

# Impact of flooding-induced water infiltration on conditions of the building envelope

Record number : OPR-1268

## Overview

### RESEARCH DIRECTION

Dominique Derome, Professeure -  
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Engineering

### INFORMATION

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### ADMINISTRATIVE UNIT(S)

Faculté de génie  
Département de génie civil et de génie du  
bâtiment

### LEVEL(S)

2e cycle  
3e cycle

### LOCATION(S)

Campus principal

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## Project Description

### Description of projet

The improvement of the resilience of buildings, and specifically residential buildings, to river and storm flooding, or even water leakage from plumbing, requires a better assessment of the actual wetting load imposed on the different building envelope and structural components. NRCC Ocean, Coastal and River Engineering has performed in 2024 major experimental work and has measured gross water leakage. This information could be the boundary condition required for a more detailed assessment of water distribution. The Chair of Multiscale Building Physics has a long expertise in experimental and modeling investigation of the building envelope and in water transport in porous materials

### Objectives

In the scope of obtaining levels or class of water leakage rate in different flooding scenarios, this objectives of this project are:

1. To assess how much water gets where, for a series of flooding and construction scenarios, specifically assessment water uptake in wood, and other porous components of the building envelope and structure, in the basement and in the ground floor assembly.
2. To parametrize water leakage through different sub-assemblies in order to develop a first estimate to water leakage depending on flowing water height.

### Expected results

A parametrization of level of water presence in small residential buildings depending of different flooding scenarios.

Such information could be used in further work to assess the best means of intervention for the retrofit of the buildings, the development of resilient construction solutions and intervention methods.

### Context

The project will be done in close collaboration with Dr. Louis Poirier and Sean Ferguson, Ocean, Coastal and River Engineering NRCC and with the research team of Prof. Dominique Derome, Canada Research Chair tier 1 and full professor at the department of Civil and Building Engineering, Université de Sherbrooke, Qc.

### Candidates

Interested applicants must have a background in building engineering, civil engineering, or mechanical engineering. They must be curious,

creative, rigorous, and highly motivated. The successful candidate will have the opportunity to acquire knowledge of the physics of hwater infiltration, building envelope hygrothermal performance and development of novel experimental techniques.

**Discipline(s) by sector**

**Funding offered**

Yes

Sciences naturelles et génie

Génie civil

The last update was on 24 October 2025. The University reserves the right to modify its projects without notice.