Maintenance Matters | Building Envelope Maintenance Bulletin No. 8

Homeowner Protection Office
Branch of BC Housing

Cladding

The nature and extent of maintenance and renewal activities varies significantly for different cladding types.

Wall cladding is the material or component of the wall assembly that forms the outer surface of the wall and is the first line of protection from the exterior environment (sun, wind, rain and temperature). It is also an important part of the appearance of a building. As with all other exposed portions of the building enclosure (windows, roofs and balconies), regular review and maintenance of the cladding is important to ensure intended performance and appearance.

Masonry veneer consists of a single layer (wythe) of masonry units (typically clay brick) and mortar. Masonry is a very durable cladding with maintenance and renewal activities focused on cleaning and occasional repointing (renewal of mortar joints).

Types of Cladding

The type of cladding used on buildings is dictated by the architecture and by Building Code requirements related to combustibility. Wood-frame buildings (combustible) are typically clad with combinations of wood siding, vinyl siding, fibre cement board, masonry (brick) or stucco. The latter two cladding types are also commonly used on concrete frame (non-combustible) buildings. Other popular claddings for non-combustible buildings are metal panels and exterior insulation and finish systems (EIFS). The nature and extent of maintenance and renewal activities varies significantly for different cladding types.

Why Must the Cladding be Maintained?

Cladding is the first line of defence in a wall assembly. It is critical for protection of the more sensitive components of the wall assembly and the interior of the building. Proper maintenance of the cladding will reduce the likelihood of water penetration and preserve the appearance of the building.

Wear and tear on cladding is expected since it is continually exposed to sun, rain, wind and temperature changes. In addition, cladding is subject to damage due to accidents, vandalism and excessive vegetation growth.

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/enclosure?

The building envelope or building enclosure 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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Wood siding, typically cedar, is lapped to keep water on the outside of the wall. Maintenance and renewal activities are focused on cleaning and refinishing, typically with paint or stain.

The durability and expected lifetime of each type of cladding will vary as will the ease and cost of maintenance.

Stucco is a cementitious product which is trowelled wet onto the wall and allowed to cure. Various finish coats are available to provide the desired texture and colour. Maintenance and renewal activities are focused on cleaning, painting or refinishing, and sealant replacement.

Rain Water Penetration Control

There are three different strategies for rain penetration control in walls: face seal, concealed barrier, and rainscreen walls. Any type of cladding can be used with the three strategies. However, the performance expectations, as well as the maintenance and renewal requirements, will vary depending on the rain penetration control strategy.

Face seal wall assemblies rely on the elimination of holes through the cladding to limit water ingress. Discontinuities in the face seal (cracks and holes) can result in water entering the wall where it is unable to readily drain or dry. This, in turn, can lead to premature deterioration of the cladding and the hidden components of the wall. Face seal walls are generally only appropriate when they are protected by significant overhangs and are rarely exposed to rain.

Concealed barrier walls also rely on the elimination of holes through a single layer, although in this case, the layer is protected or concealed behind the cladding. Typically, the sheathing membrane is the layer that is made continuous in order to control rain penetration. Since this layer is protected, it is more likely to provide adequate performance than a face sealed assembly.

Rainscreen walls are designed to take into consideration that some water will likely penetrate past the outer cladding surface and, therefore, two lines of defence are provided. The cladding provides the first line of defence while the sheathing membrane provides a second line. An air space is provided between the cladding and the sheathing membrane on the back-up wall that facilitates drainage and drying. Rainscreen walls provide more reliable and durable performance due to the multiple lines of defence, or redundancy, in the design. Therefore, they are less dependent on maintenance to ensure adequate performance.

The durability and expected lifetime of each type of cladding will vary as will the ease and cost of maintenance. For example, masonry walls are very durable, but are difficult and costly to replace. While vinyl siding can be more easily damaged, it can also be more easily repaired and replaced. Regardless of the type, cladding must be properly maintained to retain the general appearance and performance functions of the building and to reduce the likelihood of premature failure that could result in an expensive wall repair.

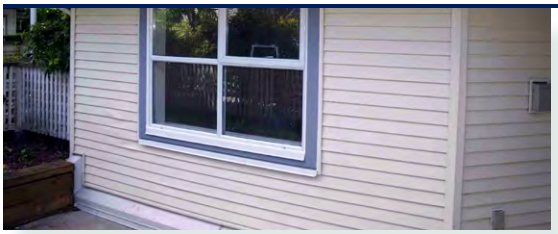
Wall assemblies that utilize a face seal water penetration control strategy require regular maintenance and repairs to the cladding. This single line of defence strategy means that water that penetrates past the cladding can quickly lead to damage within the wall.

What Maintenance Must be Performed?

Cleaning of the wall cladding is important to maintain the aesthetics of a building. It also helps expose any damage, such as cracks requiring review. Cleaning methods will vary for each type of cladding; the cladding manufacturer's recommendations should be followed for each case. Cleaning should be performed carefully to avoid damaging sealant joints, masonry mortar joints (brick wall) and cladding finishes. Removing organic debris will reduce moisture retention in any cladding joints. In general, cleaning of cladding should be performed with non-pressurized water. Inappropriate use of pressure washing can damage components of the wall assembly and introduce water behind the cladding and into the wall assembly, especially with face seal or concealed barrier designs.

Annual reviews of the condition of the cladding should be performed by somebody knowledgeable regarding building enclosure performance. A maintenance contractor or trade contractor may be appropriate for this inspection. The review of the cladding is extremely important for face seal walls as the rain penetration performance of these walls is sensitive to maintenance of an effective exterior seal. Concentrated staining of cladding is an indication of high amounts of water runoff, and may raise concerns of water ingress into the wall assembly.

Recoating the cladding is particularly important for wood siding, but is also necessary for fibre cement boards and stucco cladding.



Vinyl siding is made from plastic (mostly polyvinyl chloride) and is intended to simulate the appearance of wood siding. A variety of colours and textures are available. Maintenance is focused on cleaning.

The durability of wood cladding is dependent on the coating as wood itself is quite vulnerable to weathering when used in exposed conditions. Poor maintenance for exposed wood products can result in irreparable and permanent damage such as cracking and warping.

Fibre cement boards and stucco are made from compositions that rely on paint for protection and to reduce the effects of staining. Recoating may also seal any minor cracks that develop in cladding. However, recoating should not be relied upon as a crack repair procedure to prevent water ingress.

Sealants are typically used at joints between the cladding and penetrations, such as windows, doors, lighting fixtures, and vents. It is at these locations that the vast majority of water ingress occurs. Therefore, it is highly recommended that sealant joints be properly maintained and repaired. Joint profiles, preparation of substrate, and selection of an appropriate sealant product are important variables in determining the effectiveness and durability of sealant joints. Help from an experienced contractor or consultant is recommended.

Metal flashings and fasteners also form part of the cladding and are susceptible to deterioration over time. While corroded fasteners can sometimes be replaced with minimal disruption to the cladding, this is not usually possible with metal flashings. Repainting of flashings is usually a very short-term measure to improve appearance. When renewal of the cladding becomes necessary, highly corrosion resistant fasteners and metal flashings should be used. These elements need to be at least as durable as the cladding itself.

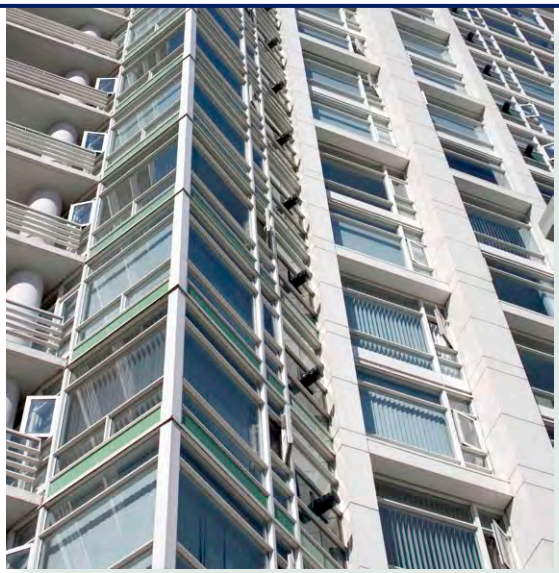
How Often Does the Cladding Need to be Reviewed and Maintained?

The checklist on the right lists a number of relevant items that should be performed as part of the maintenance plan.

Checklist of Common Cladding Maintenance Items

Cladding Type	Review/Maintenance Item	Frequency
All	Maintenance contractor or trade contractor to review condition of cladding, finishes and sealant.	Annually
All	Remove any vegetation, such as trees or shrubs, that encroaches on the cladding.	Annually
	Review metal flashings for corrosion and proper slope away from the building.	2-3 years
	Review fasteners and metal connectors that attach the cladding to the walls.	5 years
	Touch up paint to metal flashings.	7 years
	Replace exterior sealant.	10 years
Wood Siding	Clean wood siding with non-pressurized soapy water.	3 years
	Review wood siding for warping, damage, loose panels and discoloration.	3 years
	Touch up painting or staining of wood siding.	7 years
Vinyl Siding	Clean vinyl surfaces with non-pressurized soapy water.	2 years
	Review vinyl siding for discoloration, dislodged sections and damage.	2 years
Stucco	Clean stucco surfaces with non-pressurized water or stucco cleaning solution.	2 years
	Review stucco for cracks, staining, vegetation growth, corrosion of stucco stops and control joints, and delamination of finish coat.	2 years
	Recoat acrylic stucco finish.	7-10 years
Masonry	Clean surfaces with water or cleaning solutions for masonry. Do not use pressurized water as it could damage the mortar joints.	5 years
	Review masonry for cracking, spalling and loose units.	5 years
	Reseal exterior face of masonry.	6 years
	Clean and repoint mortar.	15 years
Fibre Cement Board	Review for cracking, efflorescence and damage.	2 years
	Clean surfaces with non-pressurized soapy water or soft material.	5 years
	Recoat fibre cement board.	7 years

Renewals projects should involve building enclosure consultants to examine alternatives for cladding renewals.



Metal panels are more common on high-rise buildings, rather than low-rise wood-frame buildings. Maintenance activities are focused on cleaning.

Fibre cement board is a composite material comprised of wood fibre, sand, and cement. The product is painted, and is available as a panel, siding or shingles. Maintenance and renewal activities are focused on cleaning and repainting.

Renewal or Replacement of the Cladding

Proper maintenance will prolong the life of the cladding and reduce renewal costs over the long term. Eventually the cladding will need to be renewed either because maintenance is no longer cost-effective, or because the performance or appearance of the cladding is not acceptable.

Renewals projects should involve building enclosure consultants to examine alternatives for cladding renewals, help ensure that appropriate construction details and appropriate materials are used, and to verify the quality of the construction. Enclosure consultants can also assist in the selection of qualified contractors to perform the renewal work.

Life expectancies of the various types of cladding can vary depending on exposure conditions and the level of maintenance undertaken. Cladding renewals programs should, therefore, be integrated with plans for windows, balconies and decks as well as an overall building maintenance and renewals plan for the building.

Action Plan Tips

- Report any water ingress at exterior wall locations immediately to your building manager.
- Cladding condition should be reviewed every year by a knowledgeable person and every 2 to 3 years by a building enclosure consultant.
- Develop a review and maintenance plan for the cladding and walls. Keep a record of all cladding warranties and a record log of any review or maintenance activities.
- Retain a building enclosure consultant to develop a renewal program for the cladding.

For More Information

1. *Maintenance Matters #7 – Building Envelope Maintenance and Renewals Planning*, published by the Homeowner Protection Office (HPO) and available online at www.hpo.bc.ca.
2. *Building Envelope Guide for Houses: Part 9 – Residential Construction*, published by the HPO and available online at www.hpo.bc.ca.
3. *Maintenance Matters #1: Paints, Stains and Coatings*, published by the HPO and available online at www.hpo.bc.ca.
4. *Maintenance Matters #5: Sealants*, published by the HPO and available online at www.hpo.bc.ca.
5. *Vinyl Siding Installation Manual*, published by the Vinyl Siding Institute and available at www.abtco.com.
6. Imasco Stucco Systems Maintenance and Cleaning Information, Imasco Minerals Inc., available online at www.imascominerals.com.

Acknowledgements

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