



Building Envelope Maintenance and Renewals Planning

While the gradual deterioration of building assets is inevitable, the speed at which this proceeds can be regulated.

Over the life of every building, owners are required to periodically make decisions, and take action, to maintain and renew the various physical components of their buildings. Each of these decisions and actions can impact the lifespan of the building components.



Concentrated balcony runoff leads to an unsightly appearance and potentially premature failure of the wall if not addressed

The term “assets” refers collectively to all major building components that are part of the common property. This article addresses assets comprising the building envelope such as: roofs, walls, windows and doors. However, the discussion regarding this select set of assets is equally applicable to all other building assets.

The degree to which maintenance impacts the service life of building assets will depend on their durability and their exposure conditions, as well as the quality of the maintenance program. The primary focus of this bulletin is on the importance of being proactive rather than reactive in the maintenance and care of buildings.

Why Maintain?

Building assets require maintenance and care in operation to achieve their full lifespans. For a building that has been well designed, constructed and maintained, the assets can be expected to last their full predicted service lives. Conditions deteriorate over time as a result of a variety of factors such as: weather (sunlight, rain, wind, snow and ice), and wear and tear (daily use by occupants of the building).

While the process of gradual deterioration of building assets is inevitable, the speed at which deterioration proceeds can be controlled through the decisions and actions of the owners.

Maintaining your building envelope

This publication is one in a series of bulletins designed to provide practical information on the maintenance of the building envelope of multi-unit residential buildings including townhouses, low and high-rise residential buildings.

What is a building envelope?

The building envelope includes all parts of the building (assemblies, components and materials) that are intended to separate the interior space of the building from the exterior climatic conditions. It includes, for example, the foundation, exterior walls, windows, exterior doors, balconies, decks and the roof.

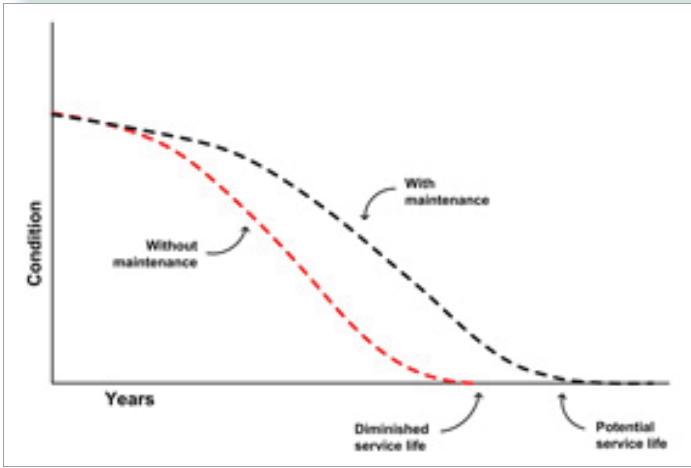
Who should read this bulletin?

Anyone who lives in or looks after a multi-unit residential building should read this bulletin including residents/unit owners, strata councils, housing co-operatives, maintenance managers, property managers or building owners. Proper maintenance of the building envelope can help prevent damage and avoid costly repairs in the future.



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Impact of maintenance on the service life of a roof

Whether buildings are constructed of concrete, steel, wood, or a variety of other materials, they are required to withstand a multitude of “forces” that impact the long-term performance of the materials that constitute the building assets.

If these “forces” are left unchecked, without the necessary and sufficient intervention of the owners, the risk of unexpected failure may increase and the assets may need to be replaced on a schedule that is contrary to the owners’ objectives.

Without adequate maintenance, the building assets will deteriorate faster and their service lives may be diminished.

How We Spend Money on Buildings

The quality of the design and construction of a building has a significant impact on the life expectancy of the building assets, as well as on the maintenance and renewal requirements associated with these assets. In the case of new buildings, strata owners have no control over design and construction decisions. However, in the case of a rehabilitated or renovated building envelope, strata owners can participate in decisions related to the design and, therefore, they can have a significant impact on future maintenance and renewal activities. These decisions usually involve the consideration of trade-offs between higher initial costs and future costs associated with operations, maintenance and renewals. Maintenance and renewals planning should start at the design phase of a project and not be left as an afterthought for the owners to address once the building is handed over.

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assets. These investment costs can be organized into four broad groups:

- **Operating Costs:** These are the costs required to run the building. Electricity, gas and insurance are typical examples of operating costs.
- **Maintenance and Repair Costs:** These costs include activities to keep assets in good working condition. Examples of routine maintenance activities for the building envelope system would include: cleaning of debris from roof drains, washing of the windows or inspecting the sealants. Small repairs are often included in the same category as maintenance costs.
- **Renewals Costs:** These include costs to replace or refurbish the assets when they have reached the end of their service lives. Replacement of the roof every 15 to 25 years is one common example of this type of activity.
- **Adaptation Costs:** These include expenditures required to adapt the building to the evolving needs of the users and to address new legislative requirements and standards that may be imposed by public orders. An example of this may be the requirement to retrofit the fire safety equipment in multi-unit residential buildings.

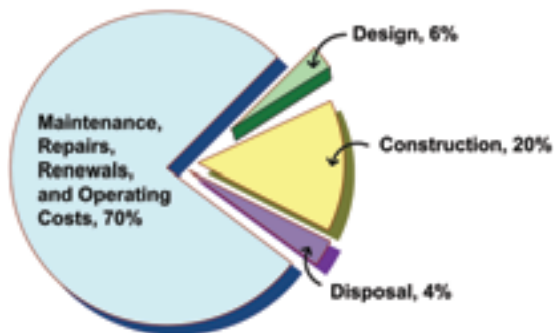


Roof drain cleaning



Window cleaning

The chart below illustrates the typical distribution of costs over the life cycle of a residential building: from the initial construction through to the disposal of the building at the end of its service life.



Distribution of life cycle costs of a typical building

The stewardship of the building assets over the service life of the building consumes the greatest cost and should, therefore, receive the appropriate level of maintenance and renewal planning and management.

What is Building Asset Management?

Asset management contemplates the continual stewardship of the building assets. Effective stewardship requires prudent planning each year and proper oversight in order to ensure that required inspection, maintenance and renewals tasks are undertaken.

Stewardship continues throughout the time the building assets are in service and eventually retired from service.

When setting up a program for the effective stewardship of building assets, owners make decisions relative to their tolerance for risk, their finances (expenditures and return on investment), their legal obligations and their need for reliable and functional assets. A variety of techniques have been developed to assist building owners in monitoring, tracking and steering the process of managing their building assets.

The key to responsible and effective building asset management is to embrace the task of managing the building assets on a consistent and ongoing basis. This does not mean that owners have to do the work themselves, however, they do have to ensure that somebody is charged with the responsibility for planning and the ongoing stewardship role. Someone is always in charge

– either the owners manage their assets or the assets will manage the owners.

Key Documents to Support Effective Maintenance and Renewal Planning

At the completion of a new construction project (or rehabilitation project), the owners, represented by the strata council, must be provided with a package of reference documents regarding the new building assets that have been placed in service. The hand-over of these documents from the building design and construction team is intended to empower the owners to achieve self-sufficiency in the stewardship of their building assets. The hand-over is also used by the construction team to transfer some responsibility for the performance of the building to the owners.

The quality and completeness of the information provided by the construction team is critical to the ability of the owners to effectively manage their building assets. It may be necessary to augment or further develop the package of documents provided to create an ongoing effective building asset management tool.

The Operations and Maintenance Support Information (OMSI) package captures and organizes key documents that are generated during the design, construction and commissioning of a new building or building envelope rehabilitation project. The key components of an effective OMSI package are summarized below:

- **Drawings:** Drawings should be readily available for reference purposes to contractors and consultants as may be required for periodic inspections, repairs and renewal activities. Since drawings are fragile and can sometimes be lost or damaged, it is strongly recommended that all drawings be converted to electronic format. This will facilitate long-term archiving and guard against having to procure replacement hard copies from City Hall and other sources.
- **Specifications:** Specifications provide information related to materials and components of the building. Unfortunately, specifications are not always provided to the owners for new construction projects.
- **Warranty Certificates:** Warranty certificates are contracts specifying that the materials and/or workmanship of different assets will meet a certain level of performance over a specified pe-

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Warranties do not cover the following types of events: normal wear and tear, normal aging, misuse and abuse and failure to carry out adequate maintenance during the warranty period.

riod of time. Essentially, warranties are intended to protect the consumer against premature failure of assets during the specified warranty periods. Warranties are carefully worded documents that contain exclusions and disclaimers.

- **Safety and Test Certificates:** These are documents that demonstrate the necessary inspections and other maintenance work associated with certain assets has been completed. Assets with important safety implications such as: elevators, roof anchors, fire suppression systems, boilers and backflow prevention valves must be tested periodically. The test certificates must be clearly posted either in the utility rooms, near the corresponding equipment or be kept on file in a designated site office.
- **Contact List:** A list of all the contractors, consultants and other parties involved in the construction or rehabilitation project is helpful since these companies have first-hand knowledge regarding the building assets.
- **Manufacturers' Product Literature:** Most companies that manufacture products used in the construction and repair of building assets produce technical data sheets with reference information about their products. This information is useful to contractors carrying out maintenance and help determine the compatibilities of the original construction materials with any new materials.
- **Inspection Forms and Logbooks:** The



owner and its contractors should use forms and logbooks to collect and record maintenance work carried out on the assets. This is necessary to demonstrate the level of care and diligence that has been made by the owners and to identify any trends in the behaviour of the building assets over time.

- **Colour Schedule:** The colour schedule provides a summary list of the basic colours (and sometimes also the textures) that were used on the various finishes installed during original construction or as part of a renewal project. This information is useful to those undertaking maintenance and renewals tasks where it is important to match colours to the existing appearance.
- **Asset Inventory:** An asset inventory is a structured list of assets that includes information related to some of the basic attributes of the assets such as their: age, quality, manufacturer and estimated useful life.
- **Equipment and Supplies Inventory:** Equipment and supplies that are kept on the premises are essential to an effective maintenance program. Maintenance supplies should be stored in a locked service room that is accessible only to authorized personnel. An up-to-date inventory should be kept of all items stored on site. This inventory helps to ensure that valuable time is not wasted procuring supplies.
- **Charts, Labels and Markers:** Equipment tags indicate the inspection dates of certain equipment such as: fire safety devices and backflow protection valves. Labels also indicate the location of important equipment and provide safety warnings to persons carrying out work in close proximity to some of the equipment.
- **Maintenance Guides:** Various organizations have produced maintenance guides, information bulletins, and other reference documents to assist owners with the maintenance and stewardship of building assets. The Homeowner Protection Office (HPO) has produced several *Maintenance Matters* bulletins regarding the maintenance of multi-unit building envelopes. To obtain these publications or for additional resources, check the *For More Information* section in this bulletin.

- **Glossary of Terms:** Since construction terminology is not familiar to most owners, it is useful to have a glossary of terms to define the various components associated with the building assets.
- **Maintenance Service Agreements:** Over time, the owners, represented by the strata council, will enter into agreements with various parties for routine inspections, periodic maintenance and eventual renewal services relating to the building assets. The types of agreements will depend on the role the owners and property manager wish to take in the ongoing maintenance program and long-range stewardship of the building assets. The types of service contracts will also be determined by the desired standard of care that the owners wish to achieve as well as the owners' tolerance for risk.

The typical OMSI package may comprise several hundreds of pages of support documents. It is helpful if all components of the OMSI are kept in electronic format for long-term archiving and access purposes. It is important that all documents are kept in a single repository and if any are removed from the repository that they are immediately copied and returned to the repository. The document repository can take the form of a simple filing cabinet or software database.

Moving From “Hand-over” to “Hands-on”

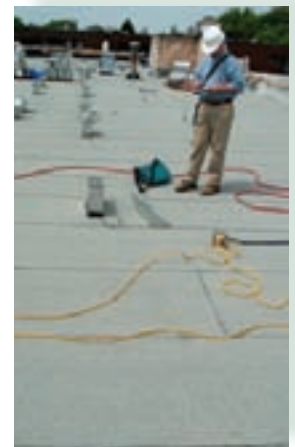
Sometimes the package of “hand-over” documents includes what is referred to as a “maintenance manual”. Although most people are familiar with maintenance manuals that come with the purchase of a new car or appliance, it is helpful to distinguish between some maintenance terms that are used interchangeably. Distinctions should be made between four closely related concepts:

- **Maintenance Manual:** This is a handbook containing instructions, rules or guidelines for performing particular maintenance tasks. Cars, appliances and electronic goods are sold with “manuals” that take a variety of forms. For example, a maintenance manual will contain the following types of information: *“Inspect the roof drains and remove any vegetation and debris that is obstructing the drainage path”*. This type of document is required to be part of the hand-over documents for both new and rehabilitation construction projects.

- **Maintenance Policy:** This is a formal statement committing the owners to a particular standard of maintenance. The policy is intended to guide future decision-making regarding the development and implementation of the maintenance plan. For example: *“It is our policy to wash the exterior inaccessible window glass twice each year.”*
- **Maintenance and Renewals Plan:** This is a scheme or method for the coordination and grouping of all maintenance and renewals tasks within a prescribed timeline. It often takes the form of tables. For example, a single line entry in a table might be: *“Replace our roof during the dry summer months”* and it would likely indicate to be required in a particular year. This type of document is not necessarily provided with the hand-over documents and may need to be developed by the owners with assistance from a consultant.
- **Maintenance Program:** This is the commitment of the owners' financial resources to a specific plan of maintenance and renewals activities for a particular time frame. It is the culmination of planning for the effective and ongoing building asset stewardship. For example, owners should be able to say: *“We have an approved budget, including the consultants and contractors, to undertake the work, and have a monthly schedule of activities to ensure that we can complete all the necessary maintenance and renewals work for this fiscal year”*.

The specific instructions contained in the maintenance “manual” are organized into a broader “plan”. The plan is then implemented through the coordinated activities in the “program”. Without a program, the manual will likely gather dust on a shelf.

Owners of homes with home warranty insurance could limit their coverage as a result of negligent or improper maintenance to the home. Licensed Residential Builders/warranty providers have a responsibility to provide maintenance information to the original buyers of a home, if they want to make home warranty insurance coverage conditional upon proper maintenance. The *Homeowner Protection Act* regulations* do not specify the contents, standards and organization of these “manuals”. This is generally left to the best judgement of the design and construction team. Therefore, it may be necessary to augment the content of the manual that is received.



Roof inspection

* *The Homeowner Protection Act* regulations are available online at www.hpo.bc.ca in the Publications section.



Maintenance and renewals manual

** The Strata Property Act is administered by the Province's Financial Institutions Commission and is available online at www.fic.gov.bc.ca.

The maintenance "manual" provides instructions regarding what needs to be done.

The maintenance "plan" sets out the tasks in an organized manner. The maintenance "program" coordinates the resources to achieve the plan.



Owners of strata-titled homes also have a legal obligation to maintain the strata property under the *Strata Property Act*.** The owners should incorporate the manual into the existing set of governance documents, such as bylaws and the annual operating budget. The maintenance and renewals plan (and the associated OMSI package) must be treated as a "living document". Therefore, it should be periodically updated.

One of the most significant challenges facing owners is the effective transition of the maintenance and renewals "plan" into a maintenance "program". Essentially, the owners must "plan the work and work the plan".

An effective maintenance program requires the owners to support the maintenance manual through the establishment of maintenance standards, maintenance policies and an approved budget. These various facets must all be carefully balanced so as to avoid any weak links that may undermine the maintenance strategy. For example, if the maintenance budget does not match the intent of the maintenance policy, then the maintenance program is headed for trouble.

Who Makes It Happen?

The owners must establish who will oversee the implementation of the maintenance and renewals plan. The "custodian" is a term used to represent the party that is responsible for safeguarding the maintenance and renewals plan and for overall coordination, management and supervision of the maintenance activities. The custodian is essentially the "timekeeper" and the "gatekeeper" of the maintenance and renewals program.

The custodian requires certain skills and resources in order to manage the recommendations of the maintenance and renewals plan. The following are some of the potential candidates for this role:

- the property manager
- a committee of volunteer owners, or
- a third-party consultant.

It is most common for the property manager to

have the responsibility for implementing the maintenance and renewals plan. However, increasingly there is recognition that the custodian role is complex and requires particular knowledge and skills to be undertaken effectively.

Over the life of a building, the appearance, performance and costs associated with the building envelope (and indeed all systems that comprise the building) are dependent on the implementation of an effective maintenance and renewals plan. This is not a trivial task and requires the ongoing commitment of the owner group, with the support of the maintenance custodian, to a process of information gathering, planning, funding and periodic updating of the plan.

Action Plan Tips

- Be proactive about your building maintenance and renewals needs.
- Notify your property manager if you believe there is a maintenance problem with the building envelope.
- Gather and preserve key documents that are critical to the effective maintenance of the building envelope.
- Ensure that the building has a maintenance and renewals plan.
- Commit to the plan and implement a maintenance program.
- Update the maintenance and renewals plan.
- Ensure that you have a custodian for your maintenance and renewals program.

For More Information

1. *Maintenance Matters* bulletins published by the Homeowner Protection Office, a branch of BC Housing, available online on the Publications page of www.hpo.bc.ca.
2. *Best Practice Guide to Wood-Frame Envelopes in the Coastal Climate of British Columbia*, published by Canada Mortgage Housing Corporation, available online at www.cmhc.ca.
3. See your building's maintenance manual.

Acknowledgements

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Disclaimer

This bulletin is intended to provide readers with general information only. Issues and problems related to buildings and construction are complicated and can have a variety of causes. Readers are urged not to rely simply on this bulletin and to consult with appropriate and reputable professionals and construction specialists before taking any specific action. The authors, contributors, funders and publishers assume no liability for the accuracy of the statements made or for any damage, loss, injury or expense that may be incurred or suffered as a result of the use of or reliance on the contents of this bulletin. The views expressed do not necessarily represent those of individual contributors or BC Housing.

The regulations under the *Homeowner Protection Act* contain specific provisions requiring owners to mitigate and restrict damage to their homes and permitting warranty providers to exclude coverage for damage caused or made worse by negligent or improper maintenance. These apply to both new and building envelope renovated homes covered by home warranty insurance. **Failure to carry out proper maintenance or carrying out improper maintenance either yourself or through qualified or unqualified personnel may negatively affect your warranty coverage.** Refer to your home warranty insurance documentation or contact your warranty insurance provider for more information.



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