



Networked Neighborhoods for Eco-Conservation

GREEN ROOFS

What are green roofs?

Green roofs are rooftops that are planted with a variety of vegetation. They can vary in type but generally they all have a water proofing and protective root barrier layer, a filter fabric, drainage, growing medium, and plants. Some also have an insulation layer, which may be required by building codes. The protective layer may consist of light weight concrete, thick plastic, or rigid insulation. The filter fabric may consist of 1-2 layers of non-woven geotextile fabric, which is used to prevent fine particles from being washed out of the substrate soil. It may also serve as a root barrier. The types of plants vary depending on the type of green roof desired, climate, and the roof's slope.

What are the major types?

The two major types of green roofs are classified as "extensive" and "intensive". Extensive green roofs have a



Photo by Patricia Pennell, raingardens.org

shallow substrate or media layer, are lighter in weight, and less expensive. They consist of low growing plants that are drought and frost tolerant, such as succulents, mosses, and grasses. They do not require much maintenance. Intensive green roofs are more elaborate, have a deeper media layer, and are usually limited to flat roofs. They are often designed as a park-like setting. They have higher maintenance costs, and may consist of trees and shrubs as well as herbaceous plants. A third type of green roof is referred to as a wildlife roof. Roofs of this design simulate habitat needs of species that may inhabit the roof.

Are they beneficial?

Green roofs provide both ecological and economic benefits. A major ecological benefit is reduction in stormwater runoff, particularly in urban areas with a high percentage of impervious surfaces. By capturing the water and slowing down the water movement off the roof, green roofs can help to moderate flooding and decrease erosion. Studies have shown that green roofs can retain 60-100% of the stormwater they receive. Green roofs also promote biodiversity, particularly in urban settings, and can filter air pollutants.

Economic benefits include better insulation within a building, insulation from outside loud sounds, and

longer life-spans. It has been estimated that a green roof can last up to twice as long as a conventional roof. Green roofs also conserve energy and provide energy savings by protecting the roof from corrosive UV light and from extreme temperature fluctuations.

Often, there is also an aesthetic appeal to having a green roof. Studies have shown that property values can increase with green roofs, particularly when the roof is accessible.

Are there disadvantages?

While extensive roofs require minimal maintenance, intensive roofs require much more maintenance, and both require more maintenance than a conventional roof. Initial costs for both intensive and extensive roofs will also likely be higher than conventional roofs due to the costs of the materials and vegetation.

What are the costs?

Cost estimates vary. Intensive green roofs may cost between \$15 and \$35 per square foot of roof surface while extensive green roofs may range between \$5 and \$35 per square foot.

References and other information:

More detailed information on green roofs is available through various sources, a few of which are listed below.

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Getter, Kristin L., D. Bradley Rowe. 2008. Selecting Plants for Extensive Green Roofs in the United States Extension Bulletin E 3047, Michigan State University Extension.

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Rowe, Brad, et al. Green Roof Research Program. Michigan State University, East Lansing, MI <http://www.hrt.msu.edu/greenroof/>

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This fact sheet was developed by Lois Wolfson, Institute of Water Research (www.iwr.msu.edu) and Department of Fisheries and Wildlife, Michigan State University