KANGAROO POINT BRIDGE

M2480D HEAVY LIFTING SOLUTION FOR BRISBANE'S ICONIC SPAN CABLE-STAY BRIDGE

AT A GLANCE

CLIENT	BESIX WATPAC – CONNECT BRISBANE CONSORTIUM
PROJECT	KANGAROO POINT BRIDGE
LOCATION	BRISBANE, QUEENSLAND, AUSTRALIA
SECTOR	BRIDGE CONSTRUCTION
DATE	2023 - 2024
CRANES	1 X M2480D

Brisbane's Kangaroo Point Bridge is one of the longest span cable-stay pedestrian and cycle bridges in the world.

An initiative of Brisbane City Council, the iconic 460-metre bridge connecting Brisbane's CBD and eastern suburbs was designed and constructed by the Connect Brisbane consortium[1], led by BESIX Watpac.

Connect Brisbane engaged Marr early in the design phase to develop the lifting strategy for the project.

THE CHALLENGE

Marr was contracted to develop a lifting strategy that supported BESIX Watpac's preferred construction methodology and addressed the project's key challenges.

Located on Brisbane's busy river, the main challenge for the project was how to construct the bridge's 95-metre-tall mast – including the installation of the 25-metre-tall masthead weighing 180 tonnes.

Additional challenges included:

- installing our M2480D tower crane on four driven piles and one of our ballasted static bases in the middle of Brisbane River;
- minimising potential impacts on public ferries and private vessels that use the Brisbane River every day; and
- working on a flowing tidal river which has the potential for significant and sudden flooding.

[1] Led by BESIX Watpac, the Connect Brisbane consortium consisted of bridge design, engineering and construction specialists including Rizzani de Eccher, WSP, Dissing + Weitling, Blight Rayner, Aspect Studios, Right Angle Studios and Rowland.

MARR'S SOLUTION

Marr's previous experience working on the construction of Turkey's 1915Çanakkale Bridge provided Connect Brisbane with a frame of reference for addressing the challenges of constructing the bridge mast.

Working with BESIX Watpac and our Brisbane-based engineering partners, Robert Bird Group, Marr developed a solution using an M2480D Heavy Lift Luffing (HLL) tower crane with a 64-metre-long boom installed on a piled support platform in the middle of Brisbane River.

This configuration allowed the 25-metre-tall, prefabricated steel masthead weighing 180 tonnes to be lifted to a height of 95 metres – a feat that wouldn't have been possible using a more traditional lifting approach.

The unique heavy lifting capacity of the M2480D also allowed for other large sections of the bridge, including the mast legs and bridge deck sections, to be lifted into place in single lifts instead of smaller sections that would have required additional site works and welding.

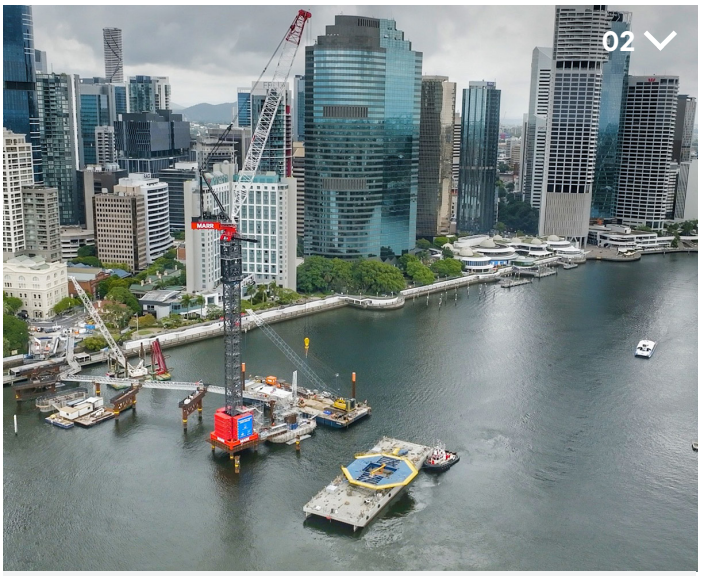
THE RESULT

Marr's scope of work on the project included more than 10 major lifts and general construction lifting requirements – all completed as planned.

By enabling fewer, heavier lifts, our approach allowed BESIX Watpac to adopt their preferred modularised construction methodology. This not only helped to deliver a safer, more productive site; but also allowed our client to share the economic benefits of the project more broadly by engaging Southeast Queensland businesses away from the work front to deliver products and services such as prefabricated components.

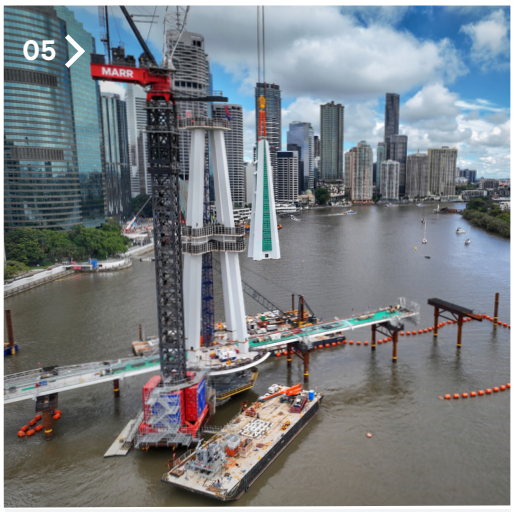
> OUR IN-HOUSE ENGINEERING TEAM WAS INSTRUMENTAL IN IDENTIFYING THIS CRANE AT TENDER PHASE AS THE PREFERRED LIFTING SOLUTION FOR THE PROJECT. AFTER COMPARING BARGE CRANE AND TOWER CRANE OPTIONS, THE TEAM CONFIRMED THE M2480D WAS THE MOST SUITABLE CRANE IN THE AUSTRALIAN MARKET CAPABLE OF LIFTING THE FULLY ASSEMBLED MAST HEAD.
>
> **ROWAN RIGGALL, PROJECT DIRECTOR, BESIX WATPAC**

JANUARY/ FEBRUARY 2023: After 12 months in the planning, the first major milestone for us on the project was installing our 330-tonne capacity M2480D heavy lift luffing tower crane on a piled platform in the middle of Brisbane River. The M2480D was installed on one of our ballasted static bases with a barge mounted 400-tonne crawler crane. The M2480D was erected on 16m of tower and then self-climbed to its final construction height of 64m (tower) and approximately 140m of hook height.



FEBRUARY 2023: With the M2480D installed, the next major lift was installing the 25m x 25m working platform ('megaframe') which weighed over 100 tonnes.

OCTOBER 2023: The unique heavy lifting capacity of the M2480D made easy work of lifting the eight prefabricated sections (four lower and four upper) of the mast legs into place. Each of these prefabricated sections were approximately 25m in length and weighing approximately 40 tonnes.



NOVEMBER 2023: After being transported up the Brisbane River by barge, the 180-tonne, 25-metre-tall masthead was installed by the M2480D in a well-planned operation that marked completion of the heaviest and final section of the bridge mast.

15 DECEMBER 2024: Kangaroo Point Bridge was officially opened on schedule and as planned.