

Remembering the Hammerhead Crane

EPBC 2012/6430



Department of Defence

June 2024

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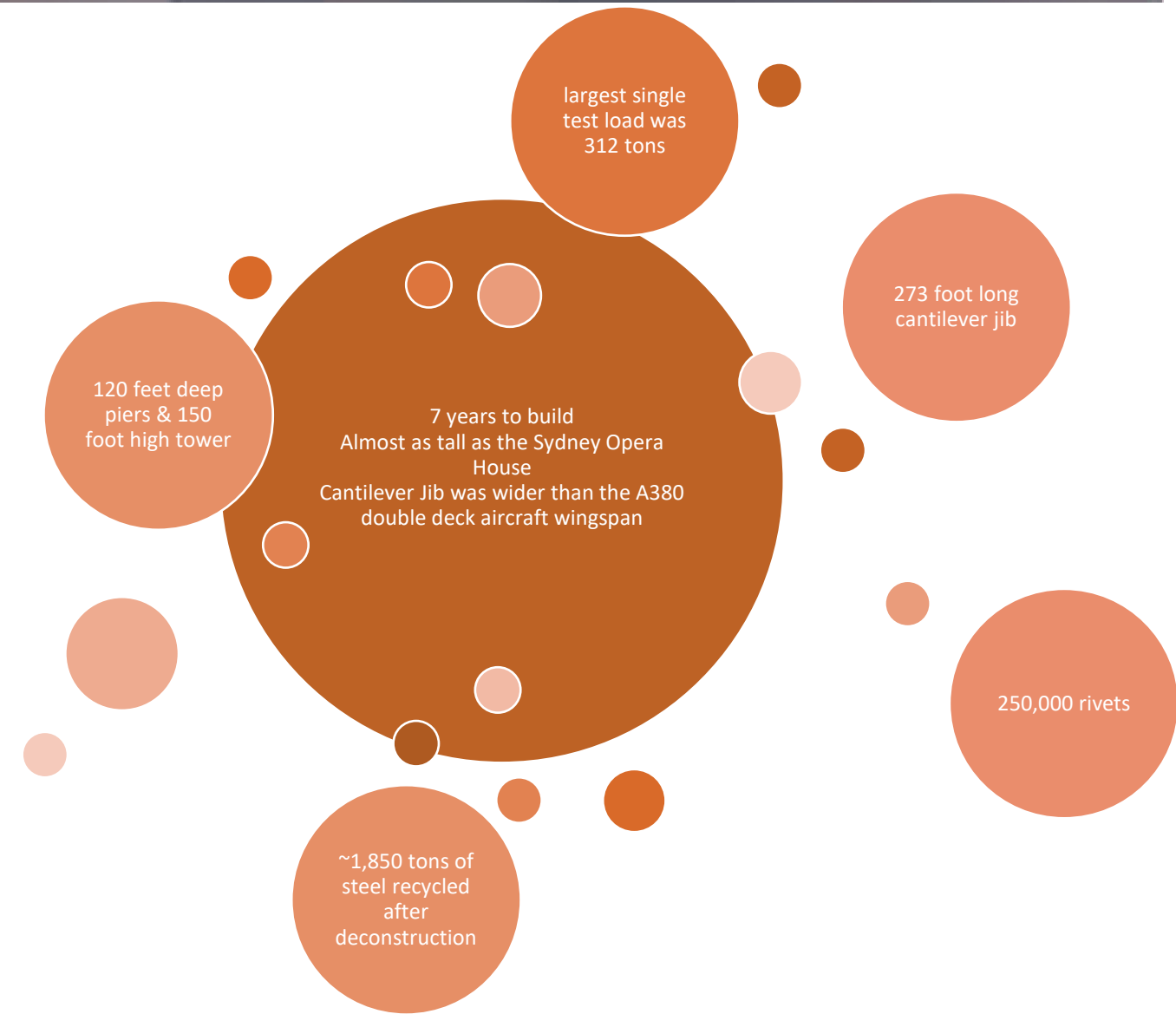
Remembering the Hammerhead Crane

The Hammerhead Crane was a giant crane that could be seen around Sydney Harbour between 1951 and 2014.

Upon completion in 1951, it was the largest crane in the southern hemisphere and could lift up to 250 tons. The Hammerhead Crane was an important part of Sydney's industrial heritage and served the Navy for almost fifty years.



Figure 1: The Hammerhead Crane and Sydney CBD, 2003
(Source: Robert Bird & Partners, 2003, Condition Study of the Hammerhead Crane)



Where was the Hammerhead Crane?

The Hammerhead Crane was built at the Naval Base on Garden Island in Sydney Harbour, on the lands and seas of the Gadigal and Birrabirragal people of the Eora nation. Construction began in 1944 and finished in 1951. The location of Garden Island and the Crane are shown below.



Figure 2 and 3 – Location of the Hammerhead Crane (Source: Parsons Brinkerhoff, 2012, Hammerhead Crane Initial Environmental Review)



How did the crane work?

This description of the Hammerhead Crane is drawn from these reports prepared for Defence:

- Robert Bird & Partners, 2003, Condition Study of the Hammerhead Crane
- Godden Mackay Logan, 2005, Hammerhead Crane Heritage Assessment

Information on how the Hammerhead Crane works is presented in a slideshow prepared by Robert Bird and Partners and available on the Defence website.

The key features of the crane described here are shown on Figure 4 and the crane's substructure is shown on Figure 5.

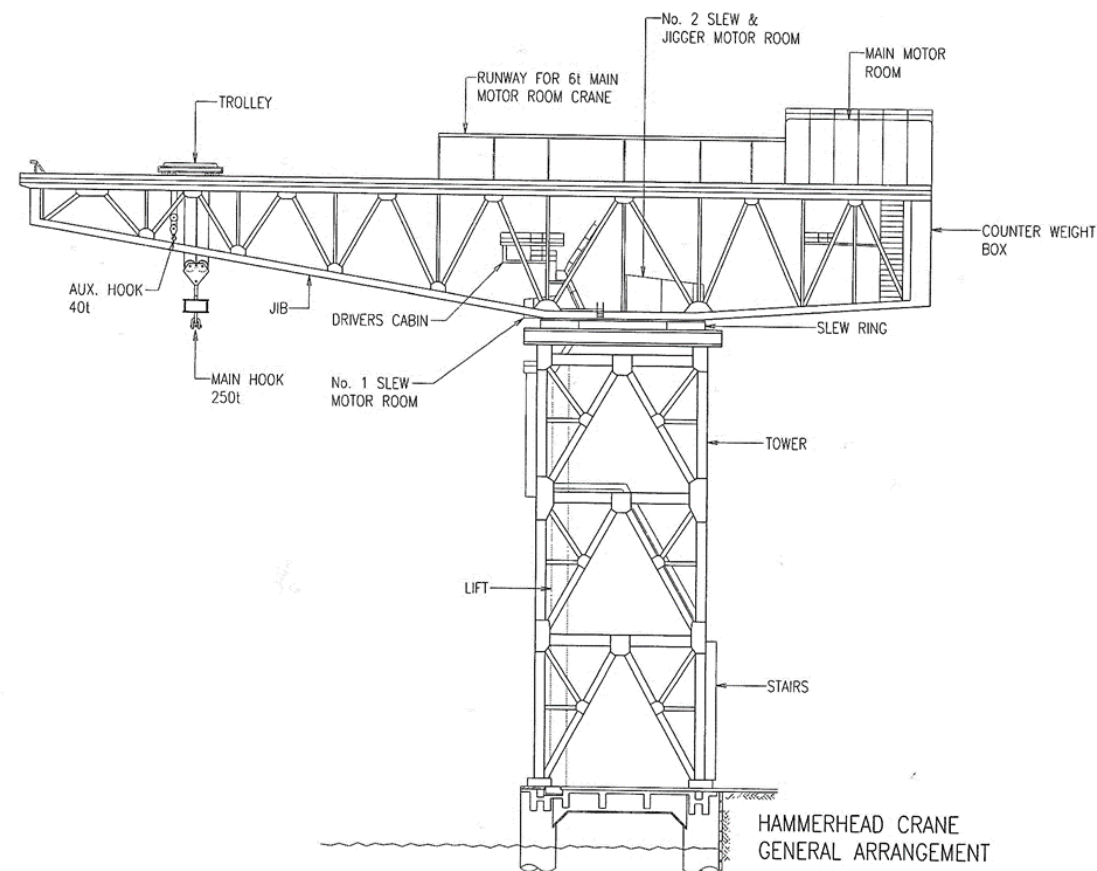


Figure 4: Hammerhead Crane General Arrangement (Source: Robert Bird & Partners, 2003, Condition Study of the Hammerhead Crane)

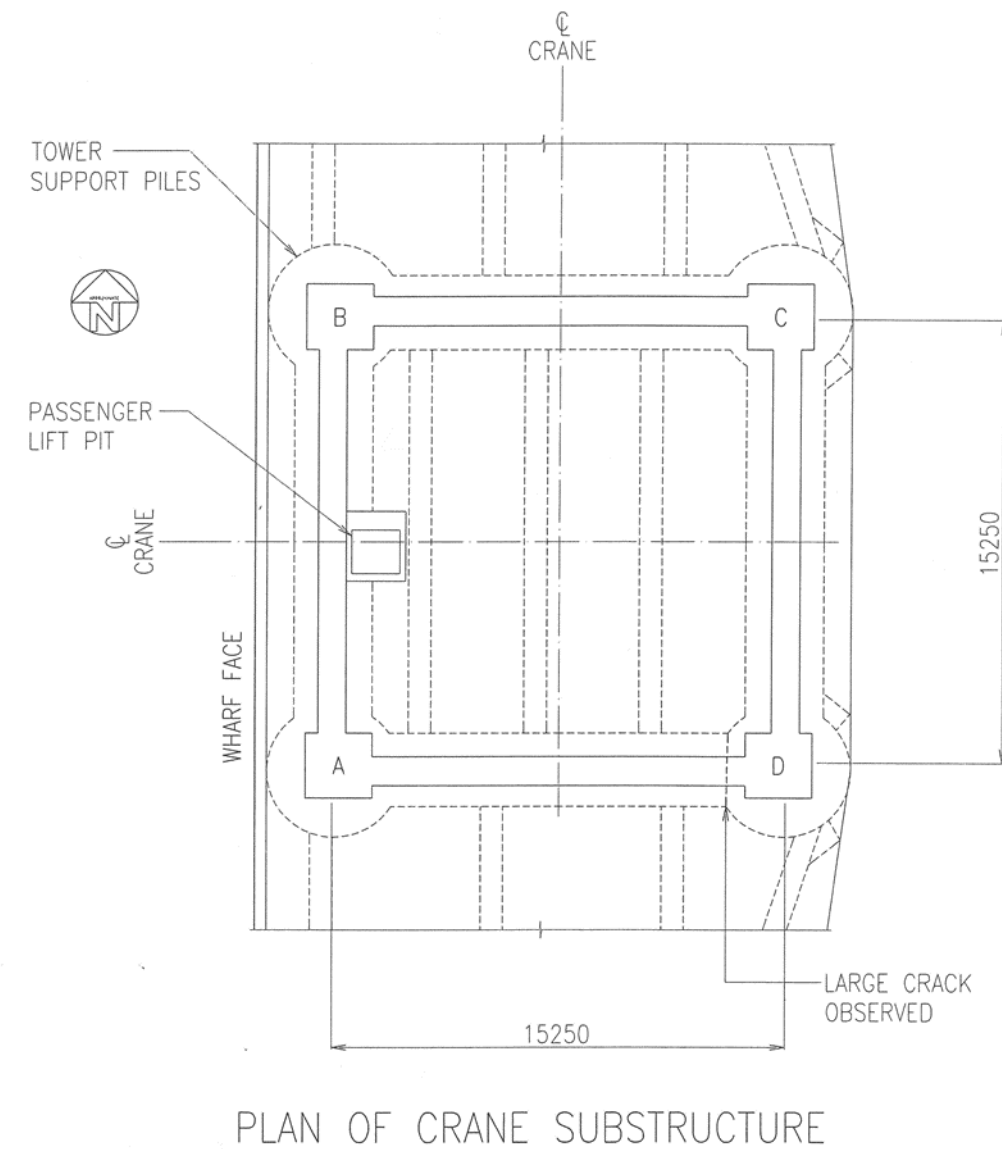


Figure 5: The Crane's Substructure (Source: Robert Bird & Partners, 2003, Condition Study of the Hammerhead Crane)

Key Components of the Hammerhead Crane

- The Hammerhead Crane was a fixed tower crane. The tower was formed from square steel sections. An asymmetric horizontal steel truss jib rotated on the tower via a slew ring.
- The Hammerhead Crane was designed to lift 250 tons at 118 feet (36m) from the centre of the tower and 120 tons at 162 feet (49.4m).
- The tower was 16m square in plan and 41m high. The jib was a further 12m high. From the centre of the crane, the long arm of the jib is 54m long, and the short arm was 29m long.
- The entire structure was constructed of riveted steelwork and weighed approximately 1600 tons.
- Each tower leg was supported by a 5m diameter concrete pile that extended well below the sea bed to the founding layer.
- The slew ring was located at the top of the tower and was 16m diameter with 96 solid cast steel rollers.
- The crane trolley ran on rails that were fixed to the top of the jib top chord. The trolley had two main hoists, each with a 125 tons capacity, and an auxiliary hoist of 40 tons capacity. The main hoists could be operated independently or combined for a single lift capacity of 250 tons.
- The main motor room was located at the end of the short arm of the jib. This motor room contained the drives and rope drums for the two main and auxiliary hoists. There were additional motor rooms for the slew drives and 10t jigger hoist. The layout of the main motor room is shown in Figure 6.

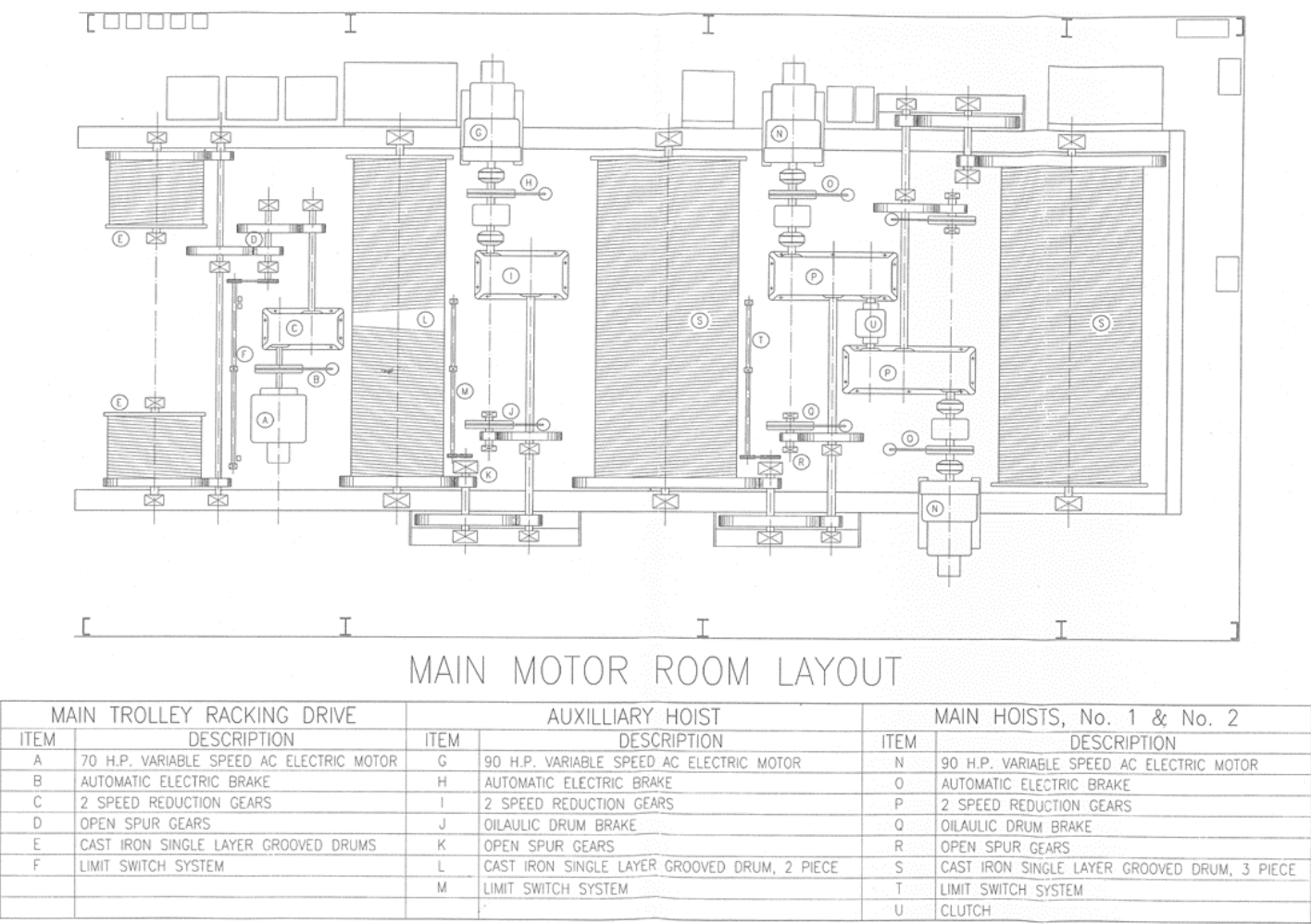


Figure 6: The Main Motor Room Layout of the Hammerhead Crane (Source: Robert Bird & Partners, 2003, Condition Study of the Hammerhead Crane)

Remembering the Hammerhead Crane

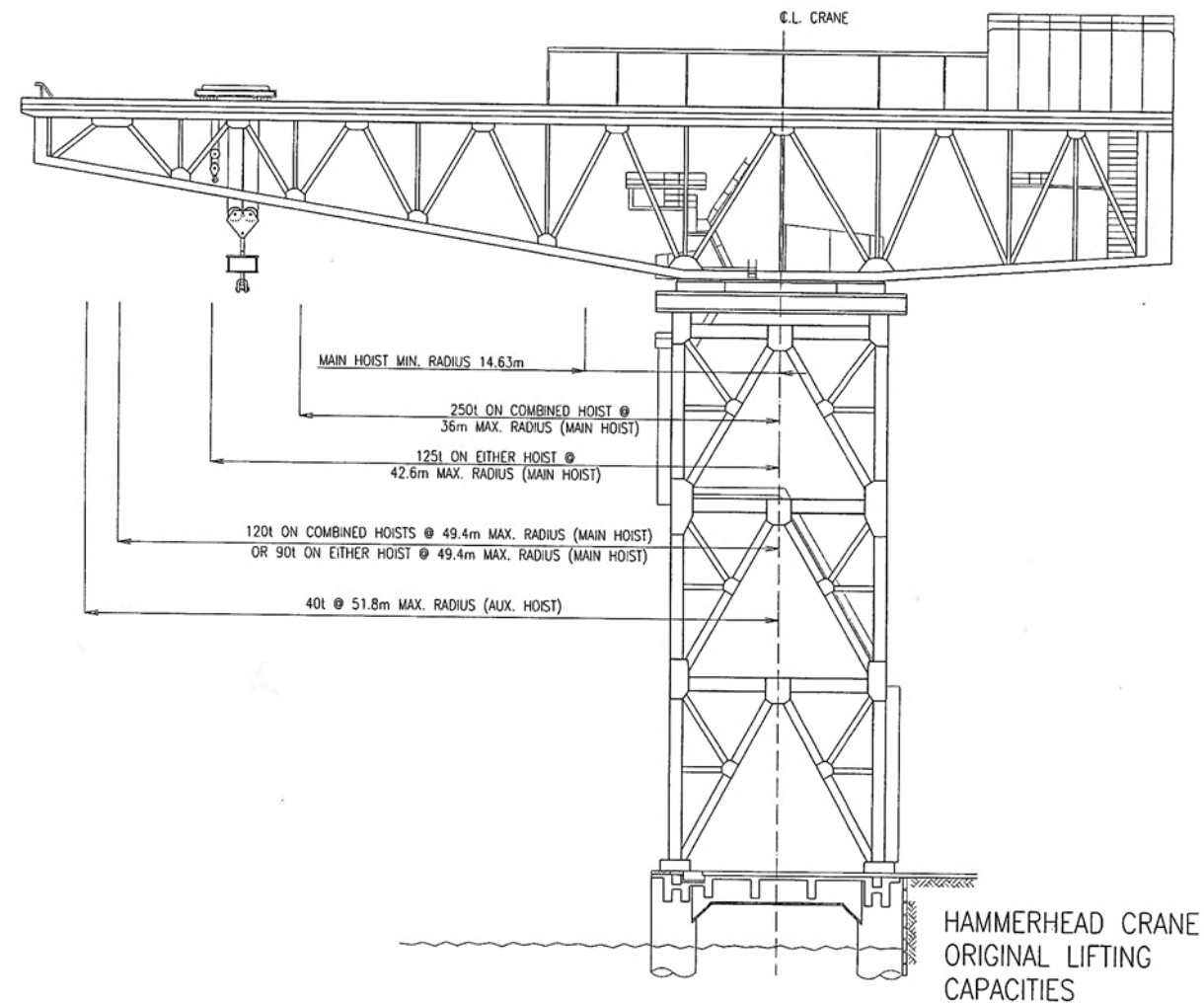


Figure 7: Hammerhead Crane Original Lifting Capacities (Source: Robert Bird & Partners, 2003, Condition Study of the Hammerhead Crane)

- Under the main motor room was the ballast box for the counterweights. The counterweight was made up of 3954 cast iron blocks, each weighing 156 pounds (70.0 kg). The total counterweight weighed 275 ton. The original lifting capacities of the crane are shown in Figure 7.
- All drive systems in the crane were powered by electric motors and controllers. The electricity supply to the crane was 415 volts, three phase at 50hz, with all wiring specified to 660 volts capacity.
- Hoist speeds for the main hoist were 1.86m per minute at low speed or 3.72 m per minute at high speed.
- The crane used over 16km of steel wire. The cable on each main winding drum was over 762m long.
- There were four concrete foundation cylinders to the crane. These were 4.6m diameter, 39.9m long and extended around 30m below the seabed to bedrock. Each cylinder weighed 144.5 tons.
- The crane tower was 45.6m high and had two levels of intermediate bracing. The legs of the tower were latticed steel beams. At each intermediate level, horizontal plate girders linked each tower leg, with truss girders as diagonal braces to the opposite leg.
- A steel stair ran up the outside of the tower legs, encircling the tower. It had treads but no risers and simple two-rail pipe handrails.
- An electric lift ran in a corrugated iron clad shaft to the top of the tower, centrally positioned between the two western legs.
- The motors and switchgear for the lift were located at the base of the lift shaft, at wharf deck level.
- The original Steel Drawings by Brookfield John Controls can be viewed in Annex A Brookfield John Controls (23 May 2014).

Historical Overview

The following overview is primarily drawn from the [2014 Hammerhead Crane Heritage Interpretation Plan](#) prepared by Godden Mackay Logan (now GML Heritage) and information available from the Royal Historical Society of Australia and the Naval Historical Society of Australia. Refer to the Interpretation Plan for more detail.

The history and heritage significance of the Hammerhead Crane was associated with the development of the Garden Island precinct (in particular the Captain Cook Dockyard) and its evolution and development as one of Australia's oldest and most important strategic naval facilities.

The location of Garden Island on Sydney Harbour in close proximity to residential areas has meant that expansion and development on the island has occurred within tight physical constraints. Significant changes to the natural topography of the site (including land reclamations) have been undertaken to meet the demands of the growing facility to an extent where the original landscape is barely recognisable.

The Hammerhead Crane was located on reclaimed land and was installed during the most extensive period in the base's development. Its massive size made it a widely recognisable feature of the base within the Sydney skyline.

Garden Island Sydney

Garden Island Sydney was used as a naval facility soon after the start of colonisation in the early 1800s. A base for use of the island by the British Royal Navy was established in the 1850s. The topography of the island was modified and the foreshore was expanded, and by the 1890s, Garden Island had quite an industrial appearance.

Following Federation in 1901, responsibility for Defence was taken over by the Commonwealth Government. In 1911, the Royal Australian Navy (RAN) was created; and from 1913, Garden Island and the buildings that had been erected on it by the New South Wales Government were handed over to the Commonwealth Government for the RAN.

World War II and the fall of Singapore in 1942

With the outbreak of World War II in 1939, the Commonwealth Government resumed the island under wartime powers and in 1945 purchased it from the New South Wales Government for £638,000. The island formed the base for fleet operations during World War II, while shipbuilding and major construction work for the navy was undertaken at Cockatoo Island, which had shipbuilding slips and graving docks.

In February 1942, Britain's great island fortress of Singapore fell to Japan. The losses included docking and repair facilities for large warships including a giant crane. Without these, it would be impossible to re-establish naval supremacy in the region. Accordingly, a safer home was required and that choice fell upon Sydney, giving impetus to the construction of the Captain Cook Graving Dock and the associated Hammerhead Crane.

From an Australian perspective, there had been a growing realisation for the need to strengthen its own defence capabilities closer to home and that the construction of a graving dock would allow a fleet to be based in Australia and, therefore, be strategically important for Australia's defence.

The massive new Captain Cook Graving Dock, built at Garden Island during World War II, was a huge engineering project for Australia at this time. It connected the island to the mainland and made it one of the most important naval bases in the southern hemisphere.



Figure 8: Giant Crane at the Singapore Naval Base, c March 1941. (Source: Australian War Memorial, [Accession No 006169](#))

Construction of the Hammerhead Crane

Construction began on the Hammerhead Crane in 1944 while the Captain Cook Graving Dock was under construction. Tenders for the Sydney crane were called in 1944. The Sydney Steel Company Pty Ltd was contracted to fabricate and erect the crane to the design of Sir William Arrol, with Sir Alexander Gibb and Partners as consultants. All mechanical and electrical equipment came from England, and all structural steelwork was fabricated and erected by the Sydney Steel Company in Marrickville. The steel was from the BHP steel works in Port Kembla.

The crane's design was an exact copy of the dockyard crane built in Singapore just before World War II. The Singapore crane was destroyed in 1942 by the British before the Japanese takeover. The plans from the Singapore Naval Base were used for the Sydney crane and it was engineered to the extremes of likely weight demand. The blueprints (Object No 2003/217/1) for the crane are available from the Powerhouse Museum. Early photographs are also available from the [Powerhouse website](#).

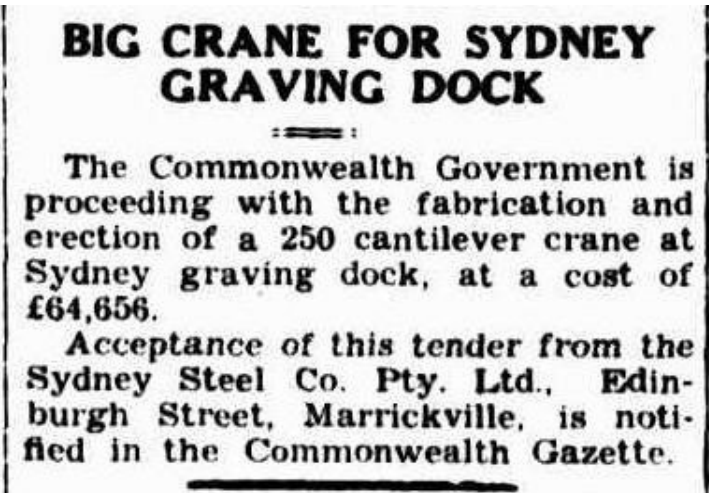
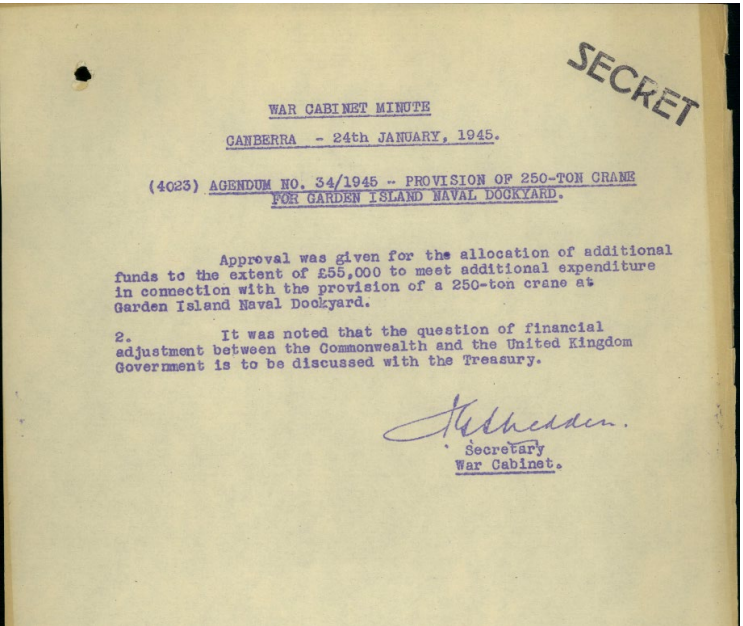
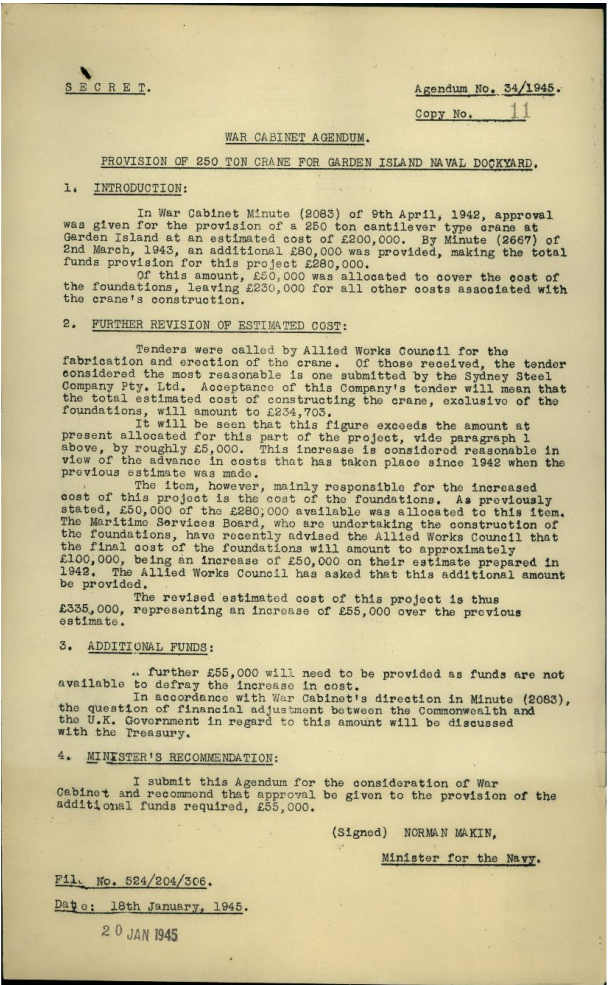


Figure 9: Announcement in *The Canberra Times* on 9 February 1945 (Source: Trove, National Library of Australia, Item No 2615693)



Figures 10 and 11: 1945 War Cabinet Agendum items identifying the need for additional funding to complete the construction of the Hammerhead Crane, and approval of the funding (Source: National Archives of Australia, Series No. A2671, CS 34/1945, Item No. 7564974)

Big Crane For Dock: Lord Louis To Inquire

If Captain Cook Dock gets a 250-ton crane Lord Louis Mountbatten, who visited it with Lady Louis on Saturday, may have something to do with it.

The resident engineer at the dock, Mr. James Muir, in presenting Lord Louis with a dock plan, pointed to a spot and said, "That's where the 250-ton crane should be."

Lord Louis: "Why isn't it there?"
Mr. Muir: "Because it is being held up by the Royal Navy."

Lady Louis: "We should hang our heads in shame."

Lord Louis promised to look into the matter. He also asked Senator Collings, who was present representing the Commonwealth Government, to do so. The dock has only 50-ton cranes, and the 250-ton one, originally planned, was part of the work that was stopped when the war ended.

Lord Louis and Lady Louis climbed down into the dock. They admired the shiny switches and the cleverly contrived index board and big pale green machinery in the cream-tiled pump room, many feet underground.

MET LION VENDOR

But, in addition, they did things like these:

Discovered that Stoker George Van Dyk (who is clean-shaven) had sold Lady Louis a lion cub in Durban in 1936 for £25.

Signed an autograph book for nine-year-old Robert McMahon, of Garden Island.

Autographed the paybook of Mrs. F. A. Cooley, who wore the uniform of the Women's Auxiliary Service, Burma, complete with 12th Army flashes and "Chindit" collar badges. "I'd do anything for a 'Washee'," said Lord Louis.

Drank soft drinks in the empty canteen, arguing cheerfully about whether it was better to use a straw or drink out of the bottle. Lady Louis was a bottle woman. Lord Louis used a straw.

VISIT TO RACES

Lord Louis and Lady Louis attended the race meeting at Canterbury on Saturday afternoon. The

burial on Saturday afternoon. The races had been named in honour of Lord Louis's associations, the principal event being the Lord Louis Mountbatten Cup.

Lord Louis presented the cup to Mrs. J. Ferguson, owner of Puffham, winner of the cup race.

Sydney horse-trainers who were close to Lord Louis and Lady Louis

in the official stand said that Lady Louis obviously knows horses.

She declared that Murray Stream had begun too smartly in the Mountbatten Cup to do himself justice in the finish, and with three furlongs of the race remaining, she handed over a pound note she had invested on the horse, with the remark, "We've lost it already."

Murray Stream was last to finish.

In the next race she put £1 on Cordale, the winner, and in the hurry of the departure from the course still had the winnings in her hand.

"Now please don't forget to congratulate the jockey, Moore, on the excellent finish he rode on Cordale," she said, "and thank him for having won this money for me."

Moore was brought from the jockey's room to the car.

After attending the races, Lord and Lady Louis visited Anzac House, where they met representatives of the Returned Soldiers' League and of the 8th Division Association.

From there they went to a cocktail party, given by the committee of King George's Fund for Sailors, at the Australia Hotel.

CRANE TOWERS OVER SYDNEY



Size of the 250-ton-capacity crane which is being built at Captain Cook Dock, Garden Island, is illustrated in this picture. In the foreground is the bow of the aircraft-carrier Sydney, with the crane towering in the background. Total weight of the structural steel in the crane is 1,400 tons.

Figure 13: The construction of the crane received regular coverage in the newspapers (Source: Sydney Morning Herald, 8 October 1949 page 3, Trove, National Library of Australia, Item No 18133904)

Both the crane's tower structure and its cantilever jib were trial erected at Sydney Steel's Marrickville workshop, which was done adjacent to the main north-south rail line, providing quite a spectacle for commuters between 1948 and 1950.

Figure 12: Article in the Sydney Morning Herald about the delay on building the crane in 1946 (Source: Trove, National Library of Australia, Item No 17974188).



Figure 14: Photograph of workers and crane weights (Source: Sydney Steel Company Pty Ltd, Photographed by Colin Stuart, 1951, Powerhouse Museum, Item No 2014/39/1-1)

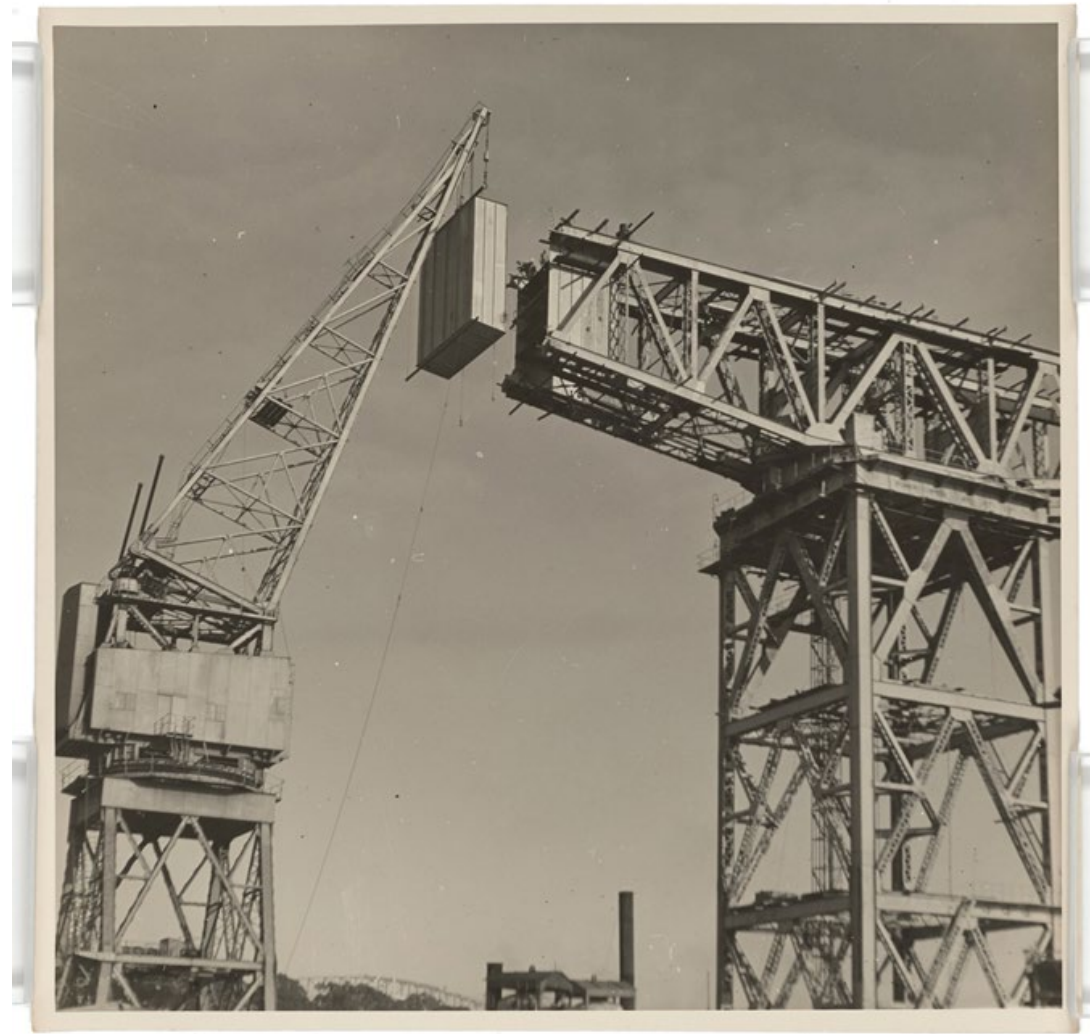


Figure 15: Photograph of Hammerhead (Giant Titan) crane (Source: Sydney Steel Company Pty Ltd, Photographed by Colin Stuart, 1948 – 1951 Item No. 2014/39/1-2)

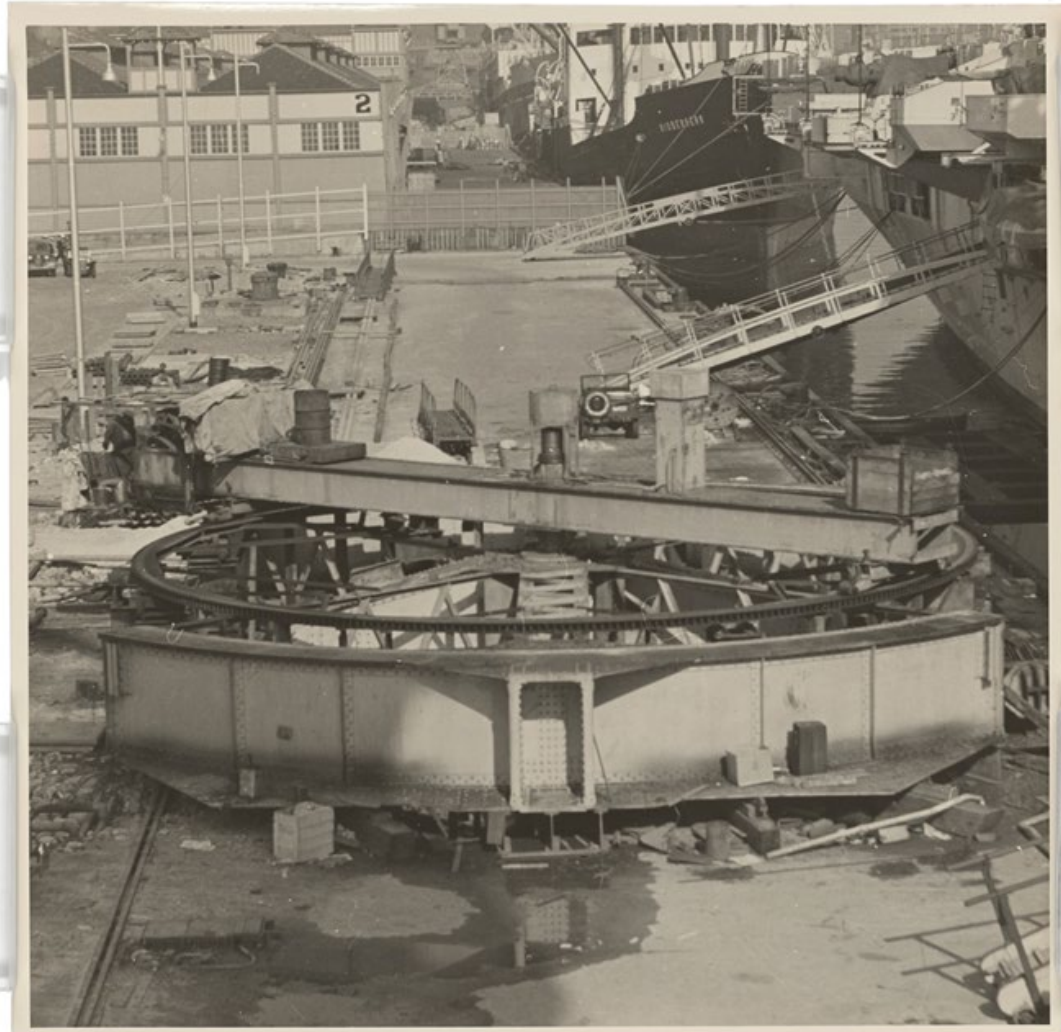


Figure 16: Photograph of the Hammerhead (Giant Titan) crane (Source: Sydney Steel Company Pty Ltd, Photographed by Colin Stuart, 1948 – 1951 Item No. 2014/39/1-22)



Figure 17: Photograph of the Hammerhead (Giant Titan) crane (Source: Sydney Steel Company Pty Ltd, Photographed by Colin Stuart, 1948 – 1951 Item No. 2014/39/1-35)

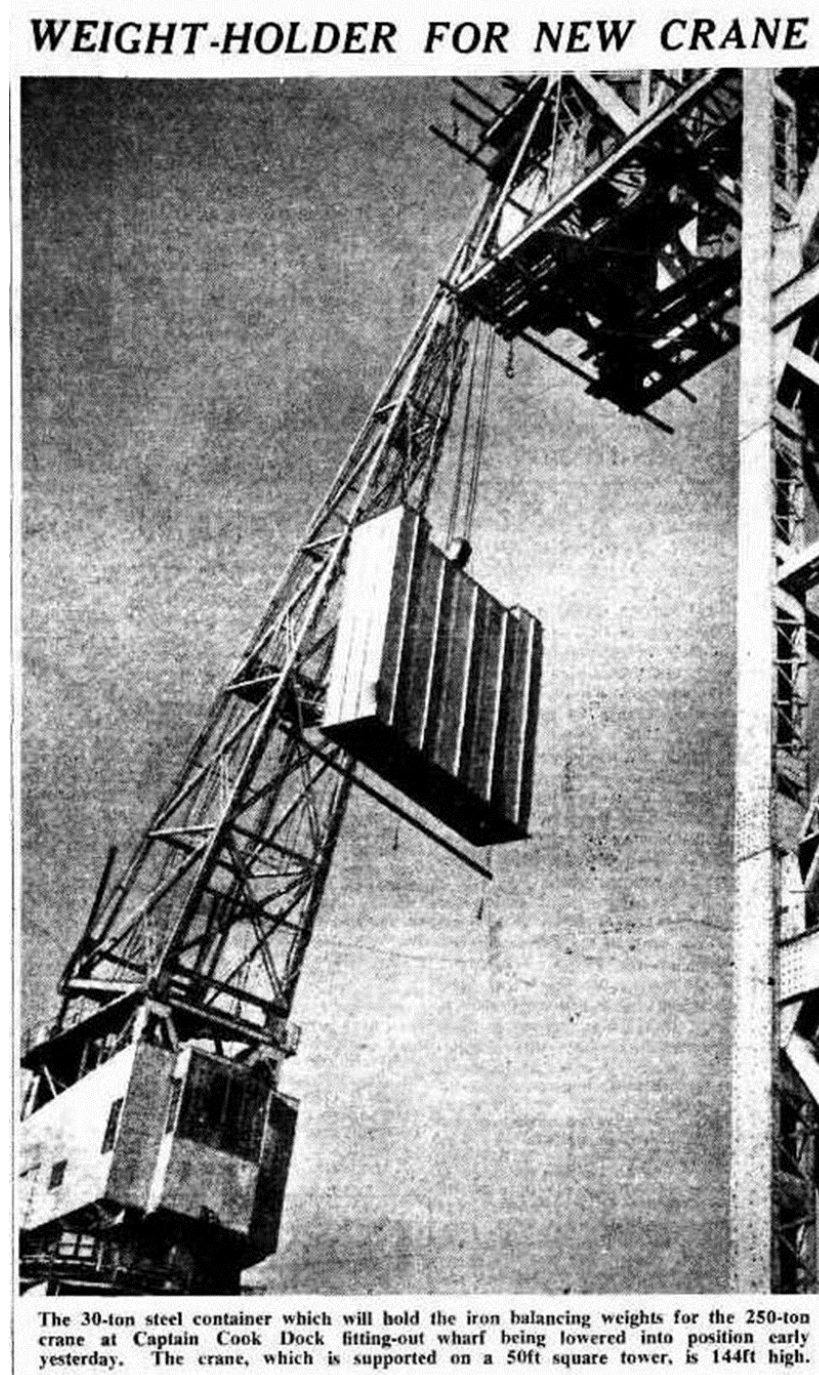


Figure 18: Addition of the counter weights in 1950. (Source: Sydney Morning Herald 24 February 1950, page 1, Trove, National Library of Australia, Item No 27582925)

Tragically, a rigger died during the construction of the crane in July 1950. Colin Merrigan fell from the cantilever jib 200 feet to the base of the crane.

Rigger Crashes To Death From Crane

SYDNEY, Friday.—A young rigger crashed 200 feet to his death from the top of a crane at Captain Cook graving dock, Garden Island, to-day.

He was Colin John Merrigan, 20, single, of Juno-street, Lakemba.

Merrigan crashed on to steel rails on a concrete foundation. Police believe he slipped.

The crane, which weighs nearly 250 tons, is being erected by Sydney Steel Co. Pty. Ltd. It is near completion.

Figure 19: Article about the death of young rigger Colin Merrigan, 22 July 1950 in the *Newcastle Herald and Miners' Advocate* (Source: Trove, National Library of Australia, Item No 13506440)

Sydney's Wonder Crane Nearly Finished

By
JOHN BRENNAN

ITS massive steel framework outlined against the sky the giant 250-ton cantilever crane at the Captain Cook Dockyard is nearing completion. The nose of its jib is already in position, and it is hoped to have the crane ready for test-loading before the end of the year.

Already it has altered the picture of Sydney. From the foreshore suburbs to the north and east it is no less noticeable a feature of the skyline than the Harbour Bridge or the A.W.A. tower.

From Macquarie Street its long arm seemingly reaches out across the Gardens and the Domain.

It will be the largest crane in the southern hemisphere. In all the British Commonwealth it is the only one of its kind outside the British Isles.

It will be capable of lifting away entirely the largest triple gun-turret on any battleship afloat, of raising a deck section and hoisting a ship's engine out for repair.

THE crane has an interesting history. With the one exception that for its maximum lift of 250 tons it has a three foot greater radius of operation—118 feet as against 115—it is an identical replica of the crane built at the Singapore Naval Dockyard in 1939 and destroyed ahead of the Japanese advance down the Malayan peninsula in 1942. The same blue-prints are being used in its construction.

Sir Wm. Arrol and Company, engineers of Glasgow, were the designers, and one of Arrol's men, Mr. A. Creswell, a careful, meticulous, slow-moving Scot, who supervised the construction of the Singapore

crane, is here as supervising engineer.

The Arrol company is one of Britain's largest engineering and bridge building concerns. It tendered for the Sydney Harbour Bridge and it did the steelwork for the London Tower Bridge and for Waterloo Bridge. The Singapore Crane was fabricated in its own workshops and shipped to Malaya in sections.

Construction work on the Sydney crane is the responsibility of Sydney Steel Company, Pty. Ltd., which built both Bunnerong and Balmain power houses, put in the caissons for the Captain Cook graving dock and built the three dockside cranes—two fifties and a forty-tonner—which their mammoth will dwarf. All the 1400 tons of structural steel in the tower and jib came from the B.H.P. works at Port Kembla.

THE suggestion that the crane be built at Sydney was made almost immediately after the Singapore crane was destroyed.

Work was commenced on the foundations in 1944. The Maritime Services Board did that part of the job, which in itself was a colossal task.

The four concrete pillars had to be taken down 120 feet to a bedding on solid rock 75 feet below the harbour floor. The pillars are twenty feet in diameter at the base. The caissons into which the concrete was poured weighed 140 tons.

Sydney Steel began the construction of the tower with six men in May, 1948. Now the foreman, Mr. C. Stuart, has 35 men on the job—riggers, fitters, electricians, boiler-makers.

On a fifty-foot square base the crane itself rises 203 feet above its foundations. The cantilever is 273 feet long. The structure is riveted

throughout—with a quarter of a million rivets.

It is really not just one crane, but two—of 125 tons capacity each,

but two—of 125 tons capacity each, geared together. Also, there is an auxiliary hoist of 40 tons capacity, and a jigger hoist on an overhead runway that will lift and carry a load of ten tons.

THE two-hundred tons weight of machinery and the "ropes" for the crane come from Glasgow. Figures on the materials will seem fantastic to the layman. The "ropes" alone weigh fourteen and a half tons—10,140 feet of them, just under two miles, and ranging in thickness from 1½ ins in circumference to 5½ ins. There are 13,614 yards of electric cable.

At the opposite end of the jib to the hoist the crane carries 275.36 tons of ballast in a series of 3,954 cast-iron blocks.

More surprising still is the fact that one man can control the lifting mechanism. An electric elevator takes him to the top of the tower, then he climbs to the ten-foot square, glassed-in control-room beneath the jib. With three levers and half a dozen push buttons he can exercise a finger-tip delicacy of control over all its workings.

He can lift his load or lower it a fraction of an inch. He can work it at a rate of two inches lift a minute, or six inches. He can swing the crane through a complete circle.

Dials and indicators after the fashion of those on the bridge of a liner show him how the crane is reacting to his touch.

When he presses the button for his first lift he'll know he has a £400,000 mechanical toy to play with.

SHIPPING DWARFED BY CRANE



Shipping and buildings at Woolloomooloo are dwarfed by the nose piece of the 270-foot jib of the cantilever crane being constructed at Captain Cook Graving Dock. The crane will have a lift of 250 tons.

Figure 20: Article on the near completion of the crane in the Sydney Morning Herald, 16 September 1950, page 11. (Source: Trove, National Library of Australia, Item No 18173147) **Figure 21:** Photograph in the Sydney Morning Herald 9 September 1950, page 1 (Source: Trove, National Library of Australia, Item No 18176121)

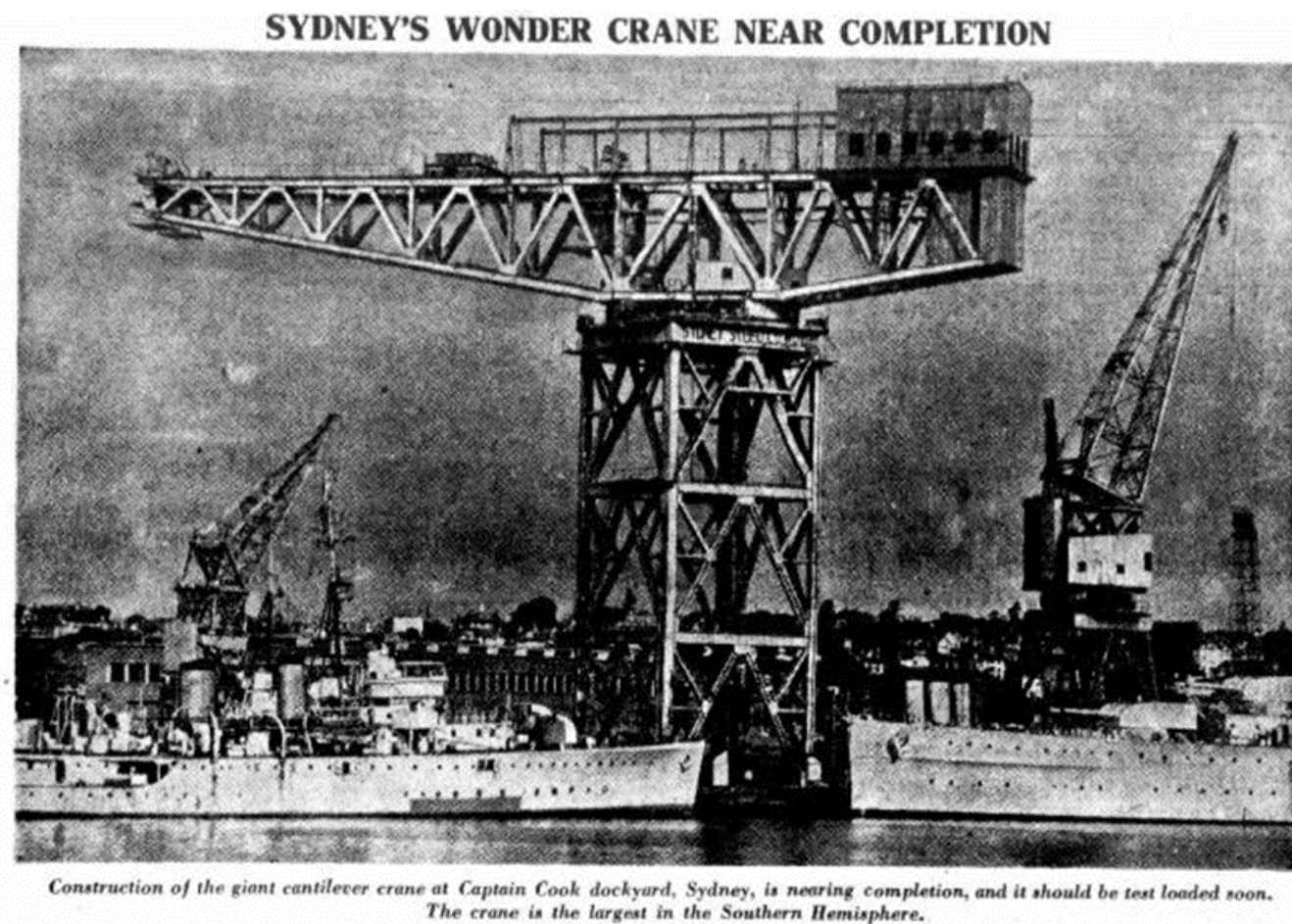


Figure 22: Photograph in the Central Queensland Herald, 26 October 1950, page 1 (Source: Trove, National Library of Australia, Item No 75568899)

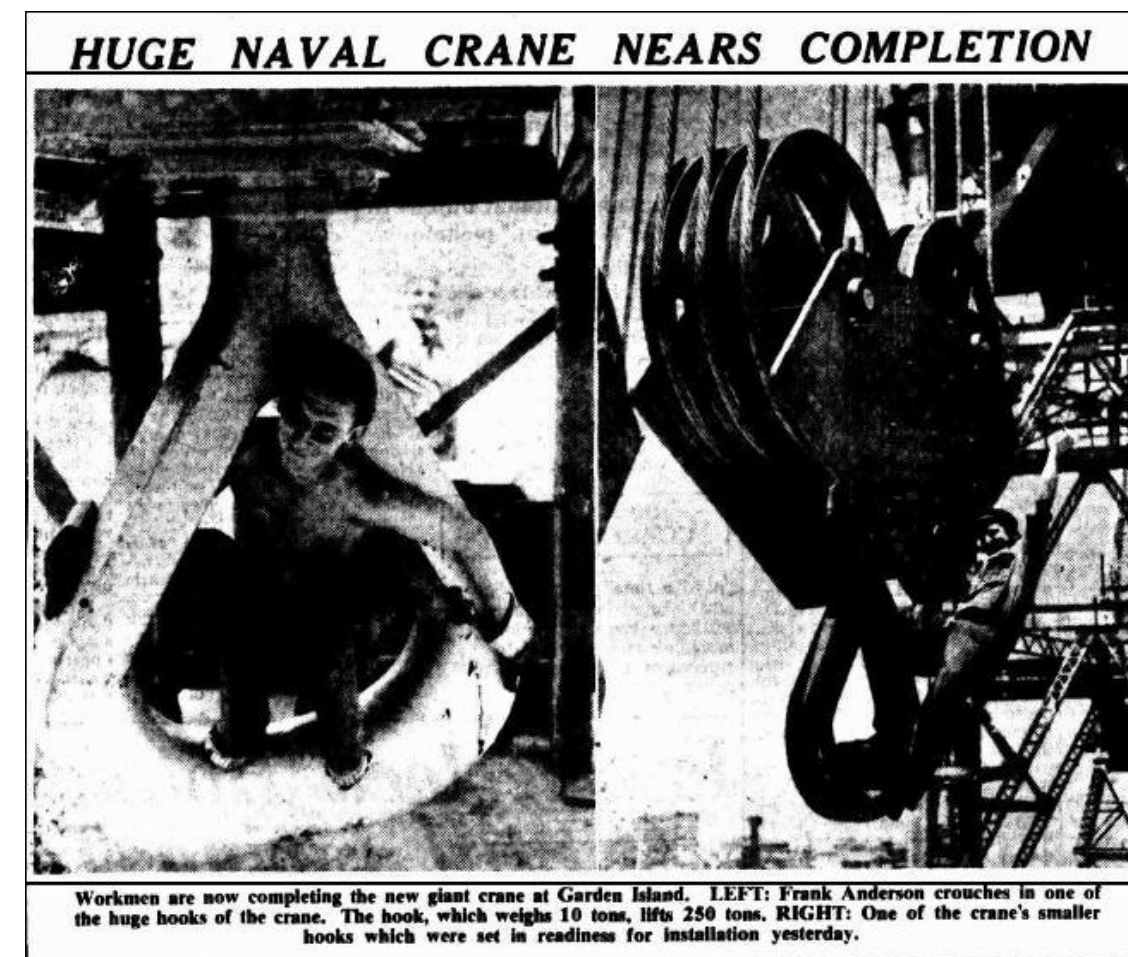


Figure 23: Photograph in the Sydney Morning Herald, 4 November 1950, page 1 (Source: Trove, National Library of Australia, Item No 1814466)

The crane was finally completed at the end of 1951, and was officially commissioned in February 1952 by the then Deputy Premier of NSW, the Honourable Joe Cahill.

HUGE CRANE FINISHED



The former Director of Works and Housing, Mr. M. W. Mahaffey, drives the last rivet into the framework of the new Captain Cook dock crane at Garden Island yesterday. The picture was taken 254 feet above the ground.

Giant Crane Completed

The last rivet of the 250-ton crane at Garden Island was driven home yesterday, and the crane made a test lift of 156½ tons.

The crane, now the largest in the Southern Hemisphere, has taken over two and a half years to build.

It is 203ft high, and the lifting boom measures 273ft. Over 1,400 tons of structural steel were used in construction. Concrete foundations run 120 feet into the ground.

An engineer who came to Australia to supervise its building, Mr. A. Creswell, will drive it at the opening ceremony next week.

The only fatality during construction was Mr. C. J. Merrigan, 25, a rigger, who fell 200 feet from the boom in July last year.

Giant Crane's Trial Lift

SYDNEY, February 14.

A giant crane built for the Royal Australian Navy at Capt. Cook graving dock swung a load of 156 tons in its first trial lift today. It is designed to lift 250 tons.

The trial lift was made shortly after the former NSW Director of Works (Mr. W. Mahaffey), at a height of 254 ft., drove the last rivet into the steelwork of the crane.

Figure 26: Article in the Adelaide Advertiser, 15 February 1951 page 2. (Source: Trove, National Library of Australia, Item No 4687718)

Figures 24 and 25: Photograph and article in the Sydney Morning Herald, 15 February 1951 (Source: Trove, National Library of Australia, Item No 18199369)

Use of the Hammerhead Crane

The new post World War II ballistic missile technology rendered large naval guns, for which the crane was designed to lift, obsolete. This meant that the crane was rarely used for the full extent of its large lift capacity.

When the last of the heavy battle cruisers, *HMAS Australia*, was decommissioned in August 1954, further naval use for the crane became problematic. However, from the mid-1950s the crane was engaged in lifting various heavy and not so heavy items as part of both naval and civilian duties. For the navy the crane played a key role in moving guided missile launchers from ships for maintenance.

From the mid-1950s to the mid-1970s it was used intermittently to discharge heavy machinery from ships to road transport bound for the Snowy Mountains Hydro-Electric Scheme.

Between 1966 and 1991, the crane was used in the repair and maintenance of the hydrofoils that ran between Sydney and Manly. These boats needed to be lifted out of the water about every 12 weeks to clean off the growth that slowed their progress and for their constant repairs (they were prone to break down). The Hammerhead Crane was the only crane capable of lifting these boats.

The crane was also capable of lifting whole tugboats out of the water for repairs. The crane's last big lift was for Greg Norman's 88-ton cruiser *Aussie Rules*. It had been constructed in Queensland and sailed to Garden Island where it was lifted by the crane and washed with fresh water, then lowered into a container to be shipped to the USA.

The safe working load of the crane was downgraded to a maximum 174 tonnes following an inspection in 1991, when a range of maintenance requirements were identified. In 1995, the jigger hoist was withdrawn from service owing to the runway being heavily corroded.

A study into the future use of the crane was prepared by Sinclair Knight Merz Pty Ltd for the Department of Defence in 1995. The report stated that, 'In recent years the crane has been used occasionally...' In 1996, the crane was tested and again downgraded to a safe working load of 70 tonnes. The crane's last operational lift was in 1996 to service guided missile launch systems.

The crane could no longer meet defence capability requirements, and was impeding use of the wharf. Safety scaffolding was installed in the early 2010s while options for the crane were being explored. A time lapse (running time 2 minutes 3 seconds) of the installation of the safety scaffolding is available on YouTube https://youtu.be/yOxWpwDT_6M.

Removal of the Hammerhead Crane

Due to the harsh environment and reduced maintenance, the crane also became a safety issue. In 2013, Defence received [approval](#) from the Minister for the Environment to remove the crane. Deconstruction of the crane was completed in 2014.

The removal of the crane was not without debate, as illustrated in a Nine News piece that ran on 8 August 2013. You can view this on YouTube <https://youtu.be/j7PqgAO5IGE>

Liberty Industrial worked with Defence and Brookfield Johnsons Control to safely remove the crane. A short film (running time 6 minutes, 30 seconds) about the removal of the crane is available on YouTube <https://youtu.be/GIVkncCh5o>. A time lapse of the removal (running time 26 seconds) is available on YouTube <https://youtu.be/X4cPh0QeCdY>.

Recollections - In their own words

In early 2014, interviews were conducted with people that have a direct connection to the history of the Hammerhead Crane. Extracts from these interviews are provided here.

Mr Warwick Stuart, Sydney Steel Company

Mr Warwick Stuart's family owned the Sydney Steel Company which fabricated the steel and built the Hammerhead Crane (twice; firstly at Marrickville and then at Garden Island) between 1948 and 1951. His recollection of his grandfather, Douglas Stuart, who volunteered the family company, Sydney Steel Company, to build the dock's two floating caissons/gates as a service to the nation. That scope of work soon expanded to include the steelwork for the dock's machine shop, the fabrication and erection of its three dockside cranes and the William Arrol designed 250 tons cantilever wharf crane. His father, Colin Stuart, built the Hammerhead Crane. In May 1948, Colin and a team of six from Sydney Steel Company started erecting the crane's tower at the fitting-out wharf, Garden Island. By the time the crane was handed over to the navy in March 1951, that team had grown to 35 and included boilermakers, fitters, riggers and electricians.

All part of the war effort on the home front:

"...when Sydney Steel took on the work for the graving dock, because it was not possible to tender for it – the Japanese had just bombed Pearl Harbor and were down the Malay Peninsula – so my grandfather, Douglas, volunteered the company to build it, just said 'We'll build it. Doesn't matter what it costs. If you provide the material we'll build it at cost'. So I think that engendered a little bit of goodwill with the government so possibly to some degree the big crane was sort of the reward at the end of the project. ... by then the government realised that if they were going to build this crane Sydney Steel was ideally suited for it: they had the infrastructure at Marrickville, they had the skills so there was really nobody else that could touch them. The only other organisation that might have had a go would have been Cockatoo Island Dockyard and they really didn't have anywhere to set this crane out so that's why it went to Sydney Steel."

The work force:

"...there's the fabrication of the crane and then there's the erection of the crane and they're two separate activities. With the fabrication, because Sydney Steel had quite a large area and at that stage they had something like three or four hundred employees, they could apply quite a lot of people to building sections of it and the issue that they ran into, though, was that they'd trained this workforce to weld, in welding procedures as part of the dockyard project and then they had to turn around and retrain them to work on rivets. So that part of it at any time, I think, might have been fifty or sixty people involved in that aspect of it. When it came to, I guess, building it or erecting it on site they started with four people when they put the first column up and then by 1951, they had about thirty-five. So you had riggers who were lifting things, you had boilermakers, you had electricians, you had fitters, turners, so that group of mechanical skills to put it all together. But in all, it's only quite a small group to actually build it physically on site, thirty five people."

Skills shortages – an age-old problem:

"...the biggest issue was just the labour force, in trying to get people that had the craft skills. It's not just drilling a hole in a piece of steel. The crane is actually made up of plates and angles and they all have to be cut, drilled and then riveted together so there's quite a lot of skill and craft in that and the biggest issue was just getting enough people with those qualifications and most of the guys that worked on it were probably in their sixties because they were the old boilermakers from the old ilk, not the Fast Eddies, the welders. So that was probably the biggest single issue they had. Steel supply was O.K. It was up and down after the war but I think that was the major issue was just trying to get a consistent labour force for it."

Australian Made – It's just gorgeous:

"...Being an engineer I look at it and I know that some people see it as ugly but obviously those people never had a Meccano set when they were growing up and to me it's such a simple design. It's just beautiful the way it's structured and I think it's such an elegant foil against the Opera House and the Harbour Bridge. So from that perspective, just as an engineer, I have always felt that that crane was worthwhile keeping in that format. Then there's the other aspect of it, which is just the personal history and the fact that the company and the family were involved in it. It is interesting to say 'Well, wow, that's been built in Sydney by local people' with a bit of help from the English and the Scots but I thought it was quite an achievement for that. So that's where I stand on it and I must admit I'm disappointed that it has to be pulled down because I would have thought that you could have done something better with it and if you see any of these cranes this crane in its setting against Sydney Harbour Bridge, looking down the harbour there is no other crane like this in the world. This is a crane in a Mona Lisa setting in my opinion, it's just totally unique. Everywhere else they're in the industrial wetlands or something but this one, it's just gorgeous ..."

Mr Steve Petras, the last crane driver

Mr Steve Petras was the last crane driver who operated the Hammerhead Crane. He served in this role for 13 years. He has first-hand knowledge of operating the crane, working with the dogman, the lifts made by the crane, and the political/union climate in which the crane operated. Mr Steve Petras shared stories about his time as the crane driver from an operational and personal perspective. Mr Petras began working at Garden Island assisting the fitters. After working there for several years, he was keen to learn how to operate the cranes and started doing so in the 1980s.

The biggest of big toys:

“...I approached one of the foremen and I said ‘I’d like to get on the cranes’. He said ‘All right. I’ll put you through’ and all that and that was it. I started with the mobile cranes, then gradually I got on the portable cranes and then the last one I was on the 250. The Hammerhead.”

What was it like driving the crane?

“It was really good. Had to be careful because, you know, it’s such a big thing. And people said ‘You had a chair to sit down?’ I said ‘No, we had to stand up ... at the window to see the dogman down there’ and that’s for the 250.”

A typical working day, with a beautiful view of the harbour:

“...we came in and a foreman come along, says ‘Righto, we need a crane driver for the 250, I need a crane driver for the old cranes, the 50 tonners, mobile crane, the forklift’. And then our foreman was there, he was really good on the job, he was really good, and he gave everybody share on all the cranes and the forklifts. And the other thing too, once you got up there you had a beautiful view of the harbour. That’s one thing that was fantastic. ...

A pie warmer in a penthouse in the sky:

“...Funny because it was about a month doing a bit of work for the electricians and all that and everything and the people said ‘Oh, by the time you walk down and up again’ so they decide – they brought a table with about four chairs and all that and a little oven to warm up the food or a meat pie or something. I mean you can’t blame them. To come down and up again and everything you’ll be wasting time. So the people just nicknamed it ‘The Penthouse’. It was just a spare room added up there.”

Mr David Stockman, Dockyard Worker

Mr David Stockman worked on the dockyard for forty years. He has knowledge about the context (physical and political) in which the crane operated and its role in the wider Garden Island operations, in particular with the Captain Cook Graving Dock. Mr David Stokman started working at Garden Island in January of 1970 as a technician in training.

The Hammerhead Crane to the rescue:

“I do remember seeing I think it was a work boat that had been hit by a larger navy vessel. It was partially sinking and they managed to manoeuvre it underneath the crane and they put large straps underneath the hull. The crane was basically stopping it from sinking any further whilst the fire brigade and the naval police could pump the water out of the vessel and just take the weight and slowly raise it as it was being pumped out. It wasn’t trying to lift it out of the water but it was just supporting it.”

A crane ride for Christmas:

“Well, the children’s Christmas parties, they used to have a large basket that was put underneath them. It wasn’t fully enclosed or anything; it was just a basket you could stand in; came up about four feet, five feet, and everyone piled into there and they closed the side of it and the crane would pick them up and they’d swing them out over the water and give them crane rides and then put them back down on the wharf again and I’ve seen that done numerous times. Open days and Christmas parties were the main times for that and they were very popular if you liked heights.”

Mr Jeff Norton, the last dogman (dogger)

Mr Jeff Norton was the last dogman (dogger) who operated the Hammerhead Crane. He served in this role in 1990 and 1991. He has first-hand knowledge about operating the crane, working with the crane driver, how they communicated with each other (via hand signals) and the last lifts the crane undertook. Divers assisted with positioning the slings under vessels that were to be lifted out of the water for maintenance, including hydrofoils used in the Sydney public ferry system. At the time of the interview, Mr Jeff Norton had been teaching construction skills including rigging, dogging, scaffolding, cranes, hoists and elevating work platforms at Sydney TAFE for 22 years.

First of all, what is a dogger?

“Well, we’re not allowed to call them ‘dogmen’ anymore because there are women in the industry now so they are called now ‘doggers’ and a person working with a crane, specifically on the end or what we call the ‘end’ of a crane – in other words on the hook end of the crane – he is the person or she is the person that is involved in the application of slings to a load and in then directing the crane to actually lift, move and place that load. So that’s generally the role of a dogger. And whether it’s a hammerhead crane or tower crane, a mobile crane, an overhead crane, it’s irrelevant but any person doing that type of work is labelled in Australia a ‘dogger’.”

An afternoon snooze in the ‘penthouse’ after a shift:

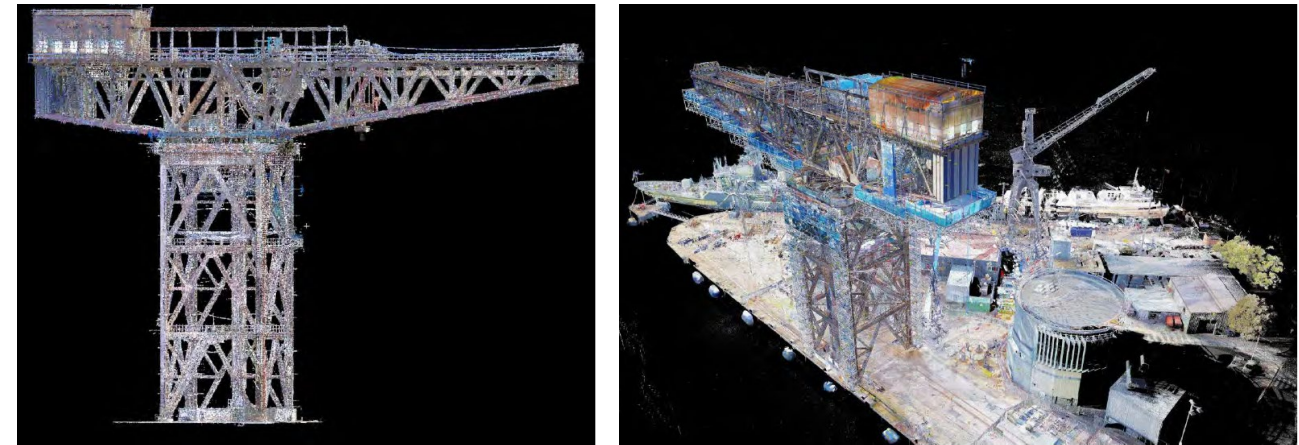
“...right at the top of the crane in the winch – what did we call it? I think it was known as the ‘penthouse’ – where all the workings and the goings-on of the crane were, well it used to be quite often frequented by workers at Garden Island for a quiet snooze. Or maybe on a night shift or whatever ‘O.K, we’ve done our work. We might just go up and have a little sherbet or two just to while away the night’. So, yeah, basically it was a good hidey-hole type of thing for some people.”

Did you enjoy the experience of the crane?

“Absolutely, yeah. Like number one crane on the site and number one dogger, etc, I was quite chuffed in actually being asked to dog it.”

3D Model of the Hammerhead Crane

RPS Group undertook a laser scan of the Hammerhead Crane prior to its removal in 2014. These scans provide a 3D model of the Crane. Images from the 3D model are available in the [Stage 1 Archival Recording Report](#) on Defence’s Hammerhead Crane website.



Salvaged Items from the Hammerhead Crane

A number of elements of the Hammerhead Crane have high heritage significance and were retained and conserved. Some of these items are on display near the Navy Heritage Centre on Garden Island. The [Salvage and Reuse Plan](#) provides more information.

Further Information

View the reports available for the approval to demolish the Hammerhead Crane (EPBC Act 2012/6430) on the [Defence infrastructure projects webpage](#).

Royal Australian Historical Society, talk by Rick Mitchell “Hammerhead Crane, Garden Island Naval Dockyard, Sydney” at History House in July 2014, running time 52 minutes 54 seconds available [here](#)– this link will take you to on You Tube. < <https://youtu.be/nHwrn95mVFw>>

The Naval Historical Society of Australia (NHSa) provides further information about the history of the Hammerhead Crane: [The Hammerhead Crane - Naval Historical Society of Australia \(navyhistory.org.au\)](https://navyhistory.org.au). The NHSa have also prepared a short video and technical booklets on the Hammerhead Crane which are available for sale and download online: [History of the 250 Ton Hammerhead Crane - Naval Historical Society of Australia \(navyhistory.org.au\)](https://navyhistory.org.au)

The [Powerhouse Museum Collection](#) has several photographs showing the construction of the crane at several stages that can be viewed online.

See the [Sydney’s Lost Structures](#) page of the Visit Sydney website.