



CLEAN WATER IS GOOD FOR BUSINESS ★ CASE STUDY

# Riverbend GreenRoofs Projects in Delaware



As storms intensify and cities continue to increase their impermeable areas, urban areas experience ever-increasing flooding. Cities with aging infrastructure are already overwhelmed by stormwater-handling problems, and their combined sewer



Delaware Technical College, Dover, Delaware

output systems are major contributors to water pollution. These factors increase municipal processing costs, public infrastructure maintenance costs, and the pressure of imminent costs for major improvements. In the face of these challenges, municipalities of all sizes are increasingly mandating on-site detention of storm water. Even properties lacking ample grounds can make use of the sizeable surface atop their buildings, and creating green roofs that maximize value, options and benefits is the role of **Riverbend GreenRoofs**.

Riverbend is a green roof maintenance provider and a licensed grower and producer of LiveRoof<sup>®</sup>, a patented green roof system. With more than 34 years as a perennial plant grower and supplier, Riverbend utilizes its expertise to select regionally appropriate plants for custom-grown green roofs that thrive year-'round. With a territory covering much of the eastern United States, the firm is committed to helping reduce water-impact problems, notably in the 13,500+-sq.-mi. Delaware River watershed region.

In Delaware, cities such as Newark have enacted storm-water management regulations requiring developers to reduce the volume of their stormwater run-off. With their natural ability to hold water, green roofs are becoming a sought-after solution. Newark's first green roof, installed in 2013 on an apartment building at 132 Delaware Ave, was Riverbend's LiveRoof system. Aware that developers will specify green roofs when they understand the potential cost offsets and payback, Riverbend has made it a practice to help clients find cost-effective options. For example, combining multiple green infrastructure systems including green roofs can significantly reduce stormwater fees and heating and cooling costs. Additional savings may be realized through stormwater management grants, tax incentives, and increased property value. The chart at the right from Green Roofs for Healthy Cities highlights some cost-benefit equations.

## Cost-benefit Analysis of Green Roof vs. Black Roofs

NATIONAL LEVEL RESULTS	Roof Size (ft <sup>2</sup> )		
	5,000	10,000	50,000
<b>Impact on Owners/Occupants/Investors</b>			
Initial Premium, \$/ft <sup>2</sup> of roof (extra cost of installing a green roof instead of a black roof)	(-\$12.6)	(-\$11.4)	(-\$9.7)
NPV of Installation, Replacement, & Maintenance, \$/ft <sup>2</sup> of roof	(-\$18.2)	(-\$17.7)	(-\$17.0)
NPV of Stormwater, \$/ft <sup>2</sup> of roof (savings from reduced infrastructure improvements and/or stormwater fees)	\$14.1	\$13.6	\$13.2
NPV of Energy, \$/ft <sup>2</sup> of roof (energy savings from cooling and heating)	\$6.6	\$6.8	\$8.2
Net Present Value (installation replacemnt & maintenance + stormwater + energy NPV)	\$2.5	\$2.7	\$4.5
Internal Rate of Return (IRR)	5.0%	5.2%	5.9%
Payback, years	6.4	6.2	5.6
Return on Investment (ROI)	220.0%	224%	247%
<b>Other Financial Impacts (less realizable)</b>			
NPV of CO <sub>2</sub> , \$/ft <sup>2</sup> of roof (emissions, sequestration & absorption)	\$2.1	\$2.1	\$2.1
NPV of Real Estate Effect, \$/ft <sup>2</sup> of roof (value, rent absorption & vacancy)	\$120.1	\$111.3	\$99.1
NPV of Community Benefits, \$/ft <sup>2</sup> of roof (biodiversity, air quality, heat island, etc.)	\$30.4	\$30.4	\$30.4

Source: US GSA

Cost containment starts with Riverbend's streamlined production system utilizing custom-made machinery that reduces the physical labor required to fill, grow, and package LiveRoof products. Further savings are available throughout the involvement of Riverbend's accredited green-roof professionals, who assist with every stage of the project, from planting plans and specifications to take-offs and product delivery. Developers, general contractors, and owners who purchase the LiveRoof system directly from Riverbend GreenRoofs realize additional savings, and the firm's staff trains project installation crews at no additional cost. While the firm's planting mixes range from native plants to custom sedum designs, it offers an in-stock option of evergreen and flowering sedum to further minimize costs. Once savings opportunities are understood, the beauty of the benefits take center stage.

At the time of installation, LiveRoof modules already have 95% plant coverage, ensuring immediate stormwater benefits. The standard LiveRoof green roof system with a depth of just over four inches can absorb more than a gallon of stormwater per square foot. Additional systems provide thicker depths and greater rewards. At six inches deep, modules can hold flowering perennials; at eight inches deep, modules can grow tall grasses and detain over two gallons of stormwater per square foot. And at any size and depth, green roof plants and their growing media also filter runoff and remove pollutants. Some green roofs can reduce runoff by 90 percent annually, and this runoff occurs hours after peak flows, giving sewer systems more time to handle the runoff burden from impermeable surfaces.

Since its pioneering 2013 installation in Newark, Riverbend has performed numerous projects ranging from small residential installations to Delaware Technical College to the Westin Hotel, which boasts a 1,460-square-foot LiveRoof. One recent project in the state was installation of the 3,600-square-foot LiveRoof Standard Module green roof atop the Chesapeake Utility building. With a depth of 4½ inches, the green roof retains 1.3 gallons of rainwater per square foot; a total of 4,680 gallons.



Project: Chesapeake Utility, Dover, Delaware,  
Photo by: Autumn Chalabala, Chesapeake Utility Director

Riverbend promotes and educates the public, especially business property owners and developers, on the importance of green roofs, not only to owners but to their communities and the watershed they all depend on. The firm shares its message with a wide range of influencers and decision-makers, from prestigious building and landscape architects to installers. Making the project turnkey, efficient and comfortable is not only good business, it fosters wider adoption of the multi-benefit green roof solution to meeting municipal requirements.

Beyond the essential stormwater management function, green roofs perform many of the same positive services as landscaping around buildings. They alleviate the urban heat island effect of excessive hardscape, helping reduce building cooling costs and the risk of fires. In cold weather, a green roof's growing media and evergreens can help insulate against heat loss as warm air rises toward the roof. Green roofs also help provide acoustic insulation, mitigating stressful urban noise. What's more, green roofs can provide the proven human health benefits of everyday access to nature, enhancing employees' physical and mental wellbeing and attracting today's aware customers. Protecting the Delaware and other watersheds is a massive, vital job, but green roofs are doing their part, one building after another. ★

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