



HAMMERHEAD CRANE DECONSTRUCTION.

Location
Garden Island, Sydney, NSW

Client
Department of Defence

Duration
9 months



CLICK TO WATCH
or visit vimeo.com/libertyindustrial



Project overview

Liberty Industrial carried out the deconstruction of the Hammerhead Crane located at the Garden Island Naval Base on Sydney Harbour. The project involved dismantling a heritage significant giant cantilevered dockside crane for the Department of Defence.



Built to lift up to 250 tonnes, the 61 metre tall Hammerhead Crane was, at the time of its construction, the largest crane in the Southern Hemisphere, and up until its deconstruction, it remained the largest dockside crane in Australia.

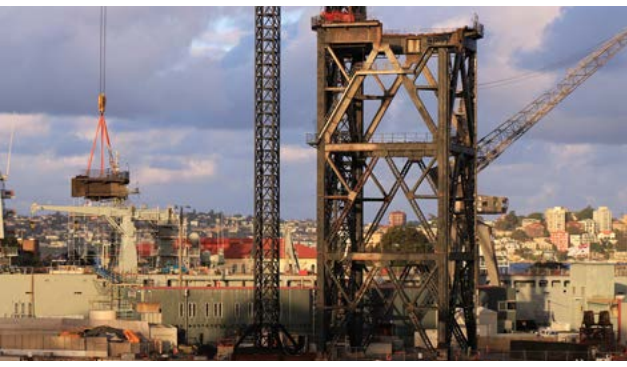
At tender stage, Liberty Industrial engineered, and successfully pitched, an efficient alternative design solution to the Department of Defence, reducing their proposed dismantling methodology from 250 lifts down to just 70. By reducing the number of lifts required to dismantle the crane, our alternative dismantling strategy greatly reduced the potential for exposure to height, significantly minimising the safety risks involved with carrying out the deconstruction and reducing the project cost and timeframe.

Favelle Favco M2480D and M120RX Luffing Jib Tower Cranes were hired for the project. A capacity of 330 tonnes out to a 15 metre radius makes the M2480D the world's largest capacity tower crane. The project team engineered a solution to free stand the Favelle Favco M120RX, constructing a steel support structure off the wharf and erecting the bottom third of the tower with a 55 tonne mobile crane and completing the assembly with a 300 tonne mobile crane. The base for the Favelle Favco M2480D Tower Crane, was provided by Brookfield Johnson Controls, who were managing the project on behalf of Defence. A 230 tonne pin jib truck crane in conjunction with the 300 tonne mobile crane lifted the boom into position, with the crane self-climbing the last 12 metres.

We carried out spray painting and paint stripping works to prepare the crane for disassembly, encapsulating the crane's existing lead chromate paint coating with a high build flexible water-borne acrylic paint to stabilise any flaky paint on the structure, to prevent the release of lead chromate paint during deconstruction. The acrylic was applied by airless spray to avoid disturbing the crane's hazardous coating. The predetermined separation locations were carefully marked and the paint removed from these areas to prepare the surface for oxy cutting. This prevented the release of harmful vapours during cutting.

A stringent environmental monitoring program was implemented to monitor and manage the risk of lead and chromate contamination, to prevent harm to the harbour's delicate marine surrounds and protect the health of workers, naval personnel and the local community. This included surveys for lead in soil and sediment, surveys for lead in water and a comprehensive ambient air monitoring program. The structure was progressively





dismantled in large sections in a highly choreographed sequence, engineered to maintain the structural stability of the crane. Sections of the crane were rigged to the M2480D Tower crane, and separated from the remaining structure by oxy cutters working from a workbox rigged to the M120RX Tower Crane. Once separated, the sections were lifted down to the designated materials processing area and downsized. The jib tip was our largest lift at 65 tonne.

Working alongside 24/7 Naval operations at a naval base on Sydney Harbour presented a few challenges for the project team who were faced with the constraints of an operational site, and a confined 4000m2 work area. The limited work area severely restricted the availability of workspace for landing loads and materials processing.

We deployed a 33t Volvo EC330LC Hydraulic Excavator with a shear attachment to carry out the heavy duty downsizing. Oxy-cutters assisted to further downscale and process scrap materials, removing the lead chromate paint from the cut locations prior to cutting. The processed components were transported to an offsite recycling facility. In total, 2027 tonnes of the 2036 tonnes, or 99.56% of all materials were recovered. This included the salvage of 132 tonnes of heritage items, the recycling of 1855 tonnes of steel and 40 tonnes of concrete. Only 9 tonnes of material was not able to be recovered; 6 tonnes of lead paint waste and 3 tonnes of general waste.

In addition to the removal of the structure, the project had a substantial salvage component with the preservation and restoration of numerous heritage significant components of the crane. Components of the crane identified for salvage included the crane's main hook assembly, hook platform and trollies, the driver's cabin, slew ring and machine house plant items among others. Because of their value it was imperative these items were not damaged or structurally altered during the removal and refinishing works so we developed a comprehensive methodology for the removal, relocation, refinishing, storage and reinstatement of the heritage components to ensure their condition was maintained.

Once carefully dismantled, these items were transported to an offsite facility where they were decontaminated of their lead chromate coating and refinished. We fabricated a specialised frame for the crane's enormous 25.7 tonne hook assembly. At 7m wide and 8m long it was transported under Police Escort to the storage location. Liberty Industrial constructed concrete plinths outside the Royal Australian Navy Heritage Centre for the reinstatement of key heritage items.

The project was shortlisted as a Finalist for the Contract of the Year over US \$1M at the 2015 World Demolition Awards.

WORLD
DEMOLITION
AWARDS 2015
SHORTLISTED
CONTRACT OF THE YEAR OVER US\$1 MILLION
ORGANIZED BY dsri