Revision Sheet for
SEATTLE STORMWATER MANUAL, Director's Rule DWW-200/21-2015

This table contains proposed revisions and clarifications to the City of Seattle Stormwater Manual, January 2016 (Directors' Rule DWW-200/21-2015). The current manual can be found at http://www.seattle.gov/dpd/codesrules/codes/stormwater/.

Item no.	Date Added	Volume/ Appendix	Section	Page no.	Figure/ Table	Proposed Revisions
1	5/26/17	Volume 1	Section 2.3	2-7	NA	**Step 3 - Identify the Receiving Water and Downstream Conveyance** Revise the 2nd bullet as follows: Creek Basins: include stream basins throughout Seattle (((~~Figures 2.6 and 2.7),~~)) (designated under SMC 22.801.040 - "C"), generally referred to as "creek basins." Discharges are to the creek or the associated drainage basin (example: SMC, Section 22.805.050.C.2).
2	5/26/17	Volume 1	Section 2.3	2-7	NA	**Step 3 - Identify the receiving Water and Downstream Conveyance** Revise the 4th bullet as follows: Small Lake Basins: in Seattle these include Bitter Lake, Green Lake, and Haller Lake (((~~Figures 2.6 and 2.7),~~)) (designated under SMC 801.200 - "S"). Discharges are to the small lake or the associated drainage basin.
3	5/26/17	Volume 1	Section 2.3	2-8 & 2-9	Figures 2.6 & 2.7	**Step 3 - Identify the Receiving Water and Downstream Conveyance** Delete Figures 2.6 and 2.7 and refer to definition of creek to determine requirements. Figures do not accurately reflect piped and unpiped portions of creek basins.
4	5/9/16	Volume 1	Chapter 5	Page 5-1 to 5-16	NA	Header for Chapter 5 should be revised as follows: "Chapter ((~~(4)~~)) 5- Minimum Requirement((~~s)) ((Based on Project Type))~~ Standards"
5	5/9/16	Volume 1	Section 5.2.2.2	Page 5-6	Table B for 22.805.070.	**On-site List for Trail and Sidewalk Project.** Per Stormwater Code Section 22.805.070.D.3, Table B, revise this table as follows: - Category 2, Column 2, Row 2: revise to "Permeable Pavement ((~~Surfaces)~~) Facilities" - Category 2, Column 2, Row 3: revise to "Permeable Pavement ((~~Facilities~~)) Surfaces"
6	7/26/17	Volume 1	Section 8.2	Page 8-3	N/A	**Comprehensive Drainage Review for Large Projects** Change the first paragraph as follows to be consistent with Stormwater Code Section 22.807.020.A.2: Comprehensive Drainage Review is required for projects involving 5,000 square feet or more of new plus replaced ((~~impervious~~)) hard surface or 1 acre or more of land-disturbing activity, prepared by a licensed engineer. In addition to the requirements of the Standard Drainage Review, the following information is required for the Comprehensive Drainage Review:

<table>
<tr><th>Item no.</th><th>Date Added</th><th>Volume/ Appendix</th><th>Section</th><th>Page no.</th><th>Figure/ Table</th><th>Proposed Revisions</th></tr>
<tr><td>7</td><td>5/24/17</td><td>Volume 2</td><td>Section 4.1.1.2</td><td>Page 4-7</td><td>Table 3</td><td><u>BMP E1.15 Mulching, Matting and Compost Blankets</u>
Revise Column 2, Row 3 of Table 3 as follows:
<table>
<tr><th>Mulch Material</th><th>Quality Standards</th><th>Application Depth</th><th>Remarks [a]</th></tr>
<tr><td>Wood fiber
cellulose (partially digested wood fibers)</td><td>((~~• Dyed green~~))
• Should not contain growth-inhibiting factors</td><td>Minimum 2 inches</td><td>• If used on critical areas, double normal application rate.
• Apply with a hydro-mulcher with seed and tackifier. No tie-down required.
• Fibers should be less than 0.75-inch; packaged in 100-pound bags.</td></tr>
</table></td></tr>
<tr><td>8</td><td>5/24/17</td><td>Volume 2</td><td>Section 5.1.3.</td><td>Page 5-7</td><td>NA</td><td><u>BMP C1.25: Demolition of Buildings</u>
Revise the Purpose Section as follows:

The loose debris produced by building demolition activities can contain toxic organic compounds, toxic compounds, metals, and suspended solids that may pollute stormwater. <u>Toxic organic compounds, including PCBs, may be present in buildings built or remodeled prior to 1980. Projects, regardless of size, shall implement practices to properly handle and dispose of materials that may contain PCBs such as transformers, light ballasts, caulk and some roofing materials so that they do not come into contact with stormwater.</u></td></tr>
<tr><td>9</td><td>7/22/16</td><td>Volume 3</td><td>Section 4.3.2.1</td><td>Page 4-11</td><td>NA</td><td><u>Requirements for Projects with No Off-site Point of Discharge.</u> Revise the third paragraph as follows:

One option for a small project ((~~overflow scenario~~)) <u>with no approved off-site point of discharge</u> consists of an infiltration BMP (i.e., infiltration trench, drywell or infiltration chamber) situated downstream of a bioretention cell or a permeable pavement facility sized to infiltrate storms up to the conveyance standard (25-year recurrence interval flow). Refer to Appendix E, Section E-10 for <u>dry well</u> sizing ((~~information~~)) <u>provided for this scenario</u>.</td></tr>
<tr><td>10</td><td>5/24/17</td><td>Volume 3</td><td>Section 4.3.2.1</td><td>Page 4-11</td><td>NA</td><td><u>Requirements for Projects with No Off-site Point of Discharge.</u>
Add the following:

<u>Infiltration testing and plan preparation clarification for detached accessory dwelling units (DADUs) and additions with less than 1,500 sf of new plus replaced hard surface on lots with No Off-site Point of Discharge:</u>
• <u>The applicant is allowed to perform the infiltration testing unless otherwise determined by the Director.</u>
• <u>If the applicant chooses (in lieu of a licensed professional) to conduct the infiltration testing, the applicant shall conduct the Small PIT (rather than the Simple Infiltration Test).</u>
• <u>The test shall be documented with the Pilot Infiltration Test Checklist and a minimum 0.25 in/hr measured soil infiltration rate must be demonstrated.</u>
• <u>Drywells shall be sized, at a minimum, per Appendix E-10 - Drywell Sizing Tables (as modified 7/22/16 in the Clarification Sheet for the Seattle Stormwater Manual).</u>
• <u>The applicant is allowed to prepare the drainage control plan unless otherwise determined by the Director.</u></td></tr>
</table>

Item no.	Date Added	Volume/ Appendix	Section	Page no.	Figure/ Table	Proposed Revisions
11	5/9/16	Volume 3	Section 5.3.3.5	Page 5-17	NA	**Splashblock Downspout Dispersion - Contributing Area.** Revise this section as follows: "A maximum of 700 square feet of roof area may drain to each splashblock. If at least 50 percent of the roof is a vegetated roof, contributing roof areas ((~~larger than~~)) up to ((~~700~~)) 900 square feet ((~~may~~)) will be ((~~approved~~)) allowed."
12	5/9/16	Volume 3	Section 5.3.5.5	Page 5-28	NA	**Sheet Flow Dispersion - Dispersion Flowpath.** Revise this section as follows: "The general minimum requirements associated with the dispersion flowpath are provided in *Section 5.3.1.2*. An additional flowpath requirement specific to sheet flow dispersion is as follows: • Provide a vegetated flowpath of 10 feet to disperse sheet flow runoff from hard surface with a contributing flow length of 20 feet. If the contributing hard surface is at least 50 percent permeable pavement, the contributing flow length may be increased from 20 to 25 feet. Provide an additional 10 linear feet of vegetated flowpath for each additional 20 linear feet of contributing flow length or fraction thereof. • Down gradient of the required flowpath (per the bullet above), an additional 10 feet shall be provided before the flowpath intersects a property line (excluding the property line abutting the right-of-way) or encounters a structure."
13	5/9/16	Volume 3	Section 5.3.6.5	Page 5-31	NA	**Concentrated Flow Dispersion - Contributing Area**. Revise this section as follows. "A maximum of 700 square feet of impervious area may drain to each concentrated flow dispersion device (i.e., rock pad or dispersion trench). Larger contributing areas may be approved for other types of hard surfaces (e.g., permeable pavement). If at least 50% of the contributing area is permeable pavement, contributing areas up to 900 square feet will be allowed."
14	5/9/16	Volume 3	Section 5.3.6.5	Page 5-32	NA	**Concentrated Flow Dispersion - Dispersion Trench.** Revise this section as follows: "If selected as the dispersion device, the dispersion trench design shall meet the following minimum requirements: • The trench shall be a minimum of 18 inches deep and 2 feet wide. • The trench shall be level and aligned parallel to site elevation contours to disperse the water to the downslope flowpath. The trench shall be constructed to prevent point discharge and erosion. • Trenches serving up to 700 square feet of impervious area shall be 10foot-long. If the contributing area is not an impervious surface (e.g., permeable pavement), contributing areas larger than 700 square feet may be approved for a 10foot trench. If at least 50% of the contributing area is permeable pavement, contributing areas up to 900 square feet will be allowed for a 10-foot trench. For contributing areas greater than the contributing areas noted above, the trench length shall be calculated as a minimum of ten feet plus a proportional trench length based on the additional contributing area. For example, trench length for trenches serving non-permeable pavement areas larger than 700 square feet shall be calculated as: Total roof area in square feet x 10 feet ÷ 700 square feet. • A setback of at least 5 feet shall be maintained between any edge of the trench and any structure or property line. A 10-foot setback from a building with a basement is recommended."

Item no.	Date Added	Volume/ Appendix	Section	Page no.	Figure/ Table	Proposed Revisions
15	7/22/16	Volume 3	Section 5.4.3.6	Page 5-48	NA	**BMP Sizing - Sizing for On-site List Approach.** Revised the first paragraph as follows: Drywells can only be selected to meet the On-site List Requirement (refer to *Section 3.3.1* and *Appendix C* for infeasibility criteria) when the site measured infiltration rate is at least 5 inches per hour. The hard surface area managed with a drywell sized according to Table 5.14 meets the requirement. ((~~For sizing a drywell downstream of a bioretention cell or permeable pavement facility, refer to *Appendix E, Section E-10.*~~))
16	5/9/16	Volume 3	Section 5.4.4.5	Page 5-60	NA	**Infiltrating Bioretention – Ponding Area [in the right-of-way].** Third paragraph, first bullet and sub-bullets. Revise as follows: “To address traffic and pedestrian safety concerns, the following additional minimum requirements apply to bioretention facilities in the right-of-way: ○ The following minimum setbacks shall be provided for facilities with sloped sides: ○ 2 feet minimum from face of curb to top of slope on non-((~~major~~)) principal arterial streets ○ 4 feet minimum from face of curb to top of slope for ((~~major~~)) principal arterial street ○ 1 foot minimum from edge of sidewalk to top of slope”
17	7/26/17	Volume 3	Section 5.4.4.5	Page 5-56	N/A	**Infiltrating Bioretention – Contributing Area** Change first bullet of the 5th paragraph as follows: It is also preferred that flow control facilities be sized for the entire area draining to the facility where feasible. Additional flows may pass through a bioretention facility sized to meet a flow control standard or on-site stormwater management requirement with the following limitations: • The maximum ((~~additional~~)) area (i.e., areas beyond the area for which the facility is sized) that may pass through a bioretention facility shall not exceed twice the area for which it is sized due to sediment loading concerns;
18	5/24/17	Volume 3	Section 5.4.4.5.	Page 5-56	N/A	**Infiltrating Bioretention - Contributing Area** Revise the first paragraph as follows: Bioretention cells are small and distributed. The contributing area to a bioretention facility is limited as follows: • No single cell may receive runoff from more than 5,000 square feet of impervious area, ((~~except as noted below for~~)) unless it is in)) a series of bioretention cells. • ((~~Runoff from more than 5,000 square feet of impervious area may be directed to an upstream cell in a bioretention series (interconnected series of cells).~~)) The bottom area of an individual cell shall be no larger than 800 square feet per the Ponding Area section (page 5-59).
19	5/24/17	Volume 3	Section 5.4.4.5.	Page 5-56	N/A	**Infiltrating Bioretention - Contributing Area** Revise the fifth paragraph as follows: It is also preferred that on-site and flow control facilities be sized for the entire area draining to the facility where feasible. Additional flows may pass through a bioretention facility sized to meet a flow control standard or on-site stormwater management requirement with the following limitations:

20	5/9/16	Volume 3	Section 5.4.4.6	Page 5-67 to 5-68	Table 5.18	**On-site List Sizing for Infiltrating Bioretention with and Without Underdrains.** Revise this table as follows:

Bioretention Configuration	Average Ponding Depth	Subgrade Soil Design Infiltration Rate	Sizing Factor for Facility Bottom Area	
			Without Underdrain[a]	With Underdrain[b]
Sloped sides	2 inches	0.15 inch/hour	NA[c]	8.9%[d]
		0.3 inch/hour	4.7%[e]	5.2%[d]
		0.6 inch/hour	4.5%	5.0%
		1.0 inch/hour	4.5%	5.0%
		2.5 inch/hour	4.5%	5.0%
	6 inches	0.15 inch/hour	NA[c, f]	((~~NA[f]~~)) 5.6%[d]
		0.3 inch/hour	3.5%	3.9%
		0.6 inch/hour	3.5%	3.9%
		1.0 inch/hour	3.5%	3.9%
		2.5 inch/hour	3.5%	3.9%
Sloped sides (continued)	12 inches	0.15 inch/hour	NA[c, f]	((~~NA[f]~~)) 3.2%[d]
		0.3 inch/hour	NA[f]	((~~NA[f]~~)) 2.6%
		0.6 inch/hour	2.3%	2.6%
		1.0 inch/hour	2.3%	2.6%
		2.5 inch/hour	2.3%	2.6%
Vertical sides	6 inches	0.15 inch/hour	NA[c, f]	((~~NA[f]~~)) 9.2%[d]
		0.3 inch/hour	5.3%[e]	5.9%[d]
		0.6 inch/hour	5.0%[g]	5.6%[g]
		1.0 inch/hour	5.0%[g]	5.6%[g]
		2.5 inch/hour	5.0%[g]	5.6%[g]
	12 inches	0.15 inch/hour	NA[c, f]	((~~NA[f]~~)) 7.1%[d]
		0.3 inch/hour	NA[f]	((~~NA[f]~~)) 5.6%
		0.6 inch/hour	5.0%	5.6%
		1.0 inch/hour	5.0%	5.6%
		2.5 inch/hour	5.0%	5.6%

NA – not applicable.

[a] Sizing factors are based on achieving a minimum wetted surface area of 5 percent, unless otherwise noted.

[b] Sizing factors are based on a minimum wetted surface area of 5 percent multiplied by a factor of 1.11, unless otherwise noted.

[c] Underdrain systems shall be installed if the subgrade soils have a measured infiltration rate of less than 0.6 inches per hour (note that the infiltration rates listed in the table are design rates).

[d] Sizing factor increased to the size required to meet the On-site Performance Standard for a pre-developed condition of forest on till and multiplied by a factor of 1.11.

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						[e] Sizing factor increased beyond the minimum wetted surface area of 5 percent to meet the On-site Performance Standard for a pre-developed condition of forest on till. [f] Ponding depth and infiltration rate combination do not achieve drawdown requirements. [g] To maximize flow control benefit, 12 inch vertical side walls are recommended for design infiltration rates exceeding 0.3 inches per hour. Bioretention Facility Bottom Area = Contributing Hard Surface Area x Factor (%)/100. Hard Surface Area Managed = Bioretention Facility Bottom Area ÷ Factor (%)/100.
21	5/9/16	Volume 3	Section 5.4.5.5	Page 5-79	NA	**Rain Garden – Ponding Area [in the right-of-way].** First bullet and sub-bullets. Revise as follows: • "The following minimum setbacks shall be provided: ○ 1.5 feet minimum from face of curb to top of slope on non-arterial streets for rain gardens with average ponding depths of 3 inches or less ○ 2 feet minimum from face of curb to top of slope on non-arterial streets for rain gardens with average ponding depths greater than three inches ○ 2 feet minimum from face of curb to top of slope on non-((~~major~~)) principal arterial streets (((~~1.5foot setback allowable for rain gardens with average ponding depths of 3 inches or less~~))) ○ 4 feet minimum from face of curb to top of slope for ((~~major~~)) principal arterial streets ○ 1 foot minimum from edge of sidewalk to top of slope"
22	5/9/16	Volume 3	Section 5.4.7.5	Page 5-102	Figure 5.17	**Perforated Stub-Out Connection.** Revise this figure as follows: • Delete "LEVEL", "SLOPE" and "FLOW" call outs and arrows
23	5/9/16	Volume 3	Section 5.4.9.6	Page 5-110	Table 5.26	**Pre-sized Sizing Factors and Equations for Infiltration Chambers.** Revise this table as follows: • Reverse bracket on 4th row, 3rd column: [0.0733 x A ((~~[~~))]+ 79.9
24	5/24/17	Volume 3	Section 5.5.1.6.	Page 5-116	N/A	**Rainwater Harvesting - Modeling Approach for On-site Performance Standard and Flow Control** Revise Step 1 as follows: ***Step 1: Determine rainwater demand*** When estimating rainwater demand for the purposes of modeling the on-site performance standard or a flow control ((~~benefits~~)) standard, only year-round indoor uses may be included (e.g., seasonal irrigation may not be considered). Typical assumptions for non-potable and potable uses are provided in Tables 5.28 and 5.29 below.

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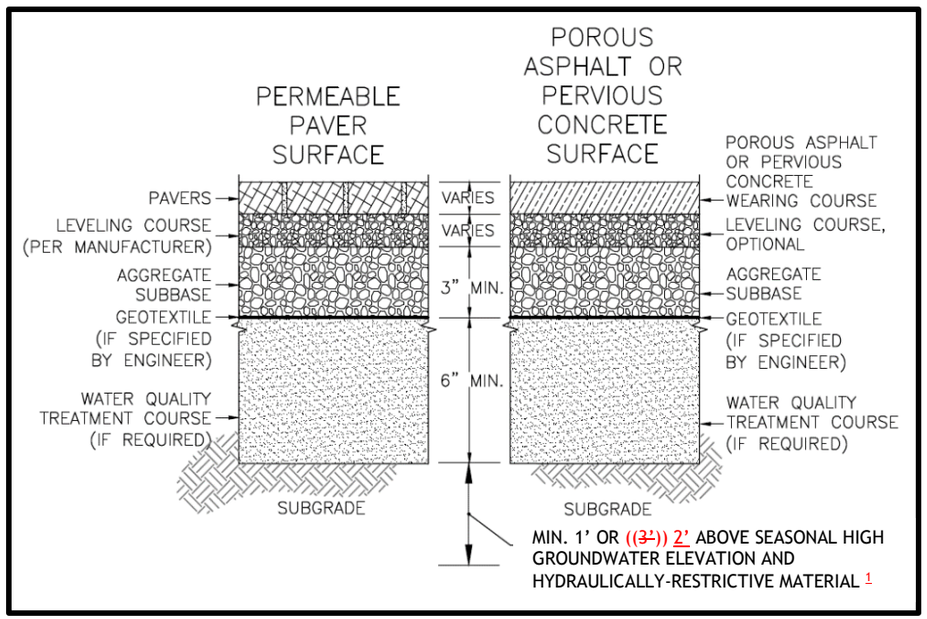
25	5/24/17	Volume 3	Section 5.6.2.5.	Page 5-133	Figure 5.21.	**Permeable Pavement Surfaces – Design Criteria** Revise Figure 5.21 as follows:  1 See Table C.3 of Appendix C to determine minimum vertical separation. Note: Subsurface investigation is not required for permeable pavement surfaces, but subsurface investigation must be performed to demonstrate infeasibility due to lack of vertical separation.
26	5/9/16	Volume 3	Section 5.8.2.6	Page 5-167	NA	**Non-infiltrating Bioretention - Pre-sized Approach for Flow Control and Water Quality Treatment.** First bullet. Revise as follows: • "The bottom area shall be sized using the applicable sizing factor or equation. When used to meet the Peak Control Standard, the facility size shall not be significantly larger (i.e., area shall not be more than 25 percent larger) than prescribed by the Peak Control Standard sizing factor because peak flow control performance may be diminished for larger facilities."
27	5/9/16	Volume 3	Section 5.8.2.6	Page 5-167	Table 5.45	**Non-infiltrating Bioretention - Pre-Sized Sizing Factors and Equations.** Revise footnote b as follows: "b. When used to meet the Peak Control Standard, the facility size shall not be significantly larger (i.e., area shall not be more than 25 percent larger) than prescribed by the sizing factor (or sizing factor range) because flow control performance may be diminished for larger facilities (larger facilities will not pond water sufficiently to slow flows)."

<table>
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<tr><td>28</td><td>5/24/17</td><td>Volume 3</td><td>Section 5.8.4.6.</td><td>Page 5-179</td><td>Table 5.46</td><td>
Table 5.46.
Basic and Compost Amended Vegetated Filter Strip Design and Sizing Criteria.
<table>
<tr><th>Design Parameter</th><th>Basic Filter Strip</th><th>CAVFS</th><th>MFD</th></tr>
<tr><td>Longitudinal Slope</td><td>1 – 33%</td><td>1 – 15%</td><td>5%</td></tr>
<tr><td>Lateral Slope</td><td colspan="2">NA</td><td>2 – 25%</td></tr>
<tr><td>Maximum velocity</td><td colspan="2">0.5 feet/second</td><td>NA</td></tr>
<tr><td>Maximum water depth</td><td colspan="2">1 inch</td><td>NA</td></tr>
<tr><td>Manning’s roughness coefficient</td><td>0.35</td><td>0.40 to 0.55[a]</td><td>NA</td></tr>
<tr><td>Minimum hydraulic residence time at Water Quality Design Flow Rate</td><td>9 minutes</td><td>NA</td><td>NA</td></tr>
<tr><td>Minimum length</td><td>((~~100 feet~~)) N/A [c]</td><td>((~~100 feet~~)) N/A</td><td>NA</td></tr>
<tr><td>Maximum side slope</td><td colspan="2">Inlet edge ≥ 1 inch lower than contributing paved area</td><td>NA</td></tr>
<tr><td>Max. tributary drainage flow path</td><td colspan="3">150 feet</td></tr>
<tr><td>Max. longitudinal slope of contributing area</td><td colspan="2">5% (steeper than 5% need upslope flow spreading and energy dissipation)</td><td>5%</td></tr>
<tr><td>Max. lateral slope of contributing area</td><td colspan="2">2% (at the edge of the strip inlet)[b]</td><td>NA</td></tr>
</table>
[a] Manning’s n ranges from 0.40 (hydroseeded, grass maintained at 95% density and 4-inch length via mowing, periodic reseeding, and possible landscaping with shrubs) to 0.55 (top-dressed with ≥ 3 inches compost or mulch [seeded or landscaped]).
[b] A stepped series of flow spreaders installed at the head of the strip could compensate for slightly steeper slopes.
[c] Length based on achieving required hydraulic residence time.
</td></tr>
<tr><td>29</td><td>5/24/17</td><td>Volume 3</td><td>Section 5.8.11.6.</td><td>Page 5-218</td><td>N/A</td><td><u>Proprietary and Emerging Water Quality Treatment Technologies - BMP Sizing</u>
Step 1: Determine the water quality design flow rate
Use an approved continuous model to determine the on-line water quality design flow rate using the following assumptions.</td></tr>
</table>

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<tr><td>30</td><td>5/24/17</td><td>Volume 3</td><td>Section 5.8.11.6.</td><td>Page 5-219</td><td>N/A</td><td>
<u>Proprietary and Emerging Water Quality Treatment Technologies - BMP Sizing</u>
Step 2: Adjust the water quality design flow rate
<table>
<tr><th></th><th colspan="5">Mass Loading Ratios [1]</th></tr>
<tr><th>Zoning Categories</th><th>Bay Filter®</th><th>Filterra®</th><th>FloGard Perk Filter®</th><th>Stormwater Management StormFilter (StormFilter)®</th><th><u>Bio Clean (Forterra) Modular Wetland System ®</u></th></tr>
<tr><td>• Parcels zoned as SFR or MFR
• Non-arterial streets adjacent to properties zoned as SFR or MFR</td><td>((~~5.0~~))
<u>4.0</u></td><td>1.0</td><td>((~~2.5~~))
<u>2.0</u></td><td>((~~4.0~~))
<u>3.0</u></td><td><u>1.0</u></td></tr>
<tr><td>• Parcels zoned as neighborhood/commercial, downtown, major institutions, master planned community, or residential/commercial
• Arterial streets with adjacent property zoned as neighborhood / commercial, downtown, major institutions, master planned community, or residential/commercial</td><td><u>4.0</u></td><td>1.0</td><td><u>2.0</u></td><td><u>3.5</u></td><td><u>1.0</u></td></tr>
<tr><td>• Parcels zoned as manufacturing/industrial
• Non-arterial or arterial streets with adjacent property zoned as manufacturing/industrial</td><td>((~~7.5~~))
<u>6.0</u></td><td>1.0</td><td>((~~3.5~~))
<u>3.0</u></td><td>((~~6.0~~))
<u>4.5</u></td><td><u>1.5</u></td></tr>
<tr><td colspan="6"><u>[1] Mass loading ratios were developed for this limited set of proprietary technologies using a mean total suspended solids concentration (See table 3.5) and assumed use of an on-line water quality design flow rate. Use of this table is restricted to uses that match those assumptions. For other proprietary technologies, or other assumptions, see Section 3.5 BMP Selection for Water Quality Treatment.</u></td></tr>
</table>
</td></tr>
<tr><td>31</td><td>7/22/16</td><td>Volume 4</td><td>Section 3.2.2</td><td>Pages 3-11 - 3-15</td><td>NA</td><td>
<u>BMP 10: Fueling at Dedicated Stations</u>
See Clarification Attachment 2: BMP 10 Fueling at Dedicated Stations
http://www.seattle.gov/dpd/cs/groups/pan/@pan/documents/web_informational/p2470656.pdf
</td></tr>
</table>

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<tr><td>32</td><td>5/24/17</td><td>Appendix C</td><td>Permeable Pavement Surfaces</td><td>Page C-6</td><td>Table C.3</td><td><u>On-Site List Infeasibility Criteria: Category 2 BMPs.</u>
Add to Permeable Pavement Surfaces the following infeasibility criteria:
• <u>Based on subsurface investigation, groundwater or hydraulically-restrictive layer is too shallow per the following Minimum Vertical Separation table.</u>
<table><tr><th colspan="4"><u>Permeable Pavement Surfaces</u></th></tr><tr><th rowspan="2"><u>Season</u></th><th rowspan="2"><u>Minimum Investigation Depth (ft)[a]</u></th><th colspan="2"><u>Minimum Vertical Separation, ft[a]</u></th></tr><tr><th><u>Groundwater</u></th><th><u>Hydraulically-Restrictive Layer</u></th></tr><tr><td><u>Wet Season (November – March)</u></td><td><u>2</u></td><td><u>1</u></td><td><u>1</u></td></tr><tr><td><u>Dry Season (April – October)</u></td><td><u>3</u></td><td><u>2</u></td><td><u>1</u></td></tr></table><u>[a] The minimum investigation depth and vertical separation shall be measured from the bottom of the BMP. The bottom of the BMP is defined as the deepest portion of proposed BMP where water is expected to move into the underlying soil (i.e. at the aggregate subbase or Water Quality Treatment Course (if required)).</u>

<u>Note: Subsurface investigation is not required for permeable pavement surfaces, but subsurface investigation must be performed to demonstrate infeasibility due to lack of vertical separation.</u></td></tr>
<tr><td>33</td><td>5/9/16</td><td>Appendix D</td><td>Section D-3.3</td><td>Page D-9</td><td>NA</td><td><u>Small Pilot Infiltration Test (Small PIT) - Step 9.</u> Change from “At the conclusion of testing, over-excavate the pit…” to “<u>Within 24 hours after the falling head period</u>, over-excavate the pit…”</td></tr>
<tr><td>34</td><td>7/22/16</td><td>Appendix E</td><td>Section E-10</td><td>Page E-61</td><td>NA</td><td><u>Drywell Sizing Tables.</u> Revise the first paragraph as follows:

((<s>The City has determined that the most common small project overflow scenario consists of a drywell situated downstream of a bioretention cell or a permeable pavement facility.</s>)) <u>For small projects with no approved off-site point of discharge (see Section 4.3.2.1),</u> Table E.25 and Table E.26 specify the required area for drywells of 4-foot and 6-foot depths to be used ((<s>as overflow/point of discharge</s>)) downstream of a bioretention cell or a permeable pavement facility for parcel-based and single-family residential projects, respectively.</td></tr>
<tr><td>35</td><td>7/22/16</td><td>Appendix E</td><td>Section E-10</td><td>Page E-62</td><td>NA</td><td><u>Drywell Sizing Tables.</u> Revise the first paragraph as follows:

((<s>Drywells that do not meet the above design criteria and the assumptions shall be sized to meet the Peak Control Standard per Volume 3, Section 5.4.3. For projects that discharge directly to a drywell (if a bioretention cell or permeable pavement facility are not feasible upstream), the drywell shall be sized to meet the Peak Control Standard per Volume 3, Section 5.4.3.</s>)) Table E.27 specifies the required area for drywells of 4-foot and 6-foot depths that are not located downstream of a bioretention cell or permeable pavement facility.</td></tr>
<tr><td>36</td><td>7/22/16</td><td>Appendix E</td><td>Section E-10</td><td>Page E-62</td><td>NA</td><td><u>Drywell Sizing Tables.</u> Add the following after Table E.27:

<u>Drywells that do not meet the above design criteria and assumptions shall be sized to meet the requirements for projects with no off-site point of discharge per Volume 3, Section 4.3.2.1.</u></td></tr>
<tr><td>37</td><td>5/9/16</td><td>Appendix F</td><td>Section F-3</td><td>Page F-9</td><td>Table F.7</td><td><u>Physical Characteristics of Seattle Lakes - Outfalls to Lakes and the Ship Canal.</u> Revise this table as follows:
□ Water surface elevation on 2nd row, 5th column [Lake Union] and 6th column [Lake Washington]: ((<s>16.8</s>)) <u>18.6</u></td></tr>
</table>

Item no.	Date Added	Volume/ Appendix	Section	Page no.	Figure/ Table	Proposed Revisions
38	5/9/16	Appendix F	Section F-4	New Section	NA	**On-site Performance Standard BMP Design** See *Clarification Attachment 1: On-Site Performance Standard BMP Design* http://www.seattle.gov/dpd/cs/groups/pan/@pan/documents/web_informational/p2437965.pdf
39	7/22/16	Appendix F	Section F-4	Page F-14	NA	**HSPF Parameter Modification.** Revise the first paragraph as follows: In HSPF (and MGSFlood and WWHM) pervious land categories are represented by PERLNDs and impervious land categories are represented by IMPLNDs. The only PERLND and IMPLND parameters that ((~~are authorized to~~)) should be adjusted by the user are LSUR (length of surface overland flow plane in feet), SLSUR (slope of surface overland flow plane in feet/feet), and NSUR (roughness of surface overland flow plane). These are parameters whose values are observable at an undeveloped site, and whose values can be reasonably estimated for the proposed development site. Any such changes will be recorded in the model output. The user ((~~should~~)) shall submit ((~~justifications for~~)) PERLND and IMPLND changes with their project submittal.
40	5/24/17	Appendix F	Section F-6	Page F-48	N/A	**Rational Method – Time of Concentration Estimation.** Add equation after first paragraph. Travel time for each segment is computed using the following equation: $T_t = L / V$

<table>
<tr><th>Item no.</th><th>Date Added</th><th>Volume/ Appendix</th><th>Section</th><th>Page no.</th><th>Figure/ Table</th><th>Proposed Revisions</th></tr>
<tr><td>41</td><td>7/22/16</td><td>Appendix G</td><td>Section No. 18</td><td>Page G-43</td><td>NA</td><td><u>No. 18 – API Oil/Water Separators.</u> Revise Table No. 18 as follows:
<table>
<tr><th>Maintenance Component</th><th>Defect or Problem</th><th>Condition When Maintenance is Needed</th><th>Results Expected When Maintenance is Performed</th></tr>
<tr><td rowspan="5">Inlet/Outlet Pipe</td><td>Sediment accumulation</td><td>Sediment filling 1/3 or more of the pipe</td><td>Inlet/outlet pipes clear of sediment</td></tr>
<tr><td>Trash and debris</td><td>Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)</td><td>No trash or debris in pipes</td></tr>
<tr><td>Damaged</td><td>((~~Cracks wider than ½-inch at the joint of the inlet/outlet pipe~~
~~Any evidence of soil entering at the joints of the inlet/outlet pipes~~))

<u>Cracks, broken welds, seams or any other conditions that allows water to be discharged from other than the submerged portion of the tee</u></td><td>((~~No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe~~))

<u>Water will be discharged from the submerged portion of the tee.</u></td></tr>
<tr><td><u>Missing</u></td><td><u>When the required inlet or outlet tee is not installed</u></td><td><u>Tees installed</u></td></tr>
<tr><td><u>Permanently installed</u></td><td><u>When the tee is grouted to the inlet or outlet pipe and is not removable to allow for maintenance and inspection</u></td><td><u>Tee removable for maintenance and inspection</u></td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Item no.</th><th>Date Added</th><th>Volume/ Appendix</th><th>Section</th><th>Page no.</th><th>Figure/ Table</th><th>Proposed Revisions</th></tr>
<tr><td>42</td><td>7/22/16</td><td>Appendix G</td><td>Section No. 19</td><td>Page G-45</td><td>NA</td><td><u>No. 19 – Coalescing Plate Oil/Water Separators.</u> Revise Table No. 19 as follows:
<table>
<tr><th>Maintenance Component</th><th>Defect or Problem</th><th>Condition When Maintenance is Needed</th><th>Results Expected When Maintenance is Performed</th></tr>
<tr><td rowspan="5">Inlet/Outlet Pipe</td><td>Sediment accumulation</td><td>Sediment filling 1/3 or more of the pipe</td><td>Inlet/outlet pipes clear of sediment</td></tr>
<tr><td>Trash and debris</td><td>Trash and debris accumulated in inlet/outlet pipes (includes floatables and non-floatables)</td><td>No trash or debris in pipes</td></tr>
<tr><td>Damaged</td><td>((~~Cracks wider than ½-inch at the joint of the inlet/outlet pipe Any evidence of soil entering at the joints of the inlet/outlet pipes~~))

<u>Cracks, broken welds, seams or any other conditions that allows water to be discharged from other than the submerged portion of the tee</u></td><td>((~~No cracks more than ¼-inch wide at the joint of the inlet/outlet pipe~~))

<u>Water will be discharged from the submerged portion of the tee.</u></td></tr>
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<tr><td><u>Permanently installed</u></td><td><u>When the tee is grouted to the inlet or outlet pipe and is not removable to allow for maintenance and inspection</u></td><td><u>Tee removable for maintenance and inspection</u></td></tr>
</table></td></tr>
</table>