



INSULATING SLAB-ON-GROUND FLOORS

Current methods for adding insulation to slab-on-ground floors have some disadvantages. However, recent BRANZ research has developed more effective methods.

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Current practice for adding insulation to slab-on-ground floors usually involves either putting the insulation under the perimeter of the slab, or putting it on the outside vertical face of the foundation wall, including the area of foundation exposed above ground level.

While the first technique is relatively easy to implement, its effectiveness is limited by the fact that without a thermal break between the slab and foundation, heat from the interior environment can readily flow along the slab and through the foundations to the exterior.

The second technique is more difficult to implement, and even though there are some proprietary solutions that use expanded polystyrene formwork they are reliant on finding an effective means to protect the insulation. The technique is particularly difficult to use when the wall system is a standard 90 mm timber frame.

When is insulation required?

Addition of insulation is usually required for small floor slabs (<80 m²) and where there are heating elements embedded into the

slab. Insulation is also recommended when the local water table is less than 1 m below ground level.

Apart from very large floor slabs achieving SNZ/PAS 4244: 2003 *Insulation of lightweight-framed and solid-timber houses*, recommended better practice (R1.9 m²C/W) requires the addition of insulation to a slab-on-ground floor.

New, improved methods

Figure 1 illustrates a more effective insulation method that uses timber to

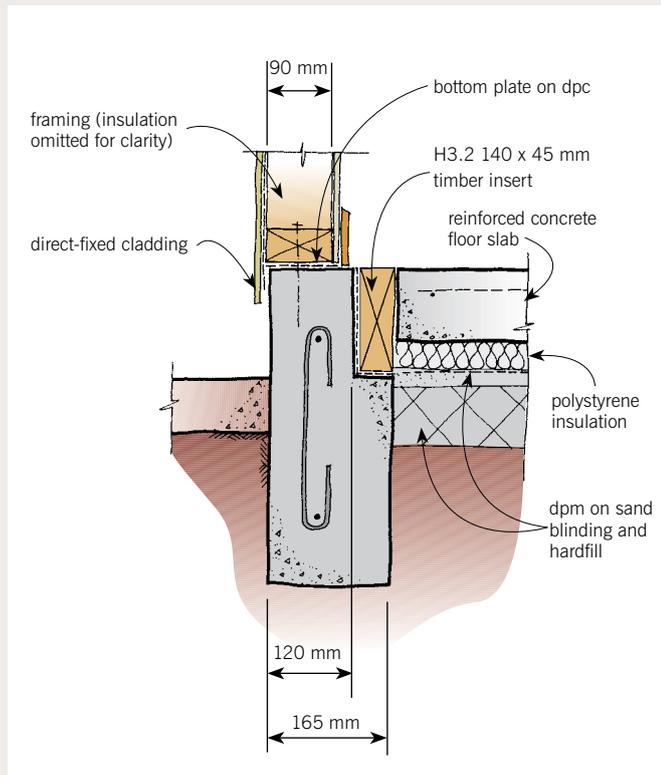


Figure 1: Floor slab insulation – single storey.

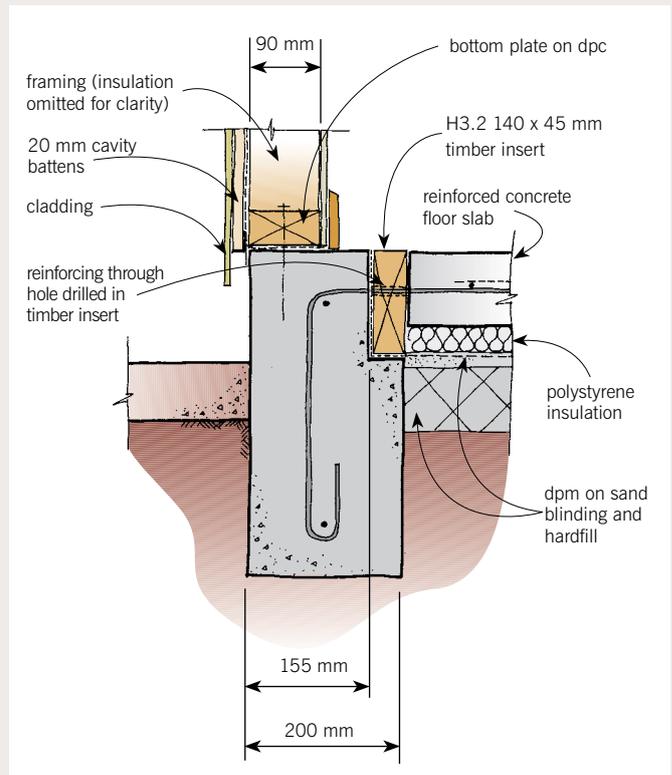


Figure 2: Floor slab insulation – double storey.

provide a thermal break between the slab and its foundation. In this case, the construction is single storey. For double storey construction, the floor slab is required to be tied to the foundation (see Figure 2). In both cases it may be necessary to cast the bottom plate fixing in place to avoid spalling of the concrete faces when attempting to install the fixing later.

Some heat will still be able to bypass the insulation in the area between the thermal break and bottom plate. A further improvement in the thermal performance of

the slab can be achieved by using 140 mm deep wall studs to eliminate this gap (see Figure 3).

Figure 4 shows an insulation solution for a slab-on-ground floor where the wall is brick veneer. Since the bricks provide some additional thermal resistance, as well as protection for the insulation, additional insulation under the perimeter of the slab may not be necessary. It is important to apply a wedge of mortar to the top edge of the insulation and to align it with the weep holes to ensure proper drainage of the cavity.

A Building Research Levy funded study developed this new method (see pages 103–105 for a report on the research project). ■

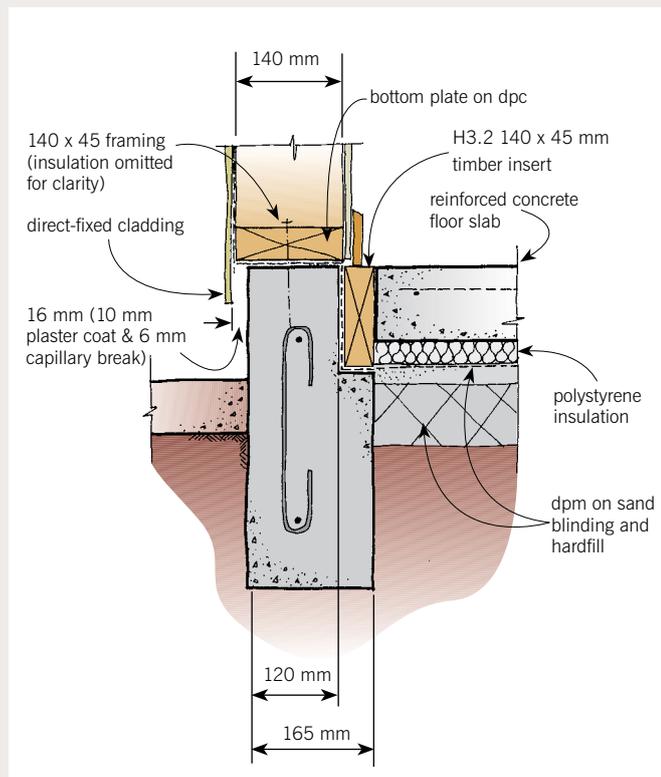


Figure 3: Floor slab insulation – single storey with 140 mm studs.

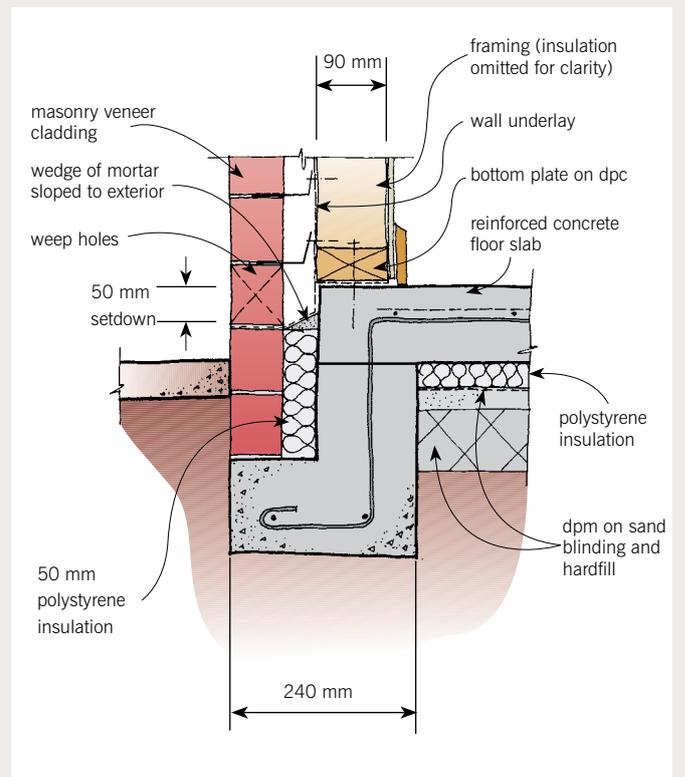


Figure 4: Floor slab insulation – single or double storey with masonry veneer cladding.