**MAY 2013**

**Aluminium components and copper-based timber treatments**

There have been a number of questions to the BRANZ Helpline regarding the compatibility of aluminium building components (windows, flashings and cladding) in contact with or subject to run-off from a timber component (plywood, weatherboards and so on) treated with a copper-based treatment.

E2/AS1 Tables 21 and 22 indicate that mill finish or raw aluminium is unsuitable for use in contact with or when subject to run-off from CCA-treated timber (as well as timber treated with the other copper-bearing preservatives ACQ and CuAz) irrespective of exposure (corrosion) zone. The reason is that galvanic reduction of copper ions released from the treated timber will lead to corrosion of aluminium, particularly pitting.

Powder-coated components are permitted by E2/AS1 Table 21 to be in contact with CCA-treated timber in exposure zone B but not to have run-off from CCA-treated timber components onto them. What this means is that aluminium windows, cladding or flashings cannot be used where water will pass over uncoated CCA-treated plywood, timber trims or timber weatherboards and then flow onto the aluminium.

The reason for this is that, under these conditions, the risk of galvanic corrosion still exists since any physical defects in the anodised layer or paint coating would provide paths for ingress of the copper ions released from the treated timber, leading to gradual deterioration of the aluminium surface. This risk will be higher when the contact is exposed to aggressive environments such as exposure zones C and D.

Table 22 allows run-off from CCA-treated timber onto stainless steel flashings. However, there will still be run-off onto the aluminium windows, which is not permitted. Stainless steel is also required to be isolated from aluminium in exposure zones C and D in consideration of possible galvanic corrosion. Actual risk depends on surface area ratio (corrosivity is lower when the area of the stainless steel is small relative to the aluminium) and aggressiveness of the environment.

Painting CCA-treated timber components may reduce leaching and therefore the corrosion risk, but the coating integrity needs to be checked regularly, and a regular recoating programme should be in place. Owners need to be aware of their on-going responsibility for the coating maintenance so that the windows are afforded some protection from the run-off.

**Flashing and construction requirements for framed flues**

E2/AS1 only covers the direct flashing of a penetration through the roof cladding for penetrations up to 86 mm in diameter. Larger penetrations that use a boot flashing fitted directly to the roof cladding are outside the scope of E2/AS1.

Options for flashing a round metal flue penetration:

- An overflashing and boot flashing as detailed in the New Zealand Metal Roofing Manufacturers *Metal Roof and Wall Cladding Code of Practice* section 6 (drawing 6.2.8 B) and the BRANZ *Good Practice Guide: Long-run Metal Roofing* section 6.9. The NZMRM COP limits the length that an overflashing as shown in drawing 6.2.8 B can extend down from the ridge line to 1.5 metres. This is to reduce thermal

movement and the risk of condensation on the underside of the flashing. Where the penetration is further down the roof, other alternatives are offered in the COP. Where a flat sheet overflashing is provided, the flat sheet will require support.

- A soaker flashing as detailed in E2/AS1 Figure 54.
- A proprietary boot flashing with attached flexible skirt designed to suit flue diameters, dressed and sealed to the roofing profile. A safer option if possible is to locate the flue so that the top edge of the flashing is fitted under a ridge or apron flashing. Flashing details must be supplied as an alternative method as part of the consent documents.

Constructing the penetration:

- E2/AS1 requires the penetration to be framed where wider than 200 mm (E2/AS1 Figure 21).
- Catchment areas above the penetration must be within the limits of E2/AS1 8.1.7 (b).
- A solid fuel burning or gas burning appliance flue must meet the required clearances from a combustible material as given in AS/NZS 2918:2001 *Domestic solid fuel burning appliances – Installation*, which is cited by C/AS1. AS/NZS 2918 does not cover the flue flashing details.

**Particleboard and plywood flooring for suspended ground floors**

NZS 3602:2003 *Timber and wood-based products for use in building* allows the use of untreated high-density particleboard and plywood flooring to timber or light steel-framed suspended floors. NZS 3604:2011 *Timber-framed buildings* clause 2.3.7 and manufacturers' installation instructions for particleboard and plywood require a minimum distance of 550 mm between the underside of the flooring and the cleared ground. Particleboard and plywood manufacturers state maximum permitted weather exposure for their products.

Medium-density wood based building components (particleboard and MDF) are not permitted for use where exposed to ground atmosphere or for flooring.

**Particleboard and plywood flooring in wet areas**

In wet areas such as bathrooms, kitchens, laundries and toilets, particleboard and plywood flooring is required to be protected (NZS 3604 clause 4.3.4 and E3/AS1) by an impervious finish or lining with sealed joints. Where the integrity of the impervious finish cannot be assured, the flooring must be H3-treated plywood.

**BRANZ ALF 3.2 and apartment buildings**

ALF 3.2 is designed solely for calculating the thermal performance of stand-alone houses. It is not suitable for calculating the thermal performance of apartments or multi-unit housing. Where the thermal performance of an apartment complex, multi-unit housing or larger buildings is required, the options given in H1/AS1 are to use the schedule, calculation or modelling methods in NZS 4218:2009 *Thermal insulation – Housing and small buildings* or NZS 4243.1:2007 *Energy efficiency – Large buildings – Building thermal envelope* for commercial buildings that have more than 300 $m^2$ of ground floor area.

**Bracing to internal walls – hold-down fixings to concrete slabs**

The maximum rating of bracing elements in NZS 3604 for internal walls on concrete slabs is 150 BUs per metre. This typically requires a hold-down fixing at each end of the panel with a 15 kN characteristic strength. Some proprietary fixings may require a slab thickening under the wall to give sufficient concrete depth to insert the fixings into to achieve the required characteristic strength. Check BRANZ Appraisals (concrete hold-down fasteners) for products that have been appraised. The Appraisal will give the embedment requirements for the kN rating of the fixing.

**Calculating rafter spans using NZS 3604 Table 10.1**

When selecting suitable rafters using Table 10.1, the default value given is for rafters on a building in the extra high wind zone. For buildings where the design wind speeds are less, a multiplier is used to determine the permitted span for the given rafter size and spacing. To apply the multiplier:

1. Choose the rafter size and the spacing intended and read off the permitted span.
2. Multiply the span given by the multiplier for the wind zone (low and medium = 1.3) or (high and very high = 1.1) to calculate the extended span for the wind zone chosen.
3. The span can be further extended by 10% if the span is continuous over two or more supports (Note 1 in the table).

**Clarification regarding top plate joints in walls (from April *Guideline*)**

A small but crucial clarification regarding top plate joints in walls containing bracing elements – the nailed or plate connections are not needed when an extra top plate is used. See NZS3604:2011 Fig 8.1.4 Note 2.

**Waterproof decks – removable walk-on surfaces gap to cladding**

Where a removable raised walk-on surface of timber, tiles or pavers is installed over a waterproof deck membrane to give level access from inside the building it is important that the surface when installed has a minimum 12 mm gap between it and the adjacent wall cladding and door joinery (E2/AS1 Figure 17A) to allow water to drain through and air to circulate. The remainder of the surface must also have sufficient gaps (5 mm given in E2/AS1) to allow rainwater to drain through to the waterproofed surface. As a reminder, waterproof decks designed to E2/AS1 require:

- a 35 mm minimum clearance between the bottom of the cladding and the waterproof surface (measured at the highest point of the waterproof deck surface)
- a minimum fall of 1.5° or 1:40
- no downpipes discharging onto the waterproof surface of the deck
- the waterproof membrane to be accessible for checking and maintenance
- either butyl rubber or EPDM membrane
- no steps within the waterproof deck surface
- a 100 mm threshold between the waterproof deck surface and the inside of the building – either a step down or a raised bulkhead

- a minimum plywood substrate thickness of 17 mm.

**Getting the Best Out of Your Building – BRANZ science roadshow**

*Getting the Best Out of Your Building* will use the expertise of BRANZ scientists and their latest research to aid the future performance of well designed and built homes and buildings. Knowledge gained through the scientists' research projects will be presented on:

- ventilation drying in weathertight structures
- air infiltration and ventilation
- thermal bridging in the building envelope
- the Healthy Housing Index
- current energy performance of homes
- availability and assessment of new technologies.

| Location | Date | Venue |
|---|---|---|
| Invercargill | Monday 27 May | Kelvin Hotel |
| Queenstown | Tuesday 28 May | The Heritage Hotel |
| Dunedin | Wednesday 29 May | Forsyth Barr Stadium |
| Timaru | Thursday 30 May | The Grosvenor Hotel |
| Palmerston North | Tuesday 4 June | Hotel Coachman |
| Wanganui | Wednesday 5 June | Kingsgate The Avenue |
| New Plymouth | Thursday 6 June | Quality Hotel Plymouth International |
| Christchurch | Monday 10 June | Addington Events Centre |
| Greymouth | Tuesday 11 June | Kingsgate Hotel |
| Nelson | Wednesday 12 June | The Rutherford Hotel |
| Blenheim | Thursday 13 June | Marlborough Convention Centre |
| Whangarei | Monday 17 June | Forum North |
| Auckland – Mount Wellington | Tuesday 18 June | Waipuna Hotel and Conference Centre |
| Auckland – North Shore | Wednesday 19 June | North Harbour Stadium Function Centre |
| Hamilton | Thursday 20 June | Claudelands Conference and Exhibition Centre |
| Masterton | Wednesday 26 June | Gateway Motor Inn |
| Upper Hutt | Thursday 27 June | Silverstream Retreat |
| Wellington | Friday 28 June | InterContinental Wellington |
| Tauranga | Monday 1 July | Trinity Wharf |
| Rotorua | Tuesday 2 July | Rydges Hotel |
| Gisborne | Wednesday 3 July | The Emerald Hotel |
| Napier | Thursday 4 July | War Memorial Conference Centre |

All seminars will be held from 1:00—4:00 pm. More details are available on the BRANZ website (www.branz.co.nz/seminars).