Number 21

MAINTENANCE MATTERS

BC HOUSING RESEARCH CENTRE

Preventing Water Leaks in Your Home

Water damage from water leaks in homes and buildings can be costly and disruptive, and can lead to long term property damages if not addressed promptly and effectively. Maintenance and effective repair strategies can help to avoid water damage claims which are the most common insurance claims for residential buildings.

This bulletin outlines steps that homeowners and occupants can take to help reduce water leaks and minimize the damage that can occur from unexpected water leaks. It will help you identify the water systems in your home, what maintenance is required, and what to do in case of water leaks. This bulletin applies to single-family dwellings, townhouses and multi-unit residential buildings.

For strata corporations seeking information on preventing water leaks, an accompanying bulletin Maintenance Matters No. 20: Managing Internal Water Systems covers the maintenance of building-wide water systems. These include domestic hot water systems, sprinkler systems, boilers and piping for hydronic space heating, and sanitation and drainage systems.

It is essential to use skilled professionals for much of the maintenance work, such as equipment replacements and plumbing connections. In multi-unit buildings, strata corporations may contract a dedicated service provider or skilled professionals to achieve economies of scale compared to individual owners contracting professionals separately.

Maintenance Matters

This series of bulletins and companion videos is designed to provide practical information on maintaining residential buildings. Produced by BC Housing, this bulletin was prepared by RDH Building Science in collaboration with the Condominium Home Owners Association and the Office of Housing and Construction Standards, Building and Safety Standards Branch.

Knowing the Water Systems in Your Home

The first step to prevent water leaks in your home is to understand the potential sources. For this, you must take stock of all systems in your home that use water. These include:

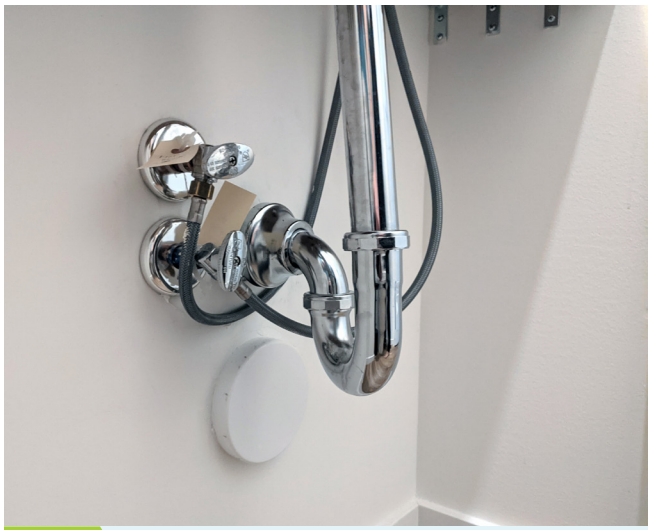
- Plumbing systems
  - › Hot and cold-water pipes, sinks and faucets, toilets, tubs, drains, etc.
- Household appliances with connections to water lines
  - › Dishwashers, washing machines, dryers, fridges with chilled water or icemakers, etc.
- Heating, ventilation, and air conditioning (HVAC) systems
  - › Hot water heating systems, tanks, boilers, etc. (within your unit).

It is important to identify the main water shut off location for your home. Knowing how to access and operate your water shut off before a leak happens ensures you are prepared to act immediately to minimize any damage.

Water shut offs for suites in multi-unit residential buildings are often located in the ceiling of the hallway outside the entrance door or in a utility closet. If you live in a multi-unit building, contact your building maintenance staff or strata representative to find out where your shut off is located. Most appliances and fixtures also have individual shut offs directly at their connections.

An on-demand domestic hot water heater in a home

A main water shut off valve in a single-family dwelling



Most appliances and fixtures also have individual shut offs directly at their connections.

What Can You Do to Prevent Leaks in Your Home?

Water leaks may be prevented by regularly inspecting water systems. Annually inspect your water systems to look for any signs of dampness, discolouration, deteriorating materials, or loose connections. If you live in a multi-unit building, your building's property manager, superintendent, strata council or homeowner's association can tell you what measures are in place to mitigate water damage in your building. Proactive leak prevention measures for water leaks from different sources are described below.

Water faucet for washing machine connection, which may be shut off if needed

Water shut off valve for a toilet connection, which may be shut off if needed

Proactively Managing Water Systems for Homeowners and Occupants

	DO
✔	**DO** take stock of all systems in your home that use water
✔	**DO** conduct yearly visual inspections of all water systems. Turn water shut off valves off and on to confirm they have not seized
✔	**DO** identify the main water shut off location
✔	**DO** create an emergency plan in case of a water leak
✔	**DO** conduct yearly visual inspections of your showers, tubs, and toilets to ensure they are properly sealed
✔	**DO** place drain pans under hot water tanks and heating, ventilation, and air conditioning (HVAC) equipment
✔	**DO** install drain catchers to prevent unwanted debris from going down the drain
✔	**DO** remove vegetation and debris that accumulates in downspouts, rain gutters, and deck and balcony drains
✔	**DO** install water detection sensors to monitor the presence of water around your appliances
✔	**DO** shut off the water supply to your washing machine when you go on vacation
✔	**DO** ensure you have written permission from the strata corporation (if applicable) before allowing a qualified professional to make repairs or alterations to plumbing systems

	DO NOT
✘	**DO NOT** attempt to make repairs or alterations yourself (contact a licenced professional)
✘	**DO NOT** leave the house while any appliance is operating, such as the washing machine or dishwasher
✘	**DO NOT** flush anything other than human waste and toilet paper
✘	**DO NOT** wash grease down the drain
✘	**DO NOT** hang any items from fire sprinkler heads or shut off valves

Leaks from Worn Out Pipes

For homeowners who are responsible for pipe maintenance (e.g. single-family dwellings), the following list outlines possible causes for leaks in pipes and presents techniques to minimize risk of failure. Strata corporations are responsible for pipe maintenance required for common property areas. Please refer to Maintenance Matters No. 20: Managing Internal Water Systems for more information.

- **Plumbing and heating pipes** wear out as they age.
  - › Annually check joints and connections for cracks and leaks. Repair if necessary.
- **Copper pipes** will corrode as they age (depending on the production quality and mineral content of your local water). This eventually leads to pinhole leaks.
  - › If they are over 20 years old, investigate their condition and start a replacement plan.

Exterior faucets should be checked annually for leaks and signs of deterioration

- **Grey plastic polybutylene pipes** have been found to exhibit premature failure. If you have polybutylene piping in your building, your insurance provider may exempt any claims relating to poly pipes or deny insurance coverage.
  - › Replace with copper pipes or a more durable plastic such as cross-linked polyethylene (PEX).
- **Exterior water fixtures** can cause interior water damage if leaks are not addressed.
  - › Annually check outside spigots, faucets, and interior plumbing for signs of cracks or leaks. Repair if necessary.
  - › In the winter, use the shut off valve for each outdoor faucet to turn off the water supply. Leave the faucet on to drain any water throughout the winter and insulate the exterior pipes or install freeze-proof faucets.
- **High water pressure** can wear down pipes more quickly.
  - › If your water pressure exceeds 80 psi[1], consider hiring a licensed contractor to add a pressure reducing valve (PRV) to your water inlet.

Polybutylene piping for domestic hot water in a residential home

[1] The International Association of Plumbing and Mechanical Officials (IAPMO) defines excessive water pressure as pressure measuring above 80 psi in its Uniform Plumbing Code.

Leaks from Appliances

Common household appliances include refrigerators, dishwashers, ice makers, washing machines, sinks, tubs, and toilets. Older appliances, pipes within the strata lot or home, and connecting hoses should be monitored closely as they are more likely to need repair. Even new appliances may be at risk of leaking if they are installed improperly or with poor material connections. To prevent leaks from appliances and water system equipment, it is important to perform the following maintenance **annually**:

- Check appliances for cracks or corrosion. Replace or repair any joints, pipes, gaskets, and hoses that show signs of damage or mineral buildup
- Check fixtures for leaky joints and hoses
- Test all shut off valves by shutting them off and on to ensure they operate correctly. This can be done by the homeowner or a maintenance contractor.

Ensure all hoses that connect appliances to a water source are inspected regularly. Also, inspect braided metal hoses for breaks in the stainless steel protection. Be careful not to cross thread the metal hoses on plastic connectors of appliances.

Dishwashers may leak if they are not level. If a dishwasher becomes unlevel over time (and starts rocking as it runs), use shims or adjustable feet to readjust its position. Do not leave the house while the dishwasher or washing machine is running.

If there is a compatible drain pan for a washing machine, and the pan can be connected to a floor drain, it can catch leaks in the event of a washing machine overflow or hose failure (this can also be applied to dishwashers). In some cases, the drain pan can be connected to a drainpipe to move water away from the area. Keep an eye on the drain pan's condition and replace it periodically because it may break or crack over time. Drain pans may be installed under Heating, Ventilation, and Air Conditioning (HVAC) equipment such as a boiler and are usually installed under hot water tanks. An HVAC safety switch or float switch on the water pan (without a drainpipe) underneath the equipment will automatically stop the system from operating when an overflow is detected. While newer equipment may have a safety switch, older equipment is less likely to have these devices.

Mineral buildup on a sink tap that can cause damage or clogging

Example of a corroded pipe joint

If you are leaving for an extended period (e.g. a vacation), shut off the water supply to the washing machine and dishwasher, as these connections have the highest risk of failing. In-suite or home water heaters should also be turned off. Alternatively, turn off the main water supply (always comply with strata corporation bylaws if applicable). Ensure the main valve is turned off slowly and ensure the taps to the bathtub or shower are both fully open before turning the main water supply back on to prevent a pressure surge. Do not shut off the main water supply if older copper pipes are in place, as negative pressure can induce leaks through pinholes.

Finally, be prepared to replace equipment to prevent leaks. Understand the life expectancy of your equipment. Check with appliance manufacturers for expected lifetimes. Many household fixtures such as faucets and hot water tanks last 10 years, pumps may last 10-15 years, and boilers (e.g. for radiant heating) last approximately[2] 20 years.

Braided metal hoses such as these are far more resistant to leaks compared to standard rubber hoses. Inspect braided metal hoses for breaks in the stainless steel protection

Leaks from Drain Backups

Bathroom

Flushing anything other than human waste and toilet paper can cause toilet blockages. This can lead to sewage water flowing back up the pipes and coming out at the lowest point – usually the shower drain. Many typical household cleaning and hygiene products can create backups in the sewer line if flushed, even the items that are labeled as "flushable" or "biodegradable." **DO NOT** flush paper towels, diapers, hygienic wipes, feminine hygiene products, facial tissue, baby wipes, kitty litter or hair. Only flush human waste and toilet paper. Never leave your home until the toilet has cleared and water flushing has stopped.

To prevent other types of leaks in the bathroom:

- Check the seal and caulking around showers, tubs, and toilets annually to make sure they are watertight and reseal if necessary.
- Reseal the base of the toilet during bathroom renovation work or if a seal is otherwise broken to ensure a good connection and seal with the plumbing stack.
- Use drain catchers to prevent hair and other debris from going down the drain.

Example of sealant around a shower that is in need of replacement

[2] www.bchydro.com/content/dam/BCHydro/customer-portal/documents/power-smart/builders-developers/bch-ncp-workbook-project-name-date-jan-2019.xlsm

Kitchen Sinks

Clogged kitchen drains and in-sink garburators can result in dishwasher drainage backup and potentially overflow of the sink (depending on how the kitchen is plumbed). Grease that is washed down the drain with hot water will solidify once it cools off (either in the drain itself, in the sewer pipe leading to the property line, or in the main city/public sewer). This can cause the line to constrict and eventually clog. Sinks can back up and overflow if they get clogged. To prevent clogging:

- Properly dispose of dairy, grease, and fat by pouring it into a heat-resistant container and disposing of it in a compost bin after it cools off.
- Use drain catchers to prevent food debris from going down the drain.

Outside Drains

Vegetation can create drain blockages by growing into drainpipes and sewers and accumulating debris. To prevent clogging:

- Remove vegetation and debris that accumulates in downspouts and rain gutters.
- Position downspouts so that they direct water away from the building.
- Clear main drain lines that have been blocked by debris and root growth.

Stormwater Backups

If you live in a home with a basement, you may also wish to install and maintain a backwater valve which allows stormwater to go out but not come back in. This can minimize backups. Backwater valves on sanitary sewers are not recommended as they can lead to more clogging of the line itself and require regular cleanout.

It is illegal to drain stormwater management systems to a sanitary sewer because debris and silt will clog your line. This includes building sumps, French drains, and even small stormwater sump pumps in basements and crawlspaces. If you suspect your home uses improper drainage, contact a plumber to inspect and fix the connections if needed. Ensure stormwater systems are inspected and cleaned annually by a qualified technician.

How to Tell if Your Home Has a Water Leak

It is not always obvious if there is a water leak or water damage in your home. For example, if a pipe is consistently leaking at valves or joints it is possible that you may hear dripping, however it might not be noticeable depending on its location.

To check for leaks, annually inspect your home:

- Check **floors, walls, ceilings**, and **basements** for:
  - Damp spots, stains, rust, peeling/flaking paint, rotting wood
  - Seepage around any joints
- Check **bathrooms** for:
  - Toilets that are loose, cracked, always running, or have poor drainage
  - Loose tiles, damaged caulking or grouting around tiles, sinks, and showers
  - Moisture around pipes and toilet tanks
  - Dripping at the shut off valve
- Check **kitchens** for:
  - Slow drainage from sink
  - Loose caulking around sink
  - Signs or smells of moisture under sink vanity
  - Leaking from taps or feed lines
  - Dripping at the shut off valve
- Check **laundry room** for:
  - Proper ventilation and build up of lint in dryer
  - Moisture, dampness or smells of dampness
  - Covered or clogged drains

Stormwater sump. These should not be connected to any sanitary sewer

If you suspect a leak in your home, turn off all faucets and appliances that use water, while keeping the main shut off open. Watch your water meter if you have one. If it continues to increase, there is likely a fast leak somewhere. If the meter doesn't change, refrain from using water for a few hours and check again. An increase in usage would indicate a slow leak somewhere. Monitoring your monthly water usage for steady rises in usage can indicate a slow leak (if water use habits are unchanged). If you live in a multi-unit building, notify the strata corporation.

Catching Leaks Early with Water Sensors

Water sensors, also known as water alarms or flood sensors, are useful devices that monitor the presence of water on surfaces around your appliances. These devices can detect and notify you of a water leak, allowing you to take quick action. Basic water sensors can be found at most home improvement stores or online and range in price between $10 – $150. They should be placed near appliances such as the washing machine, dishwasher, and under sinks. The exposed leads of the sensors set off an alarm when in contact with moisture. In addition to sounding an alarm, Wi-Fi connected devices can notify you even when you are away from home by sending an alert to your smartphone.

Automatic water shut off devices automatically turn off the water supply if a leak is detected. These devices can help prevent further damage; however, these devices must be installed on a building's water main. If you live in a multi-unit building check with your building's property manager or strata council to see if your building is equipped with such a device, or to request that one is installed.

What to Do if You Find a Leak?

Preventative measures such as inspections and water sensors can reduce the risk of water damage, but water leaks may still occur. Understanding what to do in case of an emergency water leak or burst pipe can significantly reduce the cost and long-term damage to your residence and those of your neighbours. Creating an emergency plan is helpful if an issue does occur, as every minute can mean more damage to your home. Make a list of preferred vendors and emergency contacts. If you are leaving your home for an extended period of time, ensure someone is aware and has access to your home. The following table summarizes the steps to take if you have detected a leak in your home or unit.

There are many inexpensive water leak detection devices that sound loud alarms when in contact with liquid water

Some leak detection devices are WiFi enabled and can send notifications directly to your email or smartphone app if a water leak is detected

Steps	Single-Family Dwellings	Townhouse or Unit in a Multi-Unit Building
Have a Plan	Know who to call and what to do if there is a water leak in your home. This may include keeping a list of emergency contacts nearby such as a plumber, insurance provider, home warranty insurance provider, building manager, and remediation specialist. Ensure you have "before" photos of your basement or any other area that could be affected and create an inventory of valuables.	
Shut Off Supply	If you know it is a specific appliance that is causing the leak, check if there is a way to shut off the water to that appliance locally.	
	Turn off electricity to the area where the leak occurred to prevent electric shocks.	
	If you are unable to shut off the water locally at the source of the leak, shut off the main water valve of your home (it is often found by your water meter). Turn on a faucet to drain the water that remains in the pipes.	If you are unable to shut off the water locally at the source of the leak, shut off the main water valve to your unit or floor, or contact your building's emergency line.
Contain	Place a bowl or bucket under the leak. Towels may help reduce water flow, though they will need to be rung out periodically to be effective.	
Damage Response & Emergency Repairs	Immediately call your insurance provider who will send a restoration professional to begin remediation, and a plumber if repairs are needed. The faster the water is removed, the less damage there will be. If you suspect a construction defect contact your home warranty insurance provider to file a claim and get advice on mitigation and documenting the leak.	Depending on the location of the leak and the building regulations or bylaws, either you or your building management or strata council may be responsible for coordinating the damage response.
	Save all receipts related to repairs and cleaning services if they were not from your insurance/warranty provider directly.	
Alert	Alert the residents of the house, and your neighbours depending on the location of the leak and proximity of other homes.	Contact your building's emergency line and alert your neighbours depending on the location of the leak.
Insurance (if not contacted during damage response)	Contact your insurance provider and/or home warranty insurance provider. Take pictures to document the leak and the timeline of events. Compare to your "before" photos and itemize property losses.	
	Review your insurance and home warranty insurance policies.	Review the strata corporation or Homeowner's Association master insurance and common property warranty insurance policies.
Cleaning & Remediation	Water removal, drying, and repairs are typically handled through your insurance provider/restoration professional. Seeking to manage the repairs without professional assistance is not advised, because damage can be pernicious and repairs often require specialized equipment and sensors. Even if the damage/loss is not covered through insurance, a restoration specialist should still be used. Failing to notify your insurance provider may impact future home warranty or damage insurance coverage, and it can expose you to liability. If the water is contained and has not entered structural components or seeped beneath floors and furniture, drying may be appropriate without specialized assistance. Clean any remaining standing water and wet surfaces. Deal with all water damage right away as allowing spaces that trap moisture to stay wet could create health issues due to mould and bacteria.	

What to Do if there is a Storm or Sewer Backup?

A sewer backup occurs when a blockage or pumping problem causes the normal flow of wastewater to back up into a home or onto a property. If this happens, evacuate the area. Sewage contaminants are hazardous to people and animals. If possible, turn off the electrical power to the flooded area and shut off the main water valve. If it is necessary to walk through sewage water, wear protective clothing like a facemask, eyeglasses, gloves, and rubber boots. If you live in a multi-unit building, contact your strata corporation. Notify your insurance provider as soon as possible and notify your municipal authority if you are connected to a public sewer. Do not use any water in your home until the problem is fixed, including toilets. Open windows and doors to ventilate the area. The same precautions should be taken in the event of stormwater backup.

Be sure that a restoration professional is contacted and sent right away to remediate the damage. The affected property should be cleaned immediately to prevent mould or further damage. Handling the contaminated water should be done by a professional. Depending on the affected area, cleanup could include wet vacuuming, mopping floors, wiping walls with soap, flushing plumbing fixtures, steam cleaning, removing wet carpets, repairing or removing damaged wall coverings, and cleaning the ductwork. Ensure all surfaces and fixtures are disinfected.

- Contract a qualified professional for repairs to plumbing systems; do not attempt to make repairs yourself.
- Do not make alterations without a licensed plumber and written permission of the strata corporation.
- Do not use safety facilities such as shut off valves or fire suppression systems (including sprinklers) for support or hanging of materials.
- Do not attempt to manage a water leak or remediate damaged areas without assistance from a restoration professional.

What to Expect from Insurance?

Home Damage/Loss Insurance

Mortgage providers require home insurance for building(s) and common property. “Contents” insurance for possessions within the home may be optional but is always advised. If the damage from leaks or storm/sewer backups is insurable, the insurance provider should be the first point of contact. Insurer’s have emergency claim phone lines operating 24 hours a day, and once notified they will typically be the ones to coordinate the emergency restoration response and plumbing repair if needed. Review your home insurance policy or speak with your provider directly to confirm the most appropriate course of action in the event of water damage. If you live in a multi-unit building, review the strata corporation or Homeowner’s Association master insurance policy. Pay special attention to the insurance policy for exclusions relating to common property and the responsibilities of the strata corporation, lack of regular building maintenance, or extended vacancy in the home.

Water circulation pipes in mid-repair after a slow leak was observed by a wet stain in the drywall

Home Warranty Insurance

New homes in B.C. are covered by a policy home warranty insurance related to construction unless they qualify for an applicable exemption. The 2-5-10 home warranty insurance provides coverage for 12 months for defects in labour and materials (15 months for common property) and 24 months for defects in major systems and violations of the building code (some limits apply).

Read your policy thoroughly and make note of what's covered, the expiry dates, and your responsibilities. Before each expiry date, inspect your home to identify any problems. Strata properties may have different expiry dates for individual units and common property.

If you discover a potential defect promptly submit a claim in writing to both the home warranty insurance provider and the builder. Home warranty insurance coverage may be limited if you do not take timely action to prevent or minimize loss or damage, including the failure to give prompt written notice to the warranty provider of a potential defect, or if you don't adequately maintain your home in accordance with the maintenance information provided by your builder or warranty provider.

More Information

- Maintenance Matters No. 20: Managing Internal Water Systems, available at www.bchousing.org
- BC Government, Strata Housing Repair and Maintenance, visit www2.gov.bc.ca
- Insurance Bureau of Canada, visit www.ibc.ca
- Condominium Home Owners Association (CHOA), visit www.choa.bc.ca
- Vancouver Island Strata Owners Association (VISOA), visit www.visoa.bc.ca
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BC Housing's Research Centre works in collaboration with housing sector partners to foster excellence in residential construction and find innovative solutions for affordable housing in British Columbia. Sharing leading-edge research, advances in building science, and new technologies encourages best practice. The Research Centre identifies and bridges research gaps to address homelessness, housing affordability, social housing challenges and the needs of distinct populations. Mobilizing knowledge and research expertise helps improve the quality of housing and leads to innovation and adoption of new construction techniques, Building Code changes, and enhanced education and training programs. Sign up to receive the latest news and updates from BC Housing's Research Centre at www.bchousing.org/subscribe.

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