BRANZ

FREE TO ALL BUILDERS | ISSUE 96 | JUNE 2019

builder's mate

CRACKING UP (AND HOW TO AVOID IT)

A concrete floor slab starts to cure as soon as it is placed, and as it cures, it starts to shrink and crack. Installing shrinkage control joints can help reduce the risk of uncontrolled cracking, but getting the dimensions and the timing right is crucial for a good result.

Shrinkage control joints act as weak links in the concrete, so cracks tend to form along those lines in a controlled way. NZS 3604:2011 *Timber-framed buildings* says these joints can be made by inserting a crack-inducer (typically PVC or metal) in the slab when it is poured or cutting the slab after it has started to harden.

The inducer or cut extends to a quarter of the depth of the slab and must not damage the damp-proof membrane under the slab.

The designer should show the location of shrinkage control cuts on the floor plan. Ideally, joints will be hidden under internal walls wherever possible.

Cracking is most likely to occur at major changes of plan, so NZS 3604:2011 requires that shrinkage control joints are created to coincide with these locations (Figure 1). >

INDUSTRY NEWS

Big changes coming to building law

The government is proposing big law changes in the industry. They include reducing the Building Levy, changing the LBP Scheme and introducing building guarantees. You can find more details in Mouthpiece over the page.

Accord agreed between industry and government

The Construction Sector Accord is a high-level government–construction industry partnership that aims to overcome problems with building company collapses, poor-quality builds and skills shortages. See www.mbie.govt.nz/about/news/government-and-industry-sign-construction-sector-accord

Precast concrete safety

WorkSafe has published guidelines on working with precast concrete. Download from www.worksafe.govt.nz/topic-and-industry/concrete/safe-work-with-precast-concrete

Building Basics *Your business*

Just released, the second edition of this BRANZ book is an essential read for builders thinking of starting their own business as well as those already running their own firm. Buy print and/or digital copies from www.branz.co.nz or 0800 80 80 85 (press 2).

HAMMER 'N' NAILS

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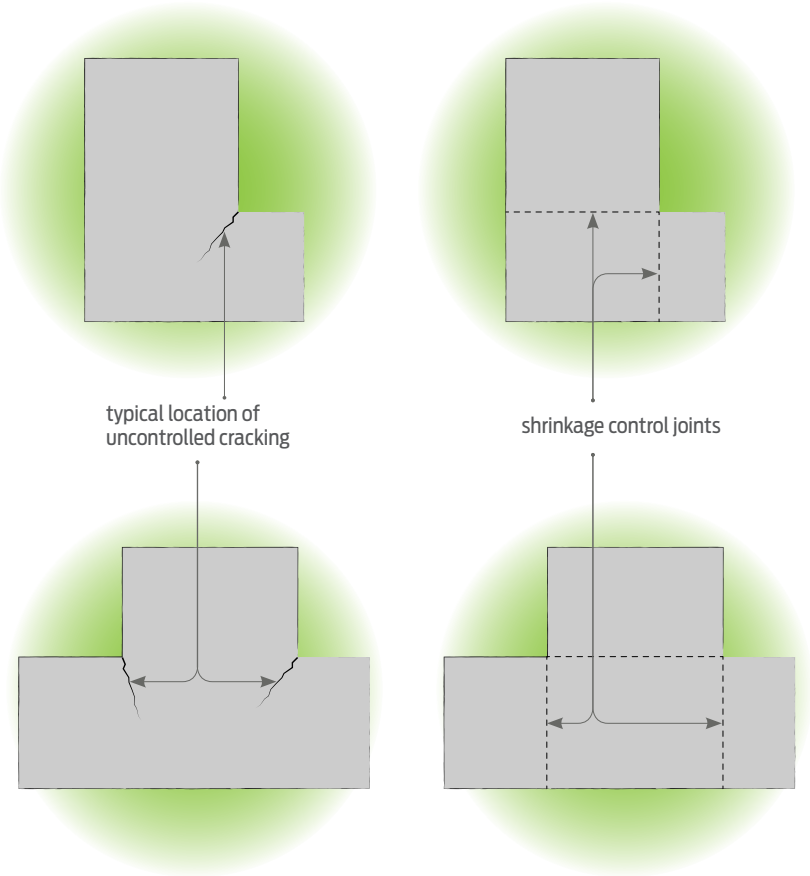

Figure 1. Shrinkage control joints located at changes in plan (after Figure 7.19 in NZS 3604:2011).

Shrinkage control joints must be at maximum 6 m spacings to create bays, with no bay bigger than 6 x 6 m. The length-to-width ratio of bays between shrinkage control joints or between shrinkage control joints and a free joint should be between 2:1 and 1:1.

When to saw cut a slab

Where shrinkage control joints are formed after laying, the cuts are usually around 5 mm wide and 25 mm deep. Getting the timing right is crucial. Concrete New Zealand recommends using an early-entry saw and cutting the slab within 6–8 hours of placement. Cutting early means the risk of random cracking from restrained early thermal contraction is reduced. If a conventional diamond-edged circular saw is used, the slab should be cut as soon as it is sufficiently hard to get a clean cut (typically within 24 hours).

NZS 3604:2011 requires cutting "no later than 24 hours after initial set for average ambient temperatures above 20°C, and 48 hours for average ambient temperatures below 20°C". That's typically the day after pouring in summer and 2 days after pouring in winter. Leave it too late, and uncontrolled cracks will start appearing. Saw-cut joints are of little use at this stage.

Free joints

A free joint is required when a slab is over 24 m long. No reinforcing steel can pass through the joint, and the vertical faces are not bonded. R12 dowels 600 mm long at 300 mm centres must be lapped 300 mm with the slab reinforcement on both sides of the joint and with a bond breaker to all bars on one side of the joint.

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Mouthpiece

Big overhaul proposed for building laws

The biggest changes in a decade have been proposed for our building laws. The government has published a discussion paper and asked for feedback before Friday 7 June 2019.

The Ministry of Business, Innovation and Employment (MBIE) has outlined concerns and possible changes in five broad areas. The proposals include the following:

BUILDING PRODUCTS AND METHODS

- Clarify roles and responsibilities for building products and methods.
- Require manufacturers and suppliers to provide information about products.
- Strengthen the product certification framework.
- Make consenting easier for modern construction methods (including prefabricated).

OCCUPATIONAL REGULATION

- Change the LBP Scheme to lift competence and widen the definition of restricted building work.
- Bring in a new licensing system for engineers and limit who can do safety-critical engineering work.
- Remove exemptions that let unlicensed people do plumbing, gasfitting or drainlaying.

RISK AND LIABILITY

- Require a guarantee and insurance products for residential new builds and big alterations, with an opt-out choice for homeowners.

BUILDING LEVY

- Reduce the Building Levy from $2.01 (incl. GST) to $1.50 (incl. GST) per $1,000.
- Standardise the Levy threshold at $20,444 (incl. GST). This is the minimum value of a project where the levy must be paid.
- Let MBIE spend Levy funds more widely.

OFFENCES, PENALTIES AND PUBLIC NOTIFICATION

- Increase maximum financial penalties.
- Set different maximum penalties for individuals and organisations.
- Extend the time enforcement agencies can lay a charge from 6 to 12 months.

You can find more information at www.mbie.govt.nz/have-your-say/building-system-legislative-reform-programme-public-consultation/

INSTALLING PLYWOOD SUBSTRATES FOR **MEMBRANE ROOFS**

The performance of a membrane roof is influenced by how well the substrate has been installed. If the substrate isn't properly constructed, rainwater may not drain away, or bubbles can form under the membrane where it is applied over a wet substrate.

Acceptable Solution E2/AS1 only covers butyl or EPDM membranes over plywood substrates with a minimum fall of 2°. (BRANZ recommends a minimum fall of 3° to ensure better run-off, but builders should follow the fall given in the consented plans.)

The plywood should be specified by the designer. It will typically be H3 CCA-treated and kiln-dried CD grade structural ply of 17 mm minimum thickness. LOSP-treated ply is usually not suitable.

Check what the membrane manufacturer specifies for the substrate – there are subtle differences in construction requirements. These are some common E2/AS1 and manufacturers' requirements:

- Ensure that the roofing substructure is dry and has the required fall and there will be a minimum 20 mm gap between insulation and plywood.
- Install the ply with the smoothest (sanded) face upwards.
- Lay in a staggered joint pattern (brick bond) with the face grain of the top ply layer at right angles to the main support.
- Ensure the ply is supported by framing at 400 mm maximim centres and at all edges.
- Fix sheets with countersunk 10 g x 50 mm stainless steel screws at 150 mm centres to the edges (100 mm in very/extra high wind zones) and 200 mm centres within the sheet area. (Some membrane manufacturers also require that the ply is glued.)
- Check with the membrane manufacturer's requirements for the treatment of joints. Liquid-applied membranes typically require 2–3 mm gaps between sheets, while sheet joints can be loose-butted with torch-on systems.
- Allow a perimeter expansion gap of 5 mm where sheets are within a confined area (for example, surrounded by parapets).
- Provide arrises of minimum 5 mm radius (10 mm is better) to all external edges.
- Chamfer or radius corners where the membrane is turned down into a gutter.
- Install 20 mm H3.2 angle fillets to vertical upstands (except for some thermoplastic membranes).
- Fill/level holes or cracks.
- Sand filler, joints and fixing holes to remove splinters.
- Vacuum (or use a leaf blower) to remove surface dust and dirt.
- Keep the substrate dry – E2/AS1 requires that ply and substructure has a maximum moisture level of 20% at membrane installation (BRANZ recommends a maximum of 18%). Cover with tarpaulins at the end of each day and when rain is forecast.

For more information, see E2/AS1 or BRANZ Good Practice Guide *Membrane Roofing* (second edition, 2015). This BRANZ book also covers other substrate types.

Plywood substrate with angle fillet installed

Competition

Here is a tool

What is it?

A DeWalt 18V cordless hammer drill driver kit worth $370!

This latest generation ultracompact hammer drill/driver is perfect for tight spaces. Two-speed all-metal transmission, single sleeve keyless chuck, bright LED light plus new battery technology.

The prize is provided courtesy of The ToolShed.

All you need to do is tell us the name of the mystery tool at the top of the page.

Email your answer to **buildersmate@branz.co.nz**. Put "June Competition" in the subject line. The message should include your answer, your name, postal address and phone number. 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 12 July 2019. Details will be posted on the BRANZ Ltd website (www.branz.nz) and in the next edition of ***Builder's Mate*** due out on 1 August 2019.

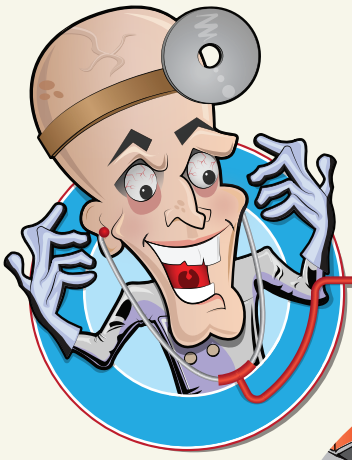
The ToolShed

Winner of ***Builder's Mate 95*** was Maurice Bland of Stratford. Maurice wins a Makita bluetooth radio. The mystery tool was a cordless vacuum cleaner.

Pictured February winner Angela Peden with her prize, a Milwaukee hammer drill.

Terms and conditions:

Entry is open to all New Zealand residents except employees and immediate families of BRANZ and The ToolShed shops. The competition will close at 9 am on Friday 12 July 2019. The prize is not transferable for cash. The judge's decision is final. No correspondence will be entered into.



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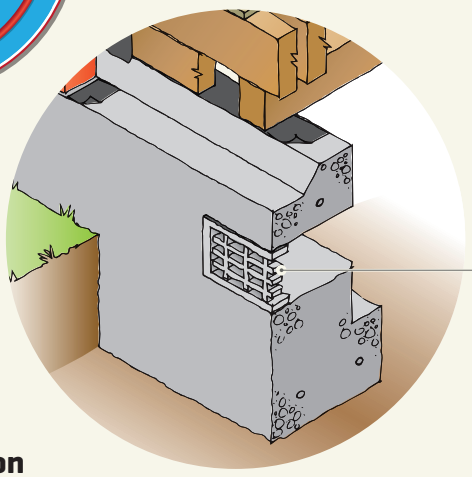

The required ventilation area is the clear opening and not the dimensions of the vent itself. (The clear space is less than 20% of the total area of some readymade vents.)

Subfloor ventilation

With suspended timber floors, NZS 3604:2011 *Timber-framed buildings* requires vent openings at least 3500 mm² per m² of floor area. This is clear opening space – not vent dimensions (see drawing). Typical options include vents starting 750 mm from corners and 1.8 m apart or continuous 20 mm slots between baseboards.

If this is not possible, the standard requires a damp-proof ground cover such as a 0.25 mm thick polythene sheet lapped 75 mm at joints and weighed down with rocks or bricks. Water must not pond. There must still be vent openings at least 700 mm² per m² of floor level.