

RESEARCH AND DEVELOPMENT PROGRAM

DECONSTRUCTION OF THE CHAMPLAIN BRIDGE



Learning from the past to build a better future

The deconstruction of the Champlain Bridge gives JCCBI a unique opportunity to implement an applied research program. The lessons learned from this research will let us develop innovative techniques and improve the longevity of the infrastructure under our responsibility.

The applied research program on the Champlain Bridge, a large-scale structure subject to particular challenges, will significantly advance knowledge about infrastructure performance and longevity. These different research projects will be conducted on bridge components heavily exposed to northern climate conditions. This will help us evaluate premature degradation and longevity issues that affect transportation infrastructure that is exposed to Quebec's winter weather conditions.

The reinforcement and rehabilitation techniques applied to the Champlain Bridge over the years will also be studied to improve this type of intervention program.

The proposed research program offers high potential to advance research and development in the field of construction. The developed program will mainly address the following areas:

- + Testing on full-scale components at the end of their life cycle.
- + An analysis of degradation mechanisms and phenomena related to Quebec's climate conditions.
- + An evaluation of the actual contribution and effectiveness of repair techniques used on the bridge.

Using a sustainable development approach that focuses on optimizing resources and costs and improving services to users, JCCBI's research program will help us acquire knowledge that will benefit all of its structures.



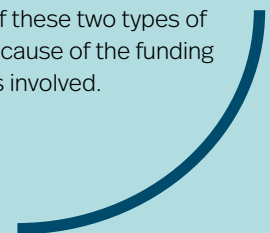
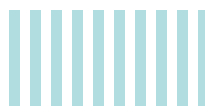
Improving structural longevity

This research and development program will provide benefits not only to JCCBI but also to all managers of similar infrastructure as well as the scientific community.

Carried out jointly with different university and scientific research bodies, the submitted projects will undergo a selection process to assess their potential to have a positive impact on JCCBI's structures and on all Canadian infrastructure. The research program will consist of two types of projects:

- + Those with one or more direct beneficial impacts on JCCBI's structures.
- + Those with beneficial impacts for the entire Canadian infrastructure community but that are not applicable to JCCBI's current structures.

The collaboration and execution of these two types of projects are unique particularly because of the funding method and profile of the partners involved.



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Experimental testing

Experimental testing for the research and development program specific to the deconstruction of the Champlain Bridge will be divided into three groups according to the size of the tested components:



***In situ* testing:**

In situ testing will be done on the bridge itself before the start of the deconstruction work, that is during the period between the decommissioning of the bridge and the start of the deconstruction in 2020. Some components may be preserved as constructed for a period to be determined.



***Ex situ* testing (at the holding area):**

A holding area is planned on land near the bridge to test components that cannot be moved to the laboratory.



Laboratory testing:

When possible, components will be moved to a laboratory after being dismantled from the bridge. Research performed in a controlled environment will allow us to better ascertain the response of the tested components.

Together, we can
advance innovation



WOULD YOU LIKE TO SUBMIT A RESEARCH PROJECT?

Information you need to know:

In May 2019, JCCBI will launch a public competition for research bodies to select the projects for the program. After an evaluation period, the selected projects will be gradually launched starting in September 2019 according to the deconstruction phases and timetable.

+ RESEARCH PROJECT GOALS

- + Study the scale effect
- + Assess performance
- + Determine the actual contribution of the reinforcement measures
- + Validate condition assessment techniques

+ RESEARCH PROJECT TOPICS

Concrete components

- + Edge girders
- + Piers in the water
- + Pier caps

Steel structure

- + Trunnions
- + Orthotropic deck
- + Truss chords
- + Shear keys

Reinforcement techniques

- + Carbon fibre-reinforced polymers
- + Queen-posts
- + Modular trusses
- + Monostrand stay cables

For more information, visit:

champlaindeconstruction.ca