

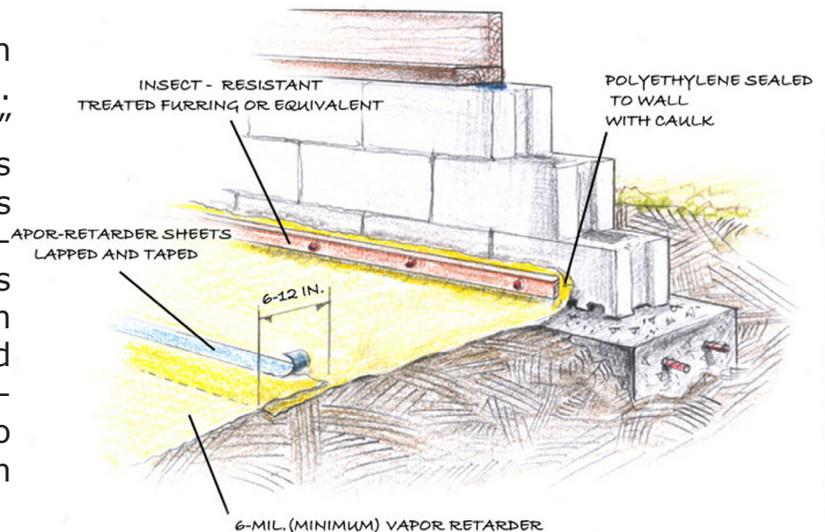


Understanding Your Crawl Space

Crawl spaces are one of those areas in the house that tend to get neglected. The old adage “Out of sight out of mind” might apply here. Unfortunately, this also means that crawl space problems can go unnoticed until they have an effect on the living space above. At this point, a problem that could have been easily remedied may have progressed into an expensive structural or health-related issue. The crawl space can also present a significant hidden energy drain on a home if not insulated properly.

Good moisture control is of primary concern in a crawl space. This starts outside the building envelope, and many problems can be stopped here in their infancy. Gutters are a relatively inexpensive addition to a house that can provide huge preventative paybacks. In a climate with lots of rain, a house without gutters can direct a lot of water against its foundation. Soils, wood, and especially concrete are good conductors of water through capillary action. Picture a paper towel soaking up water—concrete works this way extremely effectively and can carry water great distances. If gutters are not an option, then at minimum the soils around the house should be sloped to direct water away from the building.

Once water reaches the foundation, things get a lot tougher. The structure must be prepared to resist infiltration. Ideally, both concrete and wood foundations should have some form of waterproofing on the outside. If this has deteriorated or was never installed, this may need to be remedied.



Ground vapor barrier detail: Sealing the ground vapor barrier with a treated furring strip and caulking.

Assuming all external sources of moisture penetration have been addressed, the next step is to inspect the interior. With very few exceptions, exposed dirt floors should be covered and well sealed with a continuous vapor retarder such as polyethylene with a minimum 6 mil thickness. If the floor will receive traffic, then it may be necessary to use either thicker and/or reinforced polyethylene sheeting or an even more durable membrane such as EPDM rubber. Even a dirt floor that looks and feels “dry” can release significant amounts of moisture, especially after heavy rains.

Another important consideration is radon, a cancer-causing radioactive gas that occurs naturally in the earth. The UAF Cooperative Extension Service (CES) advises that if you have never tested your crawl space or basement, cold seasons are the best times to do so. The negative pressures created by combustion appliances, and stack effect in winter time, can bring radon into the home at a higher rate. Although high radon concentra-

tions are considered hazardous, it's possible that remediation after detection can be relatively simple. Testing crawlspaces is strongly recommended in areas known to have soils with radon concentrations. Test kits and information are available through the CES at 907-474-1530.

How well a crawl space is insulated and sealed can affect the entire building envelope. In Fairbanks building codes require foundations to be a minimum of 42" below grade to protect the footings from freezing and frost jacking. Anything above that point could be at risk for freezing during the winter. This can mean serious heat losses if the crawl space is under-insulated. Inspect the foundation walls and floor system closely. Particularly in wet climates, improperly installed insulation combined with high humidity levels in the crawlspace can lead to issues with mold and decay. If there are signs of water staining on the foundation walls, or the walls appear damp, then ideally these issues need to be addressed on the foundation exterior, before the walls can be insulated on the interior. If the water infiltration issues cannot be fixed, then insulating and air sealing the floor itself and ventilating the crawlspace may be the best approach.

In wet climates, the decision whether to insulate the floor above, or to insulate the foundation walls is something that must be made on a case-by-case basis by a qualified individual, such as an engineer or building inspector who is familiar with the many different variables that can be involved. For example, in an existing older home insulating the floor may require either properly insulating or moving any plumbing in the crawlspace to protect it from freezing. Additional means to cope with water and moisture related issues may also need to

be addressed before insulating can begin, such as sump pumps and a fan to exhaust air from the crawlspace. Also, any exposed ducting should be inspected to make sure that all seams are sealed and connected. Be sure that exhaust fan piping (such as dryer ducting) doesn't just terminate under the floor, but vents directly outside.

The use of both spray foam and foam board insulation may have certain restrictions or limitations in crawlspaces due to local fire codes. Some brands of foam insulation may meet fire code at a given thickness, while others may not. In addition, it may be possible to use either a coat of fire retardant paint, drywall, or fiberglass insulation to protect the foam board if required. The best source of information regarding current fire code considerations for foam insulations can be found at the local building department. Keep in mind that typically the local fire codes will need to be met if the home is put up for resale and is subject to inspection.

Tomorrow would be a good time to peek under the floor. The crawl space is integral to the foundation of the house, and in some cases the largest source of unregulated airflow into the home. It is not a good place to let moisture, poor air quality, or bad insulation practices go unchecked.

For a video on "Maintaining your crawl space" visit <http://www.youtube.com/user/ColdClimateHousing> and click on the Your Northern Home playlist.

Other homeowner resources can be found at <http://cchrc.org/yourhouse>

For questions or comments please contact CCHRC at (907) 457-3454 or info@cchrc.org.