

## WASTE TO ENERGY PROJECT

# A CRANAGE SOLUTION TO WITHSTAND THE 'FREMANTLE DOCTOR'

### AT A GLANCE

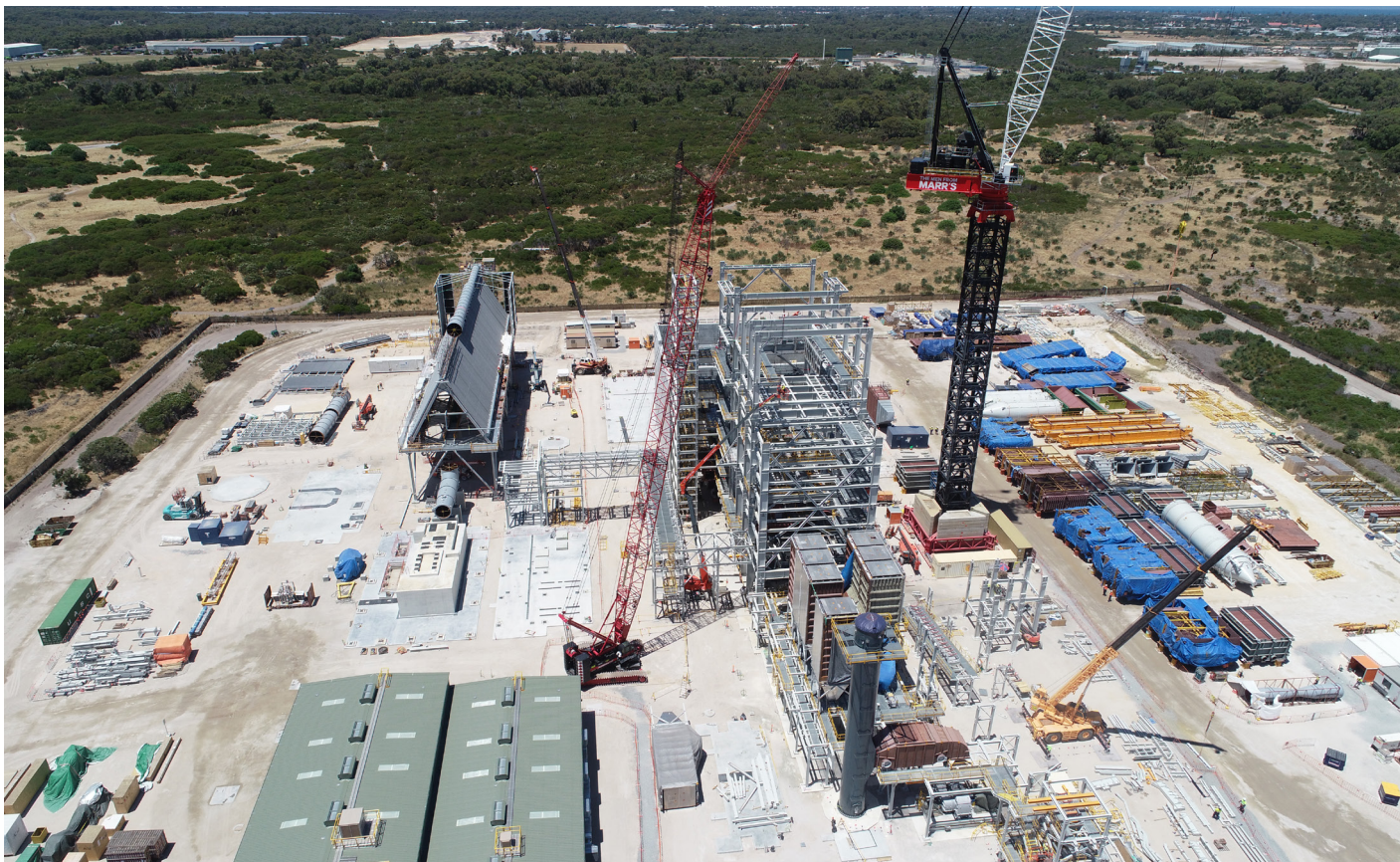
CLIENT	UNDISCLOSED
PROJECT	WASTE TO ENERGY PROJECT
LOCATION	WESTERN AUSTRALIA
SECTOR	POWER GENERATION
DATE	2021-2022
CRANES	1 X M2480D

Located 40 kilometres south of Perth, the AU\$511 million Waste to Energy Project is the second large-scale waste to energy (WtE) plant to be built in Australia. With capacity to process 300,000 tonnes of residual waste from non-recyclable commercial and industrial sources every year, the project will deliver a cost-effective waste treatment solution and a vital source of dispatchable renewable energy to the City of Perth.

After our client was awarded the lead contract for engineering, procurement and construction (EPC) on the project in 2019, they contacted Marr Contracting to work with them to develop a heavy lifting strategy and craneage solution to support their planned modular construction methodology.







## THE CHALLENGE

Located in a high wind area close to the coast, the climatic conditions of the greenfield site posed a number of challenges that our client wished to address based on their experiences constructing similar projects. Their primary concern was to find a solution that would decrease the number of lifting activities on the project and reduce the risks that wind played in this region of Western Australia where the 'Freemantle Doctor' afternoon sea breeze often blows at a rate of 20 knots (37km) per hour.

"We contacted Marr at the initial planning stage because they had a solution that would minimise interface and project risk with a 'one size fits all' crane," said the project's Construction Manager.

## OUR SOLUTION

Working closely with our client's construction team during the early stages of the project, we were able to design a simple craneage solution that reduced the number of cranes required. This reduced congestion onsite and allowed for pre-assemblies at ground level, which reduced the number of activities at height and improved onsite safety.

We also completed an analysis of historical wind data which indicated that the project was at risk of having its crane lifting operations impacted by wind on 75 per cent of days across a 12-month period if a traditional crawler or mobile crane methodology was adopted. This figure increased to over 90 per cent of days being wind-affected during the summer months - highlighting that a different approach to lifting was required if the project's craneage solution was to be successful.

Marr's solution – using a 330-tonne capacity M2480D Heavy Lift Luffer (HLL) stood on one of our ballasted static bases and crane mat system – allowed critical lifts, weighing up to 150 tonnes, to be completed by a single crane from a fixed location. With a total site coverage of over 32,000 square meters and an ability to place 25 tonnes anywhere within the crane's 102-meter radius, we were able to open up areas of the site for pre-assemblies and lay-down. This helped to significantly reduce congestion across the site.

The ability of the M2480D to work unaffected in wind speeds up to 20 meters a second, (which is double that of a traditional crawler or mobile crane approach), meant that we could de-risk the planned lifting operations from the delays that we had identified early in the crane planning process.

## THE RESULT

Marr's M2480D crane solution delivered a simple, 'clean' crane solution to the project team that:

- increased availability by eliminating risk associated with delays caused by wind – our solution meant that less than 1% of days were affected;
- reduced onsite work by lifting larger and heavier pre-assembled modules including structural steel cubes and boiler pressure parts (up to 98T) and steam boiler drum, which reduced:
  - working-at-height risk
  - onsite welding, heat treatment and NDT
- required little ground improvement or expensive civil construction works
- allowed the site to react to unscheduled lifting requirements; and

– reduced the number of cranes on the project, which:

- provided a de-congested and safer site
- removed the complexity associated with multiple crane operations in numerous areas
- simplified lift planning
- switched the focus to delivering construction instead of crane co-ordination.



THIS IS A GREAT EXAMPLE OF A CLIENT ENGAGING US EARLY IN THE CONSTRUCTION PLANNING STAGE OF THE PROJECT TO ACHIEVE A SAFER, MORE-EFFICIENT LIFTING SOLUTION, THAT IMPORTANTLY DRIVES PROGRAM SECURITY FOR THE PROJECT.



SIMON MARR, MANAGING DIRECTOR,  
MARR CONTRACTING





WE CONTACTED MARR AT THE INITIAL PLANNING STAGE BECAUSE THEY HAD A SOLUTION THAT WOULD MINIMISE INTERFACE AND PROJECT RISK WITH A 'ONE SIZE FITS ALL' CRANE. WORKING WITH MARR'S TEAM FROM CONCEPT TO ON-SITE MOBILISATION ALLOWED US TO IMPLEMENT A CONSTRUCTION METHODOLOGY THAT NOT ONLY IMPROVED SAFETY BUT ALSO PROVIDED QUALITY ASSURANCE FOR THE OWNERS OF THE PROJECT.



PROJECT CONSTRUCTION MANAGER

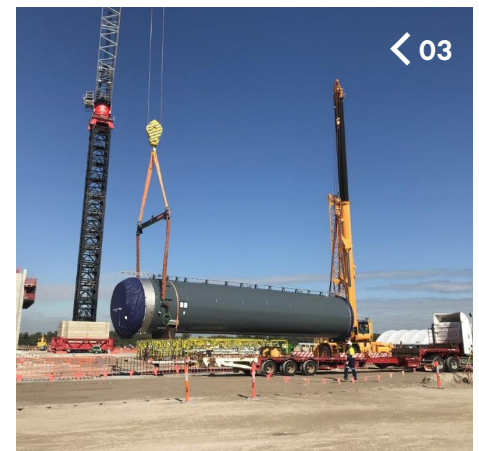
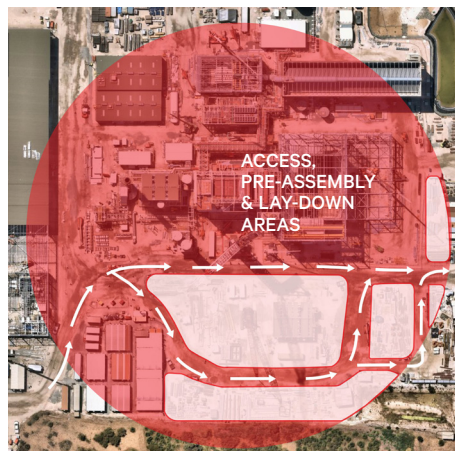
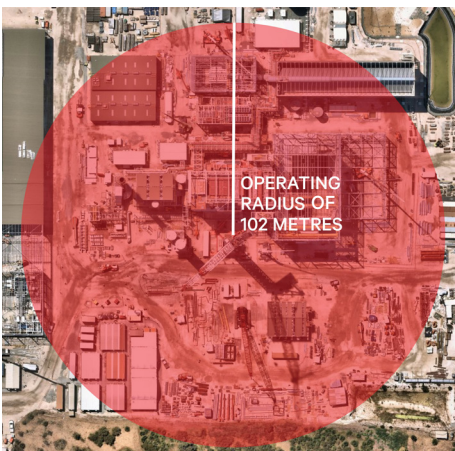




Located on the Western Australian coast in a region renowned for being impacted by the 'Fremantle Doctor' winds, the greenfield site posed a number of construction challenges. Based on their experiences constructing similar projects, our client's primary concern was to find a craneage solution that would decrease the number of lifting activities on the project and reduce the risks that winds of up to 20 knots (37km) per hour played on the construction program.



Marr's solution – using a 330-tonne capacity M2480D Heavy Lift Luffer (HLL) stood on one of our ballasted static bases and crane mat system – allowed critical lifts, weighing up to 150 tonnes, to be completed by a single crane from a fixed location.



With a total site coverage of over 32,000 square meters and an ability to place 25 tonnes anywhere within the crane's 102-meter radius, we were able to open up areas of the site for pre-assemblies and lay-down which helped to significantly reduce congestion, but still maintained vehicle access through the site.



Marr's scope of works included the development of lift plans for heavy and critical lifts for components including structural steel pre-assemblies, boiler pressure parts, steam boiler drums, stack sections, water walls and super heaters weighing up to 100T with rigging.



By enabling larger and heavier pre-assembled modules to be assembled at ground level and lifted into position for final connection, Marr's solution created a safer worksite by reducing the risk of working at height.