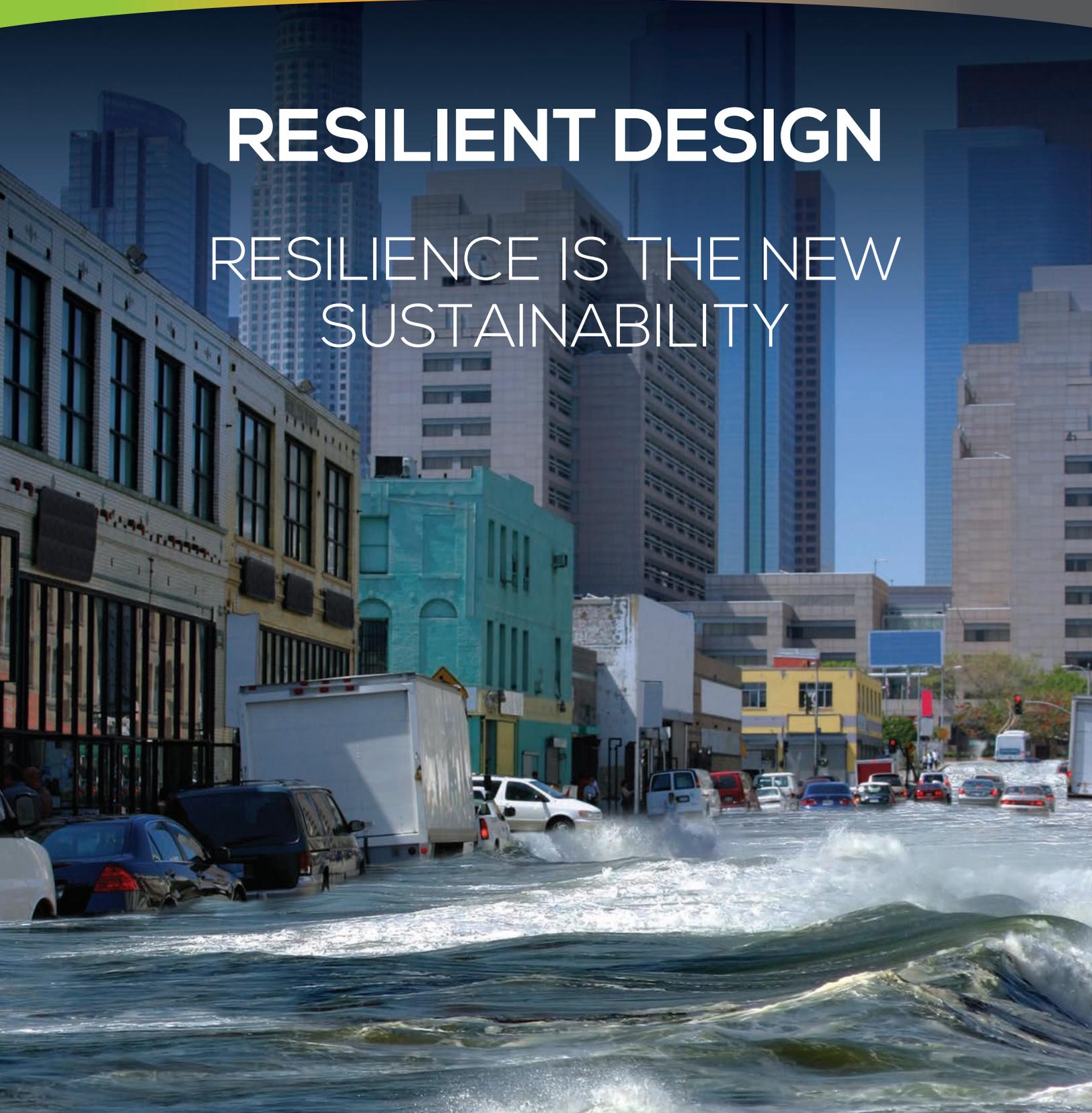


RESILIENT DESIGN

RESILIENCE IS THE NEW
SUSTAINABILITY



CANADIAN PRECAST/PRESTRESSED CONCRETE INSTITUTE

INSTITUT CANADIEN DU BÉTON PRÉFABRIQUÉ ET PRÉCONTRAIT



RESILIENT DESIGN

RESILIENCE IS THE NEW SUSTAINABILITY

After the catastrophic flooding in Moncton, Fredericton, Winnipeg, Ottawa, Calgary and the devastating wildfires in Fort McMurray, Alberta, Canadians are realizing that climate change is one of the biggest challenges that the world faces. Tackling climate change is a top priority for all levels of government - at home and internationally.



Climate change has already had far-reaching impacts on infrastructure and has profound effect on sustained operation of the built environment. This trend is likely to accelerate in the coming decades. The main threats to infrastructure assets include damage or destruction caused by extreme weather events. **Besides efforts to reduce climate change, decision makers need to prepare our infrastructure for the climate change that cannot be avoided.**

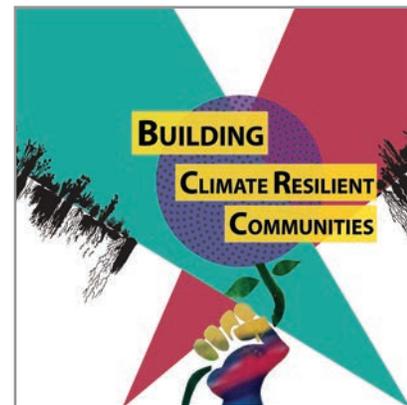
Building code requirements have an emphasis on life safety, i.e. allow major damage or total collapse providing the occupants can be evacuated prior to or during the event. Excessively damaged buildings have a slow recovery and may even prevent recovery for some neighbourhoods.

But What Exactly is Resiliency?

Resiliency can be defined as the adaptability of a system (communities) to maintain its function and structure in the face of turbulent internal and external change.

The key attributes of enhanced structural resiliency are improvements in:

- Longevity (service life)
- Robustness
- Sustainability
- Life safety
- Durability
- Adaptability for reuse
- Resistance to disasters



Thoughtfully chosen, properly designed new construction can significantly improve both the resilience to natural and man-induced disasters and the long-term sustainability of modern urban environments in the 21st century. In particular precast concrete construction has the ability to provide extremely durable buildings at similar costs to traditional construction while also providing a more sustainable construction form, in terms of higher energy efficiency, lower embodied energy, safety, and a quicker recovery after a disaster.

CPCI, NPCA, PCI and Members are the leading source of technical resources (Body of Knowledge (BOK)) for the precast concrete industry in North America. From this BOK, building codes, design guides, educational programs, certification, sustainability programs, and new research ideas are derived. This joint industry initiative develops, maintains, and disseminates the BOK necessary for designing, fabricating, and constructing sustainable and resilient precast concrete structures.

CHAMPAGNE QUARRY PARK – FORMER INDUSTRIAL LANDS REJUVENATED AS SELF-CONTAINED COMMUNITIES

Calgary, Alberta



Owner: Remington Development Corporation
Architect: Gibbs Gage Architects
Engineer: Kassian Dyck & Associates
Contractor: Remington Development Corporation
Precast Supplier: Lafarge Precast

Photos courtesy of Lafarge Precast

Champagne Quarry Park in Calgary is an example of what is happening in many parts of the country where former industrial lands along waterways and near city cores are being rejuvenated as self-contained communities.

The project comprises five individual - four- and five-storey total precast buildings located on top of two levels of interconnected underground parking. The architecture is French provincial, which is supported with details such as natural stone and steep-pitched roof lines. It has balconies and large windows and arched detailing over the top windows. Colour palettes, construction materials and specifications differentiate this property from any other in Alberta.

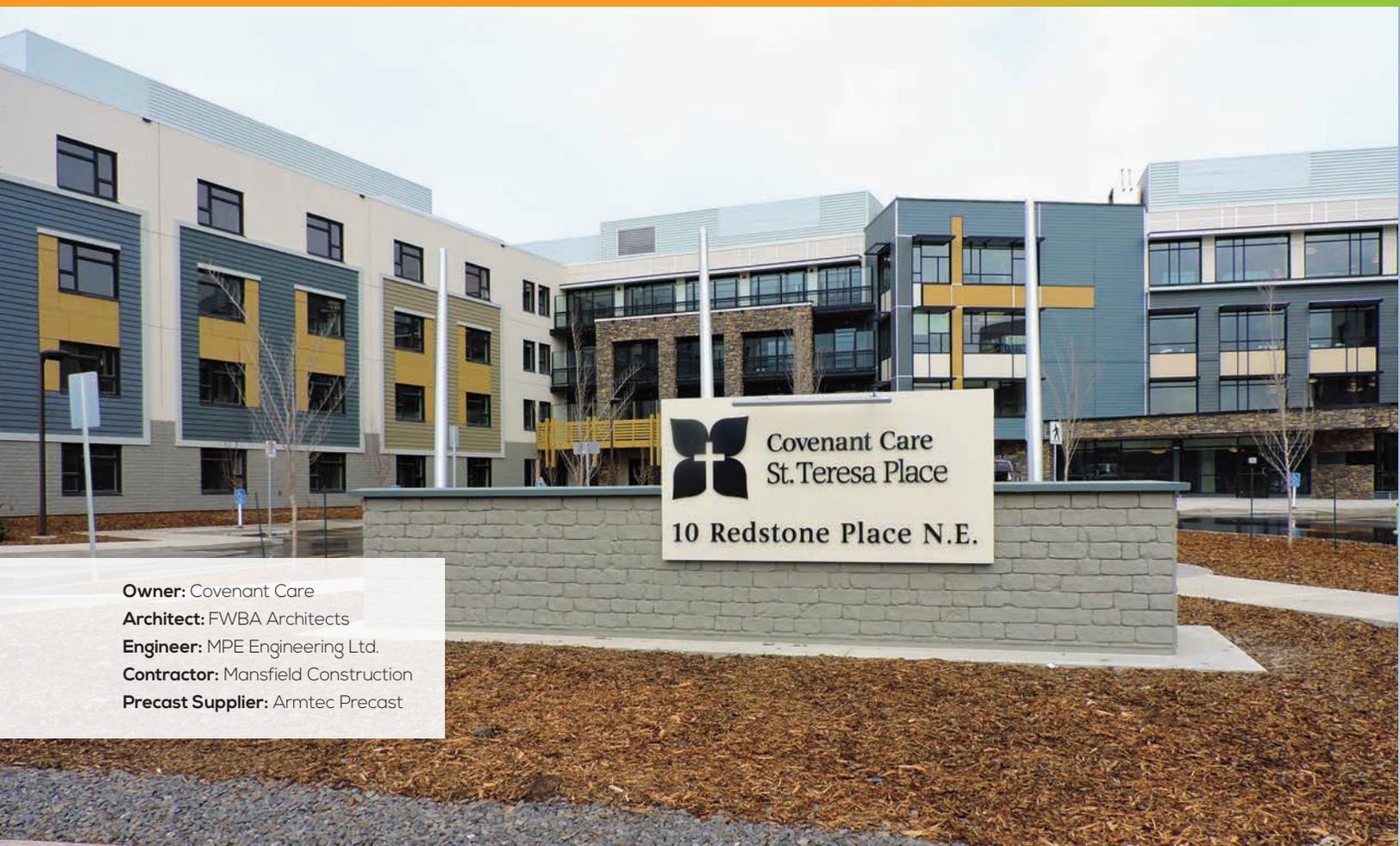
Precast Concrete is Safe

Everybody knows that precast concrete does not burn! Not only is the structural stability maintained for longer periods, but precast concrete construction prevents the spread of fire from one building to another.



ST. TERESA PLACE SUPPORTIVE LIVING FACILITY

Calgary, Alberta



Owner: Covenant Care
Architect: FWBA Architects
Engineer: MPE Engineering Ltd.
Contractor: Mansfield Construction
Precast Supplier: Armtec Precast

Photos courtesy of Armtec Precast

St. Teresa Place facility, located in Calgary, Alberta, is a total precast concrete supportive living building. Located at 10 Redstone Place in Northeastern Calgary, this supportive living complex is four storeys in height, contains 250 units and has a gross building area of 19,000 square metres (205,000 square feet). The building was completed on a condensed installation schedule, without compromising the architectural design.

This building method facilitated a fabrication and installation schedule of mere months – starting with precast production in June, precast installation starting in August and completion by the end of November. Total precast construction provides a state-of-the-art solution for continuing care needs by delivering a safe, fast, sustainable and resilient building.

Precast Concrete is Tornado, Hurricane, and Wind Resistant

Precast concrete is resistant to tornadoes, hurricanes, and wind. Debris driven by high winds presents the greatest hazard to occupants of homes, offices and commercial facilities during hurricanes and tornados.



THE BARREL YARDS POINT TOWERS

Waterloo, Ontario

SWITCH TO PRECAST CONCRETE
REDUCES THE CONSTRUCTION
SCHEDULE BY ONE YEAR



Owner: Auburn Development Inc.
Architect: Turner Fleischer Architects Inc.
Engineer: HGS Limited Consulting Engineers
Contractor: Stonerise Construction
Precast Supplier: Stubbe's Precast

Photos courtesy of Stubbe's Precast

Point Towers, Phase 5 at The Barrel Yards in Waterloo consists of two 25-storey, 85-metre [279 feet] towers of 357 living units sitting on a two-storey podium with one level of underground parking. Total ground floor area is 41,877 square metres [450,290 square feet].

The Point Tower was originally designed as a cast-in-place concrete structure with precast concrete and window wall cladding, but during the design phase the client requested to change to a total precast building to shorten the construction schedule and reduce financing costs. In comparison to a similar building also under construction on the same property, but cast-in-place, the Barrel Yards precast concrete project started six months later and finished four months earlier, which greatly reduced construction and financing costs.

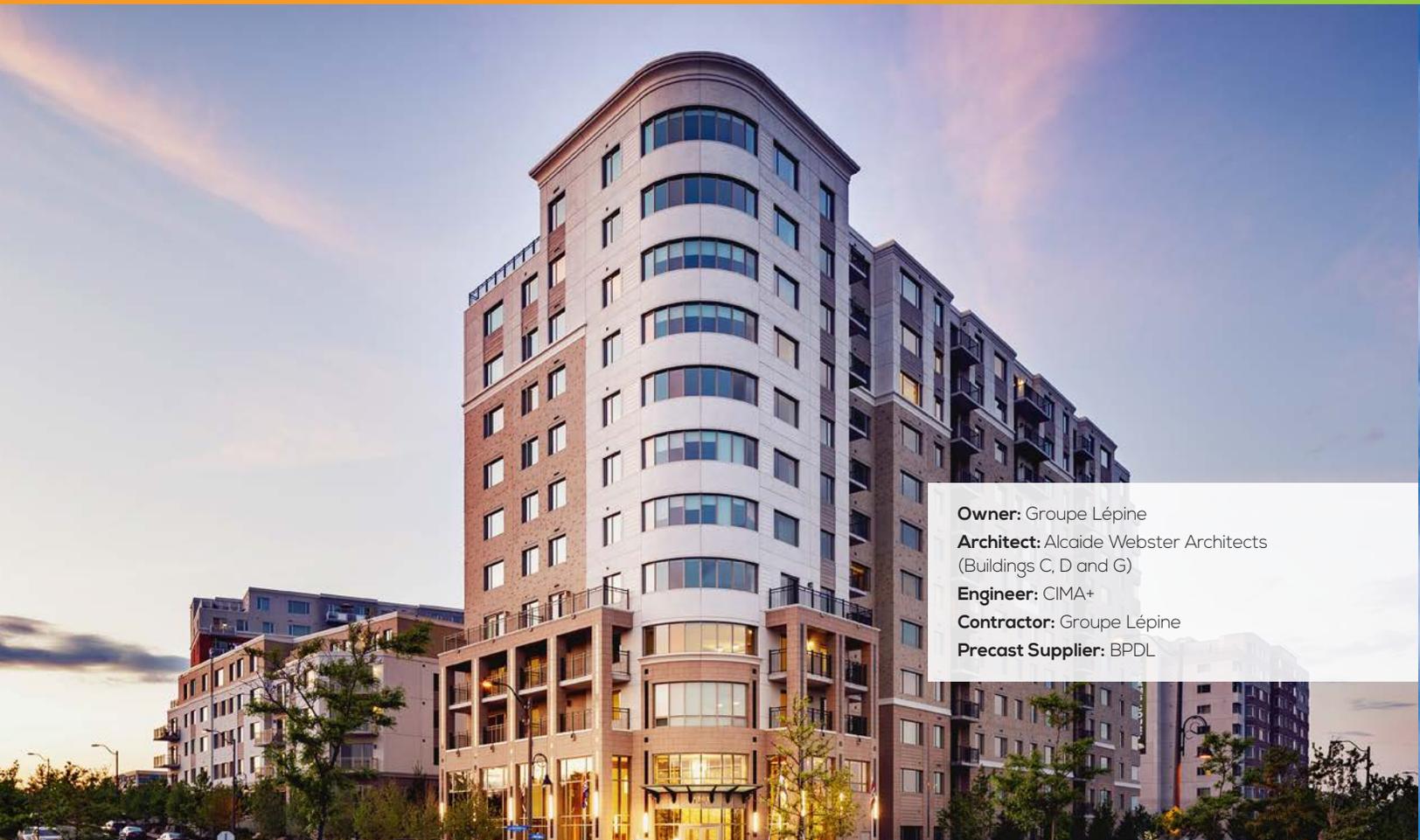
Precast Concrete is Earthquake Resistant

Precast concrete structures are designed to the seismic requirements of the National Building Code of Canada.



WILLIAM'S COURT

Kanata, Ontario



Owner: Groupe Lépine
Architect: Alcaide Webster Architects
(Buildings C, D and G)
Engineer: CIMA+
Contractor: Groupe Lépine
Precast Supplier: BPDL

Photos courtesy of BPDL

William's Court - Groupe Lépine opted for precast concrete construction because of its fast construction, its durability, and for its lower cost made possible by the tightly controlled and relatively short production process.

Groupe Lépine selected a white hammered finish and the precaster also used a brick form liner mould that was used to simulate a brick wall, which was then stained at various locations. The illusion is quite dazzling. Even natural stone was used in several locations, with some precast panels having over three different finishes or colours.

Precast Concrete is Ecological

Made of natural raw materials, locally available almost everywhere and in an enormous quantity, precast concrete minimizes the whole life cycle impact on the environment when compared with other construction materials.



THE BELMONT TRIO

Kitchener, Ontario



Owner: HIP Developments Inc.
Architect: ABA Architects, Inc.
Engineer: MTE Consultants Inc.
Contractor: Melloul-Blamey Construction
Precast Supplier: Coreslab Structures Inc.

Photos courtesy of HIP Developments Inc.

The Belmont Trio project consists of three apartment buildings with a shared above ground parking garage in Kitchener, Ontario. All three Buildings are total precast concrete structures.

“The precast installation began in March 2016 and the contractor was installing the 10th floor by the first week of June, taking a week on average to install one level. Using uniform precast concrete panels allowed for immediate installation of windows and rapid finishing of the interior floors.” Kurt Ruhland, P.Eng., MTE Consultants Inc.

“The dark colour palette of the precast concrete exterior wall panels, consisting of colour gradients of grey, contrast sharply with the stark white colouring of the boxes to give the building a strong visual presentation”. Andrew Bousfield, ABA Architects, Inc.

Precast Concrete is Healthy

Indoor air quality is a concern for all of us. Precast concrete buildings are inert systems that do not need chemical treatment to protect against rot and mold, helping to preserve long term healthy indoor environmental air quality for occupants.



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PRECAST CONCRETE BUILDS ON... RESILIENCY

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