

A Roof Garden? It's Much More Than That



Frances Roberts for The New York Times

The planting proceeds on the roof of the Silvercup complex, above, in Long Island City, Queens. The green-roof idea is slowly taking hold in New York.

August 10, 2005

By LISA CHAMBERLAIN

As temperatures soared over 90 degrees and New York City broke records for electricity use at the end of July, landscapers were installing a "green" roof at Silvercup Studios in Long Island City, Queens, where parts of the HBO series "The Sopranos" are filmed.

Above Tony Soprano's head will be New York City's largest green roof, a thin layer of plants covering 35,000 square feet in a design that aims to reduce air pollution, control heating and cooling costs, and absorb storm water runoff.

Proponents of the project, which has been two years in the making, are hoping to use data collected from it to convince commercial property owners and developers that not only are green roofs good for the environment, they can benefit the bottom line.

The highly visible location near the large Silvercup Studios' sign will be its own best advertisement. A matrix of 1,500 planters will have 20 different species of plants intended to show off their red, yellow and green colors, visible from the Queensboro Bridge when in full bloom.

Not to be confused with a roof garden, however, a green roof is less of an aesthetic amenity than it is a workhorse. The carefully selected plants and soil - engineered to weigh only a fifth as much as typical dirt - help clean the air and absorb rain that would otherwise become storm-water runoff. And when many of them are clustered together, green roofs can reduce the urban heat island effect (densely populated cities tend to be hotter than surrounding areas because of the heat-trapping properties of tall buildings, asphalt and concrete).

Less well established are the benefits of green roofs to property owners and developers. It is known that they can reduce a building's heating and cooling costs, and extend the life of the roof, but the question is, Do the long-term benefits justify the initial cost?

"We are looking to demonstrate to the government, the public and most of all private business that green technologies are an economic benefit," said Stuart Suna, co-owner of Silvercup Studios. "What exactly that benefit is will be determined by this green-roof demonstration project."

The Silvercup project originated with a study undertaken by Diana Balmori of Balmori Associates, a landscape design firm.

Ms. Balmori's interest in the submarket of green-roof design led to a comprehensive assessment of New York City's flat-roof buildings. What she discovered is that Long Island City has 667 acres of empty flat-roof surfaces suitable for vegetation, an area more than three-quarters the size of Central Park. Given the available flat roofs, the air pollution generated from the area's heavy industry and traffic, and a nearby power plant that produces 25 percent of the city's electricity, Long Island City turned out to be the perfect green-roof laboratory.

Ms. Balmori took her idea to build a demonstration green roof to the Long Island City Business Development Corporation, the neighborhood's business improvement district; Mr. Suna is a member of the group. They secured a grant from Clean Air Communities, an organization devoted to reducing air pollution and energy consumption in the city's low-income neighborhoods.

The \$500,000 grant is paying for the green-roof design by Balmori Associates, and the installation by Greener by Design, a landscaping company based in New York that specializes in green roofs. Ms. Balmori estimates the outlay will be about \$10 a square foot, not including the structural engineering costs paid for by Silvercup Studios, or the yearlong study to be undertaken by the Earth Pledge Foundation, a nonprofit environmental advocacy organization based in New York.

Leslie Hoffman, executive director of Earth Pledge, said that once the green roof was established, her organization would measure energy savings as a result of reduced temperature fluctuations in and around the building. The study will also measure the amount of storm-water retention, which alleviates pressure on the city's overtaxed wastewater system.



Peter Thompson

In Chicago, where Augusto Garcia waters plants on the roof of a McDonald's, green roofs are already common.

A study conducted in Chicago, for instance, demonstrated that a green roof absorbed nearly half the water that was captured elsewhere in a conventional roof rain barrel during a downpour.

Richard Heller, president and chief executive of Greener by Design, said energy savings from green roofs would fluctuate depending on the building type, but the greatest savings would be achieved in low-rise flat-roof buildings. The same Chicago study, conducted in 2003, showed that green-roof temperatures were 19 percent to 31 percent cooler during peak daytime hours in July compared with a conventional roof.

Despite the existing data, Ms. Hoffman and many other green-roof proponents agree that appealing to the enlightened self-interest of property owners and developers is not enough. Getting local government involved is critical to reducing the cost of green-roof installation and achieving economies of scale through mass production. With current technology, green roofs typically cost \$8 to \$10 a square foot, whereas a regular roof costs about \$4 to \$6 a square foot.

"Isolated green roofs are expensive insulation," Ms. Hoffman said. "But when you have a whole community of green roofs, it changes the microclimate of the area and reduces demand for energy. Think about one sidewalk in front of a building. That doesn't make a transportation path. But if everyone has one in front of their property, you have a way to walk around the city. Only a citywide effort can achieve that."

To that end, proponents in New York have been lobbying City Hall to offer incentives to developers and property owners. While green-roof incentives are still in the "nice idea" phase at City Hall in New York, Chicago has been a proponent of green roofs since Mayor Richard M. Daley installed the country's first municipal green roof on top of City Hall in 2001. Chicago now has both requirements and incentives in place for private businesses to follow the city's lead.

As a result, Sadhu Johnston, Chicago's commissioner of the environment, said there were approximately two million square feet of green roofs already built or in various stages of construction in Chicago. Currently, New York City has approximately 60,000 square feet of green roofs built or under construction.

Two years ago, Chicago began offering a density bonus in the central business district in exchange for green-roof installation. The city uses a complex formula to calculate the bonus, but at least 50 percent of the roof must be covered with vegetation before the bonus starts to apply. More significantly, of the estimated 150 green-roof projects currently in development, only 12 are taking advantage of the city's incentives. The rest are being built because the city requires that new developments that benefit from city financing must install a green roof.

"It's a combination of incentives and requirements," Mr. Johnston said. McDonald's built a flagship restaurant in downtown Chicago and installed a highly visible, 3,150-square-foot, bi-level green roof. Target and Apple Computer have also installed green roofs on their stores in Chicago.

While studies in Chicago and other cities in Canada and Europe have demonstrated the environmental benefits of green roofs, green roof proponents know they need hard numbers to convince New York's developers of the economic benefits.

"We want to bridge the gap between theory and reality," said Glenn Goldstein, program director for Clean Air Communities. "Having definitive data that informs developers and other real estate people how a green roof could perform for them is critical."