

# HEAVEN'S ABOVE

*Green roofs confer aesthetic and environmental benefits*

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BY PHILLIPA RISPIN  
PHOTOGRAPHY: BRETT RYAN STUDIOS

*There's a certain charm to the idea of a rooftop terrace, a patch of green amid all the grey and brown, the concrete and tar of most city skylines. But there's also a great deal of benefit from a rooftop terrace or, better yet, an entire green roof.*

The term "green" is sometimes defined rather loosely, so we'll go with the definition used by Green Roofs For Healthy Cities, a North American industry association: a green roof is a "contained green space on top of a human-made structure," a form of "living architecture."

Ron Schwenger is principal of the firm Architek Sustainable Building Products, a living architecture technologies company in Vancouver. He explains a green roof as "vegetated overburden" on a roof, analogous to the overburden of shingles or tar and gravel. And we're not talking about planters or other containers scattered decoratively across the expanse; we're talking major coverage – up to an entire roof. ☞

Photos courtesy of Architek





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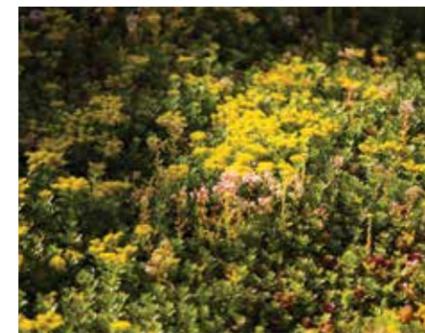
There's no doubt that green roofs impart a sense of beauty and a feeling of being close to Nature amid urban concrete and glass. Green roofs touch both the public and private domains, says architect Owen Rose, principal of Rose Architecture in Montreal who has been building green roofs since 2004. "Greening of the city helps calm people down and produces less stressful environments," he says. He also points out that "with any gardening, whether it's the roof or the front yard or wherever, it creates opportunities for social exchange." In addition, "There's also a better connection between us and Nature. We're more connected to why the environment is important."

Apart from aesthetics, green roofs have immense practical value. They reduce the urban heat island effect. All those areas of the city that used to be grass and trees are now glass and concrete, being hit by sunlight and keeping local temperature elevated—a microclimate that's unwanted in what seem to be increasingly warm summers. Countering this is vegetation, which has a daily dew and evaporation cycle. It also shades and reflects sunlight, helping to cool the area.

Green roofs play another important part in local ecology. "We rely very heavily on pollinators, both insects and animals, for our food supply," Schwenger says. "A green roof provides habitat for insects."

A vegetative carpet insulates a building during the winter and provides cooling through transpiration in the summer. According to the 2015 Annual Green Roof Industry Survey, some green roof systems reduce daily energy demands by as much as 75 per cent. The survey also notes that they provide an acoustic buffer year-round and help reduce pollution by trapping particulate matter and airborne pollutants.

Storm-water management is a major, if not *the* major, objective of green roofs in urban areas. Joy Schmidt, president of Vitaroofs International, points out that in dense urban areas "lots of condos are being built. Green spaces are being replaced with impermeable surfaces like concrete. Where is all the water going?" A heavy rainfall can quickly overwhelm storm sewers, as residents of Toronto and Montreal know all too well. ☞





“A green roof retains a certain amount of water on the rooftop so it’s not a strain on the sewage system,” Schmidt says.

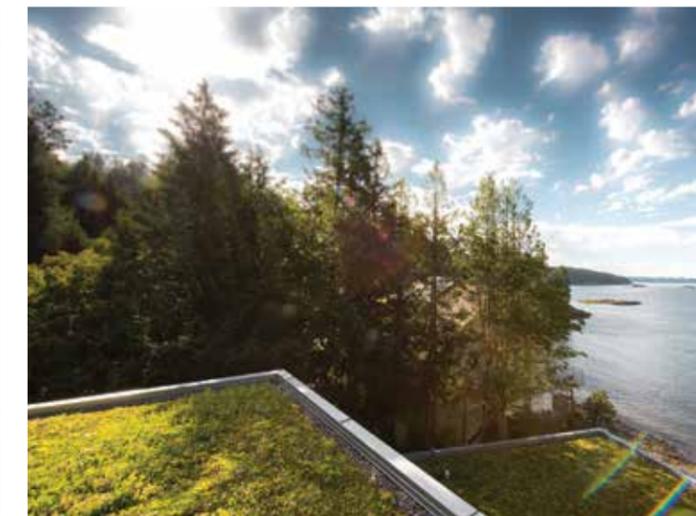
Although green roofs have been popular in Europe for decades, they’ve only recently been making an impact in North America. Schmidt did her bit to start the trend. In her native Germany she worked with Wolfgang Behrens, known as “the father of green roofs.” She was part of Behrens’s team that installed in 2002 what is one of the world’s largest extensive green roofs, on the Ford Motor Company’s plant in Michigan. When she arrived in Toronto, she continued advocating for green roofs. She was commissioned by renowned architect Eberhard Zeidler to install on his home what is claimed to be the first green roof on a Toronto residence.

In 2009, the City of Toronto, cognizant of the benefits of green roofs, became the first city in North America to require green roofs on most new development whether residential, commercial or institutional. Quebec is the first jurisdiction in North America with a province-wide set of norms for green roofs.

What goes on a green roof depends on the local climate. Sedums are popular, being hardy succulents that are drought-tolerant. More elaborate installations can include grasses, flowers, vegetables and even shrubs.

For a homeowner, there’s an immediate practical reason to want a green roof: it protects the roof membrane. A green roof on a residence typically consists of several layers: at the bottom a root barrier, then a protection mat or a drainage layer (which usually can hold some water), a filter sheet, growth medium, and vegetation. These layers are protective of the roof membrane.

“A green roof can give a huge return on investment,” says Schwenger. “Roof membranes break down because of temperature differences between night and day; membranes are constantly expanding and contracting. A green layer on a membrane keeps the temperature constant, so a roof membrane can last four times as long as normal.”



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Practically any flat roof can be “planted” as long as it is structurally able to carry the weight involved. (Some sloped roofs are also suitable but can be more complicated to deal with.) The investment required varies widely, depending on the type of roofing – membrane, built-up (tar and gravel), or modified bitumen (single-ply rolled) – and the structural strength of the building.

Rose, who has LEED certification and is active in the Groupe de travail sur les toitures végétalisées (GTTV) of Montreal, estimates that, in Montreal, costs run between \$18 and \$25 per square foot for a new membrane and a uniform vegetated roof; for a green roof system alone, the cost per square foot could be \$12-\$16 for a basic installation.

The roof must also be maintained, just like a garden. Regular maintenance is required to sustain lush and healthy vegetation. The upside is that regular maintenance probably costs less than fixing a neglected roof, says Schmidt.

Installing a green roof is not a do-it-yourself project. The building must be structurally sound, which often requires assessment by a structural engineer. The installation is also best left to experts such as companies with plenty of experience or individuals with Green Roof Professional accreditation, conferred by Green Roofs for Healthy Cities. Some professionals with LEED (Leadership in Energy and Environmental Design) certification are also well-versed in the installation of green roofs. Green Roofs for Healthy Cities publishes an industry directory of reputable companies.

Having a green roof takes some forethought, but the results are worth it. It’s a boon for the environment, it’s a civically responsible thing to do. And it can soothe the spirit. As Rose says, a green roof can be “captivating, poetic.” Good reasons, all. ☛

**FOR MORE INFORMATION:**

Green Roofs for Healthy Cities - North America Inc. [www.greenroofs.org](http://www.greenroofs.org)

Green Pages: Green Roof & Wall Industry Directory 2015/16. [www.issuu.com/grhcna/docs/grhc](http://www.issuu.com/grhcna/docs/grhc)

Annual Green Roof Industry Survey. [www.greenroofs.org](http://www.greenroofs.org)

