SYDNEY METRO CROWS NEST STATION

A NEW MODEL OF ENGAGEMENT FOR A CHALLENGING CONSTRUCTION SITE

AT A GLANCE

CLIENT	A W EDWARDS
PROJECT	SYDNEY METRO, CROWS NEST STATION
LOCATION	SYDNEY, AUSTRALIA
SECTOR	MAJOR TRANSPORT INFRASTRUCTURE (RAIL)
DATE	2018-2024
CRANES	2 X M2480D

In October 2020, A W Edwards was awarded the contract to construct the new Sydney Metro Crows Nest Station. The AU$370M project included the construction and fit out of the station, including two station entrances, underground platforms, retail space, public domain works and enabling works for future over-station developments.

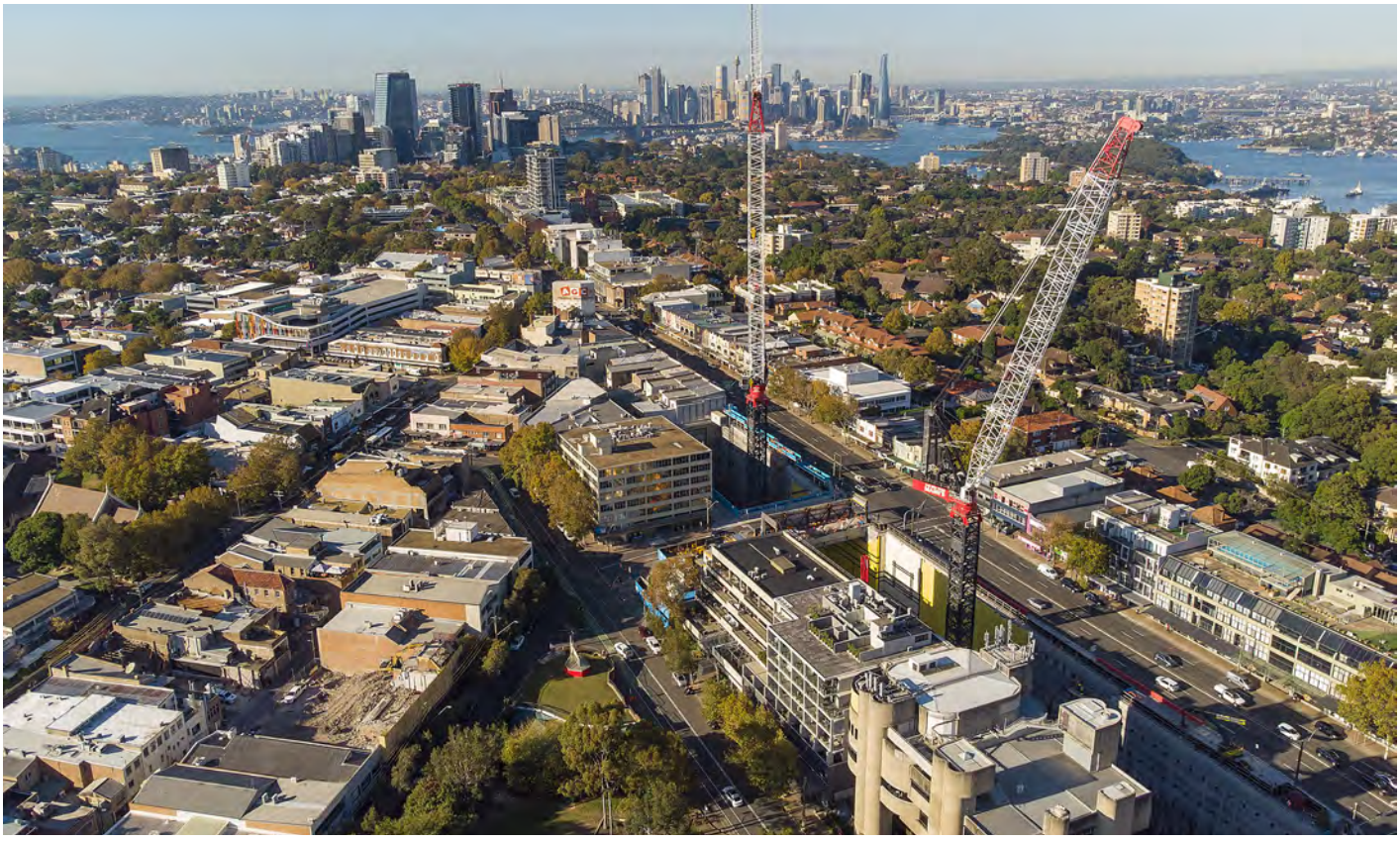
Eighteen months earlier, Marr's engineering team were approached by the end-client, Sydney Metro, during the front-end design phase to develop a craneage methodology for the project. Leveraging Marr's experience in successfully delivering on a number of other Sydney Metro station projects where similar approaches to cut-and-cover method of station box construction had been employed, the goal was to align the cranage solution to Sydney Metro's preferred precast and modular construction methodology.

As a result, Sydney Metro issued a considered and evaluated design for the construction tenderers with a suitable cranage solution built into it. Marr was subsequently awarded the heavy lifting contract by A W Edwards.

THE CHALLENGE

Following a competitive tender process, construction of the new Crows Nest Station came with a number of challenges including:

- A constrained site — limited space within the station box construction site to position the cranes;
- Location — adjacent to one of Sydney's busiest arterial roads and surrounded by a built-up retail, commercial and residential precinct;
- Limited space for the delivery of materials, crane install and removal;
- Heavy lifting requirements — precast and steel elements weighing up to 120T; and
- Construction schedule — driven by where the project sat within Sydney Metro's overall project delivery schedule for the Sydney Metro City & Southwest project.



MARR'S SOLUTION

Working closely with Sydney Metro's design and engineering team for 18 months during the front-end design phase allowed Sydney Metro to adopt their preferred designed for manufacture and assembly (DfMA) construction methodology.

Taking buildability, time and safety into consideration, Marr's solution aligned the cranage with the construction methodology to help secure the construction program.

Using two of Marr's M2480Ds installed within the station box, the bespoke cranage solution addressed the challenge of how to provide the heavy lifting capacity the project needed within the small space of the station box construction site.

Our approach also addressed the other logistical challenges that came with the lack of space available for the delivery of materials to site and the handling of large precast and steel elements weighing up to 120 tonnes.

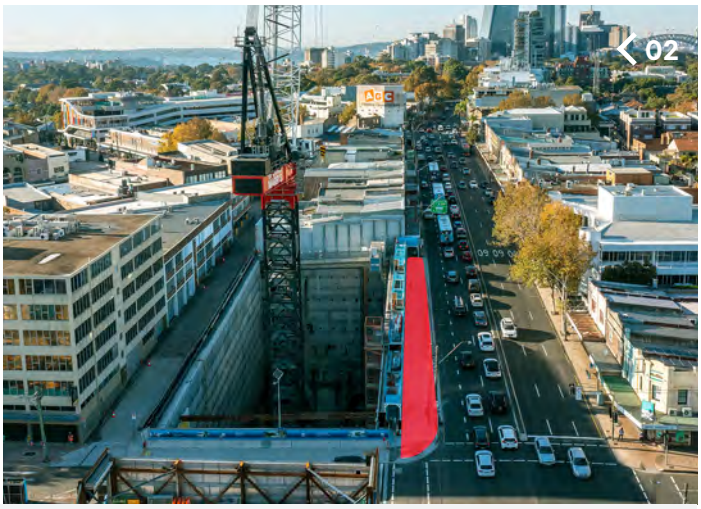
THE RESULT

Marr's expertise resulted in a cranage solution that:

- Supported Sydney Metro's preferred DfMA construction approach — allowing larger and heavier structures to be fabricated off-site and installed in single lifts;
- Aligned the cranage solution with the construction program — supporting the delivery of the project to the overall construction schedule of the Sydney Metro City & Southwest project;
- Eliminated the need for temporary works;
- Provided a solution that was safer, more efficient and cost-effective; and
- Allowed Sydney Metro to issue a considered and evaluated design for the construction tenderers with a suitable cranage solution built into it — enabling the project to transfer easily from contract award to construction in a short timeframe.

> "OUR EARLY ENGAGEMENT ON THIS PROJECT SUPPORTED SYDNEY METRO'S DESIRE TO ADOPT A DESIGNED FOR MANUFACTURE & ASSEMBLY (DFMA) CONSTRUCTION APPROACH. THEN IT WAS ABOUT ALIGNING THE CRANAGE TO THAT APPROACH & USING IT TO HELP SECURE THE PROGRAMME WITH A SAFER, MORE EFFICIENT & COST-EFFECTIVE SOLUTION."
>
> **SIMON MARR, MANAGING DIRECTOR, MARR CONTRACTING**

Located adjacent to one of Sydney's busiest arterial roads and surrounded by a built-up retail, commercial and residential precinct, the already congested site had limited space within the station box construction site to position the cranes.



As highlighted in the red areas above, the constrained site also had limited space and options for the delivery of materials, crane install and removal.

Marr's solution – using two M2480Ds installed within the station box — provided the heavy lifting capacity required within the small space available within the construction site.

Installing heavy lift luffing cranes within the station box also addressed the logistical challenges that came with the lack of space available for the delivery of materials to site and the handling of large precast and steel elements weighing up to 120 tonnes.

With a lifting capacity of up to 330 tonnes, the M2480Ds allowed large, heavy components such as steel truss beams to be fabricated off site and installed in single lifts, eliminating the need for temporary works.