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ARCHETYPE SUSTAINABLE HOME

# Showcasing the real green

**Semi-detached units a showcase for leading eco-friendly building practices and products**

Nov 15, 2008 04:30 AM

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**TRACY HANES**  
 TORONTO STAR

Amidst the 325 hectares of unspoiled woodlands at the Kortright Centre in Woodbridge, there's the decidedly suburban spectre of a new home construction site.



The Archetype Sustainable House features today's top green-building innovations in one semi-detached unit and emerging technologies in the other, including a wind turbine.

It's the Archetype Sustainable House, a state-of-the-art "green" house intended to teach the public, builders and other housing industry professionals about leading-edge eco-friendly building practices and products.

The house, which will be one of the most efficient renewable energy houses in North America when it's completed this month, consists of two semi-detached units. One (House A) showcases the best green building practices available, while the other side (House B) highlights up-and-coming technologies which may be popular five years from now.

Its features include solar photovoltaic roof panels, a wind turbine, in-floor radiant heating, heat and energy recovery ventilators, low-VOC paints and finishes, recycled paint, waste-water recycling for toilet flushing and drainwater heat recovery units.

The semis will be extensively monitored by Ryerson University students to determine which systems and products perform the best; for example, each house is equipped with both electric and gas heating systems.

The Archetype, which sits on a 50-by-120-foot lot at the end of a nature trail, is a good fit for the centre, says Alex Waters, manager of the Kortright Conservation Centre. Kortright is one of the province's premier environmental and renewable energy education and demonstration centres.

The project began in 2005 with a national design competition sponsored by the Toronto Region Conservation Authority (which operates Kortright) and run by the Design Exchange. The criteria called for a four-bedroom home with garage, designed for mass production, that had an innovative waste-water treatment and would meet LEED Gold (Leadership in Energy and Environmental Design) and Energy Star standards. The design had to be flexible to allow for intensification.

Waters says that a garage may not fit with everyone's idea of a sustainable house, but "we wanted the focus to be on what people are buying now."

The winning design – Building Blocks – chosen in 2006 was the

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## Eco-friendly features

Features of the Archetype Sustainable House, which exceeds normal building standards by 30 per cent, include:

- R20 basement walls made with Durisol blocks, which are made of recycled wood chips and shavings.
- Smart metres display real-time energy use information to the consumer and energy supplier.
- In-home energy display monitors ensure optimal temperature control.

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creation of a Toronto team that included three female architects: Anne Stevens (Fort Architect Inc.), Clelia Iori (Iori Architects) and Terrell Wong (Stone's Throw Design).

"I used the contest as a way to meet new people and learn about new technologies," says Wong, who persuaded the other women to get involved.

Her team's idea was to design a house in modules, which could be combined in various ways to create single homes, semis, row houses or stacked townhouses. Although the contest called for a single home, they submitted the plan for two semi units – 1,800 and 2,300 square feet – as well as a five-acre (two-hectare) plan to show the design's flexibility in building a whole neighbourhood. The three-storey units feature reno-ready attics for future expansion and are oriented to take advantage of passive solar energy and cross ventilation. The separate garage is joined to House B by a second-floor deck and includes a nanny suite or granny flat.

As well as meeting LEED and Energy Star standards, the semis will also be evaluated under GreenHouse and R2000 programs.

Waters says the Building Industry and Land Development Association, or BILD, was brought into the project as a partner to supply the needed expertise and builder volunteers.

Larry Brydon of Reliance Home Comfort agreed to be project manager with Empire Communities' Paul Golini Jr., architect Stephen Hunt of Hunt Design Associates and Laurie Gordon of Berkshire Homes rounding out his committee.

Originally the plan was for a 17-day blitz build in July, but due to the complexity of some of the techniques and sourcing of materials, it stretched to three months. For example, the houses' requirement for 90-per-cent use of Forest Stewardship Council-certified lumber took every available FSC board in southern Ontario. And some components for the mechanical systems had to come from Europe.

The 150-volunteer build itself was green, using a solar-powered trash compactor, solar-powered tools and electricity from "green" supplier Bullfrog Power.

"It was a huge learning curve for everyone," says Lou Natarelli, Empire Communities manager of construction, lowrise, one of the volunteers. "We were using materials we don't normally use. There are a lot of techniques we're using now in our (Empire's) LEED house."

Stevens says the Archetype required the builders to explore new methods, such as building on 24-inch, instead of traditional 16-inch centres, and to use three different types of insulation. The future intent would be for similar modular houses to be built in a factory.

Brydon says changes to the Ontario Building Code will allow builders more flexibility now to adapt some of these new techniques and products in their own houses.

"The process itself was very important, with builders learning to work with other builders and trades. Builders might compete with each other but we came together for this," says Empire's Golini. "From an educational process, we have been building Energy Star since 2007 and were able to bring what we learned here for others to learn."

The collaboration between builders and the TRCA was also beneficial, says Golini, as that relationship often had been adversarial in the past.

"For the first time, we were sitting on the same team as TRCA and it opened a whole new door. We're already working on what our next project together might be."

As for the house itself, "there will be a benefit in having a permanent learning centre in terms of ongoing education," Golini says. "If we want to initiate new technologies at our houses, for instance, we can bring our own trades and utility companies here and show them in action."

Golini says the Archetype House is not cost efficient for mass production yet and "many builders are not ready yet to put green roofs on garages." Still, he says, the industry is moving quickly.

"The goal is to engage as many builders as possible," says Waters. "It's not a short-term thing. We will give them the option of bringing their clients and trades in to do workshops here." The

- In-floor radiant heating which heats a home by applying heat underneath, or within, the floor.

- Heat recovery ventilator maintains flow of fresh outdoor air into the house (incoming air stream) while exhausting an equal amount of stale indoor air (exhaust air stream).

- Drain water heat recovery, a sealed coil that removes heat from waste water for reuse in preheating hot water.

#### Windows

- House A: Double paned, low-e fiberglass-framed windows. Low-e treated glass reflects heat back into the house during the winter and blocks radiant heat in the summer.

- House B: Triple-glazed windows.

#### Insulation

- House A: High-efficiency Roxul Batt Fibre Insulation (R21), made of mineral wool.

- House B: Spray foam insulation, including Heat-Lock Soya Polyurethane Foam and Icynene spray foam.

- Spray foam insulation minimizes air leakage for increased energy efficiency, creates a healthier indoor environment, reduces airborne sounds and offers greater design freedom.

#### Solar power

- Roof integrated solar photovoltaics convert sunlight directly into electricity.

- Solar orientation for passive solar gain.

#### Appliances/lighting

- Energy Star appliances use 10 to 50 per cent less energy and water than standard models.

- Compact fluorescent bulbs which use less power than conventional bulbs and have a longer rated life.

#### Water

- Low-flow toilets, low-flow aerators on all shower/tap fixture

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technologies in the house are "plug and play" and will be updated to keep in step with new products and techniques.

Still he says, while many of the featured technologies are cutting edge, there will be many ideas consumers can take away on how to make their own houses more energy efficient and "green." One of the big lessons is the crucial role the building envelope plays in saving energy.

House A will be outfitted like a regular home (with furniture recycled from an Empire model home) while the other will serve as a classroom.

Public tours begin Nov. 26 and will be available on weekends from 11:30 a.m. to 3:30 p.m. Tours will be every hour. Sign up at the Kortright visitor centre information desk. Tour information can be found at [www.sustainablehouse.ca/tours.shtml](http://www.sustainablehouse.ca/tours.shtml). The Kortright Centre is a 10-minute drive north of Toronto in Woodbridge, east of Highway 400 off Rutherford Rd.

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- Advanced plumbing with timed recirculation of hot water
- Hands-free fixtures so when you don't need water, it isn't running.
- Permeable pavement which will allow more water absorption into the ground through paved areas like the driveway.
- Both houses have a French drain which pumps the water into a large 6,000-litre cistern around the foundation wall. The water collected from the cistern is used for toilet water in both houses.

#### Landscaping

- Planting of native plants and species which are drought-tolerant.
- Bioswales, which are landscape elements designed to remove silt and pollution from surface runoff water.

#### Wood/Flooring

- Forest Stewardship Council wood used.
- House A: Cork flooring. No cork trees are cut down; only the bark is peeled without destroying the tree, and it grows back within nine years.
- House B: Bamboo is a grass, attractive as a building material because it is hard, strong, and dimensionally stable.

#### OK then HOW MUCH for each without the land ? etc

Breakdowns would be nice like going to new developments with & without so called UpGrades etc.

Submitted By GTA at 5:21 AM Sunday, November 16 2008

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