



ENGINEERS
AUSTRALIA



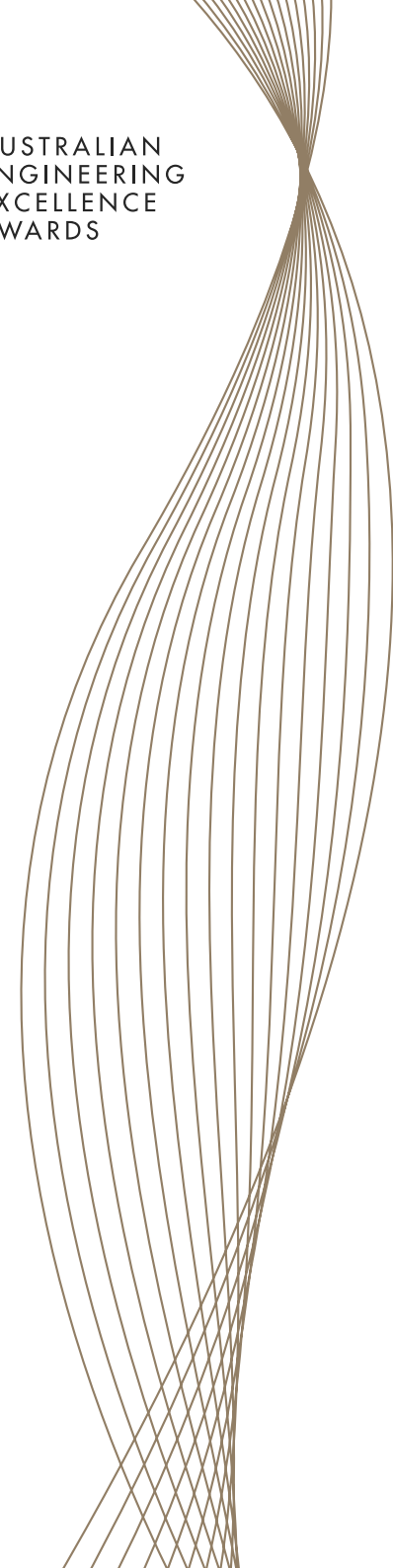
AUSTRALIAN
ENGINEERING
EXCELLENCE
AWARDS

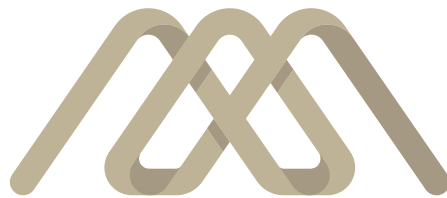
ICONIC INNOVATION

Celebrating Extraordinary Engineering

AUSTRALIAN
ENGINEERING
EXCELLENCE AWARDS

**SYDNEY
ENTRANTS 2018**





AUSTRALIAN
ENGINEERING
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AWARDS

These awards recognise and promote new and innovative ideas that are brought to life in ways that bring fundamental change to our society.

OVERVIEW

Engineers Australia recognises outstanding achievement in engineering and the invaluable contribution engineering makes to the economy, community and the environment.

The Australian Engineering Excellence Awards (AEEA) inspire and encourage engineering distinction through teamwork, innovation, and technical excellence.

The AEEA is an integrated program resulting in awards at National level once local finalists are determined. To enter the AEEA, entrants are required to submit project nominations at the relevant local level, depending on the project's location.

Excellence, distinction, merit, perfection and quality are the characteristics that winning entries exhibit. View the 2018 entrants.



ENGINEERS
AUSTRALIA

Sydney

Level 3

8 Thomas Street

Chatswood NSW 2067



SYDNEY

PRESIDENT'S MESSAGE



The Australian Engineering Excellence Awards are a wonderful opportunity to showcase the amazing projects that Australian engineers have contributed to. They highlight determination, innovation, skill, the importance of team work and most importantly a standard of excellence.

In an age where 'busy' is the norm, it can be difficult to stop and take stock of your achievements as a company to enter an awards program. However, by doing so you impact positively on your company culture, and you provide aspirational examples for the profession, be it a young engineer at the start of their career or a new company starting out in the marketplace. These projects are a source of inspiration both within the profession and to the broader public.

This is also an opportunity of great honour, being recognised amongst your peers and all entrants are to feel justifiably proud of representing the profession at this level.

I congratulate all the entrants for their contribution and wish them all the best for the awards.

Julie Mikhail FIEAust
Sydney President

CHIEF JUDGE'S MESSAGE



Engineers Australia Charter is to advance the science and practice of engineering for the benefit of the community. Engineers from Sydney and throughout New South Wales have made outstanding contributions to our community. Our awards celebrate the accomplishment of some of the greatest engineering companies and individuals in our region. We showcase leaders in our profession along with world

class engineering and innovation.

Australian Engineering Excellence Awards (AEEA) provide an opportunity to demonstrate to the community the positive contribution our engineers make to society. We shape the world and are behind many of the systems and infrastructures our society takes for granted. We deliver the innovation, knowledge and outcomes that facilitate both the maintenance and advancement of society. Through the AEEA we can actively engage and inform our community of the value, capacity and contribution of our engineering community to society.

I am very proud of the success of previous AEEA Sydney Award winners at the National Excellence Awards. In 2016 at the national level the University of Technology Sydney together with Roads and Maritime Services won the Engineering Innovation Award for their 'Autonomous Robotic Bridge Inspector'. At those same awards the University of Technology Sydney together with Arup won a National Award for Engineering excellence with their 'Dr Chau Chak Wing' building.

For Sydney this year we received fourteen submissions covering the majority of categories. These entries encompassed everything from buildings, urban and regional infrastructure, insightful projects to small business and have demonstrated innovative and cutting edge concepts within their submissions.

We have seen both metropolitan and regional projects submitted demonstrating the state-wide contribution of our profession to society.

I would like to recognise and thank our judges who have spent considerable time and energy in assessing the entrants submissions.

You will find details of all entrants within this booklet and I would like to thank you all for your involvement in the Awards process.

I congratulate all winners tonight who are now Finalists in the National Australian Engineering Excellence Awards culminating in the National Awards night to be held in Sydney on 18 September 2018.



Mr Bruce Howard FIEAust CPEng APEC Engineer
IntPE(Aus) NER
Chief Judge



JUDGING CRITERIA

Actual or potential contribution of the work to the economy

Contributes to the local, regional or national economy by reducing whole of life costs or adding to the efficient use of existing engineering construction, manufacture, maintenance or application.

Impact of the work on the quality of life of the relevant communities

Contributes positively to the communities using it in respect of cost, time, environment or general amenity of the community.

Significance of work as a benchmark of Australian Engineering

Sets new benchmarks or continues current high standards thereby raising the standard and standing of Australian Engineering.

Extent to which the work represents world best practice

Can be matched against similar engineering achievements to represent world best practice.

Other considerations

The environmental impact of the work, the sustainability of the project and the work health and safety consideration. These must outline the effect on those directly or indirectly involved and members of the community in general.

JUDGES 2018

Norman Himsley

BE, MEng.Sc, Grad.Dip.Bus,FIE Aust, CPEng
Dams Safety Consultant

Peter Goudie

B.E.(Mech) DipPM FIEAust CPEng NER GAICD RPEng
Director
GOUDIE Pty Ltd

Julia M Ratnayake

FIEAust CPEng MSc(ME) NER
Work Manager
Roads and Maritime Services, Sydney Harbour Bridge

Ping Tan

Bachelor of Power Engineering, CPEng, MPA
Subtransmission Planning Manager
Ausgrid

Thank you to our panel of judges who generously volunteered their time and effort to review all entrants, and select our Sydney Winners and AEEA Finalists.

PROJECT ENTRIES

ANBOT - AN INTELLIGENT ROBOTIC CO-WORKER FOR HUMAN-ROBOT COLLABORATIVE OPERATION IN PRACTICAL INDUSTRY APPLICATIONS

University of Technology Sydney

Burwell Technologies

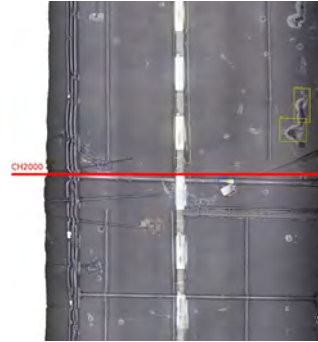


This project developed novel methodologies that optimise the combined capabilities of both the human and the robot, to facilitate human-robot collaboration in conducting physically intensive tasks in hazardous industrial environments. These methodologies have enabled the realization of

a commercial ready intelligent robotic co-worker, the first of its kind, that can recognise human intention, monitor human posture, be aware of surroundings and operations, and provide responsive physical assistance as needed and when appropriate to human workers during abrasive blasting operation. Extensive field trials have demonstrated that the robotic co-worker can significantly improve OH&S, reduce injury and fatigue, and improve productivity.

AUTOMATIC FAULT DETECTION IN TRANSPORT TUNNELS

Abyss Solutions



Current condition assessment practices of road tunnel ceilings involve manual inspection in difficult, time constrained conditions. Abyss Solutions has successfully demonstrated the capability of a new improved inspection method which combines high-resolution imaging

and machine learning algorithms. Not only does this method improve safety by eliminating the need for elevated platforms, reduce errors/omissions through algorithmic objective assessments, but its repeatability enables automatic detection of new or growing defects, called "change detection". The output is a list of the critical defects on which to focus the maintenance spending on. This method of inspection can be used in advance of scheduled tunnel shutdowns.



BOMEN ENABLING ROADS

BMD Constructions



BMD Constructions together with Wagga Wagga City Council successfully delivered the Bomen Enabling Roads design and construct project. The project met its objective to vastly improve road safety in the area, creating a round trip saving of 36 minutes for higher mass limits vehicles

and better links the industrial precinct with highways. BMD Constructions delivered an innovative rail bridge methodology utilising a top-down alternate technique. Over the two stages for the bridge's construction, BMD Constructions ensured rail operations continued without disruption, and following the relocation of a significant gas pipeline, excavations delivered a road underpass beneath the rail bridge. The project has delivered a transformative piece of infrastructure that will have a significant and long-lasting benefit for businesses and the community, touted by Council as the biggest driver for the Wagga Wagga economy for a generation.

CASCADE PIER UPGRADE, NORFOLK ISLAND

Advisian Pty Ltd

Waterway Constructions Pty Ltd

Consult Marine Pty Ltd



After identification of the need for an economic boost to the local community on Norfolk Island, a Commonwealth Grant was gained for a 25m extension to the island's Cascade Pier. This project enabled more cruise ships to access the island, delivering tourists that would

increase revenues >3 fold; improving the local economy and the livelihoods of the community. Advisian, Waterway Constructions and Consult Marine worked in collaboration to deliver a project that was best practice in the design and construction of a durable, and sustainable, marine port infrastructure that was safely constructed in a hostile open ocean environment. The extension of Cascade Pier essentially involved construction of a vertical breakwater, completed using I-shaped caissons, a design and technique which is understood to be a world first.

FOUNDATION REPLACEMENT BURRINJUCK TOWERS 125 & 126

PCA Ground Engineering
Piling & Civil Australia



Transgrid transmission line number 970, forms a 132kV link between Burrinjuck and Yass substations in regional NSW. Concerns were raised by Transgrid engineers regarding the structural adequacy of the footings at lattice towers T125 and T126 adjacent to Burrinjuck

Dam. The towers were located in a remote and challenging geographic location. The project involved the design and installation of an intricate layout of micropiles, including a bespoke connection to each tower leg. Highly specialized drilling equipment was craned and helicoptered to site locations. The Design and Construct works were carried out on time and on budget, with no LTI's.

FUTURE PROOFING FIBRE-OPTIC NETWORKS

Modular Photonics



Modular Photonics, a spin out from Macquarie University, manufactures glass-microchip devices that increase data transmission rates and reach in legacy public and enterprise optical fibre networks, and next generation intercontinental and inter-city fibre links. The

plug-and-play products avoid an impending data capacity crunch by enabling a 1000 x increase in data transfer speed, at 1/10 the cost and in 1/10 the time to recable an underground network. Successful demonstrations include a 20x data rate increase in a major data centre, a 100x data boost in a sports complex and 100x data boost in a local school. The products also support world record data transmission rates over next-gen fibres.



GREEN SQUARE LIBRARY & PLAZA

City of Sydney

John Holland

Arup

Stewart Hollenstein in association with Stewart Architecture



Green Square Library & Plaza is the new centre piece of Green Square, 4km south of Sydney's CBD. This Project is the culmination of Architectural boldness, engineering innovation and intense multi-disciplinary coordination by the City of Sydney to achieve a 5 Star Green

Star public facility.

An underground library below a public plaza, perforated by 40 walkable skylights. A 6 storey tower of active community and teaching spaces and a grand entry of slender steel and glass to welcome everyone to the City's new and egalitarian Living room.

MACQUARIE UNIVERSITY INCUBATOR

Arup Pty Ltd

Taylor Thomson Whitting



Constructed almost entirely from timber, the Macquarie University Incubator is a beautiful co-working space built to foster innovation. Based on functional sustainability, the design is capable of offsetting 60% of its energy use with features such as an overhanging roof

for shade, operable windows and solar panels powering the building and keeping it cool. A stormwater system coordinated around the building's hydraulic design promotes a natural irrigation process utilising the natural landscape. The design was integrated into the surrounding landscape, minimising the requirement for earthworks and removal of high-value trees, and clever preconstruction saw the building erected in just 37 days.

PARKES INTEGRATED WATER INFRASTRUCTURE RENEWAL PROGRAM

Parkes Shire Council

John Holland

Hunter H2O

Maddocks



Parkes Shire Council has water-proofed its future with a raft of projects to improve water security and service delivery. The flood of capital works tackles the town's entire urban water cycle, enhancing the town's diverse raw water intakes, as well as providing a new water treatment plant,

improving reservoirs, water mains augmentation, and expanding wastewater treatment to include a recycled water scheme. It is the largest capital works program that Parkes Shire Council has ever undertaken. Parkes water security is not only vulnerable without managed intervention, the local economy is supported by mining, an industry that has heavy water demands. As such, a robust and sustainable water supply is essential for the water-constrained town to thrive. The new infrastructure provides significant amenity upgrades across the town's entire water network, not only doubles the capacity of the old treatment plants, a new Recycled Water Scheme creates a new, local water source.

PARKES PROJECT MANAGEMENT OFFICE (PMO)

Parkes Shire Council



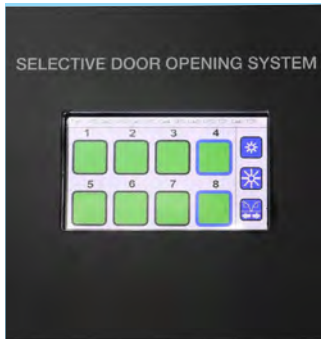
When Parkes Shire Council embarked on necessary upgrades to their entire water management system, Council wanted to ensure that the projects not only delivered water resource improvements to the town, but also maximised the economic benefits to residents and ratepayers.

The ambitious folio of works included raw water upgrades, including dam safety upgrades and river and bore pump refurbishments, the construction of three new facilities, including water treatment, sewage treatment and a water recycling facility, and several ancillary augmentation projects to the water mains network. With a combined value of \$100m, Parkes Shire Council wanted to ensure the local community enjoyed flow-on benefits. Rather than engaging external management to oversee the asset construction, as is usual for regional infrastructure projects, Parkes Shire Council instead established an in-house specialist Project Management Office to deliver the renewal program in an efficient and effective manner, completing the works on time and under budget.



RAILWAY SELECTIVE DOOR OPENING SYSTEM

OEM Technology Solutions



The Railway Selective Door Opening (SDO) system was designed and developed by OEM Technology Solutions to provide an older train with a vital safety update - ensuring train doors outside of a geo-fenced “safe-zone” cannot open when the train platform is shorter than the train

itself. The problem was a persistent safety hazard for three decades until OEM Technology Solutions devised an excellent solution. The innovative SDO system is a combination of all four elements of this award category - a control and information processing system based on the implementation of an auto-configurable WiFi telecommunications network installed along the length of the train. The result is a simple to use system that ensures passenger safety at all times. As a result of the SDO project development, OEM Technology Solutions have created a powerful new product, the Wireless Train Communications Backbone (WTCB) which it is now offering to it's global railway customer base.

SYDNEY AIRPORT T2/T3 GROUND ACCESS SOLUTIONS: PROJECT 6 – QANTAS DRIVE

BMD Constructions



As part of an early contractor involvement arrangement, BMD Constructions was contracted to design and construct the roads and infrastructure surrounding Sydney Airport's T2 and T3 domestic terminals, to improve road and intersection performance in terms of traffic flow and

accessibility. BMD Constructions successfully completed the augmentation of Qantas Drive to provide three lanes eastbound and three westbound, along with associated turning lanes. As part of the Sydney Airport Master Development Plan, BMD also reconfigured the O'Riordan Street and Robey Street intersections. The upgrade involved a major traffic reconfiguration, transforming O'Riordan Street to one-way southbound, and Robey Street one-way eastbound.

WINDSOR ROAD SINGLE SPAN CROSSING (WRSSC)

SMEC



Located in the north west of Sydney is a unique, curved in plan, three-span cable-stayed rail bridge constructed using precast segmental concrete. The bridge is known as the Windsor Road Single Span Crossing (WRSSC) and it forms the tail end of a 4.5 km elevated viaduct that is part of the new

Sydney Metro Northwest (SMNW). Both structures were recently constructed by the Impregilio-Salini Joint Venture (ISJV), with SMEC undertaking the detailed design of the works. Curved cable stayed bridges are rare and curved cable stayed rail bridges even rarer. The conceptualisation, detailed design and construction of this bridge was a huge technical challenge that went beyond conventional cable stayed practice and technology.

The cable stayed bridge is an integral part of the SMNW, improving access to jobs and services for existing communities and growth areas in the north west of Sydney. The project will deliver a reliable public transport service to a region which has the highest car ownership levels per household in NSW.

WYNYARD WALK

Taylor Thomson Whitting

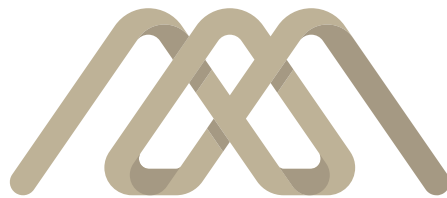
PSM - Pells Sullivan Meynink

CPB Contractors



In the heart of Sydney's CBD sits Wynyard Walk – a fully accessible pedestrian link designed around the concept of flow. This highly complex design and construction project is a major piece of infrastructure connecting one of the city's busiest transport interchanges to the new Barangaroo

waterfront precinct and Sydney CBD western corridor. Catering to an estimated 33,000 pedestrians daily, the tunnel passes beneath a unique mix of high-rise office towers and heritage buildings, presenting significant design constraints and requiring the development of innovative solutions. With a focus on linearity of movement, the design shifts the emphasis from efficiency of travel to the quality of the commuter experience. Optimised to facilitate large volumes of pedestrian movement through its curved profiles, rounded corners and sinuous forms, Wynyard Walk has created a unified identity and civic presence, delivering a socially sustainable piece of infrastructure to Sydney's CBD.



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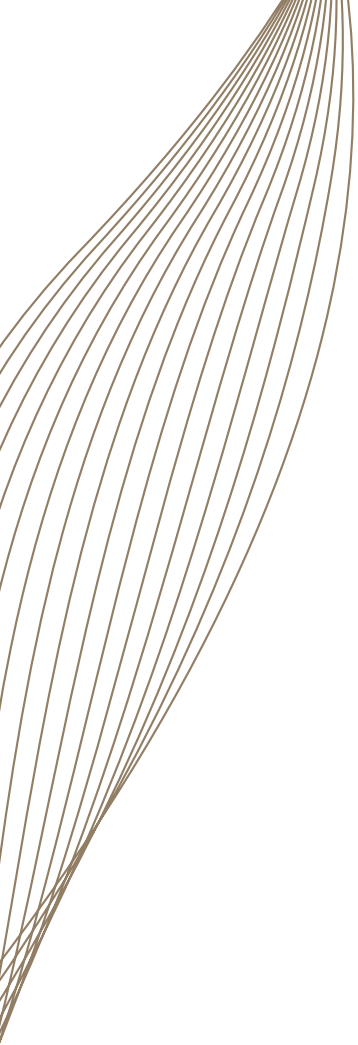
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