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Simplified Drainage Review 2016 King County Surface Water Design Manual Appendix C

Residential Site Plan Instructions

Information and Instructions for Residential Site Plan

These instructions are designed to provide references, definitions, and a step-by-step process in conjunction with the *2016 King County Surface Water Design Manual Appendix C* to design your residential site plan for Simplified Drainage Review.

Following these instructions will allow you to create a complete and accurate site plan that enables the Public Works Department to more efficiently and predictably review and approve your residential permit.

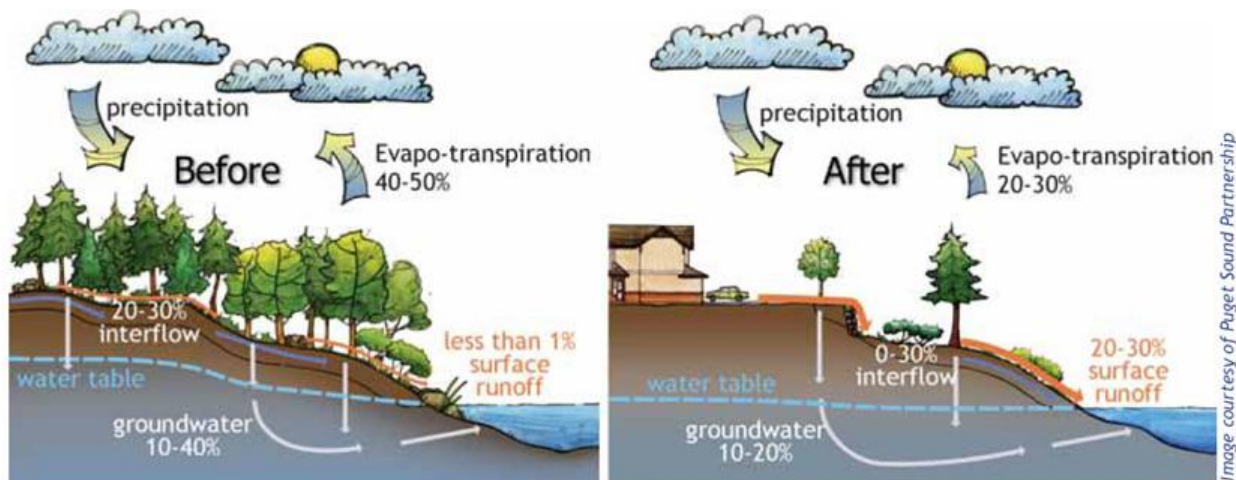
Why Flow Control Best Management Practices (BMPs) are Necessary for Small Projects

Undeveloped Land

- Rainwater soaks into the ground
- Runoff is naturally filtered through the soil to protect water quality

Developed Land

- Rainwater flows quickly and in greater quantities to lakes and streams
- Runoff picks up additional pollutants
- Results in increased runoff, combined with other sites this can result in flooding and erosion
- Pollutants can degrade water quality and habitat function of streams, lakes, and wetlands



Before development almost all rainfall is taken up by plants, evaporates or infiltrates through the ground. After conventional development, surface runoff increases significantly while evaporation and infiltration into the ground decrease.

Controlling flows from small projects is just as important as controlling flows from large developments, because the cumulative effect of uncontrolled flows from many small projects can be equivalent to those from a single large project.

Why Erosion Sediment Control (ESC) is Necessary

ESC measures are necessary because:

- Land disturbing activity associated with clearing and grading exposes a site's soils to erosion by stormwater.
- Sediment is washed downstream and deposited in pipes, ditches, streams, and lakes:
 - Sediment deposited in a pipe or ditch reduces its capacity to convey flows and can increase the likelihood of flooding.
 - Sediment deposited in streams clog the gravels that salmon use for spawning.
- Nutrients contained in the eroded soil that reach lakes can upset the chemical balance of the lake, causing excessive growth of algae, milfoil, and other plants, and decreasing recreational uses such as swimming, boating, and fishing.
- ESC measures are used during construction to prevent soil erosion and/or transport of sediment downstream until the site can be stabilized with vegetation cover/landscaping.

Other construction activities such as the use, handling, and storage of materials, chemicals, equipment, and fuel can result in contaminants coming into contact with stormwater and potentially washed downstream. Therefore, pollution prevention measures applicable to specific construction activities must be implemented to prevent the discharge of pollutants.

Utility of Appendix C

For projects in Simplified Drainage Review, this appendix outlines the drainage requirements, flow control BMPs, and ESC measures, necessary to mitigate the stormwater impacts of development without the construction of expensive stormwater facilities (i.e., flow control and water quality facilities). For projects in Full Drainage Review or other types of drainage review, the flow control BMPs in this appendix are referenced for application to any size or type of project as specified in the 2016 King County Surface Water Design Manual (*KCSWDM*.) Flow control BMPs are required to some extent on nearly all projects in drainage review regardless of whether stormwater facilities are required.

Residential Site Plan Step-by-Step Directions.

Step 1: Site Plan

Prepare a proposed site plan on the [Site Plan Template](#). The information required on the [SFR Site Plan Checklist](#) must be included on **all residential** site plans.

Step 2: Determine the *new* and *replaced* impervious and pervious surface in square feet by using attachment Table A.

Definition of New Pervious Surface means the conversion of a native vegetated surface or other native surface to a nonnative pervious surface (e.g., conversion of forest or meadow to pasture land, grass land, cultivated land, lawn, landscaping, bare soil, etc.), or any alteration of existing non-native pervious surface that significantly increases surface and storm water runoff (e.g., conversion of pasture land, grass land, or cultivated land to lawn, landscaping, or bare soil; or alteration of soil characteristics).

Definition of New Impervious Surface means the creation of a hard or compacted surface such as roofs, pavement, gravel or dirt or the addition of a more compacted surface such as the paving of existing dirt or gravel. Permeable pavement and vegetated roofs are considered new impervious surface for purposes of determining whether the thresholds for application of minimum requirements are exceeded, as are lawns, landscaping, sports fields, golf courses, and other areas that have modified runoff characteristics resulting from the addition of underdrains designed to collect stormwater runoff. Open, uncovered retention/detention facilities shall not be considered impervious surfaces for purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling.

Definition of Replaced Impervious Surface means an existing impervious surface proposed to be removed and reestablished as impervious surface, excluding impervious surface removed for the *sole purpose* of installing utilities or performing maintenance on underground infrastructure. For structures, “removed” means the removal of buildings down to the foundation. For other impervious surfaces, “removed” means the removal down to base course or bare soil. It does not include the removal of pavement material through grinding or other surface modification unless the entire layer of PCC or AC is removed. Replaced impervious surface also includes impervious surface that is moved from one location to another on the project site where the following two conditions are met: (1) the area from which the impervious surface is moved from will be restored to the same or better runoff discharge characteristics as the area being covered by the moved impervious surface, and (2) impervious surface at the new location is either designated as non- pollution-generating or the pollution-generating characteristics remain unchanged compared to that of the original location.

Step 3: Determine the Proper BMP for your site - C.1.3.1 and C.1.3.2 (pages C-18 to C-21)

For projects subject to Small Lot BMP requirements, flow control BMPs must be applied to the project's target impervious surface according to the order of preference and extent of application specified in the following requirements:

Requirement 1: If this first requirement for full dispersion is met for the site/lot, no other flow control BMPs are required for mitigation of impervious surface and the remaining requirements below are optional.

Requirement 2: Where full dispersion of roof runoff (or equivalent) is not feasible or applicable, or will cause flooding or erosion impacts, the feasibility and applicability of full infiltration as detailed in Section C.2.2 (p. C-48) must be evaluated for roof runoff (note, this will require a soils report for the site/lot). If feasible and applicable, full infiltration of roof runoff must be implemented as part of the proposed project.

Requirement 3: All target impervious surface not addressed by Requirements 1 and 2 above, must be mitigated to the maximum extent feasible using one or more BMPs from the following list.

- Full Infiltration (see Section C.2.2)
- Limited Infiltration (see Section C.2.3)
- Bioretention (see Section C.2.6)
- Permeable Pavement (see Section C.2.6),

Requirement 4: All target impervious surface not addressed by Requirements 1, 2, and 3 above, must be mitigated to the maximum extent feasible using one or more BMPs from the following list.

- Basic Dispersion (see Section C.2.4).

Requirement 5: Determine your lot size and confirm that the minimum mitigation with Flow Control BMPs is met.

If your site/lot is smaller than 22,000 square feet, your project must comply with the Small Lot flow control BMP application requirements in section C.1.3.1 (5) (page C-19).

- BMPs must be implemented, at minimum, for an impervious area equal to at least 10% of the site/lot for site/lot sizes up to 11,000 square feet and at least 20% of the site/lot for site/lot sizes between 11,000 and 22,000 square feet. For projects located in critical aquifer recharge areas, these impervious area amounts must be doubled. Doubling of the minimum impervious area required for BMP implementation in a CARA is not required for projects located within 200 ft. of a steep slope hazard, landslide hazard area, or erosion hazard area. If these minimum areas are not mitigated using feasible BMPs from Requirements 1, 2, 3, and 4 above, one or more BMPs from the following list are required to achieve

compliance. These BMPs must be implemented as part of the proposed project.

If your site/lot is 22,000 square feet or larger, your project must comply with the Large Lot flow control BMP application requirements in section C.1.3.2 (5) (page C-21) of Appendix C of the KCSWDM.

- BMPs must be implemented, at minimum, for impervious area amounts defined as follows. If these minimum areas are not mitigated using feasible BMPs from Requirements 1,2,3,and 4 above, one or more BMPs from the following list are required to be implemented to achieve compliance.
 - a) For projects that will result in an impervious surface coverage on the buildable portion of the site/lot of less than 45%, flow control BMPs must be applied to 50% of target impervious surfaces.
 - b) For projects that will result in an impervious surface coverage of 45% to 65% on the buildable portion of the site/lot, flow control BMPs must be applied to 50% of target impervious surfaces reduced by 1.5% for each 1% of impervious surface coverage above 45% (e.g., impervious coverage of 55% results in a requirement of FCBMPs applied to 35% of target impervious surfaces).
 - c) For projects that will result in an impervious surface coverage greater than 65% on the buildable portion of the site/lot, flow control BMPs must be applied to 20% of the target impervious surfaces or to an impervious area equal to at least 10% of the site/lot, whichever is less.
- Reduced Impervious Surface Credit (see Section C.2.9),
- Native Growth Retention Credit (see Section C.2.10).

Requirement 6: The soil moisture holding capacity of new pervious surfaces must be protected. The duff layer or native topsoil must be retained to the maximum extent practicable. Soil amendment is required to mitigate for lost moisture holding capacity where compaction or removal of some or all of the duff layer or underlying topsoil has occurred. The specifications for compost for soil amendment can be found in Reference 11-C.

Requirement 7: Any proposed connection of roof downspouts to the local drainage system must be via a perforated pipe connection as detailed in Appendix C, Section C.2.11.

Step 6: Design your Simplified Site Construction Stormwater Pollution Prevention (CSWPP) plan

Using section C.1.4.1 page C-26 to C-28 to determine the applicable ESC Best Management Practices and incorporate the BMPs into the [Site CSWPP plan Template](#).

Information Specific to Small Site ESC plans

In addition to the general information required in Section C.4.2.1, the information on the [SFR Site Plan Checklist](#) is required on small site ESC plans, unless otherwise directed.

- Draw site plan
- Show location of construction entrance
- Show clearing limits
- Show location of all TESC BMPs used
- Show silt fence
- Critical areas boundary and associated buffer (labeled)
- Utilities

Step 7: Prepare a Declaration of Covenant and Grant of Easement and SFR LID Facility Information Form.

A [declaration of covenant and grant of easement](#) must be recorded for each Site/lot that contains flow control BMPs. Submit a draft of the proposed covenant with the building permit for review. The covenant in Reference Section C.5.2, p. C-125, is replaced with a City of Sammamish specific form and must be used.

The [SFR LID Facility Information form](#) is required to facilitate future inspection of these required LID BMPs. A template is available online and a draft must be submitted with your application.

Step 8: Submit your building permit application and required plans. Check with the Permit Center for other applicable requirements not related to Public Works.

Table A

New and Replaced Impervious and Pervious Surface: Fill in all applicable blanks below in square feet for the proposed project. Note that shaded cells will calculate automatically.

When calculating impervious surface areas for buildings do not list the floor area or living/useable space, instead list the building roof square-footage measured to the outside edge of the eave.

Impervious Area Description	Existing	New	Total
Roof Area of Residence and Attached Garage			0
Roof Area of Detached Garage			0
Roof Area of Any Other Out Buildings			0
On-site Parking/Driveway Area			0
Off-site Parking/Driveway Area			0
Walkways/Sidewalks/Stepping Stone Area			0
Uncovered Porch and/or Patio Areas			0
Uncovered Decks			0
All Other Impervious Areas			0
Replaced Impervious Area	-		0
Summary			
Total Existing Impervious Surface	0		
Total New + Replaced Impervious Surface		0	
Resulting Total Impervious Area			0
Total Clearing Limits, Site Disturbance/Graded Area (Include septic drain fields primary and reserve)			
Total New Pervious Areas			0
[(Total clearing limits, Site Disturbance/Graded Area) - (Existing Total Impervious Areas)]			
Total of Excavation Volume			
Total of Fill Volume (Exported)			
Total of Fill Volume (Imported)			