

A tall, cylindrical skyscraper under construction, featuring a glass facade that reflects the sunset. A large crane is mounted on top of the building. The scene is set against a sunset background over a city and water. The sun is low on the horizon, casting a warm glow over the scene. The water is dark, and the city skyline is visible in the distance. The building is the central focus, with its curved form and glass panels catching the light. The crane is a prominent feature, extending from the top of the building into the sky. The overall mood is one of progress and achievement in a dramatic, high-contrast setting.

A NEW WAY OF THINKING FOR THE CONSTRUCTION INDUSTRY

HOW AN AUSTRALIAN CRANE
BUSINESS IS CHANGING THE GAME
FOR LARGE-SCALE CONSTRUCTION
PROJECTS AROUND THE WORLD

An innovative way of thinking is being introduced to the construction industry that is delivering increased productivity with fewer crane lifts, safer and less-cluttered worksites and the ability for project managers to control the critical path so that contracts are delivered safely, on time and within budget.

That new thinking is coming from Marr Contracting ('The Men from Marr's') – the Australian-based company that are recognised as world leaders in the design and delivery of heavy-lift luffing tower cranes and complex craneage services.

With a string of 'world firsts' to their name – including the design of the Marr M2480D and M1280D heavy lift luffing (HLL) cranes with their partners, Favelle Favco – Marr's team are big thinkers and problem solvers who love a challenge.

Delivering value through the unique combination of knowledge, experience, proven service delivery and people; Marr have already made their mark internationally on projects such as the world's longest suspension bridge, the 1915Çanakkale Bridge in Turkey, and Australia's biggest transport project, Sydney Metro.

Now, as the company expands its footprint and is attracting attention internationally, it is spreading the message that early engagement in the design stage is crucial for the constructor and craneage provider to find the most efficient construction solution and hold to the critical pathway for the project.



CRANES SHOULD BE A FORETHOUGHT, NOT AN AFTERTHOUGHT

Managing Director, Simon Marr, has worked in the family-owned business since he was a teenager and says that early collaboration offers huge benefits for the construction industry compared to the old ways of thinking, where work sites were cluttered with multiple small cranes. Fewer, larger tower cranes that are strategically placed, can simplify and de-risk a build.

“The old thinking is that more crane hooks mean more productivity. The reality is that too many hooks means more clutter and less efficiency,” he says.

“Some people look at one crane and think ‘it’s only one hook’. But it’s not about the number of hooks – it’s about the number of lifts you have to do. It’s about saying ‘how do you want to get to the end point of the project? Do you want lots of little lifts or to do it with fewer, more efficient big lifts?’

“Construction is a traditional industry but we have an opportunity to inspire new ways of doing things. There are those who fear change and others who are open to new ideas. Those who are brave can see how our approach can take away risks in project scheduling, how it makes their project safer because it makes the work site less congested and takes the complexity out of the project.”



Simon Marr, Managing Director, Marr Contracting

EARLY ENGAGEMENT IS THE KEY TO SUCCESS

The key to achieving maximum efficiency is early engagement with the craneage provider – and the earlier the better.

The benefits of getting the crane experts in at the early engineering design stage of planning means that they can advise on craneage requirements and this advice can be worked into the tender brief. Ultimately, it means that the right craneage will be there from the start.

“Having a craneage solution is one of the first things you need to be doing. You need that to align with your construction philosophy. If you don’t have that alignment, how can you decide how you are going to build the job? The earlier we get involved, the better,” says Simon.

“Even as early as the architect stage, we can advise how the building can be achieved in a way that fits their aesthetic requirements, then it goes through engineering so they can prepare their designs and then to the constructor. It drills down through to the sub-contracting plan.

“For example, it allows for clear instructions to steelwork sub-contractors, possibly reducing the number of steel sections, allowing for more precision work on complex sections offsite. But getting in early is the only way that can happen,” says Simon.

Early engagement also allows for innovative solutions to be found for major logistics challenges in projects, such as working in tight spaces. Big crawler cranes may take up to 30 metres of space, creating conflicts between the construction site and the neighbouring city roads and rail lines, as Marr has witnessed in many projects.

“For example, with the Darling Harbour Convention Centre in Sydney, there was a spiral concrete ramp behind the Centre which had to be built for the constructors to gain access to the inside of the building. There was a rail line next to it and a road that had to be built across, and it was a congested area.

“The schedule for this job was extremely important. If you had crawler cranes coming out each night, with the need to close the road and the rail line, only a few lifts would have been achieved each day. It would have been impossible.

“With our cranes taking up a footprint of only four metres, we devised a solution where a big crane in the middle of the project could service the build – doing all the heavy lifting work and being able to handle all types of lifts in one shift.

“Suddenly the job became so simple. The crane just blended into the job and the build was easy.”

CASE STUDY: SYDNEY METRO

A REVOLUTIONARY APPROACH TO TRANSPORT INFRASTRUCTURE PROJECTS

The benefits of using Marr’s technology – using fewer cranes with greater capacity and reach to deliver less complex, more efficient, and safer ways of constructing – has become a game changer for Australia’s biggest public transport project, the Sydney Metro.

With the Metro North West Line in operation, and work underway on three new lines, the new driverless system includes more than 113 kilometres of railway. It encompasses an extension of the Metro North West Line into the Sydney CBD, with new metro stations and existing stations being upgraded; a new underground Sydney Metro West railway network connecting Greater Parramatta and the Sydney CBD to support Sydney’s growing population; and a 23-kilometre Western Sydney Airport Line, connecting to the new Western Sydney International (Nancy-Bird Walton) Airport.

Marr were initially engaged on the construction of the new Castle Hill Station and Sydney Yard Access Bridge at Central Station, and have subsequently been engaged to deliver bespoke craneage solutions across another

four stations for the Sydney Metro City & Southwest project including Barangaroo, Central, Martin Place and Crows Nest.

Key to the successes Marr has achieved for clients has been the willingness of their project teams to engage with Marr’s team early in the planning stages – and to think differently about how craneage solutions can be delivered.

Rather than adopt the cut-and-cover box method using crawler cranes, Marr has changed the way the entire project can be constructed, by positioning tower cranes which can lift bigger pieces and which do not need costly, challenging and time-consuming groundworks.

See the full case study at <https://marr.com.au/our-projects>

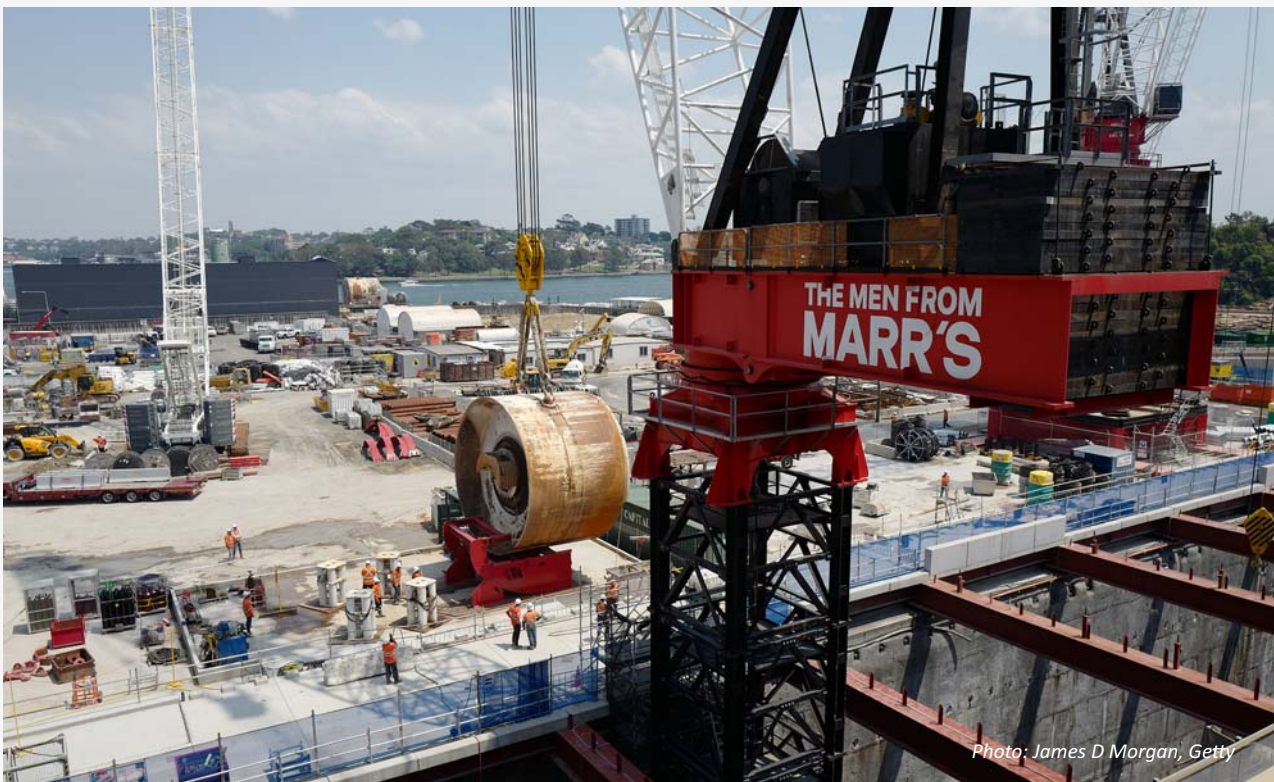


Photo: James D Morgan, Getty



REAPING THE BENEFITS OF MODULARISATION

One of the other main benefits of early engagement, and strategically deploying heavy lift tower cranes, is that it opens the door for the constructor to “think big” with their construction methodology. Constructors can consider modularisation or upsized components.

Whereas traditional construction thinking would be for lifts of two tonnes or four tonnes, Marr’s innovative approach is ‘why not lift in 50-tonne and 100-tonne pieces, and take the complexity associated with the assembly into a controlled, more efficient environment?’

Instead of lifting many, smaller pieces, one piece at a time, modules and upsized components can be assembled offsite, and then placed through a few major crane lifts. There is far more control (and safety) in welding or building sections on the ground and installing in one lift, rather than welding multiple sections at height.

According to Marr this can de-risk a project and protect the construction schedule because off-site assembly is faster and more accurate, and therefore there is greater certainty of holding to deadlines.

With Marr spreading the word about modularisation and early engagement, more and more clients are reaping the benefits, and Marr is adding to its runs on the board with examples of companies seeking craneage solutions and recognising the benefits of modularisation. Simon cites an example of successful early engagement in working with joint venture

partners, DL E&C–Limak–SK ecoplant–Yapi Merkezi (DLSY), on the 1915Çanakkale Bridge project in Turkey.

Initial contact with Marr was via an email from one of the engineers searching for a craneage solution to match how they wanted to construct the project.

“Schedule was critically important to them and they needed to reduce their construction time,” says Simon. “They invited us in early to discuss their thoughts about their planned construction methodology which was based around lifting panels of up to 20 tonnes. They were going to lift panel after panel, weld them and go again.

“We said ‘what if those panels were modularised, joined together in pieces up to 160 tonnes, and we lift them in one piece?’ Not only is lifting smaller pieces slower, you have the challenge of maintaining tolerances in the structure all the way up.

“You can take all that risk away from the site, have the fabrication done accurately offsite, bring the modules into the site and you only have to do something like one-eighth of the lifts.

“Once they could see that, they could immediately grasp the advantages. One lift replaced the eight lifts that had earlier been thought necessary.

“It was a huge success for us and our client. Even through COVID-19, we achieved all our milestones. Having a client who understood what our expertise was, let us know what they wanted to achieve and who asked us in early to devise a solution, was the key to success.”

CASE STUDY: 1915ÇANAKKALE BRIDGE, TURKEY

A GAME CHANGING SOLUTION FOR THE WORLD'S LONGEST SPAN SUSPENSION BRIDGE

The construction of the 1915Çanakkale Bridge's two 318-metre towers was the project of a lifetime for The Men From Marr's with two record-breaking lifts and an approach that could change the future of how bridges and other mega infrastructure projects are built around the world.

Working with joint venture partners, DL E&C–Limak–SK ecoplant–Yapi Merkezi (DLSY), Marr's team developed a game-changing craneage solution for the construction of what will be the world's longest span suspension bridge connecting Europe with Asia. Stretching 4.6km long the bridge has a central span of more than 2 km, supported by 318-metre-high bridge towers.

DLSY Joint Venture partners, engaged with Marr early in the design stage of the project, seeking a craneage solution to match how they wanted to construct the project. The initial construction methodology was based around lifting panels of up to 20 tonnes and schedule was critically important.

Marr suggested a better alternative. If the panels were modularised and joined together in pieces weighing up to 160 tonnes, they could be lifted in one piece. Doing so was a faster method, allowing for greater precision in building the modules off-site, increased safety and de-risked the critical path.

Marr deployed two 2480D heavy lift luffing tower cranes, each with a lift capacity of 330 tonnes. The cranes had to be available 24/7 with an average daily utilisation of 20 hours a day for both cranes. Remarkably, even through COVID-19 lockdown restrictions, all milestones were achieved.

In the first of two world-first engineering feats on the project, the two M2480Ds were placed 1km offshore in the Çanakkale Strait. The second record was the positioning of the upper cross beams on the bridge towers, 330 metres above the water – the world's heaviest lift at height.

Working over water in an environment of high winds, and in an area prone to earthquakes, Marr's solution reduced the number of lifts on the project to approximately one-eighth of the originally-proposed number. That being said, the lifting requirements across the project were still staggering with Marr completing 208 lifts of over 100 tonnes, 36 of over 150 tonnes and 8 of over 160 tonnes.

Completely different from traditional approaches to bridge building, the achievements on 1915Çanakkale were a huge success for Marr and the client – and a possible game changer for the future of how similar projects can be built in the future.

See the full case study at <https://marr.com.au/our-projects>



ADAPTING LEARNINGS ACROSS SECTORS

Other clients have learned the benefits of innovative thinking and early engagement from seeing other projects, that have adopted traditional thinking, make mistakes.

“In one data centre project, the contractor used traditional methods with crawler cranes which sat outside the building,” says Simon. “The site became congested and they couldn’t finish it off.

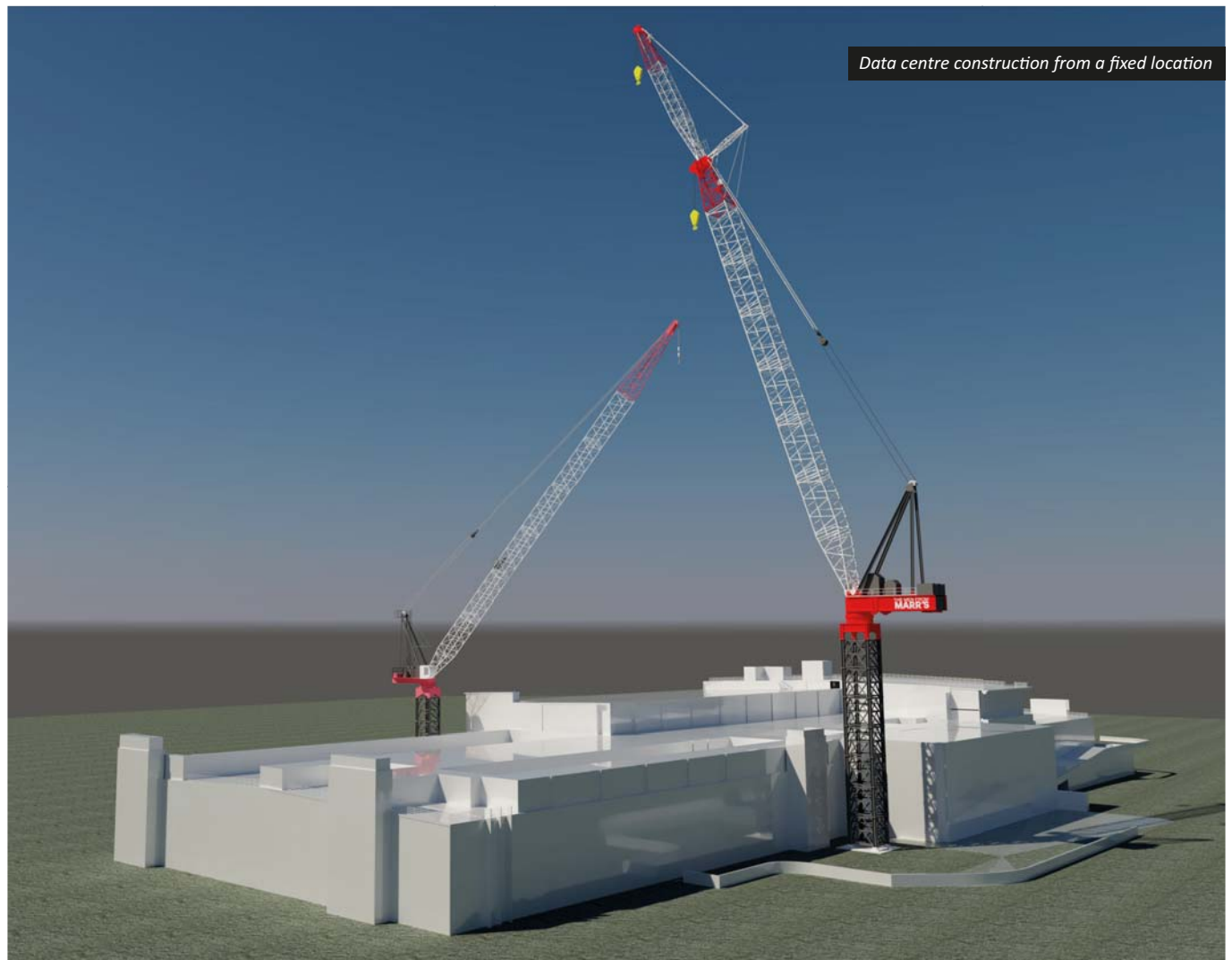
“Service infrastructure such as power or water couldn’t be supplied because cranes were sitting in the way. They were compromised as to what they could lift where and when.

“We were approached by the builder to see how we could approach it. We looked at it and said we could place a few of our big cranes strategically in the site and they could just sit there and do all the lifting across the whole job – you could make heavier pre-cast pieces, and have fewer lifts, you would take the complexity out of the job .

“They just couldn’t get the concept, but a successful tenderer for another data centre did get it. This company totally understood how it could secure their schedule and support their construction methodology.

“They adopted our craneage philosophy and their project was completed in half the time of the other build. Now this company has become the partner builder for a data centre provider, and every data centre they build is being completed faster. The last one was completed in just 35 weeks, using our cranes.”

With the knowledge Marr’s team has acquired on best practice for the construction of data centres, the business is now in discussion with clients in Europe, the United Kingdom and the United States who have the same challenges.



PROJECT INNOVATION

BESPOKE SOLUTIONS FOR DATA CENTRES AND GIGA FACTORY CONSTRUCTION

Marr's approach and track record in pushing the boundaries of what is possible is achieving results for clients in the technology sector.

By working with the client to fit the crane to the job, not the other way around, Marr's solution is always guided by the needs of the client and the project.

Marr's bespoke solutions are ideally suited to projects such as data centres and giga factory construction, with an underlying goal to reduce the number of lifts and therefore the number of cranes on a project.

How each crange solution is shaped depends on the requirements of the job but Marr is able to provide high-volume construction lifting, maximising the long reach and heavy lift capacity from a single position. Maximum reach is 120 metres.

This brings an increased capability to lift larger pre-cast components such as columns, beams and panels – (i.e. 330 tonnes @ 15 metres, 100 tonnes @ 45 metres, 25 tonnes @ 100 metres, and 12 tonnes @ 120 metres).

As a result, fewer cranes are needed. This, matched with a small crane footprint, releases laydown and onsite construction areas.

Constructors have the potential to build structural steelwork modules with equipment pre-installed. There is also potential to build pre-cast in part-room or full-room modules, and instal large plant equipment such as diesel generators, water treatment plant and roof steelwork, switch room equipment, and data-handling and storage equipment.

The benefits for the construction industry include increased productivity with fewer crane lifts, a safer worksite and the ability for project managers to control the critical timeline so that contracts are delivered on time.

“We are constantly looking at how we can add value back into a project and that means looking at how we can improve efficiency and secure the constructor's schedule,” says Simon Marr, Managing Director, Marr Contracting.

<https://marr.com.au/technology---data-centres>



Data centre build using Marr's Transit System

THE CHALLENGES OF RETROFITTING

While early engagement with the crane expert is the optimal way to plan a construction project, in order to marry construction philosophy with craneage philosophy, Marr has extensive experience in being brought into projects where the original crane choices have proven to be less optimal for what the client or constructor wants to achieve.

In those cases, Marr recognises the challenges of retrofitting, while endeavouring to solve the client’s dilemma – but it can be frustrating.

“We have had a few projects where we have been introduced late and the client has already got a construction methodology in place, supported by a less-than-ideal crane methodology.

“You come in and you try to introduce something new but then everyone in the construction team is going in one direction and you have to stop and tell them we are going down a new road. We can still change things and get a result that is better than their current plan, but maybe not as good as if we had been involved at the start. There have been a number of occasions where clients have told us they wish they had known about us earlier.”

On the plus side, it can serve as a positive learning experience for the client, who then will engage Marr’s team early in subsequent projects.

“One client used traditional crawler cranes in an earlier power plant project and it was a poor outcome for them.

“Since then they have brought us in early, they have been able to modularise the steel before we were even on site and are already well down the track in their progress. They have the project entirely planned using our cranes.

“Similar things happened in the oil and gas boom in Australia. On some projects, productivity was poor and delivery slow until the client engaged us.

“One client commented that when they put our crane to work, in one shift it had done more work than the traditional crawler crane had done in two weeks.

“For every crane they brought in from us, they took five or six crawler cranes off the job, plus the crews. There were a lot of lessons learned about how we could make the client’s projects more efficient if we were brought in early.

“The cost savings on that were nothing compared to the cost savings on maintaining their schedule.”

NOT FINISHING A JOB ON TIME IS EXPENSIVE. THE COST ON A PROJECT IS NOT THE CRANE. THE TRUE COST IS EVERY DAY YOU ARE LATE. THE TASK IS TO WORK TOGETHER TO MAKE SURE YOU ARE NOT LATE.



A STRONG & FLEXIBLE FLEET

While Marr has won international acclaim for its ‘world-firsts’ and record lifts, its particular focus is on deploying the right crane for the job. That means being flexible with the choice of crane from the company’s fleet – from the smallest crane, the tiny Marr 40R (M40R), to the world’s largest capacity tower crane, the Marr M2480D Heavy Lift Luffing (HLL) crane.

While the fleet includes mobile and tower cranes for use on high-rise and general construction jobs, it is the crane solutions and the way Marr’s approach a job that sets it apart.

“Some constructors might come to us and ask for our rates for our cranes. That’s not our approach. We aren’t just a hire company,” says Simon.

“Fitting the crane to the job is very important. We don’t fit the job to the crane. We provide craneage solutions. We ask the client ‘what do you want to achieve and what is your schedule?’ From there, we will work out a solution that enables them to achieve their goal.

“Then we will work out the pricing for the client. The aim is always to take the complexity out of the project, make it safer, improve productivity and make scheduling sure. We can deliver those outcomes if people come to us early.”

The flexibility of Marr’s fleet gives the opportunity to deploy tower cranes with a maximum radius reach of up to 120 metres, meaning more parts of the site can be accessed.

The ability to fit into a tight footprint is another big asset on crowded projects. In one copper smelter project, the footprint for the crane required only 10 square metres.

Marr’s heavy lift luffing cranes also maintain significant productivity in wind conditions that would stop many other cranes. On one of the world’s largest liquefied natural gas (LNG) projects, the Chevron-operated Gorgon project in Western Australia, data recorders logged the cranes’ performance and showed the exceptional ability of Marr’s cranes to work extended hours.



CASE STUDY: THE GORGON LNG PROJECT

INNOVATIVE THINKING FOR AUSTRALIA'S LARGEST RESOURCE PROJECT

A joint venture between the Australian subsidiaries of Chevron, ExxonMobil, Shell, Osaka Gas, Tokyo Gas and JERA, the Chevron-operated Gorgon Project is one of the world's largest liquefied natural gas (LNG) projects and the largest single resource development in Australia's history.

A 'mega project' with a legacy of world-first craneage solutions, the Gorgon Project was a game changer – not only for Marr and Chevron, but the future of large-scale construction projects in the mining and resources sector.

With the high-cost project running to a demanding schedule with multiple contractors and suppliers, Marr challenged Chevron to think differently about how craneage solutions on projects of this scale could be delivered.

Working with construction delivery partners, Kellogg Joint Venture – Gorgon (KJVG), Marr initially erected a M2480D heavy lift luffing tower crane to increase the productivity of the project's materials offloading facility at Wapet Landing, 140kms off the north-western coast of Western Australia. After that solution resulted in significant productivity gains, Chevron entrusted Marr with even bigger challenges on the project.

In collaboration with KJVG, Marr engineered additional components and methodologies to address the logistical and construction challenges presented. Innovations such as the super fly (which added extra reach and capacity to the cranes), and the SPMT transport system (which allowed the movement of fully-assembled cranes to any part of the project as required), provided greater coverage, flexibility and value to Chevron's construction methodology.



Marr's involvement in the project resulted in significant cost savings and productivity gains including:

- Reduced unloading and re-packing times at the project's materials offloading facility – from up to 5 days to one;
- Reduced crane dismantle and reassemble times – from 2-3 weeks to 1.5 hours;
- Improved safety and risk reduction by isolating crane construction away from the worksite and plant workers;
- Decongesting the work site by reducing the number of cranes required on the project; and
- Increased productivity and availability from the crane with higher allowable working wind speeds, reach and light times.

By introducing heavy lift tower cranes, new technology and innovative methodologies to the project, Marr's solutions helped Chevron adapt their construction methodology in such a way that the craneage solution could drive the programme and schedule – ultimately reducing overall risk on delivery.



See the full case study at <https://marr.com.au/our-projects>

INNOVATION IN THINKING OUTSIDE THE SQUARE

Marr's approach to using the right tools for the job extends to the philosophy of designing a bespoke solution where it is needed.

An example is the creation of the Marr's Transit System (MTS), designed to extend the reach for heavy cranes across a project site.

Proven to be a major asset across several projects, the MTS allows cranes to travel along modular rail beams, which can be picked up and relocated by the crane itself. This allows the crane to travel progressively and easily across the length of the site.

Placing the crane on rails distributes the weight evenly on the ground underneath. This compares favourably with the major groundwork often needed for crawler cranes, where the weight distribution changes depending on whether there is a load on the hook and the radius the crane is operating at.

Some customers would have to do extensive ground improvements to handle these changes, whereas the MTS requires minimal groundwork and compaction to accommodate it.

MARR'S TRANSIT SYSTEM

AN INNOVATIVE SOLUTION FOR EXTENDING THE REACH AND CAPACITY OF MARR'S FLEET

The Marr Transit System (MTS) is an example of thinking outside the square to extend the reach for heavy cranes across a project site, while decongesting the site and freeing space for the laydown of more building components close to where they will need to be lifted.

The MTS does this by having the crane travel along modular rail beams. In comparison, the MTS requires less groundwork compaction because placing the crane on rails distributes the weight evenly on the ground underneath. Each wheel is engineered to take a load of 100 tonnes with a maximum corner load of 800 tonnes.

What's more, the rails can be picked up and relocated by the crane itself or by other means such as a forklift. The modular rail means that a short section can be relocated to give an infinite operating length, allowing the crane to travel progressively and easily across the length of the site.

The site becomes decongested when the MTS is deployed because the rails allow for 8 metres free space between tracks with the standard 10-metre rail centres. The clearance under the base, allows for vehicular access under controlled conditions. The clearance height can also be increased to suit the needs of a particular project. As a result, more laydown areas are freed-up across the construction site.

The MTS is designed for use with any crane in Marr's fleet. No restrictions are applied to the operation of the cranes when used in conjunction with the MTS.



<https://marr.com.au/cranes/marr-transit-system-mts>

INVESTING IN THE TECHNOLOGY OF THE FUTURE

An exciting area of development for Marr will be in artificial intelligence (AI), allowing the gathering of real-time lifting data. Marr has been proactive in supporting innovation in this area.

“Despite the massive technological advancements that we’ve seen in other sectors, our industry hasn’t changed much in terms of technology over the last 20 years. Where manufacturing productivity has grown by 36 per cent, construction productivity growth is sitting below 1 per cent,” says Simon.

“This is why we’re joining forces with BuildAi to bring developments in technology on-site to allow us to automatically gather and analyse real-time lifting data. It’s the missing link for us in delivering even safer, faster and more cost-effective solutions for our clients.”

All of Marr’s cranes are currently fitted with remote data logging and monitoring systems, and with the addition of BuildAi’s technology, Marr’s clients will be able to access this data from anywhere in the world to see how efficiently their cranes are being used and how they are interacting with the overall project schedule.

IT’S ABOUT ADDING VALUE BACK INTO A PROJECT

Construction is a traditional industry but Marr believes in thinking differently to inspire new ways of doing things.

The benefits for the construction industry include increased productivity with fewer crane lifts, a safer worksite and the ability for project managers to control the critical timeline so that contracts are delivered on time.

A string of ‘world firsts’ bear testament to Marr’s approach as big thinkers and problem solvers who not only love a challenge, but have a track record in pushing the boundaries of what is possible to achieve results for their clients.

Above all, Marr’s team works with the client to fit the crane to the job, not the other way around. The needs of the client are what guides the solution.

“WE ARE CONSTANTLY LOOKING AT HOW WE CAN ADD VALUE BACK INTO A PROJECT AND THAT MEANS LOOKING AT HOW WE CAN IMPROVE EFFICIENCY AND SECURE THE CONSTRUCTOR’S SCHEDULE.”

SIMON MARR
MANAGING DIRECTOR, MARR CONTRACTING



Photo: Sky Monkey

Marr Contracting (**‘The Men from Marr’s’**) is a world leader in the design and delivery of heavy lift luffing tower cranes and heavy lifting services. With more than 90 years’ experience working on large-scale construction projects in Australia and around the world, their expertise spans the large-scale construction, mining, oil and gas, power, nuclear, major transport infrastructure, technology and marine sectors. Not just a crew and cranes for hire, they’re big thinkers and problem solvers who love a challenge with a string of ‘world firsts’ to their name – including the design of the world’s largest capacity tower crane, the Marr 2480D Heavy Lift Luffing (HLL) crane.

For more information www.marr.com.au