Green Infrastructure & Stormwater Management CASE STUDY

Pennswood Village

Location: Newtown, PA
Client: Pennswood Village
Design Firm(s): Wells Appel (Landscape Architect), Pickering Corts & Summerson Inc. (Civil Engineer), Princeton Hydro (Hydrologists and Ecologist), Mellon Biological (Wetlands Scientist)
Landscape architect/Project contact: Stuart Appel, FASLA, Wells Appel
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ASLA Chapter: Pennsylvania/Delaware, New Jersey, New York

Photo: Wells Appel

Project Specifications

Project Description: Located on an 82-acre Quaker-directed retirement community, this project consists of a regional stormwater capture and treatment system made up of linked best management practices that include fore-bays, vegetated swales, infiltration basins, created wetlands, and a small wet pond, surrounded by warm-season grass meadow. The design creates a park for the residents, acts as an environmental education center for students around the region, forms a “pollutant removal train” to attenuate peak flows, promotes groundwater recharge, creates wildlife habitat, and solves the problem of major downstream flooding.

Project Type:
Open space - park
Part of a new development

Design features: Bioretention facility, bioswale, and 13-acre pollutant removal chain of linked BMPs.

This project was designed to meet the following specific requirements or mandates: Developer/client preference

Impervious area managed: greater than 5 acres

Amount of existing green space/open space conserved or preserved for managing stormwater on site: greater than 5 acres

The regulatory environment and regulator was supportive of the project.

Did the client request that other factors be considered, such as energy savings, usable green space, or property value enhancements? Yes, the client was very interested in creating opportunities for passive recreation, wildlife habitat, and in creating a 'sense of place' on their property in keeping with their Quaker values and the regional context of Bucks County.

Cost & Jobs Analysis

Estimated Cost of Stormwater Project: $1,000,000-$5,000,000 (Public funding: None)

Was a green vs. grey cost analysis performed? No

Cost impact of conserving green/open space to the overall costs of the site design/development project: The preservation of existing open space increased the cost of the project, but the client opted to pay these higher premiums for high quality open spaces.

Cost impact of conserving green/open space for stormwater management over traditional site design/site development approaches (grey infrastructure)? Did not influence costs. The project reduced costs downstream in terms of eliminating major flood damage by providing a regional stormwater system.

Number of jobs created: 3

Job hours devoted to project:

Planning and Design: 12,400

Construction: 9000
Annual Maintenance: Unknown

Performance Measures

Stormwater reduction performance analysis:
No scientific data is available, but the system was designed to handle up to and including the 100-year storm. Since construction completion in 2003, there has been no discharge from the system.

Community & economic benefits that have resulted from the project: Downstream flooding has been eliminated – this was the original impetus for the project. The project also provides passive recreation for the residents and the rest of the community. The stormwater system and surrounding meadow have inadvertently become prime birdwatching sites. One longtime resident noted that she saw Baltimore Orioles, redwing blackbirds, and other species she had not seen on the property in twenty years. It has also become a great educational resource for the region - at the grade school, college, and graduate school levels. Finally, like many suburban areas, the surrounding land has continued to be developed at an alarming pace – the Pennswood site is part of the only remaining large piece of open space in the area.

Project Recognition

2003 ASLA National Merit Award; 2002 Honor Award for Design, NJASLA, 2004 President's Award for Exceptional Design, PA/DE ASLA; 2003 Diamond Award for Engineering Excellence, ACEC/PA; 2003 PA Governor's Award for Environmental Excellence; Featured in the following publications: Editorial, 'Landscape Architecture' magazine, Sept. 2003; 'Stormwater' magazine, Jan./Feb. 2006; Featured in 'Landscape Architecture' magazine, Sept. 2006; 'Context: The Journal of AIA Philadelphia', Nov. 2007

Photo: Wells Appel