

MAKING THE CONNECTION

The Airport Link And Northern Busway is the longest road tunnel system & largest ever road infrastructure project of its kind in Australia.

AIRPORT LINK & NORTHERN BUSWAY / THIESS JOHN HOLLAND

Below The tunnel connects Brisbane's CBD to the northern suburbs and Brisbane Airport precinct, avoiding several traffic lights and ultimately reducing traffic congestion in Brisbane.



After nearly four years in construction the history making \$4.8 billion Airport Link, Northern Busway (Windsor to Kedron) and Airport Roundabout Upgrade will be operational in the coming weeks. The longest road tunnel system and largest ever road infrastructure project of its kind in Australia is set to revolutionise the Brisbane transportation system when it is open to traffic in August.

The Queensland Government appointed BrisConnections to deliver the project, which involves three integrated elements: the Airport Link M7 toll road, Northern Busway stage two (Windsor to Kedron line) and Airport Roundabout Upgrade. Construction of the projects comprises two separate tunnels (road and busway) and new airport connections. The ambitious venture includes the 6.7km mainly underground, multi-lane electronic free-flow toll road, with dual 5.7km tunnels; a 1.5km, two-lane underground bus-only road (the Windsor to Kedron section of the Northern Busway), and the 750m flyover and fast-diamond intersection replacing the airport roundabout.

The main scope of the project was the Airport Link. Primarily a tunnel, it connects Brisbane's CBD, to the northern suburbs and Brisbane Airport precinct and Australia TradeCoast, avoiding up to 18 sets of lights and reducing traffic congestion in Brisbane.

BrisConnections engaged Thiess John Holland, a joint venture between Leighton Holdings Limited brands Thiess Pty Ltd and John Holland Group - names synonymous with tunneling - to undertake the design, construction and commission of the colossal venture.

Under the contract, Thiess and John Holland also designed and constructed a section of

the Northern Busway between Windsor and Kedron and an upgrade of the East-West Arterial/ Airport Drive/ Gateway Motorway interchange at Brisbane Airport, referred to as the Airport Roundabout Upgrade.

The Roundabout Upgrade was completed and opened to traffic in February 2011 – nine months ahead of schedule. On April 30 this year practical completion of the Northern Busway was reached and handed back to the State Government for operation by Translink. The second stage of the busway is now operational following the first bus run on June 18. Major construction of Airport Link - the final component of the integrated project – is now complete, with the mechanical and electrical fitout, safety testing of all the systems and final commissioning to occur before hand-over to toll road operator BrisConnections.

“An innovative feature of the project was the use of world-first tunnel lining equipment.”

An innovative feature of the project was the use of world-first tunnel lining equipment. Four 'variable arch-form' machines were commissioned to line the multiple lane configurations of the Airport Link and Northern Busway tunnel network with a series of concrete arch segments, ensuring a top quality finish to meet the 100-year design life.

The variable nature of the machines made them unique and through the use of

hydraulics and a series of steel segments, the arch form could transform from a 350-tonne machine that lines a 17-metre-diameter, three-lane tunnel, into a 500-tonne machine capable of lining a four-lane, 30-metre-diameter tunnel. “Having these machines that could cope with Airport Link's varying tunnel dimensions saved the project a significant amount of time and money,” Thiess John Holland Communications Coordinator Christine Goodwin explained.

This feat in Australian infrastructure is made even more astonishing considering it was conducted in suburbia. Ms Goodwin said construction of the project presented many challenges for Thiess John Holland – the sheer scale of building three projects in one; difficult and varying ground conditions across the project alignment; together with the majority of works being located directly adjacent to/within residential and commercial areas crossed by waterways, major arterial roads, motorways and railway lines. The Thiess John Holland team drew on national and international expertise, and a resilient, professional and considered approach was required to manage these challenges from project start to completion.

The project generated 12,000 indirect jobs and once in use the transport system is expected to reduce peak hour traffic by as much as 40% on some routes and significantly improve residential living conditions by reducing traffic congestion, pollution and noise in suburban streets. The techniques pioneered by Thiess John Holland on the Airport Link, Northern Busway (Windsor to Kedron), Airport Roundabout Upgrade will set a precedent for future Australian infrastructure works.

Below Rob Carr Pty Ltd was engaged to construct the sewer diversion works on the Brisbane Airport Link infrastructure project.



Considered Australia’s innovators in underground pipe and service installations, Rob Carr Pty Ltd was engaged to construct the sewer diversion works which enabled commencement of the Brisbane Airport Link infrastructure project.

Airport Link is a 6.7km toll road, mainly underground, connecting the Clem 7 Tunnel, Inner City Bypass and local road network at Bowen Hills, to the northern arterials of Gympie Road and Stafford Road at Kedron, Sandgate Road and the East West Arterial leading to the airport. However, the location for the proposed Airport Link Tunnel was directly in line with the Toombul Sewer tunnel.

Rob Carr Pty Ltd was contracted by Thiess John Holland to provide specialist tunnelling, deep shaft and excavation construction expertise to construct the DN800 sewer diversion around the proposed location for the new airport link tunnel. The works were critical as the diversion had to be completed prior to major portions of the construction work being undertaken so as to commence the Airport Link tunnel.

With over two decades of experience as a specialised civil works and tunnelling contractor, Rob Carr Pty Ltd is an industry leading trenchless and civil engineering contractor which has completed hundreds of diverse water, wastewater, energy and utility infrastructure projects. With unmatched experience and know how, the company has completed many of these complex infrastructure projects for most major water, power and energy authorities as well as multiple Public Private Partnerships and Tier 1 Contractors throughout Australia.

The project involved the installation of 900m of DN950 steel casing pipe which Rob Carr

installed via both conventional excavation and trenchless (microtunnelling) techniques. This work was subject to critical timeframes as well as tight alignment and pipeline grade tolerances as required for construction of the pipeline beneath a creek, major roads, and railway lines.

Upon completion of the pipeline section of works, the company installed a DN800 HDPE pipe within the casing pipe and grouted the annulus between the two pipes per design requirements.

Other major works included the construction of critical stormwater diversion works via trench excavation, construction of deep shafts and cast in situ concrete manholes for the sewer pipeline in most cases over or adjacent to critical existing services and structures. The Company also undertook multiple connections of the pipeline to the existing sewer infrastructure under live conditions at critical junctures along the pipeline.

The works required construction in highly sensitive urban/residential environments and as such, a high level of interaction with the community. Most of the pipeline installation and construction was undertaken in difficult ground conditions which consisted of wet soft to medium stiffness clays with depths of excavation ranging up to 11m.

Formed in Victoria in 1989, Rob Carr Pty Ltd has worked in many difficult locations and boasts an impressive client list of government authorities, public private partnerships and major tier 1 contractors across Australia.

The company operates primarily out of its central maintenance workshop and office complex in Yatala QLD, a facility which is the

company’s flagship centre for its entire fleet of machinery and equipment and complements their two other complexes in Welshpool WA and in western Sydney.

Rob Carr Pty Ltd has an impressive fleet of 14 microtunneling control cabins which between them operate more than 30 microtunnel boring machines, as well as ancillary equipment. The TBM fleet has the capability of installing pipe diameters between 150mm and 2400mm through varying ground conditions.

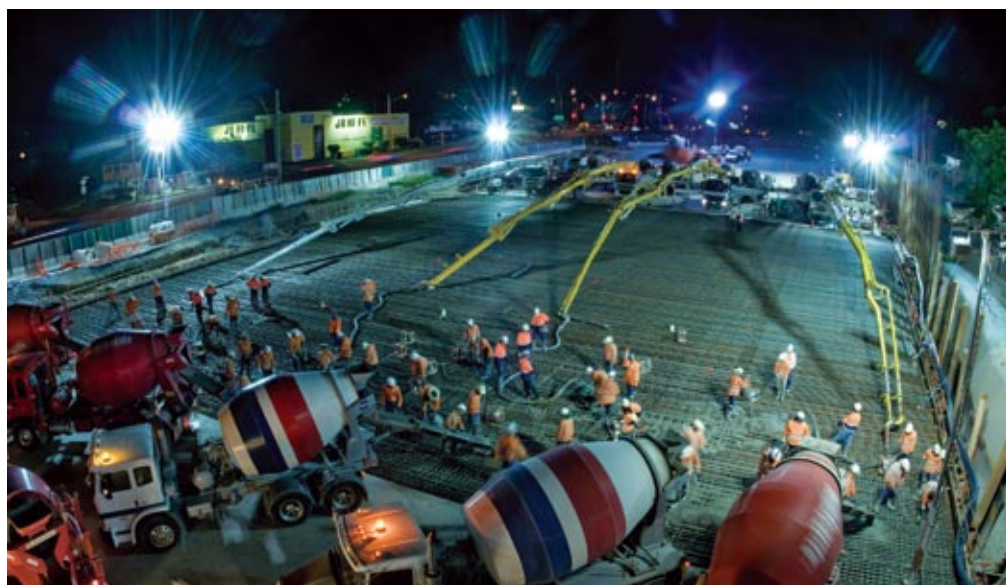
While the tunnelling business has expanded rapidly over the past 10 years, Rob Carr Pty Ltd has still maintained its capabilities within the conventional and specialty civil construction fields and owns an extensive list of civil construction equipment.

Their capabilities are showcased in projects throughout Australia including the Halls Head and Port Hedland Infill Sewerage projects in WA, the \$220m Beenleigh Merrimac Pimpama Alliance project on the Gold Coast and the Northern Networks Alliance Northern Pipeline Interconnector project on the Sunshine Coast, projects which further enhance the reputation of Rob Carr Pty Ltd delivering quality infrastructure projects through trenchless technology.

For more information contact Rob Carr Pty Ltd, WA Office: 5 Bellows St Welshpool WA 6106, Postal PO Box 396 Welshpool WA 6986, phone 08 9358 2422. **NSW Office:** 20 Aird Rd Minto NSW 2566, Postal PO Box 5111 Minto BC NSW 2566, phone 1300 883 602. **QLD Office:** 74-76 Union Circuit Yatala QLD 4208, Postal PO Box 6103 Yatala QLD 4207, phone 1300 883 602. **Contact:** Angelo Soumboulidis, mobile 0413 019 143, email: angelo@rob carr.com.au, website: www.rob carr.com.au



Below Ausreo was awarded the supply contract of reinforcing products to Australia's largest infrastructure project; the \$4.8 billion Airport Link, Northern Busway.



Ausreo's products may not be flexible, but the business model and approach to customer service this steel reinforcement company offers definitely is.

For more than a decade, Ausreo has supplied concrete reinforcement products to the building and construction industry and is considered a first class supplier in the concrete reinforcing market. Their product range is extensive and includes: reinforcing bar, reinforcing mesh building accessories.

Incorporated in 2000, Ausreo has experienced unprecedented growth, with nine service centres across the eastern seaboard states of Australia and employing over 150 personnel. Testament of the company's commitment to service and product superiority is explained by CEO

Dennis Crestani: "no job is too big or too small; it's about delivering on our promise."

The company embarked on its most ambitious project to date when it was successfully awarded the supply contract of reinforcing products to Australia's largest infrastructure project; the \$4.8 billion Airport Link, Northern Busway (Windsor to Kedron) and Airport Roundabout Upgrade.

In order to service this challenging project: "we created a wholly owned subsidiary of Ausreo called Brisreo to do the job," Mr Crestani said. Based in Northgate, Brisbane, Brisreo was opened in early 2009 to manage and operate the heavy bar bending facility to toll process (take delivery, schedule, process and deliver) - 120,000 tonnes over three years - reinforcing steel for the BrisConnections owned Airport Link project for primary contractor Thiess John Holland.

Employing up to 100 people over the duration of the contract, Brisreo's factory was equipped with state-of-the-art machinery, processing reinforcing steel to exacting standards, which was delivered to site ready for uptake into the project. Mr Crestani said the company delivered on all its promises, namely "crucial lead time parameters, demanding design and engineering challenges."

The biggest challenge for the Brisreo team was the sheer scale of the project. "It was on multiple fronts, the job presented unique challenges in that we had differing demands from all work areas across the entire project. We accepted challenges from Thiess John Holland when they changed their program, for example we often worked through the night and on weekends to achieve program deadlines of TJH," he said.

"We supplied a really flexible model which ramped up capacity to meet the varying demands of the job as it progressed." The supply contract was delivered on time earlier this year (2012). "We had the in-house expertise and world's best practices and processes to manage and deliver a job of this size on time and under budget, whilst remaining flexible to the customer's requirements," Mr Crestani said.

The arrival of Ausreo in Queensland has proved successful with the opening of two service centres to supply reinforcing products to the Queensland market, following Ausreo's purchase of Sydney Mesh and Steel Pty Ltd in December 2006. Continued growth and the desire to provide a professional service in the fast-paced building industry prompted the merger. While Ausreo has the proven track record to deliver on Australia's largest infrastructure project, no

job is too small. Mr Crestani said the company's policy to provide best quality products on time for all projects - commercial, residential and engineering has resulted in repeat business from satisfied customers.

Today, Ausreo has cemented itself as one of the nation's leading supplier of steel reinforcing products, with four sites in NSW, including the company's head office at Wetherill Park, four centres in Victoria, including the Melbourne HQ at Sunshine and two centres in Qld located at Carole Park and Gold Coast. The company adheres to strict construction safety practices and is a member of the Australian Certification Authority for Reinforcing Steels Ltd (ACRS).

Other projects Ausreo has supplied include: Civic Plaza Chatswood, Star Casino and

Liverpool Hospital. The refurbishment of Australia's iconic Sydney Opera House is currently in the capable hands of Ausreo.

For more information contact

Ausreo VIC:

Sunshine North – (03) 9313 2700

Pakenham – (03) 5941 6822

Melton – (03) 9743 1277

Ausreo NSW:

Wetherill Park – (02) 9765 2100

Brookvale – (02) 9905 8556

Taren Point – (02) 9531 8884

Penrith – (02) 4731 1108

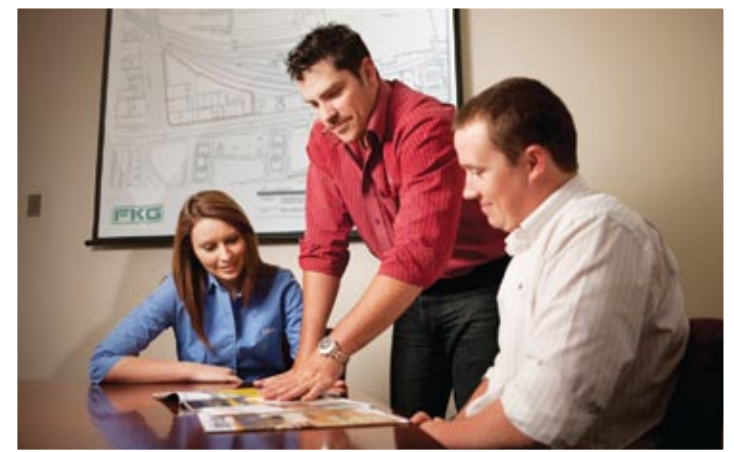
Ausreo QLD:

Carole Park – (07) 32924999

Gold Coast – (07) 5597 2933



Airport Link Operations Centre completed May 2011



The family values that underpin the success of the FKG Group will continue well into the future



The FK Gardner & Sons Group (FKG) is a proud family enterprise built from a 40 year construction and engineering heritage. From modest beginnings in rural Brookstead, some 240km west of Brisbane, in 1963, Francis 'Frank' Kevin Gardner worked on any project from small farm sheds to home renovations, pioneering what is today a multi-divisional company with an annual turn-over of \$500 million.

FKG employs more than 600 personnel across its bases in Toowoomba, Mackay, Brisbane, Roma and Cairns and its clients benefit from the company's capacity to leverage the services offered across its five divisions: Construction, Civil, Mining, Development and Design and the plant hire and commercial plumbing arms of FKG Solution Partners, Ezyquip Hire and Total Hydraulic Services.

Traditionally a regional builder specialising in remote area projects, in recent years the company has embarked on works throughout the eastern seaboard states of Australia. With a strong reputation for peak performance and value, FKG has impressed with its capabilities in technically challenging and specification driven projects, such as the BrisConnections \$4.8 billion Airport Link, Northern Busway (Windsor to Kedron) and Airport Roundabout Upgrade project.

FKG submitted a fully documented tender for the construction of the \$10 million Airport Link Operations Centre (ALOC) - the hub of Brisbane's impressive toll roads development. Behind the contemporary façade of the two-story ALOC building, which is a mix of aesthetic features and practicality, is a fully functional command centre. It is home to a customer service centre, customer call centre, tunnel control centre, operations and maintenance area with space for the BrisConnections administration office where surveillance and safe operation of the toll road is assessed 24/7. Additional on site facilities include:

truck shelter/wash bay, bunker storage facility, refuse/recycling enclosure and external storage.

Working closely with principle contractor Thiess John Holland to deliver on their specific design briefs, FKG Group Manager of Construction Wayne Rowe said the project presented some challenges. "One of the specialties of the building is that it was built to the Department of Main Roads Standard Specification. The building tolerances and inspection standards required to deliver a project under this standard are quite detailed. FKG project staff were able to successfully deliver these works utilised our Company Quality System to ensure the works were delivered in accordance with the Main Roads specification, this requires an increased level of commitment from the project staff and the Bris Connections team to achieve this outcome."

"Much of our civil work involves helping clients with design to optimise value for money."

Negotiating the largely suburban site in Brisbane's northern suburb of Kedron required extensive pre planning and programme management. "We had very little room to manage the material handling for the building delivery. The future building, associated hard stand and staff parking covered the entire site. The dedicated point of access was at times required to be a shared site access for the adjoining site west of the future control building that we were constructing. The site was confined between the highway on one side and existing occupied residential housing on the other so management of this access point was a critical delivery requirement" Mr Rowe

explained. The Airport Link Operations Centre was recently named the 2012 winner of the Brisbane Region Master Builders Award for best Commercial Building over \$5million.

In order to coordinate the build and meet targets, a regimented program was implemented, which ensured suppliers, sub-contractors and visitor could enter the site without delay and with minimal disruption. Completed in September 2011, Mr Rowe proudly states The project was delivered with very difficult site constraints to best industry standards for Safety, Time Quality and Cost.

FKG has evolved to become a multi-disciplinary team of professionals. Group Manager of Civil operations Kenn Hall said FKG is experiencing strong growth across its civil division and is involved with major reconstruction works in the flood devastated areas between Roma and St George. In addition, FKG is forging strong ties in the mining sector through new ventures with stakeholders involved in the coal seam gas industry in Queensland's Surat Basin and the company's \$80 million Witmack Industry Park at Charlton. "Much of our civil work involves helping clients with design to optimise value for money", Mr Hall said.

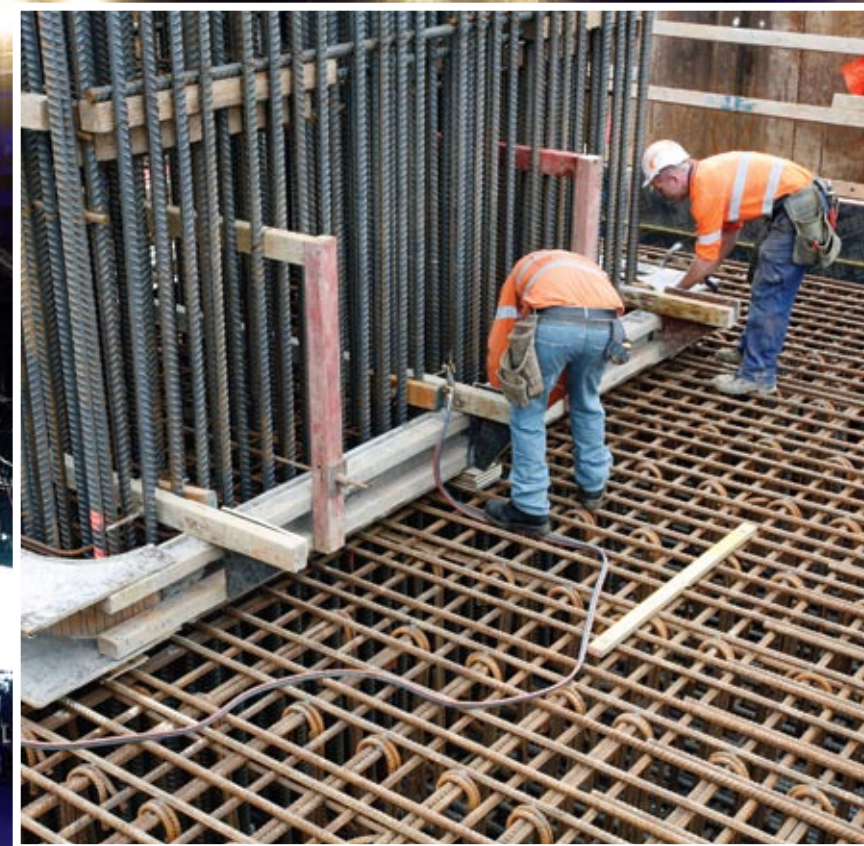
FKG's commitment to outstanding levels of health, safety, environment, quality and value performance has been recognised with numerous industry awards including: Master Builders Award Civil Contractor of the Year (2009, 2010, 2011, 2012), Innovation in Workplace Health and Safety (2009, 2010), Apprentice Employer of the Year (2009, 2010, 2011, 2012) and the NCSI Chairman's Award for Management Systems Excellence from over 3000 entries.

For more information about FK Gardner & Sons Group please refer to the website www.fkg.com.au

Below TEAM Rock Anchor provided the expertise to shore and retain the intricate, underground tunnel systems.



Below Kenny Constructions specialise in elevated roadways, bridge work and piers, as well as complex underground infrastructure.



Picture this; a casing machine, a drill rig, a gantry crane and a concrete pump. Four geotechnical engineering machines strategically positioned one behind the other in a tunnel barely 10m wide and 200m long (but only 50m of which is accessible). Semi-trailers rumble down the other side of the tunnel to cart excavated material. It's tight. Add the heat of a scorching Queensland summer, which is only exaggerated by the tunnel environment, and you can begin to appreciate the extraordinary efforts of TEAM Rock Anchors.

The Brisbane-based drilling and ground engineering contractor has developed a strong reputation for professional, quality results since its inception in July 2006. Proof of this is its successful tender to carry out ground works on Australia's largest ever infrastructure project – the Airport Link, incorporating the Northern Busway (Winsor to Kedron) and Airport Roundabout Upgrade.

Specialising in ground anchoring, shotcrete (sprayed concrete) and retention systems

design and construction, TEAM Rock Anchors provided the expertise to shore and retain the intricate, underground tunnel systems, namely tension piles, rock anchors, shotcrete, steel waler and cut-off walls.

Commissioned to complete 37 separate scopes of work in total on the ambitious Brisbane development, TEAM Rock Anchors Managing Director Barry Jones said there were four stages of particular importance; the CC211/212 tension piles in Kedron, the CC701 cut and cover tunnel in Lutwyche, the Northern Bus Station at Lutwyche and the CC102 tunnel in Bowen Hills.

TEAM Rock Anchors started the ground works in late 2007 and completed their last major element of contract works in March this year (2012). Despite having a number of geotechnical bore logs, it was impossible to predict what they would encounter. "We were drilling into rock hard granite one minute and soft alluvial river bed material like toothpaste the next. Both the level of resources used and

the wear and tear on machines was extreme," Mr Jones said. At the height of site activity, crews worked around the clock.

So specific were some of the requirements of the BrisConnections project, TEAM Rock Anchors had two gantry cranes custom built for the installation of the tension piles within the height restrictions and two drill rigs had their drill masts "basically cut in half to fit in the tunnel."

With over \$7 million worth of work completed over numerous scopes on the Airport Link project alone; a portfolio that includes the Cardwell Range Highway upgrade and Clermont Coal Mine and a staff of up to 60, TEAM Rock Anchors has a bright future.

For more information contact TEAM Rock Anchors, 8 Andrew Campbell Drive Narangba QLD 4504, phone 07 3888 6775, fax 07 3888 6114.

From site set up in Toombul in 2009 through to finishing concrete barriers in May this year, civil construction specialist Kenny Constructions Pty Ltd has played a pivotal role in the creation of Brisbane's history-making Airport Link, Northern Busway (Windsor to Kedron), and Airport Roundabout Upgrade.

The Thiess John Holland Alliance venture is the biggest infrastructure project completed in Australia to date and Kenny Constructions Pty Ltd has been involved from an early stage. The scope of works include: the Bowen Hills surface works, the southern mined tunnels (Bowen Hills to Lutwyche), the northern Toombul TBM Tunnel (Toombul to Kedron), the central mined tunnel (Kedron) and the Northern Busway.

The mid-tier contractor has a strong reputation for expertise in the supply and installation of formwork, placing and finishing of concrete, pre-fabricating and tie-in-situ of reo and erecting such items through the use of their fleet of mobile cranes, telescopic loaders and bob-cats.

Formed in 1994, one of the first contracts awarded the Sydney-based operation was the Olympic Park site and associated concrete infrastructure works. Today, with a workforce of 100 (180 at the height of activity on the Airport Link assignment) and offices in Sydney and Brisbane, Kenny Constructions Pty Ltd is involved in various sectors across the construction, civil and mining industries. The company specialise in elevated roadways, bridge work and piers, as well as complex underground infrastructure: concrete tunnel lining, cross passage construction and smoke ducts.

Construction Project Manager Conor Martin describes the company as "adaptive and innovative." "We have a lot of experience in constructing complex structural work in tight areas underground and also above ground at height." The company's professionally-trained team of project managers, engineers, OH&S officers and skilled tradespeople applied innovative construction techniques, namely automated form work in the restricted Airport

Link cross-passage tunnels, which made the project more time and cost efficient.

"We have our roots in NSW, but we've been involved in Brisbane for the last six or seven years and just last year we moved into South Australia" Mr Martin said. In Adelaide, Kenny Constructions is contracted to install all the pad foundations for the pier work on the SA government's \$800 million Urban Superway Project.

Kenny Constructions is making inroads into the stringently regulated mining sector and has received commendations from industry heavy weights BHP Billiton and Bechtel Corporation for work at the South Walker Creek Coal Mine.

For more information contact Kenny Constructions, 365 Wondall Road Tingalpa QLD 4173, phone 07 3396 3133, fax 07 3396 3144, email: info@kennyconstructions.com.au, website: www.kennyconstructions.com.au