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This Assistance Bulletin only applies to property within unincorporated Snohomish County and does not apply to property within incorporated city limits.

Low Impact Development Best Management Practices and Feasibility Analysis

Assistance Bulletin

108

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Q: Why are stormwater management BMPs required?

A: Snohomish County is required to comply with the National Pollutant Discharge Elimination System (NPDES) Phase 1 municipal stormwater permit. This permit requires use of low impact development best management practices (LID BMPs) where feasible.

The purpose of stormwater management BMPs is to control the quantity and quality of stormwater discharges produced by new development, redevelopment, and activities at currently-developed properties, such that the discharges comply with state water quality standards and do not impair beneficial uses of the receiving waters. Development and redevelopment shall not negatively impact adjacent and/or downstream property owners, nor degrade groundwater or the natural drainage system, including but not limited to streams, ravines, wetlands, potholes, and rivers. Further, development activities should not impact adjacent and/or downstream property owners in a detrimental manner compared to the predeveloped condition.

The intent of stormwater LID is to mimic predeveloped runoff conditions more effectively than is done by the "conventional" development and stormwater management approach. In the conventional approach to stormwater management, stormwater is routed as efficiently as possible to engineered flow control and treatment systems located at one part of a developed site. Little consideration is given to minimizing the amount of impervious surface or land disturbance. In contrast, *a main goal of stormwater LID is to minimize impervious surface and land disturbance, maximize retention of native vegetation and soils, and to build multiple small systems on a site that allow infiltration and dispersion of runoff as close to the source as possible.*

Q: What are LID BMPs?

A: "Low impact development" or "LID" is a stormwater management and land development strategy that strives to mimic pre-disturbance hydrologic processes of filtration, storage, evaporation, infiltration and transpiration by emphasizing conservation and use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design. (SCC 30.91L.215)

"Low impact development best management practices" or "LID BMPs" are distributed stormwater management practices, integrated into a project design, that emphasize pre-disturbance hydrologic processes of filtration, storage, evaporation, infiltration and transpiration. LID BMPs include, but are not limited to, bioretention/rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, minimal excavation foundations, vegetated roofs, and water re-use. (SCC 30.91L.216).

This bulletin is intended only as an information guide. The information may not be complete and is subject to change. For complete legal information, refer to Snohomish County Code.

Q: What are some examples of LID BMPs?

A: Some LID BMPs are used during the construction phase while others provide permanent stormwater management. Commonly used LID BMPs include site planning, tree and vegetation retention and planting, rain gardens, bioretention swales, concentrated or sheet flow dispersion through native vegetation or landscaped areas, vegetated filter strips, post construction soil quality and depth (see [Bulletin #94](#)), vegetated roofs and permeable pavement.

BMPs for stormwater management during construction can be reviewed in the Drainage Manual, Volume II, or Volume I, Appendix I-F for small projects. More detail for on-site stormwater LID BMPs can be reviewed in Volume III, Section 3.1 and Volume V, Chapter 5.

Q: How do I determine if LID BMPs are feasible on my property?

A: LID BMP feasibility is determined largely by site characteristics, specifically: soil types; topography and slope; groundwater levels; location of septic drainfields, potable water wells, structures, other drainage facilities or utilities; and available space or area needed for BMP installation relative to the capacity needed for stormwater management. Legal or regulatory issues, as described in Volume I, Section 2.5.5 of the Drainage Manual, may also limit the feasibility of LID BMPs.

Each LID BMP addresses a specific stormwater management function (retention, treatment, flow control, etc.) and has its own list of criteria that would render it infeasible under certain conditions. To determine which LID BMPs to use and whether or not they are feasible, follow the steps outlined below:

Step 1: Determine if your project is subject to the LID BMP requirements or not. If your project is exempt from the drainage code requirements outright per SCC 30.63A.200 or subject only to MR 2, or your project is eligible for the exception under SCC 30.63A.210, you do not need to assess LID BMP feasibility for your project. (Note that even if your project is exempt or eligible for the exception you may still have to address stormwater issues on a site plan and/or a SWPPP).

If the exception under SCC 30.63A.210 applies, the only requirement under MR 5 would be compliance with BMP T5.13 Soil Quality and Depth (see [Bulletin #94](#)). Feasibility analysis is not required. Stormwater runoff from rooftops may still need to be addressed if structures are included in your development or re-development proposal. Compliance with the other MRs is still required, however, the exception allows reduced requirements under MR 1 and MR 9 as well as MR 5 (see [Bulletin #107](#)).

Tip: Project design could be key to reducing regulatory requirements and lowering costs associated with development permits and stormwater management. If your project can be designed to minimize site disturbance, preserve native vegetation, avoid grading and soil compaction, minimize impervious surface and focus construction activities in the least-pervious soils on your site, you may be able to stay below the thresholds for permit requirements and manage your stormwater with minimum effort and expense. But even if you do need a Land Disturbing Activity (LDA) permit, fees will be lower if clearing and grading activities are minimized. See SCC 30.63B.070.

Step 2: If subject to MR 5, determine which list of on-site stormwater management BMPs from the Drainage Manual, Volume I, Section 2.5.5 applies. [Bulletin #89](#) will help you determine which minimum requirements apply to your project.

- If MR 1 - 5 apply, the requirements for MR 5 can be met by using List #1 or by demonstrating compliance with the LID Performance Standard.

- If MR 1 - 9 apply, the requirements for MR 5 can be met by using the following:
 - ⇒ For new or redevelopment on any size parcel inside the UGA or located outside the UGA on parcels less than 5 acres use (applicant option):

LID Performance Standard and BMP T5.13 OR List #2

- ⇒ For new or redevelopment outside the UGA on parcels 5 acres or larger use:

LID Performance Standard and BMP T5.13

Step 3: If List #1 or List #2 has been selected, review the BMPs provided for each type of surface: lawn and landscaped areas, roofs, and other hard surfaces (see Drainage Manual, Volume I, Section 2.5.5). The BMPs listed under each surface type are prioritized. Start with number 1 for each applicable surface type and review the feasibility criteria located in the Drainage Manual. If the first BMP in the list is determined to be infeasible, move to the second BMP, and so on. For each surface type, the first BMP in the list that is determined to be feasible is the one you are required to use.

<u>Surface Type</u>	<u>List #1</u>	<u>List #2</u>
Lawn and Landscaped Areas:	1. T5.13	1. T5.13
Roofs:	1. T5.30 or T5.10A 2. T5.14A or T7.30 3. T5.10B 4. T5.10C	1. T5.30 or T5.10A 2. Bioretention (Vol. V, Chap.7) 3. T5.10B 4. T5.10C
Other Hard Surfaces:	1. T5.30 2. T5.15, T5.14A or T7.30 3. T5.12 or T5.11	1. T5.30 2. T5.15 3. Bioretention (Vol. V, Chap.7) 4. T5.12 or T5.11

Note that BMPs T5.10A, B, and C are described in the Drainage Manual, Volume III, Section 3.1. All other listed BMPs are described in Volume V, Chapters 5 and 7. Chapter 5 also contains additional LID BMPs that are not required by either List #1 or #2, but which can provide specific hydrologic modeling credits assisting with flow control compliance under MR 7.

The infeasibility criteria will require documentation which must then be compiled into a report and submitted to the county with your stormwater site plan. Documentation in support of an infeasibility determination may include slope and soils analysis, depth to groundwater or hardpan, engineering calculations, available dispersion area and flowpath length, etc. - the specifics will depend on which BMP is being evaluated. At the end of this process you will either have a set of BMPs identified for your project or you will have determined that all of the LID BMPs on the list are infeasible. If all LID BMPs are infeasible, stormwater management would need to be provided through conventional facilities.

LID Performance Standard under MR 5: If required for the project or selected as the option for MR 5 compliance, stormwater discharges shall match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from 8% of the 2-year peak flow to 50% of the 2-year peak flow. Refer to the Standard Flow Control Requirement in Volume 1, Section 2.5.7 (MR 7) for information about the assignment of the pre-developed condition. Projects that must also provide flow control in accordance with MR 7 shall match flow durations between 8% of the 2-year flow through the full 50-year flow.

Use of this option allows more flexibility in LID BMP selection but will require hydrologic modeling by a professional engineer to determine if the discharge durations and rates meet the required standards. Hydrologic modeling and model requirements are discussed in the Drainage Manual, Volume III, Chapter 2.

Applying this performance standard, stormwater management may be accomplished in one of three ways:

- Solely by LID BMPs - this is the preferred method where feasible;
- A combination of LID BMPs and conventional facilities - use of LID BMPs allows for credits under modeling conditions and may result in smaller sized conventional facilities (compared to when conventional facilities are used alone); or,
- If LID BMPs are determined to be infeasible, stormwater management would be accomplished through conventional facilities alone - using the most current version or the hydrologic model, as required per SCC 30.63A. Conventional facilities will likely be larger under the new drainage requirements (effective January 22, 2016) than was required prior to adoption of the new standards.