

# WELCOME TO THE ACRA REMEDIAL INDUSTRY AWARDS 2023

27 October 2023



# REMEDIAL CONNECTIONS

2023 AWARDS EDITION • Celebrating Excellence in Remedial Building





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# REMEDIAL INDUSTRY EXCELLENCE AWARDS 2023

*Australasian Concrete Repair & Remedial Association*

*- Setting the standards in the remedial industry since 1991*

Thank you to our judges:

- Paul Sandeford, Technical Director, GHD Brisbane
- Daniel Bosco, Director and Civil Engineer, Snow Australia
- Dr. Luke Menefy, Principal Engineer and Area Manager, SMEC Queensland

## ACRA AWARDS EDITION

### President's Message



Greetings and welcome to the reimagined Remedial Connections!

It brings me immense joy to extend a heartfelt greeting to all our readers as we embark on an invigorating new phase of our professional journal. Reconnecting with our devoted community is a source of genuine delight, and I am enthusiastic about celebrating excellence in remedial construction.

I am particularly elated to unveil our special edition to recognise the winners from the 2023 Remedial Industry Excellence Awards. This marks a significant juncture for us following a prolonged hiatus since our last release.

For those of you who attended the Awards on Friday 27 October 2023 at the W Hotel in Brisbane, you will know that it was a special night which was enjoyed by everyone who attended. On the night we did not get the opportunity to learn many details behind the projects and this is why I insisted on sharing more information on these winners since I was voted President in February 2024. ACRA NSW held an night where Dapcor, Remedial, RM Watson, Slabtec and Freyssinet each shared their story behind their projects and the teams who delivered them. I was struck by the justifiable pride in their achievements in their pursuit of remedial building excellence which I found to be very inspirational.

I would also like to take this opportunity to congratulate and acknowledge the success of

the 2023 Celebrating Excellence Awards under Kieran Smith's time as ACRA President. The awards independent process for assessing and selecting winners was a triumph with details successfully kept in confidence until the award announcements. This will be a tough act to follow!

The awards event held special significance as it also marked the transition from the then President, Kieran Smith, to the new President, Michael Rutherford. Mike, as former Vice President, made ACRA history by becoming the first President from outside New South Wales. It's with a heavy heart that I pay tribute to Mike Rutherford, who sadly passed away suddenly in December 2023. Mike was a longstanding and active member of ACRA, he played a pivotal role as a founding member of the ACRA Sub-Committee in Queensland. We will have a category named in his honour at the next Awards.

Once again, welcome to Remedial Connections — a platform where we share and share excellence in remedial building. Thank you for joining us and for all of the contributors who made this publication and 2023 awards possible. I look forward to seeing the entries for the 2025 Remedial Industry Excellence Awards so please join us in Sydney next year.



**Karen C. Amery**  
President

Australasian Concrete Repair  
& Remedial Building Association

May 2024

# ACRA AWARDS EDITION

## Past President's Message



Last year, we were overwhelmed by the incredible response from our community, with a huge number of entries flooding in for the judging process. The enthusiasm and passion displayed by our industry peers are truly inspiring and reaffirm the vitality of our sector.

As I had the privilege of reviewing the entries, I was struck by the remarkable quality and diversity of the projects submitted. From innovative structural repairs to intricate facade restoration, the breadth and depth of talent showcased in each submission are a testament to the ingenuity and expertise of our industry members.

It's evident that with each passing year, the calibre and scale of projects featured in our Awards continue to rise, reflecting the continuous advancement and evolution of our industry. The work being done by our out there is not only impressive but also world-class, positioning us at the forefront of remedial construction on a global scale.

I am immensely proud to be a part of a community that consistently pushes the boundaries of innovation and excellence, driving positive change and transformation in the built environment. Our collective dedication to delivering exceptional outcomes and raising the bar for quality standards is what sets our association apart and propels our industry forward. As you delve into the pages of

this journal, I encourage you to take a moment to celebrate the remarkable achievements of our award winners and nominees. Their contributions are not only shaping the landscape of our industry but also leaving a lasting impact on the communities and environments we serve.

Once again, welcome to Remedial Connections, where we celebrate the achievements, share the insights, and foster the connections that drive our industry forward. Thank you for joining us on this journey of discovery, innovation and excellence.

**Kieran Smith**  
Past President 2021-2023

Australasian Concrete Repair  
& Remedial Building Association

May 2024

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# AWARD CATEGORY: Investigation & Design

WINNER: Duratec Australia & GHD



## HMAS Stirling Low Level Bridge Repairs

Project address: Fleet Base West, HMAS Stirling, Garden Island WA 6168  
 Completed on 30/3/2017  
 Contractor: Duratec and GHD  
 Other ACRA members involved: Fosroc, Sika



HMAS Stirling Low Level Bridge

### PROJECT HIGHLIGHTS

- Duratec implemented aluminium scaffolds, which were floated in and suspended underneath each bridge span, thereby eliminating the need for a traffic management plan during works and minimising disruption to the base. As well as reducing traffic restrictions, these custom-fabricated scaffolds provided program and cost savings.
- Duratec provided extra value for Defence by self-performing the majority of works with a team that was experienced in working in marine environments.

### PROJECT OVERVIEW

Constructed in 1972, the Low Level Bridge is part of a causeway that links HMAS Stirling, located on Garden Island, four kilometres off the coast of Perth in WA, to the mainland. By 2012, the bridge had undergone significant deterioration to both its concrete and steel elements. Duratec Limited and the project's novated designer, GHD, were tasked with recovering the bridge's useful life to at least 2027, with the future intention of extending it to 2055. Since completion of the project, ongoing monitoring and regular inspections have proven the successful, long-term durability and performance of the repair works.

sheet piling, protective coatings to all structural steelwork above water and installation of a cathodic protection system.

Concrete elements to be repaired encompassed the reinforced concrete deck soffits, deck edges, pile caps, guardrails and expansion joints at the abutments. Also included in the scope was the removal of existing coal tar epoxy coatings from the underside of the bridge. This required a fully encapsulated work area - including a negative air pressure filter and HEPA filters for the safe management of a hazardous material in a live, operational environment.

### KEY CHALLENGES

- Live operational environment
- Traffic
- Load restrictions
- Tidal conditions
- Sensitive environment
- Uncertainty regarding bridge's condition
- Increased scope and time pressures

### BACKGROUND

There is low headroom between the bridge's underdeck and the water, and over the years, this had led to accelerated deterioration and maintenance challenges. Various repair works had been conducted since the bridge's commission in 1972, albeit in a piecemeal fashion. Load restrictions had been applied due to structural deficiencies. In 2005, GHD developed a repair strategy to extend the bridge service life to 2055. This included the completion of essential repair works. In 2012, Duratec was awarded the 'Head Contract - Document and Construct' to carry out necessary repairs. The scope of works included repairs to structural steel elements, including the structure supporting the deck (beams and piles), steel



Access system in place



Before repairs



7 years after repairs



Eccentricity works grouting collar

# AWARD CATEGORY: Research, Design & Innovation



## WINNER: Infracorr Consulting

### Bulk Liquids Berth (BLB) project in Port Botany for NSW Ports

Project address: Port Botany NSW 2036  
 Completed on 31/7/2021  
 Contractor: Infracorr  
 Other ACRA members involved: Freyssinet Australia

#### PROJECT OVERVIEW

The overarching aim of this project was to extend the service life of the wharf structures at the Bulk Liquids Berth No 1 (BLB 1) Terminal at Port Botany. The strategy for achieving this focused on whole-of-life, as well as safety-in-design principles. The design utilised hybrid electrochemical treatment for corrosion protection to prestressed concrete elements to achieve an extension to service life. This was the first large scale use of hybrid corrosion protection within an operational hazardous area in the world.

#### BACKGROUND

Serving as the principal bulk liquids storage and handling facility for NSW, BLB has been critical to the supply of essential products for over 40 years. Previous condition assessments verified the gradual deterioration of the prestressed concrete structures that comprise the wharf terminal. These findings indicated the asset was approaching the end of its original design life.

#### KEY CHALLENGES

Infracorr Consulting applied existing materials, methods, and systems to overcome a unique combination of design challenges. This project was the first and largest-scale application of a hybrid electrochemical treatment for corrosion control to prestressed concrete in a classified hazardous area which the designers are aware of. This demonstrates a new approach to life extension of reinforced concrete assets in such environments, which can be more cost-effective and require less downtime than other methods.

#### PROJECT HIGHLIGHTS

- By incorporating the corrosion control treatment as part of the remediation, the designers were able to reduce the extent of concrete removal which was required in order to undertake repairs – generally only removing loose and delaminated concrete rather than all chloride-contaminated concrete.
- Design approach helped to reduce the cost and duration of the work, as well as reduce the structural impact of the remediation works and ensure that the wharf could remain in service throughout the repairs.
- This remediation project reduced the production of carbon-intensive new concrete materials.



Underside of the berth



Extending the service life of the wharf structure at the Bulk Liquids Berth No 1 (BLB 1) Terminal, Port Botany



Infracorr were engaged for engineering and technical supervision of the repair and CP installation works by NSW Ports

# AWARD CATEGORY: Research, Design & Innovation

## HIGHLY COMMENDED: ACOR Consultants



### Project Remediate

Project address: Across New South Wales  
Completed on 4/5/2023  
Contractor: ACOR Consultants

### PROJECT HIGHLIGHTS

The Pattern Book has been embraced by the NSW Government who has endorsed its use across industry as well as mandating its use for the Class 2 buildings associated with the program itself. The document provides the framework for the successful remediation of combustible cladding on Class 2 buildings in NSW and has become a reference document now being referred to nationally.

The document optimises the design process and in turn leads to efficiencies in construction through the adoption of consistent construction methodologies and approaches. The industry standard is being improved through adoption of these approaches which in should in turn leads to an inherent reduction in future issues.

### PROJECT OVERVIEW

Project Remediate is a voluntary program to replace flammable cladding for eligible Class 2 residential apartment buildings across NSW. The Pattern Book provides technical guidance and a suite of technical drawings. Both components were developed by ACOR Consultants whilst operating as the Project Remediate' Global Façade Consultant (GFC).

It is a reference document for designers involved in Project Remediate and functions as an industry reference for those undertaking private façade remediation project. The Pattern Book will be used by all design teams & building contractors on Project Remediate and facilitates standard solutions and minimises redundant re-design work.

### BACKGROUND

Project Remediate by the NSW Government to serve as a purpose-driven program focused on replacing combustible cladding. ACOR were engaged as the Global Façade Consultant (GFC) to develop industry guidelines for cladding replacement projects. ACOR developed a guidance document and associated suite of standard construction details demonstrating good practice in remedial cladding projects. The industry guidelines developed function as a critical resource for Design and Building Practitioners involved in such projects by not only showing good practice methodologies but also mandating adoption for those involved in the program.

The Pattern Book facilitates standardisation of design solutions and raises the level of quality and consistency in the replacement of cladding systems for those involved in the program. The provision of construction detailing and guidance documentation minimises redundant redesign work by providing a baseline for designers in particular.

The Pattern Book provides:

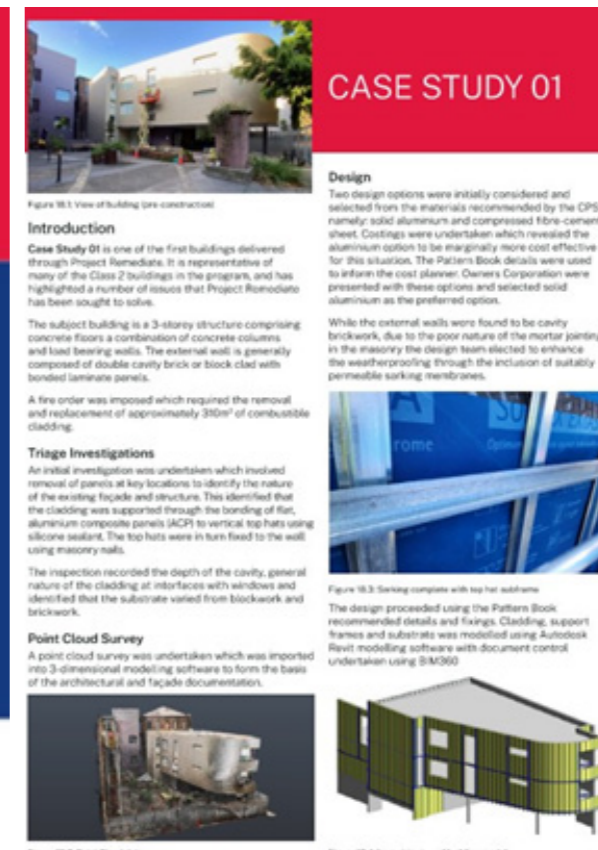
- Good practice principles around cladding replacement including program requirements set to raise the standard of cladding replacement through measures taken beyond the baseline of statutory requirements relating to conformance.
- A library of construction details reflecting good practice in remediation design approaches for building features which are often observed in such projects.

### KEY CHALLENGES

- The scope continually changed and evolved through continual engagement and discussion with peers, stakeholders and fellow construction professionals.
- Needed to ensure the document could be easily embraced and adopted by the industry.



Project Remediate cladding replacement pattern book facilitates excellence in the remedial industry



Example of a case study from Project Remediate cladding replacement pattern book

# AWARD CATEGORY: Strengthening

WINNER: Slabtec



## Quay Quarter Tower (QQT)

Project address: 50 Bridge St, Sydney NSW 2000  
 Completed on 1/12/2022  
 Contractor: Slabtec  
 Other ACRA members involved: Sika, BG&E

### PROJECT HIGHLIGHTS

Yes, the value to the client and end user the of building primarily lay in the fact that the CFRP strengthening was able to be designed, detailed and installed within the extremely limited spaces available for strengthening works. Alternate strengthening systems may have resulted in increased member sizes and potential impact to the building architecture and/or building services



Strengthening work at Quay Quarter Tower

### PROJECT OVERVIEW

The Quay Quarter Tower (QQT) structure in Sydney underwent a process of carbon fibre strengthening as part of its renovation and repurposing. CFRP is an extremely high strength and lightweight material that is often used to reinforce concrete structures. CFRP strengthening typically involves externally bonding the carbon fibre elements to the surface of the concrete using high strength structural resins, creating a composite material that is extremely strong and durable. The result is a concrete structure that is now able to withstand the requirements of the enlarged building envelope with essentially zero impact on the amenity of the building.

### BACKGROUND

QQT in Sydney is a former office tower that was originally built in the late 1970s. For many years, the building was used for its intended purpose as an office space for a variety of companies. However, as the years went by and the demand for office space in Sydney changed it was announced in the early 2010s, it was announced that the building would undergo a major renovation and reuse project that would transform it into a mixed-use development. Two-thirds of the beams, columns, floor slabs and the original core built for the AMP Society in the 1970s were retained. QQT won World Architecture Festival Building of the Year 2023.

### KEY CHALLENGES

There were several constraints and difficulties faced during the construction of QQT in Sydney, some of which included:

- Location of CFRP and being able to be inspected at a later stage
- Anchorage at the bottom of the walls and into the footings
- Coordination of service penetrations, lintels and beams
- Surface preparation access
- Design life of the epoxy
- Low strength concrete
- No design codes for structures in Australia
- Performance of CFRP under fire conditions



Quay Quarter Tower (QQT) in Sydney



Carbon fibre strengthening



Carbon fibre laminate being applied



Carbon fibre strengthening as part of the building renovation

# AWARD CATEGORY: Residential Buildings

## WINNER: ACOR Consultants



### Project Remediate

Project address: Across New South Wales  
 Completed on 4/5/2023  
 Contractor: ACOR Consultants

### PROJECT HIGHLIGHTS

The Pattern Book has been embraced by the NSW Government who has endorsed its use across industry as well as mandating its use for the Class 2 buildings associated with the program itself. The document provides the framework for the successful remediation of combustible cladding on Class 2 buildings in NSW and has become a reference document now being referred to nationally.

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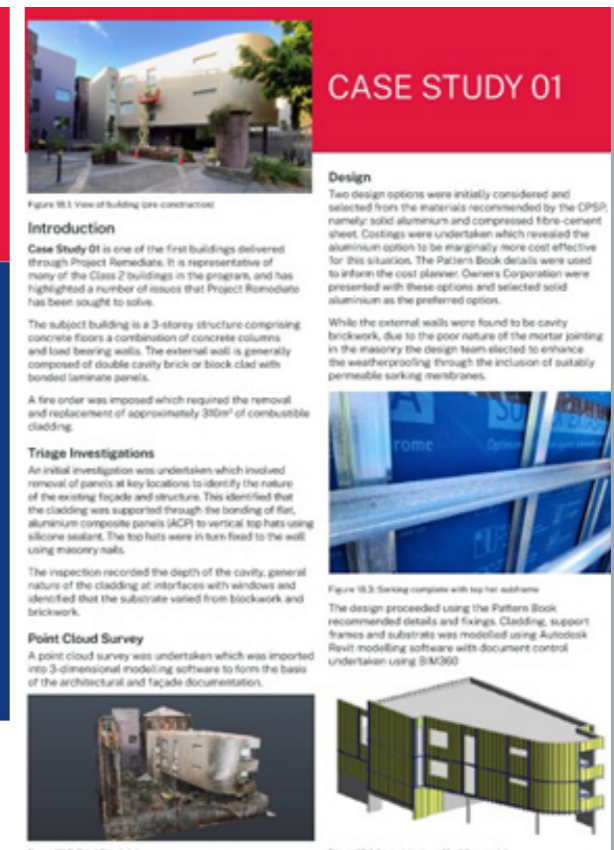
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Project Remediate cladding replacement pattern book facilitates excellence in the remedial industry



Example of a case study from Project Remediate cladding replacement pattern book



# AWARD CATEGORY: Residential Buildings



## HIGHLY COMMENDED: Remedial Building Services Australia

### Gazebo Apartments

Project address: 2 Elizabeth Bay Rd, Elizabeth Bay NSW 2011  
 Completed on 22/12/2022  
 Contractor: Remedial Building Services Australia  
 Other ACRA members involved: Diagnostech, Dulux, Sika



Containment sheeting installed on the balconies to carry out the paint removal and reinstatement process.

#### PROJECT HIGHLIGHTS

- Minimal disruption to residents and business operations
- Value-engineered solutions that led to cost efficiency for owners
- Upgrades to various elements of the building to comply to the National Construction Code (NCC)
- Safely stripping paint on the steel balustrades whilst working at heights
- Replaced the spire structure on the roof

#### PROJECT OVERVIEW

Remedial's \$12million residential mega-project to restore a Sydney icon of international architectural style began in November 2018. Over four years, the Gazebo building's unique aesthetic appeal was restored with a major façade transformation which included concrete repairs, render repairs and façade painting as well as waterproofing and tiling works. Remedial also successfully delivered a major fire upgrade that was subject to a council order; applying robust planning to minimise disruption and adding value to owners at every stage. This unique and challenging project involved a complete fire safety upgrade, protective coatings to 247 balustrades, 3500m2 façade coating, 200m2 of balcony waterproofing and 80,000+ man hours.

#### BACKGROUND

Built in the 1960s, the building originally operated as a hotel; in 2005 its conversion to apartments was complete. The building operates a bar and bistro on the ground floor and attracts a large volume of regular pedestrian foot traffic.

In 2018, The Gazebo apartments were given a council fire order due to various non-compliances in the building. Remedial was engaged to deliver a major fire upgrade to both passive and active systems. After completing the fire upgrades, Remedial was awarded further remediation work in the form of major façade upgrades to the building.

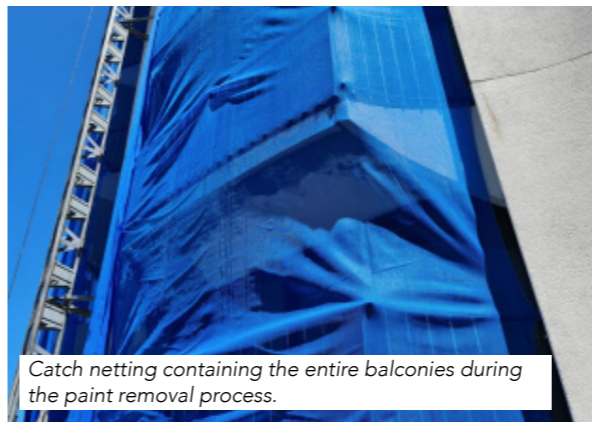
This was a testament to our high standard of customer service and satisfaction.

#### KEY CHALLENGES

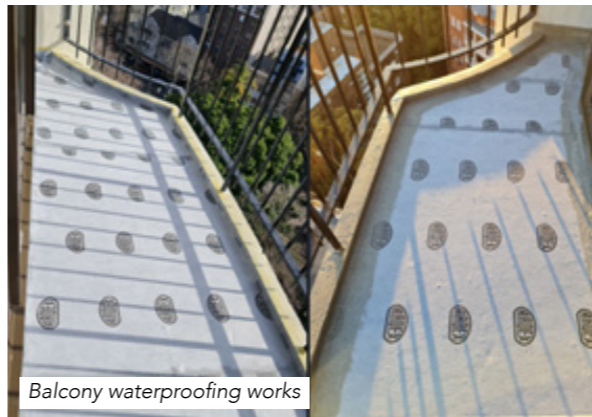
- Access solution that minimised the impact on both the six-storey basement car park and residents of the top-floor penthouse apartments of the Tower block.
- The building was fully occupied while we were carrying out fire defects on the 154 apartments across the two buildings.
- Minimal disruption to residents and no impact to business operations was expected on this project.
- The spire replacement was high risk and very challenging.
- Balustrade paint stripping on the Tower building (over 19 stories) had lots of environmental considerations and containment requirements.
- Numerous balconies had moisture issues on the soffit of the balcony.



Mast climbers for façade works at Gazebo Apartments



Catch netting containing the entire balconies during the paint removal process.



Balcony waterproofing works



Completed building and façade rectification works at the Gazebo, Elizabeth Bay

# AWARD CATEGORY: Commercial Buildings



**WINNER: RM Watson**

## Manly Pacific Hotel

Project address: 55 N Steyne, Manly NSW 2095  
 Completed on 25/11/2022  
 Contractor: RM Watson  
 Other ACRA members involved: Slabtec, Sika, BG&E



Manly Pacific Hotel prior to façade and structural repair works

### PROJECT OVERVIEW

In 2021, the Manly Pacific Hotel engaged RM Watson to undertake a complete façade upgrade to remediate issues of chloride related corrosion and refresh the external appearance in line with the recently completed internal refurbishment. Once access was in place and close inspection was possible, a more serious issue was detected, relating to corrosion of the anchorages of the post tension system. RM Watson's brief quickly changed from an upgrade of the façade to urgent structural repairs.

### BACKGROUND

Built in the 1970's under less stringent code requirements, the Manly Pacific Hotel had been suffering from chloride related corrosion of the concrete elements reinforcement across various locations of the façade. Initial visual engineering inspections determined this was the result of reduced concrete cover during the original construction method.

### KEY CHALLENGES

- Unquantified extent of works and early budget changes
- Removal of corrosion from anchorages and tendons
- Maintaining normal hotel operations

### PROJECT HIGHLIGHTS

Through emerging concrete repair technologies, RM Watson effectively addressed 50 years of structural deterioration, extending the design life of the structure by a further 20 years.

- Removal of corrosion from anchorages and tendons using high-intensity laser pulses to remove mortar and corrosion build up without damage.
- Effectively addressed the serious structural inadequacies that were present across the site, while also upgrading the overall appearance and aesthetics of the structure.
- Properly maintained, RM Watson's work will have extended the current design life of the structure by a minimum of 20 years, ensuring the continued operations of the popular hotel.
- Pre-project planning and close consultation with hotel management enabled the continual occupancy of newly refurbished hotel rooms across the site and the programming of key project milestones around the hotel's busy function and booking schedule.



Portable high intensity laser used to remove corrosion from exposed anchorages



Before cleaning using laser system



After cleaning using laser system



Manly Pacific Hotel at the completion of façade and structural repair works

# AWARD CATEGORY: Commercial Buildings

## HIGHLY COMMENDED: Duratec Australia



### 60 King William Street

Project address: 60 King William St, Sydney NSW 2000  
 Completed on 16/6/2023  
 Contractor: Duratec Australia



Canopy removed from the building façade

#### PROJECT OVERVIEW

The development at 60 King William Street is the largest commercial real estate project in the Adelaide CBD, comprising close to 45,000sqm of office and retail space. In mid-2022, Duratec was engaged by Built to restore the site's heritage-listed, art-deco building façade; namely 3D modelling of the horse motif and pressed cement details.

- **Other**

The plaster façade required more consolidation than originally documented. The existing, original window frames were twisted and damaged, which led to an increase in scope. Low-pressure cleaning with soft brushes and PH-neutral detergent were required so as not to damage the canopy, however, this made it difficult to achieve a uniform finish. Mineral silicate paint, tinted to 20% of a pigment, showed up the layer of the substrate underneath.

#### BACKGROUND

In early 2021, construction group Built began works on 60 King William Street – a \$450 million commercial development for Charter Hall. Upon completion in mid-2023, the multi-storey structure will be the largest commercial real estate project in Adelaide's CBD, comprising close to 45,000sqm of office and retail space.

#### KEY CHALLENGES

- **Heritage-listed horse emblem**  
 The facade's heritage-listed horse emblem was in such poor condition Duratec was not able to undertake the repairs as per the original documentation.
- **Heritage-listed canopy**  
 The heritage-listed canopy, which had been removed by a demolition company prior to the engagement of Duratec, had been cut into two pieces, using a quick cut and oxy torch, and left at a demolition yard.

#### PROJECT HIGHLIGHTS

For a relatively small investment percentage-wise when compared to the rest of the complex, the heritage facade provides a unique entry point to the building and has generated a lot of positive publicity.

- Delivered additional works within a tight timeframe.
- Exercised flexibility regarding work hours and the provision of access to other trades.
- The restoration of the art-deco facade was a requirement of the development application, meaning the project would not have been able to progress without the completion of these works.
- The Sands & McDougall facade has become a feature of the building with the general public glad it has been retained and incorporated into the new building.



Façade restoration works



Original horse emblem



Restored horse emblem



60 King William St façade restoration works completed

# AWARD CATEGORY: Buildings – Overall

**WINNER: Freyssinet Australia**



## 126 Phillip Street, Sydney

Project address: 126 Phillip Street, Sydney NSW 2000  
 Completed on 10/12/2022  
 Contractor: Freyssinet Australia  
 Other ACRA members involved: AKZONOBEL, ARUP Australia, Ardex Australia, Sika Australia

### PROJECT OVERVIEW

Freyssinet conducted corrosion repairs, protective coating application, design and installation of architectural lighting system and a bespoke new height access system on the Architectural Roof Structure (ARF) at 126 Phillip St, in the heart of Sydney CBD. The highest point of the structure to be repaired was 270m high. Access to complete the remediation works was done with 270 tonnes of scaffold. Due to the wind effect on the structure, the ARF had to be temporarily strengthened for the duration of the works including welding of bracing and install of external post tensioning.

### BACKGROUND

Architectural roof structure at 126 Phillip St, Sydney was built in 2005, damage and delamination of the coating system of the structural steel framing elements has been noted. In addition to the generally deteriorating coating, coating failure, localised corrosion of mild steel elements and bolted connections had occurred. Freyssinet was engaged in 2021 to conduct major remedial works on the structure, design and install a new height access system to facilitate future maintenance and inspections, design and install a new lighting system to the ARF.

### KEY CHALLENGES

The main difficulties on this project were to manage high risk works in such exposed environment located so high on the top of the building in the middle of Sydney CBD.

### PROJECT HIGHLIGHTS

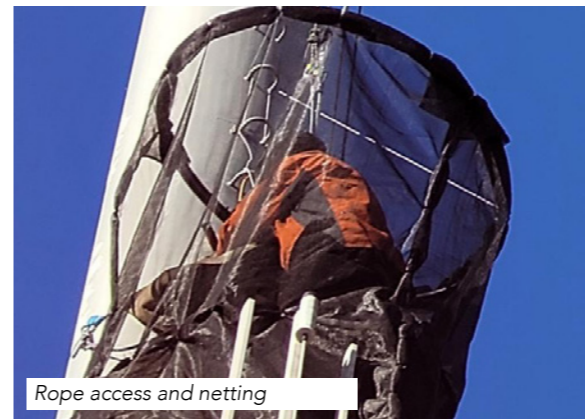
During the investigation works of 2020, Freyssinet very quickly identified and highlighted to the client that the temporary access system to safely complete the remediation works would be one of most significant and costly undertakings in the project. To make profitable use of the access, it was suggested to design and install a new lighting system, which added significant value to the structure.



ARF at 126 Phillip St, Sydney



Application of protective coating



Rope access and netting



Early morning scaffold build



Remedial works on the Architectural Roof Structure (ARF) at 126 Phillip St, Sydney

# AWARD CATEGORY: Industrial

WINNER: Absafe Group



## Mt Wellington Remediation Program

Project address: Mt Wellington Communications Tower, Hobart TAS 7000  
 Completed on 17/2/2023  
 Contractor: Absafe  
 Other ACRA members involved: Fosroc and Duoguard Australia

### PROJECT HIGHLIGHTS

Provided the client with significant time and cost savings over traditional access methods of scaffolding.

### PROJECT OVERVIEW

Upon the first site inspection Absafe just knew that the Mt Wellington Project would likely present significant challenges. Initially extreme, unseasonal weather in late spring/early summer prevented access to the site due to snow. Throughout the project the sub-zero temperatures and gale force winds consistently created obstacles with the application and curing of products. The scope of work involved internal concrete repairs and external coating works, which were completed via a bespoke custom-made swing stage.

### BACKGROUND

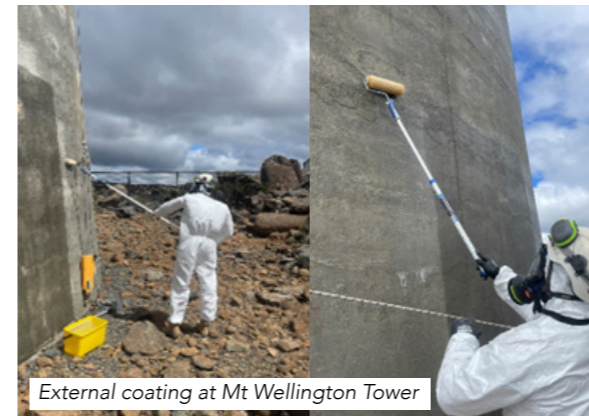
The Mt Wellington Tower is Tasmania's tallest building, situated at Mt Wellington, which is a mountain south-east of Tasmania. It is the summit of the Wellington Range and is within the Wellington Park reserve. Completed in 1995, the tower houses antenna and transmitters for many companies including Telstra, Austar, Vodafone and three television stations.

The tower consists of a hollow 67M tall reinforced concrete base topped by a 64M tall steel superstructure that supports an elevator and three antennas. The steel superstructure is wrapped in fiberglass to protect the antenna. The general condition of the towers shell appears to have been declining due to both the age of the structure and the exposure to hostile, extreme weather conditions that expose it to being constantly

battered by high winds and sub-zero temperatures. The condition of the tower has been carefully monitored by the asset manager via regular inspections, the results of which instigated the remediation project due to integrity concerns.

### KEY CHALLENGES

- Access difficulties: The 67M height, and unusual taper of the tower.
- Hostile conditions: Short weather window of opportunity to conduct external works. Due to high wind and sub-zero temperatures.
- OH&S Constraints: No access to top of tower permitted due to EME restrictions. High level of dust when conducting break out works.
- Weather Constraints: Extreme temperatures affecting the curing of concrete for void repairs and application of coatings.
- Site Constraints: Large scale of void repairs were complicated by restricted areas of breakout permitted at any one time.



External coating at Mt Wellington Tower



Completion of external coating at Mt Wellington Tower



Rope access technicians at Tasmania's tallest building, Mt Wellington Tower

# AWARD CATEGORY: Heritage Structures

**WINNER: Dapcor**



## Former Military Fortification Remediation Works Sydney Harbour National Park (Middle Head Fortifications)

Project address: 2 Governors Road, Mosman NSW 2088  
 Completed on 2/9/2021  
 Contractor: Dapcor  
 Other ACRA members involved: ACOR Consultants and Fosroc

### PROJECT HIGHLIGHTS

- A highly resistant repair system was adopted to prevent future corrosion while allowing the remaining areas to age naturally, maintaining their heritage value.
- Improved accessibility, safety measures, and conservation efforts implemented during the project such as the new handrails and viewing platforms enhance the overall experience and enjoyment of the site for visitors.
- The successful completion of the project contributed to the preservation and appreciation of Australia's historical and natural assets, thereby adding long-term value to the client and the wider community.

### PROJECT OVERVIEW

The Middle Head Fortifications, a significant heritage-listed site on Sydney Harbour, seamlessly integrates Aboriginal Cultural heritage with colonial military history from the early 1800s. A heritage-sensitive approach was employed to preserve the structures' surface finish and geometry. ACOR spearheaded the design process, while Dapcor executed the repairs. The objective was to ensure the fortifications' safety, future protection, and preservation of heritage values. The repairs were designed to have no adverse effects on the original heritage concrete, prioritising retaining weathered aesthetics and safeguarding historic fabric. Allowing for the natural weathering of the concrete, contributing to the narrative of the structure's overtime.

### BACKGROUND

The conservation work was part of a larger project to create a \$10 million walking track connecting Middle Head and Georges Head, enhancing the Sydney Harbour Scenic Walk. ACOR Consultants was engaged by the NSW National Parks and Wildlife Service to design viewing platforms and ensure the fortifications' safety at three locations: Middle Head, Obelisk Bay, and Georges Head. Having withstood 80 years of exposure in a coastal environment, the structures exhibited extensive concrete spalling, with large sections already detached. The primary focus of the repairs was to ensure visitor safety in these historically significant structures.

### KEY CHALLENGES

- Environmental: Navigating through bush and varied terrain presented difficulties in accessing and transporting materials to the work sites. Careful consideration was required to avoid damaging the surrounding flora and fauna, preserving the park's natural ecosystem.
- Access: Lack of direct access to power and water. Overhead repairs saw installation of scaffolding to address access challenges.
- Safety and security of the worksite saw installation of fencing.
- Achieving a seamless repair finish required meticulous handling and preservation.



Obelisk before



Obelisk completed



Georges Head Tower before and after



Middle Head Fortifications works

# AWARD CATEGORY: Heritage Structures



## HIGHLY COMMENDED: Remedial Building Services Australia

### Sirius Apartments, Concrete Remediation (The Rocks)

Project address: 2-60 Cumberland St, The Rocks NSW 2000  
 Completed on 30/8/2023  
 Contractor: Remedial Building Services Australia  
 Other ACRA members involved: Sika Australia, Ecotone



After the application of repair mortar

#### PROJECT OVERVIEW

The Sirius Building is a historically-significant complex in The Rocks district of Sydney CBD. Originally designed for Housing Commission NSW, it is now being renovated into 79 luxury waterfront apartments. Investigation of the building revealed significant corrosion risk related to carbonation of the concrete. The scope was to provide a 50-year design life on the structure. Remedial rectified thousands of heavily-spalled areas of concrete; repairing both the pebblecrete finish and off form concrete and installing numerous anodes into the structure. Through extensive and detailed concrete repairs works, Remedial ensured a seamless integration of the repairs and preserved the aesthetic appeal of this significant building.

#### BACKGROUND

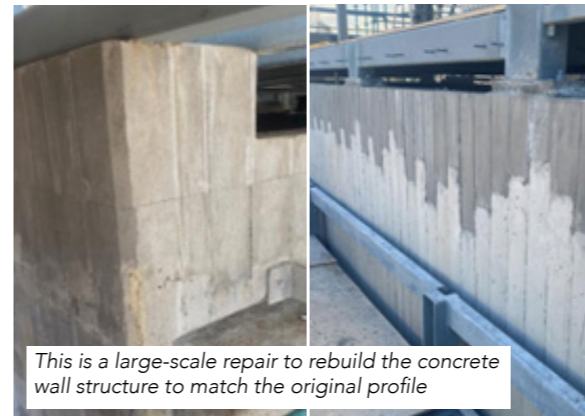
The Sirius Building at Cumberland Street in The Rocks, New South Wales, Australia, holds historical significance. Designed for the Housing Commission of NSW in 1978 -1979 by architect Tao Gofers, the Sirius Building is one of the most prominent examples of Brutalist architecture in Australia. Brutalist or 'raw concrete' buildings are known for their bold and imposing presence, often featuring large structures made of exposed concrete. The Sirius Building is the only high-rise development in The Rocks. Richard Crookes Constructions and Dedico Development Services are leading the construction management and property development of this project.

#### KEY CHALLENGES

- Size and scale of the project
- Enormity of the repairs required (over 3000 items)
- Various other contractors working concurrently on the construction site.
- Matching the concrete repairs to the existing building. In particular, finding a suitable stain to closely resemble the original concrete was most challenging.
- Hidden defects and concealed damage that we discovered when we commenced our repair work.
- Additional checks and approvals added extra complexity on this project.

#### PROJECT HIGHLIGHTS

- Providing advice on colour matching which informed the proposed design of the scope of works.
- Rectified thousands of heavily-spalled areas of concrete; repairing both the pebblecrete finish and off form concrete and installing numerous anodes into the structure.
- Achieved seamless integration of the repairs and preserved the aesthetic appeal of this significant building; extended service life of over 50 years.
- Strong protection of our works and ongoing stakeholder communication ensured no delays or incidents on-site.
- We added value by detecting hidden defects that may have remained uncovered, were it not for Remedial's expertise in this area.



This is a large-scale repair to rebuild the concrete wall structure to match the original profile



Pebbles were added to the concrete repair mix to match the existing building façade – you can barely notice where the repairs were made



Close-up of finalised concrete repair work



Remedial was engaged to undertake extensive concrete repairs to rectify and restore the original façade of the iconic Sirius Building

# AWARD CATEGORY: Marine

## WINNER: Pensar Structures



### South Bank Parklands Boardwalk Remediation Works

Project address: South Bank Parklands Boardwalk, Brisbane QLD 4000  
 Completed on 31/8/2021  
 Contractor: Pensar Structures  
 Other ACRA members involved: SMEC

#### PROJECT HIGHLIGHTS

- From a constructability point of view, Pensar saw repairing, restoring and strengthening the existing concrete foundations to be a far better approach than demolishing and removing numerous 12 metre long reinforced concrete beams and replacing with steel.
- This also provided significant cost savings to the client (at least 40% of the final project value).
- The boardwalk remained open to the public at all times throughout construction. All work was conducted under the boardwalk, out of sight and away from the main thoroughfare.
- Other than a small temporary fencing enclosure to store equipment, there was no sign of construction work onsite.



Concrete repairs at South Bank Parklands

#### PROJECT OVERVIEW

With a carefully planned and delivered program of strengthening and remediation, Pensar applied an alternative remediation approach, offering several opportunities to the project. The client's suggested remediation process involved demolishing and removing the original concrete decking foundations and replacing them with steel beams. Pensar proposed an alternative methodology - repairing and stabilising the original concrete decking, then reinforcing the foundations with steel trusses. This solution successfully restored the boardwalk's original concrete foundations, saving the client 40% of the original project value and avoiding considerable site disruption, public inconvenience and risk to work safety and the natural environment.

of the most heavily trafficked sections of one of Brisbane's most popular and widely used public spaces.

#### KEY CHALLENGES

- Access proved to be the main challenge in the delivery of this project. Pensar gained access through a 900mm gap in the promenade piles via canoes, and utilised float bricks to float in individual temporary working platform pieces. Access through the gap in the promenade was only achievable at certain lower tides, leaving the crew only four hours per day to enter, proceed with the install, remove all buoyant aides and leave before returning the following day and restarting this process.
- Once the working platform was installed, the project crew were able to access the platform from a hole created in the promenade above. This allowed the crew to operate for generally 7-8 hours a day in waders working up to their chests in the Brisbane River.
- Installation of the structural steel (some weighed over 600kg) required a series of chain blocks to be affixed to engineered anchor points on the underside of the sound spanning slabs in order to maneuver them.



Concrete repairs at South Bank Parklands



Concrete repairs at South Bank Parklands



Pensar repairs and strengthens existing concrete foundations at South Bank Parklands Boardwalk



Access proved to be the main challenge

#### BACKGROUND

Pensar was engaged by Brisbane City Parklands Services to design and construct the remediation works for a section of boardwalk at the South Bank Parklands. Routine maintenance inspections suggested part of the concrete decking foundations had deteriorated due to tidal exposure to brackish water. Left untreated, this could reduce the design load limit of the structure, potentially posing a public safety issue. Structural strengthening was required to ensure the requisite load capacity could be maintained into the future. The boardwalk is a major public thoroughfare - one



# AWARD CATEGORY: Marine



## HIGHLY COMMENDED: Infracorr Consulting

### Bulk Liquids Berth (BLB) project in Port Botany for NSW Ports

Project address: Port Botany NSW 2036  
 Completed on 31/7/2021  
 Contractor: Infracorr  
 Other ACRA members involved: Freyssinet Australia

#### PROJECT OVERVIEW

The overarching aim of this project was to extend the service life of the wharf structures at the Bulk Liquids Berth No 1 (BLB 1) Terminal at Port Botany. The strategy for achieving this focused on whole-of-life, as well as safety-in-design principles. The design utilised hybrid electrochemical treatment for corrosion protection to prestressed concrete elements to achieve an extension to service life. This was the first large scale use of hybrid corrosion protection within an operational hazardous area in the world.

#### BACKGROUND

Serving as the principal bulk liquids storage and handling facility for NSW, BLB has been critical to the supply of essential products for over 40 years. Previous condition assessments verified the gradual deterioration of the prestressed concrete structures that comprise the wharf terminal. These findings indicated the asset was approaching the end of its original design life.

#### KEY CHALLENGES

Infracorr Consulting applied existing materials, methods, and systems to overcome a unique combination of design challenges. This project was the first and largest-scale application of a hybrid electrochemical treatment for corrosion control to prestressed concrete in a classified hazardous area which the designers are aware of. This demonstrates a new approach to life extension of reinforced concrete assets in such environments, which can be more cost-effective and require less downtime than other methods.

#### PROJECT HIGHLIGHTS

- By incorporating the corrosion control treatment as part of the remediation, the designers were able to reduce the extent of concrete removal which was required in order to undertake repairs – generally only removing loose and delaminated concrete rather than all chloride-contaminated concrete.
- Design approach helped to reduce the cost and duration of the work, as well as reduce the structural impact of the remediation works and ensure that the wharf could remain in service throughout the repairs.
- This remediation project reduced the production of carbon-intensive new concrete materials.



Underside of the berth



Extending the service life of the wharf structure at the Bulk Liquids Berth No 1 (BLB 1) Terminal, Port Botany



Infracorr were engaged for engineering and technical supervision of the repair and CP installation works by NSW Ports

# AWARD CATEGORY: Marine

## HIGHLY COMMENDED: Freyssinet Australia



### Bobbin Head Bridge

Project address: Ku-ring-gai Chase National Park Bobbin Head  
 Completed on 24/3/2023  
 Contractor: Freyssinet Australia

#### PROJECT OVERVIEW

The Bridge is located in Ku-ring-gai National Park and was constructed in 1956. Freyssinet was first awarded the project in 2020 where a routine site inspection highlighted worse than expected concrete conditions. It was then identified the need to de-rate the bridge capacity to 16 tonnes GVM. Given the initial scope had to be modified, the project ceased and demobilised before FA was re-awarded stage 2. The project included; Design, manufacture and installation of a cofferdam structure to allow remedial works on headstock independently from tidal movement whilst transferring load from bridge deck to piles; coating; hydrodemolition; concrete repair and reinforcement; CP; and joint repairs.

#### BACKGROUND

The Bobbin Head bridge is in the Ku-ring-gai National Park (classified as a heritage area) located north of Sydney in New South Wales, Australia. The bridge is composed of three 19.5m spans with a total length of 58.5m. The Bridge was constructed in 1956 and each span consists of prestressed concrete girders (believed to be the first pre-stressed concrete girders ever made in New South Wales) with a total bridge width of 10.66m. Freyssinet was initially awarded the project in April 2020 with a scope of work involving conventional concrete patch repair of an estimated 30m<sup>2</sup> on the piers headstock and pile columns. The updated bridge rehabilitation requirements were developed

following a structural inspection dated 27 May 2020 signifying that the structure was already in poor condition and requiring extensive concrete repair. Given the new assessment on the structure, the initial scope of work had to be modified and project was stopped and demobilised. The project was then re-tendered and Freyssinet was awarded the second stage of the project in August 2022.

#### KEY CHALLENGES

- **Environmental and access**  
 Tidal movement saw half the pier headstock being submerged underwater during a typical workshift. The very narrow tidal window would significantly impact productivity and program, quality of the works and safety. As such, the idea of the cofferdam structure was born following the first project site visit back in 2020 and Freyssinet had designed a dry access solution to successfully deliver this project.



Concrete repairs



Installation of new reinforcing steel



Installation of new reinforcing steel



Coffer dam being lifted out of the water

#### PROJECT HIGHLIGHTS

Prior the strengthening works, bridge capacity had been de-rated to 16 Tonnes, with a full-time traffic control team located on the bridge 12 hours per day, week days and week end in order to manage traffic. Strengthening works completed by Freyssinet allowed Transport of NSW to recover the full capacity of their asset.



Aerial view of the works at Bobbin Head Bridge

# AWARD CATEGORY: Bridges

## WINNER: Pensar Structures



### Tasmanian Bridge Strengthening Work

Project address: Across seven sites in the North East of Tasmania  
 Completed on 31/3/2023  
 Contractor: Pensar Structures  
 Other ACRA members involved: Sika Australia

#### PROJECT HIGHLIGHTS

- The remediation and strengthening methodology devised by Pensar enabled extensive demolition and reconstruction works to be avoided, delivering considerable savings in time, resources and energy, while dramatically reducing waste.
- The revised methodology also posed less risk to the surrounding natural environment and waterways.
- The electrochemical realkalisation and CFRP reinforcement works were successfully completed with no environmental impacts, no quality defects and no lengthy road closures or interruptions to traffic flow.

#### PROJECT OVERVIEW

With a carefully planned and delivered program of repair and retrofitting, Pensar restored and strengthened a number of ageing concrete bridges in regional Tasmania. This preserved the integrity and extended the lifespans of the original concrete structures, avoiding extensive demolition and reconstruction. Contrary to the tender specification and the client's anticipated remediation process, Pensar recommended electrochemical realkalisation treatment to restore and stabilise the existing concrete structures and prevent reinforcement corrosion. This technique had not previously been used in Tasmania. All works were successfully completed with zero environmental impacts, quality defects, lengthy road closures or traffic interruptions.

#### BACKGROUND

The Tasmanian Department of State Growth engaged Pensar to complete remediation and strengthening works on seven ageing bridges throughout the north-east of the state - to restore and preserve the concrete structures and bring the intended design load limits in line with current standards, enabling heavier vehicles to safely use the bridges well into the future. The bridges range from around 40 to 60 years old. Several suffered from substantial concrete carbonation. If this deterioration continued untreated, the structures would fall below the necessary design load limits

and ultimately fail. Before any strengthening works could be commenced, the concrete carbonation problem needed to be addressed. Once completed, carbon fibre reinforced polymer (CFRP) supports were added to the undersides of the bridges to strengthen the structures in accordance with the required load limits.

#### KEY CHALLENGES

- Environmentally sensitive locations
- Local community/industry dependence on the roadways
- High traffic volumes and limited alternative routes
- Regional/remote sites
- Challenging landscapes
- Inclement weather with the potential for flash flooding
- Limited local availability of requisite contractors
- Inclement weather conditions coupled with the occurrence of La Nina, prevented Pensar from achieving efficient progress. Substrate moisture and relative humidity reduced the project team's ability to apply epoxy adhesives for a significant portion of the program.



Pensar restored and strengthened a number of ageing concrete bridges in regional Tasmania



Concrete repairs and strengthening at Tasmanian Bridge



Finished product

# AWARD CATEGORY: Bridges

## HIGHLY COMMENDED: Duratec Australia & GHD



### HMAS Stirling Low Level Bridge Repairs

Project address: Fleet Base West, HMAS Stirling, Garden Island WA 6168  
 Completed on 30/3/2017  
 Contractor: Duratec and GHD  
 Other ACRA members involved: Fosroc, Sika



HMAS Stirling Low Level Bridge

#### PROJECT HIGHLIGHTS

- Duratec implemented aluminium scaffolds, which were floated in and suspended underneath each bridge span, thereby eliminating the need for a traffic management plan during works and minimising disruption to the base. As well as reducing traffic restrictions, these custom-fabricated scaffolds provided program and cost savings.
- Duratec provided extra value for Defence by self-performing the majority of works with a team that was experienced in working in marine environments.

#### PROJECT OVERVIEW

Constructed in 1972, the Low Level Bridge is part of a causeway that links HMAS Stirling, located on Garden Island, four kilometres off the coast of Perth in WA, to the mainland. By 2012, the bridge had undergone significant deterioration to both its concrete and steel elements. Duratec Limited and the project's novated designer, GHD, were tasked with recovering the bridge's useful life to at least 2027, with the future intention of extending it to 2055. Since completion of the project, ongoing monitoring and regular inspections have proven the successful, long-term durability and performance of the repair works.

sheet piling, protective coatings to all structural steelwork above water and installation of a cathodic protection system.

Concrete elements to be repaired encompassed the reinforced concrete deck soffits, deck edges, pile caps, guardrails and expansion joints at the abutments. Also included in the scope was the removal of existing coal tar epoxy coatings from the underside of the bridge. This required a fully encapsulated work area - including a negative air pressure filter and HEPA filters for the safe management of a hazardous material in a live, operational environment.

#### KEY CHALLENGES

- Live operational environment
- Traffic
- Load restrictions
- Tidal conditions
- Sensitive environment
- Uncertainty regarding bridge's condition
- Increased scope and time pressures

#### BACKGROUND

There is low headroom between the bridge's underdeck and the water, and over the years, this had led to accelerated deterioration and maintenance challenges. Various repair works had been conducted since the bridge's commission in 1972, albeit in a piecemeal fashion. Load restrictions had been applied due to structural deficiencies. In 2005, GHD developed a repair strategy to extend the bridge service life to 2055. This included the completion of essential repair works. In 2012, Duratec was awarded the 'Head Contract - Document and Construct' to carry out necessary repairs. The scope of works included repairs to structural steel elements, including the structure supporting the deck (beams and piles), steel



Access system in place



Before repairs



7 years after repairs



Eccentricity works grouting collar

# AWARD CATEGORY: Wharves

## WINNER: Marine & Civil Maintenance (MCM)



### Brotherson Dock Life Extension

Project address: SITE A: PATRICK Berths 7 – 9; SITE B: DP World Berths 10 -12;  
 SITE C: Southern Return Wall; SITE D: Eastern Quay  
 Completed on 6/6/2022  
 Contractor: Marine and Civil Maintenance  
 Other ACRA members involved: Duoguard, Parchem, Bluey Omniflex, SCRIP, PCTE and Infracorr

#### PROJECT OVERVIEW

The BDLE Project consisted of the repair to approximately 2km of quay line and focused on the DP World (Berth 10-12) and Patrick (Berth 7-9) terminals. The Project involved removing and reinstatement of 250m<sup>2</sup> of defective concrete material and installing a Hybrid Anode Cathodic Protection system consisting of more than 23,000 anodes, the installation of an Impressed Current Cathodic Protection (ICCP) system and applying a silane impregnating coating system. Port Botany's primary trade is containers, and the Port currently handles 96.6% of NSW's container volume making it one of Australia's busiest ports presenting unique challenges which were overcome with strong collaboration with all stakeholders and to high QSHE standards.

#### BACKGROUND

The purpose of this project was to extend the useful life of the Brotherson Dock container wharf structures at Port Botany. The wharf structures were built 40 years ago and have been subjected to harsh environmental conditions and operational wear and tear. Chlorides from seawater had slowly ingressed into the concrete and caused the onset of corrosion of the embedded reinforcement steel. Corroded steel expands, cracks and delaminates the concrete, resulting in a loss of structural capacity and reduction of the useful life of the structure. This project will repair the current damage and protect the wharf structures from corrosion and

thereby extend their useful life through the installation of a new cathodic protection system. The project had been designed to allow for the container stevedoring operations to continue throughout the construction period.

#### KEY CHALLENGES

- Operating within the live container terminals (DP World & Patrick)**  
 MCM was required to operate in smaller sections of quay line 50-80m increments. If and when ships needed to berth MCM crews had to demobilise site and move to alternative areas. Shipping schedules changed frequently (hourly in extreme cases) and ultimately working during continuous stevedoring operations became untenable and alternative access arrangements were negotiated.
- Extreme weather and tidal conditions**  
 Conditions can change rapidly with the onset of southerly breeze precluding any tidal based activities.
- System installation constraints**  
 Areas of heavily congested arrangement of the steel reinforcement needed to be considered in the final design.
- OH&S**  
 Work were fully operational during the Covid-19 which created additional layers of complexity relating to permitting and occupational health and safety.



Installation of the cathodic protection system

#### PROJECT HIGHLIGHTS

- Worked closely with relevant stakeholders including the stevedores and Harbour Master to reduce delays and ensure safe working conditions.
- The hybrid and Immersed ICCP anode systems is designed to provide protection to the reinforcement in the areas it has been installed for 50 years.



Extending the useful life of the Brotherson Dock container wharf structures at Port Botany

# AWARD CATEGORY: Water & Sewer

WINNER: Freyssinet Australia



## Marian and Mirani Reservoir Refurbishment

Project address: Marian No. 1 Reservoir, Eungella Road, Marian QLD 4753  
 Mirani No. 3 Reservoir, Boldon Road, Mirani QLD 4754  
 Completed on 10/5/2023  
 Contractor: Freyssinet Australia  
 Other ACRA members involved: GHD and Fosroc

### PROJECT OVERVIEW

This project undertook the repair and strengthening works to Marian and Mirani reinforced concrete reservoirs which developed structural cracks since their construction 10 years ago. The reservoirs are the primary water storage facilities for Marian and Mirani with a combined population of 5000 residents. External structural condition assessments identified numerous defects on the external walls, including major horizontal and vertical cracking, leaks, and spalling concrete. Cracking was also identified on the roof area of the reservoirs. Freyssinet completed the concrete repair and strengthening works including the design and install of seven posttensioning cables to the external walls of each reservoir.

### BACKGROUND

The Marian and Mirani reservoirs are cast in-situ reinforced concrete structures that are supported by columns. They have an individual capacity of 1.60ML, with a 21.5m diameter, and are 5.1m in height. Since their construction in 2010, both reservoirs developed leaking and non-leaking cracks on their walls and roofs. Therefore, it was decided to conduct structural inspections of the exterior and interior of both reservoirs.

External structural inspections identified numerous defects in the wall areas, including major cracking, leaks, and spalling concrete. Based on the investigations it was decided to undertake the

external repairs and strengthening works to both reservoirs to prevent further deterioration and extend the residual life. This was saving money for the communities that did not need to build new reservoirs.

### KEY CHALLENGES

- Use of correct products and compatibility**  
 The methodology for the repair was required to be such that the repair products must not have contact with any of the stored potable water in the reservoirs unless they have AS4020 approval. The challenge was in choosing the product for repairing the leaking wall cracks as the repaired product was required to be quick setting, resist water pressure, and must stop the flow of water through the cracks. Freyssinet proposed the use of Fosroc SC 800 to repair the non-leaking cracks on walls with Fosroc Dekguard 2000 Protective topcoat to be applied over the walls.
- Water reduction in the reservoirs**  
 Mackay Regional Council engaged a hydraulic consultant - Stantec - to undertake an analysis of the water demand in the townships including fire and seasonal demand. It was recommended that the water level was not reduced to less than 40%. Freyssinet developed a strengthening solution that accommodated the minimum water level requirements to meet this assessment.



Repairing structural cracks



Repairing structural cracks



Application of carbon fibre strengthening to the reservoir walls

### PROJECT HIGHLIGHTS

Freyssinet were engaged to develop a solution that allowed the reservoirs to remain in service during the repair process. The solution allowed for the repair, protection and strengthening of the concrete structure without disruption to the supply of water to the community.



Refurbishment at Marian and Mirani Reservoir is complete



Refurbishment at Marian and Mirani Reservoir is complete

# AWARD CATEGORY: Long-term Performance

WINNER: Infracorr Consulting



Morell Bridge, South Yarra, Victoria

Project address: South Yarra VIC 3000  
 Completed on 6/6/1995  
 Contractor: Infracorr Consulting  
 Client: Melbourne City Council

## PROJECT OVERVIEW

The Morell Bridge is a unique earth-filled arch bridge that spans across Melbourne's Yarra River. The bridge is a significant heritage structure, and it is also a vital transportation link. A detailed study revealed extensive spalling at the soffit of the arches, displacement and drainage issues. Ian developed the concept for the restoration including the use of a cathodic protection system or 'earth' anode system' with 12 anodes placed in the soil below the footpath, permanently protecting all arch reinforcement minimising the extent of patched concrete which would weaken the arch.

## BACKGROUND

The Morell Bridge, built in 1899, is a significant heritage structure and a vital transportation link. In the early 1990s, the Morell Bridge needed major repair and restoration. The concrete was spalling, the side walls were displacing, and the bridge was suffering from drainage problems and staining. It was restored using anodes based in the soil layer, passing current through soil and through half m thick concrete arch to protect the reinforcing steel. The anodes were powered by a transformer rectifier mounted on the abutment with cables placed in trenches below the bridge footpath levels.

In 2017, during pavement restoration works the cables of the bridge were excavated in error requiring Infracorr to investigate the damage

and design the restoration of the system. During this work the anodes were upgraded to ensure additional life of the system for a further 25 years. Infracorr continues to monitor the CP system of this structure annually.

## KEY CHALLENGES

The consulting structural engineer involved in the project initially proposed full depth patch repair to be undertaken in 1m by 1m panels to minimise impacts to the structural integrity of the bridge. This patch-work based repair work would have taken over 14 months to complete the entire repair process at high cost to the client.

## PROJECT HIGHLIGHTS

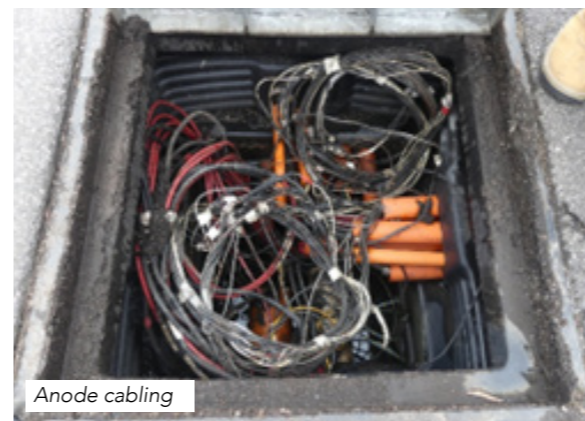
- The cathodic corrosion protection system works were completed rapidly and saved on costs for the client. This was achieved with the soil anode system. Which meant only loose and laminated concrete was removed, rather than large volumes of concrete at considerable area along the bridge.
- Significant visual improvement of the bridge. The stains, spalls, and misalignments have been removed, and the bridge now looks like new. The use of cathodic protection to protect the reinforcement the amount of patch repairs required was substantially reduced.
- The project was completed on time and within budget, and the results are impressive. The Morell Bridge is now a safe, reliable, and attractive structure that will serve the community for many years to come.



1994 repair



1994 repair



Anode cabling



Completed repairs



The cathodic protection system works saw significant visual improvement of the bridge over the long-term

# AWARD CATEGORY: Mega Projects >\$10 Million



## WINNER: Remedial Building Services Australia

### Gazebo Apartments

Project address: 2 Elizabeth Bay Rd, Elizabeth Bay NSW 2011  
 Completed on 22/12/2022  
 Contractor: Remedial Building Services Australia  
 Other ACRA members involved: Diagnostech, Dulux, Sika

#### PROJECT HIGHLIGHTS

- Minimal disruption to residents and business operations
- Value-engineered solutions that led to cost efficiency for owners
- Upgrades to various elements of the building to comply to the National Construction Code (NCC)
- Safely stripping paint on the steel balustrades whilst working at heights
- Replaced the spire structure on the roof



Containment sheeting installed on the balustrades to carry out the paint removal and reinstatement process.

#### PROJECT OVERVIEW

Remedial's \$12million residential mega-project to restore a Sydney icon of international architectural style began in November 2018. Over four years, the Gazebo building's unique aesthetic appeal was restored with a major façade transformation which included concrete repairs, render repairs and façade painting as well as waterproofing and tiling works. Remedial also successfully delivered a major fire upgrade that was subject to a council order; applying robust planning to minimise disruption and adding value to owners at every stage. This unique and challenging project involved a complete fire safety upgrade, protective coatings to 247 balustrades, 3500m2 façade coating, 200m2 of balcony waterproofing and 80,000+ man hours.

#### BACKGROUND

Built in the 1960s, the building originally operated as a hotel; in 2005 its conversion to apartments was complete. The building operates a bar and bistro on the ground floor and attracts a large volume of regular pedestrian foot traffic.

In 2018, The Gazebo apartments were given a council fire order due to various non-compliances in the building. Remedial was engaged to deliver a major fire upgrade to both passive and active systems. After completing the fire upgrades, Remedial was awarded further remediation work in the form of major façade upgrades to the building.

This was a testament to our high standard of customer service and satisfaction.

#### KEY CHALLENGES

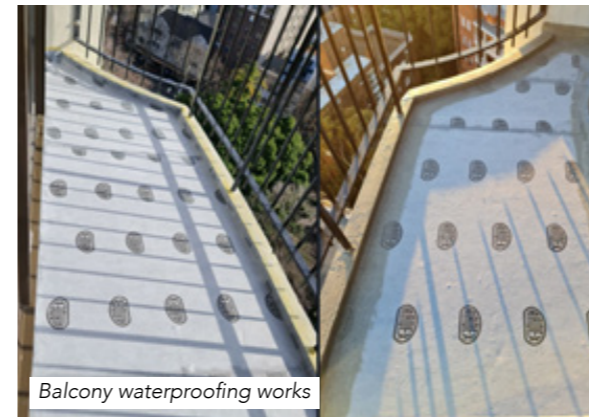
- Access solution that minimised the impact on both the six-storey basement car park and residents of the top-floor penthouse apartments of the Tower block.
- The building was fully occupied while we were carrying out fire defects on the 154 apartments across the two buildings.
- Minimal disruption to residents and no impact to business operations was expected on this project.
- The spire replacement was high risk and very challenging.
- Balustrade paint stripping on the Tower building (over 19 stories) had lots of environmental considerations and containment requirements.
- Numerous balconies had moisture issues on the soffit of the balcony.



Mast climbers for façade works at Gazebo Apartments



Catch netting containing the entire balconies during the paint removal process.



Balcony waterproofing works



Completed building and façade rectification works at the Gazebo, Elizabeth Bay



# AWARD CATEGORY: Small projects <100K

## WINNER: Mend Building



### Qld Parliament House (balconies)

Project address: 2A George St, Brisbane City QLD 4000  
 Completed on 1/11/2022  
 Contractor: Mend Building  
 Other ACRA members involved: Ardex

### PROJECT HIGHLIGHTS

This waterproofing and concrete repair project added significant value to QLD Parliament House; preserving historical integrity, prolonging lifespan, enhancing aesthetic appeal, ensuring compliance with heritage regulations, thus safeguarding the heritage listed building for future generations.



Balcony waterproofing works

### PROJECT OVERVIEW

Parliament House is Queensland's premier heritage building built in 1868, which has been maintained and upgraded throughout its life as an integral part of Queensland's political system. Mend Building were privileged to carry out waterproofing, copper flashing replacement, sandstone and concrete repairs to the main 2nd floor balconies adjacent to the Parliament Chambers of this landmark, historically significant building. Parliaments on-going operations were given the highest priority throughout the Project to eliminate or minimise disruption. Mend Building has now had the opportunity to contribute to its preservation and continued longevity.

Inhabit Australasia provided a scope of works and drawings for the waterproofing works across 3x balconies on the 2nd level. This included: removal of existing waterproofing product down to bare substrate; temporary removal of downpipes/ steelwork; drainage / topping modification to prevent ponding; installation of new sheet membrane with coloured topcoat to comply with heritage requirements; supply and install new copper flashings and floor drain grates; remediate existing flashing; concrete and sandstone repair.

### KEY CHALLENGES

- Parliament House security and operation constraints/difficulties**  
 All workers and contractors had to complete police checks and be vetted prior to being allowed on site, a process that took several days. There was also restrictive access to the work areas.
- Latent Conditions**  
 Upon removal of the existing membrane, the substrate was not as expected and did not correspond with the assumptions of the consulting engineer's report. This required extensive additional works to remediate the substrate, so that it was suitable for the new membrane.
- Material selection**  
 Considerations included performance requirements of membranes; aesthetics of the finished product to fit in line with the heritage requirements; using the correct materials that are approved by the heritage consultant.

### BACKGROUND

The Queensland Parliamentary Precinct consists of two buildings; the heritage listed Parliament House and the medium rise tower Parliamentary Annexe building. Extensive refurbishment works were carried out to the Parliament House between 1981-1982 which included repair, restoration and rejuvenation of the original sandstone building.

Parliament House is listed as a heritage site on the State Heritage Register. As a result, any project or maintenance works had to be assessed to determine what approval was required to ensure the work did not diminish the heritage values of the building.



Balcony waterproofing works



Application of waterproofing membrane



QLD Parliament House with balcony repair works complete

# AWARD CATEGORY: President's Choice

## WINNER: Marine & Civil Maintenance (MCM)



### Brotherson Dock Life Extension

Project address: SITE A: PATRICK Berths 7 – 9; SITE B: DP World Berths 10 -12;  
 SITE C: Southern Return Wall; SITE D: Eastern Quay  
 Completed on 6/6/2022  
 Contractor: Marine and Civil Maintenance  
 Other ACRA members involved: Duoguard, Parchem, Bluey Omniflex, SCRIP, PCTE and Infracorr

#### PROJECT OVERVIEW

The BDLE Project consisted of the repair to approximately 2km of quay line and focused on the DP World (Berth 10-12) and Patrick (Berth 7-9) terminals. The Project involved removing and reinstatement of 250m<sup>2</sup> of defective concrete material and installing a Hybrid Anode Cathodic Protection system consisting of more than 23,000 anodes, the installation of an Impressed Current Cathodic Protection (ICCP) system and applying a silane impregnating coating system. Port Botany's primary trade is containers, and the Port currently handles 96.6% of NSW's container volume making it one of Australia's busiest ports presenting unique challenges which were overcome with strong collaboration with all stakeholders and to high QSHE standards.

#### BACKGROUND

The purpose of this project was to extend the useful life of the Brotherson Dock container wharf structures at Port Botany. The wharf structures were built 40 years ago and have been subjected to harsh environmental conditions and operational wear and tear. Chlorides from seawater had slowly ingressed into the concrete and caused the onset of corrosion of the embedded reinforcement steel. Corroded steel expands, cracks and delaminates the concrete, resulting in a loss of structural capacity and reduction of the useful life of the structure.

This project will repair the current damage and protect the wharf structures from corrosion and

thereby extend their useful life through the installation of a new cathodic protection system. The project had been designed to allow for the container stevedoring operations to continue throughout the construction period.

#### KEY CHALLENGES

- Operating within the live container terminals (DP World & Patrick)**  
 MCM was required to operate in smaller sections of quay line 50-80m increments. If and when ships needed to berth MCM crews had to demobilise site and move to alternative areas. Shipping schedules changed frequently (hourly in extreme cases) and ultimately working during continuous stevedoring operations became untenable and alternative access arrangements were negotiated.
- Extreme weather and tidal conditions**  
 Conditions can change rapidly with the onset of southerly breeze precluding any tidal based activities.
- System installation constraints**  
 Areas of heavily congested arrangement of the steel reinforcement needed to be considered in the final design.
- OH&S**  
 Work were fully operational during the Covid-19 which created additional layers of complexity relating to permitting and occupational health and safety.



Installation of the cathodic protection system

#### PROJECT HIGHLIGHTS

- Worked closely with relevant stakeholders including the stevedores and Harbour Master to reduce delays and ensure safe working conditions.
- The hybrid and Immersed ICCP anode systems is designed to provide protection to the reinforcement in the areas it has been installed for 50 years.



Extending the useful life of the Brotherson Dock container wharf structures at Port Botany

# AWARD CATEGORY: Remedial Industry Excellence

## WINNER: Pensar Structures



### Tasmanian Bridge Strengthening Work

Project address: Across seven sites in the North East of Tasmania  
 Completed on 31/3/2023  
 Contractor: Pensar Structures  
 Other ACRA members involved: Sika Australia

#### PROJECT HIGHLIGHTS

- The remediation and strengthening methodology devised by Pensar enabled extensive demolition and reconstruction works to be avoided, delivering considerable savings in time, resources and energy, while dramatically reducing waste.
- The revised methodology also posed less risk to the surrounding natural environment and waterways.
- The electrochemical realkalisation and CFRP reinforcement works were successfully completed with no environmental impacts, no quality defects and no lengthy road closures or interruptions to traffic flow.

#### PROJECT OVERVIEW

With a carefully planned and delivered program of repair and retrofitting, Pensar restored and strengthened a number of ageing concrete bridges in regional Tasmania. This preserved the integrity and extended the lifespans of the original concrete structures, avoiding extensive demolition and reconstruction. Contrary to the tender specification and the client's anticipated remediation process, Pensar recommended electrochemical realkalisation treatment to restore and stabilise the existing concrete structures and prevent reinforcement corrosion. This technique had not previously been used in Tasmania. All works were successfully completed with zero environmental impacts, quality defects, lengthy road closures or traffic interruptions.

#### BACKGROUND

The Tasmanian Department of State Growth engaged Pensar to complete remediation and strengthening works on seven ageing bridges throughout the north-east of the state - to restore and preserve the concrete structures and bring the intended design load limits in line with current standards, enabling heavier vehicles to safely use the bridges well into the future. The bridges range from around 40 to 60 years old. Several suffered from substantial concrete carbonation. If this deterioration continued untreated, the structures would fall below the necessary design load limits

and ultimately fail. Before any strengthening works could be commenced, the concrete carbonation problem needed to be addressed. Once completed, carbon fibre reinforced polymer (CFRP) supports were added to the undersides of the bridges to strengthen the structures in accordance with the required load limits.

#### KEY CHALLENGES

- Environmentally sensitive locations
- Local community/industry dependence on the roadways
- High traffic volumes and limited alternative routes
- Regional/remote sites
- Challenging landscapes
- Inclement weather with the potential for flash flooding
- Limited local availability of requisite contractors
- Inclement weather conditions coupled with the occurrence of La Nina, prevented Pensar from achieving efficient progress. Substrate moisture and relative humidity reduced the project team's ability to apply epoxy adhesives for a significant portion of the program.



Pensar restored and strengthened a number of ageing concrete bridges in regional Tasmania



Concrete repairs and strengthening at Tasmanian Bridge





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# REMEDIAL CONNECTIONS

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