

Headline: **Building Envelope Maintenance**

**The key to protecting the value of your real estate investment**

Publication date: December 2003

Publication: CHOA Journal

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## **Building Envelope Maintenance - the key to protecting the value of your real estate investment.**

In recent years real estate values have increased significantly. For building Owners, a properly implemented maintenance program is a cost-effective method to protect the value of their real estate investment. The "building envelope" is a significant part of the building and its performance can be maximised through proper maintenance.

### **Definition and Function of a Building Envelope and Maintenance:**

"Building envelope" refers to those parts of the building which separate the interior environment from the exterior environment, and includes windows, doors, walls, roofs and foundation walls. Sometimes referred to as "building enclosure" or "environmental separator" in the Building Codes.

The Building envelope has a function similar to the skin of a living organism. The building envelope protects the structure and the interior components from the effects of the external environment. We all know that cuts or bruises that don't heal quickly may result in infections that require medical intervention and more elaborate treatment. A similar analogy applies to buildings. If the deficiencies and defects in the building envelope are not repaired promptly more serious deterioration of the underlying components, including structural elements, may occur.

In the "Guidelines on Durability in Buildings" (CSA S478-95) standard, maintenance is defined as:

"The actions and measures taken periodically to maintain a desired level of performance. Maintenance includes a planned program of cleaning, repair, or replacement of identified components such as paint or gaskets."

### **Exterior and Interior Loads affecting Building Envelope performance:**

The exterior of the building is exposed to climatic elements such as water, ice, snow, wind and sun. Building materials expand and contract to varying degrees with changes in temperature. Due to those thermal movements various defects such as cracks, or delamination of various components can occur. Depending on the age of the building, the design details, and building exposure the aging process for each exterior component will occur at a different rate.

In addition to the exterior loads the building envelope is impacted by the systems inside the building and by the activities of its occupants. The internal building systems include heating, cooling, ventilation, plumbing and electrical systems. One of the crucial maintenance items that should be monitored by the Owners is the interior relative humidity (RH).

### **Typical reasons for Maintenance:**

Building envelope maintenance is somewhat like to automobile maintenance. Most car Owners are aware of the importance to maintain their cars. We take the car for regular check-ups, tune-ups and car washes to assure their good performance and appearance.

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Maintenance of building envelope components and their interfaces is crucial in preventing moisture ingress into the building assemblies. Moisture trapped inside the building assemblies may cause their components deteriorate prematurely. The public's awareness about building envelope failures has been heightened in recent years. One has to learn from those unfortunate experiences to do all the right things to prevent them from occurring.

It is understandable that a purchaser may want to look for buildings that will be easy to maintain. However new materials and technologies such as "rainscreen" type wall designs are not maintenance free. In reality, all building envelopes require maintenance regardless of their age, design, and the materials used in order to realize their intended service life.

### **Building Envelope Maintenance Program:**

Owners/occupants who do not have staff dedicated to building maintenance may feel they don't have enough time to maintain and/or worry about their buildings. Therefore a properly documented maintenance program is the key to saving time and money for the Owners in the long term. It is recommended to have a "review and maintenance program" in place that starts during the first year of occupancy in a new building and continues annually. The Maintenance and Renewal Program should be prepared and reviewed periodically by a building envelope professional (BEP).

### **Building Envelope Maintenance and Renewal Manual and Reviews:**

Property Owners such as a Strata Complex should have a project specific maintenance and renewal manual for their building envelope. This document should contain a maintenance and renewal schedule. Regular monitoring will facilitate early detection of potential problems.

The review of the building envelope should be done by qualified personnel. Individual Owners (of Strata titled properties) can also conduct their own review of the interiors and exteriors of their units on a regular basis and report any problems to the Strata Building Committee, Strata Council or Property Manager(s), however comprehensive reviews should still be provided by pertinent professional.

### **Building Envelope Maintenance Do's and Don'ts:**

- Implement a properly designed, scheduled and administered maintenance program as the key to saving time and money to the Owners.
- Regularly update the Building Envelope Maintenance and Renewal Manual.
- Have qualified professionals regularly review building envelope components as part of the maintenance process.
- Maintain all building envelope components and their interfaces to preventing moisture ingress into the building assemblies.
- Maintain interior relative humidity (RH) to CMHC recommended levels.
- Keep in mind that even the most durable, well-designed and constructed buildings require maintenance.
- Don't assume that new materials and technologies, such as rainscreen type wall designs are maintenance free.
- Don't delay any repairs or maintenance tasks.
- Don't assume that all components age or deteriorate at the same rate.

Levelton Engineering Ltd. has developed a user friendly maintenance and renewal manual that can be customized for the building to reflect the type of cladding materials used, wall assemblies, their condition and future performance. An essential part of the manual is the maintenance and renewal schedule. The review, maintenance and renewal tasks are projected over a 20 to 30 year period depending on the age of the building.

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