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GREEN BUILDING & DESIGN
SEPTEMBER+OCTOBER 2014

Karen Weigert's plan for Chicago
A bold vision for Silicon Valley
Ken Yeang designs for happiness
Five radical linear park projects

Guest edited by
Rob Bennett

THE CITIES ISSUE

THREE TO WATCH

How Vancouver, Las Vegas, and Washington, DC, are setting the standard for sustainability

Jonathan Milikowsky Science and Technology Building

Maryann Thompson designs a solar-powered, high-performing, vibrant learning environment for New Haven's Foote School

The Foote School, a private K–9 institution in New Haven, Connecticut, needed to upgrade space for its older students and modernize classrooms for science and technology instruction for all. The Jonathan Milikowsky Science and Technology Building, designed by **Maryann Thompson Architects** and completed in 2012, addresses those needs, and its sustainable features act as teaching tools. The project is a prime example of an institution investing in sustainability and earning substantial returns in utility savings and educational value. Here's how the design team did it. *—Peter Fabris*

PREEMINENT DAYLIGHTING

Throughout most of the building, large windows invite daylight into the interior. A series of roof overhangs and wood louvers restrict the sun's rays and reduce heat gain during the summer while allowing the lower-angled winter sunrays through. Artificial lighting fixtures are regulated via light sensors and ramp up when daylight is dim. "The headmaster tells me that they rarely need to have the lights on," says **Maryann Thompson**, principal at Maryann Thompson Architects, who adds that the building has more daylighting than most other classroom buildings. While some school programs call for limited daylighting to reduce computer screen glare, the glare issue hasn't been a problem at Foote.

TIGHT ENVELOPE, STACK EFFECT

Energy conservation was a primary goal for the design team, but that aim had to be balanced carefully with costs. "We didn't have a specific energy-efficiency goal," says project manager **Martha Foss**. The school decided not to incur the cost of LEED certification, instead redirecting those funds for a purpose with clearer benefits. "The design committee wisely chose to spend that money for an energy model and cost analysis," Foss says. Payback analysis led to a tight building envelope super-insulated with closed-cell spray foam. Walls are valued at R-30, the roof at R-60. Windows are low-E double-pane glazing and can be opened high in the walls. When windows are open and assisted by ceiling fans, they encourage cross ventilation through the stack effect, reducing the need for conditioned air.

EXCLUSIVE EXTRAS
See more of the Foote School in our iPad edition or at gbdmagazine.com.

PROJECT

LOCATION New Haven, CT
Program New STEM classroom building
Size 17,000 ft²
Cost $5.6 million
Completion 2012
Awards Boston Society of Architects Award for Excellence in K-12 Design, Boston Society of Architects Award for Excellence in Sustainable Design

TEAM

ARCHITECT Maryann Thompson Architects
Client Foote School
Contractor Chapel Construction
MEP/FP Engineer Innovative Engineering Services
Structural Engineer Richmond So Engineers
Owners Representative Leland Torrence Enterprises
Mechanical Contractor Environmental Engineering
Electrical Contractor Beacon Electric

SUPPLIERS

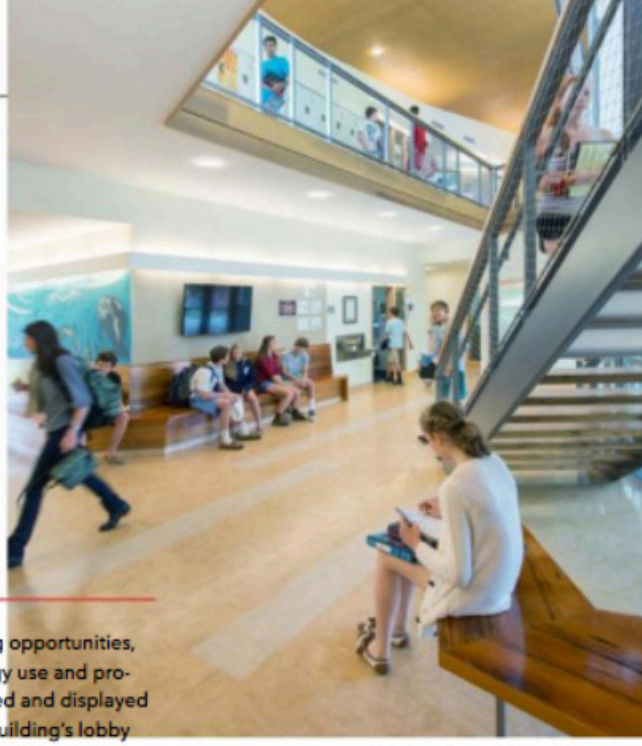
Solar-Thermal Manufacturer Bio-Tecture
Solar Panels Schüco
Windows Kawneer
Double Glazing Solar Seal
Building Envelope Icynene Spray Foam Insulation
Daylight/Occupancy Sensors / Digital Photosensors Watt Stopper
LED Down Light Lightolier
Bathroom Faucet Speakman
Toilet 'Flushometer' Sloan

PHOTOS: CHUCK CHOI

BELOW Rainwater is captured in rain barrels and used to water the school's redbud trees and other plants. The Trex decking is 98% recycled and made from plastic bags.

"This age group likes to feel like they are doing something to change the world. It helps to shape their identity."

Maryann Thompson, Maryann Thompson Architects



SERIOUS SOLAR

A photovoltaic array on the south roof generates electricity and provides a substantial amount of the building's power needs. LED lights in the entry atrium help to make that sun-generated power stretch even further, as does an energy-efficient chiller system for cooling and a high-efficiency HVAC mechanical system designed after the energy model and a life-cycle-cost analysis. A **Bio-Tecture** solar-thermal hot-water system, integrated within the louvered awning, supplies 100 percent (on most days) of the building's hot water supply for sinks throughout the building and for dishwashers in the science labs.

RECYCLED AND RECLAIMED

The sustainability ethos goes beyond energy efficiency and generation. Many of the construction materials are composed of recycled and reclaimed material. Glass bathroom tiles are made of 90 percent recycled content. Structural and infrastructure elements such as structural steel and fabric ducts were manufactured with over 50 percent recycled content. Reclaimed wooden seats, originally from Yale University's football stadium, were repurposed throughout common areas for benches and stair treads.

VISIBLE TOOLS

To provide learning opportunities, all water and energy use and production is monitored and displayed on screens in the building's lobby and is accessible on the school's computer network, allowing the building to function as an interactive teaching tool. Signs throughout the building supply information about green systems. "The things that have the most visibility have the most educational value," Foss says. Students reportedly are enjoying their environmental laboratory. "This age group likes to feel like they are doing something to change the world," Thompson says. "It helps to shape their identity." gb&d

ABOVE The building's two-story lobby is flooded with natural light. On the wall, monitors track energy use and production.

BELOW Awnings perform double duty on hot days by shading the sun and heating water through an integrated solar-thermal system.

PHOTOS: CHUCK CHOI