Fall Preview: Innovators

ELVIRA CORDILEONE PHOTOS/TORONTO STAR

The healthy house, which is not connected to the city's sewer or water pipes, has its own underground sewage bio-filtration system. That treated wastewater is then recycled for household use.

Eco-friendly designer

Self-sustaining houses are architect's goal

Materials, design help increase energy-efficiency

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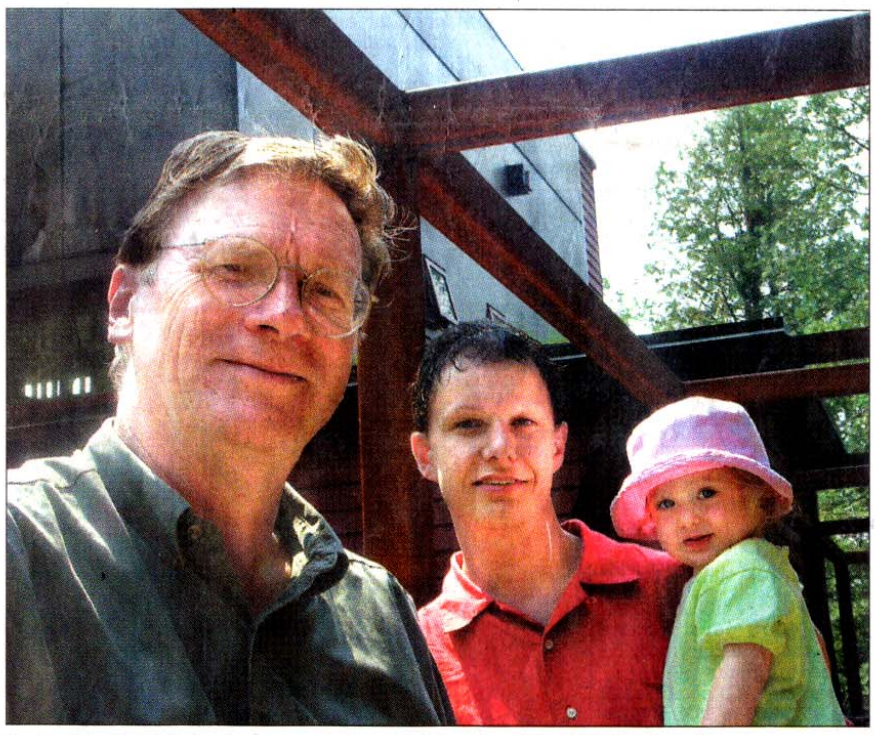

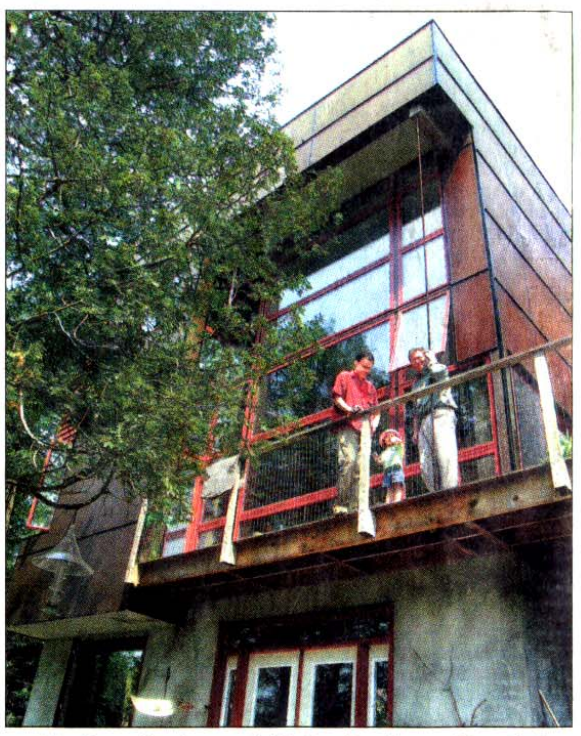

Enviro-friendly Pickering house was designed by Toronto architect Martin Liefhebber, foreground, and associate Marco Vandermaas (with daughter Hanna, 16 months). Below, the rooftop garden. The earth helps keep the house cool.

Architect Martin Liefhebber grew up in the type of practical and supportive living environment he now advocates.

His family lived on the top floor of a three-storey house in the Dutch port of Rotterdam. His grandparents occupied the second storey. His father ran a paint shop on the ground floor.

In cold weather, the upper apartment's single stove kept pots of coffee and soup at the ready, while the family sat around it and talked or read. The stove also heated metal bed-warmers for all the bedrooms.

"There is nothing more exciting," Liefhebber says, "than a room so cold you can see your breath, then — magically — you slip into a warm bed."

Liefhebber is founder and head of Breathe Architects, an eco-friendly firm that this year won the Ontario Association of Architects' award for innovative architectural practice. His work is informed by two main objectives, he says.

One is to configure houses, inside and out, in ways that naturally bring people together. For example, he says, give each house a big, warm live-in kitchen that draws together family members, and build neighbourhoods with a mix of businesses and housing on streets — not vast boulevards — that make walking practical and pleasant.

The other principle is to build houses that are as close to self-sustaining as possible.

Since founding Breathe Architects in 1984, Liefhebber, 56, has specialized in custom designs of what he calls "healthy" houses. They are built with natural materials to cut toxic fume emissions, and consume about 10 per cent of the energy that a typical new house requires.

Liefhebber's designs include a house in Bancroft made of car tires packed with earth and encased in concrete, and created a seniors' home on Toronto Island made of recycled straw bales and Styrofoam.

In the early 1990s, he also designed a self-sustaining urban house with a footprint the size of a two-car garage, a project that won him a Canada Mortgage and Housing Corp. competition and wide public attention.

"(In the Netherlands) we had to learn to work with nature," he says of his early environmental sensibility. "Interest in eco-engineering started in the 1960s, and we managed to make a life with rivers and winds a happy one."

Liefhebber immigrated to Canada at age 20. In 1974, he graduated from the University of Toronto's school of architecture and now lectures at U of T on ecology and technology.

He lives in a townhouse in Riverdale, rather than a custom house of his own design, but, arriving for an interview at a Riverdale coffee shop on his bicycle, he appears a role model for energy efficient living.

Liefhebber talks fervently about solar power's vast potential and how industries are quickly developing better and cheaper ways to harness it.

He describes how design features and an intelligent selection of materials (for example, strategically placed south-facing windows to draw the sun's warmth, coupled with concrete floors that absorb and then slowly release heat) can significantly reduce reliance on furnaces. One day, he says, every building might actually create its own electricity.

Currently, Liefhebber is working on a demonstration project for a future home show that would make healthy houses affordable to a wider market.

The concept, pioneered by McGill University professor Avi Friedman, involves pre-fabricated modules with "healthy" features such as passive solar heating.

"Rooms would be created depending on needs," Liefhebber says. "The modules would be built off site, so adding or subtracting is not a major problem."

It's a type of townhouse construction that he says would work well as infill in maturing suburbs, where open space is still available.

As for cities and their voracious appetite for resources, Liefhebber insists they can be made to better provide for needs — even beyond generating their own electricity.

"The frontier of the city is rooftops," he says. "Think of all the rooftops and empty land that can become farms... Put all these different things into the mix and a city could start looking very different."

These "big picture" ideas, however, are for the future. For now, he suggests even small efforts to save energy can count.

His own studies show a household could cut hydro consumption by up to three-quarters by replacing old appliances and electronic equipment, such as computer monitors, with energy efficient ones; using energy-efficient light bulbs; putting motion detectors in places such as storage areas, and doing away with items such as swimming pool heaters.

Improving insulation in walls and ceilings, replacing windows with a low-E variety, and installing programmable thermostats could also cut heating and cooling costs by half, he says.

After that, he says, homeowners can start thinking about generating some of their own power with products such as solar shingles and wind turbines.

Liefhebber says he hankers to design an entire community from scratch.

It would include the type of new urbanism planning principles applied to the innovative Cornell community in northeast Markham, with its compact housing and pedestrian friendly streets.

Beyond good urban design, however, the houses in Liefhebber's ideal development would also operate on a bare minimum of fossil fuels by incorporating the back-to-nature principles, such as solar technology, he espouses.

"Let's take the problem of waste and turn it into an asset," he says.

Houses could have individual bio-filtration systems for sewage and water purification, or perhaps a neighbourhood biotreatment plant that would also be the local greenhouse.

Liefhebber dismisses the suggestion that his ideas aren't practical on a large scale.

In fact, he says it's a way of life that harkens to the past, a time when our forebearers managed to make themselves comfortable — even though they didn't have air conditioners or furnaces.