



Where To Insulate

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The location of insulation is as important as its quantity.

Before you insulate and seal, you need to decide exactly where in the building to put your efforts. The obvious answer is that you insulate on the outside of a building—the so-called thermal shell, or building envelope. Often, though, it's not clear where the outside of a building is or should be. These general principles can help. When in doubt, 1) choose the strategy that uses the smallest surface area of insulation; 2) choose the route with the fewest joints and turns; and 3) don't create cold, moist spaces. These can get musty or worse.

Attics and kneewalls

Cape-style homes are attractive and economical, but are a pain when it's time to insulate their upper levels. The typical approach is to insulate the flat ceiling, the sloped ceiling, the kneewalls, and the floors in the eaves. This makes for a tricky joint in the air/vapor barrier at the bottom of the kneewall. And it wastes insulation. Insulating the roof rather than the kneewalls (Figure 1) simplifies this joint. It

B. Heating a little extra space is insignificant since air is cheap to heat. It's the surface area of insulation that counts.

Another advantage of insulated eaves is more heated floor area. Whether it's used for storage (with kneewalls) or living area, heated space is a valuable commodity. Forget about leaky doors leading into cold eaves.

Crawlspaces

Crawlspaces are used a lot in the southeast. They are a breeding ground for wood decay because they combine the unfortunate mix of moisture, wood, and warmth.

You can place crawlspace insulation under the floor or on the foundation walls—either inside or outside. In most cases, insulating the walls uses less insulation than insulating the floor. And insulating the floor may require insulation of the crawlspace plumbing as well. Another advantage of wall over floor insulation is that coupling the space with the ground reduces the cooling load.

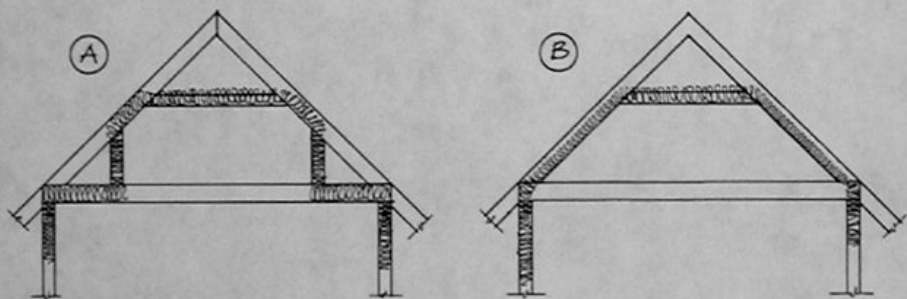


Figure 1. On the second floor of a cape, insulation option B is better than A on four counts: 1) less insulation, 2) easier job, 3) more heated floor area, 4) cheaper to heat.

reduces the number of cuts in the insulation and reduces the total amount of insulation.

At first glance, you might think that option A, the one with the insulated kneewall, is more energy-efficient because it has a smaller insulated space. But it has more surface area of insulation, so it's actually more expensive to heat than option

But insulating the walls introduces other problems. Foundation vents get more complicated because they have to pass through the insulation. Also, the vents must be operated seasonally, rather than left permanently open. Few homeowners take the trouble, so they either have too little or too much venting. But help may be on the way. A limited experiment by the Tennessee Valley Authority (TVA) found that insulated crawlspaces, left unvented, had no problems. In fact, they had less

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