Retrofitting external wall thermal insulation – a building consent is required

Schedule 1 of the Building Act 2004 defines work that can be undertaken without the need to obtain a building consent. However, all such work must comply with the relevant performance requirements of the Building Code.

Schedule 1 also states in exemption reference (jg) that there is **NO** exemption from obtaining a consent where insulation is to be installed in the external walls of an existing building.

The DBH publication *A guide to Schedule 1 of the Building Act 2004 - Building work that does not require a building consent* (see www.dbh.govt.nz/bc-no-consent-schedule-1#installing-thermal) specifically states that where "the external walls of a house are to be injected with expanding insulating foam, a building consent is required". A consent will need to be obtained before any work is carried out.

Retrofitting underfloor and ceiling insulation is exempt from the consent requirements.

Particleboard flooring – minimum heights above ground

Where a suspended floor is constructed with particleboard flooring, product suppliers specify a minimum clearance between the underside of the particleboard and the ground. Generally, this is given as 550 mm minimum, but it may be specified as a minimum dimension of 450 mm between the ground and the bottom of the joist (which will give at least 550 mm clearance with commonly used joist sizes). Where damp soil conditions exist, it is recommended that the ground be covered with polythene, even where the minimum subfloor ventilation requirements of NZS 3604 and E2/AS1 paragraph 10.7.2 are being met (net open area of 3500 mm^2 per m^2 floor area). Where minimum ventilation requirements are not being met, the polythene ground cover is required. (In this case, ventilation net open area of not less than 700 mm^2 per m^2 of floor area must still be provided – see E2/AS1 10.2.7.1.)

Note that MDF sheet is not able to be used for flooring under NZS 3604:2011 paragraph 4.3.4.2 as it is not permitted to be exposed to ground atmosphere. There is no specific minimum clearance specified for H3 CCA-treated plywood.

Plasterboard ceilings – reducing cracking risk

When specifying and installing plasterboard ceilings, it is essential that the manufacturer's specific recommendations are followed to minimise the risk of cracking at sheet joints, particularly in large ceiling planes.

Where plasterboard is being fixed to timber framing (ceiling battens, ceiling joists, rafters or truss chords), the timber must be dry – at a moisture content of not more than 18%, but some manufacturers require a maximum moisture content of 16% at time of fixing for a space that is not air-conditioned (8–18% for these spaces).

Other key fixing requirements for ceilings include:

- installing tapered edge sheet joints at right angles to the framing or ceiling battens
- using single length sheets to minimise the need for end joints
- incorporating relief joints into large ceiling areas.

For example, GIB require that tapered edge joints of their plasterboard sheets are made off framing using backblocking where:

- for timber framing with timber battens, there are three or more consecutive tapered edge joints
- for steel battens on timber or steel framing, there are six or more consecutive tapered edge joints
- a level 5 finish is required.

May *Guideline* definitions for fixing locations – open, sheltered and closed

The 'open', 'sheltered' and 'closed' definitions used in NZS 3604:2011 are to define the location of the metal components. 'Sheltered' also includes external parts of a building that are not exposed to direct rain wetting such as under eaves, an open subfloor, a cantilevered floor or a deck with a sheet material as its surface finish (see Figure 4.3 (a) and (b) of NZS 3604:2011).

Canterbury earthquake regions

The Canterbury earthquake regions are the areas administered by the Christchurch City Council, the Selwyn District Council and the Waimakariri District Council. The following sections outline the changed compliance document requirements for the region.

B1/VM1 changes

The B1/VM1 hazard factor Z (described in AS/NZS 1170) is increased from 0.22 to 0.3. The Verification Method references AS/NZS 1170, meaning that, where AS/NZS 1170 has an R factor of less than 0.3, the R factor must be increased to 0.3. Where a factor is shown as greater than 0.3, the larger factor will apply. The increased hazard factor only applies to structure periods less than 1.5 seconds. For structure periods greater than 1.5 seconds, the Z factor needs to be determined by special study, and advice needs to be sought from a seismologist.

The serviceability limit state risk factor shall be Rs=0.33.

B1/AS1 changes

B1/AS1 changes affect the referencing of NZS 3604, NZS 4229 and NZS 4299 for buildings within the Canterbury Earthquake Region:

For NZS 3604:1999:

- 'Good ground' excludes ground where liquefaction and/or lateral spread could occur.
- Use Section 5 of NZS 3604:2011 to determine bracing demand.
- The Canterbury Earthquake Region shall be Earthquake Zone 2.
- Reinforce concrete slabs on ground on 'good ground'.
- Tie perimeter foundations to the concrete slab with reinforcing steel.
- All reinforcing is to be Ductility Class E, in accordance with NZS 4671.
- Minimum slab reinforcing is to be 2.27 kg/m^2 welded reinforcing mesh sheets lapped 225 mm.
- Once slabs exceed 24 m, a free joint must be formed as required in the standard, except that there shall be dowel bars placed to minimise the risk of differential settlement. A separator coating must be applied to one side of the bar to allow movement to occur
- Determine brick veneer tie requirements from NZS 4210 for Earthquake Zone A.
- Foundations where 'good ground' has not been established are outside B1/AS1 and must be specific engineering design. In particular:
    - where liquefaction and lateral spread up to 50 mm is possible and there is perimeter ground protection, designs may be based on the DBH document *Guidance on house repairs following the Canterbury earthquake'*
    - where there has been severe land damage as defined by the three councils, the specific engineering design must include appropriate geotechnical investigations.

For NZS 4229:1999:

- Bracing demand is to be determined as for Earthquake Zone A.
- For foundations on 'good ground', concrete slabs on ground are to be as for NZS 3604:1999 as modified above.
- Foundations where 'good ground' has not been established are outside B1/AS1, and need to be subject to specific engineering design.

NZS 4299:1998:

- Bracing demand shall be determined using the earthquake zone factor >0.6.
- For foundations on 'good ground', concrete slabs on ground are to be as for NZS 3604:1999 as modified above.
- Foundations where 'good ground' has not been established are outside B1/AS1 and need to be subject to specific engineering design.

Changes to B1/AS3

- Earthquake bracing units are to be determined for the Canterbury Earthquake Region from Table 2 for Earthquake Zone A (currently they are determined for Earthquake Zone B).

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