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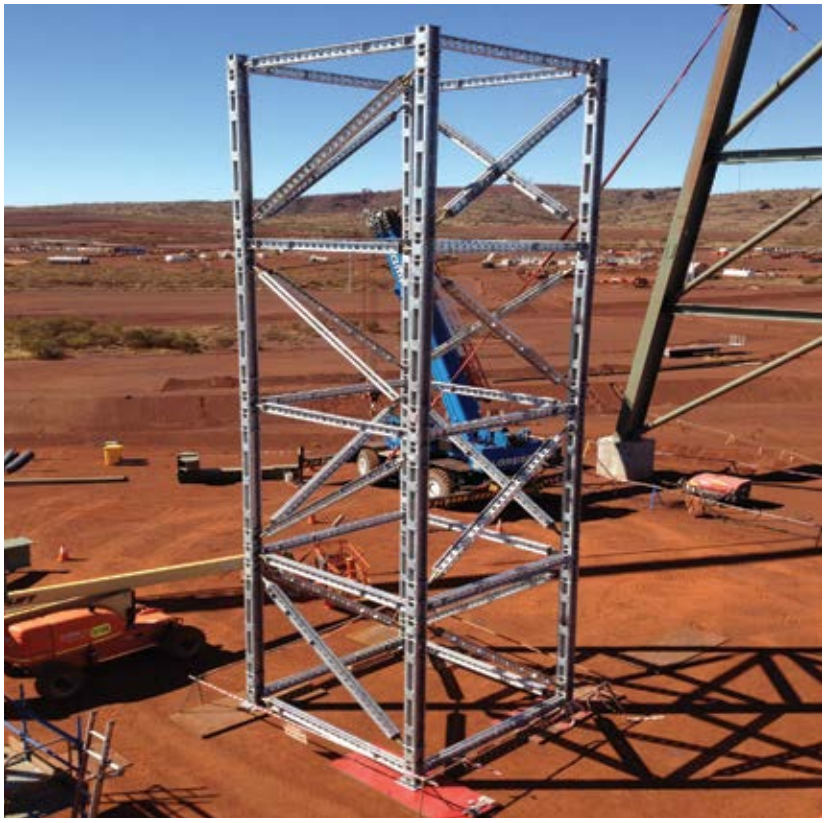

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About the Cover

The City of Gold Coast Mayor Tom Tate inspecting a section of the Gold Coast's iconic V8 Supercars track. The City is leading the nation with a new high-performance asphalt mix, which was specifically designed for the Gold Coast 600 V8 Supercars event.
Held every October, the Gold Coast 600 is held on the internationally acclaimed Surfers Paradise Street Circuit - a challenging 4.47-kilometre (2.78 mi) track that includes several fast sections and four chicanes.

▶ **Turn to Page 12 for the full story.**

Commuter parking

a critical component of public transport solutions

Dear Readers,

Even though each of the Australian capital cities like to espouse their individuality and lifestyle benefits, as one who is fortunate enough to traverse our beautiful country on a regular basis, I can confirm that there is one thing that they now sadly all have in common - traffic congestion.

Whilst we could probably argue the levels of congestion on a comparative case-by-case basis, these degrees of measure and severity are largely a moot point. The more obvious point is that whatever the city, it is clear that a large percentage of the road network infrastructure is now choking under strain of demand, and it is costing us a fortune - both as individuals and as a nation.

The inability of our transport networks to cope with demand is costing billions of dollars in lost productivity, fuels, operating costs and negative environmental impacts. And this is not a problem which is going away...

Increasing populations, a growing economy and the associated increased demand for freight will only make things worse for our already overstretched transport infrastructure - and I'm not only referring to the road network. In most cities, the public transport networks are also massively overstretched and sadly inadequate in terms of meeting the needs of our growing population and rapidly expanding cities.

That said, I believe that as a nation, one of our most critical future transport imperatives is to get people out of individual vehicles and onto public transport - even if it's only for a portion of the journey.

Unfortunately, from the current state of affairs, it would appear that one of the hurdles to achieving this goal (and there are several), is the lack of parking availability for commuters.

In short, if our aim is to get vehicles off the roads, we need to provide commuters with somewhere to park them. And before I invoke the wrath of any public transport 'idealists' who might consider that previous sentence as a personal invitation to send me an email informing me that *"...in an ideal world, individuals would not possess 'planet killing' automobiles"* (what me, facetious?), I will take this opportunity to point out that in the 'real world' immediate and easy accessibility to public transport without the assistance of a private vehicle for the first/last kilometre(s) of the journey is, for the majority of the population, never going to happen.

So, with that in mind, the only realistic option currently available is to provide suitable, secure parking for commuters.

Sadly, in the majority of cities (and for the majority of public transport networks) the parking that is available is sadly lacking - both in terms of the number of spaces, security and in some instances, permitted parking durations. Yes, I must admit, I found it more than a little surprising to drive into a railway commuter car park in suburban Melbourne only to find that the parking duration was a maximum of 5 hours. And that was at a station where the average train trip into the CBD is over 45 minutes! Sadly, the result of this lack of parking availability was that I ended up driving into the CBD rather than taking public transport.

Better Roads (a well-designed, expanded and improved road network) WILL reduce congestion and increase efficiency and productivity. **Better Public Transport** WILL reduce congestion, lower emissions and remove commuters from the road network.

These are both facts that are supported by hard evidence from across Australia and around the world. Be that as it may, I don't believe that we can sacrifice one mode of transportation for the other.

We need an efficient public transport network that attracts commuters. However, in reality, the size and expanding nature of our cities, together with people's work and travel habits, and issues such as 'door-to-door' transport requirements, mean that for many people, public transport is simply not an option without commuter parking. Without parking, they will have no choice other than to use a private vehicle for the entire journey.

Anthony T Schmidt
Managing Editor

TELL US WHAT YOU THINK!
We value your opinion and welcome your feedback and input.

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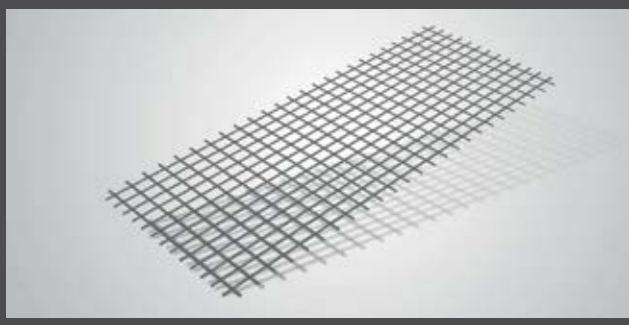

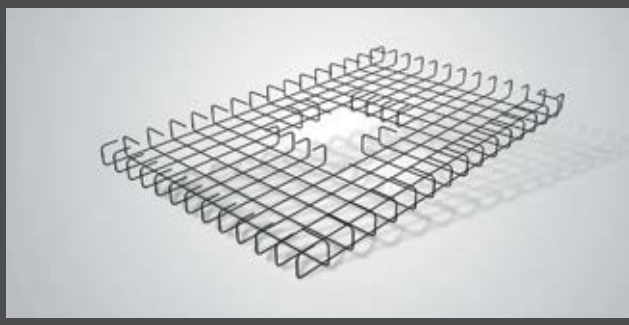

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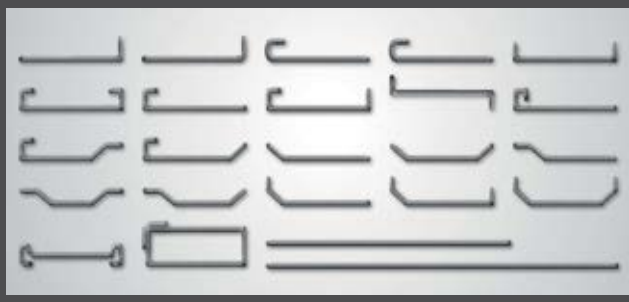

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IPWEA,CIVENEX and NSW Government in joint commitment to infrastructure in NSW


John Roydhouse, CEO, IPWEA-NSW

The major New South Wales infrastructure expo, CIVENEX, has been granted State Government permission to include the State's *NSW Making it Happen* logo at the event and in promotional material.

CIVENEX - staged annually by the State Division of the Institute of Public Works Engineering (IPWEA-NSW) for the past 61 years - is Australia's premier infrastructure showcase that generates millions of dollars in sales both on-site and afterwards for the 200 companies that exhibit to over 4,000 attendees from across Australia.

The Chief Executive of IPWEA-NSW, John Roydhouse, said the Association appreciates the recognition from the NSW Government and the encouragement to incorporate the logo in publications related to CIVENEX, which will be held at the Hawkesbury Showgrounds in the outer northern area of Sydney on May 18-19 2016.

"For the past 108 years, the IPWEA has been the peak body for infrastructure across Australia."

"We greatly appreciate this State Government support which has come directly from the NSW Premier's Office and shows the government is as serious as the IPWEA -NSW and the CIVENEX team to see NSW lead the nation's infrastructure development and continue to be the 'Infrastructure State of Australia' ", Mr Roydhouse said.

"The logo features the Waratah emblem and the words "Supported by NSW" which is important for CIVENEX, especially when dealing with potential exhibitors in overseas countries," he said.

"CIVENEX is where industry meets the Federal, State and Local Government bodies that generate infrastructure and where Private-Public Partnerships have their genesis, which explains the ongoing annual interest and the number of product launches held during CIVENEX by exhibitors."

"It is appropriate that NSW holds the major display of goods and services ranging from heavy machinery to software packages and the variety of consultancy services needed to facilitate the continual design, construction and maintenance of essential public infrastructure," he said.

"That so many overseas suppliers seek display space at CIVENEX is testimony to this State leading infrastructure-linked commerce," Mr Roydhouse said.

The CIVENEX 2016 program includes a variety of forums with key note speakers from industry and the NSW Government on topics ranging from basic regulations , latest updates on future infrastructure projects and best practice procurement.

For further information, visit:
www.civenex.com.au

Legal precedent opens door to recovery of millions in unpaid wages for terminated FIFO workers

Unions will look to pursue major resource companies for millions of dollars in unpaid termination payments following a precedent-setting victory in the Fair Work Commission. The Electrical Trades Union launched the case after the principal electrical contractor on the $34 billion Inpex Ichthys LNG project in the Northern Territory, Kentz Australia, made 150 fly-in fly-out workers redundant on the final day of their four-week shift, just prior to them commencing one week of recreation leave.

Kentz Australia reduced the termination payout to each worker by a week, counting the unpaid rostered leave as part of their notice period. The ETU challenged the move, arguing that it was unlawful for the company to have the notice period run concurrently with rest and recreation leave.

The FWC agreed with the union, ruling that rest and recreation was leave and that notice of termination of employment could not run concurrently with a period of leave, ordering Kentz Australia to pay more than $1 million to the workers.

ETU national legal officer Michael Wright said the case sets a significant precedent for other FIFO workers who had been terminated in similar circumstances in the NT, Western Australia and Queensland, including on the major Gorgon, Curtis Island and Roy Hill projects.

"This victory won't just see these 150 electricians receive additional payment, it opens the door for thousands of other FIFO workers who have been denied notice pay in breach of minimum conditions on major resource projects across Australia," Mr Wright said.

"The ETU has launched a review of the industry and we have already identified more than 3,000 FIFO workers that have been denied more than $10 million of entitlements in the same way."

"The purpose of a notice period is to give workers the chance to get new work. These employees were denied this right, with thousands of dollars stripped from their pay packets at the very time they are most vulnerable, having lost their job," he said.

"This decision by the FWC has put resource companies and their contractors on notice that they cannot use the unique vulnerabilities of a FIFO workforce to attack basic employment rights. The ETU is committed to bringing this practice to an end."

"As a result of this legal precedent, we expect to pursue claims for many more people in similar circumstances from around Australia," Michael Wright said.

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For further information on visiting or exhibiting at CIVENEX 2016, please contact CIVENEX Event Manager:
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Expanded CBD program can tackle mid-tier buildings

The Australian Government's commitment to continue the *Commercial Building Disclosure (CBD)* program has been applauded by the Green Building Council of Australia (GBCA).

An independent review of the CBD program, which was developed to drive energy efficiency improvements in the commercial office sector, has found $44 million in benefits have been realised in just four years.

"The review demonstrates why tackling energy efficiency in commercial office buildings is a smart solution to climate change – one that can be done at a minimal cost to industry and the tax payer," says the GBCA's Chief Executive Officer, Romilly Madew.

"The GBCA has always been a strong supporter of the CBD program, which has proven to be a critical driver in unlocking the emissions reduction potential of our buildings while raising awareness of building energy performance among building occupants, delivering cost savings and creating jobs," Ms Madew says.

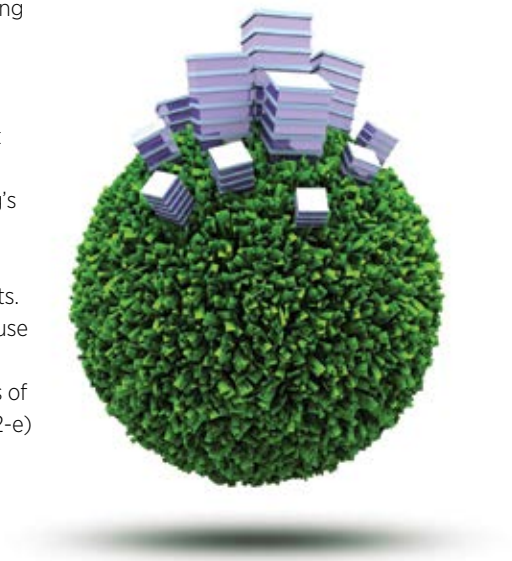
Analysis from the review has found that improvements in base building energy performance, as measured by the building's NABERS rating, has delivered cumulative benefits of $44 million between 2010 and 2014 – well in excess of the program's costs. The review also found a reduction in end-use energy consumption of 10,020 terajoules (TJ) and greenhouse gas (GHG) emissions of 2,051 kilotonnes of CO2-equivalent (ktCO2-e) over the period 2010 to 2023.'

The review has identified two enhancements to the program:

- Lowering the threshold for mandatory disclosure of energy efficiency information on buildings from 2,000sqm to 1,000sqm to capture smaller office buildings.
- Extending the length of time an office lighting assessment (known as a Tenancy Lighting Assessment) is valid from one to five years.

"Lowering the threshold for mandatory disclosure is particularly important, as it will open opportunities for greater energy efficiency in the mid-tier commercial buildings sector," Ms Madew says.

"There are an estimated 80,000 mid-tier commercial office buildings around Australia, but this sector has traditionally lagged behind in energy efficiency upgrades. Lowering the threshold for mandatory disclosure will prompt many building owners to explore the range of services, resources and technologies that can deliver building upgrades, often at relatively low cost, with attractive payback periods."



Minister for Resources, Energy and Northern Australia Josh Frydenberg has said that "...the delivery of the program, with the proposed enhancements, will deliver around $60 million of benefits to consumers through to 2019."

Buildings are responsible for around a quarter of Australia's greenhouse gas emissions, but are also one of the most cost-effective opportunities to cut emissions

"Expanding the program to include more buildings will help the Australian Government's target of increasing Australia's energy productivity by 40 per cent by 2030," Ms Madew concluded.

ABOUT THE GREEN BUILDING COUNCIL OF AUSTRALIA

The Green Building Council of Australia (GBCA) is the nation's authority on sustainable buildings and communities. The GBCA's mission is to accelerate the transformation of Australia's built environment into one that is healthy, liveable, productive, resilient and sustainable. The GBCA works with industry and government to encourage policies and programs that support its mission. The Council educates thousands of people each year on how to design and deliver sustainable outcomes for Australia's buildings and communities. And it operates Australia's only national, voluntary, holistic rating system for sustainable buildings and communities – Green Star. For more information, please visit: **www.gbca.org.au**

GCP Applied Technologies Inc. Announces its Launch as a Newly Traded Public Company

GCP Applied Technologies Inc. recently announced its global launch as a new, publicly traded company. With industry-leading product positions across its construction products and packaging technologies businesses, the GCP board said that it is focused on continuing to grow revenue and deliver value for stockholders.

The previously announced separation of W. R. Grace & Co. and GCP was completed by means of a pro rata distribution to Grace stockholders of all of the outstanding common shares of GCP. As a result of the distribution, GCP is now an independent public company and its common stock is listed under the symbol "GCP" on the New York Stock Exchange.

One share of GCP common stock was distributed for each share of Grace common stock held as of the close of business on January 27, 2016. Approximately 70.5 million shares of GCP common stock were distributed. No fractional shares were distributed.

"As an independent company, GCP Applied Technologies will grow our business by focusing on quality products and services in the construction and packaging segments we serve," said President and Chief Executive Officer, Gregory E. Poling. "We will grow through a combination of new technologies, geographic expansion and complementary acquisitions that support our customers worldwide."

Headquartered in Cambridge, MA, GCP has approximately 2,850 employees on six continents, and serves customers in more than 110 countries.

gcp applied technologies
GRACE CONSTRUCTION & PACKAGING

NSW Infrastructure has a positive outlook for 2016

There is a positive outlook in 2016 for all industries involved in building infrastructure in New South Wales according to the State Division of the Institute of Public Works Engineering (IPWEA-NSW) whose members undertake the major capital works projects for the private and public sectors.

IPWEA NSW Chief Executive Officer, John Roydhouse, said the Federal Government is injecting billions into infrastructure programs and the State Government has announced its own $20 billion infrastructure program as part of the *Rebuilding NSW* plan which includes investing $6 billion in regional NSW.

He said New South Wales is the premier state for infrastructure and will receive a major portion of the $9.7 billion in Federal funding to the States.

Mr Roydhouse said the dynamic growth in infrastructure commitment has been

reflected in bookings from overseas and across Australia for the IPWEA's CIVENEX Expo to be held at the Hawkesbury Showground on May 18-19, which is the State's major infrastructure show case.

He said the *WestConnex* road project has topped the list of infrastructure programs in New South Wales again in 2016, but now there was also the *NorthConnex* road project currently underway.

Mr Roydhouse said Stage 2 of *WestConnex*, which will more than double the capacity of the M5 East, is beginning ahead of schedule because the Commonwealth is providing a concessional loan of up to $2 billion, on top of the $1.5 billion grant it committed for all three project stages.

"Road congestion costs Australia $16.5 billion in 2015 while also adding massively to city pollution levels. Such projects as *WestConnex* will help ease congestion and improve accessibility to workplaces for employees and delivery drivers. This a win for lifestyle, cost reduction and the environment."

Mr Roydhouse also praised the Federal and State Government for working cooperatively to complete the upgrade of the Pacific Highway by the end of the decade which will help speed up domestic road trips and the delivery of primary and

secondary industry production to ports to boost the Australian economy.

"I understand the Pacific Highway project is on schedule and on budget with around 60 per cent of the 660 kilometers now upgraded and another 20 percent already under construction," Mr Roydhouse said.

"In 2016 we expect to see significant preparatory work for the Western Sydney Airport with the Federal Government due to issue a *Notice of Intent* to Southern Cross Airports Corporation soon."

Mr Roydhouse said that when combined with the Western Sydney Roads project worth nearly $3 billion, the second airport is one of Australia's most significant green-field infrastructure projects for decades.

These infrastructure projects will generate tens of thousands of jobs and spur economic growth in Western Sydney and the benefits will flow across the state and the nation long before the airport receives its first passengers in the mid-2020s.

New South Wales infrastructure projects will also include:

- spot tasks under the Federal Government's $200 million national Black Spot Program over the next two years to improve road safety
- works under Canberra's $3.2 billion Roads to Recovery Program, including tripling funding to local councils over the next two years for much needed construction and maintenance
- upgrades under the Federal $300 million Bridges Renewal Program
- the national $200 million Heavy Vehicle Safety and Productivity program
- works under the $1 billion National Stronger Regions Fund
- projects under the $500 million National Water Infrastructure Development Fund

These expenditures will allow infrastructure companies to reallocate staff and equipment that were involved in construction for the resources boom to these major projects now that many mining projects have been completed while others have been put on hold.

A first for commercial flooring in Australia

The NSW Minister for Environment Mark Speakman has just awarded funding to a collaboration organised by the Vinyl Council of Australia for a landmark project to improve recycling solutions for commercial vinyl flooring.

Currently it is estimated that 4,500 tonnes of commercial vinyl flooring ends up in NSW landfills each year, with an estimated 13,500 to 15,000 tonnes Australia-wide. These figures will continue to grow unless viable end uses for the recyclate stream are identified.

Vinyl flooring is the material of choice in hospitals, schools and retail. Made of limestone and vinyl, it is easy to clean, low maintenance, hard wearing and has a long 20+ year life. But like other forms of resilient flooring, when removed it is often contaminated with flooring residues and glues, making recycling difficult. However, it is a priority material to tackle because it is one of the few remaining elements in the construction and demolition sector requiring a solution.

As a result of the grant, during 2016, a qualified researcher will work with companies and industry associations to crack the puzzle via chemical and mechanical trials to find economically and technically viable processes and useful products for commercial vinyl flooring recyclate.

This project will leverage upon the lessons and successes of international flooring recycling projects, such as RecoFloor in the UK, which is an industry-funded product stewardship scheme collecting and

reprocessing flooring into products such as road cones and safety barriers.

'We are delighted to have created a team of brilliant minds, innovators and leaders in their fields contributing their time, expertise and facilities to find a solution to this Australia-wide waste of materials. This grant of $59,500 will leverage industry investments for a total budget of $219,800,' said Helen Millicer, Manager of Industry Recycling Strategy, VCA.

'We have a skilled research assistant in chemistry at UNSW, highly experienced reprocessors at Cryogrind, successful manufacturer in Boral Industries, and suppliers Armstrong World Industries, Gerflor, Tarkett and other members of the Australian Resilient Flooring Association who are keen to take the flooring industry in Australia into a sustainable 21st century. We will also liaise with leaders in the commercial property industry, construction and demolition through programs such as the NSW Better Building Partnership providing industry-wide engagement and coordination.'

'The solution to this challenge cannot be found by one organisation alone, and we are delighted to have received funding support from the NSW Environment Trust as part of the NSW EPA's Waste Less, Recycle More initiative, funded from the waste levy. A grant such as this that supports innovation and reprocessing in Australia is a game changer. It means that we can manage a focused and properly resourced project with contributing partners to find viable products and end-market alternatives and thereby prevent the ongoing loss of quality material to landfill.'

This project is one of two recycling research initiatives coordinated by the Vinyl Council of Australia to receive funding from the NSW Environment Trust as part of the NSW EPA's Waste Less Recycle More initiative.

ABOUT THE VINYL COUNCIL OF AUSTRALIA

The Vinyl Council of Australia is the peak industry association representing the Australian vinyl value chain and associated sectors including pipe, flooring and window fabricators. The VCA works to advance the health, safety and environmental performance of the vinyl industry in Australia by sharing information, engaging with stakeholders and fostering cooperation, as through this project.

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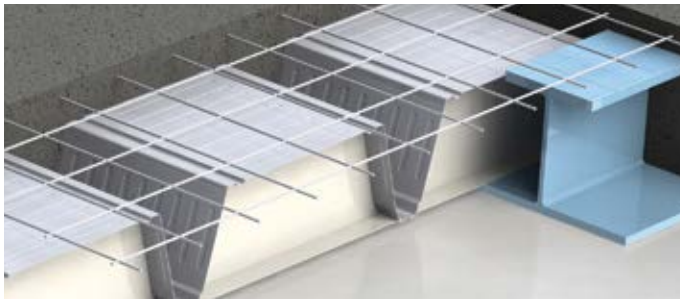
ENGINEER:	PT Design
ARCHITECT:	DASH Architects
PROJECT SPECS:	Total of 6,100m² of KingFlor® CF210 1.25mm bmt steel formwork.



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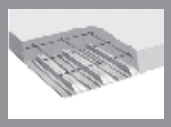
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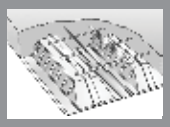
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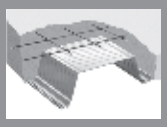
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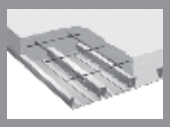
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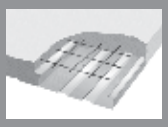
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The SlimFlor system has been developed using the Fielders CF210® profile constructed 'in plane' with a custom asymmetric steel beam design. The SlimFlor system allows for a reduced overall floor construction depth of 290mm.

SlimFlor not only delivers the intrinsic benefits of steel frame construction, but the optimised 290mm floor construction depth allows an additional 'free floor' compared to traditional steel frame design in the same building height for every 10 floors constructed. This means more tenant area for lease, reduced façade cost, reduced construction time, and less materials, labour and waste on site.

THE PROCESS

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Mike Bartels appointed as Valspar's General Manager to launch new era of "Wattyl Protective Coatings"

Valspar has appointed Mike Bartels as General Manager for its Protective Coatings business. Previously known as Wattyl Industrial Coatings, Valspar has reinforced its commitment to Protective Coatings through strategic business plans, talent investment and increased technology and innovation. Mr Bartels will head Valspar's Australasian Wattyl Protective Coatings business.

Mike's career in Protective Coatings spans over 30 years. He previously held various senior roles within AkzoNobel's International Paint, including, Australasian Business Manager, Marketing Manager (Global) and Business Development Manager, Asia. His career with Valspar began in 2015 in Melbourne as Business Development Manager, leading to his recent appointment as General Manager. Mike said, "As a local manufacturer of protective coatings, we will focus on developing and supporting products that meet the demands of the Australasian market. With recent investment in our manufacturing capacity and local R&D facilities we are well positioned to support the needs of our Customers."

Valspar's Managing Director, Richard Meagher, commented: "The appointment of Mike Bartels was an important milestone for Valspar as I am confident he will be the catalyst in helping steer Wattyl's Protective Coatings business to the next stage of professional excellence."

"Mike comes with outstanding credentials. He will bring focus and experience to our activities within the Protective Coatings market; a market which Valspar is now committed to growing globally," Richard Meagher added.

The new *Wattyl Protective Coatings* brand will be visible in the marketplace from 2016.

ABOUT VALSPAR

Valspar is a global leader in the coatings industry providing customers with innovative, high-quality products and value-added services. Its 10,800 employees worldwide deliver advanced coatings solutions with best-in-class appearance, performance, protection and sustainability to customers in more than 100 countries.

Valspar offers a broad range of superior coatings products for the consumer market, and highly-engineered solutions for the construction, industrial, packaging and transportation markets.

Founded in 1806, Valspar is headquartered in Minneapolis. Valspar's reported net sales in fiscal 2014 were $4.5 billion and its shares are traded on the New York Stock Exchange.

wattyl® Protective Coatings

Renovations in Victoria 6% cheaper than national average

Victorian homeowners are now paying 5.8% less for their home renovations than the average Australian homeowner. Renovation costs remained steady, with just a 0.63% increase year-on-year, despite national prices rising by 1.48%, a new study reveals.

The *Renovation Consumer Price Index* (RCPI) is a Quarterly report released by ServiceSeeking.com.au analysing 52,000 quotes submitted by tradesman on the website. The latest RCPI compares the cost of renovating in Q2 FY16 versus the prior year.

To support the release of the RCPI, ServiceSeeking.com.au has created an interactive map that plots price changes across 10 popular renovation services in Victoria year on year. It can be found online at: www.serviceseeking.com.au/renovations/vic

Maintaining its position as the cheapest state to renovate in Australia, the study shows that Victoria is a huge 10% cheaper compared to Western Australia, and 9.1% more affordable than neighbour state NSW.

"We believe that Victorian homeowners are shifting away from renovating their homes to purchase new property" says CEO of ServiceSeeking.com.au Jeremy Levitt.

"Lower demand has created great opportunities for homeowners to get cheaper prices for renovation jobs, as tradesman are competing for fewer jobs".

The cost of painting decreased by more than 7%, with hourly rates dipping below the $40 mark ($38.73/hr), a record low not seen in any other state.

Other popular renovation services such as plastering, plumbing and electrical work, all remained steady with prices increases of 0.88%, 1.68% and 3.4% respectively.

However, Victoria's landscaping costs were the highest across the nation at $72.34/hr, having risen 10.26% over the past year. "A shortage of landscapers in Victoria coupled with steady demand has driven prices much higher," says Levitt.

In conjunction with this price escalation, concreters and builders are also charging 9.59% and 7.95% more than this time last year.

With more than 1.96 million jobs listed on ServiceSeeking.com.au to date and over 6.8 million quotes compared, the company's latest findings provide a strong indication of renovation costs around Australia.

SMART CUSHION

Speed Dependent Crash Attenuators

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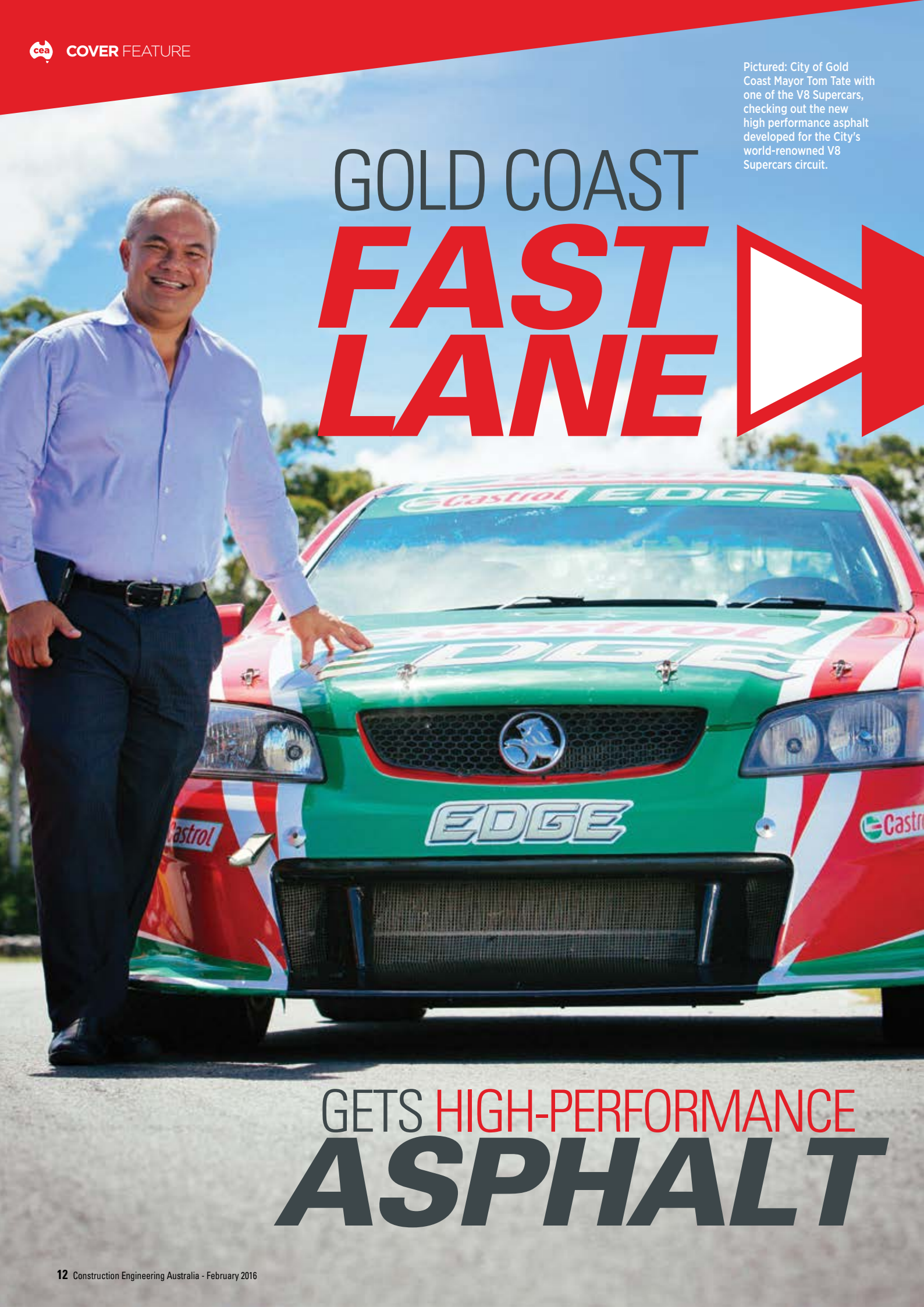


Pictured: City of Gold Coast Mayor Tom Tate with one of the V8 Supercars, checking out the new high performance asphalt developed for the City's world-renowned V8 Supercars circuit.

GOLD COAST FAST LANE GETS HIGH-PERFORMANCE ASPHALT

The City of Gold Coast is leading the nation with a new high-performance asphalt mix specifically designed for the Gold Coast 600 V8 Supercars event.

Held every October, the Gold Coast 600 is held on the internationally acclaimed Surfers Paradise Street Circuit - a challenging 4.47-kilometre (2.78 mi) track that includes several fast sections and four chicanes.

In 2014, the revered Bathurst 1000 V8 Supercars race was suspended with 100 laps to complete as a result of asphalt breaking up during competition. The event's postponement made global headlines and was a major upset to spectators and race organisers.

Mayor Tom Tate said following the Bathurst race, City of Gold Coast engineers immediately undertook a field audit to ensure the same controversy didn't occur during the Gold Coast 600 race.

"We simply were not willing to risk our city's reputation as a world-class event destination," he said.

Partnering with the Australian Road Research Board; V8 Supercars Integrated Event Delivery Management, the racing industry and Boral, the City embarked on a research and development project to refine the asphalt-mix design process needed to meet extreme racing stress conditions which include 100 degrees-plus tyre temperatures and shearing high-stress forces.

City of Gold Coast Executive Coordinator Transport Assets, Darrin McNeilage, said that the restricted timeframe meant a solution was not readily available.

"The race was only weeks away; the City's initial solution was to completely resurface the track, but it wouldn't have ample time to set," he said.

"We looked at overseas technology, but it wasn't feasible due to the unique characteristics of the V8 Supercars and Australia's climatic conditions."

The City employed the innovative idea of applying an epoxy micro surfacing to areas of the track that would experience the most extreme conditions. This product was a temporary solution for the 2014 event that allowed the stakeholder group 12 months to develop a world class solution through research and development and laboratory testing.

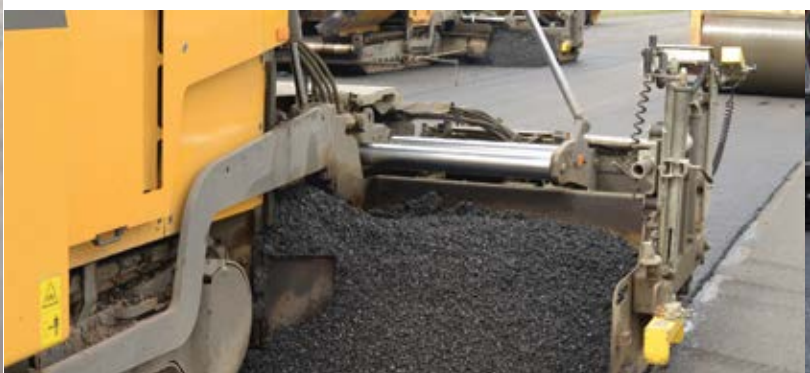
Works included selected turns of the racetrack being resurfaced and the establishment of a solid base – a commonly ignored process – that the newly developed high-performance asphalt could be compacted to the required standard.

Cr Tate said keeping the Gold Coast fast lane open was the result of fantastic teamwork.

"The scope of this project included establishing a resilient asphalt surfacing mix designed to cater for extreme racing conditions with refining the laying process," he said.

"The stakeholder group performed like a well-oiled pit crew and produced an innovative product that was delivered under stressful circumstances."

The 2015 Gold Coast 600 event was completed without any asphalt failures. The new high performance asphalt did not deform, shear or delaminate; proving that the City's innovative design is in a class of its own.



The new Eden View Drive access link will provide an alternative access route for a rapidly developing residential community.

CITY OF GOLD COAST ***BUSTS*** TRAFFIC CONGESTION

The City of Gold Coast has commenced works on a new $8.37 million congestion relief point for one of Reedy Creek's busiest thoroughfares.

Jointly funded by the City and the Australian Government's *'Roads to Recovery'* program, the new Eden View Drive access link will provide an alternative access route for a rapidly developing residential community.

Gold Coast Mayor Tom Tate said Gemvale Road carries a huge volume of traffic which includes local residents and the parents of students who attend one of the area's three schools.

"This congestion will be alleviated with a new signalised intersection at Gemvale Road, while a roundabout being funded by Kings Christian College will provide an additional connection behind the school which includes a parking and set down area. This will mean less traffic and congestion for the local area," he said.

"It's all part of our broader $83.6 million commitment to ensuring we support our city with the infrastructure it needs in order to grow and prosper."

Construction includes carefully staged earthworks, road works and stormwater drainage to limit exposed bare earth and sediment run off. Geo-fabric and jute-mesh are being used to provide temporary stabilisation to exposed earth; fabric covered earth bunds and sediment trap dams have been constructed, along with a clean water diversion path to manage the upstream catchment until the Q100 stormwater culverts are completed.

The Department of Environment and Heritage Protection praised the project for its quality of sediment and erosion control measures while the construction team were congratulated for their workplace health and safety efforts.

Once completed, the new road connection will include new walking and cycling infrastructure; increased

Construction includes carefully staged earthworks, road works and stormwater drainage to limit exposed bare earth and sediment run off.

Pictured here and below: Geo-fabric and jute-mesh are being used to provide temporary stabilisation to exposed earth during construction.

connectivity within the existing road network and alternative travel routes for local residents.

Cr. Tate said the link is a much needed alternative travel route for residential developments, including the Observatory and Varsity Heights estates.

"I look forward to seeing the benefits of this area's improved network connectivity come this time next year," he said.

The project is a key deliverable of the *City's Gold Coast City Transport Strategy 2031* and is scheduled for completion in mid-2016.

For more information, visit: cityofgoldcoast.com.au.

"It's all part of our broader $83.6 million commitment to ensuring we support our city with the infrastructure it needs in order to grow and prosper."

CITY OF GOLD COAST MAYOR TOM TATE

INNOVATIVE NEW SINGLE PHASE SLURRY PUMP

A new portable slurry sand pump, with a single phase 0.4Kw motor, has been introduced by Australian Pump Industries. Manufactured by Tsurumi, the world's largest manufacturer of submersible pumps, the product is considered to be a breakthrough in design, utility and low cost.

Tsurumi Pump's robotised factory in Kyoto, together with their recently opened facility gives the company a total annual production capacity of 1.5 million units. The development of the new slurry pump was driven by the need for a portable, single phase pump with the hard wearing internals to handle sand.

The new model, known as the HSD2.55S is a single phase electro submersible pump with a 50mm (2 inch) discharge port. The heart of the pump is a semi vortex high chrome iron impeller designed to pass sand and silt laden water easily through the pump chamber.

The shaft mounted agitator prevents "air lock" and stirs the mixture allowing the sediment to be handled. The agitator is also made of high chrome iron for long wear life in demanding applications.

Other key features include an anti-wicking block at cable entry. That block prevents the incursion of water due to capillary wicking in the event that the power cable is damaged or the end submerged.

Neil Bennett & Kurt Chapman from Aussie Pumps with Tsurumi's tough new portable HSD single phase slurry pump.

This unique Tsurumi feature prevents one of the major failures of motors in submersible pumps.

The pump's dual mechanical seals are silicon carbide, designed for long life and wear resistance. The seals are encased in an oil chamber eliminating spring failure caused by corrosion or abrasion. The oil chamber keeps both surfaces of the seal lubricated and cooled.

A patented "oil lifer" in the form of guide veins inside the oil chamber ensure the mechanical seals lubricate it even if the oil level falls. This increases the time between routine pump maintenance and adds to longevity of the motor.

Like all Tsurumi pumps, the new compact slurry pump has a thermal motor protector to guard against overheating from dry running or over current. The thermal protector automatically resets when the motor cools to a safe operating temperature.

The new pump produces 220 litres per minute flow and has a maximum head of 13.2 metres. The motor is a single phase squirrel caged submersible design, drawing 7.2 amps at full load. Starting method is fully enclosed capacity.

The pump comes with hose couplings, stainless steel fasteners and 10m of top quality submersible pump cable. Like all Tsurumi pumps sold by Australian Pump Industries they are covered by an exclusive three year warranty.

"That warranty guarantees the consumer the pump will not fail due to faulty workmanship or material during that period," said Product Manager, Kurt Chapman.

Australian Pump Industries expect the new single phase Slurry Pump to be of interest to the construction industry, hire companies and concrete product manufacturers. It's claimed to be ideal for draining wells, basements of pits and will work equally well in storm water dewatering applications.

"The new Slurry pump offers outstanding value for money and is an example of Tsurumi's relentless program to produce the world's best pumps at exceptionally competitive prices," Kurt Chapman added. Further information, including full specifications, are available from Aussie Pumps. Please visit: **www.aussiepumps.com.au**

SEMCO LAUNCHES TAKEUCHI TV CAMPAIGN

Market growth sparks high demand for compact excavators and loaders

Australian Takeuchi importer Semco is taking advantage of the buoyant market for compact excavators and loaders to situation with a major campaign to boost brand visibility of its Takeuchi equipment range.

The branding campaign of *'Those in the know, know Takeuchi'* is spearheaded by an attention-grabbing 30 second television commercial which will roll out across key markets in the first quarter of 2016.

"The television advertisement is aimed at brand positioning and reaches out to equipment owners and operators who have yet to experience the legendary reliability and performance of Takeuchi compact excavators.

"Import figures reflect a 15 percent volume growth in the market for compact excavators, with 5,500 machines imported year to date. Of this number, 5,000 mini excavators are in the under 8 tonne category. It's a similar situation for the market for compact loaders".

"Strong signs of this emerging growth were apparent from about 18 months ago, which influenced our strategy to invest heavily in the market by opening new sales and distribution centres in Melbourne, Brisbane and additional regional centres in New South Wales.

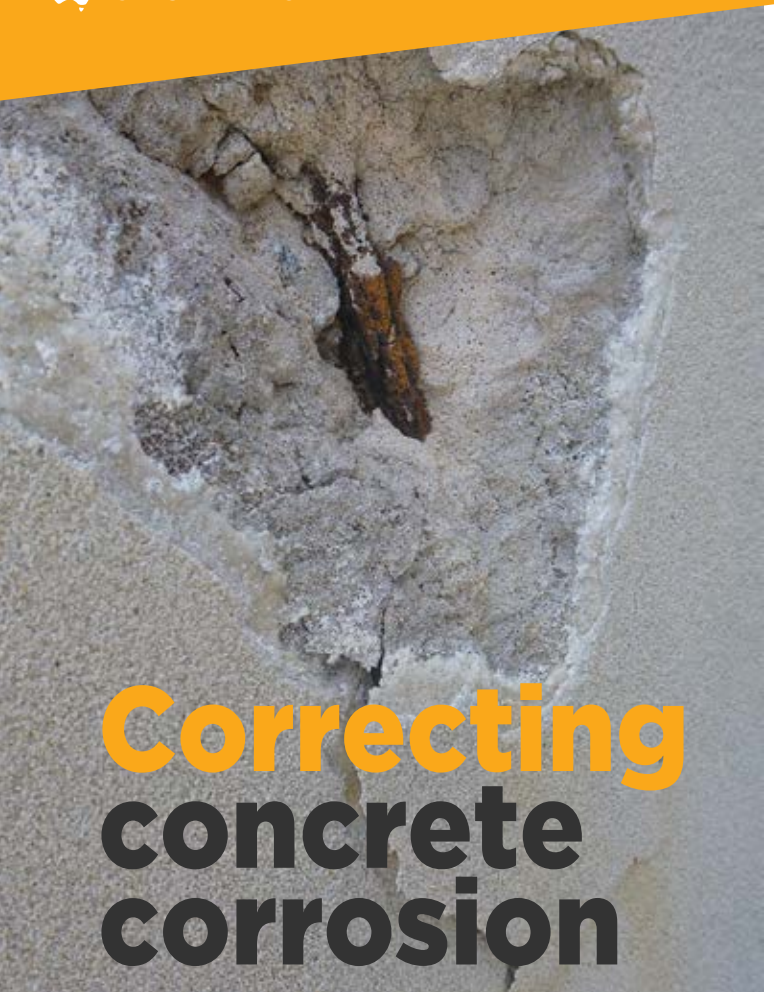
"The high level of market acceptance of the Takeuchi Brand has also been a key driver of robust sales growth, which has encouraged us to substantially expand our product offerings and boost engineering and technical support for the brand throughout the Australian market. Our in-house engineering facilities also enable us to work closely with Takeuchi Japan and our customers to develop custom solutions unique to the Australian market.

"Another factor in market growth has been the high volume of new residential construction as a result of affordable mortgages which has encouraged people to purchase properties rather than rent, reflecting a trend across Australia's major population centres of Sydney, Melbourne and Brisbane.

"Low interest rates on financing equipment purchases have also contributed to increased demand as contractors, plumbing companies and other suppliers of residential infrastructure services are moving quickly to take advantage of favourable conditions to replace or upgrade equipment".

"We know that Takeuchi owners keep their equipment for as long as possible and either replace it with the latest Takeuchi model, or move up-market to larger Takeuchi machines that offer higher productivity", Santilli said.

For further information please visit: **www.semcogroup.com.au** or **www.takeuchi.com.au**



Correcting concrete corrosion

Corrosion of the reinforcing steel in concrete is a worldwide problem that causes a range of economic, aesthetic and utilisation issues. However, if corrosion effects are considered in the design phase and the right decisions made prior to construction, buildings can be built to last and protected for as long as possible.

The corrosion of steel in concrete is accelerated in harsh environments, especially coastal, tropical or desert hotels and resorts where high salt levels or extreme temperatures can accelerate the rate of decay. Usually, the most exposed elements deteriorate first but because the active corrosion may take 5 to 15 years to initiate cracks in the concrete, much of the actual corroded reinforcement is not visible.

It is important that owners of high-value assets, such as hotels, understand the cost implications of ignoring the effects of corrosion on concrete buildings and structures. There are many advantages of planning for corrosion control and mitigation. Two of the main ones are that the life of an asset is extended and maintenance time and costs are reduced. In addition, reduced maintenance requirements increases the asset's overall utilisation and can improve its environmental sustainability.

It's not OK just because it can't be seen...

The alkaline (high pH) conditions in concrete forms a passive film on the surface of the steel reinforcing rods, thus preventing or minimising corrosion. Reduction of the pH caused by "Carbonation" or ingress of chloride (salt) causes the passive film to degrade, allowing the reinforcement to corrode in the presence of oxygen and moisture.

LEFT: Spalling concrete on a hotel wall showing corroded reinforcing rods

A voltage differential of approximately 0.5 V is set up between the corroding (anodic) sites and the passive (cathodic) sites resulting in a corrosion cell where electrons move through the steel from anode to cathode. The rate of the reaction is largely controlled by the resistance or resistivity of the concrete. Acid forms at the anodic (corroding) site which reduces the pH and promotes the corrosion of the steel.

The Australasian Corrosion Association (ACA) works with industry and academia to research all aspects of corrosion in order to provide an extensive knowledge base that supports best practice in corrosion management, thereby ensuring all impacts of corrosion are responsibly managed, the environment is protected, public safety enhanced and economies improved.

The ACA also conducts educational activities such as seminars and training courses to inform and guide organisations and practitioners about topics including the latest protective technologies and processes. Throughout the year, the ACA conducts training courses and hosts seminars across Australia and New Zealand. Corrosion specialists certified by the ACA, and other organisations, have the experience and understanding of corrosion causes and solutions that allow them to recommend mechanisms and procedures to consultants and asset owners.

Corrosion affects all concrete buildings and structures around the world to some extent, with an estimated annual cost of billions of dollars to national economies. However, it is often more of an aesthetic issue for hotels than office buildings because they need to project a certain ambiance to provide guests with a comfortable and pleasant environment. In addition, the falling concrete from buildings, where spalling is occurring, represents a real safety risk. Hotel operators do not want scaffolding, cabling and exposed metalwork on display for extended periods of time.

There are also constraints on when necessary repair or remediation work can be carried out. Commercial office buildings are usually unoccupied for several hours overnight when disruptive drilling and grinding can be done, but hotels operate 24 hours per day making it almost impossible to find convenient times to do the work.

The two commonest causes of concrete corrosion are carbonation and chloride or 'salt attack'.

In broad terms, when carbonation, chlorides and other aggressive agents penetrate concrete, they initiate corrosion that results in cracking, spalling and weakening of concrete infrastructure. As reinforcing rods rust, the volume of the rust products can increase up to six times that of the original steel, thus increasing pressure on the surrounding material which slowly cracks the concrete. Over the course of many years, the cracks eventually appear on the surface and concrete starts to flake off or spall.

Hybrid anode installation, typically with Anodes installed in 30mm diameter holes, typically spaced at approximately 400mm, with titanium connector wires. Repair mortar then completely covers the hybrid system components

As the degradation of the steel and weakening of the concrete occurs from the inside and may not be seen for many years, it is often referred to as 'concrete cancer'. According to Ian Godson, Managing Director of Infracorr Consulting PL, it might take up to 15 years before any cracking is visible. "It is a hidden problem which means that, when you find it, it is often well advanced, very much like the tip of the iceberg" Godson said.

Carbonation is the result of CO2 dissolving in the concrete pore fluid and this reacts with calcium from calcium hydroxide and calcium silicate hydrate to form calcite (CaCO3).

Within a relatively short space of time, the surface of fresh concrete will have reacted with CO2 from the air. Gradually, the process penetrates deeper into the concrete and after a year or so it may typically have reached a depth of 1 mm for dense concrete of low permeability, or up to 5 mm for more porous and permeable concrete depending on the water/cement ratio.

Chlorides, usually from seaside splash or windblown locations, migrate into the porous concrete over time, causing corrosion when the concentration of chlorides reach critical levels at the reinforcement. In addition, older structures may have utilised calcium chloride as concrete 'set accelerators' at the time of construction, again resulting in serious corrosion issues.

Concrete corrosion repair and prevention

According to Justin Rigby, coatings consultant at Remedy Asset Protection, "Concrete is a great material and is generally impervious at the start, but to increase durability, a coating should be applied."

Elastomeric waterproofing membranes can be either rolled or sprayed on to a concrete surface. Flat rooftops allow membranes to be rolled on, but where there are complex geometries, spraying the coating is the most effective method of application.

The traditional method of concrete repair is to remove the cracked and spalling concrete to a depth of 20-30mm behind the reinforcing bars to fully expose the rusted material and remove the contaminated concrete from the steel. All the corroded material is then removed and the steel treated or replaced, after which specialist repair concrete mortars are applied and the surface made good. A modern development is for the repair mortars to be polymer modified to improve adhesion and resist further ingress of contaminants. Coatings are commonly used in combination with patch repairs to reduce further entry of carbonation or chlorides.

These "patch repairs" that remove the contaminated concrete from the deteriorating sections often do not address this hidden corrosion and result in accelerated deterioration to the surrounding areas, commonly failing again within 3-5 years. Godson added, "One of the limitations of patch repairs is that you have to remove large quantities of sound concrete to solve the problem, causing significant noise and disruption to the building occupants."

Dangerously damaged hand rails with exposed rusting metalwork

ABOUT THE AUSTRALASIAN CORROSION ASSOCIATION

The ACA is a not-for-profit, membership Association which disseminates information on corrosion and its prevention or control, by providing training, seminars, conferences, publications and other activities. The ACA was established in 1955 to service the needs of Australian and New Zealand companies, organisations and individuals involved in the fight against corrosion. The ACA is the leader throughout Australasia in disseminating knowledge to enable best practice in corrosion management, thereby ensuring the environment is protected, public safety enhanced and economies improved. ACA members are drawn from a wide cross section of industries united by their common interest in reducing the impact of corrosion in Australasia.

The main alternative to patch repair is Cathodic Protection.

One type, Impressed Current Cathodic Protection (ICCP), is a technique whereby a small, permanent current is passed through the concrete to the reinforcement in order to virtually stop the corrosion of the steel.

The main benefit of ICCP is that the extent of removal and repair of concrete is vastly reduced, with only the spalled and delaminated concrete required to be repaired. Once installed, the ongoing corrosion can be controlled for the long term, eliminating future spalling and deterioration even in severely chloride or carbonation contaminated concrete.

The selection of anode systems is the most vital design consideration for a durable and efficient ICCP system. Incorrect selection and placement of the anode system can result in poor performance and vastly reduced life of the installation.

According to Godson, cathodic protection is relatively simple in theory. "Insert anodes into the concrete at set spacing attached to the positive terminal of a DC power supply and connect the negative terminal to the reinforcing steel. ICCP systems commonly operate at 2 to 5 Volts DC," he said. "The drawback is that you need lots of cables and permanent power supplies which results in this technology being mainly restricted to civil structures such as wharves and bridges with very rare applications to buildings."

A relatively recent development has been Hybrid CP which utilises zinc anodes installed in drilled holes with the anodes powered for an initial period of around 10 days. The high initial CP current totally passivates the steel reinforcement, migrating chloride away from the bars and restoring an alkaline (high pH) environment in the concrete.

Following the initial impressed current phase, the temporary power supply and cables are removed, with the anodes then connected to the reinforcement via locally placed junction boxes to provide ongoing galvanic protection. This relatively low galvanic current maintains the ongoing passive condition at the reinforcement and prevents further concrete damage. Hybrid CP systems are usually designed to give a 30 year or longer design life.

Hybrid CP offers all the advantages of ICCP, including corrosion control and reduced concrete removal, without the high cost and maintenance of power supplies, cables and control systems. Areas and structures that were previously difficult and uneconomical to treat with ICCP can now be protected using Hybrid CP technology. This includes small scale and remote structures including those situated in non-powered sites such as bridges, marine dolphins and culverts. In the case of building repairs, Hybrid CP offers significant advantages over ICCP by eliminating the need for unsightly and costly cabling and power supplies.

Diesel & Dirt Turf 2016 EXPO

PENRITH, SYDNEY APRIL 15-17 | RUN BY THE INDUSTRY, FOR THE INDUSTRY

COMPARE THE MARKET AT **'DIESEL DIRT & TURF EXPO'**

The upcoming Diesel, Dirt and Turf Expo is a great opportunity to check out the best deals and the latest and greatest gear for the construction industry, while the rest of the family can have fun and be entertained all day.

Keeping up-to-date with the latest advances in technology can be a challenge for time-poor construction contractors, builders and specialist sub-contractors.

Well organised industry expos are an efficient and time-saving way to compare equipment and services. They offer the added benefit of being able to closely inspect equipment and meet face-to-face with product specialists who speak your language and have intimate knowledge of machines' capabilities.

The "Diesel Dirt and Turf Expo" is owned and operated by members of the construction industry and is being staged in April at the Penrith Panthers, right in the middle of Western Sydney's growth boom region.

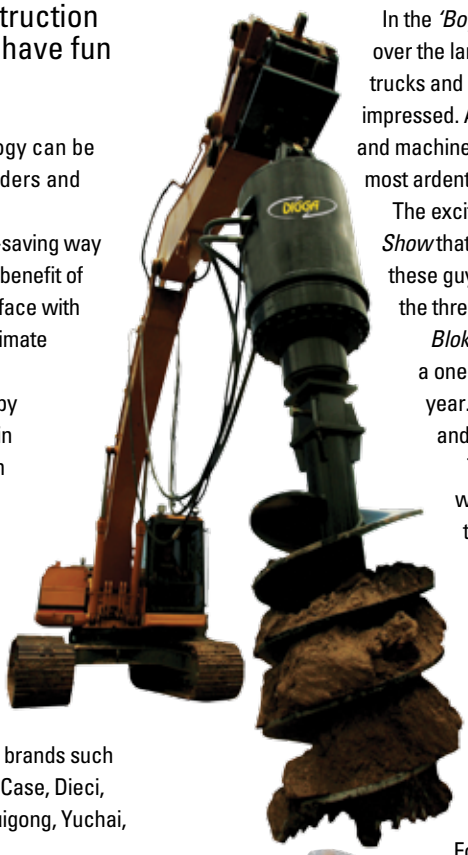
At this family-friendly and entertainment-packed event, exhibitors will be showing all the latest gear, while offering visitors unbeatable, Expo-exclusive deals on price, finance and support. Admission and ample parking is free and open to all daily on Friday 15th, Saturday 16th and Sunday 17th of April. Just arrive and enjoy the experience – there is no registration required or entry formalities.

The Expo brings together major construction equipment brands such as Komatsu, JCB, Takeuchi, Kubota, Hyundai, Toro, Terex, Case, Dieci, Yanmar, Mustang, Kanga, Ditchwitch, Toyota, Dynapac, Luigong, Yuchai, Airman, Hitachi, Vermeer and Liebherr, to name a few.

Visitors can also check out a comprehensive range of attachments from suppliers such as AugerTorque, Kinshofer, Norm Engineering, Auswide Trailers and Ramps, Digga, Boss, Atlas Copco, Hogan Buckets, Salmon Buckets , Flip screen, Atom Lasers, Peter Gardner Engineering, EI Engineering, Xcentric Rippers, Atlas Engineering, Doherty and Millers and more.

Other exhibits include a huge range of tyres, mowers and landscaping equipment, lasers, scales, plant hire equipment, finance and business services.

Continuous machinery demonstrations will be a big drawcard in the purpose-built demo area throughout each of the Expo's three days – a great opportunity to test gear to help you make those all-important purchasing decisions. Operators Challenges will test your skills, with visitors having a chance to win cash prizes as well as bragging rights for the next 12 months!



In the *'Boys Toys'* department, visitors can drool over the large display of the latest in bikes and boats, trucks and cars - whatever your interest, you will be impressed. And for those who are into vintage trucks and machinery, there will be enough there to satisfy the most ardent enthusiast.

The excitement continues with the *Flair Riders Stunt Show* that will keep the crowds enthralled, watching these guys perform amazing stunts in 12 shows over the three days of the Expo.

Blokesworld will be filming the expo to produce a one-hour episode that will go to air later in the year. The team will be interviewing exhibitors and visitors throughout the three days.

There are hospitality areas where visitors will be entertained with live music playing throughout the day, while for the kids there's huge jumping castles, farm animals, face painting, a Little Big Rigs live display and more.

Raffle prizes include a year's supply of beer, a TORO Ride on Mower and ten $250 fuel vouchers to be raffled as well as a huge number of exciting giveaways throughout the Expo's three days.

For further information, please visit: **www.dieseldirtandturf.com.au**

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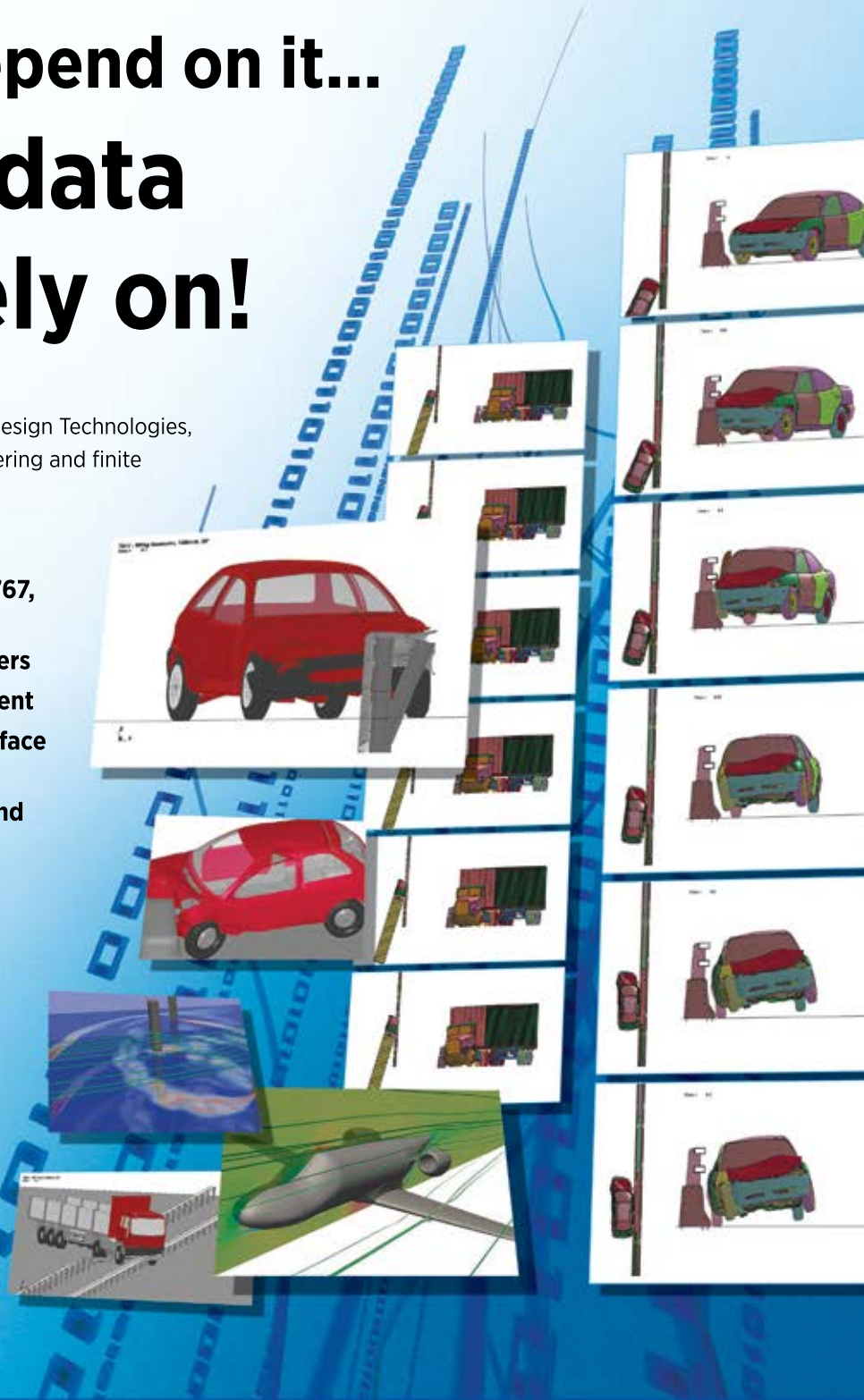

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AUSSIE OUTDOOR DESIGN

FIGHTING THE OBESITY EPIDEMIC

ONE PLAYGROUND AT A TIME

With Australia in the grips of what experts are referring to as an 'obesity epidemic', it's little surprise that health care professionals and governments are frantically looking for ways to increase the level of physical activity being undertaken by young and old alike.

Notwithstanding the issues surrounding many people's poor dietary choices, another major contributing factor in Australia's burgeoning weight problem is our increasingly sedentary lifestyle... and it's not a problem that is limited to one particular age group, demographic or socioeconomic group.

From young children and teenagers (many of whom spend the majority of their waking hours staring at a screen) through to adults of all ages – a large percentage of whom, be it for work or entertainment, also spend a significant amount of their day looking at a screen, as a nation, our lack of physical activity is taking a major toll on our health.

Now, thanks to Sydney-based company Aussie Outdoor Design, an ever-increasing number of councils, schools, community organisations and developers are helping to tackle the obesity epidemic 'one playground at a time' - and the benefits are not only for the kids!

Jason Day, Business Manager with Aussie Outdoor Design, explained:

"From the outset, our goal has been to provide councils, schools and communities with a variety of outdoor solutions; all of which are designed with a focus on encouraging participation, activity and engagement."

"Importantly, while the majority of our work tends to be centred around what would traditionally be referred to as a 'playground', in public spaces, most of the solutions we deliver are specifically designed to cater for a much wider demographic than just children," Jason added. "This not only helps to maximise the use and benefit of the facilities, it also plays a critical role in providing a 'point of focus' for communities - a positive and welcoming place where whole community can get involved in fun outdoor activities."

The benefits of this 'multi-function' approach to outdoor recreation areas is clearly evidenced in the success and popularity of the new facilities.

Rather than focusing on simply providing play equipment for young children, these new facilities incorporate a range of facilities, including self-contained outdoor 'multi-sport' courts (suitable for soccer, basketball, netball, hockey and a range of other sports), fully-accessible sensory gardens and an extensive range of outdoor gym equipment.

Needless to say, by providing a wide range of activities for young and old alike, these new facilities are proving to be extremely popular wherever they have been installed. Indeed, in most locations, these new facilities have rapidly grown into busy community hubs which attract residents of all ages.

"When designed and built correctly, quality outdoor recreation facilities can provide much more than a simple playground or sports court," Jason said.

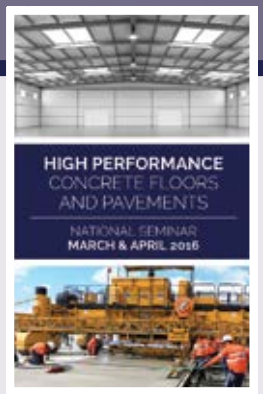
"They can become an important 'community hub'. A safe and attractive place where people can meet and feel part of the community and, importantly, feel proud of the facilities that are available in their community."

For further information on the full range of Aussie Outdoor Design's products and services, please call: 1300 887 025 or visit: **www.aussieoutdoordesign.com.au**

Jason Day, Business Manager, Aussie Outdoor Design inspects one of the new 'multi-function' outdoor recreation facilities in Penrith in Sydney's outer-west.

CONCRETE INSTITUTE of AUSTRALIA

HIGH PERFORMANCE CONCRETE FLOORS AND PAVEMENTS



DATES

SYDNEY
15 MARCH

ADELAIDE
22 MARCH

PERTH
23 MARCH

BRISBANE
5 APRIL

MELBOURNE
6 APRIL

HOBART
7 APRIL

The aim of pavement and floor design is to select the most economical pavement thickness and composition which will provide a satisfactory level of service for the anticipated traffic. Therefore, the correct choice of slab or pavement is only possible if we fully understand the demands placed in terms of performance of the wearing surface.

The Institutes first National Seminar for 2016 titled High Performance Concrete Floors and Pavements will discuss the design and construction of industrial warehouses and port pavements, concrete pavement design, construction and maintenance, post-tensioning for industrial slabs, and joint systems in flooring and pavement.

Our presenters include two of Australia's pre-eminent pavement and floor design experts along with some of our countries leading practitioners who understand the design requirements needed for good construction practice. The seminar will also include an international expert from the USA who will be discussing ACI Design Methods for Floor and Pavements.

PRICING

CIA Members	$590
CIA Retired Members	$295
CIA Student Members	$295
Non-Members	$795
Seminar & Members Package (incl. 12-month Individual Membership)	$850

SUPPORTING PARTNERS

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Program and registration details overleaf >>>

AGENDA

08:00 am: Registration

08:30 am: Introduction

08:40 am: Session 1, Concrete Pavement Design, Construction and Maintenance

Geoff Ayton — Consultant, former Roads & Maritime Services, Manager, Pavement Structures Unit

An introduction to the differences in design between slab-on-ground and pavement structures, as well as looking at quality in construction.

This will be followed by fundamentals in joint design for concrete pavements, typical joint types, joint induction methods, and interface issues.

The presentation will also look at construction issues related to pavement design and what needs to be considered with respect to batch site and on site practice, as well as typical maintenance routines.

10:40 am: Morning Tea

11:00 am: Session 2, Industrial Warehouses

Todd Halliday — Principal Structural Engineer, Northrop Consulting Engineers

Industrial warehouse developments are increasingly built to serve an expanding and developing logistics industry. Facilities are getting larger and racking has become higher meaning an increase in static and dynamic loadings. To ensure long term high performance, engineers must carefully design and detail pavements for the design life of the facility.

This presentation will cover typical static and dynamic loadings, pavement and joint design for conventional steel and steel fibre reinforced pavements, and designs and specifications to minimise cracking risks to pavements.

12:30 pm: Lunch

1:30 pm: Session 3, Joint Free High Performance Container Pavements and Case Studies

Alan Ross — General Manager BOSFA

Container pavements have to able to carry extremely heavy loads from block stacked containers and container handling equipment. They should also be designed and detailed in such a way to minimise as ongoing maintenance as uncontrolled cracking, joint failure, and loss of productivity can be problematic and challenging.

This presentation explains the loads that have to be considered and how they are modelled for these pavement types. It also discusses projects that have been constructed with no moving joints using steel fibres combined with mesh, and solutions enabling construction of large joint free areas.

2:30 pm: Session 4, Post-Tensioning of Slabs on Grade

Dominic Lambert — Manager NSW & ACT Building Freyssinet

This presentation will include an overview of the technical and commercial benefits of using post tensioning systems for slab on grade applications to improve structural performance, reduce costs and increase construction productivity. The presentation will also include relevant post tensioning design considerations and case studies of large scale applications of the technology in the Australian market.

3:30 pm: Afternoon Tea

4:00 pm: Session 5, ACI Design Methods for Floor and Pavement, incorporating High Performance Joint Systems

Robert Rodden — Lead Engineer, PNA Construction Technologies, Inc.& P.E., Infrastructure Solutions - Roads, R&D LafargeHolcim, U.S.A

This presentation reviews ACI design considerations for Industrial and Commercial Floors and Pavements with a focus on a range of design types. The content covers the relationship and interaction between thickness, joint spacing, load transfer and curling while providing recommendations for cost effective flatwork solutions that achieve high performance outcomes in serviceability and design life. In addition, the presentation provides an overview of Joint Management solutions encompassing Industrial Floor and Pavement environments. The discussion reviews the key considerations and for best practice in Joint Management incorporating Load Transfer and Joint Defection controls with a focus on serviceability and extension of the asset lifecycle.

5:30 pm: Session 6, Q&A

To register or to find out more please visit http://www.concreteinstitute.com.au/floorspavements

NEUTRAL BAY DEVELOPMENT LINKS TO THE SITE'S MUSICAL PAST

The multi-award-winning developer HELM has unveiled an eye-catching apartment project which seems certain to set new design and quality standards for Sydney's Neutral Bay.

MUSE, in Rangers Road, follows on from ESQUE in Glover Street, Mosman which was judged the best medium-density housing development in Australia. HELM is also nearing completion of a similarly outstanding apartment project called LAURIER in Parraween Street, Cremorne.

The architect for all three projects is the internationally-acclaimed Peter Conley, whose modern day masterpieces flow from function and sensual form. Liquid curves, ethereal shapes and recessed elements are the visual hallmarks of MUSE. But at this boutique-sized development beauty is more than skin deep, with the stunning exterior balanced perfectly by the premium nature of life within.

MUSE is one of those rare buildings which provide calming interiors within an energising urban neighbourhood. Like Yin and Yang, there are two harmonious elements to living here.

From an entry foyer that opens into a soaring atrium containing 15-metre-high walls of living greenery, MUSE reinterprets the notion of public and private spaces. This lush communal focal point brings nature inside and encourages residents to gather, relax and get to know one another.

It's a peaceful retreat with an important purpose, acting as the 'lungs' of the building by providing natural ventilation, sunshine and light – a welcome change from the usual air-conditioned and artificially-lit lobbies.

HELM is one of the few developers who place emphasis on large apartments in cosmopolitan locations, primarily to tempt 'empty nesters' and 'baby boomers' from their suburban homes. Neutral Bay meets this criteria perfectly, being one of Sydney's liveliest and most convenient suburbs.

"We ensure the transition from a family home is as easy as possible," said Mark Monk, General Manager of HELM.

Though layouts differ, each apartment at MUSE is designed for owner-occupiers, offering generous space, inventive storage solutions and surprising tranquillity.

"Our interiors are timeless, with elegant forms and the finest appliances," said Monk. "The aesthetic edge is achieved by a richness of materials and a suite of luxury features unmatched by most apartment developments."

Double-glazed, full-height windows and doors expand lifestyle options. Closed they turn the apartments into cosy retreats; opened they flow organically onto practical terraces, where residents can soak up the sun in privacy, enjoy an alfresco meal or entertain in style.

Each apartment at MUSE has wheelchair access and the ability to become a fully disabled apartment, if ever required.

Because MUSE enjoys the bonus of being on a corner site with three street frontages, all apartments have dual aspects that maximise views and take advantage of cooling breezes. Wide sliding glass doors provide a seamless transition from the living areas onto private balconies with commanding vistas of Sydney Harbour and the CBD in one direction, and over the emerald green suburbs of Cremorne and Middle Harbour in the other.

The 23 apartments in MUSE comprise:

- two-bedrooms (80-95sqm internal plus large balconies)
- three-bedrooms (110-150sqm internal plus large balconies)
- penthouses (130-182sqm internal plus up to 41sqm externally)

The fittings and fixtures in each MUSE apartment have been selected to combine comfort and convenience with elegance. Floor-to-ceiling windows allow natural light to bathe the spacious interiors and aid the airy feel.

The name MUSE arises from the history of the site, which was the former headquarters of the Alberts Broadcasting Company. Known as 'The House of Hits', this was a creative hub for songwriters, artists, composers and producers. Alberts helped launch the careers of such famous Australian bands as Billy Thorpe and the Aztecs, The Easybeats, The Ted Mulry Gang, AC/DC, The Angels and Rose Tattoo.

The developer explains: "We settled on the name because one of the meanings of 'muse' is: "a force that inspires a creative artist', and MUSE will be our most creative and artistic development so far."

ROSEBERY'S TRANSFORMATION CONTINUES

Rosebery is a suburb in transition. Bordering Green Square, Victoria Park and Alexandria, it is just six kilometres south of the Sydney CBD, well connected to public transport and is ripe for redevelopment.

Many of the old industrial buildings and commercial warehouses are being demolished and replaced by attractive-looking apartment complexes. The latest of these is Astor by LIVstyle, a boutique developer who has achieved great success with its other Rosebery projects, Verde and The Parker Residences.

Astor enjoys the benefit of frontages to both Mentmore and Rothschild Avenues. It is within 600 metres of the entrance to the Eastern Distributor which provides direct links to the CBD, the Eastern Suburbs and the North Shore. Green Square Railway Station is within walking distance, and Sydney Airport is just a few minutes drive away.

Aaron Tippett, a Director of LIVstyle, regards Rosebery as a "social and cultural hotbed" undergoing extensive urban renewal. "Every day you can see the area changing for the better," Tippett said.

"At 105 apartments Astor is our largest project to date, which stems from our confidence in the growing popularity of Rosebery. With Darlinghurst and Surry Hills virtually moribund through road closures and parking hassles, Rosebery has the potential to offer a similar cosmopolitan lifestyle but with less congestion and at a much more affordable price."

Astor comprises two seven level buildings, sited 23 metres apart, with a large central courtyard that will be landscaped with mature trees and have an outdoor kitchen for social gatherings, custom-designed seating, and areas for private relaxation.

Environa Studio has designed both buildings to be visually complementary, with vertical green walls and slots in the façade to create visible entry points.

"One of our design tenants is to ensure the journey for residents to their front doors is an interesting one, so once they enter the building we take them through sinuous walkways and a series of large and small communal spaces – not boring corridors," said Tone Wheeler from Environa Studio. "When they enter their apartment they will experience a feeling of sanctuary."

The 105 apartments at Astor range from one-bedroom to three-bedroom options, and include penthouses with large rooftop terraces and garden units that provide a natural connection to the outdoors.

"We have eliminated unusable floor space to ensure occupants have generous and flexible interior and external living areas whist being mindful of their need for storage," said Wheeler. "The rooms are well-proportioned and either square or rectangular which will be easy to furnish, unlike some of the odd-shaped designs created on an architect's whim.

"We have maximised the outlook, the light, the cross-ventilation, the privacy and the feeling of security for residents."

All apartments in Astor have substantial and solid balconies, many of which overlook the leafy central courtyard.

Peter Shield, Residential Project Director of Ray White Erskineville, said apartments at Astor take affordable style to a new dimension, and will be appreciated by people who have inspected lesser quality units in adjoining suburbs. "These have a warm and inviting feel, and set new standards for Rosebery with their finishes," he said.

Astor will provide most apartments with secure car spaces, and there will also be visitor parking. With parking at a premium so close to the CBD, realtors value each space at up to $80,000.

Rosebery offers an ideal base for workers, being near large-scale employer groups such as the airport, hospitals and Fox Studios. Students are equally well catered for by the University of NSW, Sydney University, UTS, Sydney Tech, the National Institute of Dramatic Art and private colleges.

"Rosebery is close to many of Sydney's best recreational attractions, such as our sporting stadiums, top golf courses, Randwick Racecourse, and our world famous beaches, including Bondi, Bronte and Coogee," said Shield.

"Most things you want are within walking distance, including restaurants, theatres, boutiques, galleries, and shopping facilities. Those who buy here will appreciate the benefits even more in years to come as Sydney becomes more crowded and properties close to the CBD grow out of the financial reach of most."

Construction of Astor is scheduled to be completed by early-2018.

NEW SCHOLAR ACCOMMODATION AIMS TO ATTRACT BRIGHTEST MINDS

An exciting new addition to the city's landscape will help attract the world's brightest minds to Western Australia.

The new development, known as Forrest Hall, has been designed to promote a stimulating and creative living environment for scholars and rising research stars attending Western Australian universities on Forrest Research Foundation Scholarships.

Designed by internationally renowned Kerry Hill Architects, Forrest Hall is earmarked to be built in a beautiful location over-looking the Swan River, at the corner of Mounts Bay Road and Hackett Drive.

Forrest Hall has been made possible by the philanthropic donation of Andrew and Nicola Forrest, who in 2013, made the largest single donation in Australian history of $65 million.

$15 million has been provided for Forrest Hall, with the remaining $50 million to be used to establish the Forrest Research Foundation to fund scholarships and postdoctoral fellowships across all five WA universities.

Nicola Forrest said the design of Forrest Hall will complement UWA's stunning campus while fitting in with the tranquillity of the Swan River.

"The views from Forrest Hall will be amazing. It is a modern building but the use of stone in its construction acknowledges UWA's tradition and history. Most importantly, the new development has been designed with the purpose of attracting and inspiring top scholars in their academic pursuits while creating a space that enhances their on campus learning experience."

The four-storey development will consist of around 33 self-catered one and two bedroom apartments, an outdoor terrace with river views, a multi-purpose room for seminars and functions, and undercroft car parking facilities.

UWA Vice-Chancellor Professor Paul Johnson said Forrest Hall will be a stunning addition to The University of Western Australia's campus.

"The vision of Andrew and Nicola Forrest to establish Forrest Hall, coupled with its wonderful location, will help attract the world's most outstanding scholarship candidates," Professor Johnson said.

Forrest Hall will also accommodate Forrest scholars studying at the other Western Australian Universities: Curtin, Murdoch, Edith Cowan University and Notre Dame.

Construction is expected to start mid-2016 for completion by semester one 2018.

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CONCRETE INSTITUTE of AUSTRALIA

Concrete Institute of Australia National President, Michael van Koeverden (on left), with fib President, Prof Harald Muller

BE "IN THE MIX"

The construction industry in Australia today moves at a rapid rate of knots. The pressure to perform means that organisations are placing less emphasis on training and professional development, as they look to maximise time and effort spent ensuring that projects are completed on time and within specification.

However – is this having an impact on our engineering skills, and more specifically, knowledge and application of concrete construction in Australia? Michael van Koeverden, National President of the **Concrete Institute of Australia,** an independent not-for-profit association founded in 1969, which provides professional development opportunities for stakeholders in the concrete industry, recently said:

"While advances have been made in admixtures, binder and aggregate production, fitments, testing and repair materials, the root cause behind many of our concrete problems is neglect of the basics. All areas of the concrete industry need to have an understanding of concrete the material and how it works. Designers must consider whether their designs can be built. Constructors must ensure they allow for realistic construction time frames with experienced supervision part of the process. Placing, compaction and curing of concrete must be undertaken correctly for all concrete construction. You only get one chance to 'get it right', with concrete, so asking the right questions at the right time is essential to getting the right outcome".

As President of the Institute, Mr Van Koeverden represents a constituency who share a common interest in the pursuit of excellence in research, innovation, technology, design, and construction of concrete in Australia. Members of the Institute can be individuals (including special categories for under 30's and students) companies and organisations, and academic institutions. The principle benefits of being a Member include:

"You only get one chance to 'get it right', with concrete, so asking the right questions at the right time is essential to getting the right outcome"

Present and participate at the Concrete Institute of Australia biennial conference

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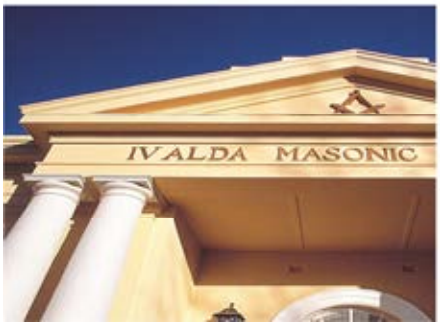

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Be part of State Branch programs

- Provision of educational resources, including:
  - Face-to-face technical seminars, workshops, and events throughout the country
  - On-line webinars and e-learning packages for all Members
  - Specific Institute technical publications and documents in hard copy and electronic form
  - Hundreds of Institute conference papers covering all sectors
  - Access to leading overseas concrete documents (ACI, *fib,* RILEM)
- Being part of a committee, where you can:
  - Learn to work with people from a number of different backgrounds and in different sectors
  - Meet mentors and develop close connections with colleagues throughout the industry
  - Take on various roles and learn specific roles involved with these i.e. chairing meetings, collaborating with sponsors.
- Participating in conferences, seminars, and events, where you can:
  - Attend as a delegate and learn, ask questions, contribute to discussions, and develop connections.
  - Write a paper, particularly for the biennial conference, that will be peer reviewed, published, and/or presented in appropriate forums
  - Present on a particular topic and develop public speaking and presentation skills
  - Be the Chair or MC requiring you to facilitate the event so that it runs smoothly, on time, and achieves the speakers, delegates, and events objectives

Institute Members can also put back into the industry by contributing expertise and knowledge to the many resources, events, and committees that provide these very benefits.

The Concrete Institute of Australia has a significant role to play in Australian concrete construction by ensuring that up to date and relevant knowledge is available to all sectors of the concrete industry to support the profession and allow educated decisions to be made. By being "in the mix" with the Institute and the concrete industry, professional development can be found in many different forms, and allows individuals and organisations to pursue these without having a dramatic impact on time, money, and resource.

As President van Koeverden says,*"With the recent launch of our online Webinar Learning Portal, which will provide continuing professional development to all through a flexible delivery method, as well as our 2016 National Seminars with presentations from industry leading professionals, and the traditional strong event schedule held at all our state branch chapters, 2016 is shaping up as a great year to be a member of the Concrete Institute of Australia."*

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SEISMIC DESIGN AND DETAILING OF REINFORCED CONCRETE BUILDINGS IN AUSTRALIA

SEISMIC DESIGN & DETAILING SIMPLIFIED

Seismic design of reinforced concrete buildings is an area that generally lacks understanding with minimal training provided to engineers. There are conflicts between the concrete structures and earthquake loading Standards, and the reinforcement detailing requirements within the Standard are often unclear and difficult to follow.

As there is a requirement to design and detail the majority of buildings in Australia for earthquake loading, to address this important and often overlooked requirement, the **Steel Reinforcement Institute of Australia (SRIA)** in conjunction with the **Concrete Institute of Australia (CIA) and supported by the Australian Earthquake Engineering Society (AEES)** are providing a series of informative seminars to be held in all capital cities. While targeted at design engineers and dealing with some of the most common issues faced when designing buildings for earthquake loading, the seminars will also be of interest to building owners and anyone wanting to learn more about how earthquakes impact buildings and some of the measures that can be taken to ensure that they provide life safety in these extreme events.

The first issue is the misconception that earthquakes in fact do not occur in Australia because we are not situated on a plate boundary. The many earthquakes experienced all around the country, including the 1989 Newcastle event which is now all but a distant memory for many people, is evidence that major earthquakes can occur anywhere in Australia. While many occur in remote locations, according to Geosciences Australia it is only a matter of time before another one occurs in a highly populated area, and it is important to ensure new buildings are capable of providing life safety and post-disaster serviceability if required.

Some engineers believe that if the wind load exceeds the static earthquake load, the building only has to be designed elastically for the wind load. As earthquake events have long recurrence intervals, to provide economic design solutions for rare but high risk events, buildings rely on their ductility and inelastic response to handle the extreme cyclic lateral loading and drift caused by earthquakes. Even if wind actions are larger than the earthquakes actions, they are fundamentally different design cases which must be separately considered.

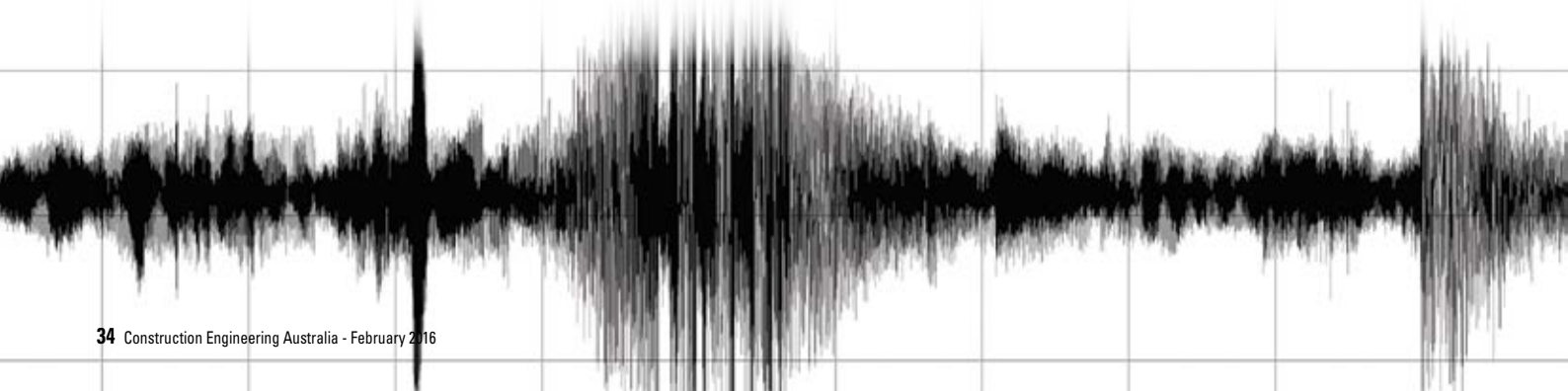
The recently published *Guide to Seismic Design and Detailing of Reinforced Concrete Buildings in Australia* by the SRIA delivers simple and cost effective design solutions in key areas such as reduced axial load for displacement capability and robustness, confinement detailing to resist cyclic loading and practical inexpensive loose bar detailing for redundancy. Further, it shows how an appreciation of structural performance under seismic action will enable the structure to be designed to withstand the anticipated earthquake actions. The Guide was awarded the 2015 Concrete Institute of Australia National Technology Category Award for Excellence and is available for free download from the SRIA website at **www.sria.com.au**. A hardcopy of this invaluable publication will be provided to all seminar attendees, along with copies of presentations and additional handouts.

Design and proper detailing of reinforcement are fundamental to the necessary elastic-plastic performance of the structure, allowing it to absorb seismic energy while maintaining its load-carrying capacity. Technology and reduced design times can shift the focus away from considering load paths, structural performance and adequate detailing of reinforcement to provide the essential ductility and structural integrity required to provide life safety. Engineers have a role to communicate seismic risk to the community and reduce seismic risk for the community.

Speakers from the SRIA and AEES will cover the earthquake risk in Australia, important design and reinforcement detailing aspects included in the SRIA's new Guide, common design errors and how designs can be improved, provisions in AS 1170.4 and AS 3600, ductility performance of structures and differences between ordinary and intermediate moment-resisting frames.

This seminar provides the opportunity to learn from a number of preeminent speakers including the principle authors of the new Guide. Speakers include John Woodside (Principal of J Woodside Consulting and former Chair of AS 1170.4), Peter McBean (Joint Managing Director of Wallbridge & Gilbert and responsible for the seismic design of the new Royal Adelaide Hospital), Associate Professor Helen Goldsworthy (The University of Melbourne and research area of Earthquake-resistant design of buildings), Professor Paul Somerville (AECOM and Risk Frontiers and President of the AEES), Scott Munter (Chief Executive, SRIA) and Eric Lume (National Engineer, SRIA).

Please refer to the CIA calendar of events for information on locations and times for these seminars to be held in late April and early May.



INTRODUCING THE NEW CIA E-LEARNING PORTAL

One of the Concrete Institute of Australia's objectives is *"...to support the professional development of all members, including provision of technical training, access to technical and research publications, and support for an ethical and professional approach in all areas of concrete industry practice."* To help meet this objective the Institute provides a number of educational resources and opportunities for Members that utilise the experience and knowledge of industry experts both locally and overseas.

Electronic learning is on an upward curve in terms of participation. It is becoming increasingly harder to commit to face-to-face events due to time, geography, cost, and a number of other restraints. Having the opportunity to undertake professional development activities at your desk, on the train, at home, or anywhere remotely, is changing the way we learn.

To help facilitate this for Institute Members and industry stakeholders the Concrete Institute of Australia is proud to launch its Online eLearning Portal. The portal already includes a webinar, titled *Durability in Concrete Structures,* which can be purchased by Members and Non-members from the Institute's website, and is available to view for 30 days from purchase.

Webinars are divided into topics with search capabilities, allowing the user to easily skip or search sections of interest without having to sit through the entire length of the presentation. Each section can be completed in your own time, at your own pace, with the ability to pause, rewind and forward each section as necessary. Where applicable, softcopy notes are also included, whilst a set of hard copy notes are also offered with the package.

The Institute will continue to upload new webinars from time to time, with the next webinar titled *Structural Concrete Design for Extreme Events,* scheduled to be made available in March.

For any questions regarding the webinars, please email education@concreteinstitute.com.au

NEW RECOMMENDED PRACTICES IN CONCRETE DURABILITY

Prior to the 1970's concrete was generally regarded by asset owners, designers, and contractors as a reliable construction material that provided long term durability with relatively little maintenance. Subsequently, premature deterioration of concrete structures, arising from changing cement characteristics, quality management, and a number of other factors, damaged this reputation. Because concrete is a complex material, research into the cause of problems and development of appropriate new rules and operational methods has taken a long time.

The durability of concrete structures does remain a complex and difficult issue to design and manage due to many variables. Whist research into concrete durability continues, the knowledge on exposure significance, deterioration processes, materials properties and workmanship implications has developed significantly over the last 25 years. In this time new durability design practices have been developed, including durability modelling methods, and new methods of construction have been introduced.

However, these developments are not fully reflected in a clear and unified manner through the Australian Standards dealing with concrete durability requirements, with various codes calling up different durability requirements for similar needs and environments. Perceived conflicts between these documents might sometimes be explained by the different owner requirements but reasons for the differences are not given, and the associated assessment methods not clearly stated. For many concrete elements in mild exposures incorporating the recent durability related developments into a unified durability design process for all structure types may make little difference to their durability design because existing code deemed to satisfy provisions often provide adequate performance. However, for elements in more severe exposures, guidelines that comprehensively detail how to assess owner's needs, environmental exposures and materials requirements; how to specify performance or prescriptive materials properties; and how to ensure construction is appropriate to the design will provide structures that meet their durability requirements more consistently.

The Concrete Institute of Australia's Durability Technical Committee, formed in late 2008 to review the 2001 CIA Recommended Practice "Durable Concrete Structures" perceived a need for a broader review of durability requirements, and following extensive industry consultation, determined that a comprehensive and unified durability guidance was required. Driven initially by long time Institute Member, Frank Papworth, and in more recent times, Rodney Paull, the committee has been developing a series of durability documents aimed at unifying the durability design process. The topics considered include:

- Planning
- Exposure Classes
- Deemed to Comply Requirements
- Good Practice Through Design, Concrete Supply and Construction
- Modelling
- Cracks and Crack Control
- Testing

Of the seven documents being compiled, three are available now and they are already making a huge difference to the way durability is considered in this country and around the world. The final 4 documents to complete the durability series are in progress and when complete the series will go a long way to providing the necessary tools for design and construction of durable structures based on the latest understanding of exposure, materials and deterioration process.

DURABILITY PLANNING (Z7/01)

Understood to be the first international construction industry guideline on this topic, the Recommended Practice Z7/01 "Durability Planning" provides a system to formalise the process of achieving durability in design, construction and operational maintenance. All concrete construction stakeholders are considered including asset owner, designer, contractor, premix suppliers, material suppliers, maintainer of the asset, etc.

The document also sets out the process of planning to achieve the required level of durability. The durability planning outcomes will be delivered in a durability assessment report specific for the project (variable content and size complementary to the project). This will describe how the desired level of durability will be achieved and ensured using appropriate tools and recommendations.

The document is intended to inform designers about the benefits of durability design so they can inspire asset owners to elevate durability planning to a position alongside structural and architectural design.

DURABILITY – GOOD PRACTICE THROUGH DESIGN, CONCRETE SUPPLY AND CONSTRUCTION (Z7/04)

This document is intended to inform all parties involved in design and construction about the benefits of durability planning and subsequent control of implementation so they can deliver the expected level of maintenance and life of the structure to the asset owners.

Australian concrete construction standards tend to focus on minimum design and material requirements and are unlikely to provide more informative recommendations about how to design or construct a structure to get the target life expectancy.

As the title suggests, Z7/04 has applicability to more general concrete design and construction as well as concrete requiring specifically higher levels of durability. Z7/04 provides more specific detail covering areas such as the impact of specifications and the contract process, impacts of design on construction, more detailed view of the materials used in construction, material quality control processes, construction process and supervision as well as some detailing issues in common structural elements that may present potential durability issues to the designer & constructor.

DURABILITY – TESTING (Z7/07)

Guidance is provided in this document on performance tests for durability design, construction and operational maintenance

for a comprehensive range of internationally available tests. The limitations and advantages of the test methods are reviewed, and recommendations provided on which test is the most suitable for project specifications.

Test categories include:

- Mix acceptance tests (including tests to validate values used in modelling)
- Quality control and assurance
- Where placed concrete is suspect
- Condition monitoring during the design life

A wide range of tests designed to demonstrate the potential durability performance of concrete have been introduced over the years. This has caused some uncertainty that is resolved by Z7/07 for – asset owners, designers, contractors, material suppliers, and suppliers of laboratory testing services.

The Recommend Practices in Durability are available through the Concrete Institute of Australia at **www.concreteinstitute.com.au** in hard copy or PDF, or email education@concreteinstitute.com.au for more information.

BUILDING FOR THE FUTURE...

Brisbane State High School, Brisbane, Qld

Precast Manufacturer:
Precast Concrete Products

Design & Construction:
Broad Construction Services

Project Owner:
Queensland Government

Construction of a new state-of-the-art facility for a Brisbane high school has been accelerated by the use of precast concrete.

As part of a major redevelopment, a new six-storey campus (two basement and four above ground) for Brisbane State High School will feature 40 classrooms, an arts centre, staff centre, tuckshop and other essential amenities. It will cater to about 850 students allowing the school to expand enrolments to 3000 students. Two levels of car parking are part of the project.

The building works incorporate precast manufactured by National Precast member Precast Concrete Products.

General Manager at Precast Concrete Products Colin Ginger says the company was contacted early during the tender process when the builder, Broad Construction, was looking for an alternative to traditional insitu construction. "We provided them a solution that would save them a lot of time with their construction and all the added flow-on benefits that come with it. This was the first precast flooring system this particular building team had used and they went through a quick learning curve. They're very happy with the amount of time they've saved.

"We've hit all the targets and all the milestones that they wanted to hit from the beginning. The time savings they initially wanted, have been achieved," Mr Ginger said.

PRECAST FLOORING REDUCES BUILD TIME AND IMPROVES SAFETY

According to Mr Ginger, the Brisbane flooring market is an evolving one. "In the past there have been people who've had a go at flooring in Brisbane but it's never really taken off in a big way. Probably part of that is not having a suitable facility like we have with the modern hollowcore plant that we've built".

The project called for a high quality flooring solution that could be installed efficiently and economically. Precast Concrete Products manufactured 300 beam shells and 1300 hollowcore planks.

Broad Project Manager Phillip Millan says the flooring solution was an innovative choice. It reduced the construction program through a shorter curing time, improved access to lower decks, cut on-site labour expenses by eliminating most of the formwork and reduced the required amount of reinforcement fixing and concrete placement.

Mr Ginger agrees the main driver for the builder was a shorter built time. "They wanted to reduce the construction time on site which we've been able to do. But, one of the other great spinoffs that comes with a precast flooring solution is the reduced number of men onsite and that's a huge advantage on an inner city site and all the associated benefits of safety that go with that".

FAST PACE ATTRACTS ATTENTION

Due for completion at the start of the 2016 school year and ready for the State High's 95th anniversary, the swift progress of site works has been welcomed. The pace of the project has attracted attention from developers, project managers and construction contractors in the Brisbane market. The Queensland Government says the project is an investment into the State's future, with school infrastructure vital to better student education outcomes.

Get up close and personal

Simply scan the QR Code or Google 'National Precast Australia YouTube' to view a new video of the hollowcore flooring for the High School being manufactured. Watch the project's progress and hear from the project team.

FAST SHOWROOM FOR FAST CARS

Porsche Dealership, Melbourne, VIC

Precast Manufacturer: Hollow Core Concrete

Project Manager: Redeighteen Projects

Builder: Cam Contractor Group

Engineer: Klopfer Dobos

Architect: Techne

Client: Preston Motors

A Porsche dealership in Melbourne is impressing customers with its sleek showroom and state of the art workshops. The spectacular space in the eastern suburb of Doncaster also showcases the substantial benefits of offsite fabrication using precast concrete.

Laverton-based precaster and National Precast member Hollow Core Concrete was contracted for this project due to the small site with restricted access and the extremely tight timeline. The precaster had just three months to design, manufacture and construct.

PRECAST CONCRETE INTEGRAL TO BUILD

Precast concrete has been used throughout the building according to Hollow Core's Balint Djeri.

"Everything is precast except for the ground slabs and the footings. The project includes precast columns, beams, hollowcore precast floor planks and wall panels that are up to about 16 tonne in weight and 14 metres tall. Basically everything that is standing up is Hollow Core precast."

The showroom has four levels, which connect seamlessly in a stunning design - perfect to display luxury vehicles. The total prefabricated structure includes a suspended mezzanine ground floor plus three additional suspended levels, with hollowcore floor planks spanning up to 15 metres. The exposed roof is used for car parking. Three precast lift shafts provide access to all levels and include two car lifts and a passenger lift. Architectural finishes have been applied at Hollow Core's factory to the external wall panels.

Offsite manufacture of this extensive list of elements resulted in a streamlined schedule, quality finishes and a safer onsite environment. About 10 workers were required on site instead of the usual 30 or 40 for a more conventionally constructed building.

OVERCOMING TIMING AND SITE CHALLENGES

The site for the new showroom is just 1674 square metres, which created an added challenge of restricted access.

"There is an operational car park on one side, a trading car dealership on the other side and we were building from boundary to boundary," Mr Balint said. "We had to keep in mind not to disrupt the pedestrians nor the businesses on either side of us."

Despite the confined site, it took just 26 working days to install the prefabricated components. A conventional build would have taken an additional six months to complete. The design also eliminated the requirement to provide temporary formwork, which allowed following trades to start their work while construction continued.

PREFABRICATED PRECAST: CONSTRUCTION OF THE FUTURE

The construction of this prestige vehicle showroom demonstrates why use of prefabricated products is the construction method for the future. As a total precast structure, it was completed quickly and safely, with quality finishes. The precaster finished the build two days ahead of schedule, and on budget, resulting in a very happy client.

Get up close and personal

Simply scan the QR Code or Google 'National Precast Australia YouTube' to view a new video of the construction of the Porsche Showroom using hollowcore precast floor planks and wall panels. Watch the project's progress and hear from the project team.

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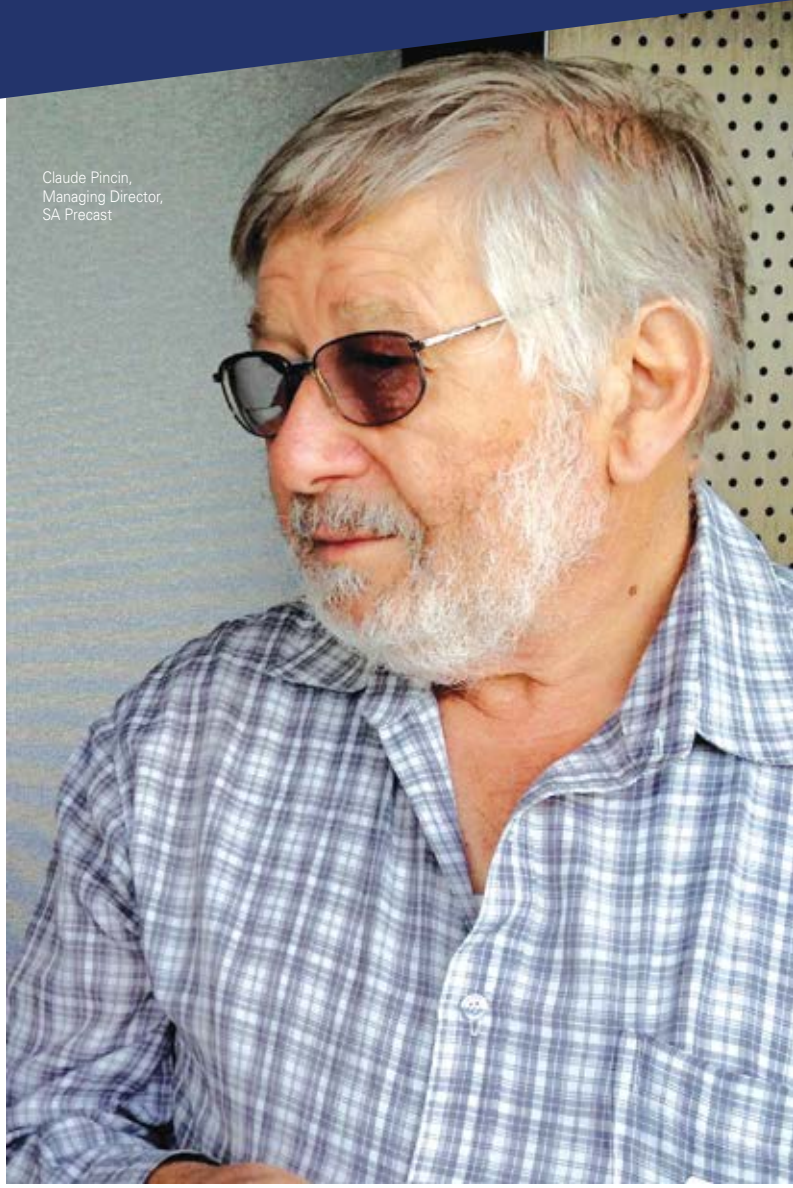

Claude Pincin, Managing Director, SA Precast

MEMBER PROFILE: SA PRECAST

A local South Australian company shines on the national stage

National Precast Concrete Association member SA Precast Pty Ltd was established in 1991. Despite its South Australian location, SA stands for Specialised Architectural Precast, and not South Australian Precast as most would expect. Since it began, SA Precast has maintained its local connection, with total South Australian ownership.

Whilst locally owned and run, the precast manufacturer has produced precast concrete for projects Australia wide. SA Precast has played a role in many major and well-known projects in its 25 years and is now renowned for its high quality products and service.

Managing Director of SA Precast, Mr Claude Pincin, has had an involvement in the company since its inception. His prior experience in the industry was invaluable right from the start – which was during tough times. "We started at the end of 1991 and beginning of '92, in the worst recession in 60 years. It was pretty hard going. We made a big effort to win several contracts around the country, so we were able to build up from there," Mr Pincin said.

Australian War Memorial
(Photo: Courtesy Australian War Memorial)

The company owns a 1.2 hectare manufacturing facility in Croydon Park, just 20 minutes north of Adelaide's CBD. This is the same land that was purchased in 1991, and was the site of the former Pioneer Concrete. As well as the land purchase, SA Precast purchased the polishing machines and mixer plants that were in the former yard. Today, the facility is the same other than some of the machinery having been updated around seven years ago.

A range of precast concrete elements are produced by the company in a variety of finishes, including polished reconstructed granite, acid washed, sandblasted, water washed and retarded, and prestressed work.

As the business grew, management increased the company's capability and set up an office and joint venture yard in Melbourne. However, as business slowed in 2010, SA Precast wound up the operation and reverted to its South Australian base.

Manufacturing high quality products, there has been a strong focus on customer satisfaction. This attention to detail and emphasis on excellence is visible in their projects. From the Sydney Opera House refurbishments to local shopping centres, to major hospitals, Mr Pincin and his team have been a part of many impressive projects. One of its biggest projects has been the involvement in the Chadstone Shopping Centre in Melbourne. "We've done a lot of work at the Chadstone Shopping Centre and the surrounding areas, with Gandel Group. Chadstone would be our biggest project with about $20 million of work over the years," Mr Pincin said. Other well known projects include the Museum of Victoria, the Australian War Memorial, Adelaide Oval and the Melbourne and Adelaide Convention Centre.

Celebrating its 25th year of producing quality precast, Mr Pincin hopes that his nephew and son-in-law, both of whom already work in the business, will take over the reins when he chooses to retire. "It's a family business, with my brother as part owner," Mr Pincin. With his philosophy of quality and service before price being passed on to his family, SA Precast's future will be in good hands.

Adelaide Oval

"We've done a lot of work at the Chadstone Shopping Centre and the surrounding areas, with Gandel Group. Chadstone would be our biggest project with about $20 million of work over the years."

THE TRAIN LINE TO SYDNEY'S FUTURE GROWTH

Sydney Skytrain, Northwest Sydney, NSW

Precast Manufacturer: Hanson Precast

Head Contractor: Impregilo-Salini Joint Venture (ISJV)

Engineer: SMEC

Client: Transport for NSW (TfNSW)

As Sydney continues to grow, there is a greater need for transport. The Sydney Skytrain is the future of transport in the Northwest area of Sydney. This new elevated train line, which spans four kilometres from Bella Vista to Rouse Hill, will provide the surrounding suburbs with a quicker train service. It will run every four minutes, making the hour long commute into the city more flexible for residents than the nearby existing service that runs every half an hour.

A significant component of the build is the large precast barriers, or parapets, which were manufactured by Hanson Precast. As well as the parapets, Hanson Precast produced all other insitu concrete for the project in their new wet concrete batching plant. The plant was established to keep up with the quality demands of this project. Part of Hanson Precast's manufacturing facility at Mulgrave was leased out to ISJV, to produce the 1200 precast concrete viaduct segments. Doing so ensured consistency of finish across the project, with all forms of concrete coming from the same source.

Mr John Hewitt, Hanson Precast Manager, has worked closely on the project and believes that precast was the only way to time effectively produce a quality project, on such a large scale. 2300 parapet units were made, with the four metre long and 1.8 metre high units weighing in at about six tonne each. The parapets, as well as 56 platform units that Hanson Precast manufactured and transported to site, cost just under nine million dollars.

A THOROUGH SAMPLING PROCESS

The parapets are one of the few components of the build that are visible, which meant there was a strong focus on the appearance and finish. The parapets hide the whole construction, like an outer shell to the train line. Hanson Precast went through a rigorous sampling process to ensure that all involved with the build were able to inspect and approve the concrete.

"A lot of work was done with the samples, from small samples, 300 by 300, right up to two metre square samples. We had three different site visits with upwards of 20 people representing TfNSW, the architects and the contractor, to make sure that it replicated the colour they wanted," Mr Hewitt said.

There was also a lot of sampling involved in the mould process, with many prototypes made. The steel moulds, which were chosen because of the finish, had to be flexible in length, as each parapet was unique to a viaduct unit, which could have minor variations in dimensions.

The moulds are adjustable to one millimetre increments to allow for such variation. Each parapet, created with a unique number and cast to the exact measurements of the viaduct segment, is then fixed to its matched precast viaduct segment. "The sampling and prototype process was quite onerous," Mr Hewitt said.

MEETING ALL THE REQUIREMENTS

As well as all the various aspects of the precast's appearance that had to be right, Hanson Precast also worked with ISJV to meet the requirements of the Infrastructure Sustainability Council of Australia (ICSA). "The majority of the concrete was 40 and 50 MPa, it had to satisfy ISCA requirements so there was 30 per cent cement replacement. We used fly ash as the supplementary cementitious material and we also used recycled water and manufactured sand," Mr Hewitt said.

The parapets for the Sydney Skytrain were carefully thought through and planned down to the final millimetres. Precast concrete was an excellent choice of material for the parapets as it sped up what could have been a lengthy insitu process, saving costs as well as allowing for the finish and the colour to be delivered. Ticking off the appearance requirements, as well as the environmental ones, Hanson Precast was able to produce such an important element for the Sydney Skytrain project.

precast... the questions

Are you comparing apples with apples?

Is your precast:

- Manufactured from approved shop drawings?
- Using approved materials?
- Checked before delivery?
- Delivered with the right concrete strength for handling?
- Using an approved lifting system?
- Delivered with a certificate of compliance?
- The right surface finish?
- The right colour?
- Within tolerance?
- Protected from handling damage during transport?
- Installed safely?
- Provided with a warranty?

Does your precaster:

- Know the latest in new products and manufacturing techniques?
- Know the latest Codes and Standards?
- Use a formal WHS system?
- Have third party quality accreditation?
- Have a good history?
- Show financial stability?
- Have the right facilities for the products you're buying?
- Batch their own concrete?
- Make their own moulds?
- Do their own shop drawings?
- Have in house engineers?
- Have a formal environmental policy?
- Erect their own precast?
- Understand risk?
- Train their employees?
- Understand commercial contracts?
- Prepare a detailed offer for your work?

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BUILDING SERENITY...

Nan Tien Institute, Wollongong, NSW

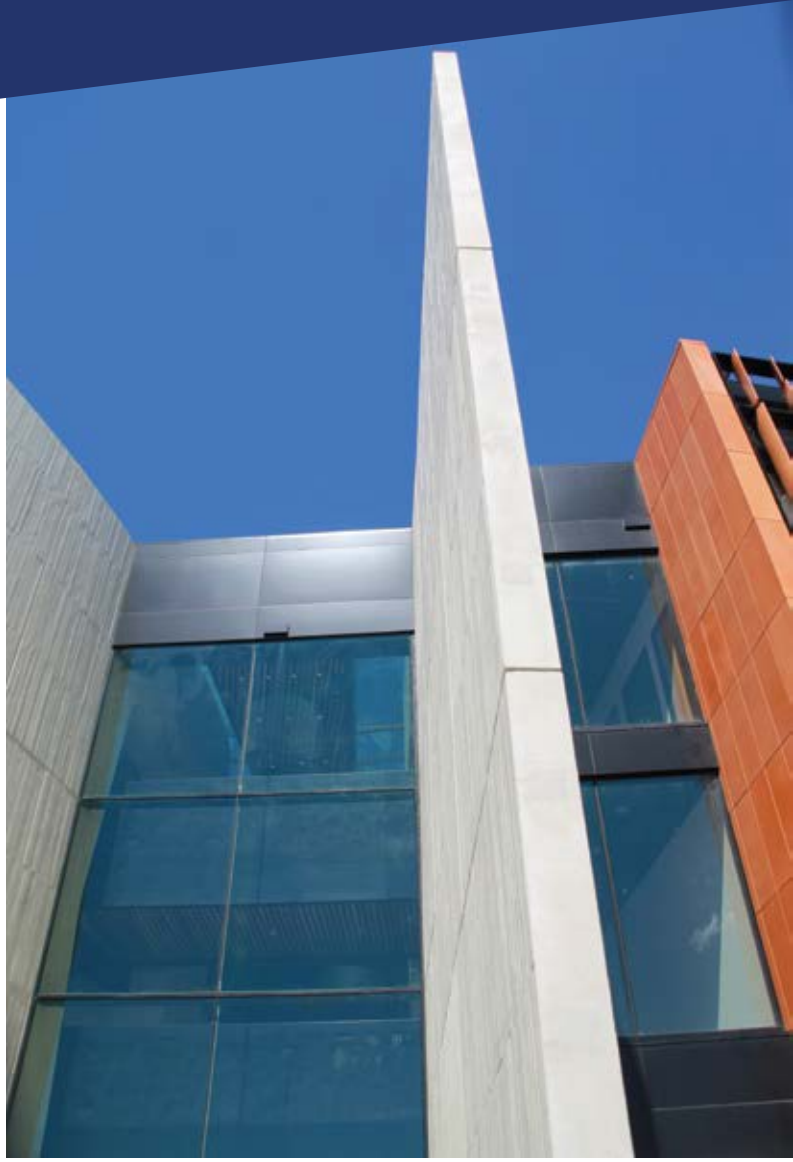
Precast Manufacturer: SA Precast

Builder: Richard Crookes Construction

Engineer: Brown Consulting & Medland Metropolis

Architect: Woods Bagot

Client: Fo Guang Shan International Buddhist Association



Australia's first government-accredited Buddhist College has opened in Wollongong, south of Sydney. The $40 million Nan Tien Institute (NTI) is being hailed an architectural and engineering milestone that pushes the boundaries of construction. The opening of the facility comes after 15 years of planning, design and construction work and marks the realisation of a vision by the monks of the Nan Tien Temple. The Buddhist Temple, which is the largest in the Southern Hemisphere, was established 30 years ago.

DESIGNED TO FOSTER BUDDHIST BELIEFS

The NTI is a state-of-the-art facility incorporating an education campus, art gallery and cultural hub. At the heart of the project was a desire to educate using Buddhist values as a base, centring on centuries-old traditions and beliefs. The result is a spectacular building that is a work of art that enhances the surrounding community.

PRECAST FOR FORM AND FUNCTION

Architecture firm Woods Bagot created the signature form of the building and it was soon apparent that precast concrete offered the design flexibility and high quality finishes required for such a project. National Precast Member, SA Precast was brought on board.

The design inspiration for the Institute is a lotus flower. There are four separate spaces, or pods, centred around a public space and all connected by internal bridges.

SA Precast's Drafting and Production Manager Troy Pincin says the distinctive design incorporated curved walls and window openings. His team relished the challenge. "From a manufacturing point of view, because of lot of panels were radiused and curved and they also had returns for door and window openings, the formwork became quite tricky. It certainly stretched the imagination of people here in terms of how to actually build the moulds

and support the concrete in its curing state". In total there were 169 panels with 13 different radiuses.

The sculptural forms of the pods were made by pouring concrete into custom-made steel and timber moulds to form unique shapes, with the pattern of the timber boards imprinted onto the concrete and visible in the final pod façades.

JOURNEY FROM FACTORY TO WOLLONGONG

The precast needed to be transported 1400kms from Adelaide to Wollongong. "It certainly had its challenges because of the complexity of the shapes that we were delivering," said Mr Pincin. "In terms of delivering, it wasn't a real issue for us. There was more difficulty in trying to find the best way to load the pieces onto the trucks to keep them safe and transport them with a minimal amount of damage". Precast also ensured relatively fast construction. The project took just 52 weeks, which is a quick timeframe for a building of this size.

The final result is a stunning structure that perfectly reflects the Buddhist feel the monks were after. SA Precast Managing Director Claude Pincin says in 51 years in the business, this was one of the most challenging projects he's encountered. It was worth the effort. His team is deservedly proud of the magnificent and unique structure that is already receiving international acclaim.

ADVANCE NOTICE...

AUGUST SEMINARS ON THE REVISED *AS 3850 PREFABRICATED CONCRETE ELEMENTS*

National Precast and Concrete Institute Australia are partnering to run a series of seminars around the country in August, covering the new standard. Watch for more information in the next issue of *Construction Engineering Australia,* but mark the dates in your diary now!

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Wednesday 3 August	1-4pm and 5-8pm	Brisbane
Monday 8 August	5-8pm	Hobart
Tuesday 9 August	1-4pm and 5-8pm	Melbourne
Wednesday 10 August	1-4pm and 5-8pm	Sydney

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