

2008

Engineering Excellence Awards

Friday 17 October 2008



ENGINEERS  
AUSTRALIA  
Queensland Division

Winners, High Commendations and  
Category Finalists





Thiess Black & Veatch in an alliance with Western Corridor Recycled Water Project has set a new benchmark in the construction industry. Stage 1A of the Bundamba AWT Plant was delivered in less than 10 months from first access to the project site.

Congratulations to the Bundamba team for achieving our vision to deliver a world-class recycled water asset in record time.

**Delivering our vision.**



# Contents

President's Welcome	2
Message from Her Excellency, Ms Penelope Wensley AO, Governor of Queensland	2
Judging Criteria and 2008 Judges	3
R.W. Hawken Award	6
2008 KarelCAD Innovation Award	7
Sustainability Award	8
Community Engagement Award	9

## **2008 Excellence Award Categories**

■ Buildings and Structures	12
■ Environment	14
■ Products & Manufacturing Facilities	16
■ Project Infrastructure	19
■ Project Management	22
■ Reports, Procedures & Systems	25
■ Research, Development & Innovation	28
■ Control Systems & Small Business Ventures	30

2008

Engineering Excellence Awards

Engineers Australia – Queensland Division

## President's Message



**The 2008 Engineering Excellence Awards once again recognised and celebrated the world class expertise of Queensland engineers and organisations. The gala event that is the Excellence Awards are an occasion to celebrate the work of engineers and organisations and the direct contribution they have made to the development of Queensland, as well as the direct influence on our way of life and the community we live in.**

We recognise and appreciate engineers for their contribution to the prosperity and development of this State, but also their dedication to

innovation, sustainability, teamwork and professionalism.

In addition, it is evident from the Excellence Awards entries that Queensland engineers are making a significant contribution to increasing our export potential with proven capabilities in world class national and international projects.

In 2008 Year of the Engineering Team we salute the workplaces in the private and public sectors, technologists and associates, together with engineers, which comprise the engineering teams that have made these projects possible.

I especially acknowledge and thank our Excellence Award Judges – organising judge, Mr Stuart Lister and the team of 12 judges – for the enormous contribution they have made to the event.

The 2008 R.W. Hawken Award, the most prestigious award of the ceremony, which recognises an accomplishment of exceptional engineering merit, was presented to Skilled Park.

The iconic 27,000 seat Skilled Park on the Gold Coast is a spectacular showcase of innovative engineering design. With its eye-catching signature roof and curved cantilevered box rafters supporting the largest fabric roof in the southern hemisphere, coupled with leading technology in building services and sustainability, Skilled Park has made its mark on the Gold Coast's landscape.

Through strong collaboration from SKM, architects HOK Sport, the Queensland Department of Works (Project Services Division), managing contractor WATPAC and the state government-owned Stadiums Queensland, the design team applied exemplary engineering services to deliver the stadium under budget and ahead of schedule.

This project demonstrates engineering excellence, dedication and outstanding performance. Congratulations to all the team that delivered this outstanding project.

I wish to thank the Queensland Division sponsors for their invaluable contribution and generous support. None of this would be possible without them. Our Platinum Sponsors: Department of Main Roads/Queensland Transport, Leighton Contractors, Thiess and WorleyParsons, our Gold Sponsors: Anchor and Maunsell and our Silver Sponsors: Brisbane City Council, Calibre Global, Davies Collison Cave, Hays Engineering, KarelCAD, Monadelphous, Powerlink, Project Services, QR, Robert Walters, Sinclair Knight Merz and Tarong Energy.

With 46 entries vying for the top award in 2008 the competition was tough, as it was varied. I would like to thank all entrants for the work they put into the projects and also into preparing their submission for these important and prestigious awards.

The following pages record highlights of the evening and showcase the winners, high commendation recipients and category finalists of the 2008 Engineering Excellence Awards and celebrate the excellence of the engineering profession.

**Michael Ganza**  
President  
Queensland Division



## Message from Her Excellency Ms Penelope Wensley, AO

Governor of Queensland



**I am very pleased to contribute to this publication marking the Engineering Excellence Awards for 2008 presented by the Queensland division of Engineers Australia, and to express my congratulations to all those who have been recognised for their outstanding achievement, eminence in the practice of engineering and the profession, and for service to the Australian community.**

Throughout a long association with engineering, both personally and professionally during my career as a diplomat, I have observed the skill and capability of Australian engineers in many

different fields, contributing enormously to national and international growth and prosperity.

In our own large and prosperous state, the rapid growth we are experiencing in Queensland's population and major centres is placing pressure on infrastructure and systems, creating unprecedented challenges for our planners, our politicians, for the private and public sector alike, to deliver structures and systems that meet demand and which are practicable and sustainable.

Queensland's engineers, in partnership with teams across Australia and internationally, have responded with flair and ingenuity to the challenges and complexities of this changing landscape, producing clever and creative responses to apparent road blocks, innovative solutions to meet the challenges of environmental and social accountability, and delivering a number of truly outstanding projects, pooling talent, ideas and energy to produce constructive, workable solutions to contemporary problems.

I commend them for their achievements, and for their continued commitment to achieving and maintaining the excellence that is the proud hallmark of the engineering profession in our state.

**Governor**



# Judging Criteria

## Dedication to Excellence

Since its inception in 1919, Engineers Australia has always been dedicated to excellence in engineering. The awards are about recognising the achievements which engineers have made to the development of Queensland and the community.

The awards highlight to the public the work performed by engineers and provide recognition of their level of professionalism and contribution to the community.

## Judges and Judging Criteria

In 2008 the judges were:

Stuart Lister, Cliff Button, Doug Hargreaves, Elizabeth Schofield, Peter Ho, Tom Baxter, Michael Waldby, Mark Blundell, Ljubo Vlacic, Joe Abercrombie, John Quinn, Keith Hampson and Marisha McAuliffe. Engineers Australia, Queensland Division would like to express its sincere thanks to the 2008 judging panel. Without the commitment of the judges the awards would not be possible.

The judges recognise that excellence and exceptional engineering may take many forms – large or small, traditional or cutting edge, technically complex or straight forward and simple. The dynamics of each of these characteristics are important, depending on the specific project.

Projects located anywhere in the world are eligible for entry. However a significant part of the engineering component needs to have been completed in Queensland.

The primary judging criterion for all project categories is the engineering aspects of the project. In addition the judges consider the following:

- Budget and program adherence
- Contribution to the economy
- World's best practice
- Benefits to the community and
- Innovation

Additional judging criteria for the overall Sustainability Award were:

- Efficient energy use
- Potential for universal application
- Economic and environmental performance
- Appeal to community awareness

Additional judging criteria for the overall Innovation Award were:

- Export potential
- Impact on the quality of life
- Extent to which the project demonstrates world's best practice
- Commitment to research and development

Additional judging criteria for the overall Community Engagement Award were:

- Participation by key stakeholders
- Innovative, creative and effective community engagement strategies
- Successful outcomes for project developers and the community
- Positive project profile

### 2008 Excellence Award Categories

- Buildings and Structures
- Environment
- Products and Manufacturing Facilities
- Project Infrastructure
- Project Management
- Reports, Procedures and Systems
- Research, Development & Innovation
- Control Systems & Small Business Ventures

# 2008 Engineering Excellence Awards



**On Friday 17 October, the engineering profession's night of nights, Queensland's best gathered at the Brisbane Convention and Exhibition Centre to celebrate and recognise the spectacular achievements of their peers at the 2008 Engineers Australia's Queensland Division Engineering Excellence Awards.**

The Awards showcased 46 of Queensland's top engineering projects at the gala presentation dinner attended by the Governor of Queensland, Her Excellency, Ms Penelope Wensley AO, Deputy Premier and Minister for Infrastructure and Planning, Paul Lucas, and more than 900 guests.

Guests were treated to the gala night's festivities with some spectacular performances from cirque style acts and the music of Glenn Shorrock and band and the sax and vocals of celebrity musician Wilbur Wilde.

Master of Ceremonies, well known Australian TV personality Andrew Daddo, hosted the night's proceedings and entertained the crowd with his humor.

Deputy Premier Paul Lucas and Julie Hammer, the 2008 National President of Engineers Australia presented the top award of the night, the R.W. Hawken Award, to Sinclair Knight Merz, HOK Sport Architects, Project Services and Watpac for their Skilled Park stadium project.

The 2008 Engineers Australia's Queensland Division Engineering Excellence Awards accordingly recognised 2008 Year of the Engineering Team by celebrating the excellence of engineering in Queensland and the engineering teams that have made these projects possible.



1. Community Engagement Award presented by Silver Sponsor Robert Walters
2. KarelCAD Innovation Award presented by Silver Sponsor KarelCAD
3. Sustainability Award presented by Silver Sponsor Project Services
4. TOP AWARD – The R.W Hawken Award goes to Sinclair Knight Merz, HOK Sport Architects, Project Services, and Watpac for Skilled Park presented by Deputy Premier Paul Lucas and Engineers Australia National 2008 President Julie Hammer



# A Celebration to Remember



# R.W. Hawken Award

**The R.W. Hawken Award is the overall winner, chosen from all Excellence Award recipients. This award recognises an accomplishment of exceptional engineering merit by an engineering individual or firm.**

The R.W. Hawken Award is presented in honour of the significant contribution to engineering in Queensland, indeed Australia, made by Professor Roger William Hawken. Professor Hawken was one of a special breed of engineers. He was a member of the teaching staff at the University of Queensland for thirty-five years, occupying the Chair of Engineering and Dean of the Faculty continuously for twenty-nine years.

During these years he served the University, the State of Queensland and the profession of engineering with distinction. He was also the first Queensland Division Chairman and contributed to the formation of Engineers Australia.



## Skilled Park

Entered by Sinclair Knight Merz, HOK Sport Architects, Project Services and Watpac

- This 27,000-seat stadium at Robina, Gold Coast, features curved 35 metre long cantilevered steel box rafters covered by 2.3 hectare of innovative PTFE fabric.
- SKM provided the engineering services for all Civil, Structural and Services Engineering including hydraulics, lighting, mechanical ventilation, fire safety, communications as well as the traffic/transport design for the stadium.
- Innovative design in combination with the adoption of a high standard of sustainability principles in water conservation and reuse, lighting, electrical energy, natural ventilation, PA systems, as well as, fire risk assessment and construction methodology.
- The \$168m stadium complex is founded on 15m deep cost-effective piling.

### Judges were particularly impressed by:

- The excellent application and integration of extensive research into a wide area of new materials/innovative design/practical sustainability outcomes.
- The utilisation of close proximity to the Robina Rail Station and bussing arrangements resulting in up to 80% of patrons travelling by public transport.
- The high demonstrated interest by National and International interests in adopting the stadium concept – with particular interest in the extensive PTFE fabric outer shell [for filtered daylight, good heat control, and unique night appearance (from internal lighting)].
- The unique 35m cantilever in C shape.
- The sum of numerous small impressive features contributing to overall excellence.

# 2008 KarelCAD Innovation Award



**The purpose of this award is to highlight and recognise a project which demonstrates a commitment to, and understanding of, the fundamental knowledge of innovative practices.**

Eighteen (18) entrants elected to enter this award.



## Hurricanes on Thames

Entered by AIMTEK Pty Ltd

- Queensland designed and built Hurricane Class Ferries now provide a fast, convenient, comfortable and affordable ferry service on the River Thames, UK.
- Nine Hurricane Class ferries are now in service helping to decongest London's road traffic and in doing so are saving five million tonnes of CO2 emission per annum. Much greater savings are forecast as the service expands.
- The success of the Hurricanes is the unique very low wash hull form produced as a result of extensive research and development program and establishment of an operating company, all funded by AIMTEK.
- Hurricanes are now an important part of the London Transport infrastructure and are leading the challenge to achieving environmentally acceptable forms of transport – quicker than a taxi, same price and more eco-friendly.

### The Judges were particularly impressed by:

- The research and testing that went into the development of a low wash hull.
- The initiative and entrepreneurial skills achieving entry into the River Thames ferry transport system.
- Investment into the innovative design and research.
- The excellent example of a good report – simple worked layout, rich in engineering and financial information.

# Sustainability Award



**The purpose of this award is to highlight and recognise a project which demonstrates a commitment to, and understanding of, the fundamental knowledge of sustainable practices.**

Twelve (12) entrants elected to enter this award.



## Green Square South Tower

Entered by Leighton Contractors Pty Limited and Leighton Properties Pty Limited

- This “Five Green Star” rated environmentally-focused building was developed in Fortitude Valley as a major segment of the largest mixed-use corporate office park developed in Brisbane in the last 15 years.
- Rigorous environmental standards were applied in the design and construction of the building and in addition it provides an environment of high quality working experience for building users.
- The design incorporated a wide variety of ecologically sustainable initiatives resulting in significant energy and water savings, improved indoor environment quality, minimisation of emissions released to atmosphere and a reduction in the use of natural resources.
- Thorough planning and coordination ensured Green Star targets were met and the project finished ahead of budget and schedule.

### The Judges were particularly impressed by:

- The initiative in designing this building incorporating researched and tested sustainability considerations, which have universal applications, especially in SE Queensland and Australia.
- The client having specified the environmental and energy rating standards to be achieved and then in construction having pursued additional measures to achieve an even higher rating.
- The various significant energy saving initiatives, which will result in ongoing efficiencies.
- The provision of many sustainable applications including the alternate “green” option for transport.

# Community Engagement Award

**This award is presented for the most outstanding entry in the field of community engagement recognising participation by key stakeholders, innovative, creative and effective community engagement strategies, successful outcomes for project developers and the community and positive project profile.**

Nine (9) entrants elected to enter this award.



## Salisbury to Kuraby Rail Upgrade

Entered by QR, Abigroup, GHD and United Group

- This \$250 million project alliance involved constructing a 9.5km third rail track and upgrading seven train stations in the midst of suburban Brisbane's working electric rail corridor.
- Associated infrastructure included roads, level crossings, electrics, signalling and telecommunications at many different sites along the rail corridor.
- It was imperative that the work was completed with minimum disruption to existing train services on the Gold Coast rail line – an already stretched service.
- Cost savings were achieved by standardisation of designs in relation to retaining walls, drainage systems and purpose designed capping layers under tracks.

### Judges were particularly impressed by:

- The very effective and ongoing community consultation, communication and involvement in this closely settled sensitive public area, which also included critical passenger rail services.



# Celebrating engineering excellence

Queensland Transport and the Department of Main Roads recognise the importance of celebrating the achievements of Queensland engineers. Their innovation, skill and ingenuity allow Queensland to undertake world class projects.

By supporting engineering excellence, Queensland Transport and Main Roads can help reward world class expertise and innovation in engineering. These talented individuals help us find the solutions that will deliver roads and transport infrastructure for the future.

If you would like to work on projects that enrich the lives of Queensland communities, enjoy a flexible work/life balance and gain access to great job entitlements, then it's time to build yourself a career with Queensland Transport and Main Roads.

Visit [www.smartjobs.qld.gov.au](http://www.smartjobs.qld.gov.au) for current vacancies.



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Engineering Excellence Awards  
17 October 2008**



# Category Finalists

2008

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Engineers Australia – Queensland Division

## EXCELLENCE AWARD



### Skilled Park

Entered by Sinclair Knight Merz, HOK Sport Architects, Project Services, Watpac

- This 27,000-seat stadium at Robina, Gold Coast, features curved 35 metre long cantilevered steel box rafters covered by 2.3 hectare of innovative PTFE fabric.
- SKM provided the engineering services for all Civil, Structural and Services Engineering including hydraulics, lighting, mechanical ventilation, fire safety, communications as well as the traffic/transport design for the stadium.
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- The \$168m stadium complex is founded on 15m deep cost-effective piling.

#### Judges were particularly impressed by:

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- The high demonstrated interest by National and International interests in adopting the stadium concept – with particular interest in the extensive PTFE fabric outer shell [for filtered daylight, good heat control, and unique night appearance (from internal lighting)].
- The unique 35m cantilever in C shape.
- The sum of numerous small impressive features contributing to overall excellence.

## HIGH COMMENDATION



### Cherrell Hirst Creative Learning Centre

Entered by Connell Wagner, Bovis Lend Lease and m3architecture

- This is a contemporary six-storey (with two basements) off-form concrete building that forms part of the master plan for Brisbane Girls Grammar School.
- Connell Wagner provided all structural, civil and building services engineering with numerous innovative approaches for this unique building.
- The space limited sloping site combined with “signature” K shaped wall/columns has resulted in an attractive and unique Learning Centre for Creative Arts.

#### The judges were particularly impressed with:

- The unique structural/architectural solution to this modern spacious school building, which was constructed ahead of schedule and under budget.
- The innovative application of sustainability principles for the air conditioning/air handling, as well as acoustics and lighting – with added provisions for additional sustainability expansion in the future.

2008

Engineering Excellence Awards

Engineers Australia – Queensland Division



### Stopping the Rocks from Rolling – Kuranda Range Rail Rock-Fall Barrier

Entered by QR

- A 5,000 kilojoule high-energy rock-fill barrier with a volumetric capacity of 1,200 m<sup>3</sup> of rock-fill debris was designed to minimise the risk of further rockslides after the historic Kuranda Scenic Railway was closed by a devastating rockslide in February '07.
- This barrier design had been successful in the Swiss Alps and was only the second barrier of this rating constructed in the world since its development and certification.
- The installation was an impressive feat with the local contractor having to overcome the many physical and technical challenges of the World Heritage-listed site.
- Workers were suspended on ropes and materials such as posts, cables and nets lifted into place by helicopter.

## EXCELLENCE AWARD



### Green Square South Tower

Entered by Leighton Contractors Pty Limited and Leighton Properties Pty Limited

- This “Five Green Star” rated environmentally-focused building was developed in Fortitude Valley as a major segment of the largest mixed-use corporate office park developed in Brisbane in the last 15 years.
- Rigorous environmental standards were applied in the design and construction of the building and in addition it provides an environment of high quality working experience for building users.
- The design incorporated a wide variety of ecologically sustainable initiatives resulting in significant energy and water savings, improved indoor environment quality, minimisation of emissions released to atmosphere and a reduction in the use of natural resources.
- Thorough planning and coordination ensured Green Star targets were met and the project finished ahead of budget and schedule.

#### The Judges were particularly impressed by:

- The initiative in designing this building incorporating researched and tested sustainability considerations, which have universal applications, especially in SE Queensland and Australia.
- The client having specified the environmental and energy rating standards to be achieved and then in construction having pursued additional measures to achieve an even higher rating.
- The various significant energy saving initiatives, which will result in ongoing efficiencies.
- The provision of many sustainable applications including the alternate “green” option for transport.

## HIGH COMMENDATION



### Pidgeon Close Remediation Project

Entered by ENERGEX, Ranbury Management Group, Thiess Services Pty Ltd

- Remediation of the contaminated former West End coal-based gas works site containing toxic ash and hydrocarbons together with large underground brick gas holders and buildings, all in close proximity to the Brisbane River.
- Key features included excavation and safe disposal of some 100,000 tonnes of contaminated soil, erection of a 100 metre by 40 metre odour control tent, demolition of three large underground gas brick gasholders and a two storey administration building.
- Other key features included installation of 150 linear metres of sheet-piling up to 30 metres deep, removal and reconstruction of two public roadways, construction of a temporary road and installation of underground clay barriers.
- Success of this project resulted from the many innovative solutions adopted, which were essential due to its complex and environmentally sensitive nature.

#### The Judges were particularly impressed by:

- The comprehensive processes devised and innovative technology adopted to successfully address this extremely difficult and sensitive project.
- The emphasis on management of this project such that it did not compromise engineering standards and environmental and community safety.

2008

Engineering Excellence Awards

Engineers Australia – Queensland Division



### Caboolture Bypass Construction (Stage 2)

Entered by Department of Main Roads

- The Caboolture Bypass accessing the Bruce and D'Aguilar Highways has removed many large trucks and much of the previous through traffic from local intersections in Caboolture precinct.
- Environmental and cultural heritage hurdles were identified and overcome before and during the construction of this project involved overpassing three roads, the main railway, showgrounds, and a sensitive creek and avoiding an historic weir.
- This submission addresses the environmental and cultural heritage challenges and outlines how the project responded proactively to them both before and during construction. These were the most innovative aspects of the project.
- Diverse sensitivities in the location were appropriately addressed in effective consultation with all relevant stakeholders.



### Moodlu Quarry Offstream Storage

Entered by Parsons Brinckerhoff

- This project was the augmentation of Caboolture water storage using disused Moodlu Quarry, assessing its suitability, hydraulic modelling and development of a pumping supply strategy.
- By focussing on a sustainable outcome for the quarry's use, Caboolture Shire Council ensured its local residents experienced an improvement in their quality of life by providing lower cost water supply.
- The project provides a single pipeline for both harvesting water from Wararba Creek when the weir is full and returning water from the quarry during dry periods.
- This project is an excellent example of a regional council addressing the concerns of a local community, and the result benefiting not just that community but the whole of south-east Queensland.

## EXCELLENCE AWARD



## Curragh North Materials Handling Project

Entered by Laing O'Rourke Australia Pty Ltd, Wesfarmers Curragh Pty Ltd

- This \$130 million materials handling system represents a state-of-the-art, technically sophisticated materials handling system that delivers some seven million tonnes a year of crushed coal at rates up to 2,500 tonnes/hour.
- This includes design, supply and construction of the world's longest single-flight conventional conveyor across the 20km workface, introducing innovations providing savings of about 40% in both capital and operating costs.
- Also included is a 2,500 tonne/hr run-of-mine dump station, three-stage crushing and screening plant and modifications to increase/improve existing coal handling systems such as a 500t, five-outlet bin, three new conveyors and upgrading seven existing conveyors.

### The Judges were particularly impressed by:

- This excellent presentation on the research and development of an extremely long high-capacity coal conveyor and coal handling system and the resultant environmental sustainability of this coal transportation facility.
- The project's approach in challenging convention and adopting a number of ground-breaking innovations, which were applied throughout the design and construction of the overall project.

2008

Engineering Excellence Awards

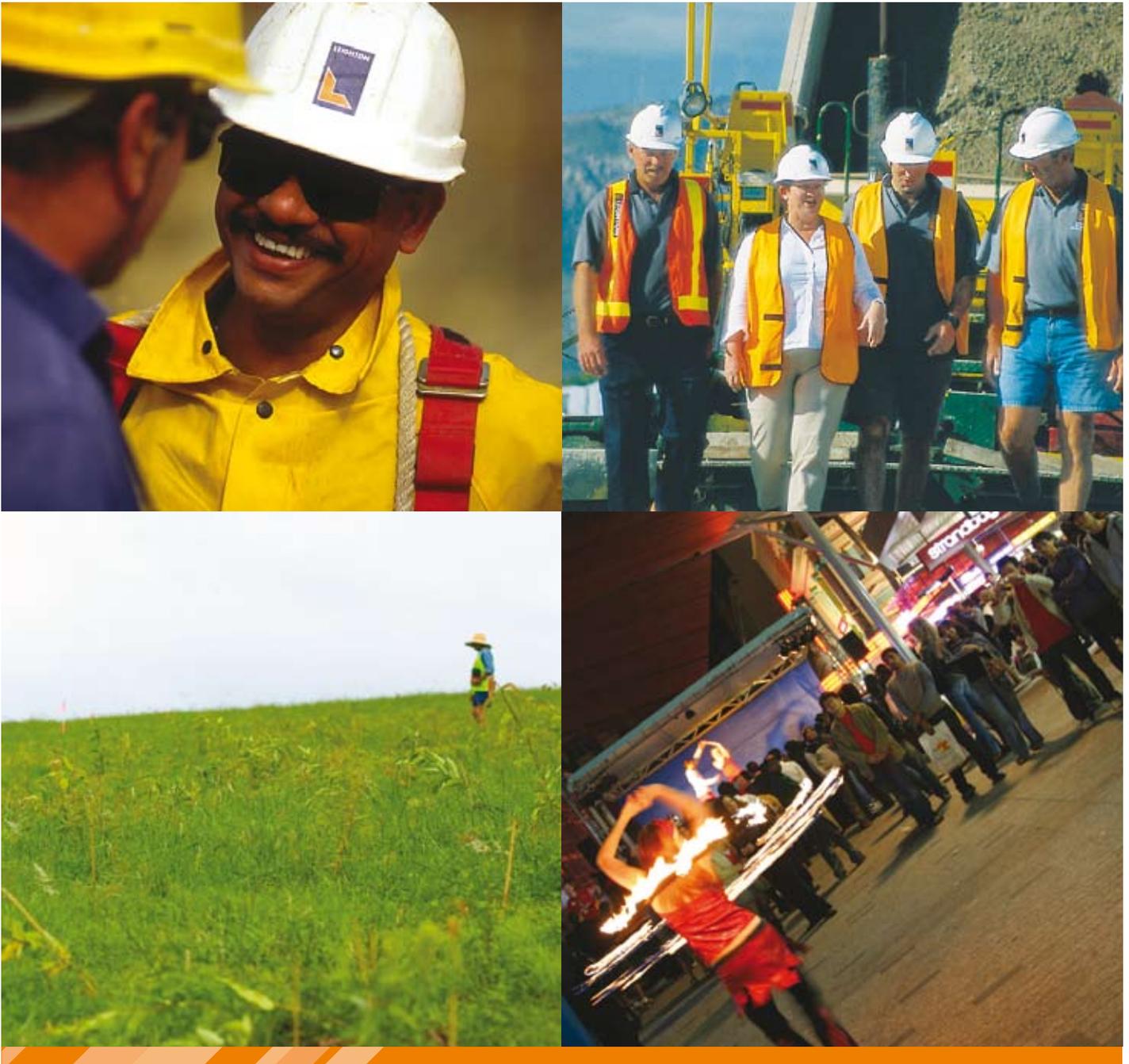
Engineers Australia – Queensland Division



### 3 for 5 Electric Locomotive Project

Entered by QR

- This project outlines QR's response to the need to provide a quick response to customer demand for increased capacity by re-engineering and rebuilding their current fleet of coal-haul locomotives.
- The technology used in the three prototypes means that, where previously five locomotives were required to haul a standard coal train, only three are now required.
- This rebuild provides a substantial increase in power necessitating a change from DC to AC traction motors and replacement of dynamic braking with more efficient regenerative braking.
- Several innovations were incorporated ensuring QR maintains its leadership in the field of AC traction on a narrow-gauge heavy-haul railway.



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# Project Infrastructure

## EXCELLENCE AWARD



### Hurricanes on Thames

Entered by AIMTEK Pty Ltd

- Queensland designed and built Hurricane Class Ferries now provide a fast, convenient, comfortable and affordable ferry service on the River Thames, UK.
- Nine Hurricane Class ferries are now in service helping to decongest London's road traffic and in doing so are saving five million tonnes of CO2 emission per annum. Much greater savings are forecast as the service expands.
- The success of the Hurricanes is the unique very low wash hull form produced as a result of extensive research and development program and establishment of an operating company, all funded by AIMTEK.
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- The initiative and entrepreneurial skills achieving entry into the River Thames ferry transport system.
- Investment into the innovative design and research.
- The excellent example of a good report – simple worked layout, rich in engineering and financial information.

## HIGH COMMENDATION



### Raising Lenthall Dam

Entered by Wide Bay Water Corporation, Geotechnical Engineering, GHD

- Design & construction of crest gates on the spillway of Lenthalls Dam almost doubled the storage capacity of water supply for Hervey Bay at a total cost of \$8.9 million, equivalent to \$30 per megalitre of increased capacity.
- These crest gates are of innovative design and are the first of their type in Australia. The water levels within the dam control the position of each gate by a simple flotation or inundation of the gate, obviating the need for complex electrical or hydraulic systems to effect automatic raising and lowering of crest height.
- As dam water level rises, the gates rise until in the closed position. If the dam inflow increases, the gates will automatically lower to release the excess flood water, thereby minimising adverse flooding effects upstream of the dam.
- Several innovations were incorporated including the challenge of effectively adapting five rectangular radial gates to the curved spillway.

#### The Judges were particularly impressed by:

- The significant increase in water storage capability at a modest cost.
- The adoption of an innovative self-operating system for crest gates using flotation changes for automatically raising and lowering the crest level.
- The precision engineering in fitting and sealing a rectangular shaped gate to a curved spillway.

## HIGH COMMENDATION



### RG Tanna Coal Terminal – Marine Structures

Entered by Connell Wagner

- This project covers the design of one of the largest continuous wharfs in the world at Gladstone, providing 1.5km of wharf – permitting loading of up to four large "Cape Class" vessels (up to 220,000 dead weight tonne).
- The final expansion of the RG Tanner Coal Terminal was officially opened in July 2008, and was the culmination of five stages of design development and design refinement of the terminal marine structures beginning in 1978.
- The design philosophy has been based on use of large tubular steel sections for all primary members including piles, headstocks, rail girders and bracing, maximising pre-fabrication, with simple site connections and realistic erection tolerances.
- A standout feature is the pile to headstock connection, which provides an ability to develop close to the full structural capacity of the pile (in bending moment and axial force) at the connection. This results in minimising the cross-sectional area of piles and the number required to support the wharf load.

#### The Judges were impressed by:

- The consistency of incremental improved design over a period of 30 years.
- The design and project schedule that permitted uninterrupted operation of ship loading.
- The significant contribution made by the facility to the development and the economic benefit of the hinterland.



### ARRP-CQ Alliance

Entered by ARRP-CQ Alliance – Ostwald Bros. Civil Pty Ltd, Canstruct Pty Ltd, WorleyParsons Services and Queensland Department of Main Roads

- This Alliance was a pure alliance and involved upgrading stretches of the Dawson and Leichhardt Highways in Central Queensland, including rehabilitation of 91km of road and replacement of 11 timber bridges.
- This roadway originally planned to be upgraded over 20 years was accelerated through smart financial management, state-of-the-art delivery mechanisms and construction techniques to achieve completion under-budget in two years.
- Innovation was applied within all elements from procurement and design processes through to construction management and work processes.
- Main Roads' personnel were integrated within all levels of the Alliance to facilitate skill and knowledge transfer between stakeholders together with many resultant community benefits.



### Diamond Pro Stone Cut SRW, Robina

Entered by Anchor Wall Engineering (Aust), Smartstone Group and Golding Contractors

- A new Anchor Diamond Pro Stone Cut Segmental Retaining Wall (SRW) system creates a 470m long and 9m high structure, flexible, strong, cost-effective and aesthetically pleasing.
- A new South Hills Industrial Estate at Robina, Gold Coast has proven it possible to effectively turn land that was once considered too expensive to develop, into prime, centrally located, commercial and industrial property.
- Incorporating a flexible design to span across the flood plain, the reinforced soil wall is the public face of 120,000 cubic metre earthworks project that has introduced economic and social benefits to the Robina community, providing a model for universal application.
- As an innovation to solve the worker-fall protection issue, a unique climbing protective barrier was implemented with its height being raised as the wall increased in height.



### Braemar 1 Power Station Project

Entered by ERM Power Pty Ltd

- This 450MW Open-Cycle Gas-fired Power Station is located 30km west of Dalby and is comprised of three 150MW turbine-generators, 150km of high pressure gas pipeline, two remote operated gas compressors and 275kV connection to the electricity grid.
- Designed to utilise locally produced coal seam gas and to operate intermittently to meet peak electricity demand taking advantage of higher electricity prices in the National Electricity Market.
- Use of a "line-pack pipeline" to store the constant supply of coal seam gas to facilitate intermittent and quick-start turbine-generator operation.
- This project has demonstrated world best practice in infrastructure planning, environmental performance, community engagement and cultural heritage management, power station and gas pipeline technology.



### Houghton Highway Duplication Project

Entered by Kellogg Brown & Root Pty Ltd

- This project covers investigation, planning, and design for a duplicated 2.8km Houghton Highway across Bramble Bay, Redcliffe and associated works.
- The new bridge will provide three lanes, a 4.5m pedestrian and cycle pathway and a fishing platform.
- The duplicate bridge design has a minimum life of 100 years and capacity to withstand a storm surge associated with an extremely rare event (i-in-2,000 year storm), such as that experienced during Hurricane Katrina which devastated the Gulf of Mexico.
- The \$315M project includes rehabilitating the existing 2.8km bridge, the longest bridge in Australia and removal of original timber bridge with section being upgraded for recreational purposes.
- Innovative approaches were applied in many areas including use of large steel piles instead of concrete piles, designed such that the number of piles was reduced from over 1,000 to 154 for the 78 span bridge.



### Burdekin- Moranbah Pipeline Project

Entered by SunWater

- This 218km water pipeline from George Weir, downstream of Burdekin Falls Dam to Moranbah terminal storage and associated works were constructed to ensure adequate ongoing water supplies to Northern Bowen Basin coalfields.
- This pipeline is to augment the existing water supply available from Eungella Dam providing drought-proofing of the region for many mining operations.
- The incredibly tight timetable and dire consequences of non-delivery made for a style of "just-in-time" engineering not seen before on pipeline construction in remote harsh environments.
- Use of Airborne Laser Surveys allowed the design of the route prior to any physical access being possible and was a first for long linear infrastructure in such an environment.



### Normanby Pedestrian and Cycle Link

Entered by Seymour Whyte Constructions Pty Ltd, Queensland Transport and Arup

- This project provided a pedestrian and cycle link between north of College Road and Roma Street Parklands, including a “jacked” tunnel underpass below College Road, segmented & reinforced retaining walls, elevated walkway and various interconnecting links.
- The \$17.1 million Normanby Pedestrian and Cycle Link provides efficient and safe access between Brisbane’s CBD and the inner west, southern and northern suburbs. It provides a cycle and pedestrian network to Roma Street Parklands and Albert Street, City.
- Innovative approaches were necessary in this very congested site including a plethora of major utility services as well as busy roads and railways.
- This project is a key part of the State Government’s vision to increase the percentage of trips taken by cyclists and pedestrians in south-east Queensland from 11 percent to 20 percent of total trips by 2011.



### Salisbury to Kuraby Rail Upgrade

Entered by QR, Abigroup, GHD and United Group.

- This \$250 million project alliance involved constructing a 9.5km third rail track and upgrading seven train stations in the midst of suburban Brisbane’s working electric rail corridor.
- Associated infrastructure included roads, level crossings, electrics, signalling and telecommunications at many different sites along the rail corridor.
- It was imperative that the work was completed with minimum disruption to existing train services on the Gold Coast rail line – an already stretched service.
- Cost savings were achieved by standardisation of designs in relation to retaining walls, drainage systems and purpose designed capping layers under tracks.



### Southern Regional Water Pipeline Planning & Design

Entered by Southern Regional Water Pipeline Alliance – Kellogg Brown & Root Pty Ltd, Abigroup Limited, McConnell Dowell Corporation Ltd, LinkWater Projects

- This Alliance is comprised of the State Government’s LinkWater Projects and non-owner partners KBR, Abigroup and McConnell Dowell.
- The Alliance for this \$901 million project completed the planning and design of this 94km reverse-flow steel pipeline, up to 1260 mm diameter and with four balance tanks, five pump stations, nine tunnels and 14 off-takes.
- Many innovations included the skewing of key performance indicators towards the design team, alignment optimisation and value management, project team integration, fast-tracked & flexible design and engineering excellence training.
- The diverse set of skills applied led to design innovations such as software module for pipeline development so common design components could be shared and an integrated energy management system that optimised pumping energy costs.

## EXCELLENCE AWARD



### Bundamba Advanced Water Treatment Plant (AWTP) – Stage 1A

Entered by Thiess Pty Ltd and Black & Veatch

- The design, construct and commissioning of this project, as the first of three such plants in SE Queensland, is part of the \$2.5 billion Western Corridor Recycled Water Project, the largest water recycling project in the Southern Hemisphere.
- The plant, located in Ipswich produces 20ML per day of purified recycled water, which was previously discharged into the nearby river as a lower quality effluent.
- This Alliance project, including 16km of 800mm pipelines, was designed, constructed and commissioned in less than ten months to international standards using the highest quality materials, equipment and technology.
- The plant removes water contaminants and impurities by use of micro-filtration and reverse osmosis membranes, as well as incorporating advanced oxidation treatment.

#### The Judges were particularly impressed by:

- The ten-month construction period for this innovative plant, which was considered to be very impressive. This period included acquisition, design, procurement, construction and commissioning.
- The project being completed within budget under excellent construction management with some thirteen months being saved from the estimated construction time. The time saving was particularly significant in the prevailing low water storage within SE Queensland.
- The plant technology, which includes world's best practice – which had not previously been applied to this scale and speed of construction.

## HIGH COMMENDATION



### Brisbane Water Enviro Alliance (BWEA)

Entered by BWEA – Brisbane City Council, John Holland Group, Aquatec Maxcon, MWH and WorleyParsons

- BWEA undertook the Wynnum Water Reclamation Plant (WRP) upgrade following the upgrading of WTPs at Sandgate, Oxley Creek and Wacol.
- Wynnum WRP introduced micro filtration combined with reverse osmosis in providing recycled water reuse for industrial applications.
- These four well planned and managed upgrading programs significantly contributed to drought control measures in South East Queensland.

#### The Judges were particularly impressed by:

- The highly innovative plant designs and process solutions applied to the scheme.
- The Australia-wide application of world's best practice for biosolids management and aeration technology, as well as the first full-scale use of nutrient removal.
- The well managed construction programs, which endured operational licences were maintained throughout the construction period.

## HIGH COMMENDATION



### Gold Coast Water CapEx Major Programs

Entered by Gold Coast City Council, Gold Coast Water, Southern Pacific Alliance Network

- Gold Coast Water's (GCW's) CapEx Programs have successfully managed delivery of \$1.26 billion in infrastructure.
- The programs cover the construction management of sewer, recycled water and water supply network upgrades, as well as recycled water treatment plants and associated pipe-works. Other projects covered by CapEx include the commencement of a major dam upgrade and the Gold Coast Desalination Project.
- The CapEx program provides a central management structure utilising skills based project packaging and flexible contract arrangements.
- This process led to reduced management staff resources and increased competitiveness in tendering.

#### The Judges were particularly impressed by:

- At its peak, program delivered eight times the volume of capital works of previous years.
- The Team approach of CapEx utilising the shared GCW skills and not applying the conventional construction management approaches based on individual and diverse geographic locations.



### Alderley Roundabout Upgrade

Entered by Brisbane City Council

- This roundabout upgrade increased the intersection's capacity, reduced traffic congestion and improved safety by removing one of the five legs and replacing the existing roundabout with a four-way signalised intersection.
- Project Management was by BCC Transport Infrastructure Branch; Design by City Design; Construction by Brisbane City Works.
- The project was completed under budget and within time constraints in an extremely difficult environment and involving extensive community engagement.
- Problems addressed included traffic management during construction, relocation of a church bell tower, integration of adjacent rail crossing requirements and replacement of 1,350mm drainage pipework.



### Blackwater Duplications

Entered by QR

- This relates to increasing the capacity of the Blackwater railway system with a series of enhancements matched to forecast tonnage demands of coal miners.
- 31km of track duplication over three sections of the 194km Blackwater line.
- Resultant reduced congestion and more dependable train cycle times.
- Innovative use of Zonal Control to facilitate unrestricted train movements during duplication works and signalling commissioning.
- Work completed within time and cost constraints.



### Amberley Stage 2 Redevelopment Project

Entered by Connell Wagner

- Connell Wagner provided project management and contract administration services for the \$285 million redevelopment of the Amberley RAAF Base.
- There were three separate project elements, namely Multi-Role Transport Tanker Facilities Relocation; Support Battalion Facilities Relocation; and Infrastructure Upgrade.
- Work included refurbishment and strengthening of main runway and taxiways, relocation of both the Army transport units and the air-to-air refuelling squadron from NSW and Victoria.
- Work was completed within time and cost constraints in spite of the difficult environment of an operating air base.



### Brisbane Caboolture Aquifuture Alliance (BCAA)

Entered by BCAA – Brisbane City Council, Moreton Bay Regional Council, Aquatec Maxcon and MWH

- BCAA was formed to design & deliver six groundwater treatment facilities and associated bore-field works within Brisbane and on Bribie Island and including 40km of new mains connecting these new water resources.
- The serious drought in South East Queensland necessitated this development being implemented in an extremely short time-frame.
- The task to deliver 25ML/day of treated groundwater within ten months was achieved with a high degree of trust between Alliance partners and an attitude of "nothing is impossible".
- There was a willingness by employees to take on new skills development and training by staff for new roles.



### Cedar Grove Weir

Entered by Water Infrastructure Services Alliance (WISA) – Queensland Water Infrastructure, Macmahon Contractors, SMEC and Hydro Tasmania

- As part of Logan River Early Works, Cedar Grove Weir, 45km south of Brisbane is an integral component of the region’s water infrastructure targeted to meet SE Qld water needs.
- Designed and constructed in six months, the project met all time, cost and quality constraints despite two major floods during construction.
- It provided a dedicated state of the art fish-way, which facilitates movement both upstream and downstream.
- Significant effort was expended in training and developing staff resulting in a more technically trained and educated workforce.



### Macintosh Island Pedestrian Bridge

Entered by Austress Freyssinet, Ark Construction Group and Arup

- This new Macintosh Island Pedestrian Foot-bridge on the Gold Coast spans Nerang River anabranch.
- Within a five-month time frame, the design and construction of this pedestrian bridge in Surfers Paradise links the island through parkland to the surf beaches, providing a vital link between recreational areas, replacing an old wooden structure.
- This magnificent bridge plays a key role during the annual Gold Coast Indy motor race, providing for both services and pedestrian access to key high activity areas.
- Utilises innovations including latest advances in compact stay cable technology.



### Municipal Infrastructure Delivery Model

Entered by Gold Coast City Council

- This model was created to program and project manage all capital works projects within Gold Coast City Council.
- The model includes roads, bridges, bikeways, drainage, flood mitigation, beaches and waterways, parklands, libraries, community centres, swimming pools, mobile fleet, plant and quarries.
- It also provides a governance link between all stakeholders and ensures projects are prioritised and managed on the basis of value to Council and capacity to deliver the needs of the organisation and the community.



### South-West 1 Enterprise Park & Berrinba Wetlands

Entered by GHD, Logan City Council and Neumann Contractors

- This 120 hectare former sand mine at Browns Plains, 25km from Brisbane CBD, has been transformed into a landmark environmental, recreational and industrial precinct with focus on knowledge industries.
- Lot developers are required to have rainwater tanks, recycling facilities, modern stormwater systems and energy conservation systems.
- High capacity optical fibre services are provided to every business park property.
- A new benchmark for integrating a business and recreational development with environmental conservation.

## EXCELLENCE AWARD



### James Cook University Creates Sustainable Future

Entered by MGF Consultants (NQ) Pty Ltd

- This report addresses the replacing of some 28 aged distributed chilled water plants for air conditioning with a new high efficiency Central Energy Plant, including Thermal Energy Storage, significantly reducing both electricity costs and greenhouse gas emissions.
- In addition, a 35% increase in air-conditioned floor area over the next four years is projected, which provides the opportunity to change the approach to overall air-conditioning delivery.
- MGF built a detailed computerised energy model to test different engineering solutions, with the preferred option based on 2010 scenario reducing electricity costs by an estimated \$990,000/year and site maximum demand from 9.8MW to 5.2MW.
- The engineering aspects were separated into a) Feasibility Report; b) Engineering Design Documentation; and c) Construction Phase with GHD nominated as construction managers with completion expected in early-2009.

#### The Judges were particularly impressed by:

- The project demonstrating a lateral thinking approach with overall resultant significant benefits for sustainability, the economy and the community as well as the client.
- The innovative development of a new thermal storage technology at a very large scale in a regional sub-tropical location.
- The allowance for future Campus expansion without further major electrical upgrade costs.
- The significant reduction of about 30% in electricity operating costs.

## HIGH COMMENDATION



### Airport Link EIS and Northern Busway CDIMP

Entered by Sinclair Knight Merz (SKM)-Connell Wagner Joint Venture

- This is the Environmental Impact Statement (EIS) of the 6.7km Brisbane Airport Link Project and the Concept Design and Impact Management Plan (CDIMP) of Stage 2 of the Northern Busway Project.
- This is a parallel investigation of the integrated Airport Link and the Northern Busway (Herston to Kedron) projects, which are designed to relieve traffic congestion in Brisbane's northern suburbs.
- Integration of these two major projects with conflicting objectives facilitates achievement of a better outcome for each project and resultant significant overall financial benefits.
- The SKM-CW Joint Venture supplied a range of services including engineering, environmental, community engagement, business case inputs and documentation for subsequent private sector bidding under Queensland's Public Private Partnership framework.

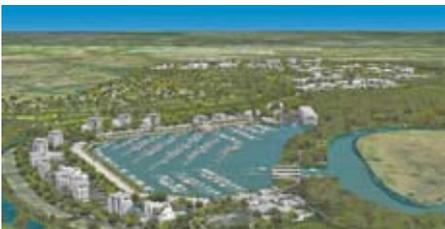
#### The Judges were particularly impressed by:

- The balance of many complex issues involved, illustrating ongoing efforts to balance community, economic and environmental values and priorities without compromising engineering standards.
- The incorporation of studies for these two major inter-related projects to optimise the outcomes for all stakeholders.

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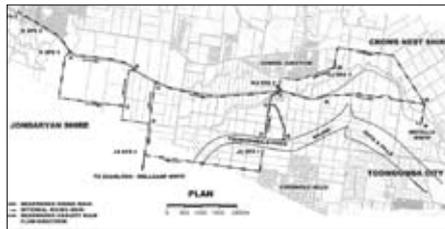
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### Engaging the Community Making People Matter

Entered by Three Plus Pty Ltd and Port Binnli Pty Ltd

- North East Business Park (NEBP) is a master planned precinct on the Caboolture River, involving a wide range of stakeholders and setting a benchmark for community engagement programs.
- The project aims to create a world class development creating the best industry, employment and community spaces creatively linked through innovative physical and social infrastructure.
- Three Plus (on behalf of Port Binnli and NRBP) undertook open community consultation, which was in addition to the legislated environmental impact process. The outcomes then informed the technical studies on which the EIS was based.
- The NEBP proposal is for a master planned mixed industry and business park, featuring an associated marina, marine industry precinct and complementary residential, commercial and community uses.



### Kingsthorpe and Gowrie Junction Sewerage Planning Report

Entered by Sinclair Knight Merz (SKM)

- Kingsthorpe (pop 1500) and Gowrie Junction (pop 800) townships just north west of Toowoomba were un-sewered with wastewater treated and disposed on-site for each property.
- This planning report includes regional treatment/disposal options, together with the wide range of necessary regulatory, permitting and funding processes for the establishment of this sewerage scheme in Rosalie Shire now part of Toowoomba Regional Council.
- The report recommends inclusion of an integrated approach to the whole urban water cycle management, including beneficial re-use of waste water.
- This investigation short-listed one local and three regional options. Based on detailed economic comparisons covering initial capital costs as well as ongoing costs, the lowest life-cycle-cost complete scheme was identified for sewage collection, treatment and disposal.



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## EXCELLENCE AWARD



### Model Based Management for Hydrogen Sulfide in Sewers

Entered by Gold Coast Water, Sydney Water, Advanced Water Management Centre of The University of Queensland

- Three years of collaborative research led to a model-based tool to facilitate management of Hydrogen Sulfide (H<sub>2</sub>S), which results in corrosion and the formation of odorous and potentially hazardous gases in pressurised waste water systems.
- This innovative "UQ Model" accurately predicts both spatial and temporal profiles of Sulfide along the lengths of pressurised wastewater networks and is successfully used in identifying the most cost-effective mitigation strategies.
- The model and on-line instrumentation have been successfully applied to the parts of the rising mains by both the Gold Coast Water and Sydney Water.
- Applications of this model are expected to result in significant economic, environmental and social benefits both nationally and internationally.

#### The Judges were particularly impressed by:

- The development and successful field application of an innovative mathematical model characterising the physical, chemical and biological processes occurring in pressurised wastewater networks.
- The use of this model which has already enhanced Gold Coast Water's management of corrosion and odour issues within their wastewater network, and enabled the clear identification of corrosion and the performance of more targeted inspections.
- The potential for universal application of this model with resultant contribution to the economy and to occupational health and safety.

## HIGH COMMENDATION



### Better Business Group

Entered by Baulderstone Hornibrook and Smorgon Steel Reinforcing

- This project was initiated with the objective of introducing innovations to change the way stakeholder construction companies interact by sharing knowledge, identifying and solving problems, increasing efficiency and opening lines of communication.
- This successful construction industry integrated supply chain management model is based on a partnering relationship concept derived from the manufacturing industry.
- The three most productive streams relate to Safety, Business Development and Efficiency.
- This model is now being used in other states and between other companies.

#### The Judges were particularly impressed by:

- This initiative by two companies to interact by sharing knowledge, identifying and solving problems, increasing efficiency and opening lines of communication, all in a partnering framework with resultant significant improvements in safety, efficiency and innovation.
- The potential for universal application of this model with resultant significant benefits to the economy and to occupational health and safety.



### Darwin Port East Arm Iron Ore Handling System

Entered by Parsons Brinckerhoff (PB)

- This study examined options for transferring iron ore from rail to stockpile at Port of Darwin without using an existing manganese ore conveyor, which introduced severe space limitations as well as strict time constraints.
- PB used a virtual reality-style computer program, utilising leading edge three-dimensional modelling, saving construction time and the need to build an entirely new train unloading station.
- Site constraints necessitated the adoption of world-leading techniques and the application of several innovative design approaches.
- PB's designs increased versatility at the conveyor exchange, as the additions made provision for another take-off in the future.



### Research & Development of Bridge Management Technology

Entered by Gold Coast City Council

- The objective was to devise intelligence techniques to predict future bridge condition ratings.
- The new deterioration model for the research and development project will provide breakthrough research outcomes as well as commercial benefits in the field of bridge management systems.
- This information enables the prioritisation and future needs of maintenance of a bridge both at various stages of its age and its condition.
- The Australian Research Council recognised the significant value in this project and its application at a national level.



### Sleeman Sports Complex Cogeneration Scheme

Entered by Project Services, Energex

- This project, developed by Energex's Energy Impact, is a joint arrangement involving Brisbane City Council, Stadiums Queensland and Project Services.
- Sleeman Sports Complex, Brisbane is the host site on which to build, own and operate a 770kW cogeneration scheme fuelled by gas from nearby landfill.
- This results in substantial reduction in methane gas and odour emissions from the landfill and the replacement of non-renewable energy sources for the sports complex.
- Waste heat recovery provides heating for the Brisbane Aquatic Centre's pools.



### Smart Solutions in Traction Power

Entered by Maunsell AECOM

- This was the first comprehensive review of Queensland Rail's (QR) power system infrastructure since its AC rail electrification in the 1970s.
- This Power Systems Assessment Study included a significant technical evaluation phase and review of world's best practice.
- The aim was to ensure equipment provided to manage and control QR's network was the best fit for current and future operation of the system and to take advantage of developments in technology.
- This resulted in significant and innovative outcomes producing world-class standards of rail safety and reliability.



### Virtual Fencing

Entered by CSIRO ICT Centre

- Virtual fencing utilises advances in wireless sensor and actuator networks to spatially control large herds of cattle without the need for physical fences.
- This replaces the need for conventional fencing in difficult areas such as along river banks and steep mountainous regions.
- GPS-enabled collars subjected to a combination of auditory and mild electric stimuli are fitted around the necks of animals which enable them to be kept behind any arbitrarily defined line.
- This project involves significant innovation and world-class engineering to successfully develop a system which has integrated cutting-edge technology with natural livestock and environmental systems.

## EXCELLENCE AWARD



### RoadEAR, Road Surface Noise Measurement Rig

Entered by ASK Consulting Engineers

- "RoadEAR", Australia's first Close Proximity Method (CPX) test rig provides cutting edge technology to record field data for the tyre / road component of traffic noise emissions (only).
- The test rig isolates tyre / road interaction noise from all other noise sources to assist in understanding the influence of tyres on road surface types.
- RoadEAR has recently completed its first commissioned project where numerous conditions were tested with five different road surfaces for the Queensland Department of Main Roads in South East and Northern Queensland.

#### The Judges were particularly impressed with:

- The thorough and dedicated research undertaken by a small consultancy.
- The unique mechanisms adopted in isolating road interface noises from all other sources such as engine noise and aerodynamics.

## HIGH COMMENDATION



### An Automated Giant

Entered by INETE Pty Ltd

- Inete is a specialised electrical engineering consulting firm contracted to rationalise and integrate several Programmable Logic Controllers (PLC) into a Bucyrus 137W class dragline at BMA's Peak Downs Mine in Central Queensland.
- This is of a different scope and a further development of an earlier project by INETE on a different manufacture of dragline for Blackwater mine.
- The company employed state-of-the-art technology, equipment and software to improve the dragline's operating costs.
- The project also included upgrading existing PLCs, as well as installing other hardware advances including an Ethernet Network for future remote monitoring and improved automation.

#### The Judges were particularly impressed by:

- The wide array of innovative features which can be introduced into other draglines resulting in superior operating characteristics for Australia-wide or international applications.
- The significant dragline upgrade being undertaken, within budget, by this small consultancy over a twelve week shut-down period in mining operations.

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### AGL Hallett Wind Farm – Stage One

Entered by icubed consulting pty ltd

- Icubed Consulting of Brisbane was engaged for detailed turbine foundation design for the AGL Energy Limited 45 x 2.1MW wind farm 220km north of Adelaide.
- The alternative design offered, using a high performance rock-anchored footing system instead of traditional gravity type footings, achieved substantial time, cost and material savings, whilst improving the environmental performance through a reduced physical and carbon footprint.
- This rock-anchored foundation system resulted in the use of only one-third of the concrete and reinforcement to achieve same performance outcome as traditional systems.
- Key aspects of the design included high level Finite Element analysis of the foundation/ground interaction to assess the stringent rotational stiffness requirements of the wind turbine.



### Smart Metering Project

Entered by Wide Bay Water Corporation

- This unique Automated Meter Reading (AMR) project provides a “drive-by” meter reading system that records water meter readings hourly for each of its 22,000 business and residential customers.
- These meters can be read remotely in vehicle mounted readers.
- The project is claimed as a world first and it provides Wide Bay Water Corporation (WBWC) detailed customer water use information, which enables the implementation of a range of innovative demand management policies such as – time-of-use water tariffs, water loss management and leading-edge use analysis and customer intervention programs.
- WBWC can now supply customers with detailed information about their water use. A 24-hour graph for the billing cycle is displayed on each water bill with comparison to the general daily average, to further encourage “water-smart” concepts.

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