Building a low-impact life of plenty

Tom Knezic and Christine Lolley pushed sustainability to the limit on their first project together. In the process, the architects also decided to get married

SOLARES

BY JULIA BELLUZ, GANANOQUE, ONT.

The back deck of the Gananoque home is built into a granite outcropping, which provides dramatic views of the 125-acre property.

Tom Knezic waves at every passing car as he drives up to the house in Gananoque he built with fellow architect Christine Lolley. "You have to wave," says Mr. Knezic, smiling about the obligatory small-town gesture. "But Christine is better at it."

The Toronto-based pair are certainly not unknown in the Eastern Ontario town; they lived here for a year while working on the project — a new home for Ms. Lolley's parents, James and Brenda. It was the first built project for the two architects, who focus on designing homes with tiny environmental footprints.

When they started the house in 2005, they didn't know they'd end up wearing hard hats, building with their own hands. They also didn't know they were setting the foundations of an even deeper, lifelong project: Mr. Knezic proposed to Ms. Lolley as construction began, and the house they built together became what Mr. Lolley calls "the ultimate test of their marriage."

Mr. Knezic, 31, had quit his job at Kuwabara Payne McKenna Blumberg Architects to move to Gananoque, just as Ms. Lolley, 29, was finishing her master's dissertation on sustainable development techniques for the North American single-family home. With the help of Mr. Lolley, the couple began work in the summer and completed the project a year later.

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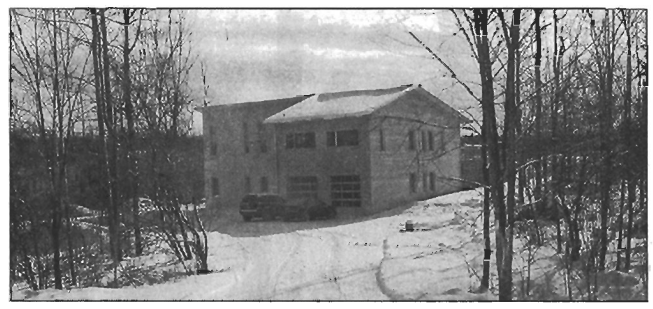

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Though the trio had little experience in home construction, there were hardly any mishaps, and the only time they had to stop working was one January morning when the temperature was 20 below. "At no time during the project did we feel overwhelmed by the enormity," says Mr. Lolley, an industrial engineer who owned a software company before he retired.

When you arrive at the house, you immediately notice its white Galvalume steel siding, quite different from the brick and vinyl of other homes in the rural neighbourhood. Used for the roof as well, the material — 55-per-cent aluminum-zinc alloy sheet steel — is recyclable and has a 50-year guarantee.

That's just the shell; the Lolley house is sustainable right down to the footings. And a similar philosophy was applied to building practices. "We never had a dumpster outside during the building," Ms. Lolley says.

Mr. Knezic explains: "We didn't generate very much waste because we bought in small quantities. We bought what we needed and were pretty careful about it. Any excess wood, we always stacked to the side and we always found another use for it. And we sorted our waste." (This eco-friendly building style plays out in the couple's everyday lives. Ms. Lolley brings home recyclables if there is no blue box where she is, and they never produce more than a bag of garbage a week.)

"We want to create a lifestyle of plenty with minimal ecological impact," Ms. Lolley says of their building principles. But don't call the Lolley residence a "green" home.

"Green homes are associated with a kind of standard house with some sort of technological device on the roof," she explains. "But we're trying to work backwards and create green homes through good design — by implementing passive solar orientation, thermal mass, and a high-performance building envelope. The technologies are actually just the cherry on top."

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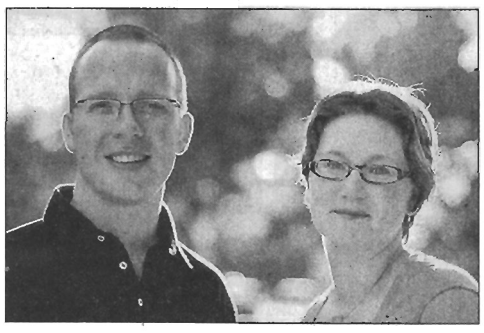
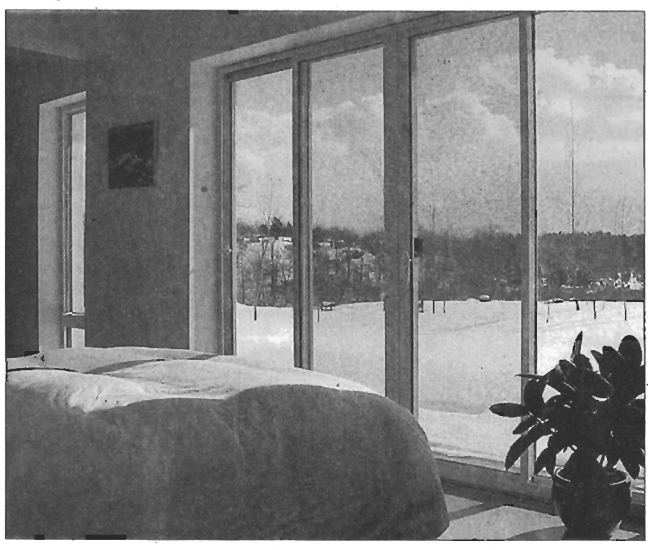
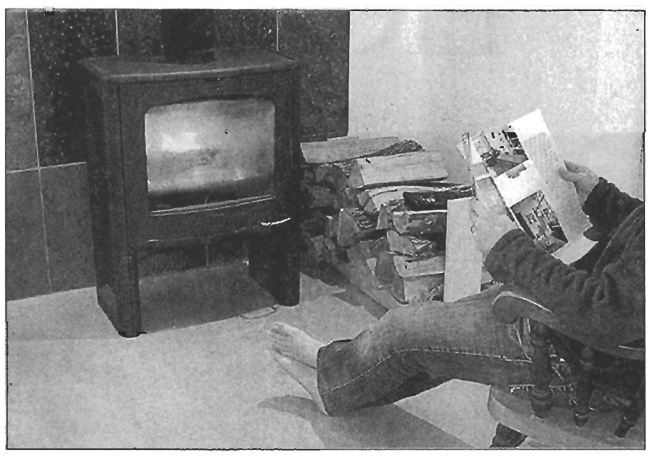
Known as the gateway to the Thousand Islands, Gananoque has a landscape full of outcroppings. A surveyor warned the architects that they'd be building on jags of rock akin to the sloped islands, except that they'd be surrounded by mud instead of water.

To prepare the land, the trio dug through clay, sometimes down to the bedrock, in the heat of that first summer. Holes were refilled with engineered fill, and then compacted to support the weight of the house. "Working in the mud and sun was hard, but really, really fun," Ms. Lolley wrote in an e-diary, which she sent to friends throughout the construction.

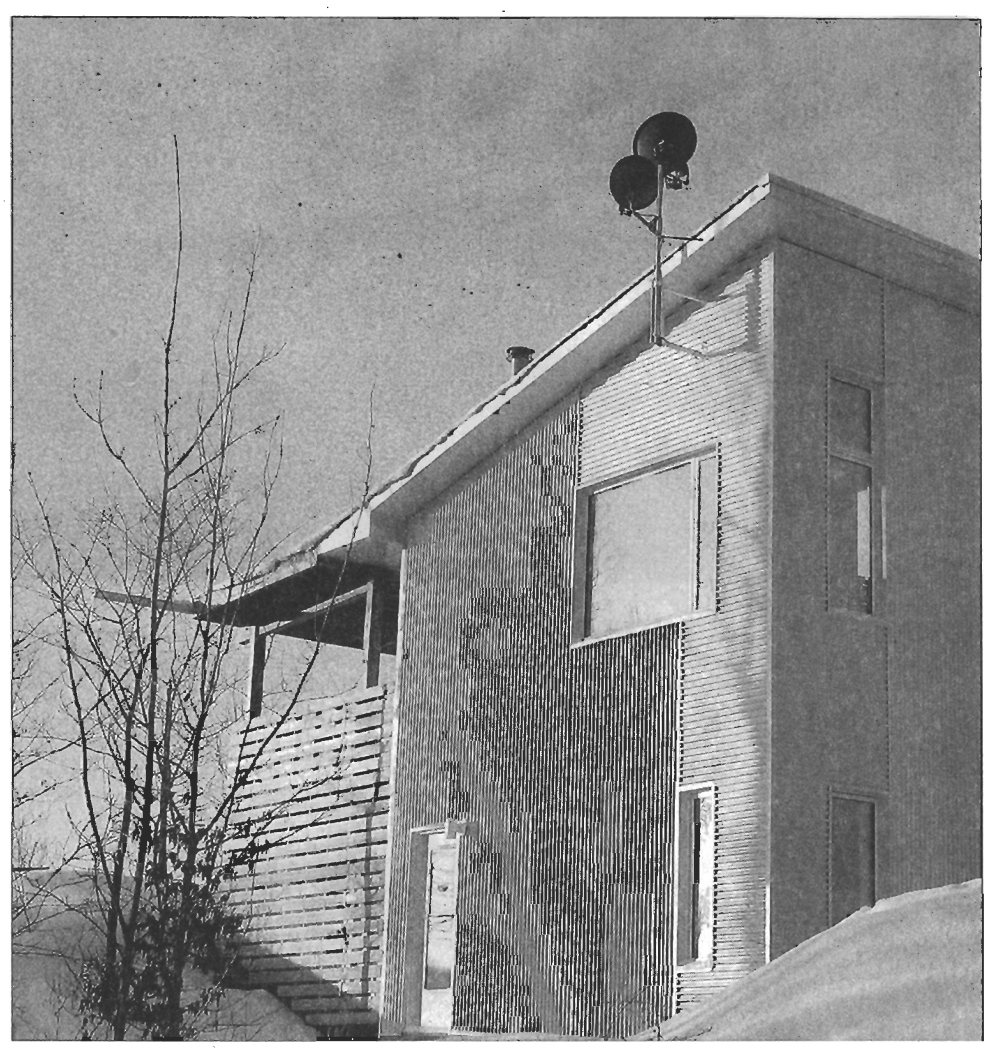
In designing the structure, the couple took advantage of the challenging terrain, placing the house right into the side of a rock outcrop. An oversized deck connects the main living space, which hovers about 12 feet above ground, to a mass of Canadian Shield granite. The rock, whose south side is a sheer cliff that drops about 30 feet, affords dramatic views of the Lolley property. Ms. Lolley says: "When we visited during the Christmas break, we didn't have to turn the heat on once."







Architects Tom Knezic and Christine Lolley, left, incorporated 'green' building techniques in the home built for Ms. Lolley's parents.



Some non-traditional materials went into the house, including Galvalume, a 55-per-cent aluminum-zinc alloy sheet steel. It was used for both siding and roofing, is recyclable and has a 50-year guarantee.

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TOM KNEZIC

facing windows onto the deck, she says, "The whole idea was to connect the inside of the house with the landscape, to seamlessly walk out [from the living area] onto the big deck, and onto the lower deck." This was a response to one of her parents' two requests: to marry the interior with the surrounding property. The other request: to create a solid residence that would require little maintenance into their retirement.

Mr. Knezic and Ms. Lolley hired a tree cutter to clear the site. But here, too, environmental care was taken. "We tried not to damage the site anywhere that we were not building," Mr. Knezic explains. "So we didn't come and clear cut a whole huge area. We just disturbed the area that we had to. We didn't dynamite any rocks. We tried to leave the trees that we could."

The tree cutter focused on the shorter-growth species such as poplar, Ms. Lolley adds.

Lumber from the cut trees was recycled, first to form the footings, for example, and then reused for safety railings and stud walls. The rest of the poplar lines the interior: doors, trim, baseboards and windowsills.

On this cold February day, none of the heating is on, and a cozy and fresh temperature is maintained. "When we visited during the Christmas break, we didn't have to turn the heat on once," Mr. Knezic says. Ms. Lolley adds, "It would only click on sometimes during the night."

The longest side of the house faces south, taking advantage of passive solar techniques. The positioning of the roof's four-foot overhang maximizes sun exposure in winter, and keeps sun out in the summer. Plus, windows are placed to create natural ventilation when they are opened in warm temperatures.

Whenever possible, the architects used local products that wouldn't harm the environment.

Beneath the siding are walls constructed of a locally manufactured modular block system called Durisol, which also is recyclable. "They were heavy to lift," says Ms. Lolley of these hollow blocks made from recycled wood chips and bonded with cement. The blocks were dry stacked, and steel reinforcing bars — bent by Mrs. Lolley — were inserted into the blocks' cavities, both horizontally and vertically. The walls were braced with wood frames and concrete was poured into the blocks.

A layer of polyurethane foam covers the Durisol blocks, acting as a total barrier — insulating the home and staving off wind. To seal this, windows and doors have low-E, triple-glazed glass with insulated fibreglass frames. Mr. Lolley says, "The snow usually doesn't even melt around them because no heat escapes."

Then there's that siding: "It's so reflective, you're reflecting unwanted heat in the summer and that helps to make the insulation more effective because you're not making the insulation work," explains Ms. Lolley.

Walking through the house, the couple gravitates toward their pride and joy — the mechanical room in the garage. "Every fixture comes back to the beginning," Ms. Lolley says. A solar heater mounted to the roof, which costs about $4,000, warms a quarter of the domestic hot water in winter, and all the water in the summertime.

"It will pay for itself over a few years," Mr. Knezic says. They also point out the heat recovery ventilator, which provides fresh air from outside, reducing the amount of heat lost through ventilation; heat energy from the stale air that is exhausted is transferred to the fresh air coming in.

After the roof went on, other trades moved in to help complete the interior. For example, a local company polished the concrete floors — a durable flooring that slowly absorbs and releases heat, regulating temperature swings. Beneath the concrete, a radiant heating system is driven by a ground source heat pump, which uses the stable temperature of the earth to create heat.

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Mr. Knezic says the downside of this kind of building is the cost — $127 a square foot.

"It would have been cheaper if we had done the typical kind of construction. This costs more because we used so much concrete and special products. But at the end of the day, you can't compare the two.

"If we built this house with a wood frame structure, typical windows and typical insulating," he explains, "it would have been cheaper, but it would be a very different house. It wouldn't have the same properties. It's comparing apples and oranges. It has its performance advantages, comfort, and solidity."

When the house was finished, Mr. Knezic and Ms. Lolley were married on the deck they built. "It was a very holistic experience," Mr. Lolley says.

The newlyweds moved back to Toronto to start Solares (www.solares.ca), a firm dedicated to providing design/build services for single-family homes. Their goal is to marry design and construction, as they did with the Lolley home.

"People don't just want a design; they want a house. So we want to move beyond the advisory role," says Mr. Knezic. His wife adds: "We want to be the facilitators," bridging the gap between architect and the trades in the spirit of Brunelleschi, Eames, and Buckminster Fuller.

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