

A PROJECT TO BE PROUD OF

Southern Gateway Alliance (SGA) has many reasons to feel great pride in the delivery of the Mandurah Entrance Road project in Western Australia. Not only was the project completed almost three months ahead of schedule, LTI-free and under budget, it also incorporates some innovative design and construction solutions.

SGA comprised Leighton contractors, WA Limestone and GHD, working in partnership with Main Roads, the State road agency. SGA was awarded the contract following their successful delivery of the \$705 million New Perth Bunbury Highway project. The \$155 million Mandurah Entrance Road (MER) project provides a 6.5 kilometre direct link from the Kwinana Freeway to Mandurah, and was funded by both the Commonwealth and the State Government of Western Australia.

Construction works included 6.5km of four lane dual carriageway; a three leg roundabout at Mandurah Road; a new 220 metre railway underpass tunnel and a 170 metre tunnel extension; upgrades of local road intersections; and links to Stock Road north and Education Drive.

The MER straddles the passenger railway line for approximately four kilometres, with carriageway separated from the rails by extensive retaining walls. The Mechanically Stabilised Earth (MSE) walls, comprise 3575 concrete panels measuring 2 metres x 2 metres in height and approximately 160mm in thickness. Each panel was placed using an excavator and on average, between 50 and 80 panels were placed each day. The combined 3.5 km of MSE wall features a painted design by

a local artist, which is one of the world's largest painted artworks in a transport context.

For added motorist safety, over 4km of TL5 Concrete slipform barriers were also installed adjacent to the railway line. These barriers were cast using a unique concrete design mix which allows the barrier to maintain structural integrity and form without formwork being used. A kerbing machine imported from the USA was used for the task, and a custom made mould designed for this specific type of barrier.

In the earlier stages of the project, SGA worked with the Public Transport Authority to construct two rail tunnels. This proved to be the most intensive part of the entire construction program.

In Parklands a 220 metre long tunnel featuring 220 precast concrete arches and 15 headwall panels was constructed, enable the northbound carriageway of the MER to cross to the eastern side of the railway line. At Mandurah Road, the existing tunnel was extended by 170 metres to enable the construction of a roundabout; this tunnel comprised 144 precast concrete arches and four headwall panels. The precast elements for both tunnels were constructed in Perth and transported to site for erection. Work on both tunnels was staged concurrently, in the tight timeframe of three weekend rail shutdowns.

The roundabout at Mandurah Road is a unique two lane roundabout design, with a centre island approximately 56 metres in diameter. The roundabout

comprises three legs including the MER and Mandurah Road both north and south bound, as well as a stub end for Exchequer Road, which is to be completed by council. At the northern end, the MER ties in with the Kwinana Freeway extension via a diamond type interchange that was created as part of the New Perth Bunbury Highway project. Minor connections were created at Education Drive to service the Peel TAFE Campus, as well as at Stock Road north for the adjacent quarry.

To mitigate noise generated by MER traffic, almost two kilometres of limestone walls averaging 3.1 metres high were erected at various locations. This construction task challenged SGA's crews, with the majority of noise wall sited on a large hill. This meant the wall had to be stepped 135 times, or around every six metres. Additionally, the limestone blocks that comprise the walls are 1metre X 0.35 metres X 0.35 metres and weigh approximately 184 kilos each.

Approximately 600,000 cubic metres of material was utilised from the road reserve for the project's earthworks, while an additional 100,000 cubic metres of sand was extracted from the site and placed at the future Road B reserve in the MER's immediate vicinity.

More than 700,000 square metres of paving material was imported to construct the road, which comprises varying layers of subbase, basecourse and deep lift asphalt.

The sealed shoulder of the MER provides a cyclist amenity and a large underpass was erected to enable safe passage for pedestrians and fauna between Marlee Reserve and Black Swan Lake in Parklands. Additionally, smaller underpasses and seven kilometres of wire fencing were provided to encourage fauna to cross under the road.

The entire project site comprising 30 hectares of land was rehabilitated using 100,000 native seedlings and 130 kilograms of native seed. In the adjacent Marlee Reserve, a legacy for the community was created, with the construction of a network of walking trails, a boardwalk and fauna fencing. Nine artificial nesting boxes known as "Cockatubes" were also installed to contribute to the ongoing protection of local bird species.

The MER was officially opened on 7 October 2010, and is a brilliant example of best practice civil construction, meeting a critical transport infrastructure need while also caring for the community, the workforce and the environment.

MANDURAH ENTRANCE ROAD

MAIN CONSTRUCTION COMPANY : Southern Gateway Alliance
DEVELOPER : W.A State Government
PROJECT END VALUE : \$155 Million
LENGTH : 6.5km of dual lanes
COMPLETION : October 2010
ARCHITECTS : Birchgroup



DELIVERING THEIR BEST TO THE WEST



Whenever a project anywhere in Western Australia needs quality, well-maintained equipment and professional and experienced people, Kais Contractors provide a fast response – 24 hours a day, seven days a week, 365 days a year.

For the Mandurah Entrance Road project, Kais supplied Southern Gateway Alliance with a 730 Cat Water Truck with an experienced Operator Carla Van Dyk, and ongoing labour hire. The company also supported SGA with the Forrest Hwy, supplying 140h Cat graders and 730 Cat water trucks.

Kais Contractors has over 33 years experience in the mining, earthmoving and construction industry. Dave and Sharon Kais deliver 24/7 service to their clients supplying the company's Caterpillar fleet, parts, service, maintenance and repairs. Topcon GPS systems and lasers are also available for hire. The company's extensive regional contacts also ensure that no matter how remote the site, any hour day or night, mechanical help is always close at hand.

"Our success is due to our commitment to quality, well maintained equipment and excellent customer service," said Director Sharon Kais.

"We supply both wet and dry hire options to all clients to meet the needs and budget of every project. We offer support to our clients with

Labour Hire of Mobile Plant Operators for all positions if required. These personnel are very professional and experienced operators capable of meeting all the requirements of every assignment. We can also source or will buy any machinery for a project.

"All our plant is well maintained to the manufacturer's specifications and the fleet is kept to low hours for high performance. Our high standards ensure all machines are delivered to every job with a high presentation. Meeting 100% productivity for our clients is the most important accolade in this business."

Other projects Kais have assisted include BHP - RGP4,5,6 for rail expansion throughout the Pilbara region with NRW and MLJV; the Ord River Expansion with Moonamang JV; Mt Gibson with Brierty Ltd; Rio Tinto's Channar Rehab, with Labour Hire of Indigenous Mobile Plant Operators; Hopedowns Access Roads and Infrastructure for Hopedowns Mine; FMG – Earthworks for the Rail, Port and Christmas Creek access roads and expansions; Rio Tinto - Brockman expansions; Thunderbox; Cape Lambert with Macmahons and Abigroup; Dampier Salt operations; Onslow Salt operations; Roe Hwy Alliance; Newman Hub; Alkimos Water Treatment Plant; and Perth subdivisions.

KAIS CONTRACTORS Pty Ltd
Unit 1, 42 Victoria Street
Midland WA 6056
t. 08 9274 1060
f. 08 9274 3201
e. Sharon@kaiscontractors.com.au
www.kaiscontractors.com.au



PINJARRA LIFTS THE WEST

With a tight construction schedule and a need for scrupulous safety, Southern Gateway Alliance relied on Pinjarra Crane and Access Hire to provide them with the lifting power and skilled operators needed to complete the Mandurah Entrance Road project.

Pinjarra have been a major supplier of cranes, transport, access equipment and labour for Southern Gateway Alliance since the beginning of the New Perth Bunbury Highway, and continued on as a preferred supplier into this next stage of the upgrade of major transport routes in the South West of Western Australia.

Pinjarra's contribution has included supplying casual cranes on an as required basis, supplying permanent labour and long term cranes for the various bridges constructed during both projects. Equipment ranged from 15t Franna cranes and multiple EWP's through to 100t All Terrain cranes.

Pinjarra's impeccably maintained fleet includes the Australian designed and built All Terrain Franna AT15, AT20 and MAC 25. Tadano 25 tonne RT, Tadano 55 tonne Truck cranes and Liebherr All Terrain cranes up to 130 tonne capacity. Genie knuckle and straight boom EWP's up to 135', Genie electric and diesel rough terrain scissor lifts and Genie Tele handlers from 2.5 tonne – 4.5 tonne capacity, as well as an extensive range of transport options.

In an industry where safety records speak volumes about a company's abilities, the proof of Pinjarra's management expertise and OSH&E performance is evident in the company's enviable nil Lost Time Injuries record.

Not only do Pinjarra provide their clients with the latest equipment and technology, Managing Director Chris Fairman has substantial hands on crane industry experience throughout Perth and the Goldfields region, ensuring an informed, reliable and professional service. Chris is considered to be a Industry Expert in Tilt-Up Construction by Worksafe, holds qualifications in Transport and Distribution (Mobile Cranes) and offers a training package for young workers entering the industry.

Chris and his team are constantly sourcing new and improved methods for cranes and access equipment to provide the best possible lifting and access solutions for infrastructure projects, construction, resources industries and all site-specific materials handling needs.

PINJARRA CRANE AND ACCESS HIRE
PO Box 694
Mandurah WA 6210
t. 08 9531 3855
f. 08 9531 2457
Managing Director: Chris Fairman
m. 0407 475 202
e. chris@pinjarracranehire.com.au
www.pinjarracranehire.com.au



LEADING THE WAY WITH TRAFFIC MANAGEMENT SOLUTIONS

Traffic management on a major project like the Mandurah Entrance Road is a demanding and complex business, with lives riding on the solution. Carringtons Traffic Services provided the solutions which ensured vehicles kept moving and safety of workers and drivers was scrupulously protected.

Utilising data supplied by MRWA (Main Roads WA), road design and construction plans provided by the Southern Gateway Alliance (SGA), and the wealth of experience gained on previous projects, Carringtons Traffic Management Design Team designed Traffic Management Plans which incorporated information on work methods, staging and scope of works from SGA's site engineers and managers. The TMPs detailed signage location for temporary works, aftercare and how traffic was to be managed past the work site. Safety was managed by using speed restrictions past the work area, installation of delineation devices and where necessary barrier systems. All TMPs were designed in accordance with AS 1742.3 to ensure a safe work place for all SGA staff and sub-contractors.

The major challenge was maintaining vehicle flows on Mandurah Road during the construction of the roundabout at the project's southern end. With high traffic volumes, keeping delays to a minimum and avoiding congestion where possible was a priority. Carringtons maintained an onsite crew of up to 12 Traffic Controllers for over a year, from initial construction through to the final remediation and defects phase.

"We are developing an in house training programme designed to up skill new and existing traffic controllers to standard above client expectations.

We are working towards a reputation of preferred supplier to the market based on professionalism, cost effectiveness and exceptional traffic management solutions," said Rainer Offermann, Managing Director of Carringtons Traffic Services.

"We would like to thank the SGA staff, project managers and engineers for the opportunity for us to work on a high profile project, allowing us to show what Carringtons Traffic Services can provide in terms of Site Safety and assisting in managing roadwork sites on long-term projects."

Carringtons has an outstanding track record, also recently providing their services to Package E, F & D for the Perth-Mandurah Rail Line, which included the construction of South St / Bullcreek and Canning Hwy Train stations; Geraldton Southern Transport Corridor and the Eyre Highway. In addition to providing total Traffic Management Plans and Traffic Control, they provide signage, crash barrier systems and guard rails. The dedication and experience of Carringtons' management team ensures that every project they undertake, big or small, long term or short term, is provided with cost-effective measures tailored to the needs of the site.

CARRINGTONS TRAFFIC SERVICES
t. 08 9356 7750
f. 08 9356 7751
e. info@carringtonswa.com
www.carringtonswa.com

