“In The Field” – Perimeter Slab Insulation

Why is perimeter slab insulation important?

A substantial amount of heat is lost through an uninsulated slab, resulting in cold, uncomfortable floors. Even if the foundation wall is insulated vertically under the slab (Figure 1), significant heat is still lost from the slab edge that is closest to the cold outside air.

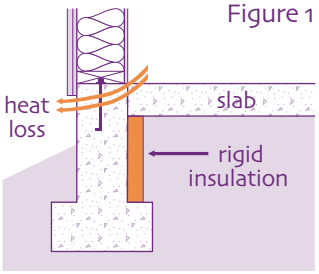

Figure 1

Where and how should perimeter slab insulation be applied?

The insulation can be applied outside (Figure 2) or inside (Figure 3) the foundation wall. Exterior applications require a metal flashing or durable finish for protection. The insulation can also be placed vertically along the foundation wall (Figure 3) or horizontally under the slab (Figure 4). Perimeter slab insulation can give termites access, so be sure to provide a termite shield (Figure 8). Some jurisdictions do not allow external insulation because the foundation must be visible for termite inspection.

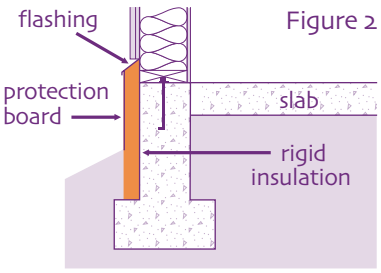

Figure 2

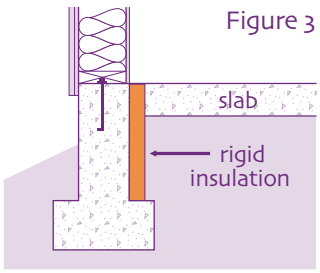

Figure 3

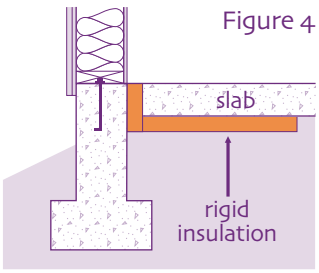

Figure 4

Is there a way to avoid bringing the insulation to the top of the slab edge so a carpet tack strip can be attached? *(see Figures 3 and 4)*

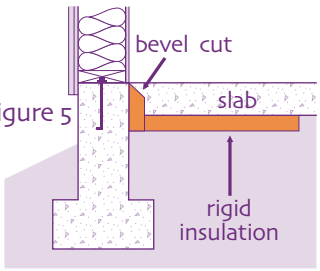

Figure 5

The insulation can be cut at a 45-degree bevel cut (Figure 5). This solution, while it does not provide full vertical face insulation, is allowed in Section 502.2.1.4 of the 2000 IECC.

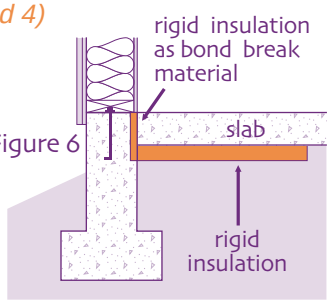

Figure 6

Rigid insulation can be used as the bond break material between the slab and footing (Figure 6). This solution requires that you have a notch in the foundation wall.

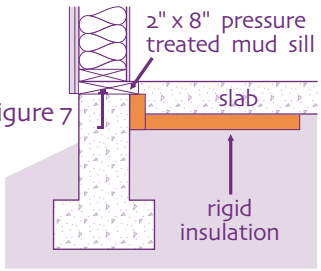

Figure 7

A 2 x 8 pressure-treated mud sill can be placed on the stem wall to cover the top edge of the insulation (Figure 7). A tack strip can then be attached to the mud sill.

Is there any way to eliminate perimeter slab insulation completely?

Perimeter slab insulation can be “traded-off” using a software tool like **MEC*check***™ or **COM*check***™. Additional insulation is added in another part of the structure to compensate for the missing insulation in the slab. The code permits this trade-off, but when carpet is placed on a cold slab, the higher humidity levels that result can attract dust mites and mold.

How do I protect perimeter slab insulation from moisture and termites?

One option is to install the insulation inside the foundation wall and provide a protective membrane (termite shield) between the sill plate and foundation (Figure 8).

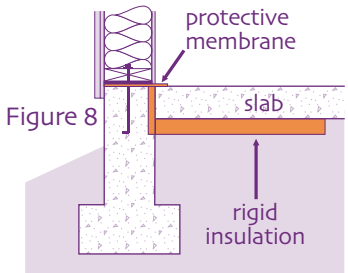

Figure 8

What are the requirements for slab insulation in the IECC 2000?

The table below summarizes the prescriptive insulation requirements for residences with 15% glazing.

Heating Degree-Days	15% Glazing*
0-2499	0
2500-4499	R4-R5, 2 ft.
4500-6999	R6-R9, 4 ft.
7000-12,999	R13-R18, 4 ft.

**Window area % of gross exterior wall area. Summary taken from Table 502.2.4(3), p.81; IECC 2000.*

For more information on this topic see the Energy Efficient Building Association’s Builder’s Guide (Building Science Corporation 1998. Building Science Corporation, 70 Main St., Westford, Massachusetts 01886, **www.buildingscience.com**) or the Builder’s Foundation Handbook (Oak Ridge National Laboratory 1991. Publication number ORNL/CON-295, Oak Ridge National Laboratory, Oak Ridge, Tennessee).