SOLARES
ARCHITECTURE

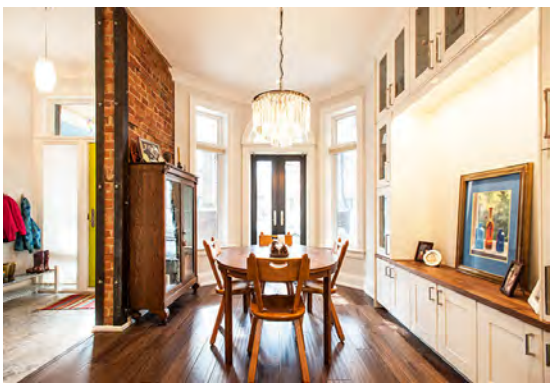
***REPORTS* ON ENVIRONMENTALLY INTEGRATED HOMES**

BICKFORD PARK

EFFICIENT RETROFIT OF A CLASSIC TORONTO HOME

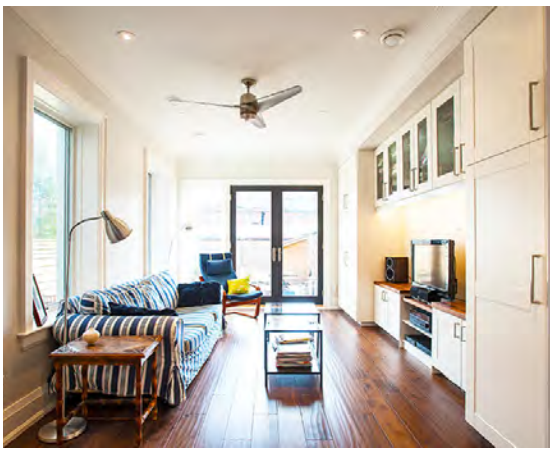
May 2016

Our project in Toronto's Bickford Park has been transformed from a structurally tired, leaky century old home with multiple units to an efficient, comfortable, and modern family home. It was a huge transformation, and our clients are ecstatic with the results!



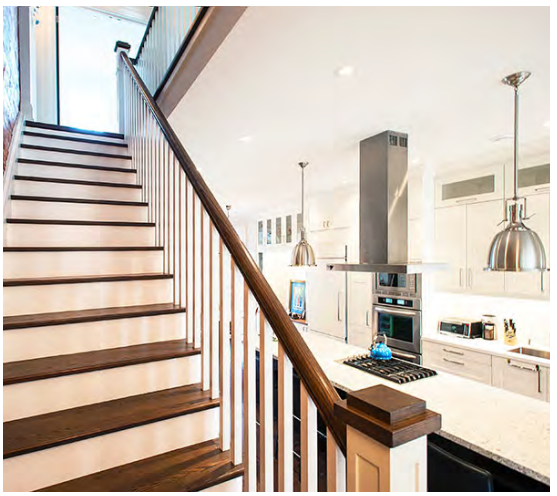
Location-wise, the Toronto home hits all the marks; in Central-West Toronto, the home sits on a tree-lined residential street just off bustling Bloor Street, packed with restaurants, grocery stores, fruit markets, boutiques, schools and community centres. A TTC subway station and two picturesque parks (Christie Pitts and Bickford Park) are only a 5-minute walk away, and the home backs onto a quiet laneway ideal for bike and car parking.

Our client bought the home about 20 years ago as a university student, and over the years lived alongside over 50 tenants and roommates. When he met his wife, they moved in together, had two children, and began saving up for the large-scale renovation they knew the home deserved. Two years ago, after careful consideration, they hired Solares for the job, because of our mutual values and energy efficient expertise. We were excited by the opportunity!



The home was thoughtfully and expertly designed by Solares' Melodie Coneybeare, who lead the project and worked closely with our clients. Our General Contractor, Jesse Hayes also worked hard to ensure the place was impeccable. Thank you to Jesse and Melodie for their hard work and expertise, and to our clients for their easygoing and endlessly positive energy.

The main floor is completely open concept. The kitchen sits right in the middle, flanked by the entry and dining area tucked in the front, and a large living area in the back, which opens to the back patio and garden. The stair runs opposite the kitchen, along the party wall. The kitchen is the heart of the home; from the large central island, the family can see and be a part of everything that happens on the main floor.



The living room and dining area stand on either side of the kitchen. The front dining area sits before a bay window and set of french doors which lead to the front porch and garden. The entire north wall of the dining room and kitchen is clad with built-in storage that extends floor-to-ceiling, giving our clients life-long storage opportunities!

The main floor living room also includes tons of built-in storage, along the length of the south wall next to the stairs. Big French doors open onto the back yard and three huge windows light the living space.

On the second floor, the master bedroom takes up the east end of the home, with an ensuite bathroom and a large picture window that overlooks the backyard. Beside the stair, an office is centrally located, just off the second-floor hallway, which can double as a bedroom in the future. Adjacent is a large laundry room also situated off the hallway, with even more built in storage, and quite a bit of floor space so the whole family can help with washing and folding. In the home's front end, a set of french doors brings privacy to a large playroom/music room, with an extra office alcove and a large western bay window which collects the last warm rays the setting sun.

The third floor is the kids' domain. Each child has a bedroom with a large window (one north-facing, the other west), slanting roofs, and tons of floor space. In the small landing between the two bedrooms sits a bathroom with a tub hidden under the angled roof.

The basement has been left unfinished for now, to be completed as a separate project a few years down the road. We made sure that all structural work was completed during this renovation, which will make underpinning and finishing the basement a cinch when the time comes.

Construction

The building had its fair share of structural issues. Though full of unique charm, it was in desperate need of massive reinforcing and rebuilding efforts. The floors were sagging and uneven, much of the bricks at grading were crumbling, and the poorly built rear addition that took up most of the backyard space was slowly sinking. Previously split into multiple units, the small and cumbersome rooms and hallways were dark and crowded, and the envelope was drafty, and not at all insulated. The building's EnerGuide rating of 22 was one of the lowest we had ever seen!

Though the home was in huge need of renovations, a brand new build was not an option, for two reasons: firstly, our clients wanted to preserve the charm and character of their original Victorian home, which is surprisingly hard to do, no matter how good the rebuild. Secondly, ripping down and re-building a semi-detached house is extremely difficult, and should only be done out of absolute necessity.

During our design process, a few red flags popped up. Along the eastern wall, we noticed the load-bearing brick wall had been plastered over - a foreboding sign that the bricks could be damaged in some way. Plastering over brick is usually evidence of a (poor) attempt to save crumbling and dissolving brick, but often this just makes the problem worse - bricks dissolve and crumble when they don't have proper ventilation. Plastering over brick only seals in moisture even more, which further destroys the brick, which many people think plaster could stop - it's a destructive cycle!

Unfortunately, our worries were justified - after closer inspection of the problem areas, the entire length of both wyths from grade up 30 inches crumbled to dust at the touch. The bricks all had to be replaced with concrete block, then insulated and clad with an Exterior Insulation Facade System (EIFS) material by Durock. Luckily this brick was along a narrow walkway between the home's semi-detached neighbour, so the home's aesthetic was nearly unchanged.

The interior needed work as well - the floors were lopsided by a few inches front to back, and the long floor joists were bowed and sagging with age. We decided it was worth the energy and cost to remove the subfloor in order to sister every existing floor joist with a new joist, effectively building a brand new but dead level floor.

We removed the back addition and decided not to re-build, which, at first, was hard to convince our clients to do! Usually when the opportunity is there, clients opt to keep and add footage, but through our design process we were able to show them that the home's footprint without the addition gave from plenty of space. Also, by removing the rear addition, we added about 30% more space to the backyard which is a rare commodity in a big city like Toronto. Lastly, not rebuilding the addition reduced the construction costs of the project as a whole, so more time and money could be spent on the rest of the house.

The brunt of our insulation was conventional foam, sprayed in between new wall studs set away from the existing brick walls and on the underside of the roof sheathing. The four inches of foam between the studs gave us an R25 wall and R40 roof. The windows were all double-glazed wood framed units from Marvin.

Systems

As for the home's systems, we installed in-floor heating between floor joists, an unconventional practice thought to be unable to properly heat a home. But with a house this efficient, even the most subtle changes in temperature (like the gradual heat of in-floor heating) make a difference to the space. Besides our in-floor heating, a tiny combination boiler and an air conditioning system by Fujitsu, also known as a "ductless mini split", is all this space needs.

We tied our air source heat pump (ASHP) by Fujitsu, also known as a ductless mini split, into our HRV Ductwork, thus creating a fully ducted, ductless mini-split. This allows for consistent heating and cooling throughout the house, regardless of whether or not a mini-split head (which sucks up hot air and replaces it with air chilled by coolant run from an outdoor condenser) is installed in the room.
The finished product boasts a 71% reduction in Annual Heat Loss, an 81% reduction in space heating, and an EnerGuide rating of 76, even without any basement renovations. Once the basement is finished, we expect a score in the 80s. The final air leakage rate sits at 4.45ACH@Pa, a huge difference from the pre-renovation 14.31 ACH@Pa!

Finally, the new renovation boasts a near 15-tonne reduction in annual greenhouse gas emissions - that's equivalent to what 5 Honda Civics *combined* produce in one year!

Our clients have fully moved in and the house reflects the family's warmth and charm. The playroom and music room is filled with instruments, art supplies, and toys, and the front and back patios are beginning to take shape in time for the family's first summer in the new reno. We're so happy to see this project off. It's time for us to step back and let the family begin to make memories in their new Solares home!