

SCCS

Self-Consolidating Concrete System

How an innovative self-consolidating concrete mix fit right into this parking garage plan



The Chapman Parkade Parking Garage

Kelowna, B.C., Canada

Twenty years. That's how long concrete supplier Con-Force Structures has been working with Grace Construction Products. So when Brian Ball, Concrete Resources Manager, at Con-Force was looking for a solution utilizing Self-Consolidating Concrete (SCC) for the city of Kelowna's Chapman Parkade parking garage, he turned to Grace. Because concrete for the

garage would be cast in double-T forms, he wanted to use SCC to speed casting production, while producing a low permeable concrete with the highest quality surface finish.

After early trials to determine the optimal mix for the job, Con-Force found a Self-Consolidating Concrete solution that represented a huge breakthrough in efficiency. The SCC mix shortened production times by eliminating the need for labor-intensive vibration and manual compaction to distribute the concrete inside the formwork. Unlike conventional flowable concrete, SCC changes shape under its own weight to self-level and self-consolidate. It completely fills formwork without segregation or blocking. So the time, cost, and noise of vibration equipment and extra manual labor

"In our first double-T project using SCC, we reduced the casting manpower down to three men, dramatically increasing our efficiency, while increasing quality."

Brian Ball
Concrete Resources Manager
Con-Force Structures Ltd.

are eliminated. In addition, high early compressive strengths achieved with SCC enabled the form to be cycled daily, maintaining the production schedule.

“By using SCC, we reduced the casting manpower down to three men,” said Brian Ball. “In just over an hour, they were able to place 20 cubic meters of concrete, and in just half an hour, they can apply the rake finish we need to 230 feet of double-T’s. That’s a 90 minute improvement using three less men—all because of SCC.”

The finish and consistency of the double-T’s was also enhanced by the SCC mix. Because there were no bugholes or surface defects, there was no need for time-consuming repair operations and touch ups. The higher quality finish also meant a more durable surface with reduced maintenance costs over the life of the new garage.

The SCC mix included ADVA® Cast 530, a superplasticizer optimized for precast and prestressed applications. Because it’s a single component system, ADVA Cast eliminated the need for a viscosity enhancing agent, which reduced steps and cost. Also included was



The use of Self-Consolidating Concrete from Grace shortened construction time and reduced the manpower required for the job.



Self-Consolidating Concrete provided a consistent, durable and high-quality finish.

“Now that we’ve experienced the benefits of Self-Consolidating Concrete, we’re including it in many of our bids for new projects.”

Tony Walton
VP & Operations Manager
Con-Force Structures Ltd.

“Using SCC was a win-win situation for everyone,” said James Sharko, Leducor Construction, Ltd. “Because the finish of the underside of the double-T’s was so smooth and consistent, we were able to eliminate the need for painting. That’s an environmental and cost benefit.”

Daravair® 1400 to provide an air void system in the hardened concrete for freeze-thaw durability. Together, they produced an SCC mix that significantly decreased the manpower required for the job while producing higher quality concrete.

PROJECT CREDITS:

- Owner:** City of Kelowna, B.C., Canada
- Concrete Supplier:** Con-Force Structures Ltd., Richmond, B.C.
- General Contractor:** Leducor Construction, Kelowna, B.C.
- Architect:** PBK Architects, Vancouver, B.C., Canada

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