5. Rainwater Management Requirements Represent a New Beginning

During the next couple of years, the City underwent a renewal process that took a critical look at its rainwater management requirements and reaffirmed commitment to the watershed-based approach to community planning. The process culminated in the development and adoption of the *Rainwater Management Design Requirements and Guidelines* (March 2009).

Back to the Drawing Board

Throughout 2008 and 2009 the City conducted a survey of municipalities to find out what source controls were being used and how they were performing.

Under direction from Peter Steblin, Coquitlam City Manager, a series of workshops was held with developers, consultants, engineers and stormwater experts from across Canada to work through the issues. The information gleaned from the workshops and survey was used to rework the LID manual into the Rainwater Management policy used today.

Systems Approach & Net Environmental Benefit

"The City renewed their commitment to watershed-based planning. This reflected the experience and work to date with Integrated Watershed Management Plans, in addition to knowledge gained from the source control workshops and survey," reflects Bill Susak, retired General Manager of Engineering and Public Works.

"Council endorsed a new 'systems approach' philosophy which aims to offset impacts in one area of a watershed with gains in another for a 'net environmental benefit'," Bill continues. "The objective was to meet or exceed the standard of no net loss (of fish habitat) used by the Department of Fisheries and Oceans."

"Recognizing the limitations of source control application on single family lots required that watershed plans deliver a strategy to augment rainfall capture shortfalls with works in other areas in order to achieve a net overall benefit," adds Jason Cordoni.

Rainwater Management Design Requirements and Guidelines

As a result of reworking the LID manual and policies, a new approach to source controls was developed. Refer to Exhibit 3 (on page 10)

It features practical, performance-based requirements which apply to all subdivision and building permit applications in watersheds with an IWMP.

The rainfall capture criteria are tailored to each watershed and specified within each IWMP.

Implementation: The new requirements remove the burden of formal permitting, security or inspection for single family building permits. Larger developments are required to have professionals undertake and oversee the requirements with drainage works being regulated within the existing subdivision approval process.

All applications are required to preserve the natural hydrologic regime to the greatest extent possible, but flexibility is built in for the City to accept equivalent or innovative measures.

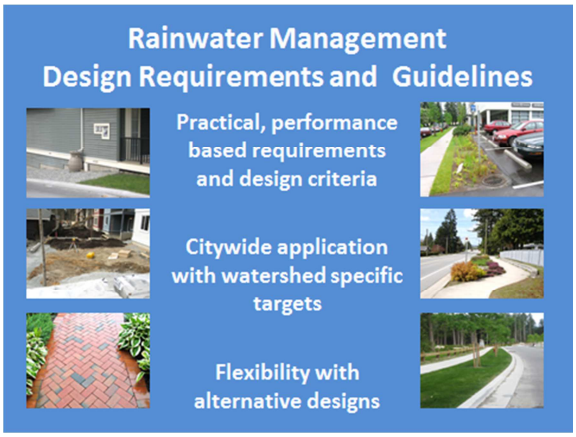
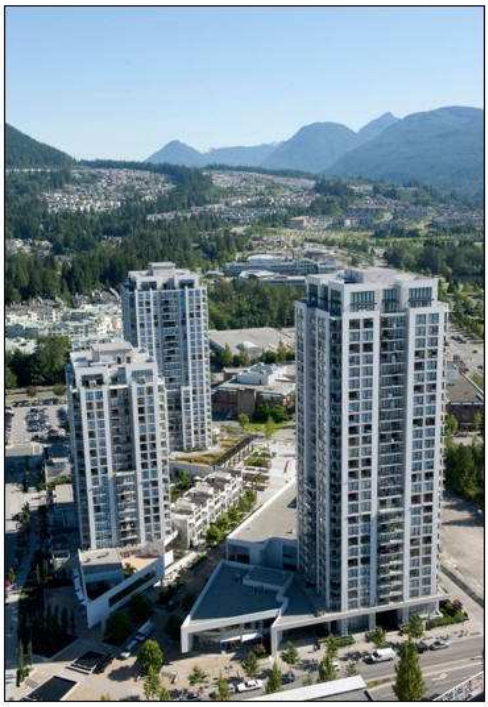


Exhibit 3: Summary of Rainwater Source Controls by Land Use Type



Land Use	Source Control
All single-family lots	• 300 mm topsoil in landscaped areas • Hard surfaces graded to landscape areas • Encourage the use of permeable paving material and rain barrels
Multi-family, housing choices commercial, institutional, industrial	• All of the above • On-site infiltration/retention trench or alternative measures • Designed to maximize stormwater volume reduction targets in applicable IWMP's
City roadways in urban residential areas	• 300 mm of topsoil in landscaped areas • Roadside surface swales in unobstructed boulevards, adjacent to parks and open spaces • Below grade retention trench in all other locations

Assessment of Source Controls

To address the concerns addressed earlier about the performance of source control facilities in sloped areas with bedrock and saturated conditions, the City used a $10,000 Provincial Infrastructure Grant in 2011 to test the performance of on-site infiltration trenches.

"We set up flow monitors at two identical townhome sites which have their roof and on-site drainage directed to infiltration trenches. We plugged the trench on the control site and left the other one active and then measured the flow downstream of both for one year," explains Melony Burton.

Runoff Volume Reduced: "The flow monitoring data results clearly demonstrated the effectiveness of an infiltration trench, even with the apparent constraints noted for the site."

Annual runoff from the site with an infiltration trench was less than 10% of the annual rainfall (90% infiltration), which meets both volume reduction and water quality treatment criteria set by Fisheries and Oceans Canada. Peak runoff rates from the treated site were also a fraction of that from the untreated catchment.

"With the relatively continuous rainfall we get in the winter months a source control facility can remain full between rain events, with the overflow heading directly to the drainage system," says Melony. "But although this condition may occasionally occur, it did not negate the benefit of the facility and its overall performance and benefit on an annual basis. And consistently, even throughout the wet months, the infiltration site outperformed the site with no trench," she adds.

Water Quality Improved: At the same time, water quality was being monitored in a newly installed bioswale median on Lougheed Highway.

The median used an engineered soil and special filter media to remove pollutants from the road runoff.

"Those results were also positive," Melony comments, "showing an 80-90% reduction in contaminants like nitrate, zinc, copper and total suspended solids."

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