

Foundations

Ground Zero for Value

Whether your new home has a basement, crawl space or slab floors, the details matter. Foundations can be problem areas. However, properly designed and built foundations can add value to your home. In addition to structural considerations, water management, tight construction and insulation are all important.



Have You Experienced...

- A sense you've left the comfort of your home when you head down the basement stairs?
- Ice on the frames of your basement windows?
- Cold foundation floors?
- A musty smell in your crawl space?

These are all indicators that too little attention went toward the design and construction of your home's foundation.

Basement or Lower Level?

Many people think of basements as dark, chilly spaces. That can result from common building practices such as deep, narrow window wells, metal-framed windows, open combustion air ducts and—in some new homes—no insulation.

As an alternative, think of that space as an attractive “lower level” that can be finished at a fraction of the cost of other living space.

Important factors include:

- **Water management.** A dry foundation is essential.
- **Windows.** Look for the same quality, high-performance windows used elsewhere in the home. It's possible to bring more daylight into the space with exterior grade changes, careful window placement and larger window wells.
- **Tight construction.** Foundation joints, cracks and sump covers should all be sealed. Closed-combustion appliances eliminate leakage and cold drafts from open flues and combustion air ducts.
- **Insulation.** Basement wall insulation lowers heating costs and provides a great comfort benefit. The type of insulating material and where it is placed determines whether insulation increases or decreases the potential for moisture problems.

These approaches can make your lower level inviting and boost resale value.

Capture the Opportunities

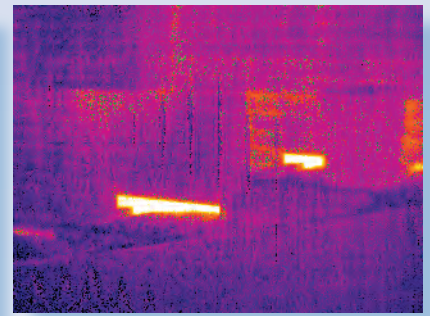
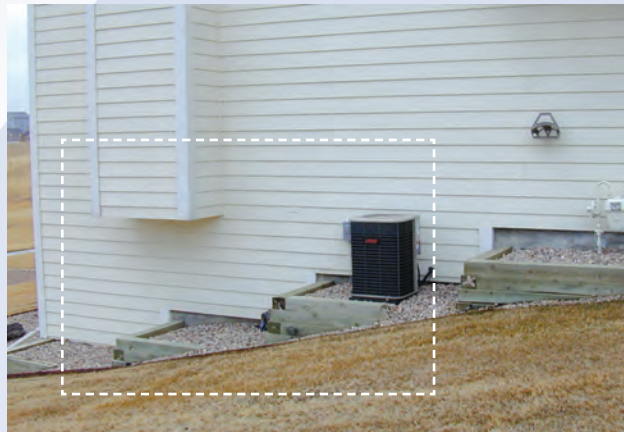
A well-designed foundation can provide many benefits:

Comfort. A basement can be just as comfortable as the rest of the home: warm in winter, cool in summer, with pleasant lighting.

Health. Properly detailed foundations minimize concerns about mold, radon and other pollutants.

Durability. Attention to details can eliminate costly maintenance for moisture-related problems.

Value. Your basement can add attractive living space at low cost. Foundation insulation reduces heating bills. A dry foundation boosts resale value.



The heat loss from an uninsulated basement wall exposed above the ground (left) shows up as bright strips in the infrared photo (right).

In a recent Colorado study, the wintertime air temperature inside uninsulated basements averaged four degrees colder than in insulated basements.



As the result of outdated understanding and insufficient attention to details, many crawl spaces built in the past have not performed well. The left photo shows insulation installation practices that were haphazard at best. New approaches treat crawl spaces as conditioned spaces, with quality insulation work, moisture control and heat delivery (right).

Non-Creepy Crawl Spaces

You might prefer that crawl spaces stay “out-of-sight, out-of-mind.” The conventional approach to crawl spaces has been to try to isolate them from the living space. It hasn’t worked. Cold, moisture and creepy-crawlies have all been common problems.

Fortunately, it’s easy to build a crawl space that performs well. Just like a short basement, a “conditioned” crawl space is water-managed, sealed from the outdoors, has insulated walls,



and intentional heating delivery. The result: a dry, comfortable crawl space that feels like part of your home. Local codes are changing to reflect this new approach.

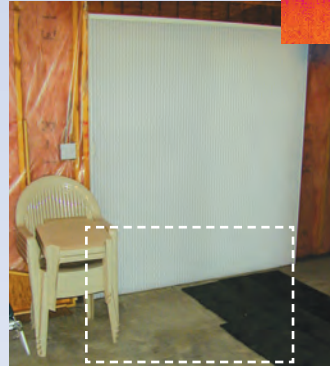
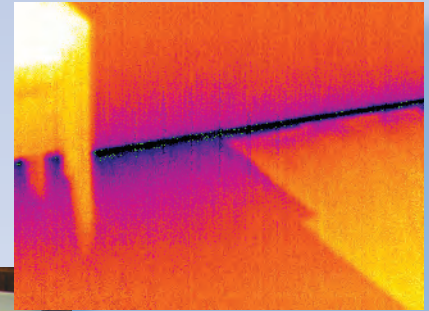
Details are even more important for “deep” crawl spaces, beneath structural subfloors in homes built on expansive soils. See [Exterior Water Management](#).

Sensible Slabs

Some Colorado homes are built entirely on concrete “slab-on-grade” foundations. More often, homes have a portion of slab foundation with a walkout basement or split-level design. In conventional construction, these slab floors have rarely been insulated. The result: a cold floor during the winter. Adding carpet keeps your toes warmer but may encourage condensation and mold growth.

Insulating these slab floors improves comfort and lowers heating bills—and may reduce construction cost, too. If the insulation is placed on the exterior of the foundation, the trapped warmth prevents the ground around the foundation from freezing deeply. If soil conditions permit, that can allow for a much shallower foundation. “Frost-protected shallow foundations” significantly reduce excavation and concrete costs.

If the slab is heated, it’s essential to also insulate beneath it for energy savings.



These photos show the walkout portion of a basement concrete slab floor. The darker colors in the infrared picture (right) show how an uninsulated slab edge wicks heat from the floor during the winter. Slab edge insulation would warm up the floor and reduce heating costs.

What’s Important

- Insist that foundation drainage details and moisture control are properly handled. See [Exterior Water Management](#).
- Think about long-term use of your basement as a “lower level” and plan accordingly.
- If your home will have a crawl space, ask that it be designed and built as a conditioned space.
- Be sure insulation has been installed on the perimeter of all foundations.
- Learn about the multiple benefits of closed-combustion furnaces, water heaters and fireplaces. See [Combustion Safety](#).
- Consider alternative building systems, such as insulated concrete forms or pre-cast foundation systems, as options for foundation walls.

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 foundations or to review fact sheets on other new home choices: www.ColoradoNewHomeChoices.org.

