SYDNEY METRO

REVOLUTIONARY HEAVY LIFTING SOLUTIONS FOR AUSTRALIA'S BIGGEST PUBLIC TRANSPORT PROJECT

AT A GLANCE

PROJECT	SYDNEY METRO
STATIONS	BARANGAROO, CASTLE HILL, CENTRAL (INCLUDING SYDNEY YARD ACCESS BRIDGE), MARTIN PLACE & CROWS NEST
LOCATION	SYDNEY AUSTRALIA
SECTOR	MAJOR PUBLIC INFRASTRUCTURE – RAILWAY
DATE	2016 - ONGOING

OVERVIEW

Sydney Metro is Australia's biggest public transport project. With one new metro line in operation, another under construction and two new lines being procured, the new driverless system includes more than 110 kilometres of railway:

– The Metro North West Line – opened in May 2019, Sydney's first metro line is also Australia's first driverless railway. The line is being extended into the Sydney CBD and beyond, due to open in 2024.

– Sydney Metro City & Southwest – a 30-kilometre extension of metro rail from the end of the Metro North West Line at Chatswood, under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with seven new metro stations and 11 upgraded stations.

– Sydney Metro West – a new underground railway network connecting Greater Parramatta and the Sydney CBD to support Sydney's growing population; and

– Western Sydney Airport Line – a 23-kilometre railway from St Marys to the Western Sydney Aerotropolis jointly funded with the Australian Government that will become the transport spine for Greater Western Sydney, connecting communities and travellers with the new Western Sydney International (Nancy-Bird Walton) Airport.

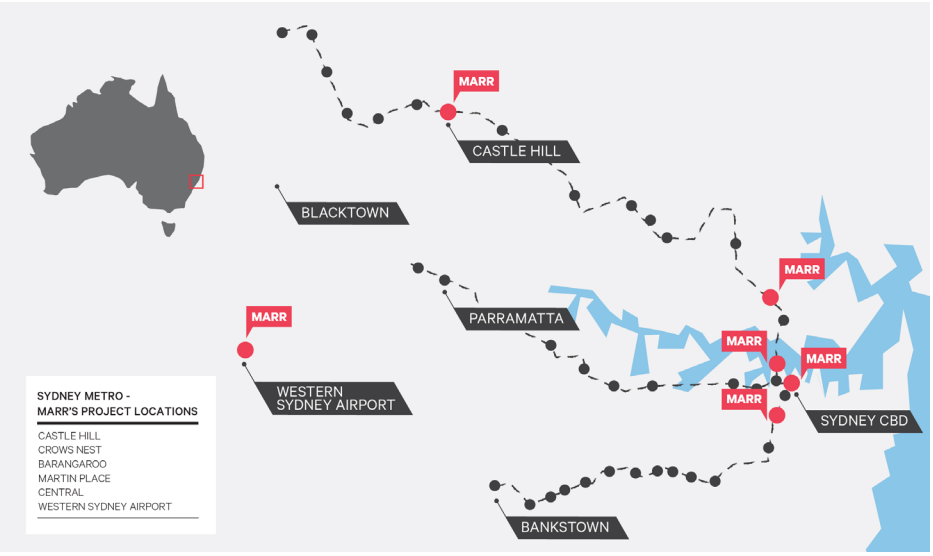
EARLY ENGAGEMENT AND INNOVATIVE THINKING - THE KEYS TO SUCCESS

From our initial engagement on the construction of the new Castle Hill Station and Sydney Yard Access Bridge at Central Station, Marr's team have subsequently been engaged to deliver bespoke craneage solutions across additional stations on the City & Southwest line including Barangaroo, Central, Martin Place and Crows Nest, and the Western Sydney Airport line.

Key to the successes we have achieved for our clients across these projects has been the willingness of their project teams to engage us early in the planning stages – and to think differently about how craneage solutions can be procured and delivered.

Similar projects around the world have adopted the cut-and-cover box method, where crawler cranes are nearly always the immediate consideration, but Marr's approach has consistently demonstrated that installing the right cranes can change the way an entire project is constructed, principally because of the ability to lift bigger pieces and remove the requirement for costly, challenging and time-consuming groundworks.

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 – is a game changer for future projects of this scale.



Above: Map highlighting key stations within Marr's scope of works: Central, Castle Hill, Barangaroo, Martin Place, and Crows Nest.


MARR'S
ashurst
Tallawong
Rouse Hill
Kellyville
Bella Vista
Norwest
Hills Showground
Castle Hill
Cherrybrook
Opening 2019
Epping
NSW GOVERNMENT
sydney METRO
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please call 24 hours
Or write to us at
sydneymetro@transport.nsw.gov.au
or PO Box K659
Haymarket NSW 1240

SYDNEY METRO CASTLE HILL

AN OUT-OF-THE-BOX SOLUTION A NEW BLUEPRINT FOR MEGA TRANSPORT PROJECTS

AT A GLANCE

CLIENT	NORTHWEST RAPID TRANSIT (NRT) CONSORTIUM
PROJECT	SYDNEY METRO NORTHWEST
LOCATION	SYDNEY AUSTRALIA
SECTOR	TRANSPORT INFRASTRUCTURE
DATE	2016 - 2018

WHAT IT TOOK

CRANES	1 X M2480D, 1 X M1680D
ENGINEERS	2
INSTALLATION CREW	6
OPERATIONAL CREW	6
MAINTENANCE CREW	2

The Northwest Rapid Transit (NRT) consortium–including MTR Corporation, John Holland, CPB Contractors, UGL Rail and Plenary Group – was awarded the operations, trains and systems contract for Stage 1 of the Sydney Metro Northwest line.

Part of the 15-year contract involves the installation of 23 kilometres of new track and rail systems, converting an existing 13 kilometres of railway to metro status, the building of eight new railway stations and 4,000 commuter car parking spaces, and the upgrade and conversion of five existing Sydney railway stations.

With 16 construction sites on the opening Northwest stage alone, Sydney Metro is notable for its scale and complexity – and when it came to the craneage solutions, there was a need for thinking outside the box, literally.

THE CHALLENGE

In 2016, NRT awarded Marr Contracting a scope of work including extensive methodologies and lift plans to cover the installation, operation, and removal of cranes at the Castle Hill Station.

At the time we started working on the project, the consortium was considering a solution using crawler cranes travelling along the edge of a 200m x 30m cut-and-cover station box in order to complete the required lifts. However, as the site was congested and landlocked between two existing roads, the proposed crawlers would have placed a large surge load against the station box walls with the consequence of having to excavate around the box and fill in with groundworks to specific bearing pressures.

Looking at the prospect of excessive costs and a limited solution that would have had a major impact on the programme, NRT challenged us to come up with a better solution.

OUR SOLUTION

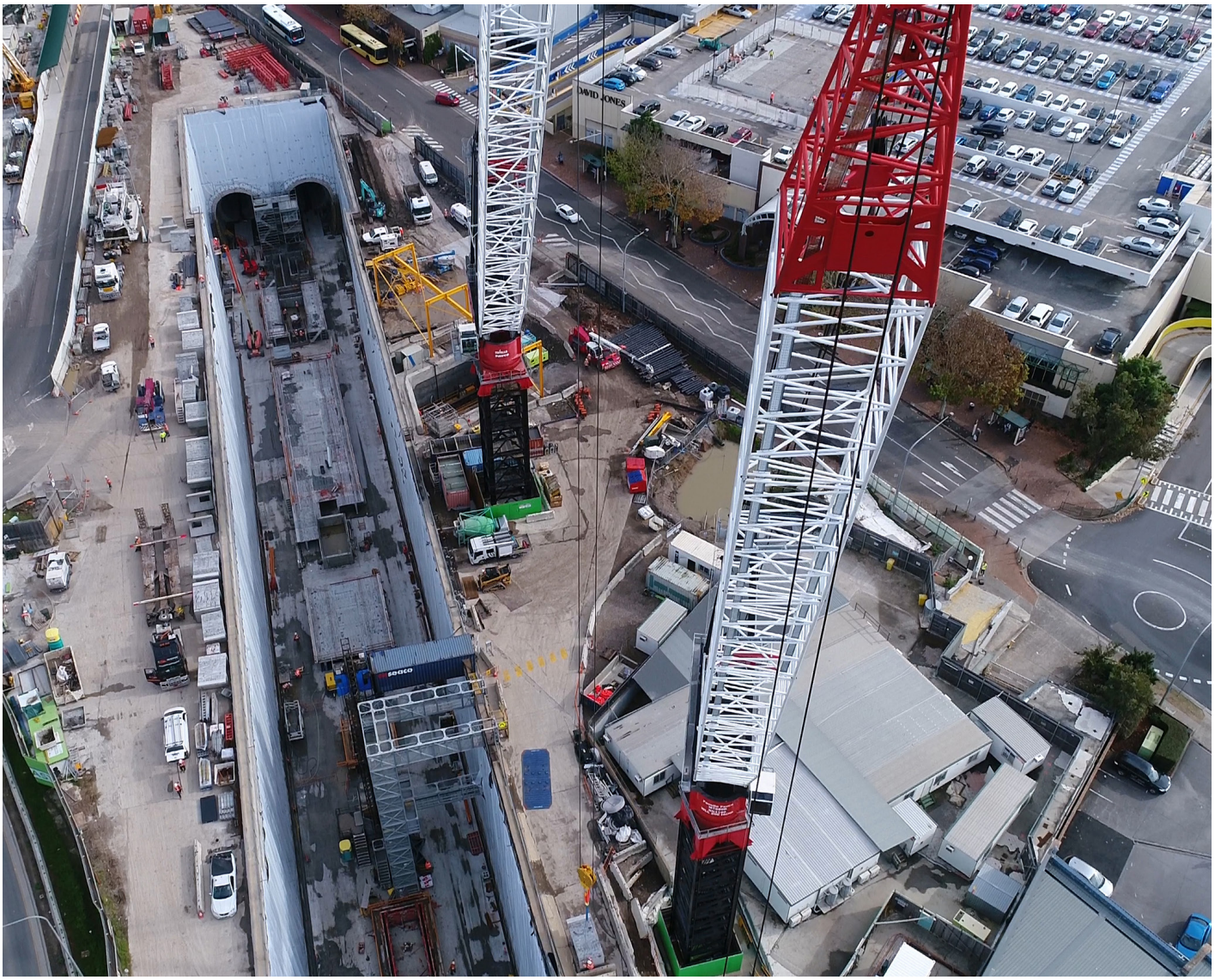
Understanding the benefits of combining fewer cranes with greater efficiency on similar scale sites in the oil and gas industry, we designed a solution using two heavy-lift, luffing jib cranes sitting alongside the station box which provided lifting capacity across the entire site.

The cranes provided were the result of design collaboration with manufacturer, Favelle Favco: a 330-tonne capacity M2480D with a 90-metre boom and a 200-tonne capacity M1680D with a 62-metre boom. They lifted a variety of loads, including pre-cast beams, columns and panels weighing up to 60 tonnes; in addition to site machinery, such as earth-moving equipment, mobile cranes, concrete, reinforcing steel, and general construction materials required for a tunnelling project of such magnitude.

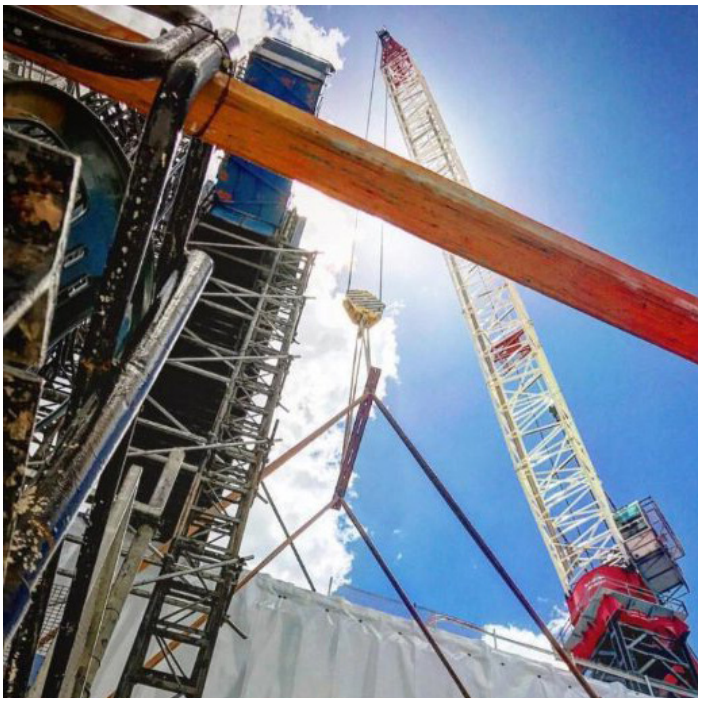
THE RESULT

Adopting our solution changed the way the entire project was constructed, principally because of the ability to lift bigger pieces, reduce land, and remove the requirement for costly, challenging, and time-consuming groundworks. In addition to decongesting the site, increasing productivity and saving costs; using fewer, higher capacity cranes also reduced the chance of collision.

The approach has since become a new blueprint for other station builds on Sydney Metro (and around the world). Following the success of the Castle Hill project, we have been engaged to use the same new technology on multiple stations in the Sydney Metro project including the new Martin Place and Barangaroo stations.


DAVID JONES
SOGCO


MARR'S



April 2017: The first crane is erected after working with NRT since initial discussions in April 2016 to develop the craneage methodology for the project. Our solution covered all aspects of the craneage requirements from design to installation, lifting and removal of the cranes on completion. Designed with efficiency in mind, the solution negated the need to move cranes around the job. This allowed the first crane (M2480D) to be installed, which was then used to install the second smaller crane (M1680D) and remove the cranes in the same fashion at the completion of the project. This meant we only had to take our large mobile crane onsite twice – for install and removal – helping to decongest the site and reduce costs to the client.

Using just two cranes in fixed locations, our methodology catered to the challenge of lifting elements weighing up to 60 tonnes, including some 50-tonne weights at the extreme ends and anywhere within and across the 200-metre station box.

A critical consideration for the project was how to decongest the site. With cranes able to reach across the station box, we were able to facilitate a more efficient delivery unload and install process to lift pre-cast beams weighing up to 60 tonnes.

October 2018: On completion we had successfully completed various lifts in addition to the heavy pre-cast beams, such as site machinery including mobile cranes, earth-moving equipment, concrete, reinforcing steel, and general construction materials required on a tunnel project of this magnitude.

A birds-eye view of the congested site showing the position of the M1680D (foreground) and M2480D (background) in relation to the station box. Designed to meet the geotechnical considerations of the site, the position of the crane foundations adjacent to the station box allowed the cranes to carry out lifts on both sides of the construction area.

SYDNEY YARD ACCESS BRIDGE (SYAB)
AT CENTRAL STATION

A HEAVY LIFT SOLUTION FOR A FAST PACED PROJECT

AT A GLANCE

CLIENT	LAING O'ROURKE
PROJECT	SYDNEY METRO – SYDNEY YARD ACCESS BRIDGE (SYAB) AT CENTRAL STATION
LOCATION	SYDNEY METRO CITY AND SOUTHWEST LINE
SECTOR	TRANSPORT INFRASTRUCTURE
DATE	2016

WHAT IT TOOK

CRANES	1 X M2480D
ENGINEERS	2
INSTALLATION CREW	6
OPERATIONAL CREW	3
MAINTENANCE CREW	1

THE PROJECT

Construction of the Sydney Yard Access Bridge (SYAB) at Central Station was the first early and enabling works package for Sydney Metro City & Southwest.

Laing O'Rourke was contracted by the NSW Government to design and construct the bridge and new access road to allow controlled heavy vehicle movements for construction and operational maintenance from Regent Street into Sydney Yard at Central Station to facilitate the construction of the new Sydney Metro works.

With plans to construct the bridge by lifting structural steel bridge sections and precast elements into place during restricted rail possessions over an existing network, Laing O'Rourke turned to Marr Contracting for a heavy lifting solution that could reduce complexity and de-risk the project.

THE CHALLENGE

Construction of the SYAB involved working within a restricted space, over a live rail line and during time-restrictive rail possessions.

The original craneage scheme planned for large crawler cranes to lift the bridge in two smaller sections and assemble in-situ due to limitations on load and reach capability. However, coordinating the crawler crane set up and rig time within the scheduled rail possession was deemed too risky. Laing O'Rourke needed a simpler solution and that's where we stepped in.

OUR SOLUTION

Using one of our M2480D Heavy Lift Luffers (HLL) – with its heavy lift capacity and extra reach – the bridge sections were preassembled alongside the operating rail line and lifted into place in a single lift during the scheduled rail possession. With the assembly of the sections taken off critical path and the M2480D installed onsite and ready to lift as soon as the rail possession took place, the crane was able to remain in place during installation and used out of possession times to complete pre-assembly works.

THE RESULT

Marr's solution reduced complexity and supported the project from a safety, time and cost point-of-view – supporting Laing O'Rourke to deliver the project on time.

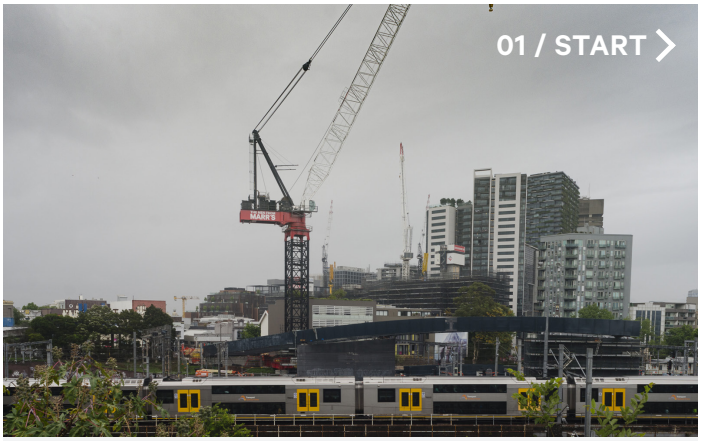
According to Laing O'Rourke's Project Lead, Huw Griffiths, "The tower crane solution at SYAB was a unique idea that differentiated Laing O'Rourke (LOR) from other tenderers. We started with the largest challenge, worked backwards and so the journey began. To build the bridge, LOR and Marr installed the world's largest tower crane in a live rail corridor to lift in a 60t beam over a section of rail corridor utilised by more than 50% of NSW rail traffic. I rang Simon (Marr) and discussed the idea and 18 months later, we lifted in the first bridge span.

The use of the tower crane at SYAB pushed a lot of boundaries. It was the first heavy lift tower crane to get formal approval to operate in the rail corridor, something that has benefitted both LOR and Marr in more recent projects. It has allowed greater use of heavy lifting cranes in the rail environment and helped developed experience and knowledge. An idea that raised more than a few eyebrows turned out to be the best engineered solution for our client."

> "The use of the tower crane at SYAB pushed a lot of boundaries ... An idea that raised more than a few eyebrows turned out to be the best engineered solution for our client."

HUW GRIFFITHS, PROJECT LEAD, LAING O'ROURKE

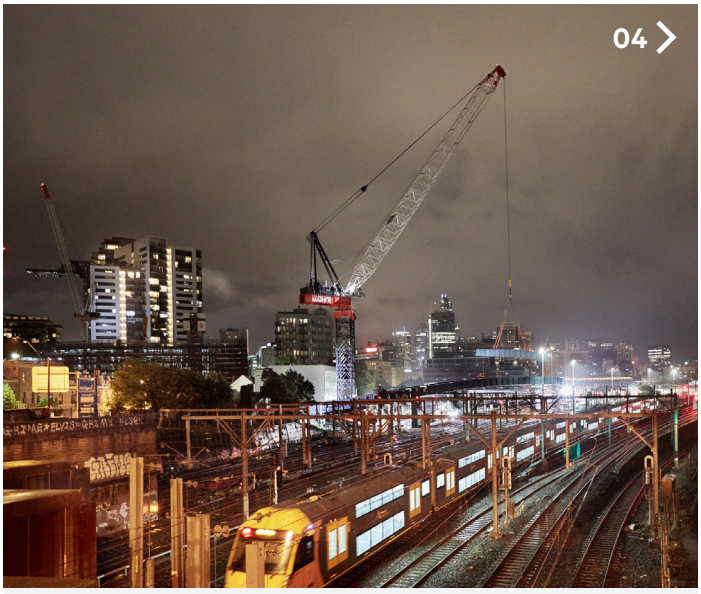

MARR'S



Construction of the Sydney Yard Access Bridge (SYAB) at Central Station involved working within a restricted space, over live rail lines and during time-restrictive rail possessions at Australia's busiest railway station.

The heavy lifting capacity and reach of Marr's M2480D Heavy Lift Luffer (HLL) allowed construction partners, Laing O'Rourke, to install the crane at sufficient distance for the M2480D to remain in place during scheduled rail possessions for the installation of the bridge sections and during time-restrictive off-peak rail possessions at Australia's busiest railway station.

Marr's solution enabled the bridge sections weighing 60 tonnes to be assembled off-track and installed in a single lift.



With the M2480D installed onsite the crane was ready to lift as soon as the rail possession took place. The same crane was also used during out of possession times to complete preassembly works.

As the first time a tower crane of this size has been used on a major rail infrastructure project, Laing O'Rourke and Marr have paved the way for a new approach to the construction of similar projects across Sydney and around the world.

SYDNEY METRO CENTRAL STATION

A NEW APPROACH TO HEAVY LIFTING AT AUSTRALIA'S BUSIEST RAILWAY STATION

AT A GLANCE

CLIENT	LAING O'ROURKE
PROJECT	SYDNEY METRO CENTRAL STATION
LOCATION	SYDNEY METRO CITY & SOUTHWEST LINE
SECTOR	TRANSPORT INFRASTRUCTURE
DATE	2020 - JAN 2021

WHAT IT TOOK

CRANES	1 X M1680D
ENGINEERS	2
INSTALLATION CREW	6
OPERATIONAL CREW	3
MAINTENANCE CREW	1

THE PROJECT

As Australia's busiest railway station, Central Station supports up to an estimated 270,000 passengers every day, with daily capacity demands expected to grow to more 450,000 passengers over the next 20 years. As the main hub for Transport for NSW's suburban and regional train services, the redevelopment of Central Station is pivotal to the new Sydney Metro network.

After working with Marr's team on the successful delivery of the Sydney Yard Access Bridge (SYAB) to facilitate heavy vehicle access to Central Station, Laing O'Rourke was keen to explore how a similar heavy lift craneage solution could be adopted on construction of the new above and below ground works for Sydney Metro Central Station.

THE CHALLENGE

Laing O'Rourke needed a solution that allowed their team to adopt a new method of modularised construction – which required lifting large architectural columns and heavy pre-assembled structural steelwork – in a confined, live rail environment.

With restricted space and the need to de-risk rail possessions, the requirement was for a crane with a small footprint and heavy lift capacity to meet the heavy lift requirements of the project whilst also servicing general construction needs.

OUR SOLUTION

Marr's solution uses one of our M1680D heavy lift luffers (HLL) with a 71-metre radius boom installed on a purpose-built steel grillage to complete the heavy lift requirements of the project – including lifting 60-tonne prefabricated roof trusses and skylight modules from laydown into place on the new concourse roof structure.

With the M1680D also used to complete the lighter lifts associated with general construction activities as well as supporting the excavation works and lifting of large earth moving equipment, it has met the varied scope of lifting requirements and eliminated the need to use a range of different sized cranes which would have presented another set of challenges in such a confined space.

THE RESULT

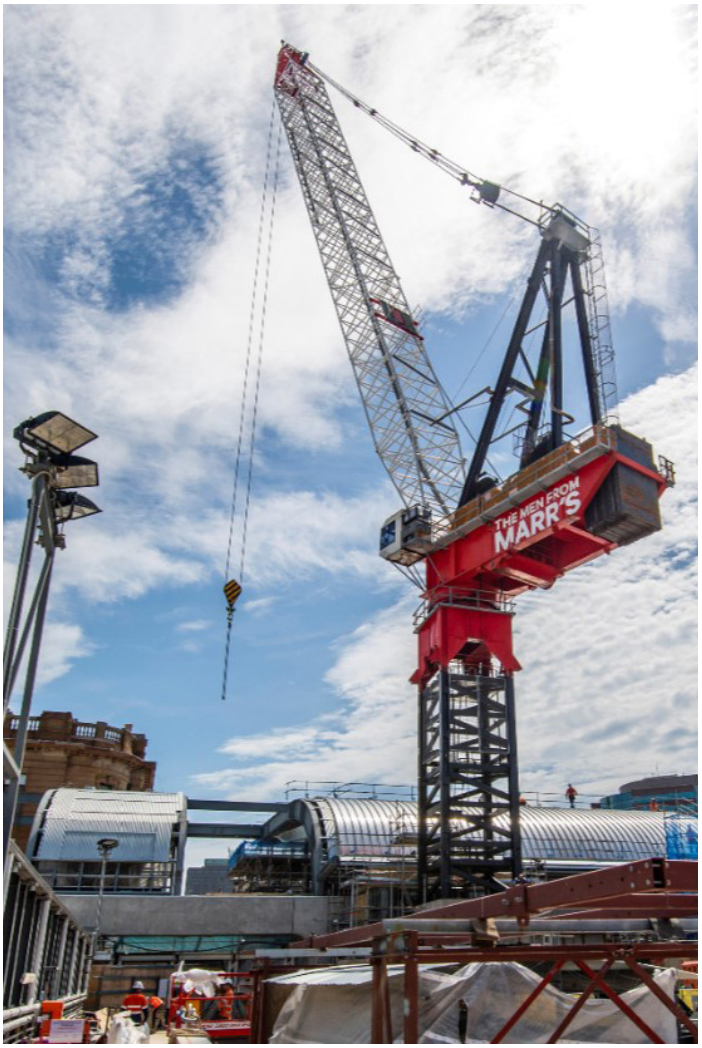
The cranage solution allowed Laing O'Rourke to construct the roof using their preferred methodology, which in turn has resulted in them delivering the roof installation ahead of schedule.

Marr's engagement on the project was completed in January 2021. Central Walk and the new escalators from Platforms 12 to 23 will be open in late 2022, with the new metro platforms due to become operational once Sydney Metro City & Southwest services begin in 2024.

Marr's M1680D HLL was installed at Central Station to complete heavy lift and general construction requirements on above and below ground works associated with the redevelopment of Australia's busiest railway station.


THE MEN FROM
MARR'S


THE MEN FROM
MARR'S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SYDNEY METRO BARANGAROO STATION

A WORLD RECORD TOWER CRANE LIFT FOR SYDNEY METRO

AT A GLANCE

CLIENT	JOHN HOLLAND CPB GHELLA (JHCPBG) JOINT VENTURE
PROJECT	SYDNEY METRO
LOCATION	BARANGAROO STATION SITE
SECTOR	TRANSPORT INFRASTRUCTURE
DATE	2018 - 2021

WHAT IT TOOK

CRANES	1 X M2480D, 1 X M1280D
ENGINEERS	2
INSTALLATION CREW	6
OPERATIONAL CREW	3
MAINTENANCE CREW	1

THE PROJECT

Located on the southern shore of Sydney Harbour on what was once a working port at the western edge of the CBD, the new Barangaroo Station will provide greater public transport access to the city's newest commercial, residential and entertainment destination.

The new station, located 25 metres below ground level, will connect the Sydney Metro line between the City and North Sydney via twin one-kilometre long tunnels under Sydney Harbour.

For construction partners, John Holland CPB Ghella (JHCPBG) joint venture, the scope of works included extensive tunnelling and excavation works – and a lot of heavy lifting in a seriously congested area.

After working with John Holland and CPB Contractors as part of the NRT consortium on the construction of the Sydney Metro Castle Hill station, Marr's team were engaged by the JHCPBG joint venture partners during the tender process to develop a craneage solution that would allow them to install heavy pre-cast elements and reduce the construction programme.

THE CHALLENGE

With the site hemmed in by Sydney Harbour, a rockface and another development, the biggest challenge for JHCPBG was the lack of available real estate for access and the movement of equipment around the site.

In addition to the excavation and construction of Barangaroo Station and a large crossover cavern, JHCPBG's scope of works also included launching and retrieving the cutter heads and shields of two tunnel boring machines (TBMs) – with sections weighing up to 255 tonnes.

JHCPBG's extensive scope meant a similarly broad scope for Marr's team including the removal of the TBMs.

Prior to our involvement, the original craneage scheme proposed using multiple mobile cranes and a 600-tonne capacity crawler crane at the southern end of the station box. However, this scenario was inefficient due to the need for piling to accommodate the crawler and the limitations of night lifts on account of road closures to allow for slewing requirements. With limited laydown areas, multiple cranes would have also required extensive co-ordination.

With the TBM removal planned at the beginning of the construction program and site access limited, there was a need for a craneage solution that had the lifting capacity and flexibility to remove the TBM as well as perform general construction tasks within a congested worksite.

OUR SOLUTION

Adopting a similar methodology to that employed on Sydney Metro Castle Hill Station, our solution used a M2480D and M1280D sitting alongside the station boxes to provide lifting capacity across the project. Sitting on purpose-designed foundations in and outside of the station box, the cranes took up 90 per cent less room than the proposed traditional crawler crane and gantry set up.

When it came to removing the TBMs, one of our M2480D HLLs was positioned within the station box adjacent to the retrieval point for the TBM and configured with a 55-metre boom and six fall 330-tonne hook block to lift the 255-tonne TBM sections.

It was the first time a tower crane had been used to lift a TBM component of this weight – and set a world record for the heaviest lift by a tower crane.

After extracting the TBMs the M2480D was reconfigured to continue working on general construction requirements for the remainder of the project.

THE RESULT

Marr's approach has reduced congestion, improved site utilisation, and reduced complexity, risk and time on the project. Using our higher capacity cranes also gave JHCPBG the option to build with precast beams allowing for increased modularisation and fewer lifts.

The approach adopted for the extraction of the TBMs has also been a game changer for future infrastructure projects around the world, demonstrating that there is a simpler, smarter way to construct projects of this kind.

> The M2480D heavy lift tower crane was the only solution for the job. With a very limited footprint and heavy loads to lift, the M2480D saved time on the program by minimising the number of crane lifts required, without impacting construction activities of the Barangaroo Station works adjacent.

DAN CALDICOTT, JHCPBG BARANGAROO STATION SITE SUPERINTENDENT


MARR'S
MARR'S
MARR'S
DURO

Located on the southern shore of Sydney Harbour at the western edge of the CBD, the new Sydney Metro Barangaroo Station will connect the Sydney Metro line between the City and North Sydney via twin one-kilometre long tunnels under Sydney Harbour.

Construction partners, John Holland CPB Ghella (JHCPBG) joint venture, engaged Marr during the tender process to develop a craneage solution that would support the extensive tunnelling and excavation works required and their proposed construction methodology – which included the installation of heavy precast elements – for the new underground station and large crossover cavern.

Marr's solution was to install one of our M2480D and M1280Ds sitting alongside the station boxes to provide lifting capacity across the project. Set on purpose-designed foundations in and outside of the station box, the cranes took up 90 per cent less room than the proposed traditional crawler crane and gantry set up.

Flanked by Sydney Harbour, a rockface and another development to the south, the already congested site posed significant access and mobility issues for JHCPBG. The originally proposed craneage scheme was to use multiple mobile cranes and a 600-tonne capacity crawler, but was inefficient in such a congested space.

In addition to the excavation, tunneling and general construction works, JHCPBG's scope of works also included launching and retrieving two tunnel boring machines (TBMs). With our M2480D installed inside the station box at the exit point of the tunnel and configured with a 55-metre boom and six fall 330-tonne hook block, we were able to remove the 255-tonne TBM sections in a single lift. It was the first time a tower crane had been used to lift a TBM component of this weight – and set a world record for the heaviest lift by a tower crane.

After the TBM was dismantled and transported offsite, the M2480D was reconfigured to continue general construction works on the project. Using Marr's higher capacity cranes gave JHCPBG the option to build with precast beams allowing for increased modularisation and fewer lifts. Marr's approach has also reduced congestion, improved site utilisation, and reduced complexity, risk and time on the project.

SYDNEY METRO MARTIN PLACE

A FLEXIBLE CRANAGE SOLUTION FOR A MAJOR INFRASTRUCTURE PROJECT IN THE HEART OF SYDNEY'S CBD

AT A GLANCE

CLIENT	JOHN HOLLAND CPB GHELLA (JHCPBG) JOINT VENTURE TUNNEL AND STATION EXCAVATION WORKS
PROJECT	SYDNEY METRO CITY & SOUTHWEST
LOCATION	MARTIN PLACE STATION SITE
SECTOR	TRANSPORT INFRASTRUCTURE
DATE	2019 - 2020

WHAT IT TOOK

CRANES	1 X M1280D
ENGINEERS	2
INSTALLATION CREW	6
OPERATIONAL CREW	3
MAINTENANCE CREW	1

THE PROJECT

Located in the heart of Sydney's CBD, Sydney Metro's integrated station development at Martin Place will include the new Martin Place metro station, two new commercial buildings above the station, a retail space, new underground pedestrian connections and improvements to the public domain.

The John Holland CPB Ghella (JHCPBG) Joint Venture was contracted to deliver the Tunnel and Station Excavation Works for the Sydney Metro City & Southwest project, which included the excavation of the Martin Place Station site.

Construction of the Martin Place Station site included building an underground platform-to-platform connection between the existing heritage-listed Martin Place Station and the new Sydney Metro Martin Place Station – built mainly by excavating new pedestrian tunnels from the Sydney Metro construction site.

Faced with a challenging schedule of works, JHCPBG partnered with Marr Contracting for a solution.

THE CHALLENGE

Excavation and construction works on a congested CBD site in the middle of a busy pedestrian thoroughfare and high traffic area presented a number of challenges in terms of access, in particular the heavy equipment required onsite at different stages of the works to meet the demanding program.

Added to these constraints, JHCPBG's scope of works included lifting into the site 14 plunge columns that were 30-metres long and weighing 80 tonnes each as well as the associated 90-tonne drilling rigs, excavators and spoil removal.

The original craneage scheme proposed the use of two crawler cranes and a small tower crane installed on a steel platform to complete general and medium lifting requirements. For the heavy lifting requirements, a mobile crane operating on the street was proposed, but this would have required costly road closures and associated risks to the construction program. This solution could also only deliver the plunge columns in 20-tonne sections which then had to be assembled and welded onsite prior to installation.

OUR SOLUTION

Marr's solution was to eliminate the need for road occupancies by installing one of our M1280D heavy lift luffers to do all the lifting from a single point within the site. This also allowed for the 80-tonne, 30-metre plunge columns to be prefabricated offsite and lowered into their final position.

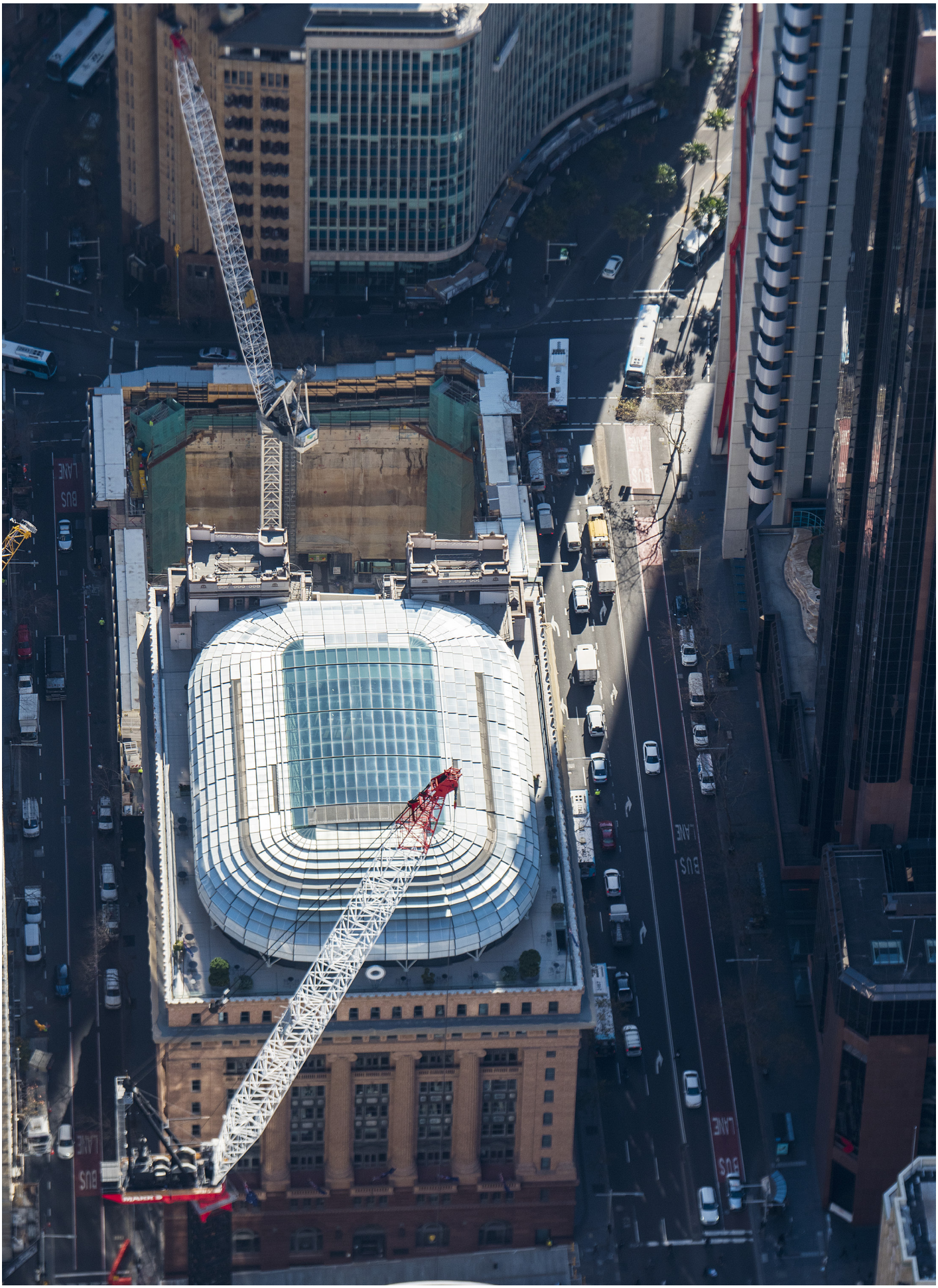
The M1280D heavy lift solution gave JHCPBG the flexibility to meet the demands of lifting a range of different equipment as requirements changed on the project – which meant delays to the construction schedule were avoided.

THE RESULT

The Martin Place South site was delivered ahead of schedule and Marr's has now been engaged by the construction partners appointed to construct the follow on above ground works on Sydney Metro Martin Place Station.

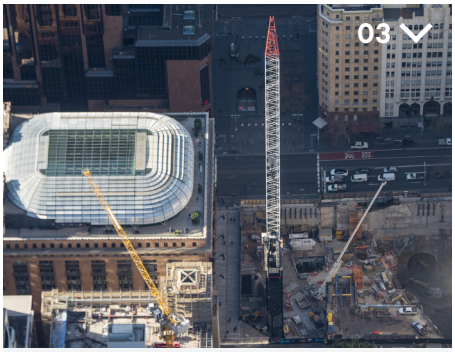
> Site productivity improved by more than 100%. We would have taken more than the same time again if we had used crawler cranes onsite.

WILL FREELANDER
CONSTRUCTION MANAGER, JHCPBG
MARTIN PLACE STATION


BUS LANE
BUS LANE
BUS LANE

Located in the heart of Sydney's CBD, the redevelopment of Martin Place Station required building an underground platform-to-platform connection between the existing heritage-listed Martin Place Station and the new Sydney Metro Martin Place Station.

John Holland CPB Ghella (JHCPBG) joint venture was contracted to deliver the Tunnel and Station Excavation Works for the Sydney Metro City & Southwest project, which included the excavation of the Martin Place Station site.



Excavating on a congested CBD site in the middle of a busy pedestrian thoroughfare and high traffic area presented a number of challenges for JHCPBG, including lifting 14 plunge columns that were 30-metres long and weighing 80 tonnes each as well as the associated 90-tonne drilling rigs, excavators and spoil removal.

Use of the 150-tonne capacity M1280D allowed for the 80-tonne plunge columns to be prefabricated offsite and lowered into their final position – eliminating the need for complex technical welding of smaller sections on-site. This was a more efficient and safer solution which helped JHCPBG to deliver the Martin Place South site ahead of schedule.

With a challenging schedule of works, JHCPBG partnered with Marr for a better solution to the original scheme proposed which relied on crawler cranes operating from a platform over the site and on the street, which would have required costly and risky road closure permits. Our solution was to eliminate the need for road occupancies by installing one of our M1280D heavy lift luffers to do all the lifting from a single point within the site.


THE MEN FROM
MARR'S
WEST SIDE STORY
THE NO.1 GREATEST MUSICAL OF ALL TIME
Sydney Opera House
16 Aug - 6 Oct
Martin Place
Elizabeth St
Telephone