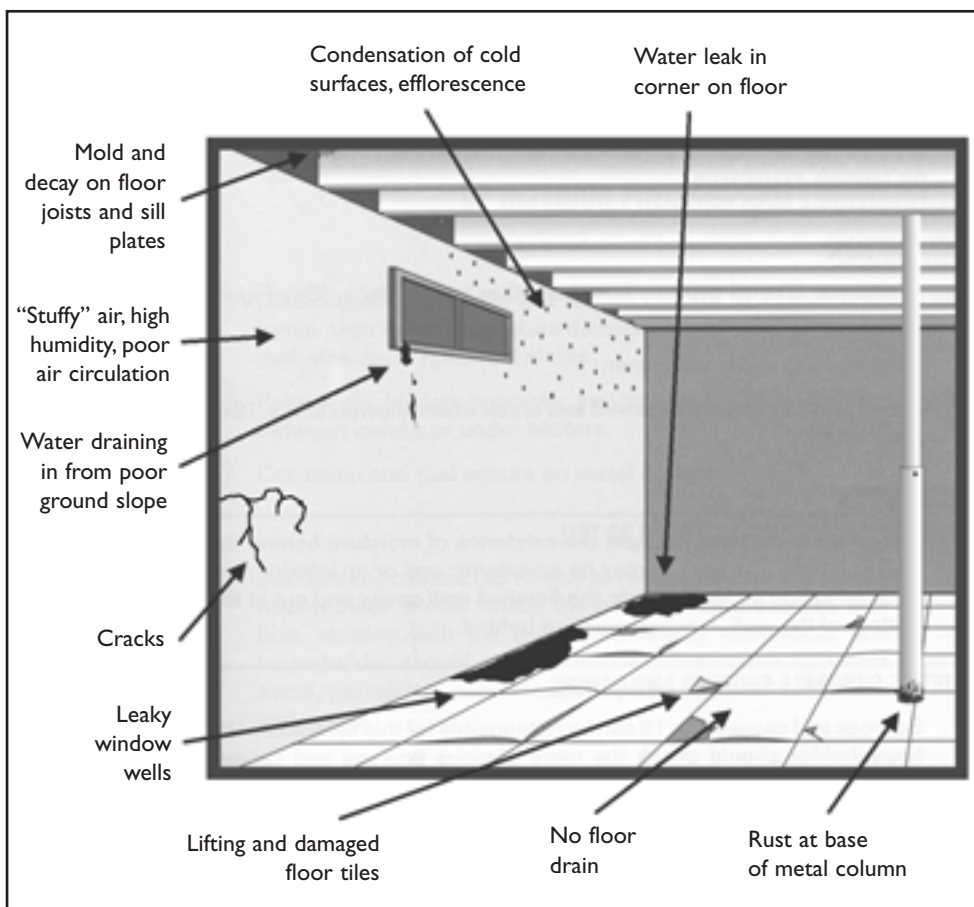


Before You Start Renovating Your Basement—Moisture Problems



Remodelling your basement is one of the easiest and most cost-efficient ways of adding new living space to your house. Besides the traditional recreation room, more and more people are using basements for self-contained “granny flats”, rental suites or home offices. No matter what the renovation purpose, ensuring that the space is clean, dry and healthy is a critical part of the project—and something that must be done before anything else.

Figure 1 Moisture problems to solve

COMMON SITUATIONS

Moisture is the most common problem in basements—either entering from outside sources or being produced inside by the occupants' activities.

The soil around the walls can contain a large amount of moisture from surface water that is seeping down or from a high water table. Water can find its way inside by gravity or through a crack or flaw in the water protection layer of the foundation. Water can also be pulled up by a “wicking action” or “pushed up” by hydrostatic pressure from the soil under the walls or floor. In the summer, warm moist air from outside can enter the house and lead to condensation on the cool basement walls or floor.

Daily activities also produce moisture that can be trapped inside the home.

Basement moisture problems often include:

- Foundation cracks that leak
- Standing water
- Efflorescence (white, chalky stains)
- Wet decaying wood in contact with concrete
- Damp or moldy walls or floor
- Condensation on windows, pipes and other fixtures

- Wet insulation
- Moisture damaged finishes
- Musty or damp carpets
- High humidity
- Stuffy, damp smell

HEALTHY HOUSING™

Renovating is an ideal time to make your house healthier for you, the community and the environment. When renovating your basement, be sure to consider:

- **Occupant health**—cleaning up mold, measures to prevent water and soil gas entry, prevention of spillage from combustion appliances, reducing contaminant exposure in workshops or craft rooms, low-emission materials, effective ventilation
- **Energy efficiency**—effective insulation, moisture and air barriers, energy-efficient lighting
- **Resource efficiency**—energy-efficient, reused or recycled components, durable materials that will last longer
- **Environmental responsibility**—efficient use of space, reusing or recycling construction waste

- **Affordability**—energy-efficient appliances and fixtures to reduce operating costs, improved house durability to protect your investment

HOUSE AS A SYSTEM

A house is much more than just four walls and a roof—it's an interactive system made up of many components including the basic structure, heating, ventilation and air conditioning (HVAC) equipment, the external environment and the occupants. Each component influences the performance of the entire system.

A renovation provides an opportunity to improve how your house performs.

Basement moisture problems can have a huge effect on the durability of the entire house structure and on the indoor air quality (IAQ) throughout the house.

AVOID SURPRISES

Moisture problems are caused by a buildup of various water sources. Whether it comes from surface or ground water that leaks in, water that wicks up or water vapour that condenses, it must be controlled.

The easiest way to control moisture is to stop it from coming in and to exhaust the water vapour produced in the house to the outside. Here are some of the likely situations that people encounter. However, every

situation is unique. You may need to hire a qualified professional to do a thorough investigation, find the moisture problems and suggest the best solutions.

ASK YOURSELF . . .

CONSIDER YOUR OPTIONS . . .

. . . AND IF YOU DON'T

Water drainage

- Do the roof, eavestroughs, downspouts and grading direct surface water away from the house?
- Do window wells drain freely?

- Repair or replace a leaky roof. Ensure that eavestroughs and downspouts with extensions direct water away from the building. Slope the grade away from the house.
- Install drainage below window wells.

- A poor rain drainage system will continue to provide a large volume of water that can leak in or overwhelm basement drainage systems.
- Water may accumulate in the wells, leading to possible leakage into the basement through or around the window.

Foundations

- Does water leak in through cracks in the foundation wall or floor?
- Is there a complete concrete floor?

- Patch small cracks from inside with cement-based material or use an injection-type foundation repair system. Fill large cracks from inside (and outside if possible) with “hygroscopic” material that expands as it dries. Consult a structural engineer or basement specialist concerning multiple, severe or expanding cracks.
- Install a concrete floor over a sealed polyethylene moisture barrier.

- Water may penetrate cracks, continue to deteriorate the existing house, affect IAQ and any proposed renovations. Severe or active cracks may be an indication of future structural problems or even present unsafe conditions.
- Without exterior protection and drainage, water will eventually find its way inside.
- Dirt floors are a huge source of moisture and soil gases.

ASK YOURSELF . . .

CONSIDER YOUR
OPTIONS . . .

. . . AND IF YOU DON'T

Basement flooding

- Are there any pools of water on the floor or damp spots on the walls?
- Is there a working floor drain at the lowest point of the floor?
- Is there a working sump pump in a covered sump pit?
- Has the basement ever flooded?
- Dampproof or waterproof the outside of the foundation walls. Install a perimeter drainage system. Install a floor drain with a trap and a sump pump in a covered pit. Make sure that the sump cover is tightly sealed.
- If future flooding seems unavoidable, do not install interior insulation or finishes that will be damaged by water.
- Without a floor drain, any water spilled inside can't get out. Working sump pumps may help, but open pits can be another source of humidity and soil gases.
- If future flooding is possible, interior insulation and finishes give mold a place to grow and will cause more difficulty and expense in flood cleanup.

Existing problems

- Are there any white, chalky stains (efflorescence) on the walls or floor?
- Are there any black, white or green mold stains or fuzzy growth on the walls or floor?
- Are there any wet or decaying wood windows, sill plates, columns or beam ends in contact with concrete?
- Are floor tiles lifting?
- Are carpets damp or musty?
- Is there any wet insulation, framing or moisture damage on finished walls?
- Provide better drainage and dampproofing to the outside. Efflorescence indicates water evaporation of moisture that has wicked through the foundation wall.
- Clean up mold according to CMHC guidelines.
- Remove the source of moisture.
- Replace decaying wood. Provide a capillary break between wood and concrete. Seek professional advice as damage may compromise structural strength.
- Damp concrete causes lifting floor tiles and damp carpets. Improve foundation drainage. Install a polyethylene moisture barrier over the concrete floor as part of a retrofit floor system. Replace carpets with hard surface flooring.
- Remove wet insulation or finishes. Fix the moisture source before refinishing.
- Continued efflorescence is a sign of ongoing moisture problems.
- Some molds are toxic. Clean up must be done carefully to avoid health hazards.
- Wood in contact with concrete will continue to decay and will eventually result in structural problems.
- Tiles won't stick to damp floors. Damp carpets will continue to be a haven for dust mites and mold.
- Materials that are wet from any source (leaks, capillary action or condensation) will get moldy and decay, leading to unsightly finishes, durability problems and hazards to health.

ASK YOURSELF . . .

CONSIDER YOUR
OPTIONS . . .

. . . AND IF YOU DON'T

High humidity

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> ■ Is there any condensation on windows, pipes or other surfaces? ■ Is the air humid? Does it seem stuffy, damp or smelly? ■ Are basement windows open in summer? ■ Is a dehumidifier or air conditioning used in summer? ■ Is there any ventilation or air circulation? ■ Is the basement heated the same as the main floors? ■ Does a clothes dryer in the basement exhaust outside, using a minimal length of duct? ■ Is wet laundry hung to dry in the basement? ■ Is firewood stored indoors? | <ul style="list-style-type: none"> ■ Install energy-efficient windows, insulate cold water pipes and insulate walls (and floors, when possible) to achieve warm surfaces. High humidity plus cold surfaces results in condensation. Keep basements ventilated and heated. ■ In summer, use a portable dehumidifier or air conditioning to reduce humidity. In warm, humid weather, keep basement windows closed. Run the furnace fan continuously to circulate house air. ■ Provide ventilation to get rid of humidity. ■ Run dryer exhausts directly outside. Do not hang wet laundry or store firewood inside. | <ul style="list-style-type: none"> ■ Opening basement windows during warm, humid weather will make basements wetter with no chance to dry out. ■ Adding humidity to already damp basements will only make problems worse. ■ High humidity will result in condensation on cold surfaces. |
|---|--|--|

Storage

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> ■ Are there a lot of stored items in the basement? | <ul style="list-style-type: none"> ■ Get rid of unused items. Store items on shelves. Avoid storing in cardboard boxes that readily absorb moisture. Allow air to circulate. | <ul style="list-style-type: none"> ■ Too many stored items, especially on the floor, will allow hidden corners to get even wetter and encourage mold growth. |
|--|---|---|

REWARDS

- Correcting foundation moisture problems can improve the durability of your home and eliminate some dangerous health hazards.
- A dry, clean basement space will provide a good starting point for your other planned renovations.

SKILLS TO DO THE JOB

Some tasks such as a thorough basement cleanup don't require special skills. A homeowner with good fix-it skills may be able to do a lot of the other work too, including:

- Roof, eavestrough and downspout repairs
- Grading and landscaping
- Patching small basement cracks
- Cleanup of small mold patches
- Removing damp insulation, finishes or carpets
- Insulating cold water pipes
- Installing dryer venting
- Installing storage shelves

Hire a professional renovator for exterior, below-grade water protection and drainage problems, large or moving foundation cracks, concrete placement or major structural repairs. You may also need a heating contractor to install heating, cooling and ventilation equipment.

Use the Basement Moisture Problems Worksheet to help you assess problems and set priorities for your basement repairs.

Basement Moisture Problems Worksheet					
Problem	Options	Advantages	Disadvantages	Help required	Estimated cost

COSTING YOUR PROJECT

Exterior, below grade work can be difficult to access and expensive to accomplish. Use the above worksheet to help you assess your options and costs. The cost of essential repairs will depend on varying conditions, including:

- The condition of the existing foundation
- Access to problem areas
- Amount of work required outside, below grade
- Professional help needed

To find more About Your House fact sheets plus a wide variety of information products, visit our website at www.cmhc.ca. You can also reach us by telephone at 1-800-668-2642 or by fax at 1-800-245-9274.

Priced Publications

<i>A Guide to Fixing Your Damp Basement</i>	Order No. 65886
<i>Healthy Housing™ Renovation Planner</i>	Order No. 60957
<i>Homeowner's Inspection Checklist</i>	Order No. 62114
<i>Renovator's Technical Guide</i>	Order No. 61946
<i>Clean-up Procedures for Mold in Houses</i>	Order No. 61091
<i>Cleaning Up Your House After a Flood</i>	Order No. 61094

Free Publications

About Your House fact sheets:

<i>Measuring Humidity in Your Home</i>	Order No. 62027
<i>After the Flood—A Homeowner's Checklist</i>	Order No. 60515
<i>Fighting Mold—The Homeowner's Guide</i>	Order No. 60516
<i>Hiring a Contractor</i>	Order No. 62277
<i>Before You Start Renovating Your Basement —Structural Issues and Soil Conditions</i>	Order No. 62248
<i>Hiring a Home Inspector</i>	Order No. 62839
<i>Sample Renovation Contract</i>	Order No. 62351
<i>Assessing the Renovation Project</i>	Order No. 62246
<i>Renovating Your Basement for Livability</i>	Order No. 64092

©2000, Canada Mortgage and Housing Corporation
Printed in Canada
Produced by CMHC
Revised 2001, 2002, 2003, 2005, 2008

15-04-08

Although this information product reflects housing experts' current knowledge, it is provided for general information purposes only. Any reliance or action taken based on the information, materials and techniques described are the responsibility of the user. Readers are advised to consult appropriate professional resources to determine what is safe and suitable in their particular case. Canada Mortgage and Housing Corporation assumes no responsibility for any consequence arising from use of the information, materials and techniques described.