King County Local Services

PERMITS

Drainage Review Requirements and Process for Single Family Residential Type Projects

These step-by-step instructions are intended to help guide applicants through the requirements and process of drainage review for single family residential type projects, in order to meet the currently adopted 2016 King County Surface Water Design Manual (SWDM). This guide outlines all the required documents that will need to be submitted for the drainage review process, as part of the building permit application. These instructions are intended to be used for the following residential type of projects:

- New residential building permits
- Additions, alterations or remodels to existing residential structures
- New detached structures on residential property
- Additions or replacement of non-structure impervious surfaces (such as patios, driveways or parking areas) on residential property
- Clearing or grading activity on residential property
- Agricultural type projects

Projects that are subject to drainage review, will be required to apply drainage devices or measures called Flow Control Best Management Practices (BMPs) for each of the target surfaces associated with the project (such as the building roof and/or driveway). Flow Control BMPs include devices such as dispersion trenches or infiltration drywells to redistribute the stormwater runoff back into the native vegetation or native soils, to reduce the amount of runoff from the development. Flow Control BMPs also include measures, such as reducing the allowed amount of impervious surface or preserving vegetation on the site. All of the various Flow Control BMPs and the design requirements are listed within Appendix C of the 2016 King County Surface Water Design Manual (SWDM).

Please note that this document is intended to provide a general and summarized description of thresholds and requirements from the SWDM. Any discrepancies between what is stated within this document and the requirements within the SWDM, the SWDM shall take precedence.

RESIDENTIAL DRAINAGE REVIEW STEP BY STEP DIRECTIONS

Step 1: Prepare a Site Plan

Prepare a proposed site plan on the King County Site Plan Template. See Residential Site Plan Requirements for required information to be shown on the site plans and for the Site Plan templates, general and temporary erosion and sediment control (TESC) in the Computer Aided Design (CAD) Templates packet. A site plan is required to be submitted for all projects regardless of whether drainage review is required.

Step 2: Complete the Site Area Worksheet.

Refer to the Site Area Worksheet. The areas noted within the worksheet should match the site plans, architectural building plans, and other documentation such as drainage reports accordingly. A Site Area Worksheet is required to be submitted for all projects regardless of whether drainage review is required.

Step 3: Determine Type of Drainage/Engineering Review

Using the areas determined within the Site Areas Worksheet above and using the Drainage Review Flowcharts included at the end of this document to determine which types of drainage review will be applicable to the project. Also refer to Section 1.1.2 of the SWDM for a complete description of the application requirements and thresholds for each review type. Below is brief summary of each of the drainage review types applicable to residential type projects.

No Drainage Review – Drainage review will not be required if the proposed project meets all of the following criteria:

- Less than 2,000 square feet of new and replaced impervious surface AND
- Less than 7,000 square feet of land disturbing activity AND
- Does not propose to construct or modify a drainage pipe/ditch that is 12-inches or more in size/depth, or receives storm water runoff or surface water from a drainage pipe/ditch that is 12 inches or more in size/depth AND
- Does not contain or adjacent to a Flood Hazard Area[1]

Projects that do not require drainage review will still be required to submit a site plan showing the proposed improvements (Step 1), and a Site Areas Worksheet (Step 2), but can skip directly to Step 11.

[1] Flood Hazard Areas include any lakes, streams, submerged wetlands or closed depressions that are subject to inundation by the base flood. A flood hazard area may consist of the following components: 100-year floodplain, zero-rise flood fringe, zero-rise floodway, FEMA floodway , and channel migration zones.

Simplified Drainage Review – Includes projects that propose between 2,000 square feet and 5,000 square feet of new and replaced impervious surfaces, or proposes more than 7,000 square feet of land disturbing activity, and meets one of the following criteria:

- Less than 3/4 of an acre (32,670 square feet) of new pervious surface AND
- Meets one of Threshold Criteria #1 through #6 listed within Section 1.1.2.1 of the SWDM

Projects subject to Simplified Drainage Review will be required to implement Flow Control Best Management Practices (BMPs) for the applicable target surfaces requiring mitigation. The required site plans, design of flow control BMPs and the drainage assessment can be prepared by contractors, architects, or homeowners without the involvement of a professional engineer. Refer to Section C.1 of the SWDM for a more detailed description of Simplified Drainage Review.

Directed Drainage Review – Includes projects that propose more than 5,000 square feet of new/replaced impervious surface or more than 3/4 of an acre (32,670 square feet) of new pervious area. Projects that are subject to Directed Drainage Review will require a Civil Engineer to prepare site plans and a Technical Information Report (TIR) to demonstrate that the project complies with all nine core requirements in Section 1.2 of the SWDM and the five special requirements in Section 1.3 of the SWDM. Refer to Section 1.1.2.3 of the SWDM for more detailed information on Directed Drainage Review.

For single family residential projects only, the Permitting Division may waive the requirement for a civil engineer for projects within Directed Drainage Review, provided that all of the target impervious surfaces are addressed using either Full Dispersion BMPs[2] or Full Infiltration BMPs[3]. In these instances, the Permitting Division may allow for a more simplified drainage assessment (as noted within Step 8), in lieu of a providing a full Technical Information Report (TIR).

Targeted Drainage Review – Targeted Drainage Review is an abbreviated evaluation by the Permitting Division review staff of a proposed project's compliance with selected core and special requirements of the SWDM (Refer to Section 1.1.2.2 of the SWDM). Projects subject to this type of drainage review are typically simplified drainage review proposals or other small projects that have site specific or project specific drainage concerns that must be addressed by a civil engineer or Permitting Division review staff. For projects that are not subject to either simplified drainage review or directed drainage review as determined above but do include one of the following conditions will be subject to Targeted Drainage Review:

[2] All minimum design requirements for Full Dispersion per Section C.2.1.1 of the SWDM must be met in order to waive the requirement for a Civil Engineer. This includes providing the required Native Growth Retention Area within the site.

[3] For projects that propose more than 5,000 square feet of pollution generating impervious surface (PGIS) that is not fully dispersed, which includes driveways and parking areas, will require a Civil Engineer to address water quality treatment requirements, per Section 1.2.8 of the 2016 SWDM.

- **Projects that contain or are adjacent to a Flood Hazard Area** – These projects will be required to meet Special Requirement #2 of the SWDM, which may require a floodplain/floodway study to be completed as per Section 4.4.2 of the SWDM. The delineation of the floodplain and the base flood elevation shall be shown on the site plan.
- **Projects that propose to construct or modify a drainage pipe/ditch that is 12-inches or more in size/depth, or receives storm water runoff or surface water from a drainage pipe/ditch that is 12-inches or more in size/depth** – These projects will be required to meet the core and special requirements listed within Section 1.1.2.2 under TDR Project Category #2 of the SWDM.

In addition, targeted drainage review will be required for projects that are subject to simplified drainage review, and contain the following:

- **The site/project contains or is adjacent to a steep slope hazard area, landslide hazard area, or drains to a landslide hazard area** – These projects will be required to address the discharge requirements listed under Core Requirement #1 of the SWDM, which may require a civil engineer or a geotechnical engineer. In addition, based upon the Flow Control BMPs that are proposed, may require a geotechnical engineer or geologist to evaluate the use of these BMPs based upon the location or setback from the steep slope or landslide hazard area. Refer to the design requirements of each Flow Control BMP per Appendix C of the SWDM.

Step 4: Determine the Applicable Target Impervious Surface Area for BMP Mitigation

If the project is a New Development project[4];

Then target impervious surfaces include **new and replaced impervious** surface plus existing impervious surface added on or after January 8, 2001.

If the project is a Redevelopment project[5] and can meet at least one of the following criteria;

- Net new impervious surface is less than 5,000 square feet OR
- Valuation of improvements is less than 50% of the assessed value of the existing site improvements,

Then target impervious surfaces include only **new impervious** surface plus existing impervious added on or after January 8, 2001.

[4] New Development project means a project that proposes to construct new impervious surfaces (driveways, residences or structures) on a vacant or undeveloped property.

[5] Redevelopment project means a project that proposes to add, replace, or modify impervious surface on a site that is already substantially developed in a manner consistent with its current zoning or with a legal non-conforming use or has an existing impervious surface coverage of 35% or more.

If the project is a Redevelopment project, but cannot meet one of the conditions listed above, then the target impervious surfaces would include **new and replaced** impervious surface plus existing impervious surface added on or after January 8, 2001.

Step 5: Application of Flow Control BMPs

Flow Control BMPs must be applied to the target impervious surfaces (determined in Step 4 above) as specified by one of the following three sets of BMP requirements, whichever is applicable based on the size of the site/lot, the extent of impervious surface coverage resulting from the project on the site/lot, and the location of the project relative to Urban Growth Area (UGA) boundaries:

- **Small Lot BMP Requirements** – For sites/lots less than 22,000 square feet. Refer to Section C.1.3.1 of the SWDM.
- **Large Lot BMP Requirements** – For sites/lots greater than or equal to 22,000 square feet and either less than 5 acres or inside the UGA. Refer to Section C.1.3.2 of the SWDM.
- **Large Rural Lot BMP Requirements** – For sites/lots greater than or equal to 5 acres and located outside the UGA. Refer to Section C.1.3.3 of the SWDM.

Step 6: Determine the Soil Type for the Site

In order to evaluate whether infiltration BMPs are feasible for the project site, the underlying native soils need to be determined. Typically, for sites that either have an existing onsite septic system or are proposing a new onsite septic system will be able to determine the soils information from the soil logs or test pits provided by the septic designer.

In addition to the soil types, the depth to ground water or hardpan/compacted soils needs to be shown on the soil logs. A copy of these soil logs or test pits should be included with the drainage assessment in Step 8 below. For sites that are not on septic systems, or the existing septic soil logs are not available, then additional soil reports or testing will be required, as per Section C.1.3 of the SWDM.

Full Infiltration BMPs – Required soil types include the following; course sands, cobbles, or medium sands (or noted as Soil Type 1A, 1B, 2A or 2B in the Soil Textural Classification system used for onsite septic system design)

Limited Infiltration BMPs – Required soil types include the following; fine sands (Soil Type 3) or loamy sands, sandy loams, and loams (Soil Type 4). Note that silt and clay loams, and cemented till (hardpan) are not suitable for limited infiltration BMPs.

Step 7: Determine Feasible BMPs for Your Site

Follow the applicable BMP requirements based upon Step 5 above, which lists out the order of evaluation of the different Flow Control BMPs for the target surfaces. Full Dispersion is always the first preferred Flow Control BMP that will need to be considered for all the target surfaces (roof and driveways) for any site.

The design requirements for Full Dispersion in Section C.2.1.1 of the SWDM will need to be reviewed to determine whether Full Dispersion can be applied to the various target surfaces within the site, given the site constraints. For example, Full Dispersion typically requires that there is a 100 foot long native vegetated flowpath with slopes of less than 15% located downstream of either the gravel dispersion trench or the edge of driveway. If there is insufficient area onsite to provide the 100 feet between the edge of the driveway and the property line, or the slopes within the flowpath area are greater than 15%, then full dispersion could be considered as infeasible. Note that alternative designs also need to be evaluated, such as collecting the driveway and routing it to a dispersion trench in a flatter portion of the site, if available.

If it is determined that Full Dispersion is not able to be applied to the target surfaces given the site constraints, then the next Flow Control BMP must be evaluated, per the applicable BMP requirement listed in Step 5 above. Once a Flow Control BMP has been determined feasible for the target surface, then it must be applied and shown on the site plans. Any supporting calculations to determine the size or length of the Flow Control BMP must be included within the Drainage Assessment noted in Step 8 below.

Step 8: Prepare a Drainage Assessment or Technical Information Report (TIR)

For projects subject to Simplified Drainage Review, shall prepare a written drainage assessment, as per Section C.4.4 of the SWDM. The drainage assessment is a supporting document to the site plans which typically includes:

- A brief summary of the project,
- Description of the proposed Flow Control BMPs and how they were selected, any supporting calculations to size the Flow Control BMPs,
- A description of how the site soil types were determined and include any supporting documents such as septic soil logs or soil reports.

For projects subject to Directed Drainage Review, will require a Technical Information Report (TIR) prepared by a civil engineer, to demonstrate that the project complies with all nine core requirements in Section 1.2 of the SWDM and the five special requirements in Section 1.3 of the SWDM. As noted earlier in Step 3, if the project proposes Full Dispersion BMPs or Full Infiltration BMPs for all target impervious the Permitting Division may allow for a more simplified drainage assessment, in lieu of a providing a full Technical Information Report (TIR).

Step 9: Complete the Post Construction Soil Management Plan

For the pervious areas within the project limits, that have been compacted or had the topsoil or duff layer removed, will need to be restored by amending with compost, importing topsoil, or reapplying stockpiled site topsoil in order to re-establish the soil moisture holding capacity. The soil amendment plan shall meet King County Code, Title16 Building and Construction Standards, Chapter 82 Clearing and Grading, Section 100 Grading Standards, Sub-section (G) Soil Standards (KCC 16.82.100 (G)). Refer to the following;

- Achieving the Post-construction Soil Standard booklet.
- Soil Management Plan Worksheet
- Compost and Topsoil Calculator

Include the Post-construction Soil Plan worksheet with the permit submittal package. The type of soil treatment option and area of soil treatment shall be shown on TESC Site Plan.

Step 10: Prepare a TESC (Temporary Erosion and Sediment Control) Control plan

The TESC Site Plan is a separate document from the site plan that was prepared in Step 1. The purpose of the TESC Site Plan is to show how the site will be disturbed and protected from erosion or sediment laden runoff during the construction phase of the project. Items like (but not limited to) clearing limits, construction access, stockpile locations, and silt fencing for the project site shall be shown on the TESC Site Plan template. Refer to SWDM Section C.1.4.1 pages C-20 to C-22, to determine the applicable Temporary Erosion and Sediment Control (TESC) Best Management Practices (BMP). Also refer to Residential Site Plan Requirements for additional required information for TESC site plans.

Step 11: Complete a Residential Drainage Review Checklist

Complete a Residential Drainage Review Checklist form; it will be required for application submittal. The checklist will be used during the permit intake screening process by Permitting staff to ensure that all required documentation has been provided for a complete application.

Step 12: Submit the Building Permit Application and Required Materials

Refer to the Residential, New Single Family Construction Packet for instructions on submitting residential building permit applications. This permit can be applied for online through MyBuildingPermit.com.

Apply On-Line at MyBuildingPermit.com

Select: King County | Building | Single Family Residential | New Construction | Residence and All Associated Structures

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Drainage Review Flowchart for Single Family Residential Projects