

Homes

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Arctic poppies bloomed on the green roof at the Phillips Eco-Enterprise Center in Minneapolis.

Plant-covered roofs can cut heating and cooling costs, help eliminate excess rain runoff and last years longer than traditional shingled roofs. And on some local condo projects, green roofs give residents another cool place to hang out.



Photographs by Joey McLeister/Star T

Corrie Zoll weeded the plant-covered roof of the Phillips Eco-Enterprise Center in Minneapolis, one of an increasing number of green roofs that are sprouting in the Twin Cities area. While most such roofs are on commercial buildings, some residential projects are using them as well.

Growing advantage

By Jim Buchta
Star Tribune Staff Writer

Residents of the Edgewater, a new condominium building along Lake Calhoun, will get to enjoy a carpet of prairie plants that will burst into a sea of wild color when they're planted next summer.

On their roof.

To the developers of the 23-unit Edgewater in southwest Minneapolis, the 9,000-square-foot "green roof" covered with 4 to 6 inches of soil won't just look pretty. It will absorb rainwater, be good for the environment and prolong the life of the roof.

Get used to the idea. An unprecedented number of green roofs are coming to the Twin Cities. More than a dozen green-roof projects are planned for a variety of buildings, including the new landmark public library in downtown Minneapolis, where crews started planting the roof last week (to see photos of the installation, go to www.startribune.com/homes).

Mike Dean, a sales agent with Freedom Financial Realty, the company that's building the Edgewater, said the developer is spending extra for the green roof because it wants to embrace as many innovative building techniques as possible.

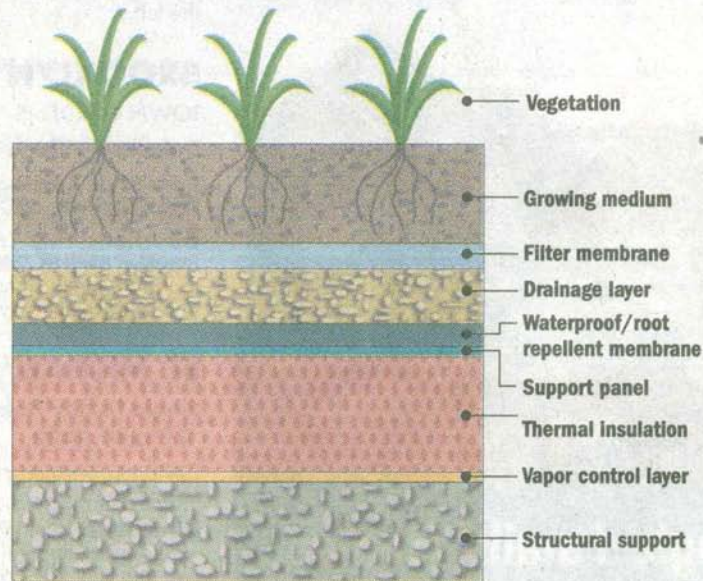
Cutting-edge the new green roofs may be, but variations go back to an ancient building technology that predates asphalt shingles.

How they work

Green roofs come in many forms, but generally, the roof system is composed of several layers, as illustrated below, including a waterproof membrane, a drainage layer, growing medium (soil) and the plants themselves.

There are two types of green roofs:

- ▶ **Intensive roofs** have more than a foot of soil and resemble a traditional garden that can be used like a public park.
- ▶ **Extensive roofs** have 1 to 5 inches of soil and are not designed for public use.



Source: Green Roofs for Healthy Cities (www.greenroofs.org).

ROOFS continues on H12



Photographs by Joey McLeister/Star Tribune

Besides a green roof, the Phillips Eco-Enterprise Center has a prairie restoration area on its grounds.

ROOFS from H1

Green-roof technology has advanced, but price is an issue

Remember the sod house that Laura Ingalls Wilder lived in on the Midwestern prairie? And native tribes in parts of Alaska used thick slices of sod to help keep out the weather.

In big cities like New York and throughout Europe, rooftop gardens date back to the late 1800s. Noted landscape architect Frederick Law Olmsted designed some of the earliest green roofs atop New York City penthouse suites.

Minnesota is a late bloomer in this trend. One of every eight buildings in Germany has a green roof; in Chicago, there are plans to create 1.6 million square feet of such roofs, said Corrie Zoll, project manager for the Green Institute's GreenSpace Partners program, one of the local pioneers in the green roof movement.

Here, developers are trying to respond to growing concerns about the amount of run-off that's flowing into city lakes and streams. Minneapolis recently passed an ordinance that will provide utility credits to people who reduce the amount of rainwater that ends up in city sewers.

"We're seeing more and more of it here," said Bruce Jacobson of Close Landscape Architecture, who was part of the design team that created the sixth-floor terrace at Skyscape Tower in the Elliot Park neighborhood.

"We're taking advantage of spaces

that we wouldn't have considered accessible," he said. That includes rooftop spaces normally reserved for compressors, vent covers and fans.

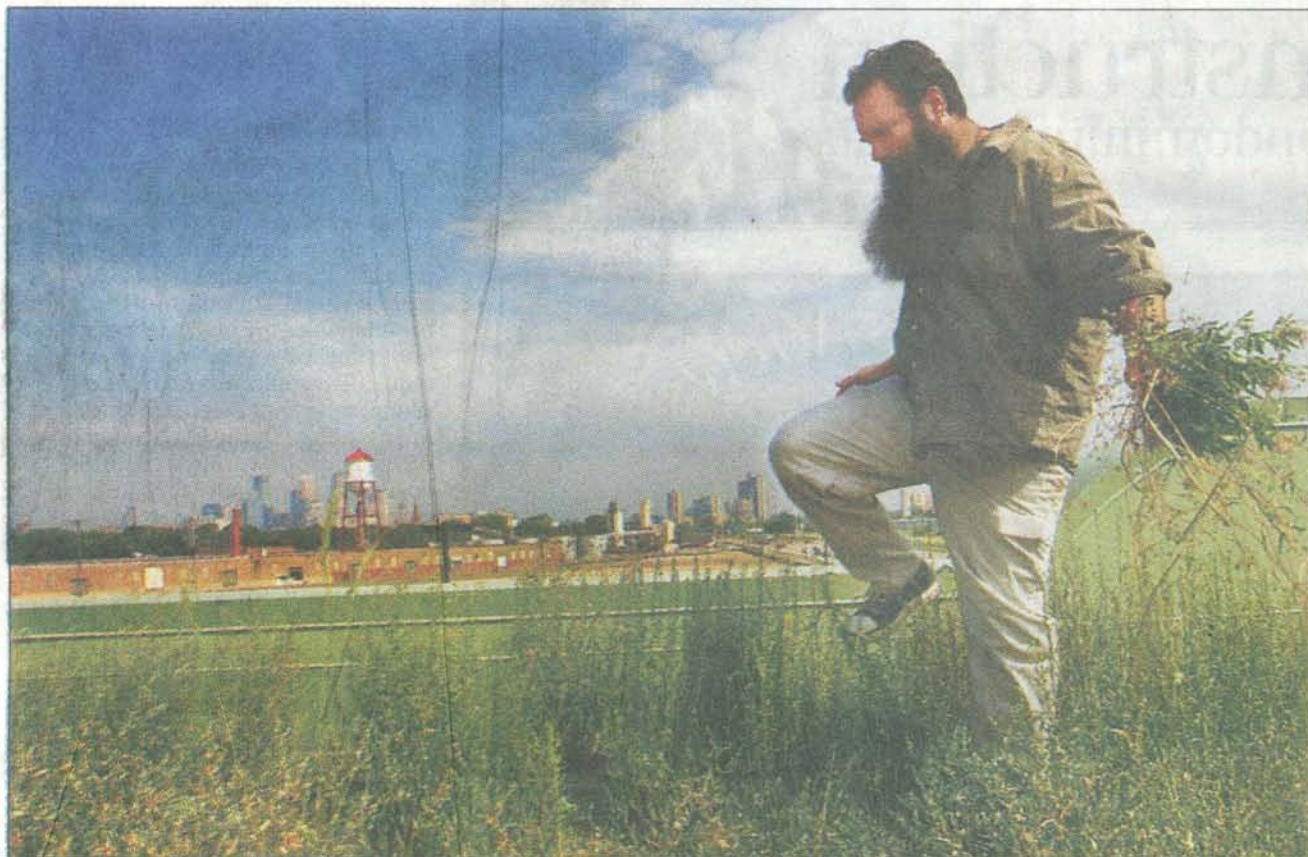
Developers say green roofs can reduce the cost of heating and cooling a house and can double the life of a rubber membrane roof because the soil and plants protect it from the extremes of Minnesota's harsh weather.

In addition, green roof technology is more advanced than ever. Rubber membranes are more durable, installers are more experienced and there are more sophisticated ways of diagnosing problems, if any should arise.

For many people, the cost is still prohibitive. Green roofs cost about 2½ times more than a traditional roof, but prices are likely to fall as production increases. The cost can vary widely, depending on size, depth, vegetation and accessibility. A shallow, lightweight green roof, including growing material, waterproof membranes and irrigation, can be installed for \$12 to \$24 per square foot, according to www.greenroofs.org, a website devoted to the subject.

Earlier this year it was estimated that designing and planting the green roof on the new Minneapolis Public Library building would cost about \$300,000.

Worries about hard-to-find leaks long have been a strike against green roofs, too. But a new leak detection sys-



Corrie Zoll had a spectacular view as he maintained the green roof on the Phillips Eco-Enterprise Center in Minneapolis. A variety of grasses, plants and cactus grow on the roof.

tem that was installed under the Green Institute's green roof for about \$3,000 will help locate leaks within a couple of inches of where they occur.

At Carleton College in Northfield, a team of students is building a green roof on top of one of the campus build-

ings to test more drought-resistant prairie plants. David Holman, one of the students working on that project, said that in addition to the environmental benefits, there are other compelling reasons why green roofs make sense.

"There are a lot of studies that show

that people like seeing plants," he said. "It is an essential connection to the natural environment that isn't just a gimmick."

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Green roof benefits

- Reduces heating and cooling costs. An asphalt roof can heat up to almost 170 degrees; a green roof will keep the roof a few degrees cooler than the ambient air temperature.
- Storm water management. A roof with 4 inches of soil can absorb a 1-inch rainfall.
- More than doubles the life of a rubber membrane roof, from 15 to 20 years to 35 to 50 years.

Source: Corrie Zoll of the Green Institute's GreenSpace Partners

Roofs proposed/under construction:

- Carleton College is doing a 665-square-foot demonstration project on the roof of the Oir Science

native prairie plants.

➤ The new Minneapolis Public Library building will have a 14,000-square-foot green roof with both sod and native prairie plants.

➤ The Edgewater Condominiums will have a 9,000-square-foot green roof atop 23 luxury condominiums in southwest Minneapolis.

➤ Skyscape condominiums in Minneapolis' Elliot Park neighborhood is a 27-story high-rise building that will have a green roof, including space for lawn games on the sixth floor.

➤ The East Village Apartments in the Elliot Park neighborhood will have a green roof over underground parking.

➤ The Garden Gate townhouses/condominiums in Woodbury also will have a green roof over its underground parking garage.

➤ The Hennepin County Board authorized \$25,000 to be spent on design and structural improvements that would allow for future installation of a green roof over part of Minneapolis' City Hall.

➤ The Seward Neighborhood Group requested a grant for a neighborhood-wide program called Green Garages and Lots that will encourage residents to replace their garage roofs with a green roof that they've grown in their backyard.

➤ Lunds has requested permission to plant a green roof on the roof of its new store on Hennepin Avenue S. in Minneapolis.

Built:

➤ Brit's Pub in downtown Minneapolis has one of the most popular green roofs in the Twin Cities. It's used primarily for lawn bowling.

➤ The Crowne Plaza North Star Hotel in downtown Minneapolis has a park-like eighth-floor green roof.

➤ The Lebanon Hills Regional Park in Eagan has a green roof on its visitors center.

Jim Buchta