

## Planting the Urban Jungle

*How the State, a Bank and a Non-Profit are Putting Richmond on the Cutting Edge*

By Nicole Anderson Ellis

Innovation is not Richmond's claim to fame. At least, it didn't use to be. But this month's ribbon cutting on the rooftop of one downtown building will put Richmond on the cutting edge of the latest (and oldest) urban trend.

Crossing the Sun Trust Bank lobby in her shorts and running shoes, April Harris looks a bit like a summer camp counselor who has lost her way. "Yeah, I look fifteen," admits the James Madison University graduate. But when Harris steps into the freight elevator, the youngest member of the roofing consultant firm DavisHarris & Associates is suddenly right at home.

"We designed three possible systems," she explains. "The one we went with was



Native Richmonder April Harris stands atop Sun Trust's Richmond headquarters, the site of Virginia's largest green roof.

a two-ply modified and cold adhesive." At the fourth floor she leads the way through the bank's bowels, ducking under air ducts and skirting past a row of air

conditioners the size of vans. She climbs a short flight of metal steps, turns her access key, and swings open a door revealing an overcast view of downtown.

City Hall is visible. So is the tarp-draped Capitol building. And the view to southwest, down the corporate canyon, shows a curve of the tumbling James.

The rain has stopped and Harris, a Richmond native, leaps down onto Virginia's newest and largest green roof.

The change isn't visible from the street. Even up close, the 12,000 foot wedge of roof looks more grey than green. According to Harris, it will be two growing seasons

(continued on page 12)

(continued from cover)

before the plants that cover the living roof reach maturity. But when they do, it'll prove well worth the wait.

From the top of Chicago's City Hall, to New York's Rockefeller Center, to the Ford Motor Company's 500,000 square foot River Rouge Plant, green roofs are proving to be the one thing that bankers, politicians and conservationists agree will meet their diverse and often divergent needs – better urban safety, better environmental health, and a better bottom line.

### Green Backs First

"It was a straight business decision," says Kevin Kolda, who oversees corporate real estate for Sun Trust Bank's mid-Atlantic region. When the company needed to replace the roof on the four-story outcropping of its Richmond headquarters, their roofing consultants suggested they go green.

At the time, neither Kolda nor Sun Trust's Vice President and Facilities Manager Walt Swartley knew anything about living roofs. They were assured by their consultant that this technology was dependable. And they were encouraged by the existence of a \$28,000 challenge grant that the Alliance for the Chesapeake Bay was offering for the creation of a green roof. Were they to win the grant, their established budget for the roof wouldn't change.

But convincing the head of corporate real estate to test drive such an unusual design was another matter.

"Before you can sell someone, you have to believe it," says Swartley, whose concerns included soil weight, maintenance issues, and the likelihood of leaks in a roof that would sit directly over a newly renovated corporate cafeteria.

"We needed to do our homework," says Kolda. They did, and what they discovered was that the green roof DavisHarris was proposing – the same system, April Harris notes, that sits on the Ford factory in Dearborn, Minnesota – had no down side.

"The normal things we look for in a roof were there," says Swartley. "That particular design was one of the most waterproof designs possible for any type of roof." But as a green roof it offered so much more. Insulation. Reduced costs for heating and cooling. Decreased sound. Slowed stormwater runoff. Aesthetics. And that's before tallying the benefits for the James River and the Chesapeake Bay.

"Was it a hard sell? No," says Kolda. "I just showed [Sun Trust] the numbers. Looking at it from a straight business standpoint, it was the right choice."

There's no denying that the high end of green roofs can get pricey. And if short-term costs are the primary concern, Harris admits, "You can get pretty cheap with a conventional roof system." But the middle, where those price ranges overlap, is what has captured builders' interest. Economy of scale, for example, brought the cost of Ford's factory's green roof down to four dollars a square foot.

The price of the Sun Trust project was much higher - roughly \$15 per square foot – but everyone involved is quick to blame the location. The job was smack in the middle of downtown. That meant awkward access and weekend work. So, Kolda notes, even a conventional roof would have cost a lot. Besides which, he explains, Sun Trust plans to recoup every dollar spent on making that roof green.

### Since 500 B.C.

Although humans have been using plant matter to keep the rain off our heads ever since we abandoned cave life, the last century has seen synthetic roofing materials become the norm. As a result, the current resurgence of green roofs is raising some eyebrows.

"The roofing industry is filled with folks who've been doing this for forty-years," explains Kolda. "They're old school."

As the youngest employee at DavisHarris, and their resident expert on green roofs, April Harris has seen such skepticism first hand. But she's armed with the facts to back her passion to the most ardent nay-sayers; even to her father, who is also her boss.

"Dad says 'ah, that *new* stuff,'" teases Harris, "but I remind him that the hanging gardens of Babylon – that was a green roof. They used tar and reeds."

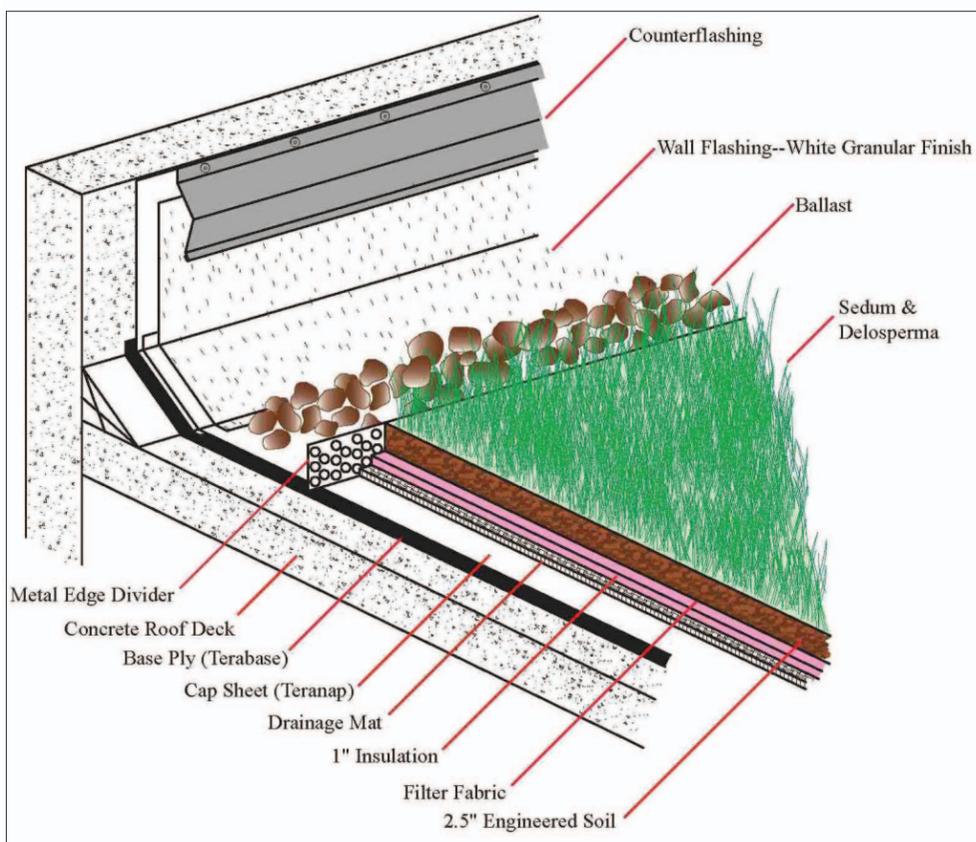
Those gardens bloomed more than 2500 years ago. Grass roofs topped villages across Europe for centuries, and more recent examples include the prairie sod homes in our American west.

Not surprisingly, today's green roofs are a bit more complex. The most basic designs involve some layering of the following: concrete, waterproof membrane(s), insulation, a drainage mat (to prevent roots from drowning in standing water), a filter fabric (to keep soil from washing away), lightweight engineered soil, and plants.

If a green roof has deep soil, hosts a variety of plants (often including small trees), and offers recreational access, it's called an *intensive* roof. In contrast, *extensive* green roofs have shallow soil and limited human access. They require less maintenance and cost less money.

The Sun Trust roof is this latter type. Bank employees won't be carrying their lunch out

*"Looking at it from a straight business standpoint, it was the right choice."*





*"Before you can sell someone, you have to believe it," says Sun Trust Vice President and Facilities Manager Walt Swartley. Not only does Swartley believe that a green roof was right for the downtown headquarters—three stories over where he stands here—but he is convinced that the project "benefits the whole city."*

there to eat. Besides the lack of railing protecting against a sharp drop to the marble plaza below, there's the prohibitively complex maze of ventilation equipment they'd have to navigate. More importantly, however, the roof doesn't offer much immediate appeal.

There are no picnic tables, no benches, and no pathways breaking up the flat triangular space. At first glance, it's even hard to see the plants. Harris doesn't really try. She strides across the surface, stomping on dozens of the newly-planted seedlings.

"You can't really be too mean to these plants," she explains, squatting to lift a few crushed specimens into her palm. The Sun Trust plot is covered in widely spaced succulents—drought resistant plants that hold water in their tissues, which Harris demonstrates by squeezing a few drops out of one fleshy leaf.

There are six varieties of hearty plants up there. None will grow to reach more than eight inches. These are ground cover, meant to spread, creating a carpet of green and rust and red.

Since nature designed succulents for the desert, these plants know how to survive the

roughness of a roof. If uprooted by wind—or the kick of a heel—they grow new roots wherever they come in contact with soil. And, by storing their own water, they are protected against the worst summer Virginia can throw them.

"Once it grows in," Harris notes with a sweep of her arm, "even with a drought, they'd dry up a bit but come back."

During the growing-in process, the roof will get a little TLC to ensure

a healthy start. The day of the planting, Harris' father watched them hose down the surface. "I can't believe I'm putting on a roof," he exclaimed, "and I have to worry about watering it."

In two years, the quarter acre roof will be

*"If everyone had a green roof, Gaston probably wouldn't have been so bad."*

covered in an ankle high shag of desert plants that, while pretty low maintenance, aren't exactly eye candy. As Swartley teases, "It's not like Bambi will be romping out there."

So grant money or not, water proof or not, one might wonder why Sun Trust would go to the trouble.

### Why Bother?

For starters, this green roof will outlast almost anything else the industry can offer.

Quality conventional roofs can last anywhere from ten to twenty years. And it's not the rain or wind that eventually causes their ruin. It's the sun.

"UV rays are the number one damage to roofs," says Harris. With a green roof, those rays are absorbed by plants before they reach the waterproof membrane. Though roofing industry literature tends to credit green roofs with a forty-year lifespan, the truth, Harris notes, is that no one knows how long they'll last. "Rockefeller Center," she points out, "has had the same green roof since 1930." The new Sun Trust roof, therefore, could last four times longer than the alternative, resulting in a savings of more than 300%.

A green roof's absorption of sunlight can also save building owners on electric bills. In the summer, conventional roofs can reach temperatures topping 140 degrees, and much of that heat is transmitted inside, requiring more air conditioning to maintain a comfortable work environment. In contrast, the temperature of green roofs plateaus at roughly 77 degrees. City officials in Chicago are expecting to save \$4000 a year in air-conditioning costs alone, thanks to their green roof.

In the winter, the insulating benefits of the plants and soil keep heat from escaping through the roof and minimize the cooling effect of winds.

"Green roofs dramatically reduce the cost of heating and cooling," confirms Harris. "So for building owners who don't care so much about the environmental benefits, that appeals to them."

"I don't think I'd call myself an environmentalist," says Harris. "But it's hard to see all the benefits [of green roofs] and not think it's worthwhile."

For example, green roofs have been shown to decrease ground level ozone and airborne dust, both of which have been linked to increases in childhood asthma. Plants also absorb sound, decreasing urban noise pollution. But the single most significant environmental benefit of green roofs may be their impact on storm water runoff.

Richmond is all too familiar with the dangers of unchecked storm water. In the country, rain sinks into soil where it's absorbed in plant roots and settles in groundwater. But cities replace greenery and soil with concrete, asphalt and other impervious surfaces that water can not seep through. During heavy rains, therefore, the result is more water, moving faster.

That's why engineers, politicians and urban planners are so excited by the potential of green roofs to control that flooding. By

acting like enormous rooftop sponges, the soil and plants capture and hold up to 78% of annual runoff. That's according to a University of Georgia study, whose preliminary findings were released just last month.

Monitoring of North Carolina State University's green roof project shows a 63% runoff retention rate, and experts at the Commonwealth's Department of Conservation and Recreation (DCR) quote studies crediting green roofs with containing as much as 100% of small storm events – an inch of rain or less.

"This is downtown," says Harris, looking east along Main Street toward Shockoe Bottom. "So if everyone had a green roof, Gaston probably wouldn't have been so bad."



*A special, lightweight, engineered soil allows plants to flourish on roof tops without burdening structures with the prohibitive weight of conventional topsoil.*

ted to helping Richmond's public and private institutions make green roofs work for them.

Following the lead of Chicago, Washington, DC, Arlington, and other cities that are using green roofs in the construction and renovation of public buildings, Richmond's Department of Public Works, and its Department of Parks and Recreation have contacted the Alliance to learn more about this cutting edge technology.

"We're hoping to partner with them," says Moulds, who's also speaking with the Goochland County school system. "School's would be perfect [for green roofs]," she explains, "because so many are buildings with big flat roofs."

Likewise, the DCR and the Commonwealth's

Department of General Services, which is charged with state buildings in the capital area, are exploring the possibility of using living roofs here in the city.

In the private sector, word of the potential savings is making green roofs a new status symbol. Though Richmond's Sun Trust roof is currently the largest in the Commonwealth, it won't be for long. A medical facility in northern Virginia is expected to steal the title at the end of the year. Other statewide projects include the Yorktowne Square Condominiums in Falls Church, and Arlington's Walter Reed Community Center.

As for Sun Trust Bank, the Richmond roof "is a proto-type for the energy conservation benefits," says Kolda. If the expected savings show up, neither he nor Swartley would be surprised to see the green roofs spread throughout the company's real estate holdings.

The financial benefits may prove undeniable, but even for Kolda and Swartley, whose careers are rooted in sound engineering and fiscal savings, the ecological impacts of their latest real estate project are a source of evident pride.

"It benefits the whole city," notes Swartley. "And we'd like to invite others to do the same." The bank vice president nods his head slowly at the image of Richmond's verdant future. "If you took an aerial shot of downtown and you saw more green than concrete – a real urban jungle? Yeah, that would be nice."

## Spreading Like Weeds

The phone on Stacey Moulds' desk keeps ringing. Representatives from the City of Richmond, as well as business and home owners are calling with questions about the new green roof. They want to see the Sun Trust project. They want information about tax incentives, and tips on growing their own green roofs. And every single phone call is proof that through the green roof grant program, the Alliance has bull's eyed its goal.

"Our purpose was to move green roofs forward," says Moulds, Senior Program Coordinator for the Alliance for the Chesapeake Bay. Prior to this project, she notes, "there wasn't an example in Richmond for people to see."

There is now. Selecting Sun Trust from among the grant applicants, Moulds explains, "came down to two things: prominent name, and location." The Sun Trust roof was ideal because of its size, its proximity to the James River, and its spot at the core of Virginia's capital city.

Though this particular grant was a one-time opportunity, made possible with funds originating with the EPA, and distributed to the Alliance via the DCR, other financial assistance is available (see On That Note), and both the Alliance and the DCR are commit-

## On That Note

### Learn More

The Alliance for the Chesapeake Bay  
(804) 775-0951  
[www.acb-online.org/](http://www.acb-online.org/)

Department of Conservation and Recreation  
(804) 786-1712  
[www.dcr.state.va.us/](http://www.dcr.state.va.us/)

Penn State Center for Green Roof Research  
(814) 863-2263  
<http://hortweb.cas.psu.edu/research/greenroofcenter/>

Green Roofs for Healthy Cities North American Inc.  
[www.greenroofs.org](http://www.greenroofs.org)  
416-971-4494

### Visit

Tours of the Sun Trust roof are being offered to selected participants in:

Virginia's Sustainable Future Summit  
September 13-15  
Richmond Convention Center  
(804) 643-7489

### Find Funding

Though Richmond is not yet among the municipalities that offer tax breaks and other financial incentives for green roofs, the following sources may help business and home owners cut the cost of installation:

Chesapeake Bay Program  
(800) YOUR-BAY  
[www.chesapeakebay.net/](http://www.chesapeakebay.net/)

Small Watershed Grants  
National Fish and Wildlife Foundation  
(202) 857-0166†  
[www.nfwf.org/programs/chesapeake/index.cfm](http://www.nfwf.org/programs/chesapeake/index.cfm)