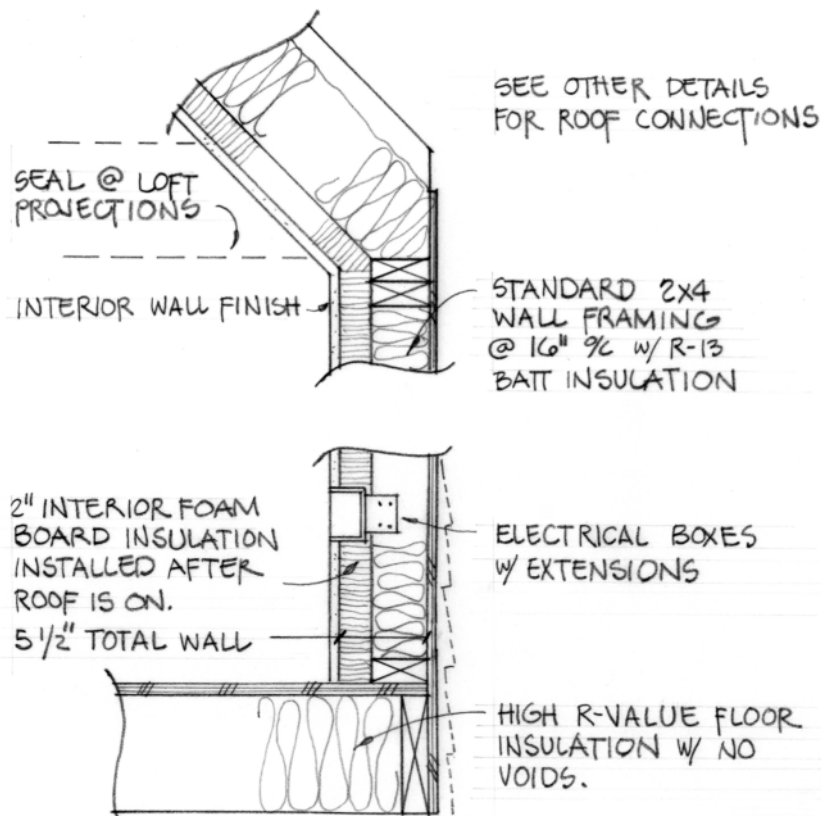


# SUPERINSULATION TECHNIQUES

Beefing up the insulation of a simple frame building



## Optional Insulation Section

1" = 1'-0

### Notes:

- Interior insulation can be done after the house is completed. In fact, you could use the house for years as an uninsulated 2x4 cabin and then upgrade it to superinsulation for a full time home.
- Superinsulation also cuts down on air infiltration. Therefore you may want to add a year round ventilation system for fresh air exchange, perhaps with heat-recovery such as an air exchanger. At a minimum know how to adjust windows for passive ventilation throughout the house.
- Provide sufficient outside air to any air gulping combustion appliance such as a wood stove, fireplace or gas water heater.

One of the best ways to do insulation is to be redundant about it. That is do it in two layers. The extra layer of foam board insulates not only the wall cavity (R-13) but the framing (R-4) and the small gaps and voids where the insulation didn't reach (R-1). Upgrading these under insulated areas boosts the effective R-value of the foam insulation as much as 50%.

There are several brands and types of foam insulation that can be used for this upgrade. Dow makes Thermax® and other products may be available where you are. If you are going to do a drywall interior you can use 2" thick polyisocyanurate foam (Thermax sheathing at R-13) or other foams with slightly less R-value. Most plastic foams require the drywall cover for fire protection.

If you want to do a wood interior choose a nail-base foam insulation such as Hy-Therm Nail line (Dow) or AC-Foam. These products have a 7/16" OSB facing bonded to the foam. This provides additional fire protection and allows any type of wall finish. This material is most commonly used on roofs.

The same interior insulation can be used to upgrade the R-value of cathedral ceilings. In flat ceilings with an attic above, it is usually most economical to just build up a deep layer of overlapping fiberglass batts or blow in insulation to the R-value desired (usually R-40 to 50). Attic framing is often buried in insulation.

The floor insulation is harder to upgrade since its depth is limited by the joists used. I would not suggest adding foam insulation to the bottom of the joists. It could trap moisture in the cavity. A better choice would be a foam in place insulation such as Icynene. The problem there is it is expensive and needs a specialty contractor. One alternative to high-density fiberglass batts is dense pack cellulose if it is available in your area. Otherwise, controlling the ventilation of the under floor area can reduce air movement that carries away heat. A non-vapor barrier such as Tyvek stapled to the bottom of the joists can help cut airflow.

You can update the above scaled detail and add it to your master set of working drawings.

### Product information:

AC Foam -

<http://www.atlasroofing.com/commercial/nailbase.asp>

Thermax Foam -

[http://www.dow.com/Styrofoam/na/polyisoc\\_home.htm](http://www.dow.com/Styrofoam/na/polyisoc_home.htm)

Icynene Foam - <http://www.icynene.com>

The above insulation system has been nicknamed, "a poor man's SIPs" for the fact that it delivers performance similar to SIP (Structural Insulated Panel) construction at lower cost.