

CONCRETE CONNECTIONS



Cover photos:
Curtesy of Pensar—Ivette Nino—Women in Engineering—breaking down the stereotypes pg 18

Lighthouse photo curtesy Australian Maritime Safety Authority pg 21

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President's message

Time goes by so quickly. Next month at the AGM meeting I'll be completing my two years as ACRA President and will be handing over to Grahame Vile. As I reflect on the past 2 years working as ACRA President, and 5 years in total as the Association board member, I consider it a real blessing to have served alongside such a dedicated team of committees, board directors, partners and staff members.

I am delighted that Grahame Vile will now lead the team as ACRA President. He will serve, as he has done in his current roles, with great distinction and I wish him well and good luck!

I want to take a moment to highlight some of our many achievements together. They are remarkable and we should all be very proud of. We have achieved some incredible things during this time. The Association has played a leading role in education and training in concrete repairs. This wouldn't have been possible without the help of our board members, committee members, the executive office and the staff who are always passionate, motivated and energised.



ACRA Awards for Excellence 2018 was a big success to honour the most creative projects in the concrete repair and refurbishment industry where we gathered to appreciate and applaud concrete innovation and excellence across the region.

Updated versions of SA HB 84:2018 Guide to Concrete Repair and Protection were made available to the industry and soon the updated Standard Method of Measurement will be completed.

We had phenomenal turnout in our technical courses, seminars and trade shows nationally, which is a testimony of the continuous dedication, involvement and commitment of our members.

Our individual and corporate memberships have witnessed good retention and steady growth.

The exciting news about the new expansion of the Association was announced earlier this year. Other areas of repair such as remedial waterproofing, strengthening, coatings and general remedial were introduced as new segments. Our technical team is continuing to be working on new courses to be added to the ACRA portfolio. We expect the memberships to grow even more with the introduction of the new sub categories which has already stirred up some interest within the current membership. The Association is even more committed to deliver trade shows, seminars and courses through exciting ideas showcasing our new expansion segments.

Collaborating and partnering with other industry associations such as CIA, ACA, Sydney Build/CIVINEX, SCA was remarkable during the last few years. The collaborative approach resulted in increased industry awareness programs and created excellent synergy.

The new redesigned website is underway and expected to be launched by the AGM next month. The new website will be communicating the Association values more effectively and would improve the user journey. It would not only give a fresher look but easier to navigate through when looking for an ACRA member contractors, consultants or suppliers. It would be possible to register directly from the website for seminars, courses and to purchase the SA HB84:2018. Our young members are the future of our industry, and providing them a platform for meaningful and informative engagements within the Association is the way forward.

I would also like to thank the Executive Officer, Nicole Raymond for the active and vibrant projection of the Association on the social media. If you haven't already, please follow us on the [LinkedIn](#) and [Facebook](#).

Finally, it's been my great honour and privilege to be a part of this team and to represent ACRA as President for the last two years. Together, we have reinvented and strengthened the Association. Our dedication, vigour and commitment towards the construction industry has transformed ACRA as one of the leading Associations – Thank you all!

-Hamid Khan - ACRA President 2017-2019

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Maintenance and Rehabilitation of Bridge Structure—Duoguard

Current estimates suggest that a significant proportion of Australia's concrete bridges are structurally or functionally deteriorating and require maintenance and rehabilitation to meet the current desirable standards.



Concrete bridges can reside in a variety of service environments, characterised by various degrees of severity and exposure.

Corrosion of reinforced concrete structures is a very common occurrence of ageing infrastructure. A concrete patch repair involves the removal of the deteriorated concrete, cleaning of the steel reinforcement and replacement with a compatible repair mortar. This process aims to eliminate the cause of original deterioration (anodic reaction) and provide protection to the repaired area against future deterioration, thus making the steel within the repair area passive again.

Patch repairs on concrete elements where there is presence of chloride or carbonation in the concrete adjacent to the patch is likely to cause the "insipient anode" effect if not treated correctly.

[Duoguard Australia](#) has a galvanic range of products that redresses the electrochemical imbalance induced through the removal of the contaminated concrete in patch repairs. Patchguard anodes are installed into the parent concrete, current is delivered directly to the reinforcement outside the patch which has the greatest corrosion risk.

Patchguard Anodes have been recently installed by two major concrete repair specialists.

Concrete Protection and Repair Services Pty Ltd [CPR Services]

CPR in Victoria have recently completed a major rehabilitation of Ballarat Road Bridge in Kensington, Victoria. The bridge encompasses 7 spans and was originally built in 1939 and has since experienced significant deterioration due to chloride intrusion. The project involved removing defective concrete, replacing defective steel, installing sacrificial anodes ([Duoguard](#) Patchguard anodes), priming steel and substrate followed by hand patching all in accordance to VIC Roads Standards. A total of 1,500 litres of structural repair mortar was used to patch and reinstate removed concrete, Patch guard anodes were installed on the project. The work was partially done on the ground and partially over water working off barges. The project took 4 months to complete.



Maintenance and Rehabilitation of Bridge Structure—Duoguard

SRG Global Services (Australia) Pty Ltd

SRG Global Services (Australia) Pty Ltd in Sydney is also currently working on a major rehabilitation of a Dam access bridge in the Australian Capital Territory. The bridge access structure provides access to services at the dam site, concrete deterioration was repaired in various elements of the structure. The specification and scope of works included the removal of deteriorating concrete and reinstating with a high-performance mortar. Patchguard anodes were installed into the parent concrete to provide additional protection of the surrounding steel and extend the life and serviceability of the asset.





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Photo courtesy of Guardian News

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Concrete rectification using micro-concrete form-and-pour technique

Hamid Khan: Product Segment Manager – Fosroc ANZ Parchem

Accelerated and premature deterioration of some reinforced concrete structures during the initial years of their life cycle is of major concern to asset owners. The premature deterioration results in reduced service life of the structures. The adoption of high standards for design and construction in new concrete structures has become a major focus today. The construction industry has recently been witnessing ever-increasing expectations for concrete's design life. This article highlights the use of high performance durable micro-concrete repair material to rectify defects in long design life structures during and after the construction phase.

Repair materials need to be able to be used in difficult locations and achieve good compaction around the reinforcing steel without any external aids such as vibration. The finished repair must provide protection against corrosive agents such as chlorides and carbon dioxide and present minimal shrinkage to reduce the risk of cracking.

What is the purpose of using fluid micro-concrete repair mortar?

The primary purpose of using the fluid micro-mortar system is to restore the structure to its original strength and integrity. The repair may include large damaged structural sections of concrete as well as for smaller locations where difficulties of access make hand or trowel applied mortars impractical and have a high associated failure rate.

How is it different from conventional concrete?

If a conventional mix of high strength concrete is used for replacement, small gaps can occur around the reinforcement steel either through poor compaction or settlement providing a potential site to initiate corrosion. To avoid these common pitfalls the repair materials need to be exceptionally fluid to completely eliminate this problem. Pre-bagged fluid micro-concrete such as Fosroc's Renderoc LA55 Plus typically have a compressive strength of ≥ 75 MPa and are based on supplementary cement materials making them environmentally friendly and sustainable with a low carbon foot print.



Figure 1: Honey combing defects in new construction



Figure 2: Cross-sectional view of fluid micro-concrete repair mortar

The micro-concrete fluid repair materials are produced off site in manageable 20 kg bags so they are simple and practical to use. The content of each bag is simply added to the measured amount of water and mixed to a uniform fluid consistency that can be pumped or poured into the formwork.

Do I need a bonding agent?

Because of the outstanding adhesion property of micro-concrete mortars, a bonding agent is not normally required. When repairs are to be carried out using cementitious mortars, the surfaces must be pre-wetted to achieve a Saturated Surface Dry (SSD) condition after cleaning in order to avoid the host concrete absorbing the moisture from the repair mortar that is required for its hydration. Although the term SSD is somewhat subjective, many experts consider it a 'safe compromise' by pre-soaking the concrete. If the concrete is dry and 'thirsty', pre-soaking is of utmost importance. The concrete should be thoroughly pre-soaked so that the concrete is 'saturated' with water. In the SSD condition, the substrate is damp and saturated but does not

contain any free water on the surface. Free water at the surface must be avoided as it can impair the bond at the interface due to increased shrinkage, leading to lower material strength and reduced bond strength.

Do I need to prepare the surface when using micro-concrete repair mortar?

The best of repair materials, despite the best of mixing and application practices, are destined to fail unless the concrete substrate is properly prepared. In European standard (EN 1504- 10:2017), the term bond refers to the adhesion of the applied material or system to the concrete substrate. Hence, adhesion has an underlying importance in the repair of concrete structures. Surface preparation of the concrete substrate is considered to be the most crucial step in a concrete repair project. Surface preparation will often be pivotal in determining the overall performance and durability of a repair. A successful repair means that the resulting multi-layer system acts monolithically, ensuring long service life. Proper attention to surface preparation is essential to achieve a robust bond between repair materials and the existing concrete substrate. Only a strong bond will lead to a strong and durable repair–

How do I prepare the surface?

Regardless of the repair technique, surface preparation is essentially the same. Defective concrete is removed until sound concrete is reached.

Marking out - Mark the perimeter of the repair area. The geometry of the repair area should be in simple square or rectangular shapes.

Sawn Edges: Sawcut the perimeter of the repair. Saw cutting is used to delineate the perimeter of the repair zone. A disc type mechanical grinder is used for saw cutting the edges along the perimeter of the repair area. The right-angled saw cut to a depth of 10-15mm is recommended to avoid any feather edging and it should not be deeper than the reinforced concrete cover.

Removal of Spalled Concrete: Remove unsound and spalled concrete with an appropriate size chipping hammer. Larger hammers may cause damage to the substrate and reinforcement. Defective concrete should be broken back to a sound and dense concrete surface. Prior to the removal of any spalled concrete from a load bearing structure, certified shoring must be provided to the structure. To avoid any micro-cracking of the concrete substrate, hydro-demolition or abrasive sand, shot or water blasting sometimes become the preferred choice for specifiers.

Steel Reinforcement Surface Preparation: Clean the reinforcement with abrasive blasting as necessary. If the steel has lost more than 25 percent of its cross-sectional area due to rusting, reinstatement of reinforcement bars



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should be carried out by cutting out and butt welding in new bars with backing plates, or splicing and lapping the affected bars with supplemental reinforcement, or by introducing mechanical coupler joints. An unbroken coat of anti-corrosion zinc rich epoxy primer is normally recommended to provide additional protection to the steel reinforcement within repair mortars to reduce the incipient anode effect.

Can it be over-coated with protective decorative finishes?

The form and pour micro concrete mortars are smooth surfaced, well bonded and match the existing concrete structure. These are strong, durable and sustainable and will protect the reinforcement from environmental attack in the repaired areas. But in order to improve the integrity of the total structure the original concrete may need extra protection. This is achieved by preparing the substrate and applying a protective coating system to the whole structure (Figure 3). This not only protects the structure but also enhances its appearance.



Figure 3: Bridge pier protected with anti-chloride and anti-carbonation protective coating after reinstatement with fluid micro-concrete mortar

Creating value through advanced research & innovation



Corrosion is a degradation process which limits the service life of reinforced concrete buildings and infrastructure and poses a threat to an asset's integrity and durability.

When corrosion control measures are designed and executed properly, they can restrict the incidence of corrosion to acceptable levels and provide environmental benefits.

Technology engineering in the field of corrosion prevention is not simply a necessary cost, but is also an opportunity to reduce ongoing maintenance costs and increase the longevity and value of an asset.

Since its inception in 2013, Remedial Technology Pty Ltd has been involved in research projects related to aspects of the design and delivery of corrosion control measures for concrete structures.

Some of our ongoing research activities include:

- **Development of solutions to stop grout acidification of ICCP systems installed in tidal areas.**



Pictured: acidification of the grout material which encapsulates the ribbon anode strips in tidal areas, and a completed repair area.

- **The use of renewable energy for the corrosion protection of concrete structures.**



Pictured: development of MicroNex solar power supply unit with remote monitoring capability.

Remedial Technology operates a Quality Management System that has been certified to AS/NZS ISO 9001.



Can I use it for structural strengthening?

It is an ideal choice for structural strengthening of columns, beams and other structural elements using a reinforced concrete enlargement system



Figure 4: Form work in progress for fluid micro-concrete repair mortar as part of structural strengthening



Figure 5: Structural strengthening of column using reinforced micro-concrete enlargement method

Form and pour micro-concrete mortar results in structural strength, outstanding bond, low chloride and carbon dioxide diffusion, high resistance to chemicals and extremes of weathering –providing a durable lasting repair.

When do I use form and pour fluid repair mortar?

Fluid form and pour repair mortar is commonly used on vertical surfaces such as structural walls, columns, and other structural elements such as beams.

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A diagram showing various construction applications of Fosroc products. It consists of eight small icons arranged in a grid, each with a label below it: 'Concrete Repair' (showing a crack being filled), 'Grouts & Anchors' (showing a grout injection), 'Waterproofing' (showing a waterproofing membrane), 'Joint Fillers & Sealants' (showing a joint being sealed), 'Industrial Flooring' (showing a floor being treated), 'Protective Coatings' (showing a surface being coated), 'Surface Treatments' (showing a surface being treated), and 'Concrete Admixtures & Grinding Aids' (showing a concrete mix). Below the icons is the Fosroc logo, which is a stylized red 'F' shape, and the text 'FOSROC' in a grey box. At the bottom right of the diagram is the text 'constructive solutions'.

It can also be used to repair slab soffits, depending on the accessibility from the above side to pour the material through holes or openings cut through the slab. It is ideal to reinstate large voids and honeycombing in reinforced concrete structures due to its fluid and self-compacting nature. The example shown in the demonstration model (Figure 6 & 7) shows the unique fluidity of Fosroc Renderoc LA55 Plus and its self-compacting properties.



Figure 6: Cross-sectional view of fluid micro-concrete repair mortar showing complete consolidation around the reinforcement

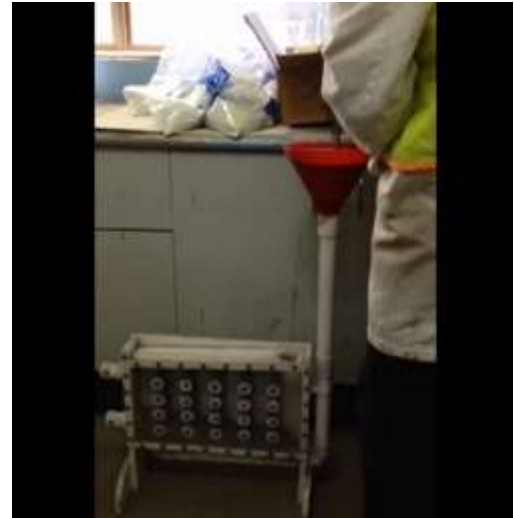


Figure 7: Demonstration of micro-concrete mortar fluidity

What are the main benefits to asset owners, designers and contractors?

Environmental friendly – The use of supplementary cementitious materials (SCMs) makes it environmental friendly and sustainable product with low carbon foot print and reduced emissions of greenhouse gases.

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Enhanced durability – It is ideal for reinstatement of new construction concrete defect reinstatement conforming to the requirements of EN 1504-3 Class R4.

Structural strengthening – It can be used for strengthening of columns, beams and retaining walls using reinforced concrete enlargement system when the project involves change of use and alteration to structure.

Saves time and money – It eliminates extra steps of additional section pours. Improves site productivity due to large volume applications. It is suitable for structural repairs that can be applied in sections from 50mm to 500mm deep. Ideal to be applied in thick sections to a depth outside normal functional range of repair mortars.

References:

1. Emmons, P. (2011), Field guide to concrete repair application, Surface repair using form-and-pour techniques – ACI RAP-4
2. Khan, H. (2017), Be Prepared - Is Surface Preparation for Concrete Repairs a Fad? Corrosion and Materials, Vol 42 No 2, pp 34-36

This technical paper was printed in ACA Corrosion & Materials magazine

Hamid Khan is President of ACRA 2017-19



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A close-up of a concrete surface showing significant corrosion and exposed rebar.

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Accurate technical information on the condition of assets is essential to making sound financial decisions regarding maintenance and repair strategies. Our staff are experienced in assessing a great diversity of structures including commercial, highrise residential and heritage buildings, and use state of the art equipment to efficiently gather critical information on the condition of structures.

Two men in business suits, one is pointing at a document.

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We provide experienced representatives to act on behalf of our clients when an Expert Witness is required for litigation or mediation cases. Our reports are independent, and prepared for the consideration of the court or tribunal in accordance with their requirements. We have represented clients in numerous matters ranging from building defects to materials failure analysis.

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ACRA QLD Durability & Waterproofing Trade Show and Seminar—25 September 2019

ACRA QLD Branch Durability & Waterproofing Seminar & Trade Show

25 September 2019

Waterproofing systems are integral to the long-term durability of concrete foundations and protecting other critical elements of the asset. However, repairing construction related defects in them can either be impractical or prohibitively expensive. This seminar will focus on the certification and design practice to ensure durability in the waterproofing of concrete, through providing useful information or discussion on membrane properties and the detailing required for a watertight design.

This event is a magnet for contractors, consultants, senior specifying and purchasing personnel who appreciate the chance to both maintain and expand their supply chains and knowledge in one convenient and comfortable location while also having the opportunity to listen to a few guest speakers. This will be a fantastic opportunity for all within the industry to touch basis with your peers as well as learning about new technology and supplies in within the remedial industry.

Presentations by:

Greg van Rooyen, Principal Materials at BG&E - Why watertight concrete structures leak-common casual factors and possible solutions

Paul Evans President, Australian Institute of Waterproofing

Cost: \$55 for members, \$77 for non-members and students free but must register with their Student ID#

Where: Colmslie Hotel, Wynnum Rd & Junction Rd, Morningside QLD (10 minutes from Brisbane), Plenty of parking.

Time: Doors open to tradeshow at 5pm.



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ACRA QLD Branch will once again be running their raffle with some AMAZING Prizes including the famous 4.5L of Chivas Regal in Cradle as just one of the prizes.

All proceeds go to CanTeen which help young kids living with Cancer.

ACRA has been a proud supporter of CanTeen for over 20 years.

**Tickets are \$10 each. You can pre-purchase by contacting ACRA
02 9645 3692 or info@acassoc.com.au**



'Sportier' approach could help tradies tackle soreness

By Australian Physiotherapy Association

Taking a 'sportier' approach to work could help tradies tackle work-related stiffness, soreness and injury, according to the [Australian Physiotherapy Association](#) (APA). In their latest survey, the APA found that 60% of tradies often have work-induced aches and pains and 36% generally finish their work day stiff and sore. Alarming, 69% of tradies believe it is normal to be sore as a result of their work. However, these issues could be at least partly prevented by stretching and warming up — practices often valued in sports and exercise. Of the tradies who exercise or play sport regularly, more than half spend a few minutes stretching and warming up before an activity because they know it will help prevent injuries. Yet, less than a quarter of all respondents warm up before starting physically demanding work, APA National President Phil Calvert said. In a positive finding from the APA study, two-thirds of tradies were open to the idea of warming up if they felt their employers would support it.

"There's a real opportunity for trade employers to take a proactive position and encourage their employees to spend a few minutes each day getting their bodies warmed up for the physical work ahead," Calvert said. "Tradies are at particular risk of a range of injuries as a result of the intensity and repetitive nature of their work, so it's important that they put these preventive health measures in place and get help before little niggles turn into more chronic issues."

Workers should also ensure they operate within their bodies' healthy limits and follow safe lifting guidelines to protect themselves from soreness and injury. Currently, 42% push their bodies beyond their limits and almost a third said they do not follow safe lifting practices.



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'Sportier' approach could help tradies tackle Soreness—continued

Ultimately, tradies need to start putting their bodies and mental health before their work and tools. According to the survey, 88% of tradies take good care of their tools while 60% take good care of their bodies and mental health.

Additionally, almost half the tradies surveyed had not taken a sick day in more than six months, and only one quarter of tradies felt comfortable talking to co-workers about mental health issues affecting their work, while just over half were open to discussing physical concerns.

"While tradies appear reluctant to open up to their workmates and bosses about mental health issues in particular, the majority (73%) said they wouldn't think any less of their workmates for taking time off for mental health concerns. So it seems they have tougher expectations of themselves than their co-workers," Calvert said. "At the end of the day we all want to go home safely to our families, so tradies should look at all options to make sure they are in the best physical and mental shape to get through the day. That might include warm-up stretches at the start of the day and open dialogue with bosses and co-workers about personal injuries or issues affecting their work."



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Presentation #1

Are You Up to Date with the Security of Payment Changes Commencing 21 October 2019?

Rob Riddell is a partner in the Sydney Construction Practice of the National Law firm, Piper Alderman.

Are you up to date with the changes starting 21 October 2019? New (reduced) maximum payment periods, extended determination times, the repeal of reference dates and the introduction of personal liabilities for company directors, just to name a few? If not, you probably should be! Join us for a presentation by Rob Riddell, lawyer, adjudicator and educator for a punchy review of the imminent changes and what they mean for you.



Presentation #2

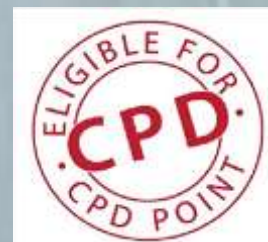
Non-Destructive Testing for Engineers & Durability Assessment

Jon Fitzgerald is the Quality Assurance and Senior Geophysicist at Total Scan & Survey Australia (TSSA)

Jonathon has 10 years of experience beginning in cathodic protection at APA Group, in 2012 he discovered his passion for geophysics and was mentored by renowned geophysicist Richard Yelf and went on to found Advance Scanning Services where he developed his skills and begun adapting geophysical techniques and methods to engineering investigations for foundation and structural inspections.

In 2014 he began his geophysics studies at Curtin University majoring in Geophysics & Geology, due to career demands he had to cease his studies in 2015. In 2016 Jonathon was accepted into a post graduate diploma program in engineering geophysics which he graduated with high distinction in 2017.

Since then Jonathon has been at the forefront of research and design, recently completing a 110 sample case study into the condition assessment of Timber piers and piles. Jonathon is an avid academic and is continuing his studies in materials and structural failures.



Project review—Remedial, facade and concrete repairs to Telstra Exchange—by Dapcor

Built in the 1970s, the Ipswich Telstra Exchange was due for remedial, facade and concrete repairs.

The aim of the project was to maintain the integrity of the building envelope without disrupting Telstra operations.

Risk of falling material

The building façades had become a potential hazard with the risk of materials falling to the pavement below.

An assessment revealed the need for concrete repairs to window reveals, brick and blockwork repairs, sealant repair and tiling.

Particular challenges of the project included working on a live Telstra Exchange Building and working over high-traffic public footpaths.

Remedial repairs delivered on time, to budget

Our solution required a mix of access equipment including scissor lifts, boom lifts and rope access works.

The project was completed on time and to budget without disrupting Telstra operations. The result? The removed risk to the public. Win-win!



Project Details

SECTOR—Remedial

LOCATION—Ipswich, QLD

CLIENT—BGIS/Telstra

VALUE—\$342,000

PROGRAM—7 Weeks

COMPLETION—June 2019



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**ACRA WA Seminar
Surface Coatings for Concrete
13 November 2019**



The protection and decoration of concrete are predominately achieved by surface coatings but is coating concrete so different. Can we use the same products we use for steel and timber?

Join us for an exploration of coatings for concrete where we hope to answer a few key questions.

- What is the makeup of a paint designed for concrete
- What kind of properties does it need
- What should we be looking for in a specification
- What are the key considerations when applying paint to concrete

Evening Seminar.

Registration from 5.45pm

Seminar starts at 6pm

Also includes a networking with your peers and a chance to make new contacts within the industry while enjoying some delicious canapés and drinks.

Cost: \$55 for members, \$77 for non-members

Where: Ingot Hotel, 285 Great Eastern Highway, Belmont

Plenty of parking and only 8 minutes from Perth.

Students are free but must still register with the Student ID #

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ACRA Events

VIC – 19 Sept – Seminar: Concrete Repair in the Water Industry

QLD – 25 Sept – Trade Show & Presentations: Durability & Waterproofing

NSW – 10 Oct – Seminar: Security of Payment Changes & Updates + NDT for Engineers
& Durability Assessment

VIC – 28 Nov – Course: Concrete Repair & Protection

NSW – 28 & 29 Oct – 2 Day Course: Corrosion & Protection of Concrete Structures &
Buildings

QLD – 1 Nov – Course: Concrete Repair & Protection

WA – 13 Nov – Seminar: Surface Coatings for Concrete

NSW, QLD, VIC, WA – 5 December - Save the date Xmas Drinks

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Creating value through advanced research & innovation



Corrosion is a degradation process which limits the service life of reinforced concrete buildings and infrastructure and poses a threat to an asset's integrity and durability.

When corrosion control measures are designed and executed properly, they can restrict the incidence of corrosion to acceptable levels and provide environmental benefits.

Technology engineering in the field of corrosion prevention is not simply a necessary cost, but is also an opportunity to reduce ongoing maintenance costs and increase the longevity and value of an asset.

Since its inception in 2013, Remedial Technology Pty Ltd has been involved in research projects related to aspects of the design and delivery of corrosion control measures for concrete structures.

Some of our ongoing research activities include:

- **Development of solutions to stop grout acidification of ICCP systems installed in tidal areas.**



Pictured: acidification of the grout material which encapsulates the ribbon anode strips in tidal areas, and a completed repair area.

- **The use of renewable energy for the corrosion protection of concrete structures.**



Pictured: development of MicroNex solar power supply unit with remote monitoring capability.



Remedial Technology operates a Quality Management System that has been certified to AS/NZS ISO 9001.

Industry News

Women in Engineering—breaking down the stereotypes by Pensar



“I have a successful career in Australia and although it has not been an easy path, it has been worth it. I am a role model for women in engineering, demonstrating how hard work, tenacity, constant learning, embracing your fears and maintaining an attitude to just keep going for it, will bring results” – Ivette Nino, [Pensar](#) Site Engineer.

A recent article by [Brisbane Times](#), highlighted the decrease in female Engineers in Australia with only 15 per cent of all graduate engineers this year being female – which is down on the 10-year average of 20 per cent.

As highlighted by Brisbane Times, a recurring issue many women face is that they don't often think they could be good engineers, thanks to a lack of role models and existing negative stereotypes combining to curb girls' ambitions.

Ivette Nino, Pensar Site Engineer, is passionate about this topic and eager to break down the negative stereotypes that might be holding girls back from considering engineering as a career path. As a female engineer who has been involved in the delivery of the Cross River Rail project, Ivette was inspired to speak

out after reading the recent [Brisbane Times article – Women are essential to delivering Cross River Rail](#).

Ivette faced a number of challenges breaking into the Australian construction industry being both female and originally from Venezuela, with English her second language.

“Securing a role in the industry in Australia proved a challenge. However, my drive and determination to succeed paid off when I followed up on a role with [Pensar](#). My proactiveness and tenacity won an interview with Reese Deaves, Director of Civil Infrastructure, who saw my determination and passion to work in the industry as aligned with the group's core values.”

“I believe the determination and tenacity I showed to obtain my position with Pensar and that I carry through in my daily role is not limited to me, other female engineers I have had the opportunity to work with show the same passion for the industry and commitment to delivering the best outcomes for their project. Once the negative stereotypes surrounding women in engineering are broken down and females understand the role, it's an exciting industry to be a part of. It is a shame that the number of all graduate women engineers will be less this year and that this could be a result of misleading stereotypes – the industry needs more women, the opportunities are endless.”

Ivette has had the opportunity to work on notable projects such as the [Gateway Upgrade North](#) and [Cross River Rail Roma Street Coach Terminal Relocation](#). Ivette was selected by IAQ to join the Emerging Professionals in Infrastructure Queensland (EPIQ) task force, where she meets with other emerging infrastructure leaders to contribute to the long-term direction of the infrastructure industry.

As an industry, construction struggles to attract females. It is commonly considered to be a male dominated industry, leading to the assumption that females will continually struggle to fit in or be viewed as equal among their peers. Although this gender imbalance is common across job sites, Ivette does not see this as a negative or deterrent and through her experiences she has always been treated as an equal among her team members.

“I have often been the only female on a job site but I don't see this as a negative, diversity fosters creativity and learning. Many of my role models have been male, working in diverse teams has only made me a better engineer. Adam Bruschi, Pensar Project Engineer, has mentored and helped me develop as an engineer and become a respected woman in the industry. Diversity is key to the success of any industry and particularly construction, if you don't have diversity then you don't have innovation and you don't have creativity, both necessary to add value to projects.”

I want to be a role model for women to encourage them to have a vision and a purpose to succeed in the industry. As an EPIQ (Industry Taskforce) member, I am part of the next generation of infrastructure sector leaders – a mixed group of role models who have a fresh approach to infrastructure and problem solving solutions. I am responsible for mentoring the undergraduate engineers at Pensar and I am excited to be mentoring my first female student.

Industry News

Duratec Australia

As part of [Duratec's](#) ongoing strategy of sustainable growth, they are delighted to announce the opening of their 11th office in Townsville! Their new operations will accommodate the growing need for their services in northern Queensland and support their commitment to providing employment to local people and supporting local business.

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ACRA QLD Sub Branch

ACRA QLD recently welcomed their newest Sub Branch team member, Craig McPhillips from Pensar. Pensar are new to the ACRA Corporate Membership and they soon started to take advantage of the benefits of being a

member of ACRA, one being able to take part in the Sub Branch and having a voice within the remedial industry and to help make this industry better for all involved. A lot of people when looking at membership in Associations tend to look at "what can the Association do for me" when they forget to think that being a part of an Association entitles you a much bigger voice within the Industry. ACRA continues to invest in its membership by lifting the standards and best practices as well as best methods to stay safe on a work site.

You can meet Craig and the rest of the QLD team at their upcoming [Trade Show 25th September](#).

If you'd like to be a part of our WA, QLD, VIC or NSW Branch phone 02 9645 3692 to discuss.



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Corrosion & Prevention 2019 to reveal latest developments in corrosion mitigation

The Australasian Corrosion Association (ACA) will host the industry leading, Corrosion & Prevention 2019 (C&P 2019) conference and exhibition from 24-27 November, at the Crown Promenade in Melbourne.

This annual conference and trade exhibition will bring together leading researchers and industry practitioners who combat corrosion, on a daily basis.

For further information and to register , please visit: <https://conference.corrosion.com.au/>

Industry News

FOSROC

Facing some of the most extreme conditions imaginable, Australia's northernmost traditional lighthouse needed remediation to bring it back to its former glory, and ensure its future. Given the very isolated nature of the site materials had to be specially shipped in, so this was an especially challenging project. Restoration of the lighthouse involved remediation work to the lighthouse's concrete structure using cementitious repair mortars, installation of anodes for corrosion protection, and finally, application of a protective coating to the entire structure. Fosroc Dekguard Elastic was applied as the protective coating, to protect the structure from the extreme conditions. Dekguard Elastic is an elastomeric, water-based protective coating based on a special acrylic polymer, and is designed to protect atmospherically exposed reinforced concrete structures from attack by acid gases, chloride ions, oxygen and water. It also provides excellent elongation and recovery, high UV resistance, and due to its polymeric formulation, minimises dirt pickup.

Learn more about Dekguard Elastic: <https://lnkd.in/gucmDAN>

Contractor: [Marine & Civil Maintenance Pty Ltd](#)

Photo supplied by: Australian Maritime Safety Authority



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New Method Can Spot Failing Infrastructure from Space

NASA—Jet Propulsion Laboratory, Pasadena, Calif.

We rely on bridges to connect us to other places, and we trust that they're safe. While many governments invest heavily in inspection and maintenance programs, the number of bridges that are coming to the end of their design lives or that have significant structural damage can outpace the resources available to repair them.

But infrastructure managers may soon have a new way to identify the structures most at risk of failure.

Scientists, led by Pietro Milillo of NASA's Jet Propulsion Laboratory in Pasadena, California, have developed a new technique for analyzing satellite data that can reveal subtle structural changes that may indicate a bridge is deteriorating - changes so subtle that they are not visible to the naked eye.

In August 2018, the Morandi Bridge, near Genoa, Italy, collapsed, killing dozens of people. A team of scientists from NASA, the University of Bath in England and the Italian Space Agency used synthetic aperture radar (SAR) measurements from several different satellites and reference points to map relative displacement - or structural changes to the bridge - from 2003 to the time of its collapse. Using a new process, they were able to detect millimeter-size changes to the bridge over time that would not have been detected by the standard processing approaches applied to spaceborne synthetic aperture radar observations.

They found that the deck next to the bridge's collapsed pier showed subtle signs of change as early as 2015; they also noted that several parts of the bridge showed a more significant increase in structural changes between March 2017 and August 2018 - a hidden indication that at least part of the bridge may have become structurally unsound.

"This is about developing a new technique that can assist in the characterization of the health of bridges and other infrastructure," Milillo said. "We couldn't have forecasted this particular collapse because standard assessment techniques available at the time couldn't detect what we can see now. But going forward, this technique, combined with techniques already in use, has the potential to do a lot of good."

The technique is limited to areas that have consistent synthetic aperture radar-equipped satellite coverage. In early 2022, NASA and the Indian Space Research Organization (ISRO) plan to launch the [NASA-ISRO Synthetic Aperture Radar \(NISAR\)](#), which will greatly expand that coverage. Designed to enable scientists to observe and measure global environmental changes and hazards, NISAR will collect imagery that will enable engineers and scientists to investigate the stability of structures like bridges nearly anywhere in the world about every week.

"We can't solve the entire problem of structural safety, but we can add a new tool to the standard procedures to better support maintenance considerations," said Milillo.

The majority of the SAR data for [this study](#) was acquired by the Italian Space Agency's COSMO-SkyMed constellation and the European Space Agency's (ESA's) Sentinel-1a and -1b satellites. The research team also used historical data sets from ESA's Envisat satellite. The study was recently published in the journal Remote Sensing.

A satellite view of the Morandi Bridge in Genoa, Italy, prior to its August 2018 collapse. The numbers identify key bridge components. Numbers 4 through 8 correspond to the bridge's V-shaped piers (from West to East). Numbers 9 through 11 correspond to three independent balance systems on the bridge. In the annotated version, the black arrows identify areas of change based on data from the Cosmo-SkyMed satellite constellation. Image credit: NASA/JPL-Caltech/Google

[Full image and caption](#)



New ACRA Members

Corporate Memberships

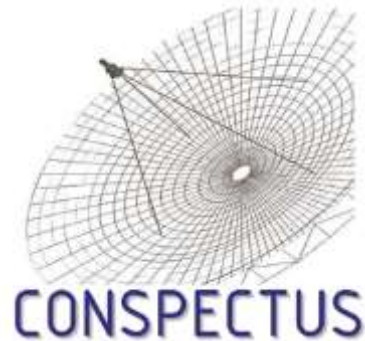
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~~VIC March 28-29 / QLD July 29-30~~

NSW October 28-29

Phone 03 9890 4833 to register

This course has been updated and provides an understanding of the mechanisms of the corrosion, protection and repair of reinforced concrete structures and buildings. It has been particularly designed for those who have the task of resolving the problems of corrosion of steel reinforced, pre stressed and post tensioned concrete elements.

Who Should Attend: This course will provide essential training for Asset Managers, Port Engineers, Bridge Maintenance Managers, Building Managers, Heritage Structure Engineers, Plant Engineers, Consulting Engineers, Architects, Specialist Contractors, Construction Material Suppliers, Asset Condition Inspectors and Overseers. ACRA Members who wish to register for this should phone **03 9890 4833**



29-30 July 2019 - QLD ACA/ACRA Course on Corrosion and Protection of Concrete Structures and Buildings - 2-day member only course.

28-29 October 2019 - NSW ACA/ACRA Course on Corrosion and Protection of Concrete Structures and Buildings - 2-day member only course.



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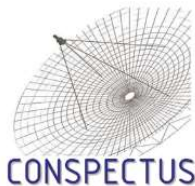
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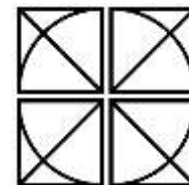
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