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Nov-Dec 2004 • \$15.00

The Cost Estimating Magazine for Design & Construction

**Special
Issue:
Building Green
In America**



Parker River National Wildlife Refuge
Headquarters & Visitor Center
Plum Island, Massachusetts
Architect: Cambridge Seven Associates, Inc.



GREEN ROOF: PAYBACK DAY 1

By Jef Fuller, AIA

With the State of Maryland's Smart Growth initiatives, adopted in July of 2002, we (DNC Architects, Inc.) were able to demonstrate that a green roof, with all the associated benefits, could be added to a redevelopment project and that the payback would be immediate.

In September 2002, our client, The JBG Companies became interested in a 3.9 acre parcel of land, occupied by 4 older office/retail buildings and surface parking lots, located within a short walk of a Metro Station in suburban Maryland. As an added benefit, there was a new lease for approximately 30,000 square feet of laboratory space under negotiation for one of the buildings (then vacant).

A walk-through "evaluation" of the building being considered for the lab quickly identified that the highest and best use for the building was demolition. Obvious problems for the 30+ year old building included: less than 10-foot floor-to-floor heights (rather than a preferred 14-foot minimum for lab utility distribution), tight column bay spacing 20- x 20-foot, 80#/SF floor LL, non-compliant exits (scissor stairs), aged leaking skin and roof, inadequate power and other utility services.

The problem then became, how could we design, permit and construct a new 60,000 GSF office/lab building with a level of underground parking in less than 16 months, in a jurisdiction not known for expedited approvals (in particular, for a building 20,000 GSF larger than the building that would be demolished), for only a reasonable investment beyond what was budgeted to renovate the existing building?

Storm Water Management was one issue that needed a creative solution, both to save permit time and minimize costs. The site was developed before the current SWM regulations, so the "normal" solution would have been prefabricated filters for quality measures and an under-



Photos Courtesy of DNC Architects, Inc.

Through the use of the "green roof", the total impervious area for JBG Companies' new office/lab building was reduced from 88% to 40%.

ground concrete vault constructed with the garage to provide the requisite quantity retention. JBA, the civil engineer for the project came up with the creative solution we needed. JBA identified that the State of Maryland had, just two months earlier, incorporated "Smart Growth" initiatives into their new SWM regulations. The short explanation was that the State wanted to encourage redevelopment over green field development, so that if, on a redevelopment project, the pervious area of a site could be increased by 20%, the state could waive the SWM quantity requirements. Through use of the "green roof", the total impervious area for the project was reduced from 88% to 40%.

The new building was budgeted as a concrete structure (because of the mixed use nature and a zoning height limit) with a high-end hot-liquid roof (because of the type of construction and the expensive laboratory fit-up).

Lightning math allowed us to demonstrate to JBG that the cost premium for a "green roof" (\$10.00/SF for a green roof - \$5.50/SF for the basic roof = \$4.50/SF premium * 20,000 SF = \$90,000 cost for the green roof) vs. the cost of underground SWM (approximately an acre of disturbed area at ~\$90,000/acre), was essentially \$0.00. However, there was a significant schedule advantage for the green roof, because it didn't require the same 3-step approval process of the civil engineering plans, and the construction time necessary to go further down for the SWM vault before coming back up with the new construction (the green roof saved the schedule 4 months in the permit review and construction process).

We were successful in convincing the local review authorities at Montgomery County that a "green roof" should count as pervious area, as it related to the new regulations. And working with the General Contractor, Forrester Construction, we were able to convince ourselves that there were several reputable roofing manufacturers and subcontractors available to accept complete responsibility for the roof membrane and the green roof, and who were able to provide the Owner with a traditional maintenance warranty.

The team ended up completing a successful project, and moving in the tenant in a timely fashion. We all ended up with our first "extensive" green roof (2-inch lightweight soil) and, as an added benefit, JBG will have an attractive green roof, for the future (significantly taller) phases of the project to look down upon.

RELEVANT TEAM MEMBERS INCLUDED:

Owner/Developer:
The JBG Companies
Architect: DNC Architects, Inc.
Civil Engineer:
Johnson-Bernard Associates
General Contractor:
Forrester Construction
Roofing Subcontractor:
Prospect Waterproofing
Roofing Manufacturer:
American Hydrotech
Green Roof Materials:
Emory Knoll Farms



DNC Architects, Inc. completed a successful project for JBG Companies in the construction of a new 60,000-square-foot building in suburban Maryland.

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The true beauty of a green roof is what you can't see



Vancouver Public Library

.....the membrane

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