BY KIM A. O'CONNELL

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2008 evergreen awards
FIRST PLACE
WINNER

PROUD IN THE PRAIRIE

In the days of westward expansion, Iowa's tallgrass prairie covered more than three quarters of the state, sometimes growing so high it could hide a rider on horseback. Restoring this historic and native landscape was a major aspect in the development of one of the state's most sustainable buildings, the Iowa Association of Municipal Utilities Office and Training Facility in the Des Moines suburb of Ankeny. ¶ Completed in 2000, the IAMU building sits low on a 40-acre (16-hectare) lot, its humble roof barely visible above the restored prairie grass around it. Designed by Des Moines-based RDG Planning & Design, in concert with association and county government partners, the building is a continuously monitored training and demonstration facility for the utility. Although it was designed before the Washington, D.C.-based U.S. Green Building Council's LEED rating system was developed, it features many sustainable features and still is widely heralded today.

An Iowa Municipal Facility Demonstrates Exemplary Performance Throughout Its Life

In August, as part of *eco-structure*'s inaugural Evergreen Awards, the IAMU building won in the "flashback" category for its ability to demonstrate 12 months of exemplary energy- and water-consumption data. The 13,000-square-foot (1208-m²) building uses only 28,000 Btus of energy per square foot per year, which is less than the 34,600 Btus of energy per square foot per year the designers originally had predicted through modeling and dramatically lower than the 65,800 Btus of energy per square foot per year used by a comparable, code-compliant building.

"Demonstration centers are an essential element in the building industry to display technology and provide a learning environment for building industry professionalism," says Ralph DiNola, principal of Green Building Services Inc., Portland, Ore., and one of three Evergreen Awards judges. "I think the thing that impressed me the most about this project is how the utility comprehensively addresses green-building strategies in a center that will provide outreach and education to the marketplace."

LIGHT AND AIR

From the beginning, it was important to the designers to bring in as many partners as possible to forge a comprehensive design solution—from the Polk County Conservation Board and the county's Soil and Water Conservation District to member utilities and even local members of the Tucson, Ariz.-based Dark Sky Association to discuss the issue of light pollution. Together, the team participated in a dozen full-day design charrettes. Overarching goals included lowering building-energy consumption, reducing the amount of construction materials, choosing materials with low embodied energy and environmental impacts, and fostering IAQ and public health.

"The building's references to Iowa's vernacular architecture skillfully act as functional and aesthetic design elements, minimizing the building's environmental footprint while creating a pleasant work environment," says Tom Glaysher of Flad Architects in Gainesville, Fla., another Evergreen Awards judge. "This project advances the green-building field by exemplifying the value of

GREEN TEAM»

[PROJECT OWNER]
Iowa Association of Municipal Utilities, Ankeny, www.iamu.org

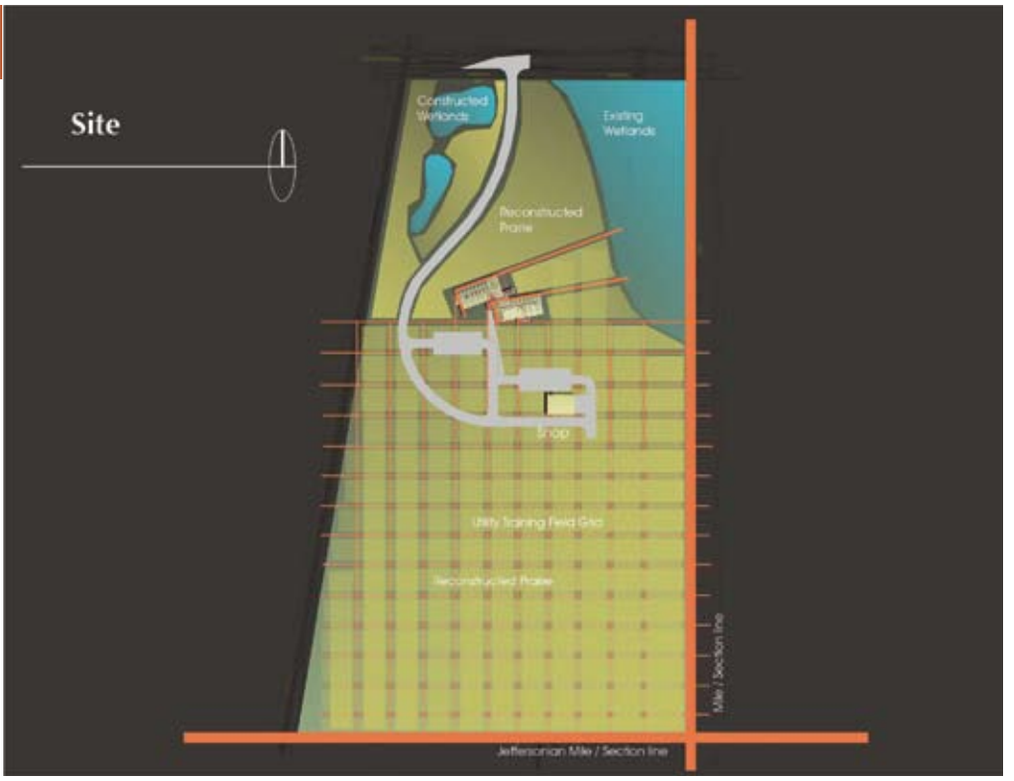
[ARCHITECT]
RDG Planning & Design, Des Moines, Iowa, www.rdgusa.com

[ENERGY CONSULTANT]
The Weidt Group, Minnetonka, Minn., www.twgi.com

planning, modeling and assessment of various options for building components in tandem with aesthetic considerations to create a visually unified and sustainable building design."

Iowa farms typically were sited to buffer northwest winter winds and allow access to southeast summer breezes. Similarly, RDG Planning & Design sited the IAMU building along an east-west axis to maximize daylighting and allow simple solar controls. The open floor plan and extensive daylighting, which covers 96 percent of the building, offer panoramic views of the native prairie beyond. Even storage rooms have been daylit. Actual metered energy consumed for lighting is just under 6,000 Btus of energy per square foot per year, a dramatic savings compared with the 17,600 Btus of energy per square foot per year used by a comparable structure, according to RDG Planning & Design, who worked with an energy consultant, the Weidt Group of Minnetonka, Minn., as well as the Iowa Energy Center, Ames, to compile the data.

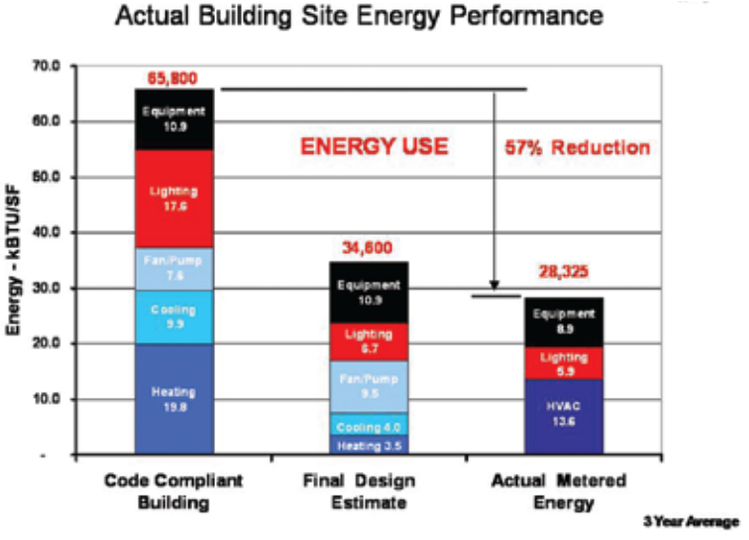
"This building is highly sustainable because of its daylighting and daylighting controls, efficient lighting and superior thermal envelope," says Kevin Nordmeyer, AIA, LEED AP, a partner with RDG Planning & Design. "We tuned the windows to the location of the sun. We minimized the east and west exposures, and the glass on those sides has a different shading coefficient. The south side is completely shaded with overhangs."



To create a high-performance building envelope, the team chose operable wood-framed windows and foamed-in-place insulation. Occupancy sensors and time clocks help control the use of electric light. A geothermal heat-pump system serves the building's heating and cooling needs. The eight pumps are based in different occupant zones throughout the building to circulate water to 38 wells underground where the earth is a constant temperature.

"When the project was first completed, the budget was very tight and the client chose not to put in a variable-speed drive on the pumps, which circulated at a constant rate," Nordmeyer says. "They've since installed a variable-speed drive, which can adjust the circulation rate up or down based on the needs of a particular zone."

Other sustainable products and materials used in the building include recycled concrete for driveways and building slab cushions, 100 percent



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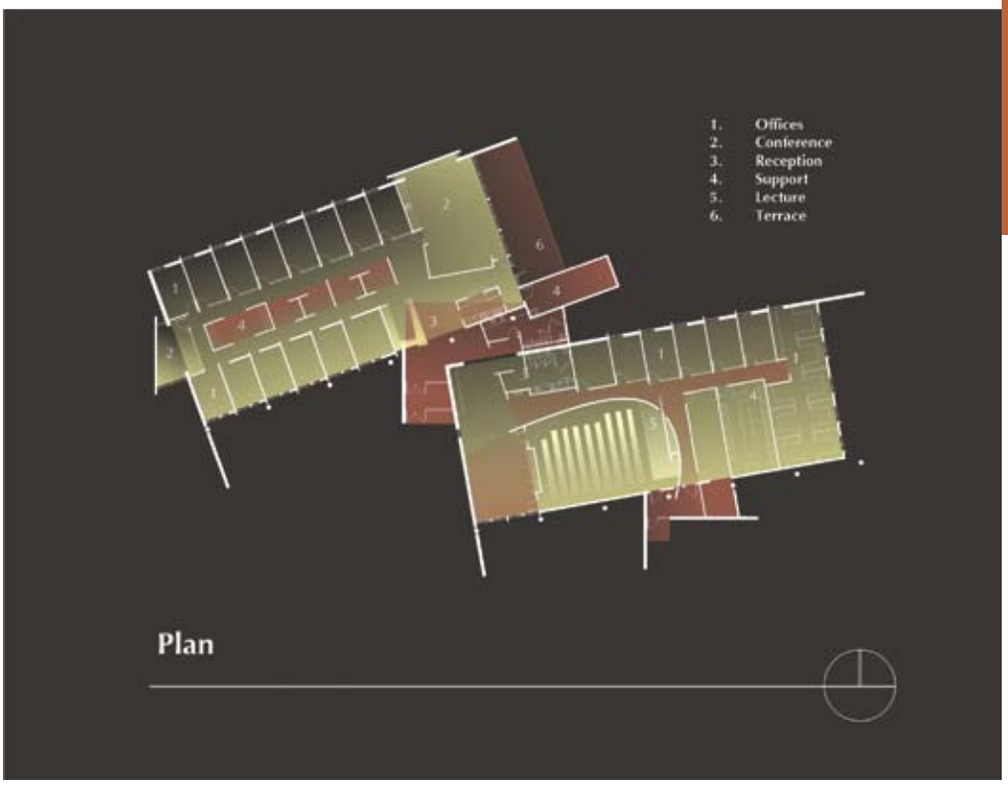

MATERIALS AND SOURCES

[WINDOWS]
Designer Series, Pella, Pella, Iowa, www.pella.com

[FOAMED-IN-PLACE INSULATION]
Icynene, Mississauga, Ontario, Canada, www.icynene.com

[EXTERIOR CEMENT-BOARD SIDING]
Viroc by Allied Building Products Corp., East Rutherford, N.J., www.alliedbuilding.com

[DRYWALL]
USG, Chicago, www.usg.com

recyclable carpeting and metal roofing and flashings, roof insulation made from partially recycled polystyrene, recycled-content cement board and formaldehyde-free particleboards for casework. The design team was careful to recycle construction waste and continually evaluated and modeled the building's energy consumption to maximize efficiency.

According to Nordmeyer, the utility association continually has sought ways in the past eight years to work with the firm and other partners to boost the building's energy performance even further. For example, the association soon will add one small wind turbine and one photovoltaic panel to the structure. "They think they're getting close to a near energy-neutral situation," Nordmeyer says.

SOIL AND GRASS

In addition to its success as a building, the IAMU project carefully has tended to the land. The project team restored a vacant farmland and coal-mining area where soil erosion had been damaging the natural habitat in a 40-acre (16-hectare) protected wetland. Now, a reconstructed Iowa tallgrass prairie, wetlands and siltation pond have recreated the native habitat on the site. (The siltation pond captures silt deposits and allows them to settle out, which then can be removed and redeposited later as necessary.)

More than 60 native species, such as coneflowers, goldenrod and compass plant, now are growing on the property, which one day may contribute seeds for other prairie restorations in the state. A biological wetlands treatment system provides on-site wastewater treatment.

"Here is a remarkable project that does it all, showing the ingenuity and passion of an integrated design team," says Bert Gregory, AIA, president and chief executive officer of Seattle-based Mithun and an Evergreen Awards judge. "This is a great place for the leaders of Iowa's utilities to learn a simple lesson: Reduce demand first."

"Even though this project was completed in 2000, it's still being awarded and written about in local newspapers," Nordmeyer says. "The owner has said that he wishes that he wasn't still the news; there should be 50 more buildings like this in Iowa. For several years now, that building has been the model that people have been trying to learn from. It's nice to be recognized."

>> KIM A. O'CONNELL writes about architecture and sustainability from Arlington, Va.