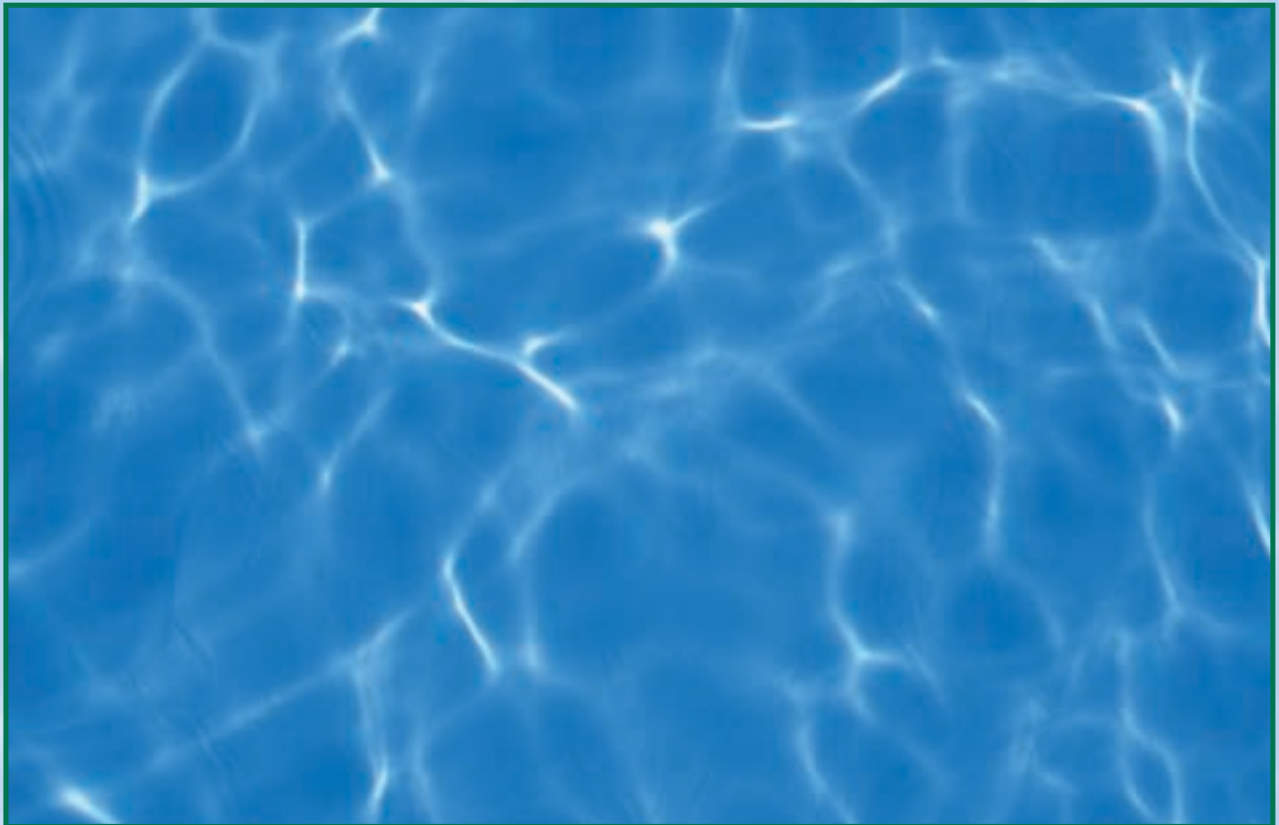


Is Your Home Protected From Water Damage?

A Homeowner's Guide to Water Damage Prevention



**INSTITUTE FOR
Business &
Home Safety**

acknowledgements

Prepared by the Institute for Business & Home Safety (IBHS), an initiative of the insurance industry to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters. IBHS is a non-profit association that engages in communication, education, engineering and research.

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Disclaimer

The purpose of this document is to provide guidance on ways to protect homes against water damage. It contains suggestions and recommendations based on professional judgment, experience and research and is intended to serve only as a guide. The authors, contributors and publisher disclaim all warranties and guarantees with respect to the information in the document and assume no liability or responsibility with respect to the information.

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introduction

This easy-to-use guide has been provided to help you safeguard your family's well-being, to help you protect your most cherished possessions, to help you save money, and to enhance the value of the investment you've made in your home.

Water, in its many forms, is an ever-present fact-of-life if you are a homeowner. Households commonly use - and discard - hundreds of gallons of tap water on a daily basis. Torrents of rainwater must be successfully shed by the roof and walls during thunderstorms. Groundwater travels through the soil beneath the foundation. We control indoor humidity levels for maximum comfort. The house itself absorbs and releases moisture in the forms of condensation and water vapor.

When a well-built home is properly maintained water is a benefit and a pleasure. On the other hand, uncontrolled water in our homes can cause damage, expense and considerable inconvenience. It can lead to mold growth, rotting wood and structural damage. It can also lead to the loss of irreplaceable personal belongings.

This guide includes a [room-by-room reference chapter](#) that [details](#) the quickest ways to spot common types of home moisture problems *before* they become dangerous and expensive. It describes what you can do to prevent moisture problems from developing. And, along the way, it also provides valuable tips, insight and practical advice from building professionals and other experienced homeowners. It's a resource you'll find useful over-and-over, as you live in, enjoy, and care for your home.

We know how important your home is to you and your family, and want to help you to **'take good care of your house, so that your house will take good care of you.'**

How Your House Handles Water

Imagine your house as a living thing. It has multiple ways to resist, absorb and channel excess moisture, as needed, to maintain its well-being, comfort and safety.

It Repels Excess Water

The exterior surfaces of your house, from roof to foundation, make up its 'skin'. The skin is designed to shed or repel excess water. If it doesn't, expect trouble.

When roof flashings, windows, foundation walls, and other building components are not properly maintained, rain-water will find its way into vulnerable parts of your house.

It Absorbs & Releases Excess Moisture

All houses must absorb and release moisture constantly, in order to maintain a healthy balance. If your house has 'breathing' problems, many types of moisture problems can develop.

Trapped moisture - dampness that cannot be released, for one reason or another - is one of the primary causes of fungus and mold growth in a house.

Fungi can literally 'eat' wood, causing decay, rot, and ultimately, structural damage.

Trapped moisture in the walls can destroy the value of your insulation and raise heating and cooling costs.

Wood that stays moist attracts carpenter ants and other insects that can accelerate structural problems.

It Transports Piped Water

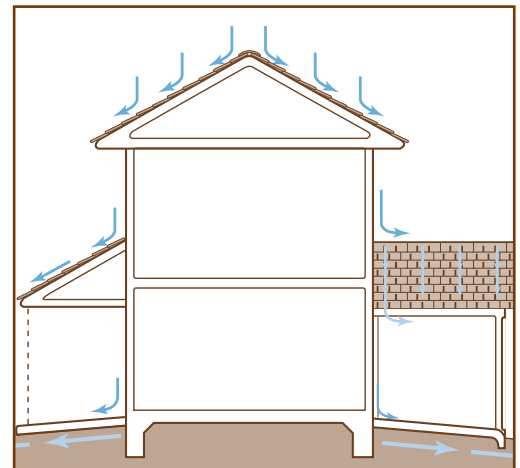
Directly beneath the 'skin' of your house is a complex maze of pipes carrying fresh water into your house and drain lines to dispose of water after its use.

There are dozens of pipe joints and specialized fittings throughout your house, any one of which can develop a leak and cause moisture damage.

It Needs a Firm, Dry Foundation

In almost all situations the best foundation is a dry foundation. A water-damaged foundation is extremely expensive to repair and can lead to damage in the rest of the house.

Ground water, flood water, or even rain-water from a misdirected downspout, can undermine your foundation and cause settling cracks, wet floors and walls, and lead to conditions that can support the growth of undesirable 'bio-matter, including mold.

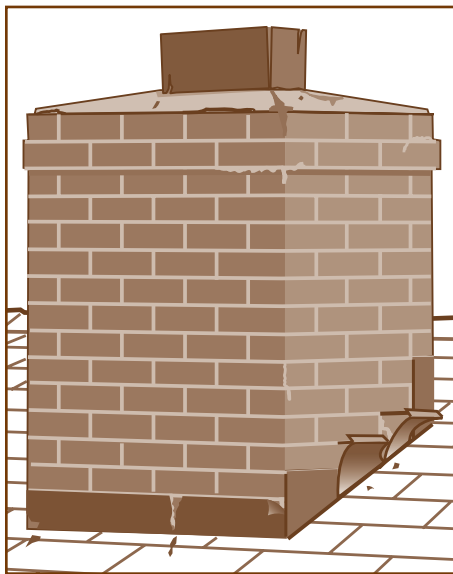


Did You know?
Unwanted moisture in a house is just as damaging as fire, termites, or even earthquakes.

Unwanted water can *intrude* through cracks in the protective skin of your house. It can also *accumulate* from interior moisture sources. The most common causes of both types of moisture damage are included here.

Roof or Flashing Needs Repair

Roofing materials can wear out, break, rust, blow off, or otherwise fail and expose the roof deck and structural components beneath to moisture intrusion and damage.



Most leaks occur around penetrations through the roof, such as at a chimney, plumbing vent, exhaust fan or skylight, flashings and sealant joints around these penetrations can crack, fail and leak.

Old or defective shingles can curl and crack, allowing moisture intrusion.

If old shingles aren't removed before new roof shingles are applied, it can reduce the life of the new roof. Chimney caps can crack allowing water into interior areas of the chimney.

Gutter flashing can fail, forcing rainwater to accumulate between the roof and gutter.

Flat or low pitched roofs have unique maintenance needs and are susceptible to water problems because they

may not drain as quickly as roofs with a steeper pitch.

Flat roof drains or scuppers can clog and hold water on the roof, increasing the risk, not only of a leak, but of a possible collapse of the entire roof under the weight of the water.

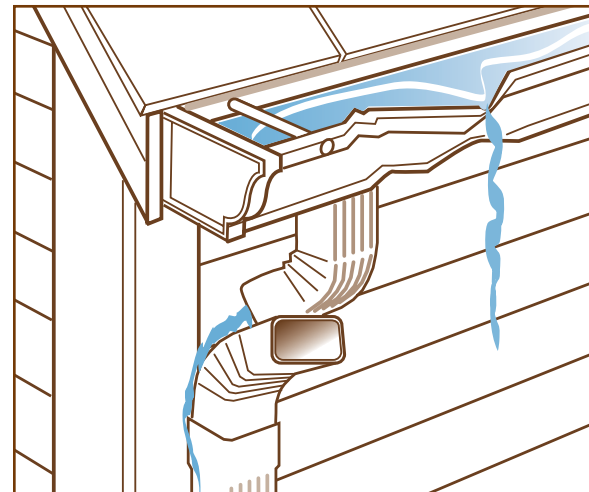
Gutter & Downspout Problems

Clogged gutters can force rainwater to travel up onto the roof under shingles, or to overflow and travel down the inside of the wall.

First floor gutters can overflow if second floor gutters have been mistakenly directed to drain into them.

An insufficient number of downspouts can cause gutters to overflow.

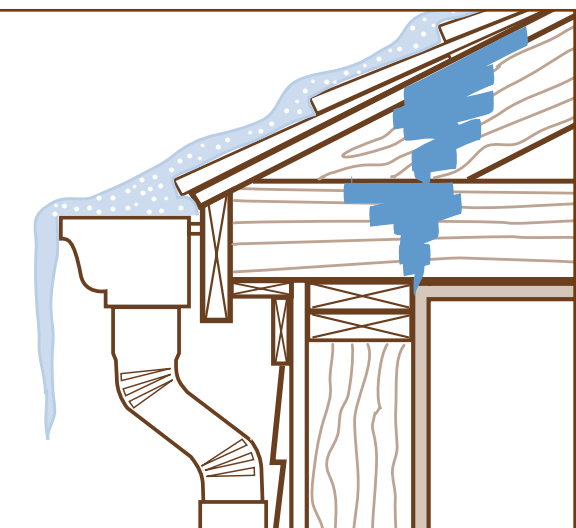
Downspouts that don't empty far enough away from foundation walls can lead to foundation wall damage and a wet basement.



Ice Dams

Inadequate attic insulation and ventilation allows heat to escape, which can turn rooftop snow into an ice-dam along the eaves. Ice dams frequently force moisture to back up under the roof shingles where it can begin to drip into the attic or walls.

Clogged or frozen gutters can act exactly like ice dams, pushing moisture up under the shingles and into the house.



Soffits and Fascias Are Damaged

Damaged soffits (horizontal surfaces under the eaves) can allow snow or rain to be blown into the attic, damaging the insulation, ceilings and walls.

Facia boards (vertical roof trim sections) **are damaged**, allowing the moisture from rain and snow into the attic and atop interior walls.

Weep Holes Become Clogged

Weep holes, which are designed to allow moisture to escape from behind walls, **can become blocked**.

Weep holes can freeze, forcing moisture to back up inside the wall cavity.

Weep holes can become clogged with landscape mulch, soil or other material.

Landscape Grade Changes Have Occurred

Recent landscape modifications may have resulted in drainage toward the foundation, rather than away from it.

A newly-built home lot may have been graded improperly, the original foundation backfill may have settled over time, causing drainage problems.

Automatic sprinklers may be spraying water onto or too close to the foundation walls.

Window & Door Flashing or Seals Need Repair

Cracked, torn or damaged seals, weatherstripping, and flashing around windows or doors can allow windblown moisture to penetrate your house.

Improperly installed windows and doors can allow moisture into the wall.

Failed or worn weather-stripping can allow wind-driven rain to penetrate a *closed* window or door.

Groundwater or Rainwater Collects

Groundwater or misdirected rainwater collects during wet seasons along the foundation wall or beneath the floor or slab. Unless it is directed away from the structure by a sump pump or corrected drainage, this moisture can lead to unwanted growths, wall failure and other destructive moisture problems.

Plumbing Develops Slow or Catastrophic Leaks

Plumbing fixtures, including dishwashers, disposals, toilets, sinks, water heaters, showers, clothes washers, tubs and other enclosures, can have pipe joint or hose attachment failures and develop leaks.

Leaks inside walls may go undetected for some time and result in significant damage.

Kitchen appliances, such as a refrigerator, icemaker or dishwasher, develop water line leaks.

Kitchen backsplash leaks from a worn or cracked seal can carry water into the unprotected wall as well as into the wood that supports the countertop.

Metal piping can corrode internally, or be damaged externally.

Hanging heavy items from pipes can cause a leak or failure.

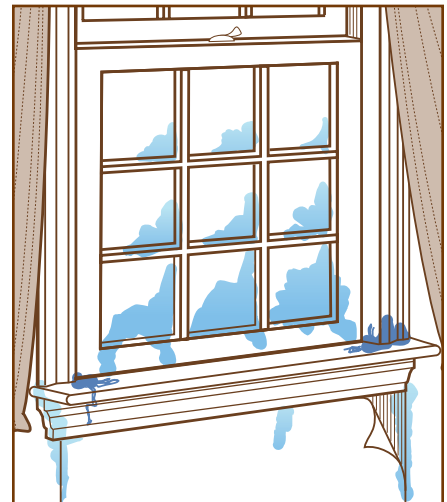
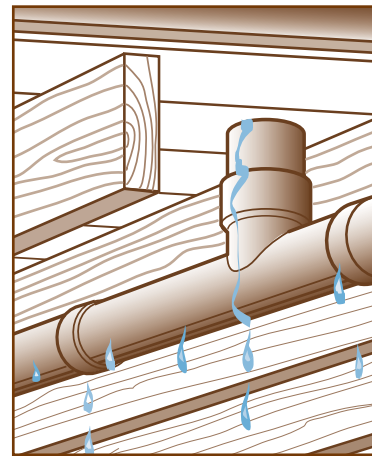
Drains can clog and cause water to back up into the house.

Water heater can have a slow leak or fail catastrophically, causing flooding.

Condensation Forms on Windows, Pipes & Inside Walls

Condensation on windows can, at minimum, damage window sills and finishes. At worst it can damage walls and floors as well.

Condensation on **uninsulated pipes** can collect nearby or travel along a pipe, to accumulate far from the original source.



Condensation can form inside improperly-built walls, and lead to serious water damage and biological growth that is hidden from sight.

Heating & Air Conditioning Systems Need Maintenance

Lapses in regular maintenance can lead to severe moisture and comfort problems, ranging from clogged drain pans to iced-up cooling coils and mold within the system.

Failure to clean and service air conditioners regularly can lead to diminishing performance, higher operating costs and potential moisture problems.

Moist, dusty, heating and cooling ductwork makes a fertile breeding ground for mold.

Unchanged, dirty filters can lead to conditions that support many forms of biological growth.

Sump Pump Needs Maintenance or Replacement

Neglecting to test a sump pump routinely - especially if it is rarely used - can lead to severe water damage, especially when a heavy storm, snow melt, or flooding sends water against your home.

Overload of the sump pump, due to poor drainage elsewhere on the property, can lead to pump failure. Frequent sump operation can be a sign of excessive water buildup under the basement floor, due to poorly sloped landscaping, poor rain runoff, gutter back-flows and other problems.

Lack of a back-up sump pump that can be quickly installed in the event the first pump fails, can lead to serious water damage and property loss. This is especially important if you rely heavily on your sump pump to maintain a dry basement, or if you live in an area of seasonally-high groundwater. Sump failure can cause extensive water damage and the loss of valuable personal belongings.

Moisture Problems: Prevention and Correction

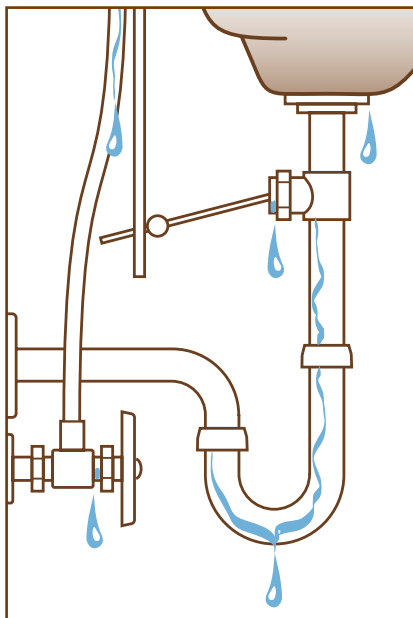
An “ounce of prevention” can prevent “gallons” of potential water leaks and damage – and a regular maintenance program is the easiest way to protect your home and its contents. The following checklists, organized room-by-room, provide you with key early warning signs to help you prevent (or at least minimize) water-related problems and home damage.

What to Look For IN THE KITCHEN

We use the kitchen so much it's easy to overlook the warning signs of excess moisture and impending water damage. Learn to keep an eye out for these all-too-common sources of moisture damage.

Under the Kitchen Sink

Under the sink is not just for storage and the trash can. It is often the starting point for many water-related problems.



Don't ignore a **drip in the trap** under the sink. It's a warning sign of potentially serious drain problems.

Don't allow a **steady drip** at a faucet to continue. Repair it promptly.

Are there **moist or stained areas in or under the wall** where the plumbing pipes penetrate?

Are there large **holes in the wall** with smaller pipes coming through? Fill these holes with

appropriate foams, caulks and sealants.

Is the floor beneath the plumbing penetrations **soft or stained**? If so, find and fix the leak immediately.

Around the Kitchen Sink

The kitchen sink is a high-traffic zone that sees more action than almost any place in the home.

If **backsplash or sink seals are cracked or loose**, have them fixed immediately.

If **countertop tile or grout is cracked**, broken or missing, it's not a minor issue. Fix it.

Under the Dishwasher

This workhorse appliance is often overlooked as a water damage risk.

If the dishwasher **backs-up or overflows** into the sink, there may be a **clogged drain line**. Clean the drain line regularly.

If the **dishwasher fails to completely empty** after use, the main filter and drain may be clogged.

If you sometimes see a **small trickle** under the dishwasher, there could be a **loose connection or leaking water hose**. Check the connection. Tighten, repair and replace as needed.

Find a **small leak** in the dishwasher water supply hose? Replace it immediately.

Behind the Refrigerator

We rarely inspect behind the refrigerator. But a regular check-up will help prevent messy problems.

Moisture behind the refrigerator is a big red flag. If you can't find the source of the problem and repair it yourself, call an appliance repair professional.

Don't ignore even a 'slight' leak or kink in the **icemaker supply line**. Replace it - fast.

If **moldy "things" are growing** underneath the refrigerator, clean them out.

Locate the source of any moisture under the refrigerator. Have the leak fixed.

If your model has a drain pan, **check the pan periodically** and keep it clean to prevent bacterial and other growths.

Beneath the Cooking Range

Another seldom-seen corner of the kitchen.

Empty and remove the **bottom drawer** to inspect beneath the stove. If you see **signs of moisture or mold**, clean the area well.

Locate the source of any **moisture under the stove** and make repairs as necessary.

Exhaust Fans and Filters

Small items that play a big role in moisture and mold management.

Is the range **exhaust filter caked and**

dirty? Clean or replace it to ensure that air can flow freely through the filter.

Is the **exhaust fan covered with dust or mold?** Clean it and make sure it operates properly.

If you have **down-vented indoor grills**, check the filters often. Keep them clean to ensure the free flow of air when needed.

Kitchen-Care Smart Tips



Remind yourself to **treat all sinks** with a **drain opener** and clean out the **disposal drains** on a regular basis.



Make it a point to **vacuum the refrigerator coils** and **clean the floor** under the refrigerator as part of your housekeeping routine. This also helps it operate more efficiently and saves money on utility bills.



Don't forget to use **new hose washers and clamps** when you replace the dishwasher hoses.



Periodically **inspect, vacuum and clean beneath the stove** to prevent accumulation of dust, dirt and food particles. You don't have to move the stove to do this. Just remove the bottom drawer. A flashlight is helpful.



Make it a habit to **inspect under the sink periodically**. Look for any drips from the traps or supply lines, or early signs of moisture stains on the back wall or near plumbing penetrations.

What to Look For IN THE BATHROOM

Here are some regular bathroom checkup tips to help prevent moisture or mildew problems:

Plumbing

Most plumbing is hidden in the walls and serious problems can begin invisibly.

If you hear **tiny drips in the wall**, take immediate action.

If a **wall is moist to the touch or discolored**, there is moisture damage in progress. Get professional help quickly.

If a **wall in an adjoining room** is moist to the touch, there is a growing moisture problem that needs prompt investigation and repair.

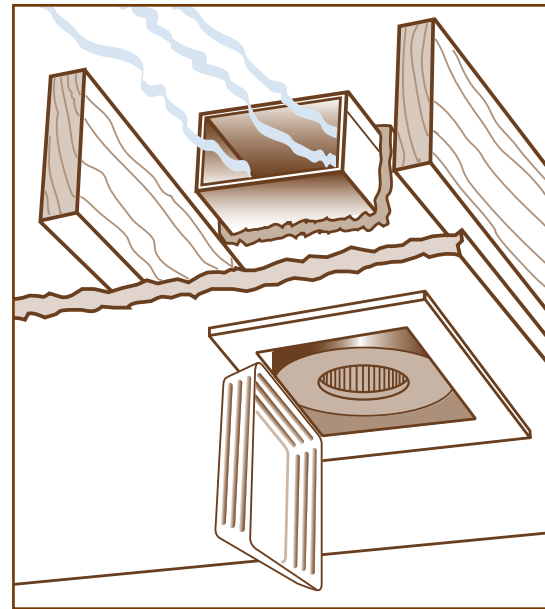
Any visible **leaks under the sink or around the toilet** need to be fixed before they lead to more serious and expensive moisture damage.

Signs of **water damage in flooring** in the bathroom or adjacent rooms are a red flag of a possible water leak. Don't ignore it.

Exhaust Fan

One of the most important tools for moisture management in the bathroom is the exhaust fan.

A **nonfunctioning exhaust fan** overloads the bathroom with damp air. Have it repaired right away.



If the exhaust **fan doesn't come on automatically** when the bathroom is in use, consider having the wiring changed so that it will.

If the **area around the fan isn't clean and dry**, or if dust or any sort of growth has accumulated on the blades or inside the exhaust duct, it may be a warning sign of excess moisture build-up. Clean the fan and area well. Then double-check that the fan is operating properly.

Be certain that the bathroom **exhaust fan vents to the outdoors, not into the house or attic**.

If the exterior vent **dampers don't operate properly** or don't seat well, have them fixed or replaced.

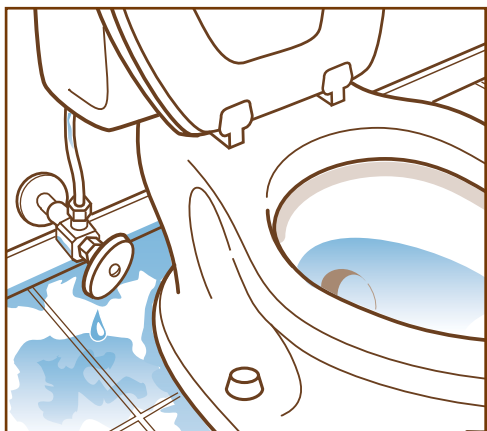
Toilet

The toilet has critical inlet and outlet functions that need to be sealed and leak free.

Make sure there are no **water line leaks**. Fix even small leaks immediately.

Check for **signs of staining or water damage on the floor**. If present, check the toilet rim seal and tank seal immediately.

If the **floor around the toilet seems soft**, structural damage may be occurring. Call a professional.



Windows

Bathroom windows need to perform properly in a wide range of humidity and temperature conditions.

If there are any obvious **breaks in the weather-stripping or seals**, repair them.

Malfunctioning locks and closure mechanisms should not be ignored.

If there are **stains or flaking on the painted surfaces**, they need to be

resealed with a fresh coat of sealer and paint.

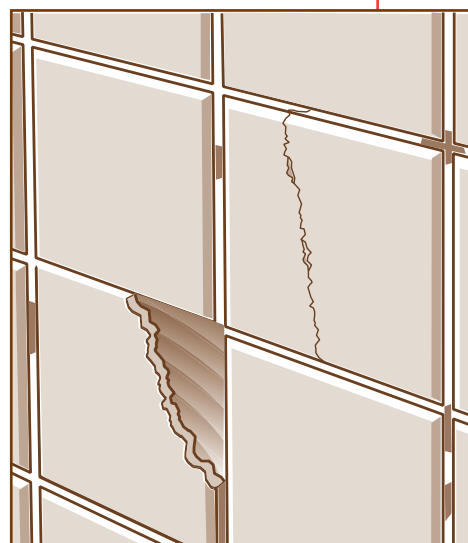
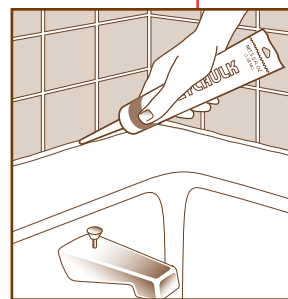
Showers and Bathtubs

Areas that are exposed to this much water need close attention to prevent problems.

If the **caulking is cracked, stiff, or loose in spots**, replace it immediately.

Cracked tiles or missing grout can channel water to vulnerable areas and need prompt repair.

If some **water remains in the bathtub after draining**, it is a warning sign of possible structural weakening in the floor beneath the tub. Call a professional immediately.



Bathroom Smart Tips

💧 **Check the basement ceiling** under bathrooms, the kitchen or laundry area for signs of mold, staining or other indications of uncontrolled moisture.

💧 **Check the supply lines and drain traps** under the sink monthly for any signs of small leaks.

💧 **Treat all bathroom drains** monthly to prevent the buildup of hair and other potential clogs.

💧 **Turn on the exhaust fan while showering** to prevent excess moisture build-up.

What to Look For IN THE UTILITY ROOM

Your water heater and heating, ventilating, and cooling system (HVAC) can be located anywhere, from the attic to the basement, or in a utility room. Regardless of the location, here are the periodic checks you can perform to help reduce the potential for moisture damage and unwelcome growth in these important systems.

Water Heater

The tank should be clean and rust free. **If you find rust developing**, it is often a sign of **imminent tank failure**. Have it checked immediately and, if necessary, replace the old water heater.

If you find **tiny leaks** at the inlet or outlet pipes **turn off the water and power** supply and have repairs made immediately.

The **area around the tank** should be clean and dry. If you find **signs of dampness**, investigate immediately. Early detection of a small leak can help prevent **far more serious damage if the tank ruptures**.

The **bottom drain valve** should be dry and rust free. **If you see rust**, check for leaks around the valve. Check the valve periodically to ensure safe and dry operation.

The **drain pan** or pipe should be clean and free flowing. If the **drain is sluggish**, treat it as you do HVAC drains, with routine cleanouts.

If the tank is gas-fired, confirm that the **exhaust vent and shield** are in place and functioning properly.

Water Softener

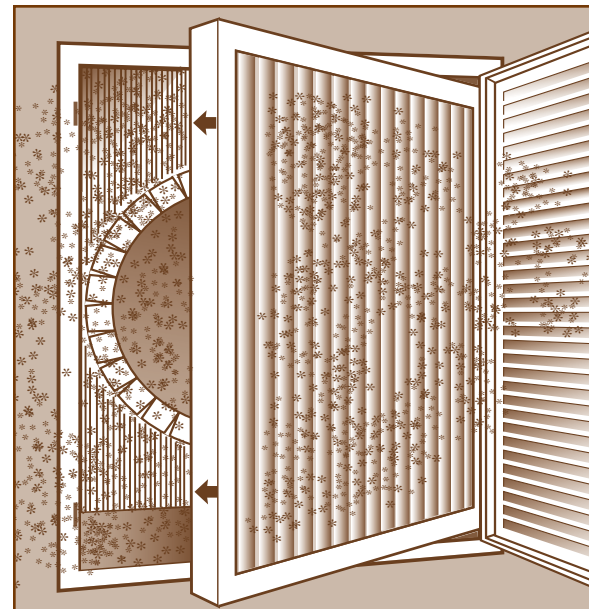
The **area around the tank** should be clean and dry. If there are signs of moisture, check for leaks and have any needed repairs made without delay.

Heating Systems

If your furnace burns oil or gas products, proper ventilation of combustion gasses is essential.

Because most gas heating systems also generate water during combustion, **proper ventilation and periodic maintenance** of your furnace will help ensure that the water is properly vented or drained away.

Check the vents for all gas furnaces, boilers and hot water systems to ensure



proper fit, **absence of rust or holes** and **free flow of exhaust air** to the exterior.

Change your HVAC system filters monthly in order to help reduce **dust and pollutants** in the home and limit any sort of growth that might start there.

Check that all **through-the-wall penetrations** for fuel lines, ducts, and electrical systems are **well sealed**.

All **ducts** should be **clean and dust free**. Inspect the air supply registers in the house for **dust accumulation**. If you see an accumulation of dust, check and replace the filter as necessary.

Periodically vacuum the **supply registers**.

Cooling Systems

Filters, supply lines, exterior wall penetrations, vents, ductwork and drainage systems must all be in good working order to avoid moisture problems.

Regularly check and **clean the cooling drainage pan**. The drainage pan operation is very important because water removal is a key element of cooling system operation.

At season switchover, remove **dust and particulates** that may have settled in the drainage pan over the winter. Pour some hot water with a few tablespoons of bleach down the drain to help clean out the drainage line.

When **replacing the filter** on your air conditioner, take time to look at the

heat exchanger as well. If it looks **dusty or rusty**, take a soft brush and vacuum the surface of the heat exchanger. If it is **very rusty or caked**, call an HVAC professional.

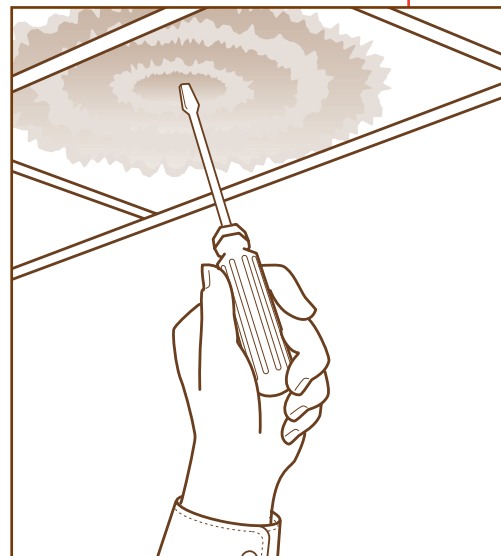
If your **air conditioner coils “ice up”** or if the **A/C runs all the time**, it can be a sign of several problems. Call your local air conditioning service contractor for a system check-up.

Other HVAC Systems

Whole house fans, humidifiers, dehumidifiers, evaporative coolers, radon systems, and other indoor air quality systems need periodic check-ups.

Be sure that your dehumidifier does not have a **clogged drain**. Clean the cooling coils regularly.

Through-the-roof penetrations require careful attention to prevent water damage. Radon and HVAC systems, attic fans and whole house fans must be checked periodically to confirm that flashings and sealants remain in good condition. Check framing and sheathing around these penetrations for signs of **staining or water intrusion**. If you can **see daylight**, you can be certain there is a problem.





Through-the-wall penetrations should be handled with as much care as through-the-roof penetrations. Electrical, plumbing, HVAC, communications, home security, cable, exhaust vents and pet doors can become sources of serious moisture intrusion. Inspect them regularly.


Check the filters, watering pad, reservoir, pump and water connections of an **evaporative cooler twice each month** during the operating season. **Hard water can damage these systems.** Annual reservoir demineralizing treatments and pad replacement are important.


Check the water connections and clean the evaporator pad of a **whole house humidifier monthly.** Replace the pads at the end of each heating season to prevent unwanted **biological growth.**


Utility Room Smart Tips


 Low-cost **carbon monoxide detectors** are one way to help in early detection of combustion gas problems.


 You'll save money on your utility bills if the **heat exchanger and cooling coils** in your air conditioner and heat pumps are clean and dust free. **Use the soft attachment of the vacuum cleaner** to clean heat exchanger and cooling coil surfaces regularly to reduce the potential for molds and other biological growths.


 **Monthly replacement of HVAC filters saves money** on your heating and cooling costs as well as reducing the potential of moisture related growth.


 Keeping all **ductwork well taped and sealed** is still another way to achieve home energy cost savings.

 At the time of **seasonal switchover**, clean any drains that do not flow freely. Vacuum first, then flush with hot water and a few tablespoons of bleach.

 Kitchen, bath and other **exhaust fans should be cleaned of dirt and debris** (such as bird nests) regularly, from indoors and outdoors. While you're doing that, it's a good idea to **oil the damper hinges** and confirm that the damper closes completely.

 Wall penetrations **for the heating and cooling systems** should all be well sealed and insulated.

 **Vacuum and dust the utility room routinely** to eliminate the potential for any sort of mold, mildew or other growth.

 **Drain the water heater tank periodically**, in order to remove sediment.

What to Look For IN THE ATTIC

Make it a habit to conduct this brief inspection every time you go to the attic. If you are unable to inspect your roof easily, the attic will be one of the first locations where roof-related problems will be evident.

Look Up! Roof Pass-Throughs

Inspect each location at which something passes through the roof. These typically include chimneys, plumbing vent pipes, skylight wells, radon vents, etc. If any of the following warning signs are present, consult a qualified contractor immediately.

Does **anything appear wet**? Are there **stains** on the wood – a tale-tell sign of previous leaks? Is it **still moist or cool to the touch**?

Is there a **damp or musty smell**?

Are there any **visible signs of mold or rot**?

Can you see **daylight** through cracks?

Attic vents

In most houses vents are near the gables, eaves, at the soffits or along the peak of the roof. Proper attic ventilation is very important.

Is the **wood and insulation** near the vents dry? That's a good sign. **Moisture or surface discoloration** is a warning sign.

Check that all **vents are well attached** to the walls and roof and are **not loose**.

Remove any **bird nests, insulation or debris** blocking the vents.

Look Down!

Be sure to look down, as well as up, when checking for moisture damage in the attic.

Insulation

Is the insulation still looking **soft and fluffy**? Is it thick? These are good signs.

If there are areas that look **unusually thin or flattened**, it could be a sign of moisture damage. Feel the area. If it is wet, you have a problem that needs to be fixed quickly.

If **insulation** near the eaves and soffits is **not as fluffy and thick** as it is near the middle, it could be a sign of a **damaged soffit or other perimeter leak**. Be sure the insulation does not cover soffit vents. Air needs to be able to flow through the vents.

HVAC Systems in the Attic

Attic HVAC systems and ductwork can be a source for unwanted moisture intrusion.

Inspect the ductwork. **If duct joints are exposed or not well-sealed**, make repairs.

If the **insulation surrounding the ductwork is deteriorating**, replace it.

See more information on HVAC systems in the Utility Room section.

Recessed Lights

You can often spot good clues for the presence of excessive attic moisture around these fixtures.

Inspect all lighting canisters. If the **canisters show rust or corrosion**, it could be a warning sign of a potential electrical hazard in addition to possible moisture intrusion. Consider replacing your older recessed 'cans' with newer, safer ones that are insulated.

If the **wood and insulation** around the canisters is **stained or shows color differences**, it is a clear sign of unwanted moisture. Check above and around these areas for sources of moisture.

Walls Connecting Attic to Basement

Interior partition walls that go from the attic to the basement are often used for electrical, plumbing and ductwork chases that can contain hidden moisture problems.

If **insulation is missing** in the middle of the attic, there may be **unwanted airflow** from the basement to the attic through an interior partition. Be sure to seal off and insulate these types of hidden channels to prevent air and moisture flow.

Attic Smart Tips



When checking or adding attic insulation, be sure that none of the soffit vents are covered or blocked.



Make attic checks routine in summer and winter. **Many moisture problems are seasonal.**



Don't ignore any attic stain. Stains near attic vents are **signs of previous moisture** intrusion through or around these vents. The cause should be investigated promptly, even if the area is currently dry.



Remember to treat an attic air conditioning drain exactly as you would any other household drain. Routine maintenance should include a periodic removal of dust and debris, and a hot water and bleach flush.



Squirrels, mice, bats, snakes and other animals often get into attics through small defects in soffits or vents. They can do additional damage that can lead to moisture problems, so be sure to repair any damaged areas promptly.

What to Look For IN THE BASEMENT

Basements often contain a wide array of the plumbing, electrical, HVAC, communications, waste removal and other systems of your home, which means there's plenty of potential moisture problems. Here's what you should keep an eye on.

All Basements

Sometimes the clues found in the basement can lead to a leak in a bathroom, an attic or even a clogged gutter.

Look for **water trails or stains on basement walls or on the floor** above. Investigate the sources of all such stains or trails.

Water pipes can sweat and this condensation, left uncontrolled, can result in **mold growth, mustiness, rust and rot**. Look for **pipes with beads of moisture** on them. Does the water have a place to go? Insulating all pipes reduces condensation and saves on energy bills.

If your heating and/or air conditioning system is in the basement, check **the drain pans and filters**. If the drain pan has collected dust and debris, or does not drain freely, clean and flush the drain. **Replace the filters monthly**.

Look at all HVAC **ductwork**. Repair any **deteriorating tape, seals or insulation**.

Inspect all overhead floor penetrations from drains, phone lines and other systems. If there is any **evidence of moisture around these penetrations** or if they are not well sealed, locate the source of the moisture and make repairs.

Check all basement vents including the laundry, waterheater and furnace vents and radon and bathroom exhaust fans for any **signs of faulty operation**. **Vent failure is serious**. Repair it quickly.

Repair any **deteriorating seals on openings through the basement walls**, such as dryer vents, plumbing to the outside, exterior electrical outlets, phone and cable connections. If there are indications of **water intrusion or any sort of growth**, locate the source of moisture and make repairs.

Check the **sump pump** if you have one. If the **pump frequently switches on and off, there may be excessive water buildup** under the basement floor or slab. Locate the source of the water in order to reduce the load on the sump pump and lessen the risk of a more serious water problem.

Crawlspaces

Damp crawlspaces are likely places for unwanted moisture and growth.

Be sure that exterior **grading does *not* tilt toward the foundation** walls. If so, make immediate grade corrections.

If **ground is not dry** in the crawlspace, you may need insulation and plastic groundcover to prevent **mold growth and structural damage**.

Check all through-the-wall penetrations and HVAC ductwork for the same problems described above.

Unfinished Basements

Even these types of basements should remain dry.

If **basement walls or floors are wet**, investigate further. Find the moisture source.

Be certain there is a **membrane or plastic on the walls** to help prevent **unwanted moisture penetration**.

If there is **insulation** on the walls or floors, inspect to be sure it's in good condition.

Check the **floor drain** if there is one. Be sure that it drains freely.

Basement Smart Tips



Damp basements attract pests such as cockroaches, mice, snakes, etc., especially during the heat of summer. A healthy basement is one that remains cool, dry and clean.



Do you rarely need the sump pump? In that case you should periodically test it to be sure that it will function properly when you really need it. Pour some water into the sump chamber and test to see if the float switch turns the motor on and that the pump drains the chamber.



If you rely heavily on your sump pump to maintain dry conditions in your basement, consider purchasing a back-up pump that can be quickly installed in the event that the first pump fails. Sump failure can cause extensive damage from an otherwise harmless rainstorm.



Buy a sump pump before the wet season begins. Home supply stores can run out of stock when numbers of area homeowners suddenly realize they need one.



If you live in a flood-prone area, a **backup power supply system** for the pump may be essential.



If you or a neighbor have made **landscape modifications** that have inadvertently diminished or destroyed good drainage, it could be one source of basement water problems.

What to Look For IN THE LAUNDRY ROOM

The recurring warmth, moisture and dust of laundry rooms can invite all sorts of problems. Here are a few warning signs and regular maintenance steps you can take to avoid them.

Washing Machine Connections

Inspect for **tiny leaks in the connections** to both **hot and cold water lines**. Repair even the most 'minor' leak.

Check both ends of the water lines for possible leaks. Replace the small hose washers in the lines if they haven't been replaced recently.

Check for **discharge hose kinks and cracks**. If the hose is brittle or old, replace it.

Hard Water Problems

In areas with **hard or mineral-laden water**, if the **washer is slow to fill**, there's a good chance that the in-line **filter is clogged**. Turn off the water supply and remove the hoses. Remove the small wire filters from the washer inlets, or, if not removable, **use an old toothbrush, cotton swab** or shop vacuum to clean out the clogged filters.

Is there a **steady drip into the washing machine**? Grit has probably damaged the shut-off valve. Repair it yourself or call an appliance repair specialist.

Hoses & Filters

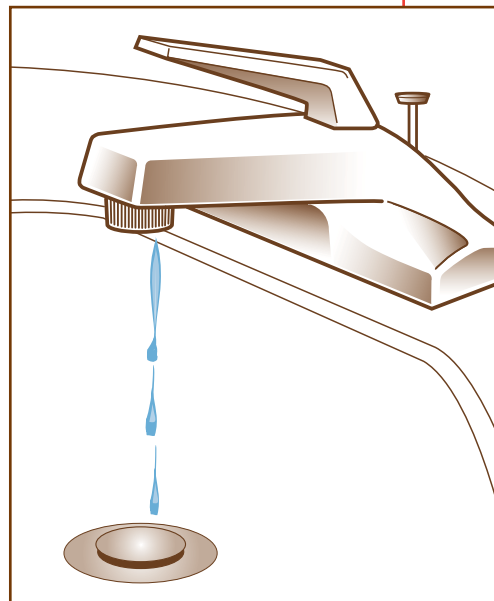
Inspect and **periodically replace all types of hoses**.

When replacing hoses, be sure to also **install new hose washers**.

Utility Sinks

If the **utility sink drains sluggishly**, take steps to remove the blockage.

Watch for any signs of **dripping faucets, water damage to the flooring, or leaks** in the drain-pipe. Do not ignore even a small leak.



Dryer Connections

If the **dryer vent hose isn't tightly connected** to the outside vent, repair the clamp or re-tape to seal.

If dryer **lint is accumulating** behind and under the dryer, the **vent pipe may be clogged**. Check that it is free of debris, both from the inside and outside of the house.

If there are **too many twists and turns** in the line for the dryer to vent efficiently, make the exhaust more short and straight.

Laundry Room Smart Tips

- Give the utility sink **periodic drain treatments** to prevent clogs and promote free drainage.
- If at all possible, **connect the dryer hose in a straight line** with the outdoor vent.
- Metal dryer vent pipes are preferable to the plastic accordion types.
- Hose clamps** and good metal **HVAC tape** can help seal up a poorly connected dryer hose and eliminate excessive moisture and dust accumulation.
- Make it a habit to vacuum** around and behind the washer and dryer routinely.
- Keep the laundry area clean.** **Dust and dirt** combined with moisture can promote unwanted growth.
- Remember to **clean out the dryer lint trap** after each load.

What to Look for OUTSIDE YOUR HOME

To keep the exterior of your home a fortress against the elements, here's what to look for.

Exterior Sidings & Wall Penetrations

Are siding **boards cracked or broken**? Is the **vinyl cracked**? Is **building paper** or **structural sheathing visible**? Repair these damaged areas immediately.

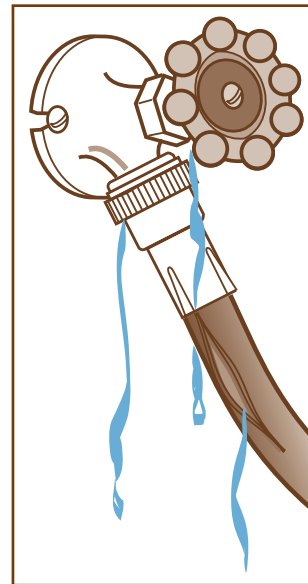
Cracks in brick, stucco, stone or other masonry need further investigation of their cause.

Check and **clean weep holes** regularly to prevent **trapped water behind walls**.

Fix any **damaged exterior hose bibs** that have even **slight leaks**.

Any **open or unsealed exterior wall penetrations**, such as for wiring, plumbing, telephone, cable and HVAC lines should be resealed with appropriate caulk, foam or sealant.

If **exhaust vent doors no longer close snugly** against their gaskets, repair or replace.



If seals along the **wall openings around vents** are loose or no longer pliable, replace.

Repair any **exposed, unstained or unpainted wood** surrounding wall penetrations.

Look for signs of **termite infestation**, or moisture intrusion from earlier termite damage.

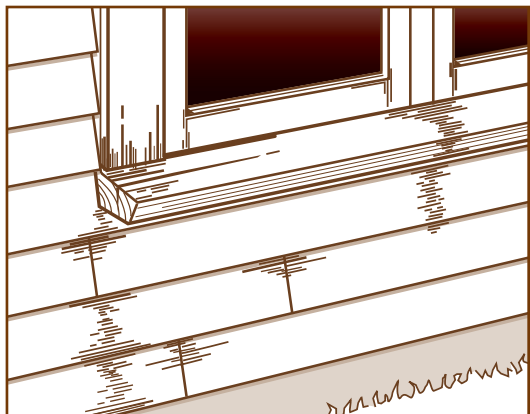
Windows & Doors

Do the closed windows still show **cracks between the sash and frame**? Are they **difficult to open and close**? Clean and lubricate the operating mechanisms.

If **window flashing is loose or damaged**, have it repaired.

If the perimeter **sealants are no longer pliable** and continuous, reseal and caulk.

If there are **signs of moisture accumulation** above or under the windows, check all water management systems above the windows, including shingles, gutters, flashing, siding and soffit vents.



If **doors no longer fit tightly** or the **locks don't hold the door tight** against the seals, the doors may need to be adjusted for water damage prevention and security.

Has the **weather-stripping** between the window sash **broken or worn away** completely? These are vital to both water and air leakage prevention. Replace broken or worn weather stripping immediately.

Good Drainage

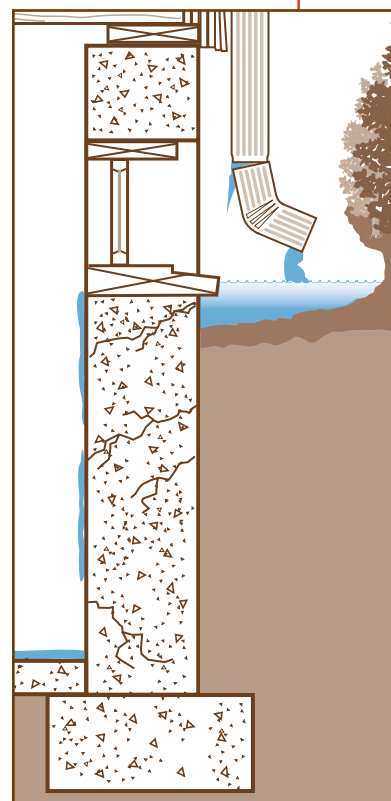
If the **ground has settled or slopes toward the foundation**, add dirt or re-grade to ensure that water drains away from the foundation walls.

If any **downspouts discharge near the house**, connect them to gutter drainpipe that discharges to a daylight opening at least 5 feet from the foundation wall.

Do the **gutter drains** slope toward the house? Make sure they slope away from the house.

Has the **landscaping altered the water drainage**? Landscape to promote positive drainage away from the foundation.

Does the **driveway channel water toward the house**? Re-grade or alter the drainage to carry driveway water away from the foundation.



Regular **driveway maintenance** can help prevent rainwater from seeping into the ground beneath the driveway and toward the house. Be sure to **reseal the driveway** surface regularly to prevent cracking and sinking.

Trees

Tree roots or yard pests can clog drain lines to septic fields and other water management systems. Check periodically to determine if roots have invaded drains.

If any **limbs are so close to the roof** that they could be **holding moisture against the shingles**, have them trimmed or removed.

If tree **limbs brush against the house or windows** during high winds or thunderstorms, have them trimmed to prevent possible **siding, shingle, gutter or window damage**.

Exterior Smart Tips

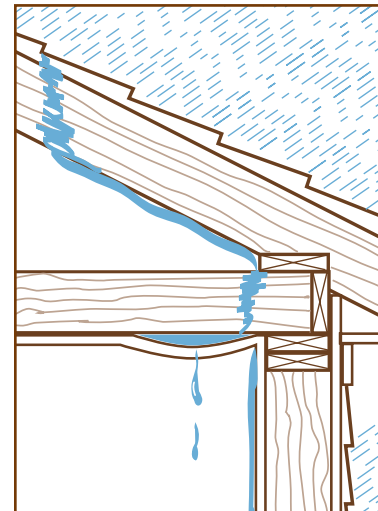
💧 **Maintaining good weather-seals on your doors and windows** translates into energy and money savings and reduced risk of water penetrations.

💧 **In a downspout-related water emergency**, use lengths of inexpensive, flexible plastic downspout extensions to direct the water toward lower ground, far away from the house to protect the foundation walls.

💧 **Walk around the perimeter of your house during heavy rains** to more easily see where gutters, downspouts and drainage systems may not be performing adequately.

What to Look For ON THE ROOF

Most of us have never been on a roof - and many roofs are not safe for homeowners to visit and inspect. The good news is that some warning signs can be seen from the ground, so make it a point to periodically look up at your roof. If you can get onto your roof safely, here's what to look for to reduce the risk of unwanted water intrusion and moisture damage.



Shingles

If the **shingles are worn or curled or missing**, it's time to repair the damaged areas.

If **shingles are over 15 years old**, it may be time to start getting estimates on a new roof.

If the **gutters regularly fill up with shingle grit**, it's a sign of rapid aging and should be investigated further.

On a tiled roof, any **visibly cracked or missing tiles** should be replaced or repaired.

With a **wood shingle or shake** roof, look for **curled, deteriorated, or mossy shingles**. Moss may be a sign of insufficient water drainage and should be inspected by a professional roofer. Have any damaged or missing shakes replaced.

Older **rooftop antennas can literally drill holes in shingles**. Check the foot of your antenna. Has the plate worn away? Is the shaft sitting directly on the

shingle? If so, get a new footplate and reseal the foot of the antenna. Repair any shingle damage that may have already occurred.

Flashings

On-the-roof inspections are best to assess flashing quality or damage, so you may need to call a professional roofer if you cannot easily and safely inspect your own roof.

If the **chimney flashing doesn't appear smooth and intact**, it needs closer inspection.

If the **flashing and sealants have failed** and there are **obvious holes** in the sheathing, or worst case, into the attic, call a professional immediately.

Confirm that the perimeter of any **skylight is well flashed and sealed**.

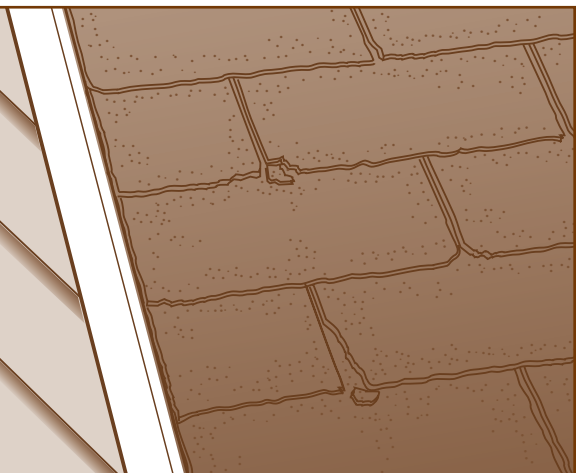
Check the **shingles around the skylights**. If any are curled and cracked, call a professional roofer.

Check the **flashing and seals** on all plumbing stack vents, chimneys, skylights or other roof penetrations. If you find cracks or gaps around these areas, re-flash and re-seal them as needed.

Gutters

Most gutter checks should be conducted from the safety of a ladder on the ground. But, if you can safely access your roof, take a quick look into the gutter.

If the **shingle drip edge** (the metal strip under the first course of shingles above the gutter) is **damaged or missing**, or if the **shingle edges have**



cracked and fallen into the gutter, the edge needs prompt repair.

If you can see an excessive amount of **shingle grit or granules in the gutters**, it's not only a sign of shingle aging, the grit can also **impede the flow of water** out of the gutter. Hose or sweep out the gravel.

If your **gutters frequently fill with leaves and twigs**, consider purchasing gutter shields that allow water in, while keeping leaves and other debris out.

If there is **standing water in the gutters**, the slope of the gutter needs to be adjusted to ensure proper draining to the downspouts.

Membrane Roofs

Flat roofs can create serious water problems if not maintained carefully.

If you see **standing water on the roof**, have the roof looked at by a professional roofer without delay.

If **roof drains are clogged**, clean them immediately *and* make it a point to clean them more often.

If there are **visible cracks** in the membrane, patch them right away.

Inspect and repair any **weak or damaged seals** on through-the-roof penetrations.

Roof Smart Tips



You don't have to actually be on the roof to see large parts of it. Try looking at its various sections from the vantage points of different windows. **Use binoculars for close-ups.**



You may need to **clean your gutters more frequently** than only in the fall, especially if the debris that collects is more dirt-like and decomposing. Gutter clogs can lead to severe **problems, such as winter ice buildup and rainstorm overflows.**

Dealing With Major Water Damage Events

Pipes burst. Toilets overflow. Water heaters fail abruptly. Natural disasters, like windstorms, floods and earthquakes, as well as hurricanes, tornadoes or fire, can occur with little or no warning. When a major or catastrophic water event occurs it's important to respond as quickly as possible.

Why Fast Action Is Important

By taking immediate action you will:

- Reduce the amount of damage and loss of personal belongings and household goods;

- Mitigate the amount of rust, rot, mold and mildew that may develop;

- Lower the likelihood that the water will lead to structural problems;

- Increase your chances of salvaging usable materials from the site.

What To Do After a Natural Disaster

Your first priority **during** a natural disaster is to protect the occupants of your home. Take all appropriate precautions that are directed by your local emergency management officials. Then, address the issue of protecting your home and belongings.

After the threat of physical danger has passed you should begin - immediately - to assess the damage and take the following steps:

- Ensure that it's **safe to venture out** of the home. If you've been evacuated to a

shelter, be sure it is safe to return home.

- Ensure that it is safe to use electrical power. **Water and electricity** are a dangerous combination.

- Ensure that the **natural gas** sources are safely secured.

- Make sure the **home is structurally safe** to enter or reoccupy.

- Secure the building exterior to **prevent further moisture intrusion**. This can include boarding up broken windows, making temporary roof repairs, sealing cracks or tacking down plastic sheeting against open gaps in walls or roofs.

What To Do After Any Major Water Damage Event

- Disconnect all electronics** and electrical equipment in the room. Move them to a safe, dry location.

- Stop the flow of water**, if possible, by turning off the main water supply to the house.

- Contact a plumber or water extraction company, if necessary, for assistance.

- Remove as much **standing water** as possible from inside the home.

- Begin to **remove water-damaged materials** immediately.

- Ventilate** the home to the best possible extent **with fans and/or dehumidifiers**.

Major Water Event Smart Tips

💧 **Carpets damaged with clean water** can usually be cleaned and re-laid over new padding.

💧 **Carpets damaged with dirty water**, such as sewer backup or river sediment, will probably need to be replaced.



💧 **Before hiring a water extraction company** be sure to get an itemized estimate.

💧 **Place your furniture up on blocks** during a major water event. It will help protect the furniture from the water, as well as protect the carpet against damage from wet upholstery dyes, wood and rust stains.

💧 If you live in a house or area where wet basement problems are common, **don't store heirlooms, family photos or important documents in the basement.**

Your Insurance Company Can Help

In the aftermath of catastrophic water damage to the home, your insurance company will work closely with you to help file your claim quickly.

Contact your property insurance company immediately following the water damage event. The company, its agents, or adjusters are your best allies during this stressful time. They will guide you through the process, using their knowledge and experience with many other policyholders that have faced similar problems and disasters.

Maintain close contact with your insurance company throughout the claim and repair period. Working cooperatively and quickly, you will be able to file your claim, repair damages, and benefit from dealing with skilled, caring professionals during what could be a difficult family situation.

In conclusion...

This guide arms you with information that can significantly assist in the protection of your biggest investment – your home.

As you can tell by having looked through this handbook, simple observations and inspections can help protect:

Against the deterioration of your home's value,

Against personal property loss, and...

Against structural damage caused by water.

Developing good home maintenance habits, taking quick action when water damage occurs, making timely repairs, and thoroughly removing excess moisture from your home will help minimize your repair costs and future moisture concerns. A well-constructed and well-maintained home will protect your family and belongings for a very long time.

Remember:
Take good care of your house and your house
will take good care of you!

resources

Whether you plan to hire a contractor for necessary repairs or improvements; if you are the do-it-yourself type; or, if you're just generally interested in learning more about home moisture management, there are a number of excellent resources available to you.

Consumer Directed Resources

We all want to live in and maintain healthy houses. The more you know, the better you'll feel.

Building Science Corporation

www.buildingscience.com/resources/mold/mold_need_to_know.pdf

GLE Associates, Inc.

www.gleassociates.com/mold/homeowners/homeowners.html

Environmental Protection Agency

www.epa.gov/iaq

“A Brief Guide to Mold, Moisture and Your Home”

For Homeowners Working with Contractors

Want help checking out a contractor before hiring; have a home improvement contract reviewed; or learn what a good home improvement contract includes? Start here.

Smart Consumer Services

www.SmartConsumerServices.org

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