



Green Infrastructure & Stormwater Management CASE STUDY

Vancouver Public Library

Location: Vancouver, British Columbia, Canada

Client: City of Vancouver

Design Firm(s): Architects: Moshe Safdie Architects – Moshe Safdie, Phillip Matthews
Downs/Archambault & Partners – Ron Beaton

Landscape architect/Project contact: Cornelia Hahn Oberlander, FASLA

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Photo: Greenroof.com

Project Specifications

Project Description: With fourteen inches of growing medium as well as a cover of plant material the roof provides insulation, resulting in energy savings with less mechanical cooling and heating costs. The green roof protects the roof membrane and thereby reduces costly maintenance to the membrane. The 33,000 cubic foot area of the roof provides increased stormwater retention and therefore less strain on the city stormwater sewer system. The roof provides a visual amenity for all of the hundreds of people who look out over the green space which translates into more productive staff and visual pleasure. There are no land costs for this benefit.

Project Type:

Part of a new development

Design features: Green roof.

This project was designed to meet the following specific requirements or mandates:

Provincial statute

Impervious area managed: 1 acre to 5 acres

Amount of existing green space/open space conserved or preserved for managing stormwater on site: less than 5,000 sq/ft. The green roof replicated the building footprint. The Library Roof was designed to improve the ecology of an area of the city that contains no parks and only a few trees. Air quality was improved through photosynthesis of plant life. The exchange of carbon dioxide and carbon monoxide result in greater volumes of oxygen. More plants means increased humidity. Plants absorbing heat and lowering ambient temperature reduce the 'Urban Heat Island Effect'.

The regulatory environment and regulator was supportive of the project.



Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements? The city has recently asked the original team of architects and landscape architect to review the inaccessible roof to determine whether it could be redeveloped into a public rooftop park.

Cost & Jobs Analysis

Estimated Cost of Stormwater Project: \$100,000-\$500,000 (Public funding: Federal, provincial, local)

Related Information: Constructed in 1995.

Was a green vs. grey cost analysis performed? No

Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)? Stormwater is

managed through stormwater retention. The fourteen inches of permeable surface slows runoff thereby reducing strain on city storm sewers and well as acting as a reservoir to hold water for the plants, reducing the need for irrigation. Plants also absorb and filter pollutants from the rainwater. The drainage material has a eggcrate construction which adds to the water retention.

Number of jobs created: Not available

Job hours devoted to project:

Planning and Design: Not available

Construction: Not available

Annual Maintenance: 10,000

Performance Measures

Stormwater reduction performance analysis: Public Works Canada funded a two-year research project to monitor stormwater runoff from the roof at Library Square. The measured stormwater runoff showed a 16% reduction in volume when compared with that estimated for a traditional flat roof. The maximum possible reduction is 33% for natural, pre-development conditions at the VPL site. This represents a 48% reduction in runoff in volume. The green roof also reduced peak flows during summer storm events. Library Square has pushed attitudes of urban design in Vancouver towards new dimensions for greening roofs by challenging old ideas with fresh, innovative thinking that builds on current research and good design.

Community & economic benefits that have resulted from the project: For the hundreds of workers and condominium dwellers who look out onto the Library roof there are social and therapeutic benefits in seeing a well-designed, aesthetically pleasing roof garden of low maintenance, enhancing the view of the city with grasses, groundcovers and 18-ft tall trees. The roof has provided, through tours, lectures and the Introductory Manual for Greening Roofs, a broad educational opportunity for many people to discover the possibility for green roofs. On-going research continues this educational component.

Additional Information

www.corneliaoberlander.ca

