Name of Place:
Bare Island Fortress

Inventory:
9

Current Use and Associated Items: Component of a Historic Site, caretaker's accommodation and venue for occasional tours.
Associated items comprise: All island structures, retaining walls, water tanks, gun casemate and emplacements, magazines and storerooms.

Other/Former Uses and Names: Bare Island Fort, Botany Fort, Bare Island. A natural sandstone island. From the 1880s a colonial military fortification used as such by both Commonwealth and State Governments until 1915. War Veteran's Home (1912 to 1963); Temporarily occupied by gunning and searchlight crews during WWII; Randwick Historical Society maintained a museum, re-enactments and a caretaker on site (1964 to 1974); From 1974 to the present day, intermittent public tours of the fort with the a re-enactment in 1979 to celebrate transferral of the gun from the front gate to Barbette No.4. The last firing of a gun on the island was in 1982, after which time, management expressed concerns about the fragility of the gun and the potential stress on the iron structure. A NPWS caretaker has been accommodated on the island since NPWS took guardianship of the island in 1967.

NPWS Item ID **SHI ID**

Location Plan

Photograph

Figure 1. (Top right) Bare Island from La Perouse Headland (2008).
Figure 2. (Bottom right) Gun No 4. emplacement looking towards Henry Head. (2008).

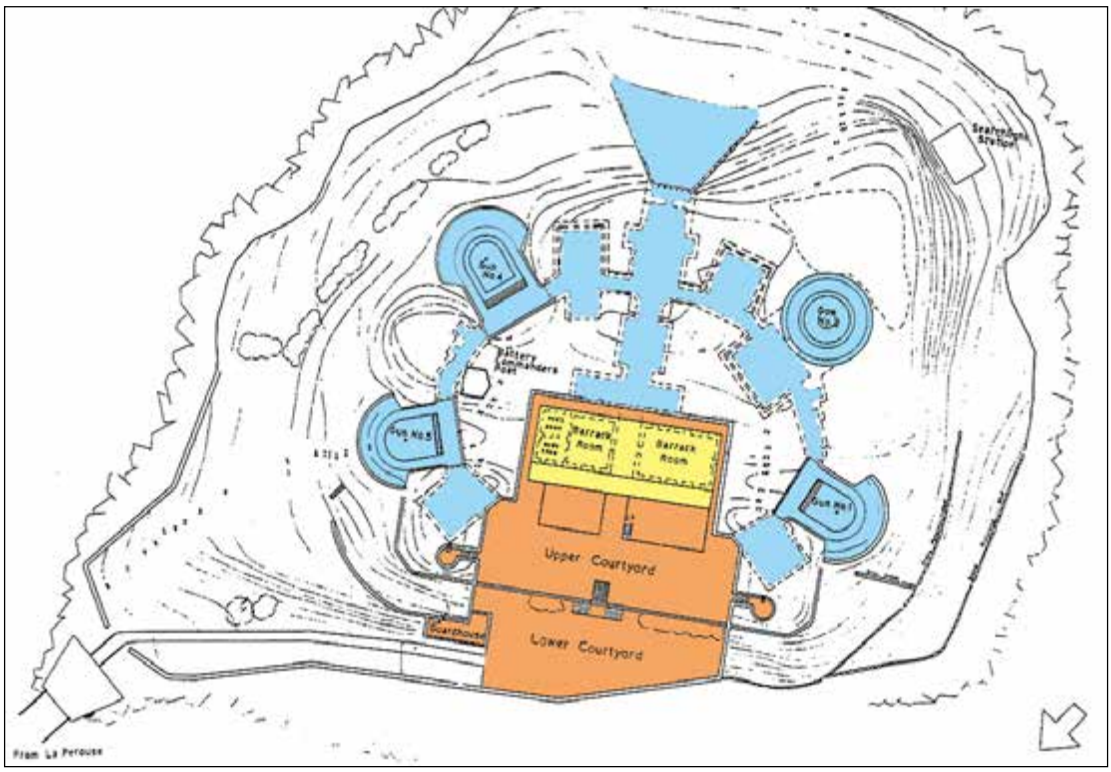
CONDITION: Good Fair Poor Ruinous Site Only **INTEGRITY : High Moderate Low**

Physical Description (Brief)

The Bare Island Fortress comprises four major elements:

1. The exterior, including earthworks, cliff faces, the outer faces of concrete retaining walls and buildings visible from the peninsular and the timber framed and decked access-bridge.
2. The semi-submerged five gun battery including the gun emplacements, shell stores and magazines, the traverse bitumen floored passage and a battery commanders post all constructed of mass concrete sometimes incorporating the living rock. This area also includes, in the vicinity of the No.3 Gun Pit, c.1920s brickwork, doors, floorboards and windows associated with conversion to a Veterans Home.
3. The two storey Barracks building with cast iron pilasters supporting a first floor verandah along the sandstone northern façade and a curved corrugated iron roof over. All other elevation are in brickwork. The roof is a flat concrete slab; windows are four paned pairs of sashes on the north elevation and pairs of single pane sashes on the southern elevation. External doors are generally four glazed panelled doors with twin moulding panels beneath. All external doors feature hopper style top lights.
4. The bitumen covered parade grounds, submerged courtyards and their associated brick buildings, rooms and water tanks.

The complex is an early example of a mass concrete structure with cast iron support and reinforcement beams. The complex is set within a much, modified Hawkesbury sandstone, island landscape. The arc of the gun battery faces south east addressing the entrance to Botany Bay. Accommodation within the Barracks was primarily for the enlisted men. The officers were housed in a purpose built c.1890s residence on the peninsular demolished by 1911.



KEY

Exterior including the earthworks and the access bridge

The Gun Battery

The Barracks

Parade Grounds & Courtyards

Figure 3. A plan view of Bare Island and the Fortress complex, adapted from Gojack, 1997, The Bare Island Conservation Plan. The Secondary Shell Store (opposite the magazine for Gun No.2 is missing from the plan. It is probably based on a 1960s plan produced by 'Wyness' at the School of Architecture UNSW. (Source information courtesy of Greg Bond)

Brief Historical Background – Bare Island Fort

Bare Island was visited by Joseph Banks during Captain Cook's initial exploration of the bay area in 1770 and was cited a number of times by both Banks and Cook in their personal journals and is consequently one of the early landmarks in Australia to have been endowed with a European name. Cook mentions the island as a useful navigational marker upon entering Botany Bay.

Following concerns of perceived attack by foreign forces in the 1860s, the New South Wales colonial government took steps to assess the defensive capabilities and shortcomings of Sydney. Botany Bay was identified as a site of potential attack, which would be particularly threatening for the colony because of its reliance on vulnerable water sources in the area, and the ease of an attack, which could be mounted on the colony from the south. In the 1860-70s the NSW government undertook a series of defence activities and projects to improve the protection of Sydney's harbours including establishment of a gun and earthwork battery at the La Perouse Headland. Following this initial action, the advice of two British military experts, Jervois and Scratchley, was commissioned to advise on defence strategy for the Australian colonies. During their initial survey of NSW, the La Perouse battery was deemed unsatisfactory and Jervois identified Bare Island as a prospective site for fortification and gun emplacement. Following this identification Scratchley, along with civil engineer Gustavus Morrell, designed the Island's fortifications and Barracks. The designs were transferred to the Colonial Architect's office. The specifications and construction were then to be administered and supervised by James Barnet, the Colonial Architect of the day.

During the 1870s, the Colonial Architect's office, led by Barnet, oversaw the construction of various military fortifications across Sydney Harbour despite Barnet having no formal military background. In 1880 the Colonial Architect's office awarded the contract for the fort construction to John McLeod. The initial works included extensive landscape modification, erection of a flying fox to move supplies between the mainland and the island, and military accommodation on the La Perouse Headland. The Island proved to be a difficult construction site due to its limited size, making works and the storage of supplies awkward.

The majority of building works took place between June 1881 and June 1883 when most concrete works were completed and 4 guns were mounted. In late 1883 to 1884 the casemate's iron shields were barged to the island and erected. The last significant fortification concrete pour occurred in May 1884, which provided concrete cover over the iron casemate plating. Further fittings for the use of the fort were installed between July 1884 and June 1887. By 1888, troops were still living in tent barracks on the La Perouse Headland and problems at the fort (mainly relating to water ingress) were becoming evident. Pressure was mounting to provide permanent accommodation for troops and against advice Barnet favoured the construction of Scratchley's original Barracks building on the island. Barnet awarded the Barracks works to McLeod, without conducting standard tendering procedures. This action led to a Royal Commission into the works at Bare Island. In May 1890 a Board of Inquiry was established to investigate claims of poor workmanship at Bare Island and the Georges Head casemate as a result of formal complaints by Lieutenant Colonel de Wolski the chief of the newly established branch of Military Works within the Public Works Department. Investigations identified a number of building faults, mostly relating to the concrete workmanship and composition. The fortifications were one of Australia's earliest 'mass concrete' structures, and were an early attempt to make use of concrete despite the colonial building industry's inexperience with the material.

Following the investigation, where responsibility for the faults was laid on Barnet, (after which he retired) de Wolski supervised various works on the island between 1890 and 1912. These included the construction of the Barracks building, other fortifications works, including replacement of Gun No. 2 with a disappearing hydro-pneumatic gun and attempts to remediate the earlier faults.

In 1901 the whole Island was transferred to the Commonwealth following Federation. The introduction of new military policy in 1902 led to the diminution of the Fort's role in Sydney's coastal defence and by 1908 no military activity on the island was taking place. From 1912 until August 1963 the Island was used as a War Veteran Home (managed by the Veterans Commission) for damaged and destitute veterans, the majority of which had served in the Empire Wars. During this period of veteran occupation various alterations took place including improved drainage, installation of bathroom facilities and adaptation of the guns' casemate and magazines into bedrooms, billiard room and other domestic facilities. The management of the site was transferred to the Returned Services League in 1939 and shortly after, following the outbreak of WWII the Commonwealth recommissioned Bare Island for military purposes, primarily for accommodation for gunning and searchlight crews following Japan's entry into the war. Despite the war a dozen or more war veterans stayed in residence at Bare Island throughout the conflict.[1] The fort also featured as a Moorish citadel in the filming of *40,000 Horseman* at this time. Following the permanent relocation of the last veterans to Narrabeen in 1963, the Department of Lands granted permissive occupancy to the Randwick Historical Society. A caretaker lived on the Island to manage the site on the Society's behalf. The Society established a museum on site and held various re-enactments conducted by the Fort Artillery Society such as live firings of guns on site. These regular firings ceased in 1982, after management expressed concerns about the fragility of the gun and the potential stress on the iron structure if the firings continued. There were also concerns about the existing deterioration of the parapet wall, and the impact resulting from firing the gun.[2]

In 1964 administration of the site was returned to the New South Wales Government and it was listed on the National Trust (NSW) Register. Following the establishment of the National Parks in 1967 the site became part of NPWS estate. In 1984 the Botany Bay National Park was gazetted and included Bare Island.

In the late 1980s and throughout the 1990s structural investigations of the Island were undertaken to address numerous problems with the structures. This led to significant stabilisation and restoration works requiring the island to be closed. These works sought to stabilise movement of some of the mass concrete structures and ameliorate areas subject to significant water damage. The island was closed for a period in 1993, and then in 1998 for these works to be undertaken. In 1999 filming of *Mission Impossible II* involved prop construction and significant filming on and around the Island. The fort was then closed for several months for waterproofing and drainage works. The fort is currently open to the public for timetabled guided tours and is managed by the NPWS.

[1] Information provided by Greg Bond based on a 1999 interview with John Whitelaw, a Gun Captain at Henry Head who during his tour of duty, visited men at Bare Battery (Bare Island), this information was also documented in sections prepared by Whitelaw in the book *'We Stood and Waited'*.
[2] Information courtesy of Greg Bond

Brief Historical Background – Barracks building

Scratchley and Morrell originally designed the Barracks building in the 1870s, as an integral part of the fortifications at Bare Island. Due to the site difficulties (limited storage space and awkward access causing double-handling) and management problems, the Barracks were not built as part of the initial fortification works. Garrison officers were initially accommodated in tents at La Perouse Headland, which eventually led to pressure to provide permanent accommodation. Disregarding advice to locate the Barracks at Henry Head or above Congwong beach on the mainland, Barnet endorsed Scratchley's original design for the Barracks building to be located on the island. Barnet handed the construction works for the building to McLeod, the fort's builder, passing over the formal tender procedures with the permission of the Minister for Public Works. The arrangement involved Barnet establishing a rate of pay for a day's work based on the costs of the previous fortifications contract. This action contributed to the mounting of the Royal Commission investigation into the works and supervision of construction works at Bare Island.
Following the investigation by the Royal Commission Barnet resigned from office and his assistants' involvement in future construction of the fort works was terminated. De Wolski took control of the Island's construction works and altered the design of the Barracks, apparently with the aim to make it shatterproof, or at least more sturdy under attack. This included altering the intended roof and floor construction, so that they would primarily be concrete slabs spanning between iron filler beams.
In 1901 the Island complex (including the Barracks) was transferred to the Commonwealth following Federation. In 1912 the Island was co-opted for use as a War Veteran Home (the first of its kind in Australia) for a period in which the Barracks in particular underwent various alterations.
Alterations that took place at this time included construction of an infill bathroom, a staircase, and the conversion of two windows into doorways in the lower level of the Barracks. Openings were probably constructed in the walls in the lower level of the Barracks at this time. Suspended timber floors were constructed in the casemate's magazines, in the Gun. No. 2 storerooms and in the entry passageway to the casemate from the Barracks upper level. At the same time the entry passageway was enclosed with brick infill walls at its eastern and western ends.
In 1964 the site was transferred to State control and the Department of Lands granted permissive occupancy of the Island to the Randwick Historical Society. For the following ten years the Historical Society used the Barracks building as a museum and appointed a live-in caretaker. In 1967 administration of the site was changed again and Bare Island fort became part of the estate of the newly established National Parks and Wildlife Service. It became part of the Botany Bay National Park in 1984 when the park was gazetted.

Phases & Chronology of Known Works

Date:	Works undertaken:
1869	Military Road to La Perouse Headland constructed.
1870	Withdrawal of last British troops out of Australia. The Australian colonies become responsible for their own defence provisions.
1871	Battery established at La Perouse Headland. Site unknown. Approach road to La Perouse Headland constructed.
c.1877	Jervois and Scratchley are commissioned to advise Australia on coordinated defence systems.
Phase I 1880-1890 Original fortification works by McLeod In 1880 Henry Parkes approved defence works on the Island and the tender for the works (not including the Barracks building) was issued. In the same year John McLeod was awarded the contract for constructing the fort. Earthworks and construction of a water reservoir were undertaken during the year. All guns were mounted by 1883. This work required a series of concrete and asphalt pours. Work on the iron casemate was commenced at the end of the year and was finished during 1884.	
c.1880	Scratchley designs and advises on the defence works on Bare Island (June). Henry Parkes approves defence works on Bare Island (November)
1881	Tenders called for construction of fortifications (excluding Barracks) (March). John McLeod (of Sydney) is awarded the contract and begins work. Earthworks and construction of water reservoirs are the first activities undertaken.
1882	Concrete and asphalt pouring activities are undertaken. 2 9" RML guns are installed (Guns No.s 2 & 4) are mounted by a working party supervised by Major Murphy (September). Guns No.s 1 & 5 are mounted (by November).
1883	All guns are mounted (January). Gun No.3 iron shield casemate construction is begun (November). Concrete pouring work is undertaken.
Phase II 1890 – 1912 Second phase fortification works by de Wolski and others (primarily pre 1895) In 1890 the Royal Commission began its investigations into the building works and supervision practices carried out at Bare Island and construction of the Barracks building commenced in the same year. In 1894 the No.2 9" RML gun was decommissioned and replaced with a new breech-loading hydro-pneumatic gun. The new gun required the extensive redesign and construction of its emplacement and magazines as well as provision of a reliable water supply. This presumably prompted the laying of mains water to the island at this time. In 1901 following Federation, the Bare Island Fort was transferred from the State to the Federal government. In the following years military strategy altered and in about 1905 the fort was downgraded and occupied by the RA Garrison Artillery who primarily used the fort for gunnery practice.	
1890	Construction of the Barracks Building commences under Barnet's supervision.
c. 1890s	Barracks Building completed following de Wolski overseeing works and altering the building's design. Officers Quarters building erected on headland.
1890	Royal Commission is undertaken to investigate the building works and supervision

	practices on Bare Island.
1894 -5	The No.2 9" RML gun is decommissioned and replaced with a new breech-loading hydro-pneumatic gun. The new guns required extensive redesign and construction of its emplacement and magazines as well as a water supply.
1895	Water is laid to Island.
1901	Fort is transferred from the State to the Federal government.
c.1905	Fort is downgraded and occupied by the Royal Australian Garrison Artillery. Site primarily used for gunnery practice.

Phase III 1912 – 1963 War Veterans Home (primarily 1912, second phase of work around 1939)

Following the military's discontinued use of the fort, it was identified as a potential site for a war veterans' home. In 1912, a home was established for seven veterans, the majority of whom had served in the Empire Wars and it became the first war veteran's home in Australia. Gun No.5's magazines were converted to a larger single room and furnished with a timber floor, as was Gun No.2's crew shelter. The room to the left of the shelter is the pump house where 2 men operated a bellows type pump to elevate the hydro pneumatic gun in the Barbette. A bathroom was constructed external to the Barracks building at the southeast on the lower level. A timber staircase from the entry passageway on the upper level to the lower Barracks level was installed and two windows were converted to doorways to access the stair and bathroom. The entry passageway between the Barracks building and Gun No. 3's casemate was enclosed with brick infill walls and double doors at each end and given a more domestic feel with the addition of a timber floor.

In 1915 intermittent gun practice activities at the Island were discontinued. In 1930 plans to sell Gun No.4 for scrap metal were stymied as the gun proved too heavy to transport across the timber bridge. It was left at the entryway at the fort where it remained for forty years. Administration of the Home was transferred to the Returned Servicemen's League in 1939 and additional alterations were made to the Island. These changes included the conversion of the casemate into a billiards room and resulted in the 18-ton No.3 Gun being buried below the casemate's existing ground level. Other significant changes included the opening to the rear of the casemate being enclosed with a roof.

1912	Fort is employed as a War Veterans Home – the first in Australia. The first inhabitants consist of seven veterans of the various Empire Wars (March).
1915	Military items are still in place on the island.
c.1930	9" Armstrong gun from emplacement (Gun No.4) is planned to be sold as scrap metal. It proves too heavy to be carried across the bridge and is abandoned at the entry to the fort where it remains for 40 years.
1939	Administration of the War Veterans Home is transferred to the Returned Servicemen's League.
c.1939	18-ton gun (Gun No.3) is buried and its casemate is converted to Veteran billiard room.

Phase IV 1941 – 1945 World War II Military Use

During WWII the defence forces recommissioned the site as a gun battery, although a dozen or more War Veterans remained on the Island. Searchlight and gunning crews were established on the Island in 1941 following fears of Japanese attack. A pillbox was built south west of the casemate to house a gun. A searchlight/fighting light station was also constructed in a forward position. The war veterans resumed occupancy of the site following the end of the War in 1945.

c.WWII	Veterans are relocated off Bare Island and fort is recommissioned by the Commonwealth for military use. A concrete pillbox is built east of the casemate and mounted with a gun. A searchlight/fighting light station is placed in a forward position.
c.1945	War Veterans return to Bare Island.

Phase V 1963 – 1975 Randwick Historical Society Museum

In August 1963 the War Veterans Home was closed, residents were relocated to Narrabeen War Veterans Home and Randwick Historical Society was granted permissive occupancy by the Department of Lands. In 1964 administration of the Island was transferred from the Commonwealth to the State and the site was classified on the National Trust (NSW) register. In the following year the Island was reclassified as a Reserve for Public Recreation. Various minor works were undertaken by the Society to develop a museum in the upper rooms of the Barracks however detailed documentation of these works has not been found. The lower level of the Barracks building was also occupied for the first time as a caretaker's flat during this period. It is believed that the alterations to the layout of the lower floor took place either at this time or during the War Veterans phase that preceded it. In 1966, following information from the public, the 18-ton Gun No.3 was exhumed and restored to its original location in the casemate. In 1967 the Island became a Historic Site and part of the estate of the newly formed NSW National Parks and Wildlife Service. During this phase artillery groups regularly conducted re-enactments and live blank firings of Gun No.4 located at the entrance to the Island.

1963	The War Veterans Home is closed (August). Randwick Historical Society is granted permissive occupancy by the Department of Lands.
1964	Island administration is transferred from the Commonwealth to the State (December). Site classified on the National Trust (NSW) register.
1965	Bare Island is dedicated as a reserve for public recreation (March).
1966	18-ton gun is exhumed and restored to its original position (June).
1967	Bare Island becomes an historic site and part of the estate of the newly formed NSW National Parks and Wildlife Service.
1972	Passageway between the No.3 Gun casemate and the upper Barracks was infilled with bricks and the iron doors were taken to Cape Banks. (Refer to the Ted Kordish video)

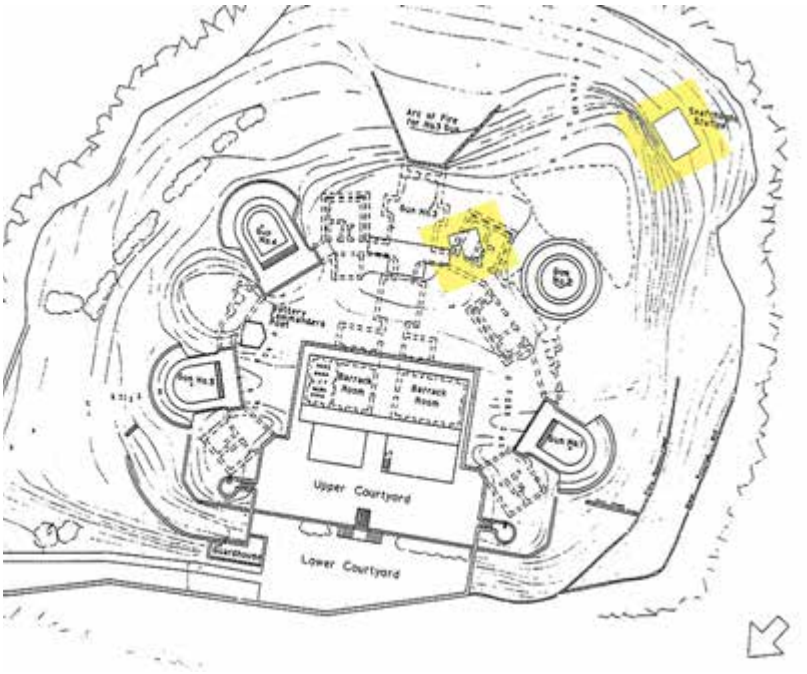


Figure 4. Plan of the island highlighting WWII constructions prior to demolition. The WWII searchlight station is shown in the top right (south of the island), while the pillbox gun mount was located near the casemate opening. (Source: NPWS)

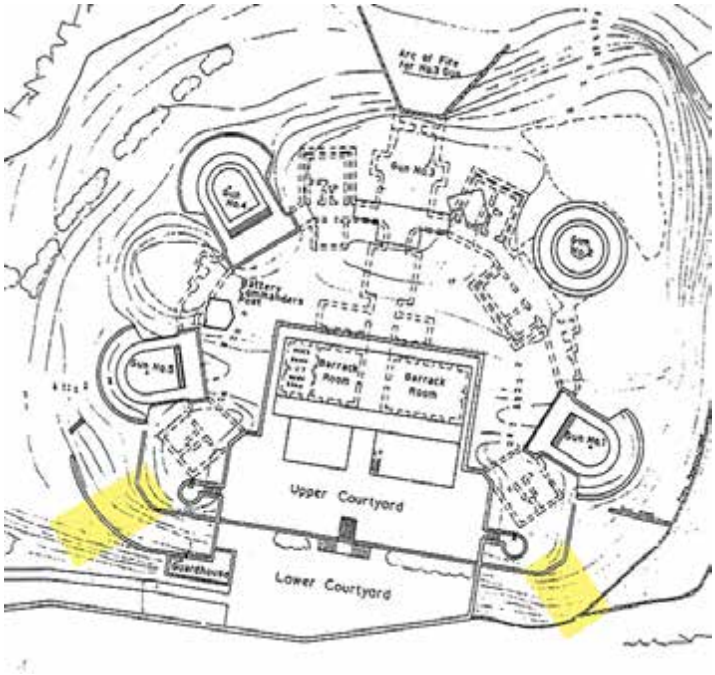


Figure 5. Highlighted areas indicate areas where engineered stabilisation work was undertaken in the early 1990s. (Source: NPWS)

The following is a list of the site's fortification walls (but does not include the structural wall elements making up the gun emplacements):
1. approx. 35m running north of the guardhouse – rendered concrete, ashlar struck render
2. approx. 35m running south east from the bridge – rendered concrete, ashlar struck render
3. approx. 90m north to south along the western cliff edge – rendered concrete, ashlar struck render
4. short length – south west corner – dry stone, concrete (associated concrete block stairway)
5. short length – south west corner – dry stone, concrete

Phase VI (A) 1975 – 1996: NPWS Works prior to re-opening to the public

In 1976 the Randwick Historical Society closed the museum to avoid further damage to the exhibition material being caused by water ingress. Regular firings of Gun No.4 ceased in 1974, the last firing took place in 1979. Work was undertaken to the area over the casemate, and between the smoke shaft and Barracks building, in approximately 1978. This work included the removal of the asphaltic concrete topping and the installation of a vinyl swimming pool liner in an attempt to improve the waterproofing of the area. In 1979 Gun No.4 was relocated from the fort entryway to its original emplacement and fired. In 1984 the bridge was repaired. In 1985 following the failure of the waterproofing membrane over the casemate, the area was excavated again (excavated fill was retained and reused) and an acrylic-based cloth-reinforced membrane was installed. In 1989 to 1993 various engineering investigations were undertaken to assess structural damage and risks and a series of remediation works undertaken. These included stabilisation works to fortification walls, replacement of the verandah slab and associated items, stabilisation and corrective works to the water tanks under the Upper Parade Grounds, resurfacing of parade ground surface, Guardhouse and Barracks roofs. Replacement of handrails at the entry forecourt was undertaken. The site was reopened to the public in 1994.

1976	Randwick Historical Society Museum closes to avoid further damage to exhibits and collection caused by leaking roofs (October).
c.1978	Ted Kordish (former NPWS caretaker) stated that work was undertaken to the grassed area over the casemate and between the smoke shaft and Barracks building. The excavation and removal of the asphaltic concrete topping material was undertaken. A vinyl swimming pool type liner, overlaid with 6mm asbestos cement sheet protective sheeting was installed (Arup Façade Engineering Drainage Project 1997).
1979	12 ton RML gun removed from the Island's entry, and is restored to its original emplacement and fired (August).
1982	Firing of the guns ceased after management concerns were expressed about the fragility of the gun and potential impacts to the iron structure and the parapet.
1984	Timber bridge is repaired.
c.1985	Following the failure of the waterproofing membrane over the casemate, the area is excavated again (excavated fill is retained and reused) and an acrylic-based cloth-reinforced membrane was installed.
1986	The timber bridge is almost entirely replaced with sections removed and access by boat.
1989 - 1991	McBean and Crisp Structural Engineers conduct Structural Condition, Supplementary and Materials and Structural Investigations Reports. Some remediation works are undertaken.
1992-1993	Various engineering investigations and projects commissioned and undertaken by NPWS. Ove Arup and Partners Engineers undertook work including installation of rock anchors to two fortification retaining walls (one to the north of the guardhouse and one to the south of the entry forecourt), and repairs to cracking and installation of weepholes in these walls. Repairs to the concrete of the western buttressed fortification wall immediately adjacent to the south wall were also undertaken. Additionally Ove Arup and Partners undertook engineering work including the demolition and replacement of the Barracks verandah slab and part of the guardhouse roof, stabilisation works to parade ground water tanks, resurfacing (including new torch on type waterproof membrane) of parade ground and bridge surfaces and guardhouse roof, and installation of new drains to the upper parade ground surface. Additionally repairs and replacements of sandstone mouldings to tops of the columns supporting the verandah and bridge occurred. Other works included the replacement of stone steps to the verandah, replacement of handrail to stairs to upper parade ground and installation of fibre cement sheeting beneath the slate water tank supports to the south of the Barrack building. Repairs and installation of moisture probes to soffits in small guardhouse rooms, workshop, toilets, laundry, store, and laboratory and drainage tunnels. The original scope of works included investigation of the ceiling of the entrance passageway (to the lower parade ground) and the lavatory room (modern caretaker flat's bathroom) to determine the appropriate repair philosophy however no records of the findings or recommended works have been located.
1994	Island is reopened for NPWS Discovery Tours

Phase VI (B) 1997-2008: Reports & Works period

An engineering report was commissioned to investigate water penetration and drainage issues at the Island. Remediation strategies and work were undertaken to ameliorate the asbestos contaminated areas of the Island, namely the covered area over the casemate and casemate's magazines. Between 1997 and 1999 rusting structural iron at the Barracks verandah was replaced and drainage problems were addressed, particularly at the parade grounds and over the casemate. The filming of Mission Impossible II scenes at the Island was undertaken in 1999-2000. Between 2004 and December 2005 a number of small works were undertaken to renovate the caretaker's accommodation. This included decommissioning the external Phase III bathroom and associated hot water system, electrical upgrading, painting and installation of new heating appliances. Between 2005 and May 2006 various reports were prepared to direct restoration works on the island, including investigations of the timber bridge, concrete damage, metal conservation works, lightning protection, reproduction carpentry and termite damage. Significant restoration works were undertaken on the 18 ton Gun No.3 including abrasive blasting to the gun and the casemate, and the reproduction of the gun mounting for the gun's exhibition. A Heritage Conservation Works Report undertaken in 2006 to specified works to remove invasive Phase III additions including removal of the bathroom addition, stabilisation of timber stairs and doorway at the south eastern elevation of the Barracks, removal of metal conduit in the first floor walls and conservation of rendered stone walls within the north-eastern passage of the fort. A report on damage to the original Lavatory Room (modern caretaker's bathroom) was undertaken. The fibro

cement ceiling was removed, gaps between sandstone edging on Upper Parade Ground above bathroom were sealed, and a vent installed at the water tank and an electrical fan was installed in caretaker's bathroom. During 2007 contractors and NPWS undertook major repairs to the timber bridge.

1997	Arup Façade Engineering was commissioned to investigate water penetration and drainage concerns at the site. The investigations focussed on determining the source of generic membrane problems, problems with any existing drainage components and the documentation of the site's drainage system. The scope of works included recommendations for any repairs needed to reinstate a satisfactory drainage system and the development of a maintenance schedule to preserve it. Ove Arup Engineers were engaged to develop remediation strategies for previously identified sites of asbestos contamination on the Island. The areas identified with asbestos were the earth fill area between the Barracks building and the casemate smoke shaft, and the earth fill over the casemate between the smoke shaft and the arc-of-fire.
c.1997-9	Various remediation works are carried out on Bare Island. These included works to reduce the presence of asbestos on the Island, replace rusting structural iron at the Barracks verandah, and ameliorate drainage problems occurring across the site but particularly at the casemate and parade grounds.
1999-2000	Action scenes of the film Mission Impossible II are shot at Bare Island.
Dec 2004- Oct 2005	War Veterans external shower and hot water system decommissioned. Caretakers flat painted, electrical upgrade, installation of new kitchen, gas stove, heater, water heater for kitchen and bathroom. Partition and timber floor in Bedroom 1 removed and partitions at doorways removed. Sink and plumbing in Bedroom 2 are removed, new locks installed throughout Barracks building. Carpet replaced and timber floor in kitchen repaired. Alarm system installed in Caretakers flat. CCTV system installed.
Jan 2005	Condition assessment and report on bridge by Taylor Lauder Bernsten Pty Ltd.
Nov 2005	Inspection and report on concrete damage above storeroom at outer Entry Forecourt.
Dec 2005 – Mar 2006	Conservation works on 10 inch 18 ton RML cannon by OHM Consultants. Works involved lifting of cannon, abrasive blasting and air chiselling of cannon and casemate, painting of cannon with a high build paint system (black polyurethane finish), construction of a new timber carriage for the cannon based on the original design. Construction of a reproduction tompion for the cannon, installation of a mantlet bar (75mm 316 stainless steel pole) and mantlet (95mm 1500mm x 1820mm Lexan panel).
Feb 2006	Report commissioned and undertaken by Kuttner Collins on the lightening protection provisions at Bare Island.
Feb 2006	Termite inspection carried out on the Island and bridge. Active termites discovered in the vegetable garden and bathroom areas. Termites were also recorded in the bridge.
April 2006	Replacement of Compressed Asbestos Cement sheeting roofing on Barrack verandah with BMT Galvanised Custom Orb roof sheeting by Steel Roofing Pty Ltd.
April – May 2006	Blue Ridge Woodworks constructed and installed new timber doors at the rear of the entry passageway to the casemate. A reproduction door was installed at the caretaker's bathroom (original lavatory).
May 2006	David Scobie Architects prepared a Heritage Conservation Works report. Areas of works listed included removal of shower recess and restoration of passage, stabilisation of timber stairs and doorways (Phase III), removal of metal conduit on first floor and conservation of rendered stonewalls within the north eastern passage of the fort. Scobie Architects also investigated and reported on damage to original lavatory room (modern caretakers bathroom). Fibro ceiling removed, gaps between sandstone edging on parade ground above bathroom were sealed, vent installed at water tank and electrical fan installed in caretaker's bathroom.
June - July 2006	Waterway Constructions prepared a scope of works for Bare Island bridge repairs. New CCTV, lights and light post were moved from previous location beside front gate to other side (Island side) of the entrance. The new robust camera, higher position and new location were designed to reduce the amount of damage to the lights and camera resulting from vandalism.
August 2006	Iron verandah roof at Barracks was painted.
Mar – Sep 2007	Australian Wharf and Bridge undertook maintenance works on the bridge. 8-12 piles were replaced, termite damaged deck and support timbers were replaced.
Dec 2007	NPWS replaced five timber beams and partial deck timbers in the span between the southern abutments over the dyke.

Current Views

Figure 7. (Left) Bare Island bridge looking towards La Perouse Headland (Photograph by K Bohdanowicz 2008).

Figure 8. Aerial view of Bare Island showing the layout of the gun emplacements and arc-of-fire. (Source: Google Earth 2009)

Selected Historical Photographs

Figure 9. Bare Island before fortifications (c.1870 - 1875)
(SLNSW ML GPO 1 - 05254 & ON 4 Box 58 No 289)

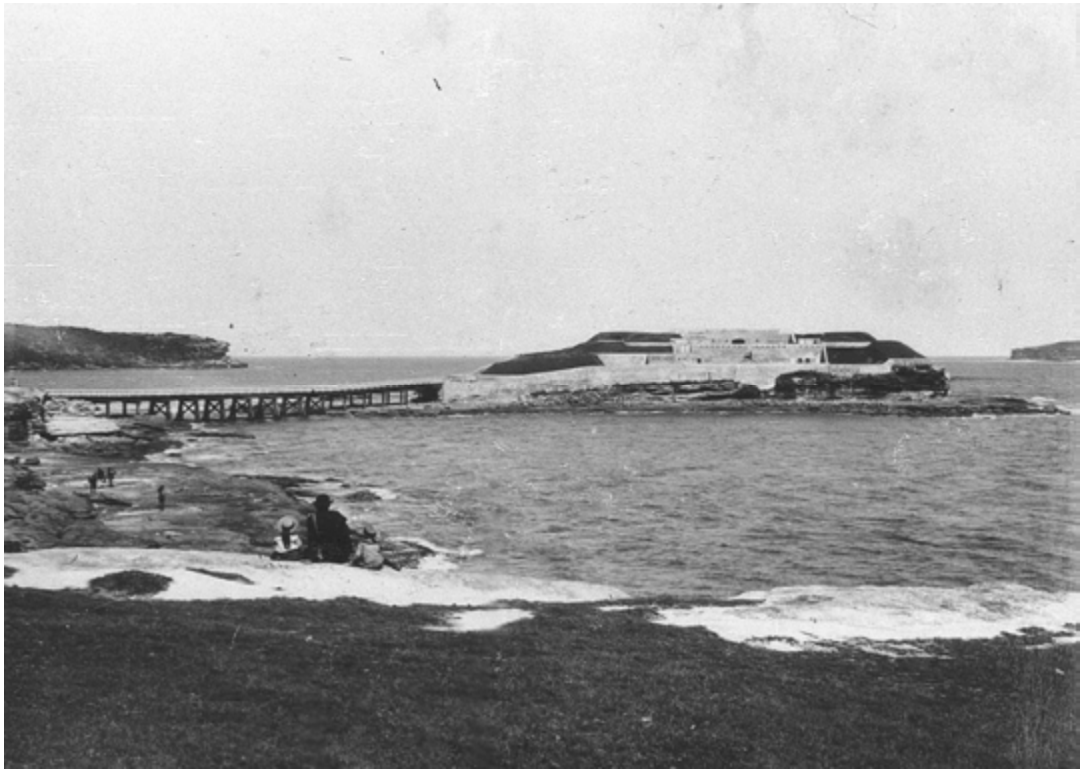


Figure 10. John Sharkey's Photograph of Bare Island, Botany Bay (1887-1889) prior to the construction of the Barracks. The fort was completed in 1885, the bridge installed in 1887 and the barracks in 1889.
(SLNSW ML 'GPO 1 - 05254)

Figure 11. Bare Island Fort (n.d.)
Image from a series of photographs that date to between 1855 & 1920. Probably pre-1910.

Figure 12. Aerial view of Bare Island from above La Perouse (c.1938) showing the Officers Quarters on the headland.
(*Bank Notes* September 1938: 42)

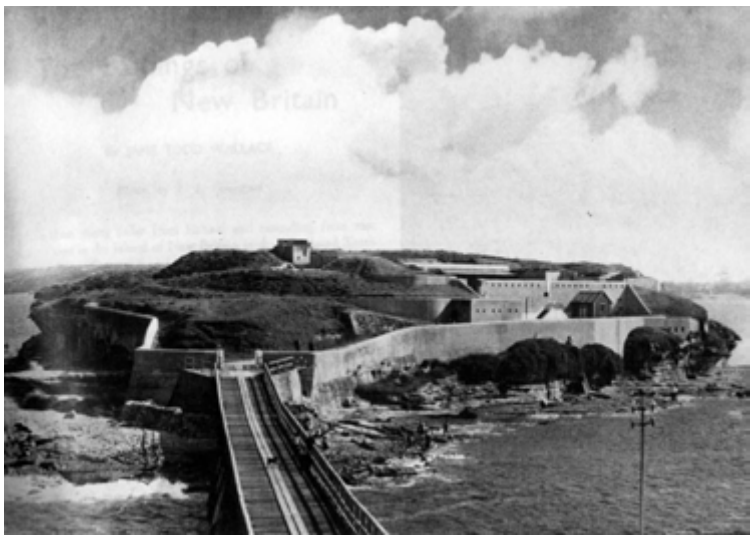


Figure 13. Bare Island, La Perouse (c.1938) clearly showing the square command post constructed for the hydro-pneumatic gun, which indicates it was still intact in 1938. The original command post was above the Casemate to the east of the smoke vent and is where the speaking tubes terminate.
(Photograph from *Walkabout* 1 June 1938)
Information courtesy of Greg Bond.

Figure 14. View across Botany Bay to Kurnell, NSW (n.d.)
An interesting oblique view of the Island from above the Congwong bay sand dune.
(SRNSW Archives Investigator Image 12932_a012_a012X2449000089)

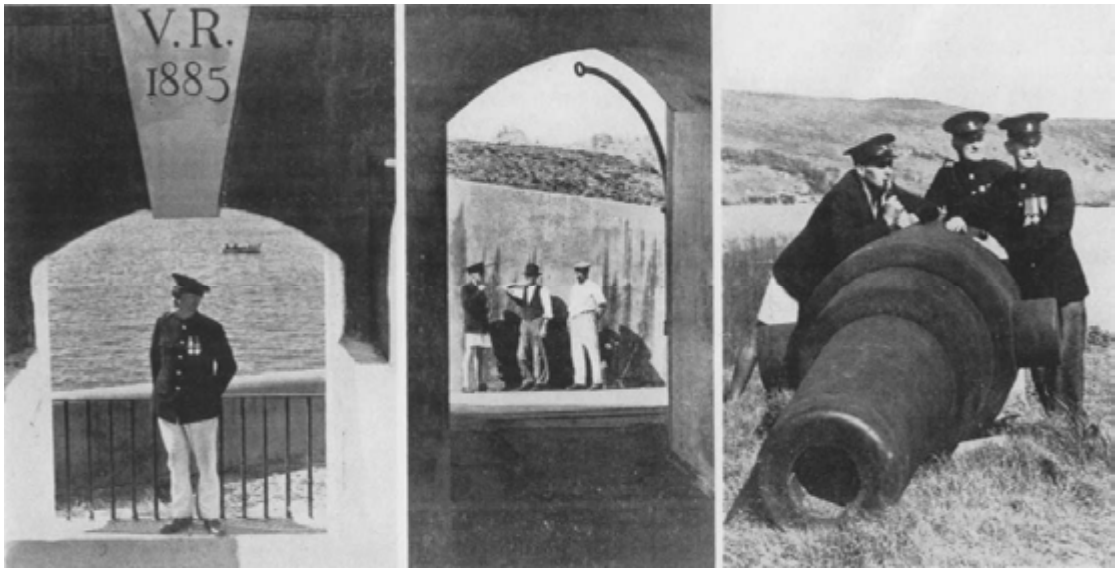
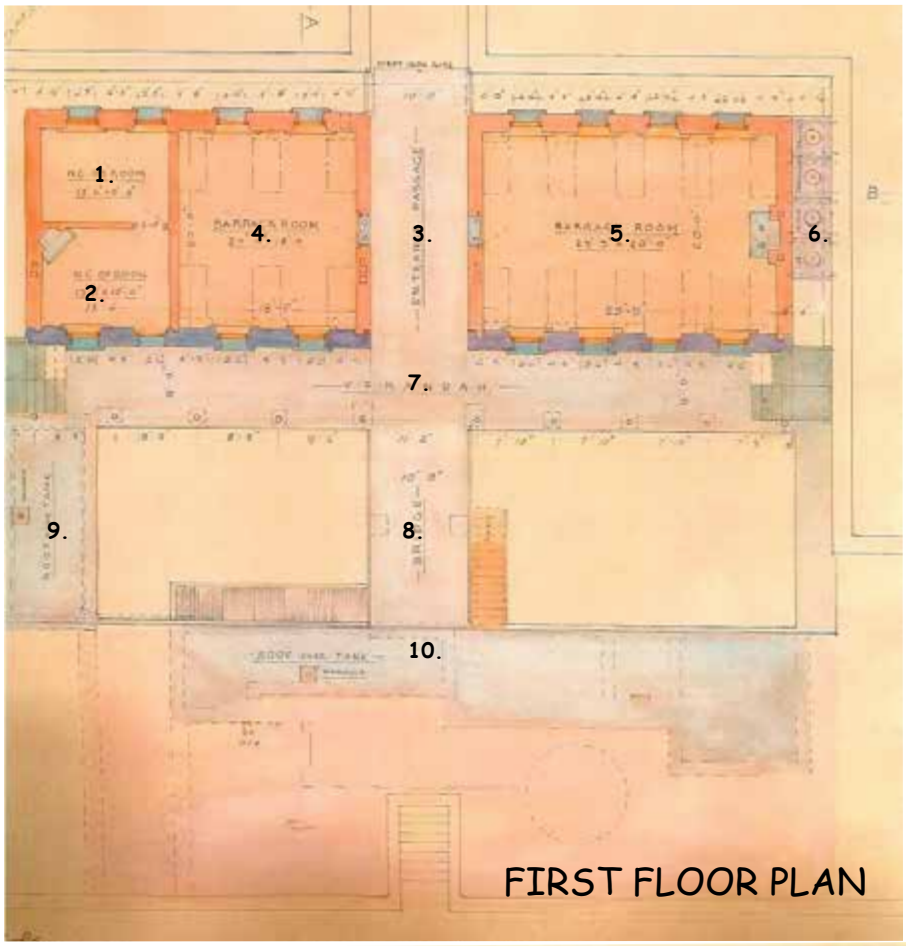
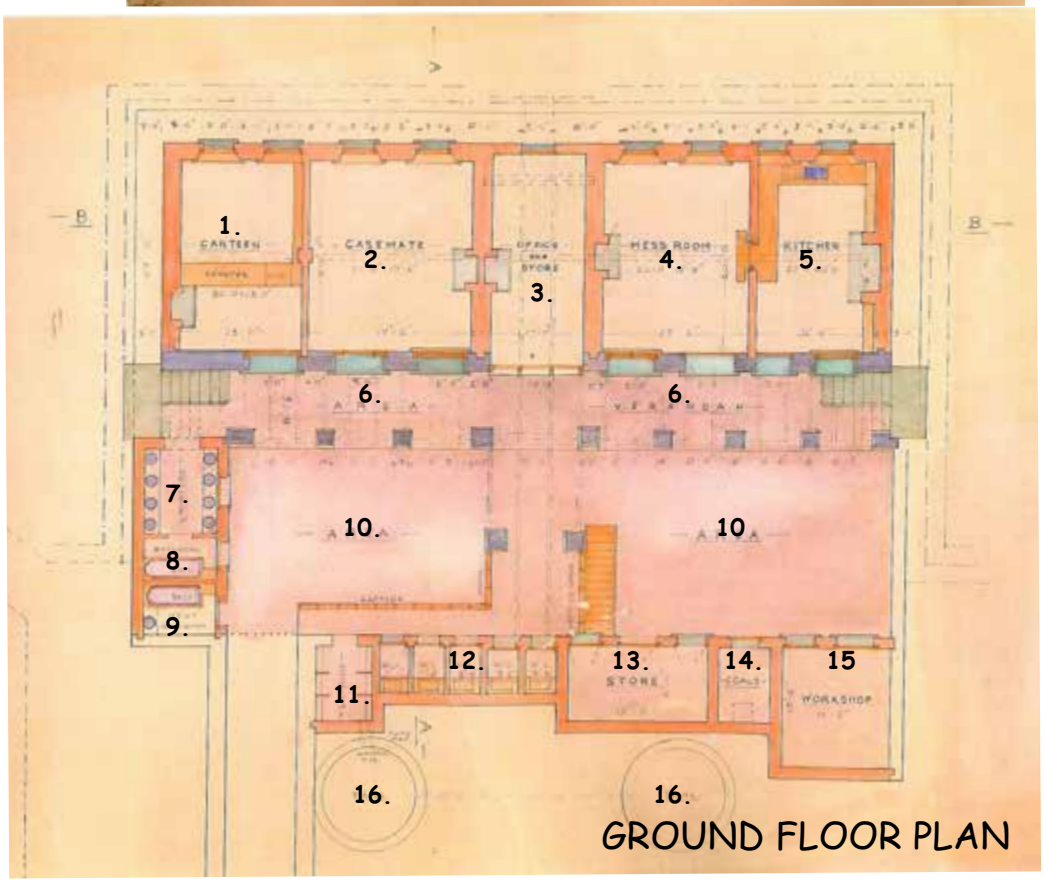


Figure 15. Scenes at Bare Island (1938)
(*Bank Notes* September 1938: 43)

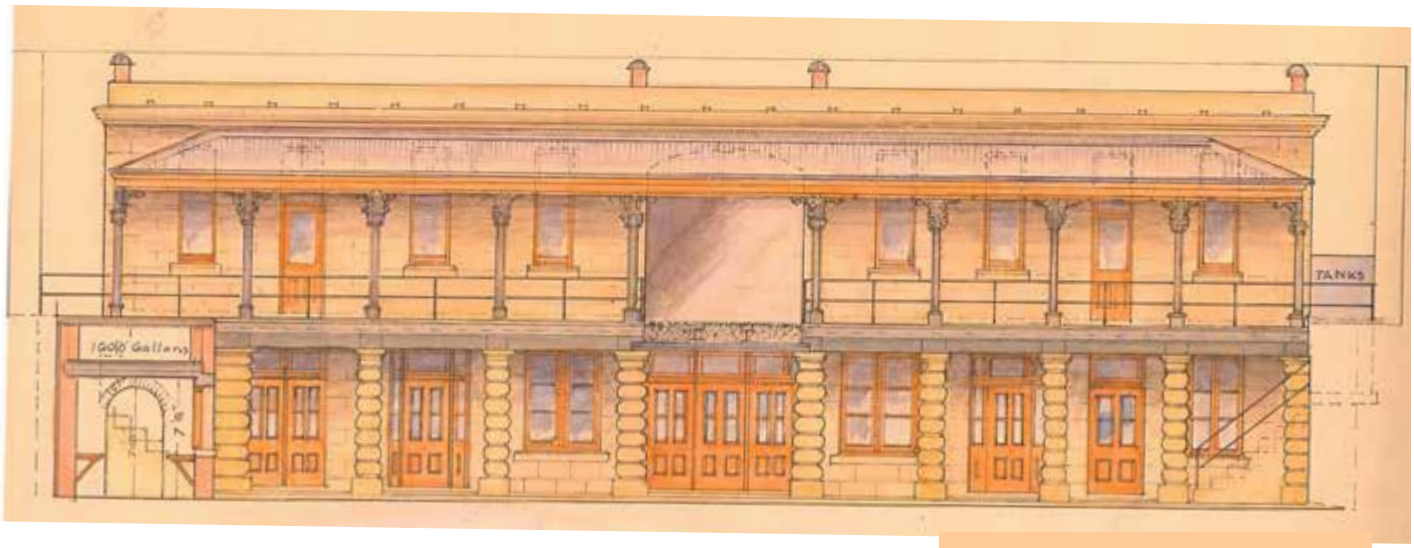


FIRST FLOOR PLAN KEY
1. NCO's Room
2. NCO's Room
3. Entrance Passage
4. Barrack room (6 bed)
5. Barrack Room (10 bed)
6. 400 gallon Tanks
7. Verandah
8. Bridge
9. Roof over Tank
10. Roof over Tank

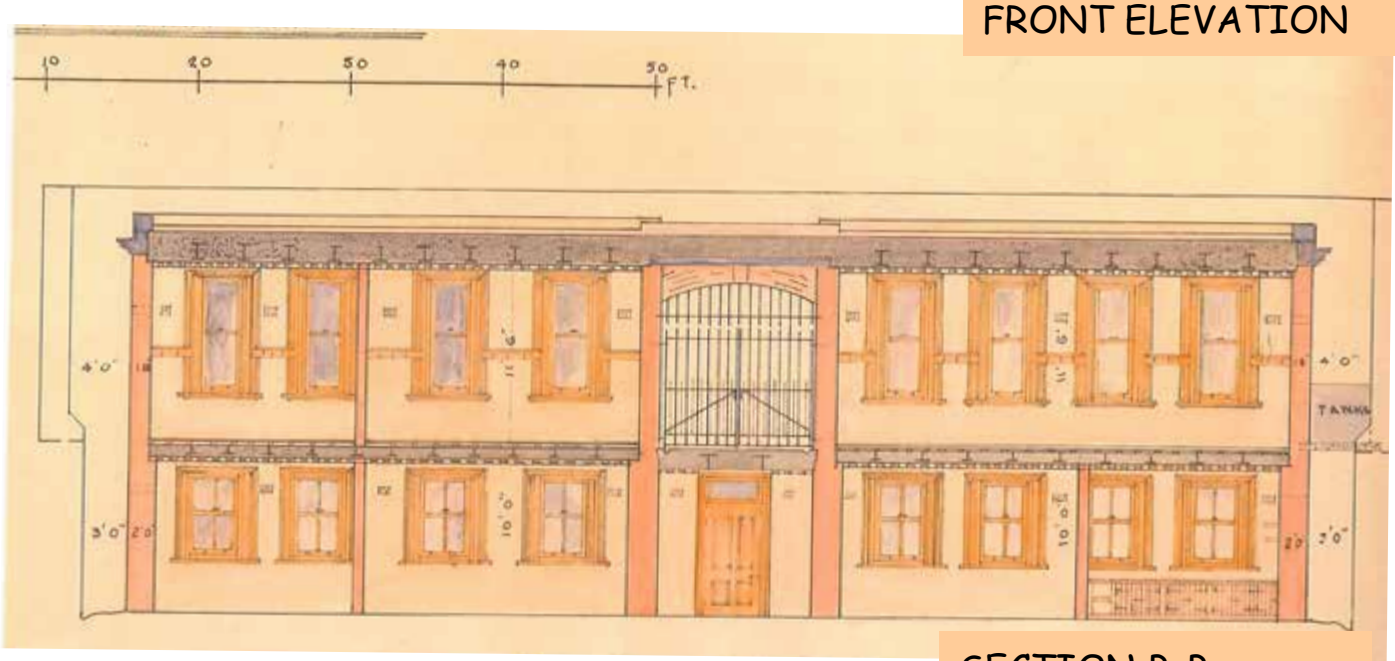


GROUND FLOOR PLAN KEY
1. Canteen
2. Casemate
3. Office & Store
4. Mess Room
5. Kitchen
6. Verandah Area
7. Lavatory
8. Bathroom
9. NCO's Bathroom
10. Area
11. Latrine
12. WCs (5)
13. Store
14. Coal
15. Workshop
16. Tank

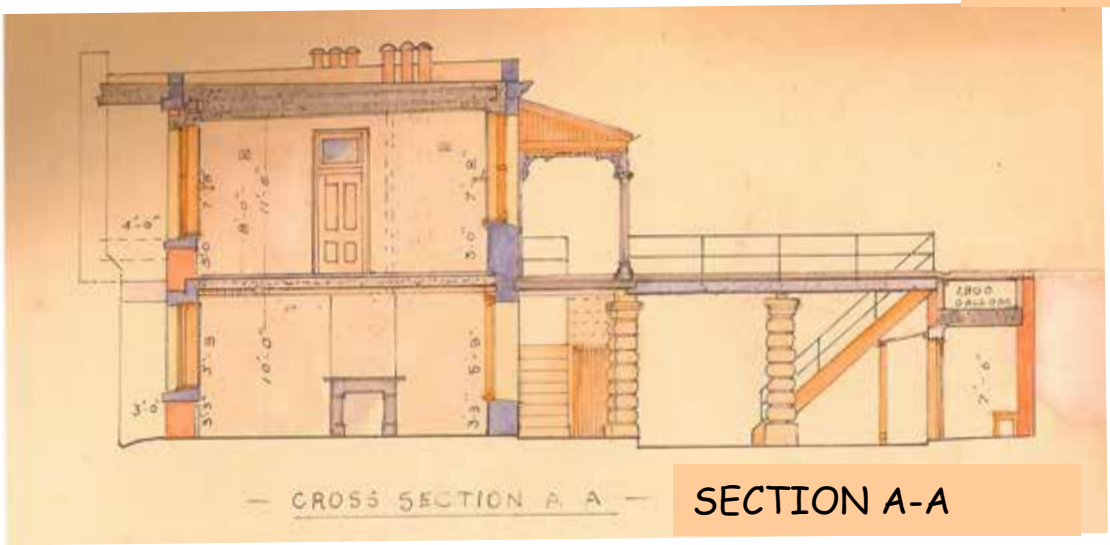
Fig. 16 Bare Island Battery Barracks and Casemate, Plans: Coloured drawing signed by Chris C Stevenson 22/7/[18] 91 reproduced by DJ Gunn 18/2/75 Courtesy of PWG BBNP



FRONT ELEVATION



SECTION B-B



SECTION A-A

Fig. 17 Bare Island Battery Barracks and Casemate: Elevations & Sections.
Coloured drawing signed by Chris C Stevenson 22/7/[18] 91 reproduced by DJ Gunn 18/2/75
Courtesy of PWG BBNP

Late 1999 Insertion of the Waterproof Membrane Works

Photographs courtesy of Greg Bond

Figure 18. View of opening at the Casemate looking north east. Waterproof membrane is being applied.

Figure 19. View looking south west indicating capping of waterproof membrane at the embrasure wall at the arc-of-fire. As can be seen no drainage method has been included to reduce water runoff from the waterproofed area onto the face of the iron embrasure wall.

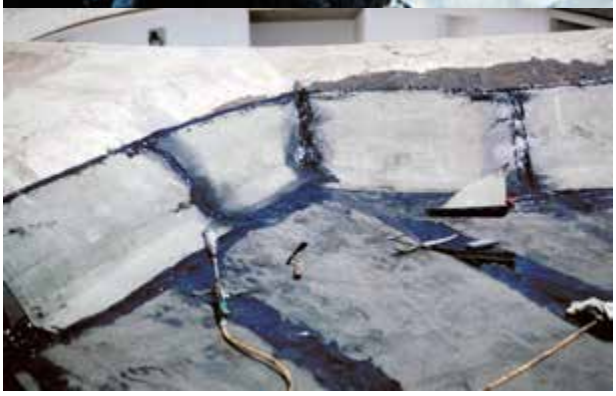


Figure 20. View of waterproofing membrane being laid at Gun No.2 emplacement.

Figure 21. Uncovered concrete catchment area/roof over the casemate as seen before works began.

Figure 22. View of waterproofing membrane over Gun No.2 emplacement area.

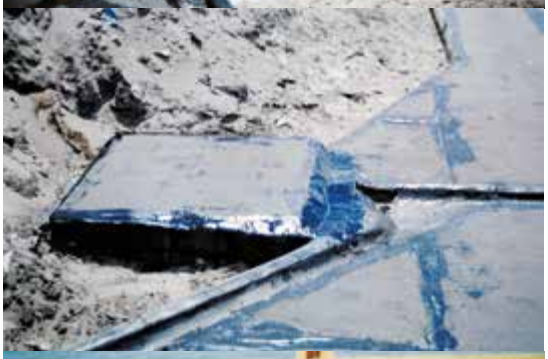


Figure 23. Detail of capping over original water vessel opening.

Figure 24.

Figure 25. Small bobcat in use on the island. Waterproofing membrane before it is installed at the structure at Gun No.2 emplacement area.

Figure 26. View of the roof area at Gun No.2 emplacement prior to waterproofing membrane being laid.

Figure 27. View looking towards the north west over the casemate water catchment area. The capping over the water vessel area can be seen in the middle left of the photograph. The drain along the edge of the catchment area can be clearly seen.

Figure 28. Photograph of the opening to the southern water vessel.

Figure 29. View showing the level change of the waterproofing membrane between Gun No.2 emplacement (lower) and the casemate water catchment area (higher).

Figure 30. Detail of the walls at the casemate opening. What appears to be a shallow drain is the recess for the speaking tube which connected Barbette No.4 to the original Command Post

Figure 31. View of the casemate opening. The step in the concrete catchment area can be seen (dark seam at the left).

Figure 32. Detail of the new waterproofing membrane at the casemate opening. A metal edging piece was fitted to fix down the edge of the waterproofing. No gutter was installed to collect or address the run-off of water from the catchment area into the casemate below.

Figure 33. View of pit dug at western fortification wall at the entry forecourt in anticipation of installing a detention tank for water runoff. [Photograph and information courtesy of Greg Bond]

Figure 34. Photograph showing new piping laid in the pit. [Photograph and information courtesy of Greg Bond]

The Significance Context

The colonial coastal fortresses constructed and/or substantially re-designed in each Australian colony, which together with those in New Zealand and Papua New Guinea comprise the c.1880s Australasian system of colonial defence and trade security, devised by the able and experienced Imperial fortifications experts Major General Sir William Drummond Jervois and Lieutenant Colonel Peter Scratchley, have outstanding heritage value for the nation. The Australasian fortress system is a component, albeit a colonially requested and funded afterthought, of the largest Imperial defence project undertaken by the British Government to that time, which saw from 1856 to the 1890s, their principal naval arsenals, dockyards and coastal settlements at home and abroad, fortified as part of an extensive and comprehensive scheme to meet the altered conditions of modern warfare in the age of steam.

The commonality of the design approach in Australia reflected the standard approach to naval defence adopted by the British Empire in the face of the new challenges presented by steam driven shipping. The fortress system was a departure from the previous isolated site planning approach and an important precursor to Federation and the introduction of a single defence force in Australia. The defence work of Jervois and Scratchley, with modifications and upgrading, was the basis for Australian territorial defence for over thirty years until after World War 1.

Typically located on dramatic coastal sites associated with major settlements and strategic coal deposits, the locations of fortresses in Australia demonstrate the accepted late nineteenth century view that the main threat to the ports and infra-structure of remote and isolated colonial settlements was a surprise raid by a small naval contingent and the front line of defence was the Imperial Navy. The perceived level of threat and its immediacy was heightened by the introduction of a telegraph line to Australia, through Darwin in 1872 and into Sydney at La Perouse in 1876. As a result of the telegraph line news of actual and potential military threats travelled more quickly and were often exaggerated by the media.

The late nineteenth century fortresses, as a group, have an unprecedented ability to demonstrate the impact of the period of rapid technological change associated with the age of steam, on Imperial defence strategy and on the details and size of fortification works.

The forts are characterised by:-

- locations on strategic coastal sites, particularly associated with major settlements and re-coaling opportunities;
- rifled ordnance of greatly increased range, which enabled the defence of greater areas;[3]
- increased artillery power in response to the armour plating of ships;
- an association with novel modes of construction, with experimental design and with new artillery;
- a corresponding increase in the 'power of the resistance of fortifications' including the widespread adoption of new mass concrete construction techniques, the introduction of massive iron walls and shields and of more massive and extensive earthworks;
- armaments of greatly increased size which necessitated the introduction of mechanical appliances and mechanical assistance, and
- alterations in the details of the old system of fortifications including an association with submarine minefields, contact and mechanical mines and in some with cases with light booms.

The armaments of the forts, which continued to use rifled muzzle loading (RML) guns long after breech loading ordnance had been introduced elsewhere, demonstrates both Scratchley's advocacy of the guns and an aspect of the commercial and exploitative relationship between the colonies and the British government who were happy to sell obsolescent models being phased out in British service to its colonies.

The fortress group in Australia comprising substantially new fort constructions instigated and designed by Jervois and/or Scratchley include in NSW, Fort Scratchley and Bare Island and modifications to South Head, Georges Head and Middle Head Forts; in Victoria, Swan Island, Popes Eye, South Channel, Fort Nepean, Point Franklin and modifications to Fort Queenscliff; in Queensland Fort Lytton and Green Hill Fort (Thursday Island); in South Australia, Fort Glanville and Fort Largs; in Western Australia, the Princess Royal Fortress and Fort Plantagenet in Albany, and in Tasmania, Kangaroo Bluff Fort. Some of the above particularly in Victoria may be batteries rather than fortresses as in addition to the fortresses Jervois and Scratchley also recommended various batteries.

Note: Additional State by State research, beyond the scope of this project is required to ensure that the above list of fortresses is accurate and comprehensive and to complete an assessment of significance and a statement of significance for the late nineteenth century fortress group associated with Jervois and Scratchley and with the meeting the particular challenges of the steam age.

[3] The 80 pounder Gun in Barbette No.1 was capable of firing a shrapnel shell into the bay to the west and northwest with accuracy to 3.2 km to prevent a ship steaming towards Cooks River. The HP Gun had a range of 8km. (Information Greg Bond)

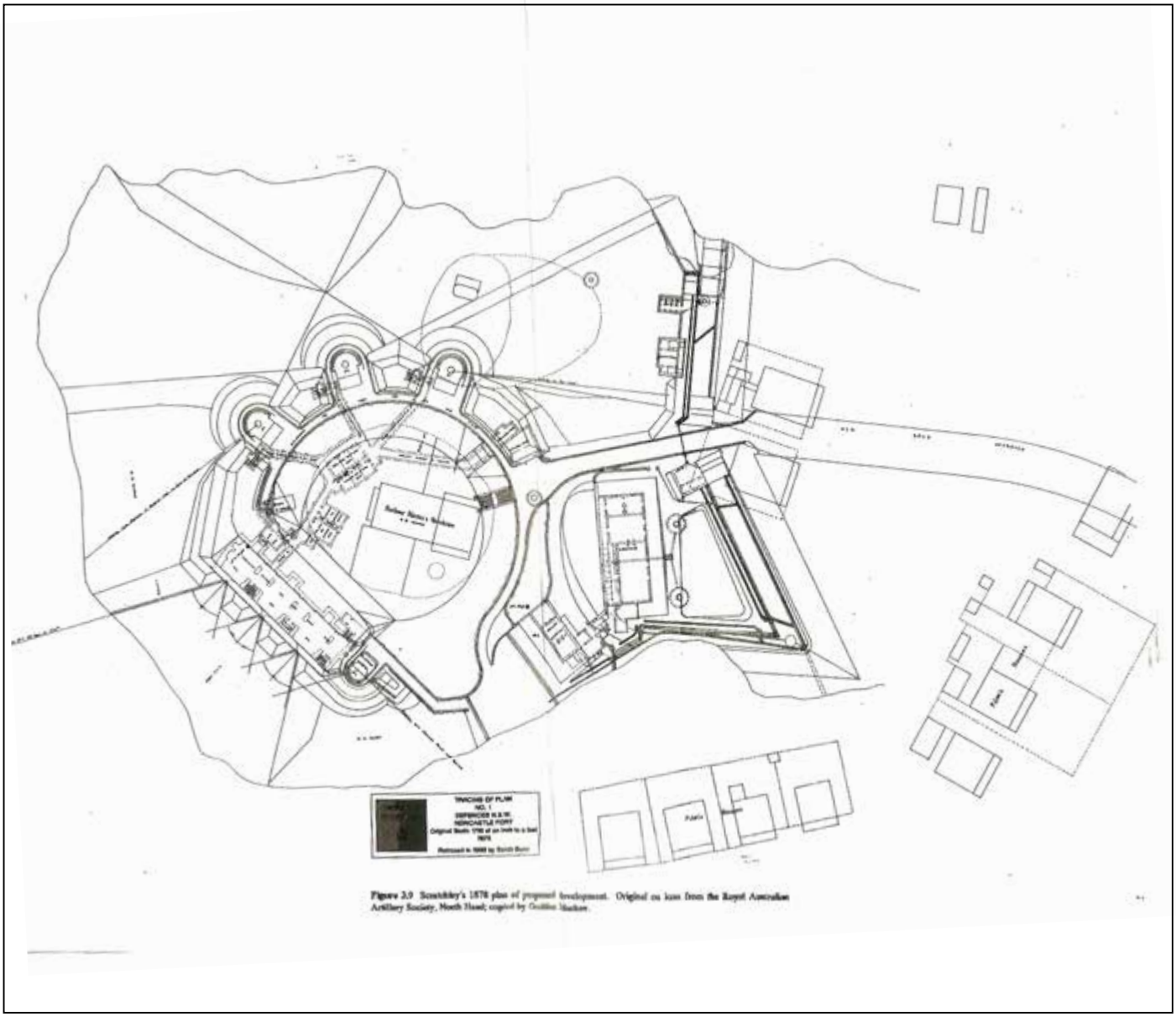


Fig. 35 Scratchley's 1876 plan for the proposed Fort at Newcastle. Note the fort was located over the old pilot station. Plan courtesy of GML P/L reproduced from the Godden Mackay Pty Ltd, 1992; *Fort Scratchley Newcastle; Conservation Plan* reprinted 1996 prepared for the Commonwealth of Australia.
The following plans illustrate the extent of changes to Fort Scratchley that are typical of those made to most forts of the period. By comparison Bare Island Fort is in a relatively original state.

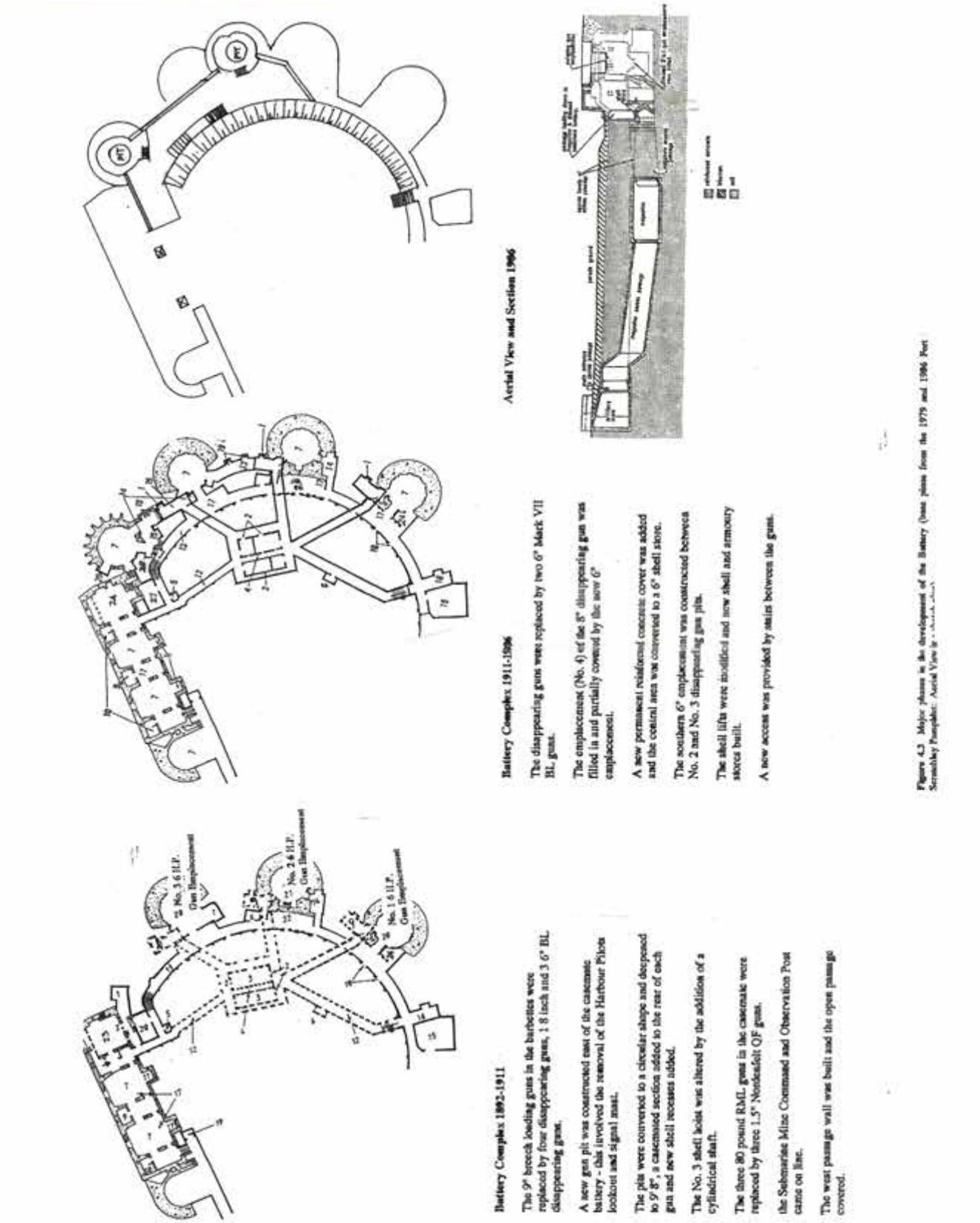


Fig. 36. Major phases in the use of the Fort Scratchley battery, reflecting changes in armaments and in the use of spaces.

Summary Statement of Significance

The 1881-1889 Bare Island Fort is one of the more substantial and impressive forts of the c.1880s group of nationally significant fortresses, strategically located throughout Australia that were recommended and designed by the Imperial defence experts Major General Sir William Drummond Jervois and Lieutenant Colonel Peter Scratchley. Those fortresses are associated with protecting important infra-structure, meeting the challenges of defence at a time of the loss of Imperial funding, rapid technological change and in the new age of steam. The survey of defence needs and recommendations by Jervois and Scratchley, which prompted construction of the forts, while at the request of the colonial governments served the interests of the Empire in maintaining the priority of Imperial defence needs.

Considered within the State context Bare Island, is a place of State Significance. The recommendation for the construction of a fortress at Bare Island recognised, Botany Bay as a viable back door approach to Sydney. While other existing Sydney harbour fortifications were modified, Bare Island and Fort Scratchley were the only two new, purpose built fortresses constructed in NSW in the late nineteenth century. Their design reflected the new conditions of warfare, which included allowance for rifled ordnance of greatly increased power, range, size and accuracy. The fortresses were also designed using comparatively new mass concrete construction techniques and included the insertion of massive iron walls and shields. The design of the batteries included in some instances provision for mechanical appliances and assistance (eg the mechanisms associated with the disappearing guns). Additionally the fortresses were sited to overlook important passages and harbour entrances with lines of electro-contact torpedoes.

The Bare Island Fortress is particularly notable for its controversial construction history and its association with the demise of the Colonial Architect, James Barnet's otherwise distinguished career. The use of poorly mixed concrete resulting in poor structural integrity and long-term water ingress problems that limited military use of the site. However, the limited military occupation and confidence in the site meant that it was subject to comparatively few changes over time and is likely to be the Australasian fortress best able to demonstrate Jervois and Scratchley's typical land fortification design approach, including the incorporation of late nineteenth century defence technology and illustrating the impact of technological change associated with the steam age, while also demonstrating the common British defensive approach throughout the British Empire at the time.

The Fortress is situated on a lovely coastal island, which is the only island in Botany Bay. Both Captain James Cook and Joseph Banks made reference to Bare Island. Banks even appears to have collected shells on Bare Island when Cook was in Botany Bay on his initial exploration of the bay in 1770. The extent of the excavation and reshaping of the island to form the fortress destroyed all evidence of the original topography and of former Aboriginal use or occupation, while creating a nonetheless pleasing artificial aesthetic of low rise, intertwined mass concrete and natural topography, characteristic of the forts of the period.

Re-use of the fortress saw it become the first War Veteran's Home in Australia which signalled the beginning of political and practical acceptance of a social and moral obligation to the veterans of wars fought across the British Empire and subsequently to veterans from other theatres of war.

Most recently the island has become an integral component of the tourism and visitation associated with the La Perouse Headland. It has been used as the set for two well-known twentieth century films. For a time the island was a local attraction featuring military re-enactments and firing of the guns. In its own right the island is locally valued for its positive contribution to the aesthetics of Botany Bay, for the colourful sea life surrounding it and for the associated diving and fishing recreational activities around its shores.

The island is important to the local community as an additional layer of history, interest and complexity, centred in the rich coastal landscape. It is greatly valued by local people and by formal recreational groups for its aesthetic qualities and associated recreational opportunities.

Risk Assessment

High H Medium M Low L None N		**Risk Assessment Summary**
Structural Risk	**M /H**	The Fortress is a massive construction that is generally stable. However there are areas with specific issues. The ceiling of the vehicular entrance to the lower courtyards, which is thought to contain a water tank, is supported by acro-propped plywood panels that show evidence of water damage above the panels, which is likely to have reduced the structural integrity of the ceiling. The ceiling in the adjacent garage/workshop is also cracked and is propped.
Fire Risk	**L**	The ceiling in the corridor behind Gun No.3 contains badly corroded iron I beams. There is water damage and a door opening to a missing staircase in the upper level corridor running down the middle of the Barracks.
Wind Loading	**L**	
Visitor Safety Issues	**M**	The main visitor safety issues are associated with the structural issues outlined above and with unfenced cliff and concrete edges.
Other		

Management Objective:

Retain and conserve the fortress and enhance the structure by sensitive repair and conservation work. Retain the artificial aesthetic that characterises the place. Identify compatible and sustainable re-use opportunities and re-use the complex. Foster spatial, recreational and other links between the Island and the surrounds.

Conservation Policy

General

- The Bare Island Fortress should be treated in accordance with the guidelines and principles of the Burra Charter of Australia ICOMOS.
- Low impact, compatible and sustainable re-use opportunities for the complex and particularly for the Barracks building that include opportunities for interpretation and some (possibly limited) opportunities for public visitation will be actively pursued.
- Alterations to the building associated with major phases of use should continue to be expressed in the building. However, evidence of minor uses such as the caretaker's occupation need not be retained.
- The artificial aesthetic that characterises Bare Island and its setting as a component of the La Perouse Peninsular and Botany Bay should be retained and enhanced where possible.
- The security of the island complex is recognised as an ongoing risk and appropriate measures with low visual impact, to manage the risk (such as installing a drawbridge in the entrance bridge and other appropriate ongoing measures including a guard dog) can be considered and continued or adopted.
- Minimum standards of maintenance and repair should be maintained in weatherproofing; drainage; fire protection; security; and essential maintenance.
- New fabric may be introduced to the Bare Island Fortress complex for sound practical reasons.
- Where possible any new work should be low impact and reversible. Any new work should respect the period and character of the current complex.
- The island will be managed in an environmentally responsible manner and new technologies will be introduced when appropriate.
- Opportunities to link the island and the fortress with related historic sites, with local initiatives and sites and with local recreational opportunities, through interpretation and with physical links and other initiatives will be taken, where such opportunities are judged to be compatible and appropriate.

Adaptive Re-Use Opportunities

This complex comprises a battery arc backed by a barracks building, parade grounds and submerged courtyards sitting within the re-shaped island. Apart from use as a film set and for tours and tourism there appears to be few re-use opportunities for the Battery arc area. However the Barracks building, parade ground, courtyards and surrounds have considerable re-use potential associated with the existing recreation around the island. Opportunities include use as a Dive School, for retail or café use, as a base for sea fishing and for Youth or special interest Hostel occupation. Other low impact uses that re-use the Barracks for an accommodation use that reflects its historical occupation can also be considered.

1.0 CATCH-UP WORKS	
Comparative analysis and assessment of Bare Island considered against other NPWS managed fortifications in the Strategic Plan for Fortifications in the Sydney Region managed by National Parks resulted in Paul Davies making the following recommendation: 'This is one of the most significant fortification sites in NPWS management and should be a priority for ongoing conservation work.' (Davies, 07:30) 'Key conservation issues are the poor quality of original concrete, conservation of finishes, metals and waterproofing' (Davies Report 2007:19)	
Built Fabric Issue	**Assessment and Required Works**
Urgent Works	Water ingress and/or leaking water tanks above the vehicular entrance to the Barracks courtyard is damaging the concrete roof, which is presently supported by marine plywood panels above Acro props. This area may be in danger of collapse if it is not addressed within the next 1-2 years. The roof should be exposed and properly assessed for urgent repair works. This will become a public safety risk issue if the damage is allowed to continue and the repair costs will be increasing the longer it is left and the more water damage is sustained.
1.1 GENERAL (1-2 Years)	
1.1.1 General damage caused by water ingress and unsatisfactory drainage of water from Site	**Assessment**: There is an argument that the whole of the top of the fortress was not designed to hold soil. There are numerous drainage issues on the site. Some specific areas of concern are noted in the following pages. The majority of damage to the fort structures has been the result of sustained water damage. Some of the contributing factors include the build up of soil above the fort, blocked drainage channels, altered ground surface levels and insufficient or altered grading of new surfacing to floor levels. Vegetation (grass) encroachment over built structures has also contributed to water damage. **Works**: - Consider complete removal of soil from the catchment roof on top of the island between the barracks and the iron railings at the rear of the casement. This roof according to Greg Bond was designed to capture and direct water into two tanks. The presence of soil causes a flow of sediment that blocks drainage in the Casemate and the rear of the Barracks. - Explore new technologies in the form of waterproofing and waterproof membranes that may result in a long-term solution. - Lower earth levels below the top of wall levels generally and cut grass back on top of the Island (primarily around the casemate opening and emplacement walls) to assist passive flow of stormwater into the stormwater drains and not over the walls themselves. Check the waterproof membrane for any holes while it is exposed. - Ground surfacing may need to be regraded to direct water to drains. This may require replacement and/or relocation of existing ground surface material. - Thoroughly check the stormwater drainage system to identify any blockages or leaks. If any are found they need to be addressed as a priority.
1.1.2 General metalwork deterioration	**Assessment**: Exposed metalwork at the site is deteriorating due to exposure to moisture and salts. Concrete spalling is also a problem at the site both internally and externally. Exposure to moisture is causing metalwork to rust and expand, which cracks surrounding concrete. **Works**: - Commission a specialist conservator to survey and treat all deteriorating metalwork, particularly each end column set in the Barracks wall at first floor level. - A regular maintenance program for monitoring and treatment of metalwork should be established as a priority.
1.2 THE EXTERIOR (1-2 Years)	Includes earthworks, cliff faces, the outer faces of retaining walls and buildings visible from off the island and the access bridge No new works identified. However, due to past earth movement it is prudent to consider setting up measurement and monitoring stations on the island.
1.3 THE BATTERY (1-2 Years)	Includes the gun emplacements, shell stores and magazines
1.3.1 Water damage at Gun No.3 casemate	**Assessment**: Water damage has contributed to the deterioration of the walls at the passageway leading to the gun. The walls are unprotected from rain and are being affected by rain runoff from the high level of the grassed area above. These problems have been exacerbated by the application of a waterproof membrane over the edges of the opening that causes water to flow over the grass and down the opening's walls. This is also the case at the embrasure wall at the arc-of-fire. This activity is significantly eroding the wall surfaces. This issue requires urgent work as damage is being caused to the wall surfaces. The timber sleepers on the waterproof membrane are termite damaged and deteriorating but are helpful (to some degree) by reducing the amount of sand and silt being washed from above into the opening. The accumulation of silt in the drains may be a cause of blockages. **Works**: To suspend ongoing damage to the casemate walls: - Lower the level of the grass and earth above the walls below the height of the waterproof membrane-covered walls to stop/reduce the flow of water into the openings. -Construction of additional trenches or channels around the opening could assist in directing the flow of water away from the opening.

	To address the flow of water into the casemate EITHER install gutters (and associated downpipes) to catch water that flows over the edge of the opening. (This will not stop rainwater falling into the casemate.) OR Construct a sympathetic, roof over the opening to stop both water flowing down the walls into the opening and also rainwater falling into the casemate.
1.4 THE BARRACKS – See Figures 16 and 17 for nomenclature generally. (1-2 Years)	
1.4.1 War Veterans era bathroom and staircase extensions	**Assessment**: The bathroom and external timber staircase retrofitted to the Barracks building during use as Veterans Home have compromised the drainage and airflow around the Barracks building causing water to enter the entry passageway and Barracks building (Lower Level). These works have substantially hindered the drainage network around the building causing water damage and have provided a suitable environment for termite activity. **Works**: - Remove the bathroom including shower, basin, associated fixtures and concrete slab and hob, behind the barracks at ground floor level. - Reinstate the drainage channel around the building. - Replace the water-damaged door from the bathroom to the Barracks building. - Additionally the door from the external stairway into the Barracks building (at Lower Level) is showing signs of severe water damage and has allowed water into the Caretakers Accommodation. It should be replaced to provide a waterproof seal at this opening either with a door or window to match existing.
1.4.2 War Veterans era roof over Barracks entry passageway	**Assessment:** The shallow roof pitch and absence of guttering and downpipes have caused significant water damage to this section of building (as water runs down the face of the walls rather than being carried away by downpipes to the stormwater drainage system below). This has caused the external timber stair and landing to get wet and (due to the location) remain wet and rot over time. Additionally the structural beams supporting the entry passageway have likewise been subject to water damage, which could threaten the structural integrity of the building in the long term if they remain untreated. **Works**: - Replace the small existing roof structure over the passage between the barracks and the casemates with a new roof designed to provide a greater roof slope and more satisfactory connection between Barracks building and rock wall face. - Install guttering and downpipes to connect to the drainage system below. Water damage to walls needs to be assessed during this work. It is expected that the water damaged window, doorframes and lintels require replacement. Replace rotten wall/floor timbers and door at the entry passageway as required. - Install a metal balustrade at the doorway over the former staircase for safety. Consider including a small external balcony to assist with interpretation of the former use. - Assess structural beams for structural integrity and provide recommendations for any treatment or replacement.
1.4.3 Barracks Roof	**Assessment**: It appears that a previous investigation was made into the construction of the Barracks roof that resulted in a core sample of the roof structure being taken. This has resulted in a hole in the roof's waterproof membrane, which has caused water damage to the roof structure and to the rear NCOs rooms below. There appears to be further water damage to the roof nearby possibly due to a blockage in one of the roofs two down pipes causing an overflow of water, damaging the internal walls. **Works:** - Repair the hole in the waterproof membrane OR if this cannot be done satisfactorily, replace the whole waterproof membrane. - Further investigation by a structural engineer is recommended to investigate potential structural damage to the roof caused by the water damage. - Water damaged floor timbers in the NCOs rooms should be repaired or replaced with matching timbers and walls and ceilings should be repaired and re-painted in a matching colour or known period colour scheme.
1.4.4 Barracks verandah guttering and water management issues	**Assessment**: The current Barracks Building verandah roof has insufficient downpipes to satisfactorily remove water from the roof. In heavy rainfall, water overflows from the gutter and falls on the verandah and bridge connecting the verandah to the Barracks Building. This water is causing damage to the structural steel members incorporated in the concrete verandah floor. **Works:** **-** Investigate replacing the existing gutter with a deeper section with a matching profile (i.e. shape). **-** Investigate incorporating additional downpipes into the hollow metal verandah posts or behind the posts in an unobtrusive manner and extending the downpipes to connect to an appropriate stormwater drain. This will require further investigation by a licensed plumber. - The steel beams supporting the verandah walkway floor connection require rust treatment.
1.4.5 Termite damage	**Assessment**: There is evidence within the Barracks Building (particularly at Lower Level caretakers accommodation and storerooms) of termite presence and damage.

	Works: **-** Engage termite contractor to assess and treat sites of termite damage/activity. The kitchen area in the current Caretakers Accommodation requires immediate treatment. This involves treating active termites and EITHER replacement of kitchen floor with a floor that allows the underfloor area to 'breathe' to reduce the moisture build up in the area OR the installation of ventilation grills in the floor to allow air into the sub-floor area and the removal of vinyl/plastic floor coverings. - Investigate the condition of the ventilation grills in the external walls of the Barracks Building and repair as required. - Investigate the source of moisture damage in the Kitchen area (this is most likely due to blockages and damage to the drains surrounding the Barrack Building, which have been identified for general investigation above and repair as required.
1.5 PARADES AND COURTYARDS AND THEIR ASSOCIATED BUILDINGS OR ROOMS (1-2 Years)	
1.5.1 Water damage to Passageway from Entry Forecourt to Lower Parade Ground	**Assessment**: The passageway arched roof/ceiling structure accessing the Lower Parade Ground has been propped for over five years. It is difficult to determine the extent of the damage to the structure but one can reasonably assume the ceiling fabric has undergone severe water damage and is failing, resulting in render, and sandstone material falling to the ground over time. This is a general problem that has occurred and been investigated previously around the parade grounds. The origin of the problem is difficult to determine due to the inherent concealed structure of the building and drainage system but it is again reasonable to assume the damage is the result of a leaking, damaged or insufficiently water proofed stormwater drainage system. **Works:** Investigative work needs to be undertaken by a structural engineer to determine the cause of water damage to the Passageway. This problem may require invasive construction works at the Parade Ground to expose the source of the problem. - Reconstruction of areas of the Passageway structure, Parade Grounds and associated storerooms (see below) may be required to address the problem satisfactorily. - Consider cosmetic reconstruction of the deteriorated sandstone archway.
1.5.2 Garage/Workshop & Vehicular Passageway ***Note: Urgent Work***	**Assessment**: The ceiling in the storeroom has been propped with Acro-props for some time. The ceiling has undergone significant water damage. The roof structure's iron structural members are visible due to the loss of render, and appear to be rusting due to the presence of water possibly from adjacent tanks (See Fig. 16 First Floor Plan) or from the highly permeable concrete. This room is adjacent to the passageway and appears to be undergoing problems caused by a similar (related) problem possibly associated with a leak from the tank above the toilets. **Works:** Investigate the cause of the water damage to the Storeroom in concert with the works for addressing the water damaged Passageway. **-** Engage a structural engineer **to** assess for structural integrity of the ceiling - Conservation works will need to be guided by the investigations but would most likely include identifying whether they're leaking from adjacent tanks and waterproofing them, patching of render and treatment of deteriorating metal.
1.5.3 Lower watch room and entry forecourt	**Assessment**: The lower watch room is currently experiencing sustained water damage. Stormwater and silt runoff from the entry forecourt is running down the stairs to the floor in the watch room. The ground level at the entry forecourt appears to be a foot higher than originally established particularly in a number of locations such as the entry to the lower watch room and at the location of the water bubbler (which appears to be very short). This rise of the ground level probably occurred when drainage works and installation of a detention pit were undertaken in the entry forecourt (see Historical Photographs Figure 33 & 34). An existing drain along the western edge of the room is blocked and does not allow the collected water to drain away. The metal-framed window openings in the western wall are water damaged and the rust is staining the walls. The internal walls are cement rendered like the fortification walls and are undergoing water damage, which is eroding the wall substructure. Large deposits of salts are accumulating in the cavities between the render and the wall substructure. This is contributing to the failure of the render. The barrel-vaulted roof beams are also undergoing rust damage. **Works:** - Clear the drain to allow water to flow out of the room. - Undertake metal conservation work to the metal openings. - Assessment of the structural safety of the water damaged roof structure is required. - Remove salt deposits and patch the cement render. - Replace the missing door - with a historically accurate copy if possible. - Reduce the level of the entry forecourt to previous levels (as seen in historical photos). This will reduce the volume of water entering and damaging the Lower Watch Room.
1.5.4 Courtyard Store Rooms (Workshop, Coal Store & Store [Laundry])	The windows and doors of all the ground floor rooms along the sides of the lower courtyard are deteriorating. Many of the windows have missing panes, the timber framework is rotting and the bases of doors are rotting. Birds getting into the rooms are an ongoing problem. When the rooms are closed to prevent birds getting in, moisture build-up from humidity exacerbates deterioration of fabric. **Works** -Repair all the timber joinery to the storerooms, toilets & bathrooms. -Repaint previously painted doors & windows in a known historic scheme or match the

	existing colours. -Install fly netting (and if necessary ventilation grills) so that windows can be opened to ventilate rooms.

2.0 MEDIUM TERM (CORRECTIVE MAINTENANCE) WORKS [1-5 YEARS]

Item	Condition Good Fair Poor Ruin	Built Fabric Issues
***2.1 THE EXTERIOR*: including earthworks, cliff faces, the outer faces of retaining walls and buildings visible from off the island and the access bridge (1-5 Years)**		
General - overall	Good	N/A
Earthworks and cliffs	Good	None.
Fortification walls	Good	Erosion is occurring to south-western buttressed walls, requires repair work. Install measuring equipment & monitor.
Bridge and approach roads	Good	None.
Safety railing	Fair	Generally railings and balustrades require preventative rust treatment and painting.
Vegetation	See Landscaping report	Site wide issue of a build up of soil & lawn encroaching upon structures. This is causing excessive stormwater run-off onto fragile built fabric. Weed removal at gun emplacements and approach roads is required to slow fretting of asphalt ground surface.
Exterior paint schemes	Fair/Poor	Generally the site needs a paint review as many areas are undergoing significant paint loss, e.g. guardhouse.
Searchlight and observation posts	Demolished	N/A
Arc-of-fire	See in Battery Section 2 below	See in Battery Section 2 below
Signage	Fair/Poor	Site wide review required to renew directional and interpretation signage.

***2.2 THE BATTERY:* including the gun emplacements, shell stores and magazines, the traverse passage and battery commanders post (1-5 Years)**		
General - overall	Fair	
Battery Commanders Post	Good	None.
View (searchlight) post	Demolished	N/A
Machine gun/watch posts	Good	None.
Gun casemate and emplacements - general	Fair	Drainage of stormwater system requires review and cleaning. Various locations around the Island appear blocked. Lawn encroachment and blockage of drains at tops of emplacement walls. Original drains and guttering needs to be reinstated around the emplacements and storerooms to direct stormwater to the drains. Weed removal is required to slow deterioration of asphalt ground surface. Metal fittings require conservation work – tracings, gun mountings, rings, hoist, air ventilation hatches, speaking tube etc. Original timber fittings require conservation work. Discolouration (algal growth) of sandstone gun mountings requires treatment. Patching of eroded or missing render is required. Some walls require painting. This requires care, as some walls have been painted with acrylic paint and this may need this to be removed prior to repainting.
Gunpowder, shell stores and traverse passageway - general	Fair/Poor	Drainage of stormwater needs to be improved to maintain the flooring/ground surfaces. This may require the regrading of the ground surfacing to direct the stormwater to the drains. Water damage to wall fabric/timber remnants has occurred due to storm water run-off and inadequate drainage. The source of standing water in many of the storerooms requires further (perhaps invasive) investigation into structural issues/sources of water ingress. Bird ingress and nesting requires treatment. Removal of bird nests is required. Loss of render due to damp environment. Render can be reinstated – however this is a temporary solution as the source of water ingress is uncertain. Conservation work to metal fittings. Re-instate missing doors.
Gun No.1	Fair	
Gun No.1 Stores	Fair	Standing water in the shell store is contributing to a moist environment, which is deteriorating the built fabric. This may be caused by a lack of a satisfactory waterproof layer above the roof structure. Invasive investigative works are

		required to further determine the cause of this issue. Until then only temporary treatment such as patching of render, which will need o be renewed in the future can occur.

Item	Condition Good Fair Poor Ruin	Built Fabric Issues
Gun No.2	Good/Fair	Missing doors to cupboards, storage units need to be reinstated. Rust prevention treatment to niches in emplacement wall and water faucet is required.
Gun No.2 stores	Good/Fair	Broken glazing panel in crew shelter needs to be replaced. Missing doors to storage cupboards is required. I beam in roof structure at passageway from Gun No.1 requires treatment for water damage. Missing metal grill from window in the larger crew shelter room requires replacement. Bird's nest to be removed.
Gun No.3	Fair/Poor	Impervious floor surface needs to be installed with adequate stormwater drainage to reduce silt built up in stormwater drainage system. Water runoff into the casemate needs to be addressed either by installation of guttering, or roof over opening, or other method. Metal conservation work to metal wall and ceiling plating is required. Recovery of gun tracings from the arc-of –fire is needed. Tracings to be installed within the casemate. Water run-off over the external embrasure wall needs to be addressed – removal of earth above and/or installation of guttering above wall is required to reduce the stormwater runoff onto the metal shield wall. Conservation work to arc-of-fire sandstone retaining walls is required. Mortar is eroding and needs to be replaced.
Gun No.3 stores	Poor	In the Entry Passageway a water leak at the Casemate end has caused water damage to the suspended timber floor. This has caused buckling of the floorboards. Drainage in the casemate (the likely cause of this damage) needs to be addressed first prior to remedying this damage. Both Gun No. 3 stores (located directly off Entry Passageway) are undergoing water damage. It appears that both rooms are succumbing to water ingress from above, which suggests a lack of a satisfactory waterproof membrane above the structure. Structural iron within the roof/ceiling structure is significantly water damaged and the ceiling render has failed and fallen off in many places. The render on the walls is drummy. These areas require application of new waterproof membranes to be installed to protect them from further water ingress.
Gun No.4	Fair	Two timber shelves in niches in the emplacement wall require conservation work. Safety railing requires painting. Hoist requires metal conservation work.
Gun No.4 stores	Fair	Missing timber doors frame components require replacement. Original shelving brackets require conservation work. Cast iron blast proof window frame and panel require metal conservation work. Window requires new glazing. Missing storage cupboards require replacement.
Gun No.5	Fair	See general notes
Gun No.5 stores	Good	Evidence of leak from roof/ceiling to floor in doorway, which is causing wall substructure to be eroded. This indicates a local breach of the waterproofing of the roof – as the rest of the roof appears dry. The waterproof membrane needs to be repaired or replaced to prevent further fabric loss.

2.3 THE BARRACKS BUILDING (1-5 Years)		
Exterior	Good/Fair	**Works** - Bird/insect mesh screens need to be installed to all openable windows. - Damaged external sandstone window sills require replacement. - Replace missing sandstone capitals of bridge support columns. - Clear the drainage channel around the building and clean out stormwater drains to improve water drainage around the building. - Patch punctures in waterproof membrane on roof. If this is not possible, replace the membrane. - Demolish the War Veterans era bathroom extension and hot water system and make good original fabric of Barracks building. A structural engineer will need to assess damage to the structure of the bridge between the Barracks and Gun No. 3 Casemate. - Remove the water tank supports, and supporting CFC sheeting to the south of the Barracks. Retain the existing original metal angle slab supports in-situ for interpretation opportunities. - Replace/repair metal air vents to stop bird/vermin entry to building.

Item	Condition Good Fair Poor Ruin	Built Fabric Issues
Verandah	Fair	Rainwater drainage needs improvement. - Replace guttering with matching profile – but larger section. - Check flow of water through down pipes and add downpipes within the columns or discretely behind columns. - Undertake metal conservation work to cast iron verandah posts, particularly the posts on the face of the building.
Interior - Upper level	Fair	- Replace missing doors and door hardware - Remove rusting metal conduit in entry passageway walls and patch render to match existing. - Replace terrazzo threshold. - Repaint windows, doors and walls throughout. - Remove adhesive remnants on walls in NCOs rooms. - Install missing hardware to internal door in NCOs rooms. - Replace/repair any damaged window sills. - Relocate core samples and building materials stored in upper rooms. - Remove cupboard unit at fireplace in NCOs room. Assess fireplace for maintenance requirements. - Remove any defunct electrical boards in NCOs room. - Fix loose electrical wiring.
Interior – Lower level	Good/Fair	- Replace termite-damaged window and sidelight unit - Replace window sills in kitchen - Undertake termite treatment in kitchen – subfloor area. - Remove synthetic kitchen floor covering and create air holes in timber floor to allow subfloor area to 'breathe'. Engage a plumber to investigate subfloor moisture issue. - Undertaken metal conservation work to Range. - Replace the water-damaged door in the Office and Store to match existing. - Replace the glass in the top light in the Canteen's window - Replace the water-damaged door in the Mess Room with a window to match existing – ensure good waterproofing. - Remove paint build up that is blocking the metal wall vents. - Repaint concrete stairs in Mess Room.

2.4 PARADES AND COURTYARDS AND THEIR ASSOCIATED BUILDINGS OR ROOMS (1-5 Years)		
General - overall	Fair/Poor	
Water tanks, drainage and sewerage systems	Poor	- Undertake investigation for blockages and leaks in the stormwater drainage system. Undertake works to remedy these issues.
Lower Parade Ground	Fair	- Re-surface concrete ground slab.
Upper Parade Ground	Fair	- Investigate water leakage above the Passageway. - Resurface the parade ground as necessary to create falls to drains to improve stormwater removal from area. - Metal conservation treatment to hoist and gate and bracketing. - Investigate re-opening hatch to laboratory – for interpretation purposes. - Repaint metal balustrading in the area. - Remove any grass that is obscuring the drains above the fortification walls in the area.
Workshop	Fair	- Repair and repaint windows and doors. - Reinstate and replace window glass. - Install insect screens to windows.
Coal Store	Fair	- Repair and repaint doors.
Store	Poor	- Repair and repaint windows and doors. - Reinstate window sills. - Metal conservation work to hooks. - Investigate ceiling damage. Include work into investigation of parade ground leaks. Treat structural iron rust. - Install insect screens to windows.

Item	Condition Good Fair Poor Ruin	Built Fabric Issues
Water tank cavity	Good	None.
Water closets and Latrine	Good/Fair	- Repair broken toilets.
Non-commissioned Officer's (NCO's) bathroom	Fair	- Metal conservation work to bath. - Repair and repaint windows. - Repair and repaint walls. - Roof/ceiling – see below.
Bathroom/Lavatory	Poor	- Proceed with previous heritage advice to mechanically exhaust shower and bathroom area until further investigation works can be undertaken to assess and remedy water damage issues in the Lavatory and adjacent NCOs bathroom. The investigation will direct the conservation work. This may include removal and rebuilding of the parade ground/roof structure. - Note: There is no heritage reason why the current bathroom (the former lavatory) should not be modernised and decorated in a specific period style associated with the historic occupation i.e. either a c.1890s scheme or a Federation scheme associated with the War Veterans occupation as soon as possible to provide a reasonable standard bathroom for the caretakers as there is not likely to be a practical new use for the former lavatory layout. The NCOs bathroom should be restored if practical.
Passageway	Poor	- Investigate source of water damage. This work will direct conservation works in this area. This may include removal and rebuilding of the passageway.
Guardhouse	Fair/Poor	- Re-instate missing doors. - Replace rusted metal roof vent capping. - Treat metal window openings. - Metal conservation work to blast-proof window shutters. - Repaint building as directed by paint scheme investigation (see Gojak).
Laboratory	Fair	- Metal conservation work to air vent hatches and shelving brackets. - Repair and repaint windows and doors. - Treat rusting iron roof structure. - Repair/patch render.
Entry forecourt	Fair	- Retain and repair fence. This may require replacement of fence posts and railings that may be rotten. Ideally the palings would be reused. Unless investigations are made to ensure the safety of the garden area (as there are a number of pumps etc located below ground surface) it is not recommended that this area is publicly accessible. The herb garden could be re-established for interpretation purposes. - Ground level in the area should be lowered according to information gathered from historical photographs. This is particularly important at the entry stair to the Lower Watch Room to reduce the amount of stormwater and silt running into the Watch Room.
Garage/Workshop	Poor	Exposed metal and concrete spalling near gatehouse requires conservation work: **Assessment**: An area of wall at the Parade Grounds near the Guardhouse has been subject to severe concrete spalling and metal deterioration. This has been caused by water damage to metalwork, leading to its expansion and cracking of concrete. Previous treatment resulted in a perspex cover to be fixed over the area and sealed on three sides with foam strips. **Works**: The perspex cover is not improving or maintaining the condition of the wall. The existing foam seals are hindering air movement at the wall face and creating a humid microclimate in the area, which is exacerbating the problem. Short-term works to slow the damage would involve retention of the perspex cover however better airflow is required to allow the wall to dry which could be achieved by removing the two vertical foam strips. Long-term conservation work potentially includes partial demolition and reconstruction of the wall due to the severe nature of the damage. This work may be undertaken as part of the investigation into the parade ground drainage issue. - Investigation of ceiling damage can be undertaken with investigation into Passageway water damage issues. - Metal window grills require conservation treatment. - Repair and repaint window.

Item	Condition Good Fair Poor Ruin	Built Fabric Issues
Storeroom – small	Fair	- Ground surface require regarding to direct water out of the storeroom. - Reinstate door
Lower Watch Room	Poor	- Repair damaged archway entry to Watch Room.

3.0 LONG TERM WORKS 1-10 YEARS

It is desirable that works listed in the Medium Term Works are carried out in 1-5 years. However, most of the works that do not affect deteriorating timber or iron fabric can be extended to a 1 to 10 year timeframe if necessary.

4.0 ONGOING MAINTENANCE

Inspection: - Make a thorough inspection of the item at three (3) monthly intervals and identify maintenance and repair issues.

- At least once a year during a heavy rainfall event, survey the complex and identify all overflow and drainage issues.
- Check storm water will flow away from the fortress complex and check that the drainage system is functioning and unblock as necessary.
- Check that grass/vegetation is not growing over gun pit and retaining wall edges; into storm water system or against building walls/footings.
- Check concrete roofs for evidence of holing or leaks through the membrane. Check corrugated iron roof sheeting on the verandah is attached firmly. Check roofing screws and sheeting for rust and replace as necessary.
- Check roof rainwater drainage systems and clean/clear down pipes/guttering/spreaders as required.
- Check condition of windows, window sills, doors and door thresholds.
- Check timber elements exposed to weathering (doors, sills, verandah timbers) and oil/repaint as required. Only oil/paint items previously painted or oiled.
- Carry out annual inspections for termites and vermin and take measures as required.
- Check interior walls and ceilings for water damage and repair as required.
- Check brick walls for erosion and scouring. Replace very deteriorated bricks with matching bricks. Re-mortar joints with mortar of matching colour and composition as specified by suitably qualified and experienced engineer as required.
- Check bridge and steps for failing structure and repair/replace as required.

Fire Protection:-Ensure vegetation and other material that could create a fire hazard is removed from the vicinity of the complex and is not permitted to accumulate.

Security:- Continue to lock building and surrounding gates and maintain a sensor lighting system to the complex and surrounds.

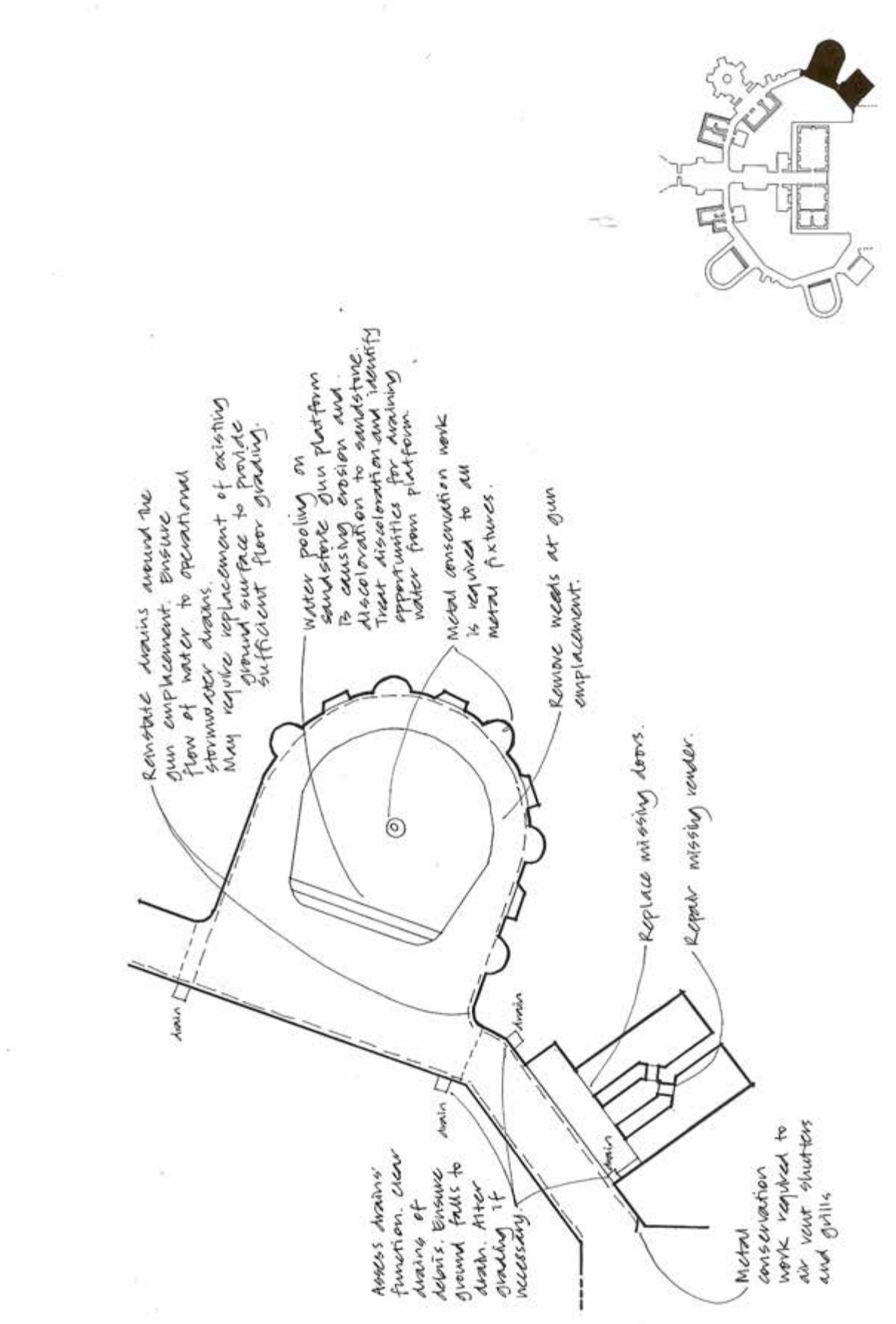
Archaeology:- Ensure potential in-situ archaeological deposits are not disturbed by ad-hoc sub-surface excavation. Any substantive excavation proposed in areas of archaeological sensitivity should be discussed with the NPWS Site Manager who will advise on the appropriate strategy.

Interpretive Opportunities

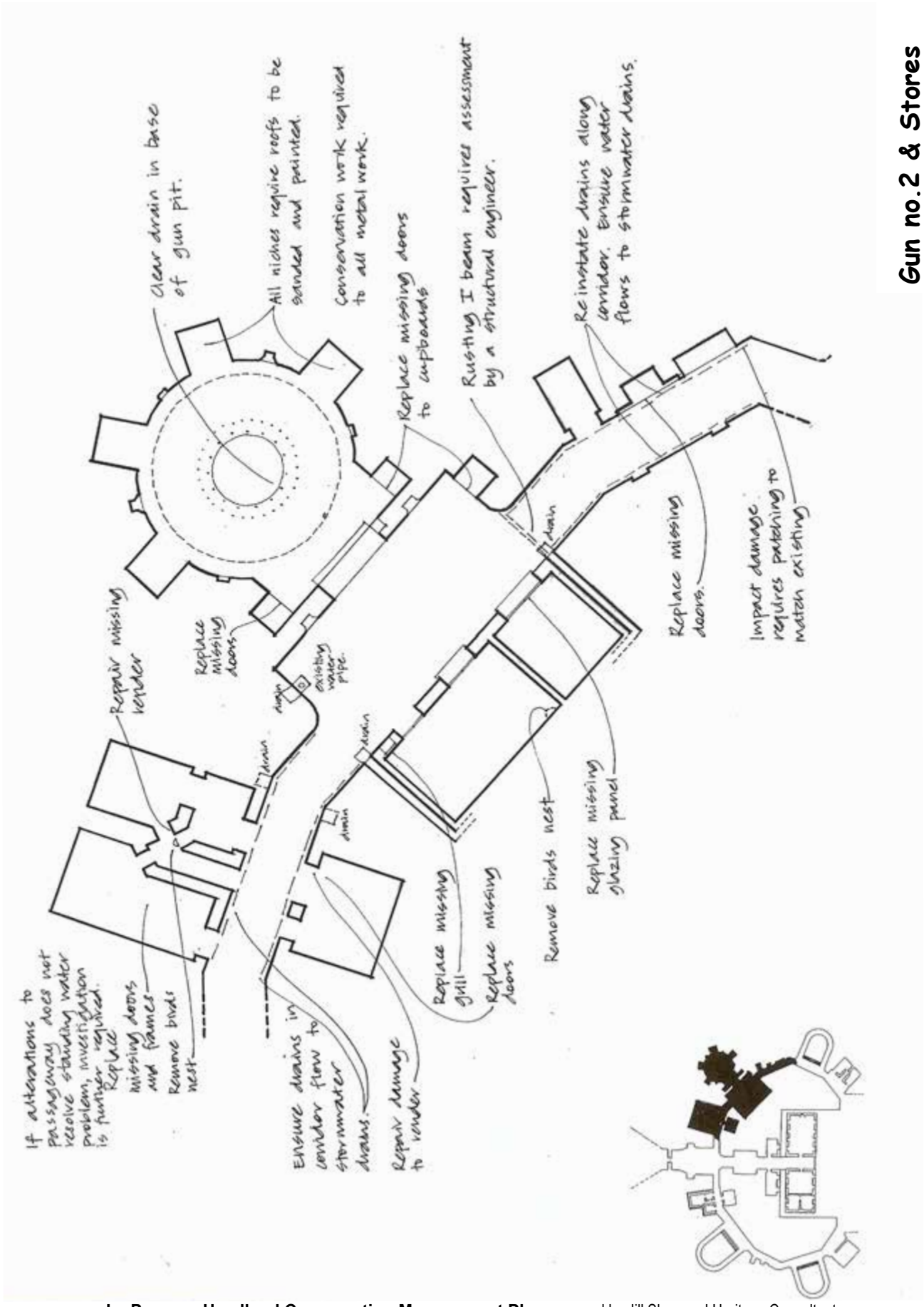
The Bare Island Fortress should/could be interpreted at a number of levels:

- as one of the first places given a European name in Australia;
- for its association with Cook and Banks;
- as part of the pre-contact landscape;
- as part of the broader Imperial and colonial defence works;
- as a representative example of the late nineteenth century fortress type, technology and a response to steam age, iron clad shipping;
- as the first War Veterans Home in Australia;
- as a place of recreation and fine views;
- for its former use for re-enactments and firing of the guns;
- as one of a suite of significant historic places around Botany Bay;
- for its role in defending Botany Bay in World War II;
- for its associations with Jervois and Scratchley, Barnet and de Wolski, and
- as one of a group of historic sites on the La Perouse Headland.

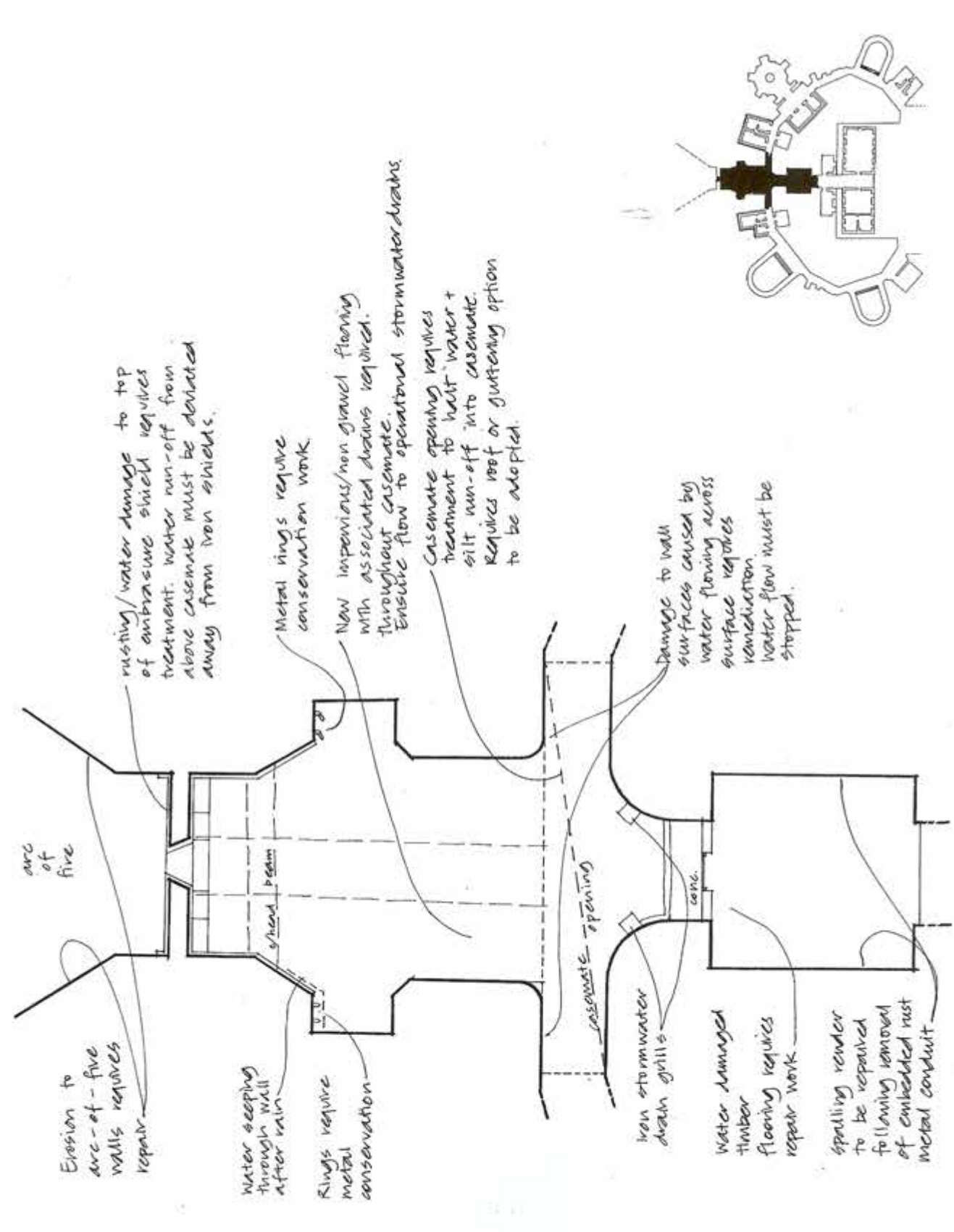
Gun no.1 & Stores



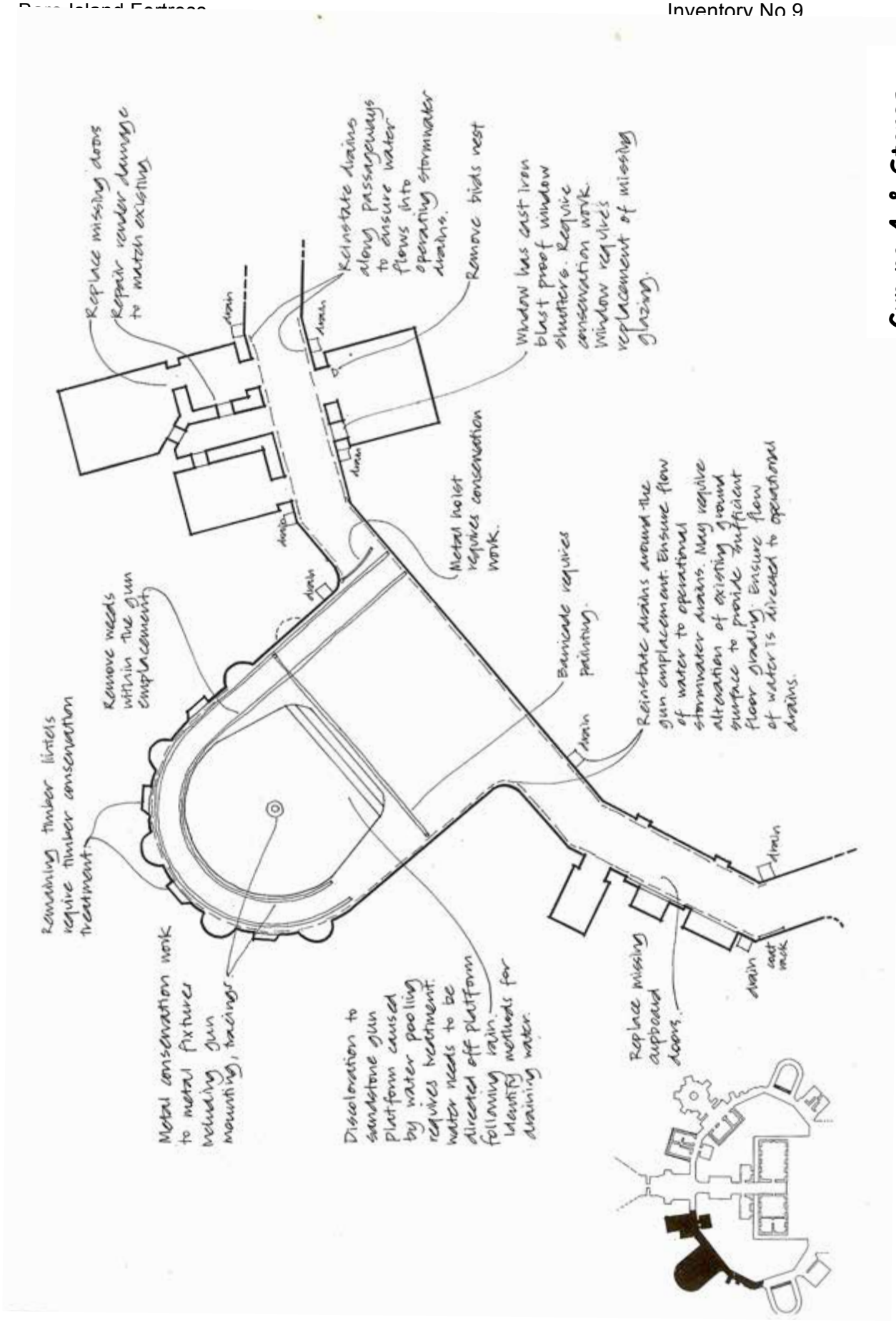
Gun no.2 & Stores



Gun no.3 & Stores



Gun no.4 & Stores



Gun no.5 & Stores