WADANGGARI PARK

AN INNOVATIVE CRANAGE SOLUTION FOR A CHALLENGING BUILD

AT A GLANCE

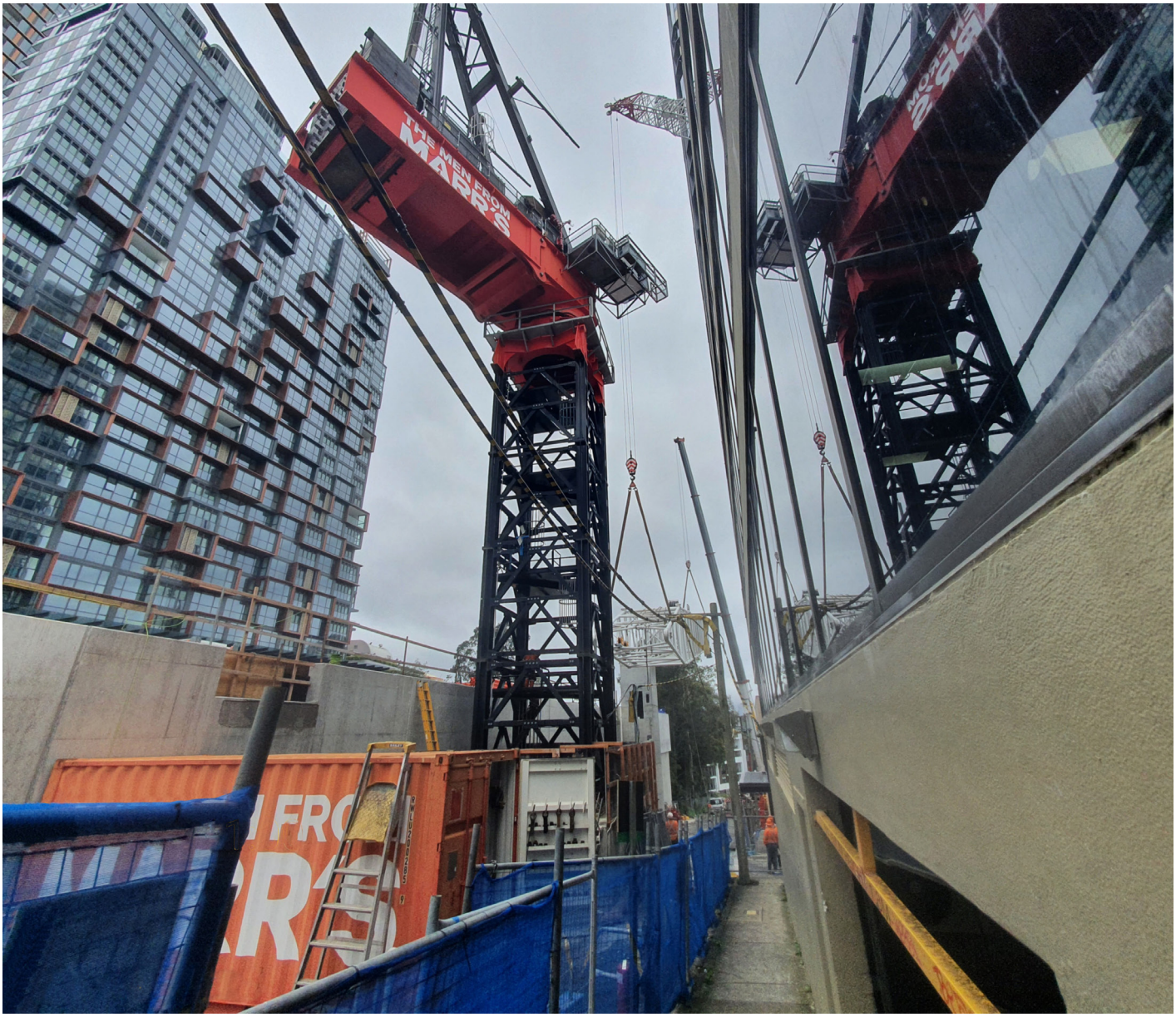
CLIENT	ARENCO (NSW)
PROJECT	WADANGGARI PARK
LOCATION	SYDNEY, AUSTRALIA
SECTOR	PUBLIC INFRASTRUCTURE
DATE	JULY – OCTOBER 2022
CRANES	1 X M2480D

When we talk about removing construction complexity by using the right crane solution, this is the kind of project we are talking about.

A bold initiative by Lane Cove Council, partially funded by the NSW Government's Public Spaces Legacy Program, Wadanggari Park features 4,750sqm of open green space connecting the community to St Leonards train station, new retail, commercial and residential developments, with pedestrian links to the new Sydney Metro Crows Nest Station.

This transformative over-rail plaza is a triumph of urban design, but for the design engineers at Aurecon, it was a difficult construction challenge.

Faced with the dilemma of how to build the project, Aurecon turned to Marr for a solution.



THE CHALLENGE

Envisaging a precast construction methodology for the over-rail structure, Aurecon needed a cranage solution that would align their proposed methodology with the constraints of the site.

'Congested' is an understatement when it comes to describing the limited space available on this site.

Wedged between high-rise buildings, one of Australia's busiest arterial roads and spanning a major rail corridor on Sydney's northern train line, the site had an area approximately seven metres wide in which to establish a crane capable of lifting precast elements weighing up to 150 tonnes, across a 95-metres-long by 30-metres-wide rail cutting.

With the construction program relying on restrictive night road closures and rail possessions, the challenge was to design a cranage solution capable of completing heavy lifting requirements safely and efficiently within these small windows of time. For Marr's team, the key challenge was as much around installing and removing the crane, as it was about completing the required lifting for the project.

OUR SOLUTION

Working with Aurecon over 18 months we designed a solution which centred around one of our M2480D Heavy Lift Luffer tower cranes. Giving the engineers the confidence that their design concept could be constructed, our solution became part of the tender package for the build-phase of the project.

Once Arenco was appointed as Head Contractor, we worked with their team to develop the detailed designs and methodology for how the cranage solution would support their construction program, as well as how we would install and remove our crane in such a congested area.

Installing one of our M2480Ds on a bespoke compact piled foundation with a 64-metre boom provided Arenco with the unique combination of the M2480D's heavy lifting capacity and small footprint (equivalent to two passenger cars parked side-by-side).

With a lifting capacity of more than 60 tonnes over a 60-metre radius, the M2480D made light work of installing more than 40 precast beams each weighing up to 80 tonnes.

The focus shifted from how many beams could the crane install during the rail possession, to how many beams could be delivered to the waiting crane hook during the rail possession.

THE RESULT

After 18 months of planning, the result was a safe, efficient solution to what would have been an otherwise incredibly complicated task.

Arenco were able to erect the girders, successfully navigating though the complex road closures and inflexible rail possessions.

The innovative solution has paved the way for alternative approaches to constructing structures and projects that have previously been deemed inaccessible to traditional construction methods.

Wadanggari Park is due for completion in mid-2023.

I contacted Marr Contracting during the early stages of Aurecon's involvement in designing the over-rail structure for this project. The site was constrained and within very close proximity to both residential and commercial high-rise buildings generating many challenges associated with the typical approach of mobile cranes/crawler cranes in erecting the precast concrete super T girders (PCSTG) for bridge structures.

Bespoke construction methods were also considered but were eventually eliminated when the use of a tower crane presented a unique solution to resolve the many challenges associated with craneage for this project. Due to the size and weight of the PCSTG, and the lift radius required for installation, it couldn't be just ANY tower crane.

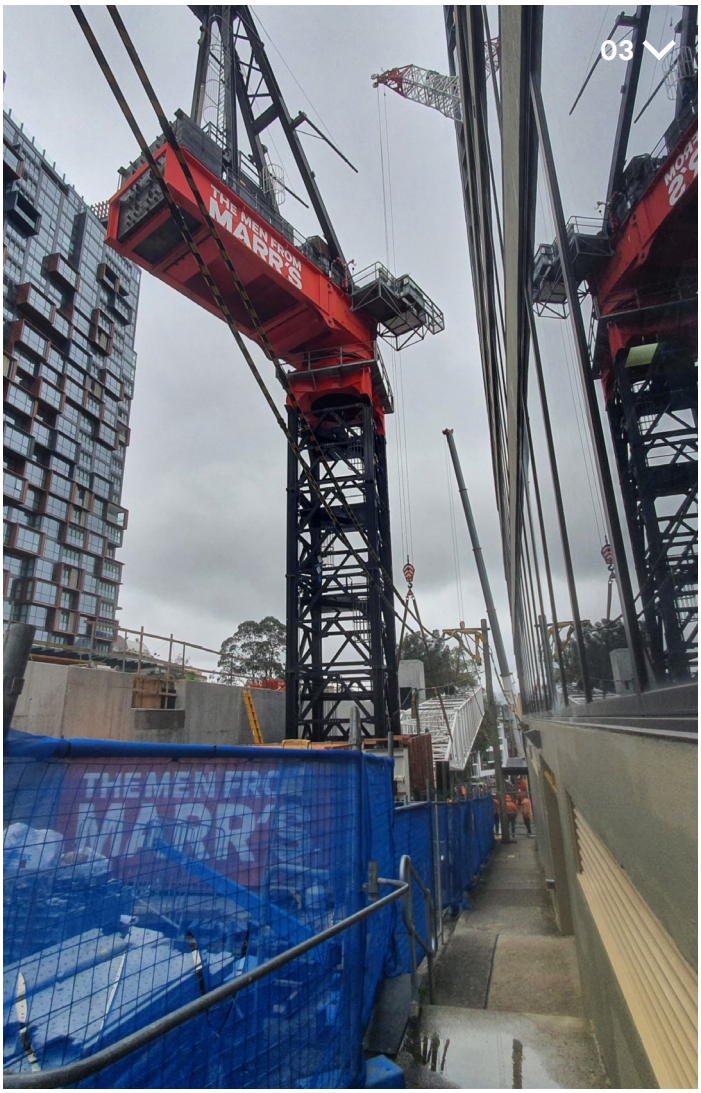
The heavy lifting capacity of Marr's M2480D tower crane provided an extremely efficient craneage solution that maximised the available time for construction works during the rail corridor shutdowns and ultimately delivered program benefits throughout the duration of the project.

Marr were nothing but proactive in not only finding a craneage solution to construct the project, but helping to procure the M2480D tower crane so that construction program surety was guaranteed for the client. To my knowledge this was the first time that a tower crane had been used on a bridge infrastructure project in this way and it was a resounding success.

PAUL FITZGERALD, SENIOR PROJECT MANAGER, AURECON

Wedged between high-rise buildings, one of Australia's busiest arterial roads and spanning a major rail corridor on Sydney's northern train line, the Wadanggari Park site at St Leonards was congested and an engineering dilemma for project engineers, Aurecon.

The area available to establish a crane capable of lifting precast elements weighing up to 150 tonnes across a 95m x 30m-wide rail cutting was just 7m wide. By installing one of our M2480Ds on a bespoke compact piled foundation with a 64-metre boom, Marr's solution provided our client, Arenco, with the unique combination of the M2480D's heavy lifting capacity and small footprint (equivalent to two passenger cars parked side-by-side).



The limited space and tight access also proved a challenge for Marr's construction team and rigging crew during the installation and removal of the M2480D using our Grove GMK6400 mobile crane.

With the construction program relying on restrictive night road closures and rail possessions, the cranage solution had to be capable of completing heavy lifting requirements safely and efficiently within small windows of time.

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With a lifting capacity of more than 60 tonnes over a 60-metre radius, the M2480D made light work of installing more than 40 precast beams each weighing up to 80 tonnes.

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The cranage solution meant that Arenco's project team could focus their attention on maximising the number of beams delivered to the waiting crane hook, (instead of the number of beams that the crane could install), during rail possessions and road closures.

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NUMEROUS RESCHEDULING REQUIREMENTS, DUE TO THE INCLEMENT WEATHER AND ALL SORT OF OTHER HUMPS IMPOSED, WERE SUCCESSFULLY SORTED OUT THANKS TO MARR'S TEAM AND THEIR PROFESSIONAL APPROACH THROUGHOUT THE PROCESS.

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ZANI BUZEVSKI
CONSTRUCTION MANAGER, ARENCO (NSW)