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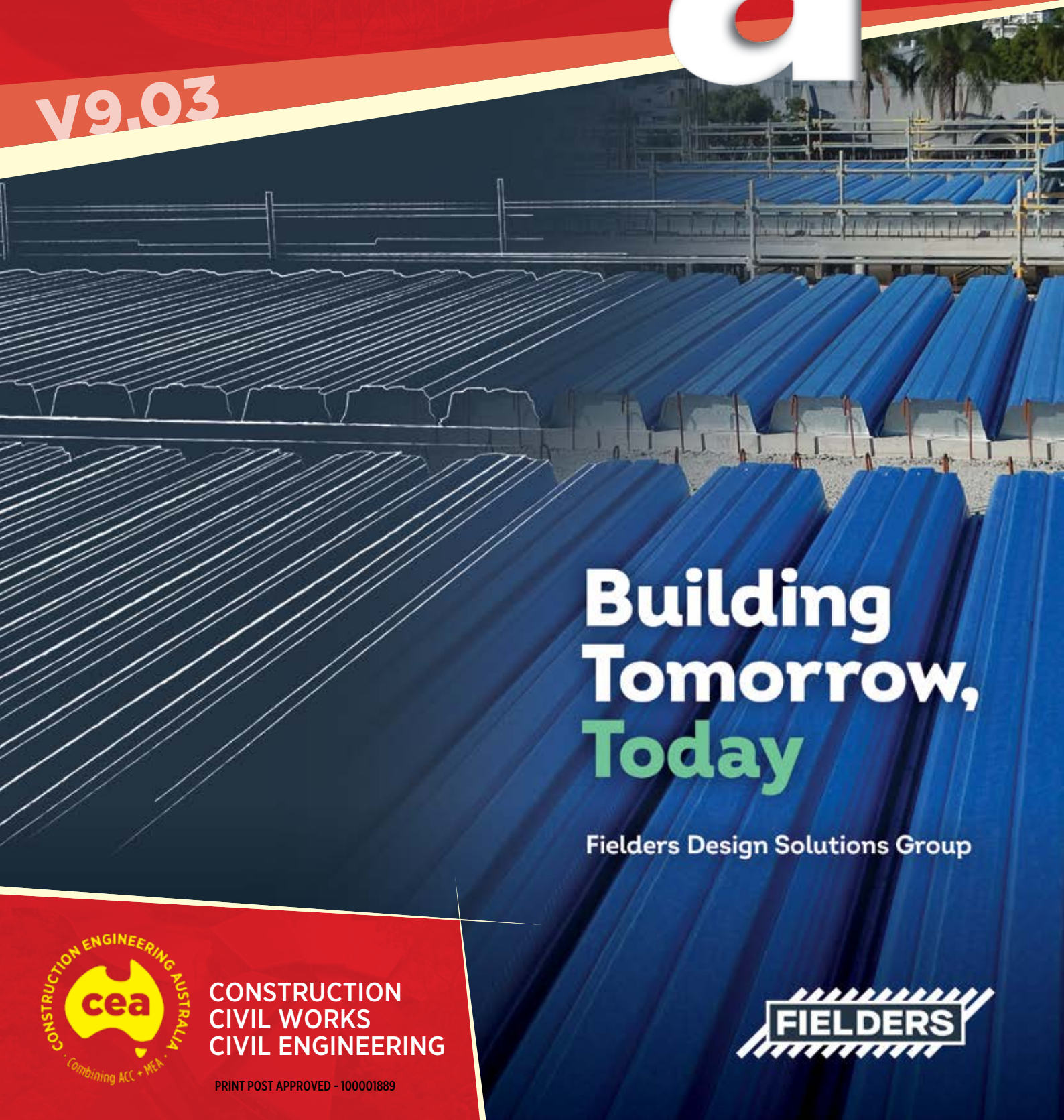

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OCT/NOV 2023
Volume 9 Number 3

Published by:
Editorial and Publishing Consultants Pty Ltd
ABN 85 007 693 138
PO Box 510, Broadford
Victoria 3658 Australia
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www.epcgroup.com

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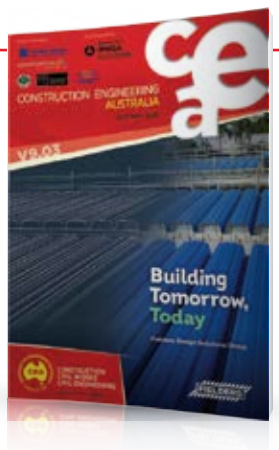
Registered by Australia Post
Publication No. 100001889
ISSN 2204-7247



About the Cover

Lysaght and Fielders, businesses of BlueScope in Australia, have announced the establishment of the new Design Solutions Group (DSG), a dedicated team of subject matter experts providing market-leading support to the industry on LYSAGHT® and Fielders® specialist range of products.

▶ **Turn to Page 10 for the full story.**

MAKING AFFORDABLE HOUSING MORE AFFORDABLE

Dear Readers,

It's a sad fact that an ever-increasing number of Australians are struggling to access permanent, secure or affordable housing – and it's not just a recent occurrence. Indeed, for as long as I can remember, there have been calls to increase public housing stocks and improve access to affordable housing. Unfortunately, despite these calls, Australia continues to slip backwards on both counts.

In fact, recent reports state that rents across Australia have increased by an average of 17 per cent over the past 12 months alone, with prices for rental units in Sydney and Melbourne increasing the most, going up by 19 and 17.5 per cent, respectively, making even the most basic rentals unaffordable for many - and the result is devastating.

According to Homelessness Australia's 2023 Fact Sheet in 2021-22, some 272,700 people were supported by homelessness services. Alarmingly, a further 105,000 people sought help but were unable to be assisted because of shortages of staff, or accommodation or other services. That's 300 people a day turned away because services are overstretched!

Now, before I continue, I feel it would be disingenuous of me not to acknowledge the outstanding work being done by all levels of government, together with many of the nation's support and welfare services (both private and public organisations), however, the latest statistics also point to the fact that much more needs to be done... urgently.

Indeed, while there are reportedly more than 175,000 households currently on the waiting list for public housing, various sources place current estimates on the public/social housing shortfall in Australia between 430,000 and 500,000+ dwellings. To put that into perspective, the Federal Government's $10 billion Housing Australia Future Fund (which, incidentally, I believe – in a totally non-partisan way - is an extremely worthwhile investment) aims to build 30,000 social and affordable housing properties in its first five years. A laudable effort certainly, but one which falls extremely short of the mark in terms of meeting demand.

In short, even when combined with the social and affordable housing projects being supported by state and local governments, NGO's and other private sector service providers, an additional 30,000 dwellings over 5 years will not come close to meeting even the immediate need.

That said, I believe that one of the major issues limiting our capabilities in the public and affordable housing sector is one of methodology. More specifically, construction methodology.

What's more, I believe there is an answer to this issue, and that answer is prefabricated and modular construction, including, of course, precast concrete construction.

It seems to me – as an external observer – that the concept of 'affordable public housing' in Australia, does not extend to the cost of construction. Indeed, if you consider the target of 30,000 houses for an investment of $10 billion, the approximate cost per dwelling runs at $333,000.

Now, while I understand the need for land, planning, services, utilities, etc. must also be considered as part of a dwelling cost, I believe that we can do much better. And it's not only about the cost...

The apparent focus on 'traditional' design and construction methods also means that these dwellings take much longer to deliver than prefabricated, precast or modular homes.

As an example, we have seen projects overseas where precast home units featuring prefabricated kitchen and bathroom units, together with a standardised precast concrete design, are being delivered at a rate of 60 - 70 units per month, at a cost of around AUD$60,000 for a 65m2 2-storey duplex unit.

From a local perspective, even the most rudimentary Google search brings up numerous companies around the country offering prefabricated compact homes in 1,2,3 and 4-bedroom formats for well under $100,000 delivered.

Sure, these aren't your 'traditional' homes or units, but they are new, modern, fully-featured and, most importantly, can provide permanent, secure housing for people who desperately need it.

In short, they may not be ideal for every situation, but I feel certain that if constructed as part of appropriate developments (e.g. with access to public transport, shops and services) they would provide an excellent, 'more affordable' affordable housing solution in a much shorter timeframe.

Anthony T Schmidt
Managing Editor

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WATCH NOW

Backing architects to design low-carbon buildings for net zero

The Federal Government is helping architects decarbonise buildings, delivering $100,000 to support a new training program aimed at lowering emissions before construction even starts. This investment will deliver a new Australian Institute of Architects' training program to equip architects with the tools to tackle the complex challenge of reducing embodied carbon in buildings.

A building's embodied carbon includes the emissions produced by material extraction, production, and transportation of building products, as well as construction, maintenance, repairs, and renovations. Current market solutions can offer five to 18 per cent reduction in embodied carbon while also achieving a 0.4 to three per cent reduction in material costs for typical building and infrastructure projects.

As the electricity grid decarbonises and energy efficiency is embraced by homes and businesses, embodied carbon will overtake operational emissions, growing from 16% of a building's total emissions in 2019 to 85% by 2050.

Assistant Minister for Climate Change and Energy, Jenny McAllister said reducing embodied carbon would be crucial to helping to achieve net zero emissions by 2050.

"Architects can dramatically reduce emissions from our built environment before one brick is even laid, just by making different design choices," said the Assistant Minister.

"Rethinking opportunities and making smarter choices in building design will help decarbonise the industry, but also save costs. Cost-effective solutions already exist, and we want to help bring these solutions to more architects across Australia.

"Clever design strategies, like repurposing an existing structure in the Quay Quarter Tower, saved 12,000 tonnes of embodied carbon. This is equivalent to taking 2,600 cars off the road.

"We want to help our architects design for a net zero future. This new training program will do just that."

The new program includes a roadmap and toolkit developed by industry experts, that will be delivered both in person and online by the Australian Institute of Architects.

World Medal honours beacon of engineering education

Professor Sally Male

Professor Sally Male, Director of the Teaching and Learning Laboratory in the University of Melbourne's Faculty of Engineering and Information Technology (FEIT), has been awarded the 2023 World Federation of Engineering Organisations (WFEO)Medal for Excellence in Engineering Education.

The award acknowledges Professor Male's leadership in engineering education research and practice, especially in curriculum development, industry engagement and inclusion, which have helped to provide engineering students of all backgrounds in Australia and internationally with the best possible opportunity to develop their professional capabilities.

The WFEO Medal was established in 1999 to help draw global attention to the need for continuous improvement in the quality, delivery and relevance of engineering education and training. Professor Male was nominated for the Medal by Engineers Australia, of which she is a Fellow.

She joined the University in 2021 and established the Teaching and Learning Laboratory at FEIT, Australia's only such laboratory. She has hired three lecturers and leads the laboratory's research program in engineering and computing education, as well as capacity building, support and celebration to advance education.

FEIT Dean Professor Mark Cassidy congratulated Professor Male on her achievement. "We are immensely proud of Professor Male and this outstanding, well-deserved recognition," Professor Cassidy said.

"Sally Male's efforts have not just benefited engineering students at the University of Melbourne, but graduating engineers around the country and beyond. Thanks to her rigorous research, innovation and leadership in engineering education, society will see a more diverse and better equipped generation of engineers, who can solve complex challenges with tenacity, creativity and a strong foundation of professional skills and knowledge."

Professor Male said she was deeply honoured to receive the Medal.

"It is a tremendous honour for me to be nominated and extraordinary to be chosen by WFEO as the Laureate to receive the Medal in 2023," she said.

Having studied electrical engineering, Professor Male began her research career with a focus on engineering education research. Building on her PhD, Competencies of Engineers Graduating in Australia, she co-authored submissions to Engineers Australia's development of competency standards and the Review of the International Engineering Alliance Graduate Attribute and Professional Competency Framework.

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Seequent acquires geothermal simulation leader Flow State Solutions

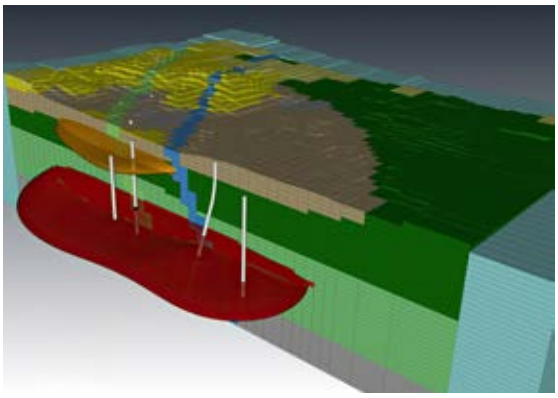
Bentley Systems recently announced that Seequent, The Bentley Subsurface Company, has signed an agreement to acquire Flow State Solutions, an industry leader in geothermal simulation software. The move further solidifies Seequent's position as the most comprehensive subsurface software provider for the geothermal industry.

Flow State Solutions' geothermal reservoir, wellbore, and surface network simulation software helps project developers and operators better understand geothermal resources for asset development and optimization and improved well performance. Combining Flow State Solutions' Volsung portfolio with Seequent's capabilities creates the most robust end-to-end solution for reservoir analysis available. Detailed models of the subsurface built-in Leapfrog Energy can be utilized in Flow State Solutions' simulation environment to build a full picture of a geothermal asset.

Geothermal industry leaders are already utilizing both solutions to better understand their resources. Simon Webbison, Vice President, Exploration and Resource Management, Ormat Technologies Inc., said, "Ormat Technologies is one of the largest and most active geothermal companies globally, and we are delighted to see the combination of Seequent and Flow State Solutions software capabilities through this acquisition. We already use both companies' software to better understand our geothermal assets and predict performance, and we are looking forward to working with the joint team to continue driving our success."

Graham Grant, CEO, Seequent, said, "We are delighted to welcome the Flow State Solutions team to Seequent. Geothermal has the potential to help solve the world's biggest energy challenges. With this acquisition, Seequent's best-in-class subsurface analysis software enables a full understanding of geothermal asset performance."

Flow State Solutions co-founder Jonathon Clearwater, who joins Seequent as Technical Domain Expert, Reservoir Engineering, said, "We are excited to join Seequent's energy team. By combining Seequent's expertise and our technical capability in geothermal modeling, we are looking forward to making a significant contribution to the renewable energy transition through improved management of natural resources."



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Former Chief Scientist of Australia

Amy Lezala Zahr
EngExec FIEAust
Chief Engineer - Rail
Department of Transport and Planning

Eytan Lenko
CEO
Boundless Earth

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Climate Smart Engineering Conference: Time to Act

Ready to accelerate Australia's transition to net zero emissions? Join Engineers Australia's, *Climate Smart Engineering* **(CSE23)** conference at Melbourne Convention and Exhibition Centre this month, 29-30 November.

Don't miss your chance to be part of the conversation on the future of engineering and sustainability at this conference connecting engineering minds, ideas and opportunities.

CSE23, is not just another conventional gathering. It serves as a call to engineers, to be at the heart of climate solutions, inspire innovation, and be the driving force behind the transformative changes urgently needed for our planet. CSE23 is a pivotal event where these aspirations and initiatives converge, propelling engineering toward a sustainable, climate-resilient future.

The two-day comprehensive conference program features an inspiring plenary program, over 150 expert-led technical sessions, a networking reception, site tours and a dynamic exhibition, ensuring that there is something for everyone who attends.

By participating, delegates will gain valuable insights and resources from leaders in their respective fields and bolster their professional networks by reconnecting with familiar peers and forging new connections. It is a chance to gain a unique platform to actively contribute your expertise and skills towards addressing the challenges associated with achieving net-zero emissions.

PLENARY PROGRAM HIGHLIGHTS:

- Calling for engineers to work on the largest economic transition since the dawn of agriculture - *Dr Alan Finkel AC, Former Chief Scientist of Australia.*
- The circular economy as an accelerator - *Lisa McLean, Chief Executive Officer, Circular Australia.*
- The engineering mindset – making change happen - *Eytan Lenko, Chief Executive Officer, Boundless Earth.*
- How can organisations overcome the engineering skills shortage that might inhibit progress? - *Join this panel of experts and stakeholders for an in-depth discussion on the ways forward for addressing the current, emerging and future engineering skill gaps, with a focus on education, recruitment and retention, skilled migrant participation and demand forecasting.*
- The next generation's hopes for the future *- Draw inspiration from a panel of Gen Z graduates, students and young engineers sharing their vision for a climate-resilient future and how best to achieve net zero.*

TECHNICAL PROGRAM

Offering a diverse range of speakers from academia, government and industry, this year's full technical program will facilitate a platform for interdisciplinary collaboration and knowledge exchange.

LAST CHANCE TO REGISTER!

Don't miss your chance to connect with the profession's brightest and boldest minds, government and industry leaders.

Visit **https://bit.ly/3Eoovk9** to view the full program and to register for CSE23.

Lending for new homes remains at 20 year lows

"Despite a rise in the number of loans for the construction and purchase of new homes in September, they remain around their lowest levels for the past two decades," stated Tom Devitt, HIA Senior Economist.

The ABS recently released the Lending to Households and Businesses data for September 2023, which provides statistics on housing finance commitments.

"There were only 4,282 loans issued for the construction or purchase of new homes in September, leaving the last three months 27.7 per cent lower than during the same quarter last year," added Mr Devitt.

"Lending activity has been weighed down by the fastest increase in interest rates in a generation. This is drying up the pipeline of new home-building work across the country.

"This is consistent with yesterday's data that showed new house building approvals around decade lows.

"This low volume of lending and approvals will produce a decade-low volume of new housing starts in 2024.

"There are very long lags in this cycle due to the record high volume of building work that was in the pipeline when the RBA first raised rates in May 2022. The volume of houses under construction only started declining in the June quarter of 2023, and remains elevated, a year after the first increase in the cash rate.

"This large volume of building work has obscured the impact of these rate rises on the broader economy, especially unemployment, as the building industry employs over one million Australians.

"This slowdown in lending for new housing will make it increasingly difficult to reach the Australian government's target of building 1.2 million new homes in five years," concluded Mr Devitt.

In original terms, the total number of loans for the purchase of construction of new homes in the three months to September 2023 declined in all jurisdictions compared to the same quarterly period a year earlier, led by the Australian Capital Territory (-70.0 per cent) and the Northern Territory (-59.4 per cent), and followed by South Australia (-32.3 per cent), New South Wales (-30.9 per cent), Tasmania (-30.1 per cent), Victoria (-27.0 per cent), Queensland (-26.4 per cent) and Western Australia (-15.1 per cent).

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At the Design Solutions Group, we're not just experts in Fielders® and associated products; we're your project partners. With a nation-wide team specialising in product application and design, we drive innovation and efficiency in every collaboration. Our focus? Delivering unmatched support and value to design and construction professionals, from precise design guidance and advanced BIM modelling to nuanced engineering insights.
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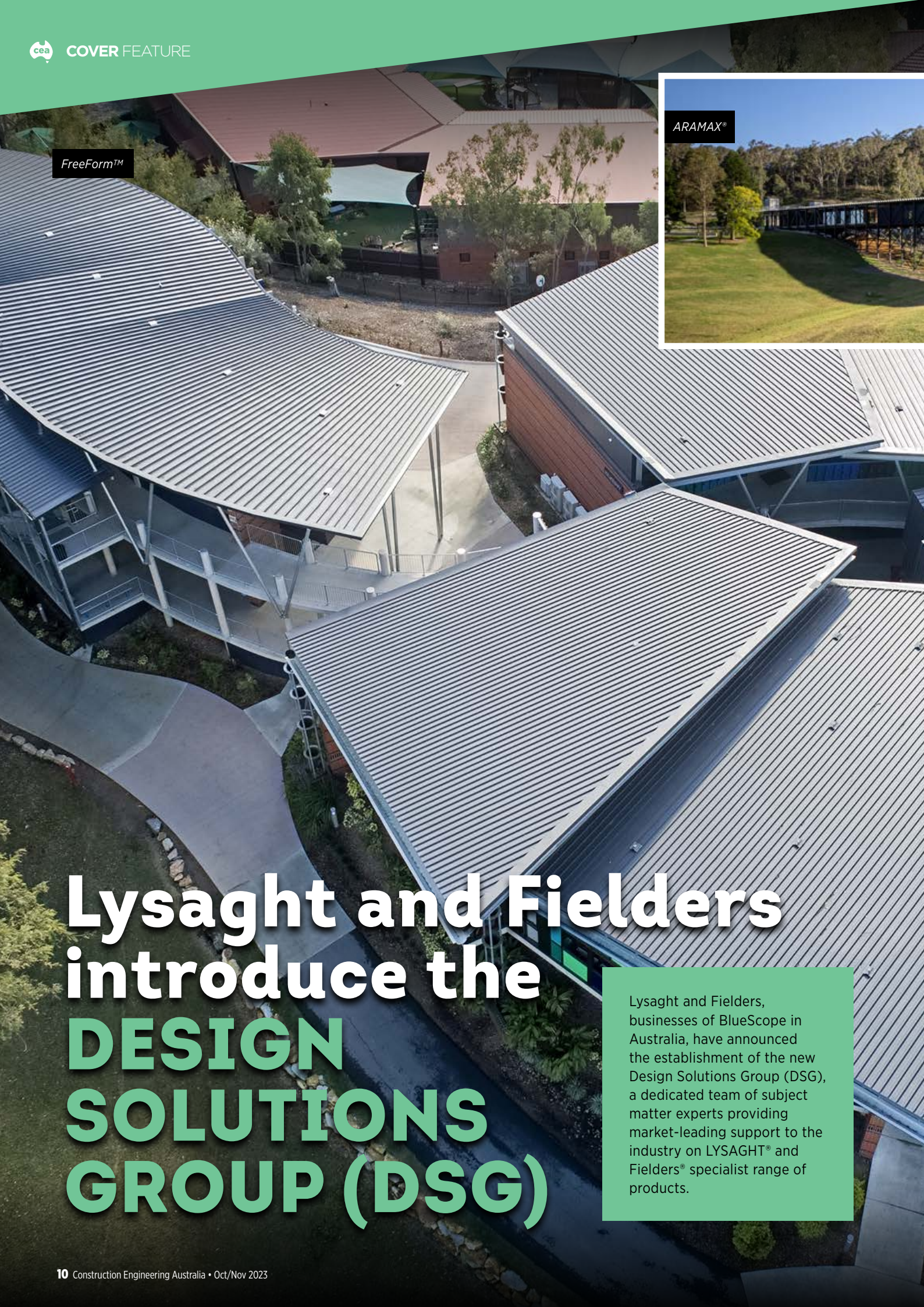


Lysaght and Fielders introduce the DESIGN SOLUTIONS GROUP (DSG)

Lysaght and Fielders, businesses of BlueScope in Australia, have announced the establishment of the new Design Solutions Group (DSG), a dedicated team of subject matter experts providing market-leading support to the industry on LYSAGHT® and Fielders® specialist range of products.

The DSG is a significant step in transforming the way Lysaght and Fielders approach how architectural and engineering projects are conceived, designed, and implemented into building structures.

Comprising a national network of Chartered structural engineers and experienced architectural Business Development Managers (BDMs), DSG serves as a conduit to combine world-class product design, manufacturing, delivery, project and sales support resources for the benefit of building & construction industry stakeholders nationally.

What sets the DSG apart is the synergy it creates. By bringing together a national team of architectural and engineering subject matter experts, it fosters an environment of enhanced market connections, knowledge sharing, and industry networking, aiming at setting new industry benchmarks.

Nathan Jack, National Manager – Design Solutions Group explains; "the intent of the DSG is to partner across the building and construction value chain and deliver leading-edge product and design solutions."

"Our commitment is to provide a seamless, industry-leading customer experience that provides real value and support to building design and construction professionals throughout the project life cycle".

The DSG primarily focuses on supporting a suite of distinguished "specification" products, including preeminent products such as Aramax® structural cladding, FreeForm® cladding, KingFlor® and BONDEK® structural decking, the Finesse® and ZENITH® premium cladding ranges, and the innovative SUPABRIDGE® integrated bridging and insulation system. These products are manufactured from leading BlueScope coated and painted products, such as COLORBOND® steel, DECKFORM® steel and ZINCALUME® steel.

Through DSG, Lysaght and Fielders envision adding unparalleled value to its stakeholders and partners in the building and construction industry. With an unwavering commitment to best practices, the group's emphasis is on engagement across all architectural, engineering, and builder domains.

Furthermore, DSG stands as a testament to Lysaght's and Fielders' dedication to market evolution by acting as a catalyst for market-driven impact on specification and innovation of products and solutions.

DSG's aim is to provide a comprehensive support system across all stages of the building cycle:

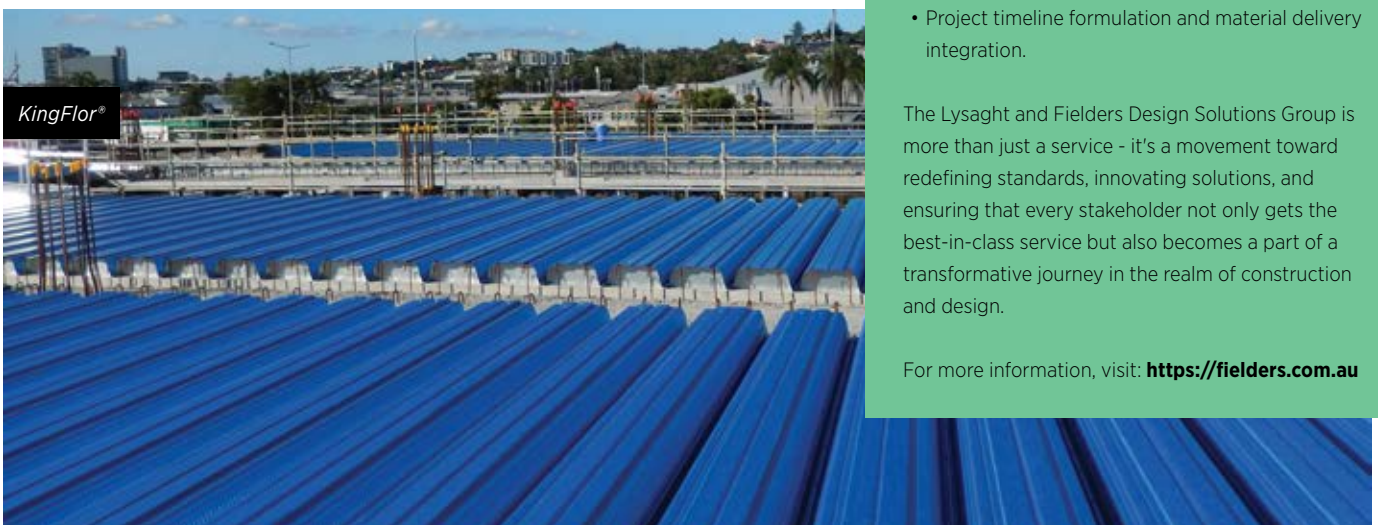
- **Architect and Engineer Support:** From enabling architects to realise their design intents with our wide product range, to supporting structural engineers in designing efficient structures, DSG promises holistic project support to the key stakeholders.
- **Builders & Developers:** Supporting conceptual design development and early contractor engagement to demonstrate market-leading solutions in steel.
- **Product & Value Chain Support:** Bridging gaps between Lysaght and Fielders, clients, installers, and other stakeholders, DSG seeks to ensure seamless project execution, while highlighting the nuances of project responsibilities, product compliance and risks associated with product substitutions.
- **Documentation Assistance:** DSG provides an array of services, from offering design alternatives and product choices to technical reviews and detailing the materials being considered.
- **Builder Engagement:** Not only does DSG provide insights into tendering builders but also can advise on preliminary pricing, support availability, and recommended installer details.
- **Installer Recommendations:** DSG ensures that the best hands are on deck by providing a curated list of recommended installers for the range of roofing, walling and metal decking products.

Supporting these aims, DSG boasts in-house expertise in:

- Product solution development, encompassing project/product aesthetic, structural and durability requirements.
- Structural design optimisation of composite steel-concrete floor designs
- Product recommendations tailored to project needs.
- Real-time R&D and rapid product prototyping to meet project needs leveraging our NATA-accredited material testing facilities.
- CAD drawing and BIM content
- Project timeline formulation and material delivery integration.

The Lysaght and Fielders Design Solutions Group is more than just a service - it's a movement toward redefining standards, innovating solutions, and ensuring that every stakeholder not only gets the best-in-class service but also becomes a part of a transformative journey in the realm of construction and design.

For more information, visit: **https://fielders.com.au**



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What's more, at around 120 kg/m installed, DOLRE bridge traffic barriers are significantly lighter than many AS5100 'Regular' / MASH TL4-rated barrier alternatives.

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DOLRE's clean, uncluttered lines and aesthetically pleasing design make it an ideal match for a wide variety of bridge designs and locations. The design allows for rapid installation, as well as rapid repair and reinstatement of the barrier following an impact. DOLRE is also easy to dismantle and remove in times of flood, thereby helping to significantly reduce the risk of damage to valuable bridge assets caused by flood-borne debris.

DOLRE is also available with an extensive range of standard or custom fascia designs and integrated lighting options.

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Available in a range of AS5100-2017 performance levels, including DOLRE Low (MASH TL2 | EN1317 N2), DOLRE Regular (MASH TL4 | EN1317 H2) and DOLRE Medium (MASH TL5+ | EN1317 H4b), there is a DOLRE barrier to suit virtually any bridge, culvert or road embankment application.

All DOLRE systems feature three rails - two rails for the initial vehicle impact and one rail to resist rollover – and one post design per system type, suitable for both sides of the bridge.

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DOLRE bridge traffic barriers can play a significant role in extending the serviceable life of many existing bridges - delivering AS5100 and AS3845 compliant protection without the need for expensive deck strengthening works or additional reinforcement.
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BENTLEY SYSTEMS ANNOUNCES WINNERS OF THE **2023 GOING DIGITAL AWARDS IN INFRASTRUCTURE**

Bentley Systems, Incorporated, the infrastructure engineering software company, recently announced the winners of the 2023 Going Digital Awards in Infrastructure. The annual awards program honours the extraordinary work of Bentley software users advancing infrastructure design, construction, and operations throughout the world.

Finalists presented their projects at the 2023 Year in Infrastructure and Going Digital Awards event in Singapore before global press representatives and 12 independent jury panels. The jurors determined the winners of the 12 award categories from 36 finalists which were shortlisted from over 300 nominations submitted by 235 organizations from 51 countries.

THE WINNERS OF THE 2023 GOING DIGITAL AWARDS IN INFRASTRUCTURE ARE:

BRIDGES & TUNNELS

WSP Australia Pty Ltd.
Southern Program Alliance
Melbourne, Victoria, Australia

CONSTRUCTION

Laing O'Rourke
SEPA Surrey Hills Level Crossing Removal Project
Melbourne, Victoria, Australia

ENTERPRISE ENGINEERING

Mott MacDonald
Standardising Delivery of Phosphorus Removal Schemes for the UK Water Industry
United Kingdom

FACILITIES, CAMPUSES, & CITIES

vrame Consult GmbH
Siemensstadt Square - Digital Campus Twin in Berlin
Berlin, Germany

PROCESS & POWER GENERATION

Shenyang Aluminum & Magnesium Engineering & Research Institute Co., Ltd. (SAMI)
Digital Twin Application Project of Electrolytic Aluminum Engineering of Chinalco China Resources
Lvliang, Shanxi, China

RAIL & TRANSIT

AECOM Perunding Sdn Bhd
Johor Bahru–Singapore Rapid Transit System
Malaysia and Singapore

ROADS & HIGHWAYS
I-70 Floyd Hill to Veterans Memorial Tunnels Project
AtkinsRéalis
Idaho Springs, Colorado, United States

STRUCTURAL ENGINEERING
Hyundai Engineering
Automated Design of Civil and Architectural Structures with STAAD API
Seoul, South Korea

SUBSURFACE MODELING & ANALYSIS
Arcadis
South Dock Bridge
London, England, United Kingdom

SURVEYING & MONITORING
Italferr S.p.A.
The Digital Twin for Structural Monitoring of St. Peter's Basilica
Vatican City

TRANSMISSION & DISTRIBUTION
POWERCHINA Hubei Electric Engineering Co. Ltd.
Full Lifecycle Digital Application on Xianning Chibi 500kV Substation Project
Xianning, Hubei, China

WATER & WASTEWATER
Project Controls Cubed LLC
EchoWater Project
Sacramento, California, United States

To learn more about the Going Digital Awards in Infrastructure, visit: **https://www.bentley.com/events/going-digital-awards**

CATEGORY: CONSTRUCTION
WINNER & FINALISTS

L-R: Greg Bentley, CEO, Bentley Systems; Corey Johnson, Senior Director Product Management, Bentley Systems; Stephen Corney, Principal Digital Engineer, Laing O'Rourke; Marion Bouillin, Senior Product Marketing Manager, Bentley Systems; and Kristin Fallon, CMO, Bentley Systems

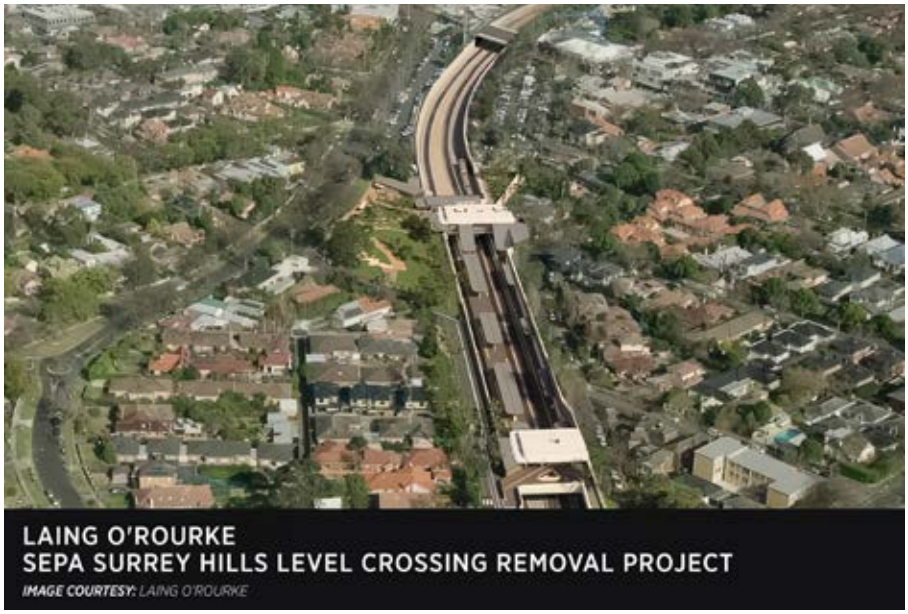
As with the eleven other categories in this year's Bentley YII Going Digital Awards in Infrastructure, the three finalists in the Construction category – including the winning SEPA Surrey Hills Level Crossing Removal Project – each provide an ideal example of the wide-reaching benefits that 'digitisation' can deliver across the sector.

From improved planning capabilities, better communication between stakeholders, improved productivity and more streamlined project delivery, to improved safety and risk management processes, reduced environmental impacts and significant cost savings, digitisation is revolutionising the construction and infrastructure sectors.

WINNER

LAING O'ROURKE

SEPA Surrey Hills Level Crossing Removal Project
Location: Melbourne, Victoria, Australia
Project Playbook: Descartes, iTwin Capture, OpenBuildings, ProjectWise, SYNCHRO



LAING O'ROURKE
SEPA SURREY HILLS LEVEL CROSSING REMOVAL PROJECT
IMAGE COURTESY: LAING O'ROURKE

The Surrey Hills Level Crossing Removal Project, one of Victoria's most complex level crossing removal projects, is expected to improve safety, limit congestion, and reduce greenhouse gas emissions by 30%.

Situated along a live railway, a 93-day shutdown occupation was enforced where 200,000 cubic meters of earthworks needed to be excavated to build a 1.7-kilometre new rail trench and new premium station. Given the complexity and scale of the works amid a stringent timeline, the team implemented a carefully crafted design for manufacturing approach. To ensure the timely and safe delivery of prefabricated components on site, as well as timely completion of construction works with minimal disruption to commuters and the environment, the team needed to precisely plan and sequence works in a virtual environment.

They selected SYNCHRO to create a detailed 4D model, visualising the entire construction program in a cloud-based platform that facilitated accessibility and scalability across the project. Using Bentley's construction management solution to simulate on-site works provided greater visibility into planning and interfacing and allowed the team to identify potential issues prior to construction.

Through digital 4D planning, the team reduced the risk of clashes by 75% and scheduling errors by 40%, compared to using traditional construction workflows.

DURA VERMEER INFRA LANDELIJKE PROJECTEN, MOBILIS, GEMEENTE AMSTERDAM
BRUGGEN EN STRATEN ORANJE LOPER
IMAGE COURTESY: DURA VERMEER INFRA LANDELIJKE PROJECTEN, MOBILIS, GEMEENTE AMSTERDAM

FINALIST

DURA VERMEER INFRA LANDELIJKE PROJECTEN, MOBILIS, GEMEENTE AMSTERDAM

Bruggen En Straten Oranje Loper

Location: Amsterdam, Noord-Holland, Netherlands

Project Playbook: PLAXIS, SYNCHRO

The municipality of Amsterdam is making changes to improve public spaces and traffic flows. As part of this program, Dura Vermeer and Mobilis contractors were chosen to help renovate 2.5 kilometres of road and tram track, including nine monumental bridges. Upon completion, the project will ensure a safe, accessible, and sustainable living environment.

Located in a congested area where people live and work, the construction site space was limited and posed many challenges. Site constraints were compounded by the various expertise necessary to reconstruct and refurbish the bridges.

Given the project complexity, the team knew a 4D solution would be imperative to visualise and rehearse construction plans to prioritize safety and involve stakeholders in project plans. They selected SYNCHRO to visualize project progress, digitize processes, and better engage all project expertise around one solution.

Working in a connected digital environment streamlined communication and change management, saving 800 resource hours for a single bridge. The digital construction solution provided real-time resource data and identified 25 risks directly from the 4D schedule, accelerating execution and improving safety.

LAING O'ROURKE
NEW EVERTON STADIUM PROJECT
IMAGE COURTESY: LAING O'ROURKE

FINALIST

LAING O'ROURKE

New Everton Stadium Project

Location: Liverpool, Merseyside, United Kingdom

Project Playbook: LumenRT, SYNCHRO

As part of Liverpool's City Dock Development plan, a new stadium is being built on an existing dock, providing the English Premier Football League team a new home to host club games for their fan base across the globe. The scope of the project includes building a 52,888-seat stadium within tight logistical confinements while paying respect to the local heritage. It necessitated off-site prefabrication works that required precise planning and coordination to avoid costly project delays.

Laing O'Rourke, the principal contractor, sought to implement a 4D digital construction approach to deliver the project on time and within budget.

Having already used SYNCHRO to win the project bid, Laing trusted SYNCHRO to help meet project goals, increase communication across the entire project team, and effectively plan and execute construction works. The 4D model was fundamental to the team's collaboration, enabling multiple disciplines to work together to submit the project ahead of schedule and within budget.

Successfully working in a collaborative 4D digital environment optimized project delivery and has transformed how Laing will deliver complex construction projects in the future.

BENTLEY SYSTEMS RECOGNIZES THE YEAR IN INFRASTRUCTURE 2023 AS GROUNDBREAKING FOR INFRASTRUCTURE INTELLIGENCE

At its annual Year in Infrastructure conference, Bentley Systems, Incorporated, the infrastructure engineering software company, described 2023 as a "groundbreaking year" for infrastructure intelligence. Citing users' projects, CEO Greg Bentley highlighted how infrastructure organizations are overcoming the engineering resource capacity gap through infrastructure intelligence strategies. When asked to quantify the engineering hours saved through digital advancements, the Going Digital Awards finalists reported significant median savings of 18%. Engineering data serves as the foundation and digital twins as the building blocks of infrastructure intelligence. With iTwin Platform, engineering data in Bentley Infrastructure Cloud (ProjectWise for project delivery, SYNCHRO for construction, and AssetWise for asset operations) can be aligned, queried, and managed to increase infrastructure intelligence over the lifecycle of projects and assets. Bentley Systems estimates that the company's engineering users accumulate at least 100 million new unique digital components per month within their respective ProjectWise environments, teeing up potential infrastructure intelligence benefits across construction, operations, and maintenance. As an indication that digital twins are becoming mainstream, the proportion of Going Digital Awards finalists crediting iTwin has risen to 64% in 2023.

Greg Bentley highlighted multiple infrastructure intelligence strategies that organizations are using to further compound the value of their data, including reusing digital components, integrating subsurface modeling, and incorporating, into evergreen digital twins, operational data from IoT sensors, drones, and even crowdsourcing. He also explained how Going Digital Awards finalists and organizations in Singapore are accelerating their infrastructure intelligence through the use of AI.

GROUNDBREAKING INFRASTRUCTURE INTELLIGENCE IN SINGAPORE

In Singapore, the location for the 2023 Year in Infrastructure conference, digital twins are extensively used to optimize decision-making and operations:

- PUB, Singapore's national water agency, is working in collaboration with Bentley Systems on a Singapore National Research Foundation-funded project to develop a new system in detecting and localizing water system anomalies and leaks in near real-time. Through a high-fidelity digital twin, AI-based predictive models, and hydraulic network model calibration and simulation, the project could potentially help in improving network resilience and water conservation.
- SMRT Trains, the leading multi-modal public transport operator in Singapore, uses AssetWise Linear Analytics software as the basis for its Predictive Decision Support System to prioritize maintenance. The digital twin system has enabled SMRT to meet its service reliability targets by optimizing maintenance deployments.
- Singapore's Land Transport Authority (LTA) fully leverages Bentley Systems' EMME and DYNAMEQ mobility digital twin software for its long-term and short-term planning, including operational traffic models for traffic impact and scheme analysis. This includes using Bentley Systems' agent-based travel demand model.
- The Singapore Land Authority (SLA) is a leader in digital twin adoption. Dr Victor Khoo, Director of Survey and Geomatics, SLA, joined the Year in Infrastructure conference to discuss Singapore's national digital twin journey and share how a 0.225-meter accurate nationwide reality mesh from aerial surveying is incorporated with extensive inputs from other mapping datasets to produce a complete digital twin of the city, which is then shared with multiple agencies and research institutes to support Singapore's sustainability initiatives.

ACCELERATING INFRASTRUCTURE INTELLIGENCE WITH BENTLEY INFRASTRUCTURE CLOUD

Following Greg Bentley's keynote, Bentley Systems' product and technology leaders explained how the company's offerings increasingly help users derive greater infrastructure intelligence from their data.

"Bentley Infrastructure Cloud, including ProjectWise, leverages infrastructure digital twins to unlock data in order to apply AI and accelerate infrastructure intelligence," said Mike Campbell, Chief Product Officer.

Greg Bentley, CEO, Bentley Systems

Henry Okraglik, Global Director of Digital, WSP Australia, joined the Year in Infrastructure conference to explain the benefits of becoming data-centric through Bentley Infrastructure Cloud.

"As we've digitally matured, we've been able to embrace capabilities from Bentley Infrastructure Cloud to improve construction staging and planning, track and export quantity data across project phases, reduce the need for physical site visits, and a lot more," said Okraglik.

For example, using ProjectWise, SYNCHRO, iTwin, and other Bentley products, WSP was able to reduce modeling time by 60%, increase productivity by 25%, and reduce the carbon footprint by 30% on a rail network project in Melbourne.

ADVANCING BENTLEY OPEN APPLICATIONS WITH ITWIN

To systematically introduce the benefits of digital twins in the design phase, Campbell announced the addition of iTwin capabilities in Bentley Open Applications, for modelling and simulation, starting with MicroStation. With iTwin capabilities and workflows natively integrated, Bentley Open Applications will be able to automatically create digital twins during the design process, enabling users to collaborate in real-time, evaluate the impact of changes more seamlessly, reduce rework, and expedite infrastructure intelligence.

"Today, digital twins are critical enablers of how infrastructure assets are built and operated. With iTwin-powered capabilities coming to Bentley Open Applications, all our users will also be able to leverage digital twin technology to improve their efficiency and effectiveness during design," said Campbell.

GENERATIVE AI, POWERED BY ITWIN

Embracing AI's potential to accelerate infrastructure intelligence, the company highlighted its existing analytical AI capabilities, powered by iTwin, for asset monitoring, and articulated its multi-faceted approach to generative AI for design. This approach is guided by the company's commitment to helping users gain ever more value from their own engineering data secured in Bentley Infrastructure Cloud – maximizing their potential from generative AI, while also ensuring each account retains explicit access and control.

Julien Moutte, Chief Technology Officer, provided examples of generative AI for infrastructure engineering, beginning with an AI agent assisting engineers in further optimizing site layouts by leveraging designs and data from previous projects. He also showed how generative AI can be applied to minimize time spent on project documentation by automating drawing production with fit-for-purpose annotations.

"We believe iTwin-powered generative AI capabilities will support engineers by augmenting the work they're already doing. We see iTwin becoming a copilot to support better decision-making, reduce repetitive tasks, and increase design quality. It can help close the engineering resource capacity gap – not only by empowering current engineers to produce more, but also by enabling a more rewarding work experience, enticing future engineers to join the community advancing infrastructure," said Moutte.

COOGEE JETTY,
WESTERN AUSTRALIA

TUFFRAIL®. AS TUFF AS YOU NEED IT TO BE.

A durable, easily installed product was required for the Coogee Jetty Marina expansion. The Moddex aluminium Tuffrail® system replaced steel handrails that hadn't lasted in an extreme beachfront location. They also come in marine-grade stainless, with a 50-year warranty, and in HDG. Find out more at **moddex.com**

50 YEAR warranty

moddex®

IS IT TIME TO RETHINK THE WAY WE BUILD?

Against a backdrop of global material shortages, increasing labour costs, affordable housing shortages, and rapidly changing climate, the Australian construction industry must continually adapt to provide solutions that are fit for purpose. Light gauge framing made from TRUECORE® steel may offer a versatile solution to tackling some of these industry challenges.

Steel is a key enabler for a construction industry seeking rapid efficiency and non-combustible materials that can be supplied locally to build homes, apartments, schools, and commercial buildings.

"Steel lends itself to structures that are designed for long life, resilient and flexible to accommodate multiple future reuse options without reinvestment in structural alteration and refurbishment and designs where end-of-life considerations are key, such as designing for disassembly and reuse" said Antony Schillaci, BlueScope's Manager, Marketing & Market Development.

"Framing made from TRUECORE® steel can be prefabricated offsite, to support minimising waste and driving efficiencies onsite. Light gauge steel framing is strong, straight and true and dimensionally accurate which assists with improving the efficiency of installers and follow-on trades onsite." said Antony.

NASH (The National Association for Steel Framed Housing) has estimated the number of Light Gauge Steel fabricators in Australia has more than doubled in the last 5 years, providing a key indicator of the building industry's broader adoption of Light Gauge Steel Framing as a viable material alternative.

Framing made from TRUECORE® steel can be prefabricated offsite, to support minimising waste and driving efficiencies onsite.

BLUESCOPE RELEASES NEW ENVIRONMENTAL PRODUCT DECLARATIONS

BlueScope has recently published a range of new Environmental Product Declarations (EPDs) providing transparency for the environmental impacts of its products, such as TRUECORE® steel.

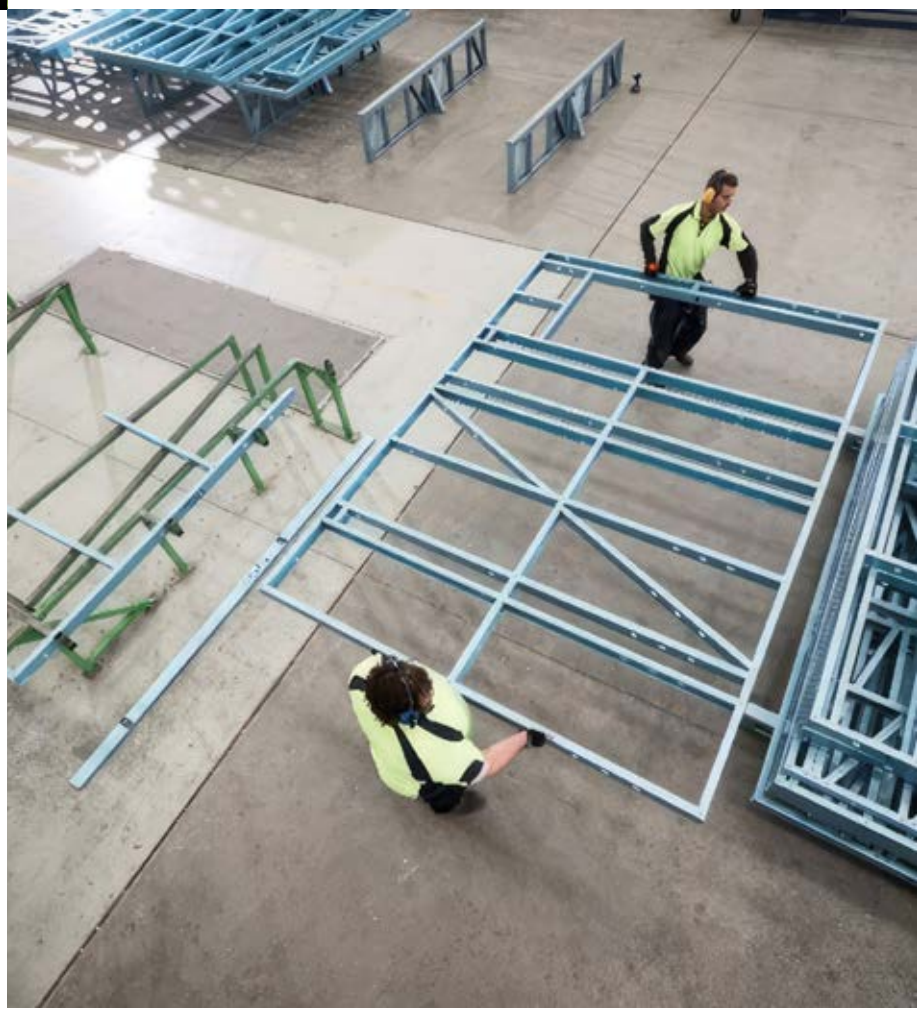
"BlueScope EPDs are expressions of our strong commitment to environmental transparency and reflect our focus on product stewardship and broader commitment to sustainability. EPDs are increasingly sought after by customers due to their robust and credible third-party verified information." said Philippa Stone, BlueScope Steel's Sustainability Manager.

"The combination of the product-specific EPD for TRUECORE® steel, and ResponsibleSteel™ certification for Port Kembla Steelworks where the steel in TRUECORE® steel is manufactured, equates to a Responsible Product Value of 15 in the Green Building Council of Australia's Responsible Products Score Checker. This is considered "Best Practice" under the Responsible Products Framework and may contribute to a project's Green Star rating." said Philippa.

Information on initiatives, and how products can contribute to a Green Star rating can be found at: **https://new.gbca.org.au/green-star/the-responsible-products-program/**

BlueScope's range of EPDs can be used to support life cycle assessments including embodied or upfront carbon, for end uses such as buildings, and can be used as a source when using rating tools such as Green Star.

BlueScope's range of EPDs can be downloaded online via: **https://steel.com.au/epds**



DYNAMIC INFRASTRUCTURE leverages all available asset condition data, reports and images - regardless of the format or age - to build a detailed chronological 'health record' for each bridge asset - providing you with immediate access to all your asset data and empowering you with actionable insights that lead to cost savings and improved maintenance efficiency.

With DYNAMIC INFRASTRUCTURE there is no need to change your current bridge inspection methods or service provider. The system utilises all existing data and reports, regardless of the format or age -including paper-based engineering drawings and plans, photos, paper-based inspection and condition reports, together with digitised data and images - to build a detailed 'health record' for each bridge asset.

Using DYNAMIC INFRASTRUCTURE'S AI-enabled technology to identify faults and damage effectively transforms the entire process from a subjective one that relies on an individual to find and identify all faults on a structure and then make a judgement call on severity, to an objective one where over 99% of faults are identified, categorised, logged and then rated for severity against a global database of over 30,000 bridges and counting.

DYNAMIC INFRASTRUCTURE enables you to identify defects before they escalate into major failures, helping you to better manage risk and prevent unexpected expenses. It can even help you maximize warranty coverage through automated repair tracking - providing you with full visibility from the field to the office.

DYNAMIC INFRASTRUCTURE

if3

T: 1300 552 878 **www.dynamicinfrastructure.com.au**

How long would it currently take you to find ALL of the historic inspection, repair and maintenance data for just one of your bridge assets?

A couple of hours?
A couple of days?
Longer?

With DYNAMIC INFRASTRUCTURE you can access ALL of your bridge asset data – including plans and historic inspection data (manual reports) as well as details of faults, damage, repairs and maintenance – within a matter of seconds.

All of the data, for each of your bridge assets, right at your fingertips... in one comprehensive, chronological digital 'health record' ...and the massive time saving is only one of the benefits!

INNOVATION
TOWARDS ZERO

DISCOVER MORE

SCAN ME

KYOWA ROCK BAGS

INNOVATIVE, ENVIRONMENTALLY-FRIENDLY EROSION CONTROL

Kyowa rock bags are innovative flexible mesh nets for use around bridges, roads, railways, shorelines and rivers to protect and manage erosion. When filled with rock or riprap, the rockbag provides a flexible, reliable and environmentally-friendly protection system.

The rock bags are a sustainable environmental civil engineering alternative solution to gabions, large rock, blockstone, free rip rap and rock mattresses.

Some of their main advantages are that they do not require foundations or ground/bed preparation, this also means the rock bags are a practical solution when installation involves uneven or sloping surfaces. The rock bags can simply be used to contain the riprap and provide a faster and more accurate means to deploy it.

The rock bags offer a rapid fill and rapid deployment system that supports the economic and environmental focus of civil projects.

Kyowa rock bags deliver proven performance in projects around the world, and are ideal for use in a wide range of applications, including:

- river embankments, riverbanks, riverbeds and creek banks
- seashores, shorelines, beaches and tidal areas
- bridges and bridge pylons
- jetties, piers and piles, groynes, marine and coastal structures
- wharves and ship berths from scouring of the revetment, toe protection
- road embankments, slope protection and road culverts
- coffer dams and floodways
- railway ballast and rail bridges,
- levelling of uneven seabed, riverbed or lakebed
- subsea marine pipelines and subsea marine cables
- gabion protection, flexible gabion, riprap rock bag
- rock mattress alternative, retaining walls
- emergency erosion restoration such as sink holes

Kyowa rock bags prevent water damage to the protected surface without destroying the environment. The rock bags reduce water flow velocity as water energy is absorbed into the space between the rocks. When installed underwater, the spaces between the rocks provide a habitat for plant life and become an adopted home for fish and other aquatic life. Moreover, they can be covered with soil to support plant regeneration, further protecting the at-risk environment.

PROVEN PERFORMANCE

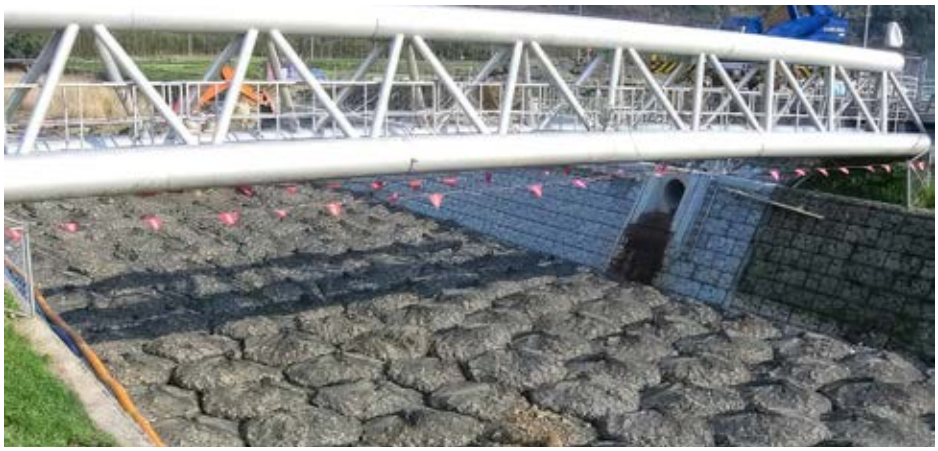
Kyowa rock bags have a proven lifespan of over 35 years and have undergone testing for a lifespan of 50 years in saltwater.

Recently, a number of civil engineering teams have started applying rock bags to protect marine cables and subsea pipelines in an environmentally friendly way.

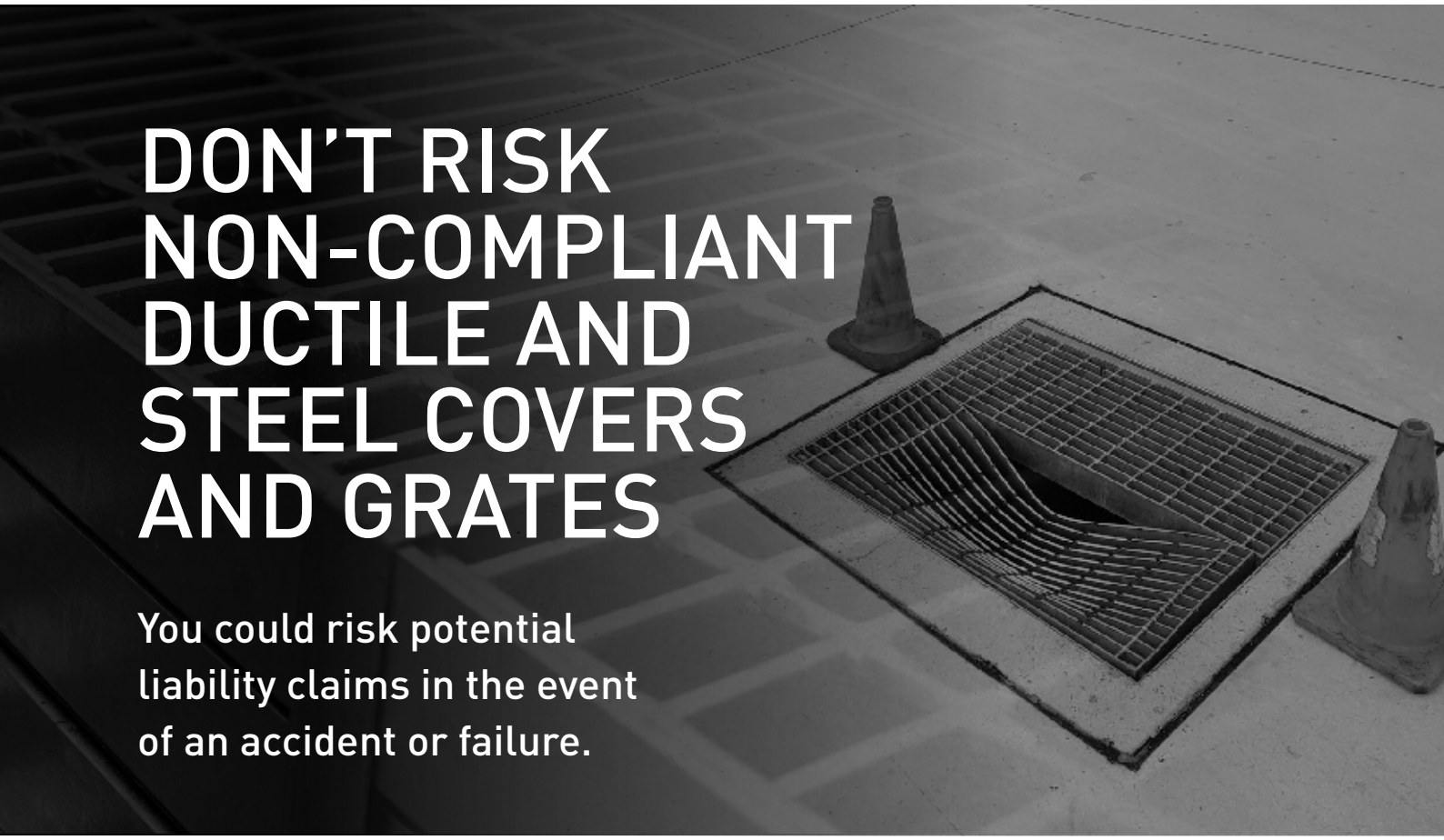
The Kyowa rock bag was used for the first time in 1987 to protect the foundations for the Akashi Kaikyo Bridge, which links the city of Kobe on the Japanese island of Honshu to Iwaya on Awaji Island. One of the world's longest-span bridges, the Akashi Kaikyo Bridge has a total length of 3,911 metres. It is part of the Kobe-Awaji-Naruto Expressway and crosses the busy and turbulent Akashi Strait.

The Kyowa Rock Bag has found wide application in civil engineering for rivers and coastal works for more than 35 years. The bags have been used in over 24,000 projects, with more than 1,300,000 rock bags installed.

For more information, contact Bluemont Pty Ltd on +61 2 9091 0360 or visit: **https://www.bluemont.com.au**



CIVILCAST®
*Precast & Steel **Solutions** for Civil*



DON'T RISK NON-COMPLIANT DUCTILE AND STEEL COVERS AND GRATES

You could risk potential liability claims in the event of an accident or failure.

Ensure the ductile iron and steel covers & grates you purchase are compliant with AS3996-2019.

Request proof of compliance from a reputable and authorised authority.

Civilcast ductile iron, steel covers and grate range is Global-Mark Certified compliant for your peace of mind.

Certified Product - AS 3996:2019

Global-Mark.com.au®
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Be Compliance Sure.
Be Civilcast Sure.

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*Precast & Steel **Solutions** for Civil*

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ENSURING COMPLIANCE WITH **AUSTRALIAN STANDARDS** FOR **STORMWATER COVERS** AND **GRATES**

Stormwater covers and grates play a vital role in civil construction projects nationwide. These essential components are extensively utilized in various infrastructure endeavours, carrying significant significance that should not be underestimated.

While some might downplay the significance of grates and covers used for stormwater drainage on roads, it is crucial to recognize their multifaceted importance. Beyond their role in water drainage, these elements bear a critical responsibility in enhancing road and pavement safety. They must withstand substantial and repeated loads from both vehicles and pedestrians.

The meticulous selection of stormwater and drainage products for Australian roads holds immense importance. Neglecting the quality and compliance of these products with Australian Standards can result in failures, potentially leading to injuries or even fatalities.

Most State Road and Municipal Councils across Australia exercise vigilance in specifying and ensuring compliance of their drainage products. Regrettably, this level of diligence is not uniformly observed across the civil construction sector.

It's worth noting that the civil construction industry currently lacks formal regulations regarding the compliance of grate and cover products. Consequently, the responsibility falls on road authorities, councils, and asset owners to ascertain the suitability and adherence of the chosen products to Australian Standards (AS3996-2019 – Access Covers & Grates).

When selecting civil stormwater and drainage products, adherence to Australian Standard AS3996-2019 is essential.

AS3996 outlines clear product Classes, detailing design loads and wheel loads for each category. However, instances of poor-quality, non-compliant, and even falsely compliant products are regrettably common in our industry. These discrepancies can have significant repercussions, such as products claiming to be of a certain Class but failing to meet the associated load requirements.

Some manufacturers opt for shortcuts to offer cheaper alternatives in the market, leading to a proliferation of non-compliant offerings. To safeguard against subpar and counterfeit products, it is imperative to exercise caution.

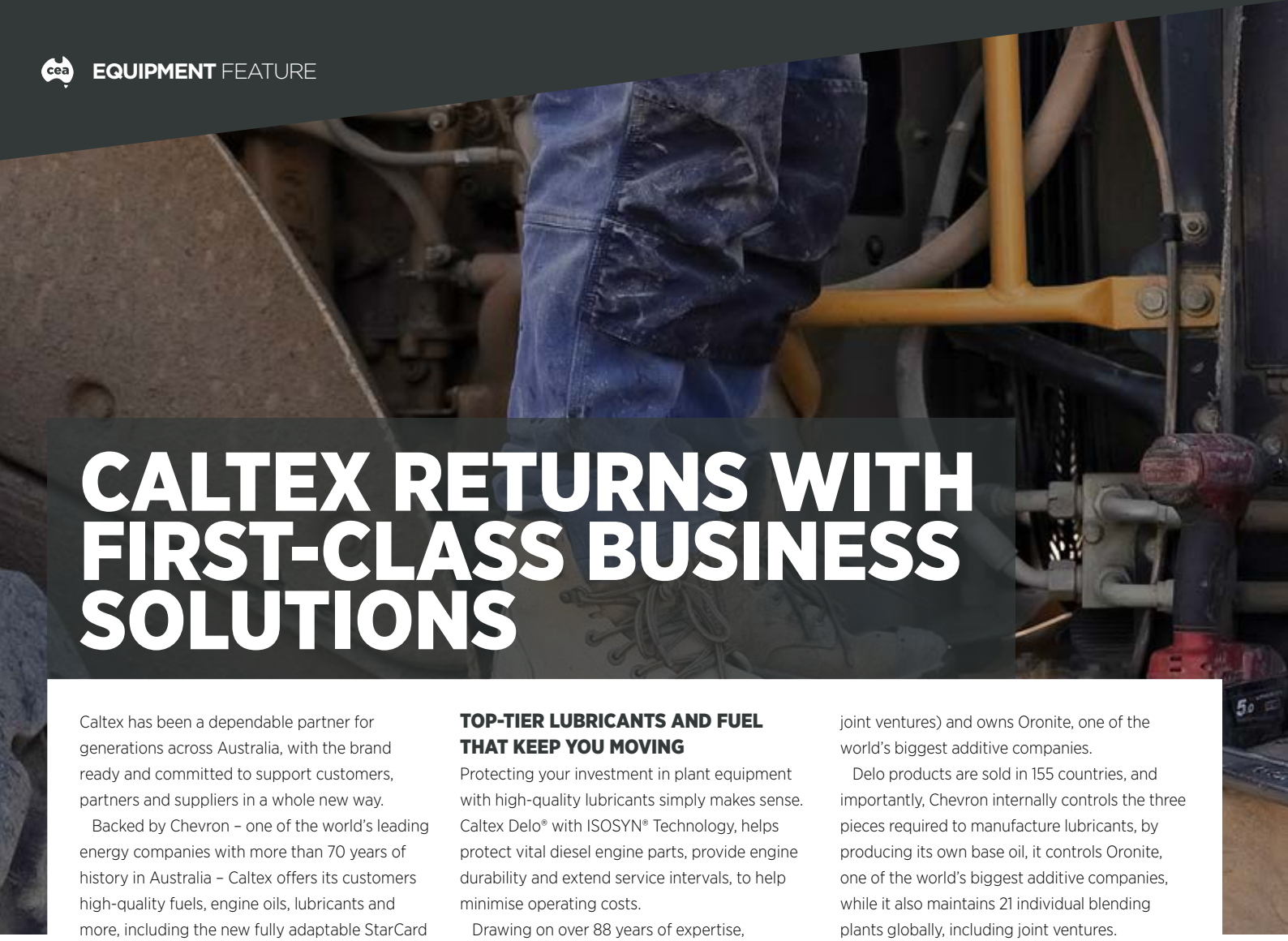
When selecting civil stormwater and drainage products, adherence to Australian Standard AS3996-2019 is essential and can be verified through physical markings on the

AS3996 outlines clear product Classes, detailing design loads and wheel loads for each category. Using non-compliant products can result in failures, potentially leading to injuries or even fatalities.

product itself. Reputable manufacturers typically imprint their company name and load class on their products as part of standard practice. The absence of these markings indicates non-compliance with Australian Standards and raises the risk of potential failure with dire consequences.

For added assurance, products that have achieved Global-Mark Certification, like Civilcast ductile and steel grates, validate compliance with AS3996-2019. This certification, provided by a recognized authority such as Global-Mark, independently verifies the adherence of products to relevant standards, providing peace of mind to consumers.

For further details, contact Civilcast at 1300 012 278 or visit their website at: **https://civilcast.com.au**



CALTEX RETURNS WITH FIRST-CLASS BUSINESS SOLUTIONS

Caltex has been a dependable partner for generations across Australia, with the brand ready and committed to support customers, partners and suppliers in a whole new way.

Backed by Chevron – one of the world's leading energy companies with more than 70 years of history in Australia – Caltex offers its customers high-quality fuels, engine oils, lubricants and more, including the new fully adaptable StarCard fleet management system.

Supporting this, Caltex is currently strengthening its distribution network, ensuring the prompt supply of products, to keep the country moving.

Following Chevron's acquisition of Puma Energy (Australia) Holdings three years ago, which included a national network of retail locations, they're now embarking on a rebranding project that will see most Puma Energy sites change to Caltex by the end of the year.

Beyond the retail experience, Caltex offers innovative industry-leading technology, such as the specially formulated fuel system-cleaning ingredient Techron®, which is available in every fuel grade – helping your car's engine deliver maximised power, better fuel economy, better acceleration, a smother drive, and reliable performance.

On the lubricants side, diesel engines will experience Caltex Delo® ISOSYN Technology, the brand's high-performance diesel engine oil offering, while Havoline® will be available for petrol engines.

By offering a comprehensive fuel and lubricant offering, Caltex is a one-stop-shop, with solutions available for every kind of application, from construction to mining, agricultural, power generation, transport, and global marine.

TOP-TIER LUBRICANTS AND FUEL THAT KEEP YOU MOVING

Protecting your investment in plant equipment with high-quality lubricants simply makes sense. Caltex Delo® with ISOSYN® Technology, helps protect vital diesel engine parts, provide engine durability and extend service intervals, to help minimise operating costs.

Drawing on over 88 years of expertise, ISOSYN® Technology combines premium base oils with high-performance additives to deliver engine component protection rivalling synthetics.

This high-performance additive formulation helps provide exceptional soot dispersion and prevent deposit build-up, ensuring vehicle performance which can contribute to extended service intervals and minimised downtime.

The road to the modern-day Delo® range is one based on marketplace innovation.

In 1935, Chevron, then known as Standard Oil of California, partnered with Caterpillar Tractor (CAT) to formulate an oil to lubricate the high-speed diesel engines that CAT was planning to build.

This joint venture between the two companies resulted in a multipurpose motor oil known as Delo®, an acronym for Diesel Engine Lubricating Oil. In the 1940s, Delo® was the first brand in the world to develop compound diesel engine oil that could be used in any diesel engine, and in the 1950s, it pioneered the first successful multi-grade engine oil, with innovations over the following decades setting industry benchmarks for long-term engine performance.

Adding further confidence, Chevron has the capabilities to manufacture lubricants by producing its own base oil, maintains 21 individual blending plants, globally (including joint ventures) and owns Oronite, one of the world's biggest additive companies.

Delo products are sold in 155 countries, and importantly, Chevron internally controls the three pieces required to manufacture lubricants, by producing its own base oil, it controls Oronite, one of the world's biggest additive companies, while it also maintains 21 individual blending plants globally, including joint ventures.

Today, Delo® products are sold in 155 countries, and the Caltex Delo® product family includes lubricants, coolants, greases, and construction equipment system consumables such as engine oils, hydraulic system oil, transmission oils, engine antifreeze/coolants, gear drive fluid, grease for bearings and other lubrication points and more.

Similarly, this offering extends to all other fleet vehicles, including trucks, trailers, and passenger vehicles, with the Havoline® brand of oils covering the full spectrum of petrol engines.

Caltex with Techron® is available across all petrol fuel grades and contains an innovative formulation that has been scientifically proven to help clean and protect engines. Techron® not only removes dirt, but also helps prevent deposits from forming on critical parts of your car's engine. This helps your car's engine to function at optimum, delivering maximum power to your wheels.

Caltex Diesel with Techron D helps keep fuel injectors clean, protect against corrosion and reduce foaming while filling up.

In diesel engines, the fuel injector nozzle can be as narrow as the width of two human hairs, and with these injectors usually located inside the combustion chamber, they are exposed to extreme heat, and are, therefore, more vulnerable to deposit formation than those experienced in a petrol engine.

STARCARD STREAMLINES BUSINESS OPERATIONS

The new Caltex StarCard is a power-packed fuel management card offering a convenient way to increase fleet management efficiency. It provides a wide range of adaptable features to manage fleet and personal expenses and is perfectly suited to the ever-changing requirements of working in the construction industry.

It has two main options, either 'open' or 'close' loop. Open loop provides the ultimate coverage allowing access to all Caltex and Puma Energy service stations, and being welcome wherever WEX Motorpass cards are accepted, meaning you can use it at over 6,000 service stations and industry partners Australia-wide. Open Loop StarCards can also be used wherever Cabcharge is accepted and for services at Magic Hand Carwashes.

A closed-loop card means businesses can avoid paying transaction fees while enjoying access to the full range of Caltex with Techron® fuels. Both options can be set up for specific drivers and vehicles, with PIN protection available too.

Additionally, StarCard provides a range of perks and discounts from leading tyre retailers, vehicle parts and accessory retailers, vehicle servicing providers and accommodation houses.

StarCard is another solution offered by Caltex to keep businesses in control and allow operations to run smoothly.

CALTEX: YOUR BUSINESS PARTNER TO MOVE FORWARD

Caltex is committed to the Australian market and making its products available to customers where and when they need them. Whether you're running the family car, the construction site or the company fleet, Caltex is there to support you with expert advice and fuel equipment solutions, quality bulk fuel supply, premium engine oils and reliable lubricants.

To learn more about Caltex visit **www.caltex.com/au/business-solutions**

UNPREDICTABLE CLIMATE... AUSSIE PUMPS TO THE RESCUE

It's undeniable that the climate is changing and seems to be more erratic every week. Hot 36°C days can be followed by temperature drops of 15°C or 20°C. Scorchers can be followed by cloud bursts. And it's not just Australia... we're seeing it all over the world.

With recent major flood events in New York, Madrid, Algiers, Scotland and Wales in the UK and in numerous cities and regions across Europe, together, of course, with the numerous floods that have occurred across Queensland, New South Wales and Victoria over the past twelve months alone, floods have a catastrophic impact on many levels.

Aussie Pumps has exceptional experience with floods, providing Local Government bodies and contractors with heavy-duty trash pumps that move huge amounts of water fast.

Juba in South Sudan flooded when monsoonal rain caused the Nile to break its banks.

THE AUSSIE SOLUTION

One company that's paying attention to what appears to be a fairly slow national response to flood mitigation is Australian Pump Industries.

Aussie Pumps has exceptional experience with floods, providing Local Government bodies and contractors, as well as international disaster response teams, with heavy-duty trash pumps that move huge amounts of water fast.

"We look on this as a kind of mobile flood mitigation process," said Aussie Pumps John Hales.

"While Governments at all levels are still pondering what to do in terms of dykes, levees, dams etc, we can deploy 6" trailer or skid mounted pumps that will each move 360,000 litres per hour," he said.

Imagine a battery of three of those units, side by side, pumping over a million litres per hour. That's around 26 million litres of water per day!

CAN THIS WORK?

Yes, it can... and does!

In August 2022, Australian Pump air freighted heavy-duty 6" pumps to Juba, the capital of South Sudan. Two-thirds of the country was under water.

The Nile flooded due to unprecedented Monsoons that hit Central Africa. Even the 'Sud' (a huge 500 square mile papyrus marsh) couldn't soak up all that extra water pouring down the Nile.

Aussie's 6" MQ600TD pumps were used in South Sudan to "move the Nile".

Aussie Pumps air freighted heavy-duty 6" pumps to Juba, capital of South Sudan to assist with the flood recovery efforts.

"We wound up with 26 of those big 6" pumps working in extremely primitive conditions, but Juba was saved", said Hales.

"If it can work in Juba, it can work in Australia," he said.

In fact, it already is.

Local Government bodies in NSW have purchased 6" pumps for use as emergency standby flood movers.

"We proved the principle many years ago when Horsham flooded in Victoria," John Hales added.

"A local earthmoving contractor who relies on his Aussie Pumps self-priming trash pump, used his gusher to divert water from the main street and into a side channel."

"In short, he saved the town from flooding."

IS IT THAT SIMPLE?

Probably not. But it does help to know that somebody can do something immediately to provide flood relief, provided there is enough forethought into the availability and location of suitable equipment.

"Perhaps the Fire & Rescue and Emergency Services bodies should start thinking about this," said Hales.

Australian Pump isn't suggesting this is the be-all and end-all of flood mitigation. Big money needs to be spent on engineering, loads of concrete and infrastructure that will protect towns instead of forcing the inhabitants to leave their homes and move to higher ground.

That said, it is also clear that reliable, high-performance, high-capacity pumps can play a key role as critical front-line tools in flood mitigation which, as was seen in Horsham and the Sudan, can help to significantly reduce the impact of, and damage caused by flood waters.

After all, it's fair to assume that we can expect more frequent, devastating floods.

Further information on flood mitigation solutions, ideas and equipment is readily available from Aussie Pumps.

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ZERO TAILSWING ViO80-7 MIDI-EXCAVATOR SCOOPS JAPANESE GOOD DESIGN AWARD

Yanmar Compact Equipment's zero tailswing midi-excavator, the ViO80-7, has been declared a winner in this year's prestigious Japan Institute of Design Promotion's 2023 Good Design Award.

Designed for the needs of the Japanese and international markets, the ViO80-7 is an ideal choice for urban civil engineering applications.

While belonging to the 8-ton class, it follows the concept of a mini excavator, enabling precise tasks such as turning in narrow spaces and digging in narrow trenches. Its high-power Yanmar engine and advanced ViPPS2i hydraulic system combine to offer a 15% improvement in excavation speed when compared to the previous ViO80-1B model.

This is not the model's first recognition – it has also achieved the highest three-star rating in fuel efficiency standards certified by Japan's Ministry of Land, Infrastructure, Transport and Tourism. The ViO80-7 also meets the criteria for 'ultra-low noise machinery'.

Other innovations include the double-lock quick hitch function, which allows attachments to be replaced using controls operated from the driver's seat, eliminating the need to get on and off the machine or using tools. This increases the machine's work efficiency, especially in sites facing labour shortages.

In receiving this award, the ViO80-7 gained recognition for its fusion of refined design tailored for narrow spaces and advanced functionality in a compact hydraulic excavator. It was praised for successfully combining user-friendliness and efficiency.

IN THE JUDGES' OWN WORDS

When announcing the Award, this is how the awards committee described the merits of the ViO80-7 mini excavator:

'The refined design stands out as a compact hydraulic excavator tailored for narrow spaces. Its wide glass area offers an expansive working space, and the spacious view is evident even from the exterior.

The multifunctional Human-Machine Interface (HMI) and simple operating system enable efficient work and ensure safety. They not only reduce the workload but also enhance operator satisfaction. The colour scheme, primarily based on the brand colours of red and black, exudes a sophisticated and urban impression. Meeting top-tier fuel efficiency standards and featuring low-noise technology, it achieves optimal performance for urban civil engineering tasks.

The fusion of high-quality design and advanced functionality not only balances user-friendliness and efficiency but also enhances Yanmar's brand value further'.

For more information on the ViO80-7 visit **https://www.yanmar.com/jp/construction/products/excavator/vio80_sv100/**

ABOUT YANMAR COMPACT EQUIPMENT

Today Yanmar is a leading global player in the industrial machinery industry. In the construction equipment sector, Yanmar was first to market with the launch of the first mini excavator in 1968 and its invention of the revolutionary zero-tail excavator in 1993.

Yanmar's Compact Equipment Business has four plants, in Japan, France, Germany and the U.S., to deliver a range of products and services to the global market.

For more details, please visit the official website: **https://www.yanmar.com/global/construction/**

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HANDRAIL SYSTEMS AS 'TUFF' AS YOU NEED THEM TO BE

Ordinary steel handrails are often unsuitable for corrosive environments, like salt air, acidic or wet industrial areas. This unsuitability is highlighted when preferential weld corrosion occurs. That's why Moddex developed the Tuffrail® range — the pre-engineered alternative to traditional welded handrail systems.

At the heart of the Moddex Tuffrail system is its remarkable durability. Built to withstand the toughest conditions, this handrail system is engineered using high-quality materials in durable galvanised, aluminium and stainless-steel materials.

WHERE SMART DESIGN MEETS COMPLIANCE AND LONGEVITY: MODDEX TUFFRAIL®

In today's fast-paced, highly regulated construction sector, safety, compliance and efficiency go hand in hand. That's where Moddex has created an advantage — for you. Since introducing Australia to pre-engineered handrail, balustrade, barrier and pathway solutions years ago, Moddex has taken leaps and bounds in developing systems that can cater for every construction and design need — always with compliance top of mind.

The Moddex Tuffrail range is a great example. As the name implies, it's 'tuff', but it also delivers an aesthetic solution, with multiple configurations that can be tailored to almost any site profile - and where it can't, Moddex are on hand to develop bespoke components from concept to installation.

DESIGNED WITH DURABILITY IN MIND

At the heart of the Moddex Tuffrail system is its remarkable durability. Built to withstand the toughest conditions, this guardrail system is engineered using high-quality materials, such as Aluminium, Hot Dipped Galvanised steel — and their unique 316 Marine-grade Stainless Steel product that's backed by Moddex with a 50-year warranty. There is also the option to powder coat in a range of Dulux colours.

Whatever your choice, Tuffrail options ensure resistance against corrosion, impacts and environmental elements, making the pre-engineered system an ideal choice for outdoor applications, including highly corrosive environments like seaways and wharves. By maintaining its integrity over time, Tuffrail minimises maintenance requirements and replacement costs, saving your clients' valuable time and resources in the long run.

In the unlikely event sections are damaged, Moddex has a large amount of shelf stock available nationally, so we can ship replacements in next to no time.

VERSATILITY REDEFINED

A standout feature of Tuffrail is its remarkable versatility. The design of the system allows for easy customisation and adaptability to various environments. Whether it's securing walkways, edges, ramps, staircases, factory floors, plant, mezzanines or machinery, Tuffrail seamlessly adjusts to different layouts, heights, and angles.

REDUCE INSTALLATION TIMES BY UP TO 50%

Versatility simplifies and speeds up the installation process — which can be done without welding, of course, and connected securely using the Moddex proprietary Dexx® locking screws and matching drill bits. Because Tuffrail reduces installation times by up to 50%, you can say goodbye to the days of complex, time-consuming installations.

FROM THE SEASIDE TO THE EXTREME SIDE

Being situated in a coastal environment, the Oaro Loop Retaining Wall in Kaikoura, New Zealand, required a handrail with the ability to handle extreme corrosive conditions. The 316 Marine Grade Stainless steel Tuffrail® system was chosen and able to cope with demanding, corrosive conditions better than any other handrail on the market. The kit-set system also meant quicker installation times, with the product delivered to site pre-assembled and flat packed and installation completed the following day.

Scott Base is a New Zealand Antarctic research facility located on Ross Island near Mount Erebus. Opened in 1957, the base was set up as support to field research into earth sciences and now conducts research in many fields and is operated by Antarctica New Zealand. The base is made up of a collection of buildings that are linked by all-weather corridors, with fairly typical weather conditions for coastal Antarctica — minimum temperatures around −45°C and summer maximum only occasionally above freezing point.

In 2018, Antarctica New Zealand tendered for a contractor to decommission the old tanks and install four new 40,000L tanks for the base. To provide safe access for staff, safety railings and interconnecting walkways on the top of the tanks were required, and Moddex Tuffrail aluminium was selected for the job. The pre-configured Moddex railing on the roof of the tanks was installed in -20°C temperatures with windchill and is still going strong!

If you need pre-engineered, ready-to-assemble handrails installed with minimum risk and guaranteed compliance, you need Moddex Tuffrail.

To find out more, visit: **https://moddex.com**

COMMON CHALLENGES FOR FACILITY MANAGERS ADOPTING NEW BUILDING OPERATIONS SOFTWARE

Facility managers are critical to the successful operations, maintenance, and management of modern buildings. They are responsible for ensuring that everything runs smoothly, from maintaining HVAC systems to managing daily operations and ensuring building occupant satisfaction. With the increasing complexity of building systems, traditional methods of manual facility management are becoming less and less effective. That's where digital building operations software comes in. By streamlining operations and providing real-time insights into building performance, this software has the potential to revolutionize the way we manage buildings in a hybrid world. However, as with any new technology, there are potential challenges that facility managers must overcome when adopting building operations software.

COMMON CHALLENGES FACILITY MANAGERS FACE IN BUILDING MAINTENANCE

When it comes to building operations and maintenance, facility managers face a number of challenges in sharing information between building facilities and operational stakeholders. Some of these issues can include:

- lack of integration between systems, which makes it difficult to manage multiple buildings from one platform
- no consolidated system to manage and record building activity, making it impossible to access a centralised database for all building operations
- lack of a 'single source of truth' for building operations, leading to duplication of data and no version tracking
- difficulty providing visibility into all building operations, making it hard to keep track of what's happening across the facility manager's portfolio
- paper-based records make it difficult and time-consuming to track progress, as well as identify opportunities to optimise the value chain
- inability to collect data related to energy usage that could be used in optimising building operations.

Bart Crowther, regional lead for Australia and New Zealand, PlanRadar, said, "While software platforms can be hugely beneficial for facility managers and building operators alike, on-ground realities can sometimes stand in the way of leveraging the strengths of technology in building operations.

"For facility management, operations software adoption is often driven by a need to reduce costs and increase operational efficiency. The problem is that these goals aren't necessarily always aligned with those of building operators. Typically, the operator's primary objective is to keep their buildings running safely and smoothly, which may not always align with the objectives of a facility manager who wants to cut costs or improve efficiency."

This conflict between objectives can result in one, or more, of the following:

- a lack of trust between building operators and facility managers
- a failure to achieve desired savings or efficiencies due to resistance from building operators.

To avoid this scenario, both parties must understand each other's motivations and expectations around the use of the software and how outcomes can be successfully achieved together.

WHAT'S IN IT FOR THE OPERATORS?

When it comes to adopting technology, it's important to build a strong benefit-value narrative among users. In this case, facility managers and building operators need to focus on how adopting and adhering to the facility management software can improve the overall teamwork efficiency, such as:

- less time spent searching for documents (e.g., inspection reports and maintenance records)
- reduced miscommunication on-site, allowing all team members access to real-time updates and the latest information
- automating routine tasks such as scheduling maintenance activities, generating work orders, and managing inventory levels
- easier access to key information related to worker site safety and fire risk hazard prevention procedures.

To streamline the transition, it's important to consider how to minimise disruption for all parties. Some best practices for implementing facility management software include:

- Create a communication plan: this helps ensure that all team members are well-informed about the new systems and expectations during the transition.
- Set up a pilot program: a trial or pilot implementation period lets facility managers test out the system and make sure it meets all needs, before moving forward with a full rollout.
- Build an operator's narrative: narrating the facility management software benefits from the operator's perspective with examples helps everyone understand how these systems can benefit their work efficiency.

- Establish a support system: make sure operators have the right support in place so they feel confident using the new system. Following up with operators after initial training sessions lets managers ensure that everyone has what they need, such as additional training sessions or assistance setting up reports, before turning over daily operations to staff members.
- Get operators on board: everyone in the building maintenance team must be on board with the change and understand why the organisation is making it, as well as what they hope to achieve by implementing it. Team members may have their own ideas about how best to implement this new software into their areas or roles, so everyone must be engaged through choosing the system, implementation, and adoption.
- Establish a training routine: create a training plan for all staff members who will be using the software for the first time, whether they are brand new hires or company veterans. Make sure that everyone has access to training materials before they start using any aspect of the system.

CONCLUSION: A SMARTER WAY TO OPERATE

Facility managers are constantly seeking new ways to improve the efficiency of building operations and enhance tenant experiences. Adopting building operations software can help achieve these goals by reducing manual tasks, providing real-time insights into building performance, and empowering building operators to make data-driven decisions.

Bart Crowther said, "Facility managers considering taking advantage of building operations software should be aware of the potential challenges they may face in the transition. However, these challenges can be effectively managed with a well-defined strategy and steady implementation of building management best practices. By understanding the common issues that facility managers face when adopting building operations software, organisations can avoid costly mistakes and ensure they can reap the full benefits of building management software."

ABOUT PLANRADAR

PlanRadar is a cloud-based Software-as-a-Service (SaaS) management platform for documentation and communication in construction and real estate projects. It can be used for fault and task management, maintenance, building inspections, construction documentation, handovers, and more. Using a web application or apps for all smartphones and tablets (iOS, Android, and Windows), teams can share digital floor plans or BIM models, communicate, and track any kind of information.

By digitising workflows, PlanRadar reduces the frequency of errors, saves time for all parties involved, and enables enormous increases in efficiency: customers report saving up to seven working hours a week.

Headquartered in Vienna, Austria, the company now enables more than 120,000 users from 65+ countries to track, connect, and solve on Construction, Mining, and Real Estate projects worldwide.

GROUTING & BRACING GUIDES TO IMPROVE PRECAST DESIGN AND CONSTRUCTION

Every architect, engineer and building professional who is involved with precast concrete construction should be familiar with the contents of two of National Precast's guides, Temporary Bracing and Propping of Precast Concrete Elements and Understanding Grouted Joints: A guide for engineers and building contractors, according to the organisation's CEO Sarah Bachmann.

Bachmann says that the two guides have been written by the industry's peak body to inform stakeholders, with the goal of improving the safety and quality of precast design and construction.

"Precast construction is a highly sustainable construction method, however, it is classified as a high-risk construction activity, so everyone needs to understand best practice and be aware of the consequences of neglecting critical stages in the design and construction process," Bachmann comments.

Grouting and bracing play a crucial role in ensuring the structural integrity and stability of precast concrete elements in construction.

CRITICALITY OF GROUTING

Grouting involves filling gaps and voids between precast elements with a cementitious material, providing additional strength and preventing the entry of water and other contaminants. This process enhances the overall load-bearing capacity and structural performance of the precast components, ensuring long-term resilience and durability.

According to Bachmann, "Loading bearing grouted joints play a critical but sometimes overlooked role in multistorey precast concrete structures."

"We've found that the three most common reasons for inadequate grouting are a lack of detailed documentation, rushed construction programmes and the assignment of grouting to untrained workers."

According to National Precast, inadequately detailed grouting - and in the worst-case scenarios an absence of grouting - can quickly lead to serious fatigue of precast joints and ultimately catastrophic structural failure of an entire building.

"This guide helps architects, engineers and building professionals to better understand the critical role that grouted joints play, and the procedures that ensure adequate design and implementation of grouted joints. Everyone should have a copy," Bachmann comments.

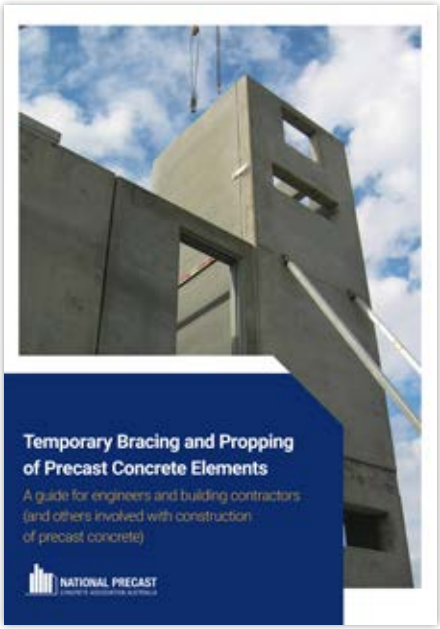
SAFE BRACING AND PROPPING

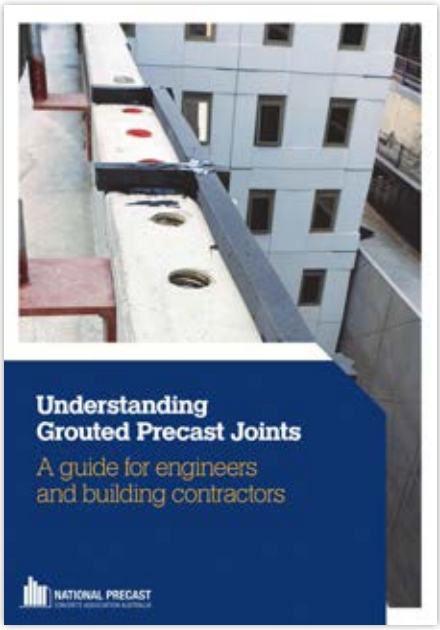
Also critical to the safety and durability of structures, are bracing and propping during construction. This process involves the use of temporary supports to hold precast elements in place during installation, and while the grout is curing. Proper bracing and propping ensures that the precast elements maintain their alignment and position, preventing any undesirable movements or deformations that could compromise safety, as well as the structural stability of the entire structure.

"We have developed the bracing and propping guide to detail the requirements, specifications and use of bracing and propping. Additionally, it explores the responsibilities for Erection Designers, In-service Designers, installers and head contractors," says Bachmann.

GUIDES AVAILABLE FOR PURCHASE

Both guides have been developed by professionals who are members of National Precast and come with extensive precast experience. They are available as a PDF or hard copy and can be purchased from National Precast's website: **https://nationalprecast.com.au/resources/publications**





THE DIFFERENCE BETWEEN BRACING AND PROPPING

Bracing is an engineering term for the structural components that resist and transfer lateral (horizontal) loads imposed on a structure. Typically, bracing applies to the securing of vertical elements, usually down to the footing system. Usual sources for these loads are wind, gravity-induced/out-of-plumb forces, seismic effects and construction loads. Resistance of such loads is required in the temporary and permanent stages, and in the temporary stage, this is typically achieved using inclined braces.

Propping – in contracts - is an engineering term for the structural components that resist and transfer vertical loads (usually self-weight and construction loads), typically for horizontal elements. The term is usually applied in the case of temporary supports only. Any lateral loads that exist with horizontal elements would usually be resisted by bracing.

GFRP-REINFORCED SLEEPERS FOR THE KOO WEE RUP BYPASS UPGRADE

The Koo Wee Rup Bypass Upgrade Project, nestled in the heart of Victoria, is rewriting the script for road infrastructure with a bold stroke of creativity and sustainability. Sunset Sleepers undertook the responsibility of crafting 1053 custom-designed concrete sleepers with the dual objectives of minimizing environmental impact and ensuring prolonged durability.

ECO-FRIENDLY FOUNDATIONS

Sunset Sleepers embarked on a groundbreaking path to promote environmental responsibility by adopting Glass Fibre Reinforced Polymer (GFRP) as a substitute for conventional steel reinforcement. GFRP presents numerous advantages, such as a remarkable strength-to-weight ratio, resistance to corrosion and extended lifespan. By reducing the dependence on steel, the production of GFRP-reinforced sleepers contributes to carbon emissions reduction, rendering them an eco-conscious choice. Additionally, the incorporation of a lower carbon concrete mix further and efficient, off-site manufacture and production methods further diminish the carbon footprint.

Sunset Sleepers' dedication to crafting exceptionally durable sleepers is exemplified by the choice to elevate concrete strength from 40MPa to 50MPa. The incorporation of a lower carbon concrete mix that incorporates waste materials equips these sleepers to withstand the challenges posed by tough environmental and adverse weather conditions.

QUALITY IS KING

To ensure that the sleepers adhered to the specified standards, comprehensive quality control procedures were meticulously enforced throughout the project. Each concrete delivery used in the manufacturing process underwent rigorous testing to verify the precise slump and strength. This exacting method ensures the uniformity and dependability of the sleepers.

Following a suitable curing period, the sleepers were cast and then carefully enveloped in plastic for a minimum of seven days, facilitating optimal hydration and the development of strength.

COMMITMENT TO MEETING STANDARDS

Sunset Sleepers adhered to a comprehensive Inspection and Test Plan (ITP) during the entire project. This ITP ensured that all manufacturing processes and materials met the specified standards and complied with regulatory requirements.

Regular inspections and tests were conducted to verify the quality of the sleepers, ensuring they met the stringent criteria for longevity and performance.

PIONEERING SUSTAINABILITY AND DURABILITY

The incorporation of GFRP-reinforced sleepers in the Koo Wee Rup bypass upgrade project establishes a groundbreaking standard for road infrastructure construction in Australia.

Anticipated to endure for a century, these sleepers exhibit extraordinary durability, leading to decreased maintenance expenses and a reduced environmental footprint. This achievement serves as a catalyst for the broader acceptance of sustainable construction methods and materials, motivating other infrastructure ventures to emphasize both longevity and environmental responsibility.

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AUSTRALIA'S JOURNEY TO NET ZERO IN THE CONSTRUCTION SECTOR

BY DR EHSAN NOROOZINEJAD FARSANGI
URBAN TRANSFORMATIONS RESEARCH CENTRE,
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Australia, a nation renowned for its diverse landscapes and unique ecosystems, stands at a pivotal juncture in the global movement towards sustainable development. As the world grapples with the escalating threats of climate change, the emphasis on transitioning to a net zero carbon future has never been more pronounced. The building and construction sector, a significant contributor to Australia's carbon footprint, is uniquely positioned to lead this transition.

This article delves into the intricacies of achieving net zero emissions within this sector, exploring the strategies, challenges, and the way forward for Australia's civil engineers, architects, contractors, consultants, and policymakers.

The Paris Agreement of 2015 and subsequent international summits have set the stage for nations to commit to ambitious carbon reduction targets. Australia, with its vast resources and technological prowess, has the potential to be at the forefront of this movement. However, the journey to net zero is riddled with complexities, especially in the building and construction domain, which encompasses a myriad of stakeholders, processes, and materials.

This article aims to provide a comprehensive overview of the current state, challenges, and future directions for Australia's path to net zero in the building and construction industry.

BACKGROUND OF GLOBAL CLIMATE COMMITMENTS

The Paris Agreement, a landmark in international climate diplomacy, set the ambitious goal of limiting global temperature rise to well below 2°C above pre-industrial levels. Recognizing the urgency, the 26th United Nations Climate Change Conference (COP26) in Glasgow further emphasized the need to limit the temperature increase to 1.5°C. These targets necessitate a significant reduction in greenhouse gas emissions, with countries like Australia playing a crucial role. The building and construction sector, responsible for a substantial portion of Australia's emissions, is under the spotlight to drive this change.

NET ZERO IN THE AUSTRALIAN BUILDING AND CONSTRUCTION INDUSTRY

1. Concept and Importance

The concept of net zero revolves around balancing the amount of greenhouse gases emitted with the amount removed from the atmosphere. For Australia's building and construction industry, this means a holistic approach encompassing energy-efficient designs, sustainable construction practices, and the integration of renewable energy sources.

2. Technological Advancements in Net Zero Energy Buildings (NZEBs)

- **IoT and AI Integration in Building Automation Systems (BAS):** The integration of Internet of Things (IoT) devices with Artificial Intelligence (AI) algorithms in Building Automation Systems can provide real-time data analytics, enabling predictive maintenance, fault detection, and diagnostics. This not only optimizes energy consumption patterns but also facilitates adaptive control strategies, enhancing the overall energy efficiency and operational performance of the building.
- **Advanced Renewable Energy Technologies and Integration:**
  - *Photovoltaic (PV) Systems with Maximum Power Point Tracking (MPPT):* Advanced solar PV systems equipped with MPPT controllers ensure optimal energy harvest from solar panels by continuously adjusting the electrical operating point of the modules.
  - *Wind Turbine Systems with Variable Speed Drives:* Tailored to Australia's diverse wind profiles, these systems can adapt to varying wind speeds, ensuring maximum energy extraction and reducing mechanical stresses.
  - *Bioenergy with Carbon Capture and Storage (BECCS):* This technology not only generates energy from biomass but also captures and stores the CO2 produced, making it a negative emissions technology suitable for Australia's energy mix.
- **Building Energy Management Systems (BEMS) and Optimization:** Advanced BEMS utilize high-frequency data acquisition systems and sophisticated algorithms to monitor, control, and optimize energy consumption in real-time. By integrating with HVAC, lighting, and other subsystems, BEMS ensures optimal energy performance, demand response capabilities, and peak load shaving, thereby enhancing the overall energy efficiency of NZEBs.

BARRIERS TO NZEBS AND SUSTAINABLE CONSTRUCTION IMPLEMENTATION IN AUSTRALIA

1. Economic Barriers: High upfront costs remain a deterrent for many Australian developers. However, the long-term benefits, both economic and environmental, far outweigh the initial investments.

2. Technological Barriers: While Australia boasts some of the world's leading technological innovations, integrating them into existing infrastructures presents challenges.

3. Regulatory and Policy Barriers: A unified national policy framework is essential to streamline and standardize sustainable construction practices across states and territories.

4. Societal and Behavioral Barriers: Changing the mindset of stakeholders, from homeowners to large-scale developers, is crucial. This involves dispelling myths about sustainable construction and emphasizing its long-term benefits.

5. Collaborative Barriers: Strengthening collaborations between academia, industry, and government can foster innovation and drive the adoption of NZEBs.

ROLE OF STAKEHOLDERS IN THE PATH TO NET ZERO

Stakeholders, with their diverse roles and responsibilities, are the linchpins in the journey to net zero. Their collective actions, decisions, and investments shape the trajectory of the building and construction industry's sustainability efforts.

1. Building Management: Beyond just the implementation of waste management protocols, building management must be proactive in adopting the latest sustainable technologies. This includes integrating smart building systems that can monitor and optimize energy consumption in real time, retrofitting older structures with energy-efficient materials, and ensuring regular maintenance to prevent energy wastage. They also play a crucial role in sourcing sustainable materials for construction, thereby reducing the embodied carbon from the outset.

2. Tenants: While building management can lay the foundation for a sustainable structure, the onus is on the tenants to utilize these features effectively. Tenants, both commercial and residential, need to be well-informed about the benefits of energy-efficient practices. Workshops, informational sessions, and regular communication can foster a culture of sustainability. Tenants can also advocate for and support green initiatives, such as recycling programs or green communal spaces.

3. Architects and Design Engineers: These professionals are at the forefront of shaping the physical and functional aspects of sustainable buildings. By prioritizing passive design strategies, such as optimizing natural light and ventilation, they can significantly reduce a building's energy demands. Their role extends to selecting sustainable materials, integrating green spaces, and ensuring that the building's design is in harmony with its environment.

4. Contractors and Consultants: Their expertise is vital in translating sustainable designs into reality. By employing green construction methods, using energy-efficient machinery, and minimizing waste during the construction phase, they can set the tone for the building's entire lifecycle.

5. Government and Policymakers: Their role is multifaceted. By setting clear regulations and standards for sustainability, they provide a framework for all stakeholders to follow. Financial incentives, such as tax breaks or grants for green projects, can motivate stakeholders to prioritize sustainability. Moreover, governments can lead by example by ensuring that public infrastructure projects embody the principles of sustainability.

6. Financial Institutions: Banks and financial institutions can influence the path to net zero by offering favourable loan terms or interest rates for sustainable projects. By recognizing the long-term value of green buildings, they can incentivize stakeholders to invest in sustainability.

7. General Public: The broader community plays a role by supporting and advocating for sustainable practices. Their preferences and demands can influence developers and policymakers. By choosing to live in or support green buildings, they drive the market in a sustainable direction.

ECONOMIC AND JOB GROWTH IMPLICATIONS FOR AUSTRALIA

Transitioning to a sustainable built environment is not just an environmental imperative but an economic one. The adoption of NZEBs and sustainable construction practices can spur job growth in sectors like renewable energy, AI and IoT integration, and sustainable construction materials. Moreover, as global markets increasingly prioritize sustainability, Australia's construction industry can position itself as a leader, attracting international investments and partnerships.

CONCLUSION AND FUTURE DIRECTION

The path to net zero is both a challenge and an opportunity for Australia's building and construction industry. While the barriers are significant, the potential benefits, both environmental and economic, are immense. As Australia looks to solidify its position as a global leader in sustainability, the building and construction sector will undoubtedly play a pivotal role.

The future beckons a collaborative approach, where architects, engineers, contractors, and policymakers work in tandem to realize the vision of a net zero future. With the right strategies, investments, and mindset, Australia can not only achieve its carbon reduction targets but also pave the way for a sustainable, prosperous future for generations to come. The journey to net zero is not just a technical challenge but a testament to Australia's commitment to a better, greener future.

ABOUT THE AUTHOR

Dr. Ehsan Noroozinejad is a Senior Researcher at the Urban Transformations Research Centre (UTRC), Western Sydney University, and an AEC consultant, where he specialises in Resilient Construction and Infrastructure. With a wealth of experience, Dr. Noroozinejad previously held a prestigious position at UBC Smart Structures in Canada. He also holds numerous memberships on committees and commissions, including the FIB, ASCE, MECLA, ASME, ANSHM and many more.

Dr. Noroozinejad has authored over 130 indexed journal papers and published seven books on his areas of expertise, which span resilience-based design of structures, digital twins in construction, and reliability engineering, among others.

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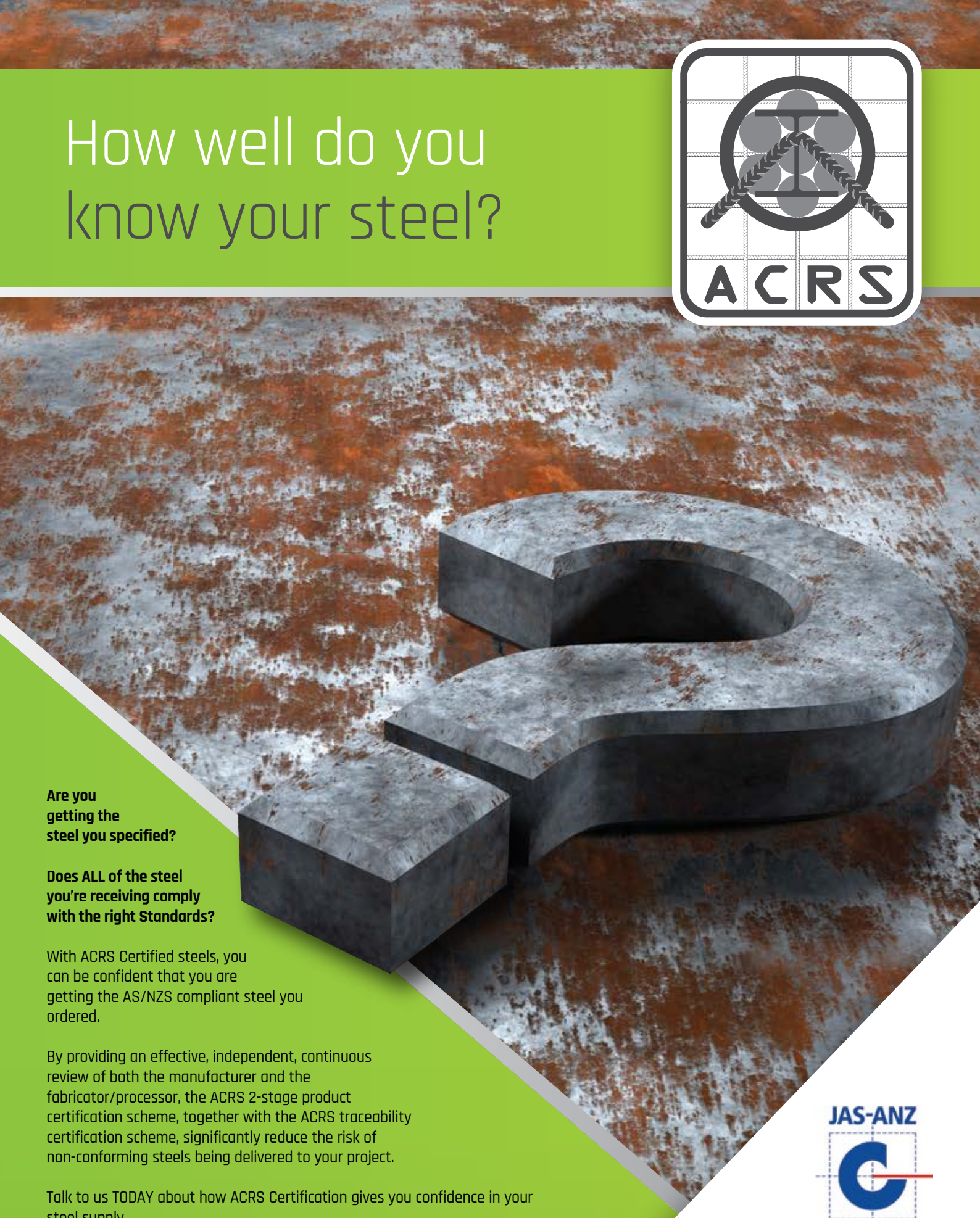

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By providing an effective, independent, continuous review of both the manufacturer and the fabricator/processor, the ACRS 2-stage product certification scheme, together with the ACRS traceability certification scheme, significantly reduce the risk of non-conforming steels being delivered to your project.

Talk to us TODAY about how ACRS Certification gives you confidence in 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

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