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BEER
WITH NO
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HEALTHY HOME

Beechwood Deep Energy Retrofit

Toronto, Ontario

It began as an uninsulated post-war bungalow in Toronto's east end; but with a major overhaul by Open Architects and highly specialized environmental building and design firm Greening Homes Ltd., the Beechwood Deep Energy Retrofit home was transformed into an award-winning model of both green and healthy living.

The house is owned by a music teacher and a waste water systems engineer who craved more space, but because their lot is sunny and backs onto a picturesque natural ravine, they didn't want to relocate. They also didn't want to demolish the solid brick construction and create a larger footprint; so instead of tearing down most of the house and starting from scratch, they decided to build up.

Heating/Cooling: Everything in the house was designed to maximize energy efficiency, which in turn minimizes the need for heating and cooling. As a result, a small shallow geothermal loop and a heat pump are all that's required to heat the entire home – even through chilly Toronto winters. The heating and cooling is then distributed through radiant ceilings rather than floors.

"On the floor you have furniture and rugs, so you're actually obstructing a lot of your radiant heat transfer," says Steven Gray, the construction manager and Certified Passive House Consultant. "And if you have radiant cooling, the cool air will drop and you get a slight current, which makes you feel more comfortable." An ERV also brings in a steady supply of fresh air, and helps to reduce moisture.

Flooring: In the basement, the designers opted for polished concrete because it not only has a great look, but it doesn't collect dust or encourage mould, it's very durable and it's easy to clean. The rest of the living areas feature warm maple hardwood that came pre-finished with a low-VOC coating, while the bathrooms boast ceramic tile and the front entrance is natural slate. The staircase is also maple, but finished with Rubio Monocoat, which is linseed oil, and natural wax-based and zero VOC. Some natural finishes aren't as durable as chemical coatings, says Gray, "but this one is easy to apply and is very durable – and it's even suitable for high-traffic areas such as stairs."

Insulation: The contractors took a page from passive house design and heavily insulated both the exterior and interior of the home using thermal bridge-free and airtight construction. Outside is rigid foam; inside is polyurethane Walltite Eco spray foam, which offers one of the highest R-value per inch. Gray is moving away from petrochemical products as much as possible, but his team decided the insulation performs so well that the ben-



This post-war bungalow was overhauled for both design and energy efficiency. Radiant heating and cooling emanates from the ceiling, while an ERV ensures fresh air. In the living and kitchen areas (above), both the paint and maple flooring are VOC-free.

efits outweigh the potential downsides – and with proper installation and curing, it shouldn't off-gas.

Wall Finishes: The drywall is a Certainteed product that's made almost entirely from recycled materials, and it was finished with no-VOC Lifemaster paint from Dulux.

Other: The home also features plenty of natural ventilation as well as a host of green features, among them triple-glazed high performance windows, noise-reducing insulation, "cool roofing" which helps to deflect heat, and a drain water recovery unit that collects heat from outgoing wastewater (sinks, showers, etc.) and transfers it to the incoming fresh water.

"It turned out great. The owners' main comment is that they never think about the heating and cooling," says Gray. "They never think, 'I've got to turn up the thermostat or turn it down.' The feeling is just comfort."

For more healthy home articles and tips, visit Allergicliving.com.