

# Kneewalls

*Air Seal and Insulate Kneewalls to Create Comfort in Attic Rooms*



Touchstone Energy®  
Cooperatives

## SKILL SET

Do it yourself or hire a professional. Two people make the task easier. Familiarity with small hand tools is essential; power tools are optional but speed the task of cutting and fitting blocking materials.

## SAFETY

This job requires working in unconditioned attic spaces, tight clearances and under task lighting. Use a dust mask/respirator, gloves, safety glasses and kneepads.

## TOOLS

Utility knife, table or circular saw, caulk gun, measuring tape, lights, straight edge and markers

## MATERIALS

Foam/caulk/construction adhesive  
Cavity insulation – fiberglass batts  
Blocking material – rigid foam board  
Sheathing – OSB/plywood, code-approved foam board or bubble-wrap radiant barrier  
Fasteners – screws with washers or button-capped nails

## COST BENEFIT

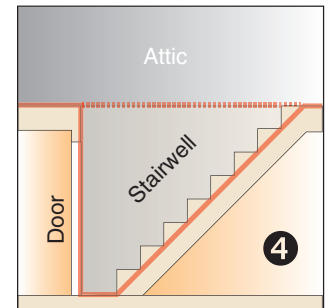
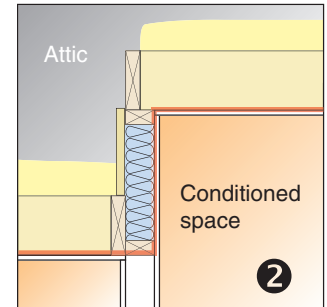
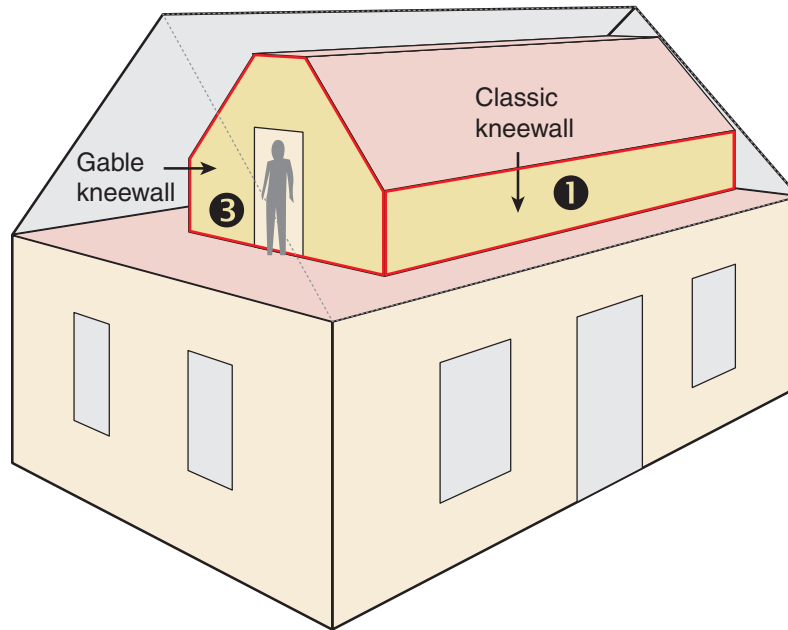
With proper attention to detail, air sealing and insulating an attic kneewall is a very cost effective DIY project.

### PRIORITY LEVEL

LOW MED **HIGH**

### SKILL LEVEL

**DIY** PRO



## Attic Kneewalls

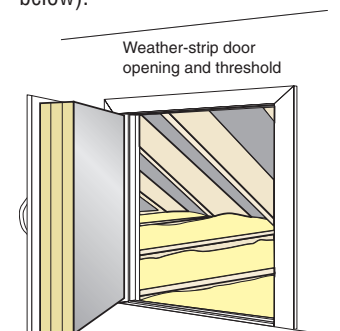
An **attic kneewall** is any vertical wall that separates conditioned space from an unconditioned attic. Attic kneewalls experience extreme temperature differences across them in the summer and are often not built to provide a comfortable living environment. Improving an attic kneewall by improving the insulation and air barrier is crucial to maintaining a comfortable and energy efficient home year round. Extra insulation on the kneewall reduces heat gain or loss across this wall, while airsealing both improves insulation performance and keeps indoor and outdoor air where it belongs. Poor attic kneewall details are especially common culprits in home comfort issues with bonus rooms.

## Four Types of Kneewalls

1. A **classic attic kneewall** is found when a second story space is built into the roofline, such as a Cape Cod style home or bonus room.
2. A **change in ceiling height**, such as a tray ceiling that juts up into an insulated flat ceiling creates short attic kneewalls.
3. A portion of an attic space is conditioned and it abuts a **gable-shaped kneewall** that separates it from an unconditioned attic.
4. A **permanent walk-up attic stairs** often includes a full height door, two side walls and the steps themselves that are separating the attic from the conditioned portion of the home.

## Attic Doors

Attic kneewall doors should be tightly weather-stripped, have a secure closure and have increased insulation R-value on the door (this can be achieved by gluing several inches of insulating foam board to the attic side of the door with construction adhesive and fastening with screws and washers - see below).



Foil-faced rigid insulation sandwiched together

## Objective

The goal is to carefully block and air seal pathways and increase the total kneewall insulation R-value to be approximately R-20. Each attic presents a challenge on how to successfully seal and insulate the area. Use common sense and keep in mind that you want to stop air infiltration between conditioned and unconditioned spaces while installing adequate insulation values to your attic.

Because typical attic kneewalls are framed with 2x4 studs, the most common approach is to insulate the cavity to R-13 and then attach rigid foam board that has been sealed to the attic side of the framing. Depending on circumstances, some blocking of the gap between ceiling joists can be achieved when installing the sheathing on the back side of the kneewall.

## Action Steps

**Blocking** – This first step is crucial to prevent attic air from leaking into the conditioned portion of the home. Blocking can be achieved by using wood, foam board or other sheet material that has been cut and installed into the gap between the ceiling joists and the vertical kneewall.

**Airsealing** – This step involves sealing the blocking into place using caulk or spray foam as well as addressing any other potential leak points in the attic kneewall, such as wall outlets.

**Installing cavity insulation** – The framed cavity should be neatly filled with cavity insulation by using materials such as batts. Take care to ensure complete coverage and eliminate compression by slitting the batt and tucking it around wires and any other obstacles inside the cavity – thoroughness counts!

**Installing sheathing** – One inch of code-approved foil-faced rigid foam board is approximately R-7. Besides increasing the kneewall R-value, the sheathing provides an additional benefit of encapsulating the batt insulation inside a sealed cavity. While fasteners will secure the sheathing to the kneewall, the edges of the sheet material must also be sealed to the framing using caulk or construction adhesive.

**Options** – When the framed cavity is deeper and can be insulated to R-20, a non-insulating sheet material such as foil-faced OSB/plywood or bubble-wrapped foil radiant barrier can be used. Install the reflective foil side outwards towards the attic.

