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# Simply efficient concrete slabs

It can be tricky to construct thermally efficient concrete slabs as the footprint gets more complicated. Here are a few points to consider.

**THE MOST EFFECTIVE WAY** of constructing thermally efficient concrete slabs is to plan the building so that the ratio of area to perimeter is as large as possible.

## Simple building gives best R-value

For example, a relatively simple 124 m<sup>2</sup> building with 50 mm underslab insulation, minor variation in plan and a perimeter length of 47.4 m gives a ratio of 2.6. Using the *BRANZ House Insulation Guide*, the R-value of this slab (with 50 mm of insulation under it) is R2.1.

Making the 124 m<sup>2</sup> footprint square, increases the R-value to 2.2.

## Complicated footprint reduces R-value

For a larger building of 159 m<sup>2</sup> with a complicated footprint and a perimeter of 73.2 m, the R-value of the slab reduces to approximately 1.75 with 50 mm underslab insulation.

## Detailing edge insulation problematic

Edge insulation may be required to achieve a higher R-value than that provided by the slab alone, especially on more complicated footprints. Detailing it to be effective in the long term can be problematical.

To work effectively, edge insulation needs to:

- remain dry
- be protected from damage
- cover as much of the edge as possible, especially the area above ground.

## Options for lightweight cladding

BRANZ Bulletin 576 *Edge insulation of slabs* outlines options where a lightweight cladding is used, but does not cover brick veneer.

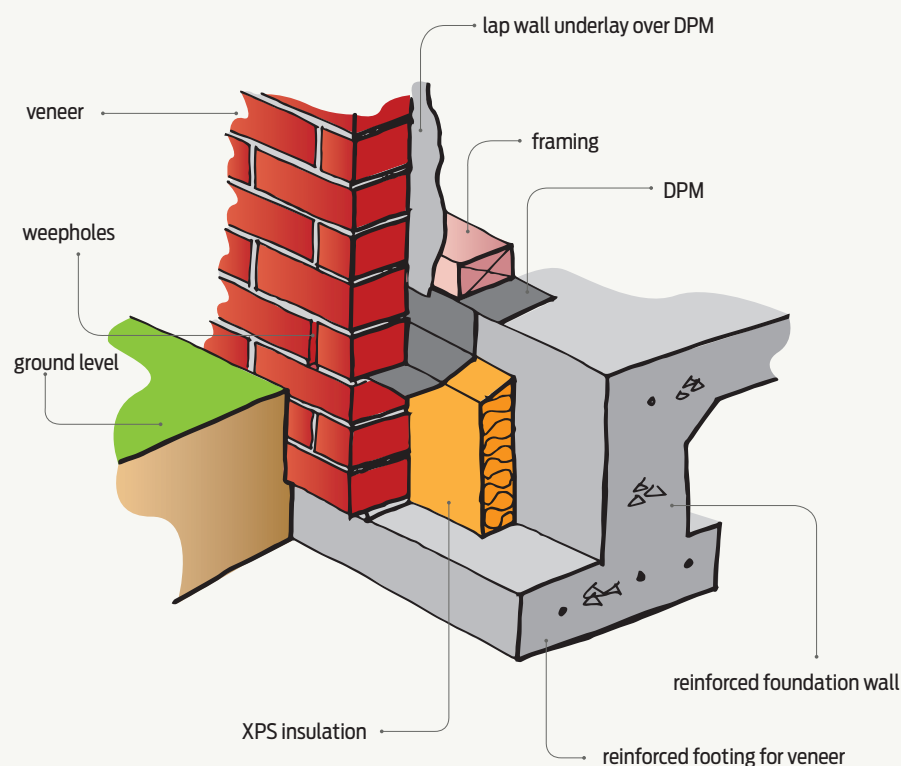
## One option for brick veneer

In our view, there is only one practical option for brick veneer. This involves a significant change to detailing of the footing and the base of the veneer.

In essence, the veneer needs to be supported on a footing well below finished ground level with the insulation material installed between the veneer and the foundation wall.

Critical to the performance of the veneer cavity is the installation of a damp-proof membrane at the top of the insulation to ensure that water is drained from the cavity (see Figure 1).

Where edge insulation is required with a raft system, contact the supplier of the system, as the brick veneer needs to be able to move with the foundation or slab. ◀



**Figure 1** Edge insulation for brick veneer with traditional slab construction.