Green Roofs

BENEFITS of a GREEN ROOF

- reduces pollution in our lakes and river systems by reducing storm water runoff
- conserves energy by insulating against heat loss in winter and heat gain in summer
- provides habitat for butterflies and birds
- reduces Urban Heat Island Effect (the increase in temperature caused by urban development and lack of natural areas)
- lasts longer than conventional roofs because the membrane isn't exposed to the elements

A Green Roof is a living roof, planted with vegetation. Green your whole roof or get started with a shed, garage, greenhouse, or awning! You can grow mosses, flowers, grasses, vegetables and fruits... some roofs can even support trees!

Getting started:

- Determine your roof angle. The easiest to work with are over 2 degrees but under 20 degrees.
- Consult a structural engineer to make sure that your structure can handle the extra weight of a green roof.
- If needed, have the engineer make plans to reinforce your structure. You may need a permit.

Design:

- Build a containment frame around the perimeter of your green roof.
- The frame needs to have holes for drainage.
- If you use wood to make the frame, choose a rot-resistant type like Cedar.
- If your roof slope is more than 20 degrees, construct a simple grid interior frame to prevent erosion and soil slippage.

Substrate

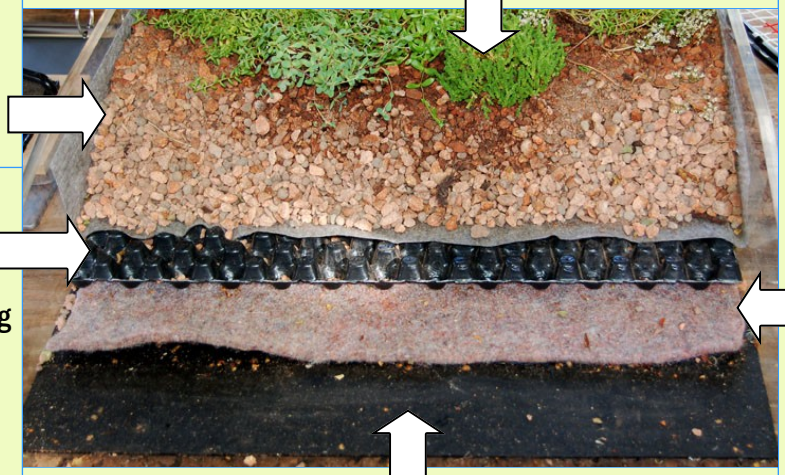
Most roofs will require between 20-100 mm of substrate. Natural soils are heavy when wet, so use a mixture of organic material (compost, leaves) and earth. Other materials like crushed brick or expanded clay can be mixed in to lighten it more.

Filter Layer

This layer prevents the substrate from entering the drainage layer, blocking water from draining. If the roof slope is greater than 10 degrees it is not necessary to put a filter layer on the entire roof, just around the perimeter and outlets. This layer can be made from a lightweight polyester geotextile.

Planting

There are lots of plants to choose from! You can use pre-vegetated mats, plant cuttings, seedlings, or seeds. The most popular for lightweight green roofs are sedums or wildflowers that are hardy, drought tolerant, and have shallow non-woody roots. Native species create habitat for wildlife, require no watering once established, and thrive on roofs because there is little competition from weeds!



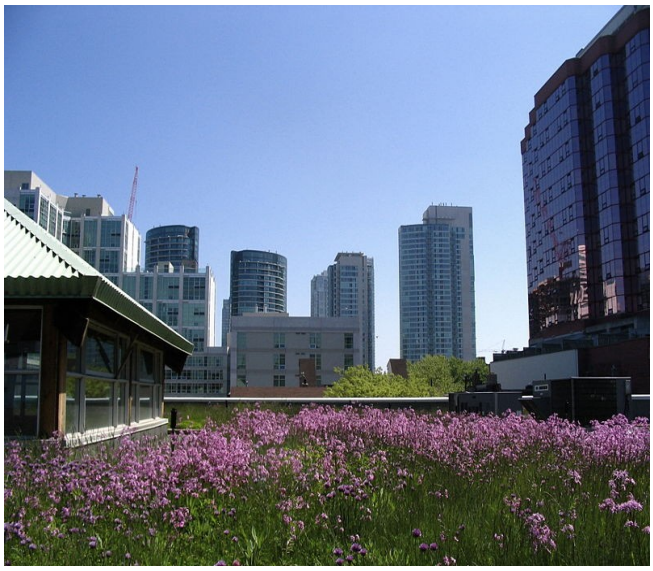
Water/Root-Proof Membrane

To avoid a leaky roof, put down a water-proof membrane that is also root-proof. Even the tiniest hole can cause big problems, so be careful not to damage the membrane. Seal the seams. Heavy duty pond liners work well.

Drainage Layer

Some green roofs can't absorb all the storm water they receive; the drainage layer allows the excess water to drain off the roof. Without it, your plants could develop root rot. If your roof slope is greater than 10 degrees, gravity will do the work, but if less than 10, this layer is necessary. You can buy pre-made plastic drainage layers, but it is best to use a more natural product like gravel, pumice or expanded shale. You need to create outlets to allow water to access the gutters, and keep them free of debris and vegetation with a filter sheet filled with pebbles.

Green Roof Resources



Books

- Planting Green roofs and Living Walls by Nigel Dunnett and Noel Kingsbury
- Green Roof Plants by Edmund C. Snodgrass and Lucie L. Snodgrass

Web Resources

- Manitoba Association of Landscape Architects
  www.mala.net
  (provides a listing of all certified landscape architects in Manitoba)
- Manitoba Association of Architects
  www.mbarchitects.org
  (provides a listing of all certified architects in Manitoba)
- Association of Professional Engineers and Geoscientists of the Province of Manitoba
  www.apegm.mb.ca
  (provides a listing of all certified engineers in Manitoba)
- Manitoba Chapter of the Canadian Green Building Council
  www.cagbc.org/chapters/manitoba/resources/sustainable_building_network.php
  (provides resources on green building)