

Princeton University: Butler College Complex Green Roofs

Princeton, New Jersey, 08540



Before



After

Extensive (shallow-profile) vegetated roofs were installed on new dorms “A”, “C” and “D” of Princeton University’s Butler College complex. The total area of the green roof is 16,500 square feet. The goal of the project was to reduce stormwater runoff, and to improve the longevity of the roof structures below. Monitoring equipment was installed by the University, including a weather station on Dorm “A.” The green roofs improve the sustainability of the campus and function as an educational tool for Princeton students and the broader community.

General:

Type of development (residential, mixed use, commercial): Institutional

Project partners:

Builder: Turner Construction Company (general); David Brothers Landscaping (green roof)

Developer: Princeton University

Engineer: Roofmeadow

Landscape Architect: Roofmeadow (green roof)

Types of green infrastructure used on site: Extensive (shallow profile) vegetated roof assembly

Project status: Complete

Costs and Benefits:

Anticipated cost of green infrastructure features: Estimated \$165,000

Actual cost: \$165,000 (\$10/sf to add the green cover system to the waterproofing system) and \$248,000 for the underlying structural roof assembly and waterproofing., totaling \$413,000.

Cost of green infrastructure installation vs. anticipated cost of gray: A roof with no green component would be \$248,000. However, stormwater would have had to be managed elsewhere on the campus which went against the goals of the project, which was to manage stormwater at its source.



Competitive advantage (How did your project design beat out the competition?): Princeton University's Campus Plan and Sustainability Plan, both "emphasize sustainable building design and improved water management." Roofmeadow was contacted because of its leadership in the robust engineering of green roofs to reduce stormwater.

Financing strategy: Private

Design Details:

What design storm was used to size the green infrastructure practice? Typically we assess green roof performance using a 2-year (3.4 inch) storm

Number of gallons or cubic feet of stormwater the project captures per storm? Reduction in runoff is 10,000 gallons for the 2-year storm

What percentage of this capture will be managed by recharge vs. detention vs. reuse? 100% (by plant uptake and eventual evapotranspiration)

What are the pre-development runoff rates for those design storms for the project? 1.5 cfs

What are the post-development runoff rates for those design storms after green infrastructure measures were put in place? 0.6 cfs

Takeaways:

Benefits to/impacts on the end user and larger community: Significant reduction of storm water entering the local stormwater system, modest improvement to energy efficiency in the building, terrific educational opportunity for the Princeton community.

Challenges: There are no major challenges to report. The extensive green roof project was comparable to other successful extensive green roofs we've designed in this area.

Lessons Learned: Information pending.

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