PRE
CAST

THE BEAUTY OF ARCHITECTURAL PRECAST CONCRETE

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A beautiful building becomes iconic by striking a permanent pose. Such elegance in Architecture makes it a perpetual fashion. This elegance goes beyond just the aesthetic cover of the structure; within such timeless buildings lies a structure giving its aesthetics an extended life and revealing a visual identity to the building.

Beauty in architecture includes the performance and behaviour of a building's structure and facade elements as a combined component. The structural form should have an aesthetic appeal while being functional to the occupants. An elegant design is the one that arises from architecture and engineering ingenuity and satisfies the requirements of efficiency, safety, sustainability and economy, all while being stylish and unique.

A desire for greater differences in aesthetics has grown as designers look to add visual interest and depth to facades. In many cases, designers are turning to architectural precast concrete, a high performance building material and system, to meet these needs. Its excellent aesthetic versatility allows for a complete spectrum of optional finishes and its plasticity provides depth and geometric shapes that create eye-catching facades.

The versatility provided by architectural precast concrete is appropriate for use on low, mid and high-rise offices and residential buildings, where the emphasis is on economy, sustainability, prestige and aesthetic appeal - and on institutional, industrial and commercial structures, where aesthetic appeal, economy and durability are paramount.

This brochure illustrates the wide range of products available from members of the Canadian Precast/Prestressed Concrete Institute (CPCI) across Canada, and their product capabilities and diversity. The focus of this publication is to illustrate the Beauty of Architectural Precast Concrete. For more information: **www.cpci.ca**

Plaza Moliere Dos 22 Mexico City, Mexico
Architect: Sordo Madaleno y Asociados, S.C.

Vancouver Public Library
Architect: Moshe Safdie & Associates

SPECIAL THANKS TO OUR JUDGING PANEL:

Don Griffith, Publisher SABMag, CaGBC FOCUS publications Canada, and the Canadian Green Building Awards

John Archer, Principal, Archer and Associates (Painter & Architect Ret.)

Vince Catalli, Design and Art Consultant

Front Cover Photo courtesy of:
Nawkaw Australia/Canada
New South Wales, Australia

CHAMPAGNE QUARRY PARK

FORMER BROWNFIELD TRANSFORMS TO A LIVE-WORK COMMUNITY

Calgary, Alberta

Owner: Remington Development Corporation
Architect: Gibbs Gage Architects
Engineer: Kassian Dyck & Associates
Contractor: Remington Development Corporation
Precast Supplier: Lafarge Precast, A Member of LafargeHolcim

The project comprises five individual four and five-storey buildings over two levels of interconnected underground parking. The architecture is French Provincial, supported with natural stone details and steep-pitched roof lines. It has balconies and large windows, and arched detailing over the top windows. The interior uses long-span concrete hollowcore floor slabs supported by precast concrete shearwalls.

The precast concrete colour palettes, construction materials and specifications differentiate this property from any other in Alberta. Architectural precast concrete was chosen for its beauty, resilience and inherent fire resistance - all being key requirements for this property.

HUMBER RIVER HOSPITAL

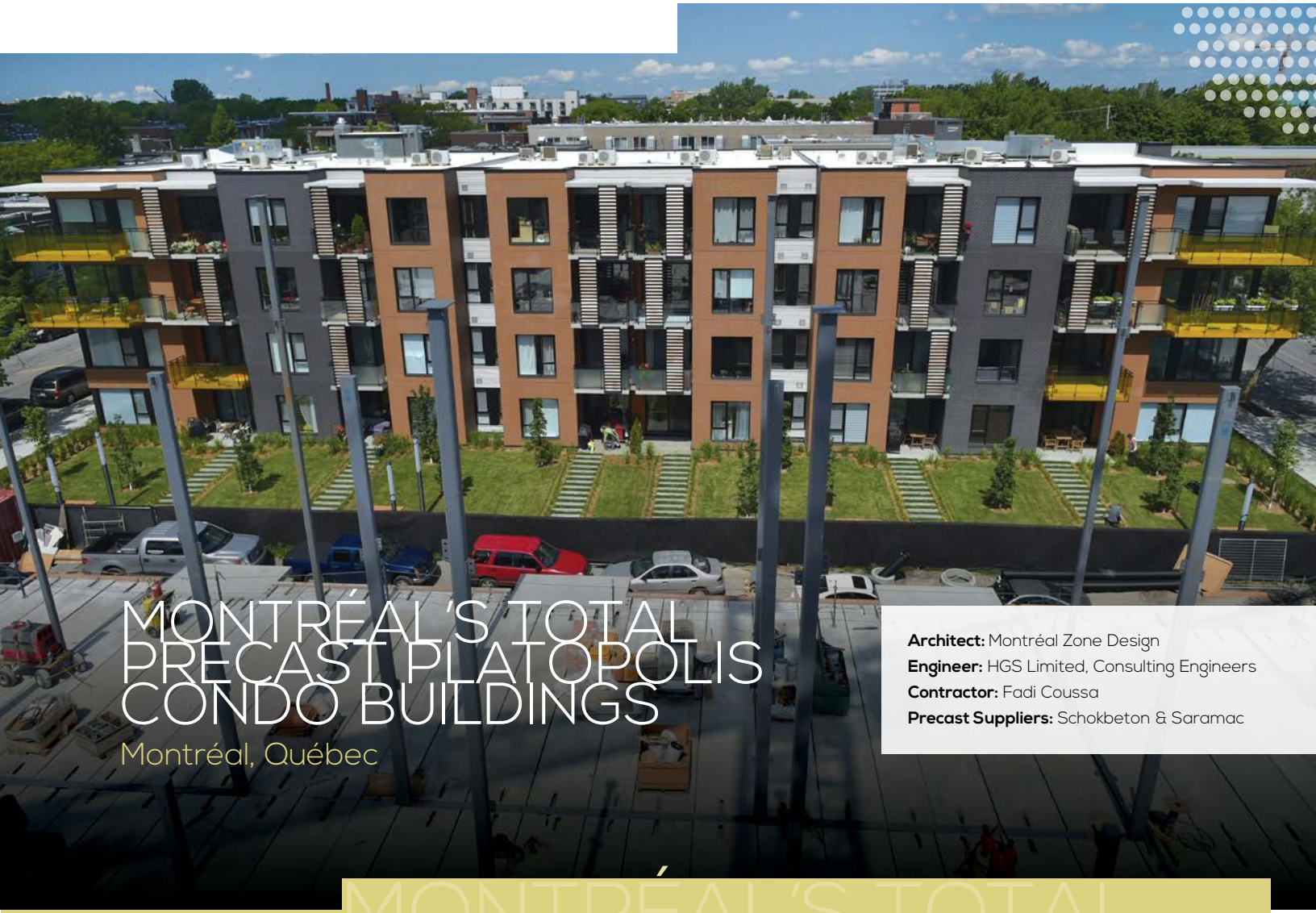
Toronto, Ontario

Owner: Humber River Hospital (Ontario Government)
Architect: HDR Architecture Associates, Inc.
Engineer: Halsall Associates
Construction Manager: PCL Constructors Canada
Precast Suppliers: RES Precast Inc. and Prestressed Systems Incorporated for the parking garages

Because the building is a tangible symbol of the Humber River area, it needed to project a contemporary image. HDR's designers composed a facade using precast concrete panels with two finishes to help accentuate the articulation of window openings and feature a strong system of reveals relating to the curtainwall fenestration pattern. This pattern also symbolically mimics the rock out-croppings lining the banks of the Humber River. The reveals within the panels echo the movement of the river moving over the river's rocks. As the exterior palette of materials was developed, architectural precast concrete was envisioned from an early stage of the design and provided a solid and durable material to help accentuate the overall goals of the hospital.

HUMBER RIVER HOSPITAL EAST AND WEST PARKING DECKS

The architectural design of the two parking decks for the Humber River hospital goes beyond simple storage for cars. The design team introduced a sense of scale, colour and texture into the architectural precast concrete system. The acid wash and light sandblast white precast, and the thin brick inlays evoke the new hospital's facade materials by introducing a textural surface that accents the beautiful landscaping and reacts to daylight by subtle shifts in shadow, shade, and texture.



MONTRÉAL'S TOTAL PRECAST PLATOPOLIS CONDO BUILDINGS

Montréal, Québec

Architect: Montréal Zone Design
Engineer: HGS Limited, Consulting Engineers
Contractor: Fadi Coussa
Precast Suppliers: Schokbeton & Saramac

MONTRÉAL'S TOTAL PRECAST PLATOPOLIS CONDO BUILDINGS

The structural system is a platform construction - a simple system of floor slabs on walls. Using total precast concrete walls and hollowcore floors is becoming a common and popular building method rendering fast and efficient erection time. The wall elements act as both bearing and shear walls, resisting gravity as well as lateral force components.

Some of the exterior architectural precast concrete wall panels received different colour stains while some have a brick veneer look created with formliners. Other exterior wall panels are double wythe insulated precast concrete wall panels consisting of an assembly of two wythes of precast concrete housing a middle layer of insulation and also used brick veneer look formliner then stained with a different colour to accent the project colour palette.

SURREY CITY HALL AND PLAZA

Surrey, British Columbia

Owner and Developer: Surrey City Development Corporation
Architects: Kasian and Moriyama & Teshima Architects
Project Manager: Pivotal Projects
Structural Engineer: Read Jones Christoffersen Ltd.
Civil Engineer: Aplin & Martin Consultant Ltd.
General Contractor: PCL Constructors Westcoast Inc.
LEED and Building Envelope Consultant: Morrison Hershfield
Cost Consultant: Gage Babcock & Associates Ltd.
Precast Supplier: Armtec

SURREY CITY HALL AND PLAZA

Precast concrete origami is the highlight of this award winner. Acting as the City's municipal government and anchor, this exceptional building is a vibrant new urban Civic Centre for the second largest municipality in British Columbia. Central to City Hall's public role is its light-filled atrium, a gathering and event space at the heart of the 16,500m^2 (177,540 square feet) building. It provides physical and symbolic connections between the Plaza and the city beyond and expresses open and democratic governance.

The west feature wall is comprised of an intricate array of 50 varying geometric-shaped architectural precast prestressed concrete panels with deep recesses that invite natural light into the interior spaces. It required considerable planning to fit them together in a particular order, similar to a jigsaw puzzle. The architects, Kasian and Moriyama & Teshima, needed the panel joints to fall in certain locations for the best visual effect. The precaster made numerous shop drawings based on the ideas of the architects, and with the overview of the structural engineers to achieve this stunning visual effect.

2015 SABMAG GREEN BUILDING AWARDS WINNER

Owner: Tri-Krete Limited
Architect: Uni-Vative Design Inc
Engineer: MZL Design
Contractor: Tri-Krete Limited
Precast Supplier: Tri-Krete Limited

SUNSET BLVD TOTAL PRECAST CONCRETE HOME

Thornbury, Ontario

This is a residential project located in Thornbury, Ontario and is used as the precaster's family cottage. The project consists entirely of architecturally finished structural precast concrete products. The precast is all self-supporting; very minimal supports were required to complete the structure. The panels are finished using various different formliners to achieve the desired look. The project is located on a golf course, which is governed by a covenant for all new construction. This covenant is very strict in which products are to be used on the exterior facades of the properties. The precaster used a custom stone formliner that matched almost exactly to one of the approved stone materials. All the panels were then stained by Nawkaw Corporation at the precaster's facility before being transported to the site.

Panels were installed using a 90 tonne mobile crane and using tilt shores to temporarily support the architectural precast concrete wall panels. The floor slabs were installed first and secured, so that the shores were able to tie back to them. The shores stayed in place until the entire structure was completed and the roof was installed. The precaster was able to erect an average of seven wall panels a day, and with 76 wall panels it took only two weeks to complete the installation of the precast. The final structure is an exquisite total precast concrete home that will stand the test of time for years to come.

SIMONS RETAIL STORES

Montréal, Toronto & Vancouver

SIMONS GALERIES D'ANJOU, QUÉBEC

Owner: La Maison Simons

Architect: LEMAYMICHAUD

Engineer: SDK & ASSOCIATES INC

General Contractor: Constructions Albert Jean ltée and Structure Universelle inc.

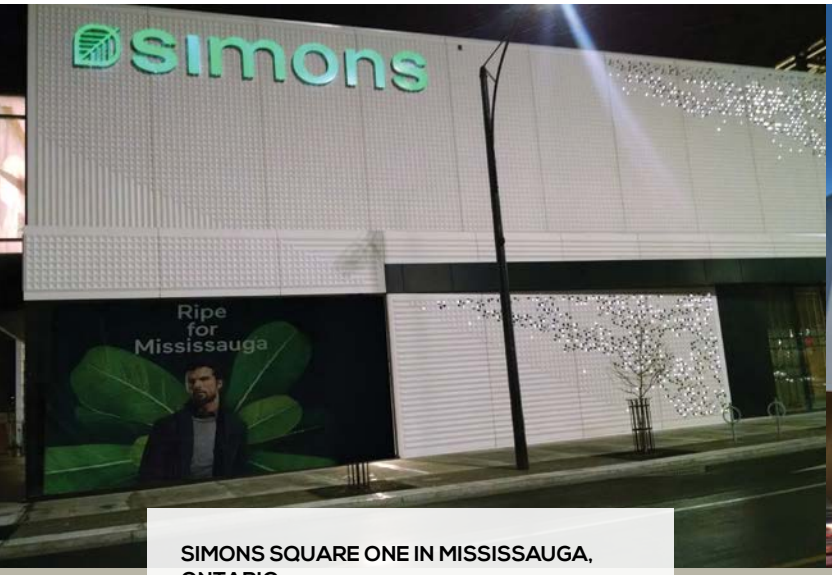
Precast Supplier: Bétons Préfabriqués du Lac Inc. (BPDL)

The impressive glittery facade of the Simons retail store at Galeries d'Anjou in Montréal, Québec

La Maison Simons (Simons) is a mainstay of the Québec apparel marketplace and its expansion into the rest of Canada has been advanced by their beautiful store designs, and their sophisticated and chic merchandising.

"We wanted to create minimalist buildings with a unique texture," says Philippe Blais, architect with Lemay Michaud Architects. Lemay Michaud used white precast concrete surfaces on the new Simons Stores to achieve a sleek look with unique features added to each store.

The design of the Galeries d'Anjou Mall in Montréal's east end employs an architectural precast concrete facade covered in recesses that are threaded with fiber-optic lights that twinkle day and night. The look was achieved using precast concrete panels, each featuring up to 2,350 recesses where the fiber-optics are displayed. "The plasticity of the concrete allowed us to achieve the dotted texture with the variable depths and diameters we wanted while keeping this as a simple white volume," Blais says. "It also helped with the integration of the fiber-optic lighting in the panels."



SIMONS SQUARE ONE IN MISSISSAUGA, ONTARIO

Owner: La Maison Simons

Architect: LEMAYMICHAUD

Engineer: Read Jones Christoffersen

Precast Supplier: RES Precast

This project involved renovating an existing anchor tenant at Square One in Mississauga, Ontario. The structure was completely reworked to accommodate the new tenant, Simons. The striking architectural precast panels are 'super-white' with a pattern of ribs and inverted pyramids. Special formliners were required by the precast supplier to transition from ribs to inverted pyramids, diagonally on each elevation. In addition, the panels also required mounting points for 2,200 fibre optic lights and 6,600 green triangular accents. The hand-cut green triangular accents were field applied, and are expressive of a flock of migrating birds.

SIMONS WEST VANCOUVER'S PARK ROYAL SHOPPING CENTRE

Owner: La Maison Simons

Architect: LEMAYMICHAUD

Engineer: John Bryson and Partners

General Contractor: Bird Construction

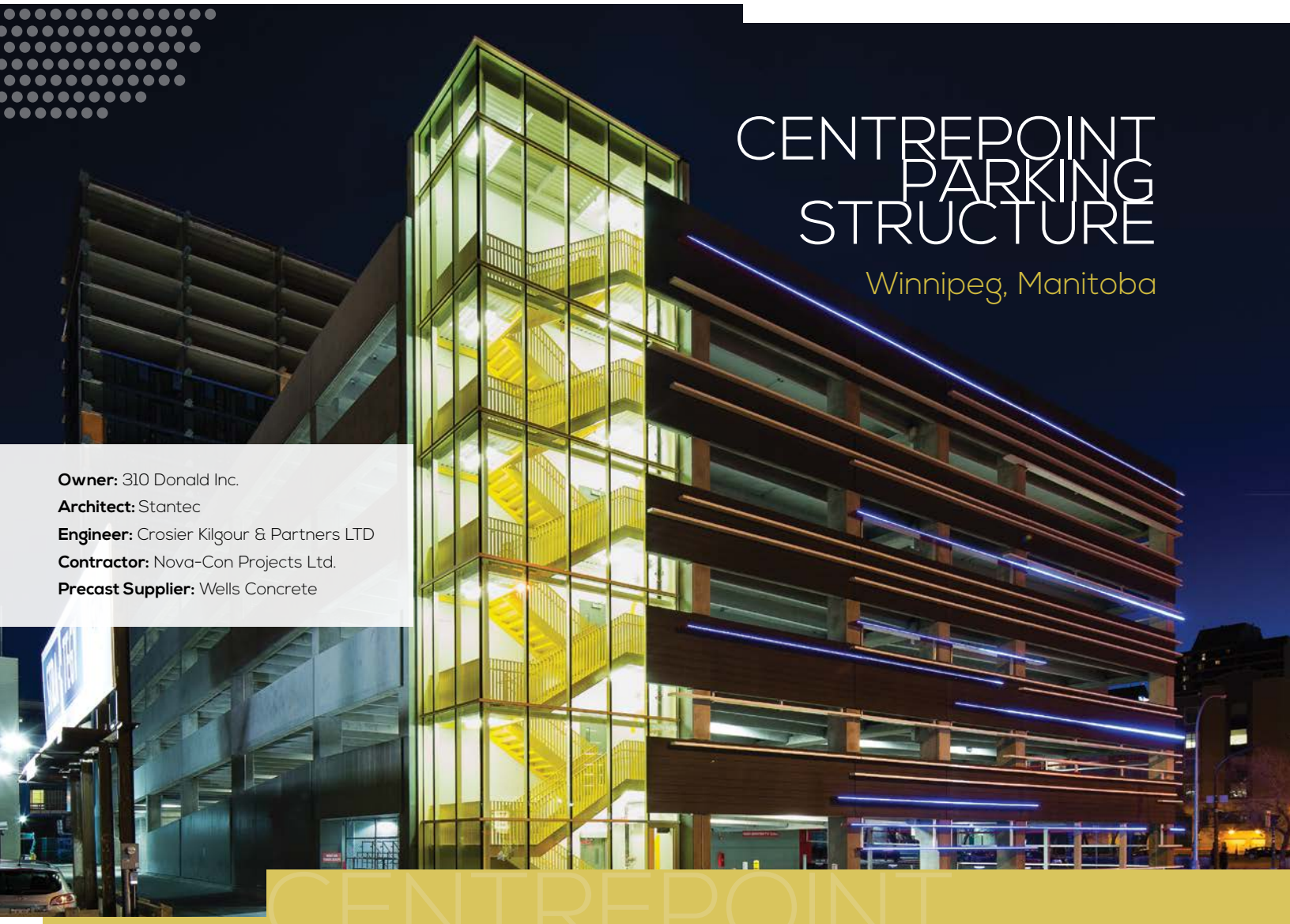
Precast Supplier: Armtec

The 9,300 m² (100,000 square-foot) Simons store at Park Royal Shopping Centre in West Vancouver, British Columbia

The 9,300 m² (100,000 square-foot) outlet in West Vancouver's Park Royal Shopping Centre has a 'Salish weaving-inspired' exterior facade design that pays homage to the store's presence on Squamish Nation territory. Architectural precast concrete panels are stacked like a repeating chevron pattern to provide an appearance of stacked blankets. Sharp rectangular projected facades give a modern look and aesthetic feel to the building. To achieve the required striking white color white cement, white aggregates and a custom made formliner were used to accomplish the chevron pattern and to achieve the architect's design vision.

CENTREPOINT PARKING STRUCTURE

Winnipeg, Manitoba



Owner: 310 Donald Inc.
Architect: Stantec
Engineer: Crosier Kilgour & Partners LTD
Contractor: Nova-Con Projects Ltd.
Precast Supplier: Wells Concrete

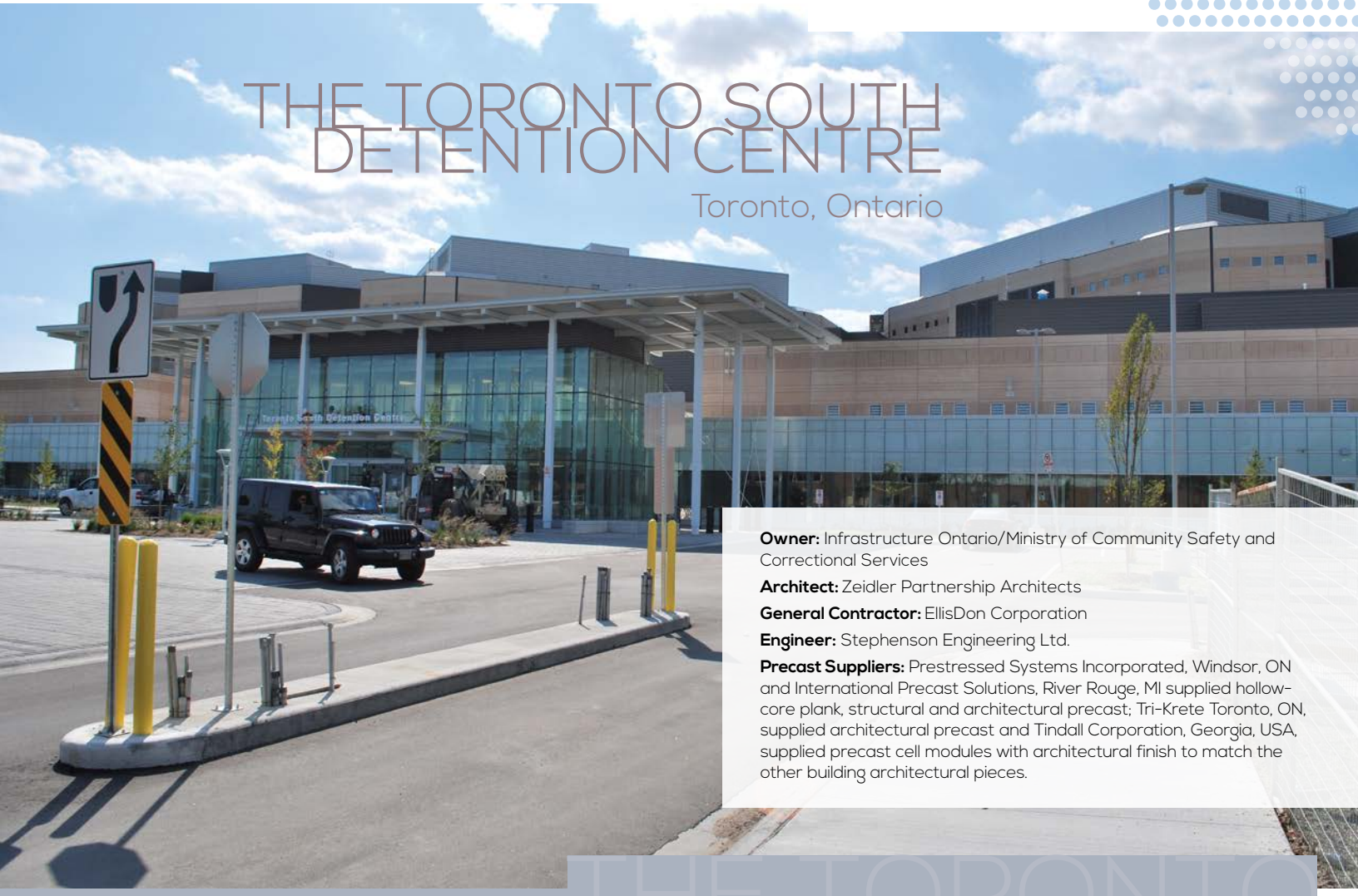
CENTREPOINT PARKING STRUCTURE

Centrepoint Parkade is located in the heart of downtown Winnipeg, Manitoba. With just over 400 parking stalls on five levels, it supplies parking for a new office/hotel tower, the Glass House apartments, and the home of Winnipeg Jets hockey. The total precast structure boasts over 500 pieces of precast prestressed concrete including 12,000 m^2 (130,000 square feet) of double tees, and a unique grey acid etch architectural precast concrete spandrel on two elevations.

The precaster collaborated early on with the design and construction team, prior to selection for insight on the architectural aspects of the precast. The primary architectural features are the load bearing spandrels on the North and West elevations. The architect desired a black finish with a reveal pattern. This was accomplished by the precaster using black sand and coarse aggregate, and grey cement with a charcoal tint. The spandrels were acid etched when cast and washed when in place.

THE TORONTO SOUTH DETENTION CENTRE

Toronto, Ontario



Owner: Infrastructure Ontario/Ministry of Community Safety and Correctional Services

Architect: Zeidler Partnership Architects

General Contractor: EllisDon Corporation

Engineer: Stephenson Engineering Ltd.

Precast Suppliers: Prestressed Systems Incorporated, Windsor, ON and International Precast Solutions, River Rouge, MI supplied hollow-core plank, structural and architectural precast; Tri-Krete Toronto, ON, supplied architectural precast and Tindall Corporation, Georgia, USA, supplied precast cell modules with architectural finish to match the other building architectural pieces.

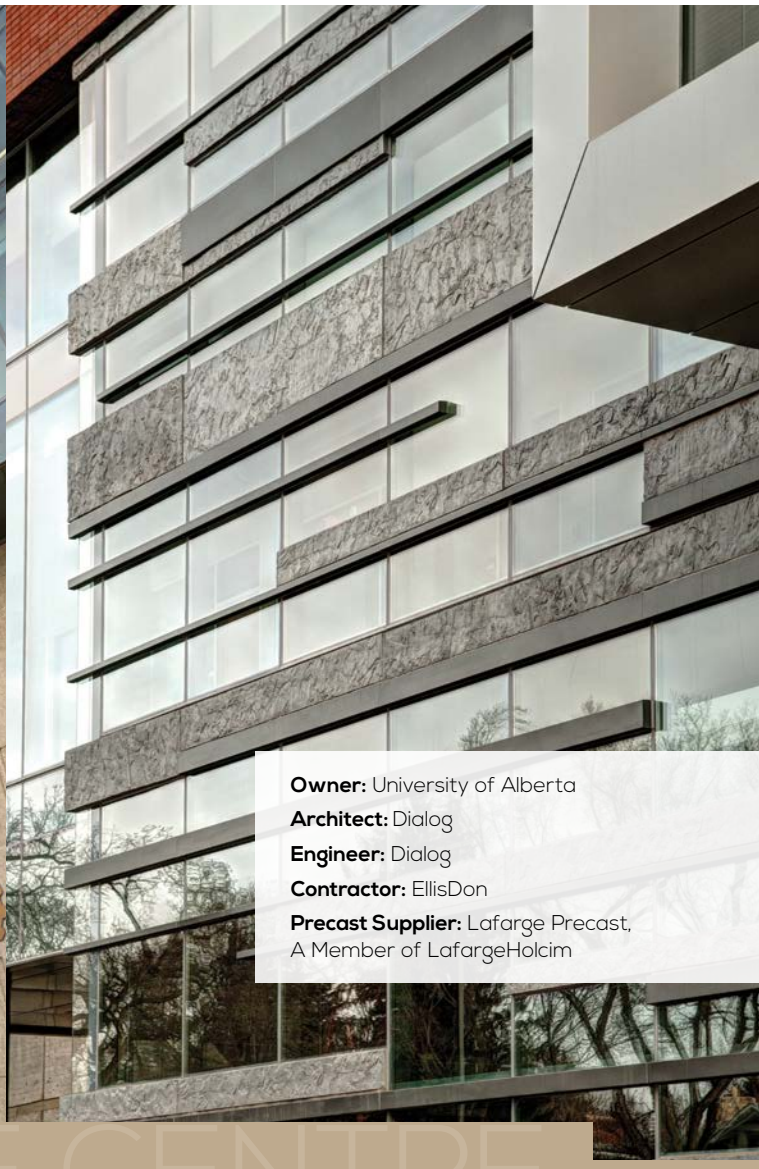
The Toronto South Detention Centre (TSDC), a replacement for the city's old Don Jail, is located on the south portion of the Mimico Correctional Centre property in the suburb of Etobicoke, ON. EllisDon awarded this approximate $12-million total precast concrete structure project in January 2010. The planning, design and detailing for the three precast towers of TSDC was an inclusive joint effort of Stephenson Engineering Ltd., Zeidler Partnership Architects and PSI.

It's not often that a prison gets recognized as a beautiful project but considering the mass of this huge structure, it is quite an iconic project with a striking pose. The structure was framed with architectural precast concrete walls, precast concrete beams and wall beams, precast concrete shear walls, precast concrete columns, architectural double wythe insulated precast concrete panels, and architectural precast concrete spandrels. It is very noteworthy to mention that three precasters all manufactured architectural pieces for this structure from different locations in North America using local aggregates, yet one would never be able to tell as these architectural pieces blend together beautifully on the finished structure.

INNOVATIVE CENTRE FOR ENGINEERING

UNIVERSITY OF ALBERTA

Edmonton, Alberta



Owner: University of Alberta
Architect: Dialog
Engineer: Dialog
Contractor: EllisDon
Precast Supplier: Lafarge Precast, A Member of LafargeHolcim

The University of Alberta Innovation Centre for Engineering is better known as the (U of A ICE building). The exterior finish of this building is a creative marriage of glass, metal and architectural precast concrete. The striking feature of this building is the "fly-by" building cladding system on the corners of the structure. The transparency of the glass and the minimal impact of the supporting structure make this feature unique.

Ductal™ Ultra-High Performance Precast Concrete was the key element that made the architectural features of this building possible. Ductal's high strength provided the capacity to carry the gravity, wind and seismic loads while maintaining an unobtrusive shallow wall thickness. The surface finish was a custom texture developed with the architect's input to generate the appropriate level of shadowing while maintaining a surface that would naturally shed dust and grime. The end result was a striking introduction of horizontal features, which reduce the verticality of the building, combined with unique corner features that have never been accomplished before.

THE CRAIGMORE APARTMENTS

Halifax, Nova Scotia

Owner: Banc Investments Ltd.
Architect: Paul Skerry Associates Ltd.
Engineer: Malcolm Pinto Engineering Limited
Contractor: Banc Investments Ltd.
Precast Supplier: Strescon Limited

THE CRAIGMORE APARTMENTS

After working with project owner Banc Investments Ltd. and architect Paul Skerry Associates Ltd. for approximately two and a half years, the precaster was awarded the supply and installation of the architectural precast concrete for the Craigmore Apartments. The design team reviewed many cladding options before deciding on architectural precast concrete. The speed of erection along with the quality and aesthetics of architectural precast cladding were just a few of the reasons why the developer decided on precast concrete. The precaster quickly installed the 120 architectural precast concrete wall panels in only eight days in late February 2014 during some of the coldest days that winter. No other material can clad a building that quickly during such inclement weather.

The architectural precast concrete wall panels cover approximately 2,700 m^2 (29,000 square feet) of the building's exterior. The warm buff tones of the lightly sandblasted panels, in combination with the exposed aggregate bands around the windows and at the base of each panel, add grace and elegance to the building.

PUBLIC SCHOOL 62

New York City, New York

'P.S. 62' (The Kathleen Grimm School for Leadership and Sustainability) is the first net-zero energy school in New York City and one of the first of its kind worldwide. The 6,300 m^2 (68,000-square-foot), two-story school serves 444 pre-kindergarten through fifth-grade students.

Designed to comply with the SCA Green Schools Guide in lieu of LEED® certification, the project is the NYC School Construction Authority's first "sustainability lab." One of these sustainable and low-energy features incorporated in the design by SOM include an ultra-tight high-performance building envelope. The architectural precast concrete building facade with drained joints acts as the rain screen system, and underground tanks are designed to collect rainwater.

Achieving net zero energy is about limiting energy loss. In order to provide the tightest seal possible, the 9 metre (30-feet) tall architectural precast concrete panels span from the foundation to the roof without any intermediate connection to the structure. This avoided potential penetrations through the building's insulation and vapor barrier, thus providing as airtight a building enclosure as possible.

The architects chose various shapes and volumes with the architectural precast concrete to create a unique "rib" aspect, enhanced by the triple-glazed windows with brightly colored window frames. The irregularly undulating pattern was meant to break up the building's mass. The architect mentions that although these panels are tall, the fact they are pleated gives them a scale and texture that appeals to both children and adults.

Owner: NYSCA (New York School Construction Authority)
Architect: SOM (Skidmore, Owings & Merrill LLP)
Engineer: DeSimone Consulting Engineering
Construction Manager: PCL Constructors Canada
Precast Supplier: Bétons Préfabriqués du Lac Inc. (BPDL)

THE BEAUTY OF ARCHITECTURAL PRECAST CONCRETE

Baha'i House of Worship Wilmette, Illinois
Architect: Louis Bourgeois

Jubilee Church (Dives in Misericordia); Rome, Italy
Architect: Richard Meier & Partners Architects LLP

Architectural precast concrete is a child of the 20th century and modern technology, but it can trace its lineage back to ancient history. As such, it is a building material almost without precedent.

Architectural precast concrete was developed to fulfill this need. The first documented modern use of precast concrete was in the cathedral Notre Dame du Raincy in Raincy, France, by Auguste Perret in 1922. It was used as screen walls and infill in an otherwise in-situ concrete solution. In 1932, work began on producing the white concrete exposed aggregate ornamental elements for the Baha'i House of Worship. By the mid-1960s, architectural precast concrete used as cladding and loadbearing elements had gained widespread acceptance by architects, engineers, developers and owners worldwide.

Improvements in fabricating processes allow architectural precast concrete to be produced in almost any color, form, or texture, making it an eminently practical and aesthetically pleasing building material. Concrete's moldability and versatility offers the freedom to sculpt the structure's facade in imaginative ways. It is difficult to imagine an architectural style that cannot be expressed with this material. The "sky's the limit" when it comes to architectural precast concrete and its applications

CPCI certified architectural precast concrete producers (precastcertification.ca) can essentially create any look or vision that an architect or designer might have in mind, all while delivering a product that is durable, cost-effective and resilient. Architectural precast concrete is not only compatible with all structural systems, it can be designed to harmonize with, and complement, all other materials.

CPCI Technical Support Help Desk
CPCI technical help desk services provide technical information about the use of precast and prestressed concrete products, through investigations and research relative to applications of precast and prestressed concrete and engineering processes for improvement in the design, manufacture and installation of precast products.

CPCI help desk support and customer support are part of a comprehensive CPCI customer support program. Please email us at helpdesk@cpci.ca or call us at 1.877.YES.CPCI (1.877.937.2724).

CPCI.ca
CANADIAN PRECAST/PRESTRESSED CONCRETE INSTITUTE

THE BEAUTY OF

ARCHITECTURAL PRECAST CONCRETE

Project: René Lépine, Montreal, QC
Owner: El-Ad Canada
Architect: DCYSM Architecture & Design
Precast Supplier: Saramac