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The greening of college campus roofs

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By Nancy Crotti

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The green roof atop the new Anderson Center at Hamline University is the first for the private college in St. Paul. (Submitted photo)

Storm water concerns, concrete jungles contribute to the trend

When Hamline University students, faculty and staff returned to the St. Paul campus this semester, they found a new student center with a rooftop terrace and an adjacent roof filled with foliage.

The 1,800-square-foot green roof atop the new Anderson Center is the first for the private university and one of

many installed around the Twin Cities.

“When we were kind of going through the concept phase of the building, we wanted to incorporate sustainability elements,” said Ken Dehkes, Hamline’s director of facilities operations and horticultural services. “This was just kind of a natural thing to integrate the green roof element adjacent to this outdoor raised-terrace area.”

Storm-water concerns in particular are fueling green roof installations, according to Steven Hegge, senior project manager at Berwald Roofing & Sheet Metal Co. in North St. Paul, which worked on Hamline’s roof and a larger project at the University of Minnesota.

“College campuses have been doing it all along. Anywhere there’s density and a demand for green space, you tend to find green roofs,” he said, adding that the roofs started taking off about 15 years ago, mostly in Boston and New York, “because the cities got on board with it.”

“They need the green space,” he said. “They have so much concrete.”

Green roofs, which can help mitigate concrete jungles on some urban campuses, absorb rainwater and slow the velocity with which runoff enters a municipal storm water system, reducing the likelihood that the system will be overwhelmed, according to landscape architect Craig Wilson, co-founder of Sustology, a Minneapolis environmental consulting and green-roof design firm.

The city of Minneapolis considers green roofs so useful that in 2005 it began offering a 100 percent credit on storm water fees to those who install them.

Hamline’s new green roof is small compared with others in the Twin Cities. The University of Minnesota is installing a 68,300-square-foot green roof atop its Cancer and Cardiology Research Building, under construction at 2231 Sixth St. SE in Minneapolis. One of many on the university’s campuses, it was added mainly to capture storm water and save energy, according to Pete Nickel, the university’s project manager for the 285,635-square-foot building.

When completed next summer, the building will accommodate 800 people, who will have access to an outdoor gathering space next to the green roof. The green roof will cost about \$1.3 million of the total \$145 million project, according to Barry Morgan, Mortenson Construction’s senior project manager and manager of the research center construction.

Nickel considers the cost of the green roof “cost-neutral.”

“If we were to put in the underground storage tanks for storm water to have it mitigate through the ground, there’s obviously a cost to do that versus putting our plants on the roof,” Nickel said.

Green roof plants can thrive in soils ranging from 2½ inches to 8 inches deep, according to Wilson. Tall plants require more soil, which adds to the weight that the roof must bear.

“You have to design a roof that can hold more weight, and that goes all the way down into the footings,” said Minneapolis architect Ken Sheehan of Architectural Alliance, project manager for the new University of Minnesota building.

In the upper Midwest, green roofs consist of hardy native plants embedded in specially mixed soil loaded onto the roof, or of modules of similar plants grown off-site in the same type of soil and transported to the building. These gardens top several layers of roofing materials, including a waterproof layer, according to Wilson.

Older buildings may be suitable for green roofs if they can sustain the load and the green roof doesn’t invalidate the manufacturer’s warranty on the existing roof, Sheehan said.

Target Center in Minneapolis is a good example of an older building that needed a new roof and went green, according to Karen Jensen, president of the Minnesota Green Roof Council and an environmental engineer with the Metropolitan Council.

The 2.5-acre roof was installed in 2009 and captures 1 million gallons of storm water annually, according to the Target Center website. At the time of design, it was the largest in Minnesota and the fifth-largest in the United States. The council estimates that Minnesota is home to more than 150 green roofs, with more added regularly.

The cost of a green roof depends on several factors, according to Doug Danielsen, sales representative for the LiveRoof green roof system at Bachman's, which installed the green roofs atop the Hamline and University of Minnesota buildings. Bachman's grows the plants for 60 to 90 days in modules manufactured by Michigan-based LiveRoof, then ships them to the site for installation.

Installed costs for LiveRoof modules are about \$20 per square foot, according to Danielsen. That compares with \$15 to \$20 per square foot for a layered green roof, says landscape architect Wilson.

The plants and installation of Hamline's green roof cost about \$44,000, excluding the supporting roofing materials, Hamline's Dehkes said.

Architectural Alliance's Sheehan said the University of Minnesota's new green roof adds more than environmental sustainability to the project.

"There are two research buildings that look over the top of this roof that is about the size of a Kmart and would have looked like the roof of a Kmart" without the green roof, he said. "It's going to be a real showpiece for the client."

Amber Ponce, business development manager for LiveRoof, said clients are asking for more creative designs as well.

"They want it to make a statement, to complement their buildings, the architecture, and to really say something about themselves to the inhabitants in the building," Ponce said.



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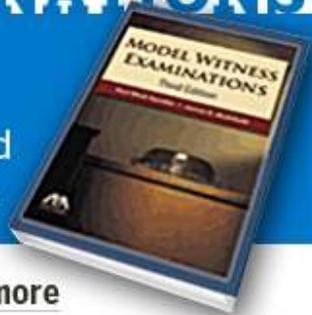
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