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Livin' Green & Getting Ready for Spring



THE ORIGINAL HOME, built in 1955, was designed in a modernist architectural style featuring a wide, flat roof and twist-turn slider windows.

Builder updates 1955 home

Modern upgrades on heating, design

By CHRISTY LYNN
MIDDLEBURY — Beginning with its avant-garde, Frank Lloyd Wrightian architectural design in 1955 and following through to a recent extensive energy retrofit, one home in Middlebury — at 17 Chipman Heights — continues to lead the way for new developments in residential construction and design.

The house sits atop Chipman Hill facing west overlooking the Exchange Street area and Wright Park, with stunning sunset views of the Adirondacks.

The house was

"While it may not have been a terrible issue for someone who was in the oil business, it was hard to escape the fact that the home was an energy pig beyond comprehension."

originally commissioned by William Rogers, an area fuel oil distributor. The architect was Benjamin Stein, whose goal was to pioneer untraditional, modern design trends to create a low-profile structure that cascaded down the slope of the hill, but was unassuming from the uphill side.

The original building used concrete block and brick cavity wall construction, with twist-turn slider windows on the south and west facing walls and large fixed corner windows that were intended to offset the boxy exterior design, according to a *Burlington Free Press* article written in October 1955.

A flat roof inspired by modernist design trends was incorporated into the design, originally made of tar and gravel.

Insulation and energy usage were hardly a focus in the design at this time, which led to a home without any insulation in the walls, floors, or roof.

The original roof was replaced around 2004 with a rubber membrane roof, which quickly showed



THE NEW, PITCHED roof added to the original home allowed for increased insulation using spray foam insulation as well as loose packed cellulose. The insulation will help new homeowners save hundreds of dollars in heating bills this winter.

signs of cracking and rotting, with soft spots and signs of damage to the framing.

The only insulation in the roof was the thin Homasote board used to secure the rubber membrane, which

meant significant energy consumption due to heat being lost through the ceiling.

MODERN UPGRADES

The home changed hands in 2012
(See Cambium, Page 3C)



INTERIOR RENOVATIONS INCLUDED replacing the retro-style brick fireplace with a newer, high efficiency insert that helped achieve the airtight quality of the new design.

Livin' Green & Getting Ready for Spring



Cambium

(Continued from Page 2C)

for only the second time since it was built. The new owners hired Chris Stackhouse of Cambium Construction in Middlebury and together they worked on a plan to perform a major energy retrofit on the home.

"While it may not have been a terrible issue for someone who was in the oil business, it was hard to escape the fact that the home was an energy pig beyond comprehension," said Stackhouse, whose small design and build firm specializes in energy efficient construction.

The design process was complicated and Stackhouse considered several options for increasing the efficiency of the home without abandoning the original character and architecture.

The flat roof presented one of the most significant challenges. Because the original roof was so poorly insulated, snow loads were relatively minor, Stackhouse said.

"The snow melted quickly and easily because the heat from inside the house was escaping right through the ceiling," a common problem with poorly insulated homes, he said.

Adding more insulation to the roof therefore meant that snow loads would increase significantly, which created a problem that would need to be addressed with additional structural support to the frame.

Interior space was already at a premium. With only 7-foot, 6-3/4-inch ceilings there wasn't an opportunity to reinforce the structure from the inside, so improvements had to be made from the outside.

Not only would that have been expensive, but two-foot thick metal fascia, which stuck three feet out from the walls on the original design, would have made the new roof appear disproportionately thick if the design required adding significant



AN OPEN FLOOR plan on the main level takes advantage of natural light brought in through large windows facing to the south and west. Original twist-turn slider windows were replaced with new, highly efficient windows by Marvin.

cant depth to the roof for insulation.

Therefore, Cambium's team proposed an alternative option for the roof, which included a multi-layered pitched roof — a solution that added adequate structure and insulation without compromising interior space.

Cambium's team added rigid foam insulation and 2-by-4 walls to the original structure, insulating them with dense packed cellulose.

After removing moldy and damaged material from the roof, they sealed the old rubber membrane with spray foam insulation and added 18 inches of loose packed cellulose to the new roof.

New trusses were incorporated with new bearing points to lower maintenance costs and should last two to three times longer than another rubber membrane roof would have, Stackhouse said.

The pitch of the roof is the lowest that standing seam panels can accommodate and was built to be able to support solar panels if that deci-



NEW ROOF TRUSSES and load-bearing points extend onto the wide overhangs designed with the original roof. The house looks west from the top of Chipman Hill, offering spectacular views to the Adirondacks.

sion were to be made in the future.

Water runoff from the roof was also carefully considered and "splash zones" were created, using gravel drains to avoid erosion of the downhill slope as well as splatter on the building's walls.

"We could have done the flat roof option," Stackhouse says, "but we wanted to make sure it was done correctly and the pitched roof seemed like more of a guaranteed option. In the end, it worked out very well and we're happy with that decision."

In renovations, one thing always leads to another, which is why it's also smart to consider a wide scope of options when launching into any specific project.

In this case, Stackhouse also leveled and insulated the basement floor, which he said is another way to reduce excessive energy usage. "If the basement floor stays at 45 degrees, but your house stays at 72, you're going to spend a fair amount of money offsetting that difference."

A heat recovery ventilator was installed in the basement as well, which exchanges stale used air for fresh air and in the process pre-warms that new air.

"This is a highly efficient system that's almost critical in an airtight house," Stackhouse says.

The home is heated using an energy efficient System 2000 oil boiler. A combination of hot water baseboard heaters and radiant heating is used.

A small "mini-split" wall unit was also installed as a highly efficient way to heat as well as cool the space, using far less electricity to operate than standard units.

PAYBACK MATH

According to the new homeowners, their oil consumption is on track to be less than a third of what it had been before the retrofit.

"What this means to me is the 'above minimum code' costs will be paid back, at current oil prices, in seven years," he said.

(See New era, 5C)



THE NEWLY SLOPED roof was perhaps the largest architectural intervention in the recent renovations by Cambium Construction. The decision was made after a long and thoughtful process and fueled by the need to increase insulation in the roof while maintaining the interior ceiling height. The pitched roof, finished in standing seam metal panels, helps achieve greatly increased energy ratings and offers a much longer-term solution than the flat roof previously finished with a rubber membrane.



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Livin' Green & Getting Ready for Spring



Expo helps us think about levels of sustainability

By EVAN JOHNSON

MIDDLEBURY — Addison County residents will be able to discuss new sustainable approaches to everyday life at the Sustainable Living Expo scheduled for March 29 at the Middlebury Union High School. The event, organized by the Addison County Relocalization Network (ACORN), will run from 9 a.m. to 4 p.m. and will feature 100 exhibitors and 35 workshops, including student presentations, off-site tours, live music and local food samplings.

Elizabeth Golden-Pidgeon, executive director for the event, said the concept for the expo was based on the Green Energy Expos of 2010 and 2011.

"They started us thinking beyond energy," she said. "It was a good start and it was valuable and important, but the issue is much more than that. I think people are ready to look at all the different levels of sustainability."

With that in mind, the Sustainable Living Expo will feature a broad range of exhibitors including government agencies, nonprofits, businesses and private citizens. Golden-Pidgeon said the focus of the Expo is to emphasize developing and promoting resources for the community from many perspectives.

"We're bringing in specific community resources that people can tap into so they can be more a part of the community," she said. "The workshops will make things happen, they'll help people go out and make changes in their lives and in the community."

A sampling of activities at the Expo includes tours of the Middlebury College solar houses and other area homes that have been retrofitted with energy-efficient lighting and water-heating measures, charcoal and compost demonstrations, and

"We're bringing in specific community resources that people can tap into so they can be more a part of the community. The workshops will make things happen, they'll help people go out and make changes in their lives and in the community."

—Elizabeth Golden-Pidgeon

a tour of a new ultra-efficient Tiny House.

The event will also feature Kathryn Blume, a writer, environmental activist and inspirational speaker, who will give the keynote address. Blume's speech is titled, "Radical Sustainability: A Fierce and Spunky Revolution."

Golden-Pidgeon said the purpose of the event is to educate and discuss solutions, not to debate current problems.

Presenters will hold six workshops on six topics:

- Health and Well-Being
- Land and Wilderness
- Energy Conservation and Renewable Energy
- Food and Farms
- Economy
- Transportation

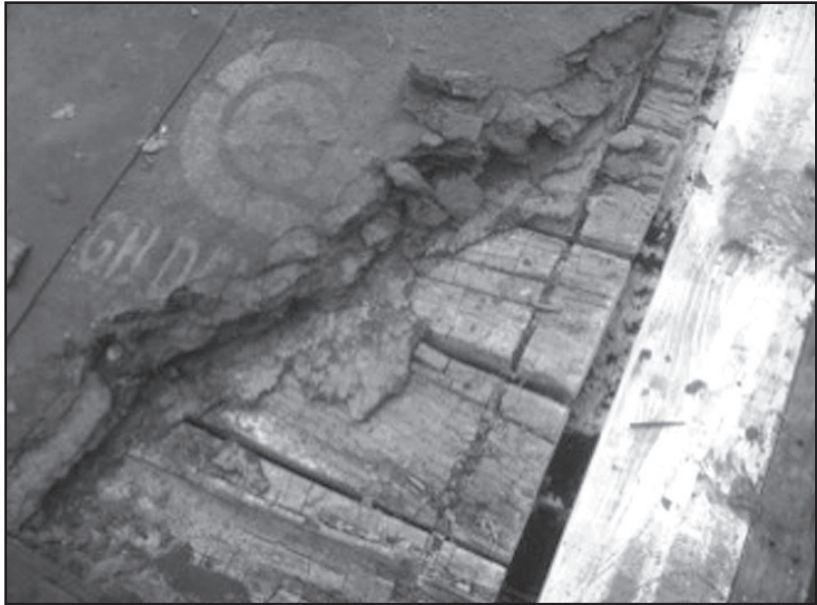
All workshops will be entirely interactive with speakers giving a brief introduction and then opening the floor to participants. The result, Golden-Pidgeon said, will be a democratic discussion that will keep people talking.

"The wonderful thing beyond all of that is the buzz that is created," she said. "The term 'networking' doesn't explain it well. It's this hum of people who are interacting with each other. It's a series of very real personal interactions with others who are also looking to be sustainable. That's the wonderful thing about the expo — when you walk in, you're a part of it."

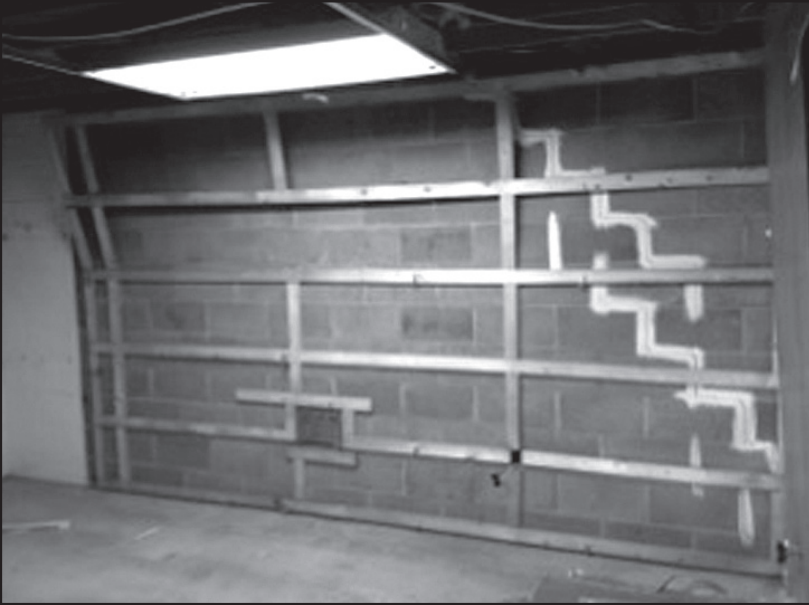
Food will be provided by Stoneleaf Tea House, American Flatbread, Vermont Coffee Roasters, the Middlebury Natural Foods Co-op and Cabot Creamery. The ACTR bus will make continuous fare-free loops around Addison County and carpooling sign-ups are available on the event's website, acornvt.org/sleeexpo, where people can sign up to volunteer at the events or suggest workshops.



INTERIOR WALLS THAT previously offered little insulation value were boosted with rigid insulation and an additional 2"x4" timber framed wall.



THE TEN-YEAR-OLD rubber membrane that covered the flat roof was already showing signs of age with water-soaked pockets that had seeped through and rotted the Homasote and timber framing beneath.



UNFINISHED AND EXPOSED concrete block framing in the basement showed signs of shifting and needed to be repaired and leveled as the basement was finished into a fully functioning, comfortable living space that now hosts a guest bedroom, bar area, and large storage compartment which hosts the new air filtration and heating units.

Keep spring cleaning safe for you and your environment

(MS) — Spring is a time of year when many people resolve to give their homes or apartments a thorough cleaning.

Spring cleaning projects help people revitalize their homes for the warm months ahead, when windows are once again opened, fresh air pervades homes and items that might have accumulated over a dark and dreary winter have become a distant memory.

Many families have spring cleaning rituals that allow them to efficiently clean their homes in a single weekend. But it's just as important for spring cleaners to place as great an emphasis on the environment as they do on efficiency when cleaning a home.

Eco-friendly spring cleaning practices produce less waste and rely on less chemicals to rejuvenate a home and get it ready for those seasons when huddling inside under the

covers takes a backseat to lounging around the house as fresh air washes into the home. The following are a handful of ways to efficiently clean a home while also protecting the environment.

- Clear out the clutter. Clutter is an enemy to homeowners and the environment alike. That's because addressing clutter is often an inefficient process in which homeowners methodically go through items that have accumulated over the years, individually choosing which items to keep and which items to discard.

Clutter can also prove harmful to the environment because rooms filled with clutter tend to collect dust, reducing air quality and leading to more indoor air pollution that can prove harmful to human health.

When sifting through clutter in (See Spring Cleaning, 10C)

New era

(Continued from Page 3C)

en years," says Stackhouse. In general, Stackhouse says it is getting easier and easier to convince homeowners that the value of building to higher energy standards reaps long-term benefits.

With energy prices relatively high and people's attention to greenhouse gases and environmental awareness increasing, it's generally pretty easy to make the case, he said.

"I'd say I'm blessed with about 50 percent of people who are already on board with higher than code energy standards," he says. "For the other 50 percent, it starts with education and some simple math. In the end, most people are willing to trade oil and electricity costs for better insulation and thoughtful plans, giving their money to local tradespeople instead of big industries hurting the planet."

NEW ERA FOR HOUSE
As for the "Rogers House" at 17

Chipman Heights, it has entered a new era of "modern design," perhaps reflecting less unique architectural details than it was once known for, but helping to define a new set of standards for progressive building science.

"While I understand the importance of protecting the architecture and artistic quality of buildings, I also value the importance of the environment in my design and that happens to be a priority for me," Stackhouse says.

Those two things certainly are not always in opposition, he continues. "Many current trends in modern architectural design are by their nature very energy efficient — from building smaller homes to more open spaces, using natural light and intelligent site planning — so it's an exciting time to be in the industry and I'm trying to stay open minded and recognize those possibilities."



CHRIS STACKHOUSE, OWNER of Cambium Construction.

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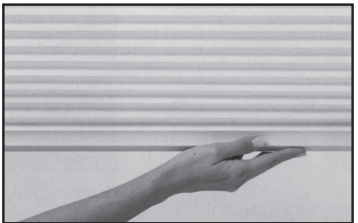


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