Guideline

February 2019

Welcome to this update on technical and informative advice for the building and construction industry on issues relating to building controls and good construction practices.

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Galling

Nuts won't tighten

When inserting a screw into a metal substrate or a nut onto a bolt, heat is generated as a result of friction and adhesion between the two. This is followed by slipping and tearing of the crystal structure beneath the surface. This phenomenon is described as galling (also known as cold welding). Galling can leave some material stuck or friction welded to the adjacent surface, whereas the galled material may appear gouged with balled-up or torn lumps of material stuck to its surface. Once a fastener has seized from galling, it is typically impossible to remove without cutting the bolt or splitting the nut.

Metals such as aluminium, stainless steel and titanium will generally be more prone to galling due to the atomic structure of their crystals. Annealed (softened) steel is slightly more resistant to galling, while steel that is fully hardened is very resistant to galling.

To avoid galling when installing fixings:

- apply a lubricant to the thread
- slow the rate of tightening
- use bolts or nuts with no damaged threads and debris
- use fasteners with coarse threads where possible
- use a hand-powered screwdriver rather than a screwgun.

We don't learn, do we?

Hard on the wallet

From recent newspaper reports:

- Waiheke property owner (who happens to own a plumbing and drainlaying business) fined $21,000 for illegal house alterations.
- Site 1 LBP held accountable for building work that was carried out contrary to the building consent issued. Incorrect cladding supplied and installed. Fined $1,000 and ordered to pay costs of $1,000.
- Carpentry LBP found to have carried out negligent building work and supervision in relation to cladding installation, waterproofing and roofing substrate work. Claim that the work was contrary to a consent was not upheld as the owner was the designer and was dealing with

consent matters. Failure to provide a record of work upheld. Fined $3,500 and costs of $1,500 ordered.
- Foundations LBP convicted of serious offending in the District Court. Found to have breached section 317(1)(a) in that the convictions reflected on his fitness as a licensed building practitioner and to have brought the regime into disrepute. Licence cancelled for 5 years. Costs of $1,000 ordered.

Bushfire risk
Fact, not fantasy

Wildfires on the edges of New Zealand's cities and towns are a real risk where forests or scrub and homes are in close proximity. Christchurch taught us this in the Port Hills wildfires of February 2017. And we have this month's Wakefield and other fires.

The Port Hills fire consumed around 1,650 hectares. Nine homes were completely lost and five others damaged. At least 450 households with an estimated 1,400 people – but perhaps as many as 2,800 – had to flee. Insurance payouts cost $17.7 million, and the total cost has been estimated at $30 million to date.

A special edition of the *Australasian Journal of Disaster and Trauma Studies* was published in December last year, with contributions from 16 fire and other scientists. It is devoted to the Port Hills wildfire, what happened and why but mostly what can be learned. Most of the articles focus on urban fringe fires, lifestyle blocks, small holdings and growing subdivisions where the highest risk is perceived because these areas have a significant fuel supply such as pine plantations, native bush, gorse and grassy paddocks that burn savagely when conditions are dry and winds blowing.

Putting a New Zealand focus on the risk, Lisa Langer and Simon Wegner of Scion wrote that "the time has arrived to awaken fire managers to the specific risks of wildfires on the fringe of major urban centres". The view of senior fire scientist at Scion Grant Pearce was that "New Zealand cannot wait until the next Port Hills-type wildfire event … to take more definitive action to reduce wildfire risk [across the country]" and that we need to learn how to cope with wildfire events and be aware of the options available to mitigate risk.

On 12 January 2019, FENZ cautioned any blaze this summer has "the potential to get big" due to rapid plant growth. In parts of Canterbury, vegetation has been the fastest growing for 30 years. Residents of Worsleys Rd, Cracroft – one of the Christchurch streets where homes were lost as the Port Hills fires tore through 1,645 hectares of vegetation – believe fuel levels are at the same level if not greater than what burned nearly 2 years ago.

Sea-level rise
More from our wallet

Approximately 65% of New Zealanders live within 5 kilometres of the ocean.

For the first time, environment and engineering researchers have calculated the cost of replacing pipes, roads and buildings destroyed by sea-level rise. They estimate, as reported on Stuff (31 January), that local councils are facing a $5–8 billion bill to replace vital infrastructure lost to climate change in the next half century.

Data was collected by surveying 60 councils on drinking water, wastewater and stormwater (known as 'the three waters'), roads, infrastructure and buildings. They also looked at green space, jetties and airports. The report does not extend to central government infrastructure or private property.

They considered four scenarios: sea-level rise of 0.5 metres, 1 m, 1.5 m and 3 m. NASA scientists predict a rise of between 300 mm and 1.3 m by 2100. NIWA estimates between 400 mm and roughly 1 m.

For a 1.5 m sea-level rise, the cost of replacing all exposed infrastructure would be approximately $8 billion. That includes 6,000 kilometres of pipe and more than 2,000 km of road. More than 2,000 buildings and facilities across the country are also at risk. With a 3 m sea-level rise, the cost rises above $15 billion.

Sea-level rise	Roads lost and cost	Cost of replacing supply and wastewater	Council buildings lost and estimated cost
0.5 m	-	$1.4 b	780, $200 m
1.0 m	-	$2.6 b	1,400, $780 m
1.5 m	2,100 km, $1.0 b	$4.0 b	2,110, $1.3 b
3.0 m	4,559 km, $2.3 b	$7.0 b	3,970, $2.2 b

Other facilities considered at risk (numbers are dependent on the actual sea-level rise):
- 163 landfills
- 185–626 bridges
- 880 hectares of parks in the Auckland region
- 11 marinas
- 6 ports.

What of the future?
Where to next?

In a 14 January Stuff article, two New Zealand architects were asked what they saw as key factors influencing both the architecture and interior design of our homes:
- Cost and availability.
- A maturing of the apartment market.
- More 'shell developments' where buyers sign up for an apartment while it is still just a shell that they can then customise to suit their needs.
- Minimal maintenance – the stained cedar weatherboards may be on the way out as owners don't want to be restaining their house or apartment every 3 years to keep 'the look'.
- More low-rise apartment complexes and more prefabricated elements for housing. Don't expect to see too much change in materials just yet. In the wake of the leaky homes scandal, architects often don't want to risk a new technology, preferring to stick with tried-and-true materials, such as weatherboards (including low-maintenance versions), brick and metal cladding systems.
- A noticeable move towards brickwork and arches: "It's been a long time since we saw arches and barrel-vault roofs."
- A common-sense approach to passive design – houses that are very well insulated, designed to let in winter sun but exclude summer sun and incorporate effective cross-ventilation.

Everything we do must be a value judgement as to what is the best solution.

Dwelling consent numbers
Uneven growth

Almost 32,800 new dwellings were consented in the year ending November 2018 – a 5.3% increase over the previous November year according to Statistics New Zealand.

Both Wellington and Auckland had a 21% growth in consents issued. In Auckland, the total number of dwelling consents issued was 12,800, while the number was 2,727 for Wellington. Two-

thirds of the consents were for stand-alone houses, but there was a sustained increase in apartments, townhouses and flats, particularly in Auckland

While Auckland, Waikato and Wellington dominated the growth, eight of the country's 16 regions reported declines in dwelling consents relative to the November 2017 year by:

- 8.1% for the rest of the North Island (5,470 consents issued).
- 8.8% for Canterbury (4,668 consents issued).
- 2.5% for the rest of the South Island (3,418 consents issued).

Still on the rise, but!!!!

The number of consents issued for the year ending December (released 4 February) was 33,996 (an increase over the November year figure above). ASB economist Jane Turner said consents finished the year almost 10% up on the previous year. "Residential dwelling consents lifted strongly over the past few years and are likely close to a peak as the construction industry struggles with capacity constraints." This was echoed by economist Cameron Bagrie who cited credit, capacity and cost constraints as issues the industry was facing. Demand was still there thanks to population growth, rising incomes, low unemployment and low interest rates. But those constraints are material. Costs are moving up, and we're seeing Auckland house prices drop. That, he says, signals margin issues for developers.

Engineered wood products survey
We'd like your feedback

There is a need for more current and relevant data on engineered wood products (EWPs) in New Zealand. BRANZ needs your input to help understand where and how these products are being used throughout the New Zealand building sector, from acceptance and design through to supply and delivery of completed buildings. Your feedback will help determine research needed to support current and increased use of EWPs in our homes and buildings. As a thank you, winners of three $250 gift vouchers will be drawn from those who complete the survey and provide their contact information. To complete the survey, visit www.research.net/r/BRANZEWP.

BRANZ seminars
BRANZ Answers

Most modern buildings have a degree of complexity that results in a wide range of junctions between materials and building elements. These junctions need to be detailed and constructed to ensure that the completed building will be Code compliant, particularly with respect to durability and external moisture.

E2/AS1 provides a limited number of junction details based on junctions between a single material such as weatherboard (internal and external corners) and elements such as aluminium windows and doors.

The aim of this seminar is to cover the key influences on junction details such as:

- Building Code clauses B2 and E2 – minimum B2 requirements, what E2/AS1 covers
- application of the 4Ds to junctions – cavity, cladding flashings
- impact of location – sheltered/exposed, internal corner, external corner, above/below
- risks – weathertightness, durability, trapped moisture, getting it wrong, drainage/drying, corrosion, wind, complexity/buildability, compatibility
- dealing with movement – thermal, moisture, building settlement, seismic
- protection to junctions – flashings (shapes, back upstand/cover, laps), cover boards, sealant
- dealing with different thicknesses/profiles – thin versus thick or vice versa, flat versus corrugate

- maintenance issues, future access
- fixing locations
- aesthetic – the transition needs to look good
- pressure moderation across junctions.

The seminar will then take attendees through a wide range of actual junction details backed by 3D drawings of those details such as:

- vertical wall cladding material junctions within the wall area and at corners such as profiled metal/weatherboard, weatherboard/brick veneer
- horizontal wall cladding material junctions such as weatherboard over brick veneer
- wall cladding over roofs (horizontal/raked aprons)
- wall cladding below roof (flush eaves, wide eaves)
- parapets, valleys, ridges, gables and hips
- rainwater heads and internal gutters.

Presenters

Greg Burn – NZCD (Arch), Dip Bus (Marketing) – Structure Ltd
Des Molloy – Building Consultant

Dates and venues

Wed 13 Feb	Hamilton	Claudelands Conference & Events Centre
Thu 14 Feb	Tauranga	Trustpower Baypark
Fri 15 Feb	Rotorua	Millennium Hotel Rotorua
Wed 20 Feb	Invercargill	Ascot Park Hotel
Thu 21 Feb	Queenstown	Crowne Plaza Queenstown
Fri 22 Feb	Dunedin	Dunedin Centre
Wed 27 Feb	Palmerston North	Distinction Palmerston North Hotel & Conference Centre
Thu 28 Feb	Whangarei	Barge Showgrounds Events Centre
Fri 1 Mar	Auckland – South	Novotel Auckland Ellerslie
Wed 6 Mar	Christchurch	Commodore Hotel
Thu 7 Mar	Hokitika	Order of St John Hokitika
Fri 8 Mar	Nelson	Rutherford Hotel Nelson
Wed 13 Mar	Auckland – Central	Crowne Plaza Auckland
Thu 14 Mar	Upper Hutt	Silverstream Retreat
Fri 15 Mar	Napier	Mission Estate
Wed 20 Mar	Timaru	Comfort Hotel Benvenue
Thu 21 Mar	Christchurch	Addington Events Centre
Fri 22 Mar	Blenheim	Scenic Hotel Marlborough
Wed 27 Mar	Auckland – North Shore	QBE Stadium
Thu 28 Mar	New Plymouth	The Devon Hotel
Fri 29 Mar	Wellington	InterContinental Wellington

Seminars will start at 1 pm with a 4 pm finish.

Online registration is available now.