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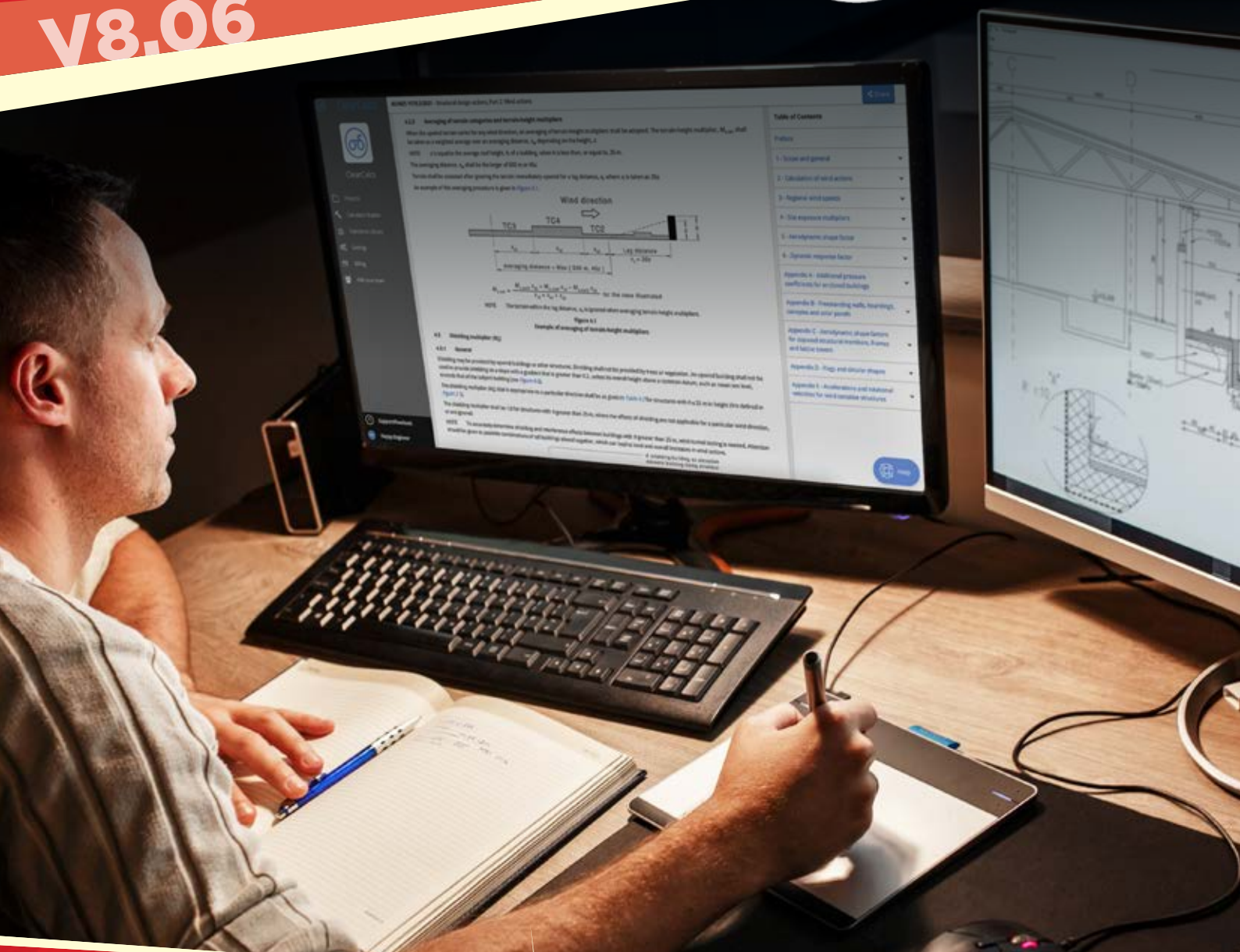
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CONSTRUCTION ENGINEERING AUSTRALIA

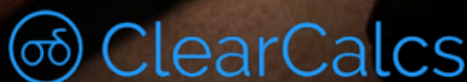
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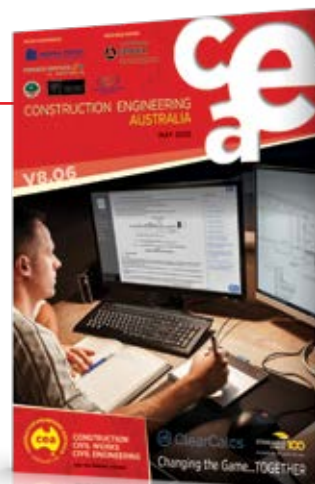
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About the Cover

In a move that looks set to revolutionise workflows across the construction engineering sector, engineering and structural design software specialists ClearCalcs has announced an industry-first partnership with Standards Australia which will allow ClearCalcs users to access and validate their calculations against all Australian Standards which are primary references in the National Construction Code - seamlessly and in real-time.

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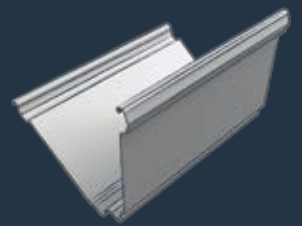
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ENGINEERS AUSTRALIA PROJECT OF THE YEAR: ELEVATED AND OPEN FOR NOMINATION

As of this year, the Engineers Australia Excellence Awards will be conducted as a single awards program.

To keep pace with the profession and celebrate the most cutting-edge engineering driving Australia forward, Engineers Australia's project awards have moved from bi-annual to annual. There will be annual celebrations of local and state finalists in each division, with winners progressing to the national awards.

The redesign is a product of an exhaustive review. Engineers Australia National President and Board Chair Nick Fleming says engineering is evolving, and the awards program must as well.

"The changes we've made to streamline the awards will ensure the categories are consistent, equitable and inclusive," he said.

Other key changes include:

- The creation of an emerging tier within Engineer of the Year awards to better recognise engineers, technologists and associates at the beginning of their careers
- Awards are open to international members
- Self-nominated and nominator entries are available.

Project awards – Nominations close Tuesday 30 May.

The project awards recognise Australia's top engineering projects and the teams behind them. It inspires and encourages engineering distinction through teamwork, innovation and technical excellence.

The project awards national winner will receive the title 2023 Project of the Year along with coverage of their winning project in print and digital media, amplifying the

team's accomplishments and expanding their professional network.

Learn more about the project awards and how to nominate here:

<https://www.engineersaustralia.org.au/about-us/excellence-awards-program/project-awards>

People awards – Nominations close Tuesday 4 July.

People awards acknowledge individual engineers for outstanding innovation and resourcefulness in their work. The Engineer of the Year awards recognise engineering professionals at all stages of their careers. Six awards are available based on the three occupational categories.

Career achievement awards apply to individual engineering professionals at all career levels and across the occupational categories. There are 11 individual awards in this category, mostly aligned to each of Engineers Australia's engineering colleges.

Also in the people category are the distinguished career awards. This category contains three separate awards which recognise the conspicuous service of individuals who have given longstanding and prominent service to the profession.

Learn more about the awards program and how to nominate here:

<https://www.engineersaustralia.org.au/about-us/excellence-awards-program>

NATSPEC STUDENT PRIZE OPENS FOR 2023

Registrations for the 2023 NATSPEC Student Prize are now open for eligible university students.

In this year's brief, the NATSPEC Student Prize challenges Master of Architecture students to explore the ways in which architects control and communicate the quality and performance of innovative design in construction.

The competition emphasises NATSPEC's objective to improve the quality of construction in Australia and mitigate the negative impact of the construction industry on climate change.

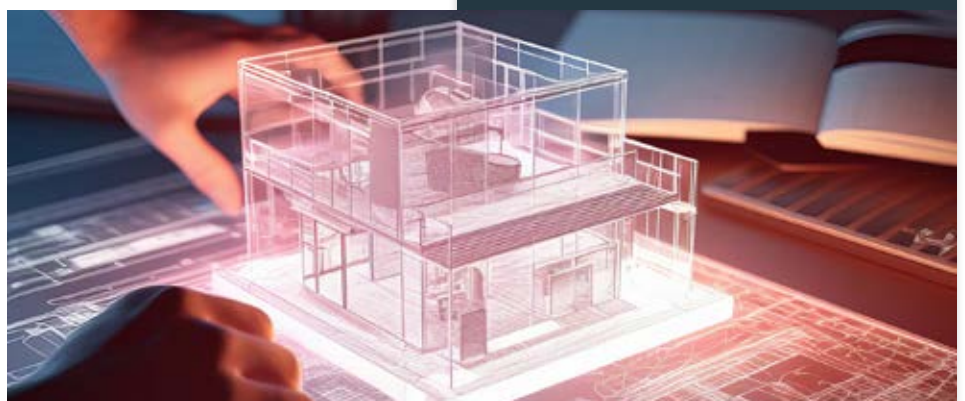
Entries are accepted from students who are enrolled at an Australian university in a Master of Architecture course accredited by the AACA. Students can enter individually or in teams of up to four members.

An independent jury will select the winner, who will receive a prize of \$8,000. Their work will be published on the NATSPEC website. Two entries will receive a Commendation award of \$1,500 each.

'What a Waste', last year's Highly Commended entry by Mitchell Pianto of the University of Melbourne, is available to view on the NATSPEC website.

The closing date for submissions is midnight AWST on Monday 4 December.

For more information, visit: www.natspec.com.au



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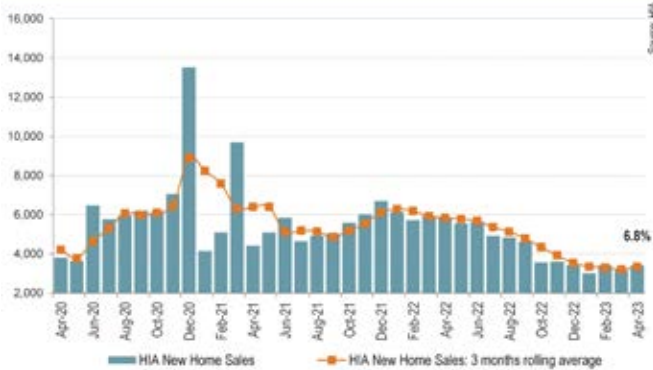
NEW HOME SALES REMAIN AT ROCK BOTTOM

"Sales of new homes across Australia rose by 6.8 per cent in April 2023 compared to the previous month," stated HIA Chief Economist, Tim Reardon.

The HIA New Home Sales report – a monthly survey of the largest volume home builders in the five largest states – is a leading indicator of future detached home construction.

"With sales relatively stable, albeit at extraordinarily low levels for six months, it does appear that the market has reached rock bottom," Mr Reardon said. "This sees sales for the three months to April stable compared to the previous three months."

PRIVATE NEW HOUSE SALES - AUSTRALIA (SEASONALLY ADJUSTED)



"This suggests that sales may have levelled out and reached a floor, barely more than half their levels from a year earlier, he said.

The cancellation rate remains elevated, with more than one new home project cancelled for every four new homes sold per month. This is its highest level since the start of the pandemic and is resulting in an accelerated decline in the pool of work sold, but not commenced.

"The RBA's rate increases last year and this year will continue to hold down new home sales and cause further cancellations as finance becomes unobtainable for an increasing number of buyers," Mr Reardon added.

"Sales of new homes fell in all states in the three months to April except for Western Australia. Sales in Western Australia were higher in the three months to April (+37.1 per cent) than in the previous three months and year (+9.8 per cent)."

"Of note, sales in Western Australia in the three months to April 2023 were 40.3 per cent higher than at the same time in 2019. This is an encouraging sign that this market may defy the best efforts of the RBA," Mr Reardon concluded.

Over the last year, NSW has seen the largest declines, with sales in the April quarter down by 70.5 per cent on the same quarter in the previous year. This was followed by Queensland (-51.7 per cent), Victoria (-46.3 per cent) and South Australia (-13.7 per cent). Western Australia saw the only increase over this period of 9.8 per cent.

ClearCalcs

STANDARDS Australia 100
CELEBRATING 100 YEARS 1922-2022

WEBINAR:

Revolutionising Access To Construction Standards

Thursday 25 May 2023, 12 pm AEST

To celebrate the integration of Australian Standards into the ClearCalcs platform, ClearCalcs will be hosting a panel discussion with **Daniel Chidgey**, Standard Australia's Head of Commercial Partnerships, and **Chris Borzillo**, ClearCalcs Co-Founder and CEO.

With the theme: "The new engineering technologies enabling innovative, creative and accurate access to construction standards" this FREE WEBINAR is your opportunity to get behind the scenes of this industry-first partnership, get the first look at what the Australian Standards integration into ClearCalcs look like, and unpack what this partnership means for your engineering workflow.

REGISTER TODAY for this FREE webinar at:
<https://clearcalcs.com/webinars/standards-australia>

BUILDING RESILIENT HOMES WITH TIMBER: WOODSOLUTIONS OFFERS \$100K FOR DESIGNERS TO JOIN THE CHARGE!

Australian designers are invited to use their skills to develop “Code+” homes with timber structures, to withstand the impacts of a changing climate.

A recently launched WoodSolutions competition offers a total prize pool of \$100,000 for new home designs that best showcase the positives of building with timber - in particular, the ability to withstand increasingly adverse weather events as Australia’s climate continues to change. The competition is part of The Resilient Timber Homes Program - an exciting new initiative designed to support the construction of more resilient homes across Australia, using timber.

Timber has a long-held reputation amongst Australian designers, architects, engineers, developers and builders for its myriad of benefits, including strength, durability, beautiful aesthetics, affordability, versatility, and sustainability. Good design has historically resulted in safe and comfortable homes, able to withstand the harsh Australian climates.

However, wood is also suitable for an increasingly important feature – the role it can play in creating resilient buildings.

The WoodSolutions Resilient Timber Homes Design Competition therefore aims to demonstrate how Australian homes can be designed using timber with a resilience-focused approach, for improved occupant safety and wellbeing, alongside increased value for investors and the community.

“At WoodSolutions we are continually impressed by the talent, creativity, and ingenuity that exists amongst Australian home designers,” said Resilient Timber Homes Program Manager, Paolo Lavisci.

“This competition provides a valuable opportunity for the design community to showcase its talents and work together to create a better and more resilient future for Australian houses and the families who occupy them.

“Specifically, we are looking for innovative home designs that use wood to help withstand

the impacts of natural disasters, including fires, floods and high winds,” said Lavisci.

The competition - based on the Australian Institute of Architects (AIA) Model Conditions for an Architectural Competition - will be run in a single stage, with two briefs for entrants to choose from.

Entrants will be required to prepare their final designs for assessment by Friday 23 June, after which a Jury comprising leading design and build experts from across Australia will decide on the two winning entries, that will receive prize money of \$50k each.

Following the competition, the program’s Partners may commission a full set of construction drawings from the winners, while WoodSolutions will work to support further R&D work suggested from the competition’s ideas.

For more information about the competition and how to enter, visit the Resilient Timber Homes Program’s Design Competition website: <https://resilienttimberdesign.com.au/>

Project Awards

Recognising Australia’s
top engineering projects.



Excellence
Awards

Nominate an engineering
project that demonstrates
technical excellence and
innovation.

Nominations
close 30 May

engaus.org/awards →



MELBOURNE & OLYMPIC PARKS COMPLETES POST-TENSIONING WORKS ON HERITAGE-LISTED AIA CENTRE

Melbourne's last remaining purpose-built building from the 1956 Olympic Games, the heritage-listed AIA Centre, has recently undergone critical maintenance works to preserve its original unique design.

Built to host the swimming, diving, and water polo competitions, and listed on the National Heritage Register and the Engineering Heritage Register, it was the first building of its kind in Australia, and today remains the only post-tensioned steel building in the state.

The AIA Centre is now home to the Collingwood Football Club and Netball Club and is managed by the Melbourne and Olympic Parks Trust.

The works were completed over a period of three weeks to maintain the building's stability, tightening the 26 vertical tie down rods which pretension the steel superstructure and provide lateral stability.

Melbourne and Olympics Parks Trust CEO John Harnden AM says maintaining buildings such as the AIA Centre is an important part of the organisations' remit, ensuring they can be enjoyed by the tenant clubs and the wider community.

"The AIA Centre is a significant building in our city's history – not only as an architectural achievement but in having made an important contribution to Melbourne's cultural and sporting landscape," he said.

"From the 1956 Olympics to its life as the Melbourne Sports and Entertainment Centre, and now as the home of Collingwood, this building is unique, and we are proud to have it within the Melbourne & Olympic Parks precinct – Melbourne's home of live events."

"We are committed to ensuring that clubs, athletes and our community can continue to enjoy the AIA Centre for decades to come, and will continue to prioritise these types of works to ensure the building remains a local landmark long into the future."

The protocols for the retuning works were completed by engineering firm WSP, which incorporates the practice founded by engineer Bill Irwin who, along with local architects Peter McIntyre, Kevin Borland, and John and Phyllis Murphy, won the 1953 design competition.

"An award-winning design at the time, the AIA Centre was designed to be material-light, reflecting the challenging post-war times where materials were limited, but labour was abundant," Principal Director WSP Phil Gardiner said.

"The ingenious use of the tensioned tie down rods, which created what was described as the world's first post-tensioned steel structure, allowed the precious structural steel content to be minimised, particularly in the girder trusses supporting the concrete seating plates and the primary roof trusses.

"To maintain this, the tie rods at each of the trusses, which are anchored into the ground via a complex spring system, need to have the correct amount of tension in them to ensure the building structure remains within its permissible stress range.

"Over time, due to weather, ground movement and surrounding infrastructure changes, the springs and rods lose their tension. They also get dirty, rusty and start to corrode. As such, adjustment of the post-tensioned tie-down rods is undertaken periodically.

"Post-tensioning is now the common solution for long-span concrete structures, but its use for a steel structure like the AIA Centre remains unusual if not unique."

In addition to the tensioning works, the AIA Centre is in the process of a \$15 million redevelopment to set up a multidisciplinary medical and sports performance hub thanks to a partnership between Collingwood Football Club and Monash University.

The four-phased project is due for completion in 2023.



Thompson said of the evolution of her vision, practice and KTA, 'When I started my practice, I had no particular plan, but I did want to rethink some of the questionable myths foundational to some of architecture's most celebrated figures: for example that design quality and business acumen were not mutually exclusive nor a rigorous design culture with a supportive workplace; that an architect could show strength and sensitivity, clarity of leadership and keen listening. In being conscious of these myths.'

'I felt I could give form to an alternate model of architectural leadership, one that challenged some stereotypes, with actions and perceptions. A determination to take on a wide scope of project scale and program was deliberate – to avoid being pigeon-holed or playing to expectations of what women architects 'should' do.'

KERSTIN THOMPSON AWARDED AUSTRALIAN ARCHITECTURE'S HIGHEST HONOUR

The Australian Institute of Architects announced Kerstin Thompson, the founding Principal of Kerstin Thompson Architects (KTA), as the recipient of The Australian Institute of Architects 2023 Gold Medal. She becomes the fourth woman to receive the prize in its 63-year history, having founded her studio in 1994 and built the business and led the practice as sole principal since.

The profession's highest award, it recognises Thompson's extraordinary service to the industry as well as her design and execution of 'buildings of high merit, producing work of great distinction that has advanced architecture...'

Previous winners of the Gold Medal include leading lights who have shaped Australia's civic culture and built environment since 1960 including Sir Roy Grounds, Robin Boyd, Jorn Utzon, Harry Seidler, Phillip Cox, Peter McIntyre, Daryl Jackson, Glenn Murcutt, Brit Andresen, Peter Corrigan, Stephen Ashton,

Howard Raggatt and Ian McDougall, John Wardle and last year, Sean Godsell.

On winning the award, Thompson said, 'This milestone is an acknowledgment of past achievements but also a future challenge to continue the design of buildings that meaningfully connect people with place and the fostering of a stimulating and supportive workplace culture.'

"To continue with the reward and responsibility of education ... and beyond the academy, advocating for architecture.'

Thompson plays an active role in promoting quality design within the profession and the wider community. A passionate defender of civic space and advocate for extracting new life from our built heritage, Kerstin has instilled her values in her team at KTA to create award-winning projects, such as Bundanon Art Museum & Bridge, Queen & Collins, Broadmeadows Town Hall and Melbourne Holocaust Museum.

COUNCILS SPARK INTEREST IN A SWITCH TO ALL-ELECTRIC HOMES

Councils across Australia are uniting to encourage residents to electrify their homes, as part of a campaign led by Merri-bek City Council in suburban Melbourne.

Councils have worked hard to develop a suite of resources to promote the benefits and provide advice on how to go electric. The resources have been developed as Australians show increased interest in making the switch to reduce bills, move away from gas, and access renewable sources of electricity at a fairer price.

The campaign will be promoted in Merri-bek through advertising outdoors, online and in council facilities, as well as through joint community events with Darebin, Yarra and Banyule councils.

Merri-bek Mayor Councillor Angelica Panopoulos said the innovative campaign is the first of its kind in Australia.

“We believe this is the first time councils have banded together to encourage their communities to electrify everything,” Cr Panopoulos said.

“The power of the campaign is in its local knowledge – each council can tailor the delivery of the message for their residents. But the message itself will resonate with Australians across the country.”

The messaging guide was developed after Merri-bek undertook research into attitudes about and knowledge of all-electric homes, with the major outcome being people wanting information, guides and the benefits of going all-electric to reduce bills, be part of the transition to a renewable future, and fairer access for all.

“All-electric is better for your hip pocket, better for the environment and the healthiest option for your home and family,” Cr Panopoulos said.

“We want homeowners and rental providers in Merri-bek and beyond to hear the advantages loud and clear – compounded by seeing the benefits in action when friends and family Australia-wide electrify everything.”

The resources include a plan and checklist for residents, posters, design files, and a range of graphics showcasing ways to electrify your household.

“Any step towards clean energy makes an impact. If you aren’t ready to install induction cooktops, you might be keen to try using an e-bike instead of your car. This campaign gives councils options to target different demographics in their community,” Cr Panopoulos said.

“If it takes six months or six years, we are helping our residents to plan to make the switch.”

“Merri-bek City Council and our community are known as a leader in the sustainability and climate change space, and we’re proud to support other councils and their communities to be part of the clean energy future,” Cr Panopoulos concluded.

By running your home on electricity, you can reduce your energy bills, and also your carbon emissions when using electricity powered by renewables.

Learn more and download the resources on the Zero Carbon Merri-bek website:

<https://zerocarbonmerri-bek.org.au/>





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CHANGING THE GAME... TOGETHER



Aussie software specialist ClearCalcs partners with Standards Australia to re-engineer the standards game

In a move that looks set to revolutionise workflows across the construction engineering sector, engineering and structural design software specialists ClearCalcs has announced an industry-first partnership with Standards Australia which will allow ClearCalcs users to access and validate their calculations against all Australian Standards which are primary references in the National Construction Code - seamlessly and in real-time. It is the first time that these guidelines for the construction and engineering industry have been available in a digitally integrated format.

Launched in 2017 by co-founders Chris Borzillo and Steven Robinson, ClearCalcs is a fast-growing Australian startup with an established presence locally and in the US, Canada, Europe, and New Zealand. The ClearCalcs platform houses a comprehensive library of purpose-built calculator tools that enable engineers, architects and building designers to better determine the structural requirements for their projects.

Now, thanks to the ground-breaking new partnership with Standards Australia, the ClearCalcs platform also allows users to integrate relevant Australian Standards directly into their engineering workflow. As well as promoting stronger adoption of industry best practice and conformance with Australian Standards, this partnership is also intended to encourage engineers to more safely and confidently explore new ideas and concepts.





ADDRESSING THE 'DATA DISCONNECT'

As the saying goes, 'necessity is the mother of all invention'... and the initial inspiration for the ClearCalcs software first came to CEO and co-founder Chris Borzillo when he saw the need for such a solution during his time working with a large engineering firm on an ISO 9001 certification project.

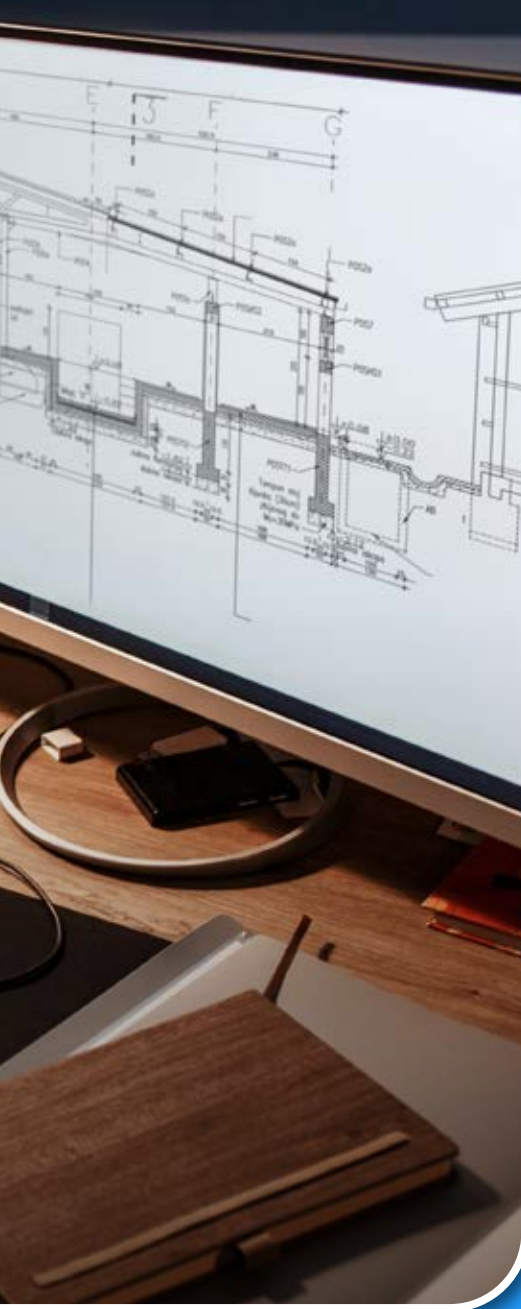
"It was only when I started working with the engineers on the ISO 9001 certification project, that I realised that many of the engineering and design work processes had some serious shortcomings. Indeed, from a digital perspective, there was a fundamental disconnect between the engineering and design calculation processes and the standards and codes which govern these critical calculations," Chris said.

"What's more, we also found that there was an array of different workarounds being used by different people in an effort to bridge this 'data disconnect'... and that can be problematic within itself."

"We had engineers using multiple software applications and as many as 30+ different spreadsheets to provide calculations for a single project. We even found engineers re-entering data from one set of workaround spreadsheets into their own spreadsheets to double-check calculations and present the data in their preferred format," he said. "In short, when it came to the engineering calculation process, we found a system and process that we considered to be fundamentally broken."

"Interestingly, while I initially thought that the problem may have been isolated to the company I was working with, subsequent investigations showed that this 'data disconnect' between engineering calculations and standards was actually a global problem," Chris added. "And with that, I knew there had to be a better way, so I got together with Steven, and we set about creating ClearCalcs."

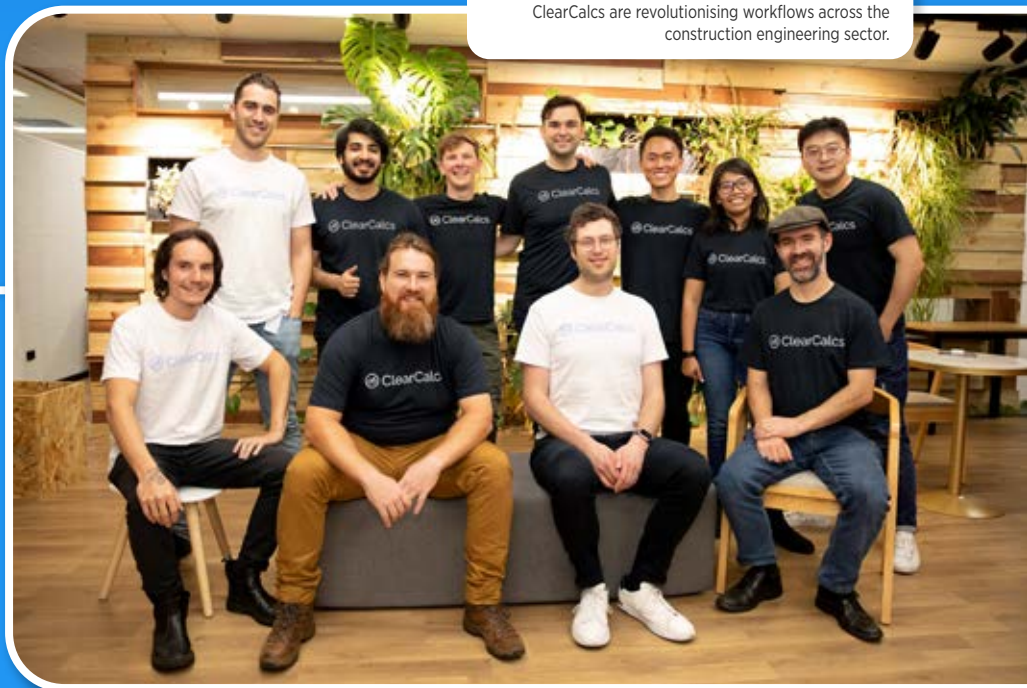
Headed up by co-founders Chris Borzillo, CEO (back row, left) and Steven Robinson, CTO (seated, 2nd from left), the Team from Melbourne-based software specialist ClearCalcs are revolutionising workflows across the construction engineering sector.



INNOVATIVE ENG-TECH SOFTWARE SOLUTION

The ClearCalcs platform has been designed to provide engineers and designers with a robust, reliable and user-friendly 'single point of truth' for all of their engineering calculations. The eng-tech software enables engineers and architects to streamline their calculations across a single platform. It delivers instant results across a broad range of design calculations, from the building's roof to its foundations for a range of material types, providing unparalleled insight and accuracy to the engineering process.

Delivered as a SaaS (Software as a Service) platform, ClearCalcs allows users to work effectively from any location, providing standards-based calculations for Australia and New Zealand, as well as Europe and North America. The platform houses a comprehensive library of mission-critical calculation tools that enable engineers, architects and building



designers to better determine the structural requirements for their projects. As a result, ClearCalcs is confident that users are able to design and build safe, compliant structures with speed, accuracy and flexibility.

Not surprisingly, the benefits of the ClearCalcs platform flow beyond the time savings and productivity gains made during the engineering design process. Indeed, with housing affordability reaching

crisis point globally, ClearCalcs is rapidly becoming the go-to software solution for the industry, as engineers, architects and designers search for new and innovative construction solutions that reduce material costs and speed construction, while still delivering structures that are fully compliant with all relevant construction codes and standards as required by law.



“In a world where housing supply is at crisis point, and the need for sustainable construction methods only continues to rise, we take pride in playing a part in helping our clients improve the design of tens of thousands of homes and structures and are committed to continuing to push innovation we believe can assist with these challenges,” Chris Borzillo said.

“One of the things that engineers love about working with us, is that we enable them to trial new and different materials and solutions that would have previously been too time-consuming or costly to consider.”

“Having access to up-to-date Australian Standards plays a vital role in giving engineers the confidence to adopt new methods and materials. So, in making standards even easier to access and understand, we hope this new partnership will inspire and encourage our clients to lead others in the industry to also think outside the box,” he said.

FULLY-INTEGRATED AUSTRALIAN STANDARDS

While ClearCalcs now has several thousand engineers using the platform globally, the recent integration of Australian Standards into the platform will no doubt prove to be a ‘game-changer’ – not only for ClearCalcs, but for the construction engineering sector as a whole.

“Integrating Standards Australia’s guidelines into our platform has been a goal of ours since day one,” Chris Borzillo said. “Our calculators are designed to help engineers make confident decisions faster, and we know that they refer to Australian Standards constantly through this process, which makes marrying the two an absolute no-brainer.”

“The standards rollout has been in beta testing since January, and the feedback so far has been phenomenal, especially from senior engineers who keep commenting on its potential to swiftly educate juniors,” he added.

“With our tools, engineers are able to quickly calculate their specific and comprehensive engineering needs, reducing the time it takes for projects to move from concept to reality. With Australian Standards now a core part of our functionality, the credibility and value of our service will only grow.”

“The Standards Australia and ClearCalcs partnership empowers our users to make informed decisions in real-time online, so that they can achieve more with confidence by placing Australian Standards directly alongside the engineer’s daily workflow. Together, we are transforming how the engineering industry operates through easy-to-use, innovation-led distribution of information,” Chris said.

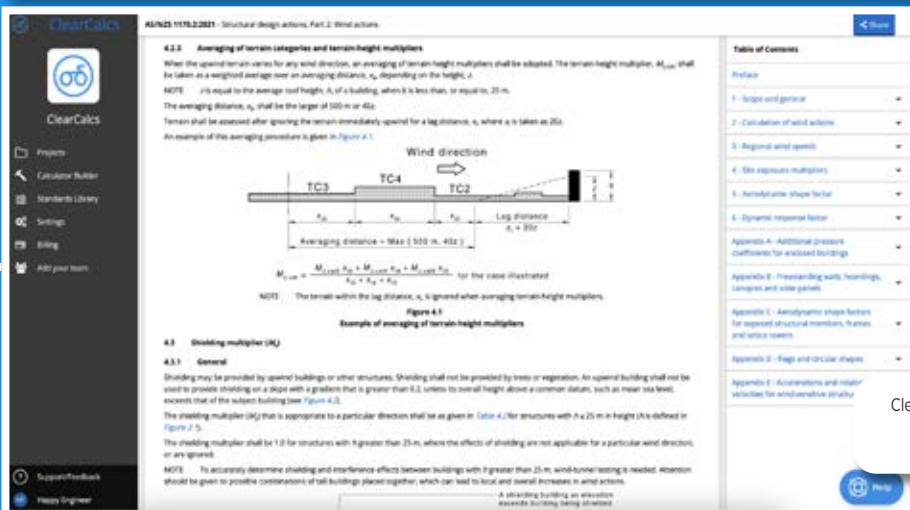
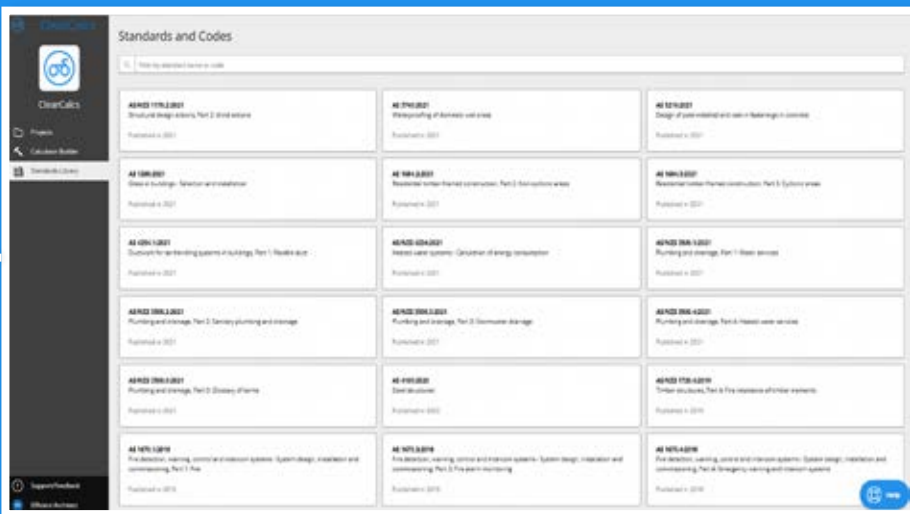
As Australia’s leading independent standards organisation, Standards Australia develops and updates the nation’s standards across multiple industries, including construction and engineering.

Speaking about the new partnership, Daniel Chidgey, Standards Australia’s Head of Commercial Partnerships, said, “We are delighted to partner with ClearCalcs to integrate trusted standards information into their innovative software platform, helping engineers make quality decisions with confidence.”

“Engineers typically make hundreds of calculations in engineering projects, often using spreadsheets, clunky platforms, and manual calculations. Mistakes when making calculations can lead to extended project timeframes and costly reworks, so they must be done right from the start. Having Standards Australia’s content embedded into ClearCalc’s intuitive engineering platform has great potential to improve their efficiency and accuracy,” Daniel said.

“Together, we are transforming how the Australian engineering industry works with standards. It’s been a pleasure partnering with ClearCalcs to bring engineering standards into the digital world,” he concluded.

For further information, including demo videos, or to start your free trial, please visit: <https://get.clearcalcs.com/standards/>



ClearCalcs now includes online access to the Australian Standards which are primary references in the NCC (National Construction Code)

CLEARCALCS WITH AUSTRALIAN STANDARDS

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3.2.1.1 Design assembly:
The design assembly of beams (M) of unnotched beams, for the strength limit state, and verify the following:
 $M_d \leq M_R$
where:
 $M_d = \alpha_1 A_s A_y A_{y1} A_{y2} A_{y3} A_{y4}$
and:
 α_1 = design action effect on bending (see Clause 3.4.3.2)
 A = assembly factor (Clause 3.2)
 A_y = the multiplication factors given in section 3.2.1.1
 A_{y1} = safety factor (see Clause 3.2.2)
 A_{y2} = characteristic value for bending for the section size
 A_{y3} = section modulus of beam about the axis of bending for rectangular beams, Z_x equals Z_{x1} and Z_y equals Z_{y1} , where Z equals the section and Z equals the depth of the beam)

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SCAN ME

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Ideal for fast-filling water carts and managing site water, diverting flows and dewatering, Aussie's Kubota powered 6" trash pump can be mounted on a trailer or transported by utility vehicle.



Fast Site Dewatering

For construction site dewatering, self-priming trash pumps are cost-effective, reliable and easy to set up. Aussie Pumps' heavy-duty 6" trash pump, powered by a Kubota 18.5 kW water-cooled diesel engine, handles solids contaminated water and delivers flows to 4,200 litres per minute (that's 252,000 litres per hour).

Reaching maximum heads of 35 metres, the QP-60TD will draught water through a vertical suction lift of seven metres. The impeller is a heavy-duty non clog style, manufactured from high SG cast iron. The hydraulic design of the impeller and volute is superbly balanced to obtain the best result in flow, pressure and co-efficiencies.

The pump body is cast iron and a ductile hardened wear plate is provided as standard equipment. The pump's 6" suction and discharge ports are flanged bolt-on style.

The easy clean-out port means that if the pump's internals become clogged, it is simple

to flush the pump internals without the need to disconnect the pipework. The pump's body can be opened simply by releasing four toggle-style hinged levers giving access to the impeller and volute for cleaning and service.

A separate drainage sump is also accessed by levering toggles, enabling easy draining of the pump. Removal of sediment from the sump is a simple matter of flushing.

Sealing is achieved by an oil bath mechanical seal running in turbine oil (viscosity ISO 32). The mechanical seal is tungsten carbide to provide long, trouble-free operation, even in trash-laden or muddy liquid applications.

The engine selected by Australian Pump for the drive is a Kubota four-cycle, three-cylinder diesel engine, model D1105. It comes with a 60-litre fuel tank that provides 10 hours of run time.

The standard unit is mounted on a sturdy skid steel base, fitted with an integrated

centre-mounted lifting bar, that enables easy craning on and off trailers or utes.

The pump comes with engine protection in the form of a low oil, high water tank cut out.

Aussie's compact design, in spite of its high-performance characteristics, weighs in at 790 kilos. It can be mounted in a trailer or transported by a utility vehicle if necessary. Like all Aussie QP pumps, the QP-60TD is covered with a five-year warranty.

The new 6" trash pump is expected to be of real interest to quarries, councils (as an emergency sewage bypass pump) and for use in infrastructure and general construction site dewatering.

Further information on the new 6" trash pump is available from Australian Pump Industries or authorised distributors throughout Australia.

For more, please visit: <https://aussiepumps.com.au>



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SMOOTH SAILING AT ROYAL FRESHWATER BAY YACHT CLUB WITH FIELDERS ARAMAX®

A contemporary new building has risen on the banks of Perth's Swan River. Its low-profile design and dark colour palette see it sit comfortably against a green background of manicured lawns and green foliage – it's restrained yet beautifully detailed.

The latest addition to the shoreline is Royal Freshwater Bay Yacht Club's Dinghy and Training Centre, new facilities that allow the club to provide sailing courses for eager water enthusiasts, who range anywhere from four years of age to older adults. The structure also provides housing facilities for the watercraft used in these courses.

While in the past functional buildings of this nature may have forgone aesthetics in exchange for functionality, the new Dinghy and Training Centre manages to combine both very well, by employing clever design and material selection.

Although featuring a restrained form, an aspect of the building that's immediately noticeable is the roof cladding. Fielders ARAMAX® in double-sided COLORBOND® Ultra steel in colour Windspray® – it's a profile that is fast gaining popularity with architects and industrial designers who are specifying the material in projects of scale for its unique look and functionality.

Fielders Architectural Manager – WA, Adam Johnson-Kain, explains how ARAMAX® was chosen for the Dinghy and Training Centre.

"Architects MJA Studio wanted a unique profile that had large spanning capabilities, and after undertaking a full feasibility study, identified ARAMAX® as the perfect product for the functionality and aesthetic they sought for this project," Adam said.

"This application provided the perfect scenario – ARAMAX®'s oversized V-shaped profile creates a striking visual aesthetic, while the material's structural rigidity provides

long-spanning capabilities of up to 20 metres, which allows greater design freedom. At 1.2mm base metal thickness, ARAMAX® is also capable of handling extreme wind loadings."

At the Dinghy and Training Centre, the ARAMAX® delivers a generous front roof overhand creating a verandah effect without the need for a supporting structure. This allows easier manoeuvring of watercraft in and out of the building, with the bonus of unobstructed views of Freshwater Bay. It's a similar story inside, with minimal steel supports needed ensuring more usable open space – an added benefit of having less substructure is reduced steel cost. Long-spanning capabilities have also eliminated roofing joints on the build, minimising the likelihood of water leaks.

Given the building's marine location on a saltwater estuary, the ARAMAX® was manufactured from COLORBOND® Ultra steel incorporating BlueScope's Activate® technology, which is specifically designed to combine long-term durability and enhanced corrosion resistance. COLORBOND® Ultra steel has been heavily tested in accelerated

corrosion trials at BlueScope's laboratories, as well as in extensive outdoor testing in severe Australian conditions, providing reassurance for its use in harsh environments.

Adam said that Fielders was also able to offer a professional onsite Mobile Mill service for the ARAMAX®, adding additional flexibility to the project.

"While ARAMAX® can, of course, be roll formed at the factory to any transportable length, given it becomes a structural roof, onsite milling is preferable and provides benefits such as rapid install, an ability to adapt to site changes, and allows us to create lengths of major continuous spans," he said.

"Fielders' Mobile Mill™ is managed by a specialist team of technicians and engineers who work very closely with the roofer, builder and architect – it's a coordinated effort that saves installation time and increases efficiency, while also providing assurance that if a miscalculation occurs, it can be addressed and rectified on site."

For information on the full Fielders Aramax® range, visit: <https://fielders.com.au/products/platinum-portfolio/aramax/>



Whether it's a TL-2 or TL-3 attenuator, your first question should always be: **IS IT MASH APPROVED?**



With the ASBAP (Austroads Safety Barrier Assessment Panel) guidelines now requiring all new TMAs sold for use in Australia to be tested and approved to MASH Standards, one of the most critical questions for equipment purchasers to ask is: **“Is it MASH Approved?”**

When it comes to **Scorpion® TMAs**, the answer is a resounding **YES** – for BOTH TL-2 and TL-3 attenuator.

In fact, the Scorpion II® Metro MASH TL-2 TMA is not only **THE FIRST TL-2 TMA** to be fully tested and approved to the latest MASH Standards, it is currently **THE ONLY TL-2** Truck Mounted Attenuator to be successfully **TESTED, PASSED & ELIGIBLE** to the current MASH Standards.

So, whether it's TL-2 or TL-3, when it comes to selecting a fully MASH tested, passed and eligible TMA that has also been **ASSESSED, APPROVED & RECOMMENDED FOR ACCEPTANCE** throughout Australia by ASBAP, the only name you need to remember is Scorpion® from A1 Roadlines.



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INFINITY TESTING

'Infinity Testing' is without a doubt the harshest method of testing the performance of a Truck Mounted Attenuator (TMA) during an impact.

NO RELIANCE ON ROLL-AHEAD DURING AN IMPACT

Rather than relying on some of the impact energy being absorbed by the forward movement of host vehicle on which the TMA is fitted, with 'Infinity Testing' the host vehicle is anchored to the ground to prevent any forward movement during an impact.

'WORST CASE' SCENARIO TESTING

Compared to standard testing with an unrestrained host vehicle, Infinity Testing is a much tougher testing regimen. It is considered 'worst-case scenario' testing which makes it much more difficult to meet the pass criteria for IS values, as all of the Ridedown Acceleration must be provided by the TMA absorbing the energy from the impact.

TMA ABSORBS & DISSIPATES 100% OF THE IMPACT ENERGY

Testing the TMA on a host vehicle which is anchored in place, tests – and for both the Scorpion II® TL-3 and Scorpion® II METRO® TL-2 TMAs – confirms the capacity of the TMA to absorb/dissipate 100% of the impact energy - without the benefit of the host vehicle roll-ahead.

NO UPPER LIMIT FOR HOST VEHICLES

From a practical standpoint, the fact that both the Scorpion II® TL-3 and Scorpion® II METRO® TL-2 TMAs were successfully tested to MASH Standards using the 'Infinity Testing' method, means both units are MASH certified with no upper weight limit for the host vehicle.



THE ULTIMATE TEST OF ATTENUATOR PERFORMANCE

HOW IT'S DONE

With 'Infinity Testing' the host vehicle is anchored in place during the impacts to assess the TMA's capacity to absorb/dissipate 100% of the impact energy without the benefit of roll-ahead.



WHAT ABOUT ROLL-AHEAD DISTANCES?

Importantly, to emulate 'real world' operating conditions, both the Scorpion II® TL-3 and Scorpion® II METRO® TL-2 TMA have also been successfully tested and MASH certified using standard 'non-anchored' host vehicles, with both units posting impressively low roll-ahead distances.

Scorpion® II TL-3 TMA

Crash Test: MASH Test 2-53 Impacting Vehicle Weight: 2266kg
Impact Angle: 10.3 Degrees Impact Speed: 103.8km/h
Roll-Ahead Distance: 5.1m

Scorpion® II METRO® TL-2 TMA

Crash Test: MASH Test 2-53 Impacting Vehicle Weight: 2295kg
Impact Angle: 9.9 Degrees Impact Speed: 81.6km/h
Roll-Ahead Distance: 12.4m



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TechnologyOne software smarts makes invoicing a breeze

An Australian software developer has created a solution that uses intelligent automation to automate invoicing, helping ensure construction enterprises and workers get paid on time.

Just like ChatGPT, the Microsoft-backed engine that uses deep learning techniques to write poems, college essays or even a line of software code, TechnologyOne's intelligent automation technology helps streamline the invoicing process and reduce the time and effort required to get paid for completed works.

The Australian software company, which provides Software as a Service (SaaS) Enterprise Resource Planning (ERP) solutions for the likes of BMD, JWH Group, BGC Group and more, knows construction companies could be crippled if they can't collect payments and pay their workforce.

This is even more important in the current climate, where worsening skill shortages have resulted in construction job vacancies increasing by a massive 80 per cent since late 2019, making retaining skilled workers imperative.

TechnologyOne's Luke Fleming, General Manager for Asset and Project Intensive Industry, said cash flow was the lifeblood of

the construction industry.

"In this climate, subcontractors and suppliers getting paid on time is crucial. Late or unpaid invoices can destroy business relationships with suppliers and subcontractors. Accounts payable is a critical business requirement, but because of its high-volume nature, it can cause a lot of issues for construction companies," Mr Fleming said.

"Invoicing in the construction industry can be especially time-consuming, as it involves several steps and can be complicated by many variables, multiple stakeholders, and complex invoicing structures. The amount of time invoicing takes will depend on a variety of factors, such as the size and complexity of the project, the number of invoices to be generated, and the systems and processes in place for managing invoicing," he added.

Understandably, it's challenging to establish a streamlined invoicing process when many businesses rely on manual processes and multiple stakeholders and approvals to pay invoices on time. And there are so many ways an invoice can fail – duplicate invoice numbers, invalid ABN, and no PO number, to name a few. It can be an admin nightmare when something goes

wrong, and accounts can't be paid, with time-consuming back and forth to get it right. This is where smart technology comes into play.

Software-as-a-service (SaaS) solutions, where software is accessed online via a subscription, rather than bought and installed on individual computers, can help streamline the invoicing process and reduce the time and effort required to get paid for completed works.

Working with intelligent automation, the TechnologyOne team have developed an industry-specific solution that provides automation, control, and efficiencies within the invoicing process and managing exceptions to those invoices.

Automating invoicing tasks and seamlessly integrating invoicing with other systems can help save time, reduce errors and increase efficiency, freeing up staff to focus on other important tasks.

TechnologyOne's integrated software solution provides real-time visibility into project costs, which can help construction companies more accurately track expenses and completed work. It helps avoid invoicing errors and delays and facilitates quicker payments.

SAVING TIME AND MONEY

Invoicing requires substantial resources and funds to keep processes and systems in order and ensure work is performed correctly and accurately. Implementing an integrated software solution with financial management capabilities can save a business time and money.

Intelligent automation is used within SaaS ERP systems to automate invoice exceptions. This functionality can save time and reduce the administrative burden on staff. Research has found that intelligent automation typically results in cost savings of 40 to 75 per cent.

With AI capabilities, a SaaS ERP solution can be tailored to align with your specific business processes and management style. Following a set-and-forget approach, during the software implementation rules can be designated by staff for the system to follow through the use of automation technology, enabling the simplification of complex

invoicing processes and the elimination of administrative work.

Automation also helps avoid human error. Everyone makes mistakes, but with intelligent automation, those errors can be caught and rectified following standard processes. Exceptions to invoices can also be managed automatically through the system and its rules-based exception engine, ultimately providing efficiency for the whole business - enabling you, your staff, and contractors to be paid faster.

IMPROVE ACCURACY AND EFFICIENCY WITH INTEGRATION

SaaS ERP software solutions can also seamlessly integrate with other solutions, such as project management software and accounting software, to provide a more streamlined and cohesive invoicing process. This can reduce the likelihood of errors and inconsistencies and can help to improve communication and collaboration between

different departments and stakeholders.

"Having worked in the construction industry, we understand the sheer volume, amount of man hours and potential human error that can occur when it comes to invoice processing," Mr Fleming said.

"That's why we have developed integrated intelligent process flows to streamline business processes and take the heavy lifting out of tedious and time-consuming tasks."

Overall, SaaS ERP solutions can help construction companies to improve invoicing processes, efficiency, and timeliness, which can ultimately lead to better financial management and greater profitability.

For more information on how intelligent automation can reduce your invoicing headaches from industry expert Luke Fleming and a live software demonstration, register for our Financial Management webinar at:

<https://technologyonecorp.com/construction>

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BOON EDAM CELEBRATES 150 YEARS WITH LAUNCH OF NEW SIGNATURE SPEEDLANE SERIES

Boon Edam's new Signature Speedlane Series is designed to fully integrate with other technologies, and comes in a range of aesthetics to suit different architectural styles and buildings.

With entrance security becoming increasingly important to protect workers and visitors in modern buildings, Boon Edam has marked its 150th year with the launch of a sleek and functional new speed gate – the Signature Speedlane Series. The Signature Series complements Boon Edam's market-leading speed gate and architectural revolving door ranges, and takes customisation to the next level, with a wide range of aesthetic options, and the ability to fully integrate with other technologies.

“As a family-owned company with 150 years of experience, Boon Edam has always looked to the future. Companies globally, and here in Australasia, are increasingly looking for bespoke solutions to meet their individual needs, and this is where the Signature Series can really shine,” says Boon Edam Australia Managing Director, Michael Fisher.

“Whether its facial recognition technology, a fingerprint scanner, or lift destination control, these features can be integrated into the speed gates, without requiring any re-engineering or add-ons to make the new functionality work,” he said.

The Signature Speedlane Series will allow Boon Edam to offer another option in its suite of entrance security products, which is already the most comprehensive in the region.

Globally, the Boon Edam group serves many of the world's leading companies, including Fortune 500 companies in 27 countries, with expertise in public, private and commercial buildings and facilities, corporate headquarters, data centres, retail, health care, diplomatic, treasury, legislative, federal and state facilities, logistics centres, and transport terminals.

The new range combines Boon Edam's high-quality manufacturing and dedication to outstanding service, with competitive pricing, designed to deliver a solution to any application requiring entrance security.

“We are pleased to see the Australian market already taking up the new Signature Series. This reinforces what we have learned from the architectural community in recent years – that bespoke solutions combining aesthetics, security, and integrations are highly valuable to architects seeking to differentiate their projects and impress their clients,” said Fisher.

BESPOKE SOLUTIONS FOR EVERY ENTRANCE SECURITY APPLICATION

The Signature Speedlane Series is equipped with the latest in security technology, including the ability to integrate with lift destination control, visitor card retention hoppers, multiple card readers (including

low-level for disability compliance), QR and bar code scanners, facial recognition, biometric authentication, and MorphoWave contactless fingerprint scanners.

“Security does not work on a one-size-fits all approach. And historically, aesthetics have been a secondary consideration to functionality. With the new Signature series, Boon Edam is leading the market with a cost-effective solution that can meet the broadest range of functionality and aesthetic needs,” said Fisher.





The new Signature Speedlane Series will come in three variants to suit different aesthetics, Contour, Sculpt, and Edge. The standard speed gate in each variant will use Stainless-Steel, but can be customised with options such as:

- Coloured Stainless Steel
- Brass/Bronze Cladding
- PPC Finish (Standard RAL Colour)
- PPC Finish (Anomatch range)
- Anodised Aluminium (Bronze Range)

“The launch of the Signature Speedlane Series is a testament to Boon Edam’s commitment to the future of entrance security. It takes the company’s 150 years of craftsmanship and security expertise, and delivers a product designed to deliver the maximum benefit to architects, specifiers, and their clients,” concluded Fisher.

ABOUT ROYAL BOON EDAM

With work environments becoming increasingly global and dynamic, smart, safe entry has become the centre of activity in and around many buildings. Royal Boon Edam is a global market leader in reliable entry solutions.

Headquartered in the Netherlands, with 150 years of experience in engineering quality, we have gained extensive expertise in managing the transit of people through office buildings, airports, healthcare facilities, hotels and many other types of buildings. We are focused on providing an optimal, sustainable experience for our clients and their clients. By working together with you, our client, we help determine the exact requirements for the entry point in and around your building.

For more information on Royal Boon Edam’s full range of revolving doors, security doors & portals, speed gates, tripod turnstiles, access gates and full-height turnstiles, please visit:

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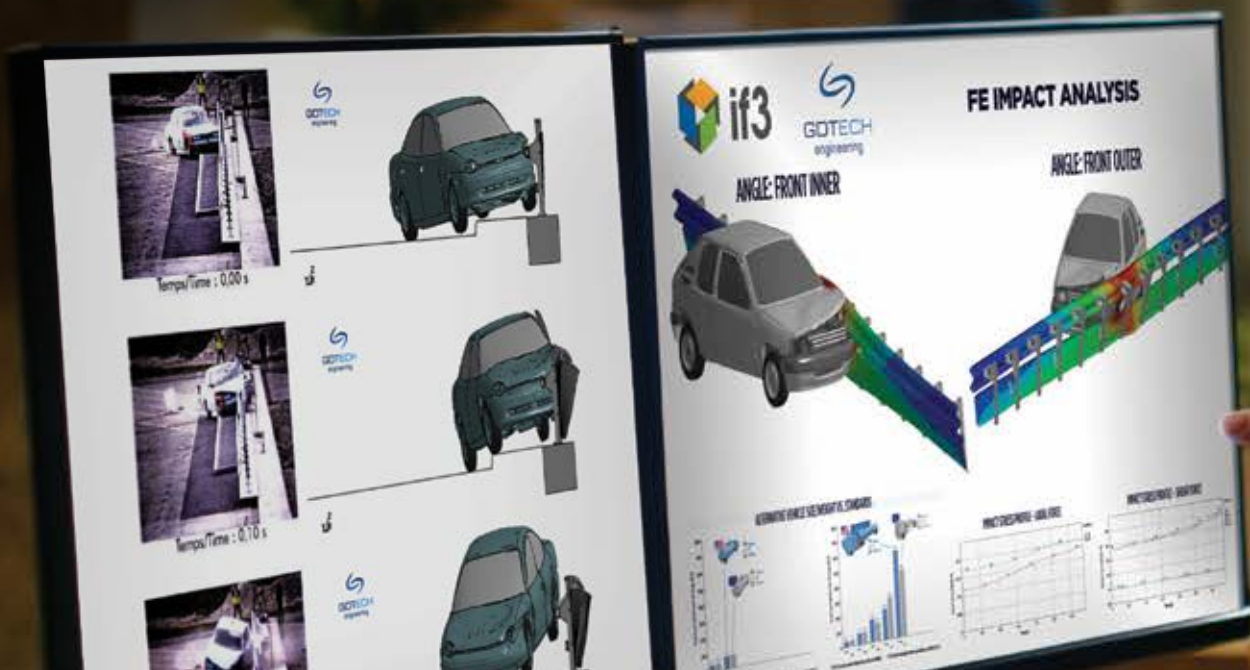


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THE MARVEL OF MASTER OAK

With a look and feel that's inseparable from real oak but with the durability, sustainability and maintenance benefits of high impact performance surfaces, Master Oak, the award-winning decorative panel from UNLIN, is now available in Australia and New Zealand through distributors, Big River Group.

Introduced with six ready-made designs, four with wood hues and two in uni-colours, the new panelling material offers many options for creative interior design professionals and has a proven ability to perform under a range of applications. Designed to look and feel like natural oak wood but made with high-performance technology, Master Oak is setting a new standard in the world of design.

"It's Master Oak's ability to combine performance, design integrity and sustainably in use that makes it an ideal decorative panel to elevate interiors with a high-quality surface finish," says Stuart McGonagle, Panels Sales and Marketing Manager at Big River Group. Master Oak HPL has many benefits over the real thing. Colourfast for longevity and a timeless look, its multi-texture surface is three times more scratch and stain-resistant than real oak, making it ideal for commercial applications. Its natural appearance is enhanced even more by the different types of pores and depth variations.

At the heart of Master Oak's impressive true-to-life look and feel is its Timber Touch Technology. Regular HPL and melamine-faced panels only have around three or four depth levels, which limits how much texture

can be applied to the surface. Master Oak is made with Timber Touch Technology, which has 64 different depth levels for 20 times more texture than regular structures. This gives Master Oak its impressive feel so that it has the touch of real oak – from rough to smooth and everywhere in between. It also gives a uniquely matt finish that has almost absent shine levels for a natural 'unfinished' effect. Along with more colour play and depth, and better sharpness and contrast from its many layers, Master Oak looks exactly like oak.

"Master Oak brings the look and feel of genuine wood with the durability and performance benefits of a surface made with busy commercial interiors in mind," says Stuart.

Another strength of Master Oak is that it can be effortlessly pressed to various cores like plywood, MDF and particleboard. This means that it's well suited to virtually all interior applications, from residential kitchen and bathroom cabinetry and horizontal joinery, commercial furniture and joinery, to shelving, doors and robes, as well as office/shop fittings and wall linings – Master Oak is a prodigious option for commercial and residential projects.

"We're very honoured to be a distributor of Master Oak. With Timber Touch Technology, UNLIN has pushed the envelope of expectation for authenticity in decorative panels. Emulating the real oak look and performance of an engineered material, Master Oak is truly a masterclass for the future of the panelling industry and in

authentic surfaces. Master Oak has recently been recognised on the international stage, winning the Product Design: Responsible Design category at the prestigious DNA Paris Design Awards," says Stuart.

For more information about Master Oak visit: www.bigrivergroup.com.au



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GREEN CONCRETE: THE KEY TO ACCELERATING AUSTRALIA'S DECARBONISATION

While Australia is making some progress towards decarbonisation, we can make a huge impact in the construction industry – which, globally, is reportedly responsible for 40 per cent of the world's annual greenhouse gas emissions. The biggest contributor to the industry's carbon footprint is concrete – the second most consumed material in the world after water, used so copiously that its emissions are greater than all countries except for China and the USA. Concrete reportedly contributes eight per cent of the world's carbon emissions.

A new report by Hatch, an award-winning multidisciplinary leader in engineering, operational and development projects in the metals, energy, and infrastructure industries, has found that 'green concrete' has the eco-credentials to be a key driver in reducing Australia's emissions.

The author of the report, Dr Ezgi Kaya, is a structural engineer at Hatch Australasia, where she co-leads initiatives on low-carbon concrete and parametric design. She has almost a decade of research and engineering consultancy experience across multiple sectors, and a broad knowledge of advanced design and analysis of complex structures under static and dynamic loadings such as earthquakes, impacts and blasts.

Dr Kaya says green concrete is a sustainable and environmentally friendly alternative to traditional concrete and an excellent

solution for reducing carbon emissions in the construction industry.

"Unlike conventional concrete, which requires a considerable amount of energy and resources to produce, green concrete often uses recycled materials and minimises the use of Portland cement, a major contributor to carbon emissions.

"To date, green concrete has been used in more than 60 projects across different sectors in Australia, including infrastructure, buildings, industrial, marine and geotechnical. Given that the carbon reduction achieved through its use can be as much as 80 per cent, the potential for green concrete to positively impact our emissions targets is monumental.

Dr Kaya says Australia is a country that has a vast potential for green concrete usage, thanks to its abundance of resources such as recycled aggregates, fly ash and slag. These materials can be used as a replacement for traditional aggregates and cement, making the production of green concrete more sustainable and eco-friendly.

She says: "Replacing just 50 per cent of traditional concrete with green concrete could reduce Australia's carbon emissions by approximately 17 million tonnes annually, which is equivalent to removing four million cars from the road."

Green concrete offers numerous benefits beyond emissions reduction – it is more

durable, more fire resistant, and has higher engineering properties, including high early-age strength, and less shrinkage. Its use in construction can lead to more sustainable and resilient infrastructure that is better equipped to withstand the impacts of climate change.

Designed to be more sustainable and environmentally friendly than traditional concrete, the key benefits of green concrete include:

- Reduced carbon footprint. One of the most significant benefits of green concrete is that it has a lower carbon footprint than traditional concrete[1]. This is because it typically contains recycled materials such as fly ash, slag, and silica fume, which reduces the amount of cement required to make the concrete. Cement production is a significant source of greenhouse gas emissions, so reducing the amount of cement needed is one of the most important steps towards reducing the carbon footprint of concrete.
- Improved durability. Green concrete often lasts longer than traditional concrete, due to its better resistance to cracking and shrinkage. This is because it typically contains additives that improve the concrete's strength and reduce the amount of water needed for mixing, which delivers a more durable finished product.

- Energy efficiency. Green concrete may improve energy efficiency. It is designed to have better insulation properties, thus lowering the amount of energy needed to heat and cool buildings made from the material.
- Cost savings. While green concrete is slightly more expensive to produce than traditional concrete, it offers cost savings in the long term. This is because it typically requires less maintenance and repair over its lifetime, which means lower ongoing costs for building owners and operators.
- Reduced waste. Green concrete helps reduce waste by using recycled materials that might otherwise end up in landfills. This helps conserve natural resources and reduces the environmental impact of construction projects.

The use of green concrete is already gaining traction around the world. It has been used in

the construction of high-profile buildings such as the Louvre Abu Dhabi and Amsterdam's Schiphol Airport.

In Australia, the benefits of green concrete are being recognised by industry leaders, who are advocating for its widespread adoption. Hatch's engineers are working with clients to identify projects in which green concrete can be used. The goal is to make this the new normal within the next few years.

"As Australia continues to push towards a sustainable future, the adoption of green concrete is a crucial step in achieving its decarbonisation goals. By embracing this innovative and environmentally friendly construction material, Australia can not only reduce its carbon footprint but also create a more sustainable and resilient built environment," Dr Kaya says.

The report is available upon request from <https://hatch.com>



Dr Ezgi Kaya

[1] Concrete is a mix of cement, aggregate and water. Cement is the binding agent and is generally produced in kilns where limestone is heated, and carbon dioxide is released in a process called calcination: $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$.

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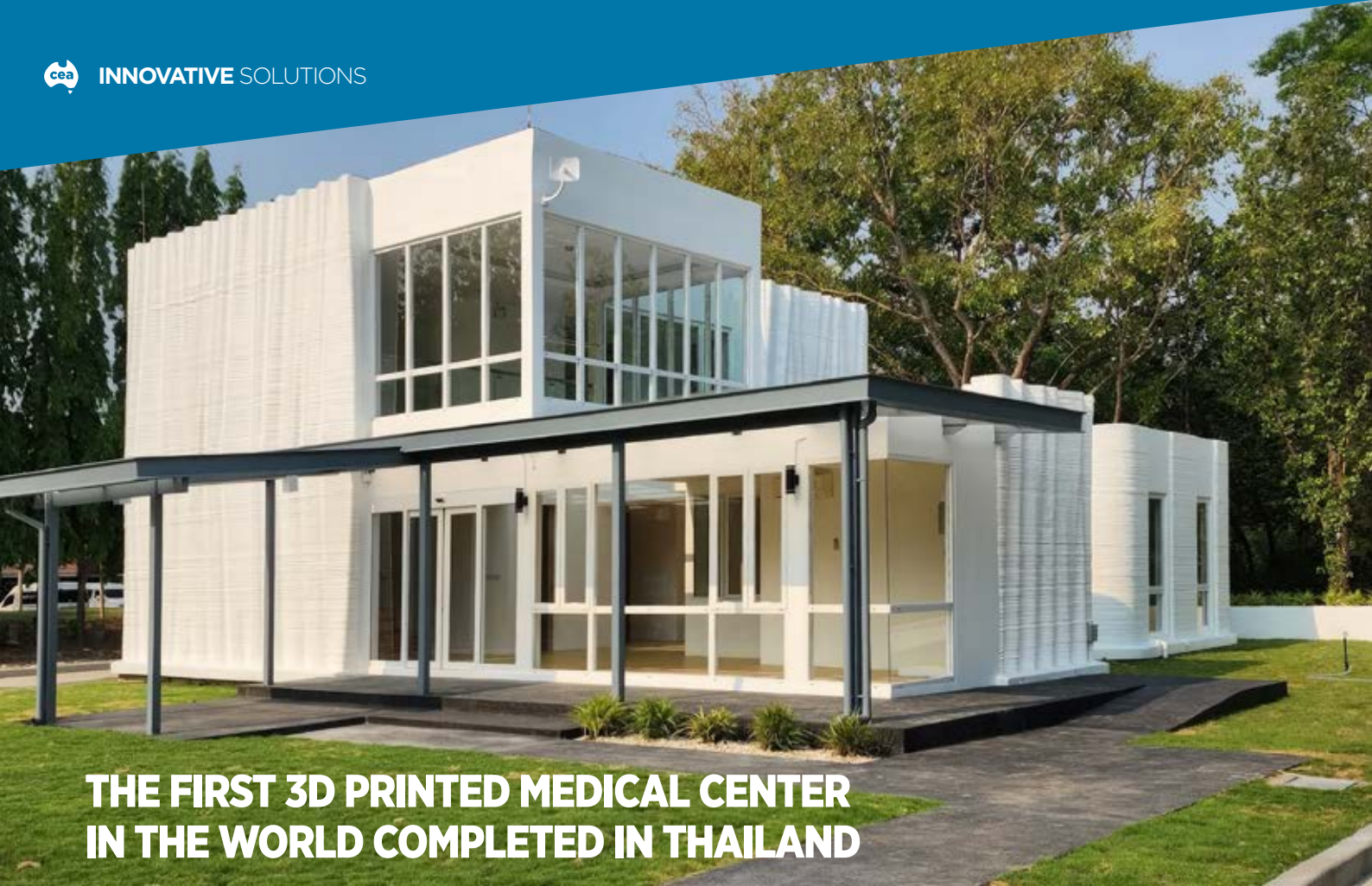
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THE FIRST 3D PRINTED MEDICAL CENTER IN THE WORLD COMPLETED IN THAILAND

3D CONSTRUCTION PRINTING BEING USED FOR MUCH MORE THAN RESIDENTIAL HOUSING.

SCG, Siam Cement Group, has completed the first 3D-printed medical centre in the world using a BOD2 3D printer from COBOD.

Located in Saraburi, Thailand, the new 2-story medical centre comprises a total area of 345m² over two levels, making it the largest 3D-printed building in the ASEAN countries. The unique and eye-catching design has only been possible thanks to the use of 3D construction printing technology.

Siam Cement Group (SCG), the largest and oldest cement and building material company in Thailand and Southeast Asia, recently revealed the successful completion of the first 2-story 3D printed building in ASEAN. What is more striking is the fact, that the building is the first 3D-printed medical centre anywhere in the whole world.

The building immediately stands out on the horizon with its wavy walls. This design solution is made possible and was easy to implement thanks to the 3D construction printer and the design freedom it allows. 3D printed buildings offer a wide range of benefits, including an easy-to-achieve flowing, freeform, increased building speed and reduced number of workers on site compared to conventional construction practices.

Simon Klint Bergh, COBOD Co-Founder and Head of APAC, commented: "Last year, I was proud to announce our local partnership with SCG for introducing our technology to

the Thai market. Now, the SCG team has truly shown the whole world, why they are the right partner with this fantastic accomplishment of printing a design-free structure like this."

"With this building, SCG is setting new standards for what can be done and showing the way for the market."

With the new 3D-printing technology, SCG now offers the market the chance to increase construction efficiency and reduce the environmental footprint by generating less waste on the construction site, while also increasing design flexibility. As an official distributor of COBOD in Thailand, SCG promotes the value of this innovative technology, which offers a range of benefits over traditional construction methods.

The building was specifically designed to support seismic loads, and while the use of 3D printing technology increased construction speed and reduced the amount of labour required compared to conventional building methods, it doesn't compromise on its engineered design capabilities.

While globally, 3D construction printing is primarily used for single-storey residential housing, as the new building by SCG shows, COBOD's technology is capable of delivering much more than that. In Africa, printers from COBOD have been used to construct schools, while JGC in Japan is using COBOD 3D printer technology for a range of industrial building

applications. Meanwhile, PERI in Austria has used the technology for an office extension.

Commenting on SCG's use of the printer and the plans for the future, Mr Chalermwut Snguanyat, 3D printing & fabric concrete technology director from SCG said: "Besides demonstrating SCG's capability to build a two-story commercial building using the COBOD printer, the project's highlight was to implement our research on a 3D printed structure."

"In this building, we successfully implemented results from our collaborative studies with top-tier universities in Thailand for constructing a single-story 3D printed load-bearing structure and a two-storey 3D printed non-load bearing structure."

"The design of the 3D-printed medical centre was approved by a senior professional engineer. The materials used in this building were SCG 3D printing mortars with strength classes of C75/80 and C30/35 for load-bearing and non-load-bearing 3D-printed walls, respectively," he said.

"As CPAC 3D printing solution under the SCG cement company umbrella, we aim to create best practices and standards for 3D printing construction," Mr Snguanyat added. "Moreover, our commitment is to help the construction industry become more sustainable and carbon-neutral through innovation and technology".



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BUILDING CLADDING WITH RECYCLED GLASS SCORES SKY-HIGH RESULTS IN SUSTAINABILITY

Engineers have developed new fire-safe building claddings using recycled glass, creating a promising circular-economy solution to address a major waste stream.

The RMIT University team worked with materials technology company Livefield to produce the composite cladding, which they say is cheap, structurally robust and fire-resistant.

Lead researcher Associate Professor Dilan Robert said using recovered glass waste as an alternative cladding material could one day help reduce the amount of glass that goes to landfill. Globally, about 130 million tonnes of glass are produced each year, but only 21% of that is recycled glass.

The team's non-combustible claddings use 83% recycled glass, along with relatively low amounts of plastic binders and fire-retardant additives.

Robert said their special blend of materials overcame the challenges with glass claddings, which were brittle and prone to fracture, as the plastic binders provided "improved toughness".

"Experiments have proven that our claddings are fire-safe, water-resistant and cheap, and meet structural and environmentally sustainable requirements," said Robert from RMIT's School of Engineering.

The technology has met the key compliance requirement of claddings for non-combustibility (AS1530.1) set by Standards Australia.

The technology, which is now being patented by Livefield, has been trialled for large-scale manufacturing capability.

Panels using the team's technology are installed at RMIT's Bundoora campus to demonstrate the technology's feasibility as building claddings.

"Livefield is keen to upscale the manufacturing process of the recycled glass composite cladding, with further research support from RMIT," Robert said.

A SUSTAINABLE SOLUTION TO A BIG WASTE CHALLENGE

Robert said millions of tonnes of reusable glass goes needlessly into landfill every year, and more glass could be recycled into products in the construction industry.

"Glass is one of the most recyclable materials in the world as it doesn't lose its quality or purity, and it can be recycled for multiple uses across a wide range of industries," he said.

"By using high amounts of recycled glass

in building claddings, while ensuring they meet fire safety and other standards, we are helping to find a solution to the very real waste challenge."

The research team of civil and material engineers was keen to work with industry around the world to find more ways of using recycled glass in products, Robert said.

"Reuse of glass that would otherwise go to landfill will bring environmental, economic and social benefits," he said.

MAKING CITY BUILDINGS FIRE-SAFE WITH THE CIRCULAR ECONOMY

Robert said testing of the new cladding materials for fire safety was an important focus of the research.

"Claddings play a key role in preventing the spread of fire, particularly in high-rise buildings," Robert said.

"Some of the most catastrophic building fires, like the 2017 Grenfell tower fire in London that led to many deaths and injuries, have been attributed to the poor fire-prevention performance of cladding materials."

These tragic events underscored the importance of understanding and designing fire-resistant cladding materials and systems for the building and construction sector, Robert said.

"Building fires can happen anywhere at any time and cannot be predicted. Therefore, fire safety requirements should be embedded in the design of buildings."

THE POWER OF COLLABORATION

This successful project is a major collaboration involving RMIT, Cooperative Research Centres Projects grants, the ARC Industrial Transformation Research Hub for Transformation of Reclaimed Waste Resources to Engineered Materials and Solutions for a Circular Economy (TREMS), Sustainability Victoria and other industry support.

Robert led the project with support from RMIT colleagues Dr Edwin Baez, Associate Professor Everson Kandare, Professor Sujeeva Setunge and Professor Kevin Zhang.

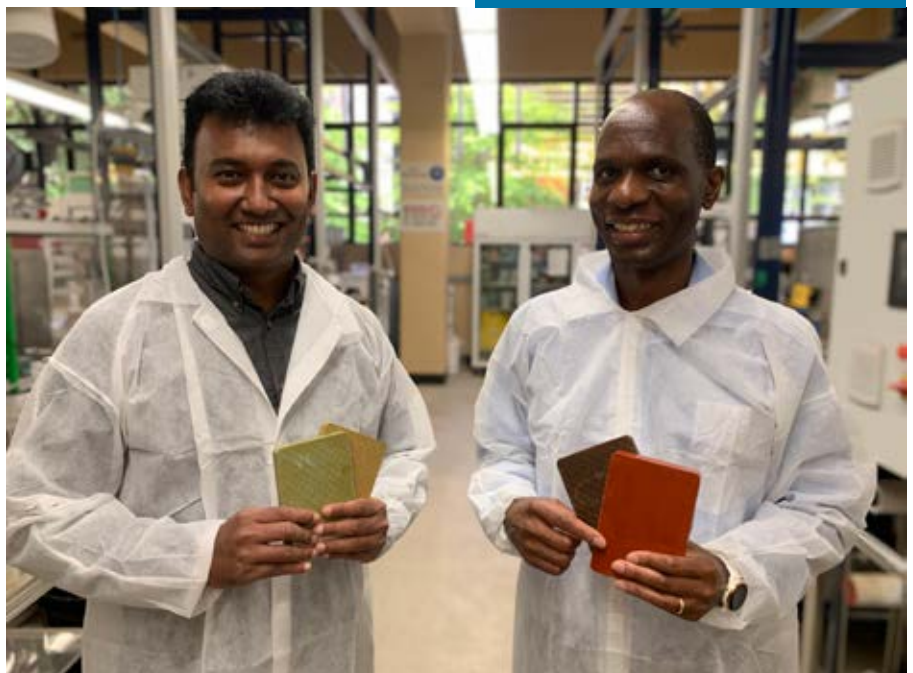
Innovation supported by peer-reviewed research

The RMIT team behind the new cladding technology has also recently published peer-reviewed research on fire-safe compliance of materials for building claddings and the use of recycled glass in construction products.

'Fire compliance of construction materials for building claddings: A critical review' is published in *Construction and Building Materials* (DOI: 10.1016/j.conbuildmat.2022.129582).

'A new technology of transforming recycled glass waste to construction components' is published in *Construction and Building Materials* (DOI: doi.org/10.1016/j.conbuildmat.2021.125539).

RMIT University lead researcher Associate Professor Dilan Robert and Associate Professor Everson Kandare with samples of the cladding made mostly from recycled glass.



EASY MCI® PEEL-OFF COATING PROTECTS WINDOWS, DOORS, AND MORE

At the end of a construction job, when the last bucket of paint has been closed and the last nail has been pounded in, you are done! Right? Unfortunately, finishing a construction project may not be that easy since clean-up comes next. Worse than that, after all the work has been done, the contractor may find that windows, doors, frames, and other surfaces were damaged in the process. Preventing these surprises and the necessary repair, replacement, or damage control that can follow does not have to be that difficult. With MCI® Peel-Off Coating, temporary protection is easy to spray on and peel off when the project is finished.

MCI® Peel-Off Coating is an acrylic water-based coating for temporary protection of non-porous surfaces against physical abrasion, weathering, and corrosion. It is low VOC (24 g/L) and may be applied by spray, roll, or dip. When no longer needed, the coating can be peeled off the surface and disposed of as solid waste.

MCI® Peel-Off Coating can be tinted to several basic colours to blend in with or stand out from the surrounding environment. It offers UV resistance for outdoor applications, in addition to temporary protection from salt and chemical-induced corrosion.

Although water-based, MCI® Peel-Off Coating will not be softened or penetrated by most solvent-based paints.

One of the primary uses for MCI® Peel-Off Coating is to protect windows, doors, and frames from the time they are installed until the rest of the job is completed. Windows and doors often go into place before the construction work is finished, leaving them vulnerable to drips or splatters from paints or putties or nicks and scratches from tools and equipment being jostled around the construction site.

Spraying non-porous surfaces with MCI® Peel-Off Coating before construction proceeds can help the contractor and building owner avoid many regrets later. Instead of a discouraging damage inspection at the end of the day, workers can simply peel the coating off the windows, doors, and frames to reveal the scratch-free surfaces beneath.

MCI® Peel-Off Coating is also a great way to mask off windows, doors, frames, and even floors during a large-scale painting project (indoors or outdoors) or during the application of surface treatments that could cause etching. Metal window frames, beams, or railings that are not designed for outdoor weathering but will be exposed to the elements during



construction can also be protected from corrosion and atmospheric damage by temporarily coating them with MCI® Peel-Off Coating. The product can also be used on light fixtures, ceilings, doorknobs, and many other non-porous surfaces that need temporary masking and protection. Going back one step earlier in the process, manufacturers of windows and doors can even apply MCI® Peel-Off Coating to sensitive areas of their products to avoid physical damage or corrosion during shipping and handling.

For more information, visit: <https://www.cortecmci.com>

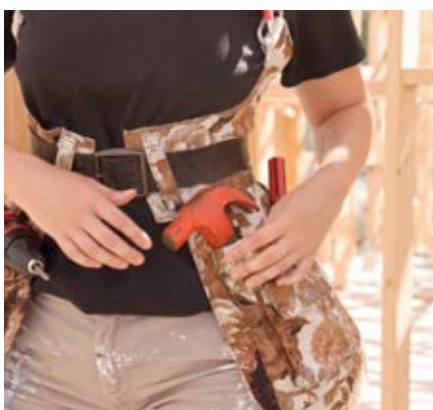
RMIT STUDENTS DESIGN TOOLBELT FOR WOMEN AND GENDER-DIVERSE TRADIES

If you're a woman working in trades and looking for a toolbelt, you can expect a slew of standard options in pink or, if you're lucky, simply manufactured in a smaller size.

Only about 3% of tradies are women, and there are many barriers to women entering this sector, including flexibility for those with caring responsibilities, women's toilets in TAFEs and – yes – uniforms that fit.

In a 2013 report commissioned by the New South Wales Skills Board's predecessor, the Board of Vocational Education and Training, it was found that while issues like this may seem small, they can be a daily, major irritant to women in trades.

Melissa Tinetti, Director, Built Environment and Sustainability at RMIT has personal experience of this.



"From my experience as a woman in the construction industry, it has always been a challenge to find suitable toolbelts and, at times, even clothing," Tinetti said.

RMIT fashion student Charlotte Hunter added that as the trade industry becomes more gender diverse, so too must the workwear.

"Coming from a female perspective, toolbelts currently available in the market are not designed for my figure," Hunter said.

"Their anchor points are predominantly around the hips and slide down with any excess weight."

For non-male bodies, this uneven weight distribution could cause injury if worn for long periods of time.

RMIT Fashion Design students designed a series of gender-diverse toolbelts for a project involving Vocational Education Trades students, addressing the need for more inclusive trade wear for women and gender-diverse people.

To mitigate the potential for injury and design a toolbelt that works on a wider array of figures, Hunter decided to work with two major anchor points on the shoulders and waist.

"The symmetric design allows for even weight

distribution, and by anchoring around the waist of a feminine figure, the belt will not slide down and potentially cause injury."

As part of the project, fashion design and plumbing trades students discussed their ideas.

Sebastian La Rocca, Program Manager for Plumbing and Carpentry, was blown away by the innovative designs.

"The students really captured the essence of a toolbelt and reimagined it in so many different ways, I would love to see some of these concepts become reality," La Rocca said.

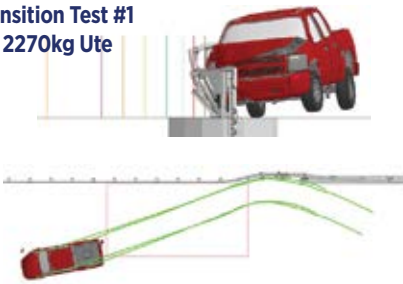
While there are no plans to take these designs to market yet, it has pushed the students to think differently about how our everyday tools and clothes can be better designed with diversity in mind.

"This has shown me we don't have to just accept what already exists, we can adapt and change products to make people's lives easier and more productive," Hunter said.

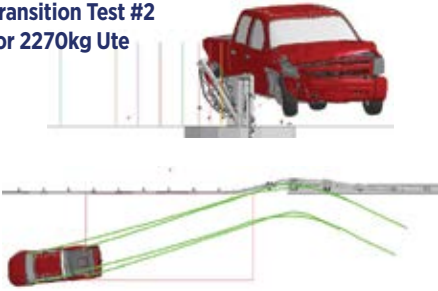
"By paying attention to the needs of the wearer, a new and necessary product can be created. With this fresh lens on design, I can bring initiative to my final year of study and hopefully solve problems and fill gaps in any market."

The toolbelt design was inspired by the straps on a hiking backpack.

Transition Test #1
for 2270kg Ute



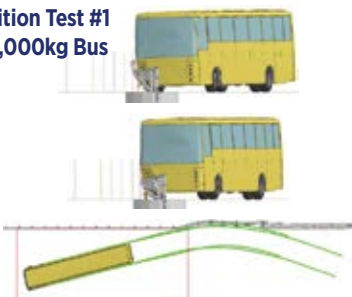
Transition Test #2
for 2270kg Ute



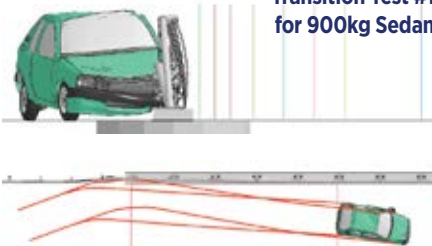
Transition Test #3
for 2270kg Ute



Transition Test #1
for 13,000kg Bus



Transition Test #1
for 900kg Sedan



The DOLRE bridge traffic barrier development demonstrates how the incorporation of FEA into the design process can optimise a solution that is vastly different from the solutions that traditional Engineering methodologies would produce.

A problem was identified and through the iterative use of FEM combined with Eurocodes for structural analysis a solution was found and optimised that was vastly different to the direction that traditional engineering was leading.

Once the bridge barrier design was optimised, the same process was used to assess **transition designs** to various European roadside barriers in accordance with EN1317 and TR16303-2011 requirements.

Australian authorities required product assessment to Australian bridge standards. Future finite element modelling in accordance with MASH standards and NCHRP179 validation requirements satisfied ASBAP's analysis for both traffic barrier and transition designs.

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ASSOCIATION MEMBERSHIP GROWS FOLLOWING STRUCTURE CHANGE

Membership is at an all-time high for National Precast, the country's peak body that represents and promotes the Australian precast concrete industry.

According to National Precast CEO Sarah Bachmann, the organisation made changes to membership categories and fees which now provide cost-effective options for precasters, suppliers and professionals including architects, engineers and head contractors.

"Without having not really even promoted the new membership options yet, we are delighted to already be experiencing a great response," Bachmann commented.

Some of National Precast's recent new members include:

- Sunset Sleepers** (Precaster) - Manufactures engineer-certified, durable and reinforced concrete sleepers for all types of applications. <https://www.sunsetsleepers.com.au/>
- Urban Cranes** (State Industry Supplier, WA) - With a team skill set not typical of most crane companies, Urban Cranes assist the construction industry with specialised high risk project delivery services. <https://www.urbancranes.com.au/>
- Ironside** (Provisional Precaster) - Ironside's origins are in forward-thinking multi residential apartment construction with precast manufacture new to the company's capability. <https://ironside.com.au/>
- PSA** (National Industry Supplier) - Supplies the precast industry with consumables and lifting products and specialty services. <https://www.psa.com.au>
- Barrason's Engineers** (Professional Associate Organisation) - Providing high quality and efficient structural and civil design work throughout Australia, specialising in precast engineering. <https://www.barrasonengineers.com.au>
- Dinale Systems** (National Industry Supplier) - Australian distributor for the NMB Splice Sleeve, a reinforcing bar connection system consisting of a cylindrical, ductile iron casting sleeve and a special high-strength, non-shrink grout filler. <https://www.splicesleeve.com>
- Milwaukee Tool** (Industry Partner) - Provides durable accessories, innovative hand tools and practical storage equipment to improve productivity. <https://www.milwaukeetool.com.au>
- Novus Precast** (Precaster) - A quality-assured manufacturer of precast concrete elements servicing the south-east Queensland market and offering clients customised solutions, utilising the latest precast technology. <https://www.novusprecast.com.au>
- Aptus Concrete Connections** (National Industry Supplier) - A disruptor to conventional construction methods, supplying concrete connections to reduce floor cycle times, eliminate propping and grouting and improve safety. <https://aptus.systems>
- Total Precast Systems** (Precaster) - Manufactures a wide range of concrete precast products to suit a variety of applications in northern NSW. <https://www.facebook.com/totalprecastsystems>
- Action Solution** (Affiliate Precaster) - Designs, manufactures and installs precast concrete flooring, walling, retaining walls, columns or footings and other precast concrete products in WA. <https://www.actionsolution.com.au>
- Hunter Precast** (Affiliate Precaster) - Designs, manufactures and installs quality precast concrete products throughout the Newcastle and Hunter Valley regions in NSW. Part of the Hunter Construction Group. <https://hunterprecast.com.au>
- Construc** (Professional Associate Organisation) - Offers design, documentation and inspection services to the construction, civil and temporary works industry throughout Australia. <https://www.construc.com.au>
- ARP Training** (Professional Associate Organisation) - a training broker based in VIC, assisting precast manufacturers and allied stakeholders to access government-funded nationally accredited worker education. <https://arp-training.com.au>

LINKING AUSTRALIAN PRECAST TO INTERNATIONAL TECHNOLOGY

Australian precast stands proudly on the world stage. Many precast projects have been recognised both nationally and internationally in architectural awards. As an industry that is constantly evolving, one company is bringing overseas technology to Australia.

According to National Precast CEO Sarah Bachmann, keeping up with new developments in technology and new products from abroad is one of the role the precast industry's peak body plays in keeping its members informed.

"Our precaster members are always trying to get ahead of the game, and knowing about new products and services is one reason why many of them join," says Bachmann. "One of our newer Industry Supplier members NexsoftAustralia, is such an example of how we connect Australian precasters to what's on offer overseas."

NexsoftAustralia represents three international stakeholders in the precast manufacturing world, including PROGRESS Group, IDAT and RATEC. Owner Bharat Dewani says he is excited to be bringing new technology to Australia.

While PROGRESS offers an impressive range of complete solutions for precast factories, from systems, machinery and software, IDAT brings to Australia software that is based on AutoCAD and Revit, and RATEC offers precast manufacturers highly efficient magnetic formwork. All three companies have their head offices located in Germany.

"That can present obvious challenges for Australian precasters. For local precast manufacturers, having a local contact via NexsoftAustralia makes the possibility of integrating these systems and technologies a lot simpler," says Bachmann. "The company is fully versed with all of the products and services offered by the three companies."

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PRECAST FLOORING DELIVERS 20 METRE SPANS IN NEW HYPERSCALE TECHNOLOGY CAMPUS DATA CENTRE

Long clear spans and an ability to support high loads are just two of the benefits of the precast concrete flooring planks and beams that have been used in a new data centre in the Melbourne suburb of West Footscray.

The new 60,000m² Merlot 3 Data Centre is being developed by NEXTDC and is part of the full 100,000m² M3 site, which is being developed into a 150MW technology campus, to target hyperscale clients when complete.

Data centres have fast become a fundamental part of digital infrastructure. Storing, processing and disseminating data and applications, they are vital to the continuity of an organisation's day-to-day operations as they house critical and proprietary assets. They are somewhat unique in their requirements, needing to provide security and maximum open floorspace while supporting heavy loads.

Hollowcore flooring planks and precast beams manufactured by National Precast Master Precaster Hollow Core Concrete easily satisfied those requirements, delivering up to 20 metre-long, clear spans without intermediate support for the beams, with the hollowcore planks spanning perpendicular to the beams.

While typical flooring load requirements for the project were 21 kPa, the hollowcore planks had the ability to support up to 45kPa loads in some specific areas, with an up to four-hour fire

rating. Due to the heavy weight of the precast beams – up to 70 tonne – void formers were used to create internal voids to reduce the weight. Using hollowcore planks also allowed for an almost 40% weight reduction of the structure.

According to Hollow Core's Managing Director Peter Healy, the use of precast saved a huge amount of time on the construction programme.

"Minimal onsite propping was required, and there was a huge time and cost saving related to the setting up and removal of formwork that would have been required, had in-situ concrete been used," Mr Healy commented.

The complex geometry in parts of the building's design also favoured precast construction.

The complexities meant that a significant amount of coordination was required between all the parties, including the builder, precaster and other suppliers.

"Using 3D modelling software facilitated efficient communication with the other parties, resulting in very minimal design clashes onsite and a very happy client," added Mr Healy.

Project: Merlot 3 Data Centre
Master Precaster: Hollow Core Concrete
Client: NEXTDC
Builder: KAPITOL Group
Engineer: ARUP Group
Architect: HDR Architects



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You wouldn't turn up with
the wrong tools...
Why risk turning up with
the wrong steel?



Choosing
the right
construction
steels for your
project is as important
as having the right tools for
the job.

Together with the increased risk of
structural failure and serious health and
safety ramifications, in these days of
widespread litigation and strict 'chain of
responsibility' legislation, using materials that don't
conform with all of the relevant Standards can spell
disaster for engineers, specifiers, suppliers, builders and
contractors in more ways than one.

ACRS certification demonstrates independently and expertly that the
supplier and the steels consistently meet the Standards stated on the
certificate - giving you confidence in the conformity of your steel supply.

**ACRS - Independent, Expert Third Party Certification and Verification of
Reinforcing, Prestressing and Structural Steels for Compliance with
Australian and New Zealand Standards**

JAS-ANZ



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