

CITY OF KIRKLAND

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**DEPARTMENT OF PUBLIC WORKS
PRE-APPROVED PLANS POLICY****Policy D-8: SOIL INFORMATION FOR STORMWATER DEVELOPMENT TO MEET FLOW CONTROL BMP REQUIREMENTS**

The soil information requirements below (i.e., Flow Control BMP Soil Report and Special Inspection for Soils) are necessary for designing flow control Best Management Practices (BMPs) per 2021 King County Surface Water Design Manual (KCSWDM). There are many other reasons a soil report is necessary for a project (e.g., steep slopes, sensitive areas, etc.). The requirements below do not replace any requirements from other City departments. If proposing to do an infiltration facility to meet Core Requirement #3: Flow Control Facility in the 2021 KCSWDM, you do not need to meet the requirements of this policy. Instead, you must meet Chapter 5.2 requirements of the 2021 KCSWDM and review City of Kirkland Addendum to the KCSWDM (Pre-Approved Plans, Policy D-10) for soil report requirements and analysis.

A. Flow Control BMP Soil Report***When is a Flow Control BMP Soil Report required?***

A Flow Control BMP Soil Report is required any time a project triggers flow control BMPs per the 2021 KCSWDM and can't meet the criteria for full dispersion, is located within a steep slope hazard area (>40% slope) or landslide hazard area OR does not trigger flow control BMPs but is planning to fully infiltrate all the stormwater runoff on the project site (i.e. there is no overflow for the infiltration BMP).

Who can prepare a Flow Control BMP Soil Report?

The Flow Control BMP Soil Report must be prepared by either a licensed onsite sewage system designer or a licensed engineer with geotechnical and/or hydrogeologic experience, licensed hydrogeologist, or licensed engineering geologist.

What information is required in a Flow Control BMP Soil Report?

At minimum, the Flow Control BMP Soil Report shall include:

- A sufficient number of soil logs to establish the type and limits of soil on project site. At minimum, identify the limits of any outwash type soils.
- At least 1 soil log for each proposed infiltration location on individual lots. The soil log should be a minimum of 4 feet below expected finished grade and at least 1 foot below the expected bottom elevation of the flow control BMP.
- No soil log or infiltration testing shall be completed within the drip line of any tree.
- Elevation of anticipated seasonal high groundwater level.
- A description of the SCS series of the soil and textural class of each horizon through the depth of the log, noting high groundwater level or evidence of it, such as mottling.
- A grain size analysis in accordance with ASTM standards is required, unless infiltration is infeasible and proven with an infiltration test (measured rate less than 0.3 inches per hour). If the measured infiltration rate is greater than 0.3 inches per hour, the BMP shall be designed using the SCS series and Appendix C sizing associated with the series.
- Groundwater Protection testing per Chapter 5.2.1 (page 5-51 of the 2021 KCSWDM) if proposing to infiltrate pollution generating impervious surfaces (PGIS).
- Infiltration testing is required for projects that do not have an overflow connection to the City storm system. An infiltration rate(s) must be reported. The flow control BMP must be designed to fully infiltrate the 100-year storm event on site and must meet minimum

measured infiltration rate standards set within Policy D-10. The following information shall be included in the Flow Control BMP Soil Report:

- The infiltration test shall occur at the bottom elevation of the proposed infiltration BMP. The following test procedures are allowed. The lowest measured infiltration rate must be used to determine the design infiltration rate. If the measured infiltration rate is less than 0.3 in/hr, infiltration is not feasible on this site and other stormwater designs must be evaluated.
 - EPA falling head percolation test procedure – 3 infiltration tests (arrayed in a triangle) is required.
 - Double ring infiltrometer test - 3 infiltration tests (arrayed in a triangle) are required.
 - Single ring percolation test - 3 infiltration tests (arrayed in a triangle) are required.
 - Small or large scale pilot infiltration test (PIT) – 1 infiltration test required.

NOTE: If infiltrating more than 1 lot OR 10,000 sf or more of impervious, OR $\frac{3}{4}$ acre pervious surface, OR 5,000 sf or more of PGIS, OR meeting LID performance criteria, Policy D-8 does not apply. Follow Chapter 5.2 of the 2021 KCSWDM and the City of Kirkland Addendum to the KCSWDM (Pre-Approved Plans, Policy D-10) for requirements.

B. Special Inspection for Soils

What Triggers a Special Inspection for Soils?

Any time a project uses an infiltration system (including, but not limited to, infiltration trench, drywell, rain garden, or infiltration vault) to meet a flow control exemption, reduce the size of the flow control facility, as a flow control facility, or to fully infiltrate the 100-year storm event on site due to no overflow, a stamped special inspection memorandum will be required. The design engineer is responsible for identifying on plans when the project will require a special inspection.

What information is gathered in a Special Inspection for Soils?

Depending on how the infiltration system was sized, the special inspection shall include:

- Sized per small site BMPs in Appendix C:
 - The licensed engineer with geotechnical and/or hydrogeologic experience, licensed hydrogeologist, or licensed engineering geologist on record shall be present when the subsurface is exposed by the contractor, verifying the soils will function as designed.
 - A stamped technical memorandum submitted to the City's inspector or development engineer by the geotechnical engineer or geologist, including findings during site visit and a location map. The stamped technical memorandum shall be submitted for review and approval prior to finaling the permit.
- Sized using an infiltration rate:
 - The licensed engineer with geotechnical and/or hydrogeologic experience, licensed hydrogeologist, or licensed engineering geologist on record shall be present when the subsurface is exposed by the contractor to do the performance testing. Performance testing shall meet the same infiltration test requirements noted above to verify the measured infiltration rate used in design.
 - A stamped technical memorandum submitted to the City's inspector or development engineer by the geotechnical engineer or geologist that includes infiltration test results and recommendations, field notes from testing, and location of the tests in relation to the infiltration system. The stamped technical memorandum shall be submitted for review and approval prior to finaling the permit.