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Vermonters shape space, better and better

By Joel Banner Baird, Free Press Staff Writer

It's been said before: Vermont has a shortage of sunlight and a surplus of cold.

And its inhabitants live in a world progressively less generous with stacks of cordwood, tankers of oil and cheap airfares to the tropics.

Vermont's architects, bless 'em, are stepping up to the challenge.

Displays of some of their latest (and greatest, some would argue) work will surface Wednesday and Thursday at the "Better Buildings by Design" conference, held at the Sheraton Burlington Hotel and Conference Center.

Paul Duane, the planning and development manager for Efficiency Vermont, previewed submissions for the "Best of the Best" awards from churches, colleges, clubs and Moe's Southwest Grill in Williston.

"We have here a collective excellence," he said last week. "They might not all be in the limelight next week, but they all add up. We're all pushing to learn."

What makes a building better?

For the purposes of its awards, Efficiency Vermont (the conference organizer) suggests that such a structure will afford its occupants ample warmth and light — and consume as little energy as possible to achieve those goals.

The formula sounds simple.

The buildings aren't.

They serve a multitude of purposes; they testify to our climate and our resources — and to conditions our descendents will encounter.

Some of them are downright beautiful as well as practical.

Take, for example, the Given Courtyard.

Message in a bottle

On the University of Vermont medical campus, where open space for construction is at a premium, this baby's a building within a building.

It's a huge, four-story, 31,000-square-foot space-saver. It's alive with light, fresh air and conversation.

The $12.5 million courtyard building rises, seemingly weightless, from the innards of an otherwise ordinary block building to within 50 feet of a clear, domed roof.

The result: a structure that attracts people.

John Evans, the former dean of medicine and now senior advisor to the president of the university, stood last week on a glass-clad balcony and surveyed the easy flow of doctors, clinicians, students and staff.

"It's become a center, a gathering place," he said. "From the earliest discussions, the question became, 'How do you get people talking?'"

Cafe tables help. So does souped-up acoustical design: Visitors hear a pleasant, conversational murmur — but not an ounce of echo.

Architect Keith Robinson of Montpelier-based Black River Design credits the project's success to close collaboration with his clients.

"We found out that interior hallways in the older building made it hard for people to determine where they were," he said. "People are a lot happier when they see sunlight.

"We created spaces that are self-explanatory," he continued. "There's less need for signage. Sunlight penetrates deep into the new spaces. This is not your usual Vermont building."

The added light reduces the need for artificial lighting.

Other design benefits are less obvious, such as reduced costs of bringing utilities to the site, efficient air-handling equipment and a system of removable walls and raised floors that ease reconfiguration of space for future needs.

Evans, who terms the structure "a ship in bottle," said he thoroughly enjoyed the planning process.

"It's sort of been fun," he said. "We've become amateur architects and engineers."

Taking off

Christopher Hill, president of Heritage Aviation, likewise brought his playful, back-of-the-envelope drawings to the table when he decided to restore a 1950s-era hanger at Burlington International Airport.

As per his specs, a bicycle-friendly path leads to Heritage from Williston Road.

A living, "green" roof planted with sedum (in patterns designed to appeal to airborne viewers) drains to a 35,000-gallon underground tank — and the water is used to wash aircraft.

Aviators might not know to thank a bank of solar hot-water panels for the warm showers.

Motorists will be forgiven if they don't notice the pebbly, porous concrete parking lot (another stormwater-reduction measure) or the state-of-the-art LED outdoor lights.

But they can't miss the facility's 100 kW wind turbine, or the south-facing solar panels.

Hill is “a rare owner,” said architect Richard Dean of Burlington-based TruexCullins.

An early decision: Strip the building (“a rusting hulk,” Dean called it) down to its concrete-and-steel skeleton to preserve structural elements.

“One of the greenest things you can do is not build a new building,” he said.

The old Air National Guard hanger’s industrial past remains intentionally vivid. Many of the original trusses and beams are now visible. Interior support rods connect to propeller-like hubs. A dull shine emanates from metal interior and exterior walls — a nod to airplane’s alloy skins, Dean said.

The aesthetics embrace energy savings, he added.

Higher ceilings and skylights raise work-light levels. Jumbo-quantities of insulation and sealing result in a high-performance, energy-efficient building “envelope.”

When the wind turbine went up last year, Hill said his vision for a more earth-friendly building stemmed in part from his work with aircraft — “an energy-intensive business” that increasingly commissions designs based on fuel savings.

Many other architectural clients have reached the same conclusion, Dean said: “It’s where we’re all headed.”

Books and pocketbooks

It’s where a school in Putney, solidly rooted in farming traditions, plans to take the 21st century

A “net-zero” building, explained Waitsfield architect Bill Maclay, is one that, over the course of a year, generates as much energy as it consumes. The Putney School’s new 16,800-square-feet field house is Vermont’s first commercial building to hold that distinction.

Completed last year for $6 million, the project was an exercise in collaboration and forward-thinking, Maclay said. Regular design meetings (termed “charettes” in planning circles) with students, faculty and staff were “incredibly rewarding and a ton of fun” and yielded “extraordinary results,” he continued.

Students seized upon the idea of a field house placed beside the dining hall, where it would attract unstructured socializing and pick-up basketball games — along with hardcore workouts.

There was broad agreement that an energy-efficient building would serve the school’s emphasis on hands-on learning.

“From the beginning, it was envisioned as a teaching tool,” said Don Cuerdon, Putney School’s communications director. “This is, among many other things, a working farm: We got on the bus before it was fashionable.”

The new building’s performance (and the output of its nearby photovoltaic trackers) will expand the curriculum in science, technology and economics, Cuerdon continued.

“We built this place to teach other people how to build this kind of building,” he said.

Maclay’s meetings with alumni and the school’s board began with price limits and fundraising strategies. Those limits and strategies shifted.

“Throughout those discussions, we showed what various enhancements would offer, both in terms of up-front cost, appearance and capital and operating costs 30 years out,” Maclay said.

The choices: to build to code; to build a “micro-load” (or renewable-ready) structure that would require minimal energy input; or the deluxe, net-zero model.

Randy Smith, the school’s chief financial officer, ultimately determined it would probably be easier to raise $1 million for a net-zero building than another $1 million endowment for future oil bills, Maclay said.

“It’s a different world now,” he continued. “Efficiency is something we’re going to be facing for the next 100 years.”

Payback time

Putney School’s decision confirms an emerging shift in how a building owner might determine “payback” for efficiency upgrades, say energy experts at Efficiency Vermont.

“Typically, it’s meant how quickly you recover your initial investment,” Efficiency Vermont’s Paul Duane said. “You ask yourself, ‘When do I get my dollars back for putting in those solar panels?’”

“You can also measure it as a cash-flow return over the life of the investment,” he continued. “Efficiency Vermont is tasked with generating savings. We’re saying, ‘If you can, this is the way to do things.’”

The new financing model, he added, assumes that fuel prices will, at best, remain unstable for the foreseeable future — and almost certainly will rise.

Blair Hamilton, policy director at Vermont Energy Investment Corp. (the nonprofit that operates Efficiency Vermont) said the model is gaining currency worldwide.

“How much risk do you want to take in assuming that energy prices will remain flat?” he asked. “How exposed do you want to be? Will you wish that you’d done something different?”

Credentials, color, curves

Other aspects of efficient building design can be quantified more firmly.

Many of them are linked to the widely touted certification offered by Leadership in Energy and Environmental Design (LEED), a rating system devised by the U.S. Green Building Council.

In increasing levels of achievement, buildings merit silver, gold and platinum LEED credentials — and their efficiency enhancements range from the installation of bike racks to recycling waste concrete.

Steve Smith, a founding partner of Burlington-based Smith Alvarez Sienkiewycz Architects, helped design the state’s first LEED-certified building (the ECHO science center on the Queen City’s waterfront) and its first LEED-Platinum building (on the Middlebury College campus).

He acknowledged the credentials are no guarantee of a successful building. “It’s a useful guide; it’s not perfect,” he said.

Another work-in-progress, he added: measuring a new, energy-efficient-building’s beauty.

Smith graciously accepted praise for his firm’s award-winning projects this year: renovations of Aiken

Hall at Champlain College, and the rustic (and LEED-Platinum-certified) structure at the Marsh Billings Rockefeller National Historic Park in Woodstock.

Neither Smith nor his project partner, Tricia Roy, found the glittery surface of photovoltaic panels inherently attractive. They become more “acceptable,” Smith said, when they are integrated into an existing roofline.

Smith paused.

Shelburne Farms, he said, has considered installing an out-of-the-way solar “orchard,” comprised of stem-mounted tracking panels.

“That,” he said, “would be beautiful.”

Smith said his evolving notions of architectural beauty face regular challenges with each successive Solar Decathlon, sponsored every year by the U.S. Department of Energy.

Within a narrowly defined budget, decathlon teams from around the world vie for the honor of building the most efficient and aesthetically pleasing structure.

This year, Smith will field a team from Middlebury College, where he teaches.

It’s a good investment of his time, he said.

“I tell my son, ‘This is a great time to be an architect,’” he continued. “It’s become a profession transformed.”

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Additional Facts

What makes a building better?

Conversations with some of the state’s top architects yielded some guiding principles for energy-efficient designs:

• **Site:** “Aim” new buildings to benefit from solar heat and natural lighting.

• **Conserve:** Preventing heat loss (through sealing a structure’s “envelope” and insulating) is a critical first step.

• **Flow I:** A tight building needs a system to introduce fresh air from outdoors.

• **Flow II:** Slow (“treat”) storm-water runoff to minimize impact to watershed.

• **Power down:** Install energy-efficient appliances.

• **Power up:** With renewable energy — but only after considering the above choices. A “renewable-ready” building is one that has been designed (or retrofitted) to require less energy.

Gawk, learn, absorb

Vermont's leading architects and builders strut their stuff at the "Better Buildings by Design" conference this week, organized by Efficiency Vermont. The event features displays of new projects and products, and workshops geared to the interests of professionals and homeowners alike.

• **WHEN:** 7 a.m. to 7 p.m. Wednesday; 7:30 a.m. to 5 p.m. Thursday.

• **WHERE:** Sheraton Burlington Hotel and Conference Center; Williston Road, South Burlington.

• **COST:** For both days, advance registration is $275 ($300 at the door); single-day advance is $175 ($200 at the door). Over the phone: (877) 248-9900.

• **MORE INFO:** Contact Efficiency Vermont at 860-4095.

• **ONLINE:** http://bit.ly/BetterBuildings