

Improving Existing Homes:**Insulating Attic Kneewalls****BUILDING AMERICA
ENERGY PERFORMANCE BRIEF**

This attic kneewall has been thoroughly insulated.

When to Do This

- Any time you have access to existing attic kneewalls.
- When you are adding insulation to the attic.
- When you are adding an addition to your attic.

Durability & Health

Uninsulated walls provide cold surfaces for warm, humid indoor air to condense, encouraging mold growth. When warm indoor air gets into a cold attic through leaks in the home's thermal envelope, it can condense on rafters and other solid surfaces, encouraging mold growth. In a cold climate in winter conditions, heat escaping into the attic can warm the roof deck encouraging ice dam formation.



Kneewalls, the sidewalls of finished rooms in attics, are often left uninsulated, and open cavities between the floor joists beneath the kneewall are often a big source of air leakage. Kneewalls can also occur where a room with a cathedral ceiling is adjacent to a room with a standard height ceiling; the wall separating the two spaces is often uninsulated on the attic side. Your contractor can insulate these walls by filling the wall stud cavity with fiberglass batt insulation, blown fiberglass or cellulose, or spray foam (see Figure 1). The R-value of kneewall insulation should equal or exceed the code requirement for exterior walls for your climate zone.

Another option is to continue the insulation along the roof line to the attic floor with either rigid foam or cavity insulation covered with rigid foam or sheet goods (see Figure 2). This ceiling covering is air sealed to attic flooring to form an air-sealed enclosed space, which insulates the kneewall and provides insulated attic storage space.

Doors cut into kneewalls should also be insulated and airsealed by attaching rigid foam to the attic side of the door, and using a latch that pulls the door tightly to a weather-stripped frame. Closets or drawers cut into the kneewalls should also be insulated (see Figure 3).

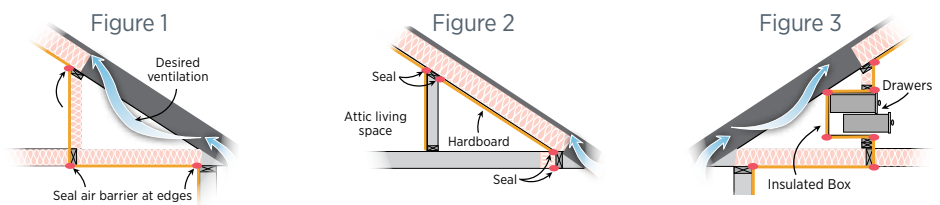


Figure 1. Insulate and air seal the kneewall (Source: DOE 2000).

Figure 2. Continue the insulation along the roof line to the roof edge. Cover with a sheet good that is caulked where it meets the wood floor sheathing, which is extended to the outside wall.

Figure 3. Build an airtight, insulated box around any drawers or closets built into attic kneewalls that extend into uninsulated attic space. Insulate along the air barrier (shown in yellow on drawing) or along the roof line with rigid foam.

References

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2009 IECC

Code Requirements for New Construction and Additions

2009 IECC 402.2.3: Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weather stripped and insulated to a level equivalent to the insulation on the surrounding surfaces.

2009 IECC 402.4.1: The building thermal envelope shall be durably sealed to limit infiltration.... The following shall be caulked, gasketed, weather stripped, or otherwise sealed with an air barrier material, suitable film, or solid material: 1. All joints, seams, and penetrations... 6. Knee walls... 10. Attic access openings... 12. Other sources of infiltration.

For More Information

www.buildingamerica.gov
 EERE Information Center
 1-877-EERE-INF (1-877-337-3463)
eere.energy.gov/informationcenter

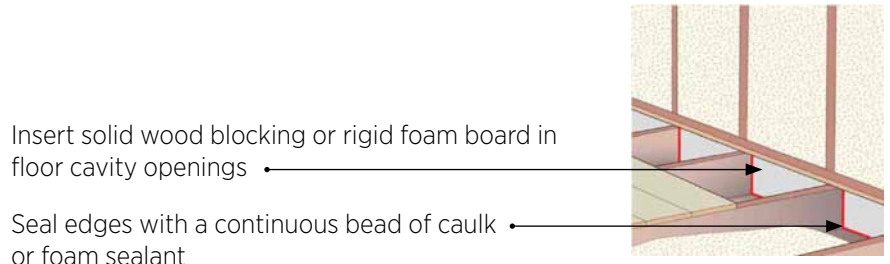
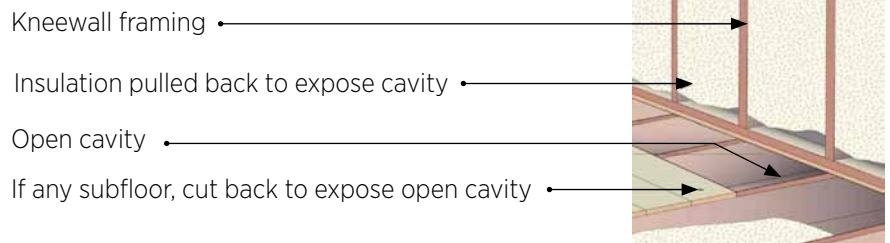


To stop air leakage from the open cavities between the floor joists under the kneewall, these cavities are stuffed with unfaced batt insulation that is rolled and covered with spray foam (see Figure 4). Or rigid foam (or another air barrier material like gypsum board or OSB) can be cut to fit each joist space and sealed in place with caulk or spray foam (see “How to” below).

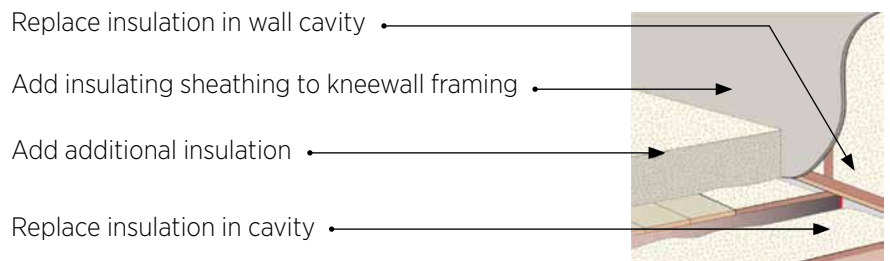
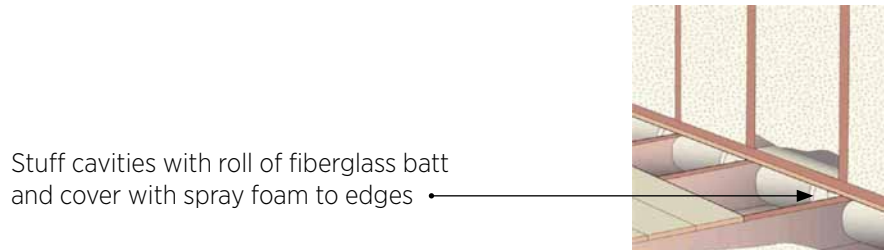


Figure 4. Air seal floor joist cavities under kneewalls by filling the cavities with rigid foam insulation, OSB, or another rigid material that is cut to fit and sealed at the edges with caulk (as shown here and below). Another option is to block the joist cavity with fiberglass batts that are rolled and stuffed in plastic bags or covered with spray foam.

How to Insulate and Air Seal Floor Joist Cavities Under Kneewalls



—OR—



(Source: Lstiburek 2010)