



Vegetated Roof

This **Advanced Method and Material** was developed jointly by the City of Bellingham Public Works Department and Sustainable Connections to increase stormwater infiltration by providing means for the installation of a vegetated (green) roof.



BENEFITS

Vegetated Roofs significantly reduce stormwater runoff and their insulating properties cut energy use. Additionally, the vegetation helps clean the air and can reduce the “heat island” effect in which cities and their pavement and black rooftops are hotter than undeveloped landscapes. Additional benefits include:

- ❖ Increased energy efficiency
- ❖ Reduced stormwater flows
- ❖ Improved air quality
- ❖ Lower heating and cooling costs
- ❖ Increased wildlife habitat
- ❖ Contribute LEED® points for your project

A Vegetated Roof (also known as a green roof or ecoroof) replaces conventional roofing with a living, breathing living roof system. A vegetated roof consists of a layer of vegetation over a growing medium on top of a synthetic, waterproof membrane. It can significantly decrease stormwater runoff, save energy, reduce pollution and erosion, and helps preserve fish habitat. Living rooftops also absorb carbon dioxide, cool urban heat islands, and filter air pollutants. A vegetated roof can increase habitat for birds and insects and provide much needed greenspace for urban dwellers.

Vegetated roof technologies not only provide the owners of buildings with a proven return on investment, but also represent opportunities for significant social, economic and environmental benefits, particularly in cities.

POLICY/CONDITIONS

A vegetated roof may be installed when the following conditions are met:

- The design must be done in accordance with Bellingham Municipal Code 15.42, the Low Impact Development Technical Guidance Manual for Puget Sound and the Stormwater Management Manual for Western Washington.
- Proof that the existing/new roof meets the ability to support the added weight of a vegetated roof (building code requirement).

SCOPE

Vegetated roofs can be installed on almost any building roof with slopes up to 40 degrees and that meet the engineered roof allowances.

DEFINITIONS

Vegetated roofs (also known as green roofs) fall into two categories: intensive and extensive. Intensive roofs are designed with a relatively deep soil profile (6 inches or deeper) and are often planted with ground cover, shrubs, and trees. Extensive vegetated roofs are designed with shallow, light weight soil profiles (1 to 5 inches) and ground cover plants adapted to harsh conditions of a roof top environment (minimal soils, seasonal drought, high winds, and strong sun exposure).

PERMIT REQUIREMENTS

City of Bellingham Building Permit (to determine ability to support weight of roof).

*in order to receive credit for stormwater fees, design needs to meet DOE standards.



Vegetated Roof (cont'd)

COMPLIANCE WITH THESE STANDARDS

- Bellingham Municipal Code 15.42
- Low Impact Development Technical Guidance Manual for Puget Sound
- Stormwater Management Manual for Western Washington

REFERENCES / SOURCES

Puget Sound Action Team – Low Impact Development – Technical Guidance Manual for Puget Sound
Washington Department of Ecology – Stormwater Management Manual for Western Washington

FINANCIAL INCENTIVES

City of Bellingham

Use of a vegetated roof will help to meet criteria that could qualify a project for a 50% reduction in the stormwater development charges. See Bellingham Municipal Code 15.16.030(B)(3) or contact City staff for details and criteria about the reduced stormwater development charges.

Additionally, a vegetated roof can also be incorporated into a project to help avoid the triggering of the 0.1 cfs increase in flow for the 100-year storm threshold to require stormwater detention or to reduce the required size of stormwater mitigation facilities by using allowed stormwater modeling credits. Credits can be found in Stormwater Management Manual for Western Washington published in 2005 or the Low Impact Development Technical Guidance Manual for Puget Sound.



ADDITIONAL RESOURCES

Bellingham Green Roofs

The best in local green roof resources, case studies and current projects.
www.bellinghamgreenroofs.com



Portland's Ecoroof Handbook

An excellent resource that contains information the city has gathered since 1996 through ecoroof research, construction, and monitoring. The information applies to Pacific Northwest conditions, mainly west of the Cascades.
www.portlandonline.com/bes/index.cfm?c=50818&a=259381



Green Roofs.com

A site dedicated to promote and inspire the earth friendly technology of organic greenroof architecture through the interchange of ideas, projects, news, video, travel, research, organization and government updates, marketing opportunities and exclusive features via the web.
www.greenroofs.com

Green Roofs for Healthy Cities

A rapidly growing not-for-profit industry association working to promote the industry throughout North America.
www.greenroofs.org

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