

# **Building Envelope Maintenance Report**

**January 2012**

**The Compton  
1316 West 11<sup>th</sup> Avenue  
Vancouver, BC**

**LMS 4382**

**Conducted by:**



## **Introduction**

We have conducted a building envelope maintenance review of the Compton project located at 1316 West 11<sup>th</sup> Avenue, Vancouver, BC. The review was conducted on January 11, 2012 in order to evaluate the current condition of exterior materials and assemblies, and as the basis for the following observations and recommendations.

This review was not invasive, and did not include the removal or destructive testing of any areas of the building. The review is intended to report the condition of materials visible at the time of inspection. It should be noted, that while every effort has been made to identify defects, we can not guarantee that every potential problem has been itemized in the review. When the maintenance work is conducted on this complex any additional issues that might be discovered should also be attended to.

## **Building Description**

The Compton is a 12 storey concrete framed residential building. The building was constructed circa 2001, and contains 50 units constructed over an underground concrete parking garage.

Exterior walls throughout the project are constructed of poured in place reinforced concrete that has been painted on its exterior. These mass concrete walls act as the environmental separator where present around the building.

Low sloped roofing throughout the project includes inverted roofs and roof decks which have been finished with rock ballast or concrete paving stones. Balconies have been waterproofed with a liquid applied polyurethane membrane.

Windows throughout the building are thermally broken aluminum framed double glazed units.

## **Overview**

In general, materials on the exterior of the building appeared in good condition. There are however issues that should be dealt with at this time in order to enhance the long term performance of the exterior materials and systems. During our review, we noted all conditions we observed which require attention, including matters that go beyond what would typically be considered maintenance issues.

The following information outlines the general condition of particular materials, as well as noting specific areas of concern. Photographs and elevation renderings are included in the appendix. Photographs give an example of particular items noted in the report, and are not correlated with a specific area of the building unless otherwise noted. Situations where a given condition is common throughout the building will be noted in the appropriate material section of this report.

## **Roof**

The main roof of the building is a low sloped roof that utilizes an inverted roof design. The roof is constructed with the waterproof membrane applied over the roof surface, which is then covered with rigid insulation, filter cloth and gravel ballast. Due to the nature of the inverted roof, a full inspection of the membrane condition is not practical; however observations regarding drainage and protection were made. Generally, the roof is in good condition from a maintenance standpoint with the ballast well dispersed and the drains clear, and free of debris.

The cap flashings at the roof perimeter were in good condition around the building. Roof penetrations also appeared in good condition. In a number of locations, sealant along the top edge of the gumlip flashing at the base of the mechanical room walls has separated and should be replaced (Photo 1). Minor cracking as well as paint deterioration were also noted at the mechanical room walls. These items will be dealt with in more detail in the paint and concrete sections of the report. Organic growth was present on the back side of the decorative concrete arch on the North elevation of the building and should be cleaned as part of an ongoing maintenance program (Photo 2).

The roof area should be visibly inspected regularly, and any debris removed and drainage problems rectified.

## **Balconies**

The term balcony refers to those areas that do not occur over habitable space, and should not be confused with roof decks, which are covered in the following section. The balconies are constructed of reinforced concrete. In all locations the balconies are sloped to their exterior, and drainage occurs through a scupper drain in the upstand wall, or over the edge at the junction of the balcony slab and the wall. The balconies have been finished on their surface with a textured liquid applied coating.

In the majority of areas, the balconies appeared in good condition at this time. There were however two locations noted where the balcony membrane has blistered and is peeling (Photo 3). These areas should be recoated in a timely manner. In two locations around the building, scupper pipes were noted as missing and should be repaired (Photo 4).

Residents should inspect the condition of the membrane looking for cracks, blisters or cuts. Damaged areas should be repaired in a timely manner. Scupper drains should also be checked to ensure they are clear and any debris or blockage removed to facilitate free drainage. Large areas of ponding or standing water can reduce the service life of membranes, and should be rectified in a timely manner. Plants or mats that hold water can promote the growth of mold or mildew on the balcony surface. Mats that are open or breathable are less likely to facilitate organic growth than a piece of wet carpeting. Placing plants on a drainable table or mat will also reduce the potential for organic growth.

Residents should regularly clean the deck surface, checking the condition of the coating for any cracks, blisters, cuts or burns. Organic growth such as moss and weeds should also be removed, as they tend to retain moisture. When cleaning balconies, it would be prudent to inspect any related sealants, flashing and railings at the balcony perimeter. When sweeping or cleaning it is also advisable to look up and check the condition of the soffit above. Staining, moisture, or damaged areas can be an indication of membrane problems on the balcony above, and should be brought to the attention of the appropriate building personnel.

## **Roof Decks**

The term roof deck refers to those exterior platforms that occur over habitable space, and act as roofs as well as being accessible deck areas. Roof decks at the Compton have been waterproofed with a liquid applied membrane that has been covered with rigid insulation and concrete pavers.

In this configuration, the membrane is protected from physical damage by the pavers, however, it is still important to clear away any sharp debris such as nails or screws from the deck areas. Organic growth such as plants and moss should be removed, as the root systems can effect drainage, and reduce the lifespan of the membrane. The balconies finished with pavers typically drain through scupper or surface drains. It is important that these drains are monitored regularly by residents. Areas that sound ‘squishy’ when walked on, or appear to have standing water beneath them should be brought to the attention of the appropriate building personnel, and investigated further. Scupper drains which pass through the concrete upstand walls should also be checked to ensure they are clear of any blockage. Organic growth such as moss and weeds should also be removed, as they tend to retain moisture. It is important that all drains servicing the deck areas are reviewed and cleaned on a regular basis.

The balcony pavers are made of concrete, and as such are subject to efflorescence. Efflorescence is a whitish deposit that is created by the salts in the cement being carried to the surface of the stone or brick, by migrating water. Efflorescence in patio pavers is an expected, temporary occurrence, and as such, should generally be left alone. It most commonly occurs in the fall and winter months when drying rates slow and pavers stay damp for extended periods. Efflorescence can often be removed with a water wash and scrubbing. Unlike treating efflorescence on masonry walls, DO NOT use an acid wash on the patio stones as this can damage the rigid insulation and membrane below.

In general the roof deck areas appeared in good condition with no signs of ponding water or blocked drains.

The residents should clean and inspect the decks and balconies regularly. Plant and organic growth should also be removed from between pavers and at deck perimeters. Regular cleaning of decks and balconies not only helps to extend the life expectancy of

the materials, it also provides an excellent opportunity for owners to assess the condition of these areas and ensure they are draining properly.

## **Concrete**

Concrete is a versatile building material with a history of good performance. As with all materials, concrete has inherent strengths and weaknesses. While concrete is strong, it is also relatively rigid. In spite of concrete's inherent durability, it can, and often does develop cracks in areas. Most cracks occur early in the life of a building and are usually a result of settlement, or drying shrinkage. Thermally induced expansion and contraction can also cause cracking throughout the building life. These cracks are generally superficial and easily repaired. Minor cracking is not an indication of structural failure, and should not be assumed to be of catastrophic proportions. As the concrete is the weather barrier portion of the wall, it is important to review its condition and conduct repairs on a regular basis.

As noted on the elevation drawings, notable cracks in the concrete are present in just a few locations around the building. In one location, a small concrete patch is spalling and should be repaired (Photo 5). There is also one location on the North elevation where a small area of rebar is exposed and should be protected (Photo 6). Hairline cracks are present in a number of wall locations, as well as at the back of reveals (Photo 7). These cracks are not large enough to warrant grinding and caulking but could be treated with a good paint coating.

It should be noted that on many new concrete buildings it is now common practice to caulk the horizontal reveals during original construction as this is a location where cracking frequently occurs. As this is a problem that may get worse over time, consideration should be given to caulking these reveals at the Compton.

In some locations efflorescence staining is present (Photo 8) beneath the concrete eyebrow above the third floor. Efflorescence staining can occur where fine cracks are present in the eyebrow. The paint coating on the concrete eyebrows has blistered and is peeling in a number of locations (Photo 9). Coating of the eyebrows with a two part polyurethane membrane will reduce the amount of organic growth in these areas as well as bridging any existing cracks. Recoating of the eyebrows should be considered as a future maintenance item.

As the concrete acts as the weather barrier portion of the wall, it is important to repair cracks in a timely manner. Allowing moisture to penetrate the concrete wall can lead to corrosion of the reinforcing steel, and further degradation of the wall.

Individual owners should report any cracking, spalling, or staining they come across to the appropriate building personnel. It is important that cracking or spalling be evaluated, and repairs instituted by someone capable of assessing the severity of the problem.

## **Paint**

The concrete walls of the Compton have been coated with an acrylic based paint. At this time paint on the exterior of the building is showing signs of age such as fading and checking and repainting should be contemplated. The greatest area of deterioration noted was on the roof top mechanical room walls (Photo 10). In these areas the paint is severely degraded, and a number of hairline cracks in the wall are visible. Repainting in this area should be carried out when practical and repainting of the remaining exterior walls should be investigated at this time. Paint was also noted as peeling in some eyebrow and upstand wall cap locations (Photo 11).

Paint coatings should be cleaned whenever they show signs of dirt, or organic growth buildup. This condition can attract and retain moisture, which can eventually cause the coating to deteriorate. The method of cleaning can range from a garden hose and soft bristled brush, to the use of cleaning agents, and a pressure washer. It is generally advisable to use as little force as is required by a given job.

## **Sealant**

Sealant is a generic term for materials used on the interior or exterior of a building to seal joints, junctures or gaps against uncontrolled moisture or air infiltration. The life expectancy of sealant can vary greatly and is affected by numerous factors. Joint design, material selection, substrate preparation, service requirements and exposure levels, all affect the longevity of a sealant material. As sealants can play an integral roll in the overall performance of the building exterior, it is important that they be monitored on a regular basis. Regular inspection of sealants is an important component of any exterior maintenance regimen.

At the Compton, the majority of the sealant appeared in good condition and performing as intended. Sealant separations were observed in a few locations as noted on the attached elevation photographs. Sealant should be repaired in these areas as soon as practical.

## **Flashings**

Flashings are used to deflect water at interfaces and joints within and between wall assemblies. They play an important role in the water management of a building exterior by directing moisture to controlled or designated areas. Flashings are used extensively throughout the building in areas such as window heads, windowsills, base of walls and wall cap flashings and gumlip flashings.

Flashing at the Compton appeared in good condition in all locations with the exception of some sealant separation at flashing ends noted on the renderings of the report.

## **Windows**

The windows at the Compton are thermally broken aluminum framed double glazed units. Portions of the building use a window-wall design, where the window incorporates a metal spandrel panel that run past the concrete slab edge. Punched windows (Windows that occur in the middle of a wall) have also been used throughout the project.

In general the window units appeared in good condition, however there are some isolated issues which should be dealt with at this time. In a few locations, the rubber splines between the window frame and the glazing have fallen out of place (Photo 12). These splines should be reinstalled where possible. In one location a sealed glazing unit has failed and should be replaced. In two locations, heavy condensation on the interior of the windows was noted, and in one location mold was also observed. Residents should all be conscious about maintaining acceptable humidity levels in their units.

Residents should check their windows on a regular basis looking for things such as fogging between glazing panes and plugged weep holes. Also, the window hardware should be checked, to ensure of proper function.

## **Vents**

Where observed the majority of the balcony soffit vents and exterior hooded vents appeared clear. Minor lint accumulation was noted in one location only. In a number of locations, vent screens were noted as missing, or bent. These covers should be repaired or replaced as part of an ongoing maintenance program (Photo 13).

Corrosion of the vent hoods on exterior walls was common on the East elevation of the building (Photo 14). The vent hoods can be primed and painted as part of an exterior repainting program.

Staining was noted at some soffit vents and is typically a result of condensation of vented dryer air in the ducts or on the underside of the concrete slab. A thorough duct cleaning as well as the installation of booster fans may be required to alleviate further condensation issues.

It is important that a regular program be implemented to remind residents to clean the exterior vent covers, as well as to arrange for professional cleaning of the dryer ducting. A poorly maintained dryer vent can lead to moisture problems and staining within the building. Where accessible, exterior vent covers should be vacuumed by residents quarterly, and professionally cleaned annually. Dryer lint traps should be cleaned regularly to help minimize the build up of lint in the ducts as well as at the exterior vent.



## **Parkade**

The parkade appeared in good condition with no breaches or major cracks in the traffic membrane. As is common there were cracks present in the ceiling and walls of the parkade which did not appear to be active at this time. There were a few locations noted where cracks had efflorescence staining present and may be active at times of precipitation (Photo 15). These areas should be further monitored to determine if they are active, and if so repairs commenced in a timely manner. Cracks with efflorescence staining were observed in the ceiling above parking stalls 8, 20, 32, 33. A horizontal crack was also noted on the wall in the stairway between P1 and P2. As noted all areas should be monitored, and repairs carried out if moisture is present at the crack locations.

## **Miscellaneous**

Corrosion of fireplace vent covers was common around the building (Photo 16). Rust staining was also present on flashings and eyebrows beneath the fireplace vents.

Observations were made outside the following units:

1205	Exterior appears in good condition with no signs of breaches or openings.
1103	Cracks outside have all been repaired.
804	Failed sealed unit. Fogging between glazing panes at small window.
404	No loose gasket found on exterior.
601	Moisture staining at soffit vents.
301	Moisture staining at soffit vents.

## **Summary**

There are components on the exterior of the building, which at this time require remedial work in order to perform as originally planned.

In general, the following items should be reviewed with regard to future work:

- Seal cracks in concrete
- Replace or reinstall window splines where loose
- Replace failed sealant & consider application of sealant in concrete reveals
- Install scupper pipes where missing
- Repair peeling paint on concrete ledges
- Repair failed balcony membranes
- Install new vent screens where missing
- Investigate repainting of building exterior
- Investigate applying polyurethane coating at concrete eyebrow

## **Appendix**

- **Homeowners Inspection List**
- **Photographs**
- **Elevation drawings with notes**
- **HPO Article “Avoiding Condensation Problems”**

## **ON-SITE PERSONNEL / OWNER INSPECTIONS**

Item To Inspected	Inspection Frequency	Inspect for
Roofing	Monthly	A cursory monthly check is intended to spot physical damage or drainage problems. This check is purely a visual inspection conducted from the ground.
Flashings	Semi annual	Physical damage. Look for flashing which may have been damaged or bent by gardeners, window cleaners or other operations around the building.
Decks / Drains	Monthly	Drain blockage, or physical damage. Individual deck drains and troughs should be checked frequently during the rainy season, and when debris is most prevalent in the fall. Check the membrane surface for cracks or splits when cleaning or sweeping. Check the soffit above for water stains.
Sealants	Semi annual	Look for damage or obvious sealant failure when cleaning windows or decks.
Paint	Semi annual	Observe condition of paint when cleaning windows or decks. Look for peeling or blistering paint.
Windows	Semi annual	Observe condition of hardware and weep holes when cleaning windows. Clear any dirt or debris from weep holes. Check sealant at mitered corners.
Vents	Semi annual	Regular cleaning of dryer lint screens will reduce the necessity to clean the exterior vent covers. Dirty or blocked exterior covers can lead to moisture accumulation in the vent pipe, and cause leakage and deterioration
Plants	Annual	Plants growing directly adjacent to or in contact with the building exterior can reduce the drying potential of the exterior cladding, and increase the likelihood of problems. Keep plants and shrubs away from exterior walls.
Doors	Annual	Doors should be checked in order to assess the hardware, and the perimeter seals. Poorly operating mechanisms or weatherstripping should be repaired or replaced.
Cladding	Annual	Visually observe the condition of the exterior materials, looking for any signs of damage or deterioration.

Notes:

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## Photographs



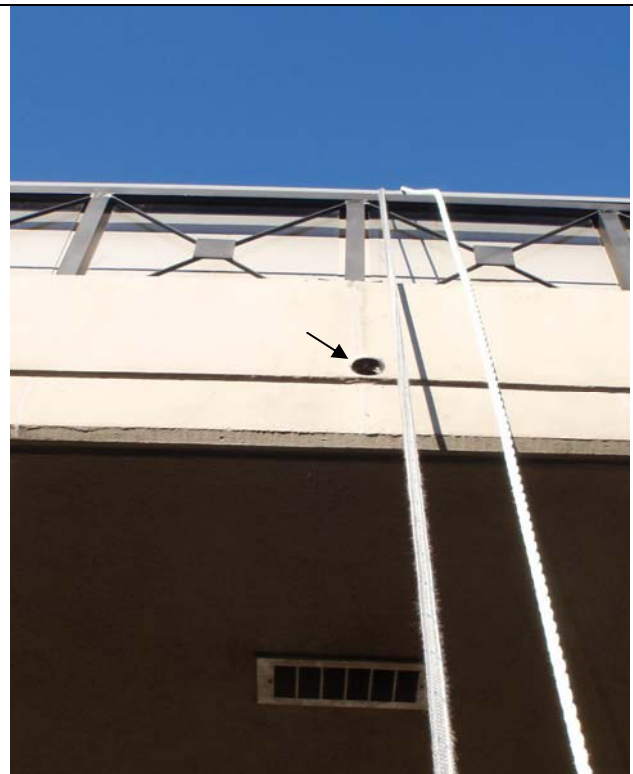
**Photo # 1 – Sealant separation at gumlip flashing**



**Photo # 2 – Organic growth on concrete wall**



**Photo # 3 – Peeling of balcony membrane**



**Photo # 4 – Missing scupper drain pipe**

## Photographs



**Photo # 5 – Spalling concrete patch**



**Photo # 6 – Exposed corroded rebar**



**Photo # 7 – Faded paint and hairline cracks**



**Photo # 8 – Efflorescence staining below eyebrow**



## Photographs



**Photo # 9 – Peeling paint at concrete eyebrow**



**Photo # 10 – Peeling paint at mechanical room**



**Photo # 11 – Peeling paint at upstand wall cap**



**Photo # 12 – Loose gasket at window mullion**

## Photographs



**Photo # 13 – Bent dryer vent screen**



**Photo # 14 – Corroded vent covers**



**Photo # 15 – Crack in parkade ceiling**



**Photo # 16 – Corrosion at fireplace vent**



North Elevation

Organic growth on back of  
concrete arch

Missing scupper pipe

Sealant separation

Organic growth and  
peeling paint on top  
of upstand walls.  
Common.

Staining at  
soffit vents

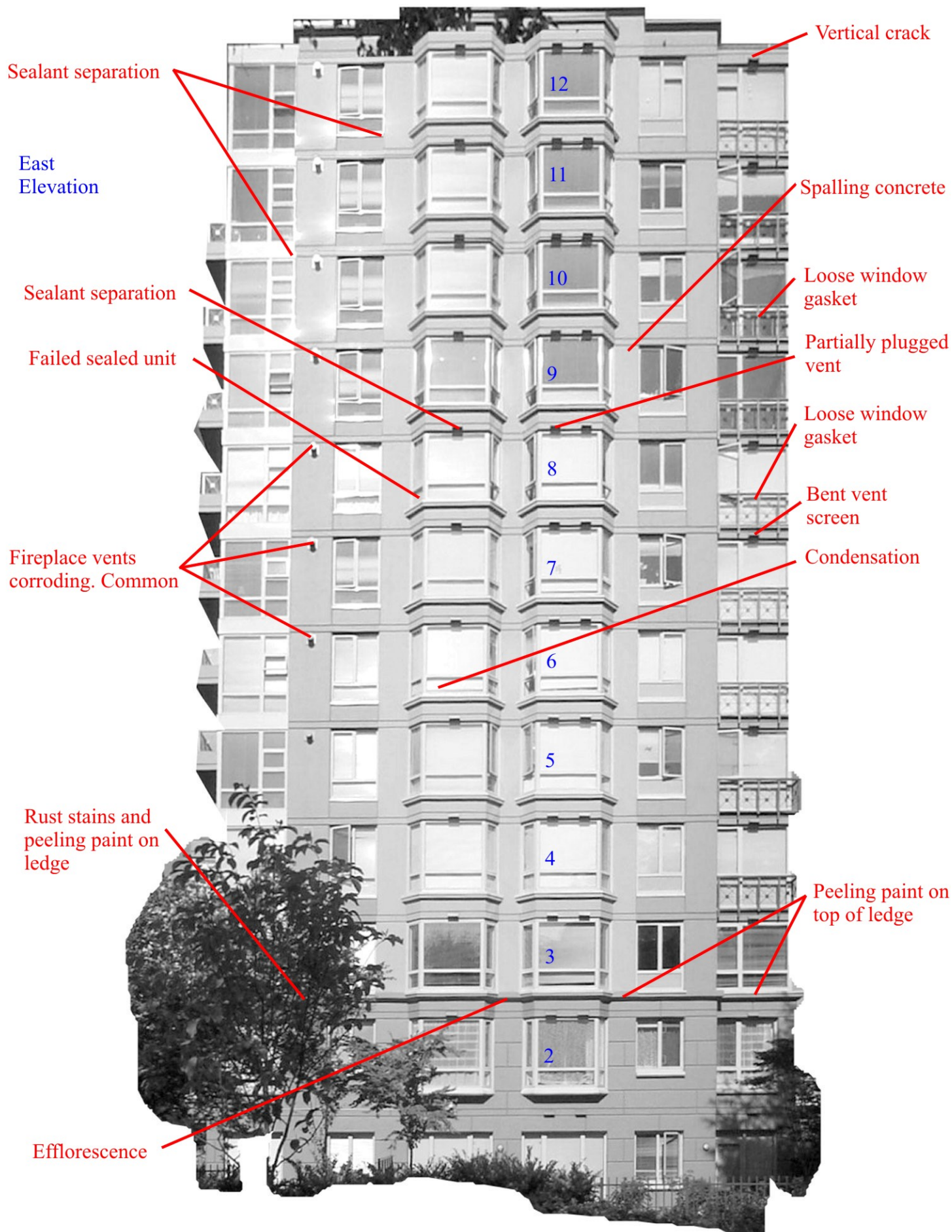
Crack in reveal

Exposed rebar and  
peeling paint

Organic growth

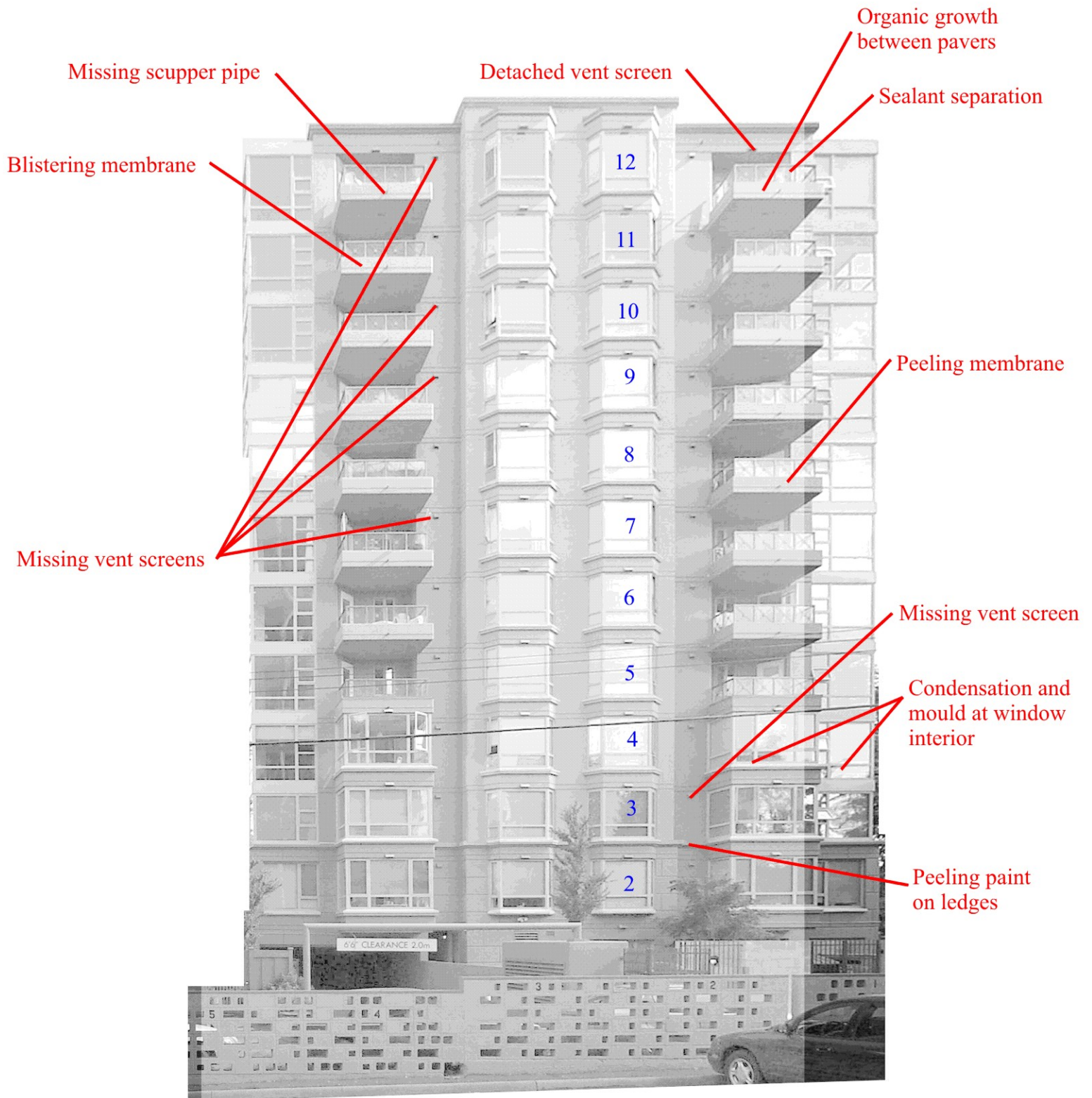
Staining at  
soffit vents







## South Elevation



West  
Elevation

Loose gasket

Sealant separation

Fireplace vents  
corroding. Common

Loose gasket

Sealant separation

Organic growth  
on ledge

Sealant separation  
at flashing  
termination





## Avoiding Condensation Problems



Homeowner  
Protection Office

Have you ever noticed water droplets on your window or black staining on the drywall of your walls? Have you ever wondered why the moisture returns around your windows after you have wiped it away? This type of moisture is from the interior air and is commonly referred to as condensation.



Condensation forms first on the coldest surfaces of a room, usually on glass surfaces of windows and doors.

### What is condensation and how does it form in my home?

Condensation occurs in your home when moist air comes into contact with a surface which is at a lower temperature. Moist air contains water vapour — commonly referred to as humidity. Indoors, we can increase humidity through our activities and lifestyle. If a surface in your home is cold enough, the air in the immediate vicinity of the surface will be cooled sometimes causing the moisture in the air to condense or change into a liquid on the surface.

Condensation forms first on the coldest surfaces of a room, usually on glass surfaces of windows and doors. These surfaces are typically cooled by lower exterior temperatures during the winter months much more easily than the walls which are kept warm by insulation. For example, if it is cold enough outside and/or warm and humid enough inside, condensation may occur on or around your windows resulting in fogging, water or ice on

the windows themselves or even a puddle of water on the window frame or sill. Other examples of condensation in your home can include damp spots or mildew on outside wall corners, closet walls or baseboards. Areas of your home with poor air circulation, such as behind furniture or in a cupboard or closet, can also be susceptible to condensation.

**If a surface in your home is cold enough, the air in the immediate vicinity of the surface will be cooled sometimes causing the moisture in the air to condense or change into a liquid on the surface.**

A small amount of condensation appearing on a surface may not necessarily be a problem, depending on the amount of moisture that forms,

### 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-rise 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-ops, 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 in partnership with Canada Mortgage and Housing Corporation and Polygon Homes Ltd.



As a general rule, steps should be taken to avoid condensation problems wherever possible as moisture can lead to damage.

how long it stays, and whether it accumulates on surfaces that can be damaged by water. Condensation can be short-term during a severe cold spell, or occur in a localized area such as kitchen, bathroom or laundry room.

In many instances, condensation moisture simply evaporates back into the air once the surfaces warm up or the moisture source is reduced. An example of this is moisture that condenses on a bathroom window during a shower and quickly disappears shortly after the shower is turned off. However, as a general rule, steps should be taken to avoid condensation problems wherever possible as moisture can lead to damage.

Taking preventative steps to avoid condensation will help prevent problems in the future.



Condensation has led to mould problems on the drywall.

hygrometers

measure

humidity levels

### Why must I avoid condensation problems?

Condensation can cause serious damage to the interior and structural elements of your home or building. If condensation occurs frequently enough and for prolonged periods of time, materials in contact with the moisture may be damaged. Drywall and wood finishes around windows are two examples of materials in your home that can readily absorb moisture and become damaged if they remain wet for a sustained period of time. If left unchecked, condensation problems can cause:

- crumbling or soft spots in drywall
- decay in wood framing or corrosion of steel framing
- peeling paint
- damage to the insulation inside the walls, and
- mould and mildew problems in your home.

Most importantly, taking preventative steps to avoid condensation from occurring in your home will help prevent avoidable and expensive problems in the future.

### Sources of moisture in the home

We add to humidity levels in our home through our activities and lifestyle. Water vapour is added to the air in large quantities by our breathing and perspiration, cooking, bathing, cleaning and other daily activities.

### How we produce humidity in our homes

- A family of four can add moisture to the air equivalent to 30 to 40 litres of water per week
- Showering, cooking, bathing and washing can add 15 to 20 litres per week
- Drying clothes indoors can add 10 to 15 litres per week

Source: Natural Resources Canada



Evidence of problems resulting from condensation can be seen on the interior window sill.

Newly constructed homes may temporarily exhibit a higher potential for condensation as moisture in plaster, cement and other building materials escapes into the air during the first heating season. This elevated level of moisture in the air should taper off after a month or two. If it doesn't, you should inform your building or maintenance manager of the situation.

### What should the indoor temperature and humidity levels be?

Interior temperature and relative humidity is often a matter of personal preference, but exceeding recommended humidity levels for extended periods of time can lead to a higher risk of condensation problems in your home. The recommended relative humidity level varies between winter and summer, and by location.

As a rough "rule of thumb", interior air temperatures should generally be maintained between 18°C and 24°C with relative humidity falling between 35% and 60% for the coastal temperate climate regions of British Columbia during the winter months. In colder and drier regions of the province, interior humidity levels should be limited to between 25% and 40% during the winter months. If you are unsure of the relative humidity in your home, small devices called "hygrometers" can be purchased that will allow you to measure the humidity levels in your home. See the "For more information" section at the end of this bulletin for references to other publications that provide information on how to measure humidity in your home.

Humidity cannot be eliminated from the air altogether. It is needed to maintain a comfortable and healthy interior environment. Without humidity we would suffer from chapped lips and dry skin, sore throats, breathing problems, static electricity, and damage to equipment and furniture. However, if humidity gets too high, problems will arise in your home such as condensation, musty smells, mould growth, allergic reactions and damage to walls and interior finishes.

### How do I avoid condensation problems?

There are number of steps that you can take to prevent condensation problems from occurring in your home.

#### 1) Reduce the amount of moisture or humidity generated in your home

- Do not regularly hang large amounts of clothes to dry indoors. Wherever possible, dry your clothes in a dryer with an outside vent.
- Shut off the humidifier if you are using one.
- While cooking, put a lid on boiling water — it will also boil faster!
- Try to have shorter showers. You will save the energy required to heat the water and conserve on water.
- Ensure the lint trap in your clothes dryer is clean. The lint trap should be inspected and cleaned before each use.
- As much as possible, try to wash full loads of dishes in the dishwasher.
- Do not store wood for your fire place indoors.

#### 2) Promote good air circulation in your home

- Open blinds and drapes so that air can circulate freely over the windows.
- Direct heat towards exterior walls and windows.
- Where condensation at window sills is a persistent problem, remove any objects on the window sill such as books, photographs, and knickknacks as they prevent air from circulating and removing the moisture.
- Move furniture such as sofas and

bookcases so they are not touching outside walls. This will improve air circulation around the cooler outside wall and reduce condensation potential.

#### 3) Promote good ventilation in your home

- Use the kitchen exhaust fan or range hood to remove humidity generated by cooking. Note: the exhaust fan or range hood should be vented to the outside.



Use your kitchen exhaust fan or range hood to remove humidity generated by cooking. The exhaust fan should be vented to the outside.

- Use bathroom fans and humidistats (if you have them) while bathing or showering. Some bathroom exhaust fans are connected to a humidistat that can be preset to ventilate the room when the humidity reaches a certain level, and keep the fan running until the humidity is below that set point. It is important that humidistats be set to the appropriate level and not turned to “off”. If the bathroom does not have a humidistat, the exhaust fan should be left running for a period of time after bathing or showering to remove the excess moisture from the bathroom. The exhaust fan should be vented to the outdoors.
- Some newer homes have a pre-set principal exhaust fan. Ensure that this fan is set to run for two 4-hour periods per day.
- Open windows periodically and

ensure that fresh air intake vents are not blocked.

- Make sure exterior vent hoods for your dryer, bathroom and kitchen vents are unobstructed and operating freely. Clothes dryers that take longer to dry than usual, and kitchen or bathroom fans that seem to not move the air could be signs of some obstruction in the duct or the outlet. Keeping vent hoods and lint traps clear will also reduce the amount of energy required to dry the clothes, thus reducing utility bills. Qualified professionals should be used to carry out this maintenance item.
- Consider upgrading your kitchen or bathroom fans. If you feel that your kitchen or bathroom fans make noise, but don't seem to do anything, you may be right. Some older or cheaper units may not work effectively and tend to be noisy. A simple upgrade is relatively inexpensive and will often dramatically improve performance. Look for units with high air movement measured in cubic feet per minute (cfm) or litre per second (L/s), and a low noise rating measured in decibels (dB) or sones.



Use bathroom fans, and humidistats if you have them, while bathing or showering.

In most cases you can address high humidity and condensation through reducing the amount of humidity generated in your home. Ventilation may only reduce humidity levels if the air introduced into the room is drier than the interior air. When ventilation is not effective at lowering the humidity sufficiently, you may need to incorporate the use of a dehumidifier (or air con-



ditioner) to further reduce humidity levels. However, this should be considered as a last resort after you have taken necessary steps to reduce the amount of humidity generated in your home. Also, dehumidifiers require electricity to operate and, therefore, may be an expensive option for you to pursue.

### Dealing with persistent condensation problems

Condensation is usually a localized problem that you can address by taking the steps described above to reduce the humidity or to promote good air circulation and ventilation in your home. However, if you have taken these steps and continue to experience condensation problems, other problems may exist that are more appropriately addressed by your maintenance manager or a qualified professional. Symptoms related to *persistent condensation* problems include:

- windows that continue to have water droplets or that fog up, frost or get ice build-up, even after you have taken necessary steps to lower humidity levels and prevent condensation in your home
- black staining on the inside of walls, mainly in corners and near the floor or ceiling
- mould or mildew growth
- ice or frost under roof sheathing-boards
- delamination of plywood materials
- damp or moist basement walls or floors

Report persistent condensation problems to your maintenance manager. Persistent condensation problems may relate to air leakage in your home, typically at the base of the wall, (sometimes causing black staining at carpet edges) or at electrical lighting and receptacle outlets, and around windows<sup>1</sup> and doors. This air leakage can allow cold air into the wall assembly and thus cool the wall and increase the potential for condensation. In other cases, it may be necessary to bring warm air to cold surfaces, either by changing the building's heating patterns or by providing dedicated heat sources to problem areas.

Blowing warm air at problem areas has the additional effect of encouraging evaporation at the problem location. In some cases the solution may be to insulate surfaces against cold temperatures, usually by increasing insulation levels in the walls behind the problem areas. The solutions to each of these potential problems, however, must be carried out by qualified professionals and co-ordinated by your maintenance manager.

<sup>1</sup> In some climates, such as central and northern British Columbia, a historical remedy for condensation around windows was to open the window slightly to allow the very dry outdoor air to mix with the relatively humid indoor air and reduce the potential for condensation. This approach is NOT recommended as it can result in condensation and serious damage in parts of the wall that are not visible to the occupants. It also results in a large consumption of energy.

### ACTION PLAN TIPS

- Take steps to avoid condensation problems in your home:
  - Reduce the amount of moisture

or humidity generated in your home. For example, do not hang laundry to dry indoors and take shorter showers.

- Promote good air circulation in your home. For example, open blinds and drapes and move furniture so that it is not touching an outside wall.
- Promote good ventilation in your home. For example, use kitchen exhaust fans, bathroom fans and humidistats as well as consider upgrading your exhaust fans if they are poor performers.
- If a persistent condensation problem becomes evident (after taking the above steps), notify your maintenance manager. A qualified professional may be needed to address the underlying cause of this problem.

### For more information

1. "About Your House" fact sheets on The Importance of Bathroom and Kitchen Fans (CE 17), Measuring Humidity in Your Home (CE 1), Choosing a Dehumidifier (CE 27) published by Canada Mortgage and Housing Corporation (CMHC). Available online at [www.cmhc.ca](http://www.cmhc.ca).
2. "Moisture Problems: Why Should I Worry About Moisture Problems?", published by Natural Resources Canada, EnerGuide for Houses. Available online at [www.ene.nrcan.gc.ca](http://www.ene.nrcan.gc.ca).
3. "Condensation on Inside Window Surfaces" (Canadian Building Digest 4), "Moisture Problems in Houses" (Canadian Building Digest 231), and "Current Approaches for Mechanical Ventilation of Houses" (Construction Technology Update No. 15) published by National Research Council of Canada's Institute for Research in Construction. Available online at [www.irc.nrc-cnrc.gc.ca](http://www.irc.nrc-cnrc.gc.ca).
4. "Best Practice Guide to Wood-Frame Envelopes in the Coastal Climate of British Columbia", published by CMHC and available online at [www.cmhc.ca](http://www.cmhc.ca).
5. See your building's maintenance manual.

Note: This bulletin and others are available on the HPO website.

## promote good ventilation

### 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

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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 carryout 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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