

THE KEN SOBLE TOWER

EnerPHit transformation lights the way to new retrofit model

THE PUTMAN FAMILY YWCA
Community neighbour combines energy efficiency and affordable housing

825 PACIFIC STREET ARTISTS HUB
New residential space provides public amenity and top performance

SOLO HOUSE
Off-grid design a learning experience for larger projects



1

1. The south elevation. During the design and construction process, the energy performance of the building was assessed to ensure that it would achieve Passive House certification, which provides 90% thermal energy savings and reduced greenhouse gas emissions of nearly 40%.

THE PUTMAN FAMILY YWCA

New community neighbour combines energy efficiency and affordable housing

By Irene Rivera and Esther Van Eeden

The Putman Family YWCA is Hamilton's first affordable housing residence for women and children. The six storey building comprises four floors of apartment units above a ground floor and basement podium that opens to a community garden on one side. The interconnected ground and basement levels provide community services to residents and the greater community, while the sixth floor provides community and amenity spaces for residents.

Of the 50 apartment units, 15 were reserved for women living with developmental challenges. Priority for all units was given to women from marginalized and Indigenous communities who have experienced domestic violence and homelessness.

Designed to fit naturally into the city's artistic Crown Point community, the building breathes new life into the disused site of YWCA's swimming pool. Using local materials and manufacturers where possible, the project aspired to reflect the tradition and aesthetic of Hamilton as a Steel Town. The brick clad podium mirrors the scale and materiality of the surrounding buildings and creates a tangible, visual connection between the streetscape and the community programming offered by the YWCA.



Site plan 

1. Resident and community reception
2. Open seating area
3. Senior's centre
4. Community centre auxiliary space
5. Administration
6. Multi-purpose
7. Community garden
8. Long term bicycle storage
9. Moving and receiving
10. Elevators
11. Parking
12. Resident entry
13. Community entrance



Background

In 2021, rent prices in Hamilton skyrocketed more than 14%, leaving many with the impossible choice of either paying for shelter or paying for food. Hamilton's waiting list for social housing is over 6,000 people. Women face unique barriers in securing safe and affordable housing and are the most vulnerable to homelessness. Safe and secure housing provides a haven for many women and children, where they are protected from abuse and given the ability to start dreaming of a brighter future.

The decision to pursue Passive House certification is consistent with that of other providers of supportive housing across the country, as it significantly reduces operating costs, while providing a high level of indoor environmental quality for residents. These attributes align with the YWCA's core mission to provide comfortable, healthy, secure, resilient, and safe housing for women.

Construction Approach

The YWCA wanted a robust building constructed of a secure material that would signify strength and a place of safety for the community they serve. They also wanted to create a building whose material expression reflected its location in a historic manufacturing town. Cast in place concrete was initially considered, but discarded in favour of precast when the manufacturer demonstrated it could meet all the design requirements with the added benefits of precast construction.



3

PROJECT CREDITS

CLIENT YWCA Hamilton

ARCHITECT/ARCHITECTE Kearns Mancini Architects Inc.

STRUCTURAL ENGINEER RJC Engineers

CONTRACTOR Schilthuis Construction Inc.

PASSIVE HOUSE CONSULTANT Kearns Mancini Architects Inc.

PRECAST CONCRETE SUPPLIER Coreslab Structures (ONT) Inc.

PHOTOS Simon Tingle, Craft Architecture Photography (photos 1, 3 and 5), Industrious Photography (photos 2, 4 and 6)

DRAWINGS/ DESSINS Kearns Mancini Architects Inc

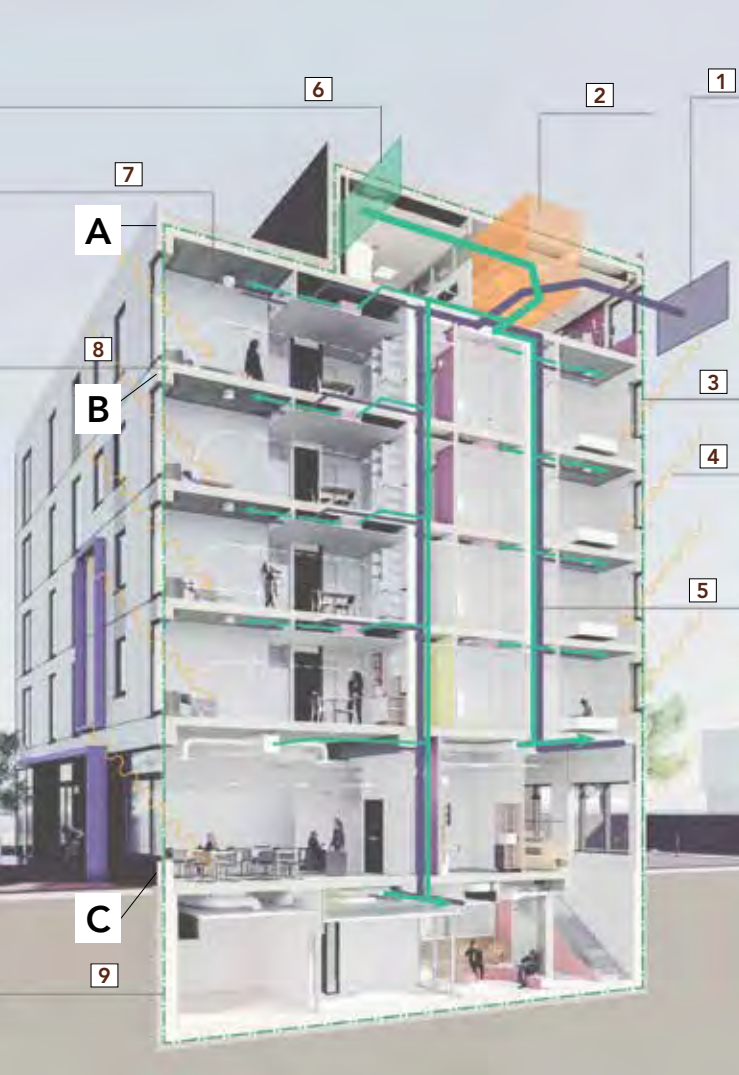
2. The Putman Family YWCA meets the organization's core mission to provide comfortable, healthy, secure, resilient, and safe housing for women.

3. The building is a prefabricated total precast concrete construction, including the exterior finishes as seen with the "corduroy" dark slate textured precast concrete finish on the north and west elevations.

4. The building recovers 85% of its heating and cooling from the ERVs, which also provide constant HEPA filtered fresh air for a high level of indoor environmental quality.



4



Principles of Passive House

1. Stale air exhaust on top level
2. Energy recovery ventilator (ERV) with heat exchanger
3. High performance window
4. Solar heat gains through glazing
5. Vertical supply and return air circulation
6. Fresh air intake on top level
7. Supply and extract air in each suite
8. Thermal bridge free junction
9. Continuous air tight layer and thermal insulation building envelope

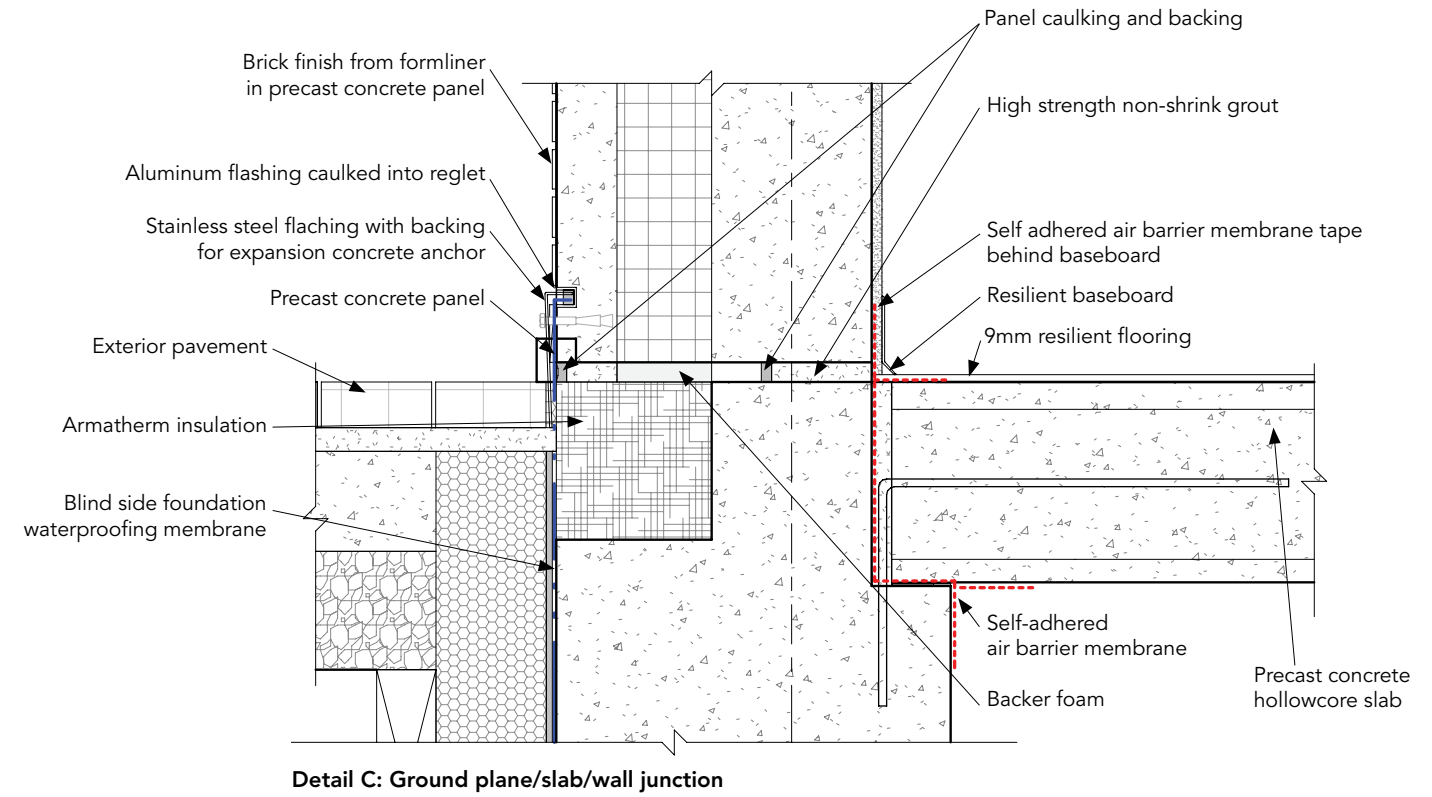
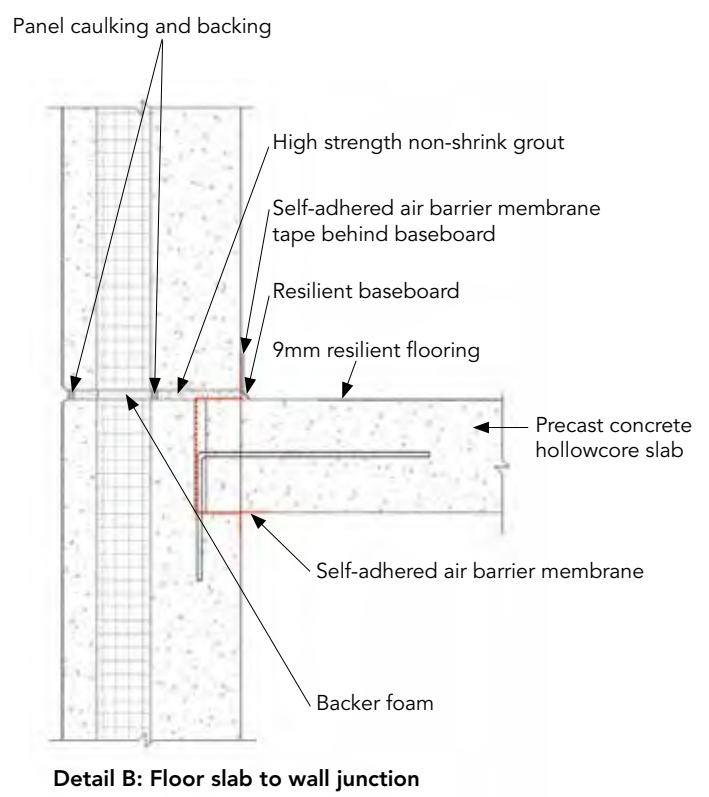
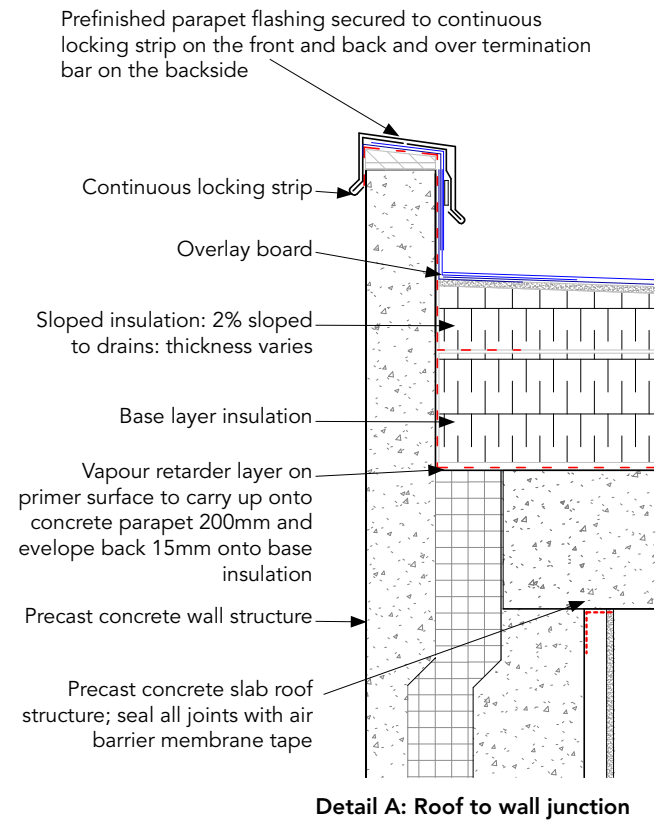
In addition to the psychological benefits offered by concrete, it is an extremely durable material that provides superior defense against material degradation caused by weather and other biological conditions. A further benefit was that the Hollow core prestressed floor elements allowed for a much lower depth to span ratio, minimizing the volume (and hence weight) of concrete per unit of floor area.

The unique total precast system satisfies thermal, airtightness and structural criteria whilst providing a robust, aesthetic façade in one factory-built component. Additionally, using a precast concrete system from a local manufacturer reduced the use of traditional formwork, auxiliary elements, and eliminated waste.

In turn, factory prefabrication reduced erection times and required only a single crane and a flat bed truck. As a result, truck idling, traffic congestion, construction site emissions and site lighting requirements were all reduced; as were noise, pollution and other environmental impacts on the surrounding community.



5. The west elevation. The building orientation was determined by the site location, height and program area required. Triple-glazed windows were sized according to their orientation using passive design strategies.





6

6. The new building occupies the site of the former YWCA swimming pool and was designed to fit into the city's artistic Crown Point community.

Building Performance

The building recovers 85% of its heating and cooling from the ERVs, which also provides constant HEPA filtered fresh air. The building's total energy use is 130 kWh/m²/year based on a treated floor area of 3,463m² totalling 233,782.7 kWh/a. The building recovers 85% of its heating and cooling from the ERVs, which also provides constant HEPA filtered fresh air.

The Passive House Planning Package (PHPP) is divided into residential and non-residential components. The breakdown is:

- YWCA residential (2,485m²) 70.7 kWh/m²/year;
- YWCA non-residential (978m²) 59.4 kWh/m²/year.

Internal heat gains from electrical sources add heat to the space. Any additional heating and cooling that may be required is provided through variable refrigerant flow (VRF) heat pumps.

The building is airtight and low tech, its orientation having been determined by its location on site, its height and the program space required. Windows were sized optimally according to their orientation using passive design strategies. High efficiency ERVs (energy recovery ventilators) are used to meet the minimal heating and cooling requirements, Heat demand is 14.85 kWh/m² and cooling demand is only 7.45 kWh/m² based

on the treated floor area. As the energy use intensity (EUI) and emission factor from hydroelectricity is so low it takes very little to offset any emissions from this building.

Life-cycle performance was considered for all building components and systems, with the precast concrete structure having an anticipated 100-year service life. The high quality construction required to achieve Passive House performance also contributes to durability. Some of the other materials have a 50-year warranty. However, should user needs change, the precast concrete system, being demountable, reusable, and having a high loading capacity, lends itself to alteration

IRENE RIVERA IS AN ASSOCIATE ARCHITECT, AND ESTHER VAN EEDEN IS DIRECTOR OF HIGH PERFORMANCE BUILDINGS, BOTH WITH KEARNS MANCINI ARCHITECTS IN TORONTO WITH KEARNS MANCINI ARCHITECTS.