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Performance Evaluation of Hydrophobic Concrete Slabs of the Laurier-Taché Parking Structure in Gatineau, QC

Objectives

To evaluate the field performance of reinforced concrete structures made with hydrophobic concrete under the combined effects of mechanical loads and reinforcement corrosion.

Background

A number of elevated concrete slabs of the Laurier-Taché parking structure in Gatineau Quebec, which were badly deteriorated, were rebuilt in the fall of 2004 using hydrophobic concrete as a means to reduce and delay corrosion of the reinforcement. The NRC was invited by the owner to evaluate the field performance of these slabs using remote monitoring with embedded sensors.

Statement of Work

- In the laboratory, test the hydrophobic concrete mix to collect physical and mechanical performance data required for later structural analysis.
- At the Laurier-Taché parking structure, instrument 4 sections of structural concrete slabs made with hydrophobic concrete, and 2 control sections made of normal concrete, to monitor strain, temperature, relative humidity, carbon dioxide and corrosion potential under indoor environmental conditions, restrained shrinkage and live loads.
- Periodically assess each of these slabs for cracking and corrosion.

Expected Outcomes

- Recommendations for the potential use of hydrophobic admixtures for concrete slabs, based on results of this work.

Partners

Public Works and Government Services Canada (PWGSC)

Start/Expected Completion Dates

This project began in 2004 and will be completed in March 2007.

Project Manager

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For more information see, http://irc.nrc-cnrc.gc.ca/ui/cs/concreteslabs_e.html

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Typical Deterioration Found in Parking Garages



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