



Memorandum

Date: July 7, 2016

To: Planning Commission

From: Tawni Dalziel, P.E,
Sr. Stormwater Program Manager

Re: Update of Surface Water Design Manual to meet 2013-2018 NPDES
Stormwater Permit Requirements

Overview

The City is responsible for regulating the design, construction and maintenance of development, including the City's capital projects, to minimize impacts to our surrounding storm and surface water systems and to comply with the City's 2013-2018 Western Washington Phase II Municipal Stormwater Permit (also known as the National Pollutant Discharge Elimination System, or NPDES Permit). The City's Surface Water Design Manual regulates proposed projects through a mixture of requirements, performance standards, and design standards.

The Public Works Department intends to provide an overview of the proposed Surface Water Design Manual including NPDES permit requirements, changes from current requirements, project impacts, vesting, outreach and adoption process.

1. NPDES Permit Requirements

The current design manuals will not be in compliance with the requirements of the city's 2013-2018 permit after the end of this year. In order to comply with the NPDES Permit, the City must revise its surface water design standards so that they are equivalent to the *2012 Stormwater Management Manual for Western Washington* (Ecology Manual) by **December 31, 2016**. The NPDES Permit requires changes in the standards in controlling runoff from new development, redevelopment and construction sites (see NPDES Permit section S5.C.4 for details). Background on the NPDES Permit can also be found using the following link:

<http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIIww/wwphiipermit.html>

Three options to comply with NPDES Permit requirements include the following:

- Adopt the 2016 *King County Surface Water Design Manual* (KCSWDM) which the Department of Ecology has deemed equivalent to the *2012 Stormwater Management Manual for Western Washington*. The 2016 KCSWDM adoption would include adoption of a Sammamish addendum and code revisions to Sammamish Municipal Code Title 13 Surface Water Management.
- Adopt the *2012 Stormwater Management Manual for Western Washington*. The 2012 Ecology Manual would include adoption of a more detailed Sammamish addendum that

would provide additional technical guidance. Code revisions to Sammamish Municipal Code Title 13 Surface Water Management would also be needed.

- Author and adopt a Sammamish specific stormwater design manual, adopt code revisions to Sammamish Municipal Code Title 13 Surface Water Management, and show equivalency to the 2012 Ecology Manual.

The table below shows what has been done to date and what must be completed in order to be in compliance with the permit. Staff's recommendation is to adopt the 2016 *King County Surface Water Design Manual* with a Sammamish addendum since the only work to be done to meet the permit requirement is to create the addendum and make code revisions to Sammamish Municipal Code Title 13 Surface Water Management.

	2016 KCSWDM Manual	2012 Ecology Manual	New Sammamish manual
Ecology approved	✓	✓	
Extensive public involvement process	✓	✓	
Consistency in approach between current Sammamish adopted manual (2009 KCSWDM)	✓		
Staff and developer familiarity with Core Requirements	✓		
Detailed design guidance	✓		
Technical/interpretation/training support	✓		
Feasibility of meeting permit adoption deadline of Dec 31, 2016	✓		

2. Sammamish Addendum

Similar to the current Sammamish Surface Water Design Manual Addendum, the Sammamish Addendum to the 2016 KCSWDM will contain guidance on how the manual will be implemented in Sammamish. For example, the 2016 KCSWDM refers to King County Code sections and departments/divisions – the addendum states the relevant Sammamish Municipal Code sections and refers to the appropriate departments.

The addendum will also include Sammamish-specific interpretations of definitions, exemptions, and implementation requirements that assist both reviewers and developers by explaining the City's understanding of the manual. It will include flow control and water quality maps specific to the City. The addendum will include requirements to provide multi-functional stormwater facilities. Examples would include recreational trails around stormwater ponds.

Because permits deadlines are pending, future work items could include updates to Critical Drainage Areas such as Inglewood Hill Historic Plat. Appropriate public and stakeholder education and involvement are necessary before any revisions are adopted.

3. Overview of Changes from Current Requirements

The City currently allows projects that disturb less than 1 acre on a project site and are not within the erosion hazard near sensitive water body overlay to use the 1998 KCSWDM. All other projects creating greater than 2,000 sf of new plus replaced impervious surface or 500 sf of new plus replaced within the Inglewood Historic Plat area are required to use the 2009 KCSWDM. The following are the most significant changes in the 2016 KCSWDM:

- 2016 KCSWDM new Core Requirement No. 9 where LID is required to the maximum extent feasible for all impervious and pervious surfaces including new development, redevelopment, single-family in-fill, and transportation projects. The 2009 KCSWDM through Core Requirement No. 3 requires a percentage of the lot area to be directed to LID facilities or handled through LID practices. Transportation projects were exempt from use of LID.
- 2016 KCSWDM requires LID to assess feasibility in the following order: 1) full dispersion, 2) full infiltration of roof runoff, 3) full infiltration, limited infiltration, bioretention, pervious pavement), and 4) basic dispersion. Green roofs are no longer listed as an LID BMP and use of rainwater harvesting requires an approved drainage adjustment.
- Feasibility and infeasibility are clearly defined for each LID BMP. Cost benefit is not a criteria. Soils report will guide project siting and layout.
- 1998 KCSWDM uses Small Site Drainage Review for projects that contain less than 10,000 sf of new impervious surface with no requirements for formal flow control or water quality facilities. 2016 KCSWDM may require formal flow control and water quality facilities, and will require LID BMPs to be implemented.
- 2009 KCSWDM drainage review types include Small, Targeted, Full, and Large Project. 2016 KCSWDM drainage review types include Simplified, Targeted, Directed, Full, and Large Project. Small Project Drainage Review name has been changed to Simplified Drainage Review. Directed Drainage Review is added to streamline projects that do not qualify for Simplified review to be “directed” by City staff to meet standard requirements.
- Flow control implementation/sizing credits for use of Low Impact Development techniques have been modified from 50% impervious/50% grass to 90% impervious/10% grass for limited infiltration, basic dispersion, and bioretention. 2016 KCSWDM provides less credit in modeling given smaller standard sizing than in the 2009 KCSWDM.
- For LID implementation, the 2016 KCSWDM proposes a “cafeteria menu” approach compared to the 2012 Ecology Manual. Bioretention and limited infiltration are set on par with permeable pavement for use in a prescribed list approach. “Design” is completed using a prescriptive approach.
- The 2016 KCSWDM requires a minimum level of LID implementation. Where LID BMPs are not feasible, reduced impervious footprints or native growth preservation are required.

- Facility design requirements and precautions are updated for sites near landslide hazard areas to protect the public from hazards associated with stormwater impacts. For example, facilities must consider cumulative impacts from full build-out conditions and must demonstrate that facilities will not create a significant adverse impact to downhill properties or drainage systems.

King County created a fact sheet summarizing changes between the 2009 and 2016 King County manuals and detailing where the 2016 King County manual differs from the 2012 Ecology manual (Attachment A).

4. Project Impacts

The adoption of the 2016 KCSWDM will likely change the cost and complexity of stormwater design and implementation for both development projects and city CIP projects (Attachment B). For development projects, the largest potential change will be for the medium sized projects such as 2-4 lot short plats and projects that were able to vest to the 1998 KCSWDM. Additional requirements, such as evaluation of flow control facilities and providing LID to the maximum extent feasible, will now be required (Attachment C). For small and large projects, there may be minimal or no change to facility requirements depending on site conditions. However, additional documentation and review will be required, which may increase design and review costs.

City transportation, parks, and other CIP projects will also be impacted by implementation of the 2016 KCSWDM. In the 2009 KCSWDM, low impact development for right of way projects was recommended, not required. In the 2016 KCSWDM, LID for right of way projects that create more than 2,000 square feet of new plus replaced impervious surface is now required to the maximum extent feasible. For grass sports fields converted to synthetic fields with underdrains, these areas will be considered both new impervious and new pollution generating impervious surfaces. LID will be required to the maximum extent feasible.

The 2016 KCSWDM includes maintenance performance standards that apply to both publicly and privately-maintained facilities. Standards for types of facilities used in the past (detention ponds, for example) have not changed, and will still be required to meet flow control and water quality requirements. However, standards for new LID facilities have been added. These new LID facilities have different maintenance needs and costs than existing facility types. At the same time, there will be a shift to large numbers of small LID facilities that serve single properties that will be privately maintained, and may need to be inspected by city staff. Staff are continuing to analyze maintenance needs and costs.

5. Vesting

Projects will be able to vest with the 2009 KCSWDM (or 1998 KCSWDM if disturbing less than 1 acre) if the application is deemed complete for a building, short plat, or subdivision application on or prior to December 31, 2016. The 2016 KCSWDM will apply to all applications submitted on or after January 1, 2017 and will apply to applications deemed complete prior to January 1, 2017, which have not started construction by January 1, 2022. In this context “started construction” means the site work associated with, and directly related to the approved project has begun. For example: grading the project site to final grade or utility installation. Simply clearing the project site does not constitute the start of construction. The City may establish additional requirements related to the

start of construction. **However, these dates and definitions are NPDES Permit requirements and cannot be revised to a less restrictive standard.**

6. Outreach and Adoption Process

The 2016 KCSWDM will change surface water requirements for development and City CIP projects. Coordination and public outreach for adoption of the 2016 KCSWDM will be conducted to inform and get input from elected officials, the development community, the public and City staff about the proposed changes. The following outreach and adoption schedule is planned:

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|---|-----------------------|
| • Staff introduction to Planning Commission | July 7, 2016 |
| • Public Open House | July 27, 2016 |
| • Stakeholders Meetings | August/September 2016 |
| • PC Public Hearing/Deliberation | September 1, 2016 |
| • PC Handoff to City Council | November 1, 2016 |
| • City Council Discussion | November 8, 2016 |
| • City Council First Reading | November 15, 2016 |
| • City Council Second Reading and Adoption | December 6, 2016 |

Needed Direction

The goal of the July 7, 2016 meeting is to provide an overview of the Permit requirements, surface water design manual requirements, development impact, and process for standard adoption. Staff requests consensus from the Planning Commission that adoption of the 2016 KCSWDM is the appropriate manual to meet NPDES Permit requirements and that members provide comments that can be addressed as part of the proposed September 1, 2016 Public Hearing and Deliberation.

Please feel free to contact me with any questions you may have. I can be reached at 425-295-0567 or at tdalziel@sammamish.us.

Appendix A - King County Fact Sheet

Updates of the King County Stormwater Code and Associated Manuals

- **What:** Updates to the King County stormwater code, Surface Water Design Manual, and Stormwater Pollution Prevention Manual for unincorporated King County.
 - The stormwater code regulates runoff and water quality for new development, redevelopment, and existing development.
 - The Surface Water Design Manual sets design standards for managing stormwater in new development, re-development, and construction sites.
 - The Stormwater Pollution Prevention Manual outlines best management practices (BMPs) to reduce contamination of polluted runoff on commercial, multi-family, and residential properties.
- **Why:** These updates will protect water quality from polluted stormwater and prevent flooding and erosion that can be caused by stormwater runoff. In addition, updates are required by the state to match the greater focus on Low Impact Development (LID) BMPs in the new Ecology stormwater manual and to comply with the National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit.
- **How often do we have to do this:** Every five years when the permit is re-issued.
- **Do other jurisdictions have to do this:** Yes, other counties and cities are required to make similar updates.
- **Timeline:** Enabling ordinance 18257 passed KC Council. Public rule adopting the SWDM and SPPM were signed and filed on March 25, 2016. **The official effective date of the manual (s) is April 24, 2016.** Revised documents incorporating final errata edits expected to be posted to web by end of first week of April.

What are the major changes:

- New Core Requirement 9: Flow Control BMPs--Implement LID BMPs such as bioretention, gravel infiltration trenches, and permeable pavement to maximum extent feasible using prescribed lists or modeling to LID Performance Standard.
- LID Performance Standard required to be achieved for large, rural projects as demonstrated through modeling
- LID BMPs are now required for roads;
- Updated methods for sizing water quality facilities
- Address public safety hazards posed by beaver dams by specifying when King County can enter private property to take action;
- Streamline the drainage review process for single family residents and farmers by simplifying and standardizing requirements (DIRECTED DRAINAGE REVIEW);
- Update facility requirements near steep slopes to protect the public from landslide hazards.
- KCRTS modeling software is being replaced with WWHM12 and MGS Flood as approved models.

Where do King County requirements differ from Ecology requirements?

- Require mitigation for existing surfaces added after January, 2001
- Require minimum flow control BMP implementation where infiltrative BMPs are not feasible by requiring reduced footprints and vegetation preservation
- Allow modest modeling credit, but do not allow explicit modeling of FCMBPs in flow control facility design to protect downstream systems—both “gray” and “green” infrastructure required.
- Use a modified “Cafeteria approach” to applying pre-modeled equivalent performance BMPs. Permeable pavement, bioretention, and limited infiltration are considered equal choices on the list approach.
- Allow run-on from standard pavements onto permeable pavement—making permeable pavement a more attractive option for roads by putting permeable pavement on shoulders
- Provide a premodeled FCBMP list approach for large rural lots in contrast with Ecology’s requirement to perform hydraulic modeling demonstrating LID Performance Standard compliance.
- Added new techniques for dispersing runoff onto farm fields instead of requiring stormwater facilities that take agricultural land out of production (farmland dispersion BMP and 4% exemption for agriculture properties from flow control facilities)

Resources/information: Contact Mark Wilgus, Engineer IV, Water and Land Resources Division, Department of Natural Resources and Parks, at 206-477-4848 or email at mark.wilgus@kingcounty.gov.

The manuals and detailed chapter by chapter summary of changes are available for review at <http://www.kingcounty.gov/environment/water-and-land/stormwater.aspx> . Updated documents will be available by the end of the 1st week of April that incorporate known errata edits, add revised figures, and address Ecology comments.

Attachment B – Impacts to Projects by Size and Type from Adoption of the 2016 KCSWDM

Impacts to Projects by Size and Type from Adoption of 2016 KCSWDM

Project Size	Typical Project	Change with New Manual	Change to Projects
< 500 sf of new plus replaced impervious surface	Addition of a patio or parking area to a single-family house	No change	No Change
<i>Small</i> - 500 - 1,999 sf of new plus replaced impervious surface	Addition to a single-family house	No change	No Change
<i>Medium</i> - 2,000 - 9,999 sf of new plus replaced impervious surface	2-4 lot shortplat, large single-family house Small-medium size City CIP project	LID required to the maximum extent feasible, potentially a full, instead of small or directed project drainage review	Potentially Large Change
<i>Large</i> - > 10,000 sf of new plus replaced impervious surface	Large commercial facility, plat of > 4 lots Large City CIP project	LID required to the maximum extent feasible	Potentially Small Change because facilities are already required. City ROW projects will now be required to provide LID.

Attachment C –Examples of Development Impact

Project – Single Family In-Fill (Tear Down / Rebuild)

Background – An existing 9,600 sf lot in a R4 Zone is planning on tearing down their house and building a new house. The lot currently has an existing house that totals 1,900 sf. No critical areas or critical aquifer recharge areas exist on or near the site. The project is not located in the Inglewood Historic Plat. Soils are fine sand/loamy sand (ie, limited infiltration potential).



Developed Conditions – The new house will total 2,500 sf (600 sf of new impervious, 1,900 sf of replaced impervious surface).

1998 KCSWDM – The project would disturb less than 1 acre and is not located in a sensitive area. The project would currently be vested to the 1998 KCSWDM. The project would require drainage review as it adds more than 2,000 sf of new plus replaced impervious surface. **Small Site Drainage Review** would be required. Stormwater would be provided with flow dispersion best management practices such as dispersion trenches or downspout splash blocks.

2016 KCSWDM – This project would fall under a **Simplified Drainage Review**. No flow control facilities would need to be evaluated (<5,000 sf of new plus replaced impervious surface). LID would need to be implemented over all impervious surfaces (2,500 sf) to the maximum extent feasible. LID priority list would start with 1) full dispersion, 2) full infiltration, 3) limited infiltration, bioretention, pervious pavement, and 4) basic dispersion. If no LID is feasible, notice on title indicating maximum impervious surface of 3,040 sf (4,000 sf minus 10% of 9,600 sf) would need to be recorded or a native growth protection area of 3.5 x 2,500 sf (8,750 sf) must be converted to native landscaping and recorded on title. Native growth protection credit is not feasible for this site due to lot size and proposed development.

Project – 2 Lot Short Plat

Background – An existing 16,000 sf lot in an R6 zone is planning to subdivide to two 8,000 sf lots. No critical areas or critical aquifer recharge areas exist on or near the site. No right-of-way dedication or frontage improvements are required. The lot currently has an existing house and driveway that total 3,500 sf.



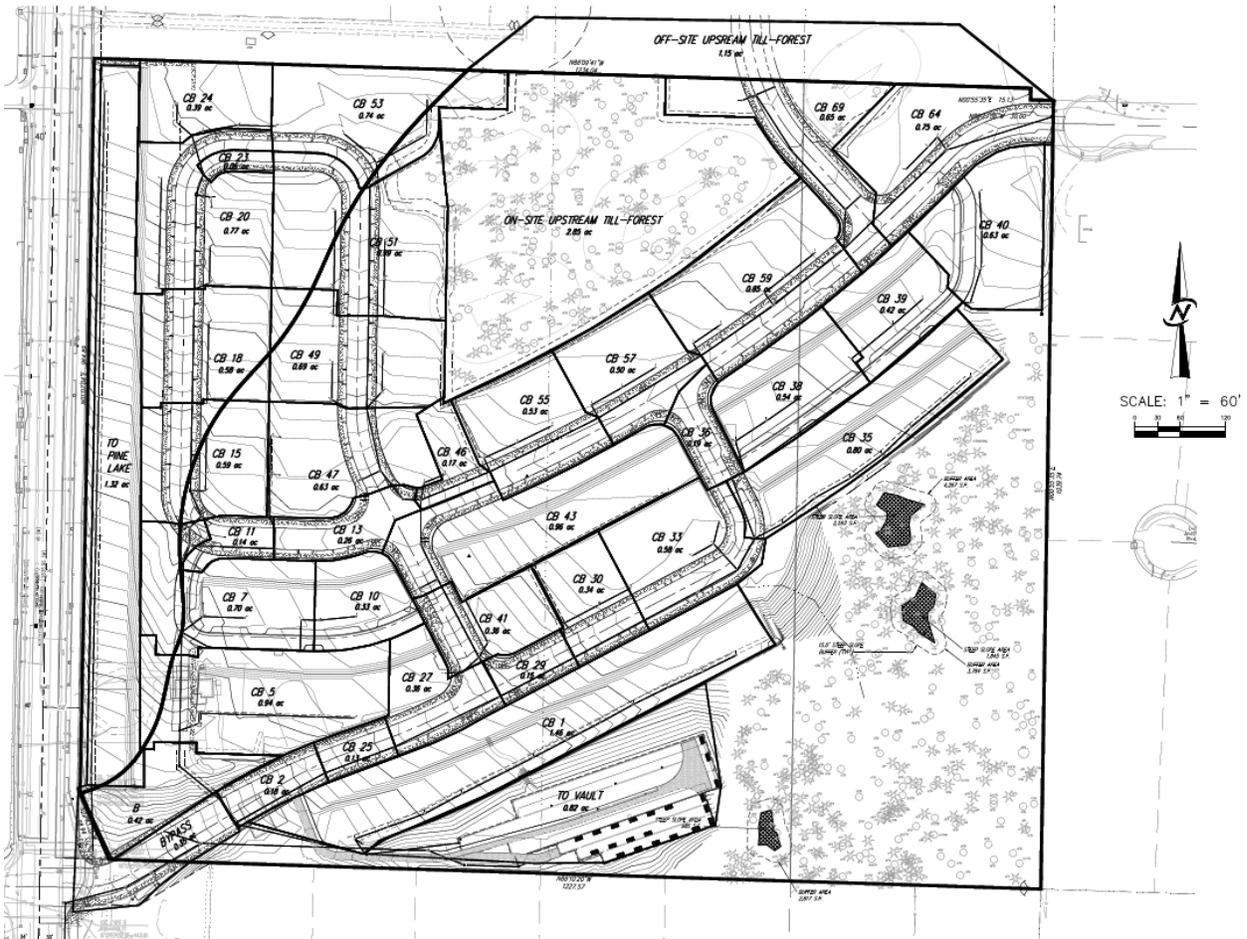
Developed Conditions – Each lot is assumed to build 4,000 sf of impervious surface. This would result in 4,500 sf of new impervious surface, 3,500 sf of replaced impervious surface, 8,000 sf of new plus replaced impervious surface, and 1,000 sf of new plus replaced pollution generating impervious surface.

1998 KCSWDM – The project would disturb less than 1 acre and would currently be vested to the 1998 KCSWDM. The project would require drainage review as it adds more than 2,000 sf of new plus replaced impervious surface. **Small Site Drainage Review** would be required as it would add less than 10,000 sf of new impervious surface. No formal flow control or water quality facilities would be required. Stormwater would be provided with flow dispersion best management practices such as dispersion trenches or downspout splash blocks.

2016 KCSWDM – This project would fall under a **Full Drainage Review**. All Core Requirements would need to be evaluated. Formal flow control facilities such as pond may be required. LID would need to be implemented over all impervious (8,000 sf) surfaces to the maximum extent feasible. LID priority list would start with 1) full dispersion, 2) full infiltration, 3) limited infiltration, bioretention, pervious pavement, and 4) basic dispersion. Flow control modeling credit would be given to reduce, but not eliminate flow control facility sizing if a facility was required.

Project – Subdivision Project

Background – The Kampp development was reviewed under the King County 2009 Manual. The total parcel size was 31.2 acres under R6 zoning. No critical aquifer recharge areas exist on the site, but wetland, erosion hazard, and landslide hazards exist on the site.



Developed Conditions – The project proposed subdivision into 121 lots.

2009 KCSWDM – Since it disturbed more than 1 acre, this project fell under a **Full Drainage Review** under the 2009 KCSWDM. Flow control, water quality, and LID for 10% of the site was evaluated. A detention and sand filter vault were provided. LID was provided by reducing the maximum impervious surface coverage for each lot.

2016 KCSWDM – This project would fall under a **Full Drainage Review**. Flow control, water quality, and LID would need to be evaluated for all new and replaced impervious surfaces, including areas within street right-of-way. A detention and sand filter vault would still be required. Reducing the maximum impervious surface coverage for each lot would only be allowed when all other LID techniques are shown to be infeasible.