

# PCL Achieves New Operational Efficiencies with SmartRock2™

Wireless Sensors Reduce Time and Costs on a Major Building Project – Leading to a New Corporate-Wide Best Practice

## Focused on Innovation

Established in 1906, PCL carries out work across Canada, the United States, the Caribbean, and in Australia. Today, with over 4,400 employees and an annual construction volume over \$8 billion, PCL is the largest contracting organization in Canada and one of the largest in North America.

Embracing innovation is at the heart of the company's strategy for business success. "We're always looking at new methods that will save us time, and our clients' money, on projects while differentiating us from other contractors," says April Smith, PCL field coordinator.

## A Time-Crunched Project Schedule

A 55-storey building project in Edmonton motivated the operations group to look for an alternative to traditional in-situ testing of concrete strength that uses field cured samples. "We were faced with an aggressive schedule that required our operations team to be working on weekends," says Smith.

Shawn Kitt, superintendent, acknowledges that concrete testing is a "very time-consuming process that adds up exponentially when working on large, multi-floor buildings." The process involves a lab tester going to the area where concrete is being poured, casting cylinders, and storing them near where the concrete has been poured. Once hardened, cylinders are collected by the tester and taken to a lab where they're tested for specified strength or to verify mixture proportions for strength. If cylinders are inadvertently damaged on-route to the lab or strength results are low, the entire procedure must be repeated.

Smith also notes that by the time you get lab results from the first cylinder break, you could already have met strength without knowing it. "You still need to wait another 3-hours or more before getting lab confirmation," she says. "Although that might not sound like much, saving 3-hours on every cycle of a 55-storey building adds up quickly."

## About

PCL is a group of independent construction companies with diverse operations in the civil infrastructure, heavy industrial, and buildings market. Visit [PCL.com](http://PCL.com)

## Challenge

- Aggressive project schedule on a 55-storey building
- Testing in-situ field cured specimens is time consuming

## Solution

- SmartRock2 with real-time information on concrete strength using wireless sensors and mobile technology

## Results

- Eliminates need for a third-party lab testing
- Gives control of information to field crew on job site
- Substantial time savings and project efficiencies
- Ability to check results anytime without incurring additional costs or destruction
- No need to do repair work on destructive testing

## In Search of Alternative Methods

In a quest to introduce time and money saving efficiencies, the Edmonton team looked at several technologies before deciding to test SmartRock from Giatec. "SmartRock was the only solution that met our evaluation criteria," says Smith.

Specifically, the PCL team was looking for a non-destructive solution that gave multiple people access to a continuous flow of information. "It [Smart Rock] seemed like the only option at a price point that would work effectively for our scale of operation," she says.

The Edmonton team started with the first release of SmartRock before transitioning to SmartRock2, a cloud-based system that was available early in the project. "I'm definitely sold on the cloud-based release," confirms Smith. She adds: "it's a much better system and easier to share information throughout the project like we need to do."

SmartRock2™ uses wireless technology to provide real-time temperature and maturity information on poured concrete. The solution uses rugged waterproof sensors which are placed in the concrete formwork prior to pouring. A SmartRock2 app delivers temperature and the resulting concrete strength in real time to users' mobile devices.

Implementing SmartRock2 is easy:

- A sensor is labeled - indicating its location on the sensor and app
- Sensor is installed by attaching it to the rebar
- Concrete is poured as usual
- Temperature and strength results are viewed anytime on the mobile app

## Putting Information in the Hands of the Contractor

In addition to reducing or eliminating the need for a third-party testing agency, the technology empowers job site personnel. "With SmartRock, the people on the job site get the information directly," says Kitt. "It really gives you control without requiring someone [a lab tester] to give you a strength estimation."

Kitt illustrates how SmartRock2 introduces important efficiencies and savings. If a slab is poured on a Friday, with the intention of stripping it on Saturday, he says the traditional process [using in-situ testing and field cures] incurs a significant human cost with a minimum of three people being involved: a PCL Foreman to let someone from the testing lab onto the job site, and someone at the lab to break the cylinder and perform the test on the collected samples. "With that approach, you're completely dependent on the lab for the information you need, and their availability," says Kitt.

## Dramatic Time Savings

Fast forward to the introduction of SmartRock2 and the approach is dramatically streamlined. "If a job is poured on Friday, my foreman looks at the screen on Saturday morning, and sends me a text message to say the strength is good and we can strip the formwork," says Kitt. "We've eliminated the need to coordinate with three people to get the information needed; you get results instantly, and it saves so much time." Kitt also points out that results can be checked anytime at no cost and there is no destruction involved.

SmartRock2 also obviates other site issues that can affect the field cure method. In some instances, when a job has piles or drilled shafts for foundation work, it can be challenging to get the test cylinder located in the exact same conditions as the pile. "When you cap a small cylinder of concrete and put it under a tarp, it's not getting the same heat generated as the pile," says Kitt. This can lead to low strength results from field cures and delays. "This would be another good application for SmartRock2," he says.



SmartRock2 sensors are fully embedded in concrete during construction

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- Shawn Kitt, Superintendent

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- April Smith, Field Coordinator

On the heels of this successful test project PCL has shared the benefits of using SmartRock2 across the company's operational units. Kitt shares the opinion that there are advantages to using SmartRock2 anywhere the company is pouring concrete and the field crew need to know early concrete strength. "For me personally, the next project I go to, whether it's a bridge, a low-rise construction, or a high-rise building, if I'm pouring concrete, I'm going to seriously think about using this technology rather than field cures – just because I have seen the advantages first hand," he says.

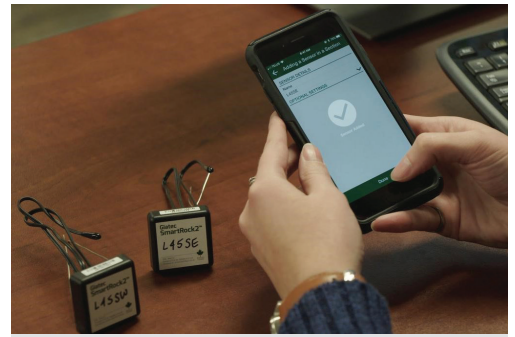
## About Giatec

Giatec Scientific Inc. is a leading provider of advanced concrete testing solutions to the global construction industry. By combining wireless concrete sensors and mobile apps, Giatec's unique smart monitoring solutions provide invaluable real-time information on concrete properties.

Giatec's knowledge-based solutions include laboratory devices, Non-Destructive Testing equipment, and wireless sensors for the accurate assessment of various parameters including concrete electrical resistivity, permeability, rebar corrosion potential and corrosion rate, as well as wireless monitoring of concrete temperature, maturity and humidity.

Contractors, builders, and ready-mix producers in over 70 countries use Giatec's smart monitoring solutions to save time, reduce their labour investment, energy and material costs while measurably increasing the profitability of their building projects.

For more information on SmartRock2™, please visit:  
[www.giatecscientific.com/concrete-sensors/smartrock2/](http://www.giatecscientific.com/concrete-sensors/smartrock2/)



SmartRock mobile app is used to manage projects and concrete mix calibrations



PCL monitors concrete strength wirelessly on the smartphone

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*-Shawn Kitt, Superintendent*