Stormwater Management Plan Guidelines

On-site stormwater management plans (SMPs) are required for all development sites under the current Watercourse Protection Bylaw and under the Subdivision and Development Servicing Bylaw.

A preliminary SMP is required at the beginning of the development process. It must be integrated with

- The proposed layout
- Environmental protection plans
- Landscaping plans
- Geotechnical recommendations
- Tree management plans
- Site development layouts

SMPs must comply with current bylaw requirements, including federal and provincial requirements, the Metro Vancouver Stormwater Source Control Design Guidelines, and any other applicable municipal policies, standards, and design requirements.

The preliminary SMP report must include the following information

1. SMP reports and plans must include the following items:
    a. Rationale and description of how and where the three tiers are being achieved, including water quality requirements along roads and parking areas. For Tier A, include location and description of recommended mechanical controls, topsoil amendments, infiltration, bio-filtration and exfiltration efforts, and integration with proposed environmental protection areas and the proposed landscaping plans.
    b. Identify how drainage and pre-development flows will be integrated with any hydrological features observed on site or off site within 50 m, such as watercourses, ditches, ponds, wetlands, existing/proposed landscaping, or green infrastructure features.
    c. Identify whether development (existing or proposed) or groundwater in the general area may require coordination/integration of stormwater management resources for dealing with water volumes, velocities, and water quality both on site and off site.
    d. Where applicable, identify potential drainage impacts, challenges, or information gaps either on site or off site that might impact SMP solutions, with consideration for impacts on neighboring properties, environmentally sensitive areas, and landscaped areas.
2. Design the site to maintain natural hydrology and flows. Provide preliminary calculations for Tier A requirements, pre-development flows, and approximate sizing for any proposed surface level–detention or bio-filtration facilities. What percent of Tier A requirements are

being met? Include information on groundwater recharge, bio-filtration (topsoil amendments, rain gardens, and vegetative swales) and exfiltration (vegetation and trees) that is being used on site.

3. The report and final design plans must demonstrate how stormwater management designs will utilize low impact development designs, including consideration for the following:
    a. Designs must consider the form and functionality of the proposed measures, including ongoing maintenance requirements, access, and designs to avoid safety concerns
    b. Ensure that stormwater facilities, such as detention ponds and hard infrastructure, do not encroach into existing or future park areas or designated protected areas
    c. Minimize the amount of impervious area on site where possible—where surface water cannot be infiltrated, assess rainwater volumes and identify appropriate alternatives
    d. On-site SMP designs must consider potential impacts on existing or proposed landscaping, tree protection or replacement areas, and potential recharge of groundwater systems
    e. Consider green roof (intensive and extensive) measures where pervious surfaces and space is limited on site—this can help with rainwater storage, release rates, climate change abatement, and more attractive spaces for future residents

Three tier SMP principles

The three tier approach is outlined in the City's Design Criteria Manual. Additional information and requirements can be found in Stormwater Planning: A Guidebook for British Columbia as well as the most current stormwater guidelines from the Department of Fisheries and Oceans.

These three rainfall tiers correspond to three components of the integrated strategy for managing the site's complete spectrum of rainfall events.

Tier A events are first flush events that are typically less than 50% of the mean annual rainfall. These represent about 90% of all rainfall. These events should be captured at source to reduce runoff volume and provide rainfall capture.

Tier B events are larger rainfall events that are greater than half the size of the mean annual rainfall. These represent about 10% of the rainfall. Typically, these events are to be managed through detention in concert with infiltration and exfiltration.

Tier C events are the extreme rainfall events that may or may not occur in any given year. Tier C is separated into the minor and major systems and must provide adequate conveyance for runoff from extreme storms without causing property damage or impacts to public safety. Consideration for potential groundwater influences in certain areas, potential downslope impacts, and cumulative impacts of heavy rainfall events over time. In some circumstances the City may determine that the minor system must detain the 1:100 year event and release at an appropriate pre-development rate.

Designers are encouraged to think about combinations of stormwater source controls with a stormwater treatment chain to maximize benefits for the site including water quality, landscaping treatments, and green infrastructure low impact development. Tier A examples are as follows:

Development type	Absorbent landscape	Infiltration swale	Rain garden	Pervious paving	Infiltration trench/ shaft	Green roof
Park/open space May include parking/buildings	✓	✓	✓	✓	✓	✓
Low volume road With roadside or medians	✓	✓	✓		✓	
Surface parking On-street/off-street w/islands	✓	✓	✓	✓	✓	
Single family/low density 30–50% building coverage*	✓	✓	✓	✓	✓	✓
High density/industrial/ commercial/institutional 50–90% building coverage*	✓	✓	✓	✓	✓	✓
Ultra high density > 90% building coverage*						✓

* Building coverage refers to the percent of the building footprint covering the site