



# PORT RIVER EXPRESSWAY

ABIGROUP  
PORT ADELAIDE SA

## THE MISSING LINK

Stages 2 and 3 of Port Adelaide's brand new Port River Expressway have been designed and delivered by Abigroup Contractors - the multi-service construction company with expertise in the delivery of complex infrastructure projects.

The Port River Expressway is an important strategic route linking State and national highways to the port and rail terminals at the Port of Adelaide. The project is being jointly funded by the South Australian Government and the Federal Government under the AusLink National Land Transport Plan.

Abigroup Managing Director, Mr Peter Brecht said the \$180 million project, which took three years to complete, will contribute to South Australia's economic development.

"It provides new road, rail and bridge connections across the Port River, linking vital export enterprises and industrial areas with key transport routes and facilities," Mr Brecht said.

"The project reduces road travel distances by up to three kilometres, reduces travel time, reduces rail distances by up to almost 4km and provides ongoing operational cost savings."

Stage 2 consisted of a four-lane, high-level opening road bridge across the Port River. Approximately 300m in length, the bridge consists of

eight fixed spans. Changes were made to existing local road networks to connect the new road link.

Stage 3 consisted of a single track, dual gauge, high-level opening rail bridge across the Port River, north of the road bridge, with connections to the existing rail system. The bridge is approximately 770m long, with 35 fixed spans.

The 61m rail and 58m road opening bascule sections each have a counterweight that balances the spans throughout the lift process. The opening bridges have a clean and uncluttered look because the counterweights and operating machinery are located out of sight in the piers supporting the bridge. The bridges are operated remotely from the traffic control centre located 16 kilometres away and require relatively little energy to operate.

Other features of the project include:

- Ten metre clearance to Mean Sea Level (approximately eight metres above high water) to enable tourist boats and smaller vessels unlimited passage;
- Opening spans to provide a 30m clear channel width for passage of tall ships and larger vessels;

- A clear zone 11m wide from the wharf edge and a minimum of 4.6m in height under the bridge. This allows for public boardwalks around the waterfront - which will be developed as part of the Port Adelaide Waterfront Redevelopment;
- Seventy seconds to open or close with back up mechanisms in the event of a power failure;
- Fendering between the two bridges to provide protection of the bridge piers.

Other key aspects of the project include connection into the local road and rail network - three kilometres of local road improvements and four kilometres of railway works including signalling, significant architectural features and landscaping.

Abigroup will maintain the project for ten years.

"Abigroup is strongly committed to delivering continued excellence through all areas of our business," Mr Brecht said.

"The broad services offered across our core engineering and building areas not only ensures clients receive the full benefit of our design, construction and management expertise, but also secures revenue streams to provide for our future growth, investment and continued stability.

"Abigroup understands the special needs of large construction projects - both in the civil engineering and building areas. In response to the considerations that projects of large scope and high value require, Abigroup's Major Projects Division is dedicated to ensuring that these projects run smoothly from EOI and tender stage through to contract negotiation, design and pre-construction phase.

Abigroup's Major Projects team has expertise and experience across a range of contract types, varying in delivery methods from DCM and BOOT to Joint Ventures, Alliances, Consortia and Public-Private Partnerships."



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## STEELING THE SHOW

RPG Australia is a leading integrated steel profiling and steel processing company. It is an Australian owned, multi-national supplier of specialist heavy steel components to the steel fabrication, engineering, construction and manufacturing industries.

Its capabilities include plate profiling, brake pressing, plate rolling, section rolling, guillotining, large diameter heavy steel pipe manufacture, heavy plate products and wind tower manufacture.

RPG Australia has a proud record of providing heavy steel components to many of Australia's major infrastructure projects.

The company is now playing a leading role in the manufacture of infrastructure for renewable energy, with significant wind tower and water pipe capability.

Major infrastructure projects include the Alice Springs to Darwin Rail Bridge, Warragamba Dam Deep Water Access project intake pipes, the Eleanor Schonell Bridge (Green Bridge), piling for the Gladstone Port Authority, Port of Brisbane Corporation wharves and the Melbourne Cricket Ground (MCG) upgrade. RPG Australia also supplied pipe and associated heavy steel components to the Comalco Alumina Refinery in Gladstone, Dalrymple Bay expansion project and many others.

But it is in the energy sector where RPG hopes for further growth. The company has supplied wind towers for many of Australia's leading wind farms including Starfish Hill, Lake Bonny, Wattle Point and Cathedral Rocks and has just secured the contract for the Capital Wind Farm at Lake George in New South Wales. The Capital Wind Farm is an expansive undertaking, with an overall capital value in excess of A\$300 million.

Leading international wind energy company Suzlon Energy Australia awarded RPG Australia the contract to manufacture 43 wind towers. The giant towers must be sturdy enough to withstand huge wind gusts of up to 210 kilometres per hour and are built to precise international standards using finest quality materials.

RPG Australia will use over 6,500 tonnes of Grade 350 XLERPLATE® steel in the construction of the towers Lake George, NSW, which when finished will stand approximately 80 metres high with a base diameter of 4.3 metres.

Managing director, Mike Lewis said the company is also reviewing opportunities in the solar and wave energy sectors.

"We've got a foothold in the renewable sector through wind, but we are also looking to a future in wave and solar energy," he said.

"We have already invested tens of millions in wind and plan to invest further millions in new plant and equipment to expand and increase our capability and capacity."

RPG manufactured and delivered ten steel railway bridge girders to Port Adelaide for Abigroup's Port River Expressway project.

The project included the profiling of plate, fabrication and welding the girders, NDT, paint inside and outside to customer specification and deliver to site.

Alan Church, Business Manager for RPG South Australia says, "One feature of the bridge design that challenged fabrication of the trough girders was the combination of curvature and camber, which varied along the bridge to suit rail requirements-some sections were cambered but straight, whereas other sections were cambered with varying curvature along their length."

"Additionally, an innovative and different style of rotating was designed and employed using a lifting device which simplified the manufacture. This process also required internal transport by our large forklifts, one each end, so the girder could be positioned without damage to the paint. Other equipment was designed to load onto transport and unload at site," said Mr Church.

The girders varied in weight and length from 12m to 35m in length and from 21t to 52t in weight. The material used was Grade 350 XLERPLATE® steel painted with a Hempel system to suit the contract requirement. Hempel paint was used throughout.

"RPG Australia has vast experience in the manufacture of bridge girders and the process involved a method of rotating the beams for positional welding," Mike Lewis said.

"The whole project went quite smoothly, we had a good working relationship with the Abigroup team which resulted in further work being ordered by Abigroup for the project."

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## THE NAME OF THE GAME

**F**RANKIPILE AUSTRALIA (‘FRANKI’) is the recognised name for piling works throughout the construction industry in Australia. Since Franki commenced in Australia in 1953, the name has become synonymous with a wide range of quality based foundation projects.

The company specialises in the design, manufacture, installation and testing of piled foundations.

In 1998 Franki became part of the Keller Group, the largest and most profitable specialist ground engineering and foundation contractor in the world.

The Franki operation is divided into three divisions which service Queensland, Western Australia and the Northern Territory from the main office in Brisbane, NSW from Sydney and Victoria, South Australia and Tasmania from Melbourne. The company’s head office is in Sydney.

Frankipile’s products include:

- Displacement Piles
- CFA Piles
- Franki Piles
- Bored Piles
- Restricted Access Piles
- Driven Precast Concrete Piles
- Driven Preformed Piles
- Piled Retaining Walls
- Dynamic Load Testing
- Static Load Testing
- Sonic Integrity Testing
- Design and Construction Packages
- Design Certification

Since it began operations in Australia in 1953, Frankipile has established an enviable reputation for the design and construction of a wide variety of cost effective and innovative foundation solutions tailored to the needs of the construction industry.

On the Port River Expressway project Frankipile installed over 450 driven cast in-situ enlarged base Frankipiles approximately 14m deep. Frankipile also carried out high strain dynamic pile testing to prove load capacities and performed low strain integrity testing on all piles.

Frankipile were able to redesign the layouts of 60 bridge piers and abutments for both the rail and road bridge to provide the most economical pile type and design. This redesign resulted in reduced pile numbers and reduced steel reinforcement in the piles. The job required a high level of safety techniques, management and procedures due to difficult issues such as working with in meters of road traffic, close to acid storage facilities or pipes, and working in restricted access areas.



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## THE ROAD TO SUCCESS

**B**urgess BLA provides fixed plant mechanical services and also has gearbox overhaul and rebuild facilities in Kalgoorlie and Townsville. Its mobile workshops are self-sufficient with on-site service minimising down time for clients.

Burgess BLA Managing Director, Paul Burgess started the company in the early 1990’s with the purchase of an advanced technology laser alignment tool. Today, this is still a small part of the business, but Burgess BLA’s key selling point is the experience that has been developed in large mechanical equipment, e.g. large gearing and large bearings.

Burgess BLA started out doing small jobs in the goldfields and today has progressed to a staff of fifty, servicing the mining industry across Australia. Major clients include BHP Nickel West, Olympic Dam, Queensland Nickel, Compass Resources, Kagara and KCGM.

Burgess BLA specialises in mechanical installations and has been involved in many large projects including the installation of mills at Batchelor NT, Armidale NSW, Century Mine QLD, Kagara and Mungana mines in NQ, and Greenfields mine WA.

In 2008 Burgess BLA worked with Abigroup on the massive Port River Project in Adelaide. Burgess BLA was responsible for the installation of the hinge pins on which the bridge pivots on, and the drive mechanisms to raise and lower the bridge.

In describing the process Paul Burgess said “the hinge pins weigh between 14 and 17 tonnes. The girder was heated to 110 degrees C, using heat blankets and gas heaters and the pins were shrunk in dry ice and alcohol. The interferences between shaft and girder were approximately 1mm.” This work was carried out at a workshop in Adelaide where the girders were being manufactured.



The second part of the job was the set up of the drive mechanism (known as the Bascule) under the highway bridge. This process consisted of setting up foundation plates to which the sole plates and gear boxes were secured. The alignment started with two large gears (known as the racks) on each girder, then pinions to the racks, gear boxes to pinions and finally differential to the motors.

All alignments were set within a tolerance using laser alignment equipment. Once this was completed the bridge was put through a series of checks, small adjustments were made, and then all hold down bolts were tightened to the correct torque. Finally foundation plates and sole plates were grouted in to reduce movement over the life time of the bridge. The work was done utilising one of their fully equipped mobile workshops.

“Setting the racks to the same radius as the hinge pins in a static position, then setting the racks parallel to each other so that the remaining drive train would stay in tolerance, it was a challenge” said Mr Burgess.

Burgess BLA looks forward to working with Abigroup on future projects.



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## FASTENING THE TASK

Since 2001 United Fasteners has established itself as a major supplier of fasteners and associated products to the industrial, mining and building sectors in Central Queensland and the Coal Fields. This was initially achieved with two warehouses located in Brisbane and Mackay. Since then, additional warehouses have been opened in Gladstone, Adelaide, Perth and Melbourne.

Specialising in the distribution of engineering fasteners to a wide range of Australian industries through comprehensively stocked warehouses, United Fasteners sources and supplies both standard and non-standard fasteners. Additional to fasteners manufactured from mild, high tensile and stainless steel they have expertise in the supply of fasteners manufactured from more exotic materials such as Duplex and Super Duplex stainless, nickel and copper alloys, Durehete etc. Mill certificates.

As the suppliers of all fasteners for the Port River Expressway, they were required to produce both specially manufactured products, as well as some of their standard range. One of the areas that did require special attention on this project were the varying acceleration of delivery times, which placed additional pressure on the production process.

With over 120 staff throughout Australia who have extensive experience and expertise in the fastener industry and particularly in the management of supply contracts, the United Fastener's team ensures a proper

understanding of the requirements of their clients. They realise that next to quality, and appropriate pricing, speed of delivery is of paramount importance.

United Fasteners is the only Australian fastener distributor to employ a Chartered Professional Engineer with significant experience in the design and application of fasteners and the introduction and management of quality systems. It is this dedication that makes them a formidable specialist in mechanical fastening technology, consistently concentrating on their core business of nuts, bolts, rivets and similar products.

Their strength is developing products and services ideally suited to the core requirements and processes of their customers. This is enhanced by offering easy and reliable supply together with top quality standards and excellent customer service.

United Fasteners are also accredited to ISO9001:2000

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### Power Flue "an Innovation"

Recognising a gap in the market Real Flame set about developing a product that would allow the installation of a gas fireplace into areas where traditionally it was not possible, such as ground floors, apartment blocks, high rise and where the intended fireplace did not back onto an external wall. The Power Flue was quickly recognised by architects and the construction industry as the perfect solution, approved to flue up to 13.5m horizontally the Power Flue enabled the installation of 150 fires over 44 storey's into the Royal Domain Tower in Melbourne and 38 fires over 12 storey's in the Evolve Apartments at Jackson's Landing in Sydney.

The innovation and simplicity of the Power Flue has helped to secure Real Flame's position in the Australian market as the leaders in gas fireplace technology.

To find out more visit [www.realflame.com.au](http://www.realflame.com.au) or call 03 9428 4443.



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