



# case study

VOLUME 1, ISSUE 1

Ontario Cast-In-Place Concrete Development Council

**T**he new GTAA Parking Garage structure at Lester B. Pearson International Airport consists of eight levels of post-tensioned concrete with approximately 95,000 cubic metres of concrete placed in Stage 1. With the completion of Stage 1 the parking garage will have a capacity for 8,950 vehicles. A stage II provision for future construction will add approximately 1,060 vehicles and ultimate build-out of Stage III will add an additional 3,490 parking spaces creating a total capacity of approximately 13,500 parking stalls.

While numerous construction materials were considered during the design phase, the durability of reinforced cast-in-place concrete and the increased span length of post-tensioning steel was the logical choice for the construction system. This parking structure has been designed in accordance with CAN/CSA-S413 garage standards and is anticipated to have a greater life span than the average life span of similar projects. A traffic topping on all levels will help prevent road salts or contaminants migrating into the concrete slab across section, practically eliminating the potential of reinforcement corrosion. In addition, all of the concrete used in the parking decks meets or exceeds C-1 exposure class requirements (35 & 40 MPa concrete) and in the high chloride exposure areas it also includes a chemical corrosion inhibitor. The concrete columns of the parking structure were required to meet a 55 MPa compressive strength requirement and included the use of silica fume in the concrete mix design.

Each level contains approximately 39,000 square metres and is subdivided into 13 independent building-like structures bound by expansion joints.



**Owner:** Greater Toronto Airports Authority (GTAA)

**Architects:** Greater Toronto Airport Groundside Association (GTAGA), a joint venture of:  
• Homes & Narver Canada Inc, and  
• Engineering Ltd.

**Engineers:** Carruthers & Wallace Limited

**Construction Team Members:**

*Project Manager:* Ellis Don  
*Forming Contractor:* Strucform/Hardrock (Joint Venture)  
*Rebar Installer:* Harris Rebar/Gilbert Steel (Joint Venture)  
*Prestressed Cables:* Harris Rebar/Canadian BBR (Joint Venture)  
*Concrete Supplier:* Dufferin-Custom Concrete Group  
*Sharing Supplier:* Aluma Systems  
PERI Formwork Systems Inc.

**Crews:** Carpenters Local 27  
Ironworkers Local 721  
Labourers Local 506

**Project Statistics:** 95,000 m<sup>3</sup> Ready Mixed Concrete  
8,000 tonnes Rebar  
12,000 tonnes Prestressed Cable  
475,000 m<sup>3</sup> Formwork



*(Continued from Page 1)*

Due to the unique sequencing requirements of post-tensioning stressing, no adjoining slabs may be formed and poured unless the preceding slab is stressed. The expansion joints total 7,700 linear meters with 5,850 linear metres of perimeter steel vehicle bumper guard protection. Four tower cranes assist in materials management along with two labour and material hoists for construction operations.

The completed garage will contain 12 elevators, four moving walkway, six escalators, state-of-the-art PARCS equipment and associated pay-on-foot features, as well as other automatic vehicle identification (AVI) and license plate recognition (LPR) technologies.



*Niagara Fallsview Casino Resort Hotel*

*In 2000, the Ontario Cast-In-Place Concrete Development Council (OCCDC) was formed to aid the owner/developer, architect/engineer and design-build contractor in the decision-making process of choosing the best construction material for the framing system of new cast-in-place structures.*

*OCCDC promotes the benefits of reinforced concrete as the construction material of choice based upon the following advantages:*

- fast-track construction*
- costs savings*
- structural advantages*
- environmental considerations*
- local economy benefits*

*The Members of the OCCDC include (alphabetical order):*

- Aluma Systems Inc.*
- Carpenters District Council of Ontario*
- Concrete Forming Association of Ontario*
- Ironworkers District Council of Ontario*
- LIUNA—Ontario Provincial District Council*
- Ontario Formwork Association*
- PERI Formwork Systems Inc.*
- Ready Mixed Concrete Association of Ontario*
- Reinforcing Steel Institute of Ontario*

365 Brunel Road, Unit #3  
Mississauga, Ontario L4Z 1Z5  
Tel: 905-507-1122  
Fax: 905-890-8122  
Email: [buildings@occdc.org](mailto:buildings@occdc.org)