



## PIER 27 - THE TOWER ON THE LAKE

2019 ONTARIO CONCRETE AWARD WINNING PROJECT FOR MATERIAL DEVELOPMENT & INNOVATION

### PROJECT SUMMARY

Master X-Seed® 55 – Strength-Enhancing Admixture, providing solutions for stringent construction schedules, while helping to reduce the carbon footprint of concrete.



Master X-Seed® 55 admixture is based on a BASF proprietary technology that ensures a stable suspension of synthetically-produced crystalline CSH nanoparticles. These particles act as active seeds in a concrete mixture to facilitate the growth of active crystals between cement particles. The unique technology of Master X-Seed® 55 admixture provides an unmatched improvement of the hydration process in a concrete matrix which

increases early and late age strength development compared to a reference untreated concrete mixture.



Pier 27 – “The Tower on the Lake”, constructed by Citizen Development Group and Fernbrook Homes under the construction management of TMG Builders, is a new 35 storey condo on Toronto’s Harbourfront, at the foot of Yonge Street. The condo development offers an impressive architectural structure with a one-of-a-kind design from the acclaimed architect Peter Clewes of

architectsAlliance. The tower provides spectacular views of the city and waterfront.

The construction for Pier 27 presented some challenges with its construction schedule and required early compressive concrete strength to be able to post tension their cantilevered slabs. The construction team’s challenge specifically was attaining high early compressive concrete strength in approximately 16 – 18 hours and high ultimate concrete strengths, while maintaining a concrete mixture that would stay workable and pumpable for the duration of the pour.

#### OWNER

Cityzen Development Group and Fernbrook Homes

#### ARCHITECT OF RECORD

architectsAlliance

#### ENGINEER OF RECORD

Entuitive

#### GENERAL CONTRACTOR

TMG Builders

#### FORMING CONTRACTOR

Verdi Inc.

#### MATERIAL SUPPLIERS

Toronto Redi-Mix Limited

#### ADDITIONAL PARTICIPANTS

- Aluma Systems Inc.
- IUOE Local 793
- LiUNA Local 183

#### PROJECT FACTS

##### LOCATION

Toronto, Ontario

##### DATE OF CONCRETE STRUCTURE COMPLETION

June 18, 2019

##### APPROXIMATE CONCRETE VOLUME

25,000 m<sup>3</sup>

##### HEIGHT

36 Total Floors (34 Residential Floors, approx. 112.5 m)



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Toronto Redi-Mix was presented with these challenges early during the pre-construction meetings and collaborated with their concrete admixture supplier, BASF Canada Inc. (BASF), to find an optimized solution that would satisfy both concrete performance and construction criteria for the project.

Several trials were performed to refine the concrete mixture and a solution was found that met all stakeholders' expectations using the Master X-Seed® 55. The concrete mixes improved the early and late strength development, while supporting sustainable concrete construction. Traditionally, this mix would require significantly higher cementitious contents to achieve the higher compressive strengths. The Master X-Seed® 55 concrete mixture allowed for reduction in CO<sup>2</sup> emissions in comparison to a traditional mix in this application.

Further to the compressive strength and sustainability benefits of the concrete mixture, the concrete finishers were very pleased with workability of the concrete mix. Early on during the process, Toronto Redi-Mix found that with the use of Master X-Seed® 55, the concrete maintained its workability longer than traditional high early mixtures, significantly reducing slump loss and a need for re-tempering the concrete on site. This was a key part of the solution to ensure that the concrete quality was not jeopardized throughout the duration of the project, especially during the hot-weather months.

The project was successfully completed with the use of Toronto Redi-Mix and BASF's solution using the Master X-Seed® 55. Over 3,000 m<sup>3</sup> of high early strength and high strength concrete was successfully placed at this project.

Toronto Redi-Mix has provided solutions to their customers in the Greater Toronto Area for over 35 years. Over these last 3 decades the company has established a reputation for providing exceptional ready-mix concrete products and superior customer service. Toronto Redi-Mix is part of the G & L Group of Companies.

BASF Canada Inc. Admixture Division is part of BASF's Construction Chemicals division which offers advanced chemical solutions for new construction, maintenance, repair or renovation of structures under the Master Builders Solutions brand.



Master Builders Solutions is BASF's global brand of advanced chemical solutions for construction. The brand builds on the strengths of many legacy BASF brands and products and represents the experience of more than 100 years in the construction industry.

Click on links below for Master X-Seed® 55 videos:

<https://www.youtube.com/watch?v=6qLXzs9M-il>

<https://www.youtube.com/watch?v=gvp2xlhaV20>

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):

- 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



1 Prologis Blvd, Suite 102B  
Mississauga, ON L5W 0G2  
Tel: 905-564-2726  
Fax: 905-564-5680  
Email: buildings@occdc.org

[www.occdc.org](http://www.occdc.org)