



PROJECT SUMMARY

The Harvey Woods Lofts project converted the vacant Harvey Woods Knitting Mill, a 1918 three-storey solid brick factory in downtown Woodstock ON, into 54 one-bedroom affordable apartments.

The existing industrial structure and tight construction budget of \$120,000/unit placed significant constraints on the design, which were resolved by creating long and narrow unit types. As a result, the centre of the building was carved out to create a three-storey covered atrium to bring natural daylight into the residential corridors.

Much of the original building features remain visible, including hardwood maple floors, wood columns, and steel beams. The historic brick facades remain as-is, opting for interior insulation and large, high-performance windows that complete the daylighting strategy. Archival photos of women working in the factory were incorporated into the new curtain wall entrance, tying the renovation to the building's storied past.

The building's energy efficiency strategy is completed with the addition of a geothermal well system and water to water heat pump for heating and cooling.

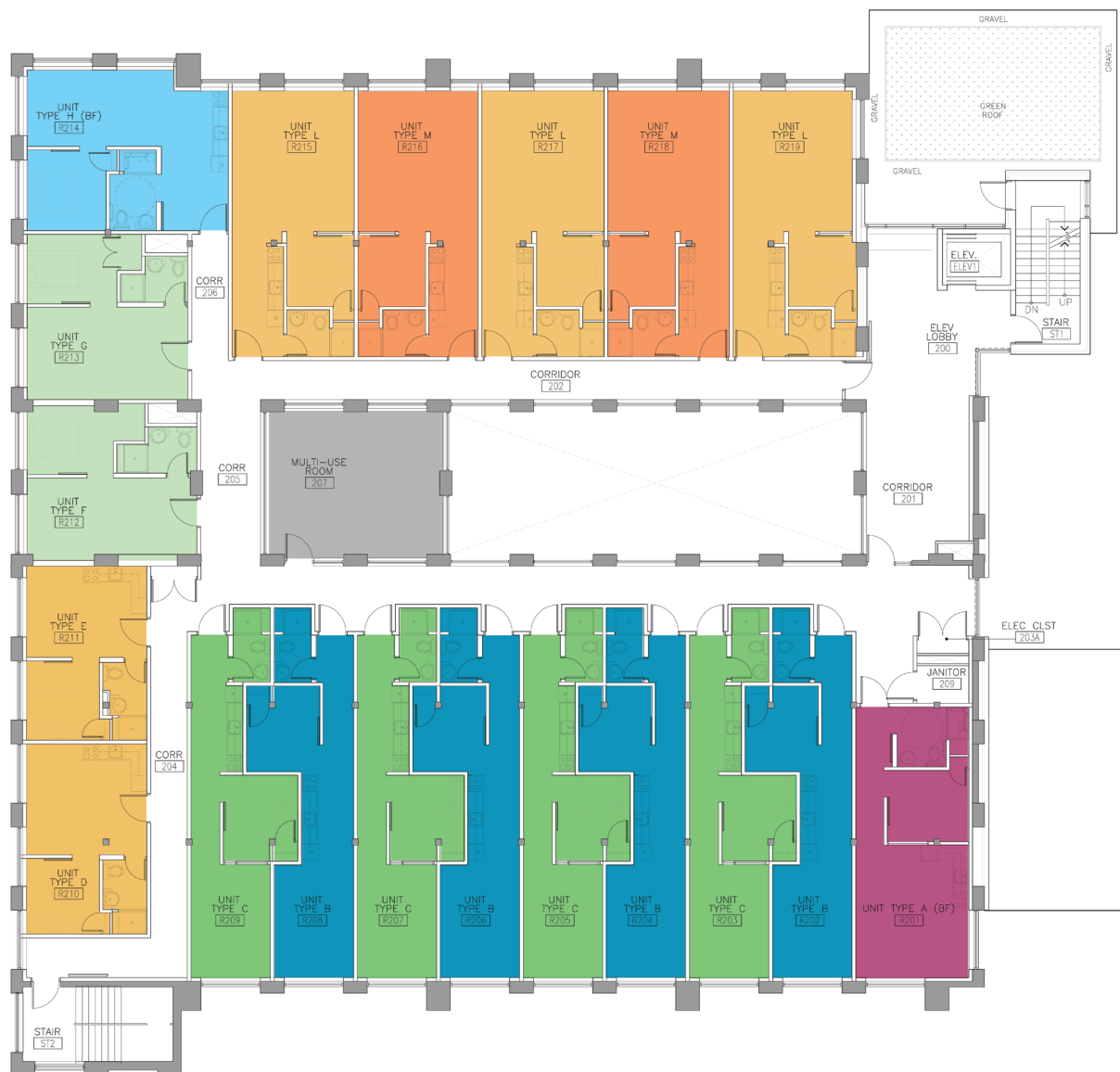
Overall, the building's energy intensity of 76 kWh/m²/yr is a significant achievement in the conversion of this historic factory. The most important achievement though, is creating 54 affordable apartments for the most vulnerable in this rural community.

MAIN PROJECT DESCRIPTION

1. Strategic Decisions

Given the pre-existing conditions of the building and its placement on the site, the key strategic decisions revolved around how to improve the access, circulation, and daylighting of the building. Working to preserve as much as possible of the original structure, and aiming to provide as many affordable housing units as possible within the limited budget, the design team arrived at a perimetral distribution with a corridor opening on to the central atrium, bathed in natural light.

The five different compact unit layouts (some deeper and narrower, some shorter and wider, accessible units, nested layouts) are grouped together to optimize circulation and maximize access to daylight and views.



HARVEY WOODS LOFTS

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2. Community



Where others saw a decaying property vacant for over twenty years, the non-profit developer saw the derelict factory as an opportunity: it was a well-known landmark in the downtown core, with transportation and other amenities nearby, and well suited to fulfill the affordable housing need for low-income residents, who were in desperate need of affordable apartments.

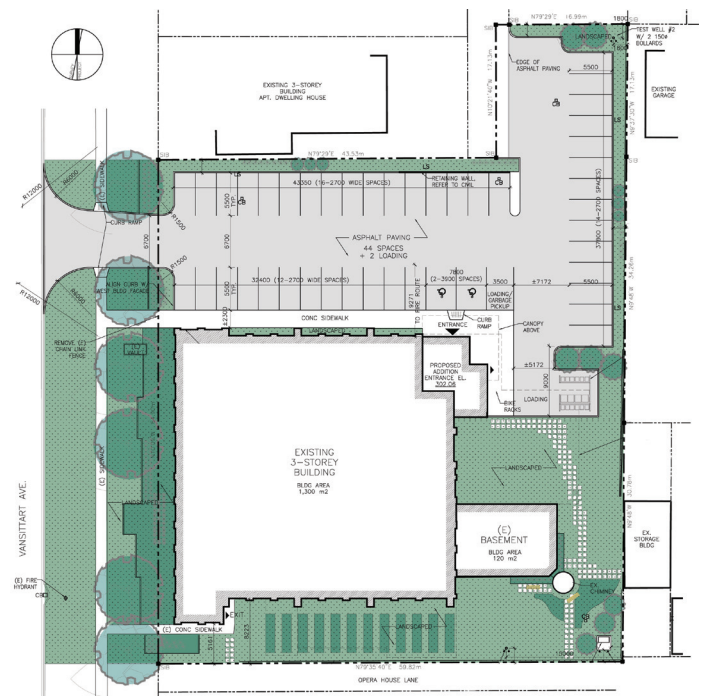
The central location of the development and the reduced 0.5 parking ratio achieved through the rezoning process helped to shift the modal transportation demand from private vehicles to walking and public transportation.

The historic chimney (only one of three left in the Woodstock area) was fully restored as a demonstration of community resilience.

3. Site Ecology

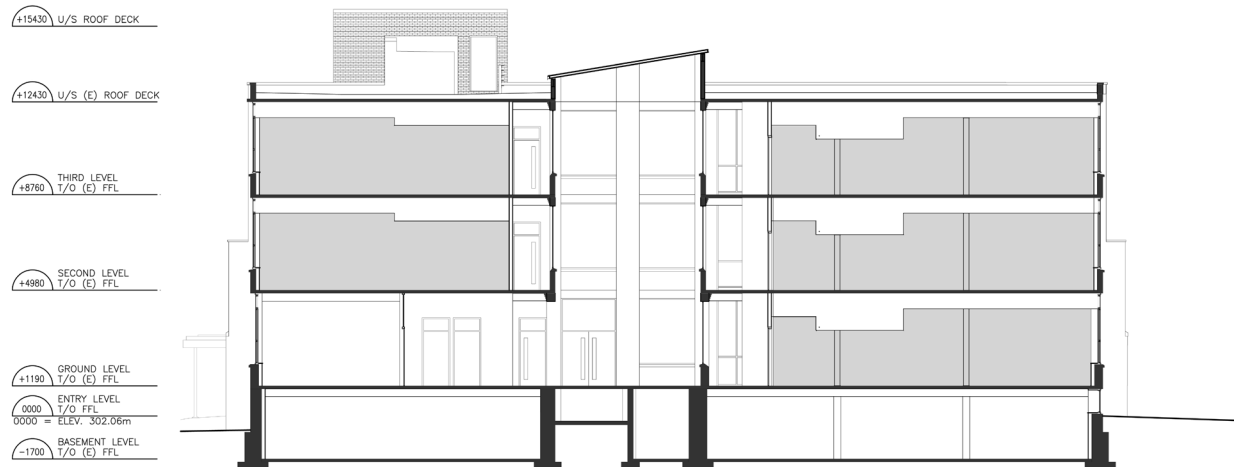
The previously contaminated site was redeveloped with the intention to minimize the impervious surfaces and maximize the landscaped area, including the use of open-joint pavers as part of the groundwater infiltration strategy. All of the chosen planting species are native, with low watering requirements, and the site also includes raised garden beds to provide residents an space to grow their own food.

The site ecology strategies are completed by a 40 m² green roof populated with low-maintenance sedum mats over the new entrance addition.



4. Light and Air

The centre of the building was carved out to create a three-storey atrium with a large skylight in order to bring natural daylight to the shared residential corridors.



The lighting system is equipped with occupancy and light sensors to reduce power consumption, and several LED fixtures are installed throughout the project. These three measures, combined with the comprehensive daylighting strategy, help reduce the lighting energy consumption to just 36.2 kWh/m² yr.

More than 30% of the occupied floor area is within 7 metres of an operable window. The rooftop makeup air unit provides fresh air to all units at a rate of 15 CFM per person, and a was sized appropriately to cover the demand of the future Phase 2 as well.

5. Wellness

The building provides several common spaces for the tenants to foster social interaction and a sense of belonging and community, all of them overlooking the central atrium:

- Community kitchen on the ground floor, with counter space set to barrier-free design requirements, to allow for everyone to participate in the cooking of nutritious, communal meals
- Fitness gym on the second floor, to promote physical activity and exercise. Weekly yoga classes are imparted by volunteer monitors
- Shared laundry room on the third floor, to facilitate fortuitous encounters and conversations



6. Water Conservation

Low-flow water fixtures were specified throughout the whole project, including toilets with a discharge of 4.2 litres per flush. The average potable water consumption is 12.76 l/m² per user per year, or 186 l/user per day.

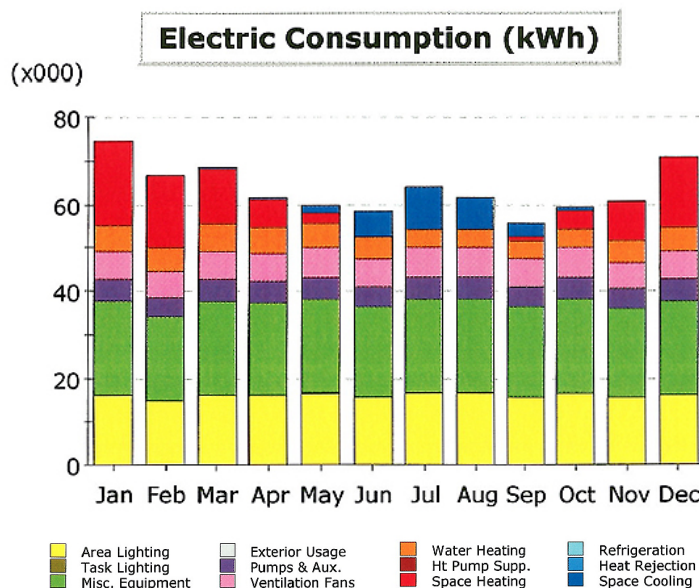
Due to the low water demand of the native plant species, there is no requirement for an outdoor irrigation system.

The geothermal system also provides significant water savings as it does not use domestic water for condensing during cooling season, unlike a conventional system that would use a substantial amount of water in the cooling tower.

7. Energy Present and Future

The project opted for an envelope first approach towards energy conservation, retrofitting the existing masonry walls with interior spray foam insulation, and large, high-performance fibreglass operable window. These are fitted with double-pane argon-filled Insulated Glass Units (Uglass 0.25) and a Solar Heat Gain Coefficient of 0.34 for the South and West Elevations, in order to reduce unwanted solar gains during cooling season.

The closed loop geothermal system (3 intake wells + 3 recharge wells) and water to water heat pump cover 100% of the heating and cooling load for the building, excluding ventilation. The monthly energy consumption breakdown is represented in the following graph.



8. Materials and Resources

Due to its interior application, the spray foam insulation used in the project is BASF Walltite Eco v3, an EcoLogo and GreenGuard Children and Schools certified product, guaranteeing a minimum 5% recycled content by weight of finished product, and ensuring occupant safety through improved Interior Air Quality. This spray foam utilizes zero Ozone Depleting blowing agents, but still manages to provide a higher R-value per inch (R 22.7 at 90mm), thus ensuring thermal comfort for the occupants.

Both millwork and paints were specified as low-VOC. The Modern Masonry concrete block by Day & Campbell used for the elevator shaft contains up to 42% post-consumer recycled aggregate.

9. Building Life Cycle Considerations

The original Harvey Woods Knitting Mill, built in 1918, was at the very end of its serviceable life in 2012. Thanks to the adaptable reuse design strategy implemented and also to the owner's management model of develop, own, operate, and maintain, the transformed Harvey Woods Lofts will continue to stand and serve the Woodstock community for another 50+ years, hence preserving the societal and historical value of the site.

The embedded energy of the masonry facades and the captured carbon on the wood structure and solid floors are conserved, avoiding the negative environmental impacts of demolition and new construction.



10. Education and Information Sharing

An open house and building tour with over 500 attendees was hosted for the project opening, featuring detailed explanations of the building mechanical systems and energy-saving measures. When a new tenant moves into the building, they receive comprehensive user education from the building manager regarding the operable windows and configurable thermostats in their units.

The old company photos integrated into the entrance curtain wall act as a constant reminder of the dilated history of the building, for this generation and the forthcoming ones.



