BRANZ

April 2022

GUIDELINE

Welcome to the BRANZ monthly technical update

Construction and COVID-19

Protection framework in place

New Zealand is operating under the rules of the COVID-19 protection framework. You can find out what this means for building work and building sites on the CHASNZ website.

If you have a workmate who is finding it tough to cope with everything that is happening, help is available through the MATES in Construction website or phone 0800 111 315.

In this issue:

The risks of not having a contract

Contracts valuable in tough times

An architectural practice we know has a construction project under way where the main building contractor has just ceased trading. There was an NZIA contract in place for this building, and the contract outlines the process to follow in this situation. However, the contractor had taken on other (concurrent) projects to try to stay afloat, some with no written contracts in place.

For several years now, it has been a legal requirement that all residential building work with a value of $30,000 (including GST) or more must have a written contract in place between the building contractor and the client. The obligation is on the builder to provide the contract. Clients can also request a contract for projects under $30,000.

Building contracts are extremely important when things go pear-shaped. While working without a contract exposes the builder to some risks, it's really the client who is (probably unwittingly) taking the greater risk. Residential clients are especially vulnerable in the absence of written contracts. With the New Zealand construction industry in the stressed state it is at the moment and sailing uncharted waters, the importance of these contracts is probably greater than it has ever been.

Patching damaged roof and wall underlay

Go big or go home

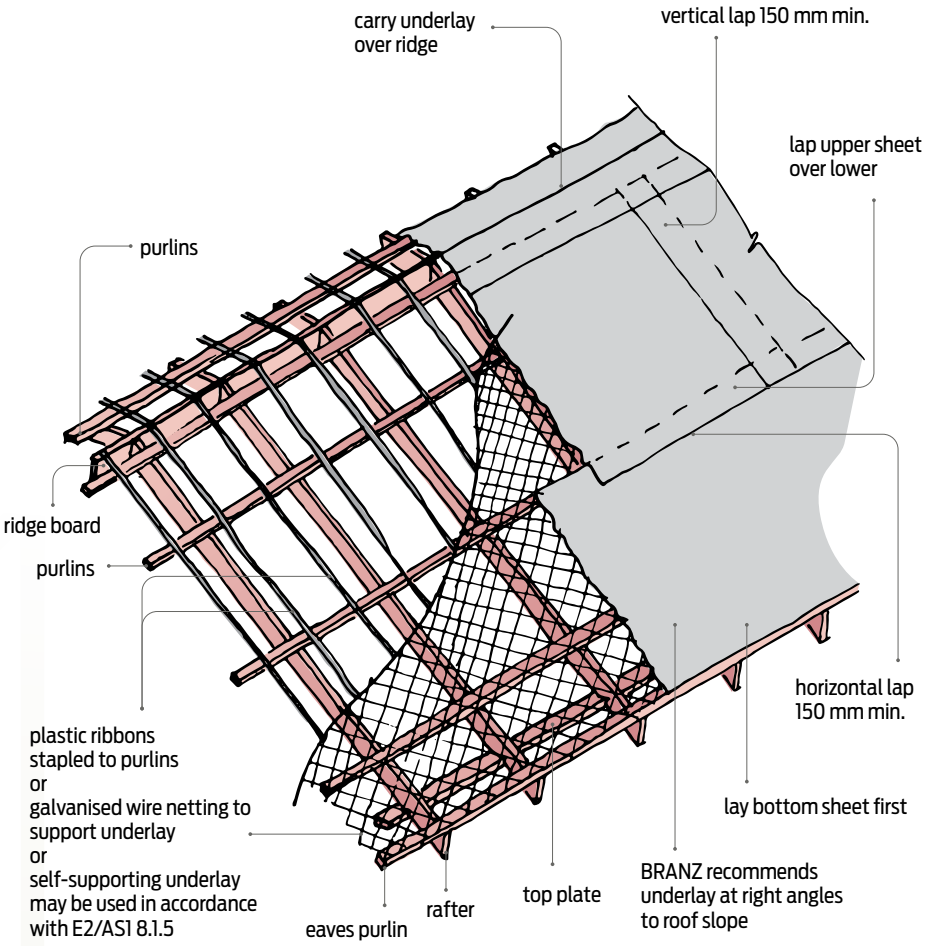
Rips and holes in wall and roof underlay are a fact of life, but just taping a small patch over the hole - something we see from time to time - isn't good practice. The right approach is set out in Appendix A of NZS 2295:2006 *Pliable, permeable building underlays*.

Tears less than 75 mm and holes less than 25 mm in wall underlay can be repaired with a compatible flexible flashing tape, with solid support provided behind so the tape can be pressed firmly to the underlay and properly adhered. Bigger rips or holes should only be repaired with new full-width underlay run horizontally from stud to stud (and fixed to studs) and lapped under underlay above or taken to the top of the wall.

Damaged roof underlay should be replaced with lengths of new full-width underlay material (Figure 1). Horizontal underlay should run from rafter to rafter and from 150 mm below the damage and up to and under the next side lap. The underlay should be fixed to the rafters.

Where roof underlay runs vertically over purlins, new sheets of full width should run from the purlin below the damage to two purlins above the damage, slipped under the old sheet and fixed to the purlin.

NZS 2295:2006 is sponsored by MBIE and can be downloaded at no cost from Standards NZ.



Note: For below 10° pitch, E2/AS1 requires underlay to be laid as shown. For long-run roofing installations where pitch is over 10°, the underlay can be run down the slope and lapped 150 mm at the sides.

Figure 1. Repairs to damaged roof underlay should only be made with full-width sheets of new underlay, not small patches.

Plans progress quickly for urban intensification

Tier 1 cities changing their district plans

The incoming Medium Density Residential Standards generally enable people to build up to three units and three storeys on most sites in Tier 1 areas without needing to get resource consent. Tier 1 councils include Auckland, Hamilton, Waikato District, Waipā District, Tauranga, Western Bay of Plenty District, Rotorua Lakes, Wellington, Porirua, Hutt, Upper Hutt, Kāpiti Coast District, Christchurch, Selwyn District and Waimakariri District.

From August 2022, district plans for these areas must include the standards (or standards that enable greater development).

The density standards are:

Number of residential units per site	Up to 3
Building height	Up to 11 m, with an additional 1 m for a pitched roof
Height in relation to boundary	Maximum – 4 m + 60° recession plane
Setbacks	Minimum – front 1.5 m, side 1 m, rear 1 m (excluded on corner sites)
Building coverage	Maximum – 50% net site area
Outdoor living space (one per unit)	Ground floor minimum – 20 m², 3 m dimension Above ground floor minimum – 8 m², 1.8 m dimension
Outlook space (per unit)	Principal living room minimum – 4 m depth, 4 m width All other habitable rooms minimum – 1 m depth, 1 m width
Glazing	Minimum – 20% glazing of the street-facing façade
Landscaping	Minimum – 20% of the developed site grass or plants

You can find more details on the Ministry of Housing and Urban Development website.

Roof insulation will be bigger

Thicker than two short planks

In the January *Guideline*, we briefly looked at the requirements for windows under the 5th edition of Acceptable Solution H1/AS1, and in February, we looked at floor insulation. This time, it's roof insulation. This is an easy one to grasp. If you plan to use the schedule method in H1/AS1 to demonstrate Building Code compliance for housing, and buildings up to 300 m², from 3 November this year, the roof construction R-value must be a minimum R6.6 in all six climate zones.

Installation of bulk insulation in roofs with roof spaces will probably follow the process commonly used today (between ceiling joists or bottom chords of trusses and over the ceiling lining) but will have to allow for thicker insulation. For example, one glass wool R7.0 roof insulation product currently on the market is 260 mm thick. Designers will need to consider the insulation they will specify before designing the roof to account for issues such as the required 25 mm clearance between insulation and roof underlay.

For skillion roofs, care will need to be given to the framing required to ensure the R6.6 performance is achieved. For example, deeper rafters (or purlins where the insulation is installed over a sarked ceiling) may be required.

The requirements in the 5th edition of H1/AS1 make allowance for the fact that the insulation required may be too thick to extend right to the ceiling edge under a sloping roof. In roof spaces where insulation is installed over a horizontal ceiling, the R-value may be reduced to R3.3 for up to 500 mm from the edge where there is not enough space for the thicker insulation required to achieve R6.6.

For H1 compliance using the schedule method, the ceiling R-value (minimum R6.6) does not need to be corrected for the reduced edge R-value provided the width is no more than 0.5 m and the reduced R-value is at least R3.3.

If the calculation method is used, the R-value needs to be adjusted. BRANZ can provide some guidance here.

A good approximation for the fraction of the ceiling area that is affected is:

$$edge\ area\ fraction\ f_e = \frac{w}{A/P} - 4.\frac{w^2}{A}$$

Where:

w = width of reduced ceiling R_value ($R_{reduced}$)

A = interior ceiling area

A/P = ceiling area to ceiling perimeter length ratio

The second half of the equation is important only when A/P is less than 2.5.

This assumes that the all the ceiling perimeter has reduced R-value (R3.3 for example). For example, if 25% of the perimeter doesn't have reduced R-value, multiply the edge area fraction by 0.75.

Once the edge area fraction is known, the R-value of the ceiling is calculated by area weighting the R-values (not the R-value of the insulation).

$$ceiling\ R\text{-}value = f_e.R_{reduced} + (1 - f_e).R_{unreduced}$$

Alternatively, this last equation can be reversed to determine the minimum unreduced R-value that would give the desired ceiling R-value (R6.6 for example).

The edge area fraction calculation can be written in terms of just the A/P ratio without the need to have the ceiling area:

$$f_e = \frac{w}{A/P} - \frac{1}{4}.\left[\frac{w}{A/P}\right]^2$$

This version will slightly overestimate the edge area fraction if the shape of the ceiling is not simply square.

Setting $R_{reduced}$ to R3.3, $R_{unreduced}$ to R6.6 and *w* = 0.5 m, the impact the reduced R-value has can be calculated.

A/P ratio	Ceiling area corresponding to A/P if shape is square (m²)	Ceiling R-value	$R_{unreduced}$ to give ceiling R6.6	$R_{unreduced}$ to give ceiling R6.6 if reduced width only 0.3 m wide and R5.0 instead of R3.3
1	16	5.2	9.2	7.2
1.2	23	5.4	8.6	7.1
1.4	31	5.5	8.2	7.0
1.6	41	5.6	7.9	6.9
1.8	52	5.7	7.8	6.9
2	64	5.8	7.6	6.9
2.2	77	5.9	7.5	6.8
2.4	92	5.9	7.4	6.8

Lithium-ion batteries in power tools

Don't cook cordless power tools in the sun

Cordless power tools can be worth their weight in gold on a building site, but the high-power lithium-ion batteries that make these devices possible are responsible for a growing number of fires. Tools with the battery in place (and even spare batteries) sitting in the sun in the back of vehicles, where temperatures can reach 40°C, can be a fire risk. Batteries left charging for extended periods, such as overnight, are also causing problems. Fire & Emergency New Zealand is being called out to a rapidly growing number of incidents around lithium-ion batteries, some involving power tools. There are very likely more incidents where the fire service hasn't been called out.

To maximise the life of a cordless tool and reduce the risk of lithium-ion battery fires:

- Don't leave tools in locations where they can get very hot.
- Make sure to use the right charger for the battery.
- Don't leave them connected to chargers for extremely long periods.

- Use only recommended batteries, not cheaper counterfeits.
- Dispose of batteries properly - do not add to ordinary rubbish.

Finally, avoid subjecting a battery to excessive mechanical shock and/or vibration. Cracked, dented and/or compressed batteries can catch fire unexpectedly at any time.

Fixing down heat pump outdoor units

Good information is available

In its most recent Annual Report released this year, EECA assessed performance in a range of areas. While there were a lot of achievements recorded, one area where the result was slightly below target was around heating retrofits. In particular, not all retrofitted heat pump installations under the Warmer Kiwi Homes scheme had the outdoor unit fixed down properly.

It is important that the outdoor unit sits level and secure so it creates no vibration. Suitable bases include a concrete pad (Figure 2). If pouring an in situ reinforced concrete pad, this should preferably be 100 mm thick with steel reinforcing mesh at mid-depth. Other options include a concrete patio or balcony or a timber slatted deck with anti-vibration mounts.

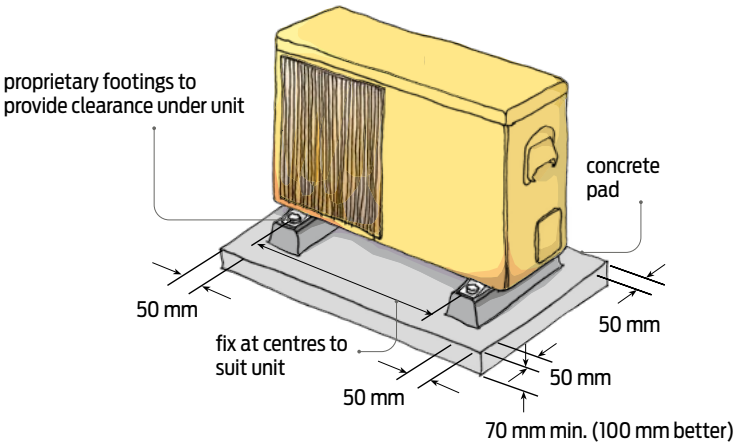


Figure 2. Installing an outdoor unit on a concrete pad.

There should be an unobstructed gap of about 100 mm under the unit, with the weight of the unit fully supported. Manufacturers generally provide proprietary footings. Fixings should be stainless steel.

Download EECA's *Good practice guide - Heat pump installation* (April 2020 version).

News

More details on the building supplies enquiry

On 31 March, the Commerce Commission released a paper giving more details around its market study into competition in the residential building supplies sector. Public versions of submissions and cross-submissions received on the preliminary issues paper for this study are also available on its website. The Commission's draft report is due to be released in July 2022, and the final report is scheduled to be published on 6 December 2022.

The Commission is also conducting a survey about how key building supplies are specified in residential building plans, how they are purchased and the various factors that go in to that decision making. If you wish to take part, you can access the survey here. The survey is open until 29 April 2022.

Māori Housing Strategy Implementation Plan

The Implementation Plan for MAIHI Ka Ora Māori Housing Strategy has been published. The strategy breaks down the problems facing Māori housing, puts in place actions that will help solve those problems and sets timeframes to make sure work is done to improve housing outcomes and wellbeing for whānau.

Don't extrude if you're freezing

Our March *Guideline* article on mortar joints brought some interesting feedback - in particular, a warning around using extruded joints in masonry in very cold climates. With extruded joints, excess mortar is squeezed out between the blocks where it is allowed to remain for effect. This is fine in many areas but not in very cold climates with freezing temperatures. Extruded joints collect rainwater, which soaks in to the mortar and the bricks/blocks. The mortar or the face of the brick can crack off when this water freezes and expands.

Ups and downs in residential construction data

New home consent numbers for the year ended February 2022 hit a new annual record of 49,733. At 4,195, the new home consents for February 2022 were the highest ever recorded for the month of February.

The consent data was followed by sobering forecasts in the ANZ New Zealand Business Outlook 30 March 2022, where, as ANZ put it, residential building intentions "tanked". Residential construction survey responses went from -5.0 in February to -26.9 in March. The numbers represent the percentage expecting improvement minus the percentage expecting deterioration.

Source: ANZ NZ Business Outlook 30 March 2022.

News

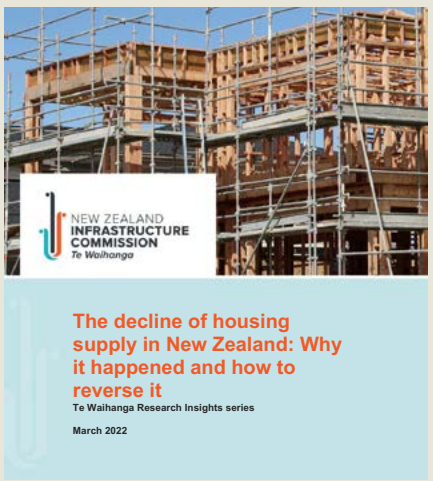
Registration and licensing for engineers

The government has announced that it will bring in a new two-tiered regulatory regime for engineers and establish a new regulator to oversee it. All engineers will have to be registered, and those in higher-risk disciplines will have to be licensed. The loss of life from building collapses in the Canterbury earthquakes was one of the reasons for the change.

"While a large number of engineers are highly professional, there are too many that are practising with no checks on their professionalism or competence and there are few means to hold them to account if their standards slip." A Bill to introduce the new system is expected to be introduced into Parliament later this year.

Why do we have a housing shortage?

A new report from New Zealand Infrastructure Commission/Te Waihanga asks why housing supply and affordability declined over recent decades and what can be done to reverse this trend. It finds that changes to urban planning policies and urban transport speeds can explain most, if not all, of the acceleration in house prices and decline in housing supply.



Wellington City Council Environmental and Accessibility Performance Fund

Wellington City Council invites Wellington-based construction industry professionals to participate in a May workshop and provide feedback on a new fund to support Environmental and Accessibility Performance (EAP fund) across the building sector in Wellington.

This is a seven-year $20M fund to encourage the medium/large scale development of environmentally sustainable and universally accessible buildings in Pōneke.

The EAP will replace the 'Green Building Remission' that sat within the Development Contributions policy.

The workshop will take place 5 May 1-3pm online. Feedback through this workshop will help refine the eligibility and specific funding criteria, with the goal of having the fund up and running by August 2022.

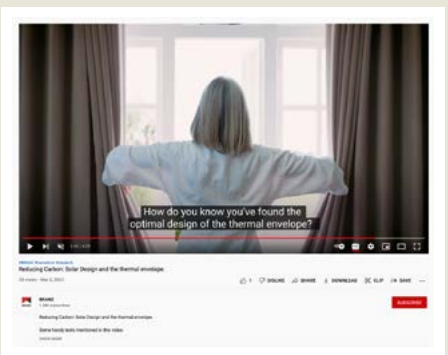
The council will be sending out the draft criteria for review ahead of the workshop. To request an invitation and link to the workshop, please email ClimateAction@wcc.govt.nz.

BRANZ releases carbon videos

BRANZ has released five short videos around how to remove carbon from construction. Each one is just a few minutes long and in plain English.

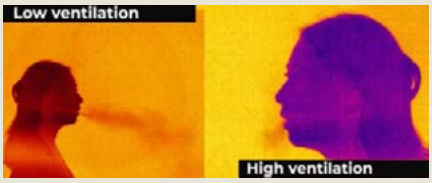
The videos cover:

- Where is carbon in a building?
- House size and form
- Solar design and the thermal envelope
- Materials selection
- Fixtures and appliances



New research centre for indoor air quality

The new Indoor Air Quality Research Centre (IAQRC) is a collaboration of seven research organisations including BRANZ. It aims to increase public awareness of indoor pollutants and related health outcomes and to advocate for improved indoor air quality in Aotearoa New Zealand. The IAQRC will coordinate research and share knowledge and resources.



Review finds vast water wastage

Water New Zealand's latest National Performance Review has found that large water savings could be made in households and supply networks. The average New Zealander uses 281.8 litres of water per day, but there are huge variations around the country. In Auckland, where water is metered, each person uses an average of 146 litres/person/day, while in unmetered districts, use goes as high as 800 litres/person/day. While there are good reasons for higher use in some areas, there is clear room for savings.

Leaks in network supply pipes are also a massive problem. It is estimated that 20% of water in network pipes leaks out overall, but in some districts, more than half the water going into the network is lost. The loss across the country is estimated at over 100 million cubic metres per year - roughly equivalent to the volume of water supplied to Hamilton, Rotorua, Dunedin and Christchurch combined.

Updated finger-jointed structural timber standard

The new edition of AS/NZS 8008:2022 *Timber - Finger-jointed structural timber - Product and performance requirements* was published on 25 March. The objective is to provide specifications for finger-jointed structural timber to facilitate the safe use of this product in structures. Changes include updates to the Verification Methods and performance requirements to enhance usability of this standard.

Looking ahead

- May 2022 – MBIE due to release for comment the proposed Building Code compliance changes for 2022.
- 12 May 2022 – changes to the healthy homes standards for rental homes around heating, ventilation and moisture ingress and drainage standards will become law.
- May 2022 – the government will release its Emissions Reduction Plan.
- 1 July 2022 – in high-risk areas such as Wellington, earthquake-prone buildings (other than priority buildings) must be assessed.
- 1 July 2022 – in medium-risk areas such as Hamilton or Nelson, earthquake-prone buildings in the priority category must be assessed.
- 1 July 2022 – waste levy of $20 per tonne introduced for construction and demolition fill (Class 2).
- August 2022 – New Zealand's National Adaptation Plan (for climate change) is due to be published.
- August 2022 – district plans for Tier 1 councils must include density standards (or standards that enable greater development).
- 2 November 2022 – end of the 1-year transition period for Building Code compliance changes announced 29 November 2021.
- 6 December 2022 – the Commerce Commission is due to present its final report on residential building supplies.