

Exterior Water Management

Keep It Dry

Water management means keeping outdoor water outside your home. A “belt-and-suspenders” approach to keeping your house dry will avoid mold and expensive moisture-related repairs. The details are common-sense yet often missed. Basements built over expansive soils demand extra attention.



Have You Experienced...

- Musty smells from your crawl space?
- Frequent condensation and icing of windows?
- Areas where paint won't hold up on exterior walls?

These may be signs that rainwater or groundwater is affecting your home.

No Water, No Mold

There have been many news headlines about mold problems in homes—even in recently built homes in sunny, dry Colorado. Mold raises health concerns, although the relationship between mold and health is not very well understood. Mold is also a sign of decay, meaning that any signs of mold growth should be dealt with immediately.

Mold is nothing new—it's around us all the time, in the dirt and in the air. It is generally only a problem when it's actively growing in a home. For that to happen, mold needs water, oxygen, food (organic matter such as wood, chip board, wallboard) and a temperature between 40 and 100 degrees Fahrenheit. Take away any of those factors and mold won't grow. The adage, “no water, no mold,” reminds us that water management practices can be used to control mold.

Capture the Opportunities

A careful approach to water management can provide many benefits:

Health. A dry house lessens the chances for mold and other biological contaminants, in turn creating a healthier living environment.

Durability. Dry building materials will last longer.

Value. Attention to detail as the house is designed and built can avoid expensive water-related repairs in the future and enhance the value of your home.



Drain it Down and Away!

Once wet, many building materials and assemblies tend to stay wet, setting the stage for mold and decay problems. The key is to keep them dry in the first place. That means a “belt-and-suspenders” approach to drainage. Several things must be designed and built to drain:

- **Site.** The lot—including the ground, patios, walks and driveways—is adequately sloped to quickly move water away from the building.
- **Roof.** Proper flashing details are critical to prevent leaks. Adequate overhangs help keep the exterior walls dry. Gutters collect water from the roof and direct it far enough away from the building so it will safely drain away.
- **Walls.** A “drainage plane” directs any water that leaks past the siding, windows or doors back to the outdoors so the wall assembly stays dry.
- **Foundation.** Free-draining backfill next to the foundation directs water downward to a drain at the footing, that in turn takes the water to daylight, sump or underground drains. “Damp-proof” coatings on the exterior of the foundation wall are not a first line of defense. Thought must be given as to how the foundation wall can dry to the inside when it does get wet.



Drainage plane materials include exterior foam sheathing with taped joints (left), building paper and flashing around windows and doors (right). Neither typical wood-based sheathings nor exposed caulk are appropriate choices. Installation details are critical.

Deep Trouble

Many homes along the Front Range are being built on expansive soils. To avoid heaving slab floors, basements in these homes are often designed with a wood-decked structural floor over a short crawl space. A fan is usually installed to ventilate the crawl space with outdoor air.

Colorado studies have shown that these deep crawl spaces can be very humid, more like the Gulf Coast than the Rocky Mountain West. High moisture levels can support mold growth and decay of the structural beams that support the basement floor. A root cause of the humid environments is foundation drainage systems that aren't doing the job. Ventilation system failures compound the problem.

Promising solutions take a "whole-house" approach that integrates water management, moisture control, indoor air quality and energy savings. Recently developed "best practice" design guidelines recommend careful drainage design, a sealed ground cover over the dirt floor, and indoor air rather than outdoor air for ventilating these subfloor spaces. Expect to pay more for a system that works.

Basement floor will be built on top of these joists.



A sealed ground cover (above) helps avoid moisture problems in a deep, subfloor crawl space. A quiet fan exhausting house air via the crawl space (left) helps to control humidity in the crawl space and can serve as part of a whole-house ventilation system.

Crawl space is below this floor.

What's Important?

- Be sure that a drainage plane, with complete window and door flashings, was installed during construction.
- Watch your gutters during a hard rainstorm to be sure they have enough capacity and direct water to a place where it drains safely away from the house.
- Once you're moved in, you have some responsibilities:
 - When landscaping, always maintain enough slope to drain water away from the house. Maintain adequate clearance (at least six inches) between the siding and the earth.
 - If you have a sump pit, install a pump and position the outlet where it can drain away from the house.
 - When irrigating, don't spray water on the house or saturate the ground near the foundation.
 - Periodically check humidity in the crawl space and look for signs of mold growth.
 - Watch for water ponding near the foundation.
 - Watch for leaks of any type (roof, plumbing, etc.).
 - Investigate any signs of dampness or mold growth.

House as a System

A house is more than just a collection of parts. It is a **system** that incorporates heating, cooling, air circulation, lighting and more. If the pieces don't work well together, there will be problems. In a high-performing home, a "whole-house" design approach and quality craftsmanship combine to deliver better comfort, healthier indoor air and energy cost savings in a package that's built to last and hold its value.

More Information

This fact sheet is one in a series. Visit the following Web site for more information about exterior water management or to review fact sheets on other new home choices: www.ColoradoNewHomeChoices.org.

