



IDAHO DEPARTMENT OF  
**HEALTH & WELFARE**

Idaho Division of Health

August 2003

---

**MOLD AND MOISTURE PROBLEMS  
IN CRAWLSPACES**

**Introduction**

Some houses in Idaho and across the country have problems with standing water or moisture in the crawlspace, providing a perfect environment for mold growth and other moisture problems. For mold to grow, three elements must be present—moisture, food, and warm temperatures. A crawlspace generally has all three of these elements in abundance. Of these, moisture is the dominant factor. We cannot control the food source (our home), and we cannot control the temperature, since crawlspaces are below grade and generally are around 60 degrees. We can, however, control the amount of moisture in our crawlspace which is the key to preventing or minimizing mold growth. Causes of moisture and mold problems in crawlspaces may include plumbing leaks, groundwater, high water tables, porous soil near the foundation, condensation, poor ventilation, lack of rain gutters, and poor drainage or grading.

**Moisture Problems**

Moisture in crawlspaces can contribute to more problems than just mold. It can also result in structural damage from dry rot, potential indoor air quality problems, as well as the presence of termites and other unwanted pests attracted to moisture. Moisture in the crawlspace eventually will raise moisture levels throughout the house and can extend to attics and roof spaces. The extent of the problem depends on how much moisture is present and how often it exists.

**Addressing Moisture in Existing Homes**

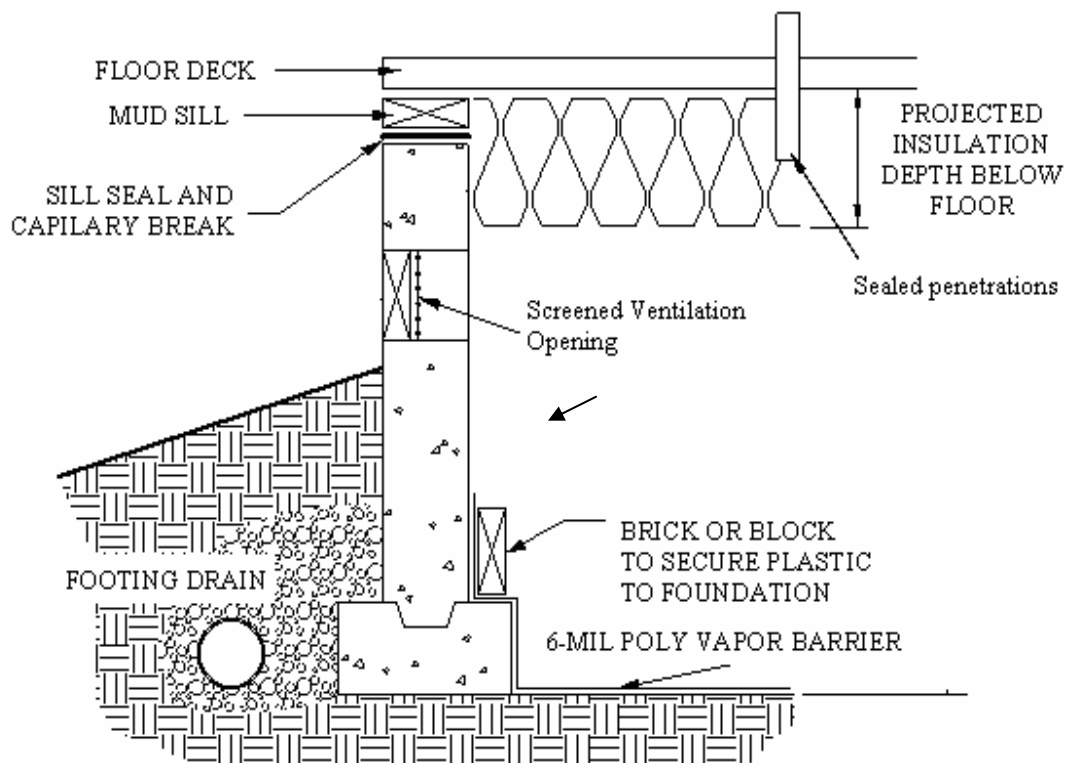
- Regularly inspect your crawlspace for signs of moisture. Promptly fix any leaks and try to control any other sources of moisture.
- Ensure that the entire crawlspace is covered with a plastic sheeting (6-mil black poly or equivalent).
- Be careful when watering lawns and landscaping. Don't allow water to spray the house.
- Avoid using the crawlspace for storage. Stored items may be damaged by moisture. Paper, cardboard, and other organic material can easily become food for mold and mildew growth.
- When ground water is the source of moisture, it may be necessary to create a drain system with a sump, equipped with an automatically controlled pump to remove water from the crawlspace.
- In most areas of Idaho, crawlspace vents should be left open year around to allow the crawlspace to ventilate. However, unless pipes are protected, some homes may be at risk of having pipes freeze and break during cold weather. Under these conditions, it is best to close the crawlspace vents during freezing weather.

**Addressing Moisture During Construction**

- Ventilate the crawlspace. Normal venting requires 1 ft<sup>2</sup> net free area of vent for each 150 ft<sup>2</sup> of crawlspace area. Vents should protect against access by animals and other pests.
- Slope yards to drain away from all sides of the building (recommended minimum of 6" drop in 10').
- Cover the entire crawlspace with a plastic sheeting (6 mil black poly sheeting or equivalent) and overlap about 12 inches at the seams and up the sides of the foundation walls.

- Install footing drains whenever the building is located on poorly drained (clay type) soils. Footing drains should discharge into an approved drainage system. Roof gutters should not discharge into footing drains.
- Install gutters and downspouts that drain runoff from the roof away from the foundation.
- In high risk radon areas - - or where other ground contaminants may be present - - additional preventative measures may be necessary to reduce the potential entrainment of soil gases into the house (contact the Idaho Indoor Environment Program at 1-800-445-8647 or visit the EPA web site at [www.epa.gov/radon](http://www.epa.gov/radon) for more information on radon resistant new construction).
- Protect water pipes in vented crawlspaces from freezing in cold climates.
- Seal and insulate heating/air conditioning ductwork in vented crawlspaces to minimize energy losses and prevent leaks in the system's return ducts from distributing crawlspace air into the house.

The figure below shows the cross-section of a typical crawlspace constructed to meet modern building codes for a vented crawlspace and incorporating generally accepted “good practice” measures.



### **Cold Climates**

During the heating season in cold climates, warm air in the house rises and leaks out of cracks and openings in the upper portion of the building, creating a slight suction on cracks and openings low in the building. This results in crawlspace air being drawn into the living area of the house through cracks and openings connected to the crawlspace. This commonly is called the “stack” or “chimney” effect. Moisture, mold, radon, and other contaminants in the crawlspace air are, therefore, transported into the house. To help reduce this effect:

- Seal floor penetrations to minimize connection to the crawlspace;
- Seal unintended openings in the upper portion of the building; and
- Ensure heating/air conditioning ducts routed in the crawlspace are thoroughly sealed.

### **Crawlspace Alternative**

Power venting is an option to control migration of air from the crawlspace to the building. By thoroughly sealing the crawlspace vents and continuously exhausting air out of the crawlspace with a fan, the crawlspace can be effectively de-coupled from the house. Crawlspace air no longer can enter the house since the “stack” or “chimney” effect is overpowered by the exhaust fan. The idea is not to exhaust a lot of air, but to create a slight vacuum – therefore, a well-sealed crawlspace is important for this option to work efficiently. Codes require at least 1 cubic foot per minute (CFM) of fan powered air flow for each 50 ft<sup>2</sup> of crawlspace area. These fans typically are operated continually.

### **Additional Information**

If you have questions, contact the Idaho Indoor Environment Program at 1-800-445-8647. Additional information can also be found here:

Building Science Corporation – “Moisture Resistant Construction”  
[www.buildingscience.com/resources/foundations](http://www.buildingscience.com/resources/foundations)

Institute for Research in Construction – “Moisture Sources in Homes”  
[http://irc.nrc-cnrc.gc.ca/bsi/83-2\\_E.html](http://irc.nrc-cnrc.gc.ca/bsi/83-2_E.html)

Good Cents – “To Vent or Not to Vent”  
<http://www.goodcents.com>