GreenSource

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Case Study:
Save the Bay Center

Providence, RI

Coast Guard: A Non-Profit's Redevelopment of a Former Landfill Serves as a Model of Urban Waterfront Restoration.

By Joann Gonchar, AIA

Save the bay first conceived of the idea of moving from its offices in a dilapidated former bank in the Smith Hill section of Providence in the late 1990s. The location, within striking distance of the Rhode Island State House, was well suited for the non-profit organ- nization's lobbying and advocacy activities centered around restoring and protecting the Narragansett Bay and its watershed. However, it did not provide access to the waterfront needed for an expanding roster of educational programs which included boat tours of the bay for children and adults.

Photo © Ruggero Vanni
Save the Bay Center

Slide show

KEY PARAMETERS
LOCATION: Providence, Rhode Island (On Narragansett Bay) GROSS SQUARE FOOTAGE: 15,000 ft2 (1,390 m2)
COST: $5 million (building); $2 million (site and infrastructure) COMPLETED: July 2005
ANNUAL PURCHASED ENERGY USE (BASED ON SIMULATION): 64 kBtu/ft2 (730 MJ/m2), 32% reduction from base case

ANNUAL CARBON FOOTPRINT (PREDICTED): 11 lbs. CO_2/ft2 (54 kg CO_2/m2)
PROGRAM: Offices, classrooms, meeting rooms, dock, and boathouse

TEAM
OWNER: Save The Bay, Inc.
ARCHITECT/INTERIOR DESIGNER: Croxton Collaborative Architects
LANDSCAPE: Andropogon Associates
ENGINEERS: Lehr Consultants International (mechanical/elec-trical/plumbing/life safety); Yoder + Tidwell (structural); Northeast Engineers (civil)
LIGHTING: William Armstrong Lighting Design
GREEN ROOF CONSULTANT: Robert Herman
ENERGY MODELING: Quest Energy Group
GENERAL CONTRACTOR: Agostini Construction

SOURCES
METAL/GLASS CURTAINWALL: Vistawall Architectural Products
WINDOWS: Pella SmartSash III Casement Windows
GLASS: Viracon Solarscreen 2000 VE-2M
LOW-SLOPE ROOFING: White TPO UNA-CLAD UC-4 Roofing System
VEGETATED SLOPED ROOFING: Sarnafil
INSULATION: Cocoon Cellulose; Dow Styrofoam Cavitymate
INTERIOR PAINTS: Pittsburgh Pure Performance
PANELING: Muraspec Wall Panel Fabric
FLOORING: Forbo Linoleum; Shaw Carpets
INTERIOR AMBIENT LIGHTING: Linear Lighting; Cooper Downlights: National Lighting; Mercury Lighting
CEILING PANELS: Armstrong
EXTERIOR LIGHTING: Cooper
LIGHTING CONTROLS: Lutron
PHOTOVOLTAICS: Kyocera KC167G 20kW photovoltaic array
CHILLERS: Yazaki CH-K40 4-ton Gas-fired heater chiller URINALS: Waterless Co. Model #2004 Sonora
TOILETS: Caroma Dual-Flush 270

Staff began searching along the industrial northern portion of the bay for a site suited for a boathouse and dock, as well as offices, classrooms, and meeting space. They identified a 6-acre waterfront parcel known as Fields Point, ideally situated near the head of the bay and just south of downtown. The group persuaded the owner, Johnson & Wales University, to donate the land, which in the not-so-distant past had served as a municipal landfill.

The selection of the former dump meant that design of the new Save the Bay Center would be just one part of a larger effort. “Our [first priority] was not to construct a green building, but to build on an urban brownfield on the coastline, in a bay-friendly, restorative way,” says Curt Spalding, Save the Bay executive director. Even the building’s architect agrees. “The coastal restoration dimension of the project was

preeminent," says New York-based Randy Croxton, FAIA, principal of Croxton Collaborative.

To support the client's larger mission and meet programmatic needs, Croxton and its consultants wrestled with several basic issues. They asked themselves where to place the building to provide protection from storms and flooding, offer physical and visual access to the water, while not impeding development of habitat for marine life and other animals. They struggled with how best to minimize the building's footprint and its impact on the site. And they grappled with a tight budget of $7 million, with about $2 million of that total needed for extensive site work, such as capping contaminated soil, installing a methane venting system, and landscaping.

The scheme that emerged from this process is simple, yet striking. Completed in 2005, the 15,000-square-foot, one-story building has a vaguely V-shaped plan that follows the outline of Fields Point, and is situated about 65 feet from the shore. Two wings—one for classrooms and another for the office area—are "hinged" by a lobby that frames a view of the bay. The steel structure, clad in wood clapboard and split-faced block, is sheltered with a series of stepped shed roofs partially covered with vegetation. From the vantage of the parking area, the green roof, along with a planted berm, creates the impression that the building has been "slid into the site," says Croxton. Inside, expanses of glass open it up to the water.

The illumination of the interior largely depends on daylight provided through skylights and clerestories. The wings' roughly east-west orientation permits use of simple strategies, such as extended overhangs to shelter the copious south-facing glazing from summer sun and prevent heat gain. Sail-cloth baffles suspended below the clerestories bounce light off the ceiling, allowing it to penetrate deeper into the space while eliminating glare.

A 4-ton, gas-fired heater/chiller provides space heating and cooling. Unlike conventional chillers, the system works without ozone-depleting refrigerants. Because it is fueled by natural gas, the equipment can reduce peak electricity load requirements. And it is capable of providing heating and cooling simultaneously to different parts of the building, explains mechanical engineer Val Lehr, PE, of the New York-based Lehr Consultants.

This dual operation is possible because the mechanical system includes eight air-handling units—a relatively large number for such a modestly sized building. The zones associated with these units are tied to occupancy sensors and the building management system, which can be set to allow temperatures to drift above or below the typical comfort range if spaces are not in use.

The building includes many other green strategies, including on-site power generation with a rooftop 20kW photovoltaic array paid for by a grant from the local utility. It incorporates water-saving plumbing fixtures such as dual-flush toilets and waterless urinals. Cellulose wall insulation, paints without volatile organic compounds, and

finishes with a high percentage of recycled content round out the more standard sustainable design choices.

In spite of all of the high-performance features, Save the Bay opted not to pursue a LEED rating. The decision was motivated in part by worries about costs that might be incurred for documentation, says Spalding. However, his main concern was that certification would require staff to redirect its attention from the organization's core activities of education and advocacy. "We spoke with other non-profits that had been through the process and LEED seemed to have consumed all of their energies," he says.

One of the costs that Save the Bay avoided was the expense associated with fulfilling the LEED commissioning prerequisite. However, commissioning might have prevented problems with the cooling system that it is now trying to resolve through retro-commissioning, says Omay Elphick, Save the Bay's on-staff project manager during construction. "In the category of lessons learned, commissioning is one of those things that can't be skimped on," says Elphick, now deputy director of Providence-based People's Power & Light, a buyer and seller of renewable energy contracts.

But despite some glitches, Elphick calls the project "precedent setting" as an example of urban waterfront redevelopment. Key to this redevelopment strategy was restoration of the site's "ecosystem services," such as cleansing the water that runs into the bay and promoting habitat for fish and other wildlife, says landscape architect José Almiñana, a principal of Andropogon, Philadelphia.

The building's roof plays a central role in this rehabilitation. In addition to merging the structure with the landscape, its vegetated surface absorbs and retains rainwater, allowing much of it to evapotranspire, reducing the amount of runoff that could mix with road salts, oils, and other contaminants, and ultimately be washed into the bay. The roof is just one piece of a site-wide strategy for capturing, filtering, and retaining stormwater that includes parking lots with pervious paving, a series of planted swales and trenches, and a buffer zone of native shrubs and grasses between the building and the shore.

Along half its waterfront, the Save the Bay team created a salt marsh. Contractors removed fill and reshaped the land with riprap and clean sand. Then volunteers planted grasses, goldenrod, and elder. The intertidal zone provides an environment for shellfish and other marine life, prevents erosion, and traps sediment and pollutants.

Throughout the design and construction process, Save the Bay was working with Rhode Island's Coastal Resources Management Council to create policy that would encourage environmentally responsible redevelopment of contaminated waterfront properties and streamline the complex permitting process. New regulations were adopted in late 2006, and redevelopment of about 7,500 linear feet of urban shoreline along the northern Narragansett Bay and its tributaries is already under way. Known as the Urban Coastal Greenways policy, the regulations set standards for public access, stormwater discharge, and vegetation, and incorporate many of the restorative techniques employed at Save the Bay. That construction of his organization's headquarters would serve as a regional

model seems to have taken Spalding by surprise: “We never thought our building would serve as a catalyst for restoration of the coastline.”