

GLNG: SITE CIVIL WORKS - CURTIS ISLAND

Gladstone, Queensland

CLIENT: Santos, (Bechtel Epc)
VALUE: \$175 Million
TYPE OF CONTRACT: Sor Contract Based On Bechtels T & C
START DATE: March 2011
FINISH DATE: December 2012

THE PROJECT

The GLNG project JV between Santos and LNG companies, PETRONAS, Total and KOGAS will process coal seam gas (CSG) into LNG. The project is located on Curtis Island 2km off Gladstone.

Macmahon is subcontracted to Bechtel Australia Pty Ltd (as EPC contractor for GLNG Plant Project) for the site civil works valued at \$175 million of a total \$16 billion project. The project will initially produce 7.8 mtpa of LNG, with a maximum production of 10 mtpa. First cargoes are scheduled for export 2015. Works have commenced by others on the upstream works extending back to CSG fields in the Roma region.

SCOPE OF WORK

The Site Civil Works for the Santos Gladstone LNG plant includes clearing, bulk earthworks, pavements, roads and drainage for a 160 hectare greenfield site on the south west side of Curtis Island.

Access to the island is via water transport. Barging Macmahon's responsibility for nine months before Bechtel assume control. The civil works convert the site into a stepped LNG plant pad allowing Bechtel and others to commence construction of the permanent facility and temporary facilities such as the construction camp. The handover is staged to facilitate the fast track plant construction.

As there are no construction facilities on the island most concrete formations and other structures will be pre-cast on the mainland and barged across. Select fill material is to be sourced from the island by Macmahon to limit the barging requirement.

PROJECT CHALLENGES

No land access, all via water transport, requires rigorous planning to ensure plant, equipment and materials are mobilised to the island when required.

The project is situated in the Great Barrier Reef World Heritage Area and has potential to cause environmental impact.

While the potential project impacts will be controlled to levels set by regulatory authorities as minimum, it is Macmahon's objective to continually improve the environmental performance and exceed these standards.

Approximately 160 ha of vegetation communities will be disturbed as part of the civil construction works. To manage impacts to flora and fauna clearing protocols are established including use of licensed fauna spotter-catchers to remove any fauna prior to clearing.

The project team will also need to account for climactic effects such as Queensland's cyclone season. Gladstone experiences after effects of North Queensland's cyclone activity which Macmahon is proactively preparing for.

FAST FACTS:

SITE SCOPE: 160ha
BULK EARTHWORKS: 3,900,000m³
SELECT AND GRANULAR PAVEMENT: 295,000m³
DRAINAGE STRUCTURES: 2.8km
BITUMEN SEAL: 190,000m²
SITE FENCING: 8km
MACMAHON WORKFORCE: 250 persons (at peak)



COMMUNITY

GLNG will result in more than 5000 jobs during construction and about 1000 ongoing positions in the operational phase. This should stimulate further business development and employment opportunities in the Gladstone and Roma regions through increased demand for goods and services.

THE TEAM THAT LIFTS PROGRESS IN CENTRAL QUEENSLAND

To turn an abandoned cattle property on Curtis Island, off Gladstone, into a fully-operational LNG processing and export facility requires a great deal of lifting and shifting. Which is exactly what Lee Crane Hire excel at doing for projects like this multi-contractor development.

Lee Crane Hire have been meeting the needs of construction, mining and industry in the Gladstone region for over 30 years, with a fleet of scrupulously maintained cranes for both wet and dry hire.

The company has depots in Biloela, Gladstone and Moura employing a total of over 130 personnel, and a growing fleet of 85 cranes ranging from 2.6T to 280T. These include Pick & Carry Cranes, Mini Cranes, Truck Mounted Hydraulic Cranes, All Terrain Cranes, Rough Terrain Cranes and Crawler Cranes. The company also has a large fleet of transport and heavy haulage equipment allowing them to meet any client's lift and shift requirements.

Reliability, safety and service excellence are the qualities which have developed long-term customer relationships for Lee Crane Hire across the Central Queensland region, from the dusty mining outback through to the booming coastal export hub of Gladstone. They take pride in

providing a wide range of onsite services and solutions, along with meeting all a client's general hire needs.

Lee Crane Hire's track record includes mining (washplants and draglines); shut down operations; machinery installation and removal; refineries; transport recoveries; bridge and civil construction; port and maritime services; plant and maintenance; building and construction; and demolition and salvaging. All the company's cranes are regularly maintained and serviced, with independent inspections carried out annually to meet CraneSafe requirements and the applicable Australian Standards. The company's level of safety awareness and meticulous care for their inventory meets the extremely high standard of safety requirements for sites such as Anglo Coal, BMA, Rio Tinto and Xstrata.

Whenever a project in the Central Queensland area needs lifting, Lee Crane Hire can ensure a safe, timely and effective solution that enables everyone to get on with the job.

For more information contact Lee Crane Hire, Head Office – Biloela, phone 07 4992 2866, Gladstone Office, phone 07 4972 3166, website: www.leeccranehire.com.au





EXPERTS AT COMMUNICATIONS FOR CHALLENGING SITUATIONS

There's a difference between 'isolated' and 'remote', and that's the ability to be connected to the world. Nixon Communications are experts at providing the technology and carrier links which mean any project, anywhere on the continent, can keep talking business. For the GLNG project, Nixon provided Microwave links from a strategic position they own in Gladstone which overlooks most of Curtis Island.

These links provide an Internet link for companies to use internet and telephone services, with Nixon having the capacity to keep more than ten links running simultaneously. They have also provided large quantities of portable and Mobile radios to many different projects on all three of the LNG construction sites in the area, and expect to be involved for the long-term providing services to the LNG pipeline construction companies who are building the pipelines into Gladstone from the Chinchilla and the Arcadia Valley areas.

"Our involvement started early in 2011 with Bechtel on the APLNG project," said Nixon's Construction Communications Manager, Shawn Purkis.

"We have a temporary Repeater base station with 6 private repeater channels and 20 Simplex channels, and we have also supplied well over 600 radios to this project alone. We have supplied radios to nearly all subcontractors on the APLNG Project: Cimeco, Walz Constructions, BMD, CBI, Fulton Hogan, McKoskers and we have also provided Microwave links for Macmahon, Laing O'Rourke, JohnHolland and MCJV, for Internet services.

"We are also the major supplier of communications for the LNG Pipeline construction companies, including MCJV who are constructing the Export pipeline for

BGQGC; for SAIPEM who are constructing the pipeline for GLNG; and also APLNG with NACAP.

"One of our biggest advantages here is our unique understanding of the Gas industry. In the last 20 years we have supplied complete turn-key communications solutions to every major pipeline built in the country in remote areas. Nixon Communications Pipeline Division specialises in temporary communications solutions for Construction projects Australia-wide and also overseas."

Nixon had approximately 15 staff involved in the project at various locations. Their skills and experience enabled them to overcome the two biggest challenges – logistics and meeting extremely tight deadlines.

The company are often one of the first on-site, setting up the communications technology which is essential for project operation, and also for worker safety and well-being in remote locations.

"Some of the key benefits we have are access to remote areas through our fleet of Aircraft. We have four Aircraft that allow us to mobilize quickly and cost effectively," explained Shawn.

"Our pilot technicians have a great deal of experience in the remote areas around Australia. The reliability of our services is critical to projects which have no access to the everyday communications we have in the built up areas in Australia.

"Basically we provide complete turn-key solutions to projects. Our Communications Center is mobilized first off, at a new camp that is usually still in early stages of construction. Within a few hours of being onsite we can provide full internet and Telephone services VIA Satellite so people

can stay in touch with the rest of the world - from a safety perspective this is critical.

"The comms centre also provides satellite TV, so personnel have something to do at night, and a small ten booth internet café that is open for use by any one onsite; this along with WiFi hotspots allows people to stay in touch with family and friends."

The combination of technological excellence and willingness to go the distance quickly has built many long-term relationships between Nixon Communications and their clients since the company commenced operations in Rockhampton in 1977.

For example, Nixon has assisted Macmahon on many remote area projects over the years, including the 'Alice to Darwin Rail (ADRAIL); Longford to Sydney Pipeline (EGP); The Burnett Dam Project; Mesa- A Rail Project; Millstream Link Road upgrade; Ayre Highway upgrade; the RGP5 Project; Solomon Spur FMG Project; and Hope downs 4 Project.

The company's Quality Systems are third-party accredited to AS/NZ ISO 9001:2008 standards, and their capability allows them to deliver design through to supply, installation and maintenance services for effective, reliable and technologically advanced communications solutions to projects across Australia, Papua New Guinea and the Solomon island.



For more information contact Nixon Communications, 2/38 Lord Street Gladstone QLD 4680, Shawn Purkis – Construction Communications Manager, phone 07 4972 2121, fax 07 4972 2025, mobile 0427 722 014, email: shawn@nixon.com.au, website: www.nixon.com.au

TOUGH GROUND
- BUT SOMEONE'S
GOT TO MOVE IT



With over 30 years of experience in civil construction, Rayment Excavations have the kind of capable approach that can solve extremely challenging site problems, like the ground conditions on Curtis Island. Rayment Excavations' scope of works included site preparation works such as excavating test holes, civil works to prepare the construction site, amenities preparation and further stages of earth works, quarry product and water deliveries.

Just getting their plant and manpower to the site was a logistical feat, with ferries the only means of access. Once there, it became apparent that ground conditions in some areas were extremely soft, creating access issues for plant. Rayment Excavations sourced and established the use of bog mats. This was a technique of improving access and ground conditions which Rayment Excavations' operators had not previously undertaken, however they quickly became proficient in sourcing the bog mats from reliable suppliers and mastering their use on site.

All Rayment Excavations staff working on the Curtis Island site had extensive safety inductions, which included managing the risks associated with such a remote and difficult location. A family-owned and operated business, Rayment Excavations' capabilities include all aspects of civil construction for industrial, commercial, corporate, government and domestic projects.

The company also redeploys removed materials, and supplies quarry products that includes but not limited to top soil, garden blend, sand, mulch, gravel, aggregate, rock, decomposed granite and granite boulders.

Since commencing operations in 1981 with a single backhoe, Rayment Excavations has grown into a multi-talented operation with a sizeable earthmoving, transport and distribution fleet that includes excavators, loaders, backhoes, bobcats, rollers, graders, dozers, tippers, water trucks, dump trucks, prime movers, floats and low-loaders. In addition to contract services, the company also offers wet and dry hire services.

Recently, rapid expansion of local project opportunities has grown the company again, with over 40 local operators, drivers, administration, accounts and maintenance personnel now employed. The company now has two depots located in Calliope and Gladstone, from which they service not only the Central Queensland region but also state-wide and national projects.

As works continue to evolve on Curtis Island, Rayment Excavations' involvement continues in providing high quality civil works services around the GLNG project. The company also have crews and plant working in Central Queensland, and ongoing contracts with Aurizon, NRG, Gladstone Area Water Board, Gladstone Regional Council and a diversity of other contracts both large and small.

“ We move the earth; to rock your world ”

For more information contact Rayment Excavations,
phone 07 4978 9200, fax 07 4978 7162
office: 3 Roseanna Street, Gladstone QLD 4680
Calliope Depot: 137 Morcom Street, Calliope QLD 4680
email: admin@raymentexcavations.com.au



CHALLENGING PROJECT NEEDS A STRONG - BUT SENSITIVE - TECHNOLOGICAL TOUCH

Curtis Island offers the kind of challenges which require intelligent, rugged and self-reliant construction solutions. Sitech Construction Systems specialise in exactly that breed of technology, making them a valuable asset to the GLNG construction teams.

Sitech Construction Systems (SCS) provided construction technology services in partnership with the principal contractor, including Trimble GNSS base infrastructure, geodetic control, field survey instrumentation, machine guidance systems, ongoing system training and on-site field support.

Their involvement commenced with initial project feasibility and continued throughout the project, with ongoing supply of technology and support. To ensure a fast response to client needs, SCS positioned a branch office in Rockhampton to service the Gladstone region.

“The main contractor utilised Trimble Machine Guidance systems for their earthwork operation which allowed them to move away from traditional ‘stake out’ survey methods,” said Sitech Construction Systems spokesman, Tim McPhillips.

“By utilising the latest available GPS networks (i.e Navstar and Glonass) the project benefitted from high accuracy GPS solutions. In final trim applications the GPS receivers were easily swapped with prisms to utilise Trimble's proprietary Universal Total Station solution. This high accuracy system features an active target allowing multiple systems to work side by side without interference.

“Sitech Construction Systems supplied technology for all major contractors across the three Curtis Island projects. The challenge was to ensure reliability of the solution during project delivery and to be able to offer high level and timely support while overcoming site access and regional logistical issues.”

SCS staff involved on the project included data managers, surveyors, support and installation technicians. This local workforce has national backup in the form of the Sitech national dealership network, which includes over 110 skilled staff.

Founded in 2008, SCS has a pedigree which stretches back over 120 years through parent company Ultimate Positioning Group, which evolved out of Herga Instruments, founded in 1888. The Sitech dealership is a worldwide enterprise. In Australia, Sitech Construction Systems service QLD, NT, PNG, VIC, SA and TAS; Sitech Solutions service NSW; and Sitech WA services WA.

SCS offer a diverse range of technology products and services which can save time, minimise costs and improve results across the construction lifecycle from project feasibility to project delivery.

“We are a trusted provider of solutions across all disciplines including Civil, Mine Infrastructure, Rail, Marine, Environmental and Design Consultancy. SCS are the lead supplier for all key major projects,” said Tim.

“Trimble's commitment to the Connected Site Solution is driving innovative and exciting applications into new elements of the construction process. Products such as Visionlink that allow the project manager to view in near real time his earthworks operations and productivity are giving our clients the competitive edge at both bid and delivery stages.”

For more information contact Sitech Construction Systems Pty Ltd, Head Office 35 Allison Street Bowen Hills, QLD 4006, phone 07 3851 8300, website: www.sitechcs.com, Branch Offices - Sitech Townsville | Sitech Rockhampton | Sitech Northern Territory Sitech Victoria | Sitech South Australia | Sitech Tasmania



TOUGH TERRAIN NEEDS SKILFUL HANDLING

Operator skill was crucial for the successful completion of Earthline Enterprises work on the GLNG project. The company was subcontracted to undertake two main tasks – loading and unloading a barge which was carting rock to Curtis Island, and assisting in providing material to cap the seawall which was constructed by Abigroup.

“Coupled with the barge loads of rock to the island, trucks also had to be carted to and fro from the island to the mainland. These were 12t body trucks, used to cart the rock from the storage area to the barge on the mainland and off the barge to the dumpsite on the island,” said Earthline Enterprises Spokesman, John Beattie

“The excavator, supplied by Earthline, was critical to the smooth running of the operation. The operators needed to liaise with the barge master to ensure the barge was kept trimmed during every loading operation and had the correct trim once loading was completed.

“Working in this environment could often be stressful for the operators as we were sometimes subject to deadlines imposed by spring tides; the low tides were too low to allow berthing at the island, and the barge could not be allowed to sit on the bottom. The bridge mechanism on the mainland had a design difficulty and when tides were high some of the trucks could not load, as where the bridge was hinged so that it could go up and down with the tide’s rise and fall became too steep and the trucks could belly out on the pivot point.”

Earthline’s staff on the project included a day shift operator, night shift operator and two stand-by operators to cover weekends and holidays. For the seawall capping, Earthline provided a dozer to push quarry overburden to a front end loader that was loading into semi tipper and carting some 4km to the seawall. “The stockpile was particularly steep and required just as much power to reverse back up the pile as it did to push a blade full down. Due to the difficult terrain, this was a job for experienced operators only,” said John.

Other recent work has included subcontracting on one of the Government-funded NDRRA projects in the Gladstone area. They engaged up to 50 people for their works, which involved crews of up to 10 repairing flood damage. Works have included resheeting roads, drain repairs, removing debris and unblocking culverts.

Earthline has been consistently upgrading their plant, putting them in an excellent position to undertake contracts up to \$5million for any kind of civil works, from bulk earthworks to detail excavation. Part of their strength is ensuring a strong, experienced middle management, along with recruiting both new and experienced operators. They are focused on steady and sustainable growth, with a dedication to safety and an ability to tackle highly challenging projects in an intelligent way.

For more information contact Earthline Enterprises, phone 07 4975 0750, email: earthline2@bigpond.com

POWERING UP INDUSTRY ON CURTIS ISLAND

There’s no construction without power, which meant Corfield’s Electrical Service had to be onsite at Curtis Island for the Gladstone Liquid Natural Gas project (GLNG) from the earliest stages of work. They provided a complete turn-key package, including electrical, fibre optic cabling, data and security for the work camp, and for some of the facilities being constructed, including long-term worker accommodation, processing facilities, docking and administrative areas.

The scale of the project is massive, with accommodation being built for up to 14,000 workers, three gas plants with a possibility of a fourth and the highly specialised processing facilities. As there is no land access, all Corfield’s workers and materials deliveries had to be transported by ferry from Gladstone. A crew of up to 15 qualified electricians and communications technicians have been based on site during the construction phase, plus management staff. Corfield’s are completing the supply and installation on works, with input into design at the early stages. Procurement and site works commencing in October 2011, and their involvement is expected to continue for the GLNG’s operational life.

The main challenges of the works are logistics and the difficulty of transporting once onsite due to heavy rain and minimal roads in the initial stages. “Diesel generators are utilised to provide power to the camp and supporting facilities” said Corfield’s Contract Administrator, Jessica Morrison. “It is like a city in itself, and as we are doing the power and communications for the camps and two other sites, relocation of gear and

maintaining equipment over there is challenging. This is something very good to be a part of,” said Corfield’s Director, Ken Corfield.

“The GLNG has to be the driving force in Queensland. It is giving a massive input to Gladstone, and it means major work for us.”

Corfield’s have been in the business of powering up projects around Queensland since 1983, and has grown to employ 75 staff, delivering electrical installation and repair services of the highest calibre across industrial, commercial, marine and general construction projects. Their specialist capabilities include design support services, and they have a rock-solid track record in contracting for oil, gas, coal, aluminium production, water infrastructure, electrical generation facilities, delivery of material handling systems, civil infrastructure, urban residential developments, process control, instrumentation, high voltage installation and testing, and data and fibre installations and testing.

“My vision for this motivated and expanding company is to surpass our previous achievements whilst upholding our standards. I will strive to make our company the most efficient and safe in the region and to utilise our standards and morals to remain at the forefront of our industry,” says Ken Corfield. “Our motto is ‘Gentlemen contractors in the electrical industry’”

For more information contact Corfield’s Electrical Service, 112 Hanson Road Gladstone QLD 4680, phone 07 4972 6977, fax 07 4972 4969



EXTRA SKILL ON DEMAND

A project like the GLNG which combines both complex and demanding offshore operations with detailed onshore efforts requires a highly skilled, flexible and technically proficient workforce to succeed. The Skilled Group are one of the nation's leading providers of both contract and permanent labour solutions with a network of offices, including one in Gladstone, which service the needs of projects across the construction, mining, natural resources, industrial and transport sectors.

For over 40 years, Skilled has been rising to the challenge of tough sites and tight timeframes. With a labour base including some of the best tradespeople and technical professionals available, and a strong culture of safety awareness, reliability and service, Skilled can tailor workforce solutions to suit any client need. Skilled not only provide flexible labour solutions, they also look to the future of their client's industries, with

training and apprenticeship, OH&S and industrial relations expertise. Skilled also manage risk, so their clients can focus on managing the job.

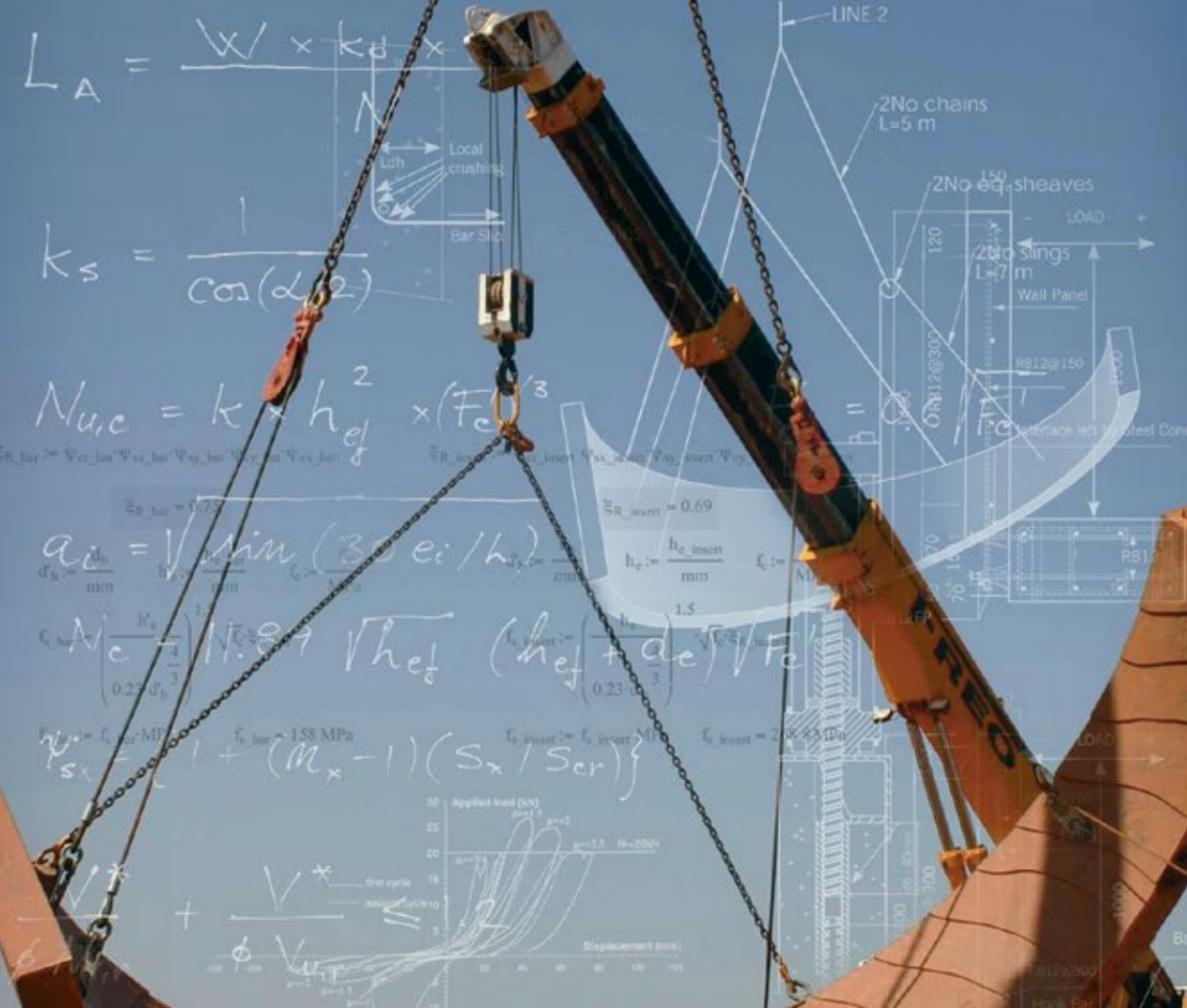
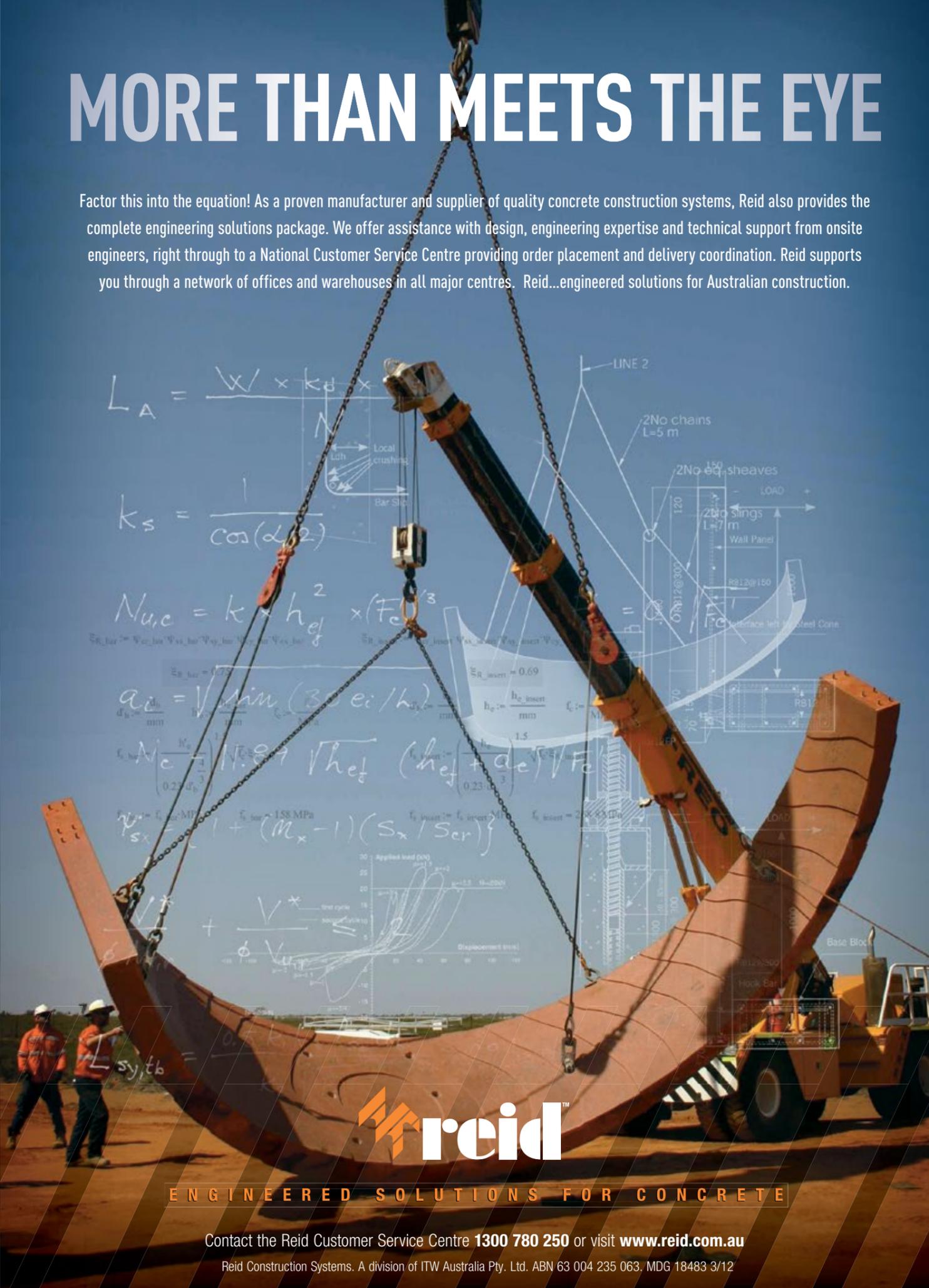
People are any project's biggest asset – Skilled ensure that investment in them, delivers productive dividends.

SKILLED

For more information contact The Skilled Group, Suite 6&7, 39-41 Tank Street Gladstone QLD 4680, phone 07 4977 6700, fax 07 4977 6766, website: www.skilled.com.au

MORE THAN MEETS THE EYE

Factor this into the equation! As a proven manufacturer and supplier of quality concrete construction systems, Reid also provides the complete engineering solutions package. We offer assistance with design, engineering expertise and technical support from onsite engineers, right through to a National Customer Service Centre providing order placement and delivery coordination. Reid supports you through a network of offices and warehouses in all major centres. Reid...engineered solutions for Australian construction.



ENGINEERED SOLUTIONS FOR CONCRETE

Contact the Reid Customer Service Centre **1300 780 250** or visit www.reid.com.au

Reid Construction Systems. A division of ITW Australia Pty. Ltd. ABN 63 004 235 063. MDG 18483 3/12