GreenSource
THE MAGAZINE OF SUSTAINABLE DESIGN

The 2010 AIA COTE Awards

OH MY, OMEGA

The Omega Center Vies To Be The First Designated "Living Building"

+ Other Top Ten Coverage

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CASE STUDIES

THE PREMIER DESIGN AWARD

The 2010 AIA COTE awards reflect the escalating standards of sustainable building —in both design and performance.

This year's COTE Top Ten jury kicked the program up a notch from recent years in terms of energy and environmental performance of the winners. Juror Dennis Hayes captured their choices well when he said that in an era of constrained and expensive energy, priorities change: "We are redefining what we see as beautiful and effective." Did they compromise on design quality in making those choices? Judge for yourself.

It wasn't the jury alone that chose to emphasize energy performance, however. The AIA Committee on the Environment (COTE), which runs the program, inserted an extra step into the awards process to make sure that reliable energy and water data were available to the jurors. The committee selected a team of experts to prescreen all the project data. This team identified areas where data was missing or unclear, and AIA staff then contacted submitting teams to clarify and supplement the data. There were very few projects that did not require some revision or clarification, according to committee chair Filo Castore, AIA.

View expanded coverage on each COTE award winner, including dozens of additional images, at greensourcemag.com/projects

The jury process began after the technical review ended. Their selections included three projects that have been featured in recent issues of *GreenSource*. We summarize them, but take a deeper look at the seven remaining projects on the following pages. In the words of jury chair Peter Busby, AIA: "COTE Top Ten should be the premier design award, because it blends both design and performance like no other design award program out there." –NADAV MALIN

THE JURY, FROM TOP:
Elizabeth Ogbu
Assoc. AIA | Public Architecture
Robert Harris
FAIA | Lake Flato Architects
Denis Hayes
The Bullitt Foundation
Alison Kwok
AIA | University of Oregon
Lisa Heschong
Heschong Mahone Group
Peter Busby
Assoc. AIA, Int'l Assoc. AIA | Busby Perkins+Will

ILLUSTRATIONS BY SCOTT MENCHIN

HOLISTIC AT HEART

A new building on the campus of the Omega Institute performs a very practical function, but also serves the organization's loftier, pedagogical goals.

More than five years ago, when the Omega Institute for Holistic Studies first began to contemplate a new sewage treatment facility for its wooded, 195-acre campus in Rhinebeck, New York, the nonprofit organization's management, at least at first, viewed the undertaking solely as an infrastructure replacement project. But it soon grew into a larger endeavor with goals in line with those of the institute itself, which offers educational programming intended to support wellness, personal growth, and social change. "We decided the new system should satisfy three basic criteria, explains Robert "Skip" Backus, Omega's CEO. "It needed to consume little energy, use no chemicals, and be accessible and educational."

In place of the campus's aging septic tank and leaching field system, Omega opted for a multi-step filtration process known as an "Eco-Machine," which mimics nature and relies on beneficial bacteria, plants, and other organisms to break down and consume pollutants in water. And to enclose this unusual system, Omega hoped for a structure that would be similarly forward looking. "Since we were taking a leadership position for water treatment, we wanted a building that would match it," explains Backus.

The result is the 6,250-square-foot Omega Center for Sustainable Living, or OCSL, which houses part of the treatment process and includes a classroom that the institute uses for general educational programs and to teach guests and the general public about the water cycle and sustainable building. The center, designed by BNIM Architects and completed in May 2009, is on track to receive LEED Platinum certification. It is also among a handful of projects vying to be the first designated as a "living building" as part of the Living Building Challenge, a program launched by the Cascadia Green Building Council. To qualify it must satisfy a list of prerequisites that includes generation of enough electricity on site from renewable sources to offset purchased energy, capturing and treating of all wastewater, and avoiding materials that contain certain chemicals.

Despite these big ambitions, the OCSL has a modest appearance. Clad in weathered cypress salvaged from a nearby mushroom farm, the center is made up of two shed-like structures connected by a flat-roofed lobby. The smaller volume is supported by a laminated timber structure and contains a mechanical room and bathrooms, while the larger one is steel-framed and encloses the classroom and two aerated lagoons. The roots of tropical plants suspended inside the concrete tanks provide habitat for microbes that scrub the water of unwanted nutrients, explains Jonathan Todd, president

>KEY PARAMETERS
Location Rhinebeck, New York (Hudson River Valley watershed)
Gross area 6,250 ft² (576 m²)
Cost $2.8 million
Completed May 2009
Annual purchased energy use (measured) -2.4 kBtu/ft² (-28 MJ/m²)
Annual carbon footprint (predicted) -0.5 lbs. CO_2/ft² (-2.7 kg CO_2/m²)
Program Wastewater treatment, laboratory, classroom

>TEAM
Owner Omega Institute for Holistic Studies
Architect BNIM Architects
Engineers Chazen Companies (civil); BGR Engineers (MEP); Tipping Mar (structural)
Commmissioning agent EME Group
Consultants Conservation Design Forum (landscape); John Todd Ecological Design (Eco-Machine)
General contractor David Sember Construction

OMEGA CENTER FOR SUSTAINABLE LIVING

By JOANN GONCHAR, AIA

Rhinebeck, New York

The Omega Center for Sustainable Living shelters a pair of aerated lagoons and overlooks a series of lush constructed wetlands. Both the lagoons and the wetlands are part of a wastewater treatment system that mimics nature.

For extended slideshow coverage, go to greensourcemag.com/projects

of John Todd Ecological Design, the designer of Omega's Eco-Machine.

The OCSL is configured to provide conditions that will allow the lagoons' plants to thrive while maintaining a pleasant environment for people. Solar-tracking skylights and a completely glazed south elevation maximize sunlight. However, a generous roof overhang and a light shelf limit summertime direct solar exposure and reduce glare. Ventilation is assisted by ceiling fans but otherwise provided by natural means through low operable windows positioned on the primary facade and in a clerestory on the opposite wall. "The building feels a little like a greenhouse," says Laura Lesniewski, AIA, BNIM principal, "but it is still comfortable."

Other building systems also have been designed to consume as few resources as possible. The OCSL's toilets, for instance, are flushed with roof runoff collected in an underground 1,800-gallon cistern. Equipment such as lighting, a geothermal heating system, and the lagoons' pumps and blowers require electricity to operate, but these needs are more than covered by three photovoltaic arrays which generated 38,994 kWh from June 2009 through this past May, about 15,000 kWh in excess of what was consumed by the building systems.

One difficulty was finding affordable materials that satisfied performance goals and could be obtained within the tight transportation limits outlined in the Living Building Challenge. For example, fly ash was originally specified as part of the concrete mix, but was not available from nearby suppliers. So in the end, the team decided to use slag, and identified a source in Maryland, just within the allowed 250-mile radius for high-density materials.

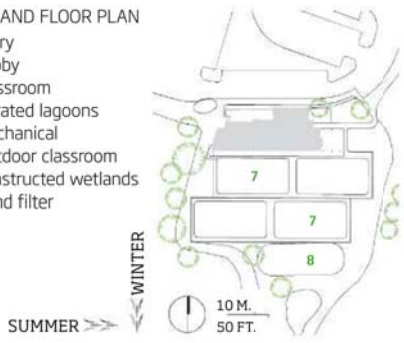
Above **The OCSL has a greenhouse-like atmosphere with solar-tracking skylights and south-facing glazing providing the daylight that the Eco-Machine's water-scrubbing plants need to thrive.**

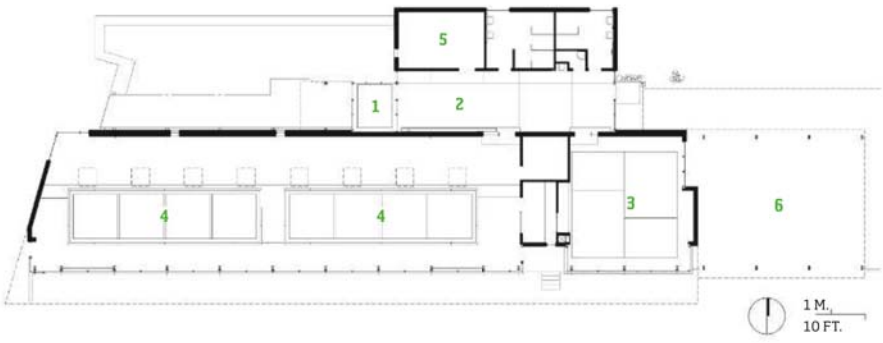
The OCSL and the tanks it encloses are just one piece of a cycle that begins when water is drawn from wells and is distributed to Omega's 115 buildings for activities such as food preparation, bathing, and toilet flushing. Then, in a process that takes about two and a half days, the wastewater (as much as 52,000 gallons each day during peak periods) flows through a system that includes underground septic and anoxic tanks, constructed wetlands, and the indoor aerated lagoons. Along the way, organic material is removed, as are contaminants such as nitrates and ammonia. Finally, the Eco-Machine-treated water gradually infiltrates an aquifer below the Omega property and feeds a nearby lake.

After some initial problems with the plants in the aerated lagoons during the first winter, the Eco-Machine works almost flawlessly. The remedy involved modifying the control sequence so that the water cycles through the tanks more slowly in cold weather. Now, "it performs amazingly," says Backus. "All I do is cut the flowers and clean the filters. The snails and the plants do the rest." GS

>SOURCES
Exterior cladding Green Courage
Building wrap VaproShield WallShield
Windows and doors Loewen
Low-slope roofing Carlisle Sure-White EPDM
Sloped roofing Drexel Metals Drexlume
Paints and stains TNEMEC Hydro-Zinc Series 94-H_2O
Interior sound insulation Green Fiber Cocoon
Photovoltaics Sunpower
Water source heat pumps Waterfurnace E Series

SITE AND FLOOR PLAN
1 Entry
2 Lobby
3 Classroom
4 Aerated lagoons
5 Mechanical
6 Outdoor classroom
7 Constructed wetlands
8 Sand filter





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