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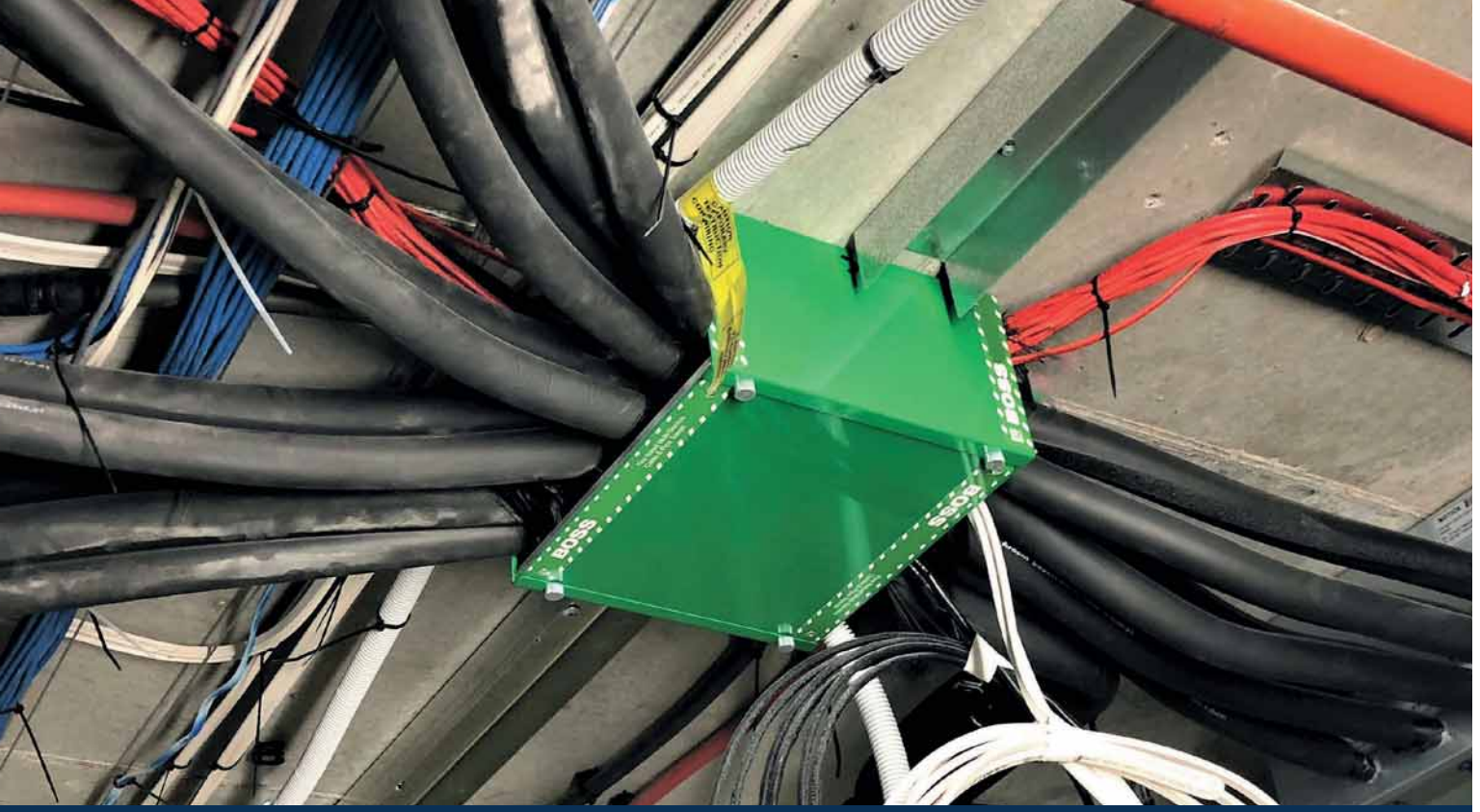

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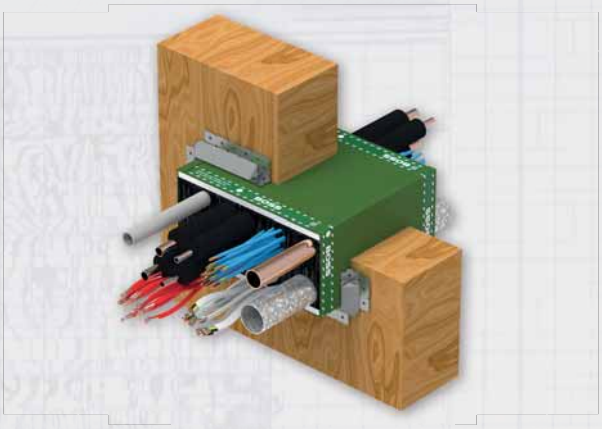

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STANDARDS' STREET APPEAL

Tradies seeking access to industry standards will soon have an extra resource in the shape of Techstreet, the first company to come on board as a distributor following legal proceedings between Standards Australia and SAI Global earlier in the year.

Standards Australia initially had an exclusive agreement with SAI Global for a period of 15 years, with an option in that contract for a further five years on 'market terms'.

But Standards Australia general manager of standards and engagement Adam Stingemore says that no further guidance was given as to what 'market terms' meant.

"We felt that market terms in the present day should be non-exclusive so we wanted to reset the agreement and have other people come into the market. We don't think monopolies work."

Legal proceedings found in favour of Standards Australia, giving way to opportunities for expansion through new partners.

But, Adam says, Standards Australia want to do much more than simply branching out through distributors and it is currently going through a fact-finding process to examine how else it can make its product available.

The next step is to find new avenues for distribution and for that, Standards Australia is engaging with the tradies on the ground all around the country.

"We've put out a discussion paper; we're going to have face-to-face consultations in every State capital and for those who can't make those, we'll also run a few online sessions, and we'll be taking submissions as well. There is no point in us deciding what works for different industries; we want the industries to tell us what works for them. We'll go out and ask 'how else do Australians want to use our product'?"

At present, standards are distributed as hard copies and/or as PDFs, and Adam says that both products perform strongly but stakeholders are saying that they want more than that and the emphasis now is on getting the content out to people who need to use it in different ways.

Adam insists that the driving factor behind their fight for non-exclusive distribution is access and availability, saying that while there are those for whom price is a consideration, many customers simply want easy access to the content. He adds that the standard is a tool of trade and so should be paid for.

While distributors will set their own individual prices on products, Adam is hopeful that a new player in the market will create competition which will have a positive impact for customers, not only in price but also in quality and ease of access, quality of technology, and customer service.

With the consultation process ongoing, he says they are hopeful of looking at new products from January of next year and, potentially, approaching further partners.

"We're not looking to appoint anyone else in this first stage: that was about opening up access and we've done that. We want to go through consultation and then, hopefully in January 2020, look at licensing and product framework. Once that is in place, there will be scope for further partners, but not next week!"

Enjoy the read

Justin Felix

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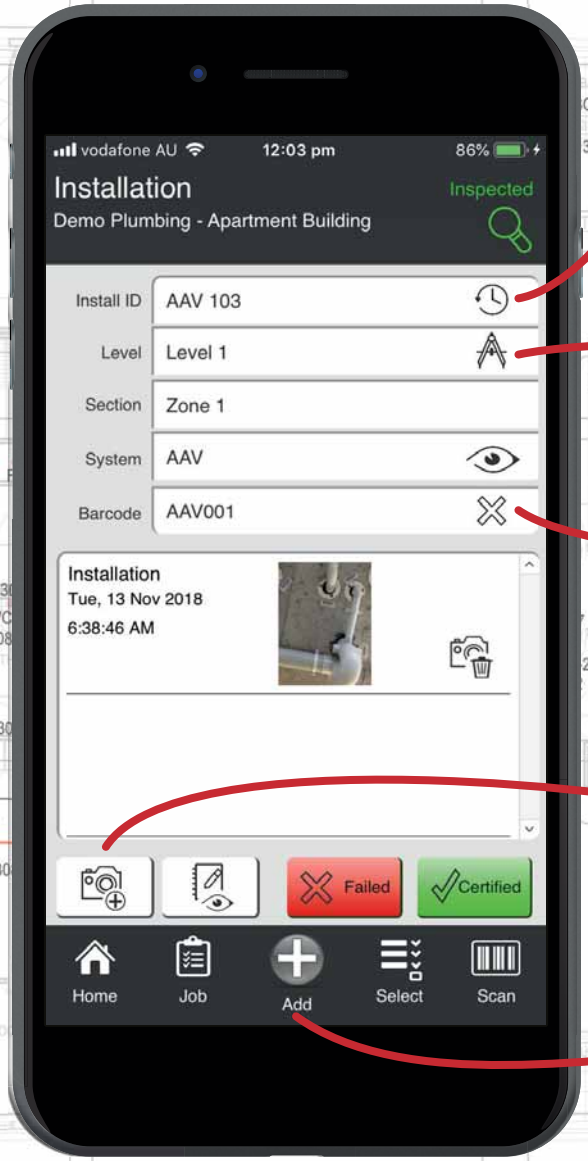

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DRUG TESTING METHODS REVISED

In order to increase safety and reliability, a revised standard guiding the detection of drugs in oral fluids has been developed. It aims to improve onsite drug testing across several sectors of the economy.

Mobile drug testing is increasingly more common, with police conducting up to 200,000 roadside drug tests each year in NSW by the year 2020[1]. However, drug testing is also becoming more common and widespread in a range of industries such as mining, construction and transport.

Standards Australia has been working with industry bodies and community members to update the standard for drug testing to ensure methods are up-to-date and deliver results consistent with community expectations.

"A number of occupations are involved in regular drug testing as part of achieving a safer workplace. Given the nature of the work at the centre of these tests, there is a strong interest in accurate results," says Standards Australia acting CEO Adrian O'Connell.

AS/NZS 4760:2019, Procedure for specimen collection and the detection and quantitation of drugs in oral fluid, has been published with a clear commitment of results and

safety. The standard highlights the latest methods of detecting drugs in saliva, which is particularly useful for law enforcement agencies as well as groups conducting local drug testing at major events like music festivals.

"This has been a very important area of work for us for some time. This revision has been built with regard to the latest technology and scientific developments to benefit to our community," says Adrian.

Organisations performing onsite drug testing stand to benefit most, given the improvements provided by this standard for the detection of drugs using oral fluids, according to Chair of the Standards Australia Technical Committee responsible for the revised standard Dr Michael Robertson.

[1] https://roadsafety.transport.nsw.gov.au/stayingsafe/alcoholdrugs/drugdriving/index.html

TIMBER INDUSTRY UPDATES MESSAGING TO YOUR CUSTOMERS

The natural warmth and durability of timber is something building designers, builders and carpenters are drawn to. But that doesn't mean the sector can sit on its hands and wait for business to walk through the door.

Other material choices including steel and concrete are going their hardest to position their offerings as being responsible environmental choices.

The Forest & Wood Products Australia (FWPA) organisation, which speaks for all timber species sectors and imports, has been looking to updating its marketing message.

The culmination of this work sees the FWPA launching The Ultimate Renewable as its branding for the future. A 'renewable product' offers a strong message in this day and age that the public relates to.

"By reinforcing the association between wood and the word 'renewable', we are aiming to encourage the community to embrace forest and wood products across the supply chain," says FWPA national marketing and communications manager Eileen Newbury.

Expect to see a lot more representations of 'Wood the Ultimate Renewable' on timber product branding soon.

AUGMENTED REALITY CONSTRUCTION SAFETY GUIDES

Pro-Visual Publishing has worked with partner Master Builders Association of Western Australia, Civil Contractors Federation and Victorian Building Authority to release its latest editions of the Augmented Reality (AR) WA Construction Site Safety Guide and VIC Construction Site Safety Guide.

They are distributed free of charge Australia-wide.

The wall-mountable printed guide is designed to be displayed in a place that is accessible and visible to construction workers. Considering the high fatality rate in the construction industry, having a resource that is informative and provides safety guidance is important in maintaining the safety of workers on-site.

The topics for each of this year's guides have been carefully selected and are issues pertinent to the industry in regards to health and safety. Some topics include, working at heights, traffic management plans and dangerous respirable chemicals.

Once again, AR is a feature on both guides this year, providing an engaging user experience. The aim of the AR is create another way for workers to interact with safety information, contributing to increased retention. By simply downloading the free Pro-Vis AR app and scanning over any AR capable content, users can access further safety information straight to their smart device, for example, videos and web-links to further information resources.

"I would like to thank all the sponsors of the WA Construction Site Safety Guide 2019/20 and VIC Construction Site Safety Guide 2019/20. Their support has made it possible for the guide to be distributed free of charge," says Pro-Visual Publishing CEO John Hutchings.

For further information, or to obtain additional copies of the Guide, please call (02) 8272 2611, email marketing@provisual.com.au or visit www.provisual.com.au

HIGH TECH GLASS AND WINDOWS ON SHOW AT AUSFENEX19

AusFenEx19 brings together Australia's leading window and glazing system suppliers, in the industry's largest-ever trade exhibition.

As the Australian industry's foremost exhibition and conference event, AusFenEx19 will present a display of remarkable achievements while showcasing emerging global trends and product innovations.

Sydney's International Convention Centre (ICC) will host this highly anticipated event over a packed three days (27–29 August 2019) and proudly display the latest in window and glazing technologies, coupled with world-leading production and design applications.

Incorporating emerging manufacturing processes and innovative displays of high-tech glazing and window systems, the exhibition will boast the most comprehensive gathering of key industry players to date, from boutique window companies, to leading global corporations, manufacturing the most advanced glazing technology available.

Over 100 manufacturers will be exhibiting, all widely respected leaders of the glazing, window, skylight and security screen industries.

The AusFenEx19 exhibition provides

the forum for attendees to learn more about the industry, while most importantly, building on a valuable professional network – so don't miss out.

This year also represents a landmark year for AusFenEx, as this will be the first joint exhibition and conference following the Australian Window Association's recent high-profile merger with the Australian Glass and Glazing Association.

For a comprehensive look at every event planned over the course of AusFenex19's three days, including a series of presentations to be conducted in the exhibition area, a complete event program is available at www.ausfenex19.com/program.

Interested in booking your place at Australia's largest-ever glass and window exhibition?

Secure your spot at www.ausfenex19.com, where you can also find out more about the impressive selection of the industry's defining figures who will be in attendance.

Register early at www.ausfenex19.com to secure your place in the glazing and window industry's premier annual celebration.

SAVE THE DATE: ARBS 2020 RETURNS TO MELBOURNE

Efficiency and technology are major HVAC&R trends which will be at the forefront of ARBS 2020, Australia's only international air conditioning, refrigeration and building services trade exhibition, which returns to the Melbourne Convention and Exhibition Building on 19-21 May 2020.

ARBS 2020 will showcase hundreds of new products and technologies which are set to shape the future, with a focus on emerging trends and technology including smart IoT solutions, automation and control, refrigerants, energy efficiency plus much more.

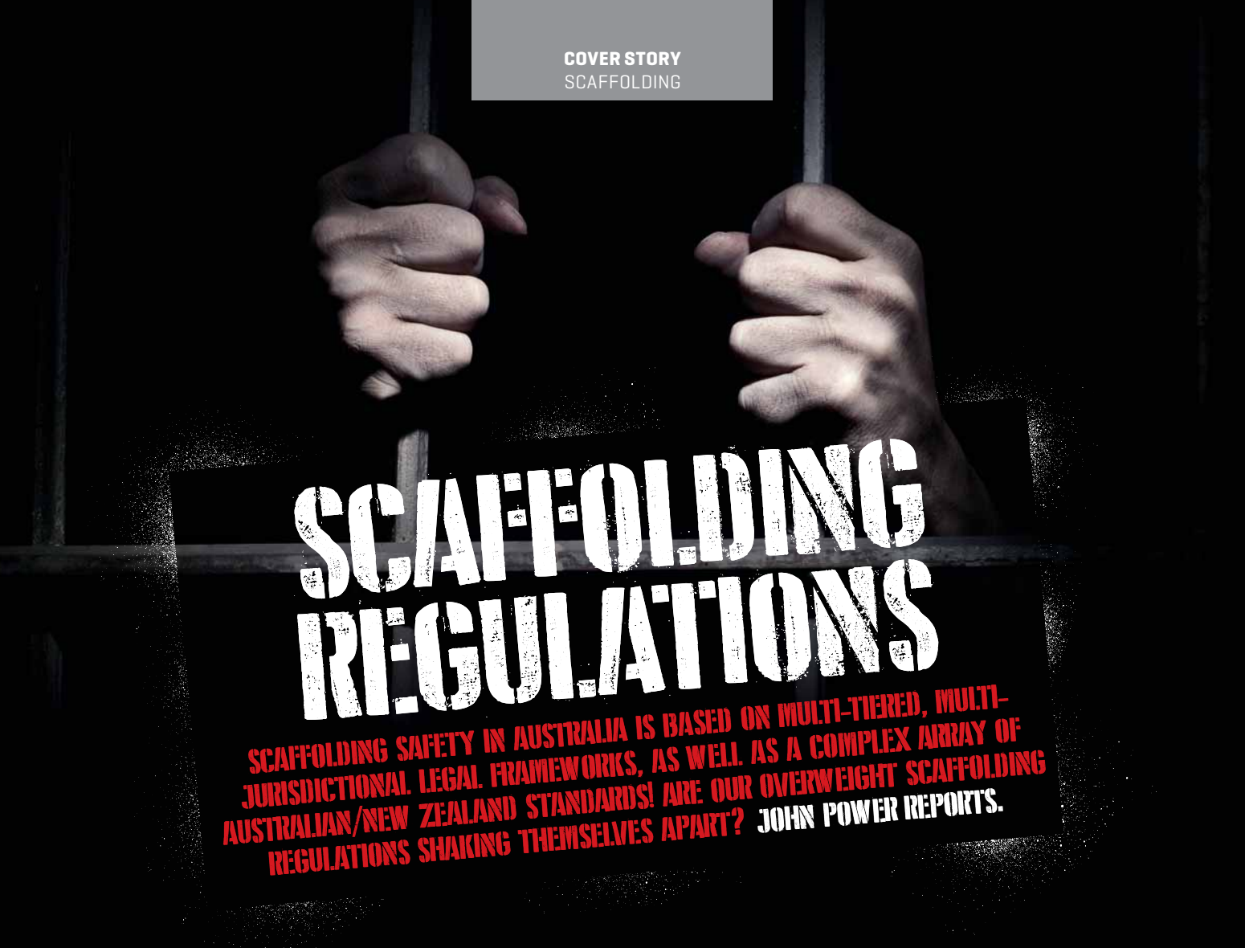
As smart building solutions continue to evolve, they allow property developers and owners to reduce costs, improve energy efficiency and enhance occupant comfort. Recent advancements have meant greater integration and interoperability between key systems, resulting in highly sophisticated building control strategies.

With more than 350 exhibitors and in-excess of eight thousand visitors, the exhibition is once again offering the industry unrivalled access to the very latest in HVAC&R in the southern hemisphere.

Over three huge days, ARBS 2020 will connect global exhibitors and leading industry experts with contractors, consultants, architects and engineers. Attendees can connect with manufacturers and distributors to see the latest products and applications whilst exploring leading design and innovation in HVAC&R.

An informative seminar program will be held alongside the exhibition encompassing both the general HVAC&R and IBTech agenda. Visitors can also choose to attend the ARBS Industry Awards presentation dinner and many other social and networking events.

For further information visit www.arbs.com.au.



SCAFFOLDING REGULATIONS

SCAFFOLDING SAFETY IN AUSTRALIA IS BASED ON MULTI-TIERED, MULTI-JURISDICTIONAL LEGAL FRAMEWORKS, AS WELL AS A COMPLEX ARRAY OF AUSTRALIAN/NEW ZEALAND STANDARDS! ARE OUR OVERWEIGHT SCAFFOLDING REGULATIONS SHAKING THEMSELVES APART? JOHN POWER REPORTS.

Perhaps a law degree should be a prerequisite for a scaffolding licence!

In order to make any sense of where scaffolding stands in the country's overall legal and regulatory frameworks, it helps to think of scaffolding as primarily a health and safety apparatus, not a building product or accessory.

As such, consider the following administrative stepping-stones (as listed in Table 1), which zigzag their way through all Federal and State/Territory bureaucracies on an epic journey towards scaffolding compliance.

The journey is long and hard:

- The national statutory authority Work Safe Australia oversees Commonwealth work, health and safety (WHS) laws.
- Each State and Territory has its own health and safety laws, based on its own interpretation of the Commonwealth laws.
- SafeWork-style regulators within each State and Territory manage, implement and uphold their own respective health and safety laws.
- Each State and Territory regulator has its own set of health and safety regulations and inspectorates.
- Each set of State and Territory regulations references its own Codes of Practice. (The relevant Code of Practice relating to scaffolding in most (but not all) States and Territories is typically described as, 'Managing the risk of falls at workplaces' or similar.)
- Each Code of Practice references Australian/New Zealand Standards.
- The main Australian/New Zealand Standards relating to scaffolding are AS/NZS1576 Part 1: Scaffolding – general requirements, as well as AS/NZS4576: Guidelines for scaffolding.
- The use of scaffolding is not 'mandatory' per se according to any construction-based criteria. However, if scaffolding is selected as the appropriate means of upholding State or Territory health and safety regulations, then it must adhere to that jurisdiction's Code of Practice(s) and all referenced Australian/New Zealand Standards.

ONE NATIONAL MODEL?

In light of the above complex State and Territory-based laws and regulations, the obvious question is: Why not simply adopt one set of national health and safety regulations for the whole country?

Surely a scaffold in Perth operates in the same way as a scaffold in Sydney or Townsville. And surely the same safety standards apply equally to all Australians...

Well, that is precisely what Australia's various State and Territory jurisdictions decided to do over a decade ago, resulting in the establishment of Safe Work Australia in 2009. This national agency quickly set about creating a suite of harmonised WHS 'model laws' which could be adopted uniformly by all States and Territories.

Alas, Western Australia and Victoria have never adopted these harmonised WHS model laws, preferring to maintain their own independently defined and managed health and safety laws and downstream regulations. NB: WorkSafe WA, a spokesperson has told us, has just begun the process of creating its own version of the national WHS model laws. However, Victoria remains a firm separatist.

Connection Magazines asked WorkSafe Victoria if it might adopt the national model laws any time soon – no response. One can only assume that Victoria's stance has more to do with justifying its own existence than finding flaw in the national model laws, which are very close to its own. After all, if Victoria were to 'rubber stamp' its federal overlord's statutes, then it (like all State and Territory jurisdictions) would be an obvious target for redundancy. After all, what is the point of myriad State or Territory authorities creating and managing their own versions of quintessentially national WHS laws and regulations? Isn't the entire current process just a wasteful duplication of services?

Most importantly, in an era of high population movement, wouldn't a single set of laws and regulations enhance workers' understanding of safe scaffolding practices?

We don't have to travel far to see an uncluttered national WHS regulatory regime in action – just visit New Zealand, which has only two levels of government compared to Australia's three, and therefore maintains a far more straightforward link between WHS requirements and Australian/NZ Standards.

"... Inspectors will continue to be the unsung heroes of scaffolding safety in Australia, serving as observers, teachers and mentors to contractors."

HAZARDS AND ACCIDENTS

There is no consistency in the way scaffolding accidents are recorded or measured across all States and Territories, as there is a great deal of subjectivity involved in such assessments.

The picture is clearer, however, in relation to fatalities; Work Safe Australia statistics show that four workers died from falls from scaffolds nationally between 2013–17. Obviously, these figures predate the well-publicised death of a worker in NSW in April this year. Another three workers died between 2013-17 following falls from elevating work platforms. Scores of additional workers were injured to varying degrees over the same period.

So, what's going wrong in the field? Clearly, regulatory complexity has not led to an eradication of non-compliant behaviour.

We asked each State/Territory regulator to define the main kinds of scaffolding non-compliance issues encountered by their inspectors (See Table 2).

Each State and Territory has its own inspection, enforcement and penalty methodologies to address scaffolding safety breaches, and there is a wide variety of approaches.

TABLE 1: BUREAUCRATIC PATHWAYS TO SCAFFOLDING SAFETY (STATES & TERRITORIES)

STATE/ TERRITORY	RELEVANT LEGISLATIVE ACT	BASED ON NATIONAL WORK HEALTH & SAFETY (WHS) 'MODEL LAWS'	REGULATOR	REGULATION	CODE OF PRACTICE
ACT	Work Health & Safety Act 2011 (ACT)	✓	WorkSafe ACT	Work Health & Safety Regulation 2011 (ACT)	ACT Codes of Practice
NSW	Work Health & Safety Act 2011 (NSW)	✓	SafeWork NSW	Work Health & Safety Regulation 2017 (NSW)	NSW Codes of Practice
NT	Work Health & Safety (National Uniform Legislation) Act 2011 (ACT)	✓	NT WorkSafe	Work Health & Safety (National Uniform Legislation) Regulations (NT)	NT Codes of Practice
QLD	Work Health & Safety Act 2011 (Qld)	✓	Workplace Health & Safety Queensland	Work Health & Safety Regulation 2011 (Qld)	Qld Codes of Practice
SA	Work Health & Safety Act 2012 (SA)	✓	SafeWork SA	Work Health & Safety Regulation 2012 (SA)	SA Codes of Practice
TAS	Work Health & Safety Act 2012 (Tas)	✓	WorkSafe Tasmania	Work Health & Safety Regulation 2012 (Tas)	Tas Codes of Practice
VIC	Occupational Health & Safety Act 2004 (Vic)	✗	WorkSafe Victoria	Occupational Health & Safety Regulations 2017 (Vic)	Vic Compliance Codes
WA	Occupational Safety & Health Act 1984 (WA)	✗	WorkSafe WA	Occupational Safety & Health Regulations 1996 (WA)	WA Codes of Practice

For instance, according to a SafeWork NSW spokesperson, SafeWork NSW undertook a construction industry safety blitz in 2018, visiting over 1,000 sites statewide to focus on the risk of falls from heights, including falls from scaffolds.

"To further focus on scaffold safety, SafeWork NSW commenced 'Operation Scaff Safe' on 1 April 2019 to ensure:

- scaffolds are built to Australian Standards and are not missing components;
- those erecting, dismantling or altering scaffolds (where the risk of an object or person falling is four metres or more) hold the correct HRW [high-risk work] scaffolding licence; and
- scaffolds remain safe and compliant throughout the build process," the spokesperson said.

"SafeWork NSW inspectors address most scaffolding non-compliance issues through the issuing of prohibition and/or improvement notices," the spokesperson added.

"For matters involving a high risk or failure of the scaffold, they are investigated further for potential legal action.

"SafeWork NSW currently has three matters in this category and has had three additional matters in the last five years."

TABLE 2: SCAFFOLDING: COMMON PROBLEMS (BY STATE/TERRITORY)

REGULATOR	Main Scaffolding Issues Found by Inspectors (by State/Territory) (as reported independently by each regulator)
WORKSAFE ACT	Non-compliant adaptations of cup lock and clip lock systems. Handrails not properly in place. Timber boards of poor quality. Substandard workmanship.
SAFEWORK NSW	Non-compliance with standards, including missing components such as planks, ledges and hop-ups.
NT WORKSAFE	Missing components, scaffold tie-ins, falling objects and lack of encapsulation.
WORKPLACE HEALTH & SAFETY QUEENSLAND	Main risks are risk of fall and being hit by falling objects.
SAFEWORK SA	No response
WORKSAFE TASMANIA	No response
WORKSAFE VICTORIA	Incomplete scaffolding and work decks.Overloaded scaffold bays. Alterations made by unauthorised persons on site that compromise the integrity of a scaffold. Failure to regularly inspect scaffolding to ensure it remains fit for purpose, for example after exposure to the elements or being hit by falling objects or machinery.
WORKSAFE WA	Footings and tie-ins.

Similarly, WorkSafe ACT typically pursues approximately 10 punitive actions (including legal prosecutions) per year in response to scaffolding offences.

At the other extreme, Work Health and Safety Queensland (WHSQ), according to a spokesperson, "issued statutory notices to more than 1,200 construction sites between January 2017 and April 2019 for violations of scaffolding regulations."

An objective observer might say the latter figure is both reassuring and alarming: on the one hand, strict action in response to scaffolding safety breaches is positive; on the other hand, such high rates of non-compliance is cause for concern.

Scaffcards provide a safety tagging system to users and regulators.

LICENSING

A licensing system is meant to serve as a safety net in relation to the safe erection, alteration or dismantling of scaffolding involving high-risk work. There are three classes of scaffold HRW licenses: basic, intermediate and advanced. In most jurisdictions, licences are required in circumstances where a person or object could fall four metres or more.

"This is a national requirement and SafeWork NSW HRW licences are mutually recognised across Australia," a SafeWork NSW spokesperson said.

While other jurisdictions, including Victoria, adhere to these licensing guidelines, WA does not: "An installer needs to be licensed if the scaffold involved has more than an 11-metre fall," a WorkSafe WA spokesperson told us, underlining the regulatory disunity confronting nationally focused contractors and suppliers.

To make matters even more complicated, ongoing equipment innovation means prescriptive Australian/New Zealand Standards are under constant threat of obsolescence.

INSPECTORS

The sad reality of day-to-day scaffolding work is that contractors have little understanding of their overarching WHS legal obligations, and only a slightly better understanding of regulations.

Contractors' primary reference for erecting and handling scaffolding, according to Chris Flanagan, an inspector for WorkSafe ACT, is the scaffold manufacturer's instructions, followed by Australian/New Zealand Standards.

Chris says there are three main types of scaffolding: clip lock, cup lock, and the comparatively new Layher system – most safety breaches relate to the first two classes of equipment.

A lack of understanding of regulations and Standards, he emphasises, is the greatest contributor to non-compliance.

"The common statement by most scaffolders that do have licenses is, 'I am building it to the Standards,'" he said. "Now, the first question I ask is: 'Have you got a copy of the Standard?' The answer is, 'No.' My next question is, 'So how can you tell me you are building it to the Standard if you don't have a copy? The response: 'Oh that's what we were taught when we got our licence.' My next question: 'Have you physically seen a copy of the Standard?' 'No.' That is one of the most common discussions I get."

Chris says the requirement to spend over $200 to buy a copy of a Standard such as AS/NZS1576 Part 1: *Scaffolding – general requirements* is an obvious impediment to contractors' understanding of the document.

"If you're doing a university course you have access to all Australian Standards," he said. "No one else gets that free availability."

Another major problem, Chris believes, relates to inadequate training, particularly with regard to newer technologies like Layher scaffolding systems. Fortunately, the Standards are in the process of being upgraded to include greater reference to Layher technologies, which means better information should also flow through to training organisations.

The reality of day-to-day scaffolding work is that contractors have little understanding of their overarching WHS legal obligations.

In the meantime, inspectors will continue to be the unsung heroes of scaffolding safety in Australia, serving as observers, teachers and mentors to contractors.

COMMON PROBLEMS

So long as Australia's current multi-jurisdictional system prevails, federal institutions like Safe Work Australia will continue to be a statutory authority in name only.

The current multi-jurisdictional framework involving Commonwealth as well as State/Territory governments means sensible national reforms must be filtered and interpreted at State/Territory level prior to implementation – a time-consuming, messy and expensive exercise that still allows for subtle non-uniformity of regulations, even if model laws are used as a template.

The mere possibility of differences between jurisdictions means international and national building companies and scaffolding suppliers must address eight sets of laws, regulations and Codes of Practice instead of one.

Furthermore, the sheer number of State/Territory laws and regulations means reforms or commonsense updates occur very slowly and at different time intervals, potentially delaying initiatives that might have been expedited by a purely national authority, and muddying directives referencing Australian/New Zealand Standards.

Thank goodness we have inspectors to explain matters to contractors... ■

John Power is a freelance journalist based in Cherokee and Carlton, Victoria, and a former editor of *Building Connection* and *Plumbing Connection*.

GETTING SERIOUS ABOUT SLIP SAFETY

Rebecca Findlay-Debeck begins her series on slip safety articles by discussing why it should be front of mind when on site. Upcoming articles include applying slip safety standards to your site; testing methods; understanding compliance certificates; spotlight on litigation and current issues.

Like Guitar Hero, pet rocks and hipster beards, it seems like the Building Code of Australia (BCA) adopts a new fad every few years. For many of us, the increasing emphasis on slip safety is just the latest 'buzz topic' in a long list of building compliance requirements.

In 2014, changes to the National Construction Code (NCC)/state-based BCAs introduced mandatory slip safety testing as part of getting an Occupation Certificate (OC) for stairs, ramps and landings. Often these areas are just the starting point for compliance testing, with council, certifier or client requirements extending to building entry areas, swimming pool surrounds, bathrooms, kitchens and other 'high risk' slip and fall locations. This has left many of us wondering why slip safety is suddenly so important...

For the past decade, slip and falls represent ~20-25% of all serious Australian workplace injuries, with more than 380 related worker deaths.

Serious injuries are defined as those requiring hospitalisation or medical treatment; form part of an accepted workers compensation claim; and result in an absence from work of seven or more days. In 2017, this 23% injury rate translated to more than 25,000 people being seriously hurt at work as a result of slip and falls, largely occurring on level surfaces.[1]

Similar statistics are found in the United Kingdom (UK), Europe and the United States (US). In the US, for example, around 80 million slip and falls (and 9.9 million falls-related injuries) occur annually, evenly distributed across adults from 18 years to 65 plus years. Insurance industry estimates are that the overall economic cost of this in the US is $111 billion per annum, with 25,924 deaths; 693,500 hospitalisations and 5,022,536 emergency room admissions each year.[2]

We know from injury incidence rates that slip and falls present a serious safety risk, but how does this connect to the BCA and building works?

There are a range of environmental,

design and human factors that contribute to slip and fall risks. Elements that impact pedestrian safety include: flooring materials; surface treatment, cleaning and maintenance; lighting/visibility; design; exposure to climatic conditions; footwear; levels of pedestrian attention... the list goes on.

So why the focus on surface materials and finishes in the BCA and Australian Standards?

Simply put, surface materials and flooring finishes are the most statistically significant factor in causing slip and falls. The US National Floor Safety Institute (NFSI) estimates that 55% of all slip and falls are attributable to hazardous surface material/finishes.[3] This finding has been mirrored in the research of SafeWork Australia and the UK national Health Service Executive (HSE), who believe that more than 50% of workplace slip and falls can be prevented through effective flooring design and other controls.[4]

At this point you might be wondering why it took until 2014 to adopt slip safety requirements? It didn't. Slip safety standards have always formed part of the BCA for stairs, ramps and landings. If we refer as far back to the BCA 1990, we see that 'non-slip' and 'slip resistant' surfaces have been a requirement for building certification for more than two decades.[5]

In fact, provisions in the 1990 BCA for the ACT extended the requirement for 'non-slip finishes' to all paving and flooring surfaces in public areas — such as colonnades, arcades and entrance lobbies — and around swimming pools.[6]

Similarly, Queensland's and Tasmania's BCAs adopted extensive provisions requiring floor surfaces to be 'designed to prevent slips, trips and falls' with an even slip resistant surface.[7]

So what were the 2014 slip resistance changes about? Quantification and specification. Previously, the BCA references focused on creating 'slip resistant surfaces' and 'preventing slips and falls'. What these objectives meant in practice was open to interpretation, leaving builders uncertain as to just what was needed to achieve compliance.

The 2014 amendments changed this — creating a direct link between the BCA and the Slip Resistance Values (SRVs) and classifications identified under the Australian Standards, *AS4586-2013, Slip Classification of New Pedestrian Surfaces and its related Handbook, HB198:2014 Guide to the Specification and Testing of Slip resistance of Pedestrian Surfaces.* The slip safety compliance tables included within the 2014 and later BCAs[8] mirror the more comprehensive provisions under *AS4586-2013* and *HB198:2014*.

Importantly, the 2014 amendments made slip safety compliance *mandatory* for stairs (treads/nosings), ramps and landings — linking requirements to specific SRV results under the Australian Standards. These results are then grouped in the standards into classification bandwidths such as P3, P4 and P5 (wet pendulum resistance testing); or R9, R10 and R11 (laboratory-based ramp testing). For example, a 39SRV would equal a P3 classification, while a 26SRV would be a P2.

What this means in practice, is that you can no longer deem slip safety compliance by a 'guesstimate' based on the materials you've used. While you might think your cove-finish concrete can 'stop an elephant', unless it has been tested for slip safety, you can't tell what SRV it actually achieves — therefore your certifying authority can't determine whether the surface meets the classifications required under the BCA. This becomes more complex when you factor in slope and temperature adjustments to testing results/SRVs required under Australian Standards.

In short, mandatory slip safety testing means just that — it's mandatory. Whether the testing is done by you or your product supplier, an Australian Standards compliant certificate is required for the surface materials used on all stairs, ramps and landings ... and for some of these materials (such as poured concrete and broadcast epoxies), testing can only be done on-site.

Simply put, surface materials and flooring finishes are the most statistically significant factor in causing slip and falls.

Moving forward, do the proposed May 2019 amendments change anything? No, this version of the BCA not only maintains the existing slip safety provisions, it extends them — now including swimming pool entry areas and accessible adult changing rooms/facilities. What does this mean for your building site? Well, like emoji's and bottled water, slip safety in the construction industry is here to stay. ■

Next article we'll explore slip safety testing and certification, as well as some common mistakes when applying slip safety principles to your building site.

[1] Current and historical data (workers compensation based) available from https://www.safeworkaustralia.gov.au/book/key-work-health-and-safety-statistics-australia-2017 (retrieved April 14, 2019). See also: https://www.safeworkaustralia.gov.au/slips-trips-falls and https://www.abs.gov.au/ausstats/abs@.nsf/mf/6324.0

[2] Liberty Mutual Institute for Safety. 2016. From Research to Reality: Fall Injuries Inevitable or Preventable (retrieved March 1, 2017) (https://www.libertymutualgroup.com/about-liberty-mutual-site/research-institute-site/Documents/FallInjuries.pdf).

[3] National Floor Safety Institute (NFSI). 2017. Untitled video (home page) (retrieved March 1, 2017) (https://nfsi.org/).

[4] For research, data, case studies etc, see: http://www.hse.gov.uk/slips/index.htm.

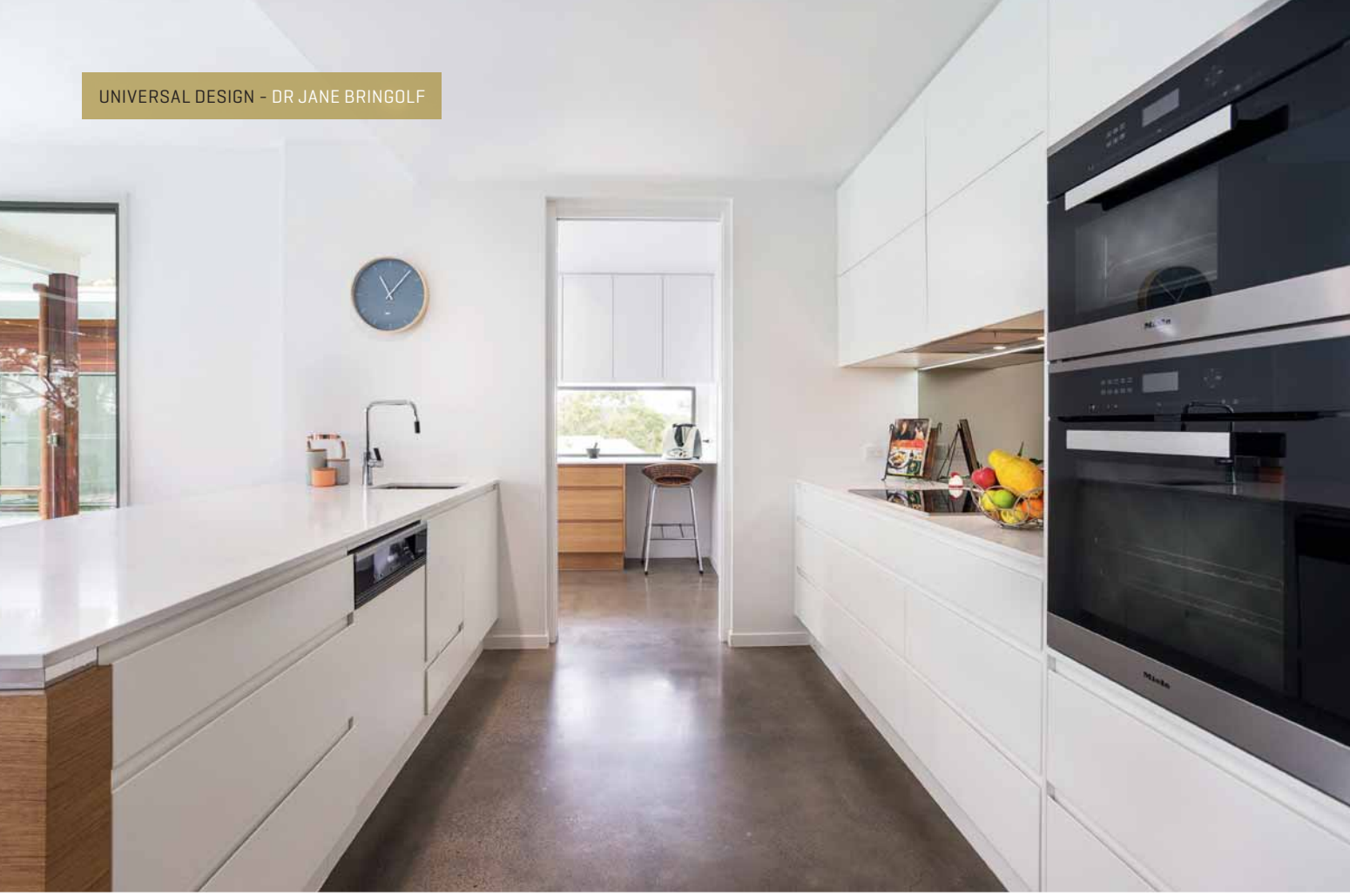
[5] BCA 1990 V1: D2.10, D2.13 and D2.14, for example.

[6] BCA 1990 ACT D2.103; G1.1.

[7] BCA 1990: Qld H101.3; H101.5; Tas H101.3; Tas H105.12; Tas H106.5.

[8] NCC2016-BCAV1 D2.14 (Building Classes 2-9; including sole occupancy Class 3) and V2 3.9.1.3 (Building Classes 1 and 10). See also NCC2016-BCA Guide, V1, V2: DP2(c); D2.10; D2.13; D2.14); G4.7 (Alpine Areas); TAS H123 P3; and V2 P2.5.1 + 3.9.1.4 (Building Classes 1 and 10).

Rebecca Findlay-Debeck is Managing Director of Slip Assessment Services (www.slipassessment.com), an independent slip safety consultancy.



A SUMMARY OF ABCB'S REPORT ON MAINSTREAM ACCESSIBLE HOUSING

Dr Jane Bringolf summarises some of the key issues identified in the Options Paper put out by the ABCB regarding the Livable Housing Design Guidelines.

Last issue I talked about the Livable Housing Design Guidelines and mentioned the ABCB put out an Options Paper on accessible housing last year. The ABCB has followed up with a report on all 179 submissions and the feedback from the stakeholder consultation sessions.

The aim of the report is to reveal some of the complexities that need to be thought about in the next stage – the Regulation Impact Statement (RIS).

The report doesn't provide any recommendations; it only reports on the outcomes of the consultations and submissions. It is a very lengthy report, over 121 pages, so I will pick out some highlights for a quicker read.

The executive summary listed the key issues as:

- The need to consider concepts of equity, independence and the principles of universal design
- Government commitments
- The number of households with at least one person with disability
- The need to account for population ageing
- Provisions for difficult sites and other one-off circumstances
- Consideration of rental properties where modifications are required
- Consideration for structural features that are costly to modify later
- Benefits that go beyond the physical aspects of the home such as increased participation and inclusion
- How to quantify any additional costs that could fall to industry or consumers
- Should it be called 'accessible housing' or something else

So let's take a look at some of these issues and what it might mean.

The Options Paper used the term 'Accessible Housing' and asked if this was an appropriate term. Many submissions thought this sounded too much like housing specifically for people with disability. No other terms seemed to work though. However, if you think about it, if universally accessible features are included in the NCC then

it would just be housing. There would be no need to separate it out because it would be a mainstream product, and universal design is all about the mainstream.

On a practical level, lack of universally designed housing affects several groups of people – and we will all know someone who is affected: older relatives reluctantly moving from their family home, a family member who can't visit, a friend struggling to manage after injury or illness, or a young person forced to live in aged care.

This issue is personal – it's not just about other people.

The construction industry wears out bodies earlier in life than most workplaces. Bad back, damaged knees, frozen shoulder, workplace injuries and arthritis are better managed in a universally designed home.

Not being able to leave hospital because you can't go home until its modified is not bad luck, it's the design of the home. And the number of people affected is bigger than you think because disability is not all about wheelchair users.

People with disability, a chronic health condition, and most older people, do not live alone. They live in family groups. So it affects whole families. The Australian Bureau of Statistics latest census found at least 35% of households have at least one person with a disability. If we include households with a long-term health condition, we can add another 40%. That is not a small number.

There is also a link between housing and access to employment, education and community amenities. Many people can't get a job because they can't find a suitable home near work. Increased participation is important for Australia's productivity and economic success. Social isolation costs individuals and their family, the health budget and the economy.

The rental market makes up 31% of Australian homes. Landlords are extremely reticent to allow modifications, even a grab rail, because they believe it will reduce the value of their property. If they do agree, they often insist that any modifications be removed when the tenant moves out.

PHOTOS: TAYLOR'D DISTINCTION.

Level entry provides convenience for everyone and should be a serious consideration for any new build.

When it comes to difficult sites, of course there will be exceptions. There will always be a market for homes on steep sites for that great view. But that doesn't mean universal design features should be left out altogether. Most features are convenient for everyone. As the majority (72%) of new homes are separate dwellings, most will be built on new land release. So difficult sites will be the exception, not the rule.

Social and public housing have a proportion of 'accessible' dwellings, but they are few and far between. Many are one bedroom which doesn't suit a family. And that's if you can get on the waiting list. Over 55 (seniors) dwellings are rarely for rent because they are targeted to the home ownership market. That means many older people in cheaper rented accommodation will end up in aged care sooner than they would like and that also translates to a cost to the tax payer.

Level entry in wet areas should be a consideration during the design process. It's much easier to do initially than it is if relaying a floor down the track.

Many of the features in the Livable Housing Design Guidelines are about the structural aspects that are costly to modify later on. This includes expanding doorway and corridor widths and remodelling bathrooms. Level entry might be easy later on if there is only one step into the dwelling, but it is so much easier to make it level to start with – and of course it is convenient for everyone. Set downs in the slab to allow for level entry to wet areas is another consideration. There is a lot of cost in relaying a floor to meet the level of wet areas if it is needed later on.

The report has more detail about how the Options Paper was devised, what they wanted from it and lots of policy matters. Issues such as: do we need changes to housing standards, and if so, how much; population statistics into the future; socio-economic matters; the right of people to visit family and friends; the role of the planning system; and rural and regional areas. Will there be extra construction costs? How can these costs be measured against presumed additional construction costs? Can most costs be designed out? Due to the costs to the tax payer of government funded home modifications, should universal design features also be included in major renovations as well as new builds?

It is not clear from the report how the costs and benefits will be weighed or who will do the weighing. This will be part of the preparation for the regulatory impact statement.

If and when these features are included in the NCC – the earliest will be 2022 – we won't see a huge number of universally designed homes right away. But let's say that industry had done the job voluntarily using the Livable Housing Design Guidelines starting in 2010. By next year we would have around 1.5 million new dwellings that provide greater independence and convenience for everyone. It will be slow, but necessary progress.

The second half of the report goes into detail about technical elements such as drainage, termites and site gradients. The features in the Livable Housing Design Guidelines are being applied in seniors living developments and some larger housing developments. That means most, if not all, design issues have been resolved. If the Livable Housing features are eventually included in the NCC, it will provide consistency for all home builders and designers.

Behind the scenes, the Building Designers Association Australia is developing a course for its members on the practicalities of universal design in housing. The Australian Network for Universal Housing Design and Ecolateral are working with them on this. John Moynihan, the author and presenter of Green Smart training will present this course in the second half of the year. Will keep you updated.

Links to the ABCB documents can be found online at universaldesignaustralia.net.au.

Jane Bringolf is a passionate advocate for universal design and promotes inclusive thinking in all the things we humans design, including private housing.

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FUTURE INSIGHTS

The Future Building Insights Summit focused on current and expected technological, regulatory and economic disruptions affecting the Australian building industry. **Justin Felix** attended and reports on some of the key learnings.

"Change in technology can be exciting, but also unsettling." Building Products Industry Council (BPIC) chairperson Dave Gover made the remark during his opening address at the Future Building Insights Summit 2019 in March.

In my opinion, he hit the nail on the proverbial head. And when it comes to the building industry, there's a lot to consider. And that consideration needed to begin some years ago, because as the first speaker's presentation was aptly titled, 'The future of building is already here!'

BPIC brought together an impressive line-up of speakers over two days to help delegates tackle the blizzard of changes and reforms that are shaping the sector now and continue to do so for years to come.

The audience consisted of a mix of building products supplier, contractor and procurement CEOs, executive general managers, strategy/technical managers, construction industry representative/advocacy CEOs, and building industry regulatory/policy executives.

The two-day event aimed to uncover potential new opportunities and most importantly, foster the development of new effective strategies.

Artificial intelligence (AI), 3D printing and virtual reality (VR) are all making inroads into the building industry and are starting to make their presence felt as far as innovation and efficiency are concerned.

Futurist and partner, global head of technology & innovation Norton Rose Fulbright Nick Abrahams almost opened his presentation by dropping a staggering prediction by an Oxford Martin School study. He said, "47% of jobs will be lost to automation in the next 15 years."

Some of you will consider that scary, while others will pay little attention to such a prediction. Predictions are just that after all. Regardless of your stance though, it is worth thinking about.

If someone were to tell you 15 years ago that we'd all be walking around with an internet accessing, photo taking, GPS wielding device that could also make calls – all the while fitting comfortably in your pocket – you'd have likely laughed. Such is the rapid rise of technology and the geniuses that make it all a reality.

Speaking of which, Nick strongly advises you consider how millenials can fit into your business and help you realise your tech-potential.

"At the heart of it, they're digital natives and have a stronger ability to conceptualise it all," he said.

Delegates were also presented with some seriously disruptive and game changing technologies by Laing O'Rourke director, technical futures and engineering excellence group Andrew Harris. Robots, 3D printing and augmented reality all made an appearance, and provided a glance at some of the incredible feats already being achieved in the construction industry thanks to such advanced technology.

Andrew urged delegates to consider how they could develop smarter building products to complement and keep up

to speed with the rapid advancements of the aforementioned technologies. While day one set the scene regarding technology and its place in the construction industry, day two required a need to look beyond technology and consider changing business models, social, economical and political forces, as well as environmental concerns. By combining the two it provided a platform for delegates to develop effective strategic thinking, action and leadership.

Economist Robert Mellor provided insight into global industry trends as well as a focus on those closer to home. Some of his key points included:

- Leading residential building indicators are now broadly in retreat for most major markets.
- While the peak of the cycle was 2015/16 at 233,900 dwellings, activity remained close to this elevated trough to 2017/18.
- Approvals were down 17% for total dwellings over the first half of 2018/19. The decline was predominantly in attached dwellings (-29%), with houses (-5%) having only a modest decline.
- It is now expected that 2018/19 national commencements will come in at 190,000.
- Dwelling commencements are forecast to trough in 2019/20 at 161,000. This would represent a peak-to-trough decline of 31%.
- The decline is focused in two boom states of NSW and VIC.
- Continued elevated population growth, low interest rates and a decent labour market are sustaining housing demand and preventing a bigger decline.

Other sessions included a look at how the NCC works in practice and how it is evolving along with Standards to meet rapidly changing industry conditions.

Australian Building Codes Board CEO Neil Savery outlined some of the key challenges, including the fact that The NCC going forward, and indeed building regulatory systems in general, need to have regard to that fact that buildings and their operating systems are far more complex than when the current systems were devised.

Economist Robert Mellor shared insight into industry trends, including statistics on expected dwelling commencements and how it will affect the economy.

" We need to consider everything form a holistic perspective, understand the scale and pace of change and acknowledge that in order to be competitive, industry is looking to minimise costs while dealing with buildings and products that present greater risks," says Neil.

Former Supply Chain Sustainability School CEO Robin Mellon introduced the audience to a 'new' way of thinking, without trying to stuff 'sustainability' down anyone's throat.

His thought provoking session provided ideas for alternative procurement strategies while exploring the idea that 'whole of building/precinct – whole of life' is what matters, rather than the attributes of individual elements.

Robin encouraged delegates to consider the three following priorities:

- Sustainable procurement
- Modern slavery (if you haven't already, read the Government white paper titled Hidden in plain sight)
- Materials and how we can choose better

The event was wrapped up by a panel session discussing how manufacturers can go about getting products specified in a digital world. It showcased real-world examples of products that have been successfully digitised for use across multiple BIM platforms, the technology used and emerging technologies such as those explored on day one.

This thought provoking summit provided plenty of food for thought while opening the industry's eyes to the role disruptive technologies are playing in the construction industry today and the boundless possibilities of the future.

The question is, will you be ready?

EMERGING TECHNOLOGIES TO FEAST YOUR EYES ON

The opening day of the summit presented users with an insight into some disruptive technologies that are nothing short of revolutionary. When you've got a few moments to spare and feel like being inspired, punch the following keywords into Google:

- Google Crabot
- Alibaba City Brain
- Airobotics drone
- Astro live experiences
- AP Works by Airbus

GOING GREEN WITH GEOTHERMAL

With a vision to expand its reach and training capabilities, a new Plumbing Industry Climate Action Centre is landing in Melbourne's southeast. And it's sporting an impressive geothermal system that's putting this facility on the map, for all the right reasons. *Building Connection* reports.

For a number of years now, the Plumbing Industry Climate Action Centres (PICAC) have been providing integrated education and training programs in advanced areas of plumbing and gasfitting in Brunswick and Geelong, Victoria.

PICAC's facilities are second to none and include the Fire Protection Centre of Excellence, the Occupational Health and Safety Centre of Excellence, a demonstration Green Plumbing House, world class reticulated water systems, the newest technology in water and energy efficiency. By its own admission, showcasing the world's very best, leading edge technology means PICAC is training the plumbers of tomorrow, today.

Such has been the success of PICAC in Brunswick, Victoria, that in November 2014 the Andrews Government announced it would support the development of two new PICACs in Geelong and Narre Warren. With the Geelong site successfully completed and now delivering training, we were eager to see where things were at in Melbourne's southeast. Needless to say, it's an impressive structure, both in a tangible and intangible sense.

"The building itself incorporates contemporary plumbing product. But we've gone beyond that. The plumbing is a proud aspect of the building, so at every opportunity we're looking to expose it. Plant rooms are glassed features and pipework is exposed wherever possible," says PICAC chief executive officer Shayne La Combre.

As has been the case with all PICAC buildings, ideas and inspiration have been drawn from across the globe, to ensure the centre remains contemporary while delivering training excellence for the industry.

"The biggest challenge for plumbing training, or any sort of training really,

is staying contemporary. But staying contemporary, just to ensure you're up to date with 'now', is almost conceding the lead," explains Shayne.

"We're constantly asking ourselves how we can get in front because we need to ensure our industry is always training for the future. We're investigating how certain technologies will have an impact on our industry while trying to pre-empt how we can deliver training for careers that don't even exist yet.

"From the industry's perspective, we're not going to be left high and dry. We're not leaving it to the likes of government regulators to say, this is the direction you need to take. A place like this will be charting the direction," says Shayne.

While this is all conceptual at this stage, it remains to be seen how the Narre Warren site will capture those visions; however, the industry needs the capacity to deal with change in the future. And that's exactly what the PICAC team see as the purpose of this building.

As per the two existing training facilities, the Narre Warren site is not being set up to compete with local TAFE's and other registered training organisations, but rather exist to complement them.

"This is the way of the future for training in this country. It's not just a 3-year component of an apprenticeship; it's about a relationship with the industry's training arm to make sure career trajectory is taken as far as it can go."

The geothermal system combined with solar technology and an airtight structure make this one of Australia's most impressive buildings.

And this is where the footprint of the building promotes ongoing innovation. It isn't just a shed that's been converted. It's a purpose-built facility. On top of that, it's Australia's first net-zero energy (NZE) education and research centre.

With climate change being a very real thing, there is a challenge to architects, designers and builders to produce sustainable buildings.

Not one to back down from a challenge, FMSA Architecture once again collaborated with PICAC to design an energy-efficient building that maximises northern exposure to both the ground and first floor.

"PICAC has done a number of renovations over the years at its Brunswick site as they've grown and each significant renovation or project there has had some sort of sustainable element incorporated. The Narre Warren site is by far their largest Greenfield project though, which is why they've had the opportunity to push for the technology to achieve such an energy efficient structure," says FMSA architect James Kazalac.

"It's the first time we've worked on a net zero building and as part of this project we received a federal grant to assist in installing the geothermal and part of that thinking is to make the system more available to the market and a more common practice across the country.

A net-zero carbon building is highly energy efficient and powered from on-site or off-site renewable power. This particular building will generate enough energy to support its own requirements. Such a feat has been achieved via a combination of the geothermal system, solar technology, an airtight building, roof design and a 375-kW photovoltaic (PV) system.

"It's the first time it's been done in the Southern Hemisphere. We've taken a lot of American ideas and added multiple layers to them," says Hutchinson Builders site manager Nick Hollier.

That's not to say it's been an easy road though.

"One of the hardest aspects of the build was the fact the Geoexchange geothermal system was integrated into the structural. That hasn't been done here before. Having thermals going into the ground is normal. It's more the fact that of 580 piles, 190 of them have waterlines in them, 28 of which descend one hundred metres into the ground.

"We already had the base down, ready for slabs, because none of us had coordinated this type of project before. There is 7km of waterlines horizontal and 7km vertical. The concreter had to come back through and work around the complex piping network, tidy it all up and set his slab up. You can probably imagine what kind of nightmare that is. It was a massive challenge. It took us six months to get out of the ground. It would normally take two months at worst."

As they say though, nothing worth having comes easy, and Hutchinson Builders and its consultants took a boutique geothermal system and expanded it to a fully integrated building system, with the outcomes being a net-zero energy building.

Nick explains that while the upfront investment was high, through research, discussions and experience from the plumbing industry in the Northern Hemisphere a 5-7 year payback is anticipated.

When you consider this incredible achievement coupled with the training, testing and collaborative works on the horizon, it's fair to say the industry as a whole has a lot to look forward to.

The official opening of PICAC Narre Warren will take place on 10 September, a day before World Plumbing Conference begins, with visiting international guests set to take part in the proceedings. ■

HOW DOES GEOTHERMAL WORK?

The absorption of solar radiation/energy (47% of the sun's energy that reaches the earth) by the ground is the renewable energy source of geoexchange systems. In most localities across the globe, depths of greater than 2-3m provide a stable temperature environment that is the approximate equivalent of average annual air temperature for that location.

One is only required to enter an underground cave or wine cellar to experience this temperature stability first hand. These stable temperatures are typically present in the top 100m or more of the ground. The rare exceptions to the rule are unique geological regions such as those present in Rotorua, New Zealand and elsewhere that geothermal heat is present at shallow temperatures.

For example, the ground temperature in Perth, Adelaide, Melbourne, Sydney and Canberra is approximately 16-18˚C while in Brisbane it is 22-23C. In contrast, Darwin has a ground temperature of approximately 31C and Hobart approximately 14˚C.

In essence, geoexchange systems use this solar energy stored within the earth for heating buildings in winter (earth as a heat source) and as heat rejection in summer (earth as a heat sink). Both internationally and in Australia, the technology has been applied at the residential, commercial and district scales.

Heating
During the heating cycle, a geoexchange system uses the earth loop to extract heat from the ground. As the system pulls heat from the loop it distributes it through a conventional duct system as warm air (water to air). The same heat energy can also be used for a radiant floor system, swimming pools and spas (water to water).

Cooling
In the cooling mode, a geoexchange system air conditions your home by reversing the heating process. Instead of extracting heat from the ground, it is extracted from your home and either moved back into the earth loop, or used to preheat the water in your hot water tank. Once the heat is removed from the air by being passed through the loop, it is distributed through the duct system in your home.

**This information has been provided by GeoExchange Australia.*

NEW FACE FIX TIES

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Abey Australia have developed and manufactured their new R2 galvanised light-duty face-fixing sheriff veneer ties for use in steel frame construction.

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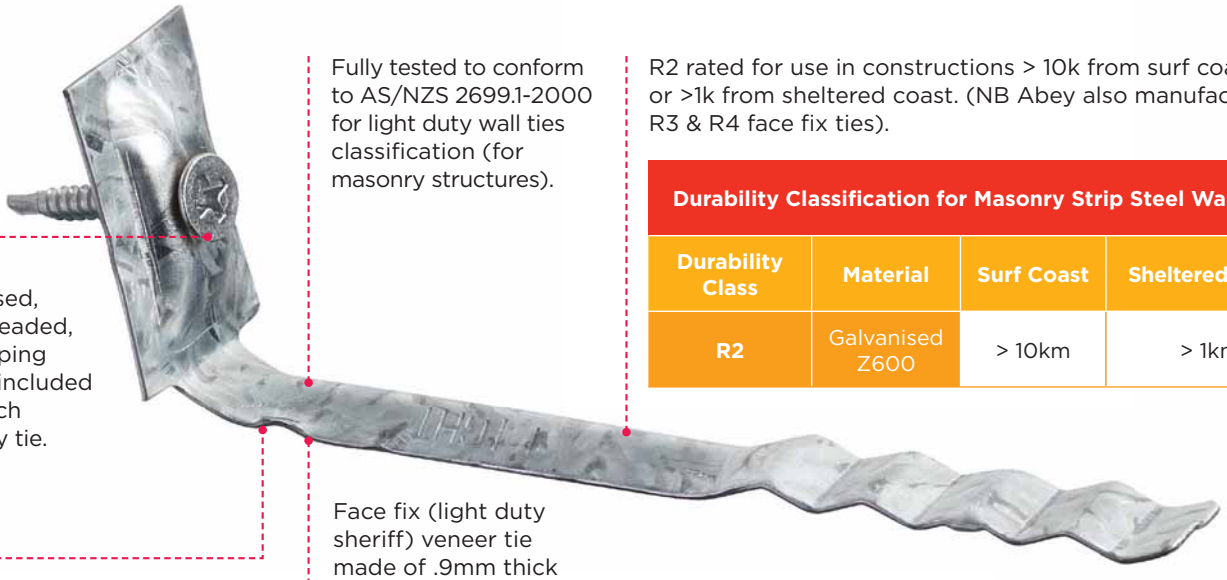

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DOGS TAKE BITE OUT OF TERMITE DAMAGE

A keen sense of smell and the ability to navigate awkward spaces makes dogs the perfect termite busters. **Anna Hayes** found out more.

When we think of damage to our homes, our minds instinctively turn to natural disasters like fires, storms and floods.

In reality, the biggest danger is often much smaller and harder to find.

Termites will affect one-in-three Australian homes, according to surveys. In many cases, home insurance policies will not cover the destruction caused by termites. This leaves people with damaged homes and no back-up.

Termite damage is something that often goes undetected until it is too late.

There are plenty of termite detection options. Flick, however, offers something a little bit different; it is teaming up with a four-legged friend to track down the troublesome pests.

The company has been using dogs for the detection of termites and termite damage for the past five years. It offers its service in Adelaide, Ballina, Gold Coast, Melbourne, Sydney and Brisbane. At present, it has six dogs with a new pup, Ollie, due to start his detecting career very soon.

The dogs are trained by Flick Anticimex's national dog handler and trainer Gavin Skinner who explains that the dog's keen sense of smell is one of the greatest assets they can have when they are carrying out an inspection.

Flick Ballina branch manager Dan McCafferty says that, on any new job, they always do a timber pest inspection to Australian Standard 4349.3.

Following that, the dog is brought in to inspect the external area before moving inside. Handlers pay close attention to the dog's reactions and make note of points of interest for further examination.

The dogs offer an extra dimension to inspections, not only because of their sense of smell but also their agility which allows them to access areas that people couldn't, including tricky roof spaces.

Gavin Skinner and one of his trained pups make for a termite's worst nightmare.

The dogs are trained from a young age and Gavin explains that the key factor is to familiarise them with the scent of termites and encourage them to search for it.

"It depends on the dog but some can be out on inspections after six months. Most take between six and 12 months. We like dogs that have a bit of drive," says Gavin, adding that a lot of their dogs are English working cocker spaniels. Rewards for a good training session come in the shape of playing with a tennis ball rather than food as the latter is more likely to distract them from their task.

"Once they get the scent training, we move on to more advanced training such as distraction odours. They're trained to ignore things like other animals and food and that's why we

don't use it as a reward because it can be a big distraction when we're out on inspections," Gavin explains.

The dogs are particularly good on problem jobs as they can detect old damage and where termites are accessing a building.

"For example, in a house with termites, you can permanently solve the problem if you know where they are getting in. The dogs can find that quite easily whereas, before, the only way to do that was to remove the walls. If we have a specific location that we can focus on it makes it more cost effective," says Dan.

Generally speaking, one dog is used per inspection but in cases of bigger buildings a second dog might also be used.

Currently, there aren't too many other businesses, aside from Flick, using detection dogs, Dan says. The work and responsibility of training and keeping the dogs makes it prohibitive for most.

"There is the odd solo operator but none on as large a scale as us," he says, pointing out that the dogs are a costly investment. They also require continuous training, as well as specialised vehicles that adhere to RSPCA standards for transporting them.

"We feel that it does give us the edge over competitors. It's an additional tool that helps us to provide a more extensive service and lets people feel that they are getting value for their money," he says, explaining that they are hoping to extend the service, getting the dogs out to more of their branches around the country.

All of their services, he adds, come with a 12-month warranty but the termite dogs have had an excellent track record to date. ■

A keen sense of smell and uncanny agility make the dogs indespensible members of the Flick Anticimex termite detection team.

THE PROFESSIONAL INDEMNITY HANDBRAKE

Jeremy Turner reports on the changes in the professional indemnity insurance market and how it affects the building industry.

AIBS is not the only industry body that has been advising its members about changes happening in the professional indemnity insurance market for some time now.

As expectations of the financial cost of remediating non-conforming building product use, and who is responsible, and how the courts would decide on these points are becoming known, we are seeing a fairly rapid response from insurers.

AIBS and other bodies have been working hard to ensure governments and industry are informed of the situation as it develops, including the ramifications for all.

Building surveyors are particularly attuned to the professional indemnity insurance market in the main because legislation requires building surveyors to obtain insurance as a prerequisite to registration as a private practitioner. Other practitioners also carry professional indemnity, some because they are required to in order to be recognised by professional bodies and others because it makes good business sense to do so.

The tightening of the insurance market is not isolated to building surveyors. Just as building surveyors are seeing significant increases in premiums, drastic reductions in the value of claims that will be covered, and dramatic increases in the excess that must be paid with each claim, other practitioners are also seeing these effects as the insurance industry looks at professional indemnity for the building industry as a whole.

The other aspect to this issue is the shrinking number of insurers willing to provide policies that will cover claims related to cladding, combustible cladding products, non-conforming building products used as cladding and similar exclusions or limitations that are often used by insurers wishing to either exit the market or to downgrade their exposure.

The UK government has just announced a 200-million-pound fund to be used for remediation of cladding risks. What will our government do?

AIBS has been warning regulators around the country not to drop requirements for comprehensive cover by allowing practitioners who are required to carry insurance to register with limited or incomplete cover.

The end result would likely result in these practitioners not only being unable to deal with matters involving items excluded from their insurance but any claim that arises relating to previous work involving matters now excluded will not be covered. Such claims will then be made against the assets of the business and could also extend to the personal assets of the business owner in particular circumstances.

It is likely such claims could not be covered by business or personal assets, or both. The end result then is that the consumer seeking compensation

for the claim could be left without compensation. This would not happen should regulators maintain a requirement for comprehensive cover.

A further consequence of allowing registration with incomplete cover is that before long, there would not be any practitioners with appropriate insurance to deal with remediation of existing cladding risks.

The most appropriate response of governments and regulators is to establish a funding model that provides assistance where cladding risk mitigation is required. There is a range of funding models that could be used for this and it would be up to the government of the day to establish the most appropriate of these for the jurisdiction involved.

The UK government has just announced a 200-million-pound fund to be used for remediation of cladding risks.

Governments are reticent to provision of funds because they wish to maintain a façade of innocence in respect to the advent of combustible cladding and non-conforming building products on buildings.

If governments think they might not be exposed to claim if they don't admit that the regulatory systems and technical requirements were in part to blame for this situation, they have another thing coming. The failure of the professional indemnity insurance market for the building industry will leave the government as the only player capable of dealing with existing cladding mitigation because owners will largely not be able to cover it themselves. Instead of taking a share of the responsibility, governments will have most of it and take a far more significant reputational hit in the process.

The best thing for the federal government to do would be to investigate opportunities for the establishment of a funding model supporting state and territory governments to mitigate cladding risk with existing buildings.

State and Territory governments need to review their auditing schemes to ensure they are capable of detecting poor practice and non-conforming or non-compliant product and material supply and use.

The enforcement systems need to be strengthened to ensure that where adverse audit findings occur, non-complying work or non-conforming products and materials can be dealt with, quickly, effectively and safely.

A range of other reforms is needed including in relation to the requirements for all practitioners to be licensed or registered to participate in the building industry. In addition, the mandatory inspection requirements need to be reviewed to ensure an adequate standard of minimum inspections is undertaken of work in progress.

Hand in hand with licensing and registration requirements, there needs to be a scheme that makes it mandatory that all practitioners maintain knowledge of their area of practice before they can qualify for ongoing registration or licence renewal. Governments that issue licence renewals without obligation to demonstrate suitability for ongoing practice are just taxing participation in the industry.

The final piece in this jigsaw is the NCC BCA itself. There remain ambiguities regarding how the NCC BCA 2019 deals with cladding and what is and is not allowed regarding combustible types of cladding. There needs to be further work done to address these ambiguities so that with the introduction of the NCC BCA 2022, it will no longer be a factor in future non-conformity.

AIBS believes that the reforms and other measures necessary will not happen with a single voice making these calls. AIBS is actively working with other industry bodies to ensure that governments hear the call and respond to the recommendations made in Shergold and Weir's 'Building Confidence' report and in the findings of the Senate Inquiry into Non-Conforming Products and Asbestos.

The BMF has developed an implementation plan which responds to the 'Building Confidence' report which confirms the fears held by many that each jurisdiction is essentially going their own way on each recommendation, often choosing to do nothing. The Building Ministers have failed to meet the challenge of coming together and resolving an agreed pathway to reform.

Without reform, there won't be access to appropriate professional indemnity insurance cover, practitioners will decline to engage with work they cannot be insured for, and where claims continue to arise, one by one, practitioners will cease to exist.

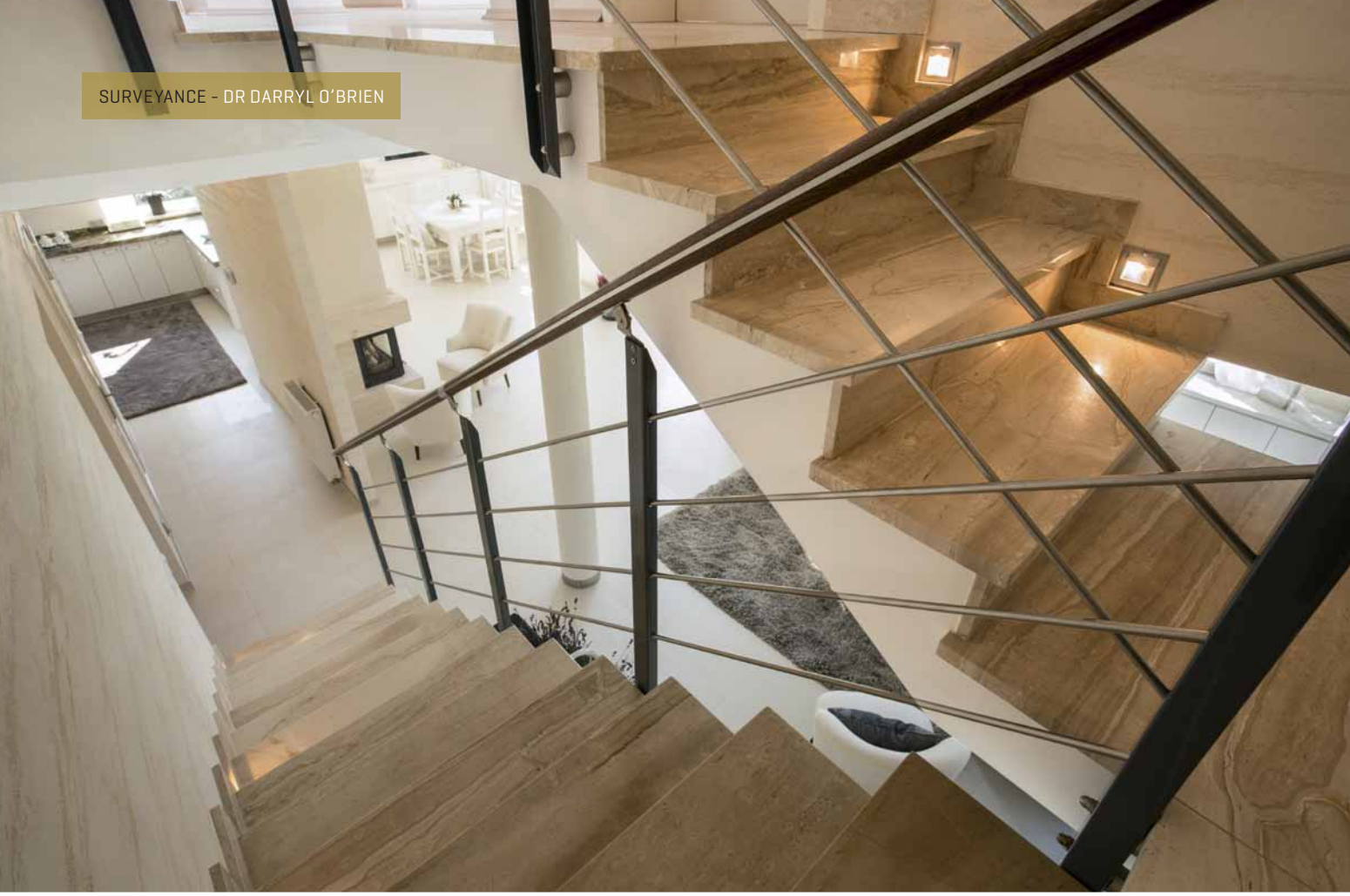
The UK government has just announced a 200-million-pound fund to be used for remediation of cladding risks.

The handbrake that this would place on the entire economy as it struggles to obtain design advice, documentation, assessment services, approvals, inspections, occupancy authority and even to find practitioners prepared to undertake projects, has the potential to be profound.

There is no backstop in local government, even where local government maintains involvement in the assessment and approval process. While there are bright spots within the local government sector, the specialisation and customer focus that is available via private sector involvement in building assessment simply cannot be replicated across the local government sector so that the whole of industry would be reverted to 1970s style approvals processes and all the costs and timeframes associated with that.

We believe there is a better outcome available right now and hope that we are not the only voices calling for the necessary changes to be implemented. ■

AIBS
www.aibs.com.au



A PERFORMANCE BASED DESIGN SOLUTION – STAIR FLIGHTS

Darryl O'Brien provides an example of how a performance based design solutions may work in practice. I will consider the case of a flight of stairs in a Class 1a dwelling having 20 risers, rather than the prescribed 18.

So where do we begin?

First, we need to remember that the only mandatory compliance level under the National Construction Code (NCC) is the performance provisions. Meeting the performance requirements may be achieved in a number of ways. These are developing a Performance Based Building Solution (PBBS) that is the equivalent to the Deemed to Satisfy (DtS) requirements (a benchmark approach) complying with the performance requirements (a first principles approach), meeting the prescriptive DtS solutions or a combination of these compliance measures.

So with this in mind, what do the performance requirements say about flights of stairs?

In this case the relevant part of P2.5.1 requires that in order to allow people to move safely to and within a building, the stairway must include suitable landings to avoid user fatigue. Thus, to achieve this goal the DtS solution restricts flights to 18 risers.

Now, our performance solution needs to demonstrate that by having two additional risers, our flight of stairs will not cause excessive fatigue and will be safe. I will need to demonstrate (the burden of proof) how this will be achieved (the standard of proof). To demonstrate that my performance solution meets the performance requirement, I will consider three factors:

1. Stairway widths
2. The number of handrails, and
3. The shape and size of handrails.

In accordance with Part A0.9 I will assess the performance solution using a combination of DtS comparison (benchmarking) and expert judgement. To achieve this, we need to identify the minimum DtS requirements:

1. Stairway width – no minimum or maximum widths prescribed
2. The number of handrails – one

handrail provided for each flight of stairs

3. Shape and size of handrails – the BCA is silent on this matter.

So, what will my 20 riser flight of stairs look like?

To improve safety and usability the flight will have the following attributes:

- The stairs will be one metre wide. The actual width is inconsequential until we consider handrails, at which point the stair width becomes critical if we are to effectively use the handrails, which brings me to point 2.
- My flight of stairs will have handrails on both sides, which is a 100% improvement on the DtS option of only requiring one handrail.

Why does this matter?

In a 1996 study it was found the older people rely on hand rails to support body weight and to control descent speed. Further, it was found that older people were generally unable to descend four consecutive stairs without the aid of a handrail. So the use of two handrails allows older people to support their body weight and control descent speed.

This feature will significantly improve the usability of the stairs for older people, reduce fatigue and improve safety – our key performance requirements. It was also found in a 1998 study that handrails help people maintain balance on a flight of stairs. So again the use of two handrails will significantly improve safety.

- The shape of the hand rail has a critical role in making and maintaining hand contact. In a 1998 study it was found that a hand rail having a circular section and between 32-50mm was the most effective size and shape. The DtS provisions are silent on these matters, meaning we could provide a 100 x 100mm timber handrail – compliant, but ineffective. Again, by providing two round handrails of optimum size we have significantly improved the key performance benchmark of stair safety above the DtS.
- Finally, is a long flight really a more dangerous option? Typically, studies suggest that the more risers in a flight of stairs means the safer that flight of stairs is. Indeed, the probability of an accident decreases on flights having more than six risers. But why is this the case? Firstly, often there are no visual cues to warn users of a small flight of stairs in their path of travel, so we don't adjust our walking speed or gait which can lead to falls.

The number of risers and shape of handrails play an important role in determining whether a flight of stairs is deemed safe or dangerous.

Secondly, over long flights we quickly adapt and adjust our proprioceptive feedback to effectively negotiate the stair geometry – this does not happen as readily with short flights. So it can be demonstrated from published studies that a longer flight is statistically safer, again meeting this crucial performance requirement.

As a final note, the Building Code of Australia (BCA) does not require handrails on flights less than one metre high. So the most statistically dangerous flights don't require handrails – a critical element shown to be effective in preventing falls.

The studies that I have referred to are all peer reviewed and published in reputable journals, but could they be considered a form of expert judgment to support the performance solution? The BCA definition of Expert Judgement means the judgement of an expert with qualifications and experience in the matter. This would suggest that the studies could be used by an occupational therapist, access or ergonomics consultant to support the performance solution.

Two final points. This article is not a criticism of the BCA. Always remember that the BCA is minimum standard and not always best practice so where evidence suggest possible ways to improve outcomes, these can always be used. We can always go better, just not less than the BCA. And finally, would I approve this performance solution? I'm not sure, as there have not been enough judgements to see how the courts would view the use of a performance solution where there an injury or death. As they say, the jury is still out on this one. ■

Dr Darryl O'Brien is Head of Course, Undergraduate Built Environment, at CQ University. He is a member of the Australian Institute of Building Surveyors.

SUSTAINABLE SITES FOR THE FUTURE

Full skips are a thing of the past for one Adelaide company which has taken building site sustainability to a whole new level. **Anna Hayes** reports.

Sustainable or green building is becoming increasingly more important as builders and clients are mindful of, and keen to reduce, their footprint on the environment.

Waste has always been an unfortunate side-effect of a building site, with most of the discarded materials loaded into a skip and removed, resulting in high costs for the builder.

Joe Golotta, of Premier Insulation in Adelaide, started Precycle almost two years ago, as a process offered by his family-run company, following a lot of engagement from builders lamenting on the volume of waste created on sites. They would then be charged a huge fee as a skip would be completely filled with insulation cut-offs.

The days of ignoring recycling materials need to end – tradies' habits are very important in this process.

So, as a deal, Premier Insulation began to take these off-cuts for a fee and, soon after, this evolved to taking plasterboard waste.

It was at this point that Paul Greig, co-owner of Precycle and operations manager of Premier Insulation, came up with the idea that would become Precycle. After a trial with a local builder, the business grew from there.

Paul explains: "The Precycle process is a partnership between Precycle and the builder; the more the builder drives and promotes the six stage recovery system, the better result that can be achieved."

He says it is, naturally, a learning curve for all trades as everyone on a site has a responsibility to act in a positive manner in relation to their effect on the overall outcomes.

"The days of ignoring recycling materials need to end – tradies' habits are very important in this process."

Joe's son Ben Golotta is the sales and marketing director for Precycle and he says that their service is coming at a time when people are very aware

of the effect they can have on the environment.

"The positives to moving forward in a sustainable way are that it breeds forward-thinking. Society is at a point of wanting change and each industry must follow. The benefits fall back into your pocket," he says.

So how exactly does it work?

From, once upon a time, seeing skips full of off-cuts destined for a dump site, the range of uses for repurposed material is almost limitless.

"Through six stages of a worksite clean, we minimise landfill, site hazards, and CO2 emissions," says Ben, explaining that they identify the important, waste-heavy stages of the building process. At the end of these stages, contractors are instructed to leave off-cuts in a designated area to be collected by Precycle within 48 hours of job completion.

"At each stage we do an entire site clean and feather the bin for any excess of un-contaminated recyclables."

Precycle takes timber, bricks, steel, REO, plastics, concrete and anything else that could be repurposed. As long as the material is not contaminated, Precycle will take it.

It can then be recycled into a wide variety of items.

"In terms of how the materials are repurposed, that is completely up to the body who takes it. For example, plasterboard is crushed and mixed into soil. A lot of our timber off-cuts are being sent to high schools to help future makers. We are open to anyone who is willing to reuse our materials in an environmentally positive way."

As a model, Precycle is the first of its kind. Ben says they pride themselves not only on being environmentally positive but also on creating a safe environment for each worksite, and he believes it is why builders should consider using a system like Precycle.

"At the end of the day, we help to facilitate an organised, well maintained work site. It is not just the practice of recycling materials that is beneficial; it is having someone that is responsible across the board, for the entire build."

Precycle, he says, removes the need for labour in cleaning sites as they make sure the sites are maintained to the highest order, helping to reduce waste and material costs.

"Long term relationships mean we have an understanding of builders' ordering practices."

And this knowledge subsequently leads into creating a more sustainable process in the building industry, says Ben who points out that being an environmentally positive and sustainable builder has its difficulties.

"Waste is an enormous part of that. Previously, there were no real alternatives to the current model of dumping everything into a skip and forgetting about it."

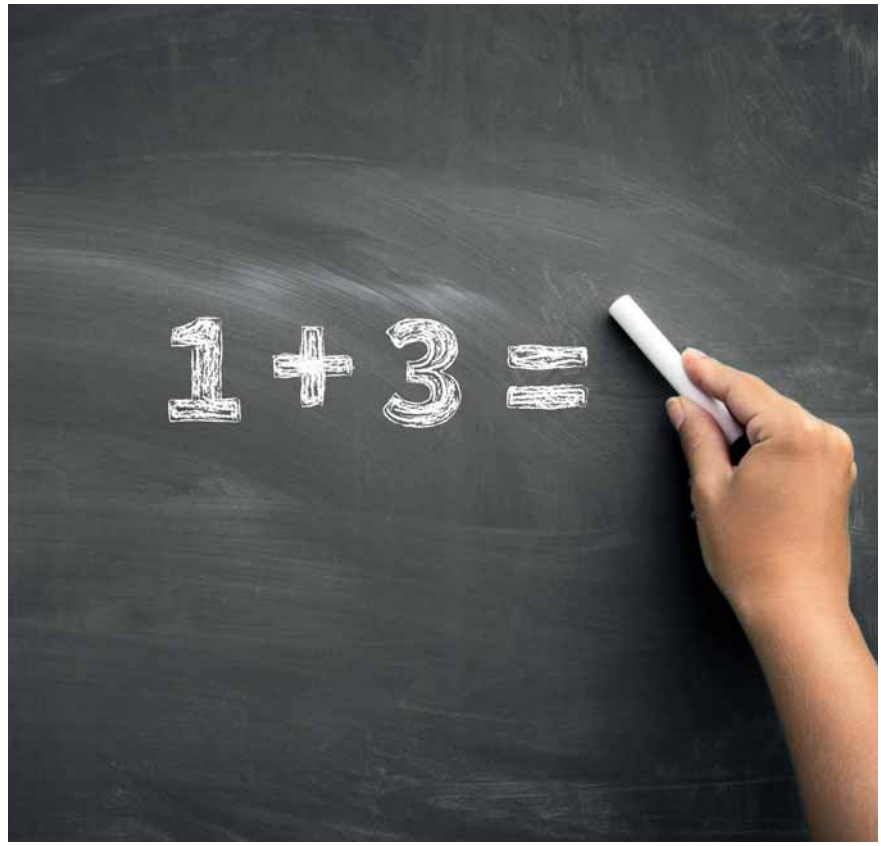
But Precycle is not just about dumping in an environmentally friendly way; it's about reducing the amount of resources being used from the very beginning.

"If we can create a circular economy in the building industry, we can give back to builders whether it's materials they haven't used, or giving them an understanding of what they have consistently over-ordered," says Ben.

Not only does Precycle's model encourage recycling, it also creates a cleaner, safer work environment for everyone working on the jobsite.

DO THE MATH

Greg Cheetham discusses the need for students to sharpen up on their level of mathematics and shares details of a program that is paving the way to ensure it happens.



Almost 50% of students seeking an apprenticeship in the building and construction industry were rejected due to their level of mathematics according to the Apprenticeship Engagement Forum (AEF)[1].

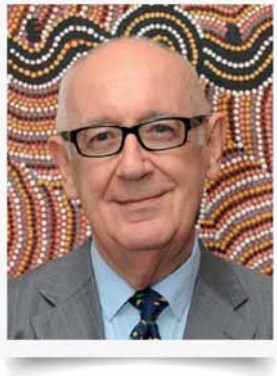
With nearly 30 years in vocational education, 20 of which were at the coalface, I can testify that one of the biggest barriers to apprentices and trainees completing their qualifications is their ability to do the maths. This has been well recognised for many years with multiple taskforces and committees established at national, state and even local levels to try and find solutions.

The AEF is contracted by the Training Services NSW to be an advocate for the construction industry on training matters and encourage the uptake of construction apprenticeships to meet the industries skill needs into the future.

According to the AEF, almost 50% of students seeking an apprenticeship in the building and construction industry were rejected due to their level of mathematics. Andrew realised early on that the key to improving completions in construction trade qualifications would be found in secondary schools where the fundamental principles of mathematics are laid.

To help address the maths issue, CEO of the AEF Andrew Bryson enlisted the support of Master Builders Association (NSW), Master Plumbers (NSW), Housing Industry Association (NSW) and the principals of four high schools.

The first step in addressing the problem was to get the members to engage with the secondary schools, students and parents at high school subject selection nights and provide up-to-date information on building and construction apprenticeship opportunities.



Andrew Bryson - CEO Apprenticeship Engagement Forum.

AEF members regularly encountered resistance from students when discussing the need for them to select maths as a subject. That was the spark that ignited the development of the Mathematics in Trades Pathway (MITP) based on the current mathematics curriculum using experiential learning concepts.

MITP does not replace the current Stage 5 mathematics outcomes, but simply repackages it in a practical and engaging way to support students pursuing an apprenticeship or traineeship as their first career option.

It aims to:

- Ensure students can achieve workplace numeracy requirements and the necessary stage 5 and 6 outcomes through the Mathematics in Trades Pathway.
- Support students to ensure they are confident, capable and successful apprentices with proficient and practical numeracy skills.

As an example, students may be asked to design, cost and finally build a landscape project. The project involves making a scaled drawing, calculating

areas and volumes for soil and spoil and calculating material quantities and costs for timber, bricks, sand, cement and plants and irrigation supplies. They have to visit a hardware store and contact suppliers to get prices and order materials. Then they build it. This is only an example, I'm sure you could think of many others that would suit a high school learning environment.

In 2017 a trial of the MITP was set up in a small number of high schools in the western suburbs of Sydney involving year 9 students.

Rooty Hill high school deputy principal and head teacher mathematics and past president of the Mathematical Association of NSW John Meng joined the AEF and is responsible for the development of MITP.

He led a team of like-minded high school mathematics teachers to collaborate on the design, implementation and evaluation cycle of MITP in 2018. Today MITP programs and resources are shared in the public domain with teachers from across three school sectors in NSW and beyond.

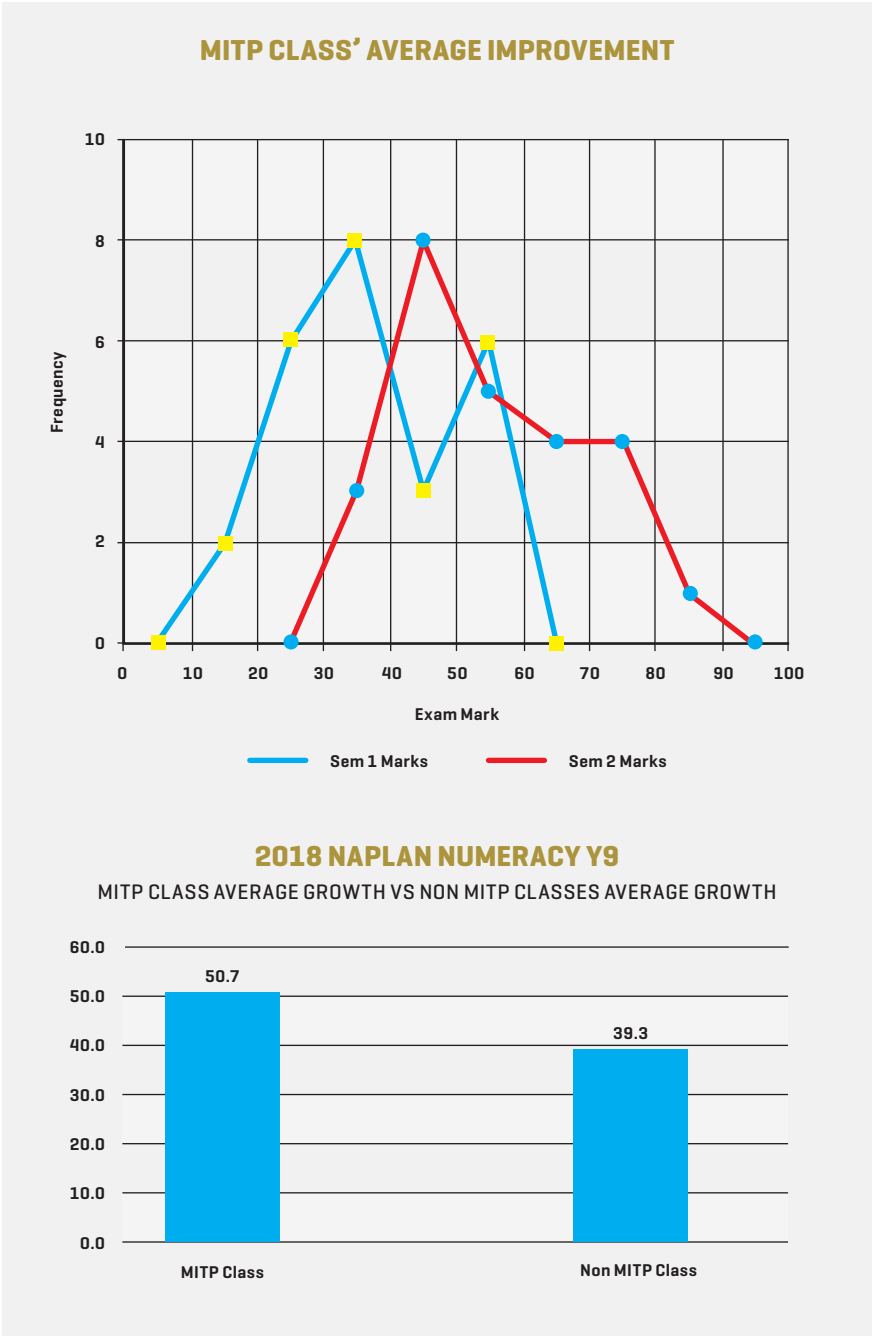
"It was not an easy step to take, but so far, the underpinning theory of MITP is well accepted by the teachers. But, some concerns were raised. It would be challenging to teach mathematical concepts and skills in 'trade' context... and to meet the strict safety requirements when MITP students are attempting practical work," says John.

To overcome the barriers the team designed and delivered multiple professional development workshops for MITP teachers with a special focus on co-plan and team teach practical lessons with qualified TAS/VET teachers to avoid the anxiety and risks caused by teaching 'out-of-field'. At the moment (early 2019), there are about 50 students in the MITP across two schools in the area. But it is expected there will be many times that number across NSW by year's end.

There are similarities between STEM and MITP approaches to motivate and engage learners, but MITP applies mathematics in a 'trade' context, e.g. calculate the pitch and rafter length in a gable roof.

Another distinct feature of MITP is the extensive use of assessment strategies to assess students' knowledge and skills through teacher observation and professional

John Meng, (Co-Deputy Principal and Head Teacher, Mathematics at Rooty Hill High School).



judgment. The 'Project Based Assessment' approach has the advantage of better reflecting their mathematics learning achievements.

The results from the first groups were analysed in 2018 with what I think are remarkable results. For many participants it was their first real engagement with maths in this way. The trial showed a marked improvement with reduction of E grades, with 5 students achieving top grades at the end of semester 2.

The 2018 NAPLAN showed MITP class' average improvement exceeded other Year 9 classes by 29%.

What was even more exciting was a 66% (2018 MITP students) reduction in the number of school suspensions given to students in MITP, significantly reduced from 13 in 2016 (No MITP program) and then 11 in 2017 (first year MITP was run) to just 4 in 2018. The trial unmistakably demonstrated greater student participation and success in mathematics.

Following on from the successful trial, over 20 high schools have signed on to introduce the MITP program in 2019. The trial has expanded to include years 10 and 11 with a year 12 MITP trial planned for 2020.

The first full graduates of the MITP will be announced by the end of 2021 by which stage ut is hoped 200-plus schools will adopt it as teaching model.

As part of ongoing research, each student in a Trade Readiness or VETiS course is given a Unique Student Identifier number (USI). The USI is used to track and record training and qualifications gained through any recognised training organisation (RTO). This way they will be able to track through to completion any student that goes into an apprenticeship.

Other states and territories are watching the progress of the trials and developing project based and experiential learning models for their students

John Meng believes the key to ongoing success for the MITP is to work to engage industry with schools and teachers to make the benefits of a career in building and construction known to students and help unpack the literacy, numeracy and interpersonal skills that a successful apprentice must develop.

If you're a teacher, trainer or concerned parent of a secondary student/s and think your students, sons or daughters could benefit from this approach, contact Andrew Bryson from the Apprenticeship Engagement Forum via www.apprenticeshipengagementforum.com.au

Or simply forward this article onto your local high school and encourage them to make contact. ■

Greg Cheetham has been a construction worker, shopfitter and detail joiner for most of his life, including nearly 30 years in VET as a teacher and manager.

ENWARE

NEW

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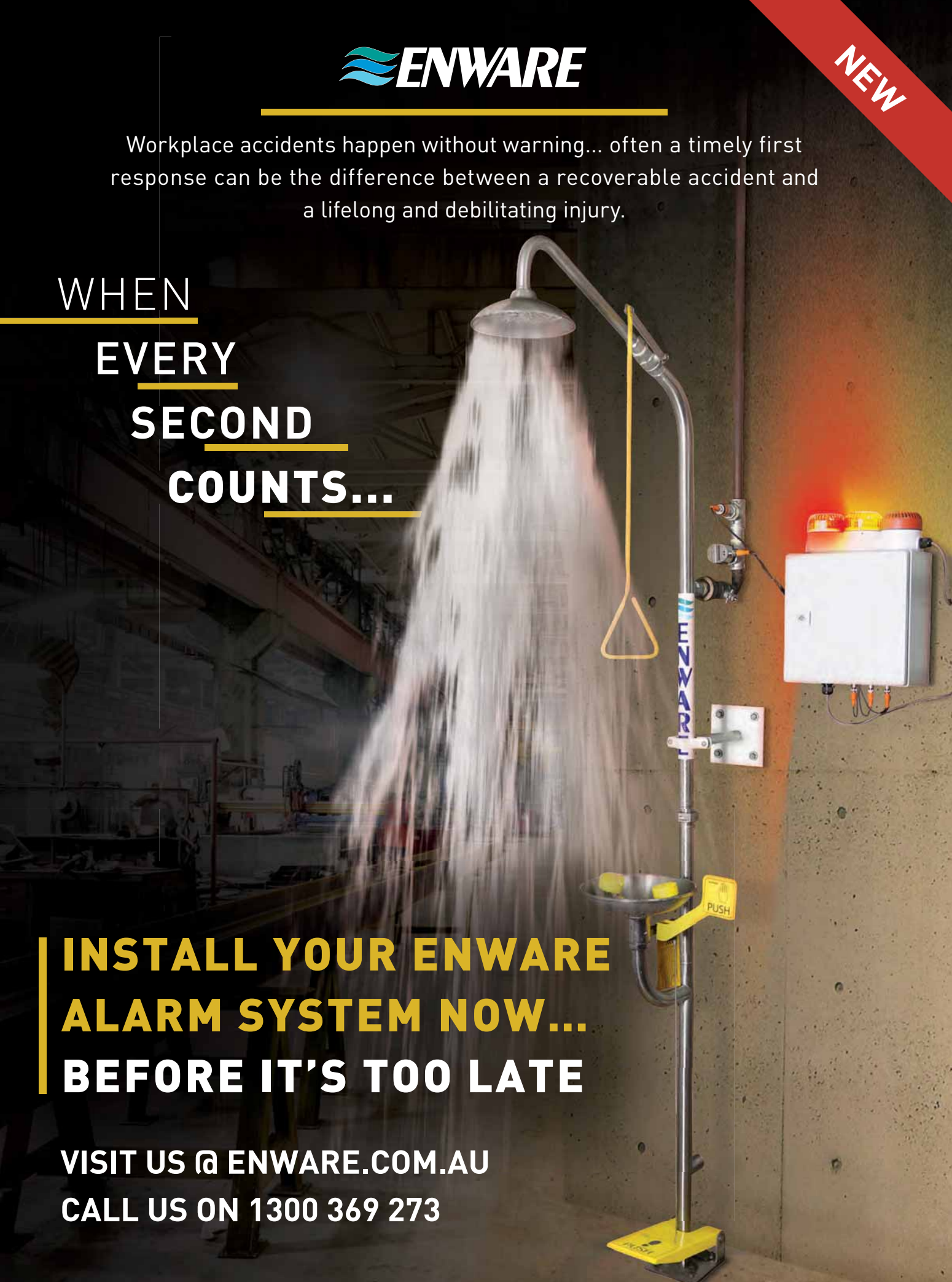

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HIGH PERFORMANCE GLASS & ITS PLACE IN DOORS AND WINDOWS

Over the past few editions of Building Connection Magazine Gary Smith has spoken about the main framing materials for windows and doors in Australia, including PVC, timber and aluminium. In this issue he discusses the other main material of a window and door system, the glass with a focus on high performance.

In today's built environment, glazing does far more than keep out the wind and rain, although these have always been its primary function. It has become increasingly important to consider the design, selection and installation of glazed elements. In terms of energy performance, windows and doors are key areas that need to be heavily focused on during the design and build phase of a construction.

While windows typically represent less than 10% of the surface area of a home, they can realistically contribute to as much as 49% of the heat lost during winter and as much as 87% of the heat gained during summer. This means that homes with ordinary windows use up to a staggering 60% more energy to heat and cool their home than is necessary.

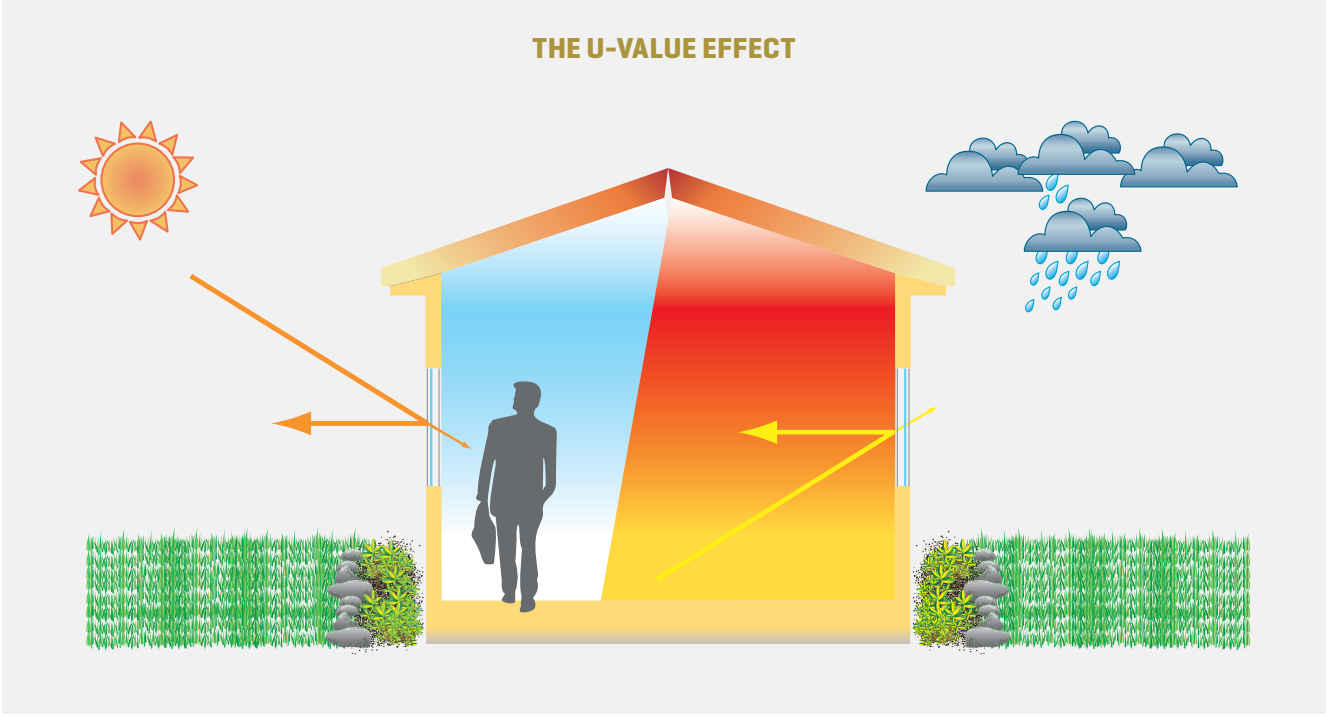
For many years, the effect of glazing on energy performance, home comfort and safety has been greatly under used in Australia. One of the shortcomings of glass is its relatively poor insulating qualities. Poorly designed windows and inefficient glass can make a home too hot in summer or too cold in winter and it increases the demand on air conditioning and artificial heating.

Energy efficient glazing can significantly reduce the amount of heat that travels through windows. The most energy efficient windows result from a combination of both the right frame and the right glass to achieve superior energy performance. Energy efficient windows will not only save money on energy bills but will also play a significant role in improving the overall comfort of a home.

The emphasis on selecting the right product to reduce heat loss in a colder climate and reduce heat gain in a hotter climate should be an important decision to achieve greater comfort and energy efficiency.

There are literally thousands of energy efficient window systems (including high performance glass) available to choose from. Advances in technology have made a host of new and exciting glazing products available including high performance double and triple glazing systems, and spectrally selective films and Low-E coatings to name a few.

Low-E stands for low emissivity glass. It is manufactured with the



addition of a special thin metal coating on one side of the glass. Low-E glass increases the energy efficiency of windows by reducing the transfer of heat or cold through the glass (around a 30% reduction in the amount of heat conducted compared to ordinary glass). This means that in winter, a house stays warmer, and in summer, it stays cooler.

There are two types of Low-E glass available; hard coat (pyrolytic) and soft coat (sputtered). Hard Coat Low-E glass is quite hard, very durable, and can be exposed to air and cleaned without damaging the coating. Hard coat Low-E glass is typically designed to reflect heat back into a room.

Soft Coat Low-E glass is not sufficiently durable to be used in single glazed applications. However, when the coated surface is positioned facing the air space of a sealed insulated glass unit, the coating will last as long as the sealed glass unit.

Even though soft coat Low-E has only been readily available over the last couple of years, it is now a common product in the Australian market. Soft coat Low-E glass generally performs better than hard coat Low-E glass – by reducing the transfer of heat through the glass – creating significantly better performing and more comfortable buildings.

However, the most comprehensive solution is found by combining a Low-E coating with an Insulated Glass Unit (IGU).

An IGU consists of two or more panes of glass separated by a spacer and sealed to prevent humid outside air from entering the unit. To prevent condensation forming, the spacers are typically filled with or contain a desiccant to remove moisture trapped in the gas space during manufacturing.

Double glazing (two panes of glass) is the most common form of IGU and can reduce heat loss (or gain) by more than 50% in comparison to single glazing, although visible light transmittance and solar heat gain for a double-glazed unit with clear glass will remain relatively high.

Adding a Low-E coating to a surface of a double-glazed unit will increase the energy performance as will adding a gas fill between the layers of glass.

Low-E glass is not better than double glazing. Double glazing provides better performance for windows and can be used in conjunction with Low-E glass to achieve greater performance results. Low-E glass may result in a more cost effective option in warmer climates, if used with a tint. However, using Low-E glass within an IGU also has the added benefit of sealing the coating within the unit. This protects the Low-E coating from scratches and harsh chemicals, allowing for a longer life.

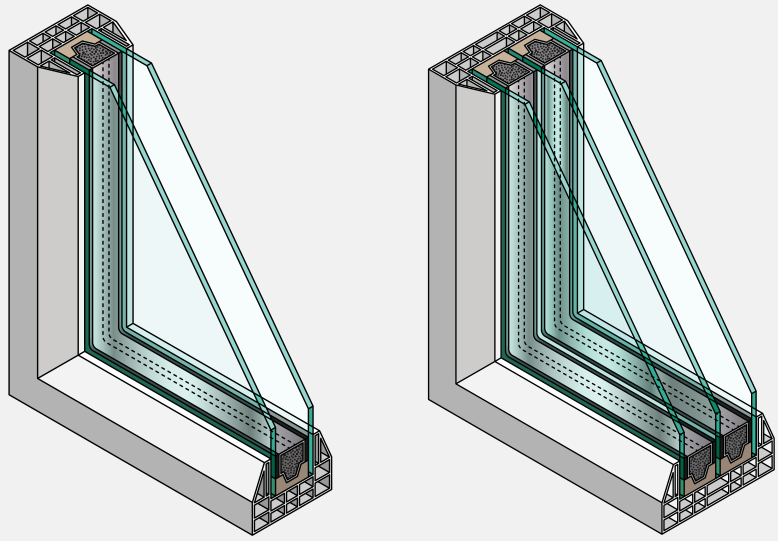
Choosing the right frame and glazing option will lower the U-value of a window system.

Choosing the right frame and glazing option will lower the U-value of a window system. The lower the value, the better the overall window performance (U-value is the rate of energy transfer through a material). Heat always flows through a material from warm to cold areas. The higher the U-value, the greater the energy transfer or heat loss through a window system.

Any time you invest energy (and cost) into changing the air temperature inside a home (through heating or cooling), it's worth considering steps to avoid it becoming uncomfortable and keeping it comfortable for as long as possible. Energy efficient windows and high performance glazing are uniquely powerful in giving us this control. These systems will help maintain year-round comfort in a home, reduce power bills and make a home safer and more secure. ■

To find out more about high performance windows and glass, visit https://www.awa.org.au/ and www.wers.net

AN IGU CROSS-SECTION



Gary has worked in the window and glass industries for the past 27 years and is the marketing and communications manager of the Australian Window Association.

WHAT'S NEW IN STANDARDS?

A lot has been happening at Standards Australia with core areas in the building sector being put on the radar. Getting ready for the implementation of the National Construction Code for 2019, consulting with the sector on cladding, improving the standards on welding metal and finding out where to next on self-drilling screws are just some of the highlights.

ARE YOU NCC READY?

Three volumes and hundreds of standards later, May 1 marked the official adoption of the 2019 National Construction Code (NCC). The NCC is always a prominent focus area for Standards Australia as hundreds of standards are developed to support the implementation of building policy across Australia.

The dozens of technical committees at Standards Australia in this space have worked tirelessly to contribute a number of new and amended standards in this version of the NCC. Below is a small sample of some of the changes to referenced documents in NCC 2019.

Amendments to existing references intended for NCC 2019

- AS/NZS 1170.2:2011, Structural design actions - Wind actions (Amdt 4 & 5)
- AS/NZS 1170.3:2003, Structural design actions - Snow and ice actions (Amdt 2)
- AS 1170.4, Structural design actions—Part 4: Earthquake actions in Australia (Amdt 2)
- AS 1288-2006, Glass in buildings - Selection and installation (Amdt 3)
- AS 1668.1:2015, The use of ventilation and air conditioning in building, Part 1: Fire and smoke control in buildings (Amdt 1)
- AS 1668.2:2012, The use of ventilation and air-conditioning in buildings - Mechanical ventilation in buildings (Amdt 2)
- AS 1905.1:2015, Components for the protection of openings in fire-resistant walls - Fire-resistant door sets (Amdt 1)
- AS 2047: 2014, Windows and external glazed doors in buildings (Amdt 1 & 2)
- AS 3660.1:2014, Termite management Part 1: New building work
- AS 5113: 2016, Classification of external walls of buildings based on reaction to fire performance (previously known as Fire propagation testing and classification of external walls of buildings) (Amdt 1)

Revisions to existing references intended for NCC 2019

- AS 1562.1:2018, Design and installation of metal roof and wall cladding—Part 1: Metal
- AS 1657:2018, Fixed platforms, walkways, stairways and ladders—Design, construction and installation
- AS 1670.1:2018, Fire detection, warning, control and intercom systems - System design, installation and commissioning, Part 1: Fire
- AS 1670.3:2018, Fire detection, warning, control and intercom systems - System design, installation and commissioning, Part 3: Fire alarm monitoring
- AS 1670.4:2018, Fire detection, warning, control and intercom systems - System design, installation and commissioning, Part 4: Emergency warning and intercom systems
- AS/NZS 2293.1:2018, Emergency lighting and exit signs for buildings—Part 1: Systems design, installation and operation
- AS/NZS 2327:2017, Composite structures composite steel - concrete construction in buildings
- AS 2050:2018 Installation of Roof Tiles
- AS/NZS 2918:2018, Domestic solid-fuel burning appliances—Installation
- AS 3600:2018, Concrete structures (Including Amdt 1)
- AS/NZS 4200.1:2017, Pliable building membranes and underlays – Materials
- AS/NZS 4600:2018, Cold-formed steel structures
- AS/NZS 3500.1:2018, Plumbing and Drainage – Water Services
- AS/NZS 3500.2:2018, Plumbing and Drainage – Sanitary plumbing and drainage
- AS/NZS 3500.3:2018, Plumbing and Drainage – Storm Water Drainage
- AS/NZS 3500.4:2018, Plumbing and Drainage – Heated Water Services (Including Amdt 1)

CONSULTING WITH INDUSTRY ON CLADDING

There has been much discussion around the use of aluminium composite panel (ACP) on multi-storey buildings across Australia. This conversation is largely fuelled by several high-profile external cladding related fires around the world.

The Building Ministers' Forum, made up of Commonwealth, state and territory ministers responsible for building matters, identified the development of a permanent labelling system for ACP in Australia as a priority to prevent the use of non-compliant building products.

To support the proposal currently being put forward by the Australian government, Standards Australia released a consultation paper seeking advice from industry and other stakeholders on the proposed approach for labelling of ACP products.

After releasing the 'Labelling of ACP Products' Discussion Paper, there was a great response from a broad scope of the industry. The intention is for this feedback to provide the base for a lower-consensus technical specification and deliver quality with speed to market in mind.

THE WELD OF METAL

Australian Standards for welding in metal have been recently enhanced with international expertise brought into focus. Two sections of the AS/NZS 2205 series have recently been superseded to adopt the international guidance from ISO. The following two standards are a sample of the work being done in this space by the technical committee:

AS/NZS 2205.4.1:2019, Methods for destructive testing of welds in metal Method 4.1: Fracture test

The objective of this Standard is to specify the sizes of test specimen and the procedures for carrying out fracture tests in order to obtain information about types, sizes and distribution of internal imperfections such as porosities, cracks, lack of fusion, lack of penetration and solid inclusions on the fracture surface.

This Standard is identical with, and has been reproduced from *ISO 9017:2017, Destructive tests on welds in metallic materials - Fracture test.*

AS/NZS 2205.5.1:2019 Methods for destructive testing of welds in metal, Method 5.1: Macroscopic and microscopic examination of welds

The objective of this Standard is to provide recommendations for specimen preparation, test procedures and their main objectives for macroscopic and microscopic examination.

Users of this Standard should be aware that its test methods include the methods specified in the superseded AS 2205.5.1 and now includes additional methods for microscopic examination not previously available. This Standard is identical with, and has been reproduced from *ISO 17639:2003, Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds.*

THIS IS NOT A DRILL...

Self-drilling screws were on the agenda in recent months with an industry forum held by Standards Australia. The purpose was to engage stakeholders in a comprehensive conversation highlighting the current gap in standards on self-drilling screws, working towards finding an acceptable solution for the industry.

Some interesting and challenging subjects were raised and discussed at length, with the group making great progress on how to push forward and deliver on what is needed. Watch out for some future proposals to produce a new edition of *AS 3566.2-2002 Self-drilling screws for the building and construction industries - Corrosion resistance requirements.* ■

CUTTING CORDS

Jerry Tyrrell chats about the benefits of cordless.

Like most 'normal' blokes, I have a tool fetish. I really appreciate the quality makes and I still have some I bought as a young tradesman – a pair of German multi-grips, an Irwin hammer and trowels that still 'talk' to me. I like to 'cuddle' these and remember learning lots using them. But cordless technology is one of highlights of the past 20 years.

The first cordless electric drill was made by Black and Decker in 1961. I thought the first battery powered tools were heavy and clumsy. However, when I had to cut old hardwood roof trusses to build an attic in the '90s I stumbled on a cordless Dewalt reciprocating saw. It was stunning! Not only did it save time as I sweated and swore and tortured my body, it allowed me to get closer to where I needed to cut than a handsaw.

Since then, I have watched the industry use battery powered tools more and more. Initially, I was frustrated with the manufacturers using different sized batteries so you couldn't use the same ones on all the tools they made. But there have been so many improvements over the past 10 years. Plus battery technology has improved significantly and power saws are bigger and have long run time. And there are now mowers, compound mitre saws, lights and jackhammers.

First cordless electric drill was made by Black and Decker in 1961.

Now I have over 40 different tools among my team. I love my 54v cordless compound mitre saw with tungsten aluminium and timber blade. And Dewalt's latest reciprocating saw has a delicious range of blades which can be easily reversed. I love good tools!

SELECTION CRITERIA

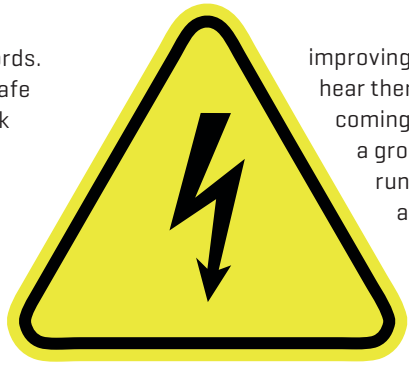
Here are the tips I use when choosing the right cordless platform. Yep I did check these with my 20 colleagues at Tyrrells. They are all ex-builders and are on over 6,000 building sites every year.

CORDLESS TOOLS ARE SAFER

Probably the best feature of cordless

SELECTION CRITERIA	
WHAT TO LOOK FOR	**HOW SOME COMPANIES DO THIS**
No instruction needed	Pictograms, different colour for buttons / levers, embossed / engraved symbols etc
Safe	Saws and grinders usually use a 2 stage switch and have a lock function
Ergonomic	Easy to hold, grip in use, light as possible, easy to clear (nail guns), minimum vibration.
Cut line / drill point easy to see	Right handers like blade on the left. Maybe saws will be available for left handers soon?
Illumination	Many drills and saws use a small light to illuminate the work surface
Easy to find	Yellow, orange are easily visible
Durable / droppable / attachments are securely fixed	Text
Option for dust extraction	Vacuum system
BATTERIES	
• fits ALL tools • long run time • fast recharge • Indicator on battery • multi battery charger	
ACCESSORIES	
• universal fittings to take bits, blades	ALL masonry drills, saw / grinder blades, multi – tool blades should fit
• spanners and allen keys attached place for different tips	Blades easy to changes
Range	Every type of tool – demolition, metal shears, gardening etc.

tools is their lack of cords. This keeps everyone safe from electrocution risk – both when using the tools but also from all the extension leads running through the sites or private DIY work. And I know there are no more tradespeople or DIYers being electrocuted when they pull out an old 240v drill or saw.



You've probably noticed that most manufacturers are also fighting to provide features that make their tools easier to use. To me this often means they are safer. They're adding features such as safety or locking devices, lighting and small blades that are less likely to 'throw' if the apprentice uses them when they're blunt.

EXTRAORDINARY CHOICES

I understand most manufacturers are improving battery life. I even hear there is a battery station coming out that will invert a group of batteries to run 240v corded tools... and I used to joke with my mates about buying a cordless generator.

If I could provide some tool suggestions for manufacturers, I would probably ask them to:

1. add a small pump – great for lift pits, basement work
2. add a quality water saw
3. put QR codes on their tools so newbies can check how to use/clear e.g. nail guns
4. offer a branded dust sheet to put over tools not being used
5. provide universal maintenance guides (online) e.g. when to spray with lubricant, what to do if a tool gets wet etc.

SHOUT OUT FOR CORDLESS 'BARNRAISING' 4 HUMANITY!

I always help Salvos (and any other NGO or religious organisation) if I can. We joined Robyn and Mitchell at Street Level in Sydney and demolished a shambles of partitions to make a 300m2 multi-purpose space for their church and community functions.

It was over $100K of work we did for around $25K. I worked out what had to be done and on the first day, we were joined by Stefan and his colleagues from Salesforce. These dynamic executives donate their time to help others. I am SUPER impressed and I showed them lots of different skills.

But what became clear was how much they needed a bunch of essential cordless gear. All the usual tools: drills/drivers, saws, masonry and metal grinders, rotary hammers, reciprocating saws, vacuums, lights, charger stations... they wanted to use them. So to all you manufactures out there, Salvos Street Level needs this kit.

I am happy to work with you and Bunnings to 'house' these in a trolley for getting things done for humanity. And if this works I want these to be seen with hundreds of groups of volunteers across Australia/Oceania .

So not only will work get done, but more and more unskilled people will learn how to use tools properly.

I encourage the likes of Dewalt, Makita, Bosch, Milwaukee, Ryobi, AEG, Hilti to think about what they can contribute to volunteer groups as I guarantee they'll see that social capital will provide them with a different type of profit.

And YOU can make a difference by emailing me your advice, tips and feedback ANY TIME jwtyrrell@tyrrells.com.

Jerry Tyrrell is co-founder of Tyrrells Property Inspections. He has more than 46 years' experience as a contractor, architect and author.

NEW CONDENSATION REQUIREMENTS

NCC 2019 introduces new condensation management provisions into Volumes One and Two through Performance Requirements FP6.1 and P2.4.7. They require 'risks associated with water vapour and condensation must be managed to minimise their impact on the health of the occupants' and apply to Class 1 buildings, sole-occupancy units (SOUs) of Class 2 buildings, and Class 4 parts of buildings.

COMPLIANCE PATHWAYS

To comply with these new requirements you can follow the Deemed-to-Satisfy (DTS) Provisions outlined in Part F6 (Volume One) and Part 3.8.7 (Volume Two) or use the Verification Methods FV6 (Volume One) or V2.4.7 (Volume Two). Alternatively, you could do a Performance Solution from first principles. For more information about Performance Solutions, see the ABCB Resource Library.

The purpose of this article is to assist builders and designers comply with the new DTS Provisions for the use of pliable building membranes in clauses F6.2 and 3.8.7.2. Readers should note that the NCC condensation management DTS Provisions also contain requirements for exhaust systems and ventilated roof spaces, which are not covered in this article.

DTS PROVISIONS

The intent of the condensation DTS Provisions is to assist the mitigation of condensation within a building, mainly focusing on allowing water vapour to escape the building envelope. It's important to note that installing a condensation management system may not prevent condensation in all instances. As part of design and construction, designers and builders have a responsibility to assess product specifications and wall designs to ensure buildings perform as intended. The NCC's new condensation management provisions for pliable building membranes need to be considered where one is installed, regardless of whether it was required by the NCC.

Figure 1 provides a flow chart of the DTS Provisions for condensation management using pliable building membranes.

WALL ASSEMBLIES WITH PLIABLE BUILDING MEMBRANES

When using a pliable building membrane, there are two key points to consider:

1. Is a pliable building membrane required?
2. Does the pliable building membrane need to be vapour permeable?

A pliable building membrane may be required for different reasons such as weatherproofing purposes, energy efficiency (i.e. part of the total RValue of the envelope) or managing condensation. In some instances it's also common practice to install a pliable building membrane where it's not strictly required. As an example, a builder or designer might include a pliable building membrane as an extra layer of weatherproofing/insulation or to protect water sensitive materials. In this situation, whilst well-intentioned, it might inadvertently create a risk associated with water vapour and condensation.

When thinking about whether a pliable building membrane needs to be vapour permeable or not, how the water vapour moves through the building envelope needs to be considered. A pliable building membrane is often placed on the external side of water sensitive materials. This may prevent water vapour from escaping the building envelope, creating a situation where condensation accumulates on the internal side of the pliable building membrane (where the water sensitive materials are located). Subclause F6.2(a) and 3.8.7.2(a) address this issue by requiring that pliable building membranes installed in cooler climate zones 6, 7 and 8 be vapour permeable membranes regardless of why they have been installed.

As part of design and construction, designers and builders have a responsibility to assess product specifications and wall designs.

WALL ASSEMBLIES WITHOUT PLIABLE BUILDING MEMBRANES

Single skin, reinforced masonry construction is a very common form of construction used for DTS compliance in cyclonic areas, particularly for houses. Single skin masonry and concrete walls are exempted from requiring either a cavity or a pliable building membrane by subclauses F6.2(b) and 3.8.7.2(b). However, it should be noted that weatherproofing of these wall assemblies may still be necessary.

A reverse brick veneer construction with no cavity is not considered *'single skin masonry.'* It would therefore require, either, a pliable building membrane, or a drained cavity separating the primary water control layer from water sensitive materials to satisfy the condensation management DTS Provisions.

ADDITIONAL INFORMATION

Read our *Condensation in Buildings Handbook* to find out more about condensation management. The ABCB is updating this handbook to incorporate the NCC 2019 requirements and it's expected to be released in late 2019.

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BOOM IN MASS TIMBER CONSTRUCTION

Kevin Ezard discusses the phenomenal growth of timber construction across the globe.

Increasing pressures to reduce costs and time in building construction have created the opportunity for mass wood systems to boom in North America and the United Kingdom with hundreds of new projects underway.

This was demonstrated at the International Mass Timber Conference held in Portland Oregon during March, which was the largest-ever gathering in the world of cross-laminated timber and other mass wood experts.

The event attracted 1,600 attendees from 30 countries, including a large group of delegates from Australia, covering the spectrum of forestry, building design, development, prefabrication and construction.

With an attendance of 500 at the first event 3 years ago, the organisers are now projecting an increase to 10,000 delegates by 2025 to keep pace with the uptake of offsite construction systems.

This phenomenal growth reflects the construction industry's acceptance of offsite mass wood buildings and the rate of conversion from steel and concrete structures in a wide range of building types for residential and commercial developments.

In addition, there has been an expansion in design capacity with architects and engineers developing a greater awareness of timber and wood requirements in the design and specification of buildings.

Not only is the construction industry expanding, the supply chain is also responding with new manufacturing plants for cross-laminated timber (CLT), nail-laminated timber, glulam beams and panels, mass plywood panels, dowel-laminated timber and laminated veneer lumber (LVL).

A presentation that indicated how mass wood construction can address the housing crisis in the UK was delivered by Modular Housing for Swan Housing managing director Paul Williamson. Swan Housing is a London based not-for-profit Association formed in 1994 to provide high-quality and affordable homes to rent and buy.

An increase in uptake of offsite construction systems has seen a boom in CLT being used across residential and commercial builds in recent times.

To solve the housing shortage in the UK would require some 300,000 homes per year and using existing building methods would need some one million workers at a time when trades are in rapid decline.

To contribute to the solution Swan decided to set up a construction model moving from 'craft' to 'process' using lean manufacturing principles to encourage improvements and reach a target of one house completed every day.

By moving from a 'one-off' concept to a 'system' using DfMA (design for manufacture and assembly) it established a supply process that offers customers a selection of housing with 1.2 million individual options for each house, and an average build time of 16 weeks from order to occupancy.

To enable this mass production approach the houses are fully manufactured in Cross laminated timber (CLT) allowing digitally controlled production, with a resulting improvement in productivity of 60% which justifies the higher material cost.

It indicated its next move is robotics in manufacturing to increase production rates and further improve efficiency.

These trends will provide the opportunity of a strong future for mass wood prefabrication and construction in Australia, but will need collaboration between the various sectors involved in the process of design, supply, manufacture and construction to ensure the outcomes are successful.

Mass wood is definitely on the rise, so watch out for the boom!

Kevin Ezard provides business communication and marketing consultancy services to the timber and wood products industry.

Get the whole story.

BUILDING CONNECTION

www.buildingconnection.com.au

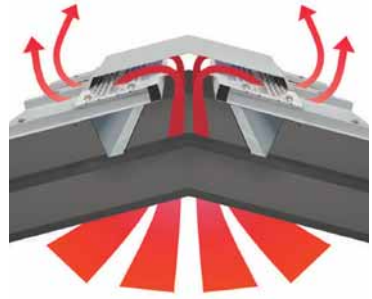
FAUX BRICK

Avante's walling system by PGH Bricks mean a real brick look can now be achieved on residential and multi-residential projects where traditional brick can't be used due to space, weight or height restrictions. This versatile, ventilated rainscreen façade system is particularly suited to tight spaces where a brick finish is required to work in conjunction with traditional brickwork. It's secure, lightweight and easy to install, meaning that projects can be completed on budget and on time. The Australian-made, lock in rail system consists of brick facings that are fixed mechanically to a galvanised steel rail. These profile rails are mounted in horizontal rows onto a vertical support system and the brick facings are then 'clipped' into place.

www.pghbricks.com.au/avante

ROOF VENTILATION

Vent-A-Roof uses technology that aims to provide complete roof ventilation for residential and commercial applications. Designed for modern structures and to combat mould and mildew issues within Australia, the Vent-A-Roof team came together to introduce Aussies to a continuous waterproof roof vent for metal roofing. The creatively designed product helps roof structures withstand the test of time and the elements. The low-profile design has been engineered to shield wind driven rain and water leakage and is cyclone rated Australia-wide.



www.ventaroof.com.au

STEEL BLUE

Steel Blue has three new releases; including two composite work boots for men, plus a new scuff cap option in the ladies range of work boots. The composite toe cap is now available in the flagship Steel Blue style, the Argyle Zip, as well as its newer hiker-style, the Parkes Zip. The Argyle Zip work boot is popular with FIFO workers as well as those in the construction, and oil and gas sectors.

Key features:

- Quick release side zip for easy on and off
- Scuff guard for extra protection in the toe area
- Entirely non-metallic
- Insulates against heat and cold
- Airport friendly

www.steelblue.com/au/

RIDIGD FLEXSHAFT MACHINES

FlexShaft Machines quickly and efficiently deliver wall-to-wall clean in 32mm-50mm residential and commercial pipes up to 21.3m. The machines use powerhouse chain knockers that expand to the size of the pipe to quickly clear the entire circumference. The machines work in conjunction with a full suite of accessories designed for clearing grease, sludge, small tree roots and soft blockages. Designed with efficiency and cleanliness in mind, FlexShaft machines allow for inspection cameras to remain in-pipe throughout the entire drain cleaning process for maximum efficiency. Since the cable spins inside a durable nylon sheath that is housed within a fully contained drum, there is less jobsite mess.

www.ridgid.com/au

SAFETY FIRST

Ensuring your eyes are protected on the job site should always be front of mind, which is why DeWalt take protective eyewear seriously. Seamlessly linking between the latest style and cutting-edge technology for optimum functionality and protection, the lenses are coated with a scratch resistant 'hard coat' with anti-fog properties. The de-centred cut of the lens matches the focal point with the line of sight, ensuring clarity of vision and reducing eye-fatigue. DeWalt's Excavator Safety Glasses is the perfect all-rounder. The impact-resistant polycarbonate lens provides 99.9 percent UV protection, perfect for rigorous work inside and out.

www.dewalt.com.au

ATT

ACROSS THE TRADES

SPRING 2019

FIND-A-TRADIE

AN OFFLINE REVIEW OF ONLINE JOB FINDING SERVICES

TRADIES ON THE LINE

OPINIONS ABOUT 'FIND-A-TRADIE'-STYLE WEBSITES ARE DIVIDED, WITH DEVOTEES AND DETRACTORS EQUALLY FIRM IN THEIR CONVICTIONS. **JOHN POWER** LOOKS AT THE ADVANTAGES AND DRAWBACKS OF DIFFERENT ONLINE JOB SOURCING PLATFORMS.

The online review didn't mince its words: 'Good for customers. Bad for tradies'. These were the opening remarks about one particular job-sourcing website, as posted by a tradie on the independent review portal ProductReview.com.au, on 5 April 2019.

It's not difficult to find negative comments from tradies about 'find-a-tradie' websites; nor is it difficult, on the other hand, to find extremely positive feedback about solid leads and good business growth. So which opinion is right?

The appropriateness of any given find-a-tradie website is a highly nuanced affair.

At present there are four main find-a-tradie-style websites in Australia: Airtasker, ServiceSeeking, Oneflare and Hipages.

In broad terms, all these sites are matchmakers: customers lodge a description of their job online and, in some cases, a budget or quote range. The website then provides leads for that job to its own database of pre-registered trade businesses servicing that geographical area – then it's up to the trade business to pursue the lead, if desired, and win the job. All these sites operate nationally and avow customer numbers in the tens of thousands per month.

NB: The above websites each have different business structures: ServiceSeeking requires its registered trade businesses to pay ongoing monthly fees; others, such as Hipages and Oneflare, operate primarily on a 'pay per lead' basis; Airtasker, on the other hand, does not involve any ongoing fees or 'pay per lead' costs, but instead charges a flat 15% commission on completed jobs. For a detailed overview of the main features of each website, see Table 1.

Clearly, the various find-a-tradie platforms available in Australia differ in fundamental ways, and the appropriateness (or otherwise) of any given model for trade businesses gets very complicated very quickly, depending on considerations like:

- Nature of the trade business – is the trade business dependent on large volumes of leads (handyman, small painting tasks, etc),

or low volumes of leads (specialist water engineering services, top-end architectural glazing, etc)?

- Demography – is the trade business operating in a low- or high-density catchment? Does the local catchment feature mainly new or old building stock, with high or low owner occupancy levels?
- Job complexity – are customers likely to present realistic job descriptions and have credible pricing expectations?
- Job costs – are average job costs small (hundreds of dollars) or high (many thousands of dollars)?
- Work demand – is the trade business seeking year-round or only intermittent work from the website?
- Tradie capability – is the tradie capable of rapidly evaluating leads, and confident enough to make a professional pitch for work?

With these criteria in mind, let's take a closer look at each of the four major providers.

Airtasker
Established: 2011 | Staff: 120

BMH says: *"Airtasker enables me to reach more customers easily and be assured of work that is accepted and payments for that work. I use Airtasker for top up work when my regular work is slow. I have found it to be really effective."* ★★★★★

Shadzo says: *"I joined Airtasker 1+ years ago as a professional tradesperson with employees. Unskilled, unqualified people are allowed to bid on the rubbish on offer. I really feel for customers when they get absolute rubbish work from people on this site. It is a joke."* ★☆☆☆☆

As noted above, Airtasker is the only commission-based website operating in this sector. Typically, a consumer posts a task description and proposed fee/budget on the site and invites all relevant registered businesses in the area to

respond. Once tradies have expressed interest in the job, the customer then chooses their preferred business and makes an escrow payment to Airtasker. Following completion of the job, the tradie makes on online request for payment and the customer then releases the funds, minus 15% commission to Airtasker.

The deficiencies of this process in relation to the professional trade sector are easy to spot. It's not always easy to establish an appropriate service fee *before* a tradie actually inspects a job. Of course, reliable cost estimates might be quite straightforward for certain simple tasks, particularly those that are effectively 'build to a budget' projects; however, more specialised tasks involving plumbing or electrical repairs, for instance, are virtually impossible for lay customers to diagnose or price effectively. Also, dispute resolution arising from differences between upfront quotes and final (post-inspection) cost estimates are far from clear: for instance, what if a customer has no capacity/intention to pay for a job that turns out to have a higher complexity and cost than originally described? The tradie might have to abandon the job without compensation of any kind – a wasteful outcome that might have been avoided if there had been some mechanism for better tradie-customer communication upfront.

Assessing the appropriateness of any given find-a-tradie website is a highly nuanced affair.

TABLE 1: Find-a-tradie websites and features

WEBSITE FEATURES	AIRTASKER www.airtasker.com	HIPAGES https://hipages.com.au	ONEFLARE www.oneflare.com.au	SERVICESEEKING www.serviceseeking.com.au
Membership Fees	✗	Optional	Optional	✓
Commission Fees	✓	✗	✗	✗
Pay-per-lead Fees	✗	✓	✓	✗
Capped Numbers of Leads	✗	✓	✓	✗
Customers Define Quotes	✓	✗	✗	✗
Licensed Trades Vetted	✓	✓	✓	✓
Customers Provide Reviews	✓	✓	✓	✓

Another problem relates to 'wink-wink, nod-nod' lead selection, whereby a tradie might accept a ridiculously low-cost lead based on an assumption that a fairer cash-in-hand price will be negotiated privately with the client later, thus minimising the commission paid to Airtasker (seemingly a win-win result for both the customer and the tradie, but hardly the basis for a reliable business dealing).

Overall, one might describe Airtasker as suitable for exotic, low-budget, easy-to-price, small jobs of the 'cash in hand' variety.

Most recently though, a $100,000 fine was issued by the Brisbane Magistrates Court to a Queenslander who posed as an electrician on Airtasker.

From November 2015 to June 2017, Amilcar Appel advertised his electrical services on Airtasker to residents of the greater Brisbane area.

After a licensed electrician made a complaint regarding Amilcar's defective work to the Electrical Safety Office (ESO), an investigation was conducted and the results established that Amilcar had conducted similar non-compliant electrical work in eight other properties of which he was not qualified to perform in any way.

Amilcar, who failed to make an appearance in court, was convicted and ordered to pay a $100,000 fine for 13 offences under the *Electrical Safety Act 2002*.

ServiceSeeking
Established: 2007 | Staff: 27

Brody says: *"Came across the site by chance. After getting a great result ... I would recommend to anyone."* ★★★★★

John says: *"Good for customers. Bad for tradies. In the process of launching legal action against ServiceSeeking for theft and misrepresentation. These people owe me a lot of money."* ★☆☆☆☆

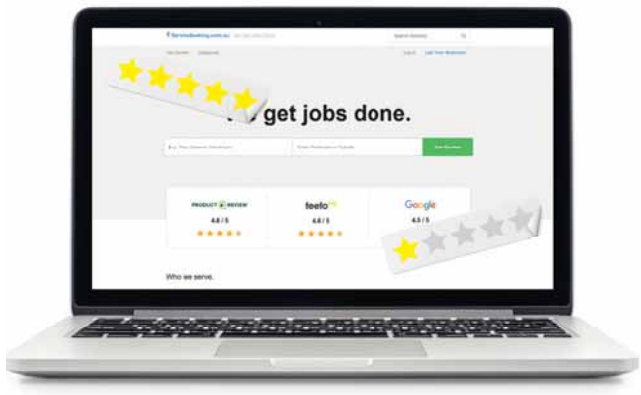
Established over a decade ago, ServiceSeeking is the only membership fee-based portal in this sector. The portal services a wide variety of industry sectors, including trades: "We think a membership fee model is the fairest way of charging tradies; they like certainty, they like to quote on everything (they don't like to pick and choose), and it's a fact of life they like cash payment," says ServiceSeeking chief executive Jeremy Levitt.

"In total we've got just under 200,000 businesses registered, and on a monthly basis we get around 3,500 new business registrants."

The portal has handled over 4 million online job listings since inception, Jeremy says, and over the past year the number of registered trade businesses has tripled.

Most registered businesses, Jeremy says, have fewer than five staff, and there is a monthly churn of 5%–10%, which Jeremy attributes to the natural volatility of small (often unskilled) businesses.

The ServiceSeeking methodology is clearcut: customers lodge an online job description on the ServiceSeeking platform. Leads are then sent to all relevant tradies in that geographical area, and it's up to each trade businesses to



lodge indicative quotes and hopefully win the job. It's up to the trade business to perform the job satisfactorily without any further intervention from ServiceSeeking, and to handle their own invoicing. There are no caps on the number of tradies who might respond to a lead, and no caps on the number of quotes or expressions of interest received by the customer. Approximately one in three jobs listed on the portal results in a business being hired.

"We've got the highest liquidity in this space – our average number of quotes per job is 12," Jeremy explains.

Different styles of membership are available to tradies, with monthly fees averaging $50.

"We've got different [membership] levels, like entry and then premium and master, depending on what features you want and how you want your leads developed. Memberships also vary in price according to likely demand, and might be as low as $10 per month for low-volume specialist trades like bamboo flooring, etc."

In addition to monthly fees (no exit fees), trade businesses are welcome to take out annual memberships in return for a 20% discount – no refunds. Jeremy says approximately 40% of trade businesses opt for annual memberships.

The ServiceSeeking model, we might conclude, suits high-volume trade businesses that depend on steady streams of small jobs. The ongoing membership model might appeal to tradies who want to use online lead generation as a primary – or at least substantial – part of their business in a busy catchment. The uncapped, competitive nature of ServiceSeeking's lead distribution and response model means this service might suit fast-acting, online-savvy professionals with good communication skills.

However, the company did land in Federal Court for allegedly engaging in misleading conduct relating to customer reviews.

From July 2016, the platform's 'Fast Feedback' feature allowed trade businesses to use a template form to write their own reviews and choose a star rating after completing a job, which was then emailed to the customer.

If the customer did not respond to a business' self-written review within three days, the review was automatically published under the business' profile on ServiceSeeking.com.au.

The Australian Competition and Consumer Commission (ACCC) alleges Service Seeking's 'Fast Feedback' feature breached the Australian Consumer Law (ACL) by misleading consumers, as at least 80% of 'Fast Feedback' reviews were not written or approved by customers.

RENAULT
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Renault TRAFIC LWB 85

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The Renault Trafic LWB 85 combines performance, practicality and value in the perfect set of wheels for a hard working tradie.

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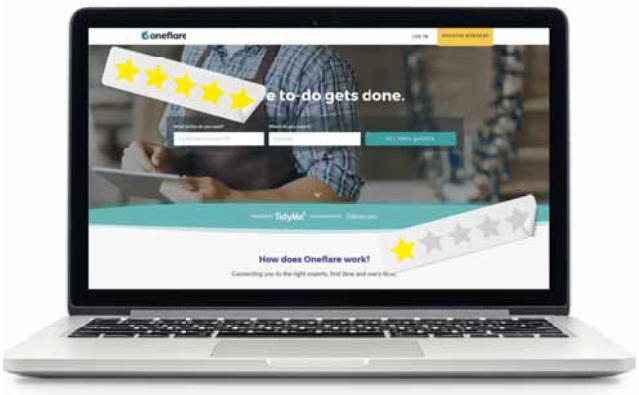
TRAFIC 85 LWB from

$35,990* drive away

renault.com.au

*Recommended drive away price for TRAFIC LWB 85 Turbo with solid paint. Pricing valid for vehicles ordered before 30/09/2019. Demo vehicles are eligible for the balance of the 3 Year/Unlimited kilometre warranty. First three scheduled services are capped at $549. Service intervals are 12 months or 30,000km, whichever comes first. ABN buyers only. Renault reserves the right to vary, extend or withdraw this offer.



Oneflare
Established: 2012 | Staff: 262

Aussie_Cameron says: *"I'm a plumber and used Oneflare since it began 7/8 years ago. The app is easy to use and compared to other sites, it's easily the best job service provider on the market. Job leads always pretty good and fair dinkum."* ★★★★★

Bill says: *"Might be good for the customer but it comes at a big price for the trades that answer the job. Costs a minimum $26 for each person just to answer the ad, but sometimes the customer won't answer the phone, reply to emails or the job wasn't as described. Customers need to be aware that it isn't a free service."* ★☆☆☆☆

Since its creation in 2012 in Sydney, Oneflare has grown year on year, and now handles 60,000 listed jobs per month across approximately 300 business categories, including trades. Unlike ServiceSeeking, Oneflare operates mostly on a 'pay per lead' basis, whereby trade businesses pay a fee to receive full contact details for each job lead they wish to pursue. Payment for a lead, as it sounds, represents an opportunity to make a pitch to the customer for that particular job; it is no guarantee of work.

Costs per lead start at $6 each and rise according to ballpark job value, location, and other metrics. Trade businesses can also opt to take out subscriptions starting at $49 per month, which include additional exposure through online directories, and also include up to 30% discounts on lead costs.

"The important thing about our subscriptions is there are no lock-ins, you can always cancel with no exit fees," says Oneflare chief executive Billy Tucker.

What are the advantages of a 'pay per lead' job sourcing service?

"We find successful business' calendars fill up nicely, so quite often they have a gap emerge and they're looking for a very specific type of job," Billy says.

"So they don't want a relationship with a new builder who's got a whole series of homes under construction, they just want a consumer who's willing to pay a premium to get something done… With a pay-per-lead model you offer the greatest ability to choose exactly the nature of work that fits your current portfolio perfectly."

The same rationale makes the service ideal for tradies seeking seasonal work – the tradie pays for the service only when it is needed.

Another vital point of difference relates to capped lead numbers. Once a job is listed online, all relevant trade businesses have an equal opportunity to pay for and pursue the lead; however, the service is capped at three trade businesses (first in, best dressed) per lead, unless the customer wants more. There are several reasons for capping the number, Billy says. Not only does it limit the amount of administrative work for the tradie, but it also increases the odds of success in line with busy customers' real-life preferences for speedy, no nonsense attention – rarely does a customer need more than three quotes to make a decision, Billy says: "We don't think it makes sense to leave jobs open for protracted periods while businesses trickle in with responses."

At any given time there might be 10,000 active businesses vying for work on the Oneflare platform, he adds, and most tend to "stick around".

We might conclude, generally speaking, that this service is geared towards higher-value jobs, which might reduce the cumulative cost impacts of failed leads.

Oneflare is partly owned by Fairfax's Domain Group, after a $15 million investment in 2016 secure the organisation a 35% ownership stake.

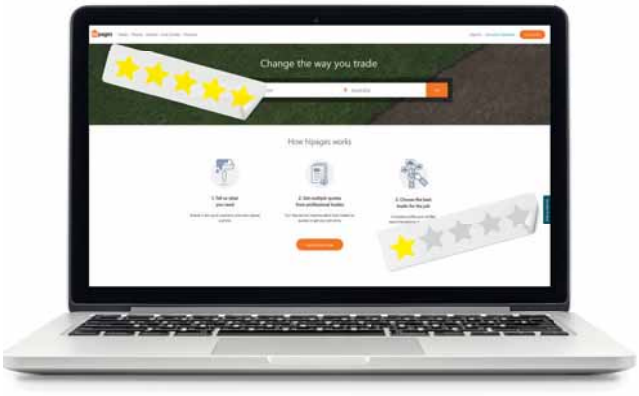
Hipages
Established: 2004 | Staff: Unknown

Ronnie says: *"Hipages is excellent. I haven't used much, but when I do, I am more than happy."* ★★★★★

Adrian says: *"You get nothing but 90% dud calls, people wasting your time using you for quotes, changing/reducing quotes when you've paid full price for the lead, and worst of all as soon as you advertise on Hipages you get inundated with a storm of telemarketers for websites and community organisations asking for your money."* ★☆☆☆☆

Unlike the other portals listed above, Hipages deals only with trade businesses, using a 'pay per lead' model very similar to Oneflare's.

Its reputation is for slightly higher costs per lead, servicing a mostly serious customer base. We sought information from Hipages for this article – no response. However, a call to a sales representative revealed that the portal, like Oneflare, offers a suite of subscription options to trade businesses. These start



at $69 per month, extending all the way up to $900 per month, and include credit on future lead payments. Typical leads might cost in the order of $10–$36.

Like Oneflare, the portal has a cap (3–5) on the number of leads per job that its trade business registrants might buy.

We might assume its merits are similar to Oneflare's, i.e. it might suit professional, highly selective tradies wanting to cherry-pick intermittent or seasonal work in average-volume professions.

In 2018, Hipages announced a national partnership with Bunnings to deliver a new installation service.

Making access to licensed tradies easier and offering customers a solution for installing a toilet suite at a fixed-price, the service is now available at all Bunnings stores around the country.

Those wanting to access the service simply add a Hipages toilet installation voucher at the checkout when purchasing a toilet at a Bunnings Warehouse store. A time is then organised, either online or via a self-serve kiosk desk, with a Hipages plumber to install the toilet and dispose of the old unit.

ONLINE REVIEWS

Customer reviews are a major feature (albeit contentious) of find-a-tradie websites. These reviews serve a complex purpose, helping tradies to shore up a bank of (hopefully favourable) customer reviews, which might help them stand out from the crowd and win more business. A long and current review profile, we should add, encourages trade businesses to focus on one website, rather than dilute their presence over multiple platforms.

Trade businesses that are adept at winning positive public feedback – through swift communication, well developed quotes, timely completion of jobs, as well as reasonable pricing (not the cheapest, not the priciest, but somewhere in the middle) – will perform best on digital job sourcing platforms.

Finally, it pays to look at independent reviews of the websites themselves on portals like ProductReview.com.au. For example, Billy Tucker at Oneflare says he was gratified recently to see that his service went 35 consecutive days without a single negative review on ProductReview, during which time there were 200 different pieces of feedback.

Overall, find-a-tradie websites are like a pair of overalls – either they fit or they don't. At a basic level, the success of a trade business using online job sourcing might depend on the raw salesmanship of the tradie, or their ability to spot potentially lucrative jobs based on sometimes meagre details, rather than the structure of the find-a-tradie website.

The only way to find out if it's the right fit is to test the waters with an entry-level registration.

Additional reporting by Paul Skelton.

CARS TO DRIVE HOMES

AUTOMOTIVE MANUFACTURERS ARE TURNING TO THE CONSUMER AV'S LARGEST TRADE SHOW TO DEMONSTRATE THEIR LATEST AND GREATEST INFOTAINMENT TECHNOLOGIES. **TERRY MARTIN** INVESTIGATES.

The annual Consumer Electronics Show (CES) in Las Vegas is fast becoming a must-attend event for motor vehicle manufacturers and automotive suppliers that are using the world's biggest technology showcase to present their latest and greatest – not only cars, but in-car tech systems and, let's face it, some pretty wild ideas.

This not only demonstrates how technology is rapidly changing the experience in the car, but highlights the increasingly strong connections between home, office and personal transport, as well as applications and concepts that might start from the vehicle before quickly expanding into other areas.

The 2019 CES is a case in point, from virtual reality (VR) and artificial intelligence (AI) breakthroughs to new noise-cancelling tech that dispenses with headgear and applies to an entire cabin.

So let's take a deeper dive into some of the highlights.

AUDI VR PLATFORM

As we've witnessed a stunning rise in quality home cinematic systems, the auto world has quickly turned its attention to transforming – and in Audi's case, "redefining" – in-car entertainment.

The days of seatback screens are well and truly over before they really even took off – among mainstream brands, at least – with Audi taking to CES to show how VR glasses can be used as part of a fully immersive experience, using technology that enables the virtual content to respond to vehicle movements in real time.

Partnering with Disney, Audi demonstrated the system using a game, *Marvel's Avengers: Rocket's Rescue Run*, which gives back seat passengers a unique VR experience in that every movement of the car is seamlessly reflected in the experience. So if the vehicle takes a sharp right-hand turn, the spaceship in the experience does too, curving around an oncoming hazard. When the car accelerates quickly, the ship in the experience does the same.

That sounds to us like a sure bet for travel sickness, but Audi insists that the synchronisation between the visual experience and the user's actual perception means the chances of throwing up are "significantly reduced".

While the technology has debuted on a video game, and will easily translate to movies, educational formats and real-life immersive experiences, the developers say there are "almost no limits to what is possible". This is particularly relevant as intelligent transport systems, such as V2X (or, 'vehicle to everything') communications, expand and enable

traffic events encountered along the driving route to be integrated into the VR experience.

The aim is to have the system on the market within the next three years using standard VR glasses. To get there so quickly, the German prestige car-maker, through its Audi Electronics Venture subsidiary, has co-founded a start-up company, Holoride, which will look to commercialise the technology via an open platform made available to other car-makers and content developers.

WAYRAY TO GO

Head-up displays (HUDs) are becoming increasingly common on today's new vehicles in Australia, projecting useful information such as vehicle speed and traffic sign information onto a small portion of the windscreen.

They work well in keeping the driver's eyes on the road, but the technology is really cranking up, as demonstrated Hyundai Motor Group and Swiss deep-tech start-up WayRay which brought to CES what is billed as the world's first holographic augmented reality (AR) navigation system.

Equipped in a Genesis G80 luxury sedan, this next-generation visual tech takes the in-car experience to the next level. While conventional HUD units project a reflected image indirectly through an LCD screen mounted on the dash, the holographic AR display projects a stereoscopic image through the windscreen, displaying it on the actual road.

There's no headset or earpiece involved, and the images and information are constantly adjusted in real time according to vehicle speed and the driver's viewing angle. The virtual image measures 1,310mm high and 3,152mm wide and is projected at a distance of 15m from the driver's eyes.

What's more, the level of detail here is quite stunning, with the technology already sophisticated enough to not only show navigational features such as current speed and destination points, but incorporate advanced driver-assist features and alert the driver to oncoming hazards.

Hyundai is among several global investors in WayRay – Porsche is another – and expects annual growth to the tune of 30% in the holographic AR display sector.

Hyundai Motor Group and Swiss deep-tech start-up WayRay brought to CES what is billed as the world's first holographic augmented reality (AR) navigation system.

The tech will also soon be able to display pedestrians, objects, buses, bike lanes and footpaths, while the major players expect the incorporation of V2X technology and connectivity features will allow data such as traffic signals, surrounding vehicle information and road and weather information to be built into the system, all provided in real time.

Traditional automotive is just the tip of the iceberg as WayRay works on AR concepts across land, air and water transportation, spanning safety, navigation and infotainment streams. It also recently launched a True AR Software Development Kit that allows third-party developers to integrate virtual objects into the real world, creating new applications that run on its holographic AR displays.

Given that glass is such a big component of our smart cars, buildings and cities, the opportunities for this emerging tech look to be huge – and the possibilities endless.

KIA READS THE MOOD

Hyundai's sister brand Kia also attracted plenty of attention at CES as the Korean car-maker looked ahead to a time – not all that far away, depending on who you believe – when fully autonomous driving becomes the norm and new forms of technology ➤

Kia monitors a driver's emotional state using sensors to read their facial expressions, heart rate and electrodermal activity.

will be applied to enhance the driving experience.

Sorry, that should be 'human mobility experience' given 'driver' will by then be an archaic term and the cabin will not be encumbered with a steering wheel and other controls. It will be more like the home or office, where technology dominates, and at CES Kia turned up with what it claims is "the automotive industry's first technology converging human senses-oriented in-cabin environment control and AI-based emotional intelligence".

Or, to put it more simply, the tech is called READ, short for Real-time Emotion Adaptive Driver.

Developed in collaboration with the Massachusetts Institute of Technology, the READ system is designed to optimise and personalise the cabin space by analysing a driver's emotional state in real time via AI-based bio-signal recognition tech.

Kia says the technology monitors a driver's emotional state using sensors to read his or her facial expressions, heart rate and electrodermal activity. It then tailors the cabin environment according to its assessment in an effort to create "a more joyful mobility experience".

AI deep-learning technology enables the system to establish a baseline in user behaviour, and then identify patterns and trends to customise the cabin accordingly.

Forming part of the READ system is another claimed world first in the form of virtual touch-type gesture control technology. Dubbed V-Touch, this application employs a 3D camera to monitor users' eyes and fingertips and allows the occupants to control cabin features such as climate, lighting and infotainment via a head-up display and using simple hand gestures, thus eliminating the need for conventional switchgear or even touch screens.

Capping it off, the READ system also includes music-response vibration seats, where occupants can 'feel' their favourite songs as well as listen to them. Sensory-based signal processing technology adapts the seat vibrations according to sound frequencies of the music being played.

The vibrating seats also have settings for massage and, should something go wrong in this utopian accident-free autonomous environment, can provide haptic warnings from the advanced driver-assist systems on-board.

Along similar lines, AI company Nuance also used the CES to introduce a new innovation in its 'Dragon Drive' intelligent automotive assistant platform using voice, sight, gesture and emotion interaction that "transforms it into a conversational, humanised mobility assistant that will be core to the digital, button-free car of the future".

AN ALTERNATIVE ROUTE

Just as Audi has forged close ties with Disney, American tech giant Intel has joined forces with Warner Bros – using a specially modified BMW X5 SUV – to explore the potential of next-generation entertainment when the vehicles are driving by themselves.

Kia's future self-driving cars might look to read the occupants' mood, but here Intel tech and Warner Bros blockbusters combine to make the journey one that could potentially be 'controlled' by a fictional character and the trip itself set in a fictional place, breaking the boredom of the daily commute or a long-haul drive.

In this case, the virtual ride – complete with giant screen, projectors, sensory and haptic feedback and immersive audio and lights – takes place in Gotham City, moderated by Batman's trusted butler Alfred, who comes to life, in a sense, by interacting with the occupants, keeping them comfortable and informed of actual events occurring outside in the real world: traffic jams, road closures, route changes, and so on.

But the chaperone/navigator could be anyone or anything, and the environment

A fictional trip hosted by a fictional character, thanks to Intel and WB.

anywhere, highlighting the prospect of an entertaining but nonetheless safe future driving experience backed by Intel, which via its Mobileye subsidiary is positioning itself as a leading player in autonomous vehicle development with the hi-tech computing power required to make it all work.

It also brings into play the marketing opportunities for big media giants like WB, which have a captive audience in a highly connected car with which to build strong relations, screen movies, run trailers of future films, identify nearby cinemas, help them purchase movie tickets, and so on. And those are just some of the obvious applications we can imagine today.

Intel says the so-called "passenger economy" brought with autonomous cars will free up more than 250 million hours of commuting time per year in the world's most congested cities, while the future market for new in-vehicle apps and content is an estimated $US200 billion – hence the heavy investments now being made into R&D and exploring how consumers will interact with emerging forms of entertainment within cars "once they are uncoupled from the steering wheel".

Nissan's 'Invisible to Visible' technology merges the real and virtual worlds.

SO MUCH MORE TO SEE

There was so much more on display at CES from the auto giants, including Mercedes showing off the latest application of its still-fresh MBUX (or Mercedes-Benz User Experience) infotainment system – via the new-generation CLA Coupe – which is underpinned by AI and deep learning, including intelligent voice control with natural speech recognition.

Among others, Nissan was there demonstrating 'Invisible to Visible' (I2V) technology which merges the real and virtual worlds using sensors inside and outside the vehicle with data from the cloud, enabling the system to anticipate what's ahead – even behind a building or around a corner.

Some smaller players also won plenty of attention, notably electric vehicle start-up Byton with its M-Byte SUV concept featuring a mammoth 48" 'Shared Experience Display' that runs the full length of the dashboard. Not stopping there, M-Byte also includes a 7" tablet floating on the steering wheel pad that stays upright as the tiller is turned, and another 8" touchpad on the centre console for the front passenger.

Byton calls the cabin a 'mobile digital lounge' and, while we're yet to see the production version, the company says M-Byte "represents the transformation of the traditional car into a next-generation smart device".

As part of this, Byton is one of several car-makers – others being Toyota/Lexus, Audi, BMW and Ford – to join forces with Amazon and its Alexa virtual assistant and is working with the e-commerce juggernaut to develop advanced in-vehicle voice control functionality.

Indeed, Amazon's work in this area was a major talking point at the show, with its potential to tap into the huge automotive sector – both OEM and aftermarket – and pave the way for new advances in connectivity between car and smart home.

Equally smart in our view was audio giant Bose's 'Road Noise Control' (RNC) system that, for the first time, adapts its intelligent wireless QuietComfort noise-cancelling headphone tech to a vehicle's cabin – no small feat, given controlling noise in a car is much more difficult than the relatively small area around your ears.

Vast resources are pumped into reducing noise inside a vehicle, generally focusing on sound-deadening material and tyre spec, but here Bose has used a combination of accelerometers, proprietary signal-processing software, microphones and the audio system to electronically control unwanted sound, calculating an "acoustic cancellation signal" and then delivering this through the car's speakers to reduce the targeted noise.

Harman was also there at CES with parent company Samsung, presenting an updated version of their digital cockpit which is based on Samsung's Bixby intelligent platform and, in similar fashion to Amazon's tech, offers high-level connectivity between vehicle and home, such as enabling the owner to remotely check the fuel tank or start up the climate controls before reaching the car.

This is the sort of functionality we are not just getting our head around, but are beginning to expect, which shows just how far the car-makers have come in recent years – and how we're ready for the ride. ■

Square Invoices app

Global payments provider Square has announced it's releasing the standalone Square Invoices app, providing small businesses with a self-serve tool for creating, managing and sending electronic invoices no matter where they are.

From sending quotes and requesting deposits, to issuing recurring invoices and automated reminders, the Square Invoices app adds all the extra functionality small businesses need to ensure they get paid fast.

Square Invoices will now also enable businesses to send quotes to confirm details of future jobs through the app or on their desktop.

Square
www.squareup.com/au

Ledlenser iF4R

Keeping your hands free, the Ledlenser iF4R allows you to prop up your light source.

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This construction light is rechargeable and contains five fully adjustable brightness settings. While it burns bright, its efficient cooling element eliminates the fear of it overheating, creating a long life and optimum performance.

Ledlenser
www.ledlenser.com.au

Vend-ready PPE

Personal protective equipment (PPE) vending machines can help large worksites save time and money, reduce waste, and improve OHS compliance and site safety.

Demand for vend-ready products which can be stocked in the machines is increasing, according to ProChoice Safety Gear, which has released its own vend-ready range.

ProChoice has released a new range of five gloves in vend-ready packs. They're rolled and shrink-wrapped to fit into the coils nice and neatly. It has also released a range of ear plugs, safety glasses and disposable respirators that typically fit vending machines.

ProChoice Safety Gear
www.prochoice.com.au

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GOING UNDER

A PAYROLL EXPERT HAS REVEALED SEVEN REASONS WHY COMPANIES GET CAUGHT IN UNDERPAYMENT SCANDALS.

Every few months sees a major employee underpayment scandal – companies announcing that they have made payroll errors that have impacted thousands of employees – go public. Examples are the $43 million error by Rebel Sport this year, the $2 million error by Lush Cosmetics last year, the $1 million in underpayments by Maurice Blackburn and more than $1 million in underpayments by Rockpool.

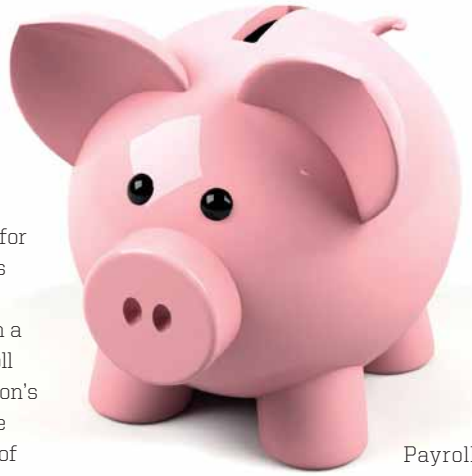
These types of errors are often identified and corrected by payroll expert Tracy Angwin at Australian Payroll Association, an industry network that has helped hundreds of organisations over 25 years ensure their payroll meets their legal requirements.

Tracy says underpayments are more common than one might think.

"The various clauses across the 122 employee awards in Australia, as well as Federal- and State-based legislation, are extremely complex. At times, even the relevant Government bodies have not been able to answer our questions when we ask for clarification. In addition, legislative changes occur weekly," she says.

"The errors behind the scandals are often a result of inadequate training given to payroll managers. The Australian Payroll Association's 2019 Benchmarking Report reveals that the average payroll manager has just 2.6 days of training a year. Yet they are responsible for millions of dollars in payments and ensuring those payments meet the law."

Tracy reveals the most common payroll mistakes and oversights that usually lead to such scandals.



The 7 mistakes that lead to major employee underpayments:

1 **Incorrect calculations in overtime provisions.** Mistakes are made when organisations do not ensure every ruling on overtime has been considered for employees. Many employee awards have numerous sections on overtime – for instance in the 'overtime', 'breaks' and 'part-time work' sections. One often overlooked ruling is overtime. Employees must receive a minimum of 10-hour breaks between shifts. If their break is fewer than 10 hours, under some awards – such as those governing hospitality, aged care and social service employees – they must be paid overtime rates thereafter, until they receive their full 10-hour break.

2 **Underpayment on termination.** The most common error here is payroll managers failing to refer to the Fair Work Act, in addition to the relevant employee award. The Act entitles employees over age 45 who have had at least two years of service with the company to receive one additional week of notice upon termination.

3 **Failing to pay overtime penalty rates to part-time employees.** Many organisations erroneously place the same rules on overtime payments to part-time employees as to full-time employees. However, some common employee awards – such as the retail award and clerks award – require overtime penalty rates to be paid to part timers when they work more than their contracted hours. This is where underpayment mistakes are commonly made.

4 **Superannuation underpayments.** Many employers fail to pay superannuation on employee payments on top of regular wages or salary. Super should be paid on any employee payment that is regarded as ordinary time earnings – this includes bonuses, leave loading, payment in lieu of notice of termination, and cashed-out annual leave.

5 **Only paying the base rate on annual leave payments.** This is an error that Australian Payroll Association has identified across multiple organisations in the health support services and manufacturing sectors. The awards governing employees in these sectors require that annual leave payments should include the full payments owed to the employee if they had worked. This includes penalties and allowances, not just the base rate of pay.

6 **Excluding commissions and bonuses from long service leave.** Many employers do not include commissions, incentives and bonuses when they calculate the value of long service leave. These payments should be included when long service leave is paid.

7 **Lack of payroll reviews and outdated systems.** A major oversight that contributes to all of the above errors are failing to review the accuracy of payroll systems alongside legislative changes – therefore new regulations that benefit employees are not implemented.

Australian Payroll Association
www.austpayroll.com.au

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OH WHAT A FEELING

PEUGEOT EXPERT

Peugeot has returned to the light-commercial vehicle (LCV) segment in Australia, launching the mid-size Expert van and following up later this year with the larger Boxer and the compact Partner vans.

This marks a change in strategy for the French PSA Group brands, with independent distributor Inchcape Australasia moving away from the position of its predecessor, Sime Darby Motors, which was planning to use Citroen – rather than Peugeot – for a renewed LCV push.

As a result, the Citroen Berlingo compact van, which has built up a loyal following over many years, will be sidelined in favour of the Partner as the Inchcape-run Peugeot Citroen Australia puts all its efforts behind the European lion brand.

As demonstrated by the Expert, these vans will all come with a high level of specification and a useful five-year/200,000km warranty.

The Expert lines up against the Toyota HiAce, Hyundai iLoad and European-bred models such as the Renault Trafic, Volkswagen Transporter, Ford Transit Custom and Mercedes-Benz Vito.

The launch range is made up of five three-seater variants spanning three common-rail turbocharged four-cylinder diesel powertrains, manual and automatic transmission options (both six-speed units) and two body lengths (4,959mm and 5,309mm).

At the entry level is a standard-length 1.6L BlueHDi 115 manual variant priced from $36,490 plus on-road costs. The engine produces 85kW of power at 3,750rpm and 300Nm of torque at 1,750rpm and offers fuel economy of 5.2L per 100km on the official combined (urban/extra-urban) cycle.

At the mid-range is a 2.0L HDi 150 variant with the option of either body or transmission, the standard-length manual starting at $39,990, rising to $42,490 for the auto or $44,190 for the auto-only long-bodied version.

This bigger-displacement engine pushes power up to 110kW at 4,000rpm and torque to 370Nm at 2,000rpm, with fuel economy ranging from 6.2-6.4L/100km, depending on the variant.

At the top of the range is a higher-output 2.0L BlueHDi 180 unit with the long-length body and automatic gearbox, good for 130kW and 400Nm (at same engine speeds as the HDi 150) and similarly listed at 6.2L/100km in the mileage stakes.

The entry and top-end BlueHDi engines are rated to the Euro 6

emissions standard and come with a selective catalytic reduction (SCR) system that uses the AdBlue diesel exhaust fluid (housed in a separate tank), while the mid-range HDi is at Euro 5. Service intervals are set at 12 months/20,000km across the range.

Based on PSA Group's front-wheel-drive EMP2 platform, the Expert's suspension configuration comprises independent MacPherson-style struts up front and oblique wishbone trailing arms at the rear axle.

The steering is a variable-assist electro-hydraulic system, the turning circle measures 12.4m, and braking hardware includes four-wheel disc brakes – 304mm ventilated rotors up front and 290mm solid discs at the rear – with a supporting cast of electronic aids including ABS, electronic brake-force distribution, brake assist, a hill holder, 'active' traction control and, not least of all, autonomous emergency braking (AEB).

Indeed, Peugeot claims to be the first brand in this segment with standard fitment of AEB, and a leader with other advanced safety features included in the price such as blind-spot monitoring, a reversing camera, driver drowsiness detection, adaptive cruise control, forward collision warning and speed limit recognition.

Front and rear parking sensors, front fog lights and four airbags, including side curtain protection, are also on board.

Load volume varies from 5.3m^3 to 6.1m^3 on the longer body, while load length is 2,512mm/2,862mm for the standard/long variants respectively. Maximum load height is 1,397mm, and width 1,636mm (or 1,258mm between the wheel arches).

Peugeot's 'Moduwork' bulkhead and a removable panel underneath the passenger seat can also liberate more space, while the load area is accessed via dual side sliding doors and 180° rear barn doors.

A common wheelbase length of 3,725mm is used on the Expert, with the extra length built in at the rear overhang (800mm versus 1,150mm), while the van's overall height of no more than 1,935mm should ensure it slots easily into city carparks and garages.

Load volume varies from 5.3m^3 to 6.1m^3 on the longer body, while load length is 2,512mm/2,862mm for the standard/long variants respectively.

Kerb weight ranges from 1,789kg to 1,958kg, and GVM 2,660-3,000kg, while payload comes in at an even tonne for the entry 115 model, 1,300kg for the mid-spec 150 and 1,250kg for the top-end 180. The latter has the highest braking towing capacity across the three engine variants, at 2,200kg, while the 150 can pull 1,500kg and the base 115 manages 1,800kg.

In all, this looks to be a carefully constructed line-up that caters for various trade applications and brings with it a lot of features for the money.

As well as the high-level safety equipment already mentioned, all Expert variants come with a 7.0" touch screen infotainment system, voice control, Apple CarPlay and Android Auto smartphone mirroring, Bluetooth radio, automatic headlights/wipers, auto-dimming interior mirror, trip computer, tinted windows, one-touch electric windows, electrically folding door mirrors, driver's seat height adjustment, air-conditioning, remote central locking and three 12V sockets.

The standard wheel size is 16" with a steel rim and full-size spare.

FORD TRANSIT CUSTOM

Ford Australia has introduced a wide-ranging update to its Transit Custom van that includes powertrain, payload and towing capacity improvements, new variants and extra high-level driver-assist safety systems fitted standard across the range.

Transit's safety package was already comprehensive, but now goes even further with a host of advanced technology like autonomous emergency braking (with pedestrian detection), adaptive cruise control, traffic sign recognition, blind-spot monitoring, rear cross-traffic alert, lane-keeping assistance with a driver alert system and automatic headlamps – including auto dip when on high beam.

Rain-sensing windscreen wipers are also now included on a list that runs to six airbags, full-colour rear-view camera, Sync emergency assist (automatically calling for help in the event of a crash), front and rear parking sensors and a variety of electric handling aids such as dynamic stability control, rollover mitigation, trailer sway control, crosswind stabilisation, load adaptive control and hill launch assist.

On the powertrain front, Transit Custom's 2.0L EcoBlue four-cylinder turbo-diesel has been revised to meet Euro 6.2 emissions standards and in the process raises power and torque to 125kW (+29kW) and 390Nm (+5Nm) respectively on all models bar the newly introduced Sport variant, which uses a meatier 136kW/405Nm version.

Alongside the engine tweak, the Transit Custom short-wheelbase models now have a higher gross vehicle mass (GVM) – up to 3,400kg (as denoted by the 340S model designation, replacing 300S) and, as a result, a higher braked towing capacity in the six-speed automatic version of 2,150kg (up from 1,800kg).

As well as extra grunt, which combines with the six-speed auto only, the new 320S Sport Van has unique styling elements including 17" black machined alloy wheels, a body kit, racing-style stripes, gloss-black grille, body-coloured mirrors and, not least of all, hi-tech bi-Xenon headlights with static bending and LED daytime runners. Standing out from the crowd, it also has two exclusive metallic colours – blue and orange.

One downside is that the sportier wheel and tyre specification does reduce GVM slightly to 3,200kg.

Ford has also introduced a new Double Cab-in-Van (DCiV) body style based on the long-wheelbase Transit Custom that can carry up to six occupants (three each at front and back) and still offer 4.4m^3 of load space. The regular SWB low-roof model offers 6m^3, and the LWB 6.8m^3.

A rear bulkhead is standard and the rear seats are accessed via the dual side loading doors, while both regular and Sport variants are also available – the latter using only five seats (in a 2+3 layout) and carrying some minor spec differences, such as sat-nav on-board but cornering lights not.

Ongoing updates now see the cabin of all models equipped with the Sync 3 infotainment system with 8.0" touch screen, Apple CarPlay and Android Auto smart phone capability, 4.2" colour instrument cluster (previously optional), heated windscreen/seats and the programmable MyKey that can be used to tailor settings such as speed, audio and driver assist tech.

The other headline attraction is an aftersales care package that includes a five-year/unlimited-kilometre warranty, 30,000km service intervals and fixed-price servicing for the first four years (or 120,000km). ▲

FORD RANGER

Running changes to Ford's popular Australian-developed Ranger ute now sees autonomous emergency braking (AEB) fitted standard across the expansive 29-variant range, from the XL single cab chassis at $28,340 (plus on-road costs) to the high-performance flagship Raptor dual cab pick-up priced from $75,990.

In addition to the AEB system, which is clever enough to detect pedestrians as well as other vehicles, the on-board technology includes a lane keeping aid with driver alert system, traffic sign recognition and automatic high beam.

At the lower end of the range, XL and XLS models benefit further with a new 'acoustic' windscreen that adds a layer of sound dampening material for reduced cabin noise and therefore improved levels of overall comfort and refinement, while XL cab chassis variants are set up to allow an optional rear-view camera to be fitted and fully integrated into the Sync infotainment system display.

This is particularly important for trade vehicles that have specialist configurations at the rear end, with Ford saying that the camera kit includes rugged heavy-duty housing, brackets and wiring to ensure easy fitment to a wide variety of tray types.

Pick-up models already have a rear-view camera and rear parking sensors as standard, while the entire range also features various other electronic handling devices such as dynamic stability control (incorporating ABS, load adaptive control and rollover mitigation), traction control, trailer sway control, hill descent control and hill start assist.

Ranger XLT buyers can also add additional advanced technology with a more affordable Tech Pack, which costs $800 (down from $1,700) and includes adaptive cruise control and semi-automatic active park assist which makes light work of parking the big ute in tight spaces.

All models are covered by a five-year/unlimited-kilometre warranty.

MERCEDES-BENZ EDITION 1 X350D

The most expensive mid-size utility on the Australian new-vehicle market has arrived in the form of the Mercedes-Benz Edition 1 X350d 4Matic, priced from $87,500 plus on-road costs.

Mercedes often heralds its new models with a limited-run 'Edition 1' variant from the factory, but this dark and brooding flagship version of the V6-powered X-Class dual cab ute is shipped here in top-spec X350d 'Power' form (retailing from $79,415) and then modified with a host of exclusive black design features and accessory parts that turn it into the special edition.

The V6 is a purely pick-up affair with a permanent four-wheel drive system (with low range reduction gear), 7G-Tronic seven-speed automatic transmission and a 3.0L engine developing 190kW of power and 550Nm of torque.

Available in black, white or grey body colours, the Edition 1 has an array of black elements that are designed to give it a menacing edge. These are found on the centrally positioned star badge and twin-louvre grille, front and rear bumper valance, fog light surrounds, side door handles, rear tailgate handle, nomenclature badges, beltline trim strip, roof rails and, perhaps most noticeably, the 19" six-twin-spoke alloy wheels.

Not stopping there, Mercedes has also added sports stripes on the bonnet, wing mirrors, V6 badge surrounds, lower side lines and rear tailgate, while a black sports bar and tubular side steps are also noted.

All the exterior parts and stripes have a high-gloss finish when the body colour is 'kabara' black, while matte-black paint is applied for those utes in 'bering' white and 'rock' grey. The bed lining and hard tonneau cover are matched to the exterior colour.

The interior carries Edition 1 decals and unique floor mats but otherwise sticks with the standard trim in the X350d Power, which has loads of creature comforts and safety equipment to help justify the top-end pricetag.

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Cutter blade shears the metal between the anvils




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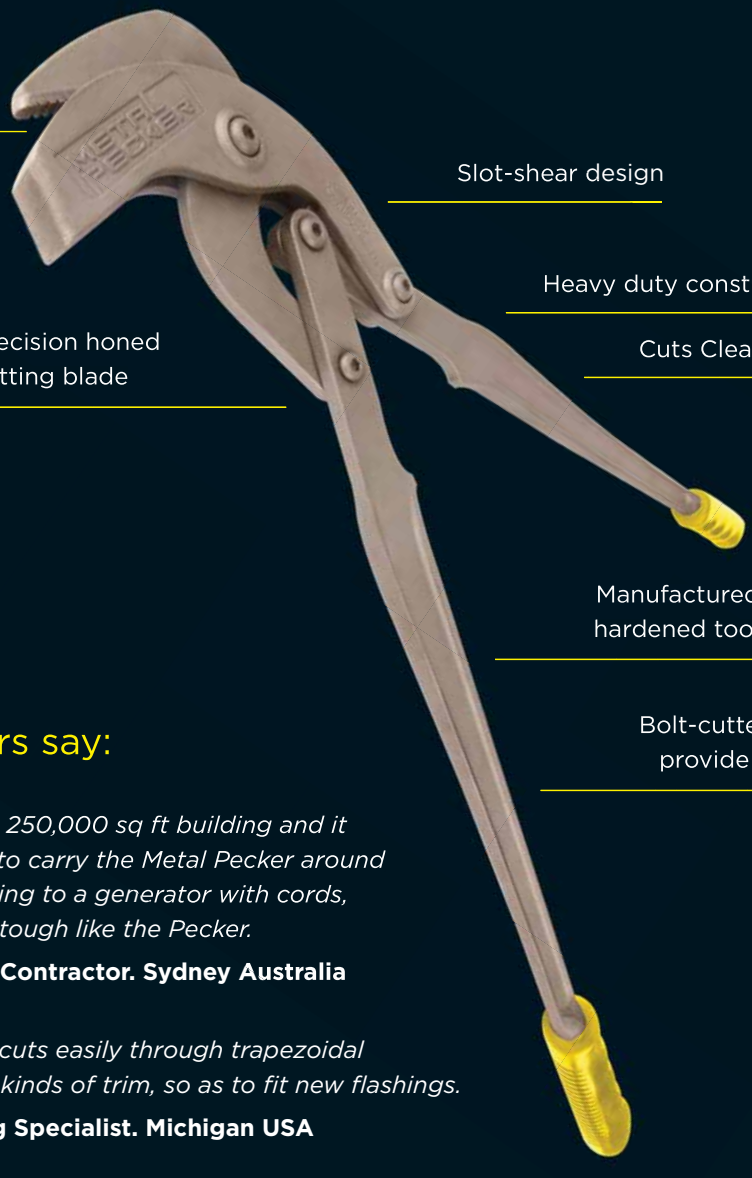

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ISUZU D-MAX

Isuzu Ute Australia has upgraded its popular D-Max utility and brought a new X-Runner special edition back to market after a two-year absence.

It has also ushered in an improved aftersales care package which includes a six-year warranty.

The new '6-6-7' ownership program sees the warranty period extend by a year to now run to 150,000km (up from 130,000km previously), and includes six years of roadside assistance and seven years (or 105,000km) of capped-price servicing. The latter is up two years/30,000km and equates to $3,600 in total over the period.

Following major overhauls for the D-Max in both 2017 and 2018, the 2019 model year has brought a relatively modest update that is largely cosmetic but adds useful equipment and sees the model line-up revised slightly, with the EX single cab chassis and LS-U space cab pick-up discontinued due to lack of demand.

The comprehensive range now covers 21 variants spanning the usual three cabs (single, space and dual), two back ends (pick-up and cab chassis), four trim levels (SX, LS-M, LS-U and LS-T), and 4x2 and 4x4 drivelines with a six-speed manual/auto transmission option and just the one powertrain: an unchanged 130kW/430Nm 3.0L four-cylinder turbo-diesel.

The flagship LS-T is the main beneficiary in the 19MY update, picking up various matte-black features including machined-face 18" alloy wheels wrapped in newly specified 255/60R18 Toyo Open Country Highway Terrain tyres that are claimed to reduce road noise.

Revised matte-black roof rails are now standard on LS-T, while LS-T and LS-U gain redesigned side steps that are made from durable fibre-reinforced polymer and have better underfoot grip and improved water dispersal. Extra black styling treatments are now applied to the front end of all LS-grade variants – and on the B-pillars of the crew cabs.

Keyless entry/start functionality also comes on board the 4x2 LS-T, putting it on a par with the equivalent 4x4 spec, and front park assist (using a three-stage radar sensor system) is now offered as a $545 dealer-fit accessory across all LS models in this model year and 17MY and 18MY.

The new X-Runner steals the show, however, with its unique exterior styling elements and accessories such as matte-grey grille with red Isuzu badge, dark grey finish to the front fog lights and tailgate branding, X-Runner decals on the bonnet, doors, rear quarter and tailgate, a satin-black sports bar and, in the tub, a spray-on liner.

Based on the LS-T 4x4 dual cab, the X-Runner is limited to 645 units and only available in red or white exterior paint. It carries rear park assist, which is an option on the regular model, while the cabin features red/black leather-accented seats (with red stitching), branded X-Runner scuff plates, piano-black and dark-red trim elements on areas such as the dashboard, doors and steering wheel, and black roof and pillar lining.

The X-Runner is priced from $54,990 drive-away, while the permanent D-Max line-up starts at $28,600 (plus on-road costs) for the SX 4x2 single cab chassis manual, topping out at $54,800 for the LS-T 4x4 dual cab pick-up. ▲

MAHINDRA PIK-UP

Indian auto brand Mahindra is working overtime to steer attention its way, targeting tradespeople with a specially tailored offer on its Pik-Up workhorse ute and, at the top end, developing its first-ever special edition for the Australian market – the Black mHawk.

The deal for the trades is available on the S6 single cab manual – priced from $23,990 plus on-road costs for the 4x2, or $26,990 for the 4x4 – and adds a general-purpose aluminium tray, ladder rack, towbar, Bluetooth mobile phone connectivity and cruise control.

The Black mHawk, meanwhile, is a locally developed special edition based on the 4x4 S10 dual cab priced at $38,990 drive-away and follows various other brands in applying a darker theme to the donor model to impart a more aggressive or upmarket 'black-tie' impression.

The latter is evident here, with Mahindra using black as the colour of choice for the model's 17" wheels, alloy sports bar, side steps, custom decal set, wheel-arch flares and factory bullbar.

All Pik-Up variants use a 2.2L four-cylinder 'mHawk CRDe' turbo-diesel engine that delivers 103kW of power and 330Nm of torque (available from 1,600-2,800rpm) and combines with a six-speed manual gearbox only. There is no automatic transmission available.

Standard safety equipment includes dual front airbags, a rear differential lock, hill descent control, electronic stability control, rollover mitigation and ABS brakes with electronic brake-force distribution.

The S6 is otherwise a fairly basic package, with cabin features including air-conditioning, and fabric seats with vinyl inserts. The S10 ups the ante with extra sound-deadening material for a quieter ride, climate-control air-conditioning, full-fabric seat trim, remote central locking, multi-function steering wheel, driver's seat height adjustment, automatic headlights/wipers and a better infotainment system with 6.0" touch screen. ▲

HSV SPORTSCAT RS

Holden Special Vehicles is trading on its high-performance pedigree with a new SportsCat RS special edition of its Holden Colorado-based ute, although the additions are mostly cosmetic.

Priced from $63,990 plus on-road costs, the RS-badged SportsCat sits $1,000 upstream of the entry Cat upon which it is based, but remains $5,000 adrift of the flagship SportsCat+ that carries a range of features now applied to the RS, such as a bonnet bulge and wheel-arch fender flares that accommodate black-painted 18x10" forged alloy wheels wrapped in 285/60 Cooper Zeon LTZ Pro Sports AT tyres.

Other highlights of the package include a hard tonneau (with load-rail provision and quick-release mechanism) and sports bar, while front occupants are treated to Premium SV Sports bucket seats with leather and suede upholstery – a trim combination that adorns the instrument panel, too. Double stitching (in red) is also used on the seats and the leather-wrapped steering wheel, door trim and centre console cover.

As with the other HSV-tweaked SportsCat variants, the RS comes with a host of chassis modifications – targeting the suspension and brakes in particular – that aim to improve dynamic performance in both on-road and off-road situations. The AP Racing braking package on SportsCat+ – with front four-piston callipers, 362x32mm diameter discs and larger brake master cylinder – remains optional at $1,995.

The RS is available only with a six-speed automatic transmission and, as with the regular Colorado, uses a 2.8L four-cylinder turbo-diesel engine that produces 147kW of power at 3,600rpm and a muscular 500Nm of torque at 2,000rpm.

The SportsCat is based on Holden's Thai-built Colorado Z71, with its various modifications carried out at the Walkinshaw Automotive Group's production facility in Melbourne, where Chevrolet Silverado and Ram pick-up trucks are also converted to right-hand drive. ▲

LDV T60 TRAILRIDER

Chinese brand LDV has introduced a specially tailored T60 dual cab ute for Australia, dubbed the Trailrider, which goes a step further than many other special editions by including a local suspension calibration applied at the factory.

The unique suspension set-up was developed by Holden Special Vehicles' parent company Walkinshaw Automotive Group in Melbourne, which already has close links with Australian LDV distributor Ateco Automotive through the Ram full-size pick-up truck right-hand-drive conversion program that Walkinshaw executes on behalf of Ateco.

The Trailrider is based on the T60 Luxe flagship, which runs a different calibration for the double-wishbone front and live-axle leaf-sprung rear suspension to the lower-series Pro version. The Pro was deemed more likely to be laden with tools and equipment whereas the Luxe was expected to spend most of its time as a family or recreational vehicle, hence the individual spring and shock absorber ratings.

But, as most of the leading mid-size ute manufacturers have found, Australian buyers want a vehicle that can perform well in our conditions both unladen and with heavy loads, and operate as both a workhorse and a recreational vehicle. To typecast tradies as those simply looking for the cheapest model is also a mistake these days, as industry figures show that the overwhelming majority of mid-size ute sales are highly specified variants.

As its name suggests, LDV's special edition is therefore something of a trailblazer for the Chinese brand. Apart from the suspension changes, the T60 Trailrider comes with increasingly common black cosmetic enhancements that aim to give a little more sportiness and pizzazz.

Combining with red, white, grey or black body colours, these include the 19" 12-spoke alloy wheels, the nudge bar, sports bar and side steps. A black grille replaces the chrome finish on the regular model, while a lockable black Mountain Top roller tonneau is fitted to the load tray. Topping it off, Trailrider decals are also applied to the bonnet, across the flanks and at the rear end.

Pricing starts at $38,937 driveaway for the six-speed manual version, while the six-speed automatic comes in at $41,042 driveaway. ABN holders can get hold of one for $36,990 (manual) or $38,990 (auto).

The unchanged powertrain is a 2.8L four-cylinder turbo-diesel engine producing 110kW of power and 360Nm of torque, driving through a part-time four-wheel drive system with high and low range and a rear differential lock.

The T60 Luxe has a 2,950kg gross vehicle mass (GVM), 875/815kg (manual/auto) payload, 1,995-2,060kg kerb weight and 3,000kg braked towing capacity.

As per the T60 Luxe, the Trailrider has a high level of equipment including leather upholstery, six-way power-operated and heated front seats, a 10" touch screen display, Bluetooth phone connectivity, keyless entry/start, climate-control air-conditioning, automatic wipers and heated/folding door mirrors.

Safety features include a 360° camera, adaptive headlights, blind-spot monitoring, six airbags, tyre pressure warning, electronic stability and traction control, ABS brakes with EBD and brake assist, hill descent control, hill start assist and 'roll movement intervention'.

All T60 models are covered by a five-year/130,000km warranty with roadside assistance and a loan car program thrown in. ▲

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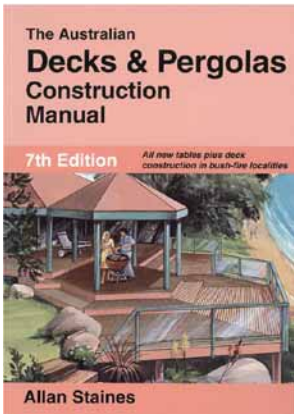

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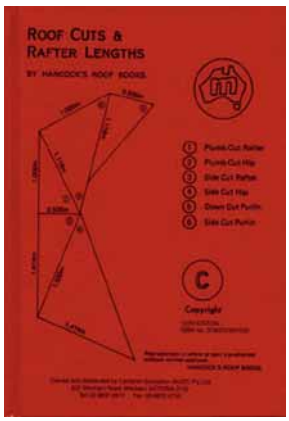

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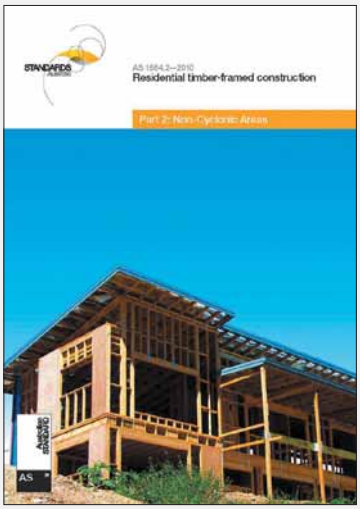

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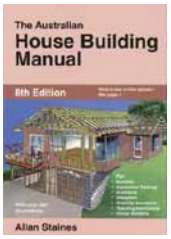

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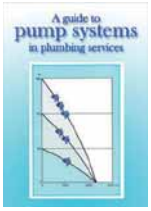

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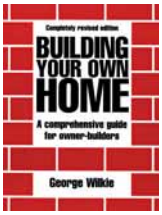

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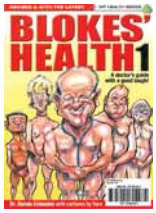

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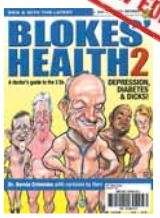

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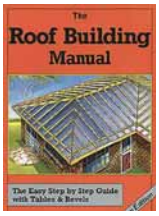

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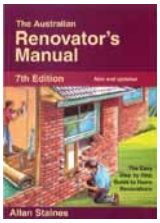

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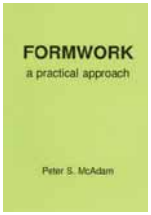

This is a practical skill development manual based on the principles and practice of building better, more economical and safer formwork. It is aimed at the hands-on people, carpenters, foremen, supervisors and inspectors. Covering materials and components, ground, wall, soffit, beam, stair, etc. forms, and lots more. It provides detailed diagrams and clear illustrations for every point of discussion, principle and practice.

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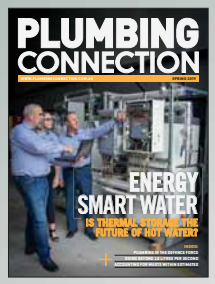

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