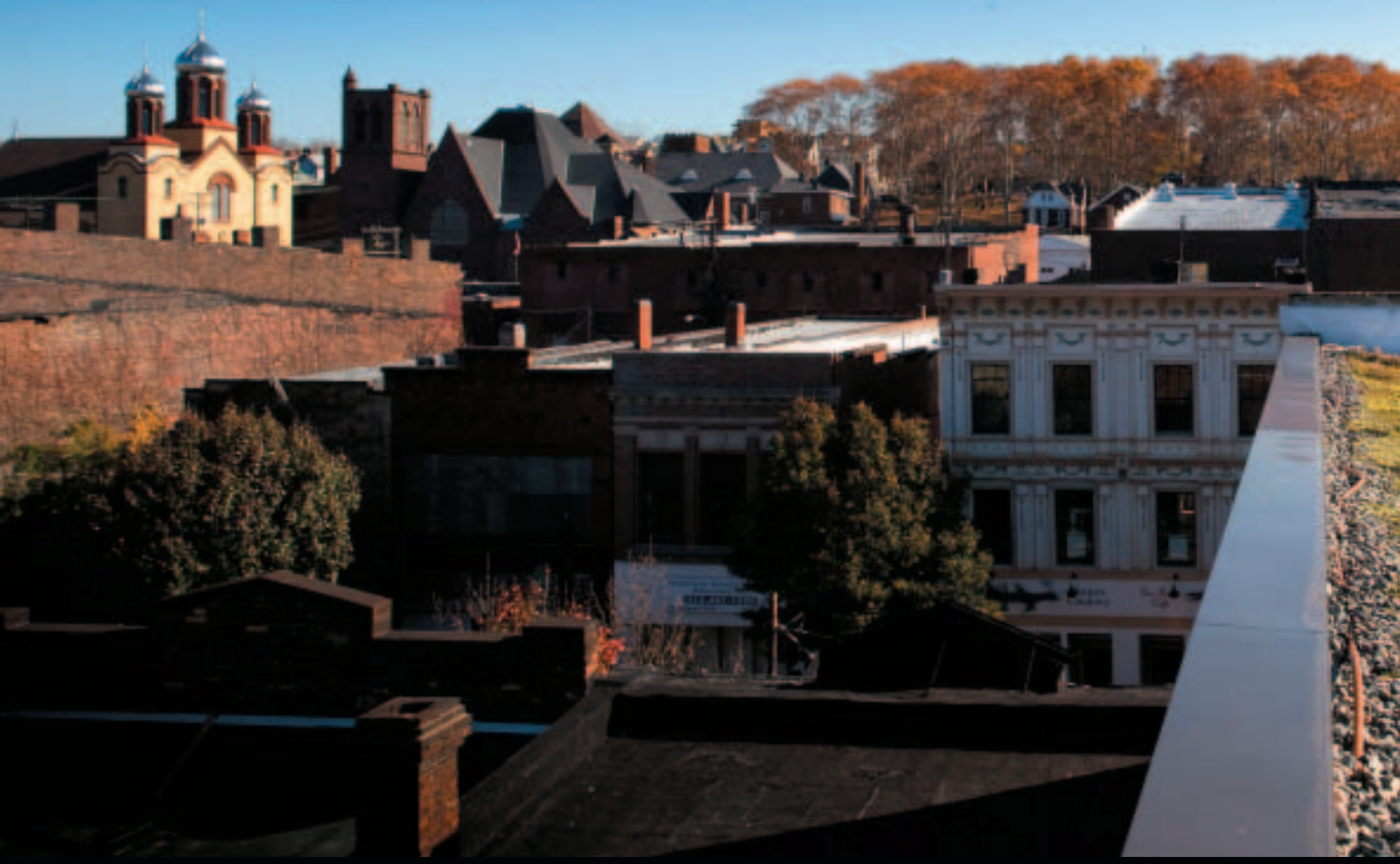
Top Soil

Pittsburgh roofs are the new fertile turf for environmentally sustainable construction projects that aim to dig in and blossom.

By Carmen J. Lee Photography by Joshua Franzos



In the former steel town of Homestead, east of Pittsburgh, the building at 213-215 East Eighth Avenue was known over the years for housing stores with cheap goods: Woolworth's Five-and-Dime, Gil's Discount, Rite Discount. Then in 2000, it was transformed into the aptly named Five and Ten Lofts, which has four loft apartments, a commercial first floor and was capped in 2007 with a green roof, thanks to funding from the Endowments-supported 3 Rivers Wet Weather Demonstration Program. Among plants that Judith Tener-Lewis and others tend on the roof is sedum sexangular, a ground cover that spreads into a thick carpet with tiny star-shaped flowers that blossom in June.

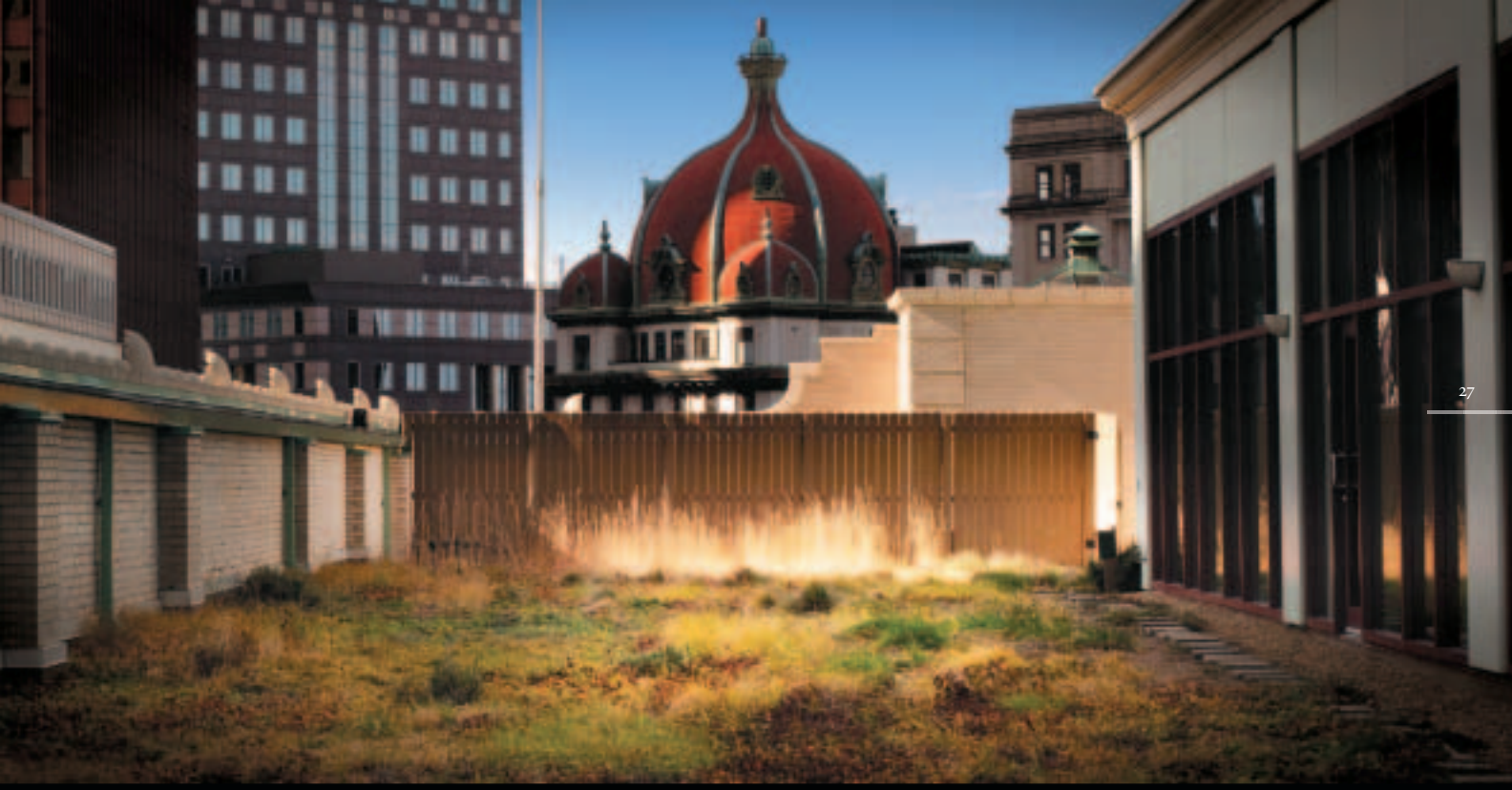
If you go to the roots of the sustainable development movement, the concept of a green roof wasn't about making a building look pretty. It was about thermal insulation, waterproof membranes, "evapotranspiration" and other technical details that would excite only a LEED-loving engineer. Then something happened over the years as more buildings were topped with ground cover. It became apparent that green roofs could be stylish, even glossy-brochure, coffee-table-book, garden-party-reception stylish. And more lay people began to realize that a green roof could be a union of artistry and utility, architectural creativity and energy-saving construction, that is eye-catching as well as environmentally beneficial to us all. • Travel back a few hundred years, however, and early green roofs weren't visions of beauty—just simple sod coverings for peasant cottages that stretched across medieval Scandinavian landscapes and into the pages of textbooks on European history. Yet, even from the beginning, these grass-shingled canopies proved their functional worth, helping to keep humble homes cool in summer and warm in winter.

When Heinz 57 officials decided to convert a former downtown Gimbels department store into a company office building, they wanted executives to see more than a concrete landing when they looked out their windows. The 15,000 square feet of flowering meadow that was planted later proved to have environmental as well as aesthetic value. The plant species include sedum kamtschaticum, which can tolerate various types of soil and temperature exposures.

It took German engineering to update the archaic design 40 years ago and create energy-efficient earthen coverts for the modern age. The construction trend eventually crossed the Atlantic, and now green roofs—lauded for their aesthetic as well as their utilitarian value—adorn commercial and university buildings, hospitals and private homes across the United States. Chicago Mayor Richard Daley has even made green roofs a special initiative. He has promoted their installation and turned municipal buildings into role models, resulting in more than 400 public and private green roof projects in that city totaling 7 million square feet, the most in the country.

In Pittsburgh, green roofs are growing on us. Our first introduction was, in the 1980s, to installations that were more like roof gardens. The close architectural kin were designed primarily for the eyes and souls of meeting-weary executives or body-mending hospital patients rather than for any healing touch to urban infrastructure. Such was the case for the plant coverings on the Gimbels-converted Heinz 57 Center office building downtown and UPMC Montefiore hospital in the neighborhood of Oakland, the region's educational and medical epicenter. Then building managers began noticing benefits such as increased absorption of rainwater, which lessened runoff into sewers, and cooler temperatures in the summer, especially when compared to other structures suffering from the "urban heat island" effect typical of many concrete-bound cities.

Closely tracking these trend-winds was the local environmental group 3 Rivers Wet Weather, which also saw green roofs as another useful tool in combating stormwater overflow that plagues our region's antiquated sewage system. The organization used $525,000 in federal funding and a $125,000



Heinz Endowments grant to sponsor a project competition in 2005 that led to the installation of green roofs on three different types of buildings: a Carnegie Mellon University engineering center, a neighborhood grocery store, and a mixed-use residential and commercial building. True to intentional green roof design, the plants on these roofs included varieties of sedums and species native to the region that could withstand seasonal changes and had root systems deep enough to soak up lots of water. And many were colorfully attractive, too.

"We saw it as an opportunity to demonstrate what could be done with what is typically considered wasted space to improve air and water quality," says Janie French, director of green infrastructure programs for the Pennsylvania Environmental Council and former watershed manager for 3 Rivers Wet Weather.

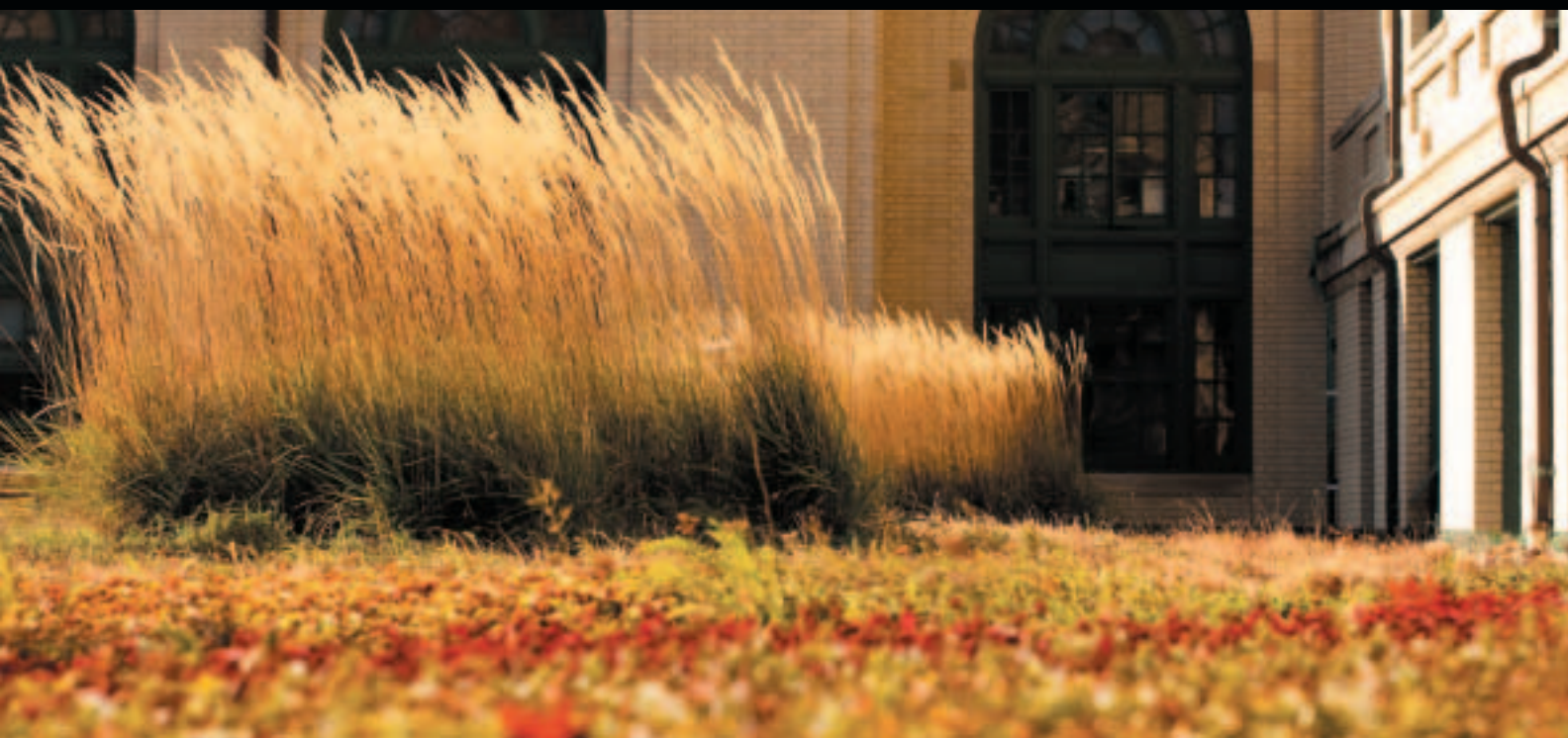
It was a strategy well-suited to the Endowments' goals of promoting green buildings and green building practices as ways of embracing sustainable development principles. Environment Program Director Caren Glotfelty says the variety of advantages green roofs offer urban environments—less stormwater runoff, decreased energy use, temperature-change mitigation, beautification—can help cities become healthier and more "people-friendly" for residents and workers.

Today, if you climbed into a helicopter and hovered over both rural and urban sections of southwestern Pennsylvania, you'd see nearly two dozen building-top green roofs dotting the landscape. Others are in the planning stages, though at a pace that might seem more befitting of a medieval Scandinavian village than a 21st-century American city. Still, a growing number of local business owners and politicians are starting to appreciate the journey from sod to sedum, from coarse tuffs of grass to equally sturdy budding plants in shades of amber and red. They are burnishing their reputations with "environmentally conscious" public relations points and their balance sheets with energy savings.

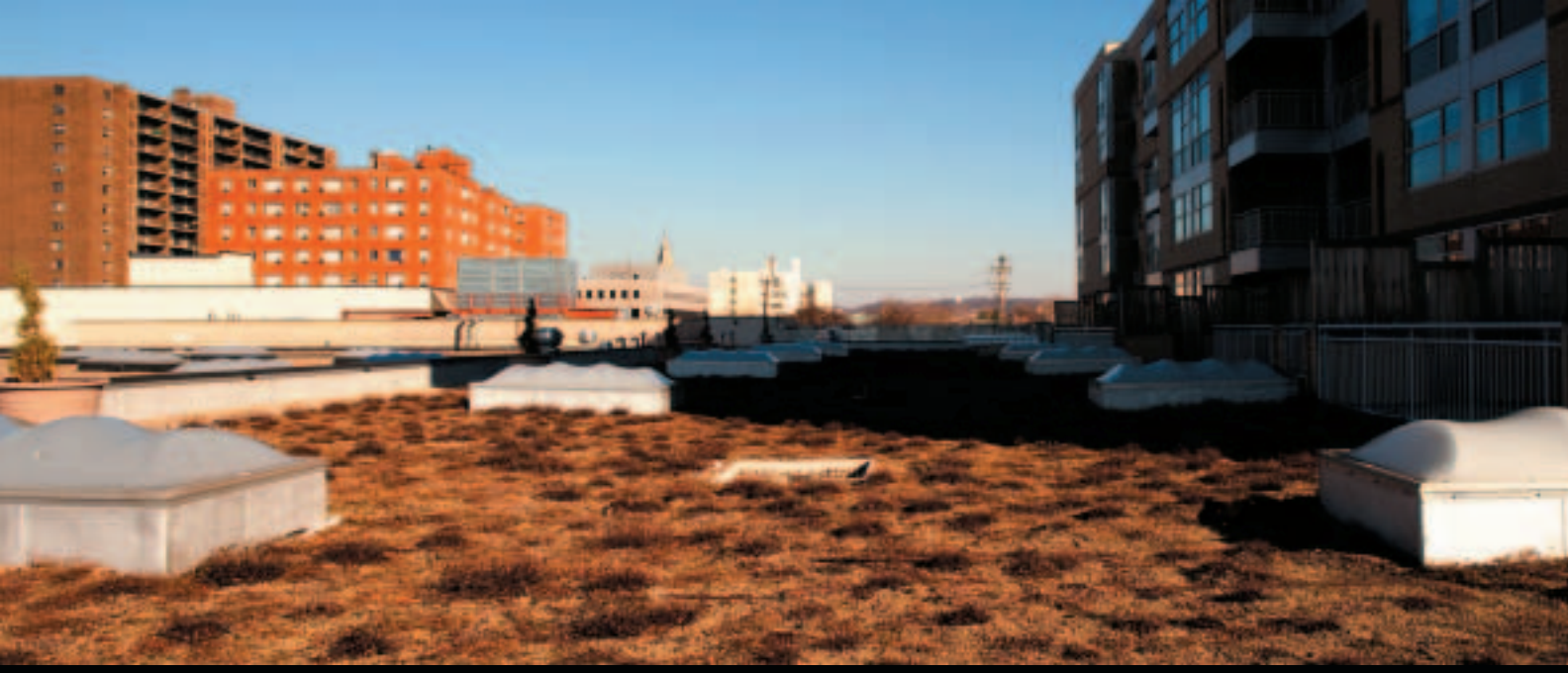
But moving our entire region to accept the economic and quality-of-life benefits of greens roofs may require inspiring more business and government leaders to see rooftops as untapped resources. It may mean urging them to take the next step of incorporating green roofs into a regional environmental strategy, rather than leaving such initiatives to personal or community preference. It also may involve convincing more owners of public, private and residential buildings that the long-term savings from green roofs outweigh immediate installation costs, which can range from $15 to $60 per square foot, depending on the location. It will take work, but green roofs that have been incorporated within attractive, verdant communities in other cities—including those in present-day Scandinavia—are already demonstrating that the effort is worth it.

"Imagine looking down from an airplane with a bird's-eye perspective and, instead of seeing huge expanses of concrete or black tar roofs imposing themselves on our natural environments, you see moving strands of flowering, multi-colored plants," says Linda Velazquez, publisher and editor of Greenroofs.com. "The roof now blends into the landscape as naturalistic meadow scenes or as designed gardens and parks, creating a new façade for human recreation…

"In an era where developing clean and renewable energy strategies and addressing ever-increasing energy consumption rates are so crucial to our economic and ecological future, we need to fully examine eco-friendly alternatives that also make economic sense in order to truly create a sustainable world." *h*



It probably was just a matter time before green roofs would lead to green walls, and that's what happened with the installation of the 2,380-square-foot, plant-based mural on the side of PNC Financial Services Group's downtown Pittsburgh headquarters, One PNC Plaza. As North America's largest "living wall," it contains 602 panels of regional plants that help cool the building in the summer and insulate it from heat loss in the winter, as well as create an appealing tapestry effect. Below, the green roof atop the Hammerschlag Hall engineering building at Carnegie Mellon University was another project that was part of the 3 Rivers Wet Weather Demonstration Program. It also received support from the Pennsylvania Environmental Protection Agency. Among the ground cover used for this roof is a fast-growing sedum species known as dragon's blood that blossoms with brilliant red flowers in late summer.



Plant-covered roofs also provide a unique texture and landscape contrast to the tops of buildings, particularly those in urban settings. Above, the green roof for the Giant Eagle Market District supermarket not only was part of the 3 Rivers Wet Weather Demonstration Program, but also was a feature complementing the store's successful effort to become the world's first LEED—Leadership in Energy and Environmental Design—Silver grocery store. The hearty sedums, which include sexangular shown above, share space with skylights that provide natural sunlight to help reduce the store's electrical lighting demands. Below, the new environmentally friendly wing of the University of Pittsburgh's Falk Elementary School includes a green roof that workers installed with sedum species such as album, far left. The 31,000-square-foot addition opened in September.