

# BUILDER'S MATE

### ISSUE 44 | October 2010



Check claddings and flashings for **deflection** (aim to keep water out)

Arrange for **drainage** paths to outside (should water get in)

> Arrange for ventilation and vapour diffusion **drying** (to eliminate remaining moisture)

Choose components that are **durable** for conditions (to avoid damage from moisture)

# **FOLLOW THE 4DS**

The external walls of all buildings should be designed and built following the basic philosophy for managing water known as the 4Ds:

- Deflection having the cladding and other elements such as windows intercept water on the face
  of the building, protecting surfaces from wetting by the use of eaves and other overhangs and/or
  diverting water away from potential entry points.
- Drainage providing paths behind the cladding to allow gravity drainage to remove any water that does enter.
- Drying allowing any remaining moisture to be removed by drying as a result of air movement behind the cladding.
- Durability using materials with appropriate durability.

#### Deflection

The more a wall is exposed to water, the higher the risk water will penetrate. As well as using an effective cladding to intercept the incoming water, it should be deflected away from critical junctions in the cladding by using specific deflection devices (such as window head flashings) on the exterior of the building.

Worth

## Win A Bosch 14.4v cordless drill kit

Comes complete with 2 batteries, a 45-minute fast charger a 13 mm keyless chuck and a plastic carry case.

#### 0800 948 665 www.thetoolshed.co.nz

## INDUSTRY NEWS

## CHANGES COMING

The next few months will bring changes for the building industry with the planned releases of a significantly revised edition of NZS 3604 Timber-framed buildings (the foremost standard in New Zealand for the building and construction industry), a minor technical revision of E2/AS1 (the Acceptable Solution for Building Code clause E2 *External moisture*) and a simplification of the treatment requirements for timber-framed buildings, which will be covered in changes to NZS 3602 (in essence, allowing the almost universal use of H1.2 boric treated framing). In 2011, BRANZ proposes to run a large number of seminars around the country to explain the changes in NZS 3604 and E2/AS1.



#### Continued from previous page

The style of the building can also help deflection – features such as roof eaves and verandahs shelter areas of wall and restrict the amount of water that reaches these walls. Buildings that have deflection devices like this have a lower risk of weathertightness failure than buildings with parapets where the entire wall area is fully exposed.

Even with a 20 mm drained and vented cavity behind the cladding, the face of the building should be designed and constructed to deflect 100% of the water impacting on it. The cavity is there solely as a back-up, much like the airbags we have in a car – for emergency use only. For brick veneer cladding, it is likely that not all water will be deflected – a significant amount will be absorbed by the cladding and this will need to be removed from the face and back of the veneer by drying and drainage.

Water that is deflected must also be able to drain off the exterior surfaces of the building. Wind and sun also dry remaining water from building exteriors.



Figure 1: Drained and vented cavity showing three drainage paths.

# Dribblings from the Old Geezer



The first instruction in the traditional weka pie recipe is the evocative "First, catch your weka". So you're going to become a licensed building practitioner – great! First, get your info pack from the Department of Building and Housing – either directly or get your builders' merchant to get you one.

There is a lot to know before you pick up a pen– or a weka. This whole process is not something you do in the site shed during a shower of rain. First, there is a brochure and several fact sheets to digest – 130+ pages! Next is the application pack for your class licence. It is in two parts and includes a brochure – *Understanding the regulatory environment* – for you to digest. It is 52 pages and includes a 30 question assessment to complete so you know you are ready to go off and get your weka.

If you've got this far OK, you now have to launch into the application itself. All the licensing classes are similar in format. First, you have to prove who you are – yep, tick to that one – but it does need a JP or lawyer to certify. After your whole work history is recorded, you put forward two projects from the last 5 years to be assessed in some detail (one is to be from the last 3 years) and both require detailed answers to a lot of questions – so much so that I think I'll just have a lie down and think about that pie for a bit...

#### **Des Molloy**

#### Drainage

Any water that does occasionally get past the exterior cladding must be able to be drained out before it can accumulate within the wall assembly and cause damage to wall components.

This water must be able to drain down the back of the cladding. Drainage is significantly improved where the back of the cladding is separated from the face of the wall underlay by the use of a cavity and where the cladding is non-absorbent.

#### Drying

Not all water, especially with a masonry veneer cladding, will drain from within a wall assembly as some of it will be absorbed by building components such as cavity battens and the veneer. Drainage and drying will always be better where the cladding is separated from the wall underlay by a cavity.

To remove this remaining moisture, wall assemblies also need to be designed and built to allow air circulation behind the cladding to dry it out. For example, window head details require a 5 mm gap between the bottom of the cladding and the top of the flashing to allow for drainage and air entry for drying while 20 mm cavity closures have the slots or holes to allow water out and air in.

BRANZ research has shown that water that gets beyond the wall underlay and into the framing and insulation will take months to dry out – and having a cavity does not significantly improve the drying rate for this moisture.

If there is no drying (or if drying is too slow) or there is regular water entry, building materials like timber eventually reach moisture contents that allow decay to start, even if they are treated to the levels of treatment (H1.2 and H1.3) required for wall framing.

#### Durability

The exterior cladding and components within the wall assembly must meet the minimum levels of durability required by the Building Code. This means they will continue functioning even if they become wet occasionally.

Claddings like brick veneer are very durable while other cladding types may need an exterior finish to make them durable enough. Treated timber framing will be durable if it remains dry, but it may rot if it is kept wet for long periods of time. Kraft-based wall underlays are durable but will deteriorate if they are kept wet, while syntheticbased wall underlays have greater durability.

Materials specified must meet minimum durability requirements of the Building Code, be fit for purpose and meet the serviceable life expectations of the building owner.

See BRANZ *Building basics: Weathertightness* for more information.



Do you get your **free** *Build* magazine? All building contractors who are in the business of building and have paid a Building Research Levy in the current year can receive BRANZ's *Build* magazine for free. This Levy is paid as part of the building consent fee on all construction projects over \$20,000. If you are missing out on your free copy of *Build*, call 0800 80 80 85 (press 2) or email verachan@branz.co.nz.

ADVISORY HELPLINES

BRANZ

Calls cost \$1.99 per minute plus GST

## www.branz.co.nz

# Measuring moisture content in timber

The moisture levels of timber can be critical for a building's performance and durability. Timber that is too damp in use may not be sufficiently durable, and timber that dries in place will shrink, which can affect the level of finishes achievable.

Building Code clause E2 *External moisture* E2/AS1 gives these moisture contents for timber framing at time of completion:

- For timber framing at the time of installing interior linings – 20% before internal linings are fixed although a lower moisture content may be required by manufacturers whose product is fixed to the timber.
- For timber weatherboards and exterior joinery at the time of installation 18% or less.
- For reconstituted wood products 18% at all times.

NZS 3602 *Timber and wood based products for use in buildings* requires lower in-service moisture contents to meet the durability provisions of clause B2 of the Building Code:

- H1.1 and H1.2 treated framing 20% maximum in service (this in-service moisture content also applies to framing with a higher hazard class treatment).
- Kiln-dried untreated timber 18% maximum in service.

To measure the moisture content, the electrodes attached to the moisture meter are inserted into the timber at a set distance apart, and the electrical resistance of the material between them is measured. This reading (electrical resistance) is directly related to the moisture content of the timber being measured. Several factors affect this relationship, for example, the timber species, treatment and temperature.

#### How to take readings

- Identify the timber species to be measured. Most framing will be radiata pine, either treated or untreated. If the timber is treated, identify the treatment type.
- Check the meter and ensure that the batteries are charged and the electrodes are undamaged and correctly connected. If the meter has not been used for some time, it is advisable to check it against the test card.
- Test those areas of framing to which internal linings are to be attached, such as wall framing, ceiling battens, rafters and floor joists.
- Insert the probes into the timber the required distance, parallel to the grain, and at least 400 mm from an end of the timber. End grain will dry, or absorb moisture, faster than other areas and may not reflect the true state of the timber. Samples taken near the middle of the widest side of members reduces the depth the probes need to be driven in (Figure 2).
- Read and record the moisture content percentage and the temperature.

- Carefully remove the probes without bending them. (Use the sliding hammer attached to longer probes.)
- Correct the reading for the variation in temperature and then for the species of timber being measured, and record the result.

Take the required samples from throughout the building, with at least half the samples taken in areas of restricted drying. For preservative-treated framing:

- insert insulated probes to approximately one-third depth (i.e. for 50 mm thick studs, insert 15–17 mm deep from the wide face)
- test 10 studs, six ceiling battens and six lintels from throughout the works.

For kiln-dried untreated framing:

- insert probes to approximately one-quarter depth
- test 10 studs, six ceiling battens and six lintels from throughout the works
- test five interfaces of framing in contact, such as double joists and solid lintels (50 mm insulated probes will be required to penetrate to the interface of 50 mm thick members)
- test three surfaces of bottom plates in contact with flooring, especially concrete slabs. (Because concrete dries at a slower rate than timber, any timber in contact with it will also dry more slowly. This can be minimised by using a damp-proof course under all bottom plates.)

An acceptable moisture content for close-in is when 90% of the test samples indicate moisture contents within the required range, with the remaining readings just above.

See Bulletin 515 *Measuring moisture in timber and concrete* for more information.



Figure 2: Measuring moisture in framing.





Here's a close-up of part of a tool. What is it?



## A Bosch 14.4v cordless drill kit Worth \$459!

Comes complete with 2 batteries, a 45-minute fast charger, a 13 mm keyless chuck and a plastic carry case.

The prize is provided courtesy of The Tool Shed.

All you need to do to win is tell us the name of the mystery tool (above right).

Send us your answer plus your name, address, telephone number and email address on the back of an envelope. Post it (you don't need a stamp) to: Builder's Mate 44, Mystery Tool Competition, FREEPOST BRANZ, Private Bag 50 908, Porirua City 5240. One entry per entrant please.

Don't forget to tell us where you picked up your copy of *Builder's Mate*! The winner will be the first correct entry drawn at 9 am on Friday 29 October 2010. Details will be posted on the BRANZ Ltd website (www.branz.co.nz) and in the next edition of *Builder's Mate* due out on 3 December 2010.

#### **Terms and conditions:**

Entry is open to all New Zealand residents except employees and immediate families of BRANZ and The Tool Shed shops. The competition will close on Friday 29 October 2010. The prize is not transferable for cash. The judge's decision is final. No correspondence will be entered into.

Only

from



#### **BUILDER'S MATE WINNER**

The winner of the BM 43 competition was Viv Page from Ashburton. The mystery tool was a lead dresser, for making lead roof flashings, and the prize was a mid-sized ToolShed Trade Ute Storage Box.

Photo: BM 42 competition winner Leon Kennedy receives his prize from Adrian Waterworth at The Tool Shed Penrose.

# BLOKES on the job

#### **KEVIN ROGERS** Roofing in Hamilton



**Favourite tool** Paslode nail gun.

**Favourite tip** Builders – make sure the house is square.

#### **STEVE KLOUWENS** Repiling on North Shore



**Favourite tip** Throw away the water level.

**Favourite tool** Laser level (to replace the water one).

#### BRENDON ASHTON

Working on a villa restoration in Herne Bay



**Favourite tool** Makita power sabre saw.

**Favourite tip** Rip into it but watch for kick back.

Know someone on the job? Send us details of his or her favourite tip and tool and you could win \$50 worth of BRANZ books.

www.branz.co.nz www.branz.co.nz

04 237 1170

Although BRANZ has made every attempt to ensure the accuracy of its information, it provides generic advice only, and BRANZ accepts no liability for any loss or damage incurred. Opinions expressed in *Builder's Mate* do not necessarily reflect the views of BRANZ.

0800 80

Standards referred to can be purchased from Standards New Zealand. Tel: 04 498 5991 or www.standards.co.nz. ©BRANZ Ltd, October 2010

plus \$8 p&p or phone

*Renovate villas* is the first in a new series that will cover the renovation of houses from different eras. It's well illustrated with crystal clear drawings showing typical construction methods for framing, roofing, windows and interior building elements.

