

Summary of Changes to Kitsap County's Stormwater Design Manual
(2016 to 2020 Public Review Draft)

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
Global	<ul style="list-style-type: none"> Inconsistent terminology Broken weblinks References appearing in multiple sections of the Stormwater Design Manual (SDM) 	<ul style="list-style-type: none"> Reviewed and updated terminology for clarity and consistency (e.g., BMP instead of facility, runoff treatment instead of water quality treatment, etc.) Updated references to the Stormwater Management Manual for Western Washington (Ecology Manual) and other guidance documents Updated weblinks Created consolidated References section at the end of the SDM (Volume I and Volume II)
Volume I – Project Minimum Requirements and Site Planning		
Chapter 1 - Introduction		
1.2 – How to Use This Manual	Stated that the Kitsap SDM should be used in conjunction with external references such as the Ecology Manual and LID Technical Guidance Manual.	Added clarification that the guidance provided in the Kitsap SDM supersedes other referenced manuals in the event of conflicting guidelines or standards.
Chapter 3 – Determining Minimum Requirements		
3.2 – Step 2 – Identify the Receiving Water and Downstream Conveyance	Discussed identifying the receiving water or point of discharge for the stormwater runoff from the project site (e.g., wetland, lake, creek, or salt water).	Added reference to Underground Injection Control (UIC) wells.
Chapter 4 – Minimum Requirements for New and Redevelopment		
4.1 – Project Applicability	<ul style="list-style-type: none"> Figure 4.1 – Flow Chart for Determining Minimum Requirements for New Development Projects Figure 4.2 – Flow Chart for Determining Minimum Requirements for Redevelopment Projects 	Updated Figure 4.1 and Figure 4.2 to reflect updates in the Ecology Manual.
4.1.1 – New Development	NA	Added a reference to a new requirement for determining the minimum design assumption for hard surfaces and developed pervious surfaces for residential plats (detailed in Volume II, Section 1.2.5).
4.1.2 – Redevelopment	Provided criteria for the valuation of proposed improvements	Clarified valuation of proposed improvements based on updates in the Ecology Manual.
4.1.3 – Regional Facilities	NA	Added new section on regional facilities that refers to Volume I, Appendix I-D of the Ecology Manual.

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
4.2.1 – Minimum Requirement #1: Preparation of Stormwater Site Plans	No changes have been proposed to MR #1	
4.2.2 – Minimum Requirement #2: Construction Stormwater Pollution Prevention Plan (SWPPP)	Text referencing the previous Construction Stormwater General Permit	Updated text in several elements to incorporate changes that were made by Ecology in the 2015-2020 Construction Stormwater General Permit.
4.2.3 – Minimum Requirement #3: Source Control of Pollution	No changes have been proposed to MR #3	
4.2.4 – Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls	NA	Minor terminology revisions were made to MR #4
4.2.5 – Minimum Requirement #5: Onsite Stormwater Management	<ul style="list-style-type: none"> List #1 – Projects Triggering MR #1-5 List #2 – Projects Triggering MR #1-9 – Inside UGA or Inside UA on Parcel Less Than 5 Acres List #3 – Projects Triggering MR #1-9 – Outside UA and UGA 	<ul style="list-style-type: none"> Clarified text related to the LID Performance Standard and the List Approach Shifted the List Approach into a tabular format Relabeled lists (List #2 is now List #2A, List #3 is now List #2B) since the Ecology Manual added a List #3 for flow control exempt projects
4.2.6 – Minimum Requirement #6: Runoff Treatment	NA	<ul style="list-style-type: none"> Clarified that Threshold Discharge Areas (TDAs) in the Ecology Manual are not applicable to the implementation of MR #6 in Kitsap County Clarified text under Runoff Treatment Sizing, Water Quality Design Flow Rate, and Additional Requirements Streamlined text under Supplemental Guidelines
4.2.7 – Minimum Requirement #7: Flow Control	Allowed an hourly or 15-minute time step when evaluating the increase in the 100-year flow frequency.	<ul style="list-style-type: none"> Updated to require a 15-minute time step for evaluating the increase in the 100-year flow frequency Clarified that TDAs in the Ecology Manual are not applicable to the implementation of MR #7 in Kitsap County Clarified text under Exemptions and Supplemental Guidelines

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
4.2.8 – Minimum Requirement #8: Wetlands Protection	Referred to Guide Sheets #1 through #3 in Volume I, Appendix I-D of the Ecology Manual.	<ul style="list-style-type: none"> Updated reference to Ecology Manual (wetland protection guidance is no longer in the Guide Sheet format and is now in Volume I, Appendix I-C of the Ecology Manual) Clarified that TDAs in the Ecology Manual are not applicable to the implementation of MR #8 in Kitsap County Added KCC reference for fencing and planting requirements for wetland buffers Streamlined text under Supplemental Guidelines
4.2.9 – Minimum Requirement #9: Operation and Maintenance	NA	Minor terminology revisions were made to MR #9
Volume II – Design Standards and Requirements		
Chapter 1 – Plans and Reports		
1.2 – Drainage Review	Listed Sewage Disposal Permit and Well Permits as example permits or approval from the Kitsap Public Health District in Table 1.2.	<ul style="list-style-type: none"> Added links to the Kitsap Public Health District forms web page Added guidance for Single Family Residential Subdivision Design (Section 1.2.5)
1.4 – Submittal Documents	Required plan views of on-site stormwater management BMPs, flow control BMPs, and water quality treatment BMPs in <i>Simplified Drainage Review – Engineered</i> submittals.	<ul style="list-style-type: none"> Added text to clarify print formatting for online submittals Added BMP “cross-section” as a requirement for <i>Simplified Drainage Review – Engineered</i> submittals Added a new section (Section 1.4.6) for Single Family Residential Subdivision Design Submittals
1.5 – Permit Issuance	NA	<ul style="list-style-type: none"> Added a new section on Changes to a Previously Approved Stormwater Site Plan (Section 1.5.2.3) Added a new section (Section 1.5.6) on Permit Extensions and Renewals
Chapter 2 – Construction Stormwater Pollution Prevention		
2.1 - Introduction	NA	Streamlined introduction text
2.2 – Construction Stormwater BMPs	Listed local amendments to Volume II of the Ecology Manual to reflect the 13 required elements in the Construction Stormwater Pollution Prevention Plan (SWPPP).	<ul style="list-style-type: none"> Removed local amendments section; no longer needed due to updates in the Ecology Manual Added overview text (new Section 2.2) for Construction Stormwater BMPs
Chapter 3 – Source Control of Pollution		
3.2 – Project Submittal Requirements	Provided background information on MR #3	<ul style="list-style-type: none"> Deleted duplication of Volume I, Section 4.2.3 text Streamlined text

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
3.4 – Selection of Operational and Structural Source Control BMPs	Provided a description of Treatment BMPs for Specific Pollutant Sources	<ul style="list-style-type: none"> • Deleted text describing Treatment BMPs for Specific Pollutant Sources; this content is included with the Structural BMPs and does not need to be called out separately • Added language from the Ecology Manual to describe when source control BMPs are required • Added language from the Ecology Manual on how to determine which source control BMPs are appropriate for a site
3.5 – Local Amendments to Operational and Structural Source Control BMPs	NA	Added a new section with local amendments for: <ul style="list-style-type: none"> • S427: BMPs for Storage of Liquid, Food Waste, or Dangerous Waste Containers • S429: BMPs for Storage or Transfer (Outside) of Solid Raw Materials, Byproducts, or Finished Products • S431: BMPs for Washing and Steam Cleaning Vehicles/Equipment/Building Structures • S449: BMPs for Nurseries and Greenhouses
Chapter 4 – Conveyance System Analysis and Design		
4.2 – Conveyance System Design Flow	Listed both WWHM and MGSFlood, but WWHM was not listed as an approved continuous simulation model.	<ul style="list-style-type: none"> • Updated to clarify that WWHM is an approved continuous simulation model. • Clarified that MGSFlood is currently not approved by Ecology for modeling bioretention.
4.3 – Route Design and Easement Requirements	Allowed an hourly or 15-minute time step when evaluating the increase in the 100-year peak discharge.	<ul style="list-style-type: none"> • Updated to require a 15-minute time step for evaluating the increase in the 100-year peak discharge
4.4 – Pipes, Outfalls, and Pumps	Provided the following figures: <ul style="list-style-type: none"> • Pipe compaction design and backfill (Figure 4.2) • Debris barrier (off road right-of-way) (Figure 4.6) • Debris barrier (in road right-of-way) (Figure 4.7) 	<ul style="list-style-type: none"> • Added a through-curb inlet figure (Figure 4.3) • Updated lined corrugated polyethylene (LCPE) pipe to corrugated polyethylene pipe (CPEP) • Added language from the 1997 Kitsap SDM for <i>Pipe Design between Structures</i> (Section 4.4.1.1) • Removed pipe compaction design and backfill figure; added reference to WSDOT Standard Plan for Pipe Bedding • Removed debris barrier (off road right-of-way) figure • Updated design criteria for outfall features (Section 4.4.2.1) and tightline systems (Section 4.4.2.2)

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
4.5 - Culverts	NA	<ul style="list-style-type: none"> Added text regarding concrete end protection from the 1997 Kitsap SDM Added a concrete end protection figure (Figure 4.10)
4.7 – Downstream Analysis	Provided a short description of a Level 2 Analysis, but not a stepped approach.	<ul style="list-style-type: none"> Added steps for Level 2 Analysis
4.8 – Hydraulic Structures	NA	<ul style="list-style-type: none"> Added text from the Ecology Manual to the Flow Spreader design criteria section (Section 4.5.2.1)
Chapter 5 – Stormwater Management BMPs		
5.2 – Organization of this Chapter	Stated that the Kitsap Stormwater Design Manual (SDM) should be used in conjunction with external references such as the Ecology Manual and LID Technical Guidance Manual.	<ul style="list-style-type: none"> Added clarification that the guidance provided in the Kitsap SDM supersedes other referenced manuals in the event of conflicting guidelines or standards. Added note that TDAs are not applicable
5.3 – BMP Selection		
5.3.1 – Determine Dispersion Feasibility	<ul style="list-style-type: none"> Provided flowpath requirements for full dispersion, sheet flow dispersion, and concentrated flow dispersion in three bullets. Provided minimum horizontal setbacks between stormwater BMPs and on-site sewage systems in Table 5.2 Provided minimum horizontal setbacks between stormwater BMPs and private/public wells in Table 5.3 	<ul style="list-style-type: none"> Replaced dispersion flowpath bullets with Table 5.1 (Summary of Minimum Dispersion Flow Path Area and Length Requirements) Updated site constraints for dispersion BMPs Updated terminology and setbacks listed in Table 5.2 Added subsurface stormwater infiltration or dispersion components to Table 5.2 Added infiltration basins to Table 5.2 and Table 5.3
5.3.2 – Determine Infiltration Feasibility	<ul style="list-style-type: none"> Provided setbacks for infiltration BMPs Allowed a small or large pilot infiltration test (PIT) for sites with ≥ 1 acre impervious area (Table 5.4) 	<ul style="list-style-type: none"> Added infiltration BMP setbacks for: <ul style="list-style-type: none"> Drinking water wells, septic tanks, and drain fields Open water features and designated landslide hazards Springs and flowing artesian wells used for drinking water supply Within 50 feet from the top of any slope over 15% Updated requirements for sites with ≥ 1 acre impervious area to a large PIT (Table 5.4) Updated acceptance testing to infiltration testing (Step 3 [Conduct Infiltration Testing] and Table 5.4)

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
5.3.2 – Determine Infiltration Feasibility (continued)	Specified minimum infiltration rates in Table 5.5 (0.6 inches/hour for bioretention without underdrain)	<ul style="list-style-type: none"> • Updated the minimum measured infiltration rate for bioretention without underdrain to 0.3 inches/hour (Table 5.5) • Added language to clarify that infiltration BMPs are generally not appropriate for sites that have a design infiltration rate less than 0.3 inches/hour, but may be approved by the County on a case-by-case basis
5.3.4 – Select BMPs for Runoff Treatment	Included Step 3 (Determine if Infiltration for Pollutant Removal is Practicable) in Figure 5.2, but not in the stepped approach in the manual text	<ul style="list-style-type: none"> • Added a reference to the Ecology Manual for Site Suitability Criteria (SSC) and UICs • Updated the Treatment BMP Selection Flow Chart (Figure 5.2) • Added “junkyards and areas with vehicle recycling operations” to the site uses that require oil control treatment • Added Step 3 (Determine if it is Practicable for Provide Runoff Treatment by Infiltrating into the Native Soil) • Updated and clarified the Enhanced Treatment BMP requirements (Step 5) for discharge to systems tributary to fresh waters and within/outside Urban Growth Areas • Clarified that additional Basic Treatment BMP is not required if Enhanced or Phosphorus BMPs meet both goals (Step 6) • Added Basic Treatment Performance Goal and updated requirements (Step 6)
5.4 – BMP Design	NA	<ul style="list-style-type: none"> • Streamlined introductory text • Added a new section on Runoff Treatment Prior to Infiltration BMPs • Added a new section on BMPs Classified as UICs
5.4.1 – Post-Construction Soil Quality and Depth	<ul style="list-style-type: none"> • Did not include a reference to the Building Soil manual • Referenced the Western Washington LID O&M Guidance Document 	<ul style="list-style-type: none"> • Added a reference to the Building Soil manual • Expanded O&M requirements related to vegetation • Removed reference to the Western Washington LID O&M Guidance Document (this guidance has been integrated into the Ecology Manual)
5.4.4 – Dispersion BMPs	NA	<ul style="list-style-type: none"> • Added language from the Ecology Manual for a site that applies Full Dispersion • Updated Applications and Limitations for Full Dispersion • Updated dispersion area requirements

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
5.4.5 – Rain Gardens	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> Removed bulleted list of design components addressed in the Ecology Manual
5.4.6 – Bioretention Cells, Swales, and Planter Boxes	<ul style="list-style-type: none"> Provided a bulleted list of design components addressed in the Ecology Manual Referenced the Western Washington LID O&M Guidance Document 	<ul style="list-style-type: none"> Expanded description of bioretention purpose and application Removed bulleted list of design components addressed in the Ecology Manual Provided updated planting guidance Removed reference to the Western Washington LID O&M Guidance Document (this guidance has been integrated into the Ecology Manual)
5.4.7 – Perforated Stub-out Connections	NA	<ul style="list-style-type: none"> Added reference to Kitsap County Board of Health Ordinance 2008A-01 Added language to clarify that perforated stub-out connection BMPs may not be used for the LID Performance Standard or to provide runoff treatment or flow control
5.4.8 – Permeable Pavement	Allowed infiltration under impermeable pavements in lieu of permeable pavement.	<ul style="list-style-type: none"> Deleted language regarding allowing infiltration under impermeable pavements in lieu of permeable pavement Added language regarding limitations to permeable pavements (no run-on from pervious surfaces, etc.) Added language regarding allowing permeable pavement to meet runoff treatment requirements (Table 5.12) Removed bulleted list of design components addressed in the Ecology Manual Updated acceptance testing to infiltration testing
5.4.9 – Tree Retention and Tree Planting	NA	<ul style="list-style-type: none"> Added reference to recommended street tree list in Appendix B of the Kitsap County Low Impact Guidance Manual
5.4.10 – Vegetated Roofs	NA	<ul style="list-style-type: none"> Removed design criteria and replaced with a reference to the Ecology Manual Removed reference to the Western Washington LID O&M Guidance Document (this guidance has been integrated into the Ecology Manual)
5.4.12 – Minimal Excavation Foundations	NA	<ul style="list-style-type: none"> Clarified Applications and Limitations of tracked equipment

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
5.4.13 – Rainwater Harvesting	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Clarified design information and modeling requirements • Restricted property size for outdoor-only use • Removed bulleted list of design components addressed in the Ecology Manual
5.4.14 – Pre-settling Basins	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Added text to Applications and Limitations regarding referring to specific BMPs for pre-settling requirements • Updated Site Considerations • Removed bulleted list of design components addressed in the Ecology Manual
5.4.15 – Infiltration Basins	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Clarified design requirements • Removed bulleted list of design components addressed in the Ecology Manual
5.4.16 – Infiltration Trenches	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Clarified that infiltration trenches that include perforated pipes are UICs • Removed bulleted list of design components addressed in the Ecology Manual • Updated Minimum Construction Requirements and Operations and Maintenance
5.4.17 - Drywells	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Clarified that drywells are UICs • Added new Site Considerations and Design Information • Removed bulleted list of design components addressed in the Ecology Manual • Updated Operations and Maintenance
5.4.18 – Compost-amended Vegetated Filter Strips (CAVFS)	NA	<ul style="list-style-type: none"> • Clarified Design Information
5.4.20 – Media Filter Drains	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Clarified language under Performance Mechanisms related to an underdrain trench • Added areas of seasonal ground water inundations or basement flooding to Site Considerations • Removed bulleted list of design components addressed in the Ecology Manual
5.4.22 – Wet Ponds	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Updated BMP Description • Removed bulleted list of design components addressed in the Ecology Manual • Added reference to Appendix D of the Kitsap County Stormwater Pond Retrofit Design Guidance Manual (recommended plant list)

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
5.4.23 – Wet Vaults	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Updated BMP Description • Updated Design Information • Removed bulleted list of design components addressed in the Ecology Manual
5.4.24 – Stormwater Treatment Wetlands	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Clarified that stormwater treatment wetlands are not expected to provide phosphorus control as a stand-alone BMP and must be paired per the treatment train approach • Removed bulleted list of design components addressed in the Ecology Manual • Added a requirement under Operations and Maintenance regarding coordinating with Kitsap County to develop a monitoring plan
5.4.25 – Oil/Water Separators	NA	<ul style="list-style-type: none"> • Updated BMP Description • Clarified several bullets under Site Considerations
5.4.26 – Detention Ponds	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Added a requirement regarding the minimum bench area at fence line • Removed bulleted list of design components addressed in the Ecology Manual • Added note regarding sizing using AutoPond in WWHM
5.4.27 – Detention Tanks	<ul style="list-style-type: none"> • This BMP was called Detention Pipes • Provided a bulleted list of design components addressed in the Ecology Manual 	<ul style="list-style-type: none"> • Updated BMP name to Detention Tanks • Updated BMP Description • Removed bulleted list of design components addressed in the Ecology Manual
5.4.28 – Detention Vaults	Provided a bulleted list of design components addressed in the Ecology Manual	<ul style="list-style-type: none"> • Updated BMP Description • Removed bulleted list of design components addressed in the Ecology Manual
5.4.29 – Combined Detention and Wetpool Facilities	NA	<ul style="list-style-type: none"> • Clarified live storage component of combined BMP under Application and Limitations
5.4.30 – Manufactured Treatment Devices as BMPs	This BMP was called Emerging Technologies	<ul style="list-style-type: none"> • Updated BMP name to Manufactured Treatment Devices as BMPs • Updated references to Ecology TAPE program
Chapter 6 – Wetlands Protection		
6.4 – Standard Requirement	Referred to Guide Sheets #1 through #3 in Volume I, Appendix I-D of the Ecology Manual.	Updated reference to Ecology Manual (wetland protection guidance is no longer in the Guide Sheet format and is now in Volume I, Appendix I-C of the Ecology Manual)
6.5 – Coordination with Minimum Requirement #7	NA	Added new section on coordinating with MR #7

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
Chapter 7 – Operation and Maintenance		
7.2 – Operation and Maintenance Requirements	Referred to the Clean Water Kitsap Plant List	<ul style="list-style-type: none"> Replaced with reference to Kitsap LID Guidance Manual Appendix C checklists Added KCC reference for privately maintained plats
Chapter 8 – Critical Drainage Areas		
8.3 – Supplemental Requirements	NA	<ul style="list-style-type: none"> Updated Critical Drainage Area figures (Figures 8.1, 8.2, and 8.3) Clarified requirements for closed depressions that are wetlands (Section 8.3.1) Updated modeling guidance for closed depressions (Section 8.3.1)
Chapter 9 – Grading		
9.2 – Review Coordination	Stated that the latest version of the form entitled “Notice of Grading or Filling” shall be used; see Appendix I for a copy of the form	Removed the reference to Appendix I since this form can be found on the County’s website.
9.4 – Grading Standards	Stated that the evaluation should be performed by a soils engineer	Updated “soils engineer” to “geotechnical engineer”
Appendices		
Appendix A - Glossary	NA	Added the following definitions: <ul style="list-style-type: none"> Bioengineering Steep slopes Strahler order Treatment train Underground Injection Control well Vegetated flow path
	NA	Added the following acronyms: <ul style="list-style-type: none"> BMPs – Best Management Practices CESCL – Certified Erosion and Sediment Control Lead CMP – Corrugated metal pipe CPEP – Corrugated polyethylene pipe HDPE – High-density polyethylene HDPP – High-density polyethylene pipe LID – Low Impact Development PVC – Polyvinyl chloride SDAP – Site Development Activity Permit SWPE – Solid-wall polyethylene TDA – Threshold discharge area
	NA	Updated conveyance system definition
Appendix B – Standard Plan Notes	NA	<ul style="list-style-type: none"> Updated terminology Updated references

Chapter/Section	2016 Kitsap SDM	Proposed 2020 Kitsap SDM
Appendix C – Site Assessment and Planning Packet	No changes have been proposed to this appendix	
Appendix D – Determining Construction Site Sediment Damage Potential	NA	<ul style="list-style-type: none"> • Updated terminology • Updated references
Appendix E – Construction Site Sediment Transport Potential Worksheet	NA	Converted text into a tabular format
Appendix F – Hydrologic/Hydraulic Modeling Methods	Tables and figures were missing in the 2016 Kitsap SDM	<ul style="list-style-type: none"> • Added missing tables and figures (from 2010 Kitsap SDM) • Added a new figure (formerly in Volume II, Chapter 4) • Updated equation formatting
Appendix G – Subsurface Investigation and Infiltration Testing for Infiltration BMPs	NA	<ul style="list-style-type: none"> • Updated terminology • Updated references • Added language regarding UIC wells • Updated Small PIT and Large PIT procedures for consistency with the Ecology Manual • Added language regarding the calculation of design infiltration rate of the native soils based on the Ecology Manual • Added new section for “The Simplified Approach to Calculating the Design Infiltration Rate of the Native Soils” based on the Ecology Manual • Added a reference to the Ecology Manual for “The Detailed Approach to Calculating the Design Infiltration Rate of the Native Soils” • Added text for groundwater mounding analysis the Characterization of Infiltration Receptor section (Section G.6)
Appendix H – LID BMP Infeasibility Criteria	NA	<ul style="list-style-type: none"> • Updated infeasibility criteria for consistency with updated SDM text and the Ecology Manual • Removed infeasibility criteria for permeable pavement; replaced with reference to Ecology Manual