



The 2007 Green Roofs for Healthy Cities conference will be held in Minneapolis next spring. To learn more about the national trade organization hosting the event, or to obtain more information about green roofs, visit [www.greenroofs.net](http://www.greenroofs.net).

## Green design goes through the roof

**The Twin Cities have become a magnet for green roof builders.**

BY DAN EMERSON

To call it "The greening of Minneapolis" might be overstating the case, but there does seem to be a green roof trend developing in the metro area.

A major player in this movement is The Kestrel Design Group, a landscape architecture and sustainable design firm in Minneapolis, which planted the innovative green roof atop Minneapolis Central Library.

Peter MacDonagh, founder of the design company, cites two reasons why green roofs have gained a local foothold: increased concern about filtering runoff water before it enters rivers and lakes, and the desire to reduce energy consumption.

"A hot day is when green roofs are

**ON A RECENT 90-DEGREE DAY IN JULY, MINNEAPOLIS CENTRAL LIBRARY OFFICIALS MEASURED NOONTIME TEMPERATURES ON THE BUILDING'S ROOF. THEIR FINDINGS: THE BLACK ASPHALT PORTION WAS 170 DEGREES, WHILE THE GREEN SECTION MEASURED 92 DEGREES.**

most effective at saving energy," MacDonagh said. On a recent 90-degree day in July, Central Library officials measured noontime temperatures on the building's roof. Their findings: the black asphalt portion was 170 degrees, while the green section measured 92 degrees.

The library's \$773,700 green roof,

which contains more than 19,000 carefully selected plants, can also absorb massive amounts of rainwater. Any additional runoff is collected in a 7,500-gallon cistern system below ground that, when needed, pumps the water back to the roof using solar power.

A few days before the downtown library opened, building officials re-

ceived more proof of the roof's benefits, MacDonagh said. "They went up on the roof to test the AC equipment. The intake air readings on the green roof were so much cooler than they were used to, they thought their equipment was broken," he said.

MacDonagh and partner Elizabeth Ryan started Kestrel Design in Chicago in 1990, after working for an architecture firm specializing in zoo design. The two University of Minnesota graduates returned to the Twin Cities in 1996.

A native of Ireland, MacDonagh first experienced green roofs in the early '80s while serving horticultural apprenticeships in Norway and Germany. Green roofs and green walls have been used in Europe for many years, he said.

Kestrel Design finished its first green roof in the Twin Cities in 2002, which was a demonstration project for The Green Institute in Minneapolis. The 4,000-square foot roof won an award during the recent Green Roofs for Healthy Cities national conference.

THROUGH THE ROOF TO PAGE 8

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# Focal Point

## GREEN DESIGN AND CONSTRUCTION



### Through the Roof: 'There's a reason why Europeans have been doing green roofs for a long time.'

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Subsequent projects include a 30,000-square foot green roof at the Shakopee Mdwakanton Sioux Community wastewater treatment facility, a 9,000-square foot green roof atop the Edgewater condominiums near Lake Calhoun, and a green roof at the Crowne Plaza Northstar Hotel in Minneapolis.

Kestrel Design has another half-dozen green roof projects in the works, including City Hall and a Lunds grocery store in Minneapolis.

Industry data indicates that green roofs can reduce the power demand on HVAC units by 15 percent to 30 percent, while also prolonging the roof's lifespan and mitigating the urban heat island effect.

Green roofs are on average about 2 1/2 times more expensive than a conventional roof. They also weigh more, adding up to 20 pounds per square foot, and may require building upgrades to handle the load.

As for the design, "There is no single green roof design that fits all applications," Ryan said. "We design every roof for the particular situation." And in Minnesota's climate of extremes, selecting the right plants is essential. "We select native plants that grow on top of the cliffs along the Mississippi and Min-

#### Kestrel Design Group Inc.

**Description:** Landscape architecture and sustainable design

**Headquarters:** Minneapolis

**Founded:** 1990

**Management:** Elizabeth Ryan, president; Peter MacDonagh, vice president

**Contact:** 952-928-9600 or visit [www.kestrel-designgroup.com](http://www.kestrel-designgroup.com)



Kestrel Design Group founders Elizabeth Ryan and Peter MacDonagh sit atop the Central Library's green roof in downtown Minneapolis. (F&C photo by Bill Klotz)

nesota rivers," she said. Plants like the prairie dropseed can thrive in shallow soil without much nutrition, which makes them ideal for urban rooftops.

Aside from occasional weed removal, maintenance is relatively easy. The most important chore is preventing tree seedlings from taking root and damaging the waterproof membrane underneath the plants, MacDonagh said.

Green roofs are not just a fad, said

Dan Mehls, construction supervisor for M.A. Mortenson Co., general contractor for the library project. "The concept makes a lot of sense. There's a reason why Europeans have been doing green roofs for a long time," he said.

"They are more expensive — we have to upgrade structures to handle the additional load for soil and plantings, and add specialized membranes to keep them from leaking. But the U.S. is defi-

nately making a large move toward more energy-efficient buildings," Mehls said.

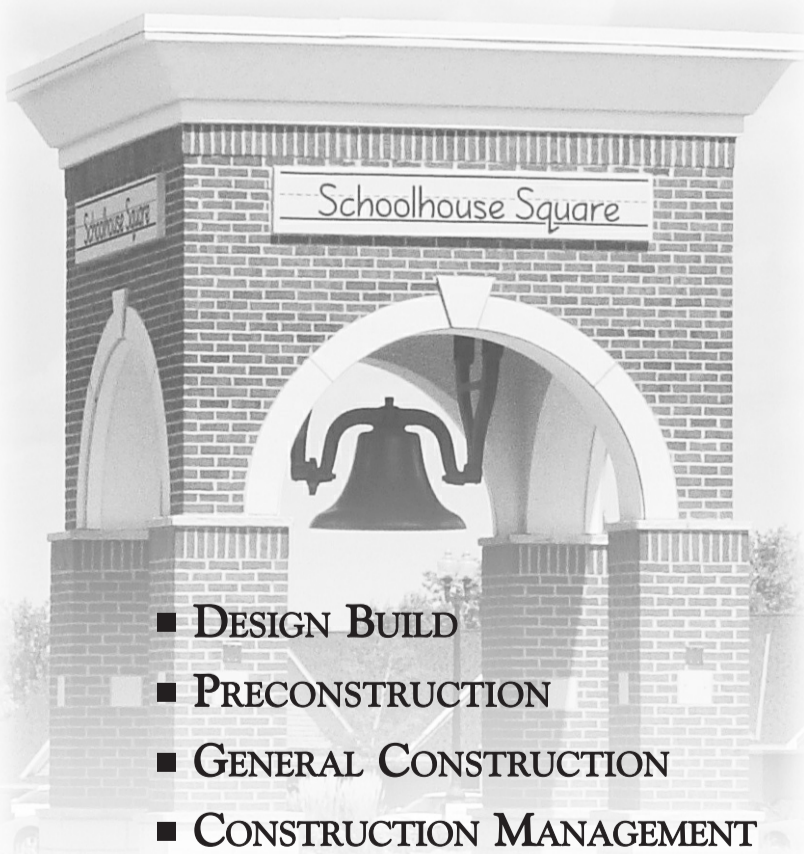
"I suspect we'll see more and more green roofs as long as public agencies such as the state and city are willing to subsidize some of the upfront costs with short-term grant money," he said.

*Dan Emerson is a Minneapolis-based freelance writer and frequent contributor to Finance and Commerce.*

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