

Insulation installation – quality is bloody important

The changes to Building Code clause H1 require higher levels of insulation to roofs, walls, windows and floors to reduce energy use in buildings. To achieve these higher levels of performance it is critical that:

- the thermal bridging effect of the framing is recognised in the calculation of the construction (as-built) R-value
- the insulation is correctly installed
- there is enough framing depth to allow the specified insulation to be installed.

The first point can be addressed by referring to the third edition of the BRANZ *House Insulation Guide* which allows designers to determine the construction R-value for a range of construction systems and framing centres.

The second point has the potential to impact significantly on the construction R-value actually achieved. BRANZ staff have seen a number of insulation installations that would be lucky to achieve half the design R-value because they were so poorly installed on site.

In foil installation to a newly constructed floor, the faults identified were:

- the drape dimension was inconsistent, leaving large gaps at the lapped sheet joints. This will allow air flow between the foil and the flooring, significantly reducing the insulation value
- the foil had a 20–30 mm gap between the end of the foil and the adjacent boundary framing or blocking to the joists, again allowing air flow
- insufficient drape between the joists – foil was installed at 25 mm drape rather than the minimum required drape of 100 mm
- some of the foil was cut or torn (and this is before the building is complete)
- in an open sub-floor the foil was unprotected – giving a floor R-value less than Code minimum and the risk of damage to, or premature deterioration of, the foil.

For wall installation of bulk fill insulation the construction and insulation material R-value was compromised by:

- gaps between the insulation and the framing
- gaps between individual segments of insulation
- compressed and squashed insulation material
- creased and folded insulation where it had not been cut to size correctly.

Small gaps between the insulation and the framing can halve the R-value of that part of the wall, and result in the installation not complying with H1 requirements.

When installing insulation into wall framing it is critical that the insulation material:

- fits firmly within the framing (no gaps between it and the framing)
- is not squashed or compressed
- does not have folds or creases
- does not, in drained cavity wall construction, push the wall underlay across the cavity and close it off
- has one face of the insulation against a solid face – preferably installed against the wall underlay.

Key references for insulation installation are BRANZ Bulletins 494 and 496 and NZS 4246 *Energy efficiency - Installing insulation in residential buildings*.

At one site the R-value of the material stored on site was insufficient to meet minimum wall and ceiling Building Code requirements once the allowance for the thermal bridging of the framing was taken account of.

Wall area definition for thermal design

A shortened version of the definition of wall area (when used for calculating the percentage of glazing) in NZS 4218 is 'the area of the internally exposed external wall'. In effect this is the area of the wall thermal envelope.

Definitions

Designers should always read and use the definition contained in Standards and Compliance Documents.

R-value of a meter box

A question we have been asked is 'what is the R-value of a meter box?'. The obvious answer is not much. When calculating wall areas, allowance can be made for the bridging effect of the box by including its area in the window area calculation, or treating it as the equivalent of the opaque part of a door.

Wall performance may be able to be improved by installing some insulating material between the wall lining and the back panel of the meter box if there is space. Installing 12 mm of polystyrene reduces the thermal bridging that occurs at the meter box. (Remember any electrical wires that pass through the polystyrene must be sleeved).

Subfloor foil durability

The Building Code durability requirement for subfloor foil insulation given in Table 1 of B2/AS1 is not less than 50 years. Designers and BCA's need to make sure that the specified material will meet this durability requirement, including the retention of the thermal performance over the life of the installation.

Open subfloors

E2/AS1 requires a minimum subfloor ventilation for suspended floors of 3,500 mm² clear opening per m² of floor area. Open areas significantly larger than this (e.g. baseboards with a 20 mm gap between boards) will reduce the insulation value able to be achieved with foil and should be considered as an open subfloor.

New publications from BRANZ

BRANZ will be publishing the fifth title in the LEVEL Sustainable Building Series – *Materials* at the end of June. Order online at: www.branz.co.nz. Coming in July are *Coatings* and *Heating and Ventilation*.

Withdrawn bulletin

Bulletin 368 *Preventing Moisture Problems in Timber Framed Skillion Roofs* although listed in the recent BRANZ publication catalogue was withdrawn in July 2007. At present there are no plans to replace it until research currently underway on roof performance is completed.

BRANZ Seminars 2008

Window & Flooring Selection

Registrations will open soon for this seminar which is aimed at architects and designers. It will cover:

1. **Flooring Selection** – using specific situations we will work through the application of selection factors to make decisions on the most appropriate forms of floor covering.
2. **Window Selection** – bringing together selection criteria such as relevant regulations, function, performance, materials and aesthetics, this section of the seminar will work through exercises using sample situations to make window selection decisions.

Venues and dates for July are 21st Dunedin; 22nd Christchurch; 23rd Auckland; 24th Hamilton, and 25th Wellington.

Visit our website for more details and to register online – www.branz.co.nz (click on Seminars).

Webstreaming

Watch this space for details of a new service from BRANZ which will allow you to view our past seminars online on a pay-per-view basis. Registered architects and Licensed Building Practitioners will be able to gain CPD points by taking an online quiz afterwards