

ENGINEERS AUSTRALIA
Western Australia Division



NOMINATION OF
FREMANTLE FORTRESS - ROTTNESST ISLAND WW2 COASTAL
DEFENCE FACILITIES

FOR A
ENGINEERING HERITAGE NATIONAL LANDMARK



PREPARED BY ENGINEERING HERITAGE WESTERN AUSTRALIA
ENGINEERS AUSTRALIA
WESTERN AUSTRALIA DIVISION

August 2010

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INTRODUCTION

In the mid 1930s the Government of the Commonwealth of Australia commenced an upgrade of its fixed coastal defence artillery batteries to protect key Australian ports from possible enemy attack.

On the west coast priority was given to establishing new facilities on Rottnest and Garden Islands and the modernising of the existing batteries on the mainland, to upgrade and extend the existing coastal defence system for the Port of Fremantle. The combined facilities were known as '**Fremantle Fortress**'.

This nomination focuses on the construction of the installations on Rottnest Island where two 9.2 inch guns were constructed at Oliver Hill and two 6 inch guns at Bickley Point. Rottnest Island is located 19 km off the west coast of Western Australia, adjacent to the Port of Fremantle at the mouth of the Swan River (see Figure 1). The waterway named Cockburn Sound extends to the south of Fremantle and lies between the coast and Garden Island. Cockburn Sound provides major harbour facilities for the Kwinana industrial strip and the Garden Island Naval Base. Garden Island is 20km south of Rottnest Island.

Of the mainland facilities the Leighton Battery at Buckland Hill was the most extensive, commissioned in 1943 and comprising two 6 inch Mark 7 guns and 300 metres of underground tunnels. It is a well preserved heritage site. The Fremantle Harbour battery comprised 2x6 pdr 10 cwt and 2x 18 pdr Mk 4 guns. The Swanbourne battery comprised two 6 inch Mark 7 guns. There were other smaller gun installations on the north mole of Fremantle harbour, at South Beach and at Point Peron, south of Fremantle.

The Garden Island facility consisted of two 9.2 inch guns, two 4 inch ex-US naval guns and 2x155 mm guns.

Construction of battery installations at Oliver Hill (2 x 9.2 inch Mark 10) and Bickley Point (2 x 6 inch Mark XI) on Rottnest Island commenced in 1935. At the outbreak of WW2 the system had been enhanced by the batteries on Rottnest Island. During the war, additional batteries were installed on Garden Island, Fremantle Harbour, Leighton and Swanbourne (north of Fremantle) and Point Peron (south of Garden Island). The extent of coverage afforded by the Fremantle Fortress batteries is illustrated in Figure 2. The inner approaches to the Port of Fremantle were well protected. However, the island facilities, and in particular the Rottnest Island batteries, extended that range well out to sea in order to protect against potential damage to the Port delivered by ship-borne long range guns.

STATEMENT OF SIGNIFICANCE

The Rottnest Island WW2 Coastal Defence Facility is the only intact establishment remaining in Australia of the seven 9.2 inch coastal gun batteries constructed during the late 1930s and early 1940s to defend key Australian ports when there was a real threat of invasion by hostile enemy forces. It is one of a very small number of 9.2 inch gun batteries remaining in the world.

The Port of Fremantle played a vital role in Australia's involvement in WW2, being a major base for American, British and Dutch submarines, a troop convoy assembly point, a shipping repair facility and a bunkering port. The Rottnest Fortress, as it was known, had a major deterrent role in the defence of Fremantle against possible seaborne enemy attack.

The construction of infrastructure for and the installation of high precision military equipment, in difficult circumstances, was a significant technical achievement. For the thousands of ex service men and women who served on the island up to and during the WW2 years the facilities have considerable social significance.

LEVEL OF SIGNIFICANCE : National

LOCATION

The geographical location of Rottnest Island is illustrated in Figure 1, while details of the military sites on the island are indicated on Figure 3.

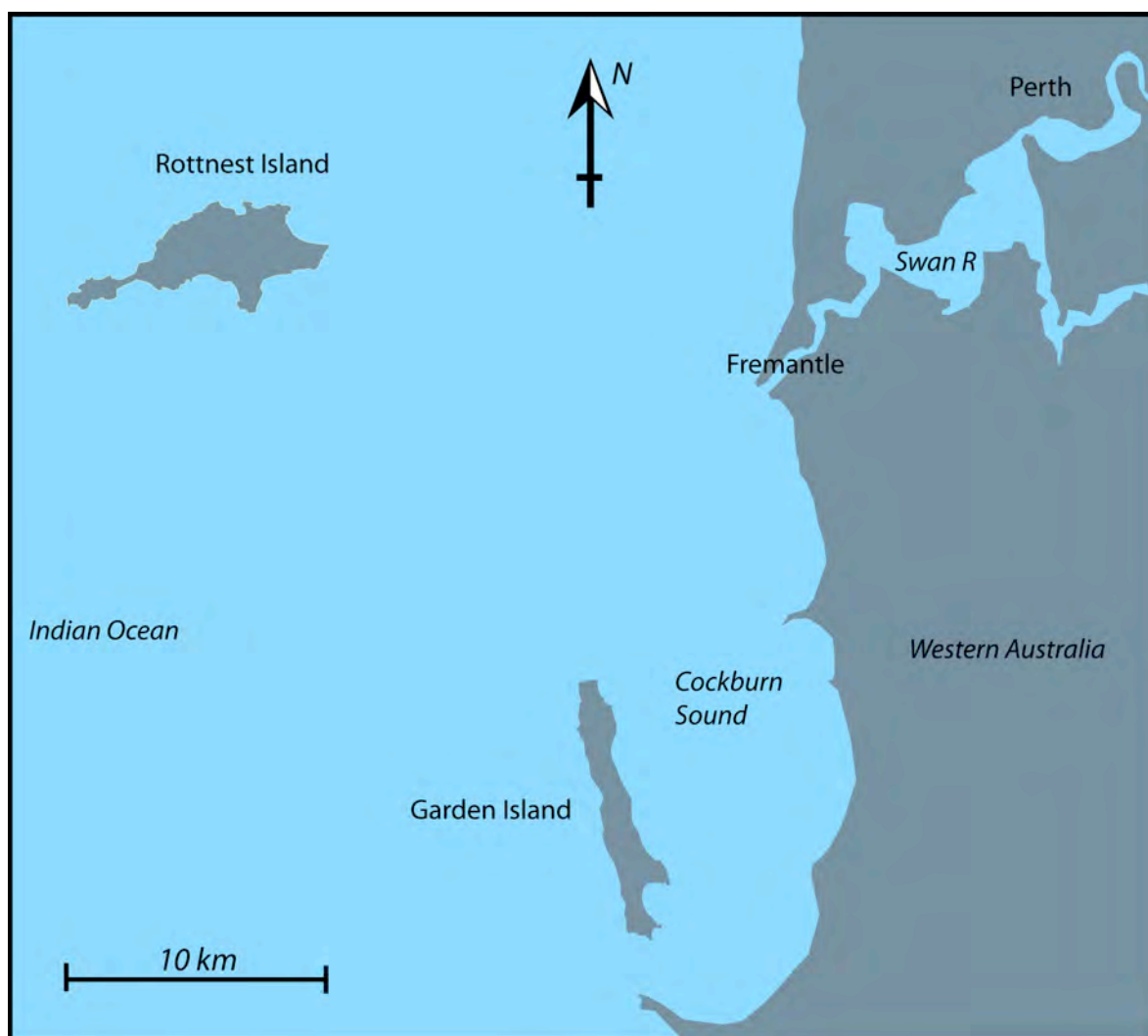


Figure 1. Location of Rottnest Island in relation to Perth, Fremantle and Garden Island

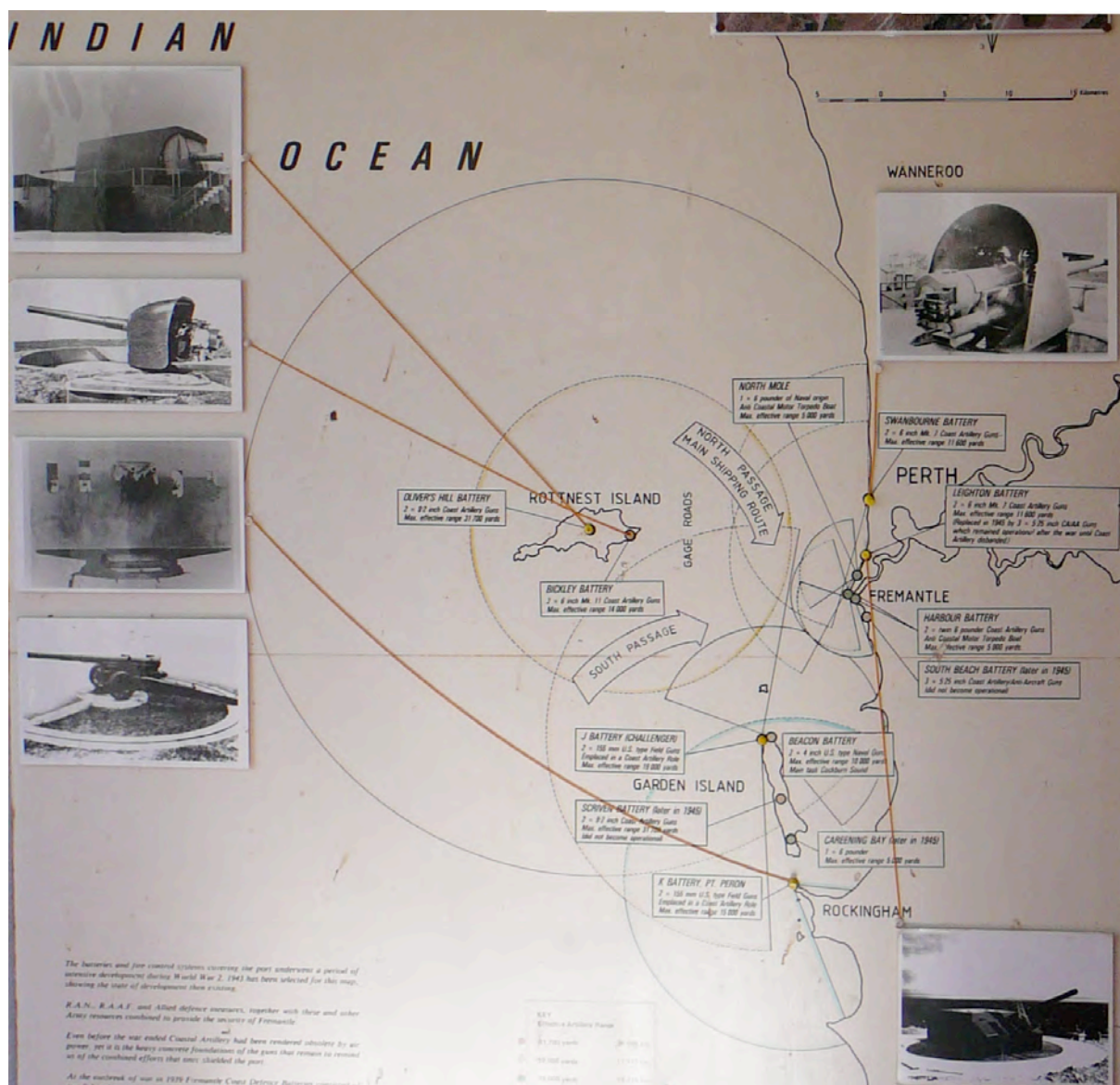


Figure 2. Coverage afforded by the Fremantle Fortress batteries by 1943.



WORLD WAR II MILITARY SITES (1944)*

rotnest island



*This diagram is derived from overlaying a 1944 army map onto a 2008 Google Earth aerial image. Note that not all sites are covered by this map and contention exists on the precise location and configuration of some sites

image key

- 01 Radar Hill
- 02 White Hill
- 03 Bare Hill
- 04 Signal Station
- 05 Light House
- 06 Battery Observation Post
- 07 Kitson Point
- 08 Oliver Hill

09 Military Railway

- 10 Tree Hill
- 11 Black Hill
- 12 Battalion camp
- 13 Air Strip
- 14 Bickley Point Battery
- 15 Army Jetty
- 16 Thomson Bay searchlight location
- 17 Phillip Point searchlight location

18 Bickley Point searchlight location

- 19 Settlement
- 20 Rifle range
- 21 Water catchment
- 22 Mt. Herschell
- 23 North Point
- 24 Cape Vlaming
- 25 Stark Bay
- 26 Light House

■ Sites identified by 1944
Army map as Commonwealth
owned property.

■ Sites identified by 1944
Army map as Army works on
Board of Control property.

□ Other sites. Source: John
Mercer.

Figure 3. Detail of WW2 military sites on Rottnest Island. The broken line indicates the rail line linking the Army Jetty (15), Kingstown Barracks, Bickley Point Battery (14) and the Oliver Hill Battery (08). From Malloway Studio and Kloeden 2009.

HERITAGE RECOGNITION NOMINATION FORM

The Administrator
Engineering Heritage Australia
Engineers Australia
Engineering House
11 National Circuit
BARTON ACT 2600

Name of work: *Rottnest Island WW2 Coastal Defence Facilities*

The above-mentioned work is nominated to be awarded a

Engineering Heritage National Landmark

Location, including address and map grid reference:

This nomination refers to the defence facilities on Rottnest Island (see Figure 1), being part of a larger coastal defence system built before and during WW2 (Figure 2). Specifically, the nomination focuses on the core of the Rottnest Island facilities: The gun batteries and supporting infrastructure located at Oliver Hill and Bickley Point, the Kingstown Barracks, the interconnecting railway line, and the associated Army Jetty at Thomson Bay. Further support facilities on the island included the observation posts at Mount Herschel, Bare Hill, Cape Vlamingh, One Tree Hill and, most importantly, the three storey Combined Fortress and Battery Observation Post on Wadjemup Hill (Signal Ridge). See Figure 3 for a detailed inventory of all Rottnest Island WW2 era military installations.

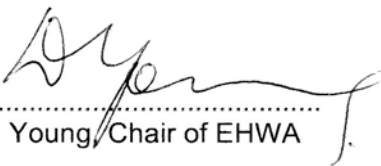
OLIVER HILL: 32 00' 25" S, 115 31' 01" E
BICKLEY POINT: 32 00' 32" S, 115 33' 10" E
KINGSTOWN BARRACKS: 32 00' 17" S, 115 33' 12" E
ARMY JETTY: 32 00' 05" S, 115 32' 59" E

Owner (name & address): Rottnest Island Authority, PO Box 693, FREMANTLE, WA, 6959

The owner has been advised of this nomination and a letter of agreement is attached.

Access to site: The Island is accessible by private boat, light aircraft or by ferry from Fremantle or Perth. Oliver Hill is accessed by light rail or road bus from the main settlement (Thomson Bay). Guided tours of the Oliver Hill installation and gun are conducted daily (self tours not permitted). Self tours of other sites are permitted.

Nominating Body: Engineering Heritage Western Australia, Engineers Australia, Western Australia Division


Don Young, Chair of EHWA
Date: 23 July 2010

OWNER'S LETTER OF AGREEMENT

Our Ref: PM/42-03
Your Ref:



Ms K Chisholm
Administrator
Engineering Heritage Australia
Engineers Australia
PO Box 6238
Kingston ACT 2604

Dear Ms Chisholm

Rottnest Island WW2 Coastal Defence Facilities Engineering Heritage National Landmark Award

This letter accompanies the nomination by Engineering Heritage Western Australia to Engineering Heritage Australia of the Rottnest Island WW2 Coastal Defence installation for an Engineering Heritage National Landmark Award.

We are very pleased to support this initiative of Engineering Heritage WA and if the nomination is successful we would be happy to cooperate in assisting with a dedication ceremony for the award.

If you should have any queries please contact Ms Harriet Wyatt, our Cultural Heritage Manager, on 08 93729701 or harriet.wyatt@rotnestisland.com

Yours sincerely

Paolo Amaranti
CHIEF EXECUTIVE OFFICER

22 July 2010

Administration

Rottnest Island Authority
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Fremantle WA 6160, Australia
Telephone: (08) 9432 9300
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Accommodation

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Information

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ABN: 38 836 160 172

HISTORICAL SUMMARY

In 1925, at the request of His Majesty's Government in the Commonwealth of Australia, the Joint Oversea and Home Defence Sub-Committee of the Committee of Imperial Defence of Great Britain prepared a Secret Memorandum on the defences of Australian Ports (CID. Paper No. 249-C). This Report was duly approved by the Committee of Imperial Defence and forwarded to His Majesty's Government in the Commonwealth. In early 1926 a revision to CID Paper No. 249-C was issued "as a result of further experimentation in connection with the mountings of 9.2 inch guns, it is now proposed to substitute 55° for 45° mountings, and, for the 6 inch guns, to modify the 15° mounting so as to make it capable of 35° elevation."

In 1931 Japan invaded Manchuria and in the following year withdrew from the United Nations. In 1932 a newly elected Australian Government proceeded to overhaul defence plans for the Commonwealth and by 1933 a Three Year Defence Program was underway. The need to defend vulnerable points on the Australian coastline became a priority. Fremantle was identified as a key point on the Western coastline.

The original plan for the defence of Fremantle was to place 9.2 inch guns on the mainland at Buckland Hill in Mosman Park, but it was realised that this strategy would not have prevented the long range bombardment of Fremantle Harbour by cruisers equipped with 8 inch guns. Planning then focused on Rottnest Island. 9.2 inch guns located on the island could engage hostile ships well before they were in range of bombardment of the port.

The first reconnaissance on Rottnest Island to look for suitable military sites took place in June 1934 when esteemed Western Australian World War 1 soldier and architect Lieutenant-General (Rtd) Sir J.J. Talbot Hobbs assisted the Department of Defence in its survey for suitable gun battery locations.

In August 1934 the Director of Military Operations and Intelligence from the Department of Defence in Melbourne, Colonel V.A.H. Sturdee conducted further reconnaissance of sites on Rottnest Island for barracks, workshops and other establishments required to support the coastal defence system. He recommended the area east and north of Bickley Swamp as the most suitable area for barracks and quarters (the future Kingstown Barracks).

In June 1935 the Commonwealth Department of the Interior was authorised to proceed with fortification works on Rottnest Island consisting of two 9.2 inch gun emplacements, two 6 inch guns and four searchlight emplacements, together with the necessary magazine shell stores, powerhouse and directing stations. Barracks for 40 men, a railway from the jetty (later referred to as the Army Jetty) to the 9.2 inch gun battery and improvements to the jetty were also in the scope of works. It was decided to put the main construction work out to tender to private contractors, with military personnel responsible for technical installations and overall supervision.

In the first half of 1936, with the assistance of visiting British Secretary to the Imperial War Cabinet, Sir Maurice Hankey, a new Report was drawn up by the Defence Committee of the Commonwealth of Australia.

On 30 July 1936 the Prime Minister of Australia, The Hon Joseph Lyons, sent a dispatch to the Dominions Office referring to the new Report, in which he pointed out that certain of the recommendations contained in the 1925 Memorandum had been "superseded by conclusions which owe their origin to changes in the importance of the Ports involved, developments in artillery science, and the decisions of the Australian General Staff following a reconnaissance of the defences of the localities concerned". The Prime Minister asked that this Report should be submitted to the Committee of Imperial Defence "for its information

and for favour of any observations it may wish to offer.” Among the many recommendations with respect to all Australian ports it was proposed to install two 9.2 inch guns on Rottnest Island in lieu of Buckland Hill, two 6 inch guns on each location at Rottnest, Arthurs Head and Fort Forrest (North Fremantle), in lieu of Fort Forrest only.

In response to the Lyons dispatch the Joint Oversea and Home Defence Sub-Committee examined the Report and in Committee of Imperial Defence Paper 440-C, dated February 1937, made a number of detailed observations on the substance of the Australian Report but essentially accepted the recommendations with respect to Fremantle.

Six other 9.2 inch gun batteries were constructed in Australia before and during WW2, at North Head, Sydney Harbour; Cape Banks, La Perouse; Fort Drummond, Wollongong; Fort Wallace, Newcastle; East Port Darwin; and Garden Island WA.

Construction of the Rottnest Island defence facilities commenced in late 1935. A contract to construct the railway from the jetty to Oliver Hill was awarded in November 1935 with a completion date of March 1936. Captain (later Brigadier) Frank Hussey of the No.5 Fortress Company, Royal Australian Engineers (RAE) was transferred from Sydney to supervise the work. Construction of the two 9.2 inch gun emplacements commenced in March 1936 and work was completed in December 1937. The Bickley Battery gun emplacements were constructed in the period September 1937 – April 1938. Warrant Officer (later Lieutenant Colonel) Ray Lucas RAE and Warrant Officer (later Captain) William Lake RAE oversaw the installation of engines and other equipment in the engine room at Oliver Hill. The two 9.2 inch guns were installed in 1937 and 1938 by the No. 6 Heavy Battery of the Royal Australian Artillery under the supervision of Major F. Nurse and Warrant Officer Gallagher. The Oliver Hill Battery was proofed for firing on 21 November, 1938. In the same year two 6 inch guns were installed at Bickley. Work began in late 1936 on the Kingstown Barracks complex and continued in three phases through to completion in 1938.

When war broke out on 3 September 1939 the Rottnest batteries were ready for action but fortunately did not have to fire a shot in anger for the duration of the war.

After the war, all units at Rottnest Island were disbanded and the guns were placed in long term storage. Kingstown barracks and surrounding buildings were mostly vacated by the military, however the barracks were partially occupied by personnel engaged in dismantling the batteries on the island, until work was completed in 1953. An artillery maintenance detachment remained on the island until 1960, when the remaining 9.2 inch ammunition was finally removed by the 44th Railway Squadron. The railway was restored at that time in order to transport the ammunition. Kingstown Barracks was used by the army for training purposes from 1955 to 1984, until the official closing ceremony on 15 December 1984. The Rottnest Island Board took ownership of the barracks buildings from July 1985 to establish an Environmental Education Centre, which continues to operate today. The Board (now “Authority”) continues to maintain and develop buildings at the Kingstown settlement for various purposes, including visitor accommodation.

The Oliver Hill battery site, including the original 9.2 inch guns and the battery's remaining supporting infrastructure, was listed by the National Trust on 8th February, 1980, and included in the National Estate on 28th September, 1982. The listing incorporates “All constructions on the Commonwealth Reserve both on the surface and underground including the railway installations, tunnel complex and gun mountings and at Signal Ridge near the main Lighthouse the three story brick Battery Command Post building”. The Oliver Hill battery has been stabilized and was partially restored in 1986 (See section “Physical Description and Condition”). It is operated as a tourist and education site by the Rottnest Island Authority. The Authority has plans to restore other parts of the WW2 defence system

(see Malloway Studio and Kloeden, Paul : Rottnest Island WW2 Coastal Defence Heritage, Interpretation Concept Development Plan, February 2009.).

BASIC DATA

Item Name:	<i>Rottnest Island WW2 Coastal Defence Facilities</i>
Location:	Rottnest Island sites: OLIVER HILL: 32 00' 25" S, 115 31' 01" E BICKLEY POINT: 32 00' 32" S, 115 33' 10" E KINGSTOWN BARRACKS: 32 00' 17" S, 115 33' 12" E ARMY JETTY: 32 00' 05" S, 115 32' 59" E
Address:	Rottnest Island Authority, PO Box 693, FREMANTLE, WA, 6959
Suburb/Nearest Town:	Fremantle
State:	Western Australia
Local Govt. Area:	Town of Cockburn
Owner:	Rottnest Island Authority
Current Use:	Tourism and heritage conservation. The Oliver Hill No. 1 battery complex (H1) was restored under the administration of the Rottnest Island Board with the assistance of a Bicentennial Grant. Restoration began in 1986. The site is operated as a tourist and educational attraction by the Rottnest Island Authority in collaboration with the Rottnest Voluntary Guides Association.
Former Use (if any):	Not applicable
Designer:	Commonwealth Department of the Interior.
Maker/Builder:	Mostly constructed by private contractors under the supervision of the No.5 Fortress Company, Royal Australian Engineers. Specialised work involving the mounting of the guns was performed by personnel of the No. 6 Heavy Battery, Royal Australian Artillery, and the installation of engines and generators by the No.5 Fortress Company of the Royal Australian Engineers.
Year Started: 1935	Year Completed: 1940
Modifications and Dates:	See section "Physical Description and Current Condition".
Historical Notes:	See section "Historical Summary".

Heritage Listings:**Kingstown Barracks**

Heritage Council of Western Australia, Permanent Entry, Register of Heritage Places, 00525, 3/7/1992

Register of the National Estate, Permanent Entry, Australian Heritage Commission, 22/6/1993.

National Trust, List of Classified Places, 4/4/1969.

Oliver Hill Battery

Heritage Council of Western Australia, Interim Entry, Register of Heritage Places, 00526, 1/10/2002

Register of the National Estate, Permanent Entry, Australian Heritage Commission, 28/9/1982.

National Trust, List of Classified Places, 8/2/1980.

PHYSICAL DESCRIPTION AND CURRENT CONDITION

The establishment of the defence complex on the island was a major undertaking, as it included the support facilities required to maintain and operate the batteries and to accommodate the personnel needed to construct and to operate the complex. Some illustrations and aerial photographs are included in this section to support the descriptions. However, the final section of this nomination, "Additional Illustrations", contains a series of additional historical photographs that serve depict various aspects of the project in more detail.

The key facilities built or developed in the late 1930's include:

- (i) *The extension and strengthening of the existing jetty at the south end of Thomson Bay, later referred to as the "Army Jetty", and the construction of an overhead gantry crane for the unloading of all military equipment, including the heavy guns.*

A jetty at this location was originally built in 1906. In 1935 it was extended by 47 feet and equipped with the gantry. The Public Works Department of WA was responsible for the jetty works. A rail line was installed from the end of the jetty to nearby Kingstown Barracks.

The jetty remains in use today, however the rail line, surface cladding of boards and the gantry crane have all been removed. See Figure 4 for current condition.



Figure 4. Army Jetty. Aerial photo Nov 2009 courtesy NearMap.

- (ii) *The 9.2 inch gun battery (2 guns, H1 and H2) at Oliver Hill and the supporting infrastructure (see Figures 5-7).*

The above-ground infrastructure consisted of the rail head, workshop and associated store, crew shelter and associated store, and gunner's cottages (See Figure 4 for an overview of the site). The extensive underground facilities included magazines, gun loading and machinery room ("gun room" – See Figure 11), pump room, engine room and various personnel rooms and store rooms. A cross sectional view can be seen in Figure 8. Plotting rooms were also located near the H2 site. Contractor F.J. Deacon began work on the site in March 1936 and completed in December 1937 at a cost of £55,344. The Plotting Rooms were extended further in 1942 to house equipment associated with the introduction of radar fire control systems.

The 9.2 inch H1 gun barrel installed at Oliver Hill in 1938, and still on display there, was manufactured in 1901 by Armstrongs (See Figures 5-6). The barrel weighs 28 tons. It was originally supplied to the Royal Navy, to be held in reserve for the Fleet in Hong Kong. It was transferred to the British Army for land service in 1910. The breach block was manufactured by the Elswick Ordnance Co.

The 9.2 inch H2 gun barrel, also installed at Oliver Hill in 1938, was used by the British Army in the defence of Portland Harbour, Dorset UK, in 1919. The breach block is stamped 1902.

H1 arrived at Fremantle aboard MV Wairangi in February 1937 and H2 on MV Karamia in the same year. Each gun, its mountings, sights and sundry equipment cost £40,400 at the time (GB Hill and Partners, 1995).

The H1 gun and underground tunnels and rooms have been restored and stabilized, and are the subject of guided tours. The H1 gun itself is intact. The underground rooms are mostly empty, although a mock-up of the projectile and propellant magazine rooms has been installed (see Figure 10). The engine room is empty, but once housed two diesel engines, generators and control systems (Figure 9). The original use of the rooms is explained comprehensively through interpretation panels, photographs and the guided tour. The former crew shelter adjacent to the rail head is used to display a range of photographs and interpretive material and is the starting point for the guided tour. A former store next to the crew shelter is now used to hold visitor's belongings while they investigate the gun and underground facilities.

The H2 gun and site have not been restored, but can be accessed by walking trail. The plotting rooms remain to be restored and are not open to the public. The workshop and associated store and the gunner's cottages no longer exist. (see Figure 5)

A detailed conservation assessment of the Oliver Hill complex was carried out by GB Hill and Partners in 1995.



Figure 5. Overview of Oliver Hill complex. Aerial photo Nov 2009 courtesy NearMap.



Figure 6. Overview of H1 Site, Oliver Hill. Aerial photo Nov 2009 courtesy NearMap.

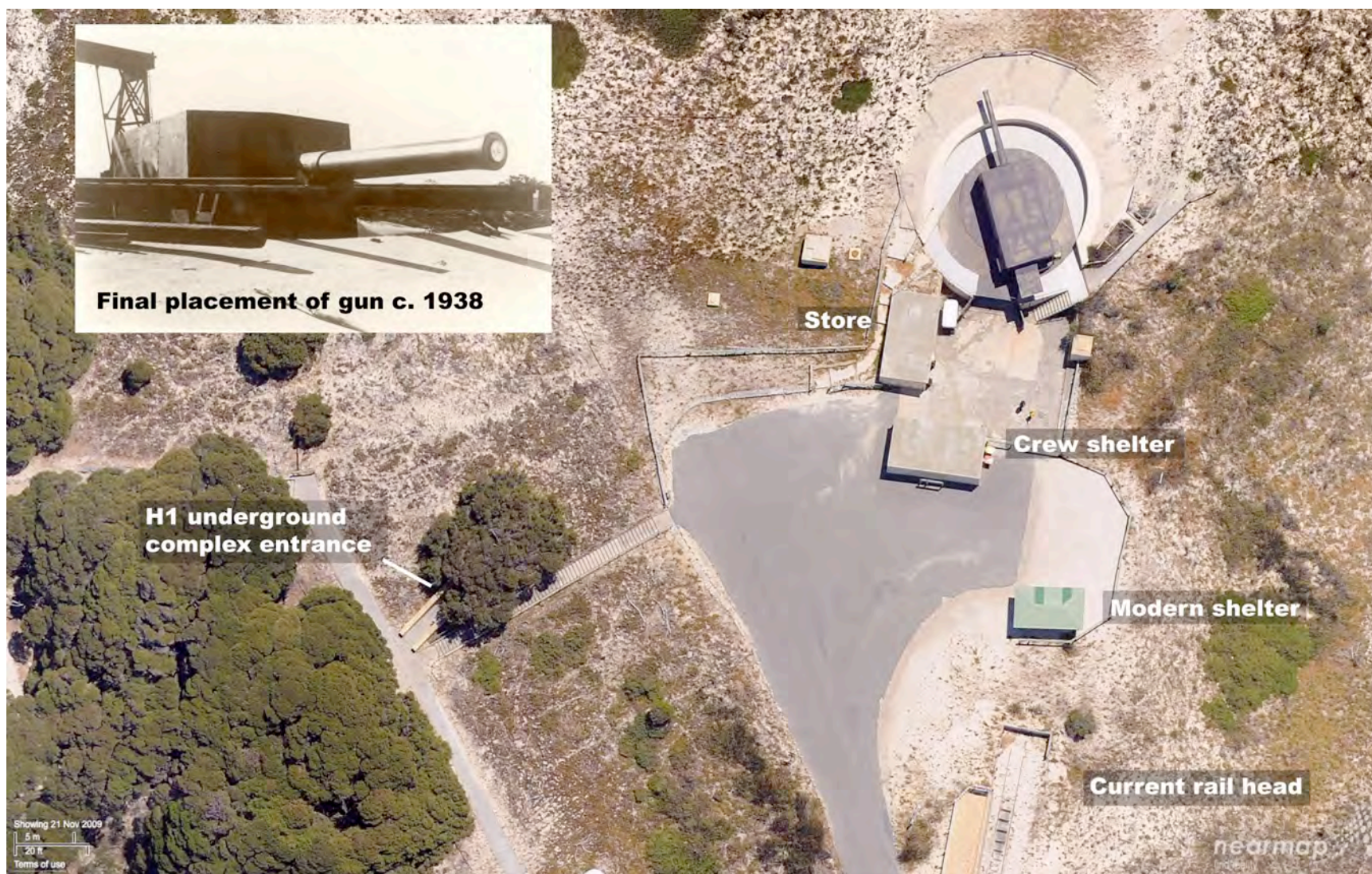


Figure 7. Detail of H1 Gun Site, Oliver Hill. Aerial photo Nov 2009 courtesy NearMap.

9.2 INCH BATTERY AT OLIVER HILL ROTTNEST ISLAND - WESTERN AUSTRALIA

INFORMATION EXTRACTED FROM ORIGINAL 1951-57 ARMY DRAWINGS

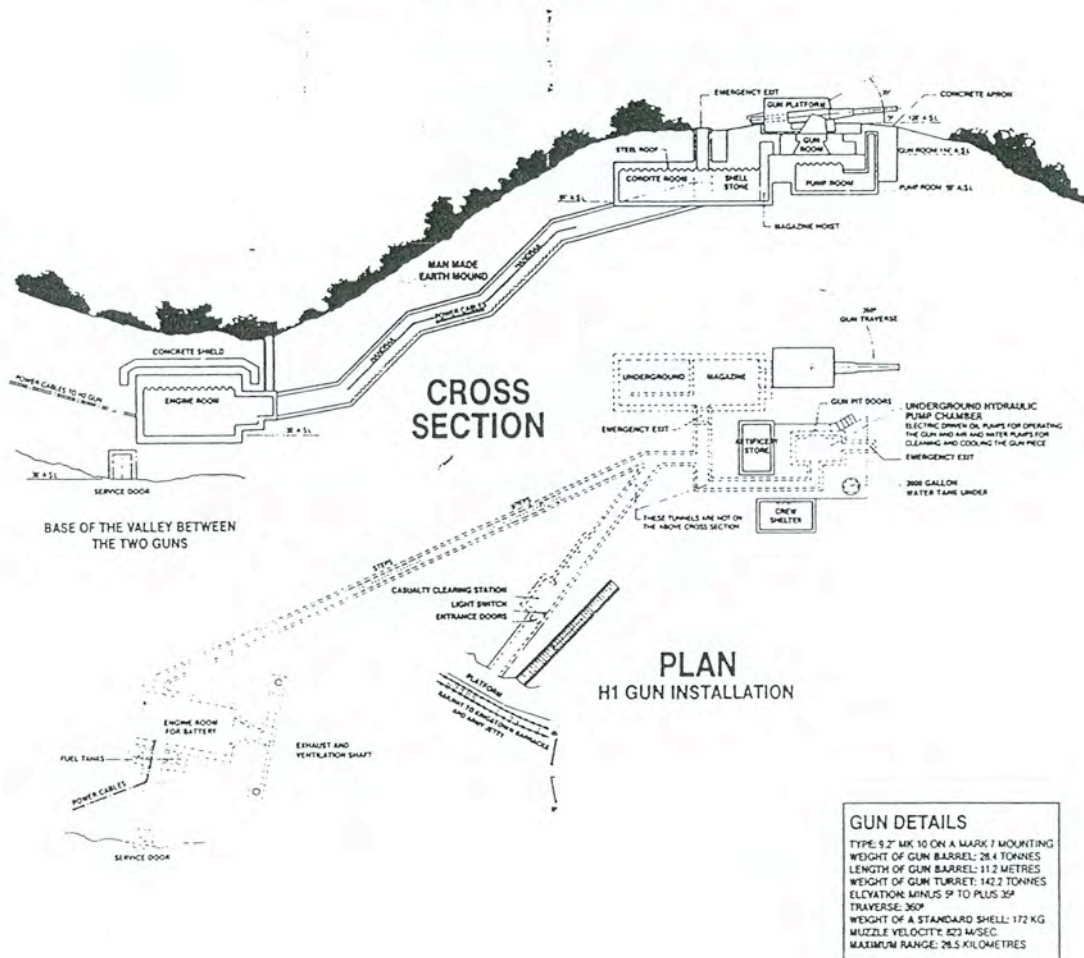


Figure 8. Cross-sectional view and plan of underground complex at the H1 site, Oliver Hill. From G B Hill and Partners report, 1995.

The Engine Room once contained twin Ruston Hornsby 180 HP 6VCR diesel engines coupled to Laurance Scott 120 kVA DC generators and control systems to power the complex and both guns. A smaller diesel generator set was also housed there to provide power to the complex when the guns were not in operation. Hydraulic power was supplied by electrically driven pumps in the pump room located close to each gun. The large diesel engines and generators were removed during the 1960s to provide remote power generation by the SEC.

No equipment of any sort remains in the engine or pump rooms, however a display of photographs and drawings in the Engine Room depicts the original layout and equipment, as illustrated in Figure 9.

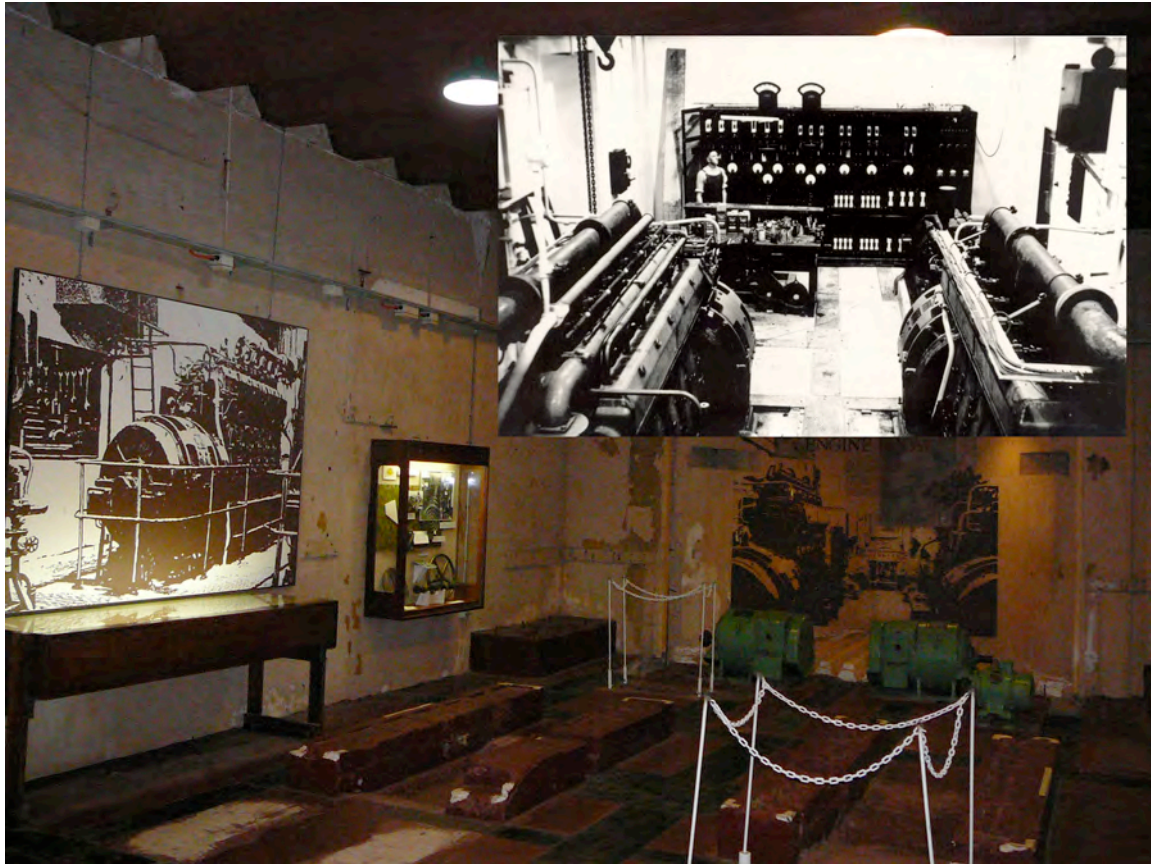


Figure 9. Current state of the Engine Room. Inset shows the original diesel generating sets.

Figure 10 shows the current Magazine Room mock-up to physically illustrate the original layout and operation, while Figure 11 shows the restored equipment in the Gun Room located immediately beneath the H1 gun.

The Gun Room houses the original gun mount, the gun actuating equipment and the equipment used to transfer shells delivered from the adjacent magazine to the firing room directly above. The inset shows the firing room, which is located in the shielded turret.

The photograph on the cover page to the nomination document illustrates the current external appearance of the H1 gun barrel and shield.



Figure 10. Current condition of the Magazine Room.

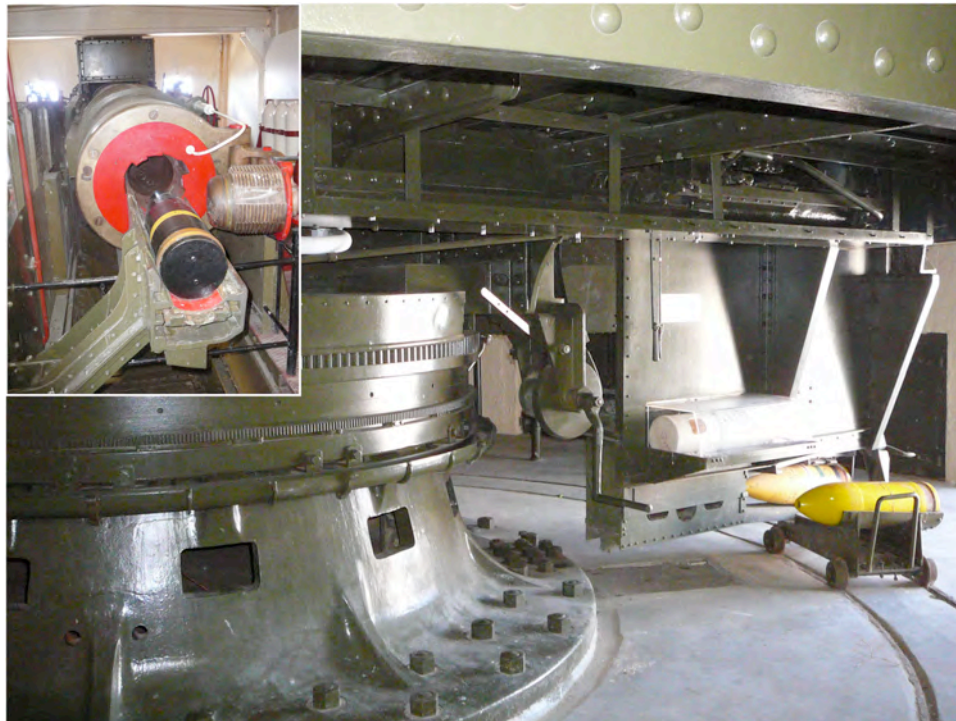


Figure 11. Current condition of the Gun Room.

- (iii) *The 6 inch gun battery at Bickley Point (2 guns) and supporting infrastructure (above ground) including the magazine, plotting rooms and command post.*

The current condition of this site is shown in Figure 12. The circular gun platforms remain, but all battery equipment has been removed. One of the gun barrels is on display at Kingstown Barracks.

Todd Brothers of Leederville built the Bickley Battery gun emplacements, roads and water services for a contract cost of £8,471. Work commenced in September 1937 and was completed in April 1938. In late 1939 or early 1940 the top of Phillip Rock was removed by explosives to improve the field of unobstructed fire from the Bickley Battery. The 6 inch Mark XI guns were of from first World War Naval ships HMAS Melbourne and HMAS Brisbane.

The magazine and plotting rooms, command post and gun shelters can be entered and viewed, but have not been restored. Access is by walking trail along the original rail spur line (lines now absent) from Kingstown Barracks. Self guided tours are available.

- (iv) *Kingstown Barracks, to accommodate military personnel and their families.*

The Kingstown complex consists of a variety of buildings centred on the main barracks and parade ground. Figure 13 illustrates the evolution of the barracks to 1941. By 1939 the troop strength on the Island was thought to be around 4000, but by 1942 it was reduced to 2500. (Ralph Hoare Architect, 2002). Other buildings include the DID (Detail Issue Depot), hospital, office buildings, mess buildings, officer's cottages and various sheds and stores.

Construction of the Barracks took place in three phases. In late 1936 work began on the main Barracks by contractor F.J. Deacon at a contract price of £28,669. The main Barracks would accommodate up to 150 personnel, and was completed in late 1937. Furniture and cupboard contracts were let to Millars Timber and Trading Coy Ltd for £3,319. Other contracts and tenders were let to various contractors for hot water, curtains and furniture. Refrigeration and ice making was provided by Atkins WA Ltd for £419. The Barracks were initially occupied by the 6th Heavy Battery Royal Australian Artillery (RAA) and the 5th Fortress Company Royal Australian Engineers (RAE).

The second phase began in 1938, with the awarding of a contract to Todd Brothers of Cleaver Street, Perth, for the building of the RAA and RAE administration offices, officer's mess, canteen and married quarters.

In a third phase, also in 1938, additional married quarters, the hospital, parade ground and sundry other buildings were built. Todd Brothers again won the tender to construct the houses, at a contract price of £6,480. The hospital was built by H. Hoyle of Subiaco for £2,787. The total works in phase three were completed in 1939 at a total cost of £9,802.

Most buildings (including the Barracks) have been maintained and have been adapted for use as visitor accommodation, ranging from dormitory to cottage style accommodation, Rottnest Island Authority (RIA) staff accommodation and for RIA operations (sheds, storage, meeting rooms). See Figure 14.

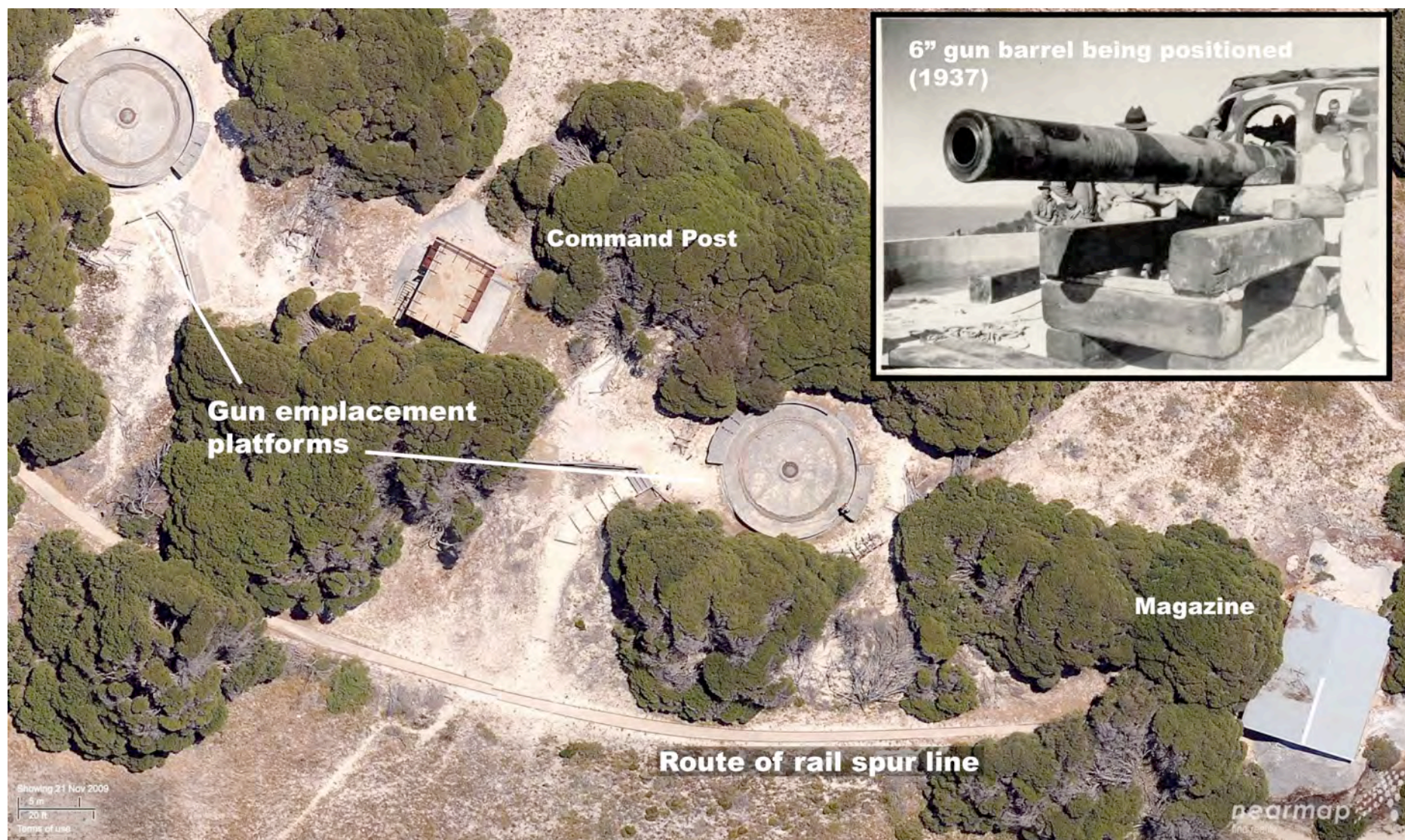


Figure 12. Bickley Battery Site. Aerial photo Nov 2009 courtesy NearMap.

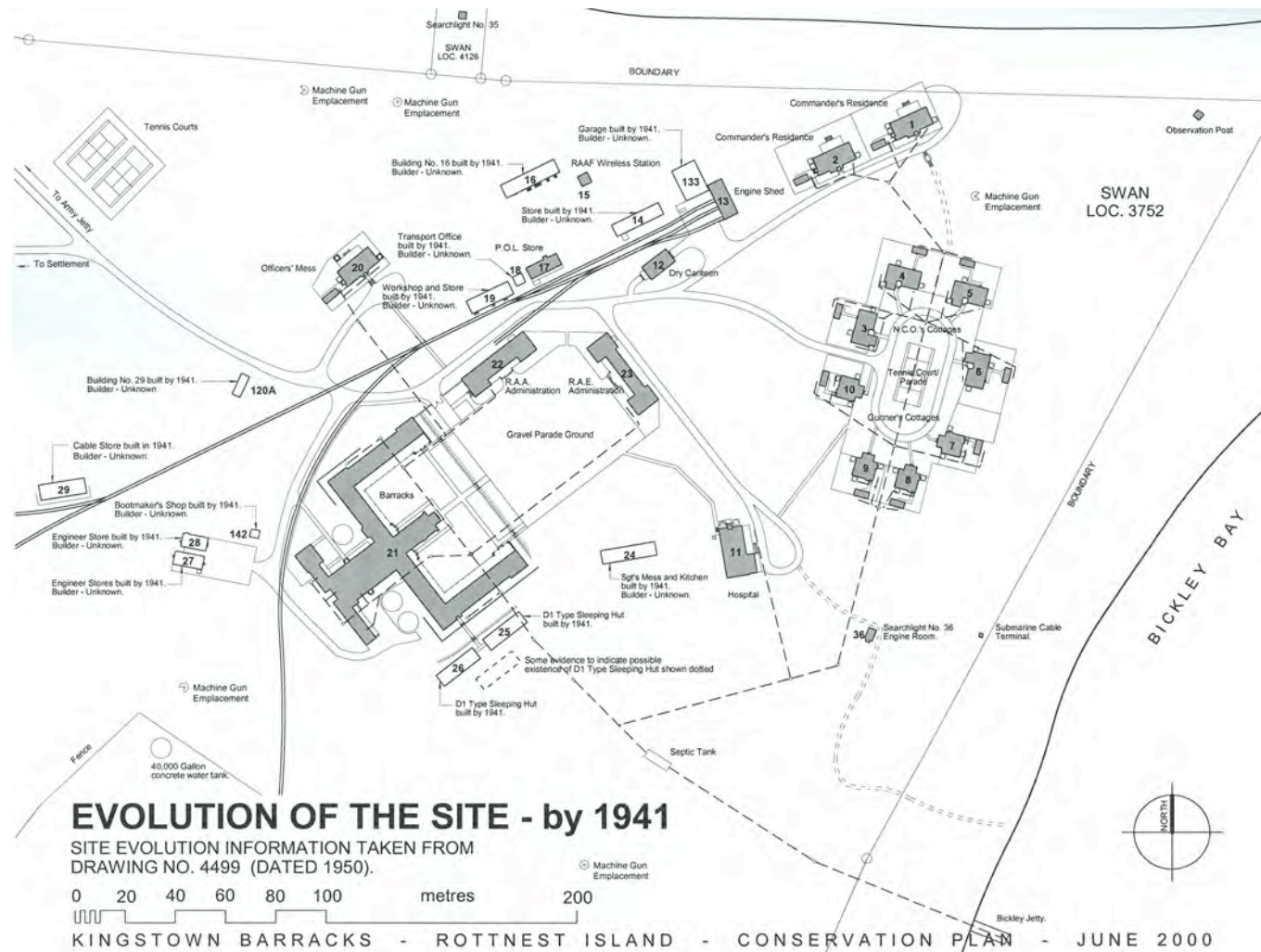


Figure 13. Detail of Kingstown Barracks in 1941. From Ralph Hoare Architect : Kingstown Barracks Conservation Plan, 2000.



Figure 14. Current condition of Kingstown Barracks. Aerial photo Nov 2009 courtesy NearMap.

- (v) *3.5 foot gauge railway from the Army Jetty to Oliver Hill, with spur lines to the Kingstown Barracks and Bickley Battery*

The construction of roads and the rail line marked the start of the creation of the Rottne Island Fortress. The rail line was particularly important, as it enabled heavy loads to be carried from the jetty to the building sites, and later carried the guns and associated equipment. The tender for construction of the rail line was let to John Dunstan and Son in November 1935 at the contract amount of £13,364. The completion date was set for March 1936, just 5 months.

The original rail line between Oliver Hill and Kingstown Barracks has been maintained, extended to the Settlement, and is used to carry visitors to and from the gun site. Small modern shelters have been constructed at the Oliver Hill and Settlement termini. (Fig 7).

- (vi) *The three storey combined fortress, battery observation post and signal station on Wadjemup Hill (Signal Ridge) and associated WRANS quarters (cottages).*

These buildings have been restored and are maintained. Extensive work on the battery observation post was completed in 2009. They are in good condition. They can be viewed from the outside, but are not open to the public. Interpretation is available on site. The former WRANS quarters are currently in use as visitor and RIA staff accommodation.

- (vii) *Fortress observation posts on Mount Herschel, Bare Hill, Cape Vlamingh and One Tree Hill.*

These buildings are in various states of disrepair.

- (viii) *Water catchments and covered water tanks, installed on Mt Herschel during 1940, to hold 2 million gallons.* The water catchments on Mt Herschel are still in use.

- (ix) *Expanded and improved airstrip.*

This was proposed by the Commonwealth in 1940, at which time the Commonwealth entered into a 25 year lease at peppercorn rental with responsibility to maintain the aerodrome. The airfield was handed on to the Dept of Civil Aviation in 1954 and is still in use today.

- (x) *Radar Towers, searchlight positions and anti-aircraft gun emplacements.*

Remnants of these facilities remain.

ASSESSMENT OF SIGNIFICANCE

Creative or Technical Achievement

The construction of the integrated Rottnest Island WW2 Coastal Defence facilities in the second half of the 1930s was a significant technical achievement. Rottnest is an undulating sand and limestone island twenty kilometres from the mainland (see Figure 1). At the time of commencement of construction there was only a basic jetty available for unloading materials and no paved roads. Work was carried out before the days of readily available modern heavy earthmoving equipment and large capacity cranes. The railway provided an inexpensive and efficient means of transporting construction equipment, materials, guns and stores to their locations. Consequently gantry cranes had to be designed, built and erected at loading and unloading sites. Extensive use was made of rollers and man operated capstans to haul large pieces of machinery (up to 30 tons mass) into position. The successful installation of high precision artillery equipment reflected great credit on those involved.

Social Significance

The Rottnest Island Defence complex was a strategic establishment in WW2. Fremantle was an important bunker port and troop convoy assembly point for allied vessels. It was also the largest base in the southern hemisphere for allied submarines.

With the increased probability of attack after Japan entered the war in December 1941 the level of defence preparedness on the island increased. All woman and children residents were evacuated to the mainland and the level of military personnel ramped up. Personnel operating the guns were located in temporary wartime hut camps in close proximity to the guns. Fifty Australian Women's Army Services (AWAS) personnel were moved to Rottnest in 1942 with a primary role to operate the underground plotting rooms at the Oliver Hill Battery. Women were also deployed at the Bickley Battery and a contingent of Women's Royal Australian Navy Services (WRANS) operated the Navy Port War Signal Station on Wadjemup Hill (Signal Ridge). In 1942, 2500 military personnel were based on Rottnest, including members of the Royal Australian Navy and the Royal Australian Air Force.

Due to the secrecy needed in wartime, personnel were not permitted to move freely about the island. However a great deal of camaraderie existed between men and women stationed on the island. Monthly dances with music provided by the Army band were held at Kingstown Barracks. Oral histories of wartime personnel stationed on the island have been recorded by the Rottnest Island Authority Cultural Heritage personnel.

Kingstown Barracks has been maintained as an accommodation venue and environmental centre, demonstrating its value as a tangible link with the major international event of WW2. For the many ex-servicemen and women who worked on the island during the war years the barracks have considerable social significance.

Rarity

The Rottnest Island WW2 defence establishment, in particular, the Oliver Hill Battery with its H1 and H2 9.2 inch guns, is the only primarily intact establishment remaining in Australia of the seven 9.2 inch gun batteries constructed in the late 1930s and early 1940s. It is one of the most complete coastal defence systems in the British Commonwealth. It is one of a very small number of sites in the world that retain their 9.2 inch gun batteries. The Rottnest Island Authority deserves great credit for its efforts to conserve and manage the facilities for tourism purposes. Kingstown Barracks has considerable rarity value, as it is the only purpose built permanent barracks complex built in Western Australia to support the coastal defence fortifications in a remote location for the protection of a key target. It is one of only two permanent barracks built as part of the national coastal defence program, the other being at North Head in Sydney.

Representativeness

The Rottnest Island WW2 defence establishment is of great importance because it is able to demonstrate the preparations that were taken to protect the port of Fremantle from possible enemy attack in WW2. Planning provided for the 9.2 inch long range guns to be able to shell large enemy warships approaching from the northwest with the intention of bombarding Fremantle. The smaller 6 inch guns at Bickley Point covered the possibility of smaller enemy ships approaching Fremantle from the shallower South Passage.

Integrity

The integrity of the Kingstown Barracks is very high. The current use of the barracks as an environmental centre and youth hostel, and the commanders' residences, officers mess, NCOs and gunners cottages as holiday accommodation should ensure that the integrity of Kingstown Barracks will remain high.

The railway line from Kingstown Barracks to Oliver Hill has been refurbished and extended to the Settlement. A new diesel rail car was purchased so that regular trips to Oliver Hill can convey tourists to the H1 gun emplacement. The H1 gun platform, gun room, magazine, powerhouse and connecting tunnels have been refurbished by the Rottnest Island Authority and informative tours are conducted by Rottnest Volunteer Guides. Work is underway to refurbish other WW2 facilities at Bickley Point and Signal Ridge (Wadjemup Hill).

HISTORIC INDIVIDUALS ASSOCIATED WITH THE PROJECT

Joseph Lyons

Joseph A. Lyons was born in Tasmania in 1879. On leaving school he trained as a teacher and also became an early member of the Australian Labor Party in his home state. In 1903 he was elected to the Tasmanian House of Assembly and soon demonstrated his ability by becoming Finance Minister in 1914, then Minister for Education and Railways in 1916. He oversaw a number of significant reforms in the state education system during his tenure as Education Minister. He became Premier of Tasmania in 1923 and was re-elected in 1928. In 1929 he entered Federal Parliament and soon became Postmaster-General and Minister for Works and Railways in the Scullin Labor Government.



When the Depression hit Australia in 1930 Lyons temporarily took over the Treasury portfolio. His conservative approach to coping with the economic crisis angered many members of the Labor caucus. In 1931 Prime Minister Scullin stood him down from the Treasury bench. Soon after Lyons resigned from the Cabinet and the Labor Party, and, together with four other disaffected Labor MPs, he crossed the floor to sit on the Opposition benches. Subsequently, he became the Head of the newly formed United Australia Party (UAP), which had a landslide victory at a general election in December 1931. Lyons was sworn in as the 10th Prime Minister of Australia in January 1932. His party was re-elected to govern in 1934 and 1937.

Lyons was one of the most popular politicians to hold the office of Prime Minister. When he died of a heart attack in April 1939 there was widespread grief throughout the nation. In 1915 Joseph Lyons married fellow teacher Enid Burnell. She was a great support to him throughout his political career, as well as being mother to their twelve children. Enid Lyons went in to politics herself in 1943, becoming the first woman to sit in the House of Representatives, and later the first woman cabinet Minister in a Menzies Liberal Government. She was made a Dame of the Order of the British Empire in 1936 and a Dame of the Order of Australia in 1980. She died in 1981.

(Photo courtesy of National Library of Australia)

Lieutenant-General Sir J.J.Talbot-Hobbs



Joseph John Talbot Hobbs was a successful Perth architect who also had a distinguished military career. After migrating to Western Australia in 1887 he set up a practice as an architect. He joined the Volunteer Field Artillery before World War 1 as a gunner, but was rapidly promoted in 1897 to the rank of Major. He made a special study of gunnery, attending courses in England in 1902 and 1906 and took a Diploma in Military Science at the University of Sydney in 1909. In 1908 he was promoted to Lieutenant Colonel and had command of the Western Australian Army Brigade. In August 1914 he was chosen to command the Australian Army's 1st Division Artillery.

Lieutenant Colonel Hobbs was involved in the Gallipoli campaign in 1915 and on the Western Front from 1916 to 1918, being promoted to the rank of Major General to command the 5th

Australian Division in January 1917. In November 1918 he succeeded General Sir John Monash as Commander of the Australia Corps, being promoted to the rank of Lieutenant General. For his distinguished service in the field he received a KCB in 1918 and a KCMG in 1919.

Post war Hobbs resumed his architectural practice in Perth but continued his military interests. In 1921 he was again made Commander of the 5th Division, holding this appointment until he retired from the army in 1927. In 1922 he became the military representative on the faculty of engineering at the University of Western Australia, which awarded him an honorary degree of Doctor of Law.

Hobbs took a special interest in the erection of war memorials. He designed four of the five division memorials in France and Belgium, chose the site of the Australian National Memorial at Villers Bretonneux, and designed the Western Australian War Memorial in Kings Park.

Sadly he was on his way to France in 1938 to attend the unveiling of the Villers Bretonneux Memorial in 1938 when he suffered a fatal heart attack. His body was returned to Perth for a state funeral with full military honours. In 1940 a memorial was erected to Hobbs on the Esplanade in Perth.

Understandably in 1934 the Minister for the Army and Army Chief of Staff were very pleased that Sir Talbot was able to provide his advice on the location of guns on Rottnest Island when the first reconnaissance took place in June of that year.

(Photo by Fred Leist, courtesy of Australian War Memorial)

Colonel V.A.H Sturdee

Colonel Vernon Sturdee, born in Victoria in 1890, was a regular officer of the Royal Australian Engineers who joined the Militia in 1908. He was one of the original Anzacs who landed at Gallipoli on 25 April, 1915. He subsequently served on the Western Front and became successively commander of the 5th and 8th Field companies.

In 1934, Colonel Sturdee was Director of Military Operations and Intelligence, Department of Defence. He travelled from Melbourne to Western Australia in August 1934 to carry out the second reconnaissance on Rottnest Island. He chose sites for the barracks, workshops and other establishments required for coastal defences in August 1934.

Ranked as a Colonel at the outbreak of WW2 in 1939 Sturdee was promoted to Lieutenant General in 1940 and became Chief of the General Staff. He then proceeded to conduct a doomed defence of the islands to the north of Australia against the advancing Japanese forces. In 1942 he successfully advised the Government to divert the Australian Imperial Forces returning from the Middle East from Burma to Australia. He then became head of the Australian Military Mission to Washington, DC, where he represented Australia before the Combined Chiefs of Staff. He was Commander of the Australian army in New Guinea in 1944-1945 and succeeded General Sir Thomas Blamey as Commander in Chief of the Australian Military Forces in December 1945. He became Chief of the General staff a second time in 1946, serving in that role until he retired in 1950. Sturdee was knighted in 1951. He died in May 1966 and was given a state funeral with full military honours.



(Photo by Murray Griffin, 1957, courtesy of Australian War Memorial)

Major E.G.B. Scriven

Major Scriven was Supervising Officer (Fortifications) with the Commonwealth Department of the Interior in Sydney in the mid 1930s and supervised the design and construction of the Kingstown Barracks buildings. The Sydney Commonwealth Office had the responsibility for the design of coastal defences around Australia. Major Scriven was a RAE officer seconded to the Department of Defence because of the special expertise required to design the battery emplacements. He visited Rottnest on a number of occasions to inspect progress. The 9.2 inch gun battery at Garden Island was named after him.

Sir Maurice Hankey



Sir Maurice Hankey was a British civil servant who was born in 1877. On leaving school he joined the Royal Marine Artillery and served in various roles in the Naval Intelligence Department before joining the Committee of Imperial Defence of which he became Secretary in 1912, a position he was to hold for next twenty six years. When David Lloyd George became Prime Minister in 1916 Hankey was appointed Secretary of a scaled down War Cabinet. Throughout his civil service he gained a reputation for competency such that when the full Cabinet was restored in 1919 he was appointed Secretary, a position he was to hold for the next nineteen years. In August 1938 he retired from the government and in 1939 he became the 1st Baron Hankey.

(Photo courtesy US Library of Congress)

Captain B.F. (Frank) Hussey RAE

Captain Hussey was born in Menzies, WA in 1907. He entered the Royal Military College, Duntroon, in February 1924, aged 16 years 10 months, the minimum age for admission. He graduated from the RMC in December 1927 (photo at right), first in his class of 14, winning the Kings Medal, and then completed a Bachelor of Engineering degree at Sydney University in 1930.

From 1934 to 1939 he was attached to the Department of the Interior and in September 1935, with the rank of Lieutenant, he was transferred to Rottnest Island to supervise the building of the railway from the jetty to Oliver Hill and preliminaries for all the works on the island. Later promoted to Captain he became Engineer-in-Charge on Rottnest for the Department of the Interior. At the end of his service on Rottnest in April 1940 he was promoted to the rank of Major and was appointed Chief Instructor at the School of Military Engineering (Fortress Wing), Georges Heights, Sydney NSW.





During the war years he rose to the rank of Lieut Colonel and in 1955 he was Chief Engineer at Victoria Barracks, Sydney. He retired from the army in 1960 with the rank of Brigadier and immediately joined the Major Construction and Hydraulic Undertakings Branch of the Public Works Department, Western Australia. During 1960 – 1963 he was based in Kununurra supervising the construction of civil works of the Ord River Diversion Dam, the first stage of the Ord Irrigation Project. He was subsequently co-author, with R J Wark, of an Interim Design Report into the Main Ord Dam, published in 1968.

(Frank Hussey at test hole east abutment, Ord River Diversion Dam, 1960)

The diesel railcar which conveys passengers on the restored railway to Oliver Hill has been named **Captain Frank Hussey** by the Rottnest Island Authority in memory of the former Engineer in Charge of construction of the fortification work.

(Photos courtesy Water Corporation, WA)

Lieutenant Colonel V.R. (Ray) Lucas RAE

Lieutenant Colonel Lucas commenced his service on Rottnest Island as a Warrant Officer Class 1 and was one of the engineers responsible for the setting up of searchlight stations and oversaw the installation of the engines and other equipment that provided power for the Oliver Hill battery.

D. E. Limburg

Mr D E Limburg was a temporary architect with the Works and Services Branch of the Department of Interior, NSW when he was transferred to Perth in April 1936 to prepare sketch plans for the Kingstown Barracks under instruction from the Director of the Commonwealth Works Department in WA. The secondment was to ensure that military requirements for the design would take into account knowledge of local conditions. The barracks buildings were designed in Sydney but much of the tendering and contract supervision and some of the drawings were done in Perth.

ACKNOWLEDGEMENTS

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Mr Robert Mitchell, Curator, Army Museum of Western Australia

Mr Ross Howarth, Archivist, Royal Military College of Australia

REFERENCES

Moynihan, John : All The News in a Flash, University of WA Press, 1988.

Holder, A.D. : Fremantle and Rottnest Coast Defence Batteries. A Brief History 1993.

G B Hill and Partners : Oliver Hill Conservation Assessment, November 1995.

Ralph Hoare Architect : Kingstown Barracks Conservation Plan June 2000.

Mulloway Studio and Kloeden, Paul : Rottnest Island WW2 Coastal Defence Heritage, Interpretation Concept Development Plan, February 2009.

Palassis Architects : Oliver Hill Battery Rottnest Island, Conservation Management Plan, December 2005.

Rottnest Island Authority : Oliver Hill Battery, Oliver Hill railway and Signal Ridge (Wadjemup Hill) Tourist Brochures.

Photo Archives of the National Trust of Australia, Defence Heritage Committee, and the Army Museum of Western Australia.

Heritage Council of Western Australia Places Database,
<http://register.heritage.wa.gov.au/index.html>

ADDITIONAL ILLUSTRATIONS

Note: The historical photographs in this section are courtesy of the National Trust of Australia.

ARMY JETTY



ARMY JETTY - Zephyr, Crayfish, troops disembarking – date unknown

The photo shows TSS Zephyr alongside the Army Jetty with the Heavy Lift Gantry in place. Troops appear to be disembarking and forming up on the left, civilians on the right, two vehicles in the centre and the rail engine 'Crayfish' on the track ready to load personnel and stores.



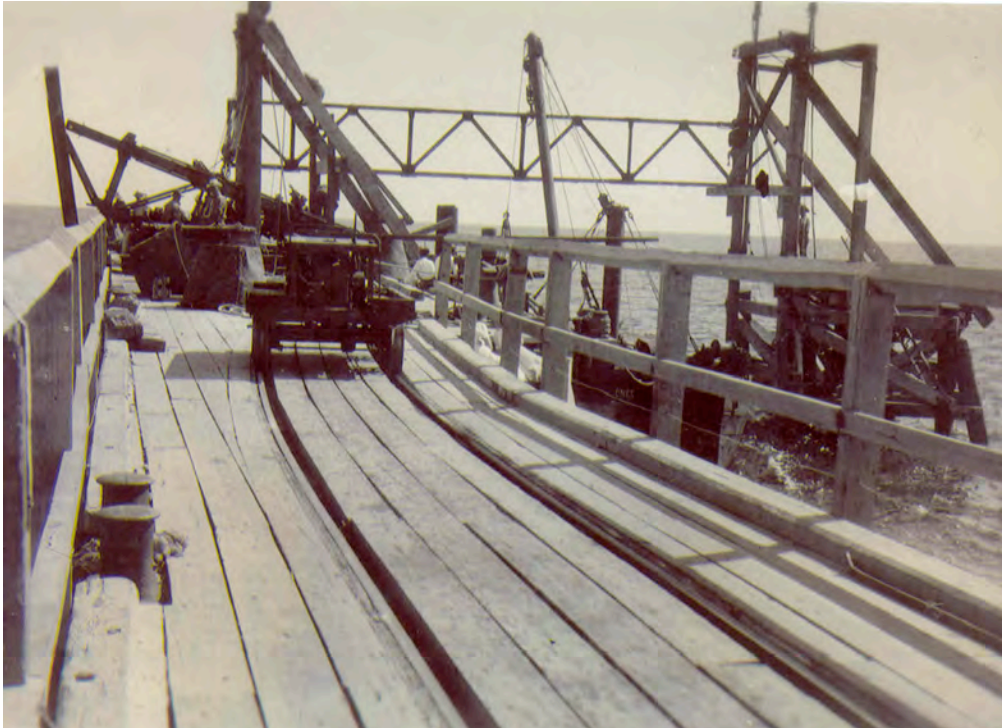
ARMY JETTY - Early stages of Army works – 1935

Clearly shows the early construction phase of the Army Jetty and railway. Barge with crane alongside.



ARMY JETTY - Erection of Fixed heavy Lift Crane - 1936

6 Heavy Battery RAA personnel in the early stages of erecting the Fixed Heavy Lift Gantry. This Gantry was used for all heavy lifts including guns and ammunition ferried across from the mainland. It remained in place from early 1936 to 1943 when it was removed and re-erected at Garden Island to facilitate the installation of their 9.2" guns.



ARMY JETTY – Decking, rail tracks and Crane (under construction) – 1936.



ARMY JETTY - Strengthened jetty showing stone work, timber work and completed gantry – Date unknown.



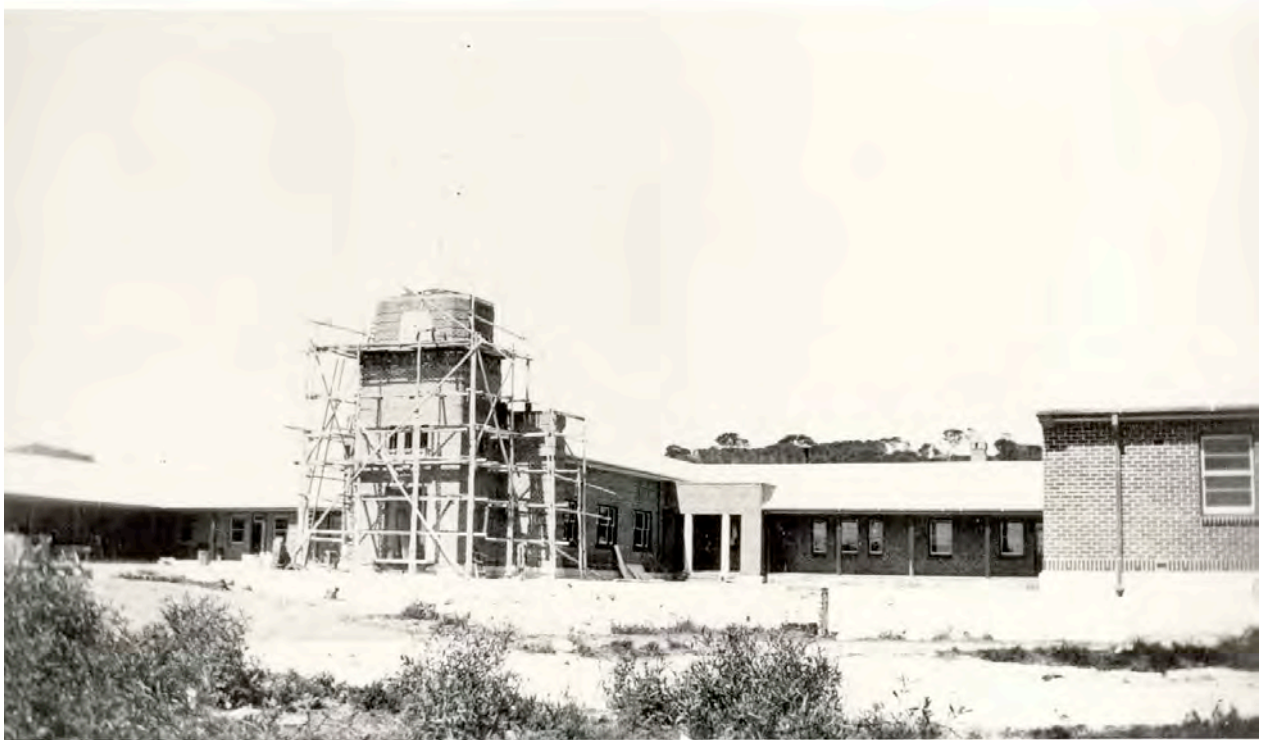
ARMY JETTY - View of gantry from arriving ferry - late 30's.

KINGSTOWN BARRACKS



KINGSTOWN BARRACKS - View looking from clock tower towards the north-east – c. 1938

Photograph shows No 2 Administration Building (RAA). On the left can be seen the RAA Canteen. The Engine House for diesel railway engines is in left far background. The area in the foreground became the Parade Ground.



KINGSTOWN BARRACKS - Clock Tower surrounded by scaffolding – c. 1937

View from the parade ground looking towards the south-west, including the main Barracks Clock Tower under construction. Note the bush and un-cleared area which became the Parade Ground.



View of clock tower in 2010, showing the 6 inch gun barrel from the Bickley Battery in foreground (Photo Don Young)

MILITARY RAILWAY



MILITARY RAILROAD - Embankment building using horse scrappers and wheel barrows – probably late 1935 or early 1936 as railroad approaches Oliver Hill. Civilian workers shown using wheel barrows to cart sand for the foundation of the railway. Note Wadjemup light house on the horizon.



MILITARY RAILROAD - Truck being loaded with limestone – date unknown

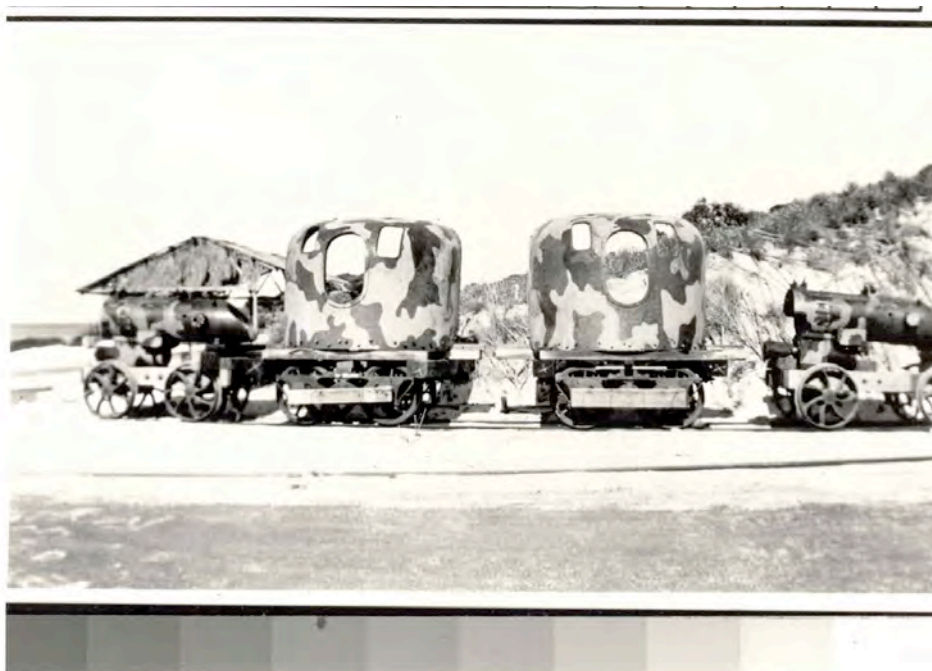
Troops appear to loading the railway truck with limestone to be used as part of the fortifications at either Bickley or Oliver Hill Batteries.



MILITARY RAILROAD - Barrel, cradle and carriage being transported – c 1938. Photo shows 9.2 inch barrel, breech block, cradle and other stores (some in wooden packing cases).



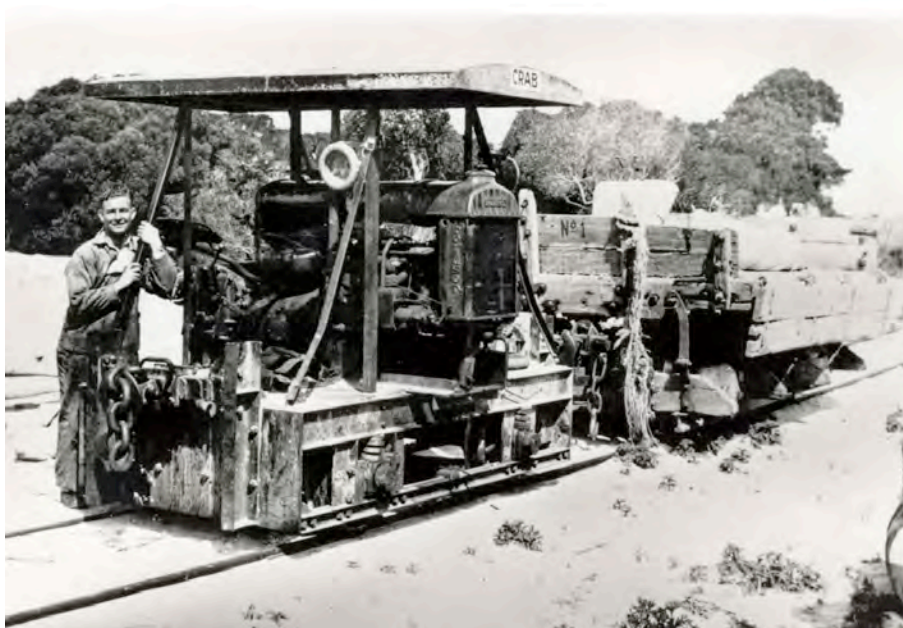
MILITARY RAILROAD - Close up of 9.2 inch barrel and carriage on rolling stock moving to Oliver Hill. C 1938



MILITARY RAILROAD - Shields and cradles for 6 inch guns enroute to Bickley – c 1938



MILITARY RAILWAY - Crayfish – 1937. A working party being transported to the 9.2 inch gun Battery from the Barracks sometime in 1937 by locomotive "Crayfish". Engineering personnel are on the locomotive; artillery personnel on the railway truck.



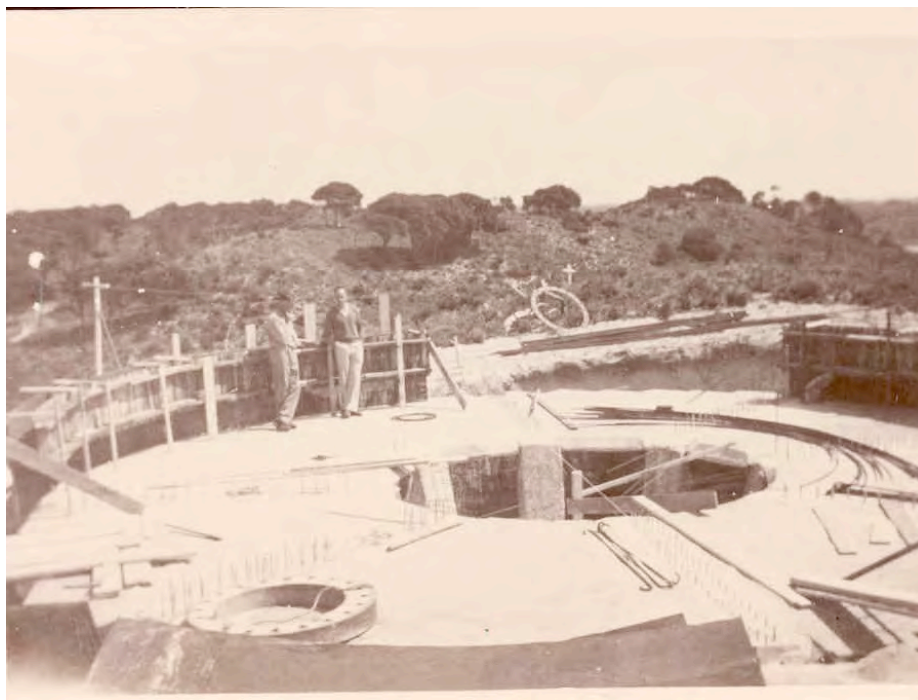
MILITARY RAILROAD – Crab - date unknown. Photo of Crab (transverse mounted engine) towing wagon No 1 and “Curly” Masters (driver). The locomotive Crab (so called because the Fordson engine was fitted transversely) was operated by 5 Fortress Engineer Company, RAE PMF during installation and subsequently to move heavy stores and equipment.



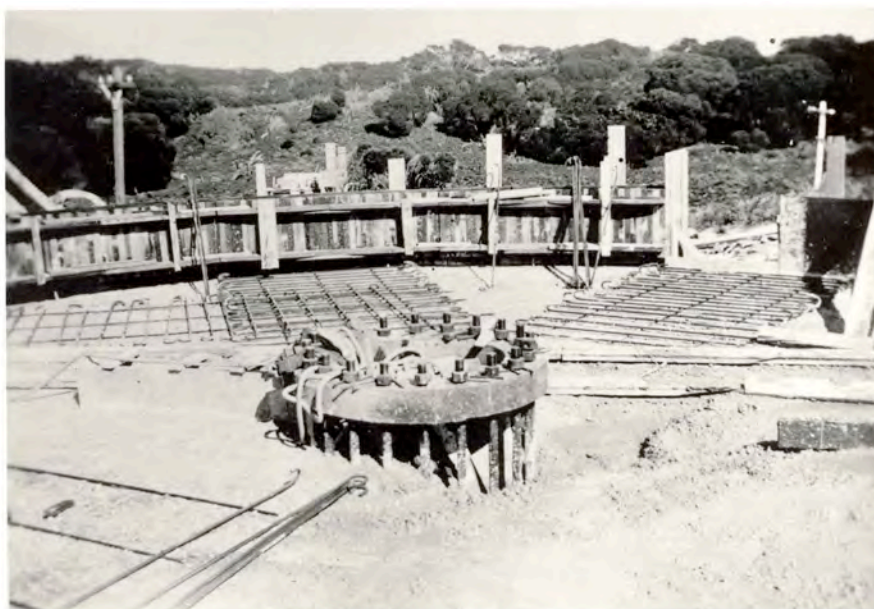
OLIVER HILL - Quarry Spur Line - 1937

Artillery personnel pushing a railway truck along a quarry spur line near Oliver Hill.

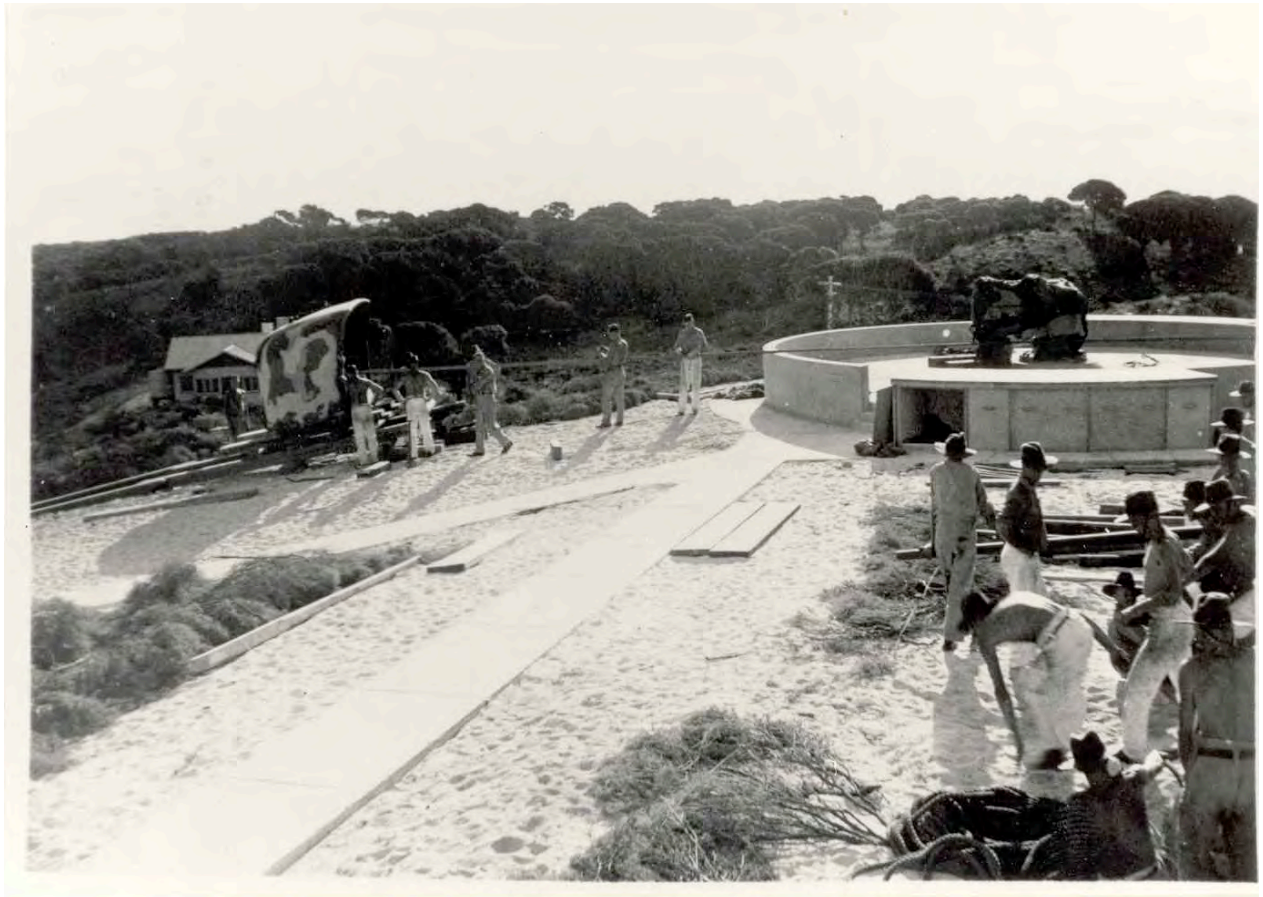
BICKLEY BATTERY



BICKLEY - Construction of Platform For P1 – c. 1937-38



BICKLEY - P2 6 inch gun platform, pour for hold down bolts – c 1937-38



BICKLEY - Hauling the gun shield up to P1 – c. 1938

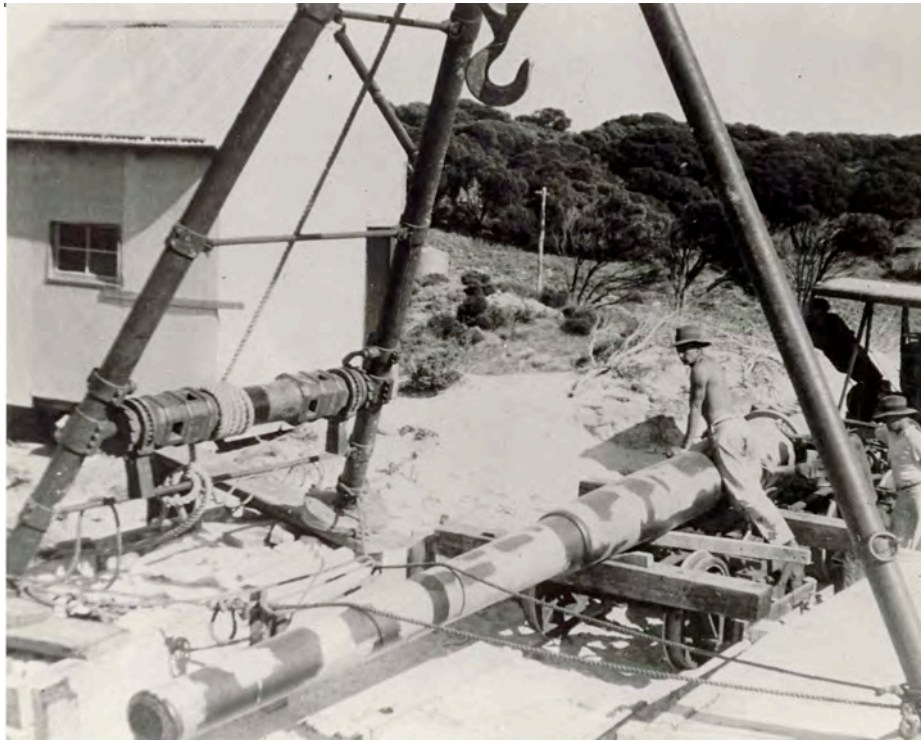
Hauling the No 1 gun shield up onto the gun position after it has been unloaded from the railway trolley. Personnel are using a timber sleigh on rollers that is being hauled up with a grab capstan (just in view on right – see also next picture). The gun position has the pivot mounting in place, concrete floor, apron and an ammunition compartment can be seen on the right. The house in the background to the left is an Army Married Quarter (the District Gunner's House).



BICKLEY - Details of grap capstan hauling gun shield to P2 – c 1938

6 Heavy Battery personnel using a grap capstan to haul the gun shield into place.

The building at the rear is the Battery Command Post. Upper floor has armoured windows and contains the Range Finding equipment. The lower section, partly underground, contained the Switchboard and Range and Bearing transmission equipment. The guns could be directed and fought from the Battery Command Post and Battery Observation Post, a similar building about 600 m north west of the gun position. In the Battery Command Post was the Gun Position Officer, the Officer controlling the searchlights, Range Takers, Switchboard Operators and Range and Bearing transmission personnel.



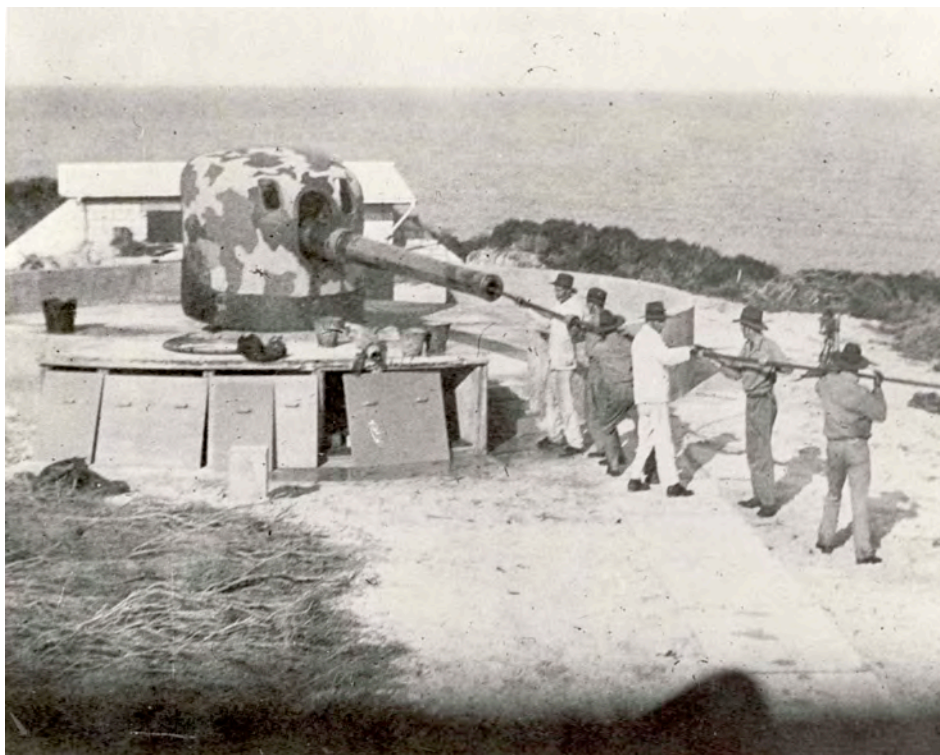
BICKLEY - 6 inch barrel being prepared for lift using Heavy Gin or Sheer Legs – c 1938
 The 6" barrel on the railway trolley, ready to be lifted off and moved onto the gun position.



BICKLEY - Personnel from 6 Heavy Battery lifting gun shield from trolley / Butler – c 1938.

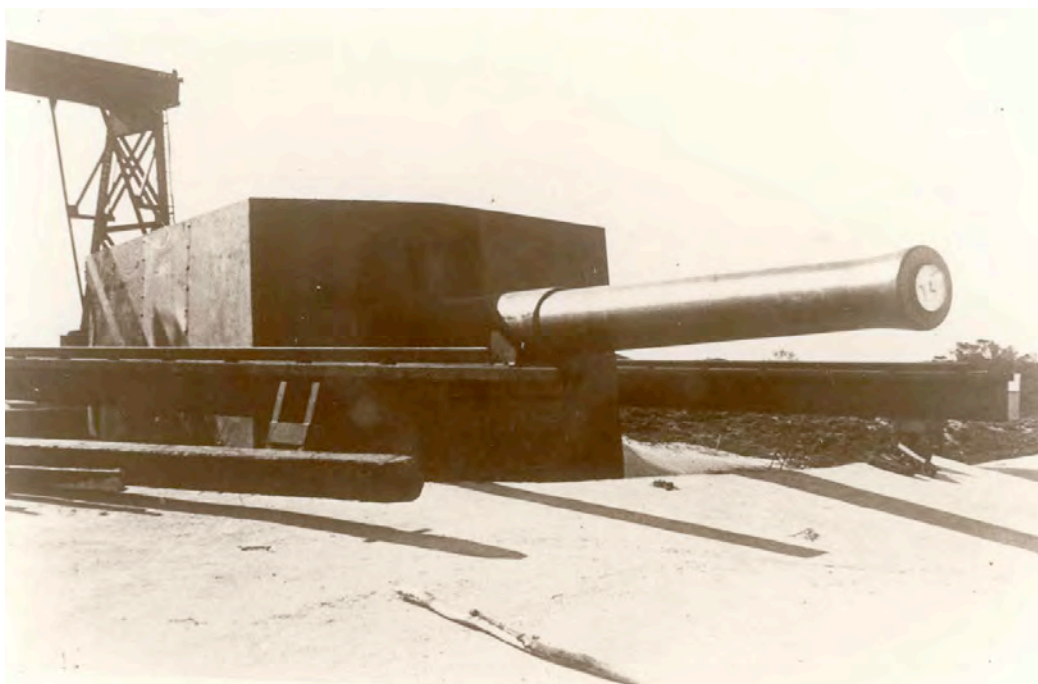


BICKLEY – 6 inch gun barrel being slid into place – c 1938 The barrel has just been slid into the cradle on the mounting through the shield and is still supported by skidding. Barrel No. 2309, now on display at Kingstown Barracks, originally served on the HMAS Melbourne from 16/8/1912 to 3/12/18



BICKLEY - Cleaning barrel of 6 inch gun – c 1938. Photo shows the gun being cleaned by personnel of 6 Heavy Battery RAA PMF during installation. The ammunition magazine for No 2 gun can be seen in the background.

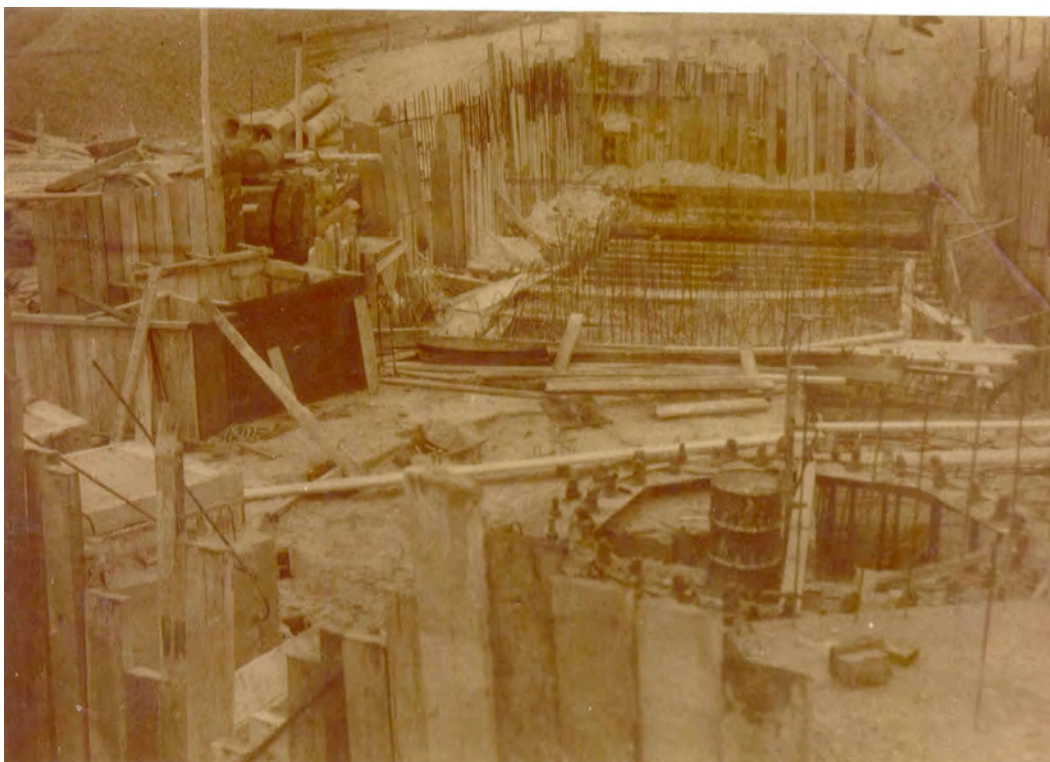
OLIVER HILL BATTERY



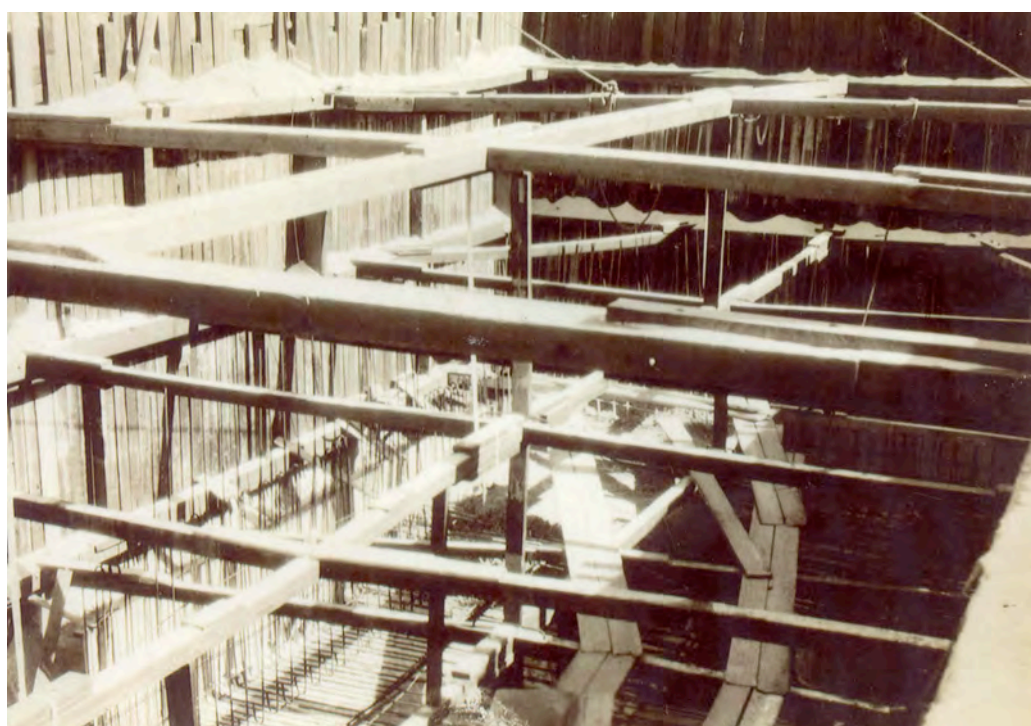
OLIVER HILL - H1 Gun assembled, gantry not yet removed – c 1938
Final emplacement of the gun, showing the Heavy Lift Gantry at the rear.



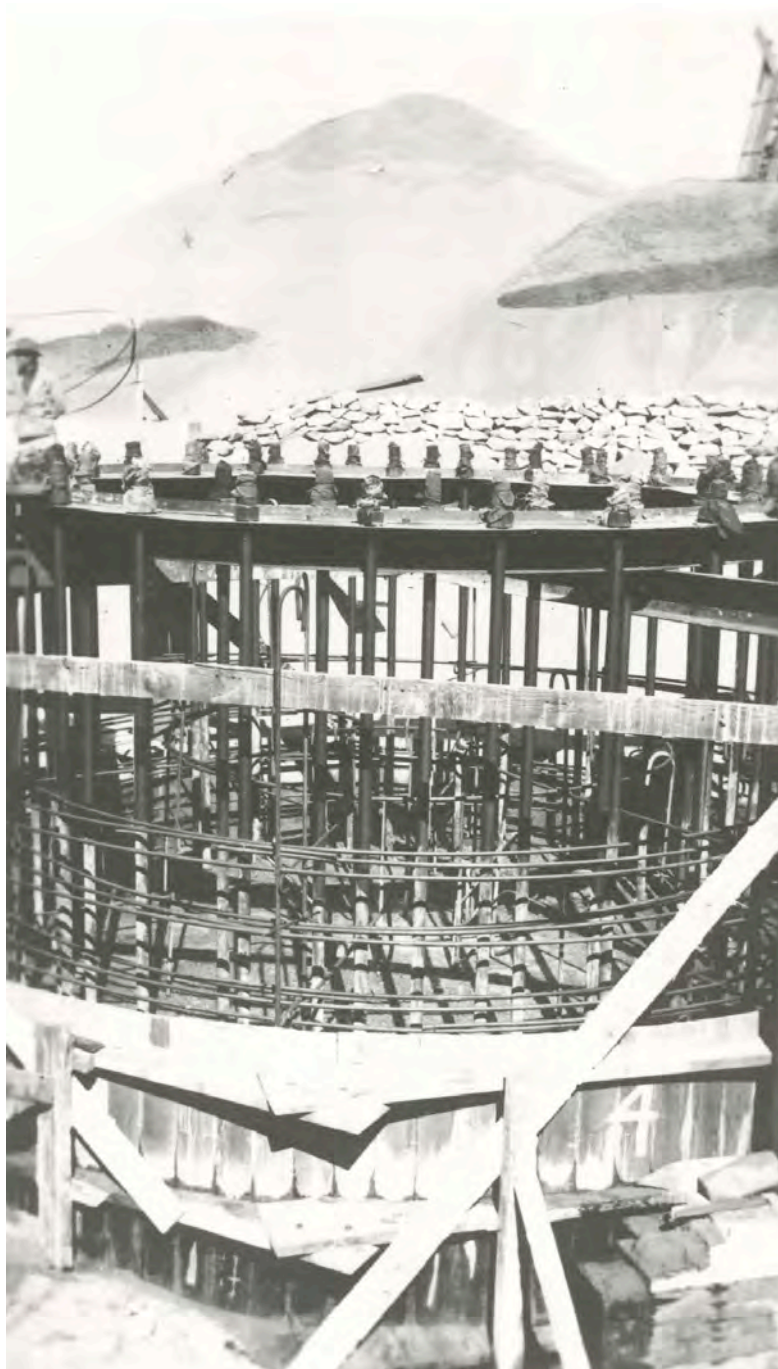
OLIVER HILL - Workshop, Skidding Store and No 2 Cottage – date unknown. View from H1 site looking back along the rail line. The left hand spur leads to the gun (behind photographer). The right hand spur line leads to the fuel tank filling pipe above the engine room.



OLIVER HILL - Formwork for gun floor and pump room – c 1936

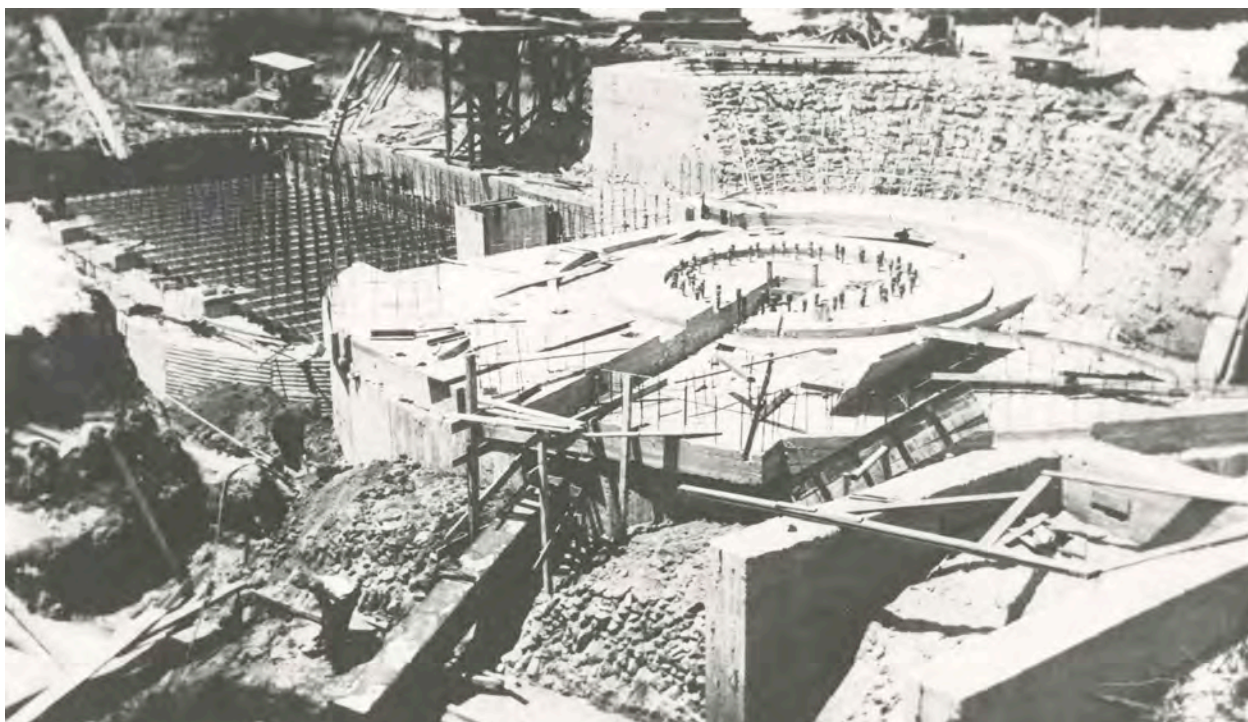


OLIVER HILL - Framework for engine room prior to pour – c 1936

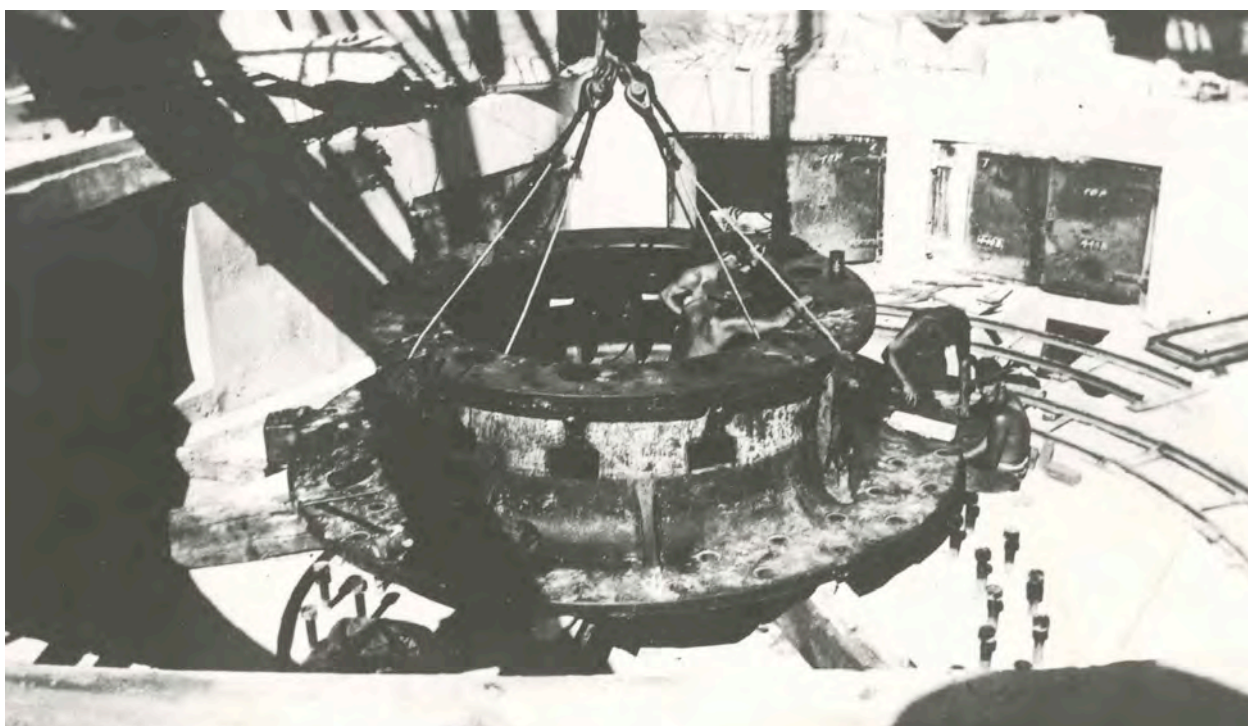


**OLIVER HILL - Pedestal
holdfast anchoring plates and
hold down bolts in position - C.
1936**

Photograph of the pedestal holdfast anchoring plates and holding down bolts in position prior to being embedded in concrete. There were 52 holding down bolts each 9'11" (approx. 3mtrs) long.



OLIVER HILL - H2 Emplacement Under Construction – 1937. The 52 holding down bolts are in place. In the centre can be seen the channel through which the hydraulic pipes and electric cables were led into the mounting and up through the central pivot.



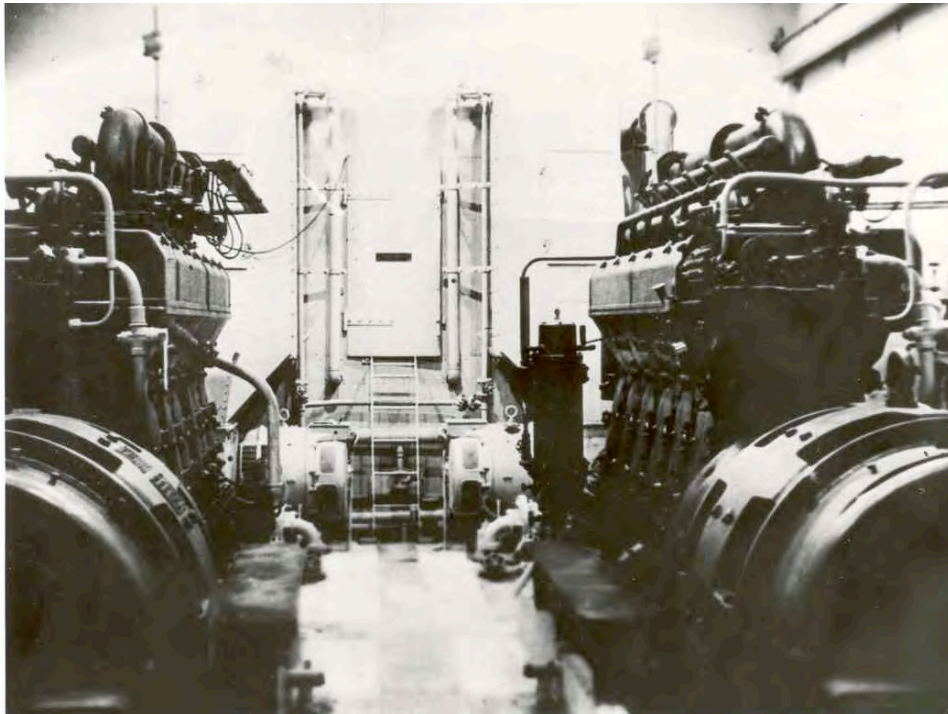
OLIVER HILL - Lowering pedestal and pivot plate into H2 - 1937

Lowering the Pedestal and Pivot Plate into No.2 gun preparatory to bolting down onto the hold down bolts, some of which can be seen on the right. The workers standing on the pedestal give an impression of scale.

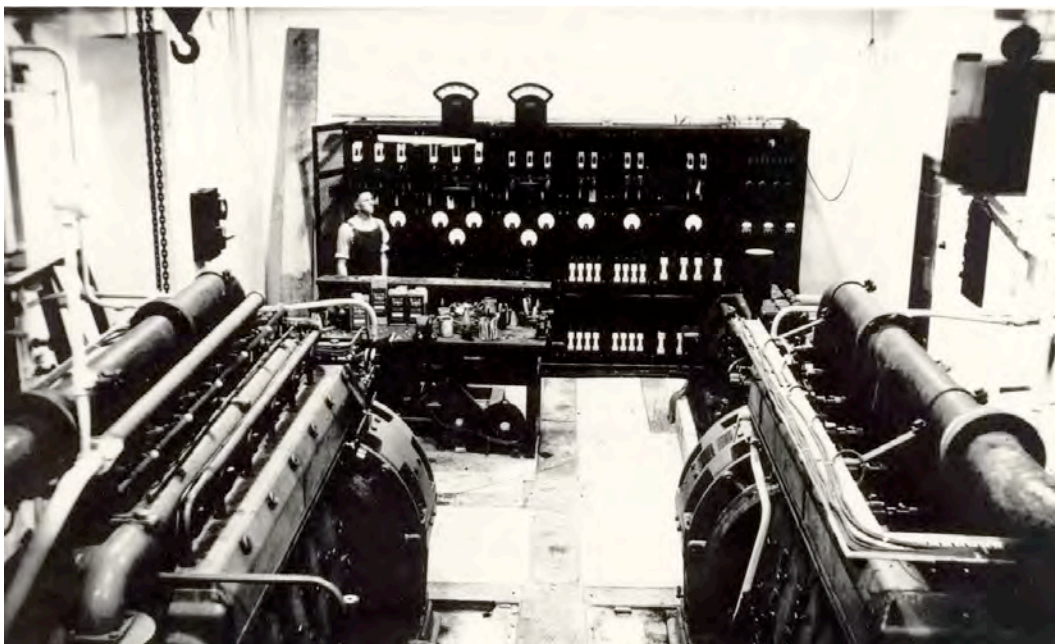


OLIVER HILL - Lowering Motor into Pump Chamber – c. 1937

Using Sheer Legs to lower electric motor and part of the hydraulic pump into the pump chamber beneath H1 gun at Oliver Hill Battery. The Warrant Officer in charge is WOII Waghorn the Battery Master Gunner. He was responsible for the maintenance of the guns, the bringing to account the Gun Stores, equipment and ammunition, gun history sheets and all fire control instruments and stores. The Engineer Sapper holding the chain is Spr. George Marinner, 5 Fortress Engineers.



OLIVER HILL - Engine Room facing exhaust fans – date unknown. Two 180 HP Ruston 6VCR diesel engines coupled to two Laurance Scott 150KvA electric generators provided power to operate guns through hydraulic pumps and to air compressors. The generators also provided power to the adjacent workshops at Oliver Hill, and Battery and Fortress Plotting Rooms.



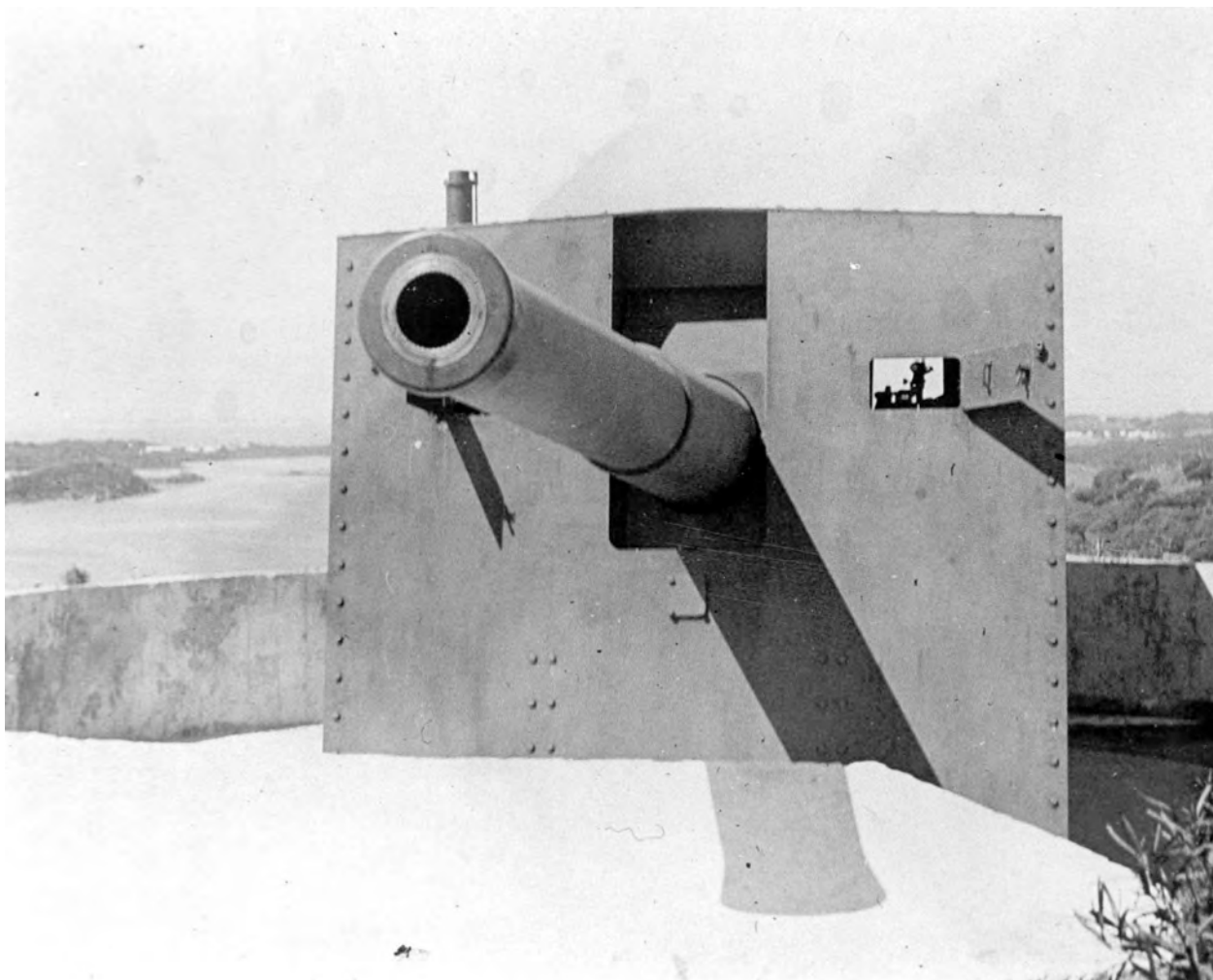
OLIVER HILL - Engine Room facing electrical distribution board – c. 1938

The switchboard installation appears to be incomplete and the paint pots on the bench indicate that the generating room has not been commissioned.



OLIVER HILL - H2 Magazine showing APC Mk158 projectiles – date unknown

The underground shell magazine, probably under the H2 gun. The overhead rail fixed to the ceiling supports a chain tackle with grabs to lift the shells and convey them to the gun-pit. The shells stacked on their sides against the wall are armour piercing capped high explosive (APC MK15B) fitted with a base fuse No. 346 which can be seen in the base of the shells. The shells standing on their base in the foreground have not been positively identified, however they appear to be nose plugged which indicates a shell to take a nose fuse, not armour piercing. These are for landwards firing or against an armoured vessel (HE MK19B).

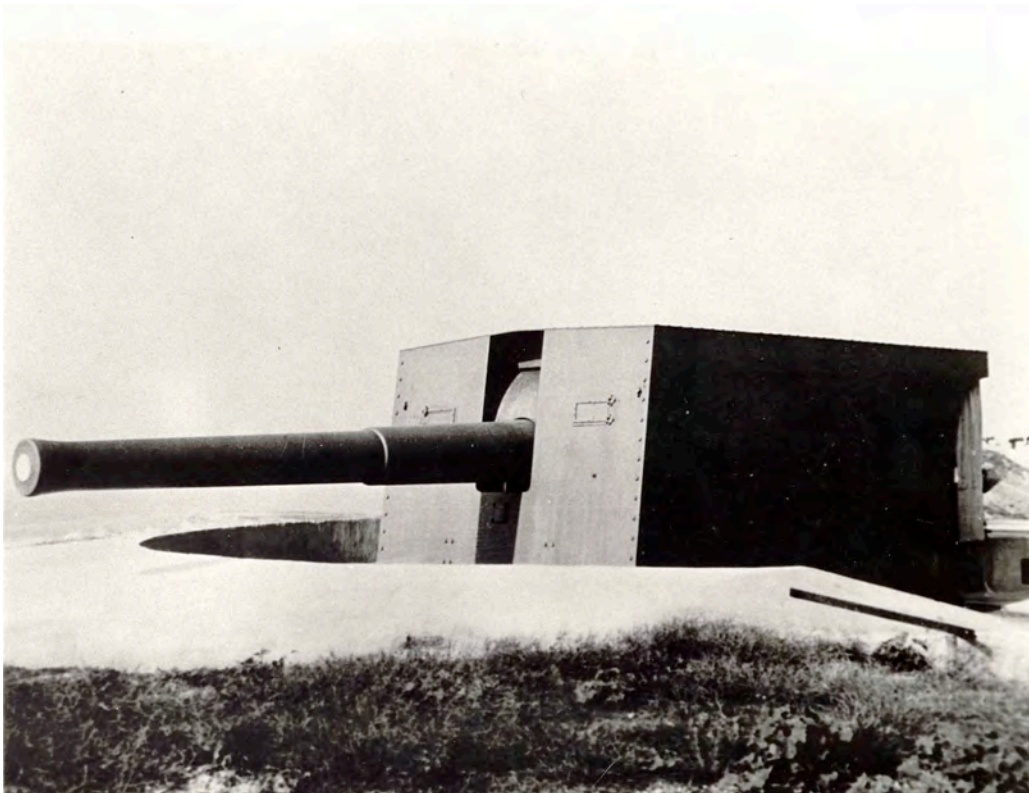


OLIVER HILL - 9.2" MK10 Coast Defence Gun on MK7 mounting – date unknown.

9.2" MK10 Coast Defence Gun on MK7 mounting, (H1) No 1 Gun Oliver Hill Battery. The automatic sight (elevation) aperture is open on the left hand side of the gun. Part of the periscope fitting on the gun's right hand side is used by the No1 gunner (aimer) to direct fire on the target.



OLIVER HILL - H2 Gun Awaiting Side Panels – c 1938



OLIVER HILL - General view of completed H2 gun – date unknown.