

2022 DDECM Errata (Released March 2024)

| Vol. | Section | Page No. | Description & Reason for Change | Corrected Text (red underlined = new text, strikeout = deleted text) |
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| Multiple | | | Updated hyperlinks throughout document. | |
| Intro | I | v | Clarification of terminology. | The Thurston County Drainage Design and Erosion Control Manual (DDECM) establishes requirements and provides guidance on measures necessary to control the quantity and quality of stormwater runoff produced by development and redevelopment such that they comply with water quality standards and contribute to the protection of beneficial uses of receiving waters in Thurston County. This Manual is an update to the 2016 DDECM, which was adopted by Thurston County on October 18, 2016. The 2016 DDECM was a completely revised update to the 2009 Thurston County DDECM. This updated DDECM is intended to comply with the requirement of the National Pollutant Discharge Elimination System (NPDES) <u>Western Washington</u> Phase II <u>Municipal Stormwater</u> permit issued to Thurston County by the Department of Ecology to adopt a stormwater management manual equivalent to the Stormwater Management Manual for Western Washington (Ecology 2019) by June 30, 2022. |
| Intro | I | Vi | Typo | To implement regulatory mandates such as <u>as</u> Total Maximum Daily Load (TMDL) requirements within a watershed. |
| I | TOC | iii | Page number for Appendices incorrect. | |
| I | 2.4.8.2 | 2-34 | Unable to confirm when flow control requirements were first adopted into code or rules. | <ul style="list-style-type: none"> TDAs that through a combination of effective hard surfaces and converted vegetation areas cause a 0.15 cubic feet per second or greater increase in the 100-year flow frequency as estimated using the WWHM, or other approved continuous simulation model using 15-minute time steps. The 0.15 cfs increase should be a comparison of the post-project runoff to the existing condition runoff. For purposes of applying this threshold, the existing condition is either the pre-project land cover, or the land cover |

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| | | | | that existed at the site as of a date when the County first adopted Flow Control requirements into code or rules. |
| I | 2.5 | 2-44 | No period at the end of listed items for bullets 1, 2, 4, and 5. | <ul style="list-style-type: none"> • Statutory warranty deed (individual, partnership, or corporate): conveys real property to Thurston County. • Storm sewer easement: conveys to Thurston County the right to have and maintain a storm sewer system across a specific parcel of property. • Stormwater Maintenance Agreement: delineates responsibilities of party responsible for stormwater system maintenance and grants to Thurston County the right to have access to stormwater facilities for purposes of inspection, maintenance, or repair if the party responsible for maintenance fails to take required actions in accordance with the maintenance agreement. • Slope and utility easement: conveys the right to have fill material or a cut slope and utilities on private property. • Quitclaim deed: conveys maintained but undocumented right-of-way to Thurston County. • Drainage Easement: conveys to Thurston County the right to access, use, and maintain a specific area of a parcel of property for purposes of storm drainage. This may include stormwater facilities for water quality treatment or flow control, dispersion, conveyance, or other purposes. |
| I | 2.6.2 | 2-45 | No period at the end of bullet list items. | <ul style="list-style-type: none"> • The POA shall be responsible for maintenance of storm drainage facilities. • Inclusion by reference of the Maintenance Plan prepared by the project engineer in accordance with this Manual. • Power to assess fees to maintain storm drainage facilities. |
| I | 2.6.2 | 2-45 | Incorrect section referenced. | The maintenance covenant and statement of sanctions described under Core Requirement #9, Section 2.4.11 <u>2.4.10</u> will be included in the document establishing the POA and shall be recorded with the Thurston County Auditor for the plat and recorded against each lot within the subdivision or short division. |

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| I | 3.8 | 3-19 | Delete period from last bullet item. | <ul style="list-style-type: none"> A Maintenance Plan- |
| I | 3.8.1 | 3-19 | Reformat paragraph starting with "The Drainage Report shall contain..." to be in line with bullet list. | <ul style="list-style-type: none"> Project Engineer's Certification: The Drainage Report must be developed by a professional engineer licensed to practice in the State of Washington. For projects where a PE is required, all plans and specifications, calculations, certifications, "as-built" drawings, and all other submittals which will become part of the permanent record of the project must be dated and bear the project engineer's official seal and signature. <p>The Drainage Report shall contain a page with the project engineer's seal with the following statement: "I hereby state that this Drainage and Erosion Control Plan/Construction SWPPP for (insert name of project) has been prepared by me or under my supervision and meets the requirements of the Thurston County Drainage Design and Erosion Control Manual and the standard of care and expertise which is usual and customary in this community for professional engineers. I understand that Thurston County does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me."</p> |
| I | 3.8.1 | 3-20 | Delete period from last bullet item. | <ul style="list-style-type: none"> Construction SWPPP (12 sections, summarized in Volume II, can be bound separately or together with the Drainage Report)- |
| I | 3.8.1.2.1 | 3-21 | Add period to first bullet item. | <ul style="list-style-type: none"> Show Topography on Site Map. |
| I | 3.8.1.2.2 | 3-21, 3-22 | Add period to first two bullet items. | <ul style="list-style-type: none"> Show vegetation on Site Map. Include aerial photograph in Drainage Report. |
| I | 3.8.1.2.3 | 3-22 | Add period to first bullet item. | <ul style="list-style-type: none"> Show existing Drainage on Site Map. |
| I | 3.8.1.2.4 | 3-22 | Add period to first two bullet items. | <ul style="list-style-type: none"> Show soils information on Site Map and location of any borings or test pits. Discuss in Soils section of drainage report. |
| I | 3.8.1.2.5 | 3-23 | Add period to first bullet item. | <ul style="list-style-type: none"> Show adjacent areas on Site Map. |

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| I | 3.8.1.2.6 | 3-23 | Add period to first bullet item. | Show critical areas on Site Map <u>.</u> |
| I | 3.8.1.8.1 | 3-25 | Delete period from last bullet item. | <ul style="list-style-type: none"> Existing significant trees and native vegetation- |
| I | 3.8.2 | 3-30 | Delete period from Element 12. | 12. Manage the project- |
| I | 3.8.3.3.3 | 3-32 | Delete period from eighth sub-bullet. | <ul style="list-style-type: none"> Pipe Diameter in/out- |
| I | 3.8.3.3.3 | 3-33 | Delete period from last sub-bullet item in second bullet list. | <ul style="list-style-type: none"> Inlet and outlet pipe invert elevations, slopes and pipe lengths- |
| I | 3.8.3.3.3 | 3-33 | Delete period from fourth sub-bullet item last bullet list. | <ul style="list-style-type: none"> A map showing the location of newly planted and retained trees claimed for flow reduction credits- |
| I | 3.8.3.3.4 | 3-33 | Delete period from last bullet item. | <ul style="list-style-type: none"> Utility plans (sewer, water, septic)- |
| I | 3.8.3.3.5 | 3-34 | Delete period from last bullet item. | <ul style="list-style-type: none"> Spot water surface elevations discharges and velocities for the Design Event- |
| I | 3.8.4.1 | 3-34 | Add period to the end of each bullet item where not included. | <p>The Project Engineer will prepare a Maintenance Plan including the following:</p> <ul style="list-style-type: none"> A statement of where the Maintenance Plan will be kept and that it must be made available for inspection by Thurston County upon request<u>.</u> A copy of the Maintenance Agreement (Commercial/Industrial or Residential) executed by the property owner and accepted as to form by Thurston County<u>.</u> A maintenance activity log in a format that includes sufficient space to list maintenance activities completed as a result of inspections<u>.</u> Facility Summary Forms prepared for each stormwater facility as part of final permitting<u>.</u> A written description of each flow control and treatment facility and an overview of the stormwater system for the site explaining the principles of operations and general maintenance requirements and providing such information from the Drainage Report as might be necessary to the future maintenance of the stormwater facilities. This |

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| | | | | <p>might include the design capacity of conveyance facilities, slope of pipes and swales, size and dimensions of infiltration and/or detention facilities and calculated release rates for various storm events.</p> <ul style="list-style-type: none"> • A drawing showing all stormwater facilities, drainage easements, access easements, etc., with a key referencing the applicable maintenance checklists required to be used in performing routine inspection and maintenance for the facility. • Engineering drawings of the stormwater facilities including details and specifications shall be included. Drawings may be 11" x 17" or 22" x 34" and included in a map pocket. • All applicable maintenance checklists for facilities included in the project. The applicant shall only include those checklists that apply to the project. • Vegetation Management Plan. • Identification of the responsible maintenance organization. • A description of the required maintenance frequency for each facility. • A description of required recordkeeping and reports and frequency of submittal of reports to Thurston County. • An estimate of the average annual cost of maintenance will be included. The annual cost shall include the annualized cost of major maintenance items such as sediment removal from ponds, etc. • A pollution source control plan per Volume IV. Language that prohibits unauthorized modifications, unless approved by the County. • Language that provides for a county approval process and allows modification to the covenant, or to the Maintenance and Source Control Manual. |

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| | | | | <ul style="list-style-type: none"> • Language that provides for a county process (remedies) for situations where the responsible party fails to perform the required maintenance or fails to implement the pollution source control measures. • Language that provides access authority to the County for purposes of inspection, maintenance, and repair. • Language that provides for reimbursement to the County by the responsible party in the event that the County incurs costs related to maintenance or repair. |
| I | 3.8.4.5 | 3-37 | Add period to end of first two bullet item. | <ul style="list-style-type: none"> • Name, address, and telephone number of the businesses, persons, or firms responsible for plan implementation, and the person completing the report. • Time period covered by the report. |
| I | 3.9.6.2 | 3-39 | Easement size incorrect. | Specific access requirements for ponds are included in Volume V, Appendix V-E. Generally, a minimum 15- <u>A 20-</u> foot wide access easement shall be provided to drainage facilities from a public street or right-of-way and shall provide a 12-foot minimum width drivable path surfaced with lattice block pavement, crushed rock, or other acceptable surface to allow year-round equipment access to the facility. |
| I | 3.9.6.3 | 3-40 | Incorrect section reference. | Easement requirements for conveyance systems are described in Volume III, Section <u>3.5 and 3.6.2</u> . |
| I | Appendix I-G | H-1 | Page number incorrect. | <u>G-1</u> |
| I | Appendix I-G | H-1 | Link to standard stormwater notes highlighted. | |
| I | 4.2.5.2 | 4-12 | Prior 2016 DDECM requirement not carried over. | Enhanced Treatment BMPs are required for the types of project sites listed below that: <ul style="list-style-type: none"> a. Discharge directly to fresh waters designated for aquatic life use or that have an existing aquatic life use; or |

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| | | | | <p>b. Discharge to conveyance systems that are tributary to fresh waters designated for aquatic life use or that have an existing aquatic life use; or</p> <p>c. Infiltrate stormwater within ¼ mile of a fresh water designated for aquatic life use or that has an existing aquatic life use-; <u>or</u></p> <p><u>d. Include an infiltration facility within a designated Wellhead Protection Area for a public water supply serving over 1,000 connections.</u></p> |
| II | 2.3.2 | 2-11 | Revise list of suggested BMPs. | <p>Suggested BMPs:</p> <ul style="list-style-type: none"> o BMP C100: Preservation of Native Topsoil (On-site) o BMP C101: Preserving Natural Vegetation (On-site) o BMP C102: Buffer Zones o BMP C103: High Visibility Plastic Fence. o BMP C233: Silt Fence |
| II | 2.3.2 | 2-11 | Remove period from list item. | <ul style="list-style-type: none"> o BMP C103: High Visibility Plastic Fence. |
| II | 2.3.2 | 2-26 | Missing parenthesis | Protect all LID BMPs (including, but not limited to bioretention, rain gardens, and permeable pavements) from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the LID BMPs. |
| ZS-II | 3.1 | 3-11 | Allow Permeable Ballast as construction entrance material (smaller aggregate and allowed by WSDOT). WSDOT sees it as a safety factor. | Construct stabilized construction entrances with a 12-inch thick pad of 4-inch to 8-inch quarry spalls, a 4-inch course of asphalt treated base (ATB), <u>permeable ballast (see WSDOT Standard Specification Section 9-03.9(2))</u> , or use existing pavement. |
| II | 3.8 | 3-19 | Period missing after last sentence of 7 th bullet. | See BMP LID.02: Post-Construction Soil Quality and Depth. |
| III | TOC | i | Table of contents named incorrectly. | Figure <u>Table</u> of Contents |
| III | 2.2 | 2-5 | Revise MGSFlood approval status to approved (per Ecology). | As of July 1, 2019 October 20, 2021 , Ecology reviewed the following continuous simulation models for use to comply with 2019 – 2024 Phase I and Western Washington Phase II Municipal Stormwater Permit requirements. |

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| | | | | <ul style="list-style-type: none"> • Western Washington Hydrology Model (WWHM2012) Version 4.2.16 (or later), released October 10, 2018 (approved) • MGSFlood Version 4.4956, released May 9, 2019 <u>October 5, 2021</u> (limited approval—see below <u>approved</u>) • King County Runoff Time Series (KCRTS) (not approved) <p>(At this time, MGSFlood is not approved for use in modeling BMP LID.08: Bioretention. MGSFlood Version 4.49 is approved for other modeling scenarios, using either the gage data or the 158 year synthetic precipitation time series.)</p> |
| III | 2.3 (PERLND and IMPLND Parameter Values) | 2-15 | Paragraph in last bullet has highlighted text. | |
| III | 2.5 | 2-25 | Space missing between the fourth and fifth paragraphs. | <p>Runoff from these additional areas must be modeled using the acreages associated with the existing land use areas. For the purposes of modeling in an Ecology approved continuous simulation model, these additional areas are entered under both the “Predeveloped” and “Mitigated” scenarios.</p> <p>The performance of Flow Control BMPs can be compromised if the additional area, beyond the area that needs to be mitigated, is too large. Therefore, if the existing 100-year peak flow rate from the additional area is greater than 50% of the 100-year developed peak flow rate (undetained) from the area requiring mitigation, then the runoff from the additional area must not flow to the Flow Control BMP. The bypass of the additional area must be designed to achieve both of the following:</p> |

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| III | 2.7 | 2-28 | Step 3 – groundwater depth for mounding analysis incorrect. | If less than 6 <u>15</u> feet to groundwater, then a mounding analysis will be required. |
| III | Figure III – 2.1 | 2-29 | The term “impervious” is spelled incorrectly in two places. | imper <u>v</u> ious |
| III | Figure III – 2.1 | 2-29 | Revise flow chart to match text. | Will the facility drainage area be less than ¾ <u>1</u> acre total area and less than 15,000 square feet impervious area? |
| III | 2.7 | 2-40 | Extra space between Simplified Approach and Detailed Approach paragraphs needs to be removed. | |
| III | 2.7 | 2-41 | Missing parenthesis. | Assume that the Ksat is the measured (initial infiltration rate for the native soils). |
| III | 3.6 | 3-54 | Clarify access type. | The dedicated tract for a stormwater facility shall include a minimum 20-foot wide <u>easement</u> access from a public street or right-of-way. |
| ZS-III | 3.7 | 3-61 | Reduce maximum structure spacing to 200-feet vs. the 300-feet listed in the DDECM. Ryan Langan said this reduced spacing will help with maintenance | Maximum spacing of structures for storm drainage conveyance lines running within an easement area shall be 300 feet for pipe grades greater than 0.3 percent and 200 feet for grades less than 0.3 percent. |
| III | Appendix III-A | A-2 | Incorrect section references. | Note that the safety factors below may not apply to the infiltration testing conducted for bioretention, permeable pavement and/or rain gardens (see Volume V, Sections 2.2.5 and 2.2.6 , <u>2.2.8, and 2.2.9</u> for additional information). |
| III | Appendix III-A | A-3 | Safety factor incorrect. | For the EPA method, the SDI (ASTM D3385) method, Ftesting = 0.50 <u>0.40</u> . |
| III | Appendix III-A | A-5 | A minimum of 0.5 safety factor is to be applied to all field methods for determining infiltration rates conflicts with 0.4 requirement. | (At a minimum, a safety factor “Ftesting” of 0.5 is be applied to all field methods for determining infiltration rates.) |
| III | Appendix III-A | A-10 | Clarify the use of a correction factor for Method 3. | The following grain size analysis may be used to determine initial infiltration rates if the site has soils unconsolidated by glacial advance. This method uses the ASTM soil size distribution test procedure (ASTM |

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| | | | | D422), which considers the full range of soil particle sizes, to develop soil size distribution curves. The detailed method described below is based on Massmann (2003). <u>Note that after determining the infiltration rate using Method 3, correction factors must still be applied (see Volume III – Safety Factor for Field Measurements).</u> |
| III | Appendix III-D | D-2 | Section referenced is incorrect. | Within setbacks provided in <u>Volume V</u> , Section <u>2.2.7.2.1</u> 3-4-6 . |
| III | Appendix III-D | D-4 | Section referenced is incorrect. | Setbacks and site constraints provided in Volume V, Section 2-2-6 <u>2.2.9.6.1</u> cannot be achieved. |
| III | Appendix III-D | D-6 | Remove incomplete sentence. | in Section 3-5-6. |
| III | Appendix III-D | D-6 | Volume and chapter referenced is incorrect. | See soil suitability criteria for treatment in <u>Volume III, Section 2.7</u> Chapter 6 of Volume V . |
| III | Appendix III-D | D-7 | Setbacks and criteria for dispersion not provided in Appendix V-E. | Site setbacks and design criteria provided in Volume V; Appendix E cannot be achieved. |
| III | Appendix III-D | D-7 | Setbacks and criteria for dispersion not provided in Appendix V-E. | Site setbacks and design criteria provided in Volume V; Appendix E cannot be achieved. |
| IV | TOC | ii | Add activity to table of contents. | <u>A2.5 In-Water and Over-Water Fueling..... 4-33</u> |
| IV | Activity Table | 3-2 | Not all activities have section links. | (May want to consider adding links to all activities.) |
| IV | Commercial and Industrial Activities Worksheet – A2.4 | 3-2 | Make “vehicle” plural. | In-Water and Over-Water Fueling <ul style="list-style-type: none"> • Applies to transferring of fuels to vehicles<u>s</u> or equipment in water. |
| IV | Commercial and Industrial Activities | 3-3 | Change “contain” to “container”. | Nurseries and Greenhouses <ul style="list-style-type: none"> • Applies to commercial contain<u>er</u> plant, greenhouse grown, and cut foliage production operations. |

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| | Worksheet – A3.12 | | | |
| IV | Commercial and Industrial Activities Worksheet – A7.16 | 3-5 | Add period at end of sentence. | Streets and Highways <ul style="list-style-type: none"> Includes maintenance and deicing/anti-icing of streets and Highways. |
| IV | Commercial and Industrial Activities Worksheet – A7.18 | 3-5 | Add period at end of sentence. | Well, Utility, Directional and Geotechnical Drilling <ul style="list-style-type: none"> Includes drilling water wells and utilities, environmental protection and monitoring wells, and geotechnical borings using machinery. |
| IV | Commercial and Industrial Activities Worksheet – A7.19 | 3-5 | Make “process” plural and add period at end of sentence. | Roof Vents <ul style="list-style-type: none"> Includes processes that vent emissions to the roof. |
| IV | A1.3 | 4-9 | Two commas after “vehicles” in first sentence. | Pollutant sources include the commercial cleaning of vehicles, aircraft, vessels, carpets, industrial equipment, and large buildings with low or high pressure water or steam. |
| IV | A1.3 | 4-10 | First sentence after second bullet has typo; remove word “your”. | Convey the washwater to a sump (like a grit separator) and then to a sanitary sewer (if allowed by the your sewer service provider), or other appropriate wastewater treatment or recycle system. |
| IV | A3.11 | 4-60 | Missing parenthesis. | Do not apply pesticides in quantities that exceed the limits on the product the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label. |

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| IV | A3.11 | 4-61 | Typo – extra letter. | Train e employees on proper application of pesticides and disposal practices. |
| IV | A4.10 | 4-92 | Extra bullet point. | |
| IV | A7.10 | 4-125 | Appendix reference incorrect. | Disposal of street sweeping solids must comply with “Recommendations for Management of Road maintenance materials” described in Appendix IV- C <u>B</u> of this volume. |
| IV | S.11 | 5-19 | Typo – added letter. | Create a Pollution Plan t that details: |
| IV | 6.3 | 6-3 | Link is broken. | https://www.thurstoncountywa.gov/pw/sw-grhome/Pages/sw-Main.aspx |
| IV | 6.4 | 6-5 | Link is broken. | https://extension.wsu.edu/thurston/gardening/mc/ |
| IV | 6.7.2 | 6-10 | Guidance for latex paint disposal has changed. Recommend updating to current policy. | |
| IV | 6.8.1 | 6-12 | Photo is misaligned. | |
| IV | 6.9.1 | 6-13 | Redundant information in sentence. | Owners of septic systems must follow all of the requirements of the Thurston County Department of Public Health and Social Services, Environmental Health Division. They can be contacted at Thurston County Health Department at (360) 867-2673, or on the web at http://www.co.thurston.wa.us/health/ehoss/index.html , for further information and specific requirements applicable to your system. |
| IV | 6.9.1 | 6-13 | Required BMPs should be bulleted. | |
| IV | 6.9.2 | 6-13 | Suggested BMPs should be bulleted. | |
| IV | Appendix IV-A | C-1 | Page numbers incorrect. | <u>A-1</u> |
| IV | Appendix IV-B | C-2 through C-17 | Page numbers incorrect | <u>B-1</u> through <u>B-16</u> |
| V | TOC | ii | Wrong chapter reference for MF.04 | 7.1.4- 11 MF.04 Media Filter Drain |

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| V | 2.1.2.5.2 | 2-19 | Reformat footnote to superscript. | Turf areas: Place 1.75 inches of compost and till in to an 8 inch depth. Achieve an organic matter content, as measured by the loss-on-ignition test, of a minimum 4 percent (target 5 percent) organic matter content. ¹¹ |
| V | 2.2 | 2-28 | Recommend starting new page for each LID BMP. | |
| V | 2.2.1.3.2 | 2-30 | Wrong chapter reference for soil testing requirements for infiltration. | See Volume III, Chapter 3 <u>Appendix III-A</u> for general soil testing requirements for infiltration. |
| V | 2.2.3.4.1 | 2-44 | Figure V-2.6 Typical Downspout Dispersion Trench is misaligned. | |
| V | 2.2.5.5 | 2-55 | There are two periods at the end of the first sentence. | Maintain a vegetated flow path of at least 25 feet between the discharge point and any property line, structure, steep slope, stream, wetland, lake, or other impervious surface.:- |
| V | 2.2.6.3 | 2-60 | Reformat to remove extra spaces in second sentence. | |
| V | 2.2.7 | 2-63 | Section numbering incorrect. | |
| V | 2.2.7.2.1 | 2-70 | Reformat to remove space between second and third lines. | |
| V | 2.2.7.2.1 | 2-70 | Remove redundant sentence with incorrect reference and sentence without punctuation. | Infeasibility Criteria in Section 3.4.3 for setbacks and site constraints used to evaluate the bioretention option of The List Approach (Minimum Requirement #5). (See also Appendix III-D for a summary of infeasibility criteria for all BMPs.) The following minimum setbacks and site constraints apply to all infiltrating bioretention areas (bioretention without a liner or planter box). |
| V | 2.2.7.2.1 | 2-70 | Match setbacks for on-site sewage systems with WACs. | All bioretention areas shall be a minimum of 5 feet from septic tanks and distribution boxes. <u>For setback requirements for large on-site sewage system see WAC 246-232B-0605.</u> |
| V | 2.2.7.2.15 | 2-85 | Missing term “requirement” in sentence under Signage. | Thurston County <u>requires</u> that bioretention installations include informational signage upon completion of the installation to help identify the vegetated area as a stormwater BMP and to inform |

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| | | | | maintenance crews and the general public about protecting the facility's function. |
| V | 2.2.9.9.2 | 2-109 | Typo – missing letter. | It is recommended <u>t</u> hat the same type of tests used to determine the initial infiltration rate be repeated at this time. |
| V | 2.2.9.9.3 | 2-109 | Remove hyphen from word "surface". | Permeable pavement driveways can be tested by simply throwing a bucket of water on the sur-face <u>surface</u> . |
| V | 2.2.9.9.4 | 2-110 | Minimum infiltration rate conflicting. Should be 20 inches/hour for new construction and ≤ 10 inches/hour for maintenance criteria. | Test to determine compliance with the 10 <u>20</u> inches per hour minimum infiltration rate. |
| V | 2.2.11.2 | 2-121 | No space between words. | The impervious (or cleared) area is the area that the design <u>the design</u> is mitigating for by using this BMP. |
| V | 2.2.11.2 | 2-122 | No space after comma. | The dispersion area should be situated to minimize the clearing of existing forest cover, <u>to cover, to</u> maximize the preservation of wetlands (though the wetland area and any streams and lakes do not count as part of the dispersion area), and to buffer stream corridors. |
| V | 2.2.11.2 | 2-122 | No space between words. | The dispersion area should be placed in a separate tract or protected through recorded easements <u>recorded easements</u> for individual lots. |
| V | 2.2.11.2 | 2-122 | Incorrect wording and sentences after bullets not capitalized. | All tree within the dispersion area at the time of permit application shall be retained, aside from: <ul style="list-style-type: none"> • d <u>D</u>angerous or diseases <u>diseased</u> trees, and • a <u>A</u>pproved timber harvest activities regulated under WAC Title 222. Class IV General Forest Practices that are conversions from timberland to other uses are not acceptable for the preserved area. |
| V | 2.2.11.2 | 2-122 | Font is not uniform in bulleted list under "A dispersion area". | |
| V | 2.2.12.6 | 2-141 | No space between words. | Natural dispersion areas shall have a separation of at least <u>least 2</u> feet between the existing ground elevation and the average annual maximum groundwater elevation. |

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| V | 3.2.1.7.1 | 3-9 | For infiltration basins, the table submittal identifying the design stage/storage/discharge requires too many interval flows. | In addition, project submittals must include a table that identifies the design stage/storage/discharge expected for the 2-, 5-, 10-, 25-, 50-, and 100-year recurrence interval flows. |
| V | 3.2.1.9 | 3-10 | Initial excavation to within 2 feet of the final elevation may not be achievable. Ecology requires 1 foot. | Initial basin excavation must be conducted to within 2 feet <u>1 foot</u> of the final elevation of the basin floor. |
| V | 3.2.1.10 | 3-11 | Remove reference to infiltration trench. | Provision shall be made for regular and perpetual maintenance and access (tract, easement, etc., see Volume III) to the infiltration basin/ trench . Adequate access, including measures to prevent encroachment into tracts/easements for purposes of inspection, operation and maintenance must be part of infiltration basin and trench design. Provisions must be made for regular and perpetual maintenance of the infiltration basin or trench , including replacement or reconstruction of any media used for treatment purposes. The Operation and Maintenance Plan shall be submitted to and approved by the County to ensure maintenance of the desired infiltration rate. Debris/sediment accumulation – Removal of accumulated debris/sediment in the basin/ trench should be conducted every 6 months or as needed to prevent clogging, or when the measured infiltration rate is significantly less than the design rate. |
| V | 3.2.3 | 3-21 | Drywell should be plural. | Infiltration vaults and drywells are subject to UIC regulations; see 3.1.3 Underground Injection Control. |
| V | 3.2.4.5.1 | 3-22 | Include separation requirement for vaults. | <u>Vault bottoms should be a minimum of 5 feet above the seasonal high groundwater level or impermeable soil layers.</u> |
| V | 4.1.1.3 | 4-2 | No requirement for a table that identifies the design facility stage. | <u>A table that identifies the design facility stage expected for the 50- and 100-year recurrence interval flows.</u> |

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| V | 4.1.1.5.6 | 4-4 | The emergency overflow spillway should be armored in accordance with Vol III, Section 3.8 Outfalls. | The emergency overflow spillway must be armored with riprap in conformance with the Outlet Protection BMP in Volume II <u>Volume III, Section 3.8 Outfalls.</u> |
| V | 5.1.1.6 | 5-16 | Bookmark error. | |
| V | 7.1.1.5.1.a | 7-5 | Symbol incorrect. | Note that V ≠ K. |
| V | 9.1 | 9-1 | Two periods at the end of the sentence. | Many of these devices have not undergone complete performance testing, so their performance claims cannot be verified.: |
| V | Appendix V-C | C-3 | Spelling errors. | Trees removed form <u>from</u> facility facility bottom, side slopes, and maintenance access areas. |
| V | Appendix V-C | C-3 | Spelling error. | Vegetation mowed or nuisance nuisance <u>nuisance</u> vegetation removed. |
| V | Appendix V-C | C-6 | Spelling error and missing space between sentences. | Vegetation mowed or nuisance vegetation <u>vegetation</u> removed so that flow is not impeded. Grass or groundcover mowed to a height of 3 to 4 inches. <u>Removed</u> clippings. |
| V | Appendix V-C | C-6 | Missing space between sentences and spelling error. | Trees removed from facility bottom, side slopes, and maintenance access areas. Species removed that are not part of recorded planting plan. <u>Harvested</u> trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood). |
| V | Appendix V-C | C-11 | Extra space before period. | If you are unsure whether a problem exists, please contact Thurston County for technical assistance. |
| V | Appendix V-C | C-13 and C-14 | Spelling error. | #7 – Maintenance Standards for Energy Dissipaters <u>Dissipators</u> : |
| V | Appendix V-C | C-15 and C-16 | Change CAVFS reference to BMP LID.08 | #8 – Maintenance Standards for Basic (BMP BF.01) and Compost-Amended Biofiltration Swales (BMP BF.05 <u>see BMP LID.08 for soil mix</u>): |
| V | Appendix V-C | C-17 | Word duplicated. | #9 – Maintenance Standards for Wet Biofiltration Biofiltration Swales (BMP BF.02) and Continuous Inflow Biofiltration Swales (BMP BF.03): |
| V | Appendix V-C | C-19 | Missing drainage system features in maintenance standards table for wet ponds. | General <u>General</u> <u>General</u> |

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| | | | | <u>General</u> <u>General</u> <u>Storage Area</u> <u>General</u> <u>Side Slopes of Pond</u> <u>Pond Berms (Dikes)</u> <u>Pond Berms</u> <u>Emergency Overflow/Spillway</u> |
| V | Appendix V-C | C-22 – C-61 | Checklists misnumbered. | <p>#14 #13 – Maintenance Standards for Sand Filters (BMP MF.01: Sand Filter Basin, BMP MF.02: Sand Filter Vault, BMP MF.03: Linear Sand Filter):</p> <p>#15 #14 – Maintenance Standards for Manufactured Media Filters:</p> <p>#16 #15 – Maintenance Standards for Baffle Oil/Water Separators (BMP OW.01) (American Petroleum Institute [API] Type):</p> <p>#17 #16 – Maintenance Standards for Coalescing Plate Oil/Water Separators (BMP OW.02):</p> <p>#18 #17 – Maintenance Standards for Stormwater Treatment Wetlands (BMP WP.01):</p> <p>#19 #18 – Maintenance Standards for Fencing/Shrubbery Screen/Other Landscaping:</p> <p>#20 #19 – Maintenance Standards for Grounds (Landscaping):</p> <p>#21 #20 – Maintenance Standards for Gates:</p> <p>#22 #21 – Maintenance Standards for Conveyance Systems (Pipes and Ditches):</p> <p>#23 #22 – Maintenance Standards for Media Filter Drain (BMP MF.04):</p> <p>#24 #23 – Maintenance Standards for Vortechs Stormwater Treatment System:</p> <p>#25 #24 – Maintenance Standards for Stormceptor System:</p> <p>#26 #25 – Maintenance Standards for Filterra:</p> <p>#27 #26 – Maintenance Standards for CDS Media Filtration System (MFS) ®:</p> <p>#28 #27 – Maintenance Standards for Aqua Shield Aqua-Swirl:</p> |

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| | | | | <p>#29 #28— Maintenance Standards for Bioretention (BMP LID.08) (Cells, Swales, and Planter Boxes):</p> <p>#30 #29— Maintenance Standards for Cisterns (BMP LID.16):</p> <p>#31 #30— Maintenance Standards for Vegetated Roof (BMP LID.10):</p> <p>#32 #31— Maintenance Standards for Permeable Pavement (BMP LID.09):</p> <p>#33 #32— Maintenance Standards for Downspout, Sheet Flow, and Concentrated Dispersion Systems (BMP LID.05: Downspout Dispersion System, BMP LID.06: Sheet Flow Dispersion, BMP LID.07: Concentrated Flow Dispersion):</p> <p>#34 #33— Maintenance Standards for Rain Gardens (LID.08A):</p> <p>#35 #34— Maintenance Standards for Trees:</p> <p>#36 #35— Maintenance Standards for Downspout Full Infiltration Systems (BMP LID.04):</p> <p>#37 #36— Maintenance Standards for Dead-End Sump Vaults:</p> |
| V | Appendix V-C | C-28 | Spelling error. | Trees removed from facility bottom, side slopes, and maintenance <u>access</u> areas. Species removed that are not part of the recorded planting plan. |
| V | Appendix V-C | C-34 | Tense incorrect. | Vegetation does not impeded <u>impede</u> free movement of water through pipes. Prohibit use of sand and sealant application and protect from construction runoff. |
| V | Appendix V-C | C-38 | Footnote not formatted properly. | <p>1.—</p> <p><u>Note:</u> ¹ Model number and sediment depth capacities:</p> |
| V | Appendix V-C | C-41 | Footnote not formatted properly. | <p>4.—</p> <p><u>Notes:</u></p> <p>¹CDS MFS system vault is a confined space. Visual inspections should be performed aboveground. If entry is required it should be performed by qualified personnel.</p> <p>²Default maintenance is annual.</p> <p>³Configuration options include precast or cast in place concrete vaults or precast manhole structures.</p> |

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| | | | | Add "2" footnote to Maintenance Frequency column title and "3" footnote to all instances of vault under Drainage System Feature column title. |
| V | Appendix V-C | C-43 | First row missing borders. | |
| V | Appendix V-C | C-47 | Missing border between second and third rows of table. | |
| V | Appendix V-D | D-1 | Revise incorrect BMP numbers. | This appendix applies to the following BMPs: IN. 04 <u>01</u> Infiltration Basins D.01 Detention Ponds D.02 Detention Tanks D. 04 <u>03</u> Detention Vaults WP.02 Wet Ponds WP.05 Presettling Basins |
| V | Appendix V-D, D-1 | D-2 | Access road width inconsistent with easement access road width. | Access roads shall be a minimum of 15 <u>12</u> feet in width. |
| V | Appendix V-D, D-3 | D-2 | Access road wheel path radius inconsistent. | When the length of a pond access road to control structure or pond exceeds 75 feet, a vehicle turn-around must be provided, designed to accommodate vehicles having a maximum length of 31 feet and having an inside <u>outside turning wheel path</u> radius of 40 feet. Access roads to control structures shall have a maximum slope of 12 percent. |
| V | Appendix V-E | E-2 | Include description for dispersion signage. | Detention ponds, infiltration ponds, wet ponds, and combined ponds shall have a sign with educational information and emergency contact information (Figure V - E.1). Applicant shall submit sign design and proposed location for Administrator acceptance. <u>Note that dispersion areas may be marked with fiberglass utility markers or approved equal. Contact Thurston County Water Resources Division for additional information on marker requirements.</u> |
| V | Appendix V-E | E-6 | Revise setback to match WAC 246-272A-0210. | <u>30 feet down-gradient/10 feet upgradient – (discharge point) from edge of septic drainfield and drainfield reserve area (per WAC 246-272A-0210). This requirement may be modified by the Thurston</u> |

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| | | | | <u>County Health Department if site topography clearly prohibits flow from intersection the drainfield or where site conditions (soil permeability, distance between systems, etc.) indicate that this is unnecessary.</u> |
| V | Appendix V-E | E-6 | Revise setback to match WAC . | 100 feet – <u>(for unlined stormwater ponds)</u> from edge of septic drainfield and drainfield reserve area <u>of large on-site sewage system.</u> <u>See WAC 246-272B-06050 for more information and additional setback requirements.</u> Infiltration facility shall be located downgradient unless site topography clearly prohibits subsurface flow from intersecting drainfield. May be reduced to 30 feet for infiltration facilities serving a single family residence. |