ALEX NEWMAN

The Best Way to Renovate

INTEGRATING THE PAST, PRESENT AND FUTURE

Seeing as custom homebuilder Amedeo Barbini used to play trumpet professionally, it's tempting to draw on musical metaphors to describe his approach to house construction. But by orchestrating every aspect from the green core to the aesthetically pleasing envelope, he is able to create something lasting and beautiful that also appears effortless, like say something you'd experience at Roy Thompson Hall -- or the Rex Hotel if you're a jazz enthusiast.

But enough of the musical metaphors. Now into his fourth decade of custom-home building, Barbini begins each home with intensive research, carefully investigating the mechanics that will produce energy efficiency, excellent interior air quality, and consistent heat and cooling throughout the entire space. He then designs spaces with views to the exterior in mind, and pursues the finishes and materials that will result in a distinct aesthetic.

The home he is just completing was purchased at the end of 2012, a sturdy 1950s brick ranch typical of the homes built in Don Mills, a progressive subdivision development for its day. The neighbourhood's larger than average lots have made it a target for more recent renovators and new home builders looking to build larger than average homes. In this case, the 9200 sq. ft. lot allowed for a 5000 sq. ft. home.

Given city bylaw restrictions though, Barbini had to retain 50% of the existing walls, prompting construction of the new house around the old. This inadvertently served a green purpose – the remaining brick walls provided an additional eight inches of insulation. Where there isn't any masonry, walls consist of 2x6 studs with an R value of 22, covered by half-inch plywood and then two inches of Styrofoam before applying the exterior stucco.

Fortunately, the original footprint was also conducive to the contemporary style Barbini envisioned for the home, by adding four small "wings" that kept them well within the allowable gross floor area, and adding a second storey that is stepped back so as not to overpower the lot.

The handsome façade in charcoal grey Belgian brick – chosen for its precision lines and consistent thickness – and clear 1x6 tongue-in-groove Western Cedar slats, has equally attractive guts that have built-in future proofing qualities. The new HVAC system has been designed to reduce energy use and be a hedge against steadily rising energy costs, but also to create a consistent and comfortable interior air quality.

The original basement was left untouched structurally – no need for digging down since the ceilings were sufficiently high at 7.5 feet – and all Barbini did was tuck the high velocity ductwork inside the ceiling (that's the only way you can do it) to make a clean space without bulkheads. (Note: High velocity ducts are the only ones capable of being tucked inside the ceiling joists.)

The original basement, which doesn't extend under the entire new structure, has a built-in energy reducer in the crawlspace that extends over 1500 sq. ft. At a depth of 30 inches, this crawl space conditions the living space above. If you think about how cold the floor of a room gets above a garage, no matter how much or what kind of insulation is used, you'll get the idea. The crawl space was created with six inches of gravel poured at ground level, then overlaid with an R10 Insultarp insulation blanket followed by two inches of Roxul and topped in plywood to create a floor should anyone need to get into the crawl space.

Stepping back the second storey had another design benefit of allowing for some unique light transfer within the home. All the Glazing area has been placed at the rear of the house to capture the magnificent treed view – with the massive pivoting glass doors off the main floor living room it feels like being in the Muskoka woods. At the front of the house, Barbini has placed the bedrooms – a master suite on the main floor and other bedrooms and baths on the second floor. Each bedroom has wide, short windows positioned close to the ceiling line – these allow plenty of daylight to flood the spaces without compromising privacy. An overhang at the roof line over each of the smaller windows further filters light, cutting back on glare and heat and thus going easier on the HVAC – and thermostats. Large windows tend to register higher or lower temperatures adjacent to the glass, thereby triggering the on and off of air conditioning or heat, leaving the space further

WINDOW DESIGN MAXIMIZES NATURAL LIGHT AND PRIVACY

inside the home at the mercy of the fluctuating temperature levels.

All the windows are manufactured by Inline Fiberglass Ltd. They are thin-walled fibreglass windows inserted directly into the walls without exterior moldings or trim, which makes for a cleaner profile and once caulked a tighter seal. The fibreglass guarantees maximum heat retention, losing nothing from the glass to the outdoor air. Barbini also opted for increased volume with 11-foot ceilings on the main floor, except for the ten-feet in the main floor master wing, and nine feet on the second floor. This increases air- flow and visually expands the space.

When it came to running the home's heating and cooling, Barbini opted for a two zone system – with two high velocity Airmax air handlers (because of the home's large volume and footprint) and a condensing boiler, two copper drain water heat recovery (DWHR) pipes and the Flowmax indirect hot water tank which acts like a "battery" for the radiant floor system. Domestic hot water comes from the Flowmax tank, but also stores heat for the radiant floors so that the condensing boiler doesn't have to cycle on and off, which is not a good thing. There's also an energy recovery ventilator for fresh air circulation. This is such serious HVAC equipment that it's been divided between two furnace "rooms" -- two air handlers, DWHR pipes, and the Flowmax water heater in one, and the gas-powered boiler, and orange flex pipes filled with water for the radiant floor heat in the other. With first and second floors in different zones, in terms of HVAC, Barbini was able to direct more air conditioning to the second floor.

"Here's a renovator who believes in the idea of building the value of future proofing into his home, so that on the back end he can differentiate himself," says John Godden, with whom Barbini consulted several times about the HVAC system. "It's a difficult market, because this is not a brand new house, so he's doing all the things he needs to that makes it better than the new build. With the extent he's gone to he will have a HERS score below 50. This score is as good as you can get on new housing without renewables."

The system isn't as complicated as it sounds, but it does require mechanical expertise to install. In one of the many consults Barbini had with Godden and the Clearsphere team, the one mechanical contractor whose name came up repeatedly was Branko Mijatovic (Alpha Comfort and Control http://www.alphacomfortcontrol.com/). "You really need a skilled HVAC contractor who really understands this kind of system," says Godden. "Especially in a project like this, when you have different interior ceiling heights, and you're aiming to create two