



Bringing quality
to the
built environment

Sustainability of Green Roof Technology

Objectives

To demonstrate the benefits of green roof technology in urban areas and to help overcome technical barriers to its adaptation and use in Canada.

Background

Green roofs are specialized roofing systems that support vegetation growth. Properly designed and constructed, they can improve the energy efficiency of the roofing system, thus reducing the building's heating and cooling costs. They retain rainfall and delay run-off, and they can play an important role in storm water management. They can also improve air quality and biodiversity, and they provide much-needed green space.

Statement of Work

We will:

- Monitor the thermal performance of a heavyweight 80-m² green roof at our research facility in Ottawa and a lighter-weight 450-m² green roof on a facility in downtown Toronto
- Undertake field experiments to examine the various heat-transfer mechanisms of green roofs, such as shading, insulation, evapotranspiration and thermal mass, and explore ways to optimize energy efficiency, while keeping the weight of the roof system low
- Develop equipment to simulate rainfall on a green roof and to evaluate its retention by the roof
- Seek to improve the winter performance of green roofs by varying the system configurations and plant selection and location.

Expected Outcomes

A protocol will be developed to evaluate the efficiency of various green roof systems in retaining storm water. Thermal performance will be provided to building professionals for use in design and to specialists for use in developing models to evaluate the energy efficiency of green roofs.

Partners

Bakor Inc., British Columbia Institute of Technology, Canadian Roofing Contractors' Association, City of Toronto, Energy Efficiency Fund, Environment Canada, HydroTech, IKO, Program for Energy Research and Development, Public Works and Government Services Canada, Roof Consultants Institute, Soprema, Tremco.

Start/Expected Completion Dates

This project began in 2004 and will be completed in 2006.

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For more information, see <http://irc.nrc-cnrc.gc.ca/greenroofs>

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NRC's Field Roofing Facility

