



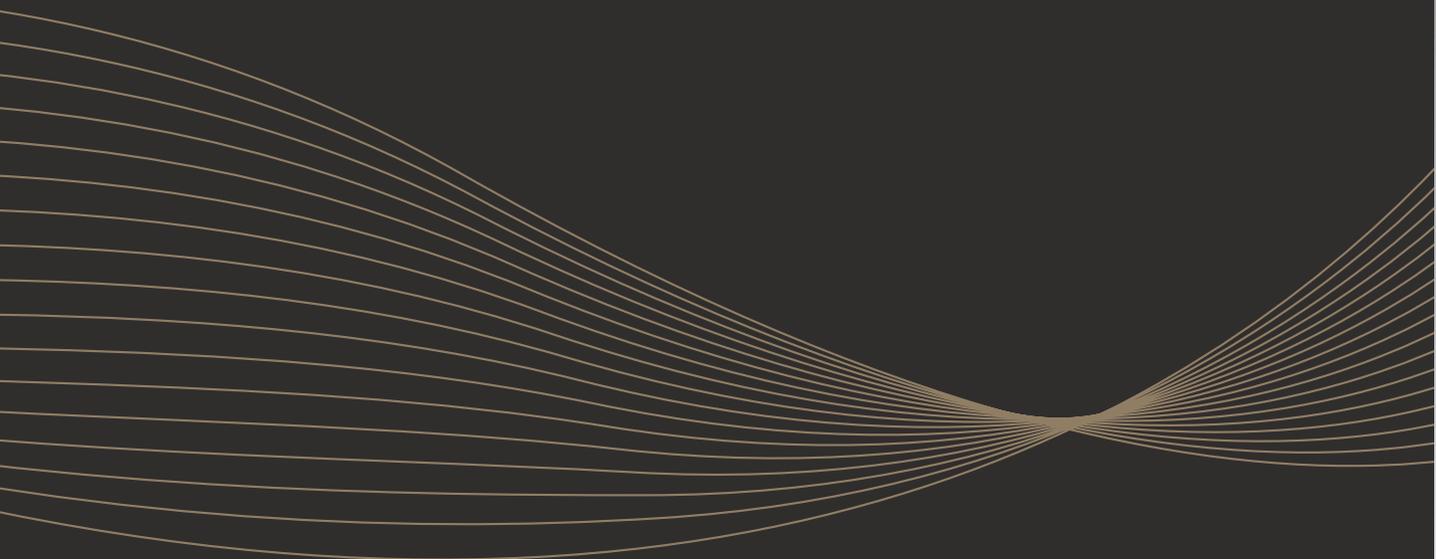
ENGINEERS
AUSTRALIA



AUSTRALIAN
ENGINEERING
EXCELLENCE
AWARDS

ICONIC INNOVATION

Celebrating Extraordinary Engineering



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 Finalists.



ENGINEERS
AUSTRALIA

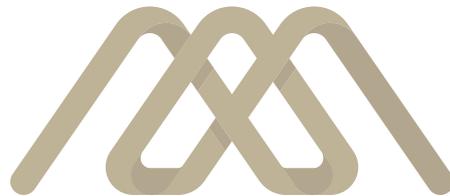
Engineers Australia

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Barton ACT 2600
Australia

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

ENGINEERS AUSTRALIA NATIONAL PRESIDENT'S MESSAGE



We are what we repeatedly do. Excellence, therefore, is not an act, but a habit. – Aristotle

The journey towards excellence means being outstanding, not just mediocre. Through the Australian Engineering Excellence Awards our nation celebrates the best of engineering talent and engineering endeavour.

Reading these pages makes me proud to be an engineer, featuring, as they do, so many impactful innovations, and so many inspiring people and projects.

Engineers Australia takes every opportunity to celebrate and promote engineers and engineering – through awards like these, in the media, in government and in our boardrooms, schools and universities.

The finalists in the Australian Engineering Excellence Awards 2018 necessarily represent just a miniscule fraction of the engineering endeavours and achievements in this country.

As engineers, we should all aspire to excellence, continuing to learn and grow throughout our careers, and helping others on their journeys.

I hope that you will be inspired by these examples of excellence – by the projects themselves, and the engineering teams and individuals behind them.

As engineers, we can be very much focused on the projects we're working on right now, but these awards provide a valuable opportunity to reflect on work already successfully completed.

With such quality entrants, determining the finalists and eventual winners must have been a very difficult task, and I'd like to thank the judges for volunteering their time and effort.

All entrants in these pages have won the excellence awards of their respective states and territories, and I congratulate you all on your achievement and on your contributions to our profession.



Hon. Trish White

FIEAust CPEng EngExec NER
APEC Engineer IntPE(Aus) FAICD
National 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 throughout our nation have made outstanding contributions to our community. Our awards celebrate the accomplishment of some of the greatest engineering companies and individuals in our nation. 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 profession to society.

I am very proud of the success of previous Australian Engineering Excellence Award winners. In 2016, Aurecon, Cox Architecture together with Brisbane City Council won the Sir William Hudson Award for the Brisbane Flood Recovery Ferry Terminals.

This year we have received forty-eight submissions in the finalist stage covering all 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 assessed both metropolitan and regional projects throughout Australia demonstrating the nation-wide contribution of our profession to society.

Our judging criteria comprehensively considered the areas of contribution to the economy, impact on quality of life of the community, significance as a benchmark of Australian engineering, extent to which it represents world best practice together with other issues such as environmental impact, sustainability and worker health and safety.

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

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

I congratulate all entrants tonight who have achieved Finalist status in the Australian Engineering Excellence Awards. To those who have won Excellence Awards tonight I congratulate you and urge you to utilise your Award to widely showcase your contribution to the advancement of science and practice of engineering for the benefit of our community.

Bruce Howard FIEAust CPEng APEC Engineer IntPE(Aus) NER
Chief Judge, AEEA 2018



JUDGES

2018

Thank you to our panel of judges who generously volunteered their time and effort to review all finalists and select our winners.



Bruce Howard

FIEAust CPEng NER APEC Engineer
IntPE(Aus)



Menno Henneveld AM

Hon FIEA FATSE FAICD



Cliff Button

FIEAust CPEng(Ret)



Paul Reynolds

BEng Mechanical (Hons. 1) MIEAust
Business Manager -
Ampcontrol CSM Pty Ltd



Damien Kennedy

FIEAust CPEng EngExec NER
APEC Engineer IntPE(Aus)



Shireane McKinnie

PSM, HonFIEAust, EngExec
Principal, Shireane McKinnie



Jaswant Deo

CEngA AFIEAust EngExec NER CPPM
MAIPM MAIRAH MIAMA
Accredited Mediator NMAS Qualified
Arbitrator and Registered Adjudicator



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.



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& Management



giammarcoengineers.com.au

CANBERRA PROJECT ENTRIES

CANBERRA VIRTUAL POWER PLANT

Reposit Power Pty Ltd



Reposit Power's smart technology makes the electricity system cheaper, cleaner and more reliable. It helps manage price volatility in the wholesale electricity market and protects network assets via Virtual Power Plants.

This technology empowers energy utilities to use consumer- owned

batteries, and puts energy users back in charge. The first and largest of its kind in the world, the Canberra Virtual Power Plant uses this technology to put consumers in the driver's seat for delivering grid support services.

This project consists of more than 400 consumers in the Australian Capital Territory. It brings together the collaboration of innovative companies - world-leading energy management software provider Reposit Power, grid operator EVO Energy, electricity retailer ActewAGL and SolarHub, the solar and battery installer, to deliver a fully operational Virtual Power Plant.

This VPP has successfully delivered in excess of 2MW of grid support over the summer 2017/18.

CONTAINER ROLL-OUT SOLAR SYSTEM (CROSS)

ECLIPS Engineering



The CROSS is a factory assembled, relocatable solar power array providing up to 2,175W of power per 20ft unit (CROSS20) and 4,350W of power per 40ft unit (CROSS40). It is delivered fully assembled and can be rolled out of a shipping container and setup in minutes. The PV array is

spring assisted to allow two people to deploy the array without lifting equipment or special tools. The CROSS are inter-connectable with corner casting twistlocks and can be stacked up to seven high in an ISO shipping container during transportation or storage. It is a modular solution suitable for projects up to utility scale, and comes pre-wired to a DC isolator ready for connection to an inverter. The CROSS can be setup at 0°, 10°, 20° and 30° angles. CROSS is structurally certified for installation in AS/NZS 1170.2:2011 Wind Regions A to D, and qualifies for Clean Energy Regulator generation certificates.

BYRON BAY RAILROAD COMPANY WORLD'S FIRST SOLAR TRAIN

Byron Bay Railroad Company

Lithgow Railway Workshop

Nickel Energy

Elmofo



Byron Bay Railroad Company has restored and converted a sixty-nine year old diesel train to become the world's first solar powered train.

The innovation, achieved with no government funding or support, shines a 4.6 billion year old light on modern travel. The design brief was to modify

heritage carriages to operate by electric traction supplied from solar PV panels and batteries rather than diesel engines, without substantially altering the heritage value of the carriages.

The design challenge was doing something that had never been done before. Carts and trolleys have run on solar power, but never a full size train. Further, working with a heritage train as opposed to custom designing a solar train brought significant design hurdles. The train is net carbon positive, with one third of the energy generated used to run the train and the remainder exported to the grid.

NeW SPACE

Aurecon



NeW Space is a \$95 million landmark education precinct in Newcastle's CBD. The visually striking geometric form of NeW Space realises the intent to create a bold physical heart for the city of Newcastle, a world-leading learning facility and a gathering space to connect the University of

Newcastle with the city.

Aurecon's state-of-the-art structural engineering solutions met the geometrical demands of the unique vertical campus for the University of Newcastle. Elegant raking columns support external viewing rooms that appear to hang from the sides of the building. Lightweight construction, clever fixing designs and energy efficient structural materials have contributed to the 5 Green Star rating achievement and enable the architectural intent for the building to be achieved.

NeW Space provides a bridge between today and tomorrow by maintaining the significant heritage aspect of the precinct while improving the amenities and built environment.

NEWCASTLE PROJECT ENTRIES

PACIFIC HIGHWAY WYONG ROAD INTERSECTION UPGRADE

Aurecon

Roads and Maritime Services NSW

Seymour Whyte



The new Pacific Highway and Wyong Road Intersection opened in November 2017, one year ahead of schedule. Roads and Maritime Services, Seymour Whyte and Aurecon have delivered an intersection that reduces congestion and improves safety for the 55,000 vehicles using it daily.

To alleviate the intersection's history of crashes and traffic congestion, the \$84 million project, funded by the NSW Government, was undertaken to replace the existing roundabout with traffic lights. Significant works included the duplication of an existing bridge over the Main North Rail Line, with digital engineering tools used to expedite construction and reduce safety risks..

THE WORLD'S FIRST EXPERIMENTAL FACILITY FOR LARGE-SCALE TESTING OF VAM ABATEMENT SYSTEMS AND COMPONENTS

The University of Newcastle



This 24 month project was part of a \$25M research program on the safety aspects of mitigating ventilation air methane (VAM) emissions from gassy underground coalmines. The project was specifically concerned with the prevention and mitigation of hybrid methane/coal dust explosions and involved

with the design, construction, commissioning and operation of the world's first 100m long detonation tube facility. This \$10M National facility is dedicated to large-scale testing of VAM abatement systems and components, including VAM capture ducts, explosion prevention/mitigation measures, and thermal oxidisers. The project involved four partners, three principal contractors and 48 sub-contractors.

COX PENINSULA REMEDIATION

Ventia Utility Services Pty Ltd



A 120-year legacy of Commonwealth maritime, Defence and communications activities had left contaminated sites across 4,700 hectares of the Cox Peninsula, located west of Darwin Harbour. The Cox Peninsula Remediation Project was required to clean up the site and

help resolve the Kenbi Land Claim, the longest-running in Australia's history. Ventia was contracted by the Department of Finance for the project.

Three different remediation methods were used: pesticide-contaminated soils were treated by direct thermal desorption, lead-contaminated soils were chemically immobilised, and asbestos and general wastes were contained in a 27,000m³ purpose-built cell.

Ventia worked closely with the Kenbi Rangers and attained a 35% Indigenous workforce against a Commonwealth target of 15%. Skilled project management overcame the challenges presented by seasonal impacts and the site's remoteness. The project was completed in March 2017, eight months ahead of schedule. The land has since been returned to the Traditional Owners, the Larrakia People.

GATEWAY SHOPPING AND HOMEMAKER CENTER (STAGE 1 & 2)

Hutchinson Builders



Gateway Shopping Center (Stage 1) was Design and Construct and ran for approximately two (2) years. There were nine (9) consultant teams engaged throughout the design phase. The construction phase had 32 subcontract companies engaged and approximately 2,200 people were inducted onto the site. ICN tracked

local content involvement for the project at 94% which given the sheer size and complexity of the project this was a massive achievement.

Securing stage one of the new master planned shopping centre project in Palmerston epitomises much that Hutchinson Builders has come to represent in the industry: tenacity, collaboration, and solutions orientation. Stage 2 being the Gateway Homemaker Centre comprised of 7000m² of Bulky Good Stores, with 450 carparks for the 14 tenancies. Associated High Voltage, Stormwater, Water Main and Sewerage upgrades were required and the relationships with local authorities ensured these services were upgraded without conflicts.

The project was completed 1 month ahead of schedule and on budget. To achieve this required constant monitoring and manipulation of our accelerated construction program. The challenges of the Darwin wet season and supplier delivery timeframes needed to be closely managed.

NORTHERN PROJECT ENTRIES

OWEN SPRINGS POWER STATION EXPANSION PROJECT

Clarke Energy (Australia) Pty Ltd

Territory Generation



The Owen Springs Power Station (OSPS) expansion project is the construction of a nominal 44 MW gas fired power station including all required mechanical, electrical, controls and civil/ structural and balance of plant.

The fuel source for the Project is natural gas sourced from a number of different fields and supplied via pipeline to the Site. The Power Station is designed to operate automatically, continuously, safely under all Site climatic conditions whilst connected to and supplying power to the Alice Springs Network.

SOLAR ENERGY TRANSFORMATION PROGRAM (SETuP)

Power and Water Corporation



Power and Water Corporation is transforming the way power is delivered to remote Aboriginal communities by incorporating solar power to reduce reliance on diesel. With the support of the Northern Territory (NT) Government and the Australian Renewable

Energy Agency (ARENA), Power and Water is delivering a wide-scale rollout of 10 MW of solar systems across 26 remote communities. The \$59 million Solar Energy Transformation Program (SETuP) is a four year program launched in 2014, and is changing Power and Water's remote community energy supply portfolio, making solar energy an established part of future power station design.

BRISBANE AIRPORT RUNWAY 01/19 STAGE 2 OVERLAY

GHD Pty Ltd



How do you resurface 3.5 kilometres of one of the world's busiest single runways without shutting down the entire airport?

Catering for up to 650 aircraft movements a day and operating twenty-four hours a day, seven days a week, Brisbane Airport is home to one of the world's busiest single

runways. As with all runways that handle passenger jet traffic, Brisbane Airport's runway requires resurfacing every 10 to 15 years.

Following a feasibility study by GHD to evaluate how such a complex undertaking might be achieved, functional design parameters was defined that would make such an undertaking possible. Despite a highly compressed timeframe for delivery of design and construction, GHD developed a design that was successfully implemented and constructed with minimal disruption to Brisbane Airport's regular operations.

BRISBANE RIVER CATCHMENT FLOOD STUDY

BMT

Aurecon



BMT and Aurecon undertook the Brisbane River Catchment Flood Study (BRCFS), which extended best-practice and developed new techniques to understand and represent flood behaviour in the Brisbane River catchment. The catchment is unique in Australia for the

complexity of hydraulic behaviour (including dams, multiple tributaries and tidal influence), and for the high flood risk to multiple major urban centres. Methodologies developed and applied in the study were highly innovative and more complex than current standard practice, including use of a Monte Carlo approach to design flood selection.

The study was independently assessed as "the most comprehensive flood study undertaken in Australia". The BRCFS is supporting communities to live and work safely in the floodplain, now and into the future. The work of BMT and Aurecon has positive impacts beyond the Brisbane River floodplain, with their world-class methodologies able to be applied in other regions of Australia, and throughout the world.

QUEENSLAND PROJECT ENTRIES

LEICA GS18 T - WORLD'S FASTEST GNSS RTK ROVER

Leica Geosystems



The heart of the Leica GS18 T innovation, the world's fastest GNSS RTK Rover borrows a key idea from the aerospace industry to integrate a sensor fusion of GNSS and IMU sensors to deliver the fastest and easiest to use GNSS smart antenna to surveying and construction professionals.

Developed by the Australian R&D Leica Geosystems team, the GS18 T innovation is the first true tilt compensation solution that is immune to magnetic disturbances and calibration free, allowing surveyors to save up to 1 hour of every working day and 20 per cent over conventional surveying practices to dramatically improve safety, productivity and accuracy of GNSS-based surveying operations.

PROJECT CURRAWONG

Boeing Defence Australia (BDA)



The Currawong project is delivering a next generation deployed integrated battlespace communications network solution to the Australian Defence Force (ADF). Currawong enables secure wideband voice, data and video services over wireless and wired infrastructure between

deployed forces and headquarters around the globe. Boeing Defence Australia (BDA) was awarded the prime contract in September 2015. Since then, the BDA team, together with its ADF partners has developed and delivered the mission and support system products in 27 months, ahead of schedule and budget.

SUNSHINE COAST UNIVERSITY HOSPITAL

Aurecon



Sunshine Coast University Hospital (SCUH) is a \$1.8b hospital project delivered by the Queensland Government as part of a Public Private Partnership contract with Exemplar Health, a consortium comprising of Lendlease, Siemens and Capella Capital, with partners Spotless Facilities Services

and Aurecon. Completed in November 2016 and opened to the public in April 2017, the SCUH complex features a state-of-the-art health facility and teaching hospital comprised of 450 beds, growing to a 738-bed facility in 2021, with a design built for expansion beyond that capacity.

The 164,000m² main hospital building forms the centre of the new hospital, and is split over six functional levels, plus roof top plant rooms and helipad. Aurecon was engaged to provide civil, structural and mechanical/electrical/plumbing engineering, security, telecommunications and environmentally sustainable design services. Aurecon has been involved from early master planning through to detail design and documentation, and a fulltime site based role during construction.

SUN AND SALT: LOGAN'S WATER QUALITY SOLUTION

Logan Water Infrastructure Alliance

Logan City Council

Downer

Cardno

WSP



Logan Water Infrastructure Alliance has harnessed the power of sun and salt in an Australian first solution for managing drinking water quality in a remote location. The \$3 million project at Round Mountain Reservoir in the City of Logan's south west combines solar power, commercial battery

storage and electro-chlorination technologies to maintain water quality for residents, 24 hours a day. This innovation achieved a \$1.9 million capital cost saving and almost \$50,000 in annual operational cost savings for Logan City Council. The solution is safe, reliable and sustainable, and easily transferrable to other Councils and utilities operating in remote locations.

SOUTH AUSTRALIA PROJECT ENTRIES

ADELAIDE CONVENTION CENTRE EAST BUILDING

Aurecon Australia



The new Adelaide Convention Centre East Building replaces the original Plenary Building with a larger, highly functional and adaptable state-of-the-art facility. While the superstructure of the original plenary was demolished, the substructure incorporating a carpark and part of the

Adelaide Railway Station was retained and significantly upgraded, completely avoiding the need for any new piling or rail disruption, to provide structural support to the new building which is almost twice as big as the original. The new superstructure supports the flexibility demanded by the project brief, including hinged seating bays and rotating seating drums in the main plenary hall.

ADELAIDE HEALTH AND MEDICAL SCIENCES BUILDING

Arup

Aecom

Aurecon Australia



Opened in 2017 with support from the Federal Government, the 12-level Adelaide Health and Medical Sciences (AHMS) building is situated in the new Adelaide BioMed City on North Terrace, alongside the Royal Adelaide Hospital, UniSA Cancer Research Institute and SAHMRI.

It is a technically complex building (both architecturally and due to the services within it), with 13,000m² of state-of-the-art laboratory, teaching, research and clinical space for the University's flagship medical and nursing degrees. The facility brings together more than 1,600 students and over 600 health researchers in a vibrant and innovative environment, featuring cutting-edge technology, a range of lecture theatres, technical training and simulation suites. It also houses offices, the Adelaide Dental Hospital in the upper floors, and an animal house in basement levels – a special facility designed for low-vibration, built within the existing structure.

SOUTH AUSTRALIA PROJECT ENTRIES

COOPERS BREWERY MALTINGS PROJECT

Mott MacDonald

Coopers Brewery

Ahrens Construction and Engineering



Custom-designed and built by Coopers Brewery, Mott MacDonald and Ahrens, the Coopers Malting plant is considered one of the most technically-advanced malting facilities globally.

Completed in 2017, and with world-leading architectural and functional engineering

design, the facility enables Coopers to produce premium malted barley. This will enhance its position as a world leader in home brew concentrate, traditional ales and malt extracts to leading domestic food manufacturers. Coopers Maltings will export premium-quality malt to Asian markets, lead agricultural innovation, increase local economic contributions, and accelerate the company's growth.

At full capacity, the Coopers Malting plant produces circa 54,000t of malt per annum.

HOPE VALLEY WATER STORAGE ROOF UPGRADE

GHD Pty Ltd

SA Water

York Civil



Originally built in 1955, the 136 megalitre (ML) Hope Valley Terminal Storage Tank supplies water to 100,000 properties in Adelaide's north-east. Spanning a space larger than a FIFA soccer pitch, standing more than three storeys tall, and holding enough water to fill 55 Olympic

swimming pools, it is one of SA Water's largest storage facilities.

Following a localised collapse of some roof members, SA Water, GHD, and York Civil worked collaboratively to replace the entire roof structure without a single person entering the storage tank.

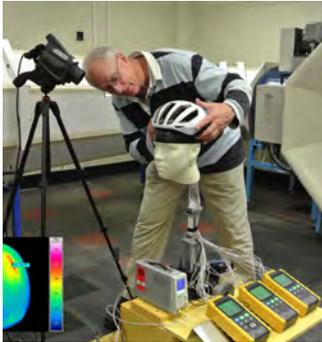
Faced with a fixed timeframe for demolition and construction, and the need to maintain security of water supply to local residents, the project team also had to overcome the unique challenges presented by this vast, unstable and high-risk environment.

Completed in December 2017, the team's unwavering focus on safety and innovation led to the delivery of a project that sets Australian and international benchmarks in engineering.

SOUTH AUSTRALIA PROJECT ENTRIES

INNOVATIVE R&D IN CYCLING PERFORMANCE

The University of Adelaide



This application relates to innovative R&D in cycling aerodynamics and performance, including the development of two of the world's most aerodynamic cycling helmets and the testing facilities required to develop these designs. These R&D solutions highlight that Australia is leading the world in this research field.

TORRENS ROAD TO RIVER TORRENS PROJECT

T2T Alliance

Australian Government
CPB Contractors

York Civil

Aurecon Australia

SA Department of
Planning Transport &
Infrastructure



The Torrens Road to River Torrens Project will deliver a 4km non-stop roadway (incorporating 3 km lowered motorway) through Adelaide's inner western suburbs.

The project includes:

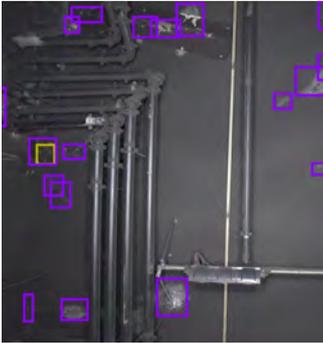
- Parallel surface (at-grade) roads along the length of the lowered motorway

- An overpass separating the Outer Harbor rail line from vehicle traffic
- Improved cycling and pedestrian facilities
- Landscaping and noise barriers, where required.

This design has taken into consideration the future transport needs of Adelaide and allows for connection to other parts of the non-stop, North-South corridor when the adjoining sections of South Road are upgraded. The Torrens Road to River Torrens Project is jointly funded by The Australian and South Australian Governments. Total project costs are \$801 million.

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.

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.

SYDNEY PROJECT ENTRIES

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.

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.

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.

SYDNEY PROJECT ENTRIES

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.

BURNIE LANDFILL & LEACHATE TREATMENT PROJECT

Syrinx Environmental Pty Ltd



The Burnie Waste Management Centre Leachate Treatment Project is a precedent project, and sustainable solution for managing landfill leachate and creating a positive environmental and community legacy within a decommissioned landfill site. Wetlands and an infiltration

forest were constructed for the on-site treatment and evapotranspiration / infiltration of landfill leachate. High flows discharge directly to a tributary of Cooee Creek, a high conservation value asset. This project is among the first in Australia to integrate the ongoing treatment of leachate from a closed landfill site within a high amenity biodiverse landscape, delivering a low-cost treatment system which meets stringent water quality standards.

CATERPILLAR UNDERGROUND MINING R1700 LHD

Caterpillar Underground Mining Pty Ltd



This project was to design, develop, test, validate and bring to market the next generation R1700 Load Haul Dump (LHD) for Underground Hard Rock Mining. This machine will be the engineering and product architecture foundation of a series of new product releases for Caterpillar's Hard Rock

Mining product group based in South Burnie, Tasmania. This complete redesign has resulted in a machine that will enable Caterpillar customers throughout the world to operate more safely and more profitably through a range of significant core-product improvements and new autonomous mining solutions.

CONSORT BRUNY ISLAND BATTERY TRIAL

TasNetworks

The Australian National University

University of Tasmania

Reposit Power

The University of Sydney



The CONSORT Project, named from “CONSUMER energy systems providing cost-effective grid support”, is trialling a distributed energy future on Bruny Island in Tasmania's south east. In this future, customers and their batteries are coordinated to relieve an overloaded cable

that supplies the island. The CONSORT project is a collaboration across the entire value chain including networks, energy services companies, and customers themselves. It also includes the researchers who can provide the innovative leadership required to navigate this transition.

TASMANIA PROJECT ENTRIES

KIMBERLEY RAIL BRIDGE EMERGENCY RECONSTRUCTION

pitt&sherry

VEC Civil Engineering



Kimberley Rail Bridge spans the Mersey River in Tasmania, as a critical part of TasRail's rail network. Built in 1884, the heritage bridge was severely damaged during one of Tasmania's worst floods in June 2016.

This project included the design and construction of the new Kimberley Rail

Bridge northern abutment, the new northernmost span, and the reconstruction of a new 200m long and 5m high rail embankment which, allowed a return to normal freight services, 36 days after the flood event.

The timeframe of 36 days for the design and construction of a new bridge abutment and 15m long bridge span, without any pre-planning or notice, we believe is a great collaborative effort between pitt&sherry and VEC. The normal design and construction timeframe for this extent of works would be 4-6 months.

The open and clear collaboration between the designers, contractor and asset owner was key in ensuring that around-the-clock restoration work was expeditiously delivered, despite the challenging weather conditions that persisted during the works.

ROYAL HOBART HOSPITAL DEMOLITION

Hazell Bros Group Pty Ltd

Aldanmark Pty Ltd



Demolition of the existing Block B at the Royal Hobart Hospital (RHH) involved substantial technical, physical and logistical challenges that had to be overcome for successful delivery.

The demolition was part of the Royal Hobart Hospital Redevelopment Project (RHHRP) and

was required to allow replacement with a new 10 storey building. The demolition work was completed within a live hospital environment. Block B was structurally connected to three other buildings on the site requiring the team to investigate and physically disconnect the structure from the remaining parts whilst minimising disturbance and disruption to the daily operation of the RHH.

BUNJIL PLACE

Taylor Thomson Whitting



Located in the Narre Warren area in Melbourne's east, Bunjil Place is an exciting example of a new form of community and civic building – a multifunctional facility that has become a cultural and civic heart to represent and reflect the values of the community, and instil a new sense

of place, pride and ownership for residents. This complex and outstanding project is the result of high levels of collaboration and expertise involving FJMT Architects, Taylor Thomson Whitting (structural, façade and civil engineers), consultants, suppliers and contractors. Featuring visually-striking elements such as the free-form timber gridshell that defines the main atrium and high glass façade facing an expansive landscaped plaza, Bunjil Place delivers: a library; 800-seat performance theatre; public gathering space; a place of exhibition, gallery and display; a flexible and experimental space for events, lectures, debate and celebration; a help point; service centre; and a place of work and collaboration.

MERNDA RAIL EXTENSION PROJECT

John Holland Group



The \$600 million Mernda Rail Extension Project is a Victorian Government project to improve and transform public transport services for the booming communities in Melbourne's northern suburbs. To be delivered by early 2019, it returns metropolitan rail services using innovative designs

to Mernda for the first time in 60 years.

The project, delivered for the Level Crossing Removal Authority by an alliance comprising John Holland Group, KBR and MTM, includes eight kilometres of new double track, five grade separations and three state-of-the-art train stations. In an Australian-industry first, the project introduced its innovative u-trough bridge design to the Victorian network.

ONE MALOP STREET

Aurecon



Rising 14 levels, One Malop St is an environmental leader in new office accommodation situated in Geelong. With a focus on cutting GHG emissions and occupant wellbeing, the development shows that it is possible to build state-of-the-art commercial spaces to the

highest standards in a regional setting using both local suppliers and workers. Malop St is an exemplar workplace that sets a new benchmark for sustainability, health and well-being. 6 Star Green Star (Base Building and Interiors) and NABERS 5.5 Star Energy (Base Building) are targeted. In addition, the development is the first in Australia to achieve dual WELL Gold precertification for Base Building and Interiors.

The base building is set to be certified WELL Platinum. GHG emissions at Malop St will be cut by up to 70% compared with conventional standards and the building design can reduce stress, improve productivity and most importantly, increase occupant health and happiness.

RMIT NEW ACADEMIC STREET

Arup



RMIT New Academic Street is world leading example of adaptive re-use.

A once disjointed, dark, confined and scattered campus, RMIT's flagship City Campus has been transformed into an interconnected, open, light and lively collection of buildings, which

has re-established a long-lost connection between the University and Melbourne's CBD. A complex project with five architects and a timeline of over five years, Arup's structural, civil and façade engineers helped RMIT and the architectural team realise the project's diverse architectural intent.

Creative and considered engineering enabled the repurposing of existing structure. Existing structure was adapted, extended and interconnected, transforming the existing disconnected 1960s and 70s architecture to create a vibrant and dynamic student hub.



UNINTERRUPTIBLE POWER SUPPLY FOR LEGACY RAILWAY SIGNALLING

Metro Trains Melbourne



Metro Trains Melbourne has engineered a highly innovative solution for raising the performance of the city's railway signalling system. A customised Uninterruptible Power Supply (UPS) provides critical signal power backup during network faults, giving the electrical control centre

an important window in which to route alternative feeds without disrupting signal power.

This kind of technology is traditionally used within the computing, high speed data and telecommunications industries. However, the UPS deployed by Metro Trains Melbourne is a world first for the railway industry, successfully integrating industrial scale continuous power supply technology with a legacy phase-reliant railway signalling network.

VICTORIA INTERNATIONAL CONTAINER TERMINAL

BMD Constructions



Melbourne's newest international container terminal, VICT, was conceptualised as part of the Port Capacity Project, a Victorian state government initiative conceived to redevelop Webb Dock East. The aim was to create more competition within the port by introducing a third

stevedoring operation at Webb Dock East, as well as to maintain Melbourne's position as the busiest container port in Australia, handling over one third of the nation's container trade.

BMD was engaged by Victoria International Container Terminal Limited (VICT) to carry out the infrastructure 'base build' construction works at the container terminal under an ECI agreement. The project has reconfigured and redeveloped Webb Dock East, returning it to its original role as an international container handling facility. The facility is one of the most technologically advanced, environmentally sustainable and safest container terminals in the world, capable of handling the equivalent of at least one million shipping containers per annum.

WEBB DOCK EAST INTERNATIONAL CONTAINER TERMINAL

AECOM Australia Pty Ltd

Victoria International Container Terminal Limited

Advanced Consulting Services Pty Ltd



In May 2014, Victoria International Container Terminal (VICT) was announced by the Victorian State Government as the successful bidder for the contract to design, build, finance and operate the new international container terminal at the Port of Melbourne,

Australia's largest and busiest port.

Just over two years later, and having worked in close collaboration with AECOM (designer) and BMD (contractor), both industry leaders in their respective fields, VICT is proud to have delivered the world's most-advanced container terminal in Australia.

In designing and building VICT at Webb Dock East, leading technologies from around the world were selected, many of which were new to Australia. But VICT's real innovation lies in integration – putting those technologies together in new ways to create one seamless operation. Everything about VICT, from its technology to its location and layout, has been designed to deliver unprecedented efficiency, safety, sustainability and security.

THE FORMFLOW PROCESS - A NEW ANGLE FOR CORRUGATED IRON ARCHITECTURE

FormFlow Pty Ltd

Austeng



FormFlow's revolutionary bending process is arguably the most significant advancement in the application of corrugated iron since the 1960's when processes for applying plastic coatings were developed.

The FormFlow process can produce sharp bends perpendicular to the

corrugations i.e. across the sheet. This provides an attractive and functional alternative to the current method for finishing joints in a corrugated sheet structure which typically involves a capping or flashing piece. Corrugated sheets can be bent to a range of angles providing a transition element for many roof or wall cladding applications. In contrast to current practice the resulting transition has no gaps and requires no additional sheet metal or sealing components. Capping and flashing are eliminated.

FormFlow bends have a distinctive visual appeal that transforms the utilitarian aesthetic of corrugated iron into a stylish architectural statement. Functionally the products provide the potential for a completely sealed outer structure which improves insulation and eliminates gaps where moisture, dirt or animals can get in.

FormFlow bends will also reduce the risk of ember attack during bushfires by eliminating gaps in the outer cladding. This will improve the BAL rating for an existing design and enable new design possibilities that previously weren't possible.



BALCONI SMART TORCH - GLOBAL LIVE

Balconi Telecommunications



The Balconi Smart Torch (BST)- Global Live, is a portable in-field telehealth office with global coverage. It provides connectivity by internet, smartphone and two-way video conferencing. It is fully contained in a small case that can be checked in as carryon luggage and powered by its own

included solar panels.

This newly developed technology provides remote and disadvantaged communities access to medical specialists globally, now for the first time the healthcare comes to the remote community.

Primarily developed for:

- Emergency Trauma First Responders
- Remote Face to Face Consultation General or Mental Health
- Remote Nursing Station Connecting to Hospital

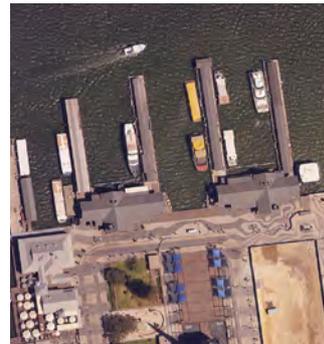
It connects over Satellite, 3G, 4G and Wi-Fi.

The BST technical breakthrough is its ability to send and receive good quality video and audio over very small bandwidths with global coverage in a portable low-cost package.

These new abilities deliver unique operational and business advantages.

DEVELOPMENT, US CERTIFICATION, MANUFACTURE AND EXPORT OF THE SPOOKFISH 'BIGEYE' AERIAL CAMERA SYSTEM

InnovAero Pty Ltd



InnovAero and Spookfish have developed the Spookfish *BigEye* Camera System which is now in commercial service with one of the largest aerial imagery companies in the world based in Rochester, New York, USA. Deliveries to just the end of 2017 have a combined capture capacity

exceeding 25,000sqkm per day at extreme resolution and world-beating accuracy. The *BigEye* system is manufactured in Perth using a world-class CASA-approved Quality Management System.

Systems are exported to the US, fitted to aircraft and commence revenue service with a combined CASA and FAA approval. This dual Australian and US approval was performed in accordance with the Bilateral Aviation Safety Agreement between the two countries. This product makes a significant contribution to Australian export earnings with significant opportunity for not only further sales of this and advanced derivative products throughout Asia, Africa and Europe, but also long-term royalty revenues flowing to Australia.

NEWMAN BATTERY STORAGE PROJECT

Alinta Energy



The project encompasses development, design, construction, commissioning and testing of a 30MW / 11.4MWh Battery Energy Storage System at Alinta's Newman Power Station in the Pilbara region of Western Australia.

One of the world's largest battery energy storage system projects, its innovation is that it is the first, as far as can be determined, utility-scale battery energy storage systems to provide grid-forming services on a high voltage network.

This capability makes it not only the largest, but the first battery energy storage system globally with the capability to support a high voltage network on its own – using no other sources of generation to support the network. Representing a significant milestone in electrical engineering, until this project, conventional thinking was that electrical networks must have thermal generators online and operating to provide the required inertia to support the network. This is no longer the case thanks to battery and inverter technologies.

NORTHLINK WA SOUTHERN SECTION: GUILDFORD ROAD TO REID HIGHWAY

John Holland
Main Roads WA
Aurecon



NorthLink WA Southern Section provides a freeway-standard, free-flowing link from Guildford Road to Reid Highway via the Tonkin Highway including:

- An upgraded Tonkin Highway with six-lanes between Guildford Road and Reid Highway.
- A new interchange at Collier Road.
- A new interchange at Morley Drive. This includes a roundabout at ground level that connects with a raised Tonkin Highway - the first interchange of this type in WA.
- A flyover at Benara Road over Tonkin Highway.
- A four-metre wide principal shared path alongside Tonkin Highway.
- Once all sections are completed, NorthLink WA will provide a vital, state of the art transport link between Morley and Muchea and will:
 - Provide a non-stop transport route between Morley and Muchea.
 - Increase road capacity to improve journey times and productivity.
 - Improve amenity in local communities by reducing congestion on local roads.

Save lives by eliminating four of the State's top 15 most dangerous intersections.



OLD MANDURAH TRAFFIC BRIDGE REPLACEMENT PROJECT

BG&E Pty Limited

Georgiou Group

City of Mandurah

Main Roads Western Australia



The Old Mandurah Traffic Bridge was deteriorating rapidly and needed replacing. The crossing bridges the narrowest section of the Mandurah Estuary, a major recreational resource that connects the Indian Ocean to the Peel Inlet, in a prominent location, creating an iconic

landmark for the City of Mandurah, Western Australia.

The primary project objective, articulated in consultation with the community, was to provide a high quality new bridge that celebrates the historic and cultural significance of the site, via a contemporary structure that delivers efficient traffic connections and creates an active, welcoming place. A unique curved soffit cross section was developed for 243 m long incrementally launched bridge over Mandurah Estuary, resulting in a cost-effective landmark structure with a strong aesthetic appeal. Additional features include 5 m wide lower level shared path that allows improved pedestrian experience and desired connection with water, fishing platforms, enhanced lighting, public art and landscaping.

PERTH CITY LINK BUS PROJECT

BG&E Pty Limited for the City Busport Alliance



The new state-of-the-art Perth Busport, which has been delivered as part of the Perth City Link Bus Project, was constructed as a second stage of the Perth City Link Project.

The underground Busport with a footprint of approximately 10,000 square metres with three above ground entry

portals facilitates uninterrupted traffic and passenger access from the ground level. In addition, the project includes construction of a 250 metre long Wellington Street bus second entry tunnel, connecting the Busport to Wellington Street and fitout of the first Milligan Street bus tunnel. The new bus station has delivered an Australian first dynamic stand allocation system providing a user experience more akin to an airport departure lounge than a traditional bus station.

BG&E and Brookfield Multiplex are non-owner participant members of the City Busport Alliance (CBA), which also includes asset owner Public Transport Authority WA.



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