

# In-ground dome home will be warm and efficient

Living in a rural home, it's not unusual to wake up to deer grazing in the backyard. At Royce Hamer's new country home, they'll likely be grazing on the roof!

And, he'll be able to lie in his bed and watch the deer – or other wild visitors to his roof – through the large octagonal skylight in the ceiling of the concrete dome where he'll sleep.

Hamer, 60, plans to build an underground concrete home this fall on a five-acre lot just outside of Drayton, a small farming community 40 kilometres north of Kitchener.

Three sides of the house, plus the roof, will be buried into the side of a grassy hill. He'll have large windows in the exposed southwest wall of the house, plus a skylight in each of the four concrete domes that form the structure of the 3,136 sq. ft. home.

"I've always felt we could be building much more energy-efficient home here in Canada, and stronger homes too. This house will last for hundreds of years," said Hamer, a millwright in a Guelph manufacturing plant who rents a farmhouse on the western edge of that city.

He plans to warm his concrete home with radiant hot water heating, a system of tubes filled with water imbedded in the concrete floors.

In addition, the home will have two wood-burning stoves, one in the living room for aesthetics, and one in the garage for cooking. The water will be heated by propane. He expects his total heating costs will be 80% less than those of his gas-furnace-heated neighbours.

No need for air conditioning  
"We won't need air conditioning. The earth around the structure will have a constant temperature of 55 degrees Fahrenheit, and there will be an air exchanger (for continuous ventilation)," said Hamer.

Hamer will put three inches of styrofoam insulation on the outside roof of the concrete shell and two inches on the outside of the underground walls. Both

the roof and walls are under dirt, other than an open patch where the skylights are exposed. An exterior drainage layer will surround the underground portion of the home. The drainage layer will be covered with earth at ground level.

On the exposed southwest wall, which will feature large windows, Hamer said he will use styrofoam insulation or sprayed-on urethane with a covering such as stucco.

He expects his construction costs to be \$329,000. The lot cost is \$100,000. His insurance bill will be significantly reduced – and his maintenance expenses should be close to zero.

Jay Scafe will build the concrete home and says it will have about the same cost per square foot as a traditional stick-built house. Scafe's company, Terra-Dome Corporation, is located in Grand Valley, Missouri. He has built more than 600 similar domed concrete homes throughout the United States, the Virgin Islands and Australia.

This will be his first project in Canada and he hopes to use Hamer's home to demonstrate his company's building techniques and plans.

"We've built some homes with 9,000 square feet and a shopping mall in Massachusetts with 30,000 square feet using 35 domes. Most of our homes are in the range of 2,230 square feet," said Scafe, 41, who started building concrete dome homes with his father 25 years ago.

"The concrete dome design creates a roof 20 times stronger than a flat roof design. We've had our dome homes go through an earthquake in Alaska that rated in the sevens on the Richter Scale and there was no damage. We had a propane car explode in the garage of one of our houses. Nobody was hurt and only an interior wooden wall was blown out," said Scafe.

The homes stand up to fire, earthquakes, hurricanes, tornadoes and termites, he says. Hamer expects the home will last for 1,000 years.

## *No interior walls*

Hamer said his home will have four domes, each with a 28-foot radius and 12-foot-high cathedral ceilings.

One dome will contain the master bedroom and ensuite bathroom he'll share with his wife Tatiana, a piano teacher. Another dome will house the two-car garage and workshop, plus the wood-burning cookstove. The stove will be in the garage to keep smells, grease and heat out of the major living areas.

Two more domes will be occupied by two more bedrooms, another bathroom, a kitchen, den, office and sewing room. "We don't need any interior walls for support, that means we can create any configuration we want for our interior layout," said Hamer.

His house could be occupied six weeks after construction starts. It takes two to three days to build each concrete dome. Concrete is poured by Scafe's Missouri-based crew at the housing site into a steel-reinforced dome-shaped frame that's supported by a hydraulic lift until the concrete hardens.

Cameron Ridsdale at the Cement Association of Canada says there's often an increase in the construction of concrete-shell homes when energy prices are rising.

"They're usually more energy efficient than traditional stick-built homes because the thick concrete walls act as a heat sink and absorb and retain heat generated in the home in winter, and thus require less re-heating of the house.

"It's the opposite in summer. It retains the coolness of the house and does a better job of keeping out the day's heat. Of course a concrete home also offers better protection against fire, wind, termites and earthquakes," said Ridsdale.

You can find out more about Hamer's Dome Home at [www.domehome.ca](http://www.domehome.ca).