
Building Envelopes in Historic Buildings

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ABSTRACT

Background

The building envelope is that part of a building that separates the controlled indoor environment from the uncontrolled outdoor environment. A historic building is an existing building that, by nature of its location, design, performance, and function, continues to provide serviceable space. It could be a century or more old, but it could also be as young as five years.

Since the late 1980s, at least half of all newly occupied space in Canada is provided by renovating existing buildings. A building may be renovated because of a need to refurbish the heritage character, or perhaps to restore the envelope performance, or maybe to upgrade the functional program. Is it possible to simultaneously conserve the heritage integrity while providing a durable building envelope and while serving the use and occupancy? The answer can best be achieved with a design team that understands the strengths and constraints of all perspectives.

This workshop is based on material that was developed by Morrison Hershfield Limited and the Heritage Conservation Program of Public Works and Government Service Canada (PWGSC). It has been presented at sessions organized by Building Envelope Councils in Ottawa, Edmonton, and Calgary. It will also be presented at the Royal Architectural Institute of Canada Festival 2001 in Halifax (June 2001) and at the international conference on the Performance of Exterior Envelopes of Whole Buildings VIII in Florida (December 2001).

Objective

The objective of this workshop is to provide the participants with the knowledge to reconcile the seemingly conflicting demands of heritage character, performance requirements, and functional program with regard to building envelopes in historic buildings.

Program

This workshop is intended for architects, designers, engineers, specifiers, project managers, and facility managers. It revolves around the separate, but complementary, viewpoints of heritage character, performance requirements, and functional program. The presentations start with a review of the fundamental principles, proceed through a discussion of the practical implications, and finish with case studies that illustrate the application of principles and practices.

Heritage Character:

Heritage character is inherent in all buildings regardless of age, and the heritage character of a building should be appreciated in any renovation project. The workshop has three modules on heritage character:

Building Envelopes and Heritage Character reviews the understanding and misconceptions surrounding heritage renewal and presents a framework from which to make decisions.

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How Traditional Building Envelopes Work *discusses how historic wall and roof designs and building services met the performance and functional programming needs.*

Intervention Strategies and Options III—Heritage Character *looks at a historic restoration project in which the heritage character was conserved while meeting the performance requirements and incorporating a “modern” functional program.*

Performance Requirements:

Building science is the discipline that deals with heat, air, and moisture flows through the building envelope, and it applies to a greater or lesser extent to all buildings. To ignore building science is to leave any building, but particularly older buildings, open to rapid deterioration! The workshop has three modules on performance requirements:

Principles of Building Envelope Design *reviews building envelope performance requirements and presents a comprehensive discussion of building science fundamentals.*

Investigating the Performance of Existing Systems *discusses tools and techniques that can be used to assess building science performance, including forensic investigations.*

Intervention Strategies and Options I—Performance *looks at a renovation project where an appropriate intervention was selected following an investigation of existing performance.*

Functional Program:

The functional program evolves from the use and occupancy of the space; the functional program for historic buildings should also reflect the reality of the existing envelope. The workshop has three modules on functional program.

Building Envelopes and Functional Program *reviews the regulations, standards, and technical guidelines that help define the functional program for a given use and occupancy.*

Intervention Options and Their Implications *discusses the pros and cons of building envelope and functional program intervention options.*

Intervention Strategies and Options II—Functional Program *looks at a project in a “heritage-designated” building in which the functional program was driving an intervention that was placing both the heritage character and the performance requirements in jeopardy.*
