ANCIENT ARTEFACTS INSPIRE A BRAVE NEW FIRST

The Brighton Bypass Project will provide safer, more efficient movement of freight and general traffic between Hobart and Tasmania's northern cities and ports.

MAIN CONSTRUCTION COMPANY : VEC Thiess Joint Venture
CLIENT : Tasmania Department of Infrastructure, Energy & Resources
COMPLETION : November 2012
PROJECT VALUE : $120 Million

The VEC Thiess Joint Venture faced enormous challenges in delivering the northern section of the Brighton Bypass, Tasmania's largest ever road infrastructure project. In the process of doing so, they not only set a new benchmark for Australian bridge construction, they also delivered their entire package of works three months ahead of schedule.

Located approximately 25 km north of Hobart, The Brighton Bypass project has been predominantly funded by the Federal Government as part of the National Highway connection. The objective is to ensure safer and more efficient freight movements and general traffic between Hobart and Tasmania's northern cities and ports.

The $103 million Northern Section's scope included 6.5km of predominantly dual carriageway, ten major structures located along the length of the bypass, and associated works. Having extensive experience in bridge construction made VEC an ideal partner for Thiess, with VEC's local knowledge and experience complementing Thiess' extensive multinational engineering and construction expertise.

The Joint Venture team worked closely with the Tasmanian Government's Department of Infrastructure, Energy and Resources (DIER) using an Early Contractor Involvement (ECI) arrangement to develop relevant scopes, preliminary designs and costs for each section of the project.

The major construction works included twin 166 metre bridges over the Jordan River; a 70 metre long single span over the Jordan River Levee; a grade separated interchange at Tea Tree Road; a roundabout to connect to the current Midland Highway; two local road overpass structures; two rail underpass structures; and three other bridges over waterways. Work commenced in April 2009, and was completed in November 2012 – a full three months ahead of schedule.

Completing these works required an estimated 450,000 cubic metres of bulk earthworks, 10,000 cubic metres of concrete, 3,000 tonnes of reinforcing steel and 170 precast Super T beams. These were manufactured in a dedicated precast yard constructed by VEC near the project site, in order to save the time and costs associated with transporting the beams from VEC's nearest pre-existing precast yard 300kms away.

Resolving the biggest challenge resulted in the project's finest hour, with the construction of the 166m long Jordan River Bridge, which includes a 70m long main span, making it the longest single span bridge ever launched in Australia. The launch method was chosen due to the discovery of Aboriginal artefacts at the Jordan River Levee in 2008. This resulted in the area being declared an Aboriginal Heritage site, which precluded any disturbance of the ground. Using launch construction meant the Heritage area remained completely undisturbed, but it also made for an extremely complex construction process.

The launch construction required two key phases, the first being the launch process and the second was the lifting process. Each of these processes was managed by a dedicated, specialist team.

The launch process involved attaching a 50 metre long temporary launching nose to the first bridge girder, and then rolling the assembly out from the bridge abutment over the protected heritage area until it connected with the pier on the opposite side. Using 10 tonnes of counter weight on the rear of the girder and a complex series of hydraulics, the launch nose and girder assembly were slowly advanced out across and above the levee, leaving the heritage site completely untouched. Once in place on the other side, the nose was dismantled and the girder was lifted onto bearings and then used as a platform to slide the remaining three girders over the levee one by one until each of them were installed.

VIC/SA/TAS/NZ Business Unit Engineering Manager Dougie Wight says, "The VEC Thiess Joint Venture has worked very hard over many months on the planning, design, and preparation for these works. After so much effort it was very gratifying to see the launch go so smoothly and entirely according to plan".

Lifting girders into their final position on their bearings was achieved by using a 350 tonne Liebherr 1350 crawler crane supplied by Sarens Group on one side of the Jordan River Levee, and a 450 tonne Grove mobile hydraulic crane supplied by Sergi Cranes positioned on the opposite side of the levee.

With a restricted construction footprint within a confined river valley on one side of the Levee and the other side confined by the bridge abutment, achieving such high capacity lifts without incident was not without its challenges.

VIC/SA/TAS/NZ Lifting Superintendent John Foster says, "Having an in-depth understanding of the challenging ground conditions has enabled us to plan and prepare down to the finest details. Due to the confined conditions, we had to change the lift methodology from a Critical lift to an Engineered lift. Both cranes where loaded beyond their de-rated lifting capacity disregarding the 20% dual lift capacity reduction factor normally mandated for dual lifting operations. Precision in our calculations was a critical factor in the success of the lift and the room for error was extremely minimal.

"In eliminating or at the very least reducing the risks, we have been able to safely achieve our goal of a safe lift with no surprises. Also added onto this is the constant monitoring of both wind speed and direction. Conditions can change pretty quickly and although we cannot control these factors, we can prepare for them and manage them accordingly to ensure everyone remains safe at all times." John added.

Thiess' Regional General Manager Rod Heale commended the team on its meticulous planning.

"Due to confined conditions, the project team was required to satisfy stringent safety controls and approvals in the planning of an engineered lift to place the four 220 tonne girders across the levee," he said.

"Everyone worked together to the highest of standards and with the one goal. It's a credit to all involved."

Their efforts were also recognised at the 2012 Crane Industry Council of Australia Lift awards, with the team taking home two awards; the People's Choice Award, and a Highly Commended award in the category one going to the VEC Thiess Joint Venture.

It is not only Heritage that was protected by the excellent management of the VEC Thiess Joint Venture team. They also succeeded in managing worker safety in an exemplary fashion, delivering the project without any LTIs, (Lost Time Injuries). The team worked closely with the Office of the Federal Safety Commissioner throughout the duration of works, proving that a major infrastructure project can achieve timely completion, or in this case, early completion, and still successfully manage all manner of risks.

The Brighton Bypass Northern Section has clearly achieved a remarkable result – protecting the past, and providing for future transport needs, while managing the challenges of the present in a way that does the whole team proud.

BENEFITS BEYOND THE BYPASS FOR CIVIL CONTRACTORS

Major infrastructure projects like the Brighton Bypass can offer not only long-term benefits for the people of a region, but also the contractors involved if they seize the opportunity as wisely as Hall Earthmoving has.

Their task was to remove the 1500m plug at Tea-Tree which separated the two VEC-Thiess sections of the bypass. The scope included the final bulk part of the road works, constructing the road to sub roadbase level, cutting the batters and removing a total of approximately 8000 cubic metres of soil to a final trim of 50mm.

Six Hall Earthmoving staff worked on the project, operating a dozer, a grader, two excavators and two articulated CAT 40 dump trucks. To ensure they could undertake the work accurately and efficiently in the short three week period they were on site, the 329 excavators were fitted with machine guidance systems in the form of TOPCON GPS equipment. This innovation is expected to deliver long-term cost-effectiveness improvements for Hall Earthmoving and their clients.

"Everything ran smoothly, and we were very pleased with the job," said Hall Earthmoving spokesman, Chris Hall.

"It gave us an opportunity to set up the TOPCON equipment, and upgrade operator training. This will help our agricultural clients and other local customers, including councils, as we can now be more productive. The new technology will allow us to give the benefit back in time and therefore cost savings. That makes it a win-win investment that's really paid off.

"The Brighton Bypass job really got that ball rolling for us. We are always growing our business, and as our customers help us out a lot and we really value them, especially our agricultural customers, we are pleased we can give the benefits of upgrading and updating our plant back to them.

"We are also expanding into the larger civil sector with a more precise operation, which will feed through into our other clients."

Hall Earthmoving is a strong, family owned enterprise, with a 30-year track record in bulk earthworks and civil construction across Tasmania. Their clients cross both major construction and civil construction, with other major projects including the Midlands Water Scheme and the Hazel Brothers section of the Brighton Bypass.

For more information contact Hall Earthmoving, phone 03 6263 7614, mobile (Mick Hall) 0427 120 927

AUSCO MODULAR HELPS TO BUILD TASMANIA'S FUTURE

Before work could properly commence on Tasmania's biggest infrastructure project, The Brighton Bypass, Ausco Modular ensured the construction team had a proper base for operations.

Ausco Modular installed the first buildings in October 2009 when work commenced on the Northern section, developing a project office complex and amenities for the administration and engineering teams which would last for the life of the project. As the project progressed south, so did the modular buildings which are Ausco Modular's speciality, ensuring the project could maintain a cohesive and stable command centre.

Ausco Modular's southern region manager, Rob Wormald, said in addition to maintaining a dedicated team of employees and subcontractors in Tasmania, Ausco Modular demonstrated a great deal of flexibility to meet the project's needs.

Mr Wormald said his team installed the main complex buildings, which measured 21 x 12 metres, about the same size as seven semi-trailers, in just three days, complete to industry construction and safety standards.

"Having a complex of this size installed and tied down in such a short time required a huge team effort from Ausco Modular's Tasmanian employees and subcontractors," he said.

"The unique open plan design of these buildings gave the client the freedom to set up their offices to their organisational preferences as they were not restricted by pre-set floor plans."

Ausco Modular has had a branch in Tasmania for a number of years. This gives the company an insight into local conditions, which, coupled with the company's national expertise in their field and a highly competitive tender, won them this coveted contract.

"We know the Tasmanian market, we know what needs to be done to work within large project teams such as this one, and we know how to manage our processes to ensure clients get exactly what they're looking for, for the right price," said Mr Wormald.

Flexibility became important when it was discovered that the bypass was potentially going to be built over an Aboriginal archaeological site and the project's timeframes changed dramatically. As a result, Ausco Modular extended the building hire throughout the investigation of the site and the revised, extended works program.

Ausco Modular have the capability to customise turn-key solutions for short or long-term residential, industrial, administrative and community purposes, all manufactured to exacting standards and engineering designs which are tested in Ausco's NATA-accredited testing facility. The company's quality management system is accredited to ISO 9001, Environmental Management accredited to ISO 14001 and OH&S to AS 4801.

For over 50 years, Ausco Modular has been delivering excellence in modular and transportable buildings to hire or buy for customers in the building, construction, education and mining industries throughout Australia.

For more information contact Ausco Modular, website: www.ausco.com.au

BRIDGING THE GAP BETWEEN DESIGN AND REALITY

With their long history of bridge fabrication, Tasmania's Haywards Steel Fabrication and Construction has the well-developed technical expertise required to fabricate and supply the four 200 tonne steel bridge girders for the Brighton Bypass' Jordan River Bridge. Their scope included developing the computer generated model and shop detail drawings using ACAD software; fabrication of the four 70m long, 3.5m high and 4m wide girders in three sections per girder; survey checking of the completed sections; transport to site; surface treatment of the girders; and splicing, a six week process undertaken at two sites. Approximately 40 of the company's 200 trade-qualified staff worked on this massive undertaking.

"The overall size of the girders was the main challenge," said Haywards Steel Fabrication Project Manager, Shaun Brown. "Haywards were proud to be able to successfully complete works given the delicate nature of the project."

The company's skills are in demand across Australia and New Zealand, with other current projects including fabricating bridge girders for Melbourne's M80 upgrade; 56 wind towers 80 metres high for the Musselroe Wind Farm; coal stackers for Queensland and New South Wales coal mines; and a tree top air-walk in New Zealand.

For more information contact HAYWARDS - Steel Fabrication and Construction, phone 03 6391 8508, fax 03 6391 8612, website: www.haywards-steel.com

Brighton Bypass, TAS

CONSTRUCTING A NATION-WIDE SUCCESS STORY

Successful businesses seek opportunities wherever they may be, as Shaw Contracting has been demonstrating. Since completing the bulk earthworks package for the Brighton Bypass project, and before that major civil works on both the Kingston and Dilston bypass projects, Shaw has looked further afield to keep their staff and plant in work, as large government-funded projects become scarce on their home turf.

Since being founded in Tasmania 76 years ago as a family blacksmithing business, Shaw has grown into a multi-faceted, highly efficient specialist operator in the mining, civil engineering and environmental management field. This talent is now being exported to the mainland, with the predominantly Tasmanian workforce currently engaged on projects in the Northern Territory, New South Wales and at home in Tasmania.

Shaw plans to increase both its Tasmanian and interstate activity over the coming years, balancing the two to match its' highly skilled and experienced workforce.

CEO John Lamb sees this combination as key: "Our competitive advantage is our workforce and their attitude and ability to deliver results to the highest standard of safety and quality, anywhere in Australia. The ability to "rest" our workforce and their families between FIFO projects is critical to maintaining their health and wellbeing for the longer term" he said.

Shaw have carved a niche for themselves by skillfully using innovative engineering to resolve demanding and challenging projects safely and reliably, with the highest levels quality assurance.

Shaw build roads, dams, pipelines, power stations, mines, wind turbines, buildings large and small, walkways, landfill sites, pump stations, fish farms, race courses, quarries, bridges, rail lines, sidings, causeways and more. The company can demolish, decontaminate, encapsulate or dispose of contaminated waste under the strictest of guidelines.

Shaw has a purpose-built mining fleet including the largest contract excavators (120 tonnes) in Tasmania. The reliability of the company's equipment is legendary, owing to a combination of skilled operators and great maintenance.

Shaw's steel fabrication workshop can build buckets, rippers, fences, walkways, bridge spans, and one-off components. The pre-cast concrete team manufactures beams, culverts, walls and specialised structures for clients' jobs.

Shaw operates a set of linked management systems to identify and manage risk in all aspects of the business. Every project, no matter how small, receives the full Shaw layered risk assessment. Because of these systems Shaw is certified to AS4801 (safety), ISO14001 (environmental management) and ISO9001 (quality assurance). The company also holds certification by the Federal Safety Commission.

Mr Lamb is clear on the value proposition: "We're not about finding a way to charge for every moment spent on our client's sites, and we don't focus on manufacturing expensive variations in our jobs. A good relationship is built on trust, and that has to be earned".

"Our team is highly skilled, multi-skilled and motivated to excel. Shaw can put a fully-equipped crew on the ground anywhere in Australia. Our results speak for themselves."

For more information contact Shaw Contracting, John Lamb, Chief Executive Officer, phone 03 6397 0207, mobile 0400 165 078, email: johnl@shawcontracting.com.au