

# PIER 27 / Toronto, Ontario

## Master X-Seed® 55 - Strength-Enhancing Admixture



Toronto, Canada: Pier 27

### The background:

Pier 27 Phase III, the tallest tower in a multi-building residential complex upon its construction, is located on the waterfront in downtown Toronto. This 35-storey tower features 5-meter (16-ft) cantilevered balconies on each floor, arranged in an alternating sequence up the building.

### The challenge:

The construction of Pier 27 faced several challenges, particularly with the schedule and the need for early concrete strength to post-tension the cantilevered slabs. Specifically, the team was tasked with developing a concrete mixture that could reach a high early strength within 16 to 18 hours, while also remaining workable and pumpable throughout its placement.

Toronto Redi-Mix was introduced to these challenges early in the pre-construction meetings and collaborated with Master Builders Solutions Canada Inc. to develop an optimized solution that met all the concrete performance and construction requirements for the project.

### Project:

Pier 27 Phase III

### Location:

Toronto, Ontario Canada

### Owner/s:

Cityzen Development Group and Fernbrook Homes

### Applicator / Contractor:

TMG Builders / Verdi Inc.

### Architect / Engineer:

Architects Alliance / Entuitive

### Market sector:

Ready mix, high rise

### Products used & amounts:

Master XSeed 55 – 10,000 Liters (2,642 gal)

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### Our solution:

Several trials were conducted to refine the concrete mixture, resulting in a solution using the Master X-Seed® 55 admixture that met all stakeholders' expectations. This solution not only enhanced both early and late strength development but also promoted sustainable concrete construction practices. Traditionally, high strengths concrete required mixtures with significantly higher cement content, increasing the carbon footprint. However, the inclusion of the Master X-Seed® 55 product allowed for optimal performance with a reduced carbon footprint compared to conventional mixtures.

Early in the project, Toronto Redi-Mix noted that using Master X-Seed® 55 maintained the concrete's workability for longer periods compared to traditional high-early-strength mixtures. This significantly minimized slump loss and the need for re-tempering on-site. Maintaining concrete quality throughout the project, especially during the challenging hot-weather months, was a crucial strategy component. The concrete's workability and finishability also earned high praise from the finishers involved in the project.

### Achievements:

- Toronto Redi-Mix successfully completed the project within the required schedule using the Master X-Seed® 55 product for this application.
- The project won the 2019 Ontario Concrete Award for Material Development and Innovation.
- The cement content in the concrete was reduced, resulting in lower costs and reduced embodied carbon.

### Key Project Insights at a Glance:

- 35 residential floors, standing approximately 112.5 meters (369 ft.) tall.
- Used 25,000 m<sup>3</sup> (32,700 yd<sup>3</sup>) of concrete, including over 3,000 m<sup>3</sup> (3,900 yd<sup>3</sup>) of high early strength and high strength concrete.
- The tallest tower in a downtown Toronto waterfront residential complex upon construction.
- Concrete mixture optimized for enhanced strength development and reduced carbon footprint.
- Concrete structure completion date: June 18, 2019.

### About Master Builders Solutions

Master Builders Solutions is a leading global manufacturer of concrete admixtures, as well as other sustainable solutions for the construction industry, focussed on delivering its vision: Inspiring people to build better. Master Builders Solutions provides value-added technology and market-leading R&D capabilities to improve the performance of construction materials and to enable the reduction of CO<sub>2</sub> emissions in the production of concrete. Founded in 1909, Master Builders Solutions has ca. 1600 employees operating 35 production sites globally, supporting their customers in mastering their building challenges of today – for a decarbonised future.

