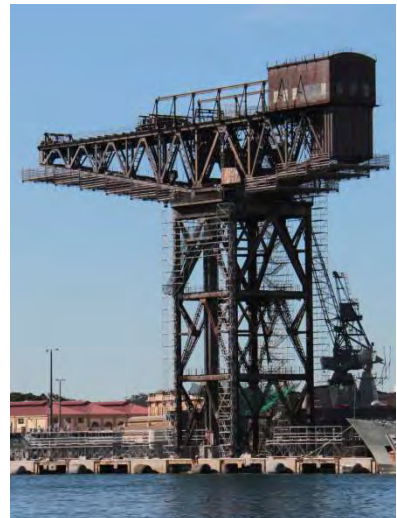




Hammerhead Crane, Garden Island, Sydney

Heritage Interpretation Plan—Support Document

Report prepared for Brookfield Johnson Controls
on behalf of the Department of Defence

October 2013

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Report Register

The following report register documents the development and issue of the report entitled Hammerhead Crane, Garden Island, Sydney—Heritage Interpretation Plan—Support Document, undertaken by Godden Mackay Logan Pty Ltd in accordance with its quality management system.

Job No.	Issue No.	Notes/Description	Issue Date
13-0287	1	Draft Report for Brookfield Johnson Control review and comment	9 October 2013
13-0287	2	Final Report	17 October 2013
13-0287	3	Revised Final Report	22 October 2013

Quality Assurance

Godden Mackay Logan operates under a quality management system which has been certified as complying with the Australian/New Zealand Standard for quality management systems AS/NZS ISO 9001:2008.

The report has been reviewed and approved for issue in accordance with the GML quality assurance policy and procedures.

Project Manager:	Julian Siu	Project Director:	Prof Richard Mackay, AM
Issue No.	3	Issue No.	3
Signature		Signature	
Position:	Consultant	Position:	Partner
Date:	22 October 2013	Date:	22 October 2013

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1.0 Introduction

Godden Mackay Logan Pty Ltd (GML) has been commissioned by Brookfield Johnson Controls (BJC) on behalf of the Department of Defence (Defence) to provide heritage services relating to the Hammerhead Crane removal project, including preparation of a Heritage Interpretation Plan (HIP) for the Hammerhead Crane.

The HIP will be prepared to commemorate the heritage values of the crane, and is to be provided to the Minister within two years of the date of the approval (ie by the 17 July 2015) and must be implemented.

This report has been prepared to provide evidence to the Minister of the Department Sustainability, Environment, Water, Populations and Communities (DSEWPaC) that a document to support the HIP has been prepared in accordance with condition 7 of the approval; that specific elements and vantage points of the Hammerhead Crane have been identified for archival recording, and that the high value components of the Hammerhead Crane have been identified for salvage and retention.

1.1 Background

In 2012, Defence commissioned Parsons Brinkerhoff and Brookfield Multiplex to prepare an EPBC Act Referral for the removal of the Hammerhead Crane. Defence determined that the proposed removal of the Hammerhead Crane was necessary to allow Garden Island to provide training and logistic support, maintenance facilities and berths for major current and future Royal Australian Navy (RAN) ships home-ported in Sydney, as well as additional berths for other visiting RAN and foreign warships.

On 15 June 2012, Defence submitted a Referral under Section 68 of the EPBC Act for the removal of the Hammerhead Crane at Garden Island, FBE Sydney, New South Wales. On 12 July 2012, the proposed action was determined to be a controlled action by DSEWPaC and as such was required to be assessed by Preliminary Documentation (EPBC Decision 2012/6430).

On 17 July 2013, the Department of Defence (Defence) received approval from the then Minister of DSEWPaC to remove the Hammerhead Crane located at Fleet Base East, Garden Island, New South Wales (EPBC 2012/6430).

A series of conditions of consent were stipulated with the approval. Condition 7 stated that:

7. In order to support the HIP required under condition 6 of this approval, the person taking the action must engage a suitably qualified expert to identify and document:

a) the specific elements or vantage points of the Hammerhead Crane which will be captured by the archival recording required by condition 8 of this approval; and

b) the high value components of the Hammerhead Crane which will be salvaged for conservation and/or public display.

The documentation of these elements must be submitted and approved by the Minister prior to any removal works.

Identification and documentation of specific elements or vantage points of the Hammerhead Crane which will be captured by the archival recording, in accordance with condition 7(a) is presented in Section 2.0 of this report.

Identification and documentation of high value components of the Hammerhead Crane which will be salvaged for conservation and/or public display, in accordance with condition 7(b) is presented in Section 3.0 of this report.

1.2 Godden Mackay Logan

Godden Mackay Logan (GML) is a leading provider of advisory and research services in environmental heritage, planning, interpretation and archaeology. GML provide expert services that facilitate the conservation management of all types of heritage. GML have been on the Defence Environment and Heritage Panel (DEHP) since 2004.

GML has an extensive knowledge of the Hammerhead Crane having provided heritage assessments, expert reports, input into the EPBC Act Referral and specialist and strategic heritage advice regarding the crane to Defence since 2000.

GML's project team includes highly experienced heritage consultants with a depth of knowledge about the Hammerhead Crane and its industrial heritage significance and interpretation specialists with extensive experience in interpretation planning and implementation.

1.3 Authors and Acknowledgements

This report was prepared by Julian Siu, Consultant. The report has been reviewed by Prof Richard Mackay, AM, Partner of GML.

This report incorporates material originally prepared by GML for the Heritage Impact Assessment (HIA) for the removal of the Hammerhead Crane (dated October 2012) and the Tender Technical Specifications (TTS) for the removal of the Hammerhead Crane (dated July 2013).

GML acknowledges the assistance of the following people in the preparation of the 2012 HIA:

- Rachel Jackson, Senior Associate, GML;
- Cecile Knowles, Graphic Consultant, GML; and
- Don Godden, Industrial Heritage Specialist.

GML also acknowledges the assistance of Defence Project officers Mr Daniel Giltrap and Mr Alan Davidson, and Defence Regional Environment Officer (REO) Mr Omar Seychell in preparing the 2012 HIA.

GML acknowledges the assistance of the following people in the preparation of the 2013 TTS:

- Dr Iain Stuart, Partner, JCIS Consultants;
- John Zaccheo, Engineer, Robert Bird Group Pty Ltd;
- Ben Towsey, Structural Engineer, Robert Bird Group Pty Ltd;
- Damien Perren, Associate, Robert Bird Group Pty Ltd;
- Nick Barker, Managing Director, Robert Bird Group Pty Ltd;
- Kylie Hilton, Archival Recording Specialist, Hyperion Design; and
- Shane Rolton, Managing Director, WYSIWYG 3D.

2.0 Archival Recording Requirements

In accordance with condition 7(a) of the approval, the following section identifies and documents specific elements or vantage points of the Hammerhead Crane which will be captured by the archival recording.

The following section incorporates material originally prepared by GML for the Heritage Impact Assessment (HIA) for the removal of the Hammerhead Crane (dated October 2012) and the Tender Technical Specifications (TTS) for the removal of the Hammerhead Crane (dated July 2013).

2.1 Specific Elements Identification

A **full archival recording** has been undertaken prior to any removal taking place or demolition scaffolding being erected, in order to fully document the current condition. These records included:

- contextual shots from Fleet Base East, Garden Island and surrounds (eg Woolloomooloo Wharf, Potts Point, Mrs Macquaries Chair and other vantage points in and around Sydney Harbour);
- from an adjacent crane (Hodkinson's Crane No 74274) or similar height building/structure within the crane's locale (eg Building No 1);
- ground level views up to and elevations of the crane;
- detail photographs of the crane (generally) via access directly onto the crane; and
- detail photographs of components (such as jib, machine house machinery, slew houses and live ring).

Targeted photographic record of components with high significance as identified in the TTS and Section 3.0 of this report (such as the mechanical equipment in the machine house, hook platform and tracks, hook blocks, slew ring, driver's cabin etc.) will be undertaken during their removal from the crane.

Time-lapse photography will also be undertaken during the removal process from consistent vantage point(s) to record the dismantling process. It is recommended that a high-resolution time-lapse camera system is installed onto a suitable platform (building, walkway, plant or equipment etc.) for the duration of the removal period (12 months). This will allow for the site to be systematically recorded at any given interval (throughout the day or week) and will capture the same view of the works being undertaken providing a detailed account of the process. The specific location is yet to be determined in consultation with Defence.

It should be noted that despite the fact that no deconstruction works have commenced the crane has extensive catchment safety platforms and netting. This is a protective system attached to the underside of the jib designed to capture any debris falling from the. The system also includes netting slung under the slew ring. The scaffold stairs along the north eastern leg of the tower provide access to the platforms.

2.2 Vantage Point Identification

To meet the specified requirements for the 2012 Heritage Impact Assessment (which included a visual impact assessment), the GML project team:

- determined public domain vantage points (shown in Figure 2.1—Vantage Points Map), which were confirmed by Defence as suitable;
- undertook a site visit on 12 and 13 September 2012 to view and photograph the Hammerhead Crane in its context;
- undertook photography from the harbour to access the key publically accessible locations including from commuter and recreational watercraft routes and wharves;
- undertook photography from land-based vantage points which are publically accessible and popular for tourists and visitors; and
- prepared a table (in Section 2.3) with a photograph from each of the 26 vantage points, including a brief explanation of the location and the view to the Hammerhead Crane.

Twenty-six vantage points were selected, in consultation with Defence, to illustrate the visual catchment of the Hammerhead Crane from within and around Sydney Harbour.

The criteria used to select the most relevant vantage points included:

- quantity of observers and duration of observation generally by residents, local Sydney-siders, tourists for site-seeing and other recreational user;
- visibility/visual prominence of the Hammerhead Crane (including skyline view, backdrop, screening, etc); and
- accessibility to public land with harbour views and roads and the harbour (for ferry commuters and leisure craft).

The position of these vantage points was then refined using a combination of topographic map interpretation and exploration of the surrounding areas by car and on foot, to confirm the most appropriate locations for photography.



Figure 2.1 Vantage points used in the visual impact assessment (Source: Google Maps. Graphics: GML)

2.3 Vantage Points

Refer to the associated map, Figure 2.1, which indicates the vantage points. The vantage points were chosen because of their public accessibility both from the harbour (referred to as views from the 'water level') and from the land or harbour edge.

In the following table there is a photograph of the Hammerhead Crane from the vantage points and a description of the view to the Hammerhead Crane in order to make identification easier. Note that views to the crane change depending on the time of day, weather conditions, and RAN ships and commercial cruise ships berthed at the Fleet Base East precinct.

View A1—From the deck of the Sydney Harbour Bridge



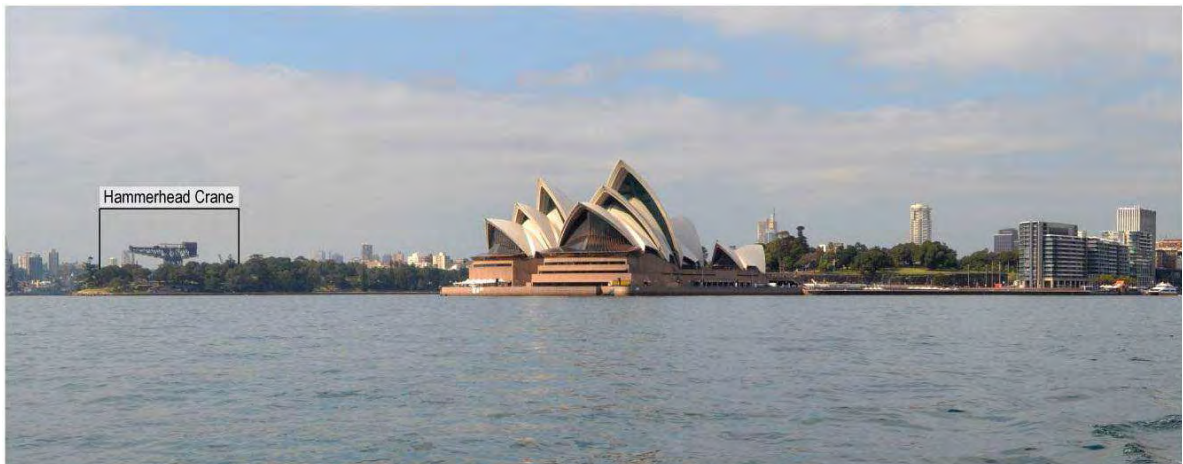
Vantage Point

The view from this vantage point is taken from the middle of the pedestrian walkway on the Sydney Harbour Bridge. Substantial numbers of tourists and locals access and view the city from this location. The main focus for viewers is usually the Sydney Opera House, CBD cityscape and the harbour.

View to the Hammerhead Crane

The Hammerhead Crane can be seen above the tree canopy of Mrs Macquarie's Chair and the Domain—between Farm Cove and Woolloomooloo Bay, and against the building skyline of Point Piper and Darling Point.

While the Hammerhead Crane, its form, structure and details of the steel truss boom and tower are moderately discernible, the focus of viewers' attention is the Sydney Opera House.

View A2—under the Sydney Harbour Bridge—image taken at water level**Vantage Point**

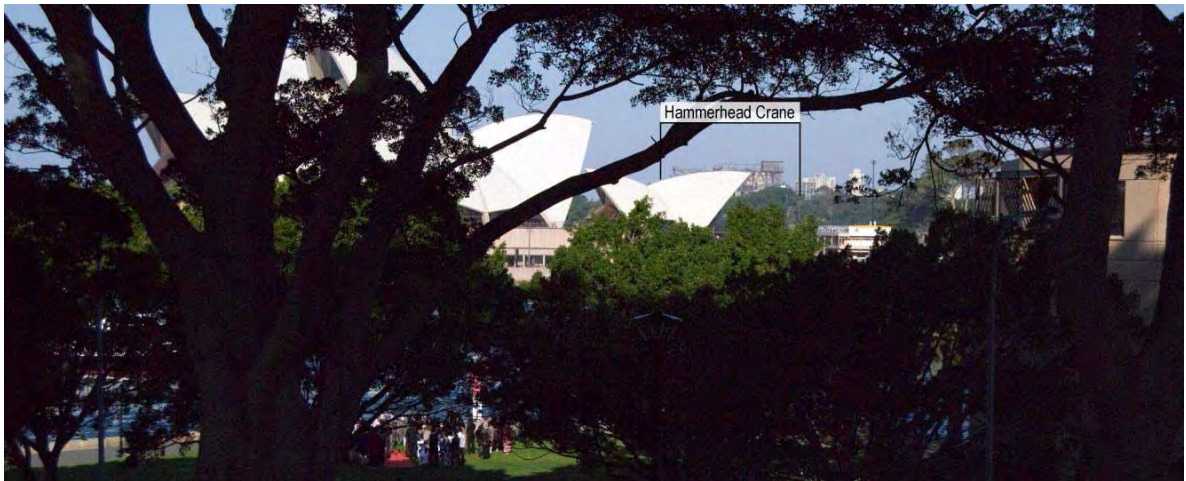
The view to the Hammerhead Crane is taken at water level, under the Sydney Harbour Bridge.

This vantage point is accessed by ferry passengers travelling to/from Circular Quay, as well as other private and public water crafts.

Hammerhead Crane

The Hammerhead Crane is silhouetted against the sky. It can be seen clearly above the tree canopy of Mrs Macquarie's Chair and the Domain.

The 'hammerhead' form and structure of the steel truss, boom and top of the tower are legible.

View B1—Dawes Point Park**Vantage Point**

This vantage point is at the top of Dawes Point Park, under the southern end of Sydney Harbour Bridge. The view is obscured by mature fig trees.

This vantage point is publicly accessible and regularly populated for viewing fireworks and other events in Sydney Harbour.

View to the Hammerhead Crane

The Hammerhead Crane can be seen in some select views through the tree branches, and in the background between the Sydney Opera House and the Royal Botanic Gardens.

View B2—Dawes Point Reserve— image taken at water level



Vantage Point

This vantage point is at water level, in Campbell's Cove, between the Park Hyatt Hotel and the Overseas Passenger Terminal at Circular Quay West. The focus of the view is the Sydney Opera House.

This vantage point is accessible to ferry passengers travelling to/from Circular Quay, as well as other private and public water crafts.

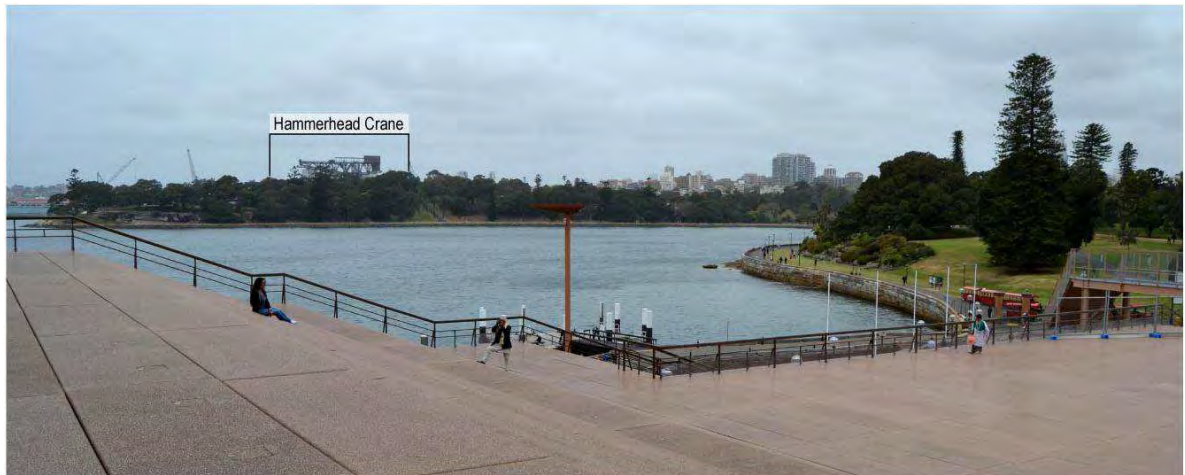
A similar view is attainable from the publicly accessible waterfront promenade Circular Quay West—the Rocks.

It is an iconic view of the Sydney Opera House and is sought after by tourists. However, the Hammerhead Crane is generally not the focus of the viewers' attention.

View to the Hammerhead Crane

The Hammerhead Crane can be seen in the background from this view, between the Sydney Opera House and the Royal Botanic Gardens, viewed against the sky.

The steel truss boom is discernible; however, the tower of the crane is obscured by the tree canopy at Mrs Macquarie's Chair and the site shed at the Sydney Opera House (Note: this is a temporary site shed in the Sydney Opera House forecourt).

View C—Sydney Opera House Forecourt**Vantage Point**

This vantage point is at the top of the Sydney Opera House steps. The view includes the trees at Mrs Macquarie's Chair, the waters of Farm Cove and some trees from the Royal Botanic Gardens.

The Sydney Opera House steps are publicly accessible and are often used for performances and events and by tourists to photograph the Sydney Opera House and the CBD. The focus of the view is dominated by Farm Cove and its surrounding landscape of the Royal Botanic Garden and the Domain.

View to the Hammerhead Crane

The steel truss boom of the Hammerhead Crane is visible against the sky, but the tower is obscured by the tree canopy of the Domain.

View D—view from the Royal Botanic Gardens



Vantage Point

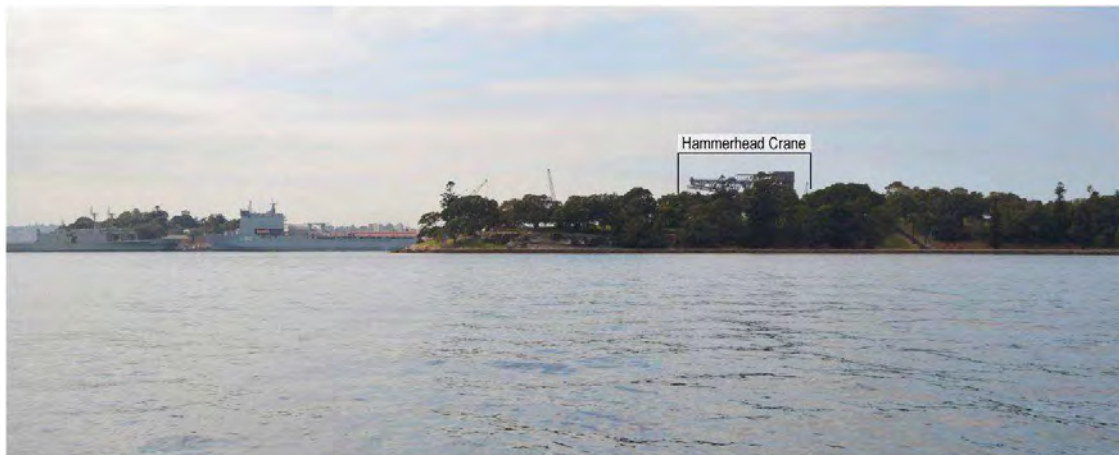
The view from this vantage point is from the Royal Botanic Gardens (Palace Gardens Precinct) adjacent to the Sydney Conservatorium of Music and easily accessible from Macquarie Street. The views of the Hammerhead Crane from the Gardens change throughout.

This site is publicly accessible and frequented by locals, tourists and visitors, plus students and staff from the Sydney Conservatorium of Music.

View to the Hammerhead Crane

The steel truss boom of the Hammerhead Crane is visible against the sky but the tower is obscured by trees from the Gardens.

View E—Farm Cove—image taken at water level



Vantage Point

The view from this vantage point is taken from the water in Farm Cove. A similar view is obtainable from the foreshore walk of the publicly accessible Royal Botanic Gardens.

The foreshore walk is used by locals, tourists and joggers. The view from this side of Farm Cove is of Mrs Macquarie's Chair but also Garden Island.

View to the Hammerhead Crane

The steel truss boom of the Hammerhead Crane is visible against the sky but the tower is obscured by the tree canopy at Mrs Macquarie's Chair.

The focus of this view is the tree canopy and the ships at Garden Island Fleet Base.

View F—Mrs Macquarie's Chair



Vantage Point

This vantage point is from the northern end of the Domain (Yurong Precinct), on the eastern side of Mrs Macquarie's Chair.

The area is part of the Royal Botanic Gardens and Domain, is publicly accessible, and is frequented by locals, tourists, and visitors to the Art Gallery of NSW and Andrew (Boy) Charlton Pools.

Views of the Hammerhead Crane and the northern extent of the Fleet Base are obtained through the overhanging tree branches along the cliff edge adjacent to Mrs Macquarie's Road (the road runs the length of the Domain).

View to the Hammerhead Crane

The steel truss boom and tower of the Hammerhead Crane are clearly visible from this vantage point against the sky. This view is the closest the public can get to the crane without being on a boat. The sheer scale and detail of the steel structure is highly discernible.

View G—Andrew (Boy) Charlton Pool



Vantage Point

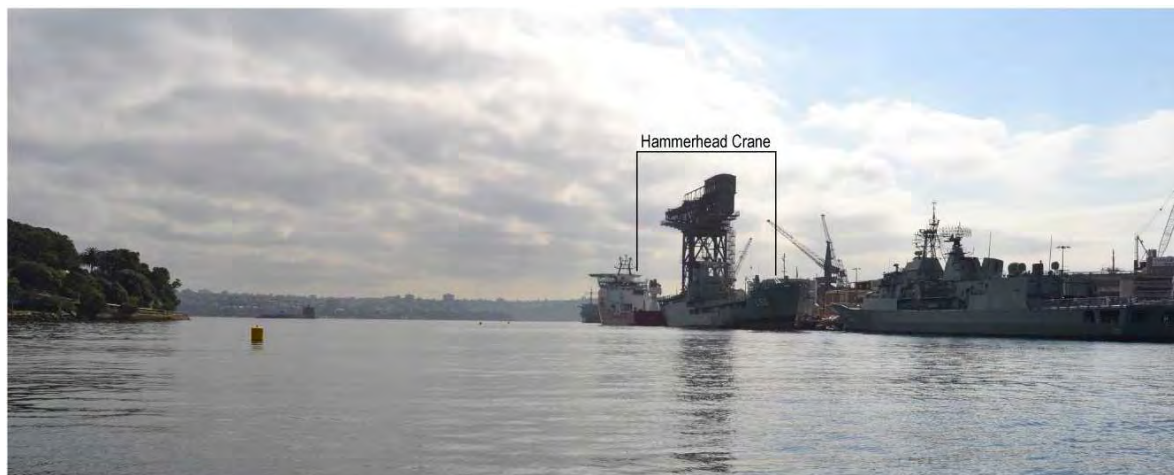
This vantage point is the footpath adjacent to Andrew (Boy) Charlton Pool. A similar view is obtained from within the pool complex (pool and café). There are unobstructed views of the Hammerhead Crane and the Fleet Base.

The path is publicly accessible along Mrs Macquarie's Road and in regular use. The pool is accessed by members only, while the café is publicly accessible.

View to the Hammerhead Crane

The steel truss boom and tower of the Hammerhead Crane are clearly visible from this vantage point against the sky. The sheer scale and detail of the steel structure is highly discernible.

View H—Woolloomooloo Finger Wharf—image taken at water level



Vantage Point

This vantage point is taken from the water level at the northern end of Woolloomooloo Finger Wharf. The focus of the view is the Hammerhead Crane, Woolloomooloo Bay and the Fleet Base Precinct.

The finger wharf is publicly accessible via the promenade but this view is also obtained by residents of the Woolloomooloo Finger Wharf.

View to the Hammerhead Crane

The steel truss boom and tower of the Hammerhead Crane is clearly visible from this vantage point against the sky. The sheer scale and detail of the steel structure is highly discernible.

View I—Harry's Café de Wheels, Woolloomooloo**Vantage Point**

This vantage point is in front of Harry's Café de Wheels. The focus of the view is the Hammerhead Crane and the ships in Woolloomooloo Bay docked at the Fleet Base.

This space is publicly accessible and frequented by patrons of Harry's Café de Wheels, as well as tourists and locals.

Views to the Hammerhead Crane

The steel truss boom and tower of the Hammerhead Crane is clearly visible from this vantage point against the sky. The sheer scale and detail of the steel structure is discernible to the viewer.

View J—Wylde Street, Potts Point**Hammerhead Crane****Vantage Point**

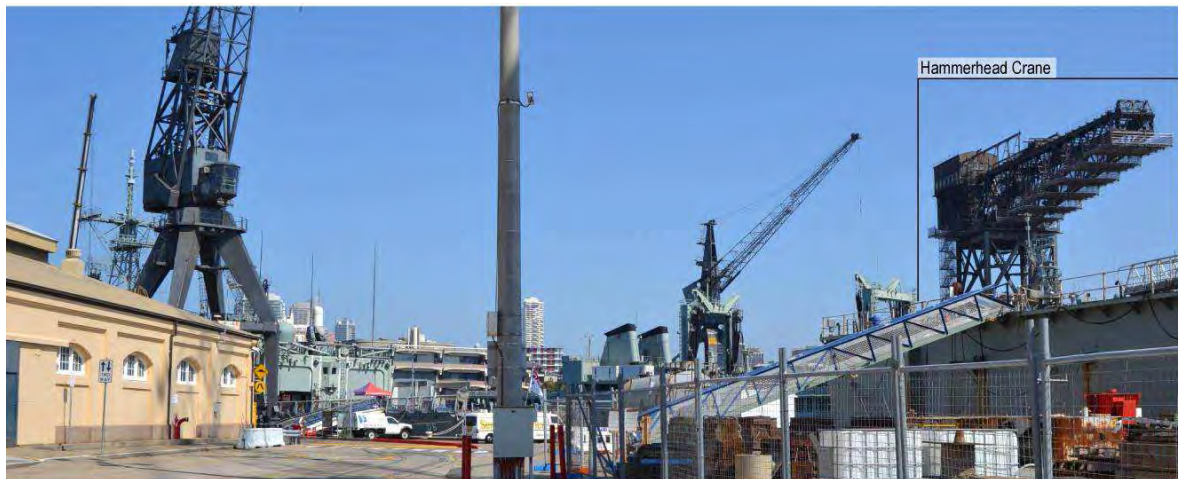
This vantage point is taken on Wylde Street, Potts Point, between the Garden Island Naval Base and HMAS Kuttabul. The footpath is frequently used by Defence personnel who walk between the bases.

View to the Hammerhead Crane

There is limited opportunity (from publicly accessible locations) to see the Hammerhead Crane due to the prevalence of tall buildings and the steep topography.

The steel truss boom of the Hammerhead Crane is clearly visible from this vantage point above Bomera at 1 Wylde Street.

View K—view from within the Commonwealth Heritage Listed ‘Garden Island Precinct’—Western Wharfage



Vantage Point

This vantage point is from the western wharfage area of the Garden Island precinct, looking south. This view is dynamic and changes with activities along FBE and of the docked RAN and commercial ships.

This vantage point is not publicly accessible and only accessed by Defence personnel and contractors.

View to this Hammerhead Crane

The steel truss boom and a portion of the tower of the Hammerhead Crane are clearly visible from this vantage point against the sky. The detail of the steel structure, its size and scale is easily discernible from this view.

View L—McKell Park, Darling Point—image taken at water level



Vantage Point

This vantage point is from the water-level in the vicinity of McKell Park, Darling Point.

McKell Park is a popular location for wedding photographs and for tourists who access water-craft from the public wharf.

This view is available to ferry passengers waiting at the wharf and travelling on the Darling Point Wharf.

View to the Hammerhead Crane

The steel truss boom and a portion of the tower of the Hammerhead Crane are clearly visible from this vantage point against the sky.

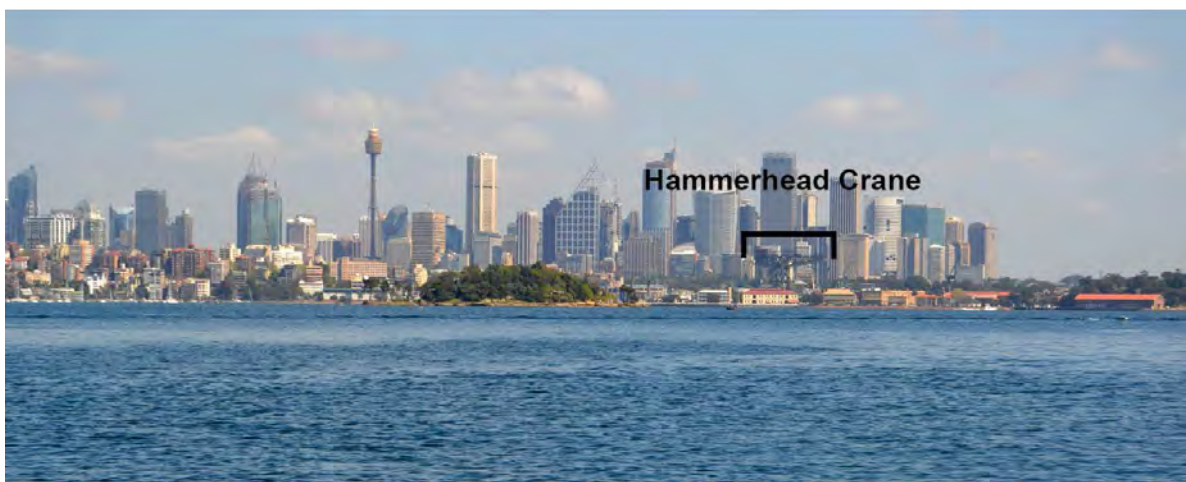
The sheer size and scale of the Hammerhead Crane, compared to the scale of the Garden Island Precinct and other individual CHL buildings, is considerable.

View M—Clark Island—image taken at water level**Vantage Point**

This vantage point is from the wharf at Clark Island (at water level). A similar view is available from on Clark Island itself. Clark Island is a popular National Parks destination for public recreational use and private functions.

View to the Hammerhead Crane

The steel truss boom and a portion of the tower of the Hammerhead Crane are visible from this vantage point as it contrasts with the CBD skyline. At this distance, the form is visible, rather than the detail of the crane.

View N—Rose Bay to Double Bay ferry path—image taken at water level**Vantage Point**

This vantage point is from the ferry route—Rose Bay to Double Bay, near Bradley's Head.

This view is available for ferry commuters as well as people aboard ships coming into Sydney Harbour.

View to the Hammerhead Crane

The steel truss boom and a portion of the tower of the Hammerhead Crane are visible from this vantage point against the CBD skyline; however, due to the distance, it is difficult to distinguish the detail.

View O—Shark Island—image taken at water level



Vantage Point

The view at this vantage point is taken on the water in the vicinity of Shark Island. A similar view is available from on Shark Island itself.

Shark Island is a popular National Parks destination for public recreational use and private functions.

This view is available for people aboard passenger ships arriving into Sydney Harbour.

View to the Hammerhead Crane

The Hammerhead Crane is visible from this vantage points against the CBD skyline At this distance, the form is visible, rather than the detail of the crane.

View P—Bradley's Head, Mosman



Vantage Point

This vantage point is from Bradley's Head Amphitheatre.

It is publicly accessible and frequented by locals and tourists.

View to the Hammerhead Crane

The Hammerhead Crane is visible from this vantage point against the CBD skyline.

View Q—Taronga Zoo Wharf—image taken at water level**Vantage Point**

This vantage point is at water level in the vicinity of Taronga Zoo Ferry Wharf. A similar view is available from the wharf itself and at certain locations within Taronga Zoo.

It is publicly accessible and frequented by locals and tourists.

View to the Hammerhead Crane

The Hammerhead Crane is visible from this vantage point against the CBD skyline.

View R—Cremorne Reserve—image taken at water level**Vantage Point**

The view at this vantage point is taken on the water in the vicinity of Cremorne Reserve. A similar view is available from Cremorne Point and the ferry wharf.

It is publicly accessible.

View to the Hammerhead Crane

The steel tower and boom of the Hammerhead Crane are clearly visible from this vantage point against the backdrop of buildings in Potts Point and the sky. The detail of the steel structure, its size and scale is discernible.

View S—Fort Denison—image taken at water level



Vantage Point

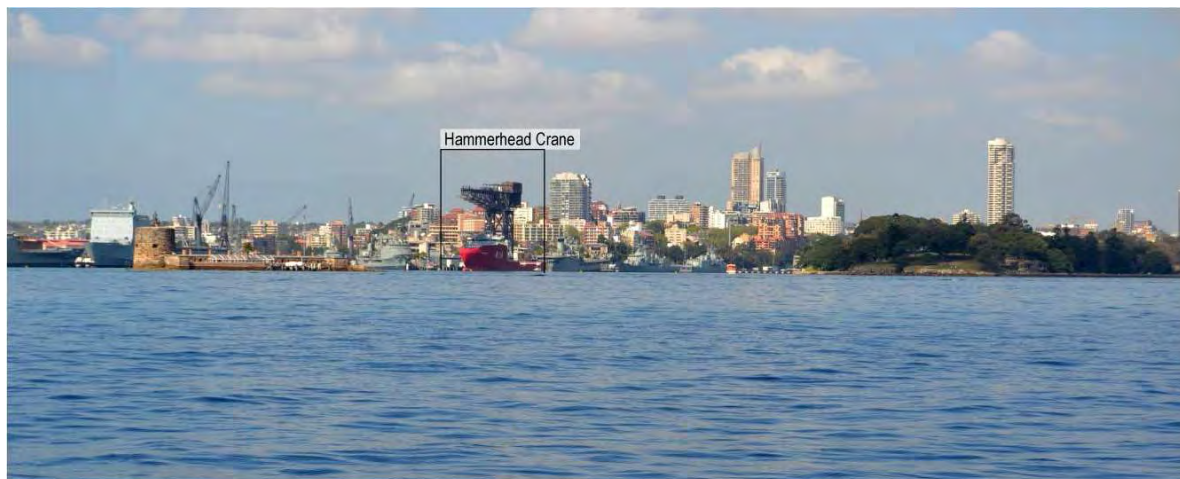
The view at this vantage point is taken on the water in the vicinity of Fort Denison. A similar view is available from Fort Denison itself.

Fort Denison is publicly accessible and often hosts private functions.

View to the Hammerhead Crane

The steel tower and boom of the Hammerhead Crane are clearly visible from this vantage point against the backdrop of buildings in Potts Point and the sky.

View T—Kurraba Point Reserve, Neutral Bay—image taken at water level



Vantage Point

The view at this vantage point is taken on the water in the vicinity of Kurraba Point Reserve, Neutral Bay. A similar view is available from Kurraba Point Reserve and the Kurraba Point Wharf.

This site is publicly accessible.

View to the Hammerhead Crane

The steel tower and boom of the Hammerhead Crane are clearly visible from this vantage point against the backdrop of buildings in Potts Point and the sky. The detail of the steel structure, its size and scale is discernible.

View U – Kirribilli Wharf—image taken at water level**Vantage Point**

The view at this vantage point is taken on the water in the vicinity of Kirribilli Wharf.

This site is publicly accessible.

View to the Hammerhead Crane

The steel tower and boom of the Hammerhead Crane are clearly visible from this vantage point against the backdrop of the sky. The detail of the steel structure, its size and scale is highly discernible.

View V—location of Admiralty House—image taken at water level**Vantage Point**

The view at this vantage point is taken from water level in front of Admiralty House, Kirribilli. There are clear views to Garden Island, Mrs Macquarie's Chair, Royal Botanic Gardens, Farm Cove, the Sydney Opera House, Circular Quay, the CBD and the Sydney Harbour Bridge.

This site is not publicly accessible, but is often hosts dignitaries and acts as a backdrop for publicity photographs.

View to the Hammerhead Crane

The steel tower and boom of the Hammerhead Crane are clearly visible from this vantage point against the backdrop of the sky. The detail of the steel structure, its size and scale is highly discernible.

View W—Luna Park, Milsons Point—image taken at water level



Vantage Point

The view at this vantage point is taken on the water adjacent to Luna Park. The view includes the Sydney Harbour Bridge, the CBD, Sydney Opera House, and Darling Harbour and Pyrmont (to the west).

This site is publicly accessible.

View to the Hammerhead Crane

The steel tower and boom of the Hammerhead Crane are clearly visible from this vantage points silhouetted against the sky. It is difficult to distinguish the detail of the crane at this distance.

View X—Lavender Bay between Milsons Point and Blues Point—image taken at water level



Vantage Point

The view at this vantage point is taken on the water in Lavender Bay. It has views to the Sydney Harbour Bridge, the CBD, Sydney Opera House, and towards Darling Harbour and Pyrmont.

This site is publicly accessible from the foreshore.

View to the Hammerhead Crane

The steel tower and boom of the Hammerhead Crane are clearly visible from this vantage points silhouetted against the sky. It is difficult to distinguish the detail of the crane at this distance.

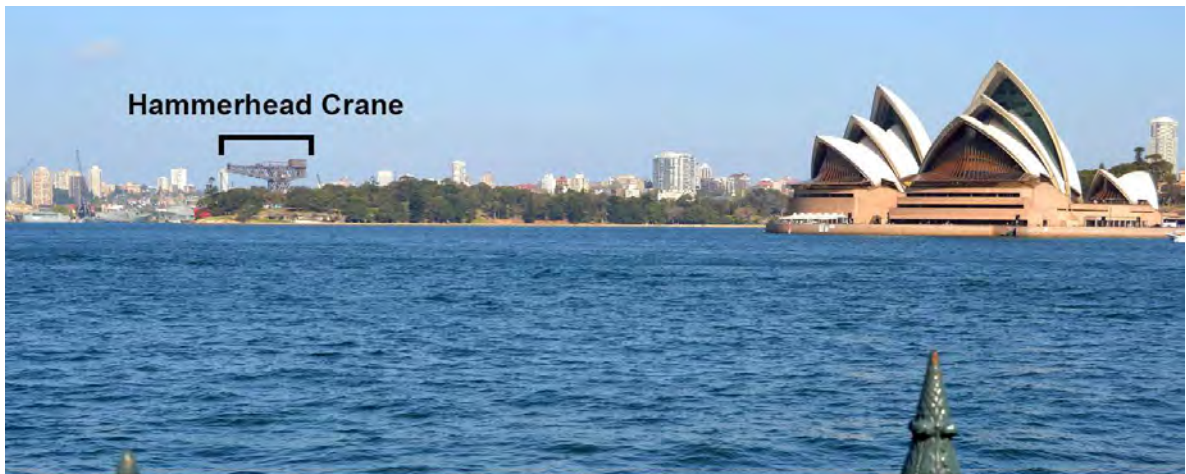
View Y—Blues Point Reserve**Vantage Point**

The view at this vantage point is taken from the southern end of Blues Point Road, which has views to the Sydney Harbour Bridge, Sydney Opera House and CBD.

This site is publicly accessible for the foreshore of Blues Point Reserve.

View to the Hammerhead Crane

The Hammerhead Crane is obscured from view by the Sydney Opera House; however, further north, from Blues Point Reserve, the Hammerhead Crane becomes more legible.

View Z—Bradfield Park, Kirribilli**Vantage Point**

The view at this vantage point is taken from the southern end of Bradfield Park. It has views to the Sydney Harbour Bridge, the CBD, Sydney Opera House, and towards Darling Point and Point Piper.

This site is publicly accessible from the foreshore of Bradfield Park.

View to the Hammerhead Crane

The steel truss boom of the Hammerhead Crane is clearly visible from this vantage point above the horizon and against the sky.

3.0 High Heritage Value Components

In accordance with condition 7(b) of the approval, the following section identifies and documents the high heritage value components of the Hammerhead Crane which will be salvaged for conservation and/or public display. Ancillary items which contribute to the historical significance and operations of the Hammerhead Crane have been identified and assessed as being of Moderate heritage significance; however they are not included in this report. They were included in the Tender Technical Specifications (dated July 2013) and will be included in the Heritage Interpretation Plan which is currently being prepared by GML.

3.1 Identification of High Heritage Value Components

A key aspect of managing heritage values is an understanding of how the heritage values are embodied in and expressed through the fabric of the heritage item/place. With this understanding, conservation strategies, policies and actions can be determined with the aim of managing and interpreting these heritage values.

The following discussion reflects on how the heritage values are expressed in the fabric of the Hammerhead Crane and provides context in regards to the selection of high heritage value components.

The selected high heritage value components, along with appropriate interpretation, are sufficient to convey the following themes for the Hammerhead Crane. The use of ancillary items can supplement the interpretation.

“Giant” Characteristics

In considering the Crane’s heritage values, a key element that comes through is the size of the Crane. It is after all a “Giant Crane” and, in contrast with other cranes, this is expressed not only by its size but also because of its bulk. This unique sense of “giantness” encompasses the ability of the fabric of the Crane to demonstrate key aspects of its heritage values such as its role and association with the Captain Cook Dockyard (Graving Dock) and its aesthetic qualities.

Location

The critical historical element of the Crane is demonstrated by its location as part of the Captain Cook Dockyard and in its own right (as it did lifting apart from Dockyard work). This is why it is difficult to separate the Crane from its location without significantly diminishing its heritage values.

Technology

The Crane is an important example of industrial technology and its fabric demonstrates this.

The Crane is asymmetric but balanced so that the forces are transmitted down through the live ring and roller track; this is the critical technology at the heart of the Crane.

The hoist, hook platform and hook system are important in demonstrating the capacity of the Crane; and the auxiliary hook also assisted in slewing or angling loads so that they could be manoeuvred into confined spaces. The stamp of “William Arrol” on the sheaves of the hook blocks reinforces the association with Sir William Arrol & Co., the designers of the Crane and a significant engineering firm worldwide – and part of the global reach of Scottish engineering.

The Machine House contains a series of electric motors, brakes, cables and cable drums as well as a small travelling bridge crane (used for moving components of the Crane for maintenance purposes).

There are two Slew Houses which contain electrical motors used for slewing (traversing) the Crane around the lifting ring by driving on the external rack. Slew House south also contains electrical motors for lifting the hook block.

The Driver's Cabin is important as it was the heart of how the Crane worked. From the Cabin, the driver controlled the slewing of the Crane, the movement of the hook platform along the jib and the raising and lowering of loads. The Cabin was sited so as to provide maximum visibility for the operator. The fabric of the cabin demonstrates the importance of the skilled operator in keeping the Crane within safe working load limits and in communicating with those outside in the placement of heavy loads. There are several layers of equipment representing different generations of communication technology in the cabin.

3.2 Heritage Assessment 2013

A Heritage Assessment was undertaken, as part of the 2005 Heritage Assessment investigations by GML.

The components of the Hammerhead Crane were re-assessed for their heritage significance in April 2013 owing to the lapse in time, changes in fabric condition and with an aim to develop a clearer understanding of the intended future for the Hammerhead Crane. This reassessment was undertaken by Julian Siu and Prof Richard Mackay, AM of GML with industrial expertise provided by Dr Iain Stuart of JCIS Consultants.

The reassessment was undertaken so that significant heritage components of the Hammerhead Crane could be identified, salvaged during the removal process, retained and conserved (as required) and used in future interpretation and/or public display.

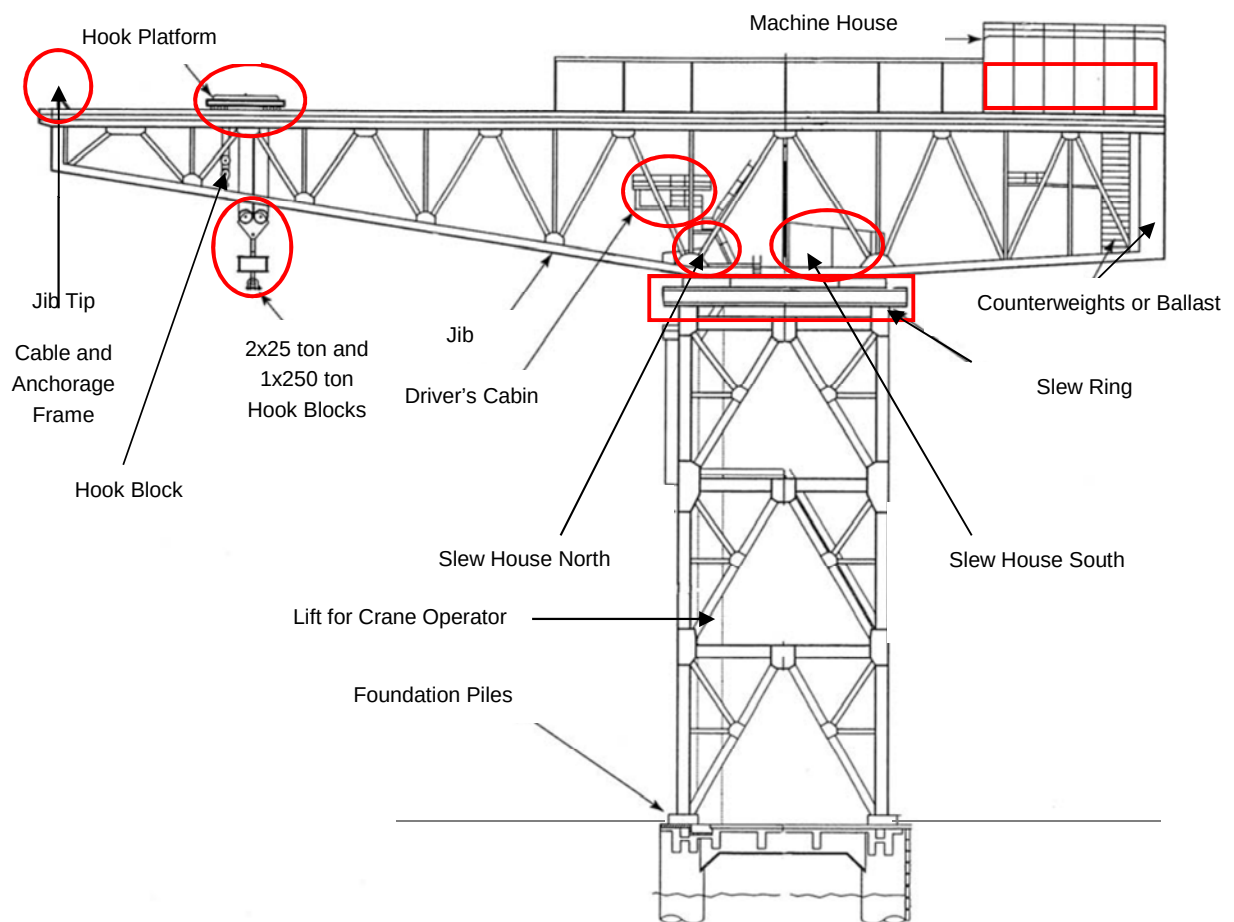
In the context of understanding the potential heritage impacts of removal or alteration of specific components on the overall integrity of the Crane, the relative significance of each of the major components was ranked as being of High, Moderate or Little significance, with comments explaining the nature of their importance.

The highlighted areas on Figure 3.1 identify the locations of specific components recognized to have high heritage significance which are to be salvaged in keeping with the project's conditions of consent. Ancillary components that could be salvaged; such as jib truss members, arch portals and steel struts, are not identified in this report, as these can be sourced from various locations on the Crane, as may be convenient. A requirement should be that a representative collection of these ancillary components are salvaged to allow sculptural interpretation of fabric from the Crane.

It is imperative that these components are clearly identified to the demolition contractor and that the methodology and requirements for their removal are considered. Also to be considered is the comprehensive labelling, tracking and storage of these components after removal, during the decontamination process and into storage and/or public display.

Table 3.1 Summary list of high heritage value components following reassessment.

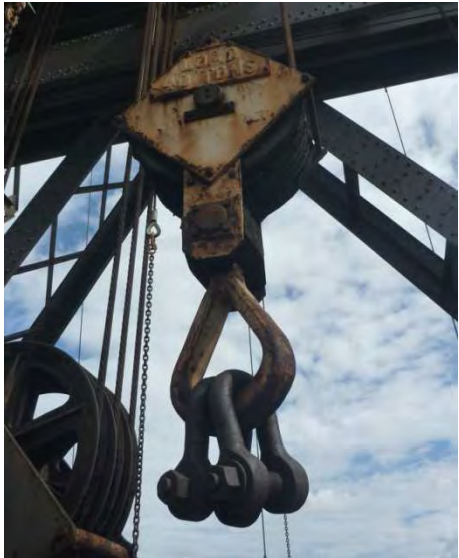
Component Name	Heritage Significance Grading
Hoist drum set	High
Hook Platform	High
Hook Blocks	High
Jib Tip Cable Anchorage Frame	High
Slew Motor Rooms North and South (2 sets of machinery)	High
Driver's Cabin	High
Slew Ring	High

**Figure 3.1** Terminology and location of components on the Hammerhead Crane recommended for salvage. (Source: Graphic from Hammerhead Crane—Heritage Assessment Report, GML, November 2005, p31).

Component Name	Hoist drum set	
Description	The Machine House contains a series of electric motors, brakes, cables and cable drums as well as a small travelling bridge crane (used for moving components of the crane for maintenance purposes). The first set of cable drums moved the hook platform back and forth along the jib while the other two move the hook and its load up and down. The main cable drums for the two 125 ton hooks (No 1 and No 2) weigh 18 tons themselves and are located at the rear of the Machine House. There are brakes attached to all the drums. The winders are remotely controlled from the Drivers Cabin. Each cable drum has its own electric motor, brake, mechanical gears and cable, therefore sets of machinery for each cable drum can be identified. The electrical fit out was by British Thomson Huston Co a well-known and important manufacturer of electrical equipment.	 Cable drums and cables  Indicative set – cable drum, cable, motor, brakes, gears
Heritage Significance Grading	High - Original Operating Equipment	
Removal Requirements	Salvage and retain (at least) one set of the main winch machinery including the cable drum, cradle, cable, motor, brakes and gears. These components will be used to present and interpret the operations of the Hammerhead Crane. Specific components should be salvaged to ensure comprehensive interpretation of the machinery's operations/function. It is critical that all the machinery in the Machine House is recorded precisely (possibly using the 3D laser scanner) and fully described in situ to ensure that reassembly is possible and accurate and that interpretation has as much information as possible. It is important to salvage the manufacturer's plaques from the machines to be scrapped for use in interpretation. The machine house sheet metal cladding and steel structure does not embody enough significance to warrant its full retention. Some sheets may be retained for reuse.	 Electric motor  Gears and cradle

Component Name	Hook Platform
Description	The hook platform runs along four tracks attached to the top of the top chords of the jib. The movement of the hook platform along the jib was limited by the trolley stop and the jib head, both of which were provided with dumb buffers. The hook platform provided the lifting and moving capability of the crane. It allowed very precise movements of the load.
Heritage Significance Grading	High- Original Operating Equipment
Removal Requirements	These components may be used to present and interpret the operations of the Hammerhead Crane. Specific components should be salvaged to ensure comprehensive interpretation of the machinery's operations/function. It is critical that the machinery is recorded precisely (possibly using the 3D scanner) to ensure that reassembly is possible and accurate.

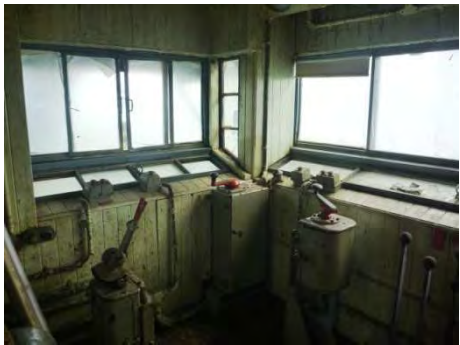


Component Name	Hook Blocks	
Description	The hook consists of the two main blocks which are suspended from the hook platform and are attached to the crosshead or load block. The hook platform moves along the jib on tracks and the hook lifts and carries the loads. The outside sheaves of No 1 and No 2 block bear are inscribed with 'Sir W Arrol & Co', 'Glasgow 1943', 'max load 125 tons'. This is an important reference to the role of Arrol's in the construction of the crane and in the broader role of engineering from Scotland in the development of Australia. Therefore these elements have high interpretive value. The lifting capacity of the hook system is marked on the block sheaves which reinforce the fact that this is a heavy lifting crane. The auxiliary hook also hangs off the hook platform. It can support a 40 ton load.	 Hoists No 1 and 2 above the 250 ton crosshead  Auxiliary hook  No 1 Hook
Heritage Significance Grading	High -Original Operating Equipment	
Removal Requirements	May be used to present and interpret the operations of the Hammerhead Crane. Specific components should be salvaged to ensure comprehensive interpretation of the machinery's operations/function. It is critical that the machinery is recorded precisely (possibly using the 3D scanner) to ensure that reassembly is possible and accurate. These components can be disconnected from each other and removed separately.	

Component Name	Jib Tip Cable Anchorage Frame
Description	This structure provided the anchor point and return for the cables that allowed the hook platform to move up and down the jib. The jib head was provided with a set of dumb buffers in the form of substantial wooden blocks to prevent the hook platform running off the end of the jib.
Heritage Significance Grading	High -Original Operating Equipment
Removal Requirements	May be used to present and interpret the operations of the Hammerhead Crane. Specific components should be salvaged to ensure comprehensive interpretation of the mechanism's operations/function. It is critical that the machinery is recorded precisely (possibly using the 3D scanner) to ensure that reassembly is possible and accurate. May be removed in sections (unbolted, unscrewed etc.) and catalogued to allow reassembly.



Component Name	Slew Rooms North and South (2 sets of machinery)	 Interior and slewing drive located in Slew Room North
Description	The slew rooms contain electric motors that drove gears articulating with the rack allocated on the outside of the live ring. This allowed the crane to slew or rotate on the tower. There would have also been a device for breaking the slewing motion. The precision of the slewing allowed for heavy loads to be placed with great accuracy. Slew Room South was inaccessible during the inspection. In addition to slewing machinery slew room south contains the machinery for operating the jigger hoist.	
Heritage Significance Grading	High-Original Operating Equipment	 The crown wheel is connected to the pinion by a vertical shaft.
Removal Requirements	May be used to present and interpret the operations of the Hammerhead Crane. Specific components should be salvaged to ensure comprehensive interpretation of the machinery's operations/function. It is critical that the machinery is recorded precisely (possibly using the 3D scanner) and fully described in situ to ensure that reassembly is possible and accurate.	

Component Name	Driver's Cabin	
Description	The Driver's Cabin is located within the jib structure of the Crane above the bottom chord and Slew House No 1. The Drivers Cabin is important as it was the heart of how the crane worked. From the cabin, the driver controlled the slewing of the crane, the movement of the hook platform along the jib and the raising and lowering of the loads. The cabin was sited so as to provide maximum visibility for the operator. The operator had views to the main hoists and hook platform above, and to the ground. The fabric of the cabin demonstrates the importance of the skilled operator in keeping the crane within safe working load limits and in communicating with those outside in the placement of heavy loads. There seems to be several layers of equipment representing different generations of communication technology in the cabin. The walls and floor of the control cabin contain numerous indicators, panels, switches, signs etc. which operated different functions of the crane. The walls are lined with stained timber but have been painted.	Underside of the driver's cabin  Interior of the driver's cabin  View of some of the indicators in the driver's cabin
Heritage Significance Grading	High-Original Operating Equipment	
Removal Requirements	The Drivers cabin should be removed as a whole. Sun roof can be removed separately. Preference for indicators, panels, switches etc. to remain attached to the walls. It is critical that the machinery is recorded precisely (possibly using the 3D scanner) and fully described in situ to ensure that reassembly and interpretation is possible and accurate. Will be used to present and interpret the operations of the Hammerhead Crane. Specific components must be salvaged to ensure comprehensive interpretation of the control cabin's function. The cabin is particularly suited for a AV based interpretation of the Cranes operation	

Component Name	Slew Ring
Description	The crane is asymmetric but balanced so that the forces are transmitted down through the live ring and roller track so this is the critical technology at the heart of the crane and what makes it different from the German Hammerhead Crane. The slew ring allowed the jib to rotate on the tower. Ninety-six 16in (41cm) diameter solid steel rollers fit together to make the slew ring. There is also a large steel pin capable of taking the weight of the crane if the roller track fails in some way. Components also include the gear rack located on the outside of the slew ring (which is engaged by the slew motors above)
Heritage Significance Grading	High-Original Operating Equipment. This is the most significant component of the crane.
Removal Requirements	Salvage a segment (approximately 1/6 of the live ring) of the slew ring including the spur wheel, rollers, trusses, spokes, cradles and the centre pin. May be used to present and interpret the operations of the Hammerhead Crane. Specific components should be salvaged to ensure comprehensive interpretation of the machinery's operations/function, however identical elements in other segments of the slew ring may be substituted for salvage depending on accessibility and removal sequencing. It is critical that the machinery is recorded precisely (possibly using the 3D scanner) and fully described in situ to ensure that reassembly is possible and accurate.

