ENGINEERS
AUSTRALIA

AUSTRALIAN
ENGINEERING
EXCELLENCE
AWARDS

ICONIC INNOVATION

Celebrating Extraordinary Engineering

AUSTRALIAN ENGINEERING EXCELLENCE AWARDS

SOUTH AUSTRALIA ENTRANTS 2018

AUSTRALIAN
ENGINEERING
EXCELLENCE
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

South Australia

Level 11
108 King William Street
Adelaide SA 5000

SOUTH AUSTRALIA
PRESIDENT'S MESSAGE

I'm excited about this opportunity to recognise and celebrate exemplary engineering that contributes to our community in SA.

This year our state nominations for the 2018 Australian Engineering Excellence Awards reflect levels of excellence around Infrastructure, Building Projects, Resources, Research and Development, Network Programs, and Manufacturing. Exceptional engineering outcomes are on display, and as a profession we can all be proud of the extent of the benefits from the science and practice of engineering.

Throughout tonight's event you will, like me, be extremely impressed with the quality of engineering work being done for the benefit of you, me, the environment and the broader community. There's no doubt that the thought and creation of solutions continues to achieve excellence.

As engineers it's important this level of productivity and effort be recognised. It's equally important that our award nominees and recipients have the opportunity to be applauded by the profession and peers for their undertakings, contributions and achievements.

I congratulate all award nominees and recipients on your contributions to the engineering profession in South Australia.

Lachlan Kinnear MIEAust CPEng NER
South Australia President

CHIEF JUDGE'S MESSAGE

It is my great honour to be the Chief Judge for the 2018 South Australia Engineering Excellence Awards and AEEA Finalists; awards that allow us to recognise and celebrate the amazing accomplishments of the engineering profession across our state.

I am consistently impressed and awed by the phenomenal and vital work that engineers do to help make our world a better place; often without the need or want of any recognition. The AEEA are a way of taking time to acknowledge these often unacknowledged outstanding achievements in the practice of engineering.

This year, South Australia received 16 project entries, judged by a panel of senior industry leaders. I would like to take this opportunity to thank all of the judges for contributing their time and expertise to this process.

All winning entries exemplify outstanding achievements in their respective fields, and can be viewed as sources of inspiration for both current and future generations of engineers.

This Showcase Booklet details each of the uniquely impressive project entries into the 2018 South Australia Engineering Excellence Awards. We thank industry for continuing to support this Awards program and allowing us the opportunity to highlight engineering excellence in our great state.

Michelle Kennedy BE(Hons) MBA MAICD FIEAust CPEng EngExec APEC Engineer IntPE(Aus)

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

Michelle Kennedy
BE(Hons) MBA MAICD FIEAust CPEng EngExec APEC Engineer IntPE(Aus)
Group Manager, Assets and Infrastructure
City of Burnside

Katharine Ward
BE (Civil & Environmental), FIEAust, CPEng, NER
Manager Water Projects, Adelaide & Mt Lofty Ranges
Department for Environment and Water

Michael de Heus
CPEng, FIEAust, NER, Fellow IPWEA
Principal Engineer, (12 years)
Tonkin Consulting

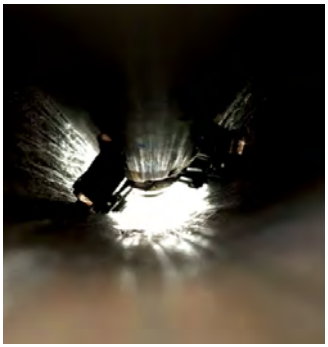
Leo Noicos
BEng FIEAust CPEng NER RPEQ APEC Engineer IntPE(Aus)
Director
LN Engineering

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

PROJECT ENTRIES

ACOUSTIC DATA GAUGE HANGER

Acoustic Data Limited



In 2011, Acoustic Data developed a unique down hole acoustic temperature and pressure gauge (finalist in the 2013 AEEA).

To widen the commercial application of this product we needed to develop a cost effective gauge hanger to fix our acoustic gauge inside the tubing as a retro-fit.

We researched and developed a gauge hanger that works on torque, an entirely different principle to anything else in the oil industry. Our tool is an order of magnitude cheaper, considerably more compact, simpler and safer than others in the market, and has been patented in Australia, Canada, Europe, and USA.

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.

ASC'S COLLINS CLASS SUBMARINE MAIN MOTOR REFURBISHMENT

ASC Pty Ltd

Wallbridge Gilbert Aztec

ASC is the platform system integrator for Australia's fleet of Collins Class submarines, as part of the Australian Submarine Enterprise, comprising ASC, the Department of Defence, Royal Australian Navy and combat system integrator Raytheon Australia.

As part of reforms across the Enterprise, ASC implemented a range of significant innovations to its sustainment and maintenance operations in South Australia and Western Australia, to support the achievement of international submarine availability benchmarks.

To meet this objective, ASC significantly reformed how it refurbished the main motor. ASC and its Technical Support network devised multiple ways to reduce the maintenance window while providing the necessary reliability in the finished product and maintain safety. A key innovation was the construction of a dedicated main motor workshop at ASC's deep maintenance facility in South Australia that allowed technicians to safely remove the motor's 35 tonne armature from the complete stator of the motor, without dis-assembly, using a cantilevered truss. The armature and casing is then refurbished as single units within the workshop.

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.

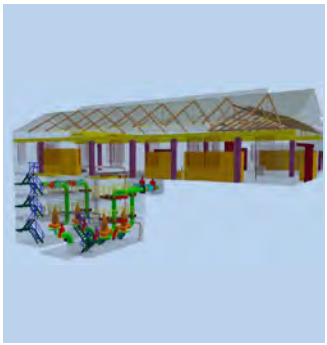
Completed in 2017, and with world-leading architectural and functional engineering design, the facility enables Coopers to produce premium malted barley. This will enhance its position as a world leader in home brew concentrate, traditional ales and malt extracts to leading domestic food manufacturers. 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.

GLENELG WWTP INLET WORKS & ANDERSON AVE WWPS UPGRADE

Fulton Hogan Construction Pty Ltd

SA Water



The $21M Glenelg Wastewater Treatment Plant Inlet Works and Anderson Ave Wastewater Pump Station Upgrade project comprised civil, mechanical, electrical, instrumentation controls and automation scopes as follows:

- SP1 - the design, supply and installation of Glenelg WWTP Inlet Works
- SP2 - the design, supply and installation of works pertaining to Anderson Ave WWPS Upgrade.

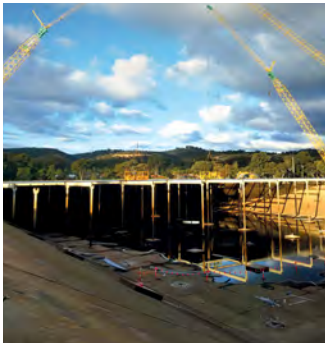
It involved two phases; ECI (Dec 2014 to May 2015) and D&C (Jun 2015 to Aug 2016) and was delivered under a self-performing model whereby >70% of work was undertaken directly by Fulton Hogan, in collaboration with SA Water. The new infrastructure ensures a reliable and secure wastewater network for generations to come. With such close proximity to urban and commercial areas, the Inlet Works and WWPS upgrade have also addressed the key risks of wastewater overflows and odour, removing business risk for SA Water and the State Government.

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.

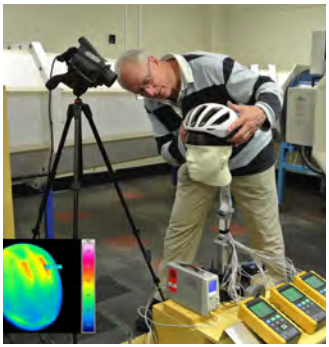
Following a localised collapse of some roof members, SA Water, GHD, and York Civil worked collaboratively to replace the entire roof structure without a single person entering the storage tank.

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.

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.

MAYNE PHARMA ORAL SOLID DOSAGE (OSD) PRODUCTION FACILITY EXPANSION

Jacobs (Australia) Pty Ltd

Jacobs was engaged by Mayne Pharma to offer full design consultancy and PMCA services for the expansion of their OSD manufacturing facility in Salisbury South. The project involved a holistic design approach coordinating local engineering disciplines with international Subject Matter Professionals to deliver a contemporary manufacturing facility using latest technology to meet the client's expanding needs. Key design requirements included:

- Sequential positioning of production rooms and equipment to offer lean, efficient and safe flows;
- Clean utilities and spatial integration of specialist pharmaceutical equipment procured throughout Europe and Asia;
- Integrating the expansion within the existing footprint, whilst maintain existing operations.

O-BAHN CITY ACCESS PROJECT

McConnell Dowell

KBR

Wallbridge Gilbert Aztec

Department of Planning, Transport and Infrastructure

The O-Bahn City Access Project builds on the SA Government's investment in a stronger public transport network. The project extends the O-Bahn guided bus system from the end of the busway at Gilberton into the cross-city priority bus lanes on Grenfell Street. It included the creation of centrally aligned priority bus lanes along Hackney Road and a dedicated 670m bus tunnel providing quicker, more reliable access for buses.

The multi-disciplined project was delivered within a highly trafficked, 2km long corridor within Adelaide's CBD. The project involved complex engineering, traffic and logistics management, and extensive consultation with adjacent businesses and residences.

Twenty-five specialist consultants collaborated to achieve architectural, engineering and environmental outcomes, interacting and engaging in a dynamic process that drove innovative thinking, and delivered an exceptional outcome for users and the community.

SA POWER NETWORKS REDEYE DMS IMPLEMENTATION, FOR DYNAMIC ENGINEERING & OPERATIONAL DELIVERY

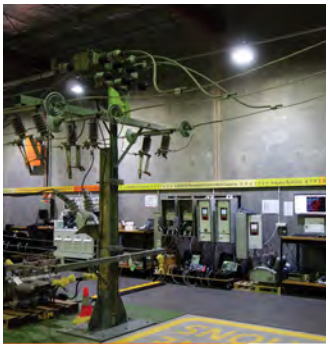
SA Power Networks

With innovative solutions, SA Power Networks reimagined the way our engineering construction and operational teams could work together using emerging technology, to lead critical infrastructure and engineering, to support operations day to day and often in hazardous areas across South Australia.

SA Power Networks created a quick method of accessing the latest engineering data, available anywhere, for design, construction and maintenance changes, enabling dynamic engineering in real-time, improving engineering outcomes, operational safety, delivery and response. The solution was implemented with the RedEye DMS platform, across 400 substations with over 100,000 drawings, changing engineering process and how we work and preparing workforce for the future.

SELF-HEALING POWER SYSTEM

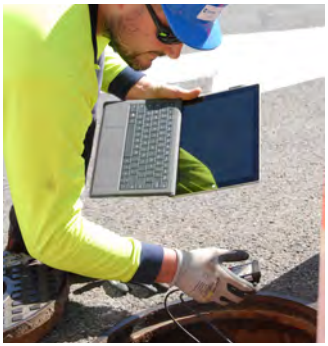
SA Power Networks



SA Power Networks has developed a world-leading system that can automatically restore power to the majority of customers after a fault on high voltage powerlines. SA Power Networks has deployed over 300 smart high voltage switches and integrated them with an advanced control system that automatically locates and isolates a fault, and then restores power to most customers from the surrounding network in less than one minute. The complex project has demonstrated excellence in systems engineering, project management, design and innovation, and is already improving reliability for 225,000 customers on targeted, poorer-performing powerlines. The system is predicted to deliver over $100 million of value to the South Australian economy through improved reliability of supply, and has potential global application.

SMART WATER NETWORK

SA Water



SA Water is setting a benchmark for the water industry by integrating smart technology on a broad scale to benefit customers by reducing community impacts like traffic delays and water service interruptions.

Its smart water network in the Adelaide CBD uses acoustic sensors, pressure and flow data, high speed transient pressure sensors, smart meters and water quality sensors.

SA Water is the first water utility in the world to implement this broad range of sensors and the Internet of Things on such a scale within a defined geographical area. With information from it's smart water network, SA Water is pioneering the science of water data analysis and changing the way it makes operational decisions. For example, they can identify anomalies and proactively repair faults. This reduces service disruptions and improves responses to unplanned works, while enhancing available asset information.

SOUTH AUSTRALIAN EMERGENCY GENERATORS

SA Power Networks

SA Government

The project was initiated to safeguard electricity supply to the state of South Australia. With recent examples of demand exceeding available capacity and the need to exercise rotational load shedding to safe guard against collapse of the grid, the emergency generator project was implemented to provide rapidly deployable generating capacity to prevent future load shedding events. The fast track development and implementation of 276MW of emergency power generation for South Australia, required to cover off projected shortfalls in reserve and prevent power outages. The project was delivered from initial engagement with the SA Government to completion of commissioning, with 276MW available for dispatch into the NEM, in less than 8 months.

TORRENS ROAD TO RIVER TORRENS PROJECT

T2T Alliance

Australian Government

SA Department of Planning Transport & Infrastructure

CPB Contractors

York Civil

Aurecon Australia

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

WATERPROOFING EASTERN ADELAIDE

Guidera O'Connor

Wallbridge Gilbert Aztec

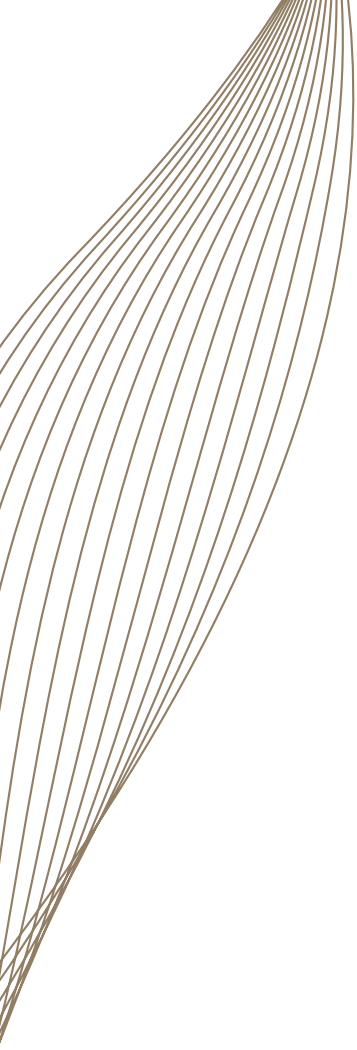
The Waterproofing Eastern Adelaide Project involved the design and construction of a stormwater harvesting scheme to capture, treat, store through an Aquifer Storage and Recovery (ASR) Scheme and then distribute recycled stormwater for irrigation purposes across the eastern region of Adelaide.

The project team has delivered over 40km of distribution network across the eastern Adelaide region and designed and constructed one wetland and six biofilters, enhancing the visual amenity of areas including Felixstow Reserve. The project has also installed four bores, a disinfection system and four pump stations. The project aims to create an environmentally sustainable source of water to irrigate approximately 50 parks, reserves, and over 25 future schools in Adelaide's eastern region. When fully operational, the project will yield up to 454ML/annum of treated stormwater.

The project has increased South Australia's future water security and hosts a range of positive environmental impacts for the local communities and Councils involved.

ENGINEERS
AUSTRALIA

WE ARE THE GLOBAL HOME FOR ENGINEERING PROFESSIONALS RENOWNED AS LEADERS IN SHAPING A SUSTAINABLE WORLD.



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