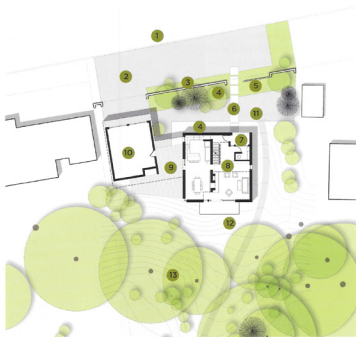


# Skinner Residence and Office

New infill conserves power and water in a pleasing package



#### Site/main floor plan N

- 1 Riverside drive
- 2 Gravel driveway
- 3 Concrete wall
- 4 Landscape/groundcover
- 5 Cedar screen
- 6 Concrete entrance steps
- 7 Main entrance
- 8 Residence
- 9 Covered breezeway
- 10 Existing renovated garage
- 11 Path to woods and river
- 12 Existing steep slope
- 13 Mature woods

**Left:** The south elevation overlooks the park and ravine, and features a large expanse of glazing to capture light and views [photo: Jackie Noble]. **Below:** The north elevation faces the busy arterial road, so the solid wall is broken only by a western red cedar screen at the main entry. The fence and horizontal cedar screen are finished with Sikkens Cetol 1 RE Reduced VOC Exterior Wood Finish.

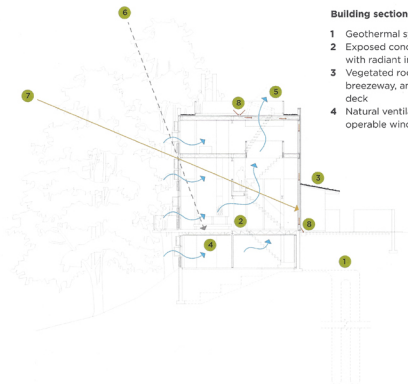


This urban infill lot stood vacant for 20 years, despite its prime location at the crest of a ravine, overlooking a river and parkland, just one kilometer from the city centre London, ON.

#### Jim Taggart

The reason may well have been the complex site constraints that included a steep and unstable slope to the south; the planned widening of the arterial road bordering the site to the north; and restrictive set backs from all sides which limited the area within which it was practical and economical to build.

These constraints, together with conservation area guidelines, and the desire to preserve and convert an existing garage structure, informed the decision to organize the program into a three-storey cube, with a footprint of only 30 by 30 feet. The building, which includes a main residence, guest accommodation and a home office was placed where imported fill had been previously dumped, meaning that the necessary excavation also effectively remediated the site and stabilized the existing bank. *[article continues on page 14]*



#### Building section

- 1 Geothermal system
- 2 Exposed concrete floor with radiant in-floor heating
- 3 Vegetated roof on garage, breezeway, and future roof deck
- 4 Natural ventilation through operable windows
- 5 Operable roof skylight exhausts warm air, and admits natural light
- 6 Mature trees provide shade in summer
- 7 Large south-facing window allows solar heat gain and natural lighting in winter
- 8 Rain water collection from roof drain to water retention pond at north

#### Project credits

- **Client / Owners:** Leslie Coates and Brad Skinner
- **Architect:** Skinner & Skinner Architects Inc.
- **General Contractor:** Owner
- **Structural engineer:** Strik, Baldinelli & Associates Ltd.
- **Mechanical Engineer:** Callidus Engineering / Just Geo-Thermal Ltd.
- **Lighting Design:** Lumen Essence Ltd.
- **Photos:** Skinner & Skinner Architects Inc., except as noted



A custom open riser concrete stair is a focal element of the house. Glass walls allow maximum penetration of natural light.



Lower floor plan



Third floor plan



Second floor plan

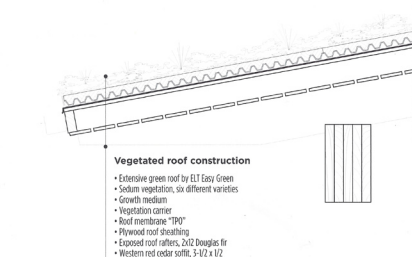
- |                         |                   |
|-------------------------|-------------------|
| 1 Walk-out entrance     | 8 Master bedroom  |
| 2 Recreation/guest      | 9 Ensuite         |
| 3 Storage               | 10 Walk-in closet |
| 4 Mechanical/electrical | 11 Sitting area   |
| 5 Office                | 12 Bedroom        |
| 6 Open to below         | 13 Bathroom       |
| 7 Green roof            |                   |



Seen from the vegetated roof of the garage, the west elevation of the house is enlivened by small randomly placed window openings. The vegetated roofs reduce solar heat gain and storm water run-off.



The existing garage was retained, refurbished and an extensive vegetated roof installed. Here TPO membrane and roof carrier are installed over the plywood sheathing.



## Materials

- **Wood-frame construction** with steel joists for main floor supporting poured concrete slab, wood trusses for second and third floors
- **EFS exterior stucco** is Senergy Senerflex channeled drainage design by **BASF**, exterior soffit, louver screen, fencing in western red cedar, exterior wood finished with **Sikkens Cetol 1 RE Reduced VOC Exterior Wood Finish**; thermoplastic polyolefin (TPO) single-ply roofing membrane and Extensive green roof by **ELT Easy Green**, spray foam insulation, 5.5" all walls including lower level, 12" roof
- **Geothermal heat pump** with supplemental hot water heat and uses hydrofluorocarbon (HFC) free, environmentally-friendly coolant, radiant floor heating lower and ground floor
- **Low-VOC interior paint**, polished concrete for ground and lower floors, locally-sourced cherry hardwood for second and third floors; Energy Star-rated appliances from **Euro-Line Appliances**, AEG oven, induction cooktop by Porter & Charles, Liebherr refrigerator compliant with European, Reduction of Harmful Substances [RoHS] standards and HFC-free refrigerant.



Construction of open riser concrete stairs. [See final result in photo on page 12.]



Radiant piping array and steel reinforcing mat are visible prior to the pouring of the ground floor slab.



Above left: Entering the breezeway between the house and garage, the visitor gets a sense of the parkland that lies beyond. Above right: The south window wall ensures that all the main living spaces of the house are flooded with natural light [photo: Jackie Noble].

The design responds to the site opportunities and constraints in a variety of ways. The renovated garage creates a visual transition between the neighbouring bungalows and the higher volume of the main house, while its vegetated roof connects the structure visually to its natural surroundings.

The main window systems run floor-to-ceiling, dividing the exterior walls into panels, and creating an interplay of solids and voids. A few small, randomly placed windows enliven the expanses of wall. On the main house, a three-storey south facing window wall captures natural light, constant breezes and beautiful views over the ravine. In contrast, a solid north wall and recessed entrance clad in cedar lath, shelters the occupants from cold winds and the busy street, while still permitting light to filter in.

Acid-etched glass ensures additional privacy where necessary without compromising daylight levels. Strips of operable windows on three sides offer additional light and enhance cross ventilation, while an operable roof sky-light forms a stack effect to vent warm air.

The house applies passive thermal principles suited to the lake region's large seasonal

temperature variations. The low-emissivity, south-facing window wall provides passive solar heat gain in winter, and is screened in summer by existing mature trees. The ground floor slab absorbs and re-radiates thermal energy, and its passive performance is supplemented by a radiant heating system supplied by a geothermal installation that also provides top-up heat for domestic hot water.

Energy Star appliances and an induction stove reduce overall power requirements, and recessed low energy, low-voltage fixtures with LED and fluorescent bulbs are used throughout. The electricity supplied to the building for energy is from regionally generated wind power and other renewable sources.

Passive and active technologies were merged in the approach to water conservation, with low-flow fixtures used throughout, and gray water recycling used for sinks, showers and the washing machine to further reduce household water consumption. Rainwater is collected and directed to a storm water retention pond at the north entrance. This pond provides an irrigation source for landscaping.

The building was designed with durability, flexibility and occupant health in mind. Polished concrete floors for basement and on-grade construction eliminate additional material finishes such as carpet or tile. Locally sourced concrete and cherry hardwood for the second and third stories minimized embodied energy. Clear structural spans and few interior load-bearing walls allow for easy renovation over time. Low and no-VOC finishes were prescribed for insulation, paints and millwork. Appliances are compliant with the European Union RoHS [Restriction of Hazardous Substances].

The building celebrates the interplay of sun, light, air and water to enhance the lives of its occupants while reducing the ecological footprint of the built form. The project stands prominently in the neighbourhood as an example of how green design principles can be applied effectively, even on highly constrained sites. ♦

JIM TAGGART IS EDITOR OF SABHOMES.