THE GLOBE AND MAIL

# Nerdy to the max

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In the age of Bill Gates and Mark Zuckerberg, being called a “nerd” is a badge of honour.

And if there were ever home builders who could proudly carry the banner of nerd-dom, it might be Solares Architecture and Equinox Development, designers of a startlingly innovative home in Cedarvale Park.

This renovation project has been completed so recently that there still isn’t any furniture to stand in the way of the real story: This is a home that’s so sustainable, so charts-and-graphs happy, so humble on the outside while deliciously innovative on the inside, that it’s a nerd’s paradise.

Get ready to geek out.

Project manager Susan Hunter of Equinox Development and homeowner Drew (who asked that his surname not be used) won’t settle for anything less than LEED Platinum when the project wraps later this year. While you needn’t be a nerd to have heard of Leadership in Environmental and Energy Design, you’d have to be real Poindexter to strive for the top designation, because it’s really quite difficult. You even have to do math.

Before the math, great care must be taken in selecting a suitable home. Drew says he and Ms. Hunter looked at “over two hundred” properties before settling on a little between-the-wars bungalow that backs onto the Cedarvale ravine: “I was [looking] at Bloor West for a while, Cabbagetown, the Annex ... I needed something that had transit access – because I really don’t like to drive downtown – and something that had green space.”

“I was looking at things like zoning,” interjects Ms. Hunter. “[The Cedarvale house] hit almost all the triggers, because the percentage of the zoning was favourable, and the existing footprint was favourable, the orientation was favourable, the access to transit ... and the compelling part was when we did the ecoENERGY audit, we found out [the house] was essentially a tent.”

A tent? Oh, it leaked heat like a tent. Right. As a matter of fact, it scored an ultra-low 18 points on the scale. An average home with some insulation and fairly good windows, by comparison, scores a 50 or 60. “I’ve never seen anything like it,” laughs Ms. Hunter. “There was tremendous opportunity here.”

With homeowner Drew in the driver’s seat, the transformation of this one-storey home into a two-storey sustainable showpiece really began once husband-and-wife design team Tom Knezic and Christine Lolley of Solares were brought on board; despite being geeks for green who specialize in “high-performance envelopes and energy efficiency,” the couple had yet to work on a residential project that aimed for top LEED certification from the get-go, perhaps because the LEED for Homes program was released just as the project began.

“We were the Guinea pigs for the ‘H’ program,” quips Ms. Lolley, who felt at first as if the team was “just counting points.” However, “when we got into the full swing of things then it really started becoming a very

holistic approach; I felt that the LEED formwork naturally becomes an excellent way of organizing your project."

And for a renovation, it was a very large project indeed. To the original shell of double-brick walls, three inches of spray-foam insulation was applied for a rating of R-20; to the new second storey, additional rigid foam was added to achieve R-25 (the new second storey is clad in reclaimed historic brick from southwestern Ontario, making it almost impossible to tell it's an addition). The roof was insulated to an R-value of about 50. And although polyurethane foam has a high carbon footprint, the fact that the home saves so much energy balances the equation out where LEED is concerned.

"I forgot to turn the furnace on for two days while my parents were here over Christmas and the temperature never got below 60," says Drew with a lingering trace of disbelief. "We were running the fire on occasion, the stove on occasion and my sister said 'It's a little cold upstairs, I wonder why?' "

Other features keep in the heat: heat recovery ventilators; double-glazed fibreglass windows (many south-facing for passive heating); radiant floors in the walkout basement; and a high-efficiency boiler combined with a forced-air system. This boiler, which is in turn fed by a rooftop solar panel, also heats the domestic hot water (other, non-heat related items are equally nerd-worthy, such as the Forest Stewardship Council-approved wood for all framing and finish carpentry and a formaldehyde-free Ikea kitchen customized by Seven Haus Design).

The result is an ecoENERGY score bump up to a whopping 73. And, incredibly, the entire renovation and new build generated exactly one dumpster full of waste.

"From our perspective it's what's behind the walls that's incredible," offers Ms. Hunter. "So, the colour of the paint is nice but we drive the client to spend the money behind the walls...you're going to repaint, you're going to switch [furniture] out, but the systems are the critical pieces, and that dovetails nicely with the LEED program too."

It also works nicely in Nerd Nation.

*SIDEBAR:*

*10 PLATINUM IDEAS FOR LEED CERTIFICATION*

*1) All construction waste was carefully sorted and removed for recycling with the exception of one 14-yard bin of mixed waste.*

*2) Very few of the existing wood joists and studs were removed for recycling. Instead, they were reused in other areas of the house or for things such as hoarding and barriers. The rest was taken by the carpenter to burn in the heating stove at his farm.*

*3) A small wine cellar in the basement was located on two exterior walls. The bottom of the foundation wall remains un-insulated to capture the cool air transfer from grade; the floor slab in this 4-foot x 5-foot room is not insulated to allow cold air penetration. The constant 58-degree temperature typical in soil will cool the wine cellar enough a supplemental unit is not required.*

*4) The home is pre-wired for a radio frequency-controlled blind system. Sensors will automatically raise the blinds on sunny winter days to allow for a natural heat gain. The opposite will occur in summer to avoid unnecessary heat gain.*

*5)* The concrete in the new basement slab is made from 20-per-cent slag (recycled material).

*6) Approximately 3,600 bricks were required for the second-floor addition. Bricks that match the existing were sourced locally by Commonwealth Brick.*

*7) In the attic, spray foam insulation covers all ductwork. This allows for the volume of air to remain at a constant temperature and not be subject to acclimatization by an outside condition.*

*8) The HVAC system is within the conditioned envelope of the home; there are no air distribution runs behind the spray foam insulation. Therefore, air temperature is not impacted by exterior temperatures.*

*9) To conform to the Indoor Environmental Quality criteria, Equinox and Solares ensured construction methods were radon-resistant. An active sub-slab depressurization system is in place for appropriate radon venting should it be necessary.*

*10/ Prior to construction, the original house was undergoing 19 Air Changes Per Hour. The final test at project's end indicated 2 Air Changes Per Hour. The original home was 1,050 square feet, now it's 2,450 sq. feet.*

Susan Hunter, Equinox Development

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