



Decks and Balconies

This bulletin provides practical information on steps to be taken for proper inspection, maintenance and long-term performance of decks and balconies.

Decks and balconies provide residents with great enjoyment and direct access to fresh air and the outdoors. Like all other building components they require routine maintenance, inspection and repair by qualified contractors and consultants to ensure durable performance.

What are Decks and Balconies?

This may sound like a simple question, but in fact decks and balconies are different. A deck is a horizontal surface exposed to the outdoors with a walking surface and *located over an enclosed space below, so it is also a roof*. A balcony is also a horizontal surface exposed to the outdoors with a walking surface, however, it typically projects from the building and *it is not located over an enclosed living space below*.

In addition to walking surfaces such as membranes, wood decking or concrete pavers, decks and balconies incorporate a variety of components including: guardrails, guardwalls, drains, gutters, soffits and vents.

What is a Deck or Balcony Membrane?

A deck or balcony membrane is a waterproof layer installed to protect the underlying structure from water leakage. The membrane may be exposed, acting as the actual walking surface, or may be covered with precast concrete pavers, wood planking or a concrete topping.

Different membranes are used depending on the type of deck or balcony construction, such as:

Liquid-applied urethane

- installed on concrete balconies to protect the reinforcing steel within the concrete from water penetrating at cracks and causing corrosion (rusting) of the steel, or on wood balconies to similarly protect the wood structure below
- used on wood decks and balconies that are built with a protected covering as an asphaltic urethane
- expected service life is usually ten years, however, with lower traffic and less exposure to the elements these membranes could last longer if regularly maintained.



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 town-houses, 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.



This bulletin is funded by the Homeowner Protection Office (HPO), a branch of BC Housing, in partnership with Canada Mortgage and Housing Corporation and Polygon Homes Ltd.



Staining on this deck membrane indicates ponding. Holes or punctures must be repaired as soon as possible to avoid water entering the structure when it rains.

Report any punctures, cracks and separations of the membrane immediately to your maintenance or building manager.

Sheet-applied vinyl

- typically used on wood-frame balconies
- most common material is reinforced polyvinyl chloride (PVC) sheeting, often simply called “vinyl” and installed in sections of standard widths with seams that are either heat-welded or glued
- expected service life is usually ten to fifteen years, depending on degree of exposure to sun, wetting, and wear and tear.

Styrene butadiene styrene (SBS) bitumen modified torch-on

- a two-ply, much stronger membrane commonly used on decks or roof surfaces
- the membrane may be protected from damage with pavers or decking.

An alternative method of deck construction, often seen in townhouses, is to have wood boards (without a membrane) spaced apart allowing water to drain between the boards down to the ground.

The most common wood for this type of construction is pressure treated lumber. Special care must be used in choosing appropriate metal hardware (e.g. nails, screws, connectors, flashings) if the existing decking boards are being replaced with new treated wood (see HPO’s Builder Insight bulletin on compatibility of fasteners and connectors with pressure treated wood for further information).

Why Must Deck and Balcony Membranes be Maintained?

Without proper maintenance, water may get in through holes and cracks in the membrane and joints that have separated and produce leaks to the interior, damage to the wall assembly and rotting of the deck or balcony structure. Holes



The upper deck is located over an enclosed space, however, the balcony (below right) is not located over an enclosed space.

caused by sharp heels, table and chair legs, and damage produced by placement of heavy objects and careless use of tools may also increase the risk of water entry. Moreover, hot barbecues, spilled gasoline or solvents can actually melt vinyl membranes.

Residents in newly constructed wood-frame buildings should be aware that their building may be more susceptible to some structural movement over the first eighteen months of operation, as moisture from the wood dries out and the wood shrinks. During this time, the balcony or deck membrane may move or pull away from the wall, causing seams to fail and allowing water ingress at the edge of the membrane. Shrinkage of the building frame can also cause the balcony slope to change, and ponding (standing water) at the wall to occur. While these matters are often taken into account during the building’s design and construction, some movement can still occur, potentially affecting the membrane. All these possible situations create a need for more diligent inspection within the first eighteen months of service.

Balconies and decks on wood-frame buildings are sensitive to water damage. If the membrane or other balcony or deck component fail, water can penetrate to the wood structure, where wood decay may occur. Interior ceiling finishes may also be damaged. Repairing this type of damage can be very expensive.

Other Deck and Balcony Maintenance Items

Guardrails and guardwalls

Guardrails and guardwalls are important safety features designed to prevent falls from balconies and decks.

Guardrails can be constructed of a combination of wood, metal and glass. One location where guardrails require special attention is at the bottom, where the guardrail may be fastened directly through the membrane to the horizontal surface of the balcony or deck. Water can leak through this vulnerable connection to the structure below. (Guardrails are best secured to a vertical face of the parapet or edge of the balcony, deck or walkway where the connection to the wall is not as vulnerable to water ingress.) Attention also needs to be paid to locations where the guardrail connects to the wall. All guardrail connections, either through the membrane or to the wall, should be regularly inspected and



Guardrail connection to the wall can be a vulnerable point of water ingress.

maintained to reduce the likelihood of water penetration into the wall assembly or building structure.

Guardwalls are typically half-height walls that wrap around the perimeter of the balcony or deck. Depending on the type of construction, guardwalls are particularly susceptible to leaks at corners and intersections with the exterior wall (saddles). Regular inspection and maintenance attention is required including any sealants that may be used at these locations.

Drains and gutters

Drains and gutters are important parts of a deck or balcony system that require regular maintenance. A critical yet easy maintenance item is to keep drains and gutters working properly by regularly cleaning balcony and deck floor surfaces to remove any dirt or debris, e.g. leaves and twigs. This will ensure that drains and gutters are free-flowing and do not clog.

Proper functioning drains and gutters are especially important for decks and balconies with surfaces that slope to an internal floor drain connected to the building’s storm drain or to a drain-pipe that is extended to discharge to the

Maintain drains free of obstructions, dirt or debris to ensure they are free flowing and to prevent water ponding.



ground or landscaping below. Often, internal floor drains have piping hidden inside the structure of the deck or balcony, making inspections and maintenance more difficult (or nearly impossible in some cases, such as piping in concrete decks and balconies). Leaking drainpipes may go unnoticed for some time before the damage is apparent. It is also important to ensure that floor drains are not covered with objects such as carpets, plant pots or other items that will slow or stop water from flowing.

Keeping deck and balcony surfaces clear of dirt and debris is also important for continuous “edge wrap” drainage systems. Located at the perimeter of the deck or balcony, these systems drain the water into a continuous gutter. It is important that these systems remain free-draining to avoid clogs and water over-flow situations.



Neglected deck and balcony components may result in higher operating and repair costs, damage to other building components, and safety risks.

Deck with combination of guardwalls and guardrails.

Water drainage from decks and balconies with guardwalls is commonly achieved through area floor drains and scuppers (drains that allow water to pass from the surface of the deck or balcony through the wall) located at the base of the guardwall. Sometimes, the scupper drainage system is susceptible to ponding of water and membrane degradation around the scupper. Any area where water can pool may become a risk factor for moisture leaks. These situations should be reported to your maintenance manager as soon as possible.

Balconies with guardwalls may have overflow scuppers placed at an elevation higher than regular scuppers. This is to prevent excess water from remaining on the balconies if the regular scuppers become clogged. If water is draining from the overflow scupper, this is a sign that the conventional drainage is clogged or not working properly, and should be examined immediately. Decks with pavers use bi-level drains to allow for drainage of both the paver level and the protective membrane level.



The build-up of debris or dirt on the underside of the balcony limited the air flow through the vent, resulting in damage.

Soffits and vents

There are a variety of vents associated with decks and balconies to provide for air circulation through enclosed spaces such as:

- soffit panels that cover the underside of balconies; typically made of vinyl or aluminum with perforations that allow air to circulate into the joist space
- round-shaped louver vents, sometimes found in the top and bottom of balcony and deck support columns
- strip vents, sometimes located on both sides of a guardwall or around the perimeter of the deck or balcony, or on the soffit to provide proper ventilation, and
- mechanical exhaust vents from kitchens, bathrooms or clothes dryers.

All vents should be inspected and cleaned of debris or dirt so that they continue to provide adequate ventilation, and should never be covered. Problems can arise in some buildings where clothes dryer vents, installed on the underside of a balcony, become clogged with lint. In this situation the warm air can potentially back-up into the joist space located above the dryer exhaust vent leading to condensation. It can also clog nearby soffits and vents with lint. Dryer exhaust vents should be kept clear of lint build-up at all times.

What Maintenance Must be Performed on Decks and Balconies?

Building residents are usually responsible for cleaning and sweeping the surface of the deck or balcony as needed, while other inspection and maintenance items should be carried out by a trained professional. When cleaning the membrane, use common household cleaners containing plastics friendly ingredients. Never use solvents, alcohol, paint thinner or lacquer thinner to clean the membrane because these products may degrade vinyl and urethane membranes. Refer



If your building does not have a maintenance manual, a building envelope consultant should be engaged to develop one that includes building-specific deck and balcony maintenance items.

to the membrane manufacturer's literature for the recommended cleaning agents that can be safely used with their product.

Building residents or maintenance managers should not perform the decks and balconies membrane inspection themselves. A building envelope consultant will have thorough knowledge of the many causes of membrane failures, deck and balcony problems, as well as the understanding of venting requirements and structural systems. If you have any doubts as to the proper approach to specific maintenance requirements, you should obtain professional advice from a building envelope consultant.

A checklist of some common decks and balconies maintenance items is presented on page 5.

How Often Must Decks and Balconies be Inspected and Maintained?

Deck and balcony membranes should be inspected at least every two years for both new and existing buildings.

If you live in a new building, the condition of decks, balconies, railings and other related components should be inspected before the end of year one and year two to detect any possible problems stemming from wood shrinkage or structural movement of the building.

The condition and strength of the guardrails and guardwalls should be inspected every two years. Scuppers should be maintained free of dirt and debris, and their attachment to the wall or the membrane should also be checked annually. Balcony and deck surfaces, including drains and gutters, should be cleaned at least twice a year (or as needed) to remove leaves and other debris and to prevent clogging and potential water build-up problems.

Who Should be Called for Service?

For Inspection

Engage a building envelope consultant (an architect or engineer) to carry out inspections, and to develop a deck and balcony inspection and maintenance program, if you don't already have one. The report should identify the condition, causes of deterioration or failure, and whether localized repairs can be undertaken or, in some cases, if complete replacement is required. If the inspection report submitted by the building envelope consultant recommends replacing the membrane, it is best to evaluate the entire waterproofing, drainage, venting systems

including the surrounding walls and guardrail connections. New building code requirements mean that more durable membranes must be used on deck surfaces, similar to those used on roof surfaces.

For Maintenance and Repair

Hire a contractor who specializes in the installation, repair, and maintenance of deck and balcony membranes and who is approved by the product manufacturer. Failure to utilize a qualified and trained contractor may result in faulty installation and may not be covered by the product’s warranty.

Check for any applicable warranties on your

current deck or balcony membrane. In many cases deck and balcony components including membranes will include warranties, and different warranties may apply for materials, workmanship, design, and so on. A proper maintenance plan will include a record of all applicable warranties, and this record should be reviewed before undertaking the maintenance activities discussed here. The maintenance plan should be updated accordingly after these activities are completed.

If the membrane is over fifteen years old, the risk of damage to the deck or balcony structure or the buildings exterior walls is increased. It may be prudent to step up the frequency of inspections

Hire an experienced contractor to carry out the identified maintenance and repair tasks once the inspection of the building’s decks and balconies has been completed.

Checklist of Common Deck and Balcony Maintenance Items

This list can be used by building residents to become familiar with some inspection and maintenance items. While some of the items can be carried out by residents, most should be coordinated by the building manager. In most cases, a building envelope consultant will need to be involved.

Inspection/ Maintenance Items	Description	Suggested Action/Who Should be Involved
Dirt, leaves, twigs and moss	Lack of cleaning can cause clogs and blockages leading to moisture build-up or ponding that can damage the deck or balcony.	Residents could sweep, clean and remove debris on their decks and balconies. Gutters cleaning should be organized by the building manager.
Water ponding on the deck or balcony floor	Ponding could indicate that the drainage hole is blocked, there is not enough slope on the deck or balcony, or that sagging or settlement of the structure has occurred.	Residents should check drainage holes or scuppers and remove debris. If water is still ponding, the deck or balcony should be inspected by a building envelope consultant. The task should be coordinated by the building manager.
Clogged soffit and vent perforations	Keep vents clear of dirt and debris to ensure adequate ventilation is achieved. Clothes dryers that vent to the underside of a balcony can clog soffit and vent perforations with lint.	Contact your building manager to coordinate the clean up of soffits and vents.
Delamination or peeling of deck or balcony membrane from the wall	The membrane is debonding or pulling away from the wall.	Inspection, repair and replacement require the services of a qualified contractor, and some cases, may require inspection by a building envelope consultant.
Seam failure of the deck or balcony sheet membrane	The membrane has failed at the lap joint. In this case it may be possible to repair the joint and the balance of the membrane can remain. Early detection and repair of this type of defect can extend the life of the membrane, avoid water leakage and preserve the structure from major repair.	Inspection, repair and replacement require the services of a qualified contractor, and some cases, may require inspection by a building envelope consultant.
Corroded, loose, unstable guardrails, or bolts and steel connectors on guardwalls	These are safety hazards because they may fail when they are needed to prevent someone from falling.	Report conditions to building manager to contact a building envelope consultant for adequate inspection.
Concrete spalling and cracking, rusting of reinforcing steel	The presence of spalling, where pieces of concrete are flaking off or cracking on your deck or balcony, may be a serious problem and needs to be inspected by an expert.	Report to building manager to contact a building envelope consultant.

Regular maintenance, inspection and repairs can detect and correct minor damages in deck and balcony components before they develop into extensive and costly situations.

to ensure ongoing acceptable performance. If the membrane needs replacement, a building envelope professional should be called in to develop the replacement program to ensure that it complies with all applicable building codes, structural requirements, and appropriate moisture-management principles.

When replacing guardrails or guardwalls, approval by a structural engineer must be obtained. Any damage to the deck or balcony membrane must be repaired prior to installing the new guards. A building permit may be required from the municipality for deck and balcony work.

A contractor specializing in gutter cleaning should be hired for this task. Often, the same contractor is hired to perform the exterior window cleaning as the gutter cleaning, and both maintenance items are performed at the same time.

- For new buildings, have the repairs done by the original supplier to maintain the warranty.
- Plan on replacing balcony or deck membranes after ten to fifteen years, and budget for this replacement program in your contingency fund.
- Where the membrane system needs to be replaced, a building envelope consultant will develop a replacement program to ensure that it complies with all applicable building codes, structural requirements, and appropriate moisture-management principles.

Action Plan Tips

- Keep the deck and balcony surface free of debris and dirt, e.g. leaves and twigs, to avoid drain clogs and potential water drainage problems.
- Hire a contractor to clean balcony and deck gutters annually (often done at the same time as window cleaning).
- If your building doesn't have one, develop a deck and balcony inspection and maintenance plan that includes a record of all applicable warranties. The record log should be updated accordingly whenever inspection or maintenance activities are completed.
- Engage a building envelope consultant to inspect decks and balconies once every two years. This inspection should consider all balcony and deck components including membrane, railings, drainage system, soffits, vents, flashings, sealants, exterior windows and doors, connectors and hardware.
- Hire a qualified contractor to carry out identified maintenance and repairs promptly to minimize any further damage.

For More Information

1. *Best Practice Guide to Wood-Frame Envelopes in the Coastal Climate of British Columbia*, published by CMHC and available online at www.cmhc.ca
2. *Balcony Repair and Retrofit*, published by CMHC and available online at www.cmhc.ca
3. *Wood Decks: Materials, Construction, and Finishing* by Kent A. McDonald and available at UBC library, www.library.ubc.ca
4. *Get to Know and How to Care for your Balcony*, CHOA Journal, published by CHOA and available at CHOA, www.choa.bc.ca
5. *Rotting Wood Framed Apartments – Not Just a Vancouver Problem*, published by Morrison Hershfield Ltd. and available at HPO, www.hpo.bc.ca
6. *Balcony Enclosures*, published by Burnaby (BC) Planning and Building Inspection Department and available at UBC library, www.library.ubc.ca
7. *Deck Inspections a Matter of Life and Death*, North American Deck and Railing Association and available online at www.nadra.org
8. *Manual for the Inspection of Residential Wood Decks and Balconies*, North American Deck and Railing Association and available online at www.nadra.org
9. See your building's maintenance manual
10. *Hiring a Professional Engineer or Geoscientist*, APEG BC and available online at www.apeg.bc.ca



Acknowledgements

This bulletin was prepared by a consortium of firms including: Levelton Consultants Ltd., JRS Engineering Ltd., Morrison Hershfield Ltd. and Read Jones Christoffersen Ltd. Organizations represented on the project steering committee included: RDH Building Engineering Ltd., the Condominium Home Owners' Association, Canada Mortgage and Housing Corporation, Polygon Homes Ltd., and the Homeowner Protection Office.

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.



1701-4555 Kingsway
Burnaby, BC V5H 4V8
Phone: 778 452 6454
Toll-free: 1 866 465 6873
www.hpo.bc.ca
www.bchousing.org
Email: hpo@hpo.bc.ca