>14.</u> The form of this Declaration has been approved by the District of Columbia Office of the Attorney General ("<u>OAG</u>") for legal sufficiency pursuant to Title 12A<u>21</u>, Section 106.6<u>529.3</u> of the D.C.M.R.<u>D.C.M.R.</u> This Declaration, and the provisions contained herein, may not be modified, amended, or terminated without the prior written consent of the District and legal sufficiency approval by the District of Columbia Office of the Attorney General<u>OAG</u>, such agreement to be evidenced by a document duly executed and delivered in recordable form and recorded with the Recorder of Deeds at no expense to the District.</p> <p>14.15. <u>15.</u> The District has the right to specifically enforce this Declaration.</p> <p>(continued on next page)</p>	285	05/01/2014	O/E

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p>15<u>16</u>. This Declaration shall be governed by, construed <u>under</u>, and enforced in accordance with, the laws of the District of Columbia.</p> <p>16<u>17</u>. This Declaration has been duly executed and delivered by the Owner, and constitutes the legal, valid, and binding obligations of the Owner, enforceable against the Owner and its successors and assigns, in accordance with its terms.</p> <p>17<u>18</u>. If any of the covenants, warranties, conditions or terms of this Declaration shall be found void or unenforceable for whatever reason by any court of law or of equity, then every other covenant, condition or term herein set forth shall remain valid and binding. ◀</p> <p>As on page 284, renumber all of the items in the list. In the new item 11, remove “warrants and;” remove “any such;” remove “may” and replace with “shall, at the District’s sole election,”. In the new item 12, remove “the” before “Owner.” In the new item 13, remove “the” twice before “Owner;” remove “is” and replace with a colon; add “is” before “duly;” remove “jurisdiction and” and replace with “organization; (ii);” add “in,” after “business;” remove “ , (ii)” and replace with “; (iii);” add a semicolon after “under this Declaration;” and remove “iii” and replace with “iv.” In the first sentence of item new item 14, add “(OAG);” remove “12A” and replace with “21;” remove “106.6” and replace with “529.3;” and remove “D.C.M.R.” and replace with “DCMR.” In the second sentence of the new item 14, remove “the District of Columbia Office of the Attorney General” and replace with “OAG.” In the new item 16, add “under,” after “construed.” In the new item 17, remove “the” before “Owner” three times. These changes conform to the revised Declaration of Covenants template issued by the Real Estate Transactions Section of the D.C. Office of the Attorney General on April 23, 2014, which was updated to reflect the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control.</p>			

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.4 Declaration of Covenants template (continued).</p> <p>► IN WITNESS WHEREOF, Owner has, as of the day and year first above written, caused this Declaration of Covenants to be signed by <u>LIST NAME AND TITLE OF OWNER</u>, a <u>LIST TYPE PERSON SIGNING ON BEHALF OF CORPORATION/PROPERTY OWNER</u>.</p> <p>By: _____ <u>Signature</u> <u>LIST NAME, TITLE</u> <u>LIST TYPE OF COMPANY/PROPERTY OWNER</u></p> <p style="text-align: center;"><u>NOTARIZATION ACKNOWLEDGMENT</u></p> <p>_____<u>LIST STATE</u>_____)) ss: _____<u>LIST COUNTY</u>_____)◀</p> <p>I, <u>LIST NAME OF NOTARY</u>, a Notary Public in and for the jurisdiction aforesaid, do hereby certify that <u>LIST NAME OF PERSON SIGNING ON BEHALF OF OWNER</u>, <u>party who is personally well known (or satisfactorily proven) to me, and being authorized to do so, executed the foregoing Declaration of Covenants, personally appeared before me and, being personally well known to me, who has been appointed its attorney-in-fact and has acknowledged said Declaration of Covenants the same to be the act and deed of LIST NAME OF OWNER/ LIST NAME OF COMPANY IN CAPACITY AS OWNER/PROPERTY OWNER</u>, and that s/he delivered the same as such.</p> <p>GIVEN under my hand and seal this ____ day of _____, <u>200920</u>. ◀</p> <p style="text-align: center;">(continued on next page)</p>	286	05/01/2014	O/E

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <p>Under the first paragraph, remove “Signature.” Also, remove “<u>NOTARIZATION</u>” and replace with “<u>ACKNOWLEDGMENT</u>.” Under the second paragraph remove “2009” and replace with “20__.” to conform to the revised Declaration of Covenants template issued by the Real Estate Transactions Section of the D.C. Office of the Attorney General on April 23, 2014, which was updated to reflect the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control.</p>			

Description of Change	Page	Date Published	Type
Chapter 5 (continued)			
<p>Figure 5.4 Declaration of Covenants template (continued).</p> <p>▶ APPROVED AS TO TECHNICAL SUFFICIENCY:</p> <p>District of Columbia <u>Department of the Environment</u> District Department of the Environment Natural Resources Administration Watershed Protection Division ◀</p> <p>▶ <u>Property Address:</u> ◀</p> <p>In the first paragraph, remove “District” and move “Department of the Environment” to the first line. Under the last line on the page, add “Property Address:” to conform to the revised Declaration of Covenants template issued by the Real Estate Transactions Section of the D.C. Office of the Attorney General on April 23, 2014, which was updated to reflect the 2013 Rule on Stormwater Management and Soil Erosion and Sediment Control.</p>	287	05/01/2014	O/E

Description of Change	Page	Date Published	Type
Appendix A			
<p>Section A.2 Instructions for Compliance Calculations</p> <p>remove:</p> <p>► $R_V = (%N \times R_{vN} + (%C) \times R_{vC} + (%I) \times R_{vI})$ ◀</p> <p>replace with:</p> <p>► $R_V = (R_{vI} \times \%I) + (R_{vC} \times \%C) + (R_{vN} \times \%N)$ ◀</p> <p>In the fourth equation of item 6, place brackets consistently around values that are multiplied to correct typographical errors and clarify the order of operations. Also remove “R_{vN},” “R_{vC},” and “R_{vI}” and replace with “R_{vN},” “R_{vC},” and “R_{vI}” to correct typographical errors.</p>	A-2	05/01/2014	E

Description of Change	Page	Date Published	Type
Appendix A (continued)			
<p>Section A.2 Instructions for Compliance Calculations</p> <p>remove:</p> <p>► $WQT_v = P/12 \times R_v \times SA$ ◀</p> <p>replace with:</p> <p>► $WQT_v = P/12 \times R_v \times SA - SWR_v$ ◀</p> <p>►</p> <p>where:</p> <p>WQT_v = stormwater treatment volume (ft³) P = regulatory rain event (1.7 in.) 12 = conversion from inches to feet R_v = weighted site runoff coefficient SA = total site area (ac) SWR_v = <u>Stormwater Retention Volume (ft³)</u> ◀</p> <p>In item 8, add “- SWR_v” to the end of the equation and add “SWR_v = Stormwater Retention Volume (ft³)” at the end of the page. This text was inadvertently omitted.</p>	A-3	05/01/2014	O

Description of Change	Page	Date Published	Type
Appendix A (continued)			
<p>Section A.2 Instructions for Compliance Calculations</p> <p>remove:</p> $\blacktriangleright Q = (P - 0.2 \times S)^2 / (P + 0.8 \times S) \blacktriangleleft$ <p>replace with:</p> $\blacktriangleright Q = \frac{(P - 0.2 \times S)^2}{(P + 0.8 \times S)} \blacktriangleleft$ <p>In the equation “Runoff Volume with no Retention,” remove “(P - 0.2 × S)2”, replace with “(P - 0.2 × S)²”, and set the numerator over the denominator to correct a typographical error.</p>	A-9	05/01/2014	E

Description of Change	Page	Date Published	Type
Appendix A (continued)			
<p>Section A.2 Instructions for Compliance Calculations</p> <p>remove:</p> $\blacktriangleright CN_{adjusted}, \text{ so } (P - 0.2 \times S_{adjusted}) \times 2 / (P + 0.8 \times S_{adjusted}) = Q_{BMP}$ $S_{adjusted} = 1000 / (CN_{adjusted} - 10) \blacktriangleleft$ <p>replace with:</p> $\blacktriangleright CN_{adjusted}, \text{ so } \frac{(P - 0.2 \times S_{adjusted})^2}{(P + 0.8 \times S_{adjusted})} = Q_{BMP}$ $S_{adjusted} = \frac{1,000}{(CN_{adjusted} - 10)} \blacktriangleleft$ <p>In the equations for “Adjusted Curve Number,” set the numerators over the denominators, remove “× 2” and replace with an exponent of 2 to correct typographical errors.</p>	A-10	05/01/2014 revised on 12/22/2014	E

Description of Change	Page	Date Published	Type
Appendix H			
<p>Section H.6 Stormwater Retention Volume Peak Discharge, Step 1</p> <p>remove:</p> $\blacktriangleright CN = \left[\frac{100_0}{10 + 5P + 1_0Q_a - 1_0(Q_a^2 + 1.2_5Q_aP)^{0.5}} \right] \blacktriangleleft$ <p>replace with:</p> $\blacktriangleright CN = \frac{1,000}{10 + 5P + 10Q_a - 10(Q_a^2 + 1.25Q_aP)^{0.5}} \blacktriangleleft$ <p>Remove “100₀” and replace with “1,000” in the numerator. In the denominator, remove “1₀Q_a” and replace with “10Q_a”; remove “1₀” and replace with “10”; remove “1.2₅Q_aP” and replace with “1.25Q_aP”; and remove the brackets. These changes are needed to correct typographical errors.</p>	H-7	05/01/2014	E

Description of Change	Page	Date Published	Type
Appendix O			
<p>Section O.1 General Notes Pertinent to All Geotechnical Testing</p> <ul style="list-style-type: none"> ▶ ▪ Testing is to be conducted by a qualified professional. This professional shall either be a registered professional engineer, soils scientist, or geologist and must be licensed in the District of Columbia. ▪ Soil boring or test pit information is to be obtained from at least one location on the site. <u>Additional borings or test pits are required within the proposed BMP facility under three conditions: (1) when the soils or slopes vary appreciably from the findings in the initial boring or test pit, (2) when the ground water level is found to be significantly higher than initial boring or test pit indicated, and (3) when the ground water level may adversely affect the performance of the proposed BMP facilities.</u> However, the location, number, and depth of borings or test pits shall be determined by a qualified professional, and be sufficient to accurately characterize the site soil conditions. ▪ Depth to the ground water table <u>(with 24-hour readings)</u> and estimated depth to the seasonally high ground water table must be included in the boring logs/geotechnical report. ▪ Laboratory testing must include grain size analysis. Additional tests such as liquid limit and plastic limit tests, consolidation tests, shear tests and permeability tests may be necessary <u>where foundation soils or slopes are potentially unstable</u> based on the discretion of the qualified professional. ▪ The geotechnical report must include soil descriptions from each boring or test pit, and the laboratory test results for grain size. Based upon the proposed development, the geotechnical report may also include evaluation of settlement, bearing capacity and slope stability of <u>soils supporting the proposed structures.</u> ◀ <p>At the end of the first bullet, add “Additional borings or test pits are required within the proposed BMP facility under three conditions: (1) when the soils or slopes vary appreciably from the findings in the initial boring or test pit, (2) when the ground water level is found to be significantly higher than initial boring or test pit indicated, and (3) when the ground water level may adversely affect the performance of the proposed BMP facilities.” In the second bullet, add “(with 24-hour readings).” In the third bullet, add “where foundation soils or slopes are potentially unstable.” In the fourth bullet, add “soils supporting.” These additions are needed to provide greater detail on constant head test methods and process, as requested by local geotechnical consulting practitioners.</p>	O-1	05/01/2014	O

Description of Change	Page	Date Published	Type
Appendix O (continued)			
<p>Section O.2 Initial Feasibility Assessment</p> <p>► The initial feasibility assessment typically involves existing data, such as the following:</p> <ul style="list-style-type: none"> ▪ On-site septic percolation testing, which can establish initial<u>historic percolation</u> rates, water table, and/or depth to bedrock. <u>Percolation tests are different than tests for coefficient of permeability or infiltration rate;</u> ▪ Previous geotechnical reports prepared for the site or adjacent properties.; or ▪ Natural Resources Conservation Service (NRCS) Soil Mapping. ◀ <p>In the second bullet, remove “initial,” replace with “historic percolation,” add an “s” to “rate,” and add “Percolation tests are different than tests for coefficient of permeability or infiltration rate.” These changes are needed to provide greater detail on constant head test methods and process, as requested by local geotechnical consulting practitioners.</p>	O-2	05/01/2014	O/E

Description of Change	Page	Date Published	Type
Appendix O (continued)			
<p>Section O.3 Test Pit/Boring Requirements for Infiltration Tests</p> <p>►</p> <ol style="list-style-type: none"> a. Excavate a test pit or drill a standard soil boring to a depth of 2 feet below the proposed facility bottom. b. Determine depth to groundwater table (if within 2 feet of proposed bottom), and the estimated seasonally high groundwater table. c. Determine Unified Soil Classification (USC) System <u>and/or United States Department of Agriculture (USDA)</u> textures at the proposed bottom and 4 feet below the bottom of the BMP. d. Determine depth to bedrock (if within 2 feet of proposed bottom). e. The soil description must include all soil horizons. <u>Perform the infiltration test at the proposed bottom of the practice.</u> If any of the soil horizons below the proposed bottom of the infiltration practice <u>(within 2 feet)</u> appear to be a confining layer, additional infiltration tests must be performed on this layer (or layers), following the procedure described below. f. The location of the test pits or borings shall correspond to the BMP locations; <u>a map or plan that clearly and accurately indicates the location(s) of the test pits or soil borings must be provided with the geotechnical report.</u> test pit/soil boring stakes are to be left in the field for inspection purposes and shall be clearly labeled as such. ◀ <p>In item c, add “and/or United States Department of Agriculture (USDA).” In item e, add “Perform the infiltration test at the proposed bottom of the practice.” and “(within 2 feet).” In item f, remove “test pit/soil boring stakes are to be left in the field for inspection purposes and shall be clearly labeled as such” and add “a map or plan that clearly and accurately indicates the location(s) of the test pits or soil borings must be provided with the geotechnical report.” These changes are needed to provide greater detail on constant head test methods and process, as requested by local geotechnical consulting practitioners.</p>	O-2	05/01/2014	O/E

Description of Change	Page	Date Published	Type
Appendix O (continued)			
<p>Section O.4 Infiltration Requirements Testing</p> <p>► The following tests are acceptable for use in determining soil infiltration rates. The geotechnical report shall include a detailed description of the test method and published source references:</p> <ul style="list-style-type: none"> ▪ Well Permeameter Method (USBR 7300-89); <u>Constant Head Bore-Hole Infiltration Tests (also referred to as bore-hole permeameter tests and constant-head well permeameter tests).</u> <u>These types of tests determine saturated hydraulic conductivity (coefficient of permeability) by measuring the rate of water flow into a borehole. Analytical solutions utilize principals of Darcy's Law, borehole geometry, and head, or multiple heads, of water in determining saturated hydraulic conductivity. Infiltration rate is determined utilizing Darcy's Law and observations of soil characteristics. Where the soil characteristics meet all of the above-described requirements for infiltration BMPs, the hydraulic gradient element of Darcy's Law is often estimated as 1 for determining infiltration rate.</u> <p><u>One published standard developed by the United States Bureau of Reclamation for this method is USBR 7300-89. Some of the commercially available equipment is listed below:</u></p> <ul style="list-style-type: none"> ◆ <u>Amoozometer</u> ◆ <u>Guelph Permeameter</u> ◆ <u>Johnson Permeameter</u> <p>▪ Tube Permeameter Method (ASTM D 2434);</p> <p style="text-align: center;">(continued on next page)</p>	O-3	05/01/2014	O/E

Description of Change	Page	Date Published	Type
<p style="text-align: center;">(continued from previous page)</p> <ul style="list-style-type: none"> ▪ <u>Double-Ring Infiltrometer (ASTM D 3385). This test method measures the rate of water infiltration into soil utilizing two concentric rings to pond water at a controlled depth at the top of the natural soil of the test area. The downward loss of water from the inner ring determines the infiltration rate while the downward loss of water from the outer ring compensates for lateral loss to the soil from the inner ring that would otherwise occur from a single ring. The details of this method, including the minimum specified diameter of the rings, must be strictly adhered to in order to maintain integrity of the test results.</u> <p><u>This test method requires that both concentric rings be placed simultaneously into the upper few centimeters of the natural soil. In some cases, signification excavation is required to prepare a working area at the desired elevation.</u></p> <ul style="list-style-type: none"> ▪ <u>Other constant head permeability tests that utilize in-situ conditions and are accompanied by a recognized published peer reviewed source reference.</u> <p><u>All soil borings and test pits shall be properly backfilled after conclusion of tests. ◀</u></p> <p>In the first bullet, remove “Well Permeameter Method (USBR 7300-89)” and replace with “Constant Head Bore-Hole Infiltration Tests” and a description of the related process and equipment. Remove the second bullet, “Tube Permeameter Method (ASTM D 2434).” In the third bullet, add a description of the Double-Ring Infiltrometer test process. In the fourth bullet, remove “recognized published” and replace with “peer reviewed.” After the list, add “All soil borings and test pits shall be properly backfilled after conclusion of tests.” These changes are needed to provide greater detail on constant head test methods and process, as requested by local geotechnical consulting practitioners.</p>			

Description of Change	Page	Date Published	Type
Appendix Q			
<p>Section Q.2 “Stormwater Management Plans (SWMP) Good Housekeeping Stamp Notes</p> <p>► Fuels and Oils. On-site refueling will be conducted in a dedicated location away from access to surface waters. <u>Tanks fabricated with double walls do not require an additional bermed area.</u> Install containment berms and, or secondary containments around refueling areas and storage tanks. Spills will be cleaned up immediately and contaminated soils disposed of in accordance with all federal and District of Columbia regulations. Petroleum products will be stored in clearly labeled tightly sealed containers. All vehicles on site will be monitored for leaks and receive regular preventive maintenance activities. Any asphalt substances used on site will be applied according to manufacturer’s recommendations. Spill kits will be included with all fueling sources and maintenance activities. ◀</p> <p>After the first sentence of the “Fuels and Oils” paragraph, add “Tanks fabricated with double walls do not require an additional bermed area.” This addition is needed to provide clarification and align with the U.S. Environmental Protection Agency memorandum OSWER 9360.8-38 (http://www.epa.gov/osweroel/docs/oil/spcc/contain.pdf), which clarifies 40 CFR Part 112.7(c) on secondary containment.</p>	Q-1	12/XX/2014	O