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Insulating Floors And Basements

Insulate all floors in living areas over unheated spaces, including crawl spaces, unheated basements and floors over unheated garages to a minimum value of R-11 and to R-22 in cold areas. The insulation will make your home more comfortable and will save money on your heating bills.

In a house with an unheated crawl space or basement, you might want to insulate the floor directly. However, if heating ducts are located in this space, they also should be insulated.

If a house has a crawl space, it may be more economical to insulate the crawl space walls (Fig. 1). With this approach, less insulation will be used, and ducts will not have to be insulated. However, close attention must be paid to installation of a vapor barrier on the ground and proper ventilation of the crawl space.

Houses with either heated or unheated basements also will lose heat through the foundation. If applying insulation to the exterior side of basement walls, extend the insulation at least as far down as normal winter frost penetration. It is a simple addition to incorporate insulation to the inside wall surfaces in a basement remodeling plan.

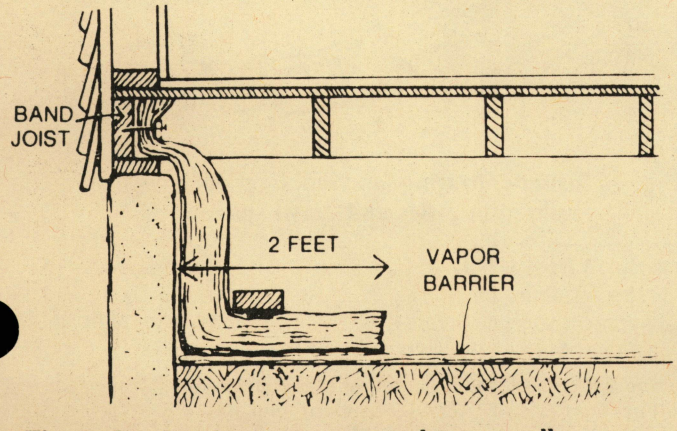

Fig. 1. Insulate basement or crawl space walls.

Concrete slab foundations are difficult to retrofit with insulation. Proper slab insulation should be installed during construction by placing a 2-foot-wide strip of rigid insulation around the perimeter of the slab forms and pouring the concrete over it. The best measure a homeowner can take against an existing poorly insulated slab foundation is to install a thick insulating pad under the rug.

Insulating Floors

Batt or blanket insulation should be installed between the floor joists, which is quite easy to do in most cases. If you are insulating over a crawl space there may be some problems with access or working room, but careful planning can make things go more smoothly and easily.

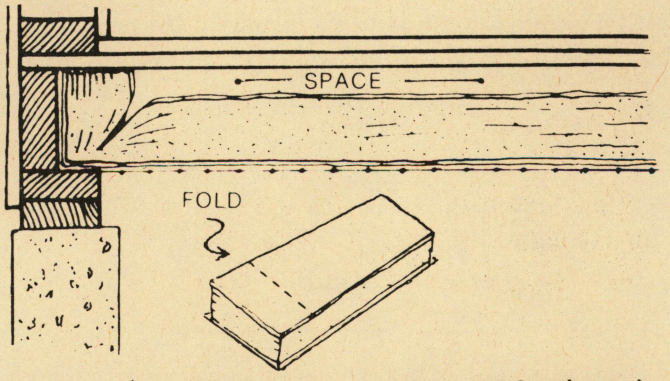

Fig. 2. Leave an air space between the vapor barrier and the floor. Batt ends should fit against the bottom of the floor.

Buy insulation with a vapor barrier, and install the vapor barrier facing up (next to the warm side), leaving an air space between the vapor barrier and floor (Fig. 2). Get foil-faced insulation if possible; it will make the air space insulate better. Be sure that ends of batts fit snugly up against the bottom of the floor to prevent loss of heat. Don't block combustion air openings for furnaces.

The installer should check the floor joist spacing. This method will work best with standard 16- or 24-inch joist spacing. If the joists are spaced irregularly, there will be more cutting and fitting and some waste of material.

Start with a wall at one end of the joists and work out. Staple chicken wire or wire mesh to the bottom of the joists and at right angles to them. Slide batts in on top of the wire. Work with short sections of wire and batts so that it won't be too difficult to get the insulation in place (Fig. 3). Plan sections to begin and end at obstructions such as cross bracings.

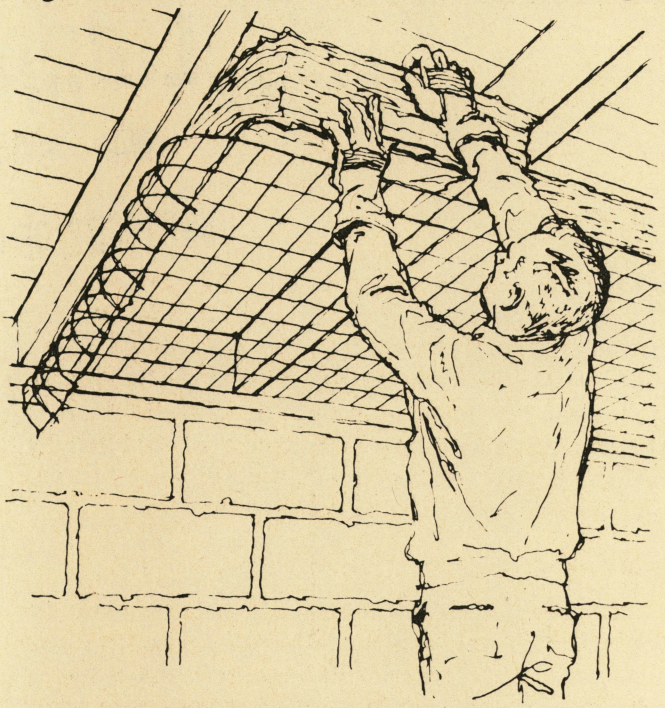

Fig. 3. Use chicken wire or wire mesh to secure ceiling insulation in basements.

Determine the area to be insulated by measuring the length and width and multiplying to get the area.

(length) × (width) = area

_____ × _____ = _____

You may want to divide the floor into smaller areas and add them.

(length) × (width) = area

_____ × _____ = _____

_____ × _____ = _____

_____ × _____ = _____

Total area _____ (includes joists)

(.9) × (total area) = area of insulation

.9 × _____ = _____

Total area = area of wire mesh or chicken wire

Duct Insulation

If the ducts for either the heating or the air-conditioning system run exposed through the crawl space or basement (or any other space that is not heated or cooled), they should be insulated (Fig. 4). Duct insulation generally comes in blankets 1 inch or 2 inches thick. The thicker variety should be used, particularly with rectangular ducts. If you're doing this job at all, it's worth it to do it right. For air-conditioning ducts, make sure you get the kind of insulation that has a vapor barrier (the vapor barrier goes on the outside). Seal the joints of the insulation tightly with tape to avoid condensation. Check for leaks in the duct, and tape them tightly before insulating.

The material you will need is R-11 (3 to 3½ inch) or R-19 (6 to 6½ inch) batts or blankets of rock wool or glass fiber insulation, preferably with foil facing. You'll also need wire mesh or chicken wire of convenient width for handling in tight spaces.

Safety Precautions

Several safety precautions should be observed when working with glass fiber or rock wool insulation. You should wear gloves and a breathing mask to prevent contact with insulation particles. Keep the material wrapped until ready for use.

When working in close spaces, provide adequate temporary lighting and adequate ventilation. Keep lights and all wires off wet ground.

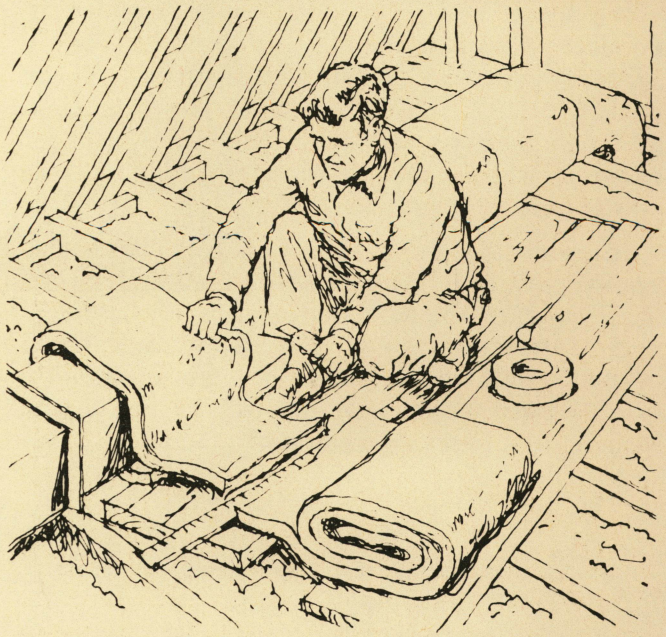

Fig. 4. Insulate heating and cooling ducts which are exposed in attics and crawl spaces.

*Adapted from U.S.D.A. Fact Sheet 2-3-12. Recommended to Idaho residents by Shirley Nilsson, Extension housing and equipment specialist, and Roy Taylor, Extension agricultural engineer, both at the University of Idaho, Moscow.

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