

# Buckland Hill

## Conservation Management Plan

November 2019 | 18-250

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Buckland Hill is sited upon Whadjuk Noongar country.  
We acknowledge the traditional owners and custodians of this land.  
We pay our respect to Elders past, and present and those who will follow in their footsteps.

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# TAWAY DIAGRAM OF A 6 inch Mk7 WIREWOUND GUN BARREL



JACKET  
WIRE WINDING  
'A' TUBE

JACKET  
WIRE WINDING  
'A' TUBE





# Executive Summary

The Buckland Hill Conservation Management Plan (CMP) has been prepared as a guiding document for the management of heritage and environmental values at the site, on behalf of the Town of Mosman Park. A CMP seeks to understand the place and assess its cultural significance before developing conservation policies based on the gathered data, in line with the expectations of the Burra Charter (2013) and the State Heritage Office (SHO) 'Conservation Management Plans Standard Brief'. The Buckland Hill CMP has also considered aspects related to environmental management including the National standards for the practice of ecological restoration in Australia prepared by the Society for Ecological Restoration Australasia (SERA) in 2018. Acting as a guiding document for future conservation and management of the site, the CMP aims to ensure that decisions are made with due regard to the cultural and environmental significance of the place and that its values are respected and enhanced by future activities.

Buckland Hill presents a complex site in which future management must balance both the heritage and environmental values of the place. Heritage values relate primarily to the World War Two Leighton Battery site and its Registered Curtilage as outlined by the State Heritage Office (Place No.3247). Environmental values need to be considered in the context of *Biodiversity Conservation Act 2016* and the *Environmental Protection Act 1986* with the native vegetation within the site noted as regionally significant, containing a threatened ecological community and providing an important corridor linking the Swan River to the coastal foreshore.

Buckland Hill has a long standing connection with the history and development of the Perth area. The topographically prominent site is located between the Swan River and Indian Ocean in Mosman Park and acts as a visual marker within the surrounding context, providing an important environmental link between the coast and the river. It is a site of continuing Aboriginal heritage significance and has historic links with the early colonisation of Western Australia playing a key role in the explorations of Willem de Vlamingh and Captain James Stirling.

In more recent times, Buckland Hill has played a vital role in the coastal defences of Western Australia. It began its military associations during World War One before being compulsorily acquired as a defence facility in 1941. It was during the World War Two period that the Leighton Battery was established and the tunnel system, gun emplacements and a number of significant above ground structures were constructed.

The Battery was one of a series of coastal defence artillery posts located around the Fremantle harbor entry known as the 'Fremantle Fortress', designed to overlook the coast and approaching vessels and protect this key defensive position from both sea and aircraft attack. Leighton Battery's visual setting and links to the Indian Ocean play an important role in interpreting the heritage values of the site.

The site is classified today as a 'class A' reserve 'for the purposes of public recreation' managed by the Town of Mosman Park with the tourism and maintenance operations of the Leighton Battery undertaken by volunteers of the Royal Australian Artillery Historical Society of Western Australia. This culturally significant local and state and nationally listed heritage site has been developed as a tourism attraction with the World War Two tunnels currently open to the public on Sunday afternoons.

Significant environmental work has also occurred on the site to rehabilitate the reserve after the departure of military uses in the 1970s and as part of the development of the Buckland Hill estate in 1989. The development of the estate has seen increased pressures put on the site to provide safety and amenity to the growing numbers of surrounding residents. The Friends of the Mosman Park Bushland currently contribute to the management of the open space as an environmental asset.

This document seeks to establish a balance between the retention and enhancement of heritage values and the impacts upon the site's native vegetation. A key outcome of this process is establishment of the proposed vegetation height management zones which relate to specific views of significance. These vegetation height management zones have been identified for their relationship to points of exceptional significance, namely the gun emplacements and observation post and will direct pruning to only occur within particular zones and to prescribed heights. This will ensure appropriate management processes occur which maintain the heritage significance of the place and assist in its interpretation, without detrimentally impacting the overall environmental values of the place.

Development of this CMP has occurred alongside engagement sessions undertaken with key stakeholders in order to understand and give voice to the various stakeholder values which Buckland Hill represents. The preparation of this CMP has been the result of collaboration between the Town of Mosman Park, element's heritage and engagement teams and Emerge Associates providing environmental advice. Together, the team aimed to provide a holistic framework and guiding philosophy to allow for future use and management of the site. The management and care of Buckland Hill should encapsulate heritage and environmental best practice and support the Town of Mosman Park's vision for the future of Buckland Hill as a sustainable heritage tourism and recreational destination.

This CMP sets out to:

- Guide the management, care and protection of Buckland Hill as an asset of cultural and environmental significance;
- Identify the constraints and opportunities arising from the heritage and environmental values of Buckland Hill; and
- Allow for change to provide for a sustainable future.

Key conservation policies include:

- The management and implementation of the policies set out in this plan is the responsibility of the primary landholder, the Town of Mosman Park;
- Identified areas of significance within the Buckland Hill landscape enhance the values of the place, and they should be conserved with minimum degree of change;
- Where further change might occur, it must be in accordance with this document and policies and be sympathetic to the heritage values of Buckland Hill;
- As a site of ecological significance any changes proposed to landforms, hydrology, vegetation, fauna, fauna habitat within the site should be sympathetic and act to protect and enhance environmental values; and
- As a site of high archaeological potential, all archaeological undertakings should be documented and interpreted in accordance with an archaeological management plan.

Primary Outcomes of the CMP are:

- Establish both significant and valued aspects of the place's culture and environment;
- Ensure authenticity and values retention of the place;
- Establish appropriate vegetation height management;
- Ensure a rights-based approach to all existing heritage values in the place; and
- Mitigate risks of fire hazards, anti-social behaviour and security.

# Abbreviations

<b>CMP</b>	Conservation Management Plan
<b>DBCA</b>	Department of Biodiversity, Conservation and Attractions
<b>DPLH</b>	Department of Planning, Lands and Heritage
<b>HCWA</b>	Heritage Council of Western Australia
<b>ICOMOS</b>	International Council on Monuments and Sites
<b>LPS3</b>	Town of Mosman Park Local Planning Scheme No. 3
<b>MRS</b>	Metropolitan Region Scheme
<b>RAAHS</b>	Royal Australian Artillery Historical Society of Western Australian
<b>SHO</b>	State Heritage Office (now referred as Heritage Services of the DPLH)
<b>SLWA</b>	State Library of Western Australia
<b>TEC</b>	Threatened Ecological Community
<b>ToMP</b>	Town of Mosman Park
<b>WAPC</b>	Western Australian Planning Commission
<b>BTY</b>	Battery

# Glossary

The following Whadjuk Noongar words are used in this CMP. We acknowledge that as an oral tradition, there are often alternative spellings of these terms and while the best effort has been made to represent this variation, other interpretations are likely to exist outside of our glossary. A number of Noongar place names have also been utilised throughout this document; appropriate translations have been provided where possible, drawn from sources including Rose Whitehurst’s Noongar Dictionary and the Kaartdijin Noongar word list.

Beeliar	River. Also spelt bilya.
Boodjar	Country, land. Also spelt boodja, booja.
Noongar	The Aboriginal people of the south-west of Australia and their official language. Also spelt Nyungar, Nyoongar, Nyoongah, Nyungah, Nyugah, Yungar and Noonga.
Whadjuk	The Noongar dialectal group from the Perth region. Also spelt Wadjuk.
Walyalup	Name for the Fremantle area, various translations for the name include ‘the crying place’ due to its relationship to burial sites in the area and/ or coming from the word ‘walyo’, Noongar term for the woylie an animal which was once abundant in the area.
Waugal	The rainbow serpent from Noongar creation time responsible for the formation of the Swan and Canning Rivers and other waterways. Also spelt Wagyl, Warkul, Waakal, Warrkul and Woggle.

Throughout this CMP the terminology set out in the Burra Charter is used. These terms are set out below in relation to heritage values. As far as possible the same terminology has been applied to environmental values. Where this does not apply, terms have been explained in text.

<b>Place</b>	means a geographically defined area. It may include elements, objects, spaces and views. Place may have tangible and intangible dimensions.
<b>Cultural significance</b>	means aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Places may have a range of values for different individuals or groups.  Note: The term cultural significance is synonymous with cultural heritage significance and cultural heritage value.
<b>Fabric</b>	means all the physical material of the place including elements, fixtures, contents and objects.
<b>Conservation</b>	means all the processes of looking after a place so as to retain its cultural significance.
<b>Maintenance</b>	means the continuous protective care of a place, and its setting. Maintenance is to be distinguished from repair which involves restoration or reconstruction.
<b>Preservation</b>	means maintaining a place in its existing state and retarding deterioration.
<b>Restoration</b>	means returning a place to a known earlier state by removing accretions or by reassembling existing elements without the introduction of new material.
<b>Reconstruction</b>	means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material.
<b>Adaptation</b>	means changing a place to suit the existing use or a proposed use.
<b>Use</b>	means the functions of a place, including the activities and traditional and customary practices that may occur at the place or are dependent on the place.

<b>Compatible use</b>	means a use which respects the cultural significance of a place. Such a use involves no, or minimal, impact on cultural significance.
<b>Setting</b>	means the immediate and extended environment of a place that is part of or contributes to its cultural significance and distinctive character.
<b>Related place</b>	means a place that contributes to the cultural significance of another place.
<b>Related object</b>	means an object that contributes to the cultural significance of a place but is not at the place.
<b>Associations</b>	mean the connections that exist between people and a place.
<b>Meanings</b>	denotes what a place signifies, indicates, evokes or expresses to people.
<b>Interpretation</b>	means all the ways of presenting the cultural significance of a place.
<b>Policy</b>	a course or principle of action adopted or proposed by an organisation or individual.

#### Additional Heritage Terminology

<b>Policy</b>	a course or principle of action adopted or proposed by an organisation or individual.
<b>Authenticity<sup>^</sup></b>	the extent to which the fabric is in its original state, generally graded on a scale of High, Medium or Low.
<b>Integrity<sup>^</sup></b>	the extent to which a building retains its original function, generally graded on a scale of High, Medium or Low.
<b>Condition<sup>^</sup></b>	the current state of the place in relation to the values for which that place has been assessed, and is generally graded on the scale of Good, Fair or Poor.

<sup>^</sup> definitions sourced from Department of Planning, Lands and Heritage, "Criteria for the assessment of Local Heritage Places and Areas" 2012.

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Filler Image 3: View from command post (element 2019).

# Part I



# 1. Introduction

## 1.1 Background

Buckland Hill is a unique landscape overlooking the Swan River and Indian Ocean in Mosman Park. Topographically prominent, the site is a visual marker within the surrounding context and provides an important environmental green link between the coast and the river. It is sited approximately 400 metres east of the Indian Ocean and 800 metres north-west of the Swan River.

The Buckland Hill site has significant national, state and local cultural and environmental values. The site sits within a registered Aboriginal heritage site (Rocky Bay 3596) and shares associations with other registered sites in the immediate area. The Buckland Hill area is believed to be a key location in the early European exploration of Western Australia, following Dutch explorer Willem de Vlamingh's expedition party exploration of the area in 1697. It is home to a complex of former military coastal defence installations known as the Leighton Battery which was part of the Fremantle Fortress complex of defence installations and played an important role in the planned defences of Fremantle during World War Two. It also supports relatively large areas of native vegetation that are considered significant, including areas of 'threatened ecological community' (TEC) '*Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain', and forms an important natural link between the ocean and the river.

Since the end of World War Two, the Leighton Battery has become a prominent feature amongst Buckland Hill and Buckland Hill Reserve, also known as Buckland Hill Park, which are bound by Stirling Highway and by a residential development established in 1989. Although no longer used for its original purpose, the Leighton Battery is currently managed by the Royal Australian Artillery Historical Society of Western Australian (RAAHS) who operates an interpretative visitor experience to the place. The greater Buckland Hill area, including Vlamingh Parkland, currently provides recreational opportunities for visitors and is managed by the Town of Mosman Park. The Friends of the Mosman Park Bushland currently contribute to the management of the open space as an environmental asset.

Buckland Hill is located on land vested to the Town of Mosman Park, who oversees the long-term management and development of the site. Management of the Leighton Battery site is undertaken by the RAAHS who have overseen the reconstruction, maintenance and redevelopment works on the site to date. They have also established the site as a tourist attraction, operating guided tours of the World War Two tunnels every Sunday.

There is an opportunity to ensure that the ongoing use of Buckland Hill Reserve combines the advantages of its cultural and environmental significance; retains and enhances its values, provides a safe visitor experience and is prepared for the prospects of increased active and recreational visitor activity. This Conservation Management Plan (CMP) provides a clear and compelling vision for the site, setting out a pragmatic and action orientated management plan to guide resourcing and funding, as well as the prioritisation of on ground works. It has been developed through substantial engagement with key stakeholder groups to ensure the final plan provides a clear pathway to reconcile the needs of significant heritage and environmental values. The CMP sets out the range of considerations that will assist in ensuring that both the tangible and intangible heritage and environmental values associated with Buckland Hill are conserved and enhanced into the future.



Figure 1. Location Plan (element, 2019)

## 1.2 Purpose

This CMP is designed to guide the future management of Buckland Hill Reserve. It will be the primary document for the protection and care of the heritage and environmental values of the place. Specifically, this CMP has been commissioned by the Town of Mosman Park in order to:

- Capture the most up to date understanding of the cultural heritage significance of Leighton Battery to inform owners, users and decision-makers;
- Identify opportunities, constraints and control risks associated with the Leighton Battery within the context of Buckland Hill Reserve;
- Identify the key environmental values and the constraints that these will pose for the future use and management of the site;
- Provide a framework to ensure that the cultural heritage and environmental significance of the place are at the forefront of planning for its future; and
- Provide a framework for ongoing management and maintenance of the place.

Proportionate weight has been afforded to the management of all values in the understanding that, if required, minor impacts to environmental values are only considered where there is a strong argument based on protection and maintenance of heritage values and vice versa.

## 1.3 Study Area

Buckland Hill is located to the south-west of Mosman Park, comprising the eastern, northern and western face of a coastal hillside. The study area is irregular in shape, located over four individual lots, as outlined in the table below. The study area is bounded by Stirling Highway to the west, Boundary Road, Poole Place, Rebel Place and residential development to the north, residential development and Portsea Rise to the east, and McCabe Street, Edwards Place, Somerset Crescent, Vlamingh Parade and residential development to the south.

The study area for this CMP includes the area of land that is heritage listed by the Town of Mosman Park as well as the Heritage Council of Western Australia (registered curtilage). Parts of the study area are also listed nationally by Engineers Australia, whose nomination specifically “focuses on the 6” and 5.25” gun batteries installed at Leighton”<sup>1</sup>

It encompasses part of Lot 455 and Lot 456 for the Leighton Battery, as well as portion of Lot 462 and 501 as shaded in the table below and illustrated in Figure 2. The current ownership of each of these lots is also outlined in the table below.

Lot	Plan/ Diagram	Vol/Folio	Address	Registered Proprietor
455	P217739	LR3096/197	2A Boundary Road	State of WA (vested in to the Town of Mosman Park)
456	P217739	LR3096/224	2A Boundary Road	State of WA (vested in to the Town of Mosman Park)
462	P017216	LR3096/234	Lot 462 Somerset Crescent	State of WA (vested in to the Town of Mosman Park)
501	P194999	LR3118/870	No Address	State of WA (vested in to the Town of Mosman Park)



LEGEND

- Study Area
- Registered Curtilage
- Cadastral



NOTES:

1. Drawings based on survey information provided by others.
2. All drawings to be printed in A3 colour

Figure 2. Study Area and HCWA Curtilage (element, 2019)

## 1.4 Relevant Legislation and Policy

The following statutory framework is applicable to this CMP for Buckland Hill.

### Heritage Act 2018

The *Heritage Act 2018* (the H Act) outlines the Heritage Council of Western Australia's functions and responsibilities. It also provides for a range of regulatory orders that the Heritage Minister may issue to provide special protection for a place. The study area contains one state registered place that is protected under this act.

The Act also requires the Town of Mosman Park to compile and maintain an inventory of places (referred to as a Local Heritage Survey) within its municipality which are considered of local heritage significance. The study area contains two places which have been included on this inventory places of local heritage significance.

### Metropolitan Region Scheme

The Metropolitan Region Scheme (MRS) defines the future use of land and provides the legal basis for planning in the Perth metropolitan region, dividing it into broad zones and reservations. The study area is reserved as 'Parks and Recreation' and partially reserved 'Primary Regional Roads' under the MRS. It is noted that the Western Australian Planning Commission (WAPC) is the responsible determining authority for any works associated within this reserve.

### Town of Mosman Park Local Planning Scheme No. 3

The Town of Mosman Park Local Planning Scheme No. 3 (LPS3) is a statutory document which sets out the way land is to be used and developed and classifies areas into zones to control land use. Pursuant to LPS3, the study area does not contain any reserved or zoned land, however includes Leighton Battery on its Heritage List.

### Planning and Development (Local Planning Schemes) Regulations 2015

The *Planning and Development (Local Planning Schemes) Regulations 2015* (Regulations) sets out the deemed provision which prevail over various provision of the Town's local planning scheme. Consequently, scheme provisions of LPS3 will have no effect if they are inconsistent with the deemed provisions of the Regulations.

### Aboriginal Heritage Act 1972

The *Aboriginal Heritage Act 1972* (AH Act) makes provision for the preservation of places and objects customarily used by, or traditional to, the original inhabitants of Australia or their descendants. Of particular relevance is the application of the AH Act to places which include both registered and unregistered sites of Aboriginal importance and significance. The study area contains one registered Aboriginal heritage site prescribed under this Act.

### Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) and its associated regulations provide for the conservation and protection of biodiversity and the ecologically sustainable use of biodiversity components in Western Australia. Under the BC Act species and communities may be classed as 'threatened' and assigned a conservation status according to their National extent. It is an offence to 'take' or disturb threatened flora species or communities without approval from the State Minister for the Environment. The BC Act also specifically prohibits the taking of flora from crown land. The site contains a threatened ecological community (TEC) listed under this act and flora within the portion of the site that is crown land would be afforded additional protection.

### Environmental Protection Act 1986

The *Environmental Protection Act 1986* (EP Act) and its associated regulations provide for the 'prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing'. All native flora and vegetation (including flowers, seeds, whole plants, timber and firewood) in Western Australia is protected under the EP Act and it is an offence to clear native vegetation without the authority of a permit or an exemption. Therefore, all native vegetation in the site is protected under the EP Act. The significance of State listed TECs (such as that in the site) is also acknowledged through other environmental approval processes under the EP Act and its associated regulations, such as 'environmental impact assessment'.

## Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's central piece of environmental legislation. It defines nationally and internationally important flora, fauna, ecological communities and heritage places and provides a legal framework for their protection and management. Under the Act, flora and fauna species and ecological communities may be listed as 'threatened' and assigned a conservation status according to their National extent. Any action likely to have a significant impact on a species or TEC listed under the EPBC Act requires approval from the Commonwealth Minister for the Environment and Energy. The site does not currently include any values listed under the EPBC Act.

## The Biosecurity and Agriculture Management Act 2007

The *Biosecurity and Agriculture Management Act 2007* (BAM Act) is the principle legislation guiding pest flora (weeds) and pest fauna management in Western Australia and lists declared pest species. Declared pests can be assigned to 'C1 – exclusion', 'C2 – eradication' or 'C3 – management' control categories under the *Biosecurity and Agriculture Management Regulations 2013* (BAM Regs). At least three weed species listed as declared pests under the BAM Act occur within the study area.

## Weeds of National Significance

The Australian government has compiled a list of 32 'Weeds of National Significance' (WoNS) (DoEE 2018), of which many are also listed under the BAM Act. WoNs are an administrative or policy listing without a statutory obligation for management. At least three weed species listed as WoNS occur within the study area.

## Land Administration Act 1997

In Western Australia areas of Crown land set aside for the protection and conservation of biodiversity and/or natural or cultural heritage values are referred to as 'conservation reserves'. The *Land Administration Act 1997* provides the legislative basis for the creation, management, amendment and cancellation of conservation reserves.

The western portion of the site (Lots 455 and 456 on deposited plan 217739) is classified as a 'Class A' reserve 'for the purposes of public recreation'. 'Class A' category reserves afford the greatest degree of protection for reserves and this classification is used solely to protect areas of high conservation or high community value.

## 1.5 Historic Heritage Listings

The cultural heritage significance of Buckland Hill is recognised through two individually identified places; Leighton Battery and the Pine Trees at Buckland Hill. The listings associated with these places and its applicable legislation are outlined in the table below.

Listing	Leighton Battery	Pine Trees at Buckland Hill
<b>Engineers Australia</b>	Awarded Engineering Heritage National Marker (2014)	-
<b>State Register of Heritage Places (<i>Heritage Act 2018</i>)</b>	Permanently entered in its own right (Place No. 3247)	-
<b>Aboriginal Heritage Sites Register (<i>Aboriginal Heritage Act 1972</i>)</b>	Registered as a mythological and named place – Rocky Bay (Place No. 3596) and recorded as Mosman Park (Place No. 21253)	Registered as a mythological and named place – Rocky Bay (Place No. 3596) and recorded as Mosman Park (Place No. 21253)
<b>Town of Mosman Park Heritage List (<i>Planning and Development Act 2005</i>)</b>	Included in its own right (Place No. 11)	-
<b>Town of Mosman Municipal Inventory (<i>Heritage Act 2018</i>)</b>	Included in its own right (Place No. 11)	Included in its own right (Place No. 20)
<b>National Trust Classification (non-statutory)</b>	Classified	-
<b>Register of the National Estate (non-statutory - repealed)</b>	Registered	-

## 1.6 Environmental Listings

Applicable Legislation	Place Name	
	Plant Community CpMI	Native Vegetation Pine Trees at Buckland Hill
<b>Threatened ecological community (TEC) list (<i>Biodiversity Conservation Act 2016</i>)</b>	Listed as a 'vulnerable' TEC 'Callitris preissii (or <i>Melaleuca lanceolata</i> ) forests and woodlands, Swan Coastal Plain'	Protected
<b><i>Environmental Protection Act 1986</i></b>		Protected
<b>Town of Mosman Park Municipal Inventory (<i>Heritage Act 2018</i>)</b>		Included in its own right (Place No. 20)
<b><i>Land Administration Act 1997</i></b>		Class A Reserve (within Lots 455 and 456)

## 1.8 Methodology

### Heritage Approach

This is the first Conservation Management Plan for Buckland Hill comprising Leighton Battery and Pine Trees at Buckland Hill. It has been prepared with particular reference to the 'Conservation Management Plans Standard Brief' and information guide published by the Western Australian State Heritage Office (SHO) (now Department of Planning, Lands and Heritage – DPLH) in 2013 and the principles and processes of the Australia ICOMOS Charter for Places of Cultural Significance, 2013 (Burra Charter). It has also been guided by the balanced methodology proposed by J.S. Kerr in 'The Conservation Plan – A Guide to the Preparation of Conservation Plans for Places of European Cultural Significance' (seventh edition, 2013).

In addition, this CMP has been prepared with regard to the following documents, which contain valuable material regarding the place, and have provided a wealth of information about its history, heritage and the people associated with Buckland Hill:

- Buckland Hill Action Group, 1988, Buckland Hill Regional Park Concept Study;
- Wood & Grieve Engineers, 1989, Buckland Hill Management Plan;
- Western Australian Planning Commission, 1998, The Vlamingh Parklands;
- Engineers Australia, 2014, Nomination of Fremantle Fortress – Leighton Battery World War Two Coastal Defence Facilities;
- Savagely Creative and Creative Spaces, 2015, Leighton Battery Interpretation Plan;
- Palassis Architects, 2015, Leighton Battery Inspection Report;
- Moodjar Consultancy, 2016, Statement of Significance for the Fremantle Area and Registered Aboriginal Sites – Cantonment Hill, Rocky Bay and Swan River;
- Dorian Engineering Consultants, 2018, Preliminary Structural Integrity Report: Leighton Battery Heritage Site – Mosman Park WA;
- Dorian Engineering Consultants, 2018, Masonry Crack Monitoring Report: Leighton Battery Heritage Site – Mosman Park WA; and
- State Heritage Office, inHerit database.

### Environmental Approach

The site supports relatively large areas of native vegetation that are considered significant for various reasons. The environmental approach in this CMP focuses on conservation and improvement of native vegetation, through actions such as revegetation, weed control and pest fauna monitoring.

A survey of flora and vegetation values of the site has been undertaken as described in Appendix 11. Some areas of native vegetation associated with military infrastructure are proposed to be subject to height management to maintain significant historical views. Height management activities will only be undertaken following receipt of appropriate permits and approvals. The environmental impacts of the vegetation height management actions are considered to be minimal and these areas will be mitigated through revegetation using local native species and weed control.

In addition to the documents noted in the previous section, the environmental aspects of this CMP have been prepared with regard to the following documents, which provide important information regarding past and present environmental approaches to the management of natural spaces within the Town of Mosman Park:

- Ecoscape (Australia), 2002, Western Suburbs Greening Plan;
- Regeneration Technology Pty. Ltd., 2004, Buckland Hill Park and Monument Hill Park Weed Control and Revegetation Plan;
- Ecologia Environment, 2009, Environmental Framework; and
- Entire Fire Management, 2018, Bushfire Risk Management Plan.

### Stakeholder Engagement Approach

As per the Burra Charter, stakeholder and community engagement is recommended throughout the preparation of the CMP to ensure that local values are adequately captured and explored.

Engagement for the Buckland Hill CMP provides a means to understand how to meet the needs of local residents, community groups and the wider community. The engagement approach was designed to engage with local stakeholders in order to:

- Present technical findings of the site analysis;
- Understand challenges and opportunities of site users;
- Gather feedback and validate understanding; and
- Present progressive preparation of the Buckland Hill CMP, including draft document review.

Preliminary engagement was limited to representative stakeholder groups during the preparation of the draft CMP. The broader community was invited to provide comment during the public consultation period.

For a detailed description of the engagement approach and activities undertaken see Appendix 12 for a copy of the Engagement Outcomes Report, including Stakeholder and Communications Plan.

## 1.9 Acknowledgements

We wish to acknowledge the custodians of this land, the Whadjuk people of the Noongar nation and their Elders past, present and future. We acknowledge and respect their continuing culture and the contribution they make to the life of this city and this region. We are also particularly grateful for the work of the following individuals and groups for their contribution to the research and understanding of the place:

- Tom Atkinson and Rachel Omodei from Emerge Associates;
- Graham McKenzie-Smith for the preparation of Defending Fremantle, Albany and Bunbury 1939 to 1945;
- David Harrington of Wood and Grieve Engineers for the preparation of the Buckland Hill Management Plan in 1989;
- The Buckland Hill Action Group for the preparation of the Buckland Hill Regional Park concept study in 1988;
- Western Australia Planning Commission for the preparation of the report for The Vlamingh Parklands in 1989;
- Savagely Creative and Creative Spaces for the preparation of the interpretation plan for the Leighton Battery in 2015;
- Palassis Architects for the preparation of the Leighton Battery Inspection Report in 2015; and
- Dorian engineering consultants for their ongoing structural reporting on the Leighton Battery site.

In addition to the above, we would like to acknowledge the invaluable assistance of Matthew MacPherson and Jackie Parker at the Town of Mosman Park, and the members of the Project Reference Group from The Royal Australian Artillery Historical Society, The Friends of the Mosman Park Bushland, and The Buckland Hill Estate Ratepayers Association.

## 1.10 Study Team

The plan has been prepared by the following **element** heritage and engagement team members, assisted by **element** administrative and graphical support staff:

- Flavia Kiperman: Associate Heritage, B.Sc. (Hons) (Architecture and Urban Designs), M.Sc (Heritage Management), M.ICOMOS;
- Alana Jennings: Consultant Heritage, BEnvDes (Environmental Design), M.Arch (Architecture), MHeri (Heritage Studies), M.ICOMOS; and
- Liz Pope: Consultant Engagement, B.ES (Environmental Science), MA. (Urban and Regional Planning).

Environmental reporting has been prepared by the following team members from Emerge Associates:

- Tom Atkinson: Senior Environmental Consultant - Ecology B.EnvSc(Hons), MEnvSc(Res); and
- Rachel Omodei: Lead Environmental Consultant - Ecology B.Sc(Botany, Zoology), BSc(Hons) (Botany).



## 2. Evidence

References and citation of the chronology table can be found in the Brief History section or as end notes.

### 2.1 Documentary Evidence

#### Chronology

The following chronology provides an overview of the key activities that have shaped Buckland Hill as it is today, from pre-colonial times, through the site's role in early exploration and military functions, its decline in use and finally its reactivation for tourism, recreation and environmental uses.

The historical information contained within this plan has been drawn from referenced sources, which are listed in the bibliography. It is not a comprehensive history of the place, rather it identifies the key phases associated with the history of Buckland Hill from pre-colonial time to the present day that will inform the assessment and management of Buckland Hill as a cultural landscape.

It is recognised that the area of land listed by the State Heritage Office of Western Australia as the Leighton Battery Registered Curtilage encompasses a specific area of land upon Buckland Hill. This site was a component of a much larger military presence in the area which has not been addressed in detail within this report. Further research and archaeological potential exists to investigate the places relationship to other military elements. This includes, but is not limited to, the camps and searchlight structures which were located outside of the Registered Curtilage, and the history and roles of the various units stationed there.

<b>Pre colonisation</b>	Buckland Hill forms part of a range known to the Whadjuk Noongar people as the Seven Sisters. It is closely linked to a number of Nyittiny (creation) stories and significant sites from the Walyalup (Fremantle) area.
<b>1696</b>	Willem de Vlamingh visits Western Australia with the ships De Geelvinck, De Nijptang and Weseltje to chart the coast for the Dutch East India Company and search for the missing vessel De Ridderschap van Holland
<b>1697</b>	Willem de Vlaming and his party come ashore around the Leighton/ Cottesloe Beach area and proceed to explore the Swan River area towards Freshwater Bay
<b>1827</b>	Captain James Stirling explores the area and names the hill after William Buckland an English theologian, geologist and palaeontologist. He recommends the site for the capital of the Swan River
<b>1850</b>	A timber-framed navigational beacon is erected on the eastern side of Buckland Hill to assist in geodesy and shipping.
<b>1875</b>	A trigonometrical station is erected on the eastern side of Buckland Hill
<b>1878-1880</b>	The Monument which sits atop Buckland Hill to the east of the Leighton Battery site was constructed by convicts
<b>1890</b>	Allotments for quarrying the Buckland Hill and the Rocky Bay area were let
<b>1893</b>	Earliest coastal defences installed at Albany, known today as Princess Royal Fortress <sup>2</sup>
<b>1904</b>	Quarries on Buckland hill ceased production
<b>1906</b>	Fort Arthur Head established north of the Roundhouse in Fremantle <sup>3</sup>
<b>1909</b>	Fort Arthur Head outfitted with two 6" Mk VII guns <sup>4</sup> Fort Forrest established in the North Port area of North Fremantle

<b>1913</b>	Buckland Hill is vested to the University of Western Australia
<b>1914</b>	World War One is declared
<b>1918</b>	World War One ends
<b>1924</b>	Metropolitan Water Board constructs the first reservoir on the eastern side of Buckland Hill beside the Monument
<b>1932</b>	Unemployment reaches a peak of 32% during the Great Depression and Buckland Hill is used as a campsite by unemployed men.
<b>1934</b>	Reservoir at the Monument site is enlarged
<b>1935</b>	Construction of Rottnest Island defence facilities commences
<b>1936</b>	Consideration is given to the construction of a defence facility at Buckland Hill, but it is overlooked due to concerns that the gunfire could interfere with the telegraphic cables and instruments located at the cable station at Leighton Beach.  Two 9.2" Mk X guns are installed at Oliver Hill on Rottnest Island <sup>5</sup>
<b>1938</b>	Fort Forrest 6" Mk VII guns are moved to Swanbourne to form part of Swanbourne Battery
<b>1937-1938</b>	Two 6" Mk XI guns are installed at Bickley Battery on Rottnest Island <sup>6</sup>
<b>1938</b>	The Royal Australian Navy (RAN) operates a signal station from Buckland Hill
<b>1939</b>	World War Two is declared in Europe
<b>1940</b>	The Japanese occupy northern Indochina Australian troops depart Fremantle



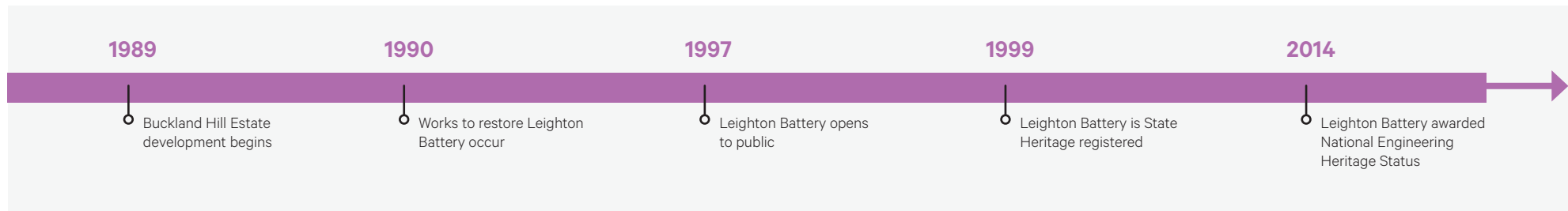
<b>1941</b>	<p>HMAS Sydney is sunk off the coast of Western Australia by the German raider Kormoran. The wreckage is located in 2008, 100 nautical miles off the coast of Steep Point, just south of Carnarvon.</p> <p>Japan launches attacks on Pearl Harbor, Thailand, British Malaysia, the Philippines, Hong Kong, Manila and Singapore</p> <p>Two 3" AA guns are placed on South Mole at Fort Arthur Head<sup>7</sup></p> <p>The Australian Army establishes Leighton Fort and three 3.7" anti-aircraft guns are installed<sup>8</sup></p>
<b>1942</b>	<p>Two 3" AA from Fort Arthur Head moved to Rottnest Island<sup>9</sup></p> <p>Plans are made to install the two 6" guns from Arthur Head at Buckland Hill Leighton Battery</p> <p>Fall of Singapore to Japanese forces</p> <p>Bombing of Darwin and Broome by Japanese forces</p> <p>Harbour Battery is established at the Fremantle harbour entrance</p> <p>Challenger Battery established on the northern tip of Garden Island</p> <p>Beacon Battery established on north eastern tip of Garden Island<sup>10</sup></p>
<b>1943</b>	<p>Harbour Battery guns replaced by two modern twin 6 pounder guns<sup>11</sup></p> <p>Scriven Battery construction commenced on Garden Island<sup>12</sup></p> <p>Two 6" guns from Arthurs Head are installed and operational at Leighton Barracks</p>
<b>1944</b>	<p>Works commence on three 5.25" guns, a battery observation post, magazine bunkers and plotting room at the Leighton Battery site<sup>13</sup></p>

<b>1945</b>	<p>Leighton battery 6" guns are replaced by three 5.25" dual coast and anti-aircraft guns with the 6" guns moved to the Princess Royal Battery.</p> <p>World War Two ends in Europe on May 8, conflicts continue in the Asia region until an armistice on August 14 and the formal surrender of Japan on September 2</p>
<b>1947</b>	<p>The 5.25" guns at Leighton Battery are proofed, becoming the only functioning 5.25" guns nationally</p>
<b>1950</b>	<p>Public demonstrations of the Leighton Battery 5.25" guns take place<sup>14</sup></p>
<b>1952</b>	<p>Leighton Battery is used as a cadet camp for Army cadets from regional schools of agriculture<sup>15</sup></p>
<b>1963</b>	<p>Leighton Battery guns are dismantled and sold for scrap</p> <p>Land surrounding Buckland Hill is reallocated for residential use</p>
<b>c1963</b>	<p>A non-directional beacon is placed on the radar hut by the Fremantle Port Authority</p>
<b>1970s</b>	<p>Homes are being established on the slopes of Buckland Hill<sup>16</sup></p>
<b>1979</b>	<p>Buckland Hill land is returned to the Western Australian government and sold for housing development, with one third being retained as public open space.</p>
<b>1983-84</b>	<p>The Monument is removed and restored, being reinstated 48m from its original position</p>
<b>1987</b>	<p>Buckland Hill land is sold to the Western Australian Development Commission<sup>17</sup></p>



<b>1988</b>	Buckland Hill Action Group publishes its concept plan for Buckland Hill Land is sold to Anaed Pty Ltd <sup>18</sup>
<b>1989</b>	Development begins on Buckland Hill Estate which includes the publication of a management plan and scheduled works to restore the Leighton Battery site.
<b>1990</b>	Fremantle Port Authority beacon is relocated from the radar hut <sup>19</sup> Works take place around Leighton Battery including conservation and repairs of tunnels, addition of entry structures, replacement of command post windows, plantings and uncovering one gun emplacement
<b>1991</b>	A reserve is created for public recreation including the Leighton Battery tunnels Re-vegetation planting commences
<b>1993</b>	Leighton Battery is placed on the register of the National Estate
<b>1996</b>	Leighton Battery is classified by the National Trust WA
<b>1997</b>	Leighton Battery tunnel complex opens to the public
<b>1998</b>	A 6" gun barrel is obtained from Rottnest Island and mounted on one of the original emplacements at Leighton Battery
<b>1999</b>	Leighton Battery is listed on the State Register of Heritage Places

<b>2013</b>	A 6" gun shield was located in Victoria, donated to the RAAHS by the Mornington Peninsula Shire and installed on site
<b>2014</b>	Leighton Battery is nominated for and awarded an Engineering Heritage National Marker by Engineers Australia
<b>2015</b>	Indicative 3.7" and 40mm anti-aircraft guns installed onsite
<b>2018</b>	' <i>Callitris preissii</i> (or <i>Melaleuca lanceolata</i> ) forests and woodlands, Swan Coastal Plain' TEC identified on the site.
<b>2019</b>	Development of a Conservation Management Plan for the site



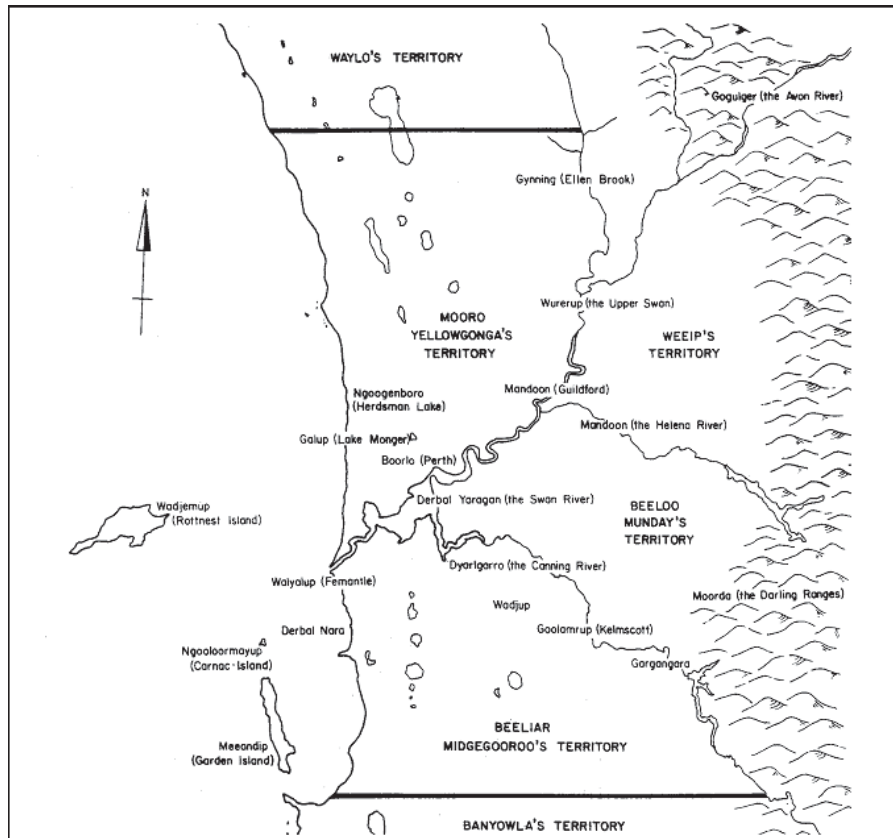


Figure 3. Neville Green, Place names and territories, in Neville Green, *Broken spears: Aborigines and Europeans in the southwest of Australia* (Perth: Focus Educational Services, 1984), 50.

## Pre-colonial Occupation

The Walyalup (Fremantle) area and sites around the Beeloo (river) encompass a number of Whadjuk Noongar places of *social, spiritual, historic and aesthetic* significance. Prior to the arrival of Europeans, Walyalup was an important place of community with sites around the area having a range of associated uses including places of spiritual belief, trade, ceremonial and cultural business, hunting and fishing, camping and lookout points.<sup>20</sup> The understanding of these places and their uses and stories developed over thousands of years through a connection to boodjar (country). This included an understanding of the six Noongar seasons and of the people's spiritual and social obligations to and of the land. The site on which Buckland Hill and the Leighton Battery is situated lies within the tribal grounds of Yellagonga known as Mooro, which stretches from the northern banks of the Swan River to the area around Joondalup and East towards Ellenbrook (Figure 3). Sets of tools and charcoal beds have been found in the area around Minum Cove which highlights the ongoing use of the area by Noongar people prior to the arrival of Europeans.<sup>21</sup>

At the writing of this plan in 2019 there are three key registered Aboriginal heritage sites located in proximity to the Buckland Hill site:

- Rocky Bay, a mythological site. The restricted site location boundary of this listing encompasses the Buckland Hill area;
- Cantonment Hill, a ceremonial, mythological, camp, named place and plant resource site. Although this site is located on the opposite side of the Swan River from Buckland Hill, its form and association with the Seven Sisters dreaming make it important to note alongside a pre-colonial understanding of the Buckland Hill site; and
- Swan River, a mythological site covering the major river systems of the Perth region.

In 2016 the City of Fremantle commissioned a report into the significance of these sites informed by consultation with the Whadjuk Advisory Group. The statements of significance for Rocky Bay and Cantonment Hill are included in a brief overview of the registered sites below. In addition to the registered sites there are a number of 'other heritage places' identified in the area that can be located through DPLH's Aboriginal Heritage Inquiry System.

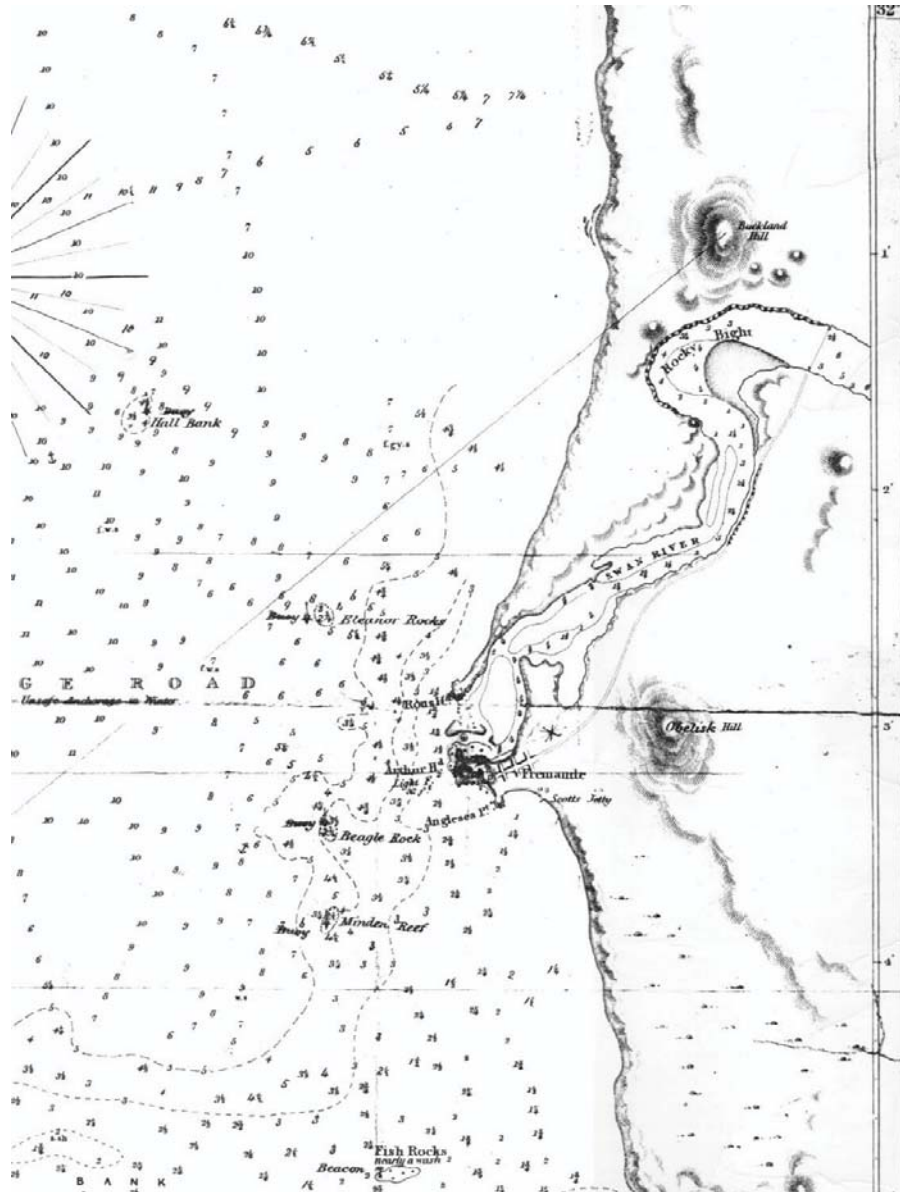


Figure 4. L.R. Stokes, Historic map showing Fremantle and part of the Swan River estuary, 1841.

## Rocky Bay

Rocky Bay is registered as the site of the Waugal Cave, also known by the name Garrungup or 'place of anger'. The physical site of the cave is located on the North Fremantle foreshore, but the associated areas of the Swan River and surrounds including Buckland Hill are closely linked to the stories and movements of the Waugal or Rainbow serpent. The statement of significance developed for the City of Fremantle highlights the social, spiritual, historic and aesthetic values of the registered site in which Buckland Hill is located. They are:

*Aboriginal Site DAA 3596 Rocky Bay is known to Whadjuk Nyoongar people as Garrungup (the place of anger). It is a large cave located in a limestone cliff [Waugal Mia] on the foreshore of the Beeliar (Swan River). Garrungup is an exceptionally important place to Whadjuk Nyoongar people. It has social, spiritual, historic and aesthetic values, which are enhanced by its uniqueness, connectedness to other places and beings, and its interpretive potential.*

*Garrungup holds high social and spiritual significance to Whadjuk Nyoongar people for its connection to dreaming narratives and creative ancestral beings. Specifically, it is the home of the Waugal (rainbow serpent), the pre-eminent creative ancestral spirit who made the trilogy of country, family and knowledge. The Waugal is central to Nyoongar beliefs, law and custom and is fundamental to Whadjuk Nyoongar sense of self, identity and culture. It is also significant for its association with major dreaming narratives including the Walyalup, Seven Sisters and Dingo Dreaming and other ancestral beings including Yondock (the crocodile) and Dwerda (the dingo).*

*Garrungup also holds historic significance as it is the residence of a significant historic figure (the Waugal) and is the location of a major historical creation event. It has aesthetic significance, as its dramatic and cavernous setting adjacent to the Beeliar (Swan River) enhances its sense of place as the home of a powerful creative being.*

*The primary significance of Garrungup is further enhanced by its rarity, connectedness and interpretive potential. The site holds rarity value, as there are no other similar sites located along the Beeliar in terms of its spiritual, social or physical components. It is extensively connected to other Nyoongar places and Aboriginal peoples across Australia through its associated creative beings, dreaming narratives and social networks. The Seven Sisters and Dwerda Dreaming's connect Garrungup with the Central and Western Deserts, South Australia and South West Australia.*

*The Walyalup dreaming connects Waugal Mia with local places including Wadjemup (Rottnest Island), Dwerda Weeardinup (Cantonment Hill), Wardan (the Indian Ocean), Beeliar (Swan River) and Kings Park. These connections are extremely important and form the basis of Whadjuk Nyoongar identity and culture. Garrungup further holds interpretive capacity as its publicly accessible setting can provide an opportunity to educate the broader public about Whadjuk Nyoongar culture and protocols.<sup>22</sup>*

### Cantonment Hill

Cantonment Hill is also known to the Whadjuk Noongar people as Dwerda Weeardinup meaning 'place of the dingo spirit'. It is recognised alongside Buckland Hill as one of the seven hills of Fremantle and is associated with the Seven Sisters dreaming narrative. It is likely, given these shared associations and the physical similarities between the sites, that aspects of this statement of significance may also be relevant to the Buckland Hill site. This connection would need to be confirmed through consultation with local Whadjuk Noongar knowledge holders.

*DAA 3419 Fremantle: Cantonment Hill is known to Whadjuk Nyoongar people as Dwerda Weeardinup (place of the Dingo spirit). It is an elevated hill located on the southern side of the Beeliar (Swan River) near where the river meets the ocean. Dwerda Weeardinup is an important place to Whadjuk Nyoongar people. It has social, spiritual, historic and aesthetic values, which are further enhanced by its uniqueness, connectedness to other places in the Fremantle region and beyond, and its interpretive potential.*

*Dwerda Weeardinup is of high spiritual and social significance to Whadjuk Nyoongar people for its connection to dreaming narratives and creative ancestral beings. It is associated with significant dreaming stories including the Seven Sisters, Walyalup and Dingo dreaming and ancestral beings including the Waugal (the rainbow serpent), Yondock (the crocodile), Dwerda (the dingo) and the Wardan Dwerda (sea dogs), which are fundamental to Whadjuk Nyoongar sense of self, identity and culture. The hill (still functions as a notable visual marker within the landscape) was used for observing the landscape and signaling other Nyoongar people with smoke and fire. Dwerda Weeardinup, with its close proximity to a wide array of resources, is also a place where people gathered and camped since nyittingy times.*

*Dwerda Weeardinup holds historic significance for its association with the first Nyoongar sightings of the arrival of the British fleet at Fremantle and its association with the incarceration of Nyoongar and other Aboriginal people on Wadjemup.*

*Dwerda Weeardinup also possesses aesthetic significance. It is an iconic landmark within the Fremantle Nyoongar landscape. Its elevated aspect relative to the surrounding landscape gives it visual and sensory connectivity to the Wardan (Indian Ocean, the place where spirits leave to go to another land), Wadjemup (Rottnest Island), Beeliar (the Swan River, the home of the Waugal), Manjaree (an important place of historic trade and exchange) and Walyalup (the wider Fremantle region). The view to Wadjemup in particular evokes strong feelings and memories associated with colonisation and the imprisonment of Nyoongar and other Aboriginal men on Wadjemup. The aesthetic setting of the place helps to reinforce the sense of place of Dwerda Weeardinup for Nyoongar people.*

*The primary significance of Dwerda Weeardinup is further enhanced by its rarity, condition, connectedness and interpretive potential. Dwerda Weeardinup is recognised by the Whadjuk Nyoongar community as one of the original seven hills of Fremantle associated with the Seven Sisters dreaming. The site therefore has rarity value as only two of these seven hills are known to exist today. Dwerda Weeardinup is connected extensively to other places and Aboriginal peoples across Australia through its associated dreaming narratives and social networks. It is connected directly with the Central and Western Deserts, South Australia, the South West Australia and has significant local connections with North Fremantle, Wadjemup (Rottnest Island), Garrungup (Rocky Bay), Wardan (the Indian Ocean), Beeliar (Swan River) and Kings Park. These connections are extremely important and form the basis of Whadjuk Nyoongar identity and culture. Dwerda Weeardinup further holds good interpretive capacity because its elevated and open setting offers a space where Whadjuk knowledge holders can interpret and educate the broader public about Dwerda Weeardinup and Nyoongar culture.<sup>23</sup>*

## Brief Thematic History ‘Understanding the Place’

### The Vlamingh Parklands

In 1696 Dutch Commodore Willem de Vlamingh visited the Western Australian coast aboard the frigate *De Geelvinck* of the Dutch East India Company along with Captain Gerrit Collaert of the *De Nijptang* and Captain Cornelis de Vlamingh of the *Weseltje*.<sup>24</sup> The vessels had departed Holland in 1696 to search for the Dutch ship *De Ridderschap van Holland* which had gone missing between Cape Colony and Batavia, or modern-day Jakarta.<sup>25</sup> During this journey they developed maps and drawings of the Western Australian coast as well as taking samples of shells, fruit and plants from where they had come ashore, reportedly in the Leighton Peninsula area.<sup>26</sup>

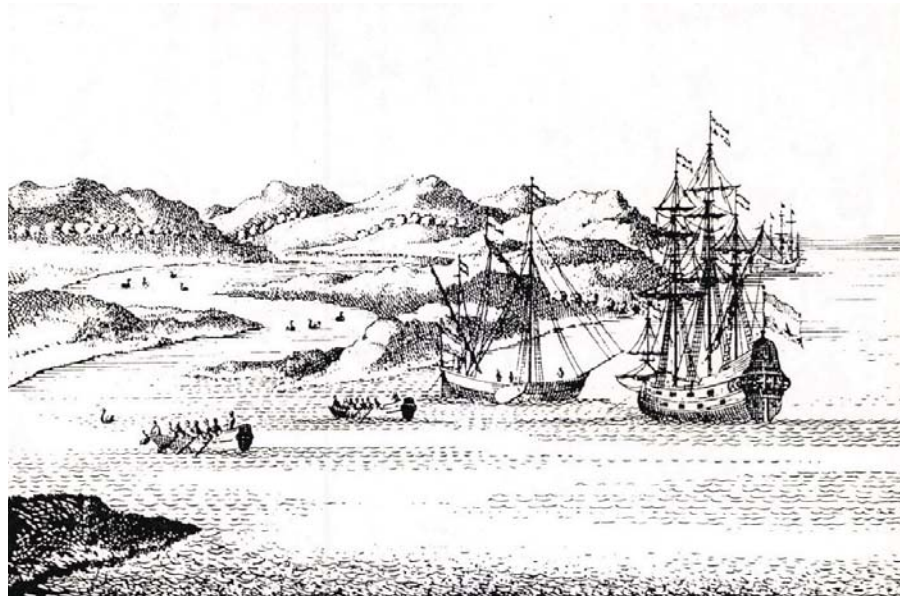


Figure 5. Etching from 1726, 'Vlamingh's fleet at the Swan River mouth, January 1697', reproduced from Buckland Hill Action Group 'Concept Study', 1988, p.7

On December 29, 1696 Willem de Vlamingh landed at Rottnest Island where he encountered the native Quokka. Mistaking the marsupial for a rat he gave the island its name; *t Eylandt 't Rottenest* ("Rats' Nest Island"), or Rottnest Island as it is known today.<sup>27</sup>

On January 5, 1697 de Vlamingh and a party of men came ashore somewhere around the vicinity of the Leighton and Cottesloe beach area. The Vlamingh memorial was dedicated to this landing in 1974 and can still be found on Curtin Avenue in Cottesloe. It is believed that Buckland Hill was the area from which de Vlamingh and his party first viewed the Swan River before exploring along the shoreline as far as Freshwater Bay. A smaller group continued to explore along the river as far as Herisson Island, before departing the area on January 13, 1697. Records of the expedition note their general disappointment with the land they had encountered describing it to be "a barren, bare, desolate region; at least along the coast, and so far as they have penetrated into the interior."<sup>28</sup> Descriptions of fauna also noted that the party observed no "remarkable animals or birds...except principally in the Swan River, a species of black swans" three of which were transported home with them only to die "one by one shortly after their arrival".<sup>29</sup>

After undertaking their inland exploration, de Vlamingh and his party continued north along the coast towards Dirk Hartog Island where they landed in February of 1697. Here they replaced the pewter plate left on the island by Dirk Hartog in 1616 with a new plate which bore the record of both ships visits.



Figure 6. Western Australian Planning Commission, "Figure 6 – Concept Plan" from The Vlamingh Parklands, 1998, p.26

In 1998 a report was published outlining 'The Vlamingh Parklands' concept plan for the Mosman Park and North Fremantle area. The objectives of this concept plan were to integrate the various parks, reserves and recreation areas around the Leighton peninsula into a single park entity which would also act as an interpretive space and an opportunity to commemorate the 300th anniversary of Willem de Vlamingh's landing and exploration. This plan incorporated the Buckland Hill site and linked it to other vegetation spaces in the area, providing a green corridor and walking trails around the Mosman Park peninsula (Figure 6).<sup>30</sup> The park now forms an important ecological link between the ocean and the river.

## Swan Location

In 1827 Captain James Stirling explored the Swan River area. A map of the colony drawn in London in September of 1832 gives the land around what is today known as Mosman Park the title of 'Buckland Downs'. It is believed that this name was bestowed by Stirling in honour of William Buckland, a noted geologist, palaeontologist and later Dean of Westminster.<sup>31</sup> The highest point in the district was named Buckland Hill with this name also being adopted for the locality. The Perth Road Board was responsible for the area from 1871 to 1893 when residents successfully petitioned for the area to become a separate road district. In 1895 the Mosman Park area was known as Cottesloe beach before the Buckland Hill Road District was gazetted in 1899. It returned to the name Cottesloe Beach in 1909 before becoming Buckland Hill again in 1930 and the Mosman Park Road District in 1937.<sup>32</sup> In 1961 with the arrival of the *Local Government Act* the area became known as the Shire of Mosman Park before being converted to a Town in 1962. As of 2019 the Buckland Hill and Leighton Battery sites are located within the boundaries of the Town of Mosman Park.<sup>33</sup>

Early road surveys and land allocation maps identify the area of North Fremantle from the West of Buckland Hill south-west to the peninsula at Rous Head. In a road survey dated 1846 there are three allotments on the river foreshore to the south-east of Buckland Hill. A later map from 1897 shows a number of quarry allotments along the foreshore to the south of Buckland Hill with the future University of Western Australia endowment noted as the primary landholder of the remainder of the Buckland Hill site (Figure 7).

In 1900 the population of Buckland Hill was estimated to be 1200. The settlement was primarily centred around the railway line with some residential development occurring near the river. Quarrying took place in the hills and ranges around the Fremantle area from the mid-1800s. In Mosman Park sites such as Rocky Bay and the western face of Buckland Hill were mined for lime and limestone with some operations continuing up until the 1960s. (Figure 8) A 1906 cadastral map outlines lots to the north of Buckland Hill vested to the Road Boards of Peppermint Grove and Buckland Hill for quarrying with the output from these quarries crushed for aggregate and road base (Figure 10). These processes vastly changed the topography of the land around Mosman Park and Fremantle with Buckland Hill being one of the only remaining hills in the area. The availability of relatively cheap land close to the railway line made the area popular for industry. This included lime kilns for the production of quicklime and slaked lime which could also be found on Buckland Hill throughout the early 1900s<sup>34</sup> (Figure 9).

The limestone taken from Buckland Hill and other sites around Fremantle was used on projects such as the construction of the Fremantle harbour moles (1890s), buildings around UWA as well as being fired for the production of lime used in building works.<sup>35</sup>

The University of Western Australia was founded in 1911 and in 1913 land between Stirling Highway and the Swan River was vested to the University. This vested land included a portion of Buckland Hill that would later be acquired for the development of the Leighton Battery.



Filler Image 6: A.Hillman 'Survey of Roads between Perth and Fremantle' (State Records Office, AUWA S236 cons3869 Roads 076, 1846).





Figure 7. State Records Office, "Fremantle 19S. North side of Fremantle, Brooking. Adjustment J. H. Goodwin, Fieldbook 6", 1897

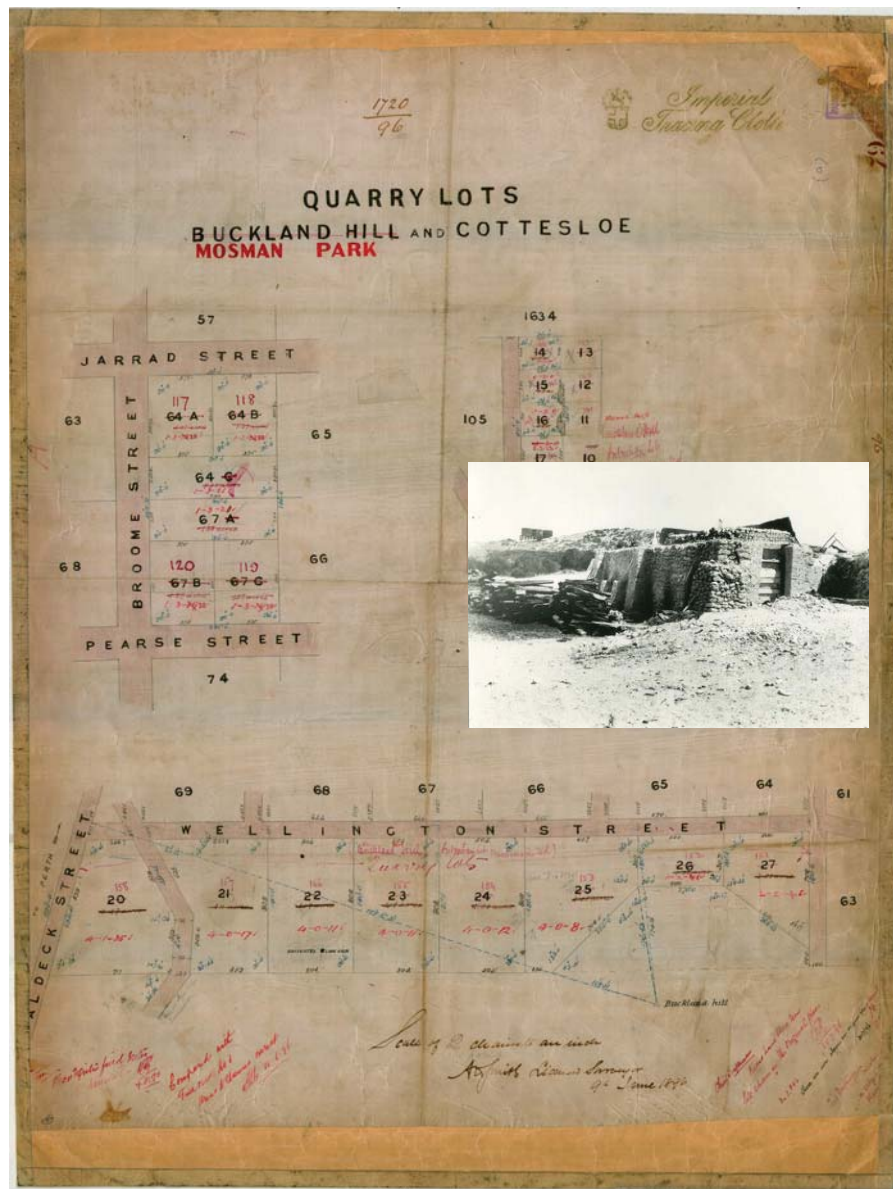


Figure 8. State Records Office, "Quarry Lots Buckland Hill/Mosman Park and Cottesloe", 1896

Figure 9. The Grove Local History Collection, "Lime kilns on Buckland Hill", c1920



Figure 10. State Records Office, "Cadastral map Department of Lands and surveys", 1906

## World War One

During World War One, gun battery defence facilities were installed at North Fremantle and to the south of the harbour at Arthur Head. Buckland Hill was utilised as a battery observation post and also served as a Port War Signal Station. This use saw the beginning of the site's long relationship with military installations and defence. Numerous Port War Signal Stations were constructed around Australia during the early to mid 1900s, manned by Naval personnel in order to watch for approaching ships.<sup>36</sup> The Buckland Hill Port War Signal Station was used to signal vessels entering and departing Gage Roads as part of the Examination Service. Vessels entering the channel would not be permitted to proceed beyond a designated area until they had been cleared by an Examination Officer. Failure to comply with these requirements would see the vessel identified as potentially hostile and a warning shot would be fired from the batteries at Fort Forrest or Fort Arthur Head. If the ship failed to stop after the warning round was fired it would be engaged as a hostile vessel.<sup>37</sup> Little information remains about the structures or exact location of the Signal Station and while there may be some archaeological potential, the extensive excavation work that took place during the construction of the Leighton Battery tunnels may have removed any trace of these earlier land uses.

In 1850 a timber framed navigational beacon had been installed on the eastern side of Buckland Hill. This became a permanent limestone trigonometric station constructed by convict labour in 1875. By 1924 access to fresh water had become an ongoing issue for residents and the decision was made to construct the first reservoir on Buckland Hill. The reservoir was located around the site of the trigonometric 'obelisk' and was enlarged again in 1934 (Figure 11).

Australia experienced high inflation from 1919 to 1920 and then severe recession until 1923. Heavy borrowing through the 1920s was directed towards public infrastructure works, but by 1932 the official unemployment level was at peak, 32 percent.<sup>38</sup> Areas around Mosman Park and specifically Buckland Hill were used as camp sites for families and groups of men living rough in tents or crude shelters.<sup>39</sup> People living rough along the river front would catch fish and live on whatever could be sourced locally, while unemployed men were noted to camp on Buckland Hill playing "two-up and poker".<sup>40</sup>

Buckland Hill also provided a unique landscape for the sporting event 'The Harley Scramble' from 1928 up until 1964. The disused quarries, bushland and limestone cliffs created a challenging motorbike course, regarded by many as the toughest in Australia.<sup>41</sup> The first race was held in 1928 with laps 3 miles in length but after 1930 the laps were reduced to 2 mile and competitors were required to complete a number of

laps. By 1952 lap requirements had increased from 20 to 28 laps which equated to a distance of 65 miles completed over two sessions and included 8 quarry walls, known as 'slides'. The rider with the lowest average lap time was declared the winner of the Melrose Cup. Increased housing development in the area saw the use gradually become unacceptable and the race was abandoned in 1964. Harley terrace to the east of Leighton Battery marks the historic start and finish point of the race<sup>42</sup> (Figure 12-14).

In the 1930s, development of the harbour saw a need to relocate the guns from Fort Forrest. Buckland Hill was suggested as an alternative site however there were concerns for fragile telegraph equipment located at the nearby Cable station. Although it was tactically an ideal site for a coastal defence battery, concerns for the Cable Station equipment along with the line of fire being across the main road rail access to Fremantle saw the Fort Forrest guns eventually moved to Swanbourne.



Figure 11. The Grove Community History Library, "The first vehicle to the summit of Buckland Hill", 1924



Figure 12. Photographer unknown, '1939 Ropeworks Hill Harley Scramble', 1939, Taken from <http://www.speedwayandroadracehistory.com/perth-buckland---ropeworks---monument-hills-harley-scramble.html>

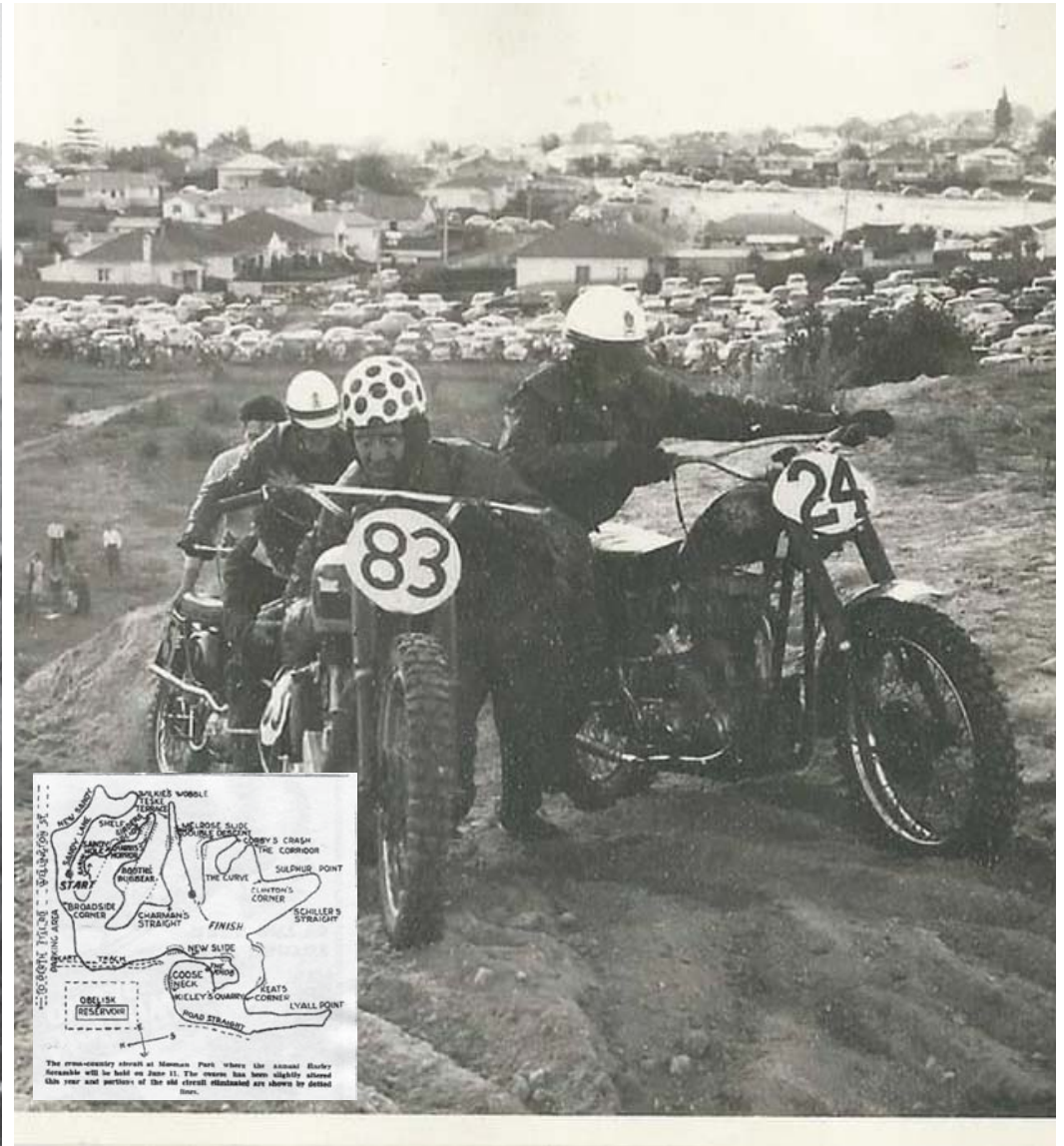


Figure 13. Photographer unknown, '1958 Harley Scramble', 1958, Taken from <http://www.speedwayandroadracehistory.com/perth-buckland---ropeworks---monument-hills-harley-scramble.html>

Figure 14. The West Australian, "Harley scramble: Rough-riding on motor cycles", June 1, 1939

## World War Two

When World War Two broke out in 1939, Fremantle was to become a key strategic position in Australia's defence efforts. This was primarily due to its proximity to the Indian Ocean and to conflicts occurring throughout Asia, which escalated with the entry of Japan in 1941 and the fall of Singapore in 1942. After these events the upgrading of coastal defences in Western Australia became a key focus, particularly with the relocation of the British Navy to an alternate base at Cockburn Sound.

In 1941 Buckland Hill was compulsorily acquired from the University of Western Australia, to serve as a defence facility during the war. 3.7" anti-aircraft guns were established on the site in September of that year and construction of the battery began in 1942. In February of 1943, two 6" guns were relocated from Arthur Head to the Buckland Hill site and installed on emplacements at Leighton Battery.

Along with the installation of the 6" guns, an underground complex of tunnels was excavated on the site, designed to house personnel, ammunition, equipment, and communications and observation posts. Royal Australian Artillery Historical Society Records state that over 300 metres of tunnels were excavated up to 10 metres underground. The tunnels were constructed with concrete floors, clay brick walls and timber ceilings. Ventilation shafts and ammunition hoists servicing these underground spaces can still be seen onsite and form a significant part of the original tunnel development.

The increasing threat of air attack after the bombing of Darwin and Broome in 1942 saw gun emplacement for three 5.25" dual artillery and air guns at Leighton Battery begin to be installed in 1944. The 6" guns were relocated to the Princess Royal Battery in Albany the following year. With the resolution of the war in Europe in May of 1945 and the Pacific in August of the same year, the 5.25" gun emplacement project was put on hold as materials were diverted into more pressing civil projects. The 5.25" guns were eventually completed and proofed in November of 1947 becoming the only operational 5.25" guns in Australia.<sup>44</sup>

According to the State Heritage Office Assessment Documentation for the Leighton Battery, the radar hut was constructed on the site in 1947/48. It has since been speculated that this construction may have actually occurred as late as the 1960's, however this will require further investigation and confirmation.

The radar hut was constructed on site in 1947/48. In 1948 the army purchased from the University of Western Australia the land to the western side of Buckland Hill which it had been occupying since 1941. From 1950 Leighton Battery was used for Army training



Figure 15. Australian War Memorial, "FREMANTLE, AUSTRALIA. COMMAND POST, LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", November 3, 1942

and from 1952 it was utilised by the Citizen Military Force, a service which was renamed in 1980 as the Army Reserve. Bullet holes can be observed in a number of the tunnel corridors, understood to be the result of training exercises.

With the development of more advanced weapons and the growth of air power defence, the coastal defence system began to become obsolete. The Coastal Artillery branch of the Royal Australian Artillery was disbanded and the facilities at Leighton Battery were dismantled and sold for scrap in 1963. At some point after 1963 a non-directional beacon was placed on the radar hut by the Fremantle Port Authority. The facilities at Leighton Battery continued to be used by the Army until 1979. Upon their exit from the site the Army sought to secure the tunnel system by bulldozing the entry points.



Figure 16. Australian War Memorial, "FREMANTLE, AUSTRALIA. LEIGHTON BATTERY, PART OF FREMANTLE FIXED DEFENCES, DURING CONSTRUCTION, SHOWING AMMUNITION SHAFT", November 3, 1942



Figure 18. Australian War Memorial, "FREMANTLE, AUSTRALIA. VIEW FROM LEIGHTON BATTERY SITE, FREMANTLE FIXED DEFENCES. MARK VII GUN POSITION IN FOREGROUND", February 3, 1943



Figure 17. Australian War Memorial, "FREMANTLE, AUSTRALIA. A MARK VII GUN SHIELD BEING MOVED INTO POSITION AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 3, 1943



Figure 19. Australian War Memorial, "FREMANTLE, AUSTRALIA. BI GUN, LEIGHTON BATT, FREM FIXED DEFENCES. L TO R LANCE-BOMBARDIER H. VALLE, GUNNER L. L. CARTER ROYAL AUS ARTILLERY STAFF-SGT W. J. DILWORTH, AUS ARMY ORDNANCE CORPS, AND CAP B. D. W. O'NEIL, MC ROYAL AUS ARTILLERY", February 18, 1943



Figure 20. Australian War Memorial, "FREMANTLE, AUSTRALIA. BI GUN, LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES, FACING SOUTHWEST", February 18, 1943



Figure 22. Australian War Memorial, "FREMANTLE, WA. NO. B2 GUN, LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES, SEEN THROUGH A CAMOUFLAGE NET", February 18, 1943



Figure 21. Australian War Memorial, "FREMANTLE, AUSTRALIA. ENTRANCE TO COMMAND POST TUNNEL, UNDER CONSTRUCTION AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 18, 1943



Figure 23. Australian War Memorial, "LEIGHTON, WA. LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES. NO. 2. GUN AND CAMOUFLAGE NET, FACING ROTTNEST ISLAND", April 12, 1943



Figure 24. Australian War Memorial, "LEIGHTON, WA. LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES. NO. 1 GUN AND CAMOUFLAGE NET, FACING NORTH EAST", April 12, 1943



Figure 26. Australian War Memorial, "LEIGHTON, WA. LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES. OVER-LOOKING NO. 2 GUN TO MONUMENT HILL", April 12, 1943



Figure 25. Australian War Memorial, "LEIGHTON, WA. THE COMMAND POST AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES, WELL OBSCURED FROM OBSERVATION BY NET CAMOUFLAGE", April 12, 1943



Figure 27. Australian War Memorial, "LEIGHTON, WESTERN AUSTRALIA. LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES. NO. 2 GUN IN FOREGROUND, AND NO. 1 GUN IN BACKGROUND", April 12, 1943

## The Siting of the Leighton Battery

The Leighton Battery covers a portion of land on the western side of Buckland Hill in the locality of Mosman Park.

In 1941 defences around the Fremantle Port had already been strengthened with the installation of anti-submarine and anti-torpedo booms across the harbour mouth, and an indicator loop installed between Swanbourne and Rottnest to warn of any passing ships. Several Operational Headquarters and an Intelligence Centre were established in Fremantle to coordinate and ensure cooperation of all three armed services in defence of the Fremantle Port.<sup>45</sup>

Leighton Battery was constructed as a key part of this coastal defence system which included batteries at Arthur Head, Fremantle Harbour, Swanbourne, Rottnest, Garden Island, South Beach and Point Peron. The combined facilities were known as 'Fremantle Fortress'<sup>46</sup> (Figure 28). It played an important role in the coordination of these defence facilities due to its position overlooking Gage Roads and the other battery sites. Heritage Council documentation describes the Leighton Battery, along with the Swanbourne site, as 'examination batteries'. Their primary role was to act as look out for approaching ships and ensure that these ships were signalling in the correct manner, identifying themselves on approach to the port.

After the sale of the Buckland Hill land in 1987 Lots 455 and 456 were set aside for public recreational use and classified as an 'A' class reserve in 1991. Leighton Battery tunnels are sited on Lot 456 with access obtained via Lot 455. Between 1991 and 1997 these Lots were vested in the Western Australian Planning Commission and from 1997 to the Town of Mosman Park. The Town was given power to lease Lot 456 for a term not exceeding 21 years, subject to the consent of the Minister for Lands.<sup>47</sup>

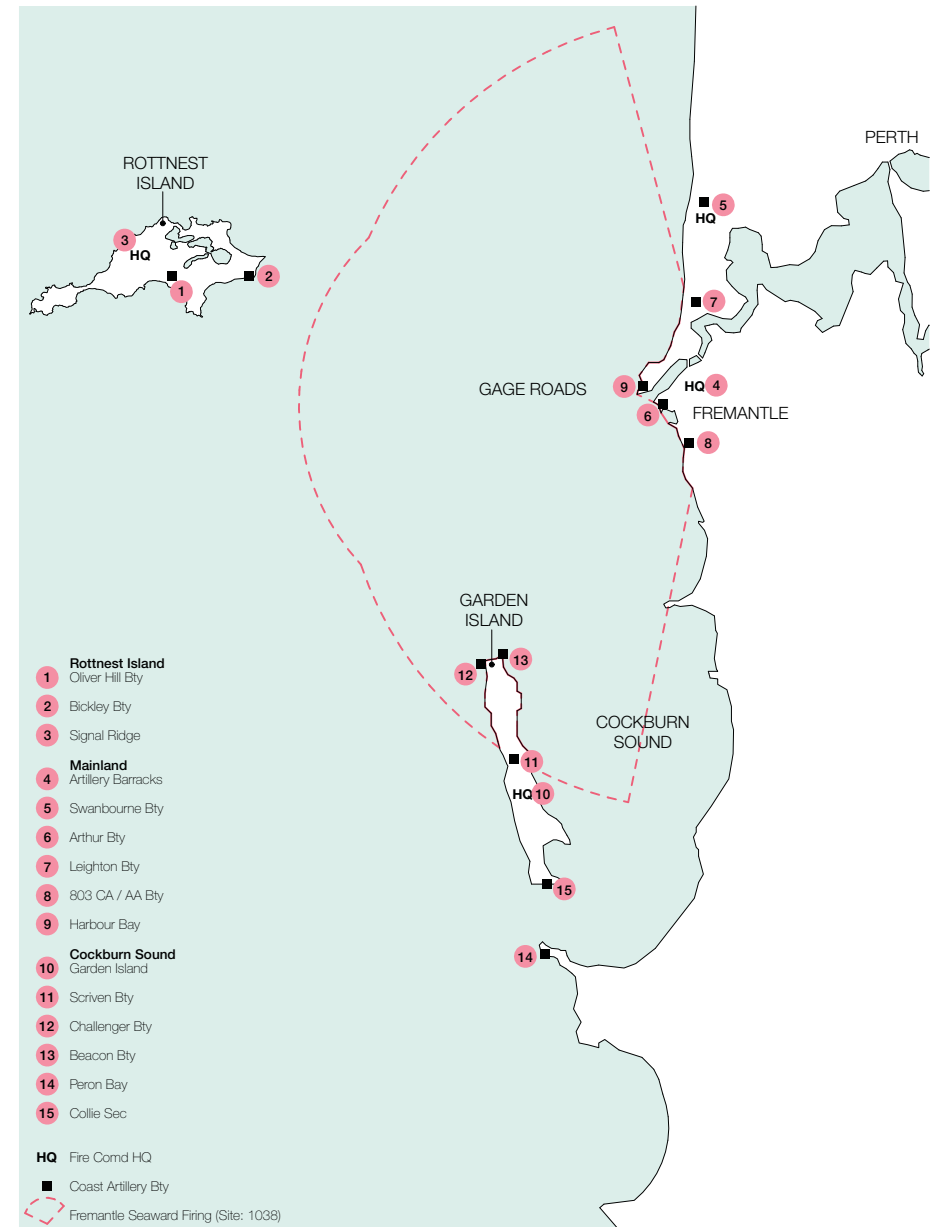


Figure 28. Fremantle Fortress Location Diagram (element, 2019) (BTY - Battery)



Figure 29. Australian War Memorial, "BUCKLAND, WA. RADIO LOCATION STATION, ANTI AIRCRAFT GROUP, FREMANTLE, FROM LEIGHTON BATTERY FREMANTLE FIXED DEFENCES", April 12, 1943



Figure 31. Australian War Memorial, "BUCKLAND, WA. VIEW FROM LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES, OVER LOOKING STATION 419, ANTI AIRCRAFT GROUP, FREMANTLE", April 12, 1943



Figure 30. Australian War Memorial, "BUCKLAND, WA. RADIO LOCATION STATION, ANTI AIRCRAFT GROUP, FREMANTLE, FROM LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", April 12, 1943



Figure 32. Australian War Memorial, "BUCKLAND, WA. VIEW OF FREMANTLE AND MONUMENT HILL FROM STATION 419, ANTI AIRCRAFT", April 12, 1943



Figure 33. Australian War Memorial, "FREMANTLE, WA. 1943-11-14. BATTERY HEADQUARTERS AND OFFICES OF LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES FROM MONUMENT HILL", November 14, 1943



Figure 35. Australian War Memorial, "LEIGHTON, WA. 1943-04-12. FREMANTLE FIXED DEFENCES. BUCKLAND ANTI-AIRCRAFT STATION FROM LEIGHTON BATTERY", April 12 1943



Figure 34. Australian War Memorial, "FREMANTLE, WA. FIRE COMMAND POST OF THE LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES FROM MONUMENT HILL WITH ROTTNEEST ISLAND IN THE DISTANCE.", November 14, 1943



Figure 36. Australian War Memorial, "LEIGHTON, WESTERN AUSTRALIA. 1943-04-12. LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES, FROM COMMAND POST, FACING CARNAC AND GARDEN ISLANDS", April 12 1943

### Construction of the Leighton Battery

At the publication of this plan in 1919, Leighton Battery comprises a complex of underground tunnels and rooms, an observation post, partially buried command post and two 6" gun emplacements (1942), two 5.25" gun emplacements one of which is buried (1944-45), a radar hut (c. 1947 - 1960) and a series of limestone retaining walls and concrete paths (c. 1990 - 2019) (Refer to Figure 71 - as existing Site Overall).

The exact date that construction commenced at Leighton Battery is unclear. Archival plans for a battery camp on the northern side of Boundary Road from December of 1942 note its proximity to Buckland Hill but show no indication of construction in that area, Figure 37. In January/February of 1943 two 6" guns were moved to the site from Arthur Head and proof firing of these weapons occurred on February 8, 1943. An archival site survey from 1944 shows the placement of these existing guns and the proposed location of the 5.25" guns along with proposed sites for the radar hut and command post. An excavation site to the north-east is noted but no references to the tunnels can be seen (Figure 39). Archival site plans from 1945 show the placement of the 5.25" guns onsite, the command post and the underground tunnel system (Figure 46). The tunnel layout shown on this early plan reflects a similar layout to that surveyed in 1981 as part of the land sales and redevelopment occurring around the Buckland Hill area. The similarity highlights that although there have been changes made to external elements and site works around the battery, the original layout of the tunnel system remains relatively unchanged (Page 35). While construction of the 5.25" batteries commenced in 1944-45 they were not completed and proofed until the later half of 1947 due to the resolution of World War Two. Similar 5.25" dual purpose guns were planned for the defence of every major port in Australia including South Fremantle and Point Peron, however the Leighton Battery was the only one which reached an operational stage.

The design of the battery site was completed by The Commonwealth Department of the Interior with construction being undertaken by the 7 Army Troops Company of the Royal Australian Engineers, the Royal Australian Artillery and the Public Works Department of WA.<sup>48</sup> A collection of photos which feature the construction of the tunnels are held by the Australian War Memorial and demonstrate the limestone excavation and erection of internal brick tunnel walls undertaken by personnel of the Leighton Battery (Figures 40-58).

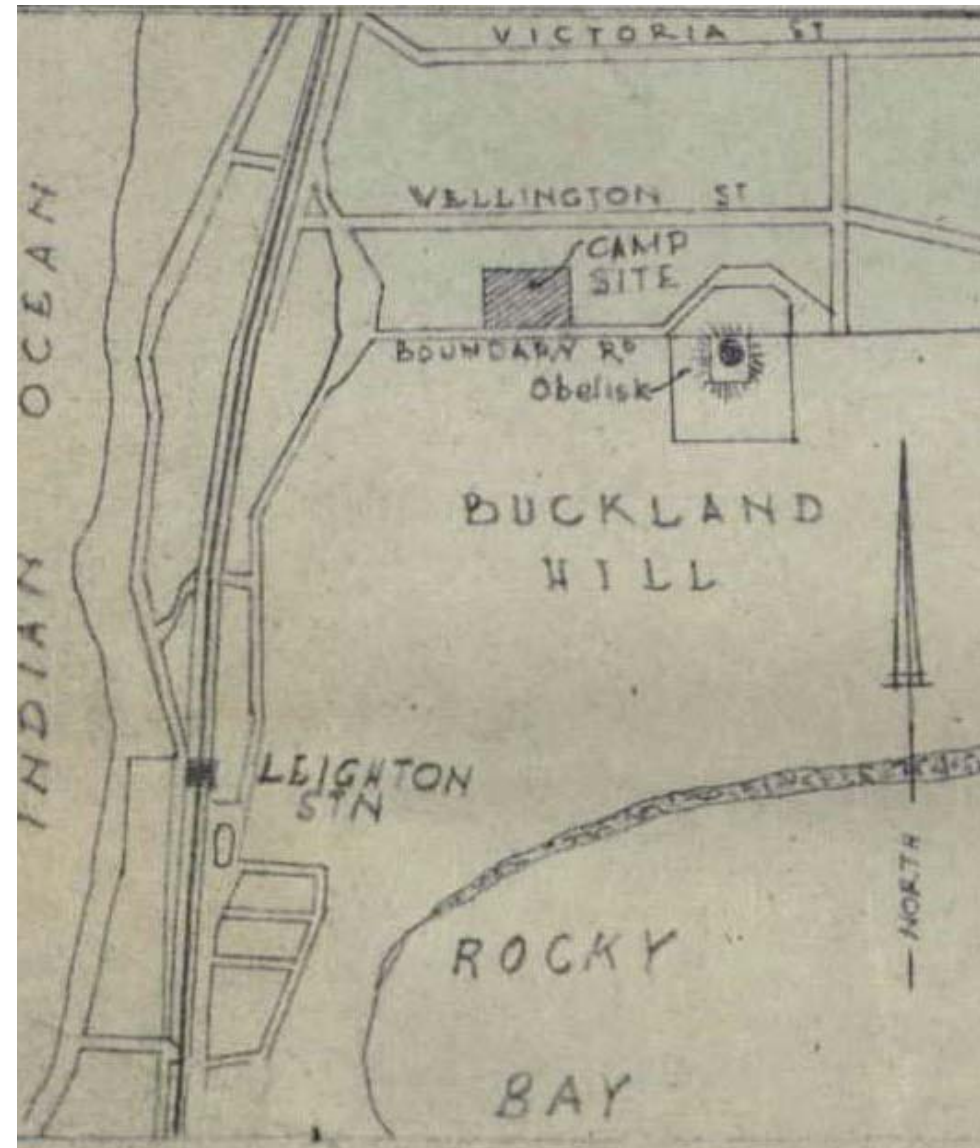


Figure 37. National Archives of Australia, Buckland Hill Fremantle - Leighton Battery - Camp Accommodation "Boundary Road Battery camp block plan: inset site plan", December 9 1942, p.12

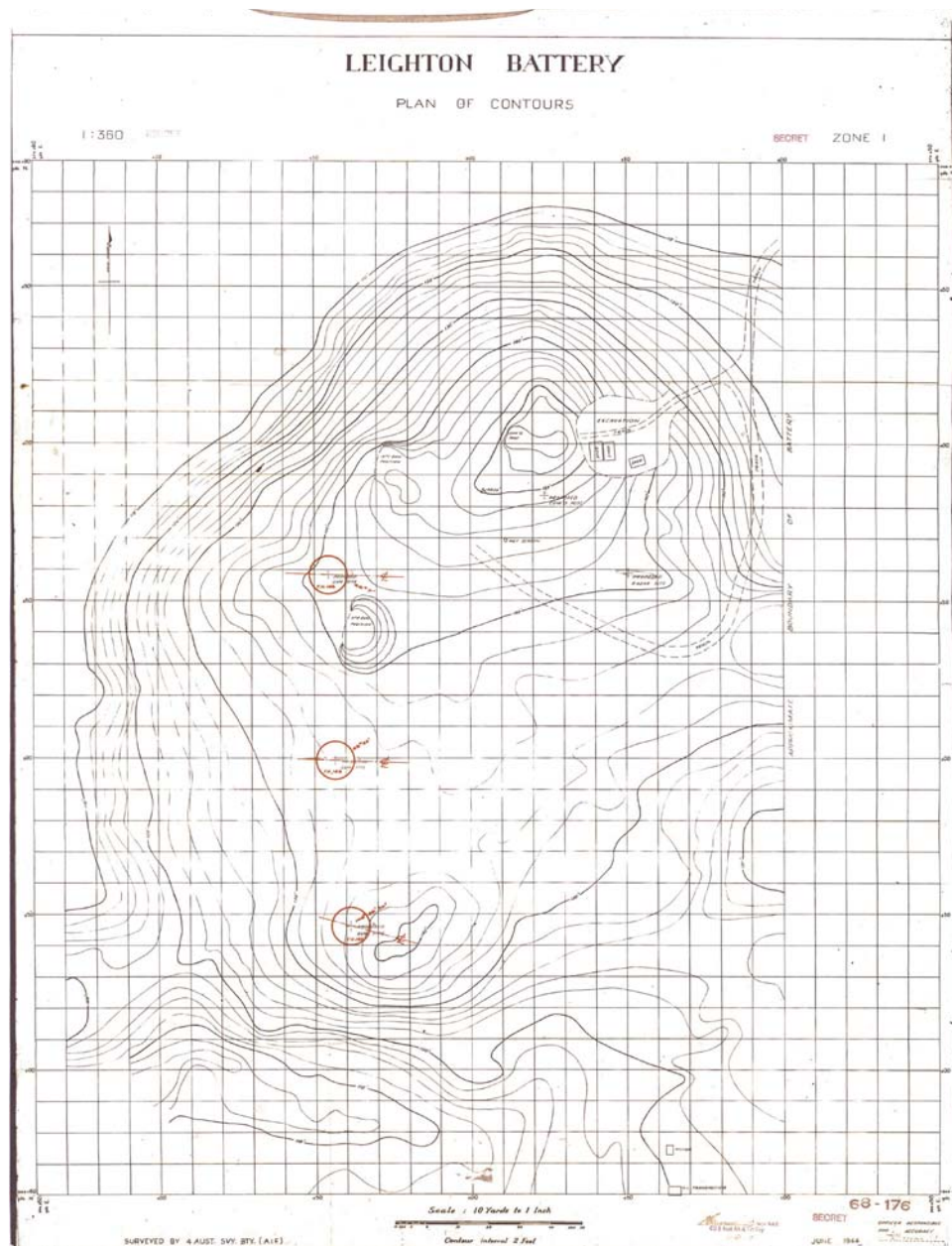


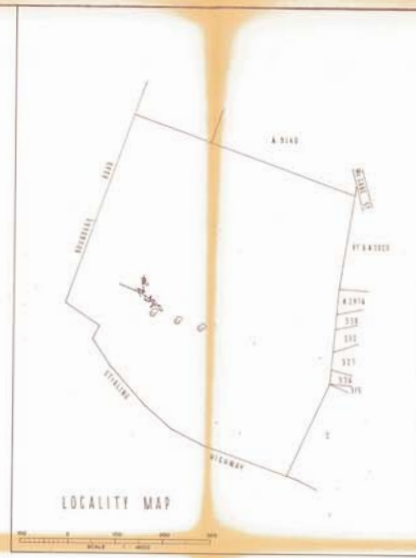
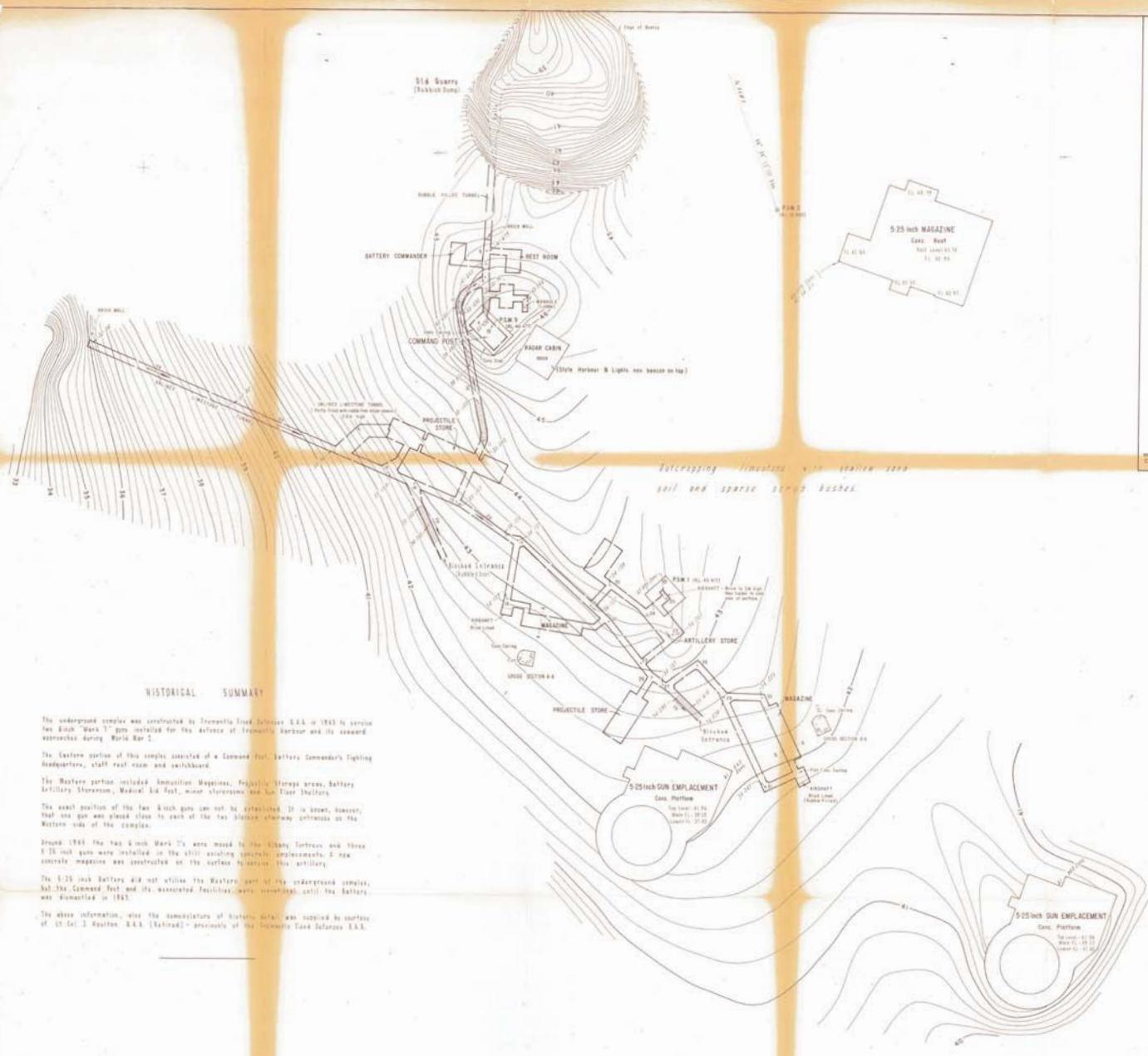
Figure 39. National Archives of Australia, "Leighton Battery: Plan of Contours", June 1944



Figure 40. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1942-11-03. TROOPS OF 7 ARMY TROOP COMPANY, ROYAL AUSTRALIAN ENGINEERS, ON THE CONSTRUCTION OF LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", November 3, 1942



Figure 41. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1942-11-03. NO. 2 GUN PIT IN COURSE OF PREPARATION AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", November 3, 1942



# HISTORICAL SUMMARY

The underground complex was constructed by Fremantle Dock Defence S.A.S. in 1943 to service two 6 inch 'Mark I' guns installed for the defence of Fremantle Harbour and its seaward approaches during World War II.

The Eastern portion of this complex consisted of a Command Post, Battery Commander's Fighting Headquarters, staff rest room and washboard.

The Western portion included Ammunition Magazine, Projectile Storage areas, Battery Artillery Storehouse, Medical Aid Post, minor storerooms and Gun Store Shelters.

The exact position of the two 6 inch guns can not be established. It is known, however, that one gun was placed close to each of the two historic roadway entrances on the Western side of the complex.

Around 1965 the two 6 inch 'Mark II' were moved to the Albany Fort and three 5.25 inch guns were installed in the still existing concrete emplacements. A new concrete magazine was constructed on the surface to service this artillery.

The 5.25 inch Battery did not utilize the Western part of the underground complex, but the Command Post and its associated facilities were investigated until the Battery was dismantled in 1983.

The above information, and the nomenclature of historic data, was supplied by courtesy of Lt Col J. Aulston S.A.S. (Retired) - previously of the Fremantle Dock Defence S.A.S.

## NOTES

1. TUNNEL DETAIL SHOWN ON PREVIOUS LISTS
2. SURFACE DETAIL SHOWN ON PREVIOUS LISTS
3. ALL TUNNELS WERE BUILT BY THE S.A.S. IN 1943
4. LEVELS ARE AT A.D. 10 TUNNEL WALLS
5. TUNNELS AND DETAIL SHOWN ON PREVIOUS LISTS

## ASSOCIATED PLANS

BOUNDARY PLAN 10-1007  
AS DIMENSIONS 17-1000 10-1008  
TUNNEL (UNDER CONSTRUCTION) 10-1009

Filler Image 7: Leighton Battery Tunnel Complex 1981 (Australian Survey Office).



AA MAGAZINE  
(UNDERGROUND)  
Carrying 2 6 inch high



Author/Editor	Ref. No. (Date)	Scale
W. A.	10-1007 (1943)	1:1000
W. A.	10-1008 (1943)	1:1000
W. A.	10-1009 (1943)	1:1000

MOSMAN PARK  
LEIGHTON BATTERY  
TUNNEL COMPLEX  
FLOOR LEVELS & SURFACE CONTOURS

SCALE 1:1000  
SOURCE: 10-1007  
ADAPTED FROM 10-1007  
10-1008  
10-1009  
AO-815



Figure 42. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1942-11-03. NO. 2 GUN PIT IN COURSE OF PREPARATION AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", November 3, 1942



Figure 44. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-03. GUNNER A.J. ROSMAN WORKING ON THE CONSTRUCTION OF AN ARTILLERY STORE ENTRANCE AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 3, 1943



Figure 43. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-03. A BRICKLAYER MEMBER OF THE ROYAL AUSTRALIAN ENGINEERS WORKING ON THE CONSTRUCTION OF AN ARTILLERY STORE AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 3, 1943

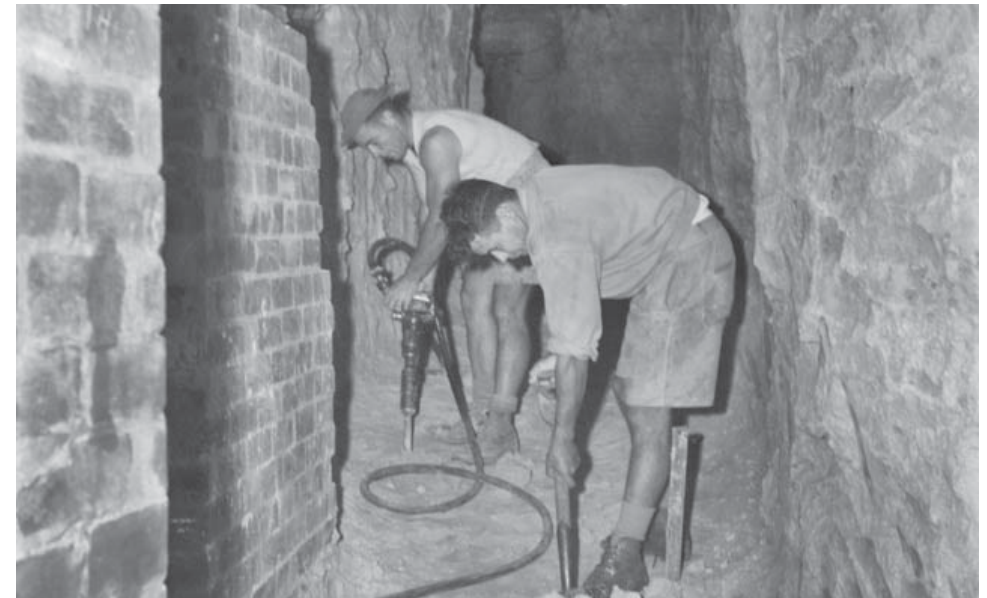


Figure 45. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-03. GUNNER E.D. HALLSTONE (FOREGROUND) AND LANCE-BOMBARDIER J. QUAKE WORKING ON THE CONSTRUCTION OF AN ARTILLERY STORE AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 3, 1943



Figure 47. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-03. GUNNER F. PASCOE (FOREGROUND) AND GUNNER B. GREENE WORKING ON THE CONSTRUCTION OF ARTILLERY STORE AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 3, 1943



Figure 48. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-03. MOVING A MARK VII GUN SHIELD INTO POSITION AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES. LEFT TO RIGHT - CAPTAIN W. HOFFMAN, GUNNER J.H. PARKER AND GUNNER G. CONSTANTINE", February 3, 1943



Figure 46. National Archives of Australia, "Govt. supply power reticulation at Leighton Bty", May 15, 1945



Figure 49. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-03. SAPPER W.A. DALZIELL AND SAPPER P.F. HOPKINS OF THE ROYAL AUSTRALIAN ENGINEERS, WORKING ON THE CONSTRUCTION OF THE MAIN GALLERY AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 3, 1943



Figure 51. Australian War Memorial, "FREMANTLE, AUSTRALIA. PERSONNEL OF LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES, HAULING A GUN SHIELD TO LEIGHTON BATTERY SITE", February 3, 1943



Figure 50. Australian War Memorial, "FREMANTLE, WA. SAPPERS R.E. MARTIN (LEFT) AND J.R. CUFFE, BOTH OF 35 FORTRESS COMPANY, ROYAL AUSTRALIAN ENGINEERS, CONSTRUCTING A BRICK ARCHWAY IN THE MAGAZINE, 30 FEET UNDERGROUND AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 3, 1943



Figure 52. Australian War Memorial, "FREMANTLE, AUS. GUNNER H.S. BILLET and LANCE-BOMBARDIER J. E. PARKINSON OF LEIGHT BATT, ROYAL AUS ARTILLERY, FREMANTLE FIXED DEFENCES, USING PNEUMATIC SPADERS ON THE CONSTRUCTION OF A TUNNEL BETWEEN COMMAND POST AND THE MAIN TUNNEL", February 18, 1943



Figure 53. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-18. A MEMBER OF LEIGHTON BATTERY, ROYAL AUSTRALIAN ARTILLERY, WHEELING OUT SPOIL THROUGH THE MAIN TUNNEL FROM CONSTRUCTION WORK ON CONNECTING TUNNELS AT FREMANTLE FIXED DEFENCES", February 18, 1943



Figure 55. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-18. GUNNER F.J. KAIN OF LEIGHTON BATTERY, ROYAL AUSTRALIAN ARTILLERY, FREMANTLE FIXED DEFENCES, WORKING WITH A PNEUMATIC SPADER ON THE CONSTRUCTION OF NO. 1 GUN FLOOR SHELTER", February 18 1943



Figure 54. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-18. GUNNER C. JOHNSON, (LEFT) AND GUNNER F.J. KAIN, OF THE ROYAL AUSTRALIAN ARTILLERY, REMOVING SPOIL FROM THE MAIN TUNNEL DURING CONSTRUCTION WORK AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 18 1943



Figure 56. Australian War Memorial, "FREMANTLE, AUSTRALIA. 1943-02-18. VIEW OF MAIN TUNNEL AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES. WHEELING OUT SPOIL DISPLACED IN THE CONSTRUCTION OF CONNECTING TUNNELS", February 18 1943



Figure 57. Australian War Memorial, "FREMANTLE, AUSTRALIA. WORK ON THE CONSTRUCTION OF A PARAPET TO NO. B2 GUN POSITION AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 18, 1943



Figure 59. Australian War Memorial, "FREMANTLE, WA. ENTRANCE TO MAIN TUNNEL, LOOKING SOUTH, UNDER CONSTRUCTION AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 18, 1943



Figure 58. Australian War Memorial, "FREMANTLE, WA. LANCE-BOMBARDIER J.E. PARKINSON (LEFT) AND SERGEANT A.E. TOOP, OF THE ROYAL AUSTRALIAN ARTILLERY, AT WORK ON THE CONSTRUCTION OF COMMAND POST AT LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES", February 18, 1943

## Associated Personnel

At its peak there were between 120 to 135 service personnel, both male and female, stationed at the Leighton Battery site. Several eminent individuals associated with the Leighton Battery project were identified as part of the nomination process for an Engineering Heritage National Marker by the Western Australian Division of Engineers Australia in 2014. These individuals were primarily associated with the planning and execution of the Fremantle Fortress World War Two coastal defence facilities with their background and contributions to the Leighton Battery outlined as follows:

### **Lieutenant– General Sir J.J. Talbot–Hobbs (World War One Artillery Expert):**



Figure 60. "Joseph John Talbot Hobbs", Lafayette Studios, 1919 (State Library of Western Australia).

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

Lieutenant Colonel Hobbs was involved in the Gallipoli campaign in 1915 and on the Western Front from 1916 to 1918, being promoted to the rank of Major General to command the 5th Australian Division in January 1917. In November 1918 he succeeded General Sir John Monash as Commander of the Australia Corps, being promoted to the rank of Lieutenant General. For his distinguished service in the field he received a KCB in 1918 and a KCMG in 1919.

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

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

Understandably in 1934 the Minister for the Army and Army Chief of Staff were very pleased that Sir Talbot Hobbs was able to provide his advice on the location of guns on Rottnest Island when the first reconnaissance took place in June of that year.<sup>49</sup>

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

### **Colonel V.A.H. Sturdee (Australian Director of Military Operations and Intelligence 1934–1939):**



Figure 61. "Colonel V.A.H. Sturdee", Courtesy Faithe Jones, date unknown (National Archives of Australia).

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

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

Ranked as a Colonel at the outbreak of World War Two in 1939 Sturdee was promoted to Lieutenant General in 1940 and became Chief of the General Staff. He then proceeded to conduct a doomed defence of the islands to the north of Australia against the advancing Japanese forces. In 1942 he successfully advised the Government to divert the Australian Imperial Forces returning from the Middle East from Burma to Australia. He then became head of the Australian Military Mission to Washington, DC, where he represented Australia before the Combined Chiefs of Staff. He was Commander of the Australian army in New Guinea in 1944–1945 and succeeded General Sir Thomas Blamey as Commander in Chief of the Australian Military Forces in December 1945. He became Chief of the General staff a second time in 1946, serving in that role until he retired in 1950. Sturdee was knighted in 1951. He died in May 1966 and was given a state funeral with full military honours.<sup>50</sup>

**Captain B. F. Hussey RAE (Engineer-in-Charge on Rottnest Island 1935–1940).**

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

From 1934 to 1939 he was attached to the Department of the Interior and in September 1935, with the rank of Lieutenant, he was transferred to Rottnest Island to supervise the building of the railway from the jetty to Oliver Hill and preliminaries for all the works on the island. Later promoted to Captain he became Engineer-in-Charge on Rottnest for the Department of the Interior. At the end of his service on Rottnest in April 1940 he was promoted to the rank of Major and was appointed Chief Instructor at the School of Military Engineering (Fortress Wing), Georges Heights, Sydney NSW.<sup>51</sup>

Photographic records obtained from the Australian War Memorial identify several other personnel whose contributions to the development and running of Leighton Battery may be worthy of further investigation or interpretation, these individuals include:

- Major Benjamin Miller, (Service Number WX30565) – Born January 12 1905, Major B. Miller began military service on July 15 1942 at Fremantle, Western Australia. He was Officer Commanding at Leighton Battery serving until his discharge on April 2 1946.<sup>52</sup>
- Captain Kenneth Archibald Holland, (Service Number WX30775) – Born May 9 1911, Captain K.A. Holland's enlisted in Albany although the date is unknown. He served as second in charge at Leighton Battery and was discharged from service on April 18, 1946;
- Lieutenant Arthur Robert Charles Hall (Service Number WX29090) – Born October 18 1915, Lieutenant A.R. Hall began military service on July 21 1942 and was an officer of Leighton Barracks. He was discharged from service on October 8 1945; and
- Members of the Women's army service – This group was formed in 1941 to allow women soldiers to replace men in non-combatant roles. Several women served as personnel of Leighton Barracks, some of these individuals are identified in Figure 64.



Figure 62. Australian War Memorial, "FREMANTLE, WA. PORTRAIT OF WX30565 MAJOR B. MILLER, OFFICER COMMANDING, LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES.", November 4, 1943

Figure 63. Australian War Memorial, "FREMANTLE, WA. PORTRAIT OF OFFICERS OF LEIGHTON BATTERY, FREMANTLE FIXED DEFENCES. LEFT TO RIGHT-- WX30775 CAPTAIN K.A. HOLLAND, SECOND IN CHARGE; WX30565 MAJOR B. MILLER, OFFICER COMMANDING; WX29090 LIEUTENANT A.R. HALL.", November 4, 1943

Figure 64. Australian War Memorial, "FREMANTLE, WA. AUS WOMENS ARMY SERVICE PERSONNEL OF LEIGHT BATT, L TO R- FRONT GUNNNERS H. D. WATSON J. V. THOMPSON O. J. BOHAN G. PEGGS D. MOLYNEAUX F. JONES L. M. PHILLIPS BACK L. M. KENCH C. C. KEHOE I. M. WINTHORP A. J. RICH V. WARD M. BARRON", November 14, 1943

## Transforming to a New Use

The Army relinquished their land at Buckland Hill in 1984 and soon after the Commonwealth government commenced discussions around the sale of the land. The Buckland Hill Action Group formed in 1985 with the goal of having land around Buckland Hill declared a reserve. They released a concept study in 1988 examining responsible land-use for the Buckland Hill site. The study was prefaced with comments from two prominent Australian landscape and conservation experts; George Seddon and Vincent Serventy, who noted the importance of Buckland Hill and described it as “a commanding site from where we can see our past and our future. It must be kept as a green space for all...We are only trustees whose duty is to guard the quality of our heritage.”<sup>53</sup> The concept plan included the Leighton Battery site (Shown as item H on Figure 65) and suggested a recreational space which spanned from the river to the ocean and looked to establish a community revegetation programme. Despite the push for the site to be retained as a park, the Buckland Hill land was sold to the Western Australian Development Commission in 1987 before being sold again to Analed Pty Ltd in 1988. Development of the site began in 1989 as the Buckland Hill Estate which included a residential area to the south of Leighton Battery and some public open space incorporating the Leighton Battery site.<sup>54</sup>

As part of this development a management plan was published by Wood & Grieve Engineers in 1989 to guide the subdivision of the Buckland Hill site into residential lots. The report focused on:

- Rehabilitation and regeneration of indigenous flora to the site;
- Retention of native and historic features;
- Landscaping, retaining walls and fencing;
- Design guidelines, positioning and materials of dwellings;
- Road treatments, finishes and landscaping;
- Provision of pathways;
- Drainage systems and water conservation;
- Integrated overall development; and
- Provision of public facilities and public open space.

As part of this development the Fremantle Port Authority radar beacon was relocated from the site c.1990.<sup>55</sup> The Buckland Hill Management Plan also stated that the associated estate development would include “dual use pathways, a lookout, secured tunnel entrances, an underground museum, tennis courts, active recreation areas and extensive planting of indigenous species.”<sup>56</sup>

Developers worked with the Royal Australian Artillery Historical Society to manage the preservation works of the Leighton Battery tunnels. These works included the “clearing of rubble, smoke damage and graffiti from the tunnels, conservation of one gun emplacement, the reconstruction and securing of tunnel entrances, and the installation of electrical services.”<sup>57</sup> Although three 5.25” gun emplacements existed on the Leighton Battery site, only the northernmost was uncovered and conserved as part of the development works. These works commenced in May of 1989 and continued through until 1990 with the installation of steel doors to the entrances, removal of burnt timbers, and the replacement of windows to the command post. Works also saw the southern emplacement removed entirely while the centre emplacement remains buried on the site. Figure 66 demonstrates the extent of the damage to the site prior to these works.

As part of the Buckland Hill Estate development, extensive alterations were made to the surrounding landscape altering the existing contours of the site to suit development requirements. Access roads and limestone retaining walls were constructed around 1990 with an approximate 24,000 native plants being planted throughout the site during the development and restoration period. Although replanting of native species formed part of the 1989 management plan for the site, it was also noted that “future pruning will be necessary to maintain the views.”<sup>58</sup>

In 1995 and 1996 grants were awarded to Leighton Battery by the Australia Remembers Council, the Western Australian Tourism Commission and the Lotteries Commission which were utilised to provide pedestrian and vehicle access to the site and develop the battery as a tourist destination.

The 1989 management plan noted that the prime intention in developing the tourism potential of the site would be “to display artefacts used by personnel and for the operation of artillery at Fort Leighton.”<sup>59</sup>

Leighton Battery was placed on the Register of the National Estate on June 22, 1993 and classified by the National Trust on May 13, 1996. The tunnels were opened to the public on Saturday November 29, 1997 by His Excellency Major General Michael Jeffery the Governor of Western Australia. In 1998 a 6” gun obtained from Rottnest Island was mounted at one of the original 6” gun emplacements.

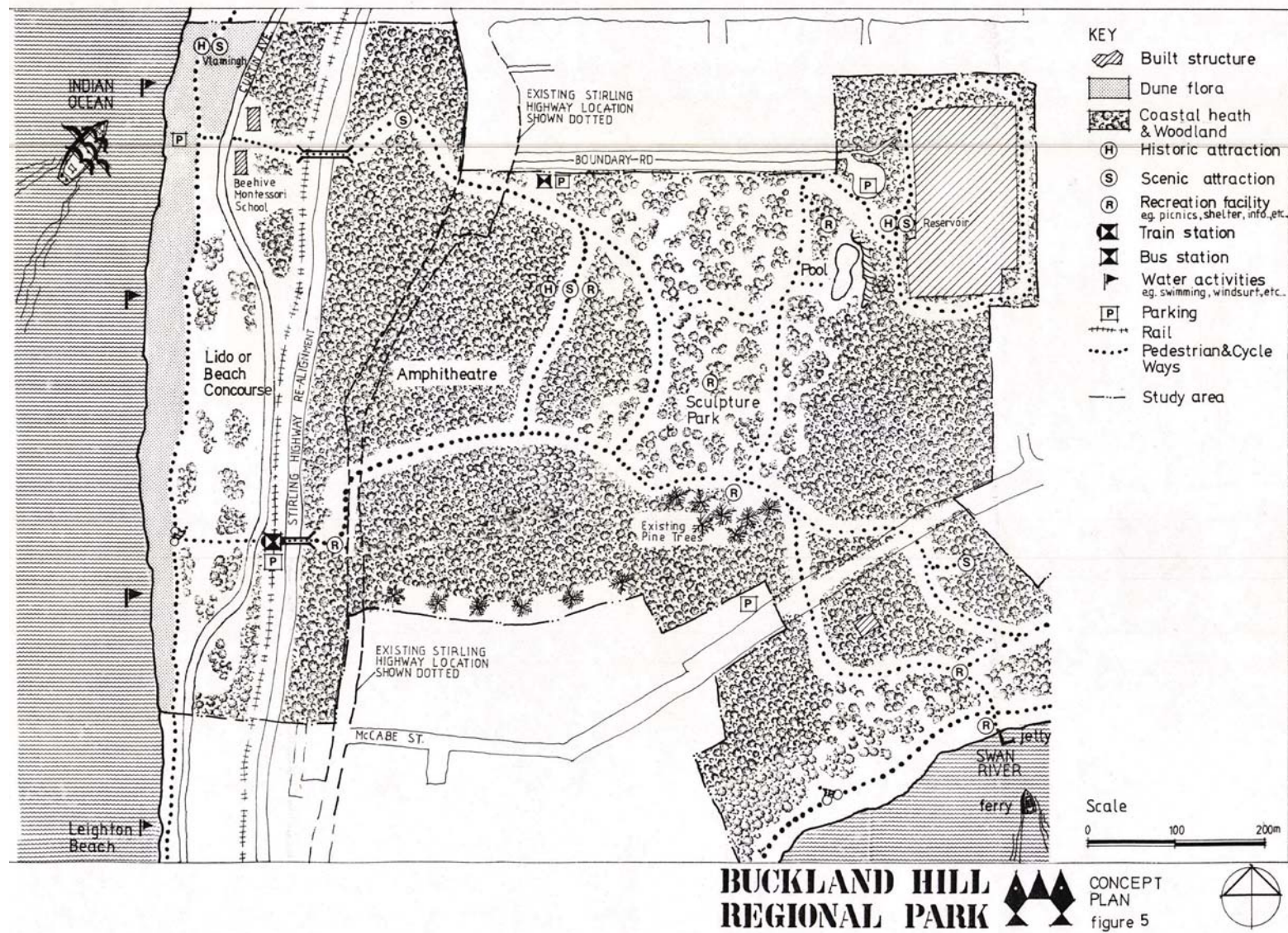


Figure 65. Buckland Hill Action Group, "Buckland Hill regional park concept plan", March 4, 1988

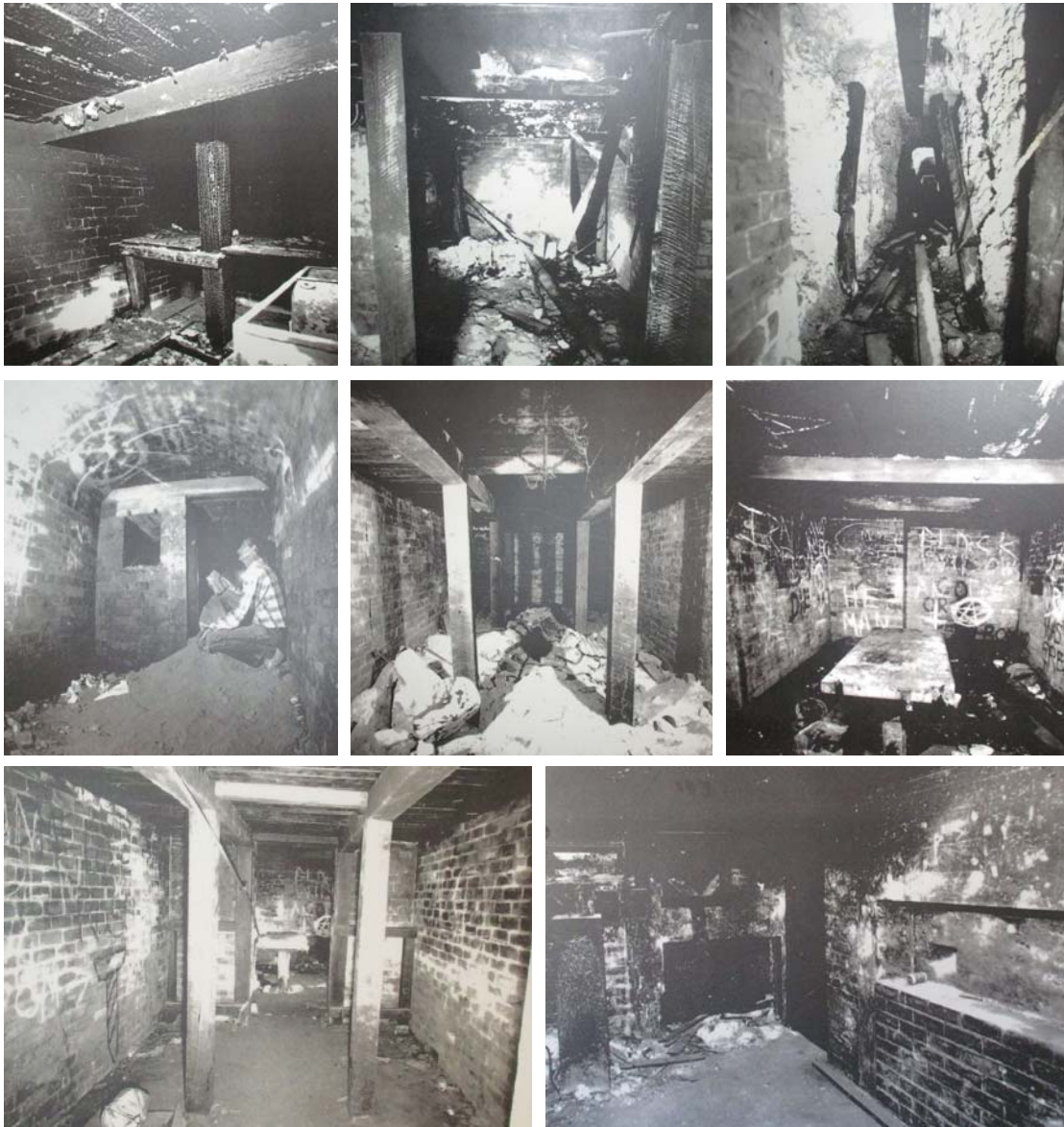


Figure 66. Royal Australian Artillery Historical Society of Western Australia, "Leighton Battery Tunnels", c.1989

The State Heritage Office added Leighton Battery to the State Register of Heritage Places on August 27, 1999. Ongoing works have taken place at the site to develop it into a local tourist attraction. These works have included the addition of elements intended to improve the safety and accessibility of the site such as fencing and railing, and interpretive additions such as the installation of two replica anti-aircraft guns that were not previously part of the battery site. As of 2019, plans are in place to reconstruct a replica 5.25" gun on the existing uncovered emplacement to increase the interpretation potential of the site. Plans for this development are included within Appendix 4. Leighton Battery is currently open to the public each Sunday between 10:00am and 3:00pm with tours conducted by volunteers from the Royal Australian Artillery Historical Society. While the site is managed by the Town of Mosman Park, the RAAHS are the leaseholders for the operation of the Leighton Battery site. This lease is current till 2025.

## Environmental context

### Climatic Conditions

Climate has a strong influence on the types of vegetation that grow in a region and the life cycles of the flora present. The south west of Western Australia experiences a Mediterranean climate of hot dry summers and cool wet winters.

The Mosman Park weather station is the closest Bureau of Meteorology (BOM) weather station to the site, located approximately 800m to the east. An average of 720.4 millimetres (mm) of rainfall is recorded annually from this station with the majority of rainfall received between the months of May and September. Mean maximum temperatures at the Fremantle station, which is the nearest temperature recording station located approximately 3.5 km south of the site, range from 18.8°C in July to 31.5°C in February, while mean minimum temperatures range from 9.5°C in July to 18.2°C in February (BoM 2019).

Climatic conditions are relevant to the CMP as they dictate the best seasonal timing for tasks like revegetation, weed control or flora survey.

### Geomorphology and Soils

Landform and soils influence vegetation types at regional and local scales. The site occurs on the Swan Coastal Plain, which is the geomorphic unit that characterises much of the Perth metropolitan area.

The Swan Coastal Plain is approximately 500 km long and 20 to 30 km wide and is roughly bound by the Indian Ocean to the west and the Darling Scarp to the east. Broadly the Swan Coastal Plain consists of two sedimentary belts of different origin. Its eastern side has formed from the deposition of alluvial material washed down from the Darling Scarp, while its western side is comprised of three dune systems that run roughly parallel to the Indian Ocean coastline (Seddon 2004). These dune systems, referred to as Quindalup, Spearwood and Bassendean associations, represent a succession of coastal deposition that has occurred since the late Quaternary period (approximately two million years ago) (Kendrick et al. 1991) and, as a result, they contain soils at different stages of leaching and formation.

Landform and soil mapping by Heddle et al. (1980) places the site in the Cottesloe unit of the Spearwood Dunes which was later confirmed during the field survey. Generally, the Spearwood Dunes are typified by a core of limestone overlain by yellow sand, and the Cottesloe unit occurs on the western side, being comprised of shallow yellow brown sands and exposed limestone (Churchward and McArthur 1980). The limestone in the

site is referred to as Tamala limestone.

Karst refers to the landscape produced by dissolution of soluble rocks by surface or groundwater. In WA, karst generally occurs in areas of limestone due to its high porosity which allows movement of groundwater and removal of calcium carbonate. The site is also mapped as a 'potential karst area' due to the presence of Tamala limestone (Gozzard 2011). Historical disturbance, including quarrying, has dramatically altered limestone formations within the site.

### Topography

Currently the central portion of the site is elevated at approximately 45 m in relation to the Australian height datum (mAHD). The land slopes to the west, north and east, being lowest in the west at 24 mAHD. The eastern portion of the site is flat to gently undulating, with a large limestone outcrop in the north eastern portion. The current topography of the site differs from its Pre-European condition, due to historical events previously discussed.

### Regional Vegetation

Native vegetation is described and mapped at different scales in order to illustrate patterns in its distribution. At a continental scale the Interim Biogeographic Regionalisation of Australia (IBRA) divides the Swan Coastal Plain into two floristic subregions (Environment Australia 2000). The site is contained within the 'SWA02' or Perth subregion, which is characterised as mainly containing Banksia low woodland on leached sands with *Melaleuca* swamps where ill-drained; and woodland of *Eucalyptus gomphocephala* (tuart), *E. marginata* (jarrah) and *Corymbia calophylla* (marri) on less leached soils (Beard 1990). This subregion is recognised as a biodiversity hotspot and contains a wide variety of endemic flora and vegetation types.

Variations in native vegetation within the site can be further classified based on regional vegetation associations. Pre-European vegetation mapping by Beard et al. (2013) shows the western side of the site as comprising 'vegetation association 1007' which is described as a mosaic of two types of shrubland: '*Acacia lasiocarpa* and *Melaleuca acerosa* (now *M. systema*) heath/*Acacia rostellifera* and *Acacia cyclops* thicket' (Beard et al. 2013). The eastern side of the site is mapped as comprising 'vegetation association 6', which is described as 'medium woodland; tuart (*Eucalyptus gomphocephala*) and jarrah (*Eucalyptus marginata*)' (Beard et al. 2013).

Vegetation complex mapping by Heddle et al. (1980) shows the site as comprising the 'Cottesloe complex – central and south' which is described as supporting a 'mosaic of woodland of *Eucalyptus gomphocephala* and open forest of *Eucalyptus*

*gomphocephala* - *Eucalyptus marginata* - *Corymbia calophylla*; closed heath on the limestone outcrops' (Hedde et al. 1980). Historical disturbance, particularly use of the site for military defence purposes, has significantly altered the vegetation from its remnant type. However subsequent revegetation and natural regeneration have increased the cover of native vegetation (as discussed in Appendix 11).

### Pest Fauna

The site has previously been included in a pest fauna control program implemented by the Western Suburbs Regional Organisation of Councils (WESROC) in 2016 and 2018. During a survey in 2016, one monitoring location in the site recorded 'old and scarce' rabbit scat's and one fresh fox scat. No foxes or cats were captured within the site during trapping undertaken in 2016 or 2018. Despite the lack of captures in the site during the above surveys there is potential for pest fauna such as rabbits, foxes and cats to occur in the site.

### Conservation Significant Values

#### **Threatened and priority flora**

The Department of Biodiversity, Conservation and Attractions (DBCA) maintains a database of occurrences of flora species listed as threatened and priority. According to this database, multiple threatened and priority flora species occur within 10km of the site. None are mapped as occurring in the site.

Only priority species, *Beyeria cinerea* subsp. *cinerea* (P3), has been recorded within the site as detailed in section 2.3.

#### **Threatened and priority ecological communities**

Similar to flora, multiple ecological communities listed as threatened or priority occur within 10km of the site. One State listed TEC, 'Callitris preissii (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain', is considered likely to occur in the site due to the presence of species associated with the TEC.

The DBCA notified the Town of Mosman Park in 2018 that the 'Callitris preissii (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain' TEC occurs within a portion of the site (V English 2018, pers. comm., 19 February). The notification included the 'approximate location of the TEC occurrence', with it being present within the majority of the western portion of the site. It was stated that 'parts of the Heritage Listed World War Two site including the Leighton Battery and associated paths and tracks are not considered part of the TEC'. It is unclear what basis the DBCA had for

excluding the extent of the occurrence of this TEC based on heritage values as the BC Act does not include provisions allowing this. During a site assessment in 2019 the TEC was recorded as occurring within some areas omitted in the DBCA advice (refer to Appendix 11). Further consultation with DBCA is recommended to confirm the extent of the TEC occurrence before any management is undertaken.

### Weeds

The term 'weed' can refer to any plant that requires some form of action to reduce its effect on the economy, the environment, human health and amenity. Many non-native flora species and some native species are considered to be weeds.

A particularly invasive or detrimental weed species may be listed as a 'declared pest' pursuant to the BAM Act or as a WoNS (DoEE 2019b). Due to historical disturbance and surrounding urban landuse a variety of weed species have potential to be present in the site.

## Land Use Considerations

In addition to the previously mentioned legislation, a range of regulations and policies are also relevant to the evaluation of vegetation in Western Australia. Key considerations applicable to the site are described below.

### **Bush Forever**

The Government of Western Australia's *Bush Forever* policy is a strategic plan for conserving regionally significant bushland within the Swan Coastal Plain portion of the Perth Metropolitan Region. The objective of *Bush Forever* is to protect comprehensive representations of all original ecological communities by targeting a minimum of 10% of each vegetation complex for protection (Government of WA 2000). *Bush Forever* sites are representative of regional ecosystems and habitat and have a key role in the conservation of Perth's biodiversity.

No Bush Forever sites occur within the site. *Bush Forever* Site 335 (Minim Cove, Mosman Park) is the closest *Bush Forever* site, located approximately 600m south east of the site.

### **Local natural areas**

Buckland Hill Reserve is recognized by the Town of Mosman Park as one of eight 'natural areas' and one of five 'remnant bushland areas'.

### **Environmentally sensitive areas**

'Environmentally sensitive areas' (ESAs) are prescribed under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and have been identified to protect native vegetation values of areas surrounding significant, threatened or scheduled flora, vegetation communities or ecosystems.

No ESAs occur within the site. The closest ESA lies approximately 200m to the south east of the site and appears to be associated with the Swan River.

### **Ecological linkages**

Ecological linkages are linear landscape elements that allow the movement of fauna, flora and genetic material between areas of remnant habitat. The movement of fauna and the exchange of genetic material between vegetation remnants improve the viability of those remnants by allowing greater access to breeding partners and food sources, refuge from disturbances such as fire and maintenance of genetic diversity of plant communities and populations. Ecological linkages are ideally continuous or near-continuous as the more fractured a linkage is, the less ease flora and fauna have in moving within the corridor (Alan Tingay and Associates 1998).

The Perth Biodiversity Project, supported by the Western Australia Local Government Association (WALGA), have identified and mapped regional ecological linkages within the Perth Metropolitan Region (WALGA and PBP 2004).

One ecological linkage (No. 2) is mapped within the central and eastern portions of the site. This linkage extends to the north and south of the site, and connects to multiple other linkages associated with the Swan River in the south.

### **Bush fire risk management**

Nearly the entire site, except a small portion in the north, has been identified as a 'bushfire prone area' under the *Map of Bush Fire Prone Areas* (DFES 2018). The *Western Australia Planning and Development Act 2005* requires that an assessment of the bushfire risk is undertaken for any land identified as bushfire prone, using the methodology described in *Australian Standard 3959-2018 Construction of buildings in bushfire prone areas* (AS 3959) (Standards Australia 2018). The suitability of the land, for the intended land use, is then to be assessed having regard to the determined risk and its compliance with the intent and objectives of State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (the Guidelines) (WAPC and DFES 2017).

A Bushfire Risk Management Plan (BRMP) was prepared for multiple bushland reserves within the Town of Mosman Park, including the site (Entire Fire Management 2018). The BRMP mapped three works areas within the site, and detailed activities to mitigate impacts of bushfire such as vegetation trimming and installation/maintenance of firebreaks. Firebreaks were recommended to achieve a minimum three (3) metre (m) width and four (4) metre height clearance, and to be located as close as practicable to the boundaries of the site.

The Town of Mosman Park currently maintains firebreaks for a portion of the perimeter of the site.

A review of firebreaks in the site may be required to ensure that the Town of Mosman Park are adhering to their requirements under Section 33 of the *Bush Fires Act 1954*.

## 2.2 Physical Evidence - Historic

Buckland Hill (the site) is located in the Town of Mosman Park overlooking the Swan River and Indian Ocean. The site extends over 9.9 ha and supports native vegetation, landscaped parks and a heritage area. The heritage curtilage encompasses a large portion of the site (7.4 ha) and is located in the central and western portion of the reserve. The remainder of the western portion supports native heathland vegetation and the eastern portion of the reserve supports both landscaped parks and native vegetation.

The Leighton Battery site is located within the eastern portion of the curtilage, on elevated land on the western side of Buckland Hill, with panoramic views to Rottnest and Garden Islands and Fremantle Port.

The Battery includes the remains, mostly underground, of a World War Two artillery coastal defence site. The Battery is composed of eight above ground constructions and associated underground tunnels and rooms that extend over 300m. Above ground constructions are: one remaining 5.25" gun emplacement, Command Post, Observation Post, Radar Shack, 6" display gun, 3.7" and 40mm indicative display guns and the north and south tunnel entrances.

Concrete walking paths connect Stirling Highway, Leighton Battery and the surrounding public open space and residential areas. A bitumen access road links the car park at the north-west corner with the Command Post in the south-east corner of the site. Limestone retaining and landscaping walls exist around the Battery and provide some structure.

Note: Where the condition of building fabric is described, this refers to the condition of significant elements that can be ascertained by visual inspection. It is not a statement of structural condition unless otherwise noted.



Figure 68. Carpark, **element** (2019)



Figure 69. Concrete Footpath, **element** (2019)



Figure 70. Limestone Footpath, **element** (2019)

## Circulation Networks

Access to the Leighton Battery is provided via Stirling Highway, Boundary Road, Edwards place and Rebell place. A bitumen carpark to the north of the Park and footpaths lead the visitors through the Buckland Hill Park to the battery site. Crushed limestone paths, concrete footpaths associated with limestone retaining walls provide the site with some landscaping. These paths are used by visitors and tour guides, and also by locals for exercise and dog walking.

The above ground structures are all concentrated to the South East portion of Buckland Hill Park. There are small paths which lead from the carpark to the Command Post, large enough to allow for controlled vehicle access. Staff often park in the open area fronting the Command Post and the route also provides access for small buses to park on both sides of the South Eastern entrance.

## Cluster of Structures

The majority of the heritage structures are in very good condition. The construction materials and techniques are reflective of a military facility, simple in shape and form but with significant engineering values. The location was strategically chosen so that troops could monitor Garden and Rottnest Islands, Fremantle Port and Perth in the distance. The overall group of buildings exhibit a unique lay-out of barracks in Western Australia, and are remnant of a much larger military complex which occupied most of Buckland Hill since 1941. The underground tunnel complex is an example of technical achievement during World War Two.



Figure 71. Site Plan Overall (element, 2019)

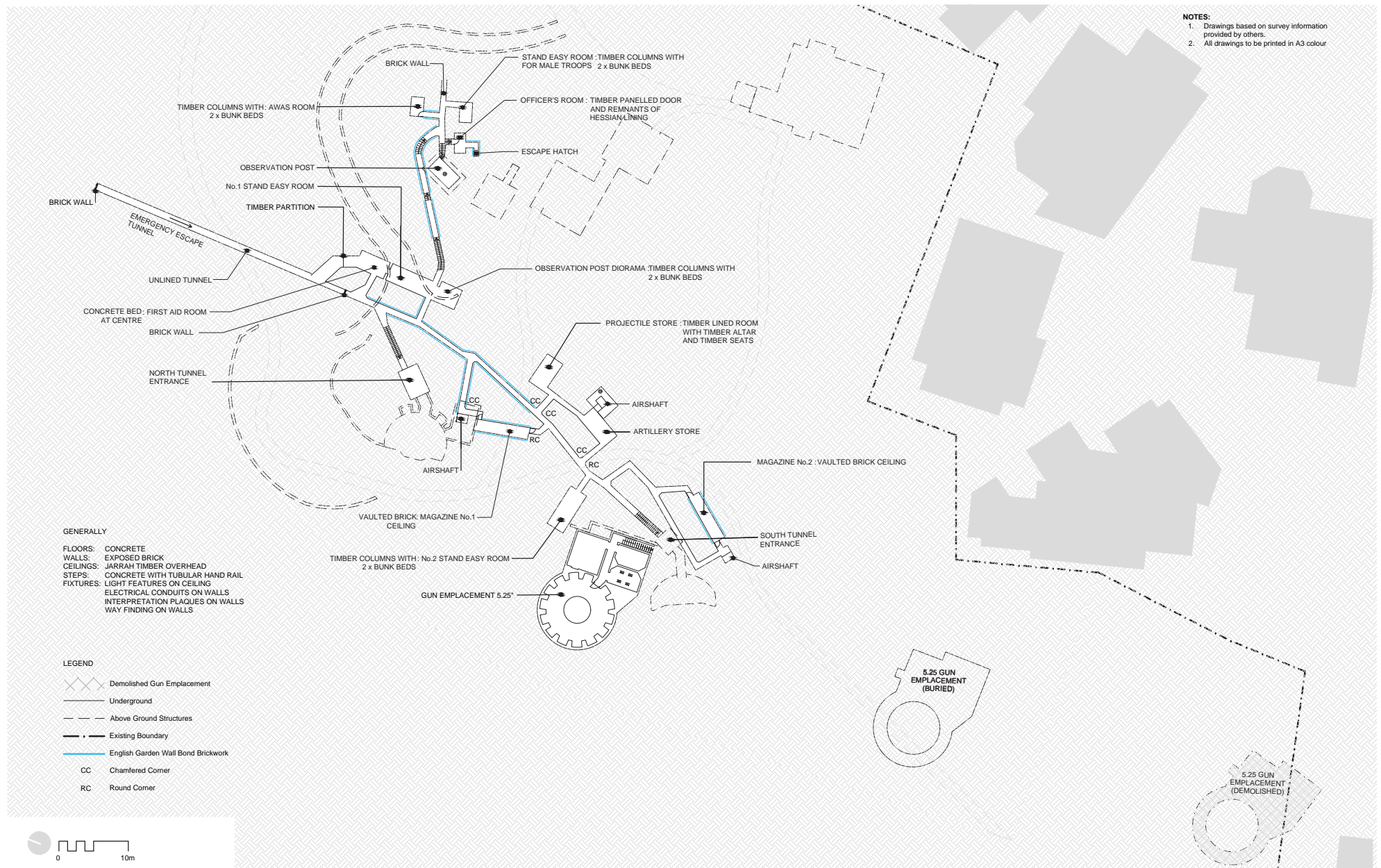


Figure 72. Underground Plan Overall (element, 2019)

## Building Materials and Construction Techniques

Most of the heritage constructions are made of concrete, concrete floors, face brick walls and concrete roofs. The tunnels and underground rooms are face brick walls, some with English garden wall bond with mortar of a grey colour finished flush. Some corners are chamfered and others have a round featured brick corner. The ceilings are mostly jarrah planks spanning through the width of the tunnel, supported by jarrah beams and posts in some rooms. Almost all of the tunnel complex has poured concrete floors. Landscaping is made up of limestone edges and crushed limestone or concrete paths.



Figure 73. Brick, element 2019



Figure 74. Concrete, element 2019

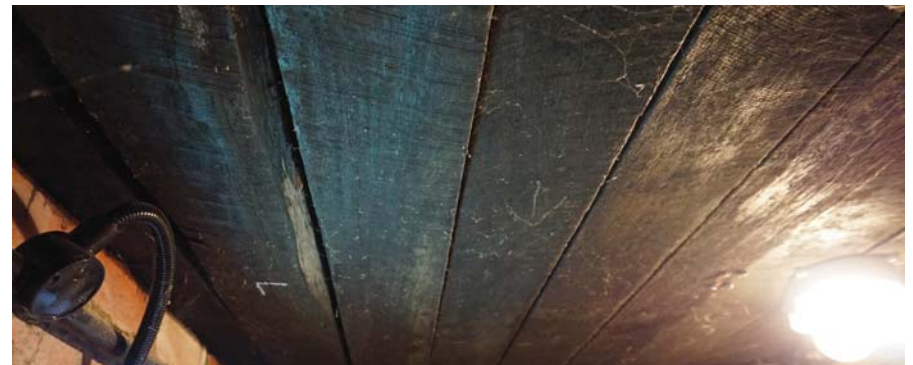


Figure 75. Timber, element 2019

## Imprints of Past Land Uses

Leighton Battery is located within a Registered Site of Aboriginal Significance. It was a known camping ground and has potential to contain artefacts of Aboriginal origin. The site was subsequently used for quarrying and military purposes however, due to the extensive ground disturbance the potential of significant finds from this period could be diminished.

The present site is much smaller than the original defence complex, the setting has altered, some of the structures have been removed and the place has much more vegetation than during its military use era. Although change has occurred, the area still has high potential to yield information about coastal defence strategies in Australia and Western Australia in particular during World War Two.



Figure 76. View to Indian Ocean and Rottne Island from Buckland Hill (element 2019).

## Views and Vistas

The key vistas of the targeted areas are of exceptional significance. They are key for the full understanding of the significant part that the defence system played in a larger, national system of coastal defence strategies during World War Two, using both artillery and anti-aircraft weapons. Views from the observation post, and from the gun emplacements provides the understanding of the technology of the period, with panoramic views of the Indian Ocean to Rottnest and Garden Islands, Fremantle Port, over the surrounding suburbs and east to the Perth city skyline and the Darling Range; the Battery serves as a vantage point.



Figure 77. View from the Observation Post. Please note limestone wall to be demolished. View from the Observation Post. Please note the limestone wall and vegetation are blocking significant views. Wall noted as intrusive and to be removed and vegetation to be pruned accordingly (element, 2019)



Figure 78. View from the reconstructed 6" gun. Please note the vegetation blocking significant views to the Indian Ocean. (element 2019)



Figure 79. View from uncovered 5.25" emplacement. Please note intrusive chain link balustrading. (element 2019)

## Condition, Authenticity and Integrity

Leighton Battery is set within an attractive, large open area. The existing vegetation is not original to the World War Two setting. However, its lush and character to a pleasant and contemporary setting. The level of authenticity above ground is moderate to low across the built elements of the site, due to the level of reconstruction and additions, such as the chain link fences, Observation Post windows, camouflaged painted roofs, concrete footpaths and limestone edges. Elements of significant value such as the tunnels and 5.25" gun emplacement have moderate to high authenticity and highly contribute to the overall setting.

All structures are in use today for interpretation purposes and are in very good physical condition. These buildings have been extensively repaired since the 1980s, however all works done to the place have respected the traditional and existent fabric, form, materiality and methodology ameliorating the deficit of authenticity. The biggest threat to the place after bushfire is vandalism. The site has been subject to anti-social behaviour and vandalism, generating a wide range of impacts such as the introduction of metal shutters to windows, grills, fencing systems and metal doors to block access to internal areas.

**It is worth noting that most of the site is in very good condition and well looked after by the current lessees, the Royal Australian Artillery Historical Society being committed to its long-term preservation.**

For structural engineering advice please refer to Appendix 13.



Figure 80. View of entry to 5.25" emplacement. Please note intrusive chain link fencing. (element 2019)



Figure 81. View from roof of Radar Shack. Please note intrusive balustrading, (element 2019)



Figure 82. View to Indian Ocean. Please note limestone walls of little significance, (element 2019)

2.2.1 Detailed Information on The Extant Structures

5.25" Gun Emplacement

Brief History

Three 5.25" guns were installed at the Leighton Battery site during World War Two between 1944/45. The war concluded prior to the guns being proofed which eventually took place in 1947. They were the only 5.25" guns to become operational in Australia although installation of this gun was planned for a number of other coastal defence sites. They continued to be used for training purposes until 1963 when they were dismantled and sold for scrap. With the development of the Buckland Hill Estate in 1989 one of the emplacements was uncovered and conserved, one was completely removed and one remains buried on site.

Physical Description

Only one of the three original gun emplacements, the northern one, still remains visible. The middle one is believed to be buried and the southernmost was demolished. The emplacement is entirely made of concrete casted *in situ*. It is accessed by a set of steps down, where the entrance is protected by a cage like chain link fence. Rooms are underground and empty, a with few remaining scattered shelving and metal parts. Floors still display concrete plinths and bases for equipment in most rooms. Walls are painted concrete.

The emplacement is in very good condition, with minor cracks and paint blistering on the exposed concrete, and rust on the metal items. Currently there is an interpretation 5.25" gun proposed to cover the round room, protecting the existing fabric from the elements. Views from the emplacements to Garden and Rottneest Islands and Fremantle Port are currently blocked with vegetation.

Item	Physical description	Finish	Condition
Walls	Concrete	Painted	Very good
Openings	Concrete	Natural	Good
Floors	Concrete	Natural	Fair
Underroof slab	Concrete	Natural	Fair
Doors	Metal	Painted	Good
Fixtures and fixings	Various metal lids and shelving	Natural	Poor
Balustrade	Tubular balustrade with chain link fencing	Natural	Good

Condition	Authenticity	Integrity
Good	High	High to moderate

PLEASE NOTE: that there is a Development Application in place for interpretation on this gun emplacement. Please refer to Appendix 4 for further drawings.

Figures

1.

Location Key – Site of the three emplacements
2.

Floor plan (not to scale)
3.

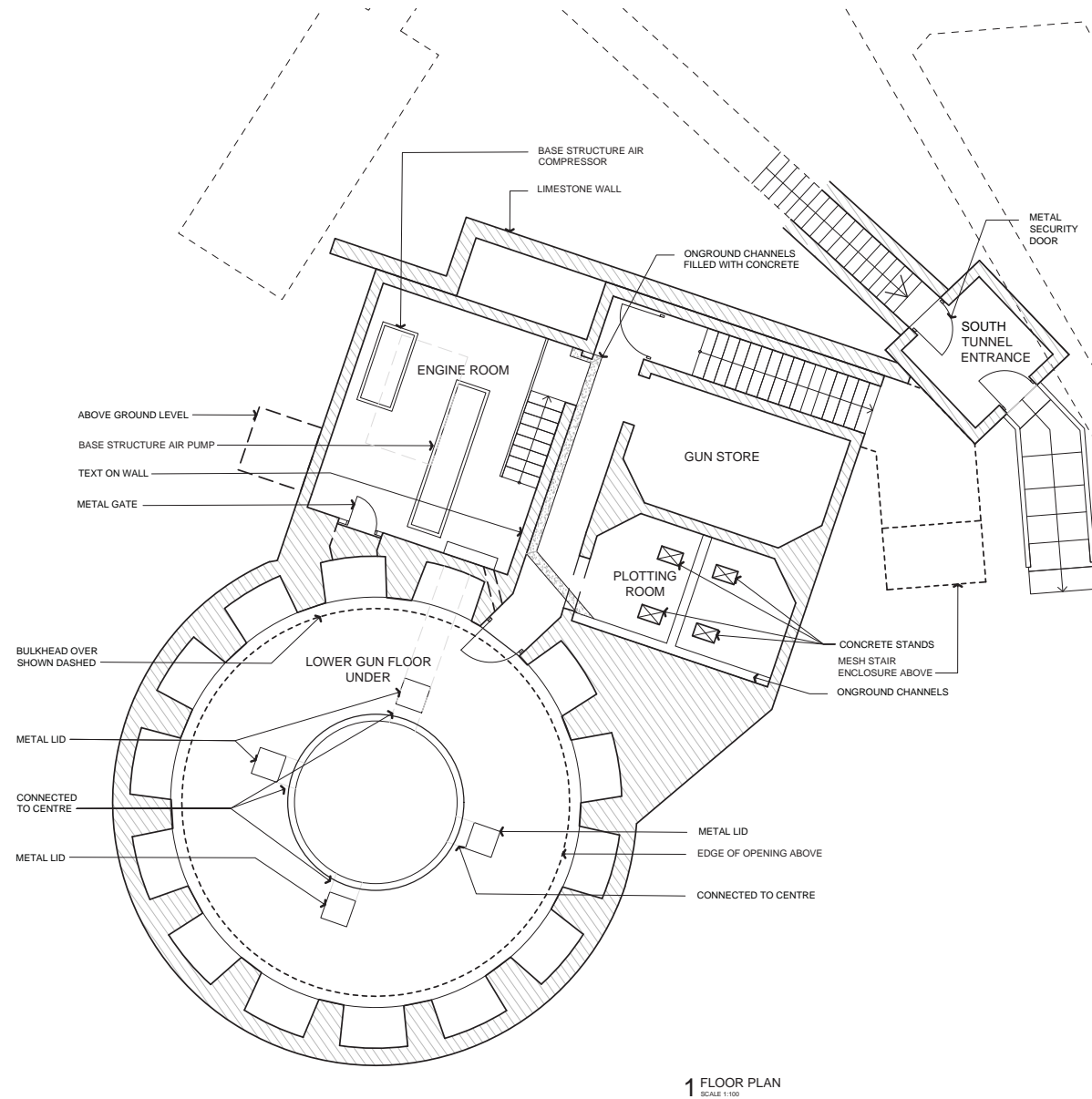
Aerial view of uncovered emplacement (element 2019).
4.

5.25" gun, date unknown (RAHHS).
5.

View of emplacement (element 2019).
6.

Internal view of emplacement (element 2019).





- NOTES:**
1. Drawings based on survey information provided by others.
  2. All drawings to be printed in A3 colour



KEY LEGEND



Figure 83. 5.2" gun emplacement (element, 2019)

Display Guns (3.7" and 40mm)

Brief History

Replica 3.7" and 40mm guns were installed at the site in 2015 as part of above ground interpretive works. They are indicative of types of guns used at the site, but not original and did not form part of the original layout. The guns are therefore only of some significance.

Physical Description

A small limestone edge was constructed to frame the 3.7" and 40mm display guns. Each gun sits in the middle of a square frame, connected by a set of steps. On the western lower part, there is a tubular balustrade around for protection. The floor is crushed limestone. On the northern corner of the lower frame, there are replica timber supports for a vehicle loading ramp.

Although not original to the site, these display guns contribute to the interpretation of World War Two history and are in very good condition. Tubular balustrades are intrusive and do not contribute to the overall setting of the area.

Item	Physical description	Finish	Condition
Walls	Small limestone edge wall Tubular metal balustrade	Natural	Good
Floors	Natural ground with concrete footings	Natural	Good
Machinery	Non original metal gun	Painted	Very good

Condition	Authenticity	Integrity
Good	Low	Low

Figures

1. Location Key.

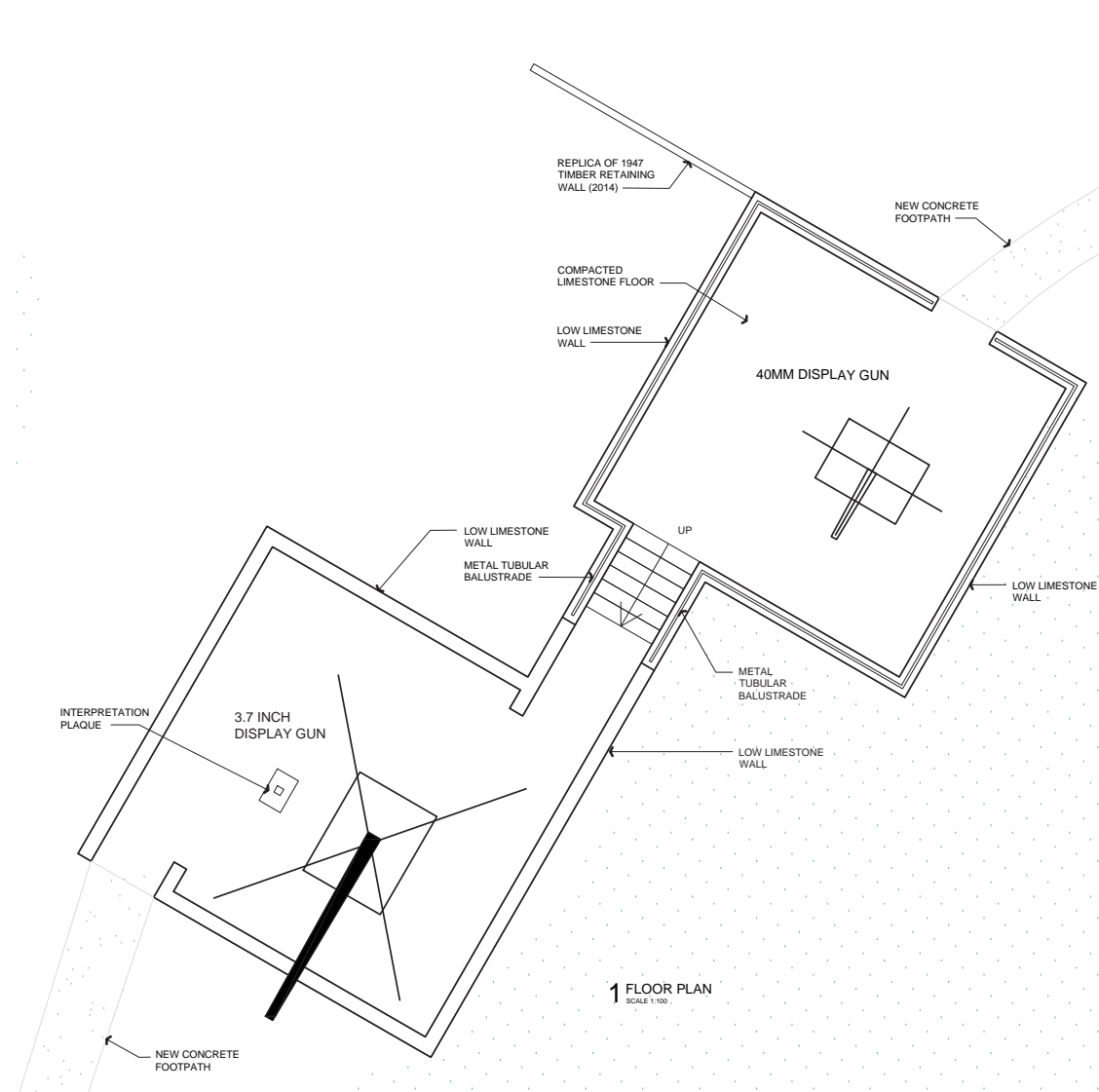
2. Floor plan (not to scale).

3. 3.7" gun at Buckland Hill 1943 (RAHHS).
4. Aerial view (element 2019).

5. 3.7" Heavy AA gun (element 2019).

6. 40mm BOFERS Light AA Gun (element 2019).





- NOTES:**
1. Drawings based on survey information provided by others.
  2. All drawings to be printed in A3 colour



KEY LEGEND

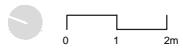


Figure 84. Display guns 3.7" and 40mm (element, 2019)

Display 6" Guns

Brief History

Two 6" guns were transferred from Fort Arthur's Head and installed at Leighton Battery in 1943 as part of the Fremantle Fortress coastal defence system. They were removed in 1944 and replaced with three 5.25" guns. The 6" gun installed on site today was originally installed on HMAS Adelaide and found in 2013 at a tip on the Mornington Peninsula. It was moved to Leighton Barracks and installed in the location of one of the original 6" emplacements.

Physical Description

Both 6" gun emplacements were partially reconstructed. The northern emplacement is the most intact and displays a 6" gun that has been reconstructed from multiple sources. The 6" gun sits on a non-original fishbone pattern brick paving, supported by two metal stands, one on each side and a concrete base in the middle. The area is surrounded by reconstructed half height face brick walls forming some niches or seats, which have a concrete base. Here, the English garden wall bond (with three courses of stretcher bond and a fourth course of headers) brick pattern is seen on all walls. There is a room shaped area to the south, with half height reconstructed brick walls, and a concrete base in the middle connecting to the ammunition hoist in the tunnel system below.

This area is in good condition, however some salt efflorescence is coming through the original bricks due to rising damp. Several minor cracks were noted throughout the area. Views from the emplacements to Garden and Rottnest Island and Fremantle Port are currently blocked with vegetation.

Item	Physical description	Finish	Condition
Walls	Low brick walls, some original at base	Natural	Good
Floors	Fishbone pattern brick paving, new	Natural	Good
Supports	Metal stands	Natural	Good
Machinery	Non original metal gun	Painted	Very good

Condition	Authenticity	Integrity
Good	Low	Moderate

Figures

- 1

Location Key.
- 2

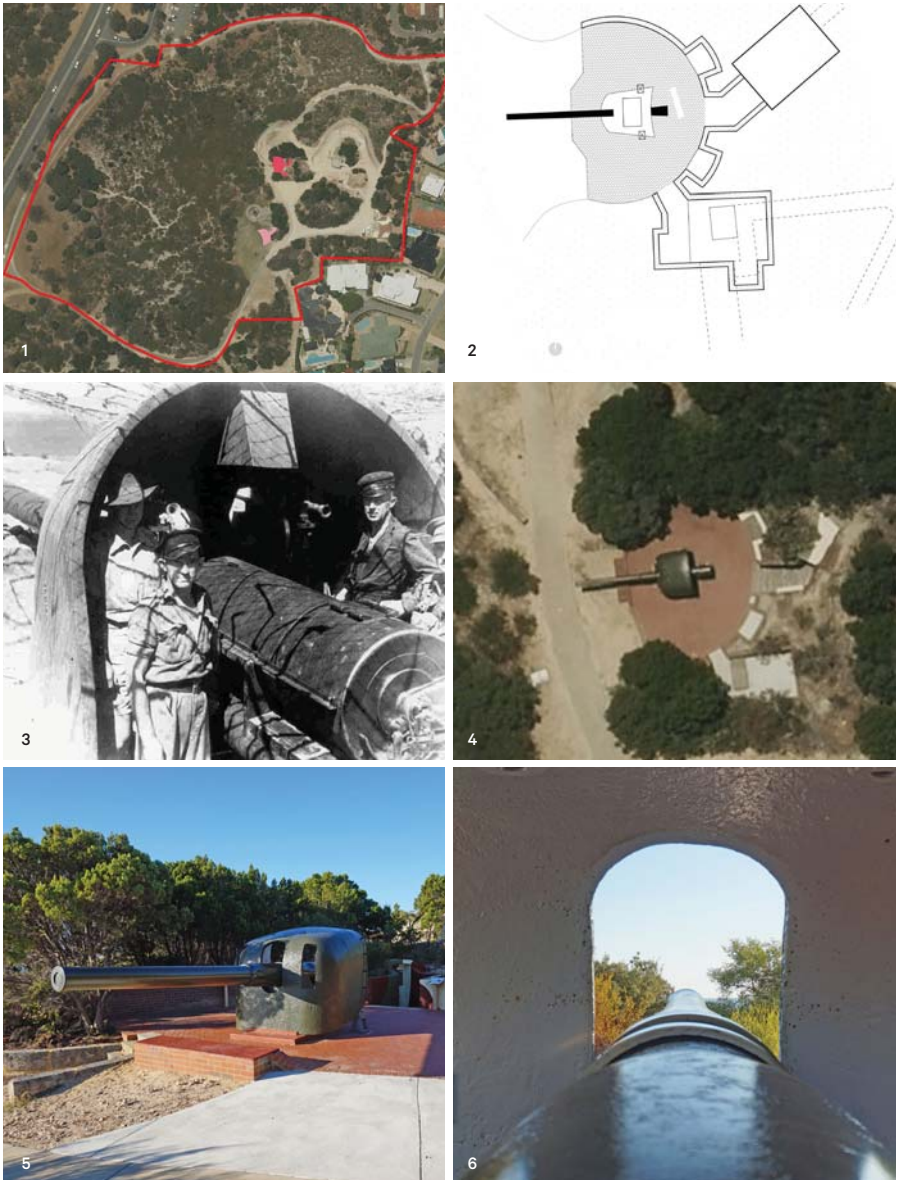
Floor plan (not to scale).
- 3

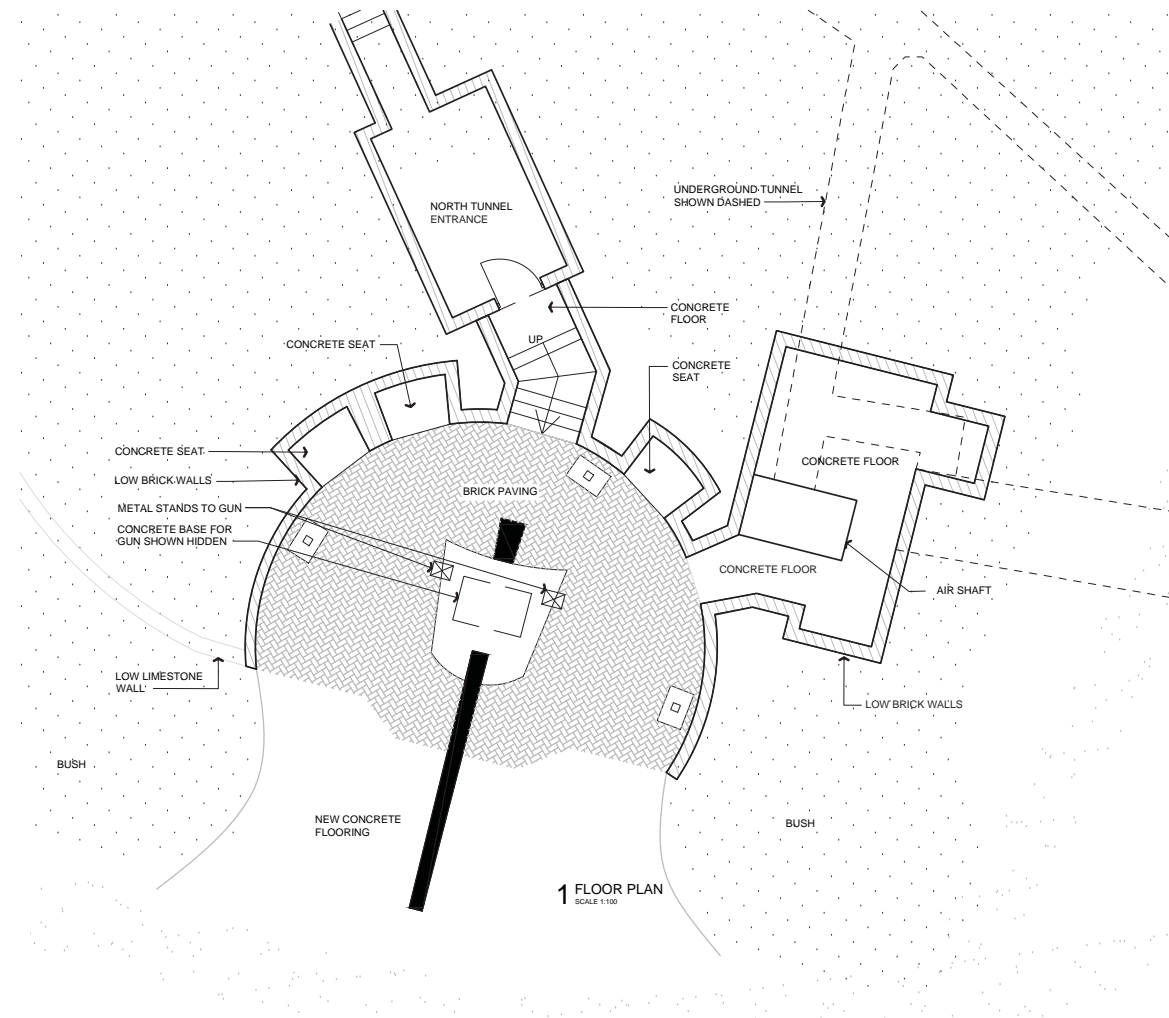
6" gun Leighton Battery 1943 (Australian War Memorial).
- 4

Aerial view (element 2019).
- 5

View of 6" gun (element 2019).
- 6

6" gun outlook (element 2019).





- NOTES:**
1. Drawings based on survey information provided by others.
  2. All drawings to be printed in A3 colour



**KEY LEGEND**

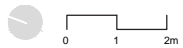


Figure 85. Display guns 6" (element, 2019)

Radar Shack

Brief History

According to State Heritage Office Assessment Documentation the radar shack was constructed c.1947 although it is currently believed that this date may have been later than initially recorded. Regardless the construction occurred after the resolution of World War Two, and therefore the significance of this structure has been identified as lower than that of the original World War Two constructions.. Records show that a non-directional beacon was placed on the hut by the Fremantle Port Authority around c.1963 which was removed as part of the 1989/90 works to develop the Buckland Hill Estate. As of 2019 it is used as a storage facility.

Physical Description

The Radar Shack is composed of one single rectangular room used today as a deposit. It has a concrete floor and roof, with load bearing brick walls. The Radar Shack only has one opening, which is the access metal door. The structure is used today as an observation point with the rooftop accessed by a set of metal stairs, protected by a tubular balustrade. The floor on the rooftop is made of multicoloured irregular slates with a decorative mosaic and flagpole in the middle.

This construction is in good condition, presenting some cracking and salt efflorescence coming through the slab inside the room and underneath the flagpole area. There is some slab edge cracking that needs repair. Tubular balustrades are non-compliant and intrusive and do not contribute to the overall setting of the area.

Item	Physical description	Finish	Condition
Rooftop	Observation point with flagpole	Slates floor mosaic	Fair
Roof	Concrete	Painted	Fair
Walls	Brick	Painted	Good
Floors	Concrete	Natural	Good
Door	Metal shutter	Painted	Good
Stairs and balustrade	Metal stairs with tubular balustrade	Natural	Good

Condition	Authenticity	Integrity
Good	Moderate	Moderate to low

Figures

1. Location Key.

2. Floor Plan (not to scale).

3. Portion of a proposed site plan, 1944 (not to scale).
4. Aerial view, 2019.

5. Radar shack external view (element 2019).

6. Radar shack internal view (element 2019).



Observation Post

Brief History

The Observation Post was constructed as part of the tunnel development and served as the fire direction co-ordination centre for the 6” guns, housing depression range finders which calculated the range to targets. Originally a limestone cap existed to camouflage the Observation Post from the air and sea. This was removed when the roof was used to mount a fire control radar. This above ground portion was reconstructed to increase security and now consists of metal rather than timber framed outlook windows and metal security shutters.

Physical Description

The observation post is a semi-buried room accessed by the underground tunnels. It is surrounded by windows on the front and half way along the sides. Those are aluminium window frames, with thin clear glass and security hopper metal shutters. It has a rough concrete roof, which is a simpler version of the once camouflaged limestone above. The wall facing the tunnels is a painted brick load bearing wall, however the other walls are of painted concrete. The floor is of square inscribed concrete, painted red. On the north eastern corner there are some remains of cabling. All walls have interpretation items and memorabilia. There are a number of concrete plinths on the floor, possibly used for equipment.

Aluminium window frames and security hopper metal shutters are not original to the construction are believed to be intrusive. The original timber tilted frames were of a scientific value, designed not to reflect the sun and contributed to the camouflaged setting. Otherwise, the construction is in very good condition. The rough surface of the roof structure has poor drainage capabilities and prone to trapping water, exhibiting signs of corrosion to the reinforcement within the roof slab (spalling). Views from the Observation Point to Garden and Rottnest Islands and Fremantle Port are currently blocked with vegetation and raised limestone wall.

Item	Physical description	Finish	Condition
Under roof	Concrete	Painted	Fair
Walls	Concrete and brick	Painted	Good
Floors	Inscribed concrete	Painted	Good
Windows	Aluminium frame windows, clear glass, metal shutters on the outside	Painted	Good
Door	Metal grill	Painted	Good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

Figures

1. Location Key.

2. Floor plan (not to scale).

3. RAAHS, Observation post, 1943.
4. Aerial view (element 2019).

5. External view (element 2019).

6. Internal view (element 2019).



Command Post

Brief History

The Command Post was constructed in 1948 to control operations of the 5.25” guns. It utilised coastal and air warning radars to identify both surface and air targets for the gun batteries. Today it houses interpretive displays and facilities for the RAAHS volunteer operations.

Physical Description

The command post does not differ significantly from the rest of the constructions. It is mainly made of load bearing brick walls, painted with military colours interpreting a camouflaged paint (maroon, deep green and beige). The windows are of steel frame, with metal bars on the inside, and metal shutter on the outside. All exterior doors are heavy metal security doors. On the inside, one can find an interpretation room, store, kitchen, toilet and staff rooms. With the exception of the wet areas, all other rooms have carpeted floors on a concrete slab and painted walls. It is used as an interpretation room with many items of memorabilia, posters and newspaper clippings. In the kitchen and toilet, stairs up to ground level have been blocked off.

The building has been adapted to the use of the visitors and staff, and it is in very good condition. Changes made to include a toilet and a kitchen were of a simple character and do not detract from the local character.

Item	Physical description	Finish	Condition
Roof	Concrete	Painted	Fair
Walls	Concrete	Painted	Good
Floors	Concrete	Carpet	Good
Door	Metal shutter	Painted	Good
Windows	Steel frame windows, clear glass, grills on the inside, metal shutters on the outside	Painted	Good

Condition	Authenticity	Integrity
Good	High	High

Figures

1. Location Key.

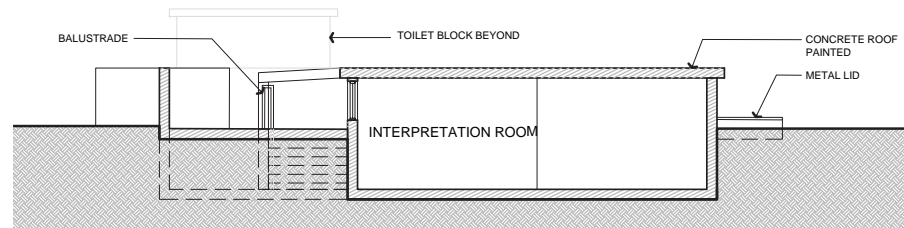
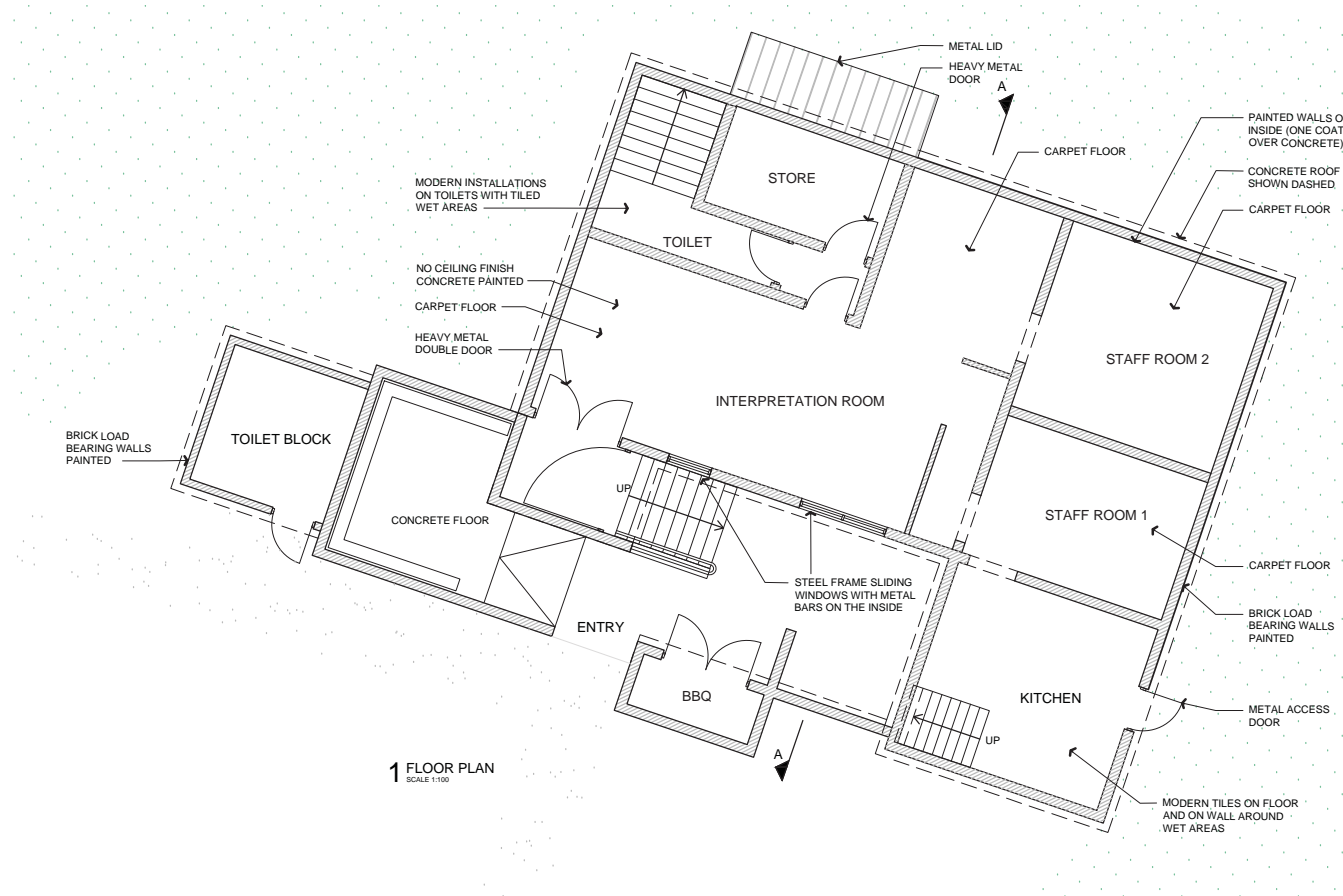
2. Floor plan (not to scale).

3. RAAHS, Command post.
4. Aerial view (element 2019).

5. Exterior view (element 2019).

6. Interior view (element 2019).





**2 SECTION A**  
SCALE 1:100

- NOTES:**
1. Drawings based on survey information provided by others.
  2. All drawings to be printed in A3 colour



**KEY LEGEND**



Figure 86. Command Post (element, 2019)

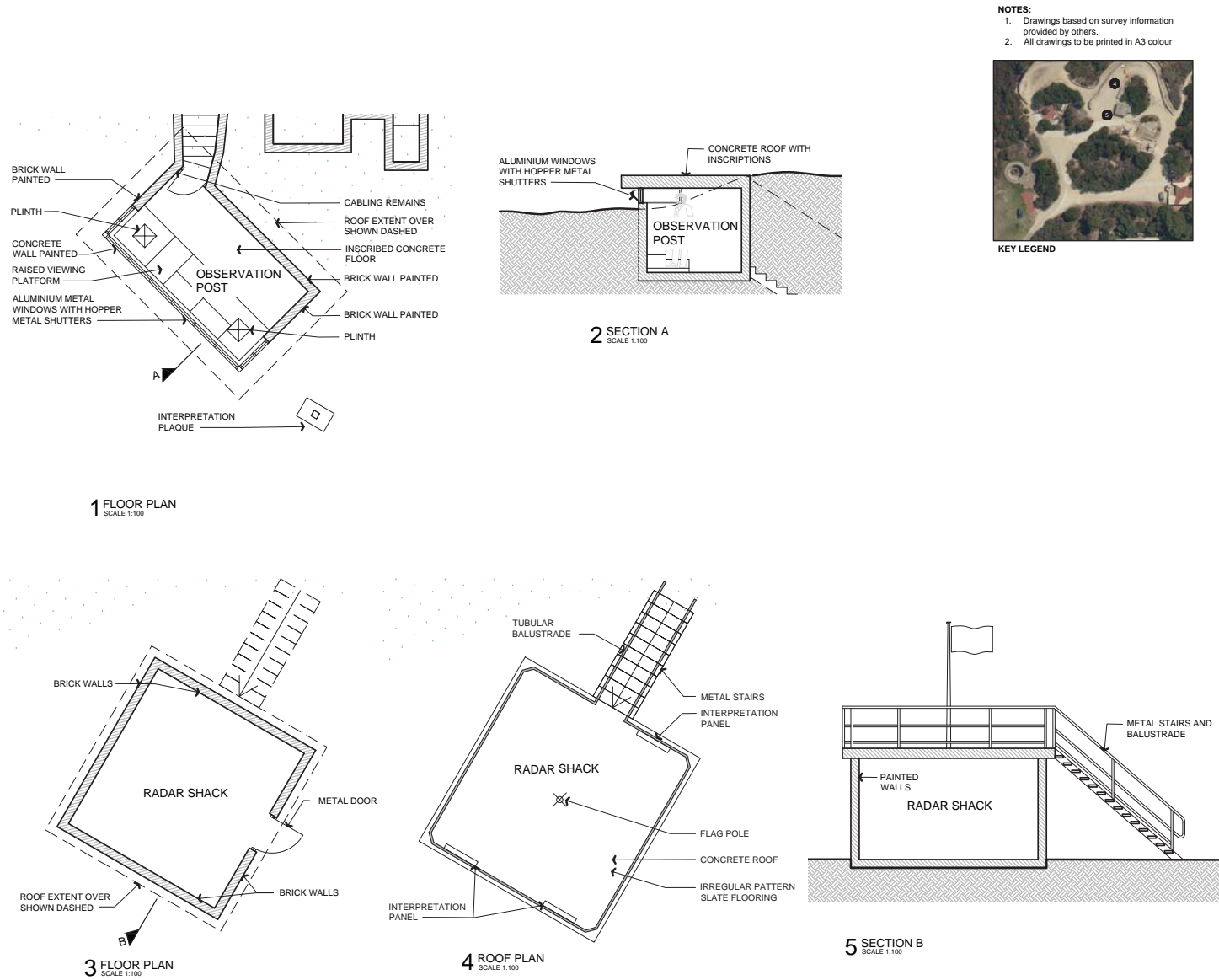


Figure 87. Observation Post and Radar Shack (element, 2019)

Tunnels Generally

Brief History

The tunnel system links a number of underground accommodations and storage facilities with the gun emplacements of the Leighton Battery site. Approximately 300m of tunnel were constructed by personnel stationed at the barracks in 1942/43 reaching up to 10m underground.

Physical Description

The underground tunnel system is approximately 10m below the surface and extends for around 300m in length. The structure is supported by the natural limestone with internal exposed brick walls, non-structural oiled jarrah timber ceilings and concrete infill floors. Lighting along the ceiling assists with way finding underground. One metal handrail is located along the stair system. On a number of wall corners, bullet marks can be seen, believed to have been made by SAS soldiers training after World War Two.

Generally, the tunnels are in good condition however, several minor cracks were noted throughout the area. For further information, refer to the structural engineers report in Appendix 13. Some of the timber ceiling beams are sagging and show small areas of bowing, splitting and deflection. There are signs of previous termite damage and fire damage in some timber sections however, the damage appears to be localised.

Number 1 and 2 stand easy rooms have salt efflorescence coming through the ceiling timber boards which is a sign that water might have come through the area in the past. Roots are coming through the unlined frame/area which could pose a threat to the existing tunnel.

Some damage has occurred throughout the life of the tunnel system from influences such as fire and vandalism including graffiti, inscriptions, destruction of areas, arson and looting.

There is story of fire and all sorts of vandalism happening throughout the years, such as graffiti, inscriptions, destruction, arson, looting and others.

Item	Physical description	Finish	Condition
Ceiling	Timber	Natural	Good
Walls	Brick	Natural	Good
Floors	Concrete	Natural	Good
Door	Timber panelled	Painted	Good

Condition	Authenticity	Integrity
Good	High	High

Figures

1.

Australian War Memorial, Leighton Battery tunnels under construction, 1943
2.

Australian War Memorial, Leighton Battery tunnels under construction, 1943
3.

Plan of underground tunnels (not to scale)
4.

RAAHS, Leighton Battery tunnel damage, c.1989
5.

View of tunnel, 2019



South and North Entrances

Brief History

There are two primary entry points to the underground tunnel system, located near the 6" gun battery to the north and the uncovered 5.25" gun emplacement to the south. Both entries have been retrofitted with modern security measures since the site was reopened following the development of the Buckland Hill Estate in 1989.

Physical Description

These entrances were constructed during the development of the adjacent housing estate (1989). They were constructed mimicking the local style with brick walls, concrete roofs and metal doors with bars and mesh leading to concrete steps leading down into the tunnel complex. The northern door is a metal frame with bars and mesh, the south door is of a metal panel with grill on top. Both entrances are painted on the outside with the same motif as the other constructions. On the walls there are fluorescent lights inside, fire extinguishers and metal conduits for electrical cabling. Entering through the north entrance, the tunnel leads to an unlined part of the tunnel, the Escape Tunnel. There is a mannequin and some memorabilia located here for interpretation.

Item	Physical description	Finish	Condition
Roof	Concrete	Painted	Good
Walls	Brick	Painted	Good
Floors	Concrete	Natural	Good
Door	Metal	Painted	Good

Condition	Authenticity	Integrity
Good	Low	Low

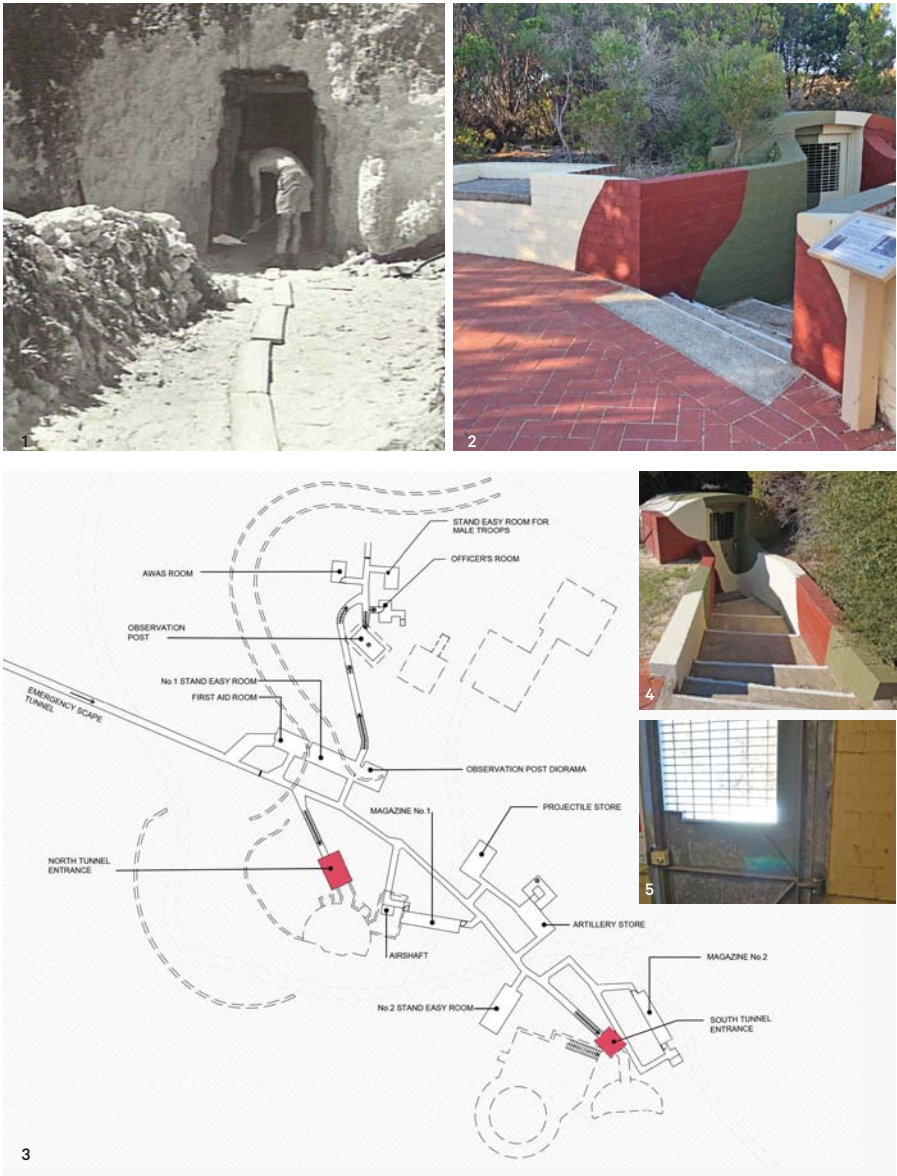
Figures

1. Australian War Memorial, Entrance to Main Tunnel, 1943

2. View of northern entry to tunnel
3. Location Plan (not to scale)

4. View of southern entry to tunnel, 2019

5. View of southern entry internal, 2019



First Aid Room

Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. The first aid room was a care space for injured soldiers and contains a built in concrete stretcher platform in the centre of the room.

Physical Description

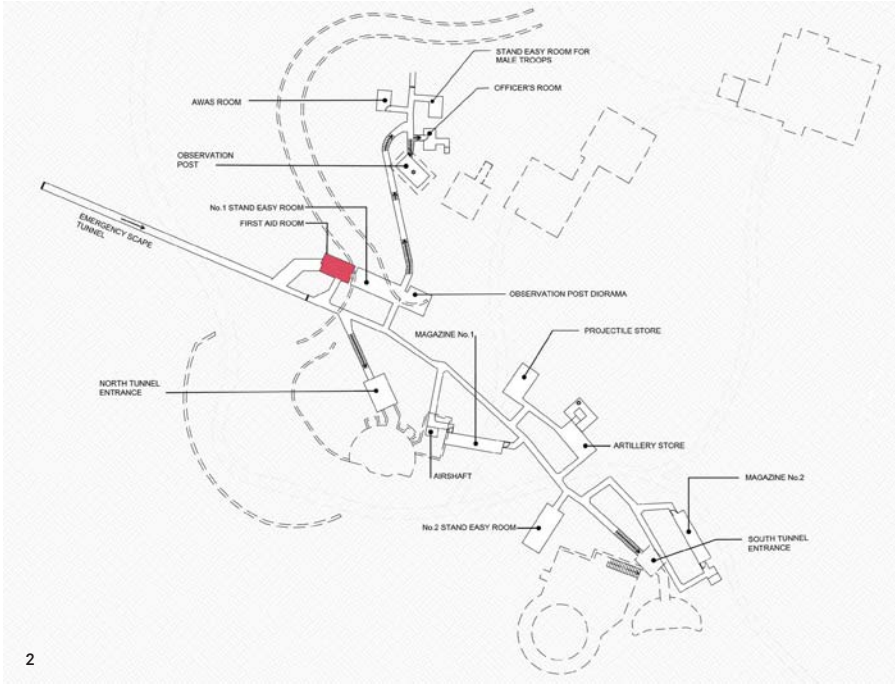
This room is arranged with a mannequin and memorabilia to assist the visitor with interpretation. There is a concrete bed in the middle of the room with a stretcher.

Item	Physical description	Finish	Condition
Ceiling	Non original Timber	Oiled	Good
Walls	Brick	Natural	Good
Floors	Concrete	Natural	Good
Moveables	First Aid equipment Images	N/A	Good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

Figures

- 1. View of First Aid Room
- 2. Location plan (not to scale)



Number One Stand Easy Room

Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. The Numner One Stand Easy Room housed rest accommodations for troops and in 2019 contains a small interpretive display that includes bunk beds and aerial images of the site taken in 1947 and 2006.

Physical Description

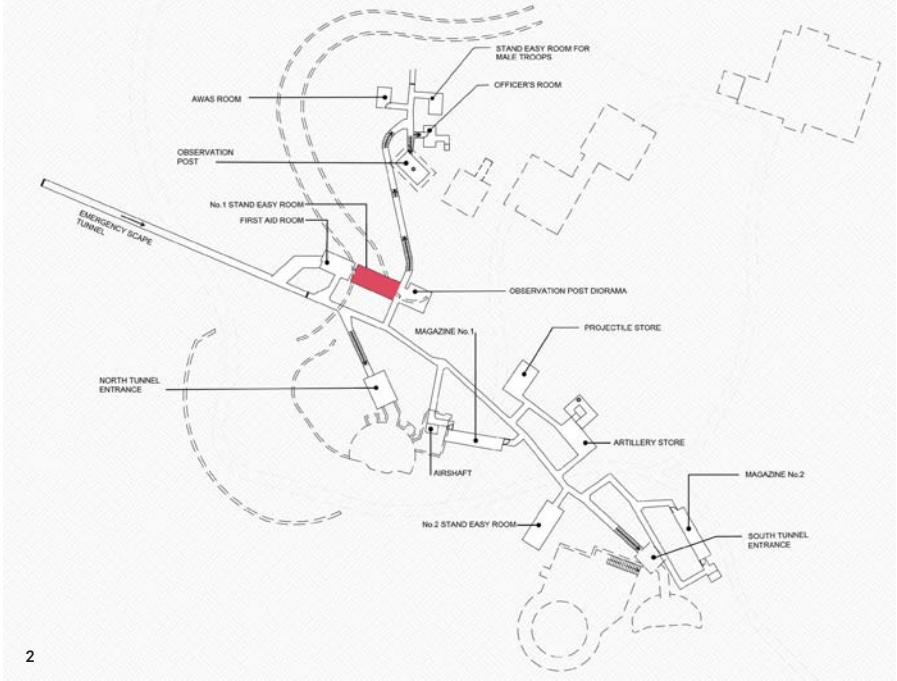
This room shows remnants of bunk beds, supported by a timber structure and eight columns. An alcove to the east of this room displays an Observation Post Diorama.

Item	Physical description	Finish	Condition
Ceiling	Original Timber	Oiled	good
Walls	Brick	Natural	good
Floors	Concrete	Natural	good
Moveables	Bunk beds original timber structure	Natural	good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

Figures

- 1. View of Number One Stand Easy Room
- 2. Location plan (not to scale)



AWAS Room (Australian Women’s Army Service)

Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. The AWAS Room is dedicated to the Australian Women’s Army Service and contains a small display of bunks and some images of women serving at Leighton Battery during World War Two.

Physical Description

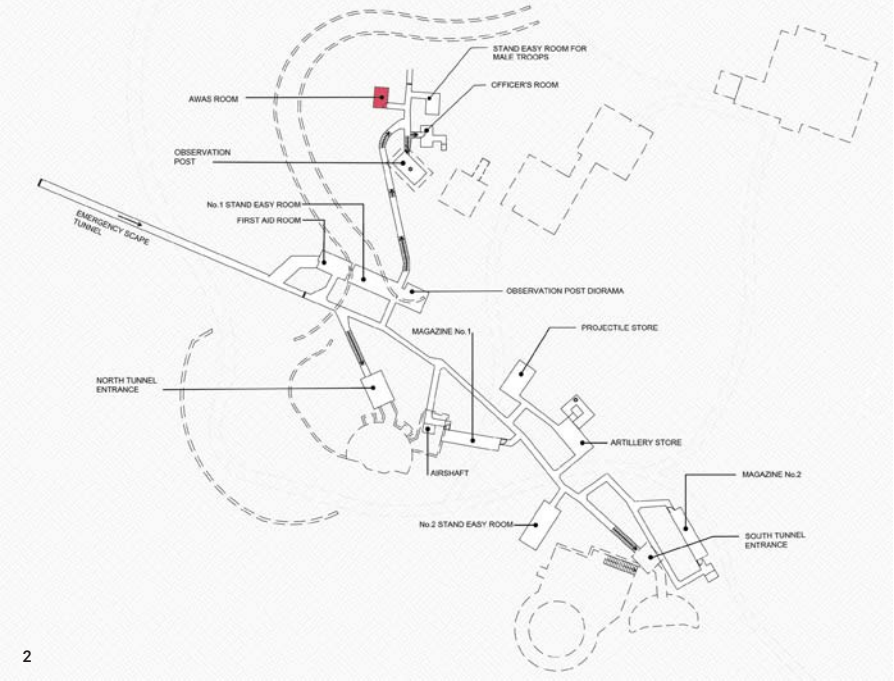
This room is arranged with a mannequin and memorabilia to assist the visitor with interpretation. There is a bunk bed installed and photographs on display.

Item	Physical description	Finish	Condition
Ceiling	Original Timber	oiled	good
Walls	Brick	Painted	good
Floors	Concrete	Natural	good
Moveables	Bunk beds original timber structure	Painted	good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

Figures

- 1. View of AWAS Room
- 2. Location plan (not to scale)



Stand Easy Room for Male Troops

Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. The Stand Easy Room housed rest accommodations for troops and in 2019 contains a small interpretive display that includes bunk beds and photographs of the tunnel construction.

Physical Description

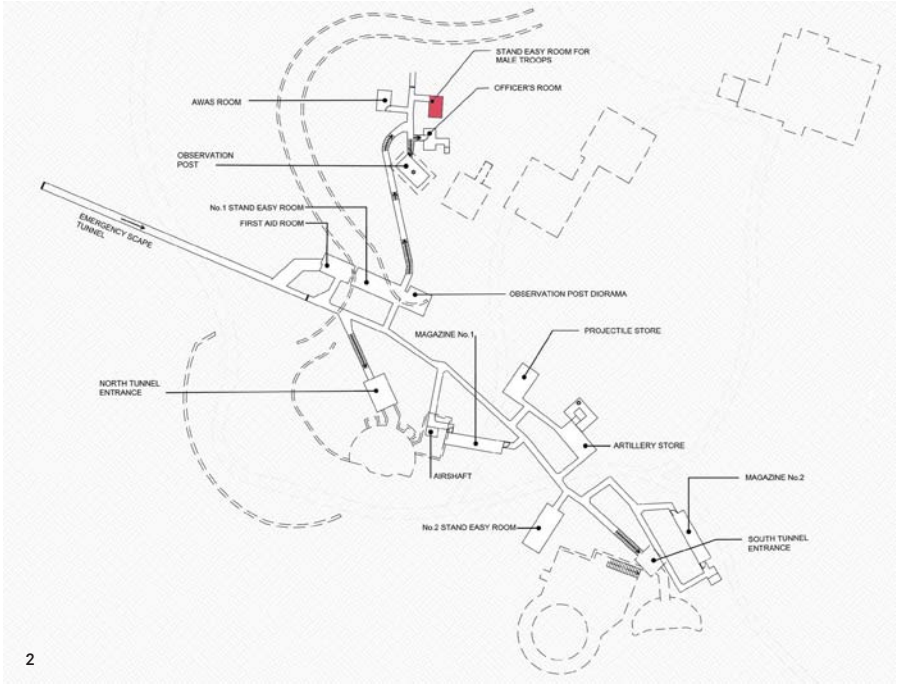
This room shows remnants of bunk beds and interpretive memorabilia.

Item	Physical description	Finish	Condition
Ceiling	Original timber	Oiled	Good
Walls	Brick	Painted	Good
Floors	Concrete	Natural	Good
Moveables	Bunk beds non original timber structure	Painted	Good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

Figures

- 1. View of Stand Easy Room
- 2. Location plan (not to scale)



Officer’s Room

Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. The Officer’s Room is located on approach to the Observation Post and in 2019 contains minimal interpretive interventions.

Physical Description

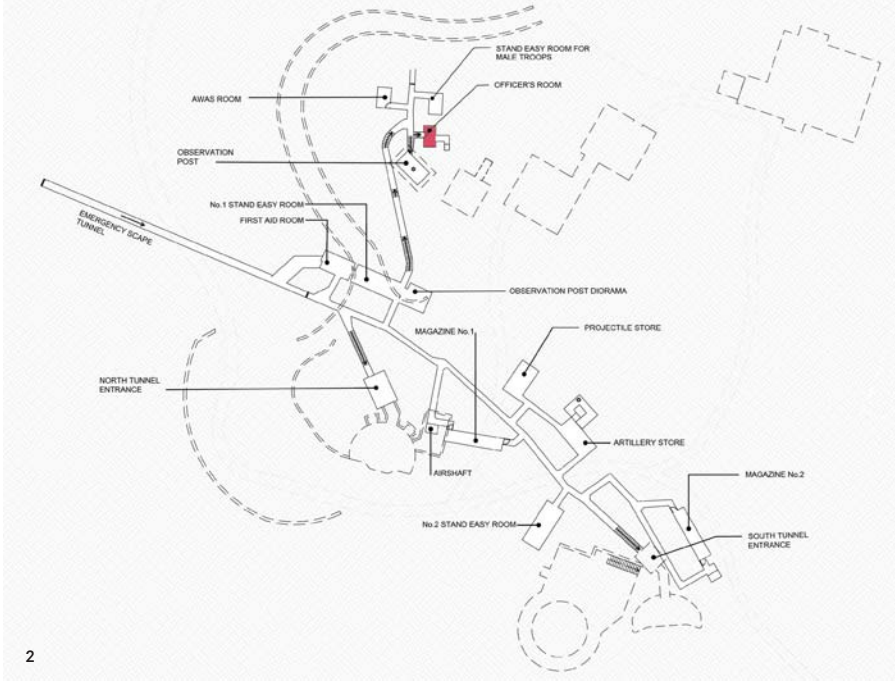
This room has a timber door, and remanents of a hessian lining to the timber ceiling.

Item	Physical description	Finish	Condition
Ceiling	Timber	Natural	Fair
Walls	Brick	Painted	Good
Floors	Concrete	Natural	Good
Doors	Timber panelled	Painted	Good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

Figures

- 1. View of Officers Rooms
- 2. Location plan (not to scale)



Escape Hatch and Airshafts

Brief History

Throughout the underground tunnel structure there are a number of points additional to the entrances where the below ground spaces penetrate the ground plane above. These structures serve a range of purposes including airshafts to circulate fresh air into the tunnels below, and escape hatches for below ground personnel.

Physical Description

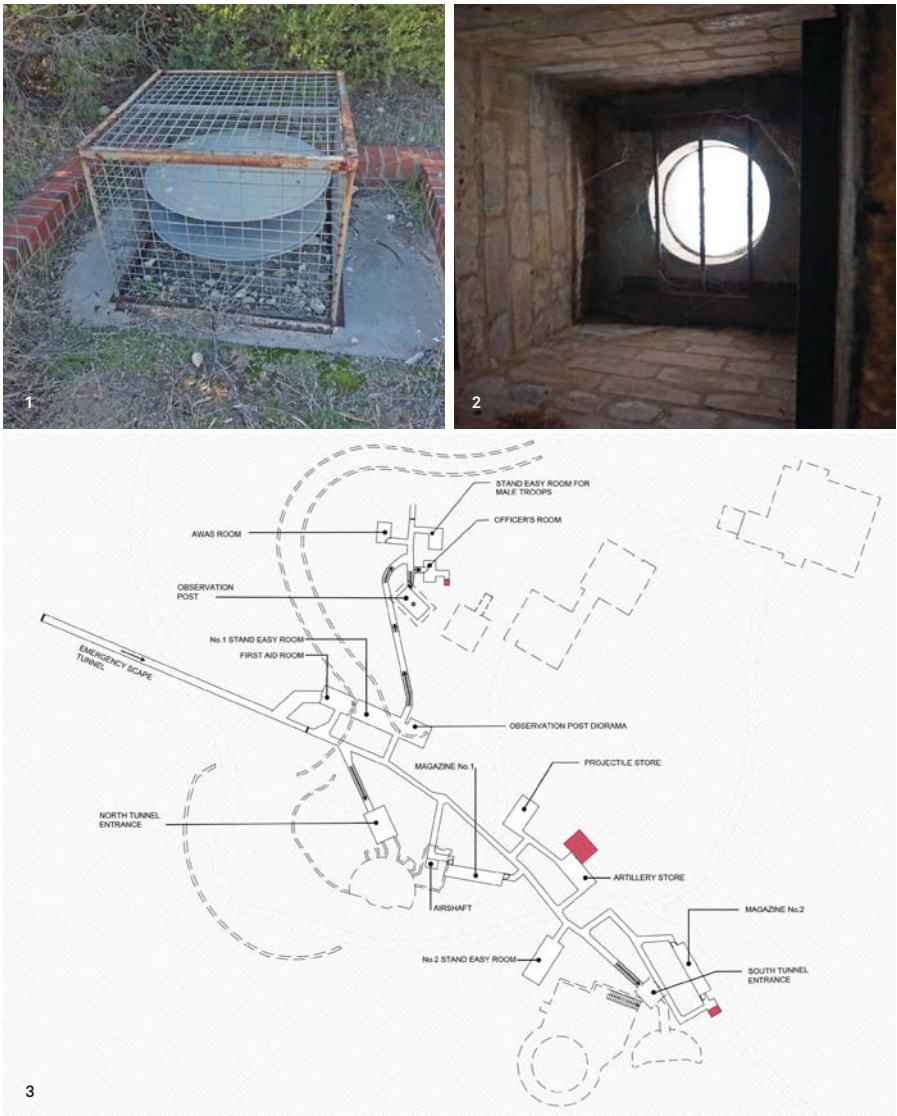
The escape hatch today has a whirlybird protected with a tubular structure with chain link fence on ground floor level, similar to the two airshafts. They are composed of face brick walls from tunnel level to ground level.

Item	Physical description	Finish	Condition
On ground cover	Concrete	Natural	Fair
Walls	Brick	Natural	Good
Floors	Concrete	Natural	Good
Moveables	Metal vent and external security caging	Natural	Fair

Condition	Authenticity	Integrity
-----------	--------------	-----------

Figures

- 1. View of airshaft near southern entry to tunnels, 2019
- 2. View of escape hatch from below, 2019
- 3. Location plan (not to scale)



Magazine Number One and Number Two

Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. Magazines Number One and Two were designed for artillery storage and today host a display of replica ammunitions.

Physical Description

The ceiling is vaulted, composed of brick arches extending the width of the room. At the entrance and exit of this room there are light compartments on the walls and two timber panelled doors at each side. Both contain considerable memorabilia, Magazine Number One presents an artistic engraving of a Kookaburra, apparently original to the tunnels. There are a number of inscriptions seen throughout the tunnels, including one of 1943 in this room.

Item	Physical description	Finish	Condition
Ceiling	Cement lined brick vaulting with original inscriptions on Magazine Number One	Natural cement	Good
Walls	Brick	Natural	Good
Floors	Concrete	Natural	Good
Doors	Timber panelled	Painted	Good
Moveables	Ammunition displays	N/A	Good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

Figures

- 1. View of Magazine Number One
- 2. View of Magazine Number Two
- 3. Location plan (not to scale)



Projectile Store

Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. The Projectile Store housed a munitions storage area however, in the current 2019 interpretation has been utilised as a memorial space.

Physical Description

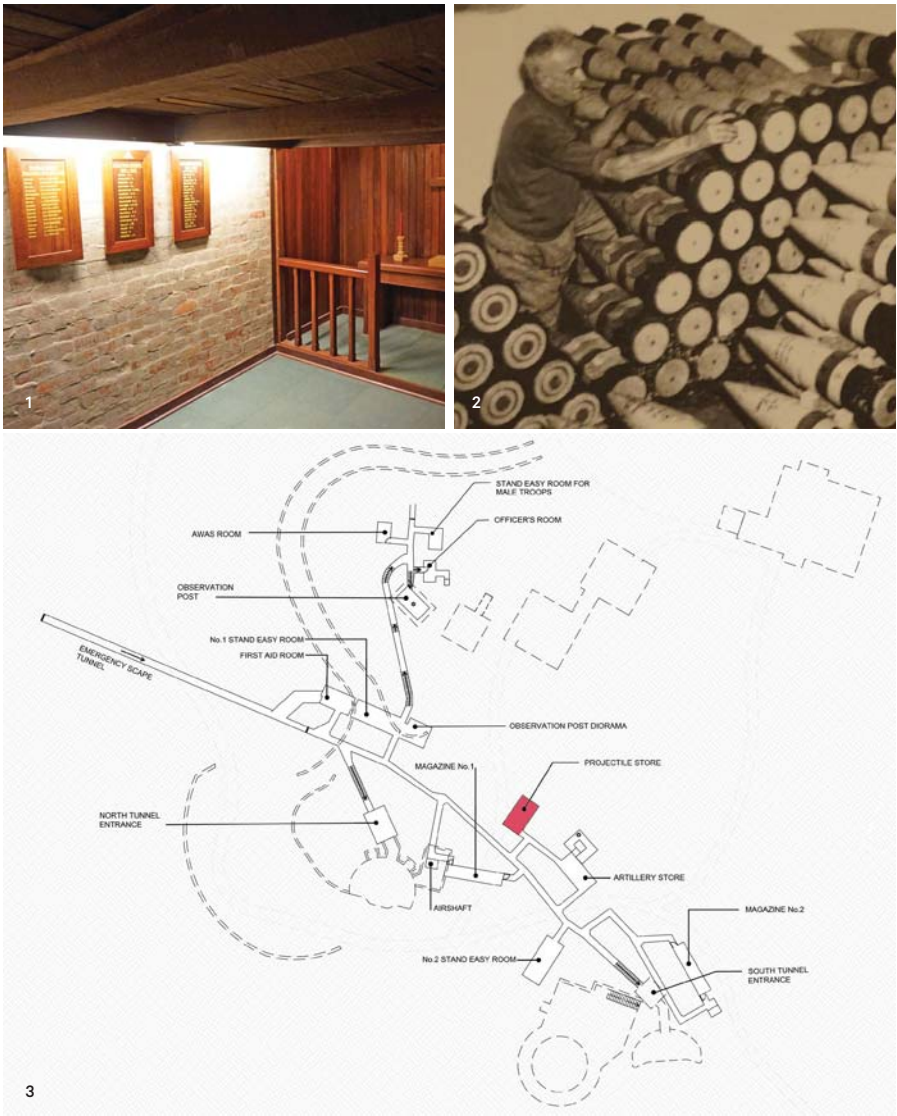
The projectile store is different from all the other rooms. It is not original and has been interpreted as a non-denominational memorial room. It is timber lined with timber benches, carpet tiles on the floor. It has a timber altar and memorial frames on the walls. The airshaft close to it exhibits an ammunition hoist with ammunition on it.

Item	Physical description	Finish	Condition
Ceiling	Timber	Varnished	Good
Walls	Brick	Natural	Good
Timber panelling	Brick painted, timber oiled	Good	Good
Floors	Concrete	Carpeted	Good
Moveables	Memorial plaques and altar	Varnished	Good

Condition	Authenticity	Integrity
Good	Moderate to low	Low

Figures

- 1. View of Projectile Store
- 2. Indicative image displayed in Projectile Store of intended use, 2019
- 3. Location plan (not to scale)



Artillery Store

Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. The Artillery Store currently houses shells recovered from Fremantle Harbour and some interpretive materials including tools and images of the 5.25” gun.

Physical Description

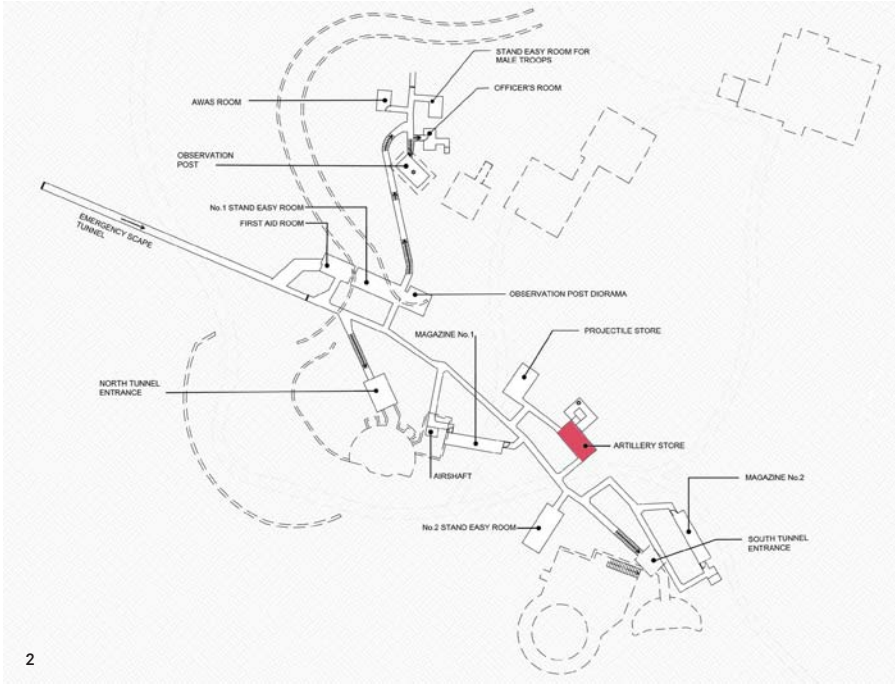
The artillery store has painted walls and timber doors, and artillery displays.

Item	Physical description	Finish	Condition
Ceiling	Timber	Oiled	Fair
Walls	Brick	Painted	Good
Floors	Concrete	Natural	Good
Moveables	Shells, tools and images	N/A	Good
Moveables	Ammunition displays	N/A	Good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

Figures

- 1. View of Artillery Store
- 2. Location plan (not to scale)



## Number Two Stand Easy Room

### Brief History

The tunnel system contains a series of underground room spaces utilised for different purposes during World War Two. The Number Two Stand Easy Room was a rest accommodation space for personnel and as of 2019 contains an interpretive display including bunk beds, historic images and other related ephemera.

### Physical Description

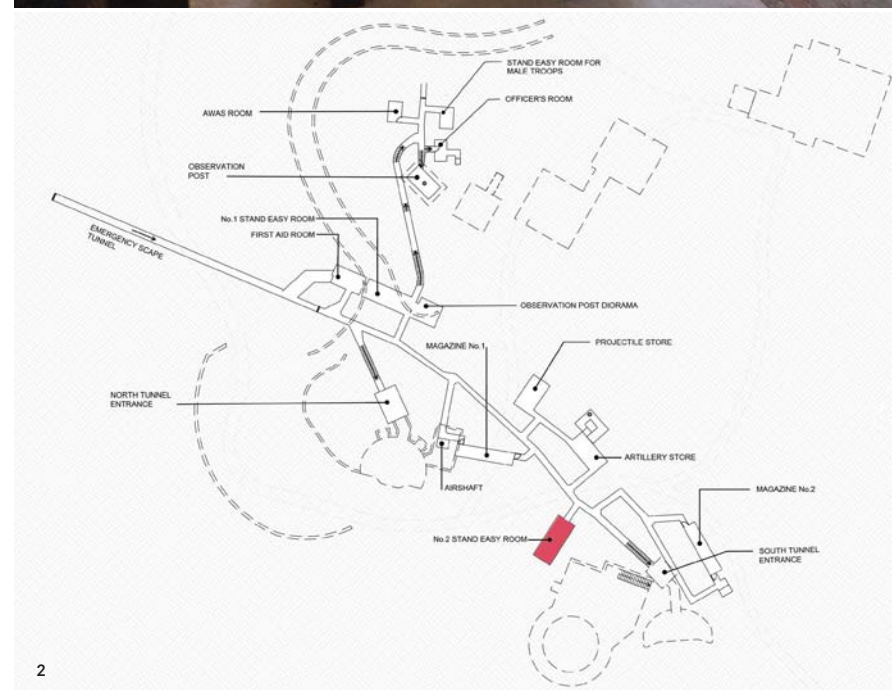
This room shows two bunk beds supported by a timber structure and eight columns. It exhibits two mannequins for interpretation.

Item	Physical description	Finish	Condition
Ceiling	Timber	Oiled	Good
Walls	Brick	Natural	Good
Floors	Concrete	Natural	Good
Moveables	Timber bunks, documentary ephemera	N/A	Good
Moveables	Memorial plaques and altar	Varnished	Good

Condition	Authenticity	Integrity
Good	Moderate	Moderate

### Figures

1. View of Number Two Stand Easy Room
2. Location plan (not to scale)



## 2.3 Physical Evidence - Environmental

The central portion of the site, around Leighton Battery, is elevated and the land slopes to the west and north. The eastern portion of the site is flat to gently undulating, with a large limestone outcrop in the north eastern portion of the site. Soils in the site consist of grey to white sands, with some limestone surface rocks and low limestone outcropping.

As indicated by historical records and aerial imagery, the site has been subject to intensive ongoing historical disturbance and more recently, re-vegetation works. Native vegetation is present in the majority of the western portion of the site, of which some species recorded are likely to have originated from revegetation commencing in 1991 (Wood and Grieve Engineers 1989). The flora species recorded in the western portion of the site are commonly found in coastal vegetation in the Perth area. The eastern portion of the site generally contains a mixture of low diversity native vegetation, tree plantings and recreation open space with turf. Areas of bare soil and non-native grasses occur across the site.

The site is currently open to the public, with no restrictions such as fencing. This section provides a summary of the information on the environmental values of the site, as recorded during a survey in 2019 (Appendix 11)



Figure 88. View from near the top of Buckland Hill looking west over native vegetation to the Indian Ocean (Emerge 2019).

## Flora

A total of 36 native and 29 non-native weeds (including planted species not native to the local area) species were recorded within the site during the field survey, representing 25 families and 51 genera. Note that \*\* denotes species non-native to the site.

One priority 3 (P3) species, *Beyeria cinerea* subsp. *cinerea*, was recorded in the site. Approximately 30 individuals were recorded within a small area in the eastern portion of the site, as shown in Figure 94. *Beyeria cinerea* subsp. *cinerea*, has been previously recorded in the local area near Monument Hill (Western Australian Herbarium 1998-2019). These plants were growing on a portion of a large limestone outcrop. No other occurrences of this or any other threatened or priority flora species were recorded within the site.



Figure 89. *Banksia sessilis* (Emerge 2019).



Figure 90. *Exocarpos sparteus* (Emerge 2019).



Figure 91. *Beyeria cinerea* subsp. *cinerea* (P3) (Emerge 2019).



Figure 92. *Beyeria cinerea* subsp. *cinerea* (P3) habitat in the site (Emerge 2019).



Figure 93. *Caladenia latifolia* or fairy orchid similar to that pictured has been found within the Buckland Hill study area (Orchids WA).

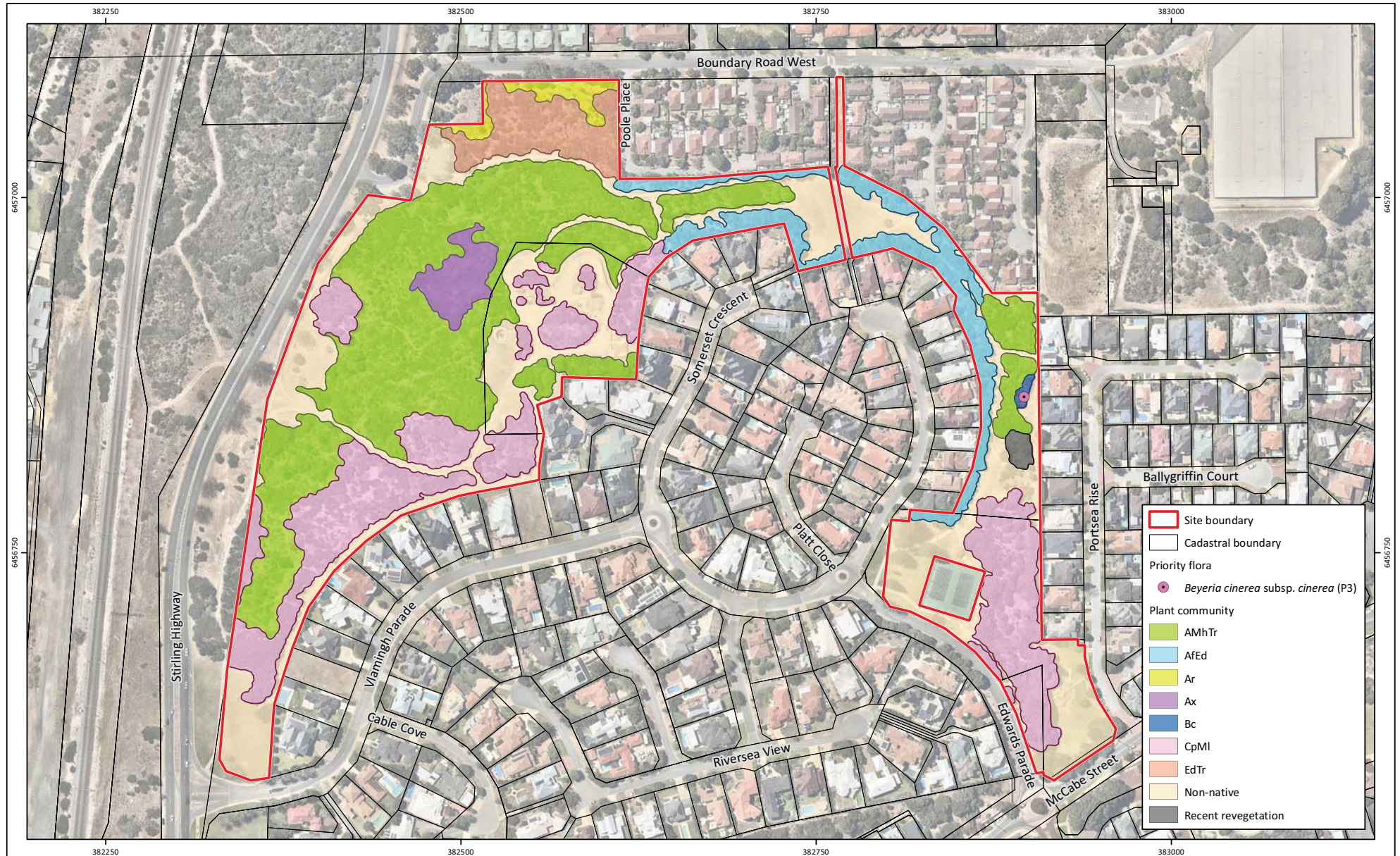


Figure 94. Plant Communities and Priority Flora (Emerge, 2019)

## Plant Communities

An ecological community is a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat. An ecological community's structure, composition and distribution are influenced by environmental factors such as soil type, position in the landscape, altitude, climate and water availability (DoEE 2019).

The plant communities in the site were identified according to the flora species present, structure, landform and soil type. Each plant community was described according to the dominant species present using the structural formation descriptions of the National Vegetation Inventory System (NVIS) (ESCAVI 2003), and assigned a unique code based on the dominant flora species.

Nine plant communities were identified in the site, of which seven are dominated by native flora species, one comprises recent revegetation and one is dominated by non-native flora species (shown in Figure 94). These communities are described adjacent.

Plant community	Description	Area (ha)
<b>AfEd</b>	Low open forest <i>Agonis flexuosa</i> and <i>Eucalyptus decipiens</i> over shrubland <i>Acacia</i> spp. and <i>Rhagodia baccata</i> over bare ground (Figure 95).	0.69
<b>AMhTr</b>	Shrubland to tall shrubland <i>Acacia</i> spp., <i>Melaleuca huegelii</i> and <i>Templetonia retusa</i> over low shrubland <i>Melaleuca systena</i> over sparse mixed native shrubland over grassland non-native species (Figure 96).	3.23
<b>Ar</b>	Open shrubland <i>Acacia rostellifera</i> over grassland non-native species (Figure 97).	0.14
<b>Ax</b>	Closed shrubland <i>Acacia</i> spp., dominated by <i>Acacia xanthina</i> (Figure 98).	0.22
<b>Bc</b>	Low shrubland <i>Beyeria cinerea</i> subsp. <i>cinerea</i> (P3) and <i>Templetonia retusa</i> over open grassland non-native species such as <i>*Lagurus ovatus</i> on limestone outcrop (Figure 99).	0.02
<b>CpMI</b>	Tall shrubland <i>Callitris preissii</i> and/or <i>Melaleuca lanceolata</i> over low open shrubland <i>Templetonia retusa</i> and <i>Rhagodia baccata</i> over grassland non-native species (sometimes occurring as a monoculture of <i>C. preissii</i> and/or <i>M. lanceolata</i> without understorey vegetation (Figure 100).	2.11
<b>EdTr</b>	Open woodland <i>Eucalyptus decipiens</i> over tall shrubland to open shrubland <i>*Leptospermum laevigatum</i> over shrubland <i>Templetonia retusa</i> over closed grassland non-native species (Figure 101).	0.46
<b>Recent revegetation</b>	Low shrubland <i>Acacia</i> spp., <i>Atriplex semibaccata</i> and <i>Scaevola nitida</i> (Figure 102).	0.04
<b>Non-native vegetation</b>	Scattered native plants, non-native vegetation, paths and tracks, buildings and bare ground.	3.01

\* indicates non-native flora species



Figure 95. Plant Community AfEd (Emerge 2019).



Figure 96. Plant Community AMhTr (Emerge 2019).



Figure 97. Plant Community Ar (Emerge 2019).



Figure 98. Plant Community Ax (Emerge 2019).



Figure 99. Plant Community Bc (Emerge 2019).



Figure 100. Plant Community CpMI (Emerge 2019).



Figure 101. Plant Community EdTr (Emerge 2019).



Figure 102. Recent revegetation (Emerge 2019).

## Vegetation Condition

Vegetation 'condition', as opposed to condition referred to in heritage sections, refers to the relative intactness of native vegetation.

The condition of the vegetation was assessed using the Bushland Plant Survey: A guide to plant community survey for the community prepared by the Wildflower Society of WA (Keighery 1994). Further information on vegetation condition assessment is provided in Appendix 11.

The condition of vegetation in the site is summarised below and shown in Figure 116.

Condition category (Keighery 1994)	Size (ha)
Pristine	0
Excellent	0
Very good	0
Very good - good	4.71
Good	1.34
Degraded	0.83
Completely degraded	3.01



Figure 103. Vegetation in 'degraded' condition in the site (Emerge 2019).



Figure 104. Vegetation in 'good' condition in the site (Emerge 2019).



Figure 105. Vegetation in 'very good - good' condition in the site (Emerge 2019).

### Threatened Ecological Community

Threatened ecological communities' (TECs) are ecological communities that are recognised as rare or under threat and therefore warrant special protection. TECs are afforded statutory protection at a Commonwealth level and/or state level, under legislation detailed in Section 1.4.

The structure and composition of plant community CpMI indicates that it represents the 'Callitris preissii (or Melaleuca lanceolata) forests and woodlands, Swan Coastal Plain' TEC. This TEC is listed as 'vulnerable' in Western Australia under the BC Act. A total of 2.11 ha of this TEC was mapped within the site as shown in Figure 117.

This community contains significant populations of the dominant tree species, *Callitris preissii* and *Melaleuca lanceolata*, that are uncommon on the Swan Coastal Plain. Furthermore, the community may have been more common along the coast near Perth and along the Swan River between Kings Park and Fremantle (DPaW 2014). As discussed in Appendix 11, the TEC occurrence in the site is associated with the Swan River, of which there is only one other occurrence mapped by DBCA in Peppermint Grove (DPaW 2014).

Whilst the information from the site survey (Appendix 11) provides a basis for determining the location of the TEC in the site, it must be approved by DBCA prior to being added to the list of confirmed TEC occurrences.

No other TECs or PECs occur within the site.



Figure 106. TEC vegetation in the site adjacent to the Leighton Battery (Emerge 2019).



Figure 107. TEC vegetation in the site dominated by *Callitris preissii* (Emerge 2019).



Figure 108. TEC vegetation in the site dominated by *Melaleuca lanceolata* (Emerge 2019).

## Weeds

Weed mapping was undertaken in the site using 'weed suites', which comprise categories of weed types broadly grouped by an appropriate control method. Only weed suites considered able to be accurately assessed at the time of the survey were assessed (e.g. annual species not visible during February were not recorded). Two weed suites were identified in the site: 'grassy' and 'woody'.

These weed suites were mapped by overlaying a sampling frame comprising a grid of 50 x 50m sample units across the site, and the 'foliage projective cover' (cover) of each weed suite was recorded within each sample unit. Opportunistic records of weeds, such as weeds listed as declared pests under the BAM Act and WoNS were recorded as the botanists traversed the site.

The grassy weed suite comprised annual and perennial grasses. The dominant species in this suite were *Avena barbata* (bearded oat), *Bromus diandrus* (great brome), *Ehrharta calycina* (perennial veldt grass) and *Lagurus ovatus* (hare's tail grass), which were mainly dead, as well as *Cynodon dactylon* (couch) in irrigated landscaped areas. The percentage cover of the grassy weed suite varied across the site but was present (>0%) in nearly all sample units. The northern portion of the site supported a large area with greater than 25% cover. The grassy weed suite cover recorded in the site is shown in Figure 118.

The woody weed suite comprised a variety of perennial shrubs, with the dominant species being *Leptospermum laevigatum* (coast teatree). Other woody weed species recorded in this suite included *Schinus terebinifolia* (Brazilian peppertree) and *Tamarix aphylla* (athel tree). Woody weed cover was mostly less than 25% across the site, with no woody weed cover recorded within some sample units in the eastern portion of the site. The woody weed suite cover recorded in the site is shown in Figure 119.

Three flora species listed as declared pests pursuant to the BAM Act, *Asparagus asparagoides* (bridal creeper), *Opuntia stricta* (common prickly pear) and *Tamarix aphylla* (athel tree), were recorded within the site. Bridal creeper was recorded occasionally throughout the site, common prickly pear was recorded in the central portion of the site adjacent to a residential property and athel pines were recorded in the central portion of the site. All three of these species are also listed as WoNS.



Figure 109. *Schinus terebinifolia* (Emerge 2019).



Figure 110. *Leptospermum laevigatum* (Emerge 2019).



Figure 111. *Asparagus asparagoides* (Emerge 2019).



Figure 112. Grassy weed suite in the site (Emerge 2019).

## Pest Animals

One pest fauna species, *Felis catus* (domestic cat) was recorded in the central portion of the site. No evidence of other pest fauna species was recorded. It is considered likely that other pest fauna may be present within the site, including rabbits which have the potential to impact native vegetation.

## Bushfire Risk

The native vegetation within the site is adapted to fire. However, fires that occur too frequently can have negative impacts, such as increasing weed growth and altering native species diversity and/or vegetation structure.

While the native vegetation in the site does pose some risk of bushfire, coastal vegetation is typically low threat. However, risks are greatly increased by the annual grassy weeds that are present. Grasses have fast growth rates and produce a high fuel load that is very flammable. As detailed before, grassy weeds occur across nearly the entire site. Coast teatree is a non-native shrub that is also highly flammable and may increase fire risk within the site (Government of South Australia 2019).



Figure 113. Existing firebreak in the site (Emerge 2019).



Figure 114. Existing firebreak in the site (Emerge 2019).



Figure 115. Grassy weeds in the site pose a fire risk (Emerge 2019).

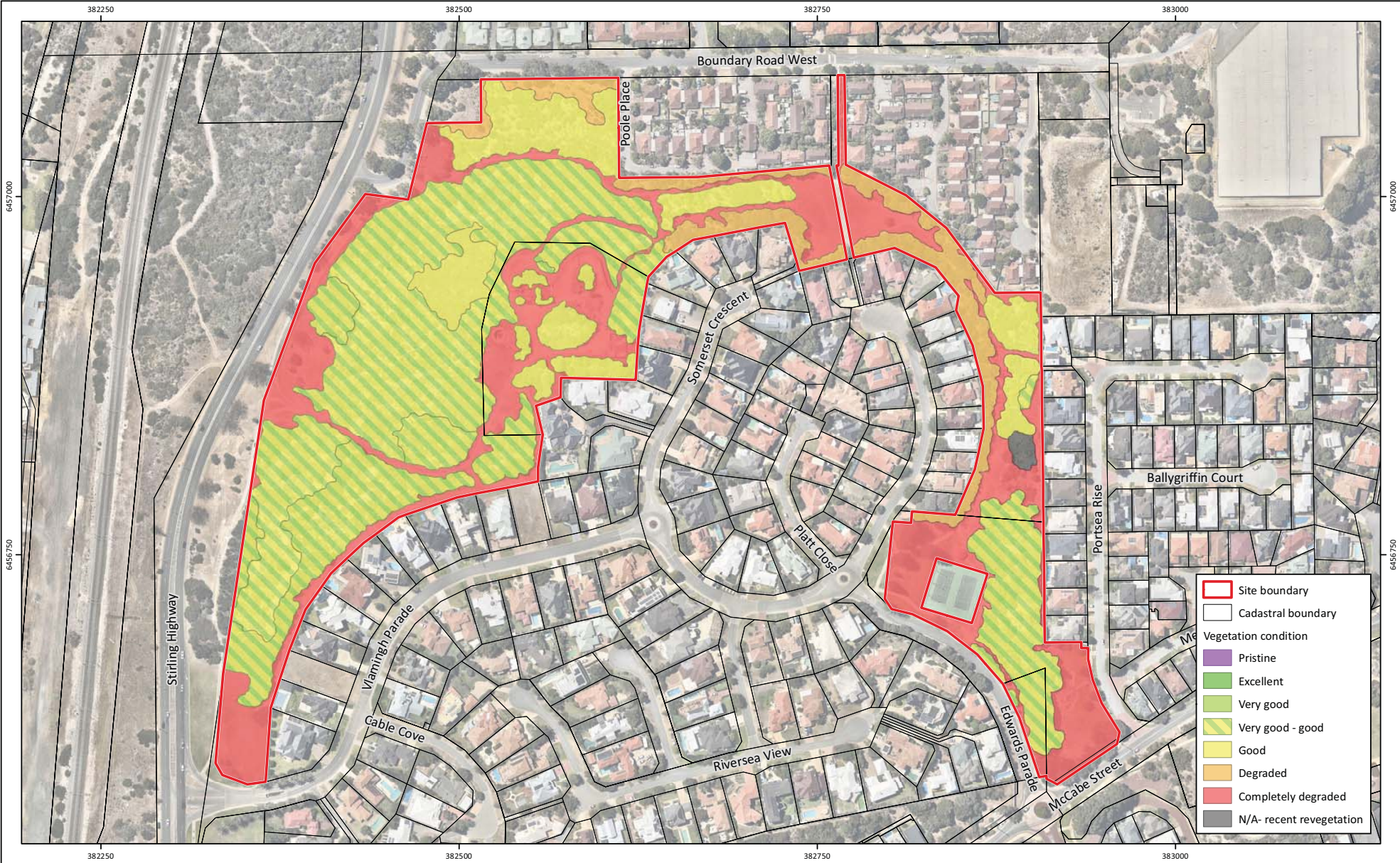


Figure 116. Vegetation Condition (Emerge, 2019)

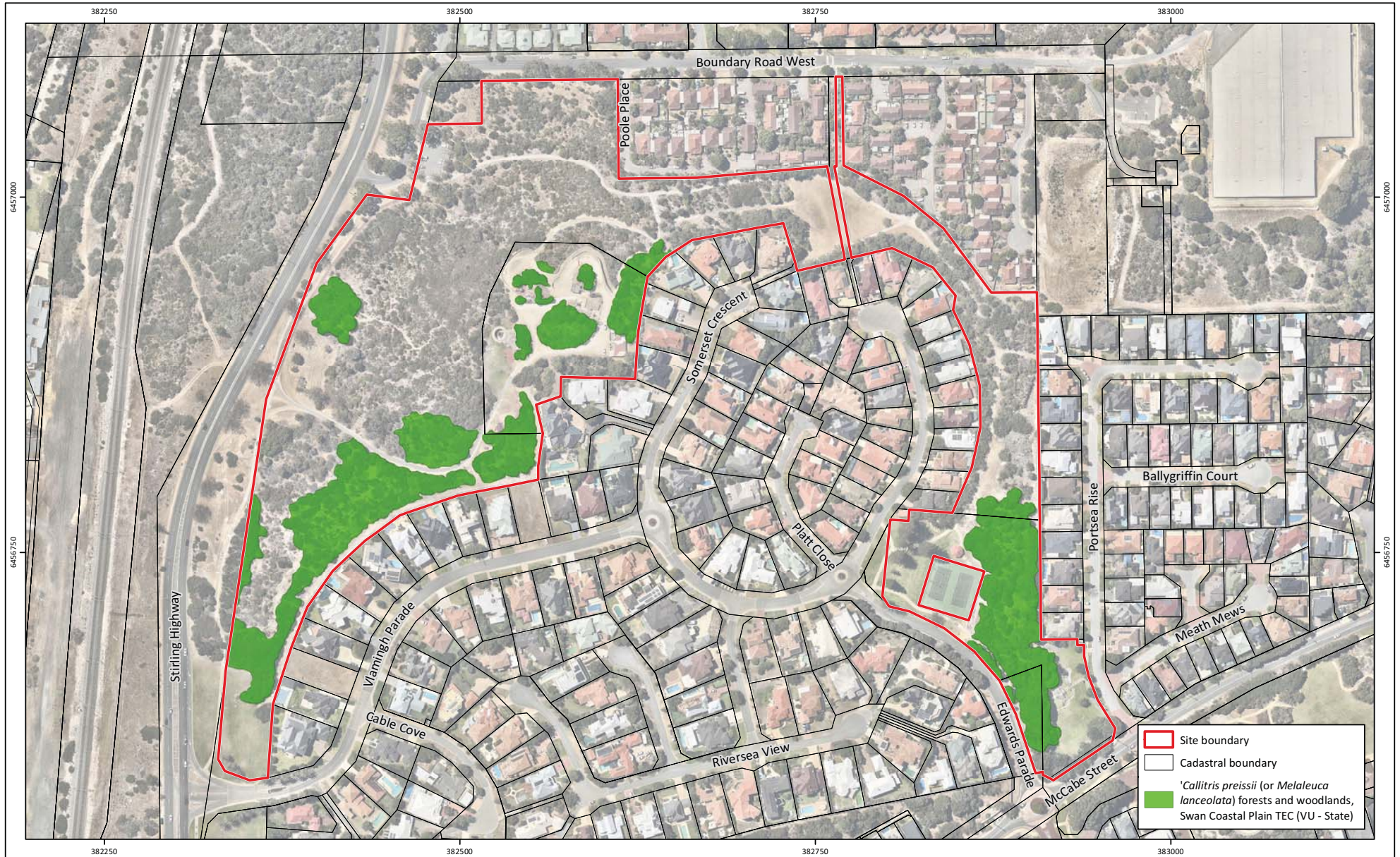


Figure 117. Threatened Ecological Community (Emerge, 2019)

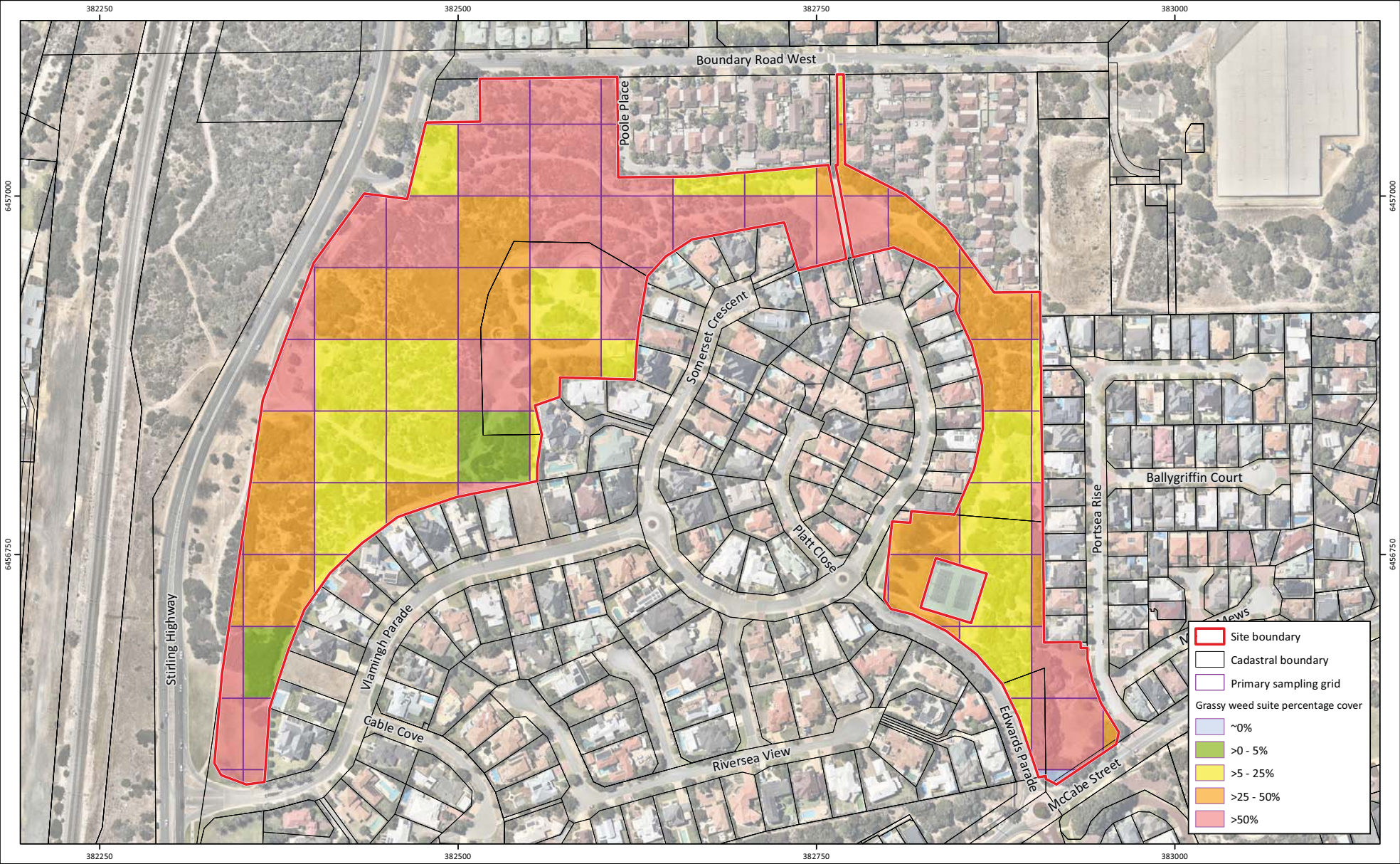


Figure 118. Grassy Weed Suite Cover (Emerge, 2019)

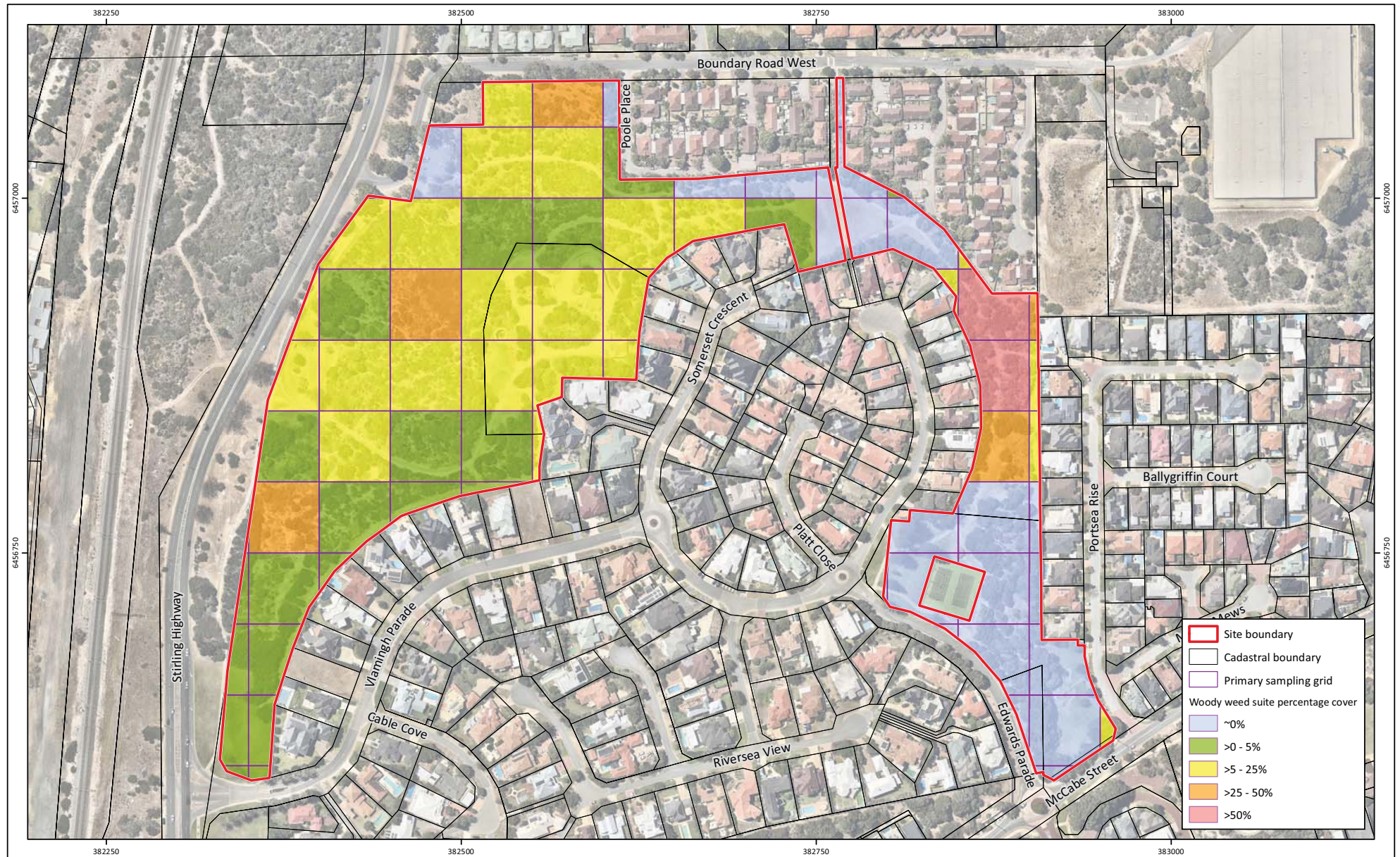


Figure 119. Woody Weed Suite Cover (Emerge, 2019)

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## 3. Analysis of Evidence

### 3.1 Heritage

#### Sequence of Development

Please refer to Figure 120 on the following page.



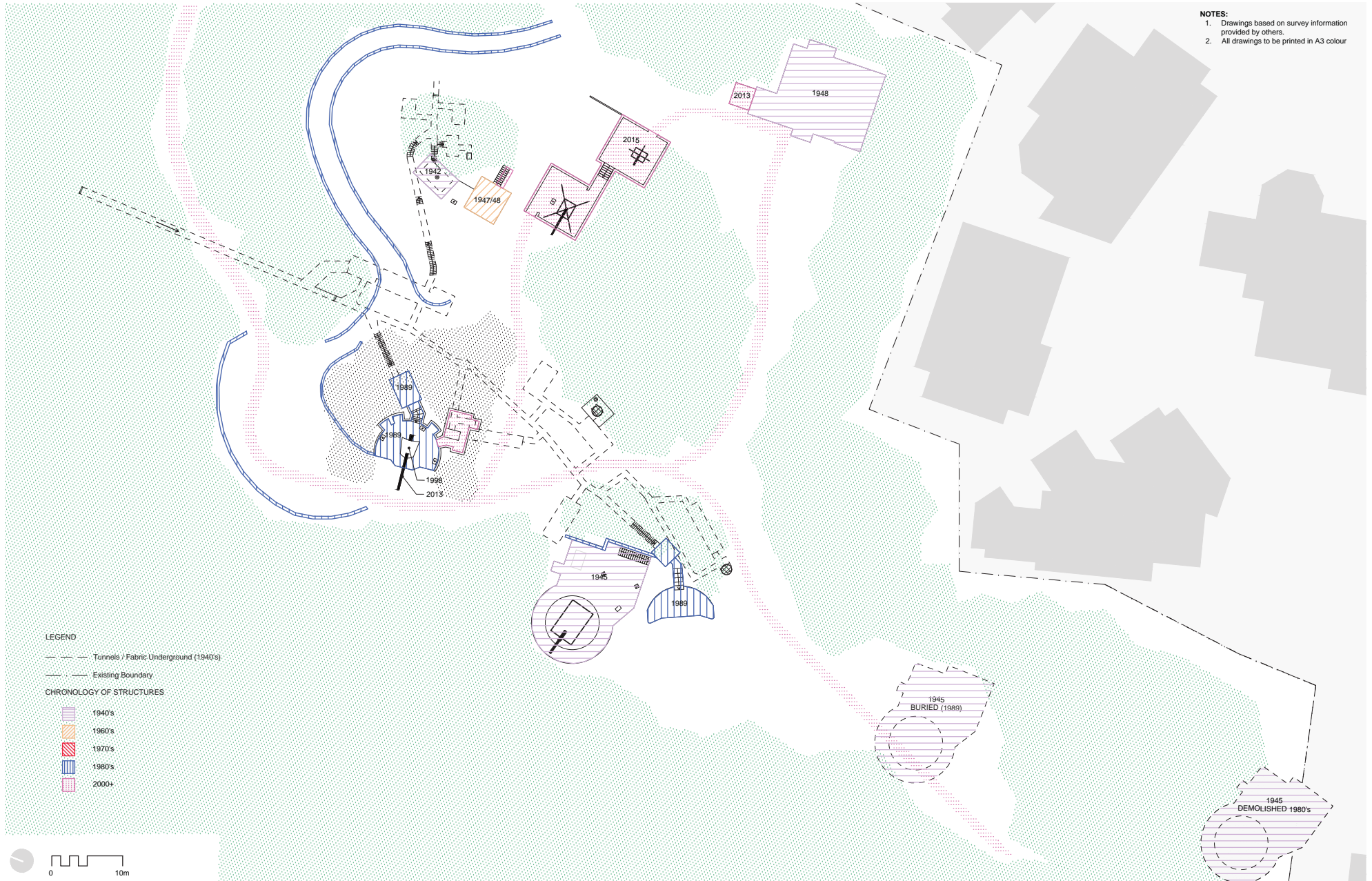


Figure 120. Chronology Plan (element, 2019)

## Comparative Analysis

Comparative analysis primarily considers other places with similar use, period, region and/or associations to the subject place. In order to determine the basis for selection of comparable places it is useful to identify the principal historic themes associated with the place. The following themes are most relevant to Leighton Battery and Buckland Hill.

### Heritage Council Heritage Themes<sup>60</sup>

- Sport, recreation and entertainment (405)
- Education and science (402)
- Community services and utilities (404)
- World Wars and Other Wars (501)

### Australian Historic Themes Framework<sup>61</sup>

- Assessing scientifically diverse environments (1.3)
- Defending Australia (7.7)
- Enjoying the natural environment (8.1.4)

The following sections endeavour to understand the significance of the Leighton Barracks in the context of other artillery or coastal defence sites that were constructed during times of military conflict, with a focus on the World War Two period, were of a similar design or use to Leighton Battery, and are still extant at the writing of this CMP in 2019. Focus has been given to sites which also included tunnel complexes as part of the battery construction. This analysis looks at both local, state, national and international sites to establish the significance of the Buckland Hill Leighton Battery site in a range of contexts. Not all local coastal defence sites have been included in this analysis. For a full list of batteries associated with the Fremantle Fortress see Figure 29 – Context Plan.

Further research could look to develop a more comprehensive understanding of the significance of the battery as it relates to coastal artillery sites at a local, state, national and international level than could be achieved within the scope of this document.

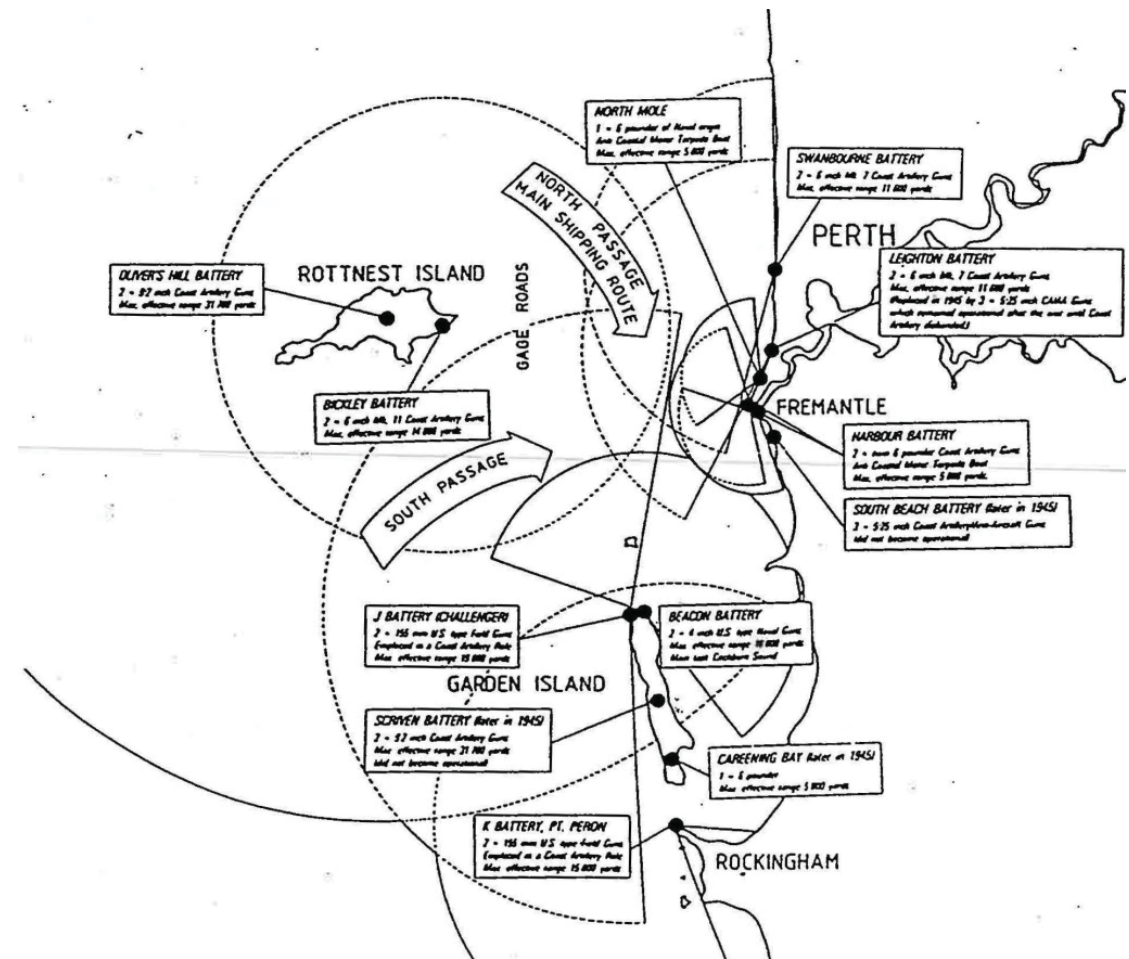


Figure 121. Plan of Fixed Defences, 1943, drawn from Hocking Heritage Studio, "Point Peron "K" Battery Conservation Management Plan", March, 2016, p.52

## Local

### **J Gun Battery – Garden Island**

J Gun Battery, located on Garden Island, was established in 1942 and is listed on the Commonwealth Heritage List. It formed part of the Fremantle Fortress defence system and is significant historically “as the first gun battery constructed on Garden Island and as one of two long range gun batteries which played a strategic role in the coastal defences of Cockburn Sound and Fremantle following the entry of Japan into the Second World War.” The battery is also significant as “The gun mountings and magazine building are important in demonstrating the principal characteristics of coastal gun batteries constructed during the Second World War and the overlapping fields of fire achieved through strategic siting of individual batteries as part of a network. Principal characteristics of the magazine building include the use of reinforced concrete and brick and the double wall system.”<sup>63</sup> Garden Island is also Commonwealth listed as a natural heritage site (Place ID 105274).

### **Oliver Hill and Bickley Batteries – Rottnest Island**

Rottnest Island was identified as a critical site for the defence of Fremantle due to its capacity to engage hostile ships in advance of their approach to the Fremantle Port. Gun batteries were installed at Oliver Hill and Bickley Battery with permanent service accommodation built at Kingston Barracks to the east of the island. A series of underground tunnels were constructed around the Oliver Hill battery site to link the gun emplacements. Oliver Hill battery is of exceptional cultural heritage significance being one of only five battery sites worldwide that retains guns in their World War Two location<sup>62</sup> and is listed on the State Register (Place No.526). Today (2019) these sites have been restored as tourist attractions providing ongoing access to one of the restored 9.2” guns and the tunnel complex.



Figure 122. Department of Environment and Energy, “Entrance to bunkers”, Date unknown



Figure 123. Pip Giovannelli, “Military facilities”, June 1995



Figure 124. Australian War Memorial, “ROTTNEST ISLAND, AUSTRALIA. PLOTTING ROOM AT OLIVER'S BATTERY IN COURSE OF CONSTRUCTION”, November 6, 1942



Figure 125. Vic Jeffery, “Restored wartime Army tunnel at the Oliver Hill Battery”, Date unknown

### **Swanbourne Army Complex – Fremantle**

The Swanbourne Army Complex is listed on the City of Nedlands municipal inventory for its historic, scientific and rarity values. The listing covers a complex of army properties including the Swanbourne rifle range and Campbell Barracks. The Swanbourne Battery 6" guns were installed in early 1938 and replaced with two guns from Fort Forrest in 1938. These guns shared the role of 'examination batteries' with the Leighton site, checking ships entering Gage roads throughout the World War Two period. Post-war Swanbourne continued as a coastal battery until 1963 when the battery was dismantled for scrap. The site continues to be occupied as an army encampment and has been primarily utilised as a training site since the 1950s for National Service training, and later accommodating the SAS. It is still an active military training site as of 2019.



Figure 126. Australian War Memorial, "FREMANTLE, AUSTRALIA. EXAMINATION BATTERY SIGNAL POST, SWANBOURNE AREA, FREMANTLE FIXED DEFENCES. BOMBARDIER A.R. CLARK OPERATING SIGNAL LAMP", February 2, 1943



Figure 127. Australian War Memorial, "FREMANTLE, AUSTRALIA. FREMANTLE FIXED DEFENCES. NO. 1 GUN, SWANBOURNE, READY FOR ACTION", February 2, 1943

### **Point Peron 'K' Battery – Rockingham**

The battery site at Point Peron was constructed in 1942 as part of the coastal defences that included the Leighton Battery site at Buckland Hill. Proofing of the guns was completed by 1943. The site works included a Battery Plotting Room, Battery Observation Post and Barracks buildings.<sup>63</sup> There was some underground excavation around the observation post site, but tunnels were not constructed to the extent found at Leighton Battery. While fabric still survives including the observation post and operations bunker as well as two gun emplacements, there is limited public interaction with the site. It is listed on the City of Rockingham's Municipal Heritage Inventory and was considered for listing on the State Heritage Register in 1996 but was identified as below threshold. Like Buckland Hill, the Point Peron Battery also sits within environmentally significant coastal lands and ecosystems.

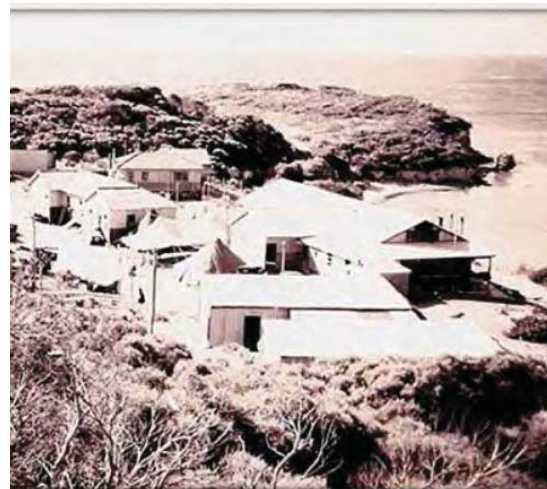


Figure 128. "Peron Barracks", c1940 (Hocking Heritage Studio Point Peron 'K' Battery Conservation Management Plan, 2016, p.60).



Figure 129. "Peron Barracks", c1940 (Hocking Heritage Studio, Point Peron 'K' Battery Conservation Management Plan, 2016, p.128).

## State

### **Princess Royal Fortress**

Princess Royal Fortress was the earliest coastal defence site in Western Australia, installed at Albany from 1893. It was designed to defend the harbour and town of Albany from raids from the sea and provide refuge for shipping converging on Breaksea Island.<sup>64</sup> The battery was situated on the crest of Mount Adelaide overlooking King George Sound, the channel leading into Princess Royal Harbour. The site originally comprised two batteries, but one was abandoned in 1910. In 1945 6" guns from Leighton Battery were relocated to Albany to update their defence capabilities. The facility was abandoned in 1977 and handed over to the state. In 1987 plans were made to develop the site into a tourist facility and it is now a Military Museum and site of the National ANZAC centre. The place is listed on the State Register under the 'Albany Forts'.



Figure 130. Vic Jeffery, "A Wartime view of a OFC 6" gun at the Princess Royal Fortress.", c1940



Figure 131. Vic Jeffery, "MK VII 6" gun located at the Princess Royal Fortress.", date unknown

## National

A number of fixed coastal and anti-aircraft defences were constructed around the Australasian coastline in the lead up to and during World War Two. While there are numerous examples of battery sites in varying states of intactness or accessibility around the country, Leighton Battery is unique in being one of the only sites to also have an extensive associated tunnel complex. An outline of some of the World War Two battery sites from around Australia can be seen in Figure 132.

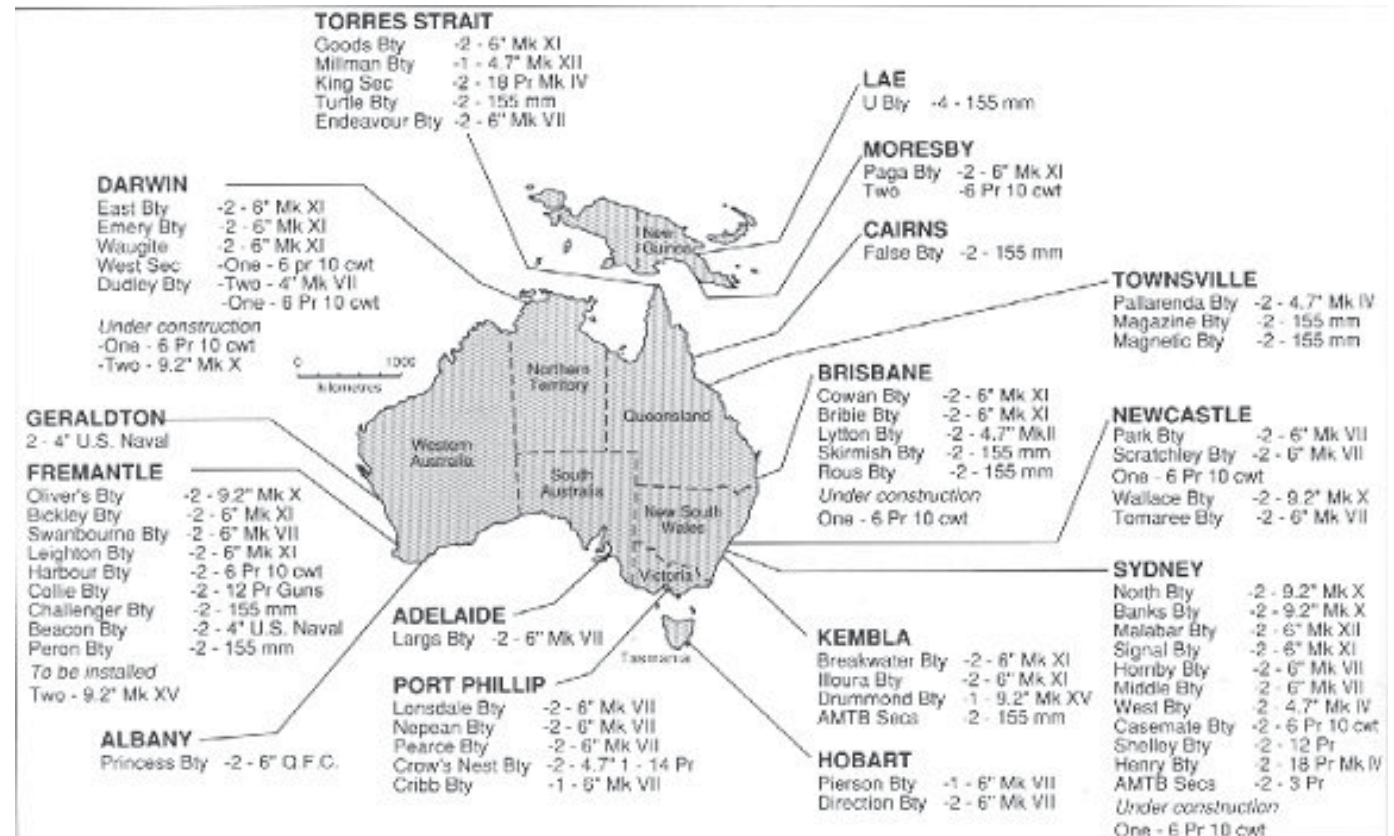


Figure 132. The Gunners - A History of Australian Artillery (David Horner, 1995).

### **Shark Point Battery – Vaucluse, NSW, Australia**

The Shark Point fortifications date from the 1870s and consist of three sandstone gun emplacements, passageways and tunnels. The site is historically significant due to its “direct association with defence and strategic concerns of the latter half of the nineteenth century. Shark Point Battery was a part of the outer line defence initiative for Sydney, instituted at a time of fears of Russian aggression, the withdrawal of British garrison troops, threats to British dependencies and increasing self reliance in defence matters.” It also reflects military thinking, planning and technology of the time and is an important example of a Sydney harbour defensive installation from the 1870s.<sup>65</sup> Although this is an earlier example of coastal military defences, the elements are similar in nature to those found at the Leighton Battery site. At the time of the sites Commonwealth registration in 1978 it was noted that most of the underground elements were filled in. Work has been undertaken to clear debris but there is no general public access to below ground portions of the site.<sup>66</sup>

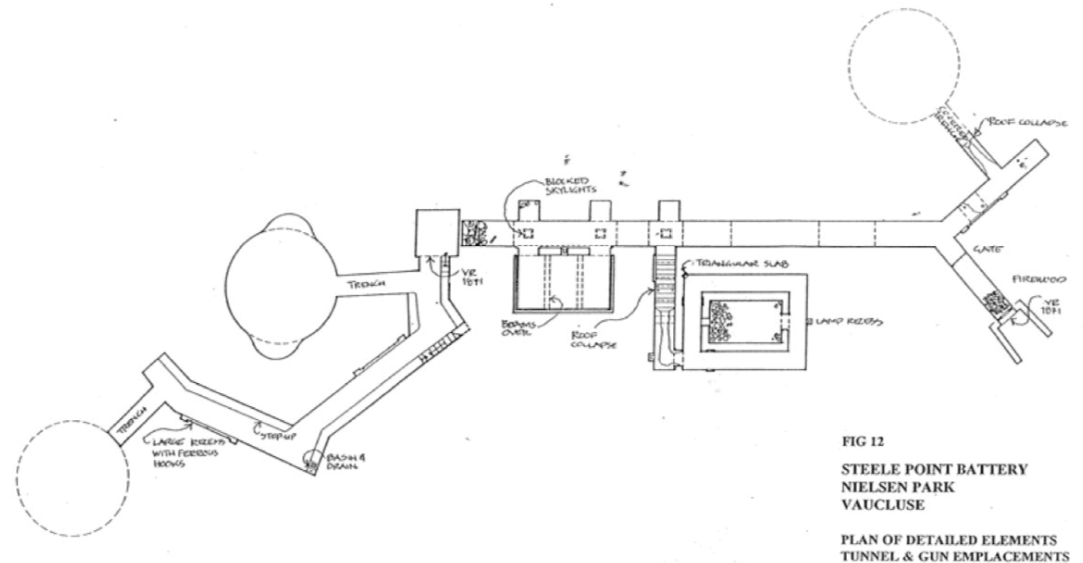


Figure 133. Figure drawn from The NPWS Fortifications of Sydney Harbour and Botany Bay: A Strategic Plan, “Plan of detailed elements, tunnel and gun emplacements”, July 2007, p.111



Figure 134. Department of Environment and Energy, “Southern entrance to Officers Mess”, Date unknown

**Headquarters Training Command Precinct, Middle Head Rd, Georges Heights, NSW, Australia**

The Headquarters Training Command Precinct is a larger site that includes a number of gun batteries among its other significant buildings and structures. It is listed on the Commonwealth Heritage List as a historically significant location of major defence works for Sydney Harbour and Port Jackson during the nineteenth and twentieth centuries. The batteries are no longer in use but are also identified as significant due to their rarity value.<sup>67</sup>



Figure 135. Roger Hobbs, "Battery for 5 guns", December 1997



Figure 136. Roger Hobbs, "Southern entrance to Officers Mess", December 1997

**Illowra Battery – Port Kembla NSW**

Illowra Battery, also known as Hill 60 Battery was constructed in 1942 as a coastal observation battery which included two tunnels built to support the gun battery, engine houses, defence personnel housing and associated amenities. It is also significant for its Aboriginal Heritage Values and was listed on the State Heritage Register in 2001. The lookout point is accessible to visitors, but the tunnel complex is not open to the public.

**Swan Island Defence Precinct – Queenscliff, VIC, Australia**

Swan Island is registered on the Commonwealth Heritage List as a cultural landscape containing elements including fortification earthworks, battery emplacements, an underground command centre and tunnel network. The site was developed from 1877 in response to fears of Russian invasion.<sup>68</sup> Swan Island has continued to be used as a Department of Defence training site allowing most of the original associated underground tunnels to survive intact. As a defence facility, the site is not accessible to the public and images are limited.



Figure 137. Australian War Memorial, "KEMBLA FORTRESS AREA, N.S.W., AUSTRALIA. 1944-10-12. NO.2 GUN, ILLOWRA BATTERY KEMBLA COAST ARTILLERY, SHOWING ITS EMPLACEMENT IN HILLSIDE AND ITS SECTION POST", October 12, 1944



Figure 138. Wikimedia commons "Illowra Battery tunnels", 2008

## International

### **Fan Bay Deep Shelter – Dover UK**

Fan Bay Deep Shelter was constructed between 1940–41 as accommodation for the gun battery located above. The gun battery was constructed to prevent German ships from moving freely through the English Channel while the tunnels would protect the gun battery teams from bombardment. The site consisted of a gun battery and searchlights, a generator house, barracks, magazines, and a plotting room located above ground. It also included five bomb-proof tunnels and a hospital sitting 75 feet below the top of the cliffs which could house up to 185 soldiers. The tunnels were decommissioned in the 1950s and filled in with rubble in the 1970s. In 2012 the site was purchased by the National Trust UK and the shelter was uncovered, requiring the removal of 100 tonnes of debris. The shelter is now a tourist site although the network of tunnels is virtually all that remains of the original site.<sup>69</sup>



Figure 139. National Trust UK, "Fan Bay gun battery: World War Two", Exact date unknown



Figure 140. National Trust UK, "Fan Bay Deep shelter, Dover, England", Exact date unknown

### **Tunnels of Gibraltar**

Tunnelling has occurred within the Rock of Gibraltar for defensive purposes for hundreds of years. Some of the earliest British tunnels were constructed from 1782, although the most intensive phase of tunnel development occurred during World War Two when the site played a key role in the conflicts around the North Atlantic and Mediterranean. During this period the tunnels were created to accommodate military personnel and link the military bases and artillery defences. Today the tunnels and bases are partially open to the public although due to the sheer number of structures and in some cases their condition, a number have been decommissioned or abandoned.



Figure 141. Dallison GW, "Royal engineer tunnellers using a water pressure drill to clear solid rock inside the Rock of Gibraltar", 1941



Figure 142. Provided by the Royal Australian Artillery Historical Society, "Princess Anne's Battery, Gibraltar", Date unknown

## 3.2 Environmental

An analysis of environmental evidence is provided in the Baseline Inventory Report (Appendix 11).



## 4. Assessment of Significance

### 4.1 Heritage Value

In 1999, Leighton Battery was entered in the State Register of Heritage Places on a permanent basis, informed by the register entry and assessment documentation that was prepared within the same year.

This documentation sets out the range of heritage values of Leighton Battery that contribute to its overall cultural heritage significance. This includes aesthetic, historic, social and scientific values all related to its significant military heritage. These values can be read in full in the State Register Assessment documentation Appendix 7. The statement of significance to follow summarises these values that are of state significance and lists them in descending order of importance. It is fully reproduced from the State Register Entry documentation included in Appendix 8. Presented below in italics.

### Statement of Significance

#### Leighton Battery

The following statement of significance has been prepared by the HCWA for Leighton Battery:

*Leighton Battery, the conserved remains of a mostly underground World War Two artillery defence installation, comprising a complex of underground tunnels, rooms and an observation post, a semi-buried command post, two 6" gun emplacements (all 1942), two 5.25" gun emplacements one of which remains buried (1944-45), a radar hut (c1947), an access road and limestone retaining walls (c1990). and the surrounding public open space, has cultural heritage significance for the following reasons:*

*the place is unique to Western Australia and rare in Australia as being an example of an extant site where a 5.25" gun battery was operated;*

*the place was a significant component of the natural coastal defence strategies for the Fremantle Port using both artillery and anti-aircraft weapons during World War Two;*

*the place is a remnant of a much larger military complex which occupied most of Buckland Hill since 1941, and has played a significant part in a larger national system of coastal defence strategies;*

*the underground tunnel complex is an example of technical achievement;*

*the place is representative of defence systems located on the Western Australian coastline and islands; and*

*the site has landmark quality.*

*The recent road and paths, limestone walls and the non-local plantings are assessed as being intrusive or of having low significance.*

In addition to the above, the Town of Mosman Park has also established a statement of significance for Leighton Battery which is identical to the statement of significance prepared by the HCWA<sup>70</sup>

### Pine Trees at Buckland Hill

The following statement of significance for the Pine Trees at Buckland Hill has been prepared by the Town of Mosman Park and is extracted from its 2014 Municipal Inventory of Heritage Place.<sup>71</sup>

- The trees have aesthetic and landmark value; and
- The trees have historic value for their association with the former use of the site by the defence forces.

## 4.2 Environmental Value

In 2018 the site was identified as containing a TEC and accordingly the site is listed in the Department of Biodiversity, Conservation and Attractions TEC database.

This documentation sets out the range of environmental values of the vegetation in the site that contribute to its overall environmental and cultural significance. This includes biodiversity conservation, aesthetic, historic, social, scientific and recreation values.

A total of 6.87ha (69% of the total site) of native vegetation exists in the site, which is considered to have significant environmental value. The vegetation may be considered significant because it:

- Is one of the few remaining areas of native coastal vegetation on limestone slopes in the western suburbs of Perth;
- Forms an ecological linkage between the ocean and the Swan River;
- Provides habitat for native fauna;
- Represents a 2.11 ha patch of the State-listed TEC 'Callitris preissii' (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain'. This TEC occurrence is associated with the Swan River, of which there is only one other occurrence recorded;

- Includes *Callitris preissii*, which has a restricted distribution; and
- Provides recreational benefits for locals.

Non-native vegetation in the site that is considered significant is limited to pine trees in the south eastern portion of the site, which have heritage value and are listed on the Town of Mosman Park Municipal Inventory of Heritage Places as a Category 3 place (place no.20).

## 4.3 Degree of Heritage Significance

The following assessment information has been drawn from the assessment documentation for State Heritage Listed Place No. 3247 shown below in italics.

### Rarity

*Leighton Battery was the only 5.25" gun battery to come into operation in Australia. (Criterion 5.1)*

*Leighton Battery is important in demonstrating a distinctive method of defence that is no longer practiced. (Criterion 5.2)*

### Representativeness

*Leighton Battery is significant in that it demonstrates some of the characteristic components of artillery sites, their design and technical features as well as aspects of military customs and conditions for personnel. (Criteria 6.1 & 6.2)*

*The design of Leighton Battery is representative of other defence systems; above ground built structures, gun emplacements and underground tunnel systems, situated along the Western Australian coastline and islands. Other batteries include Albany as well as Robb's Jetty, Oliver Hill and Point Bickley on Rottnest Island. (Criterion 6.2)*

### Integrity

*The integrity of Leighton Battery is moderate to high. The place has its major structure basically intact. The World War Two use of the site has been clearly interpreted.*

*The current use of the place as public open space and interpreted site enhance the significance of the site and allow for its long term viability. The Royal Australian Artillery Historical Society is committed to the long term preservation of the site and continuing development of its interpretation.*

## Authenticity

*The authenticity of the site as a whole is moderate. The present site is much smaller than the original defence complex, the setting has altered, some of the structures have been removed and the place has much more vegetation than during its military use era.*

*The structural components of Leighton Battery have a high level of authenticity.*

*Approximately 90% of the concrete, brick and timber components are original form and fabric. Some fabric is reconstructed, for example the tunnel entrances, and some adaptations have been made for the current use, for example security, safety and interpretation provisions.*

## 4.4 Degree of Environmental Significance

The following assessment has been provided by Emerge Associates on the basis of legislation and policy related to native vegetation in Western Australia.

The site contains a regionally rare landform (limestone hill).

The vegetation is significant because it is a relatively large reserve of native vegetation that forms part of an ecological corridor. The vegetation is modified and significant portion of the vegetation is a product of revegetation works rather than representative of remnant native vegetation. Nonetheless the revegetation is considered native vegetation as it was completed as a condition of subdivision approval.

TECs are conservation significant and the TEC within the site is one of two occurrences of *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands, Swan Coastal Plain' associated with the Swan River. The TEC in the site is listed as 'vulnerable' which is the lowest level of conservation significance applied to TECs in Western Australia.



UPPER BUNKS  
THANK YOU



## 5. Levels of Significance

This CMP identifies the level of significance of the place overall and elements within the place and complements the State Heritage Office statement of significance for Leighton Battery.

In relation to heritage significance, items at the highest level are of exceptional significance in a broad (national) context. Items of considerable significance are those that would warrant inclusion on the state register of heritage places. Elements of exceptional and considerable significance make an essential contribution to the significance of the place, while those elements of some significance are contributory, but may not be essential to an understanding of the heritage significance of the place. Elements of little significance do not contribute to the heritage significance of the place. Intrusive items which are visually intrusive may also be identified. It is sometimes the case that an item of significance may also visually intrude on the place. In such cases careful consideration must be taken in guiding future changes to the place.

The environmental significance of the site has been determined through review of background information and a site survey (Appendix 11). Determination of environmental significance has taken into account listings under Commonwealth and State legislation, determined local and regional significance and ecological functions.

### 5.1 Overall Significance of the Place

Leighton Battery is listed by Engineers Australia, being awarded a National Heritage Marker in 2014.

*Leighton Battery* is of considerable heritage significance and recognised as such through its inclusion on the State Register of Heritage Places and Municipal Inventory of Heritage Places.

*Pine Trees at Buckland Hill* are of some heritage significance and is recognised as such through their inclusion on the Town's Municipal Inventory of Heritage Places.

The elements that make up the place have differing levels of significance because of the role they play in demonstrating the heritage values articulated in the statement of significance. These levels of significance are set out in the section overleaf.

The native vegetation in the site is of significance due to its condition and role as an ecological linkage between the Swan River and the Indian Ocean. Some of the vegetation has State significance and is recognised through its inclusion on the Western Australian list of threatened ecological communities, endorsed by the Minister for Environment.

## 5.2 Graded Zones of Heritage Significance

### Significance Views

The setting of Leighton Battery is of exceptional heritage significance, in particular the views out to the Indian Ocean and different ground levels. Associated tunnels contribute to the significance of the place as a coastal defence system constructed during World War Two. The key views are of considerable significance due to their contribution to its landmark and operational values. These are shown in Figure 144.

## 5.3 Zones of Environment Significance

A total of 18 zones of environmental significance (hereafter referred to as 'management zones') have been defined within the site as shown in Figure 143. The environmentally significant values applicable to these management zones include:

- the presence of native vegetation;
- the presence of the '*Callitris Preissii* (or *Melaleuca Lanceolata*) forests and woodlands, Swan Coastal Plain' TEC;
- heritage values listed by the State (Leighton Battery); and
- heritage values listed on a local municipal register.

An additional management zone has been defined that outlines areas proposed to be managed and maintained as a firebreak, to ensure bushfire safety of residents adjacent to the site.

Management zone ID	Significant environmental values				Bushfire risk management
	Native vegetation	TEC vegetation	Heritage (State)	Heritage (local)	
1	✓	-	✓	-	-
2	✓	-	✓	-	-
3	✓	-	✓	-	-
4	✓	✓	-	-	-
5	✓	✓	✓ (potential due to buried gun emplacements)	-	-
6	✓	✓	-	-	-
7	✓		-	-	-
8	✓	✓	-	-	-
9	✓	✓	-	-	-
10	✓	-	-	-	-
11	✓	-	-	-	-
12	✓	-	-	-	-
13	✓	-	-	-	-
14	✓	-	-	-	-
15	✓	-	-	-	-
16	✓ (includes recent revegetation)	-	-	-	-
17	✓	✓	-	-	-
18	✓	-	-	✓	-
Firebreaks	-	-	-	-	✓

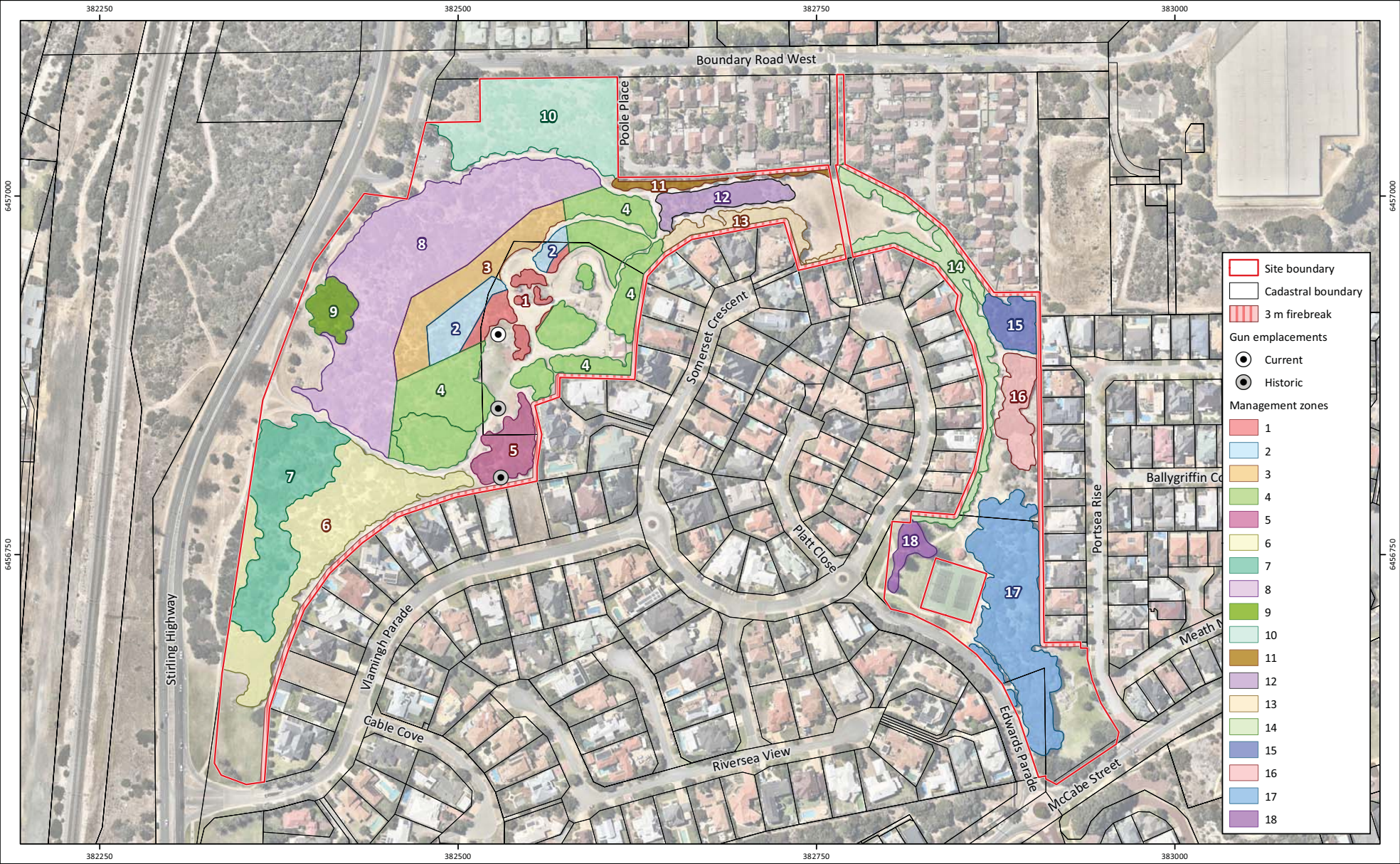


Figure 143. Management Zones (Emerge, 2019).

## 5.4 Graded Elements of Heritage Significance

### Buildings and Structures

The buildings and associated infrastructure on the site have varying levels of significance ranging from exceptional to some for all the historic buildings and structures remaining. Recent structures are of little significance. The levels of significance are shown on the following diagram. Refer to Figure 144 - Levels of Significance.

## 5.5 Graded Elements of Environmental Significance

### Prioritised Environment Zones and Elements

Each management zone has been prioritised according to determined urgency of works. Management zones 1-3 have potential to impact on the westerly sight lines of the 5.25" gun, 6" gun and/or the observation post and have been prioritised to have works undertaken within years 1-3 of the CMP implementation period. Management zone 4 is located on the top of Buckland Hill in the central portion of the site and has been allocated to have works undertaken within years 3-5 as it is near the battery and war tunnels and hence within the portion of the site most visited by pedestrians. Management zone 5 has not been allocated a priority as it has archaeological potential due to the presence of historic gun emplacements and therefore may be subject to future works associated with their display.

Works within the management zones 6-18 are expected to be initiated in the second half of the CMP period (years 6-10). Prioritisation within these areas will be determined at a later date and may be based on factors such as:

- success of works within Years 1-5;
- financial resources;
- level of community involvement; and
- preferences of community members/groups (e.g. planting adjacent to paths to increase public appreciation).

It is recommended that works are undertaken progressively in a westerly direction, extending from the area of initial works (management zones 1-4). This follows common bushland restoration practices in which works commence in higher quality areas and progress into lower quality areas (Bradley 2002).

Management zone 18 comprises seven mature *Araucaria heterophylla* (Norfolk Island pine) trees which are of local significance according to the State Heritage Office as they are a remnant of past uses of Buckland Hill. These trees are listed as 'category three' on the municipal heritage inventory, which is described as 'retain and conserve if possible'. These trees are situated within a landscaped setting with turf and revegetation, weed control or pest fauna policies in this CMP do not apply to this management zone.

The management zones applicable to years 1-5 of the CMP have been divided to make management more user-friendly, with corresponding letters to distinguish each part. Divisions were determined by factors such as planting lists and spatial separation. On-ground delineation is likely to be required for some management zones where spatial boundaries are not obvious. The remaining zones have not yet been divided but will likely need division in the future, according to later determined priorities.

Note that the management zone prioritisation provided in the CMP is a recommendation and may be subject to change, at the discretion of the Town of Mosman Park. Management zone prioritisation is summarised below and shown in Figure 145.

Management Zone	Priority (CMP Year)
1a-e	Years 1 - 3
2a-b	
3	
4a-i	Years 3 - 5
5	TBD - potential for future works associated with historical gun emplacements
6-17	Year 6 onwards (TBD)
18	No works required - retain
Firebreaks	Ongoing firebreak management and maintenance (all years)

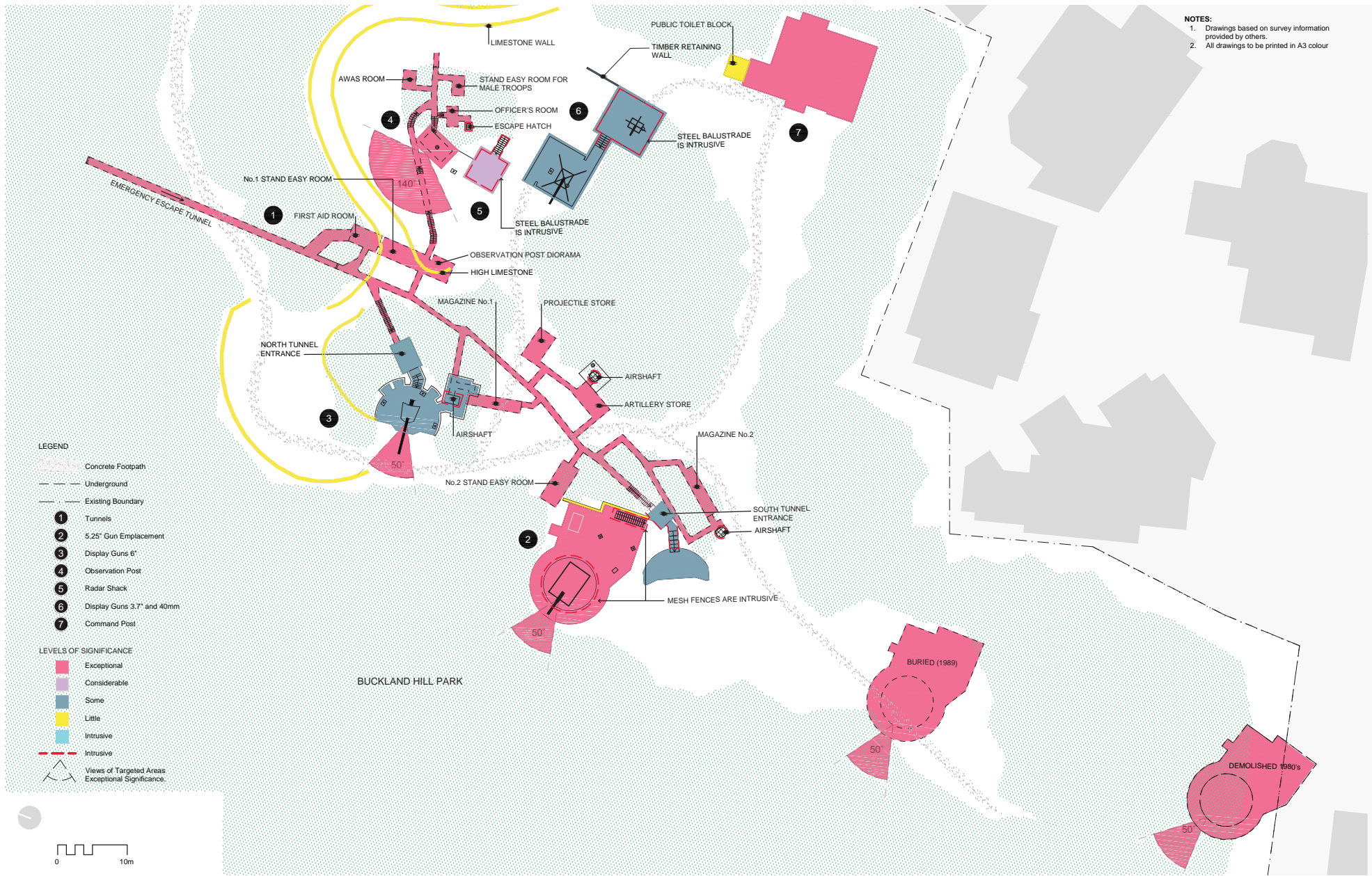


Figure 144. Levels of Significance (element, 2019)

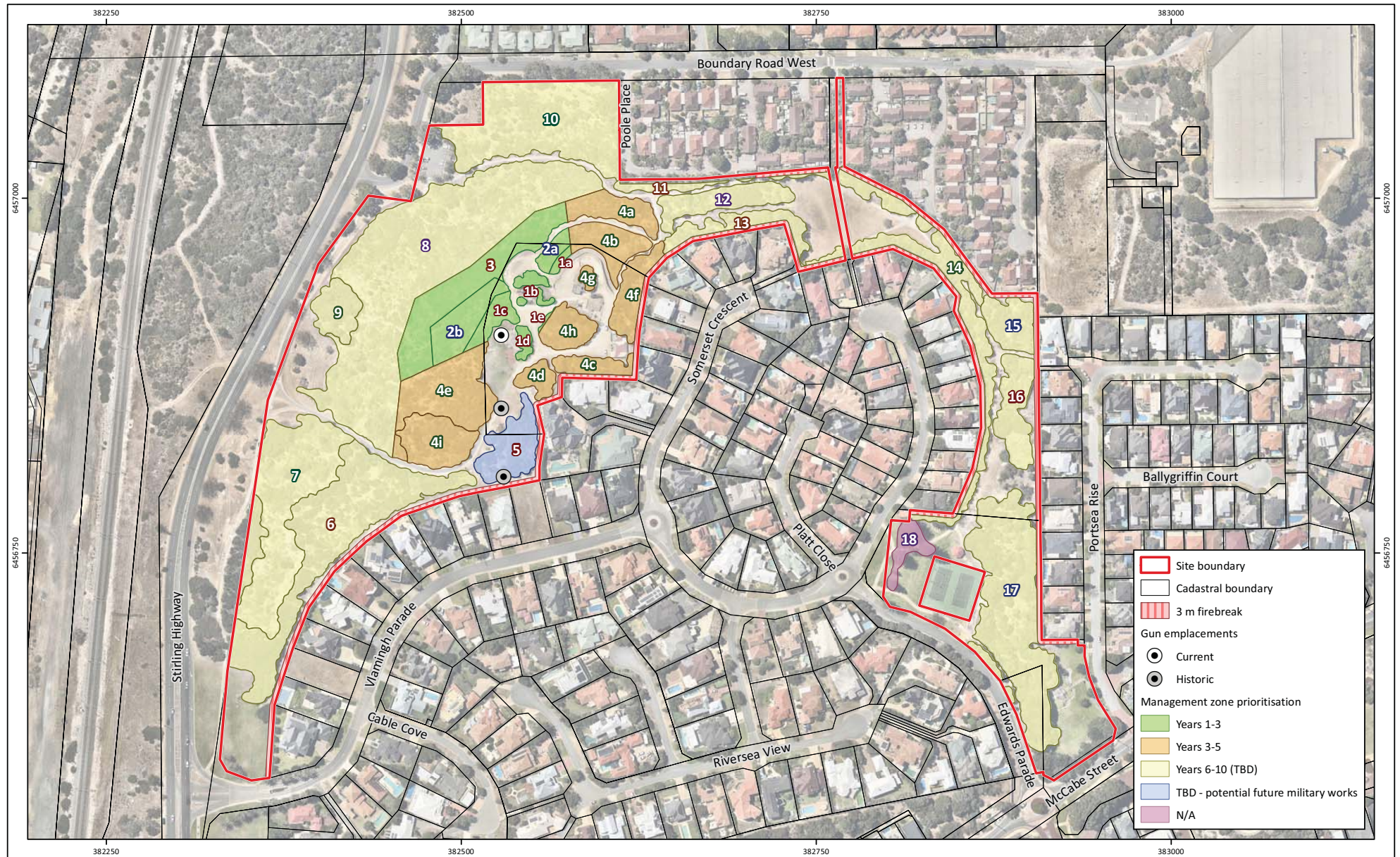


Figure 145. Environmental Management Zone Priorities (Emerge, 2019)

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## 6. Conservation Policies

### 6.1 Introduction

The purpose of this conservation policy section is to establish the principal conservation policies that will guide the conservation and future use of Leighton Battery. It also considers future development throughout the study area including Buckland Hill. The intentions of these conservation policies are:

- To retain, reveal and enhance significance;
- To anticipate factors affecting its future;
- To identify adaptive reuse potential; and
- To guide conservation and change.

## 6.2 Key Policy Statements

### Overarching Principles

Buckland Hill has a high degree of heritage significance to the people of Australia, Western Australia and is rare as one of the last remaining coastal defence systems within the Perth Metropolitan area. It contains a comprehensive in situ collection of artillery and is a regional landmark that can be transformed through change.

In addition, the native vegetation within Buckland Hill has environmental significance as it provides an ecological linkage between the Swan River and the Indian Ocean. It is an important local open space for residents and provides ecological functions. Some vegetation also has State significance as it represents a TEC and one species present is listed as a priority for conservation in Western Australia. The following overarching principles will apply to Buckland Hill, comprising Leighton Battery, as it undergoes change.

- The management and implementation of the policies set out in this plan is the responsibility of the primary landholder, the Town of Mosman Park;
- Identified areas of significance within the Buckland Hill landscape enhance the values of the place, and they should be conserved with minimum degree of change;
- Where further change might occur, it must be in accordance with this document and policies and be sympathetic to the heritage values of Buckland Hill;
- As a site of ecological significance any changes proposed to landforms, hydrology, vegetation, fauna, fauna habitat within the site should be sympathetic and act to protect and enhance environmental values; and
- As a site of high archaeological potential, all archaeological undertakings should be documented and interpreted in accordance with an archaeological management plan.

### Acceptance of approach

Conservation policy is guided by the assessment of significance of the place as outlined in this Conservation Management Plan.

*Policy 1. The assessment of significance for the place and its component elements as outlined in this document should be accepted as the basis for the conservation and planning for Buckland Hill.*

*Policy 2. All future decisions relating to use, or any other matters likely to affect the heritage and environmental values of Buckland Hill should be made with reference to this Conservation Management Plan.*

### General approaches to zones and levels of significance

The levels of significance of the elements that make up Leighton Battery relate to their contribution to the cultural heritage significance of the place as whole. In general, the greater the level of significance, the greater the care that should be taken. However, some elements have more tolerance to change than others so the specific policies related to each element should be referred to when making decisions about the place.

While the buildings and associated infrastructure have a very high level of significance for aesthetic, historical or technological values, all elements have significance in being part of the overall complex, and the significance of individual elements is enhanced by their overall context and relationship with each other in their original locations.

The tolerance to change is also useful in understanding the extent of change that may be appropriate as the place undergoes change. This identifies the amount of change that may be possible to external and internal building fabric (in a broad sense) without impacting on the cultural heritage values of the place. An element with a high tolerance to change means that extensive adaptive works are possible, with moderate tolerance to change some adaptive works are possible, while low tolerance to change means that only limited adaptive works are possible.

*Policy 3. The greater the significance of a fabric or a feature of a place, the more care should be taken in actions which may affect it.*

*Policy 4. Items identified as having considerable significance should be retained and conserved. They may be modified in keeping with the overall aims of the conservation policy.*

- Policy 5. Items identified as having some significance should be retained and conserved where possible. If removed, their significance should be recognised through an archival record.*
- Policy 6. Items identified as having little significance may be removed or modified.*
- Policy 7. When opportunities arise, the visual impact of items identified as intrusive should be ameliorated.*

The zones of environmental significance (management zones) outlined in this report comprise areas of existing native vegetation in varying condition. The aim of identifying these areas is to provide identifiable areas for planning and undertaking management works. Additional management zones may be identified by the Town of Mosman Park.

Similarly, the prioritisation of management zones in this CMP provide recommended actions for the first five years of the plan. The vegetation height management zones (1-3) are considered to be of high priority due to the current impacts on heritage views. The prioritisation of the remaining management zones is simply a recommendation and is based on best practice restoration methods. However, the prioritisation may be subject to change, as determined by the Town of Mosman Park.

- Policy 8. Impacts to native vegetation within the site should be avoided or minimised. Modification to vegetation should only be undertaken under permit or approval and as outlined in this CMP.*
- Policy 9. Impacts to the TEC in the site should be avoided or minimised. Modification to occurrences of the TEC should only be undertaken under permit or approval and as outlined in this CMP.*
- Policy 10. Non-native vegetation may be modified or removed unless otherwise identified as having significant value.*
- Policy 11. Where new vegetation values are identified in the future these should be identified as elements of significance in future documentation and responded to appropriately as part of ongoing management (i.e. with management zone).*

## Use of the Burra Charter

The Australia ICOMOS Burra Charter (2013) sets out the principles for the conservation of heritage places in Australia. It forms an important reference document for the present and future custodians of Buckland Hill and may assist in resolving and issues relating to the conservation of the place that are not explicitly dealt with in this Conservation Plan.

- Policy 12. In addition to this Conservation Management Plan, the principles and processes set out in the Burra Charter should be used to inform decisions relating to the conservation and ongoing maintenance of the place, including buildings, landscape and structures.*
- Policy 13. As per Article 31 of the Burra Charter, 'Conservation is based on a respect for the existing fabric, use, associations and meanings. It requires a cautious approach of changing as much as necessary but as little as possible.'*

## Expert Advice

The Burra Charter recognises that caring for a culturally significant place requires expert skills. This is also applicable to environmentally significant places. The input of people with expertise in specialised areas including heritage architectural, engineering and environmental management will be needed to ensure that the place is conserved for future generations.

- Policy 14. Any proposed works to the significant elements of the place should be considered with the input of a recognised heritage/environmental practitioner and appropriate specialist advice should be sought as required.*
- Policy 15. The preparation of any reports, guidelines or technical management plans for Buckland Hill (such as bush fire, access, parking and amenity enhancement, interpretation, tourism, risk preparedness and others) should be informed by this CMP, and an integrated approach is recommended.*

## Records

The need to keep publicly available records about places of cultural significance is guided by the Burra Charter. It is recommended that a record of the building containing relevant documentation and places is kept by the owners. If maintained and added to over time, the records will continue to be of use to future generations.

- Policy 16. A record of actions that have affected the place should be maintained by the owner.*
- Policy 17. A copy of this conservation Management Plan should be placed in the Battye Library of Western Australian History at the State Library (WA), City of Perth History Centre, and the Heritage Council of Western Australia's library.*
- Policy 18. The preparation of archival records prior to any major change provides an invaluable research tool for future generations and should be undertaken with care.*
- Policy 19. The policies and options set out in this document should be endorsed as the guide to the planning and development of the place.*

## Review of Conservation Management Plan

New documentary and physical evidence may come to light after the development of this Conservation Management Plan, particularly if further onsite investigative work is done to ascertain the level of change to the original fabric undertaken during the 1989 works. This will afford a different interpretation of the place, its significance and the way it should be managed. Circumstances relating to the custody, management and conservation of the place are also likely to change over time. For this reason, the periodic updating of the Conservation Management Plan for Buckland Hill will be necessary.

- Policy 20. The Conservation Management Plan should be reviewed every ten years to take into account the effects of the passage of time, conservation and adaption works, the applicability of the Conservation Policies and to assess the manner in which they have been implemented.*

## Management

The Buckland Hill CMP should be adopted by the primary land manager, the Town of Mosman Park. The Town should be committed to ensure management arrangements and resources to the extent that they are available and processes to facilitate the effective implementation of this CMP.

- Policy 21. A clear management and implementation framework for owners and leaseholders at Buckland Hill is important for the co-operative longterm management of the site. A management agreement currently exists between the Town of Mosman Park and leaseholders RAAHS and this should be subject to ongoing assessment and review to ensure effective implementation of this CMP.*
- Policy 22. The management of the complex should be holistic towards its individual components, to include previous, existing and subsequent layers of history.*

## Policies Relating to the Physical Setting

The Burra Charter states that 'cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects' (Article 2.1). The Heritage Significance of Buckland Hill entails a range of responsibilities to ensure that the heritage values of the place are conserved, managed and interpreted for present and future generations. Heritage values should be understood, celebrated and cared for by the site managers, volunteers, visitors and all stakeholders involved. As guiding principles, the following conservation policies relate to conserving the setting, the buildings and the associated infrastructure.

### Site and surrounds

The setting of Leighton Battery is significant for its operations as a coastal defence system. The fundamental purpose for Leighton Battery was to be concealed from view under the threat of any potential fire during World War II. Whilst it is not of landmark value, its associated views looking out to the Indian Ocean particular from the original gun emplacements and Observation Post contribute to the significance of the place. It is important that these primary views are protected.

- Policy 23. The Buckland Hill site has local landmark quality as an attractive, large, public open space with native vegetation and few obvious above-ground features. Change should be limited to protect the landmark quality of the setting and the overall existing landscape character and natural environment capacity of the place should be considered as part of today's place significance.*
- Policy 24. The physical setting of Buckland Hill should be retained and conserved and should not be obscured or compromised by adaptation or change.*
- Policy 25. The Leighton Battery site should be preserved, identified intrusive elements removed and unsympathetic change should be avoided around this area. Points where underground elements penetrate the surface plane are particularly sensitive given their significance as viewpoints, and change, including paths, plantings and other interventions should be carefully considered.*
- Policy 26. The natural landform should be retained throughout, and earthworks should be minimal*
- Policy 27. The Pine Trees at Buckland Hill are listed on the Town of Mosman Park Municipal Inventory and their contribution to the landscape should be retained and conserved.*

- Policy 28. The sandy soils of the site may be subject to erosion. Management actions should be undertaken if signs of erosion are observed particularly around footpaths.*

### Views

The heritage significance of Leighton Battery is intrinsically linked to its relationship with the Indian Ocean, Gage Roads, Garden Island, Rottne Island and other World War Two artillery sites, in particular the Fremantle Fortress battery locations. Maintaining these views is vital to ensure the values of the place are conserved, managed and interpreted for present and future generations.

- Policy 29. Existing uninterrupted views of the identified significant views to the ocean are important to the environmental and contextual interpretation of the Buckland Hill site and should be protected and maintained where possible.*
- Policy 30. The views and vistas of exceptional significance identified in this plan that allow an appreciation of the role of the Leighton Battery in coastal defence efforts during World War Two should be reinstated and maintained.*

### Footpaths

Footpaths in the site are used by pedestrians and occasionally vehicles. Since native vegetation occurs adjacent to paths, maintenance would be required to ensure paths are accessible. Exemptions under the regulations of the EP Act apply for clearing native vegetation for vehicular and walking tracks (Regulation 5, Items 12 and 13 respectively) and so a clearing permit would not be required.

- Policy 31. Paths in the site should be maintained to ensure accessibility. This may include pruning of native vegetation but should be limited to the minimum required.*
- Policy 32. Blocking off of informal tracks within native vegetation areas should occur to discourage pedestrian use and protect native vegetation and fauna habitat.*
- Policy 33. The installation of paved footpaths should be limited to areas of low significance so as not to conflict with interpretations of the site's heritage values.*

## Retaining Walls

*Policy 34. Retaining walls are considered intrusive. Any additions should be carefully considered so as not to diminish the heritage values of the site.*

## Carpark

*Policy 35. Onsite carparking should not encroach on the setting of the Leighton Battery or the identified areas of environmental significance.*

## 6.3 Policies Arising from the Physical Condition of the Place

Buckland Hill is a place of exceptional heritage significance that demonstrates a distinctive method of defence that is no longer practiced. Buckland Hill historic significance is linked to its past through the extant of original constructions and present through its environmental significance and use as a place of public recreation.

### Extant structures

The above ground extant structures comprise one remaining 5.25" gun emplacement, Command Post, Observation Post, Radar Shack, 6" display gun, 3.7" and 40mm display guns and the North and South Tunnel Entrances. Below ground underground tunnels and their associated rooms extend over 300 metres around the site.

*Policy 36. The physical fabric is overall in good condition, however opportunities exist to upgrade and adapt extant structures in a more heritage sympathetic and sustainable manner with respect to amenities and facilities. This includes, but is not limited to, the potential for better considered and designed safety and security elements and the establishment of parking related facilities outside of the Registered Curtilage.*

### Authenticity

*Policy 37. Authenticity should be the primary goal of the interpretation centre.*

*Policy 38. Opportunities exist for the removal or alteration of fabric and features with little or no significance so as to reveal the greater significance of the place and enhance its authenticity. Items of intrusive and little significance have been outlined within the significance plan and include elements such as fences and balustrades and the alteration of modern retaining walls.*

*Policy 39. Conserving previous and subsequent layers of the complex is essential to retain the landscape character and unity as a single entity.*

## 6.4 Policies Relating to Archaeological Potential

While there is large amount of information relating to the historic development of the site and its operation as a coastal defence system, further archaeological investigations have the potential to reveal more information about the history of the site. While there may be some archaeological potential, the extensive excavation work that took place during the construction of the Leighton Battery tunnels may have removed any trace of these earlier land uses.

### Archaeological Potential

Although it is recognised that Buckland Hill has undergone extensive physical alterations over time it is suggested that Buckland Hill and the Leighton Battery site has high archaeological potential for the investigation of earlier uses and inhabitants. These investigations could positively inform future interpretation of the site, and contribute to National, State and local history.

*Policy 40. An archaeological assessment, by a suitably qualified archiologist should be prepared and incorporated into any ground disturbing proposals affecting the place.*

*Policy 41. Potential exists for the exhibition of archaeological finds as part of the Leighton Battery interpretive experience to enhance visitor engagement with the site. Records of projects and artefacts collected from site works and disturbances should be recorded and if appropriate, catalogued and curated.*

*Policy 42. Opportunity exists to engage with local university archaeology courses to perform studies and research in the area.*

## Whole Site Indigenous

*Policy 43. The relationship between Buckland Hill and other registered Aboriginal heritage sites in the area highlights opportunities for archaeological investigation to better understand the pre-colonial history of the place.*

## Whole Site Historical

*Policy 44. The two southern most 5,25" gun emplacements (2 and 3) remain buried or demolished and provide opportunity for excavation and further research. Further investigation is required into the condition of these emplacements and their potential for archaeological return.*

*Policy 45. A wide range of material may be found on the grounds such as the known 'weapons pit' signal station, lime kiln and race tracks, the management and care of any significant finds should be undertaken through development of a clear archaeological management plan.*

## 6.5 Policies Arising from External Requirements

### Heritage listings

As Leighton Battery is entered in the Town of Mosman Park's Heritage List and State Register of Heritage Places, any proposed change or work considered as 'development' i.e. work that is not maintenance, will require planning and/or building permit approvals from the Town of Mosman Park, which will be referred to the Heritage Council of Western Australia for advice.

*Policy 46. Any development proposal concerning the Leighton Battery is to be referred to DPLH for advice.*

### Fair Access

*Policy 47. Universal access requirements should be recognised on site. Requirements should be designed to ensure that they do not adversely impact on key areas of significance around the Leighton Battery site.*

## Other Statutory Requirements

The provisions of health and fire regulations, the Building Code of Australia, and all other relevant Acts, Regulations and Local Laws, including the provision of access and facilities for people with disabilities will influence any future use of the site. Where compliance with a regulation or by-law would compromise the heritage value of the building, the HCWA's advice should be sought.

*Policy 48. Where elements have been assessed as having heritage significance, any works arising from requirements to comply with statutory requirements should be evaluated against this conservation management plan to ensure minimum impact on significant fabric. Professional advice should be sought to ensure that both safety and conservation issues are fully assessed.*

## Heritage Impact Statement

An effective way of reviewing the effect proposed changes may have on the cultural significance of a place is to obtain a professionally prepared heritage impact statement. Such statements are valuable for conservation planning, as they can be specific in ways that this, or other conservation plans, cannot be. They are also required to be submitted as part of any development application for changes to the place.

*Policy 49. Heritage impact statements specific to proposals for major works or new development either at the place or in the vicinity of its setting, should be prepared and proposals modified in light of findings.*

## Safety

Safety and security of the Leighton Battery site has been an ongoing concern for those involved in managing and presenting the place. Opportunities exist to improve the safety and amenity of the site while respecting the heritage values of the place.

*Policy 50. Change could occur to improve safety around the site and discourage anti-social behaviour, change should only occur if the sites values are respected and enhanced.*

*Policy 51. A comprehensive safety and lighting strategy should be developed that aligns with the identified areas of heritage significance and is informed by an interpretation strategy for the site.*

## 6.6 Compatible Use and Future Development

Continuing engagement with the site will become part of the history of Buckland Hill and it is therefore important not to falsify or confuse the story of the place through the introduction of 'faux' heritage. Many areas contain important elements of historical and/or archaeological potential which should direct the change response and use. Constraints on the development of the place include potential impacts in relation to:

*Policy 52. Significant uses of the place relating to the coastal defence strategies should be continued and facilitated within the cultural and environmental constraints of the place.*

*Policy 53. There is an opportunity and a need to adopt a flexible approach to meet present and future needs, ensuring all significant characteristics of the place are respected and enhanced.*

*Policy 54. Funding opportunities should be identified to support tourism endeavours on a long-term basis.*

### Indigenous Tourism

Opportunities exist to engage with Aboriginal traditional knowledge of the site through stories and cultural activities including art and tourism enterprises.

*Policy 55. Future use of the site should look to engage with Aboriginal connections to the Buckland Hill site and provide opportunities to incorporate cross-cultural interpretations of the place.*

*Policy 56. Cultural tourism opportunities should be encouraged which look to provide training opportunities and engage with local Aboriginal communities including groups and individuals with associations to the place.*

### Historical Tourism

Leighton Battery has developed since its opening in 1997 into a popular site for tourist visitation. It currently opens to the public one day a week and opportunities exist to engage with and grow the tourism potential of the place.

*Policy 57. Encourage increased visitation to the Leighton Barracks by extending the opening times of the World War Two tunnels where possible.*

*Policy 58. Encourage the growth of the site as a tourism destination by supporting the volunteer network to continue acting as guides and custodians of the place.*

### Place Activation

*Policy 59. Encourage increased engagement of the site through activation and amenities such as mobile food and beverage units. Waste production and visual impacts of these units must be assessed in order to preserve the environmental and cultural values of the site. Such activation should only occur in accordance with the owners policies and in agreement with the leasee.*

*Policy 60. Opportunity exists to explore the use of the outdoor site for small to medium scale events. Increased use of the site would need to ensure that native vegetation values are protected. Such activation should only occur in accordance with the owners policies and in agreement with the leasee.*

### Trails

*Policy 61. Connections of the site to wider heritage and environmental trails should be encouraged to increase awareness and engagement with the heritage and environmental values of the site.*

## 6.7 Policies Relating to Services and Renewable Energy Systems

### Services

Should upgrading of electrical and plumbing services be required or new services installed care should be taken to minimise the potential impact to existing original fabric or finishes.

*Policy 62. The provision of new services should be installed inconspicuously and should not have an adverse visual impact on the significant fabric and the character of significant spaces. The installation of services should not be visible from the principal vistas of the place.*

*Policy 63. New services should be installed using existing openings, voids and cavities where possible.*

### Renewable Energy

The installation of renewable energy systems on existing sites is becoming more common and needs to be carefully considered in relation to the potential impact on the setting and building fabric.

*Policy 64. Renewable energy systems should be attached to newer, less significant buildings in preference to those identified as being of significance.*

*Policy 65. Should renewable energy systems be installed at Buckland Hill the following principles should be adhered to:*

- *The visual setting of the place, particularly significant identified views must be maintained. The system must not detract from the visual presentation of the site;*
- *Fixing and anchor points should, as much as possible, utilise existing points of be located so as to minimise damage to significant fabric; and*
- *The installation of the system must be readily reversible.*

## 6.8 Policies Relating to Interpretation

It is important to provide visitors and the local community with an appreciation of the history of Buckland Hill so that they can understand, respect, appreciate, and enjoy the heritage and environmental values and the role it has played in the social development of the area.

*Policy 66. An increased awareness should be encouraged regarding Buckland Hill Natural, Indigenous and Cultural significance and heritage value through the process of interpretation.*

*Policy 67. When funding opportunities arise, an updated interpretation plan should be developed to direct and unify use and understanding of the site. Development of an interpretation plan could help to define the brand and direction of the Buckland Hill site across all opportunities and user groups.*

*Policy 68. As a coastal defence site a significant aspect of the original design of the place was the ability to remain hidden from view from approaching, potentially hostile ships or aircraft. Any installation of lighting onsite should look to respect this design intent and refrain from highlighting the battery features through spot lighting.*

*Policy 69. Awareness and protection of environmental values should be developed through appropriate interpretive signage.*

*Policy 70. Interpretive items should be site specific and curated to reflect an accurate understanding of the history and heritage values of the site.*

## Signage and Physical Interpretation

*Policy 71. New signs should be readily removable, and should not damage the fabric of a Heritage Place.*

*Policy 72. Viewing points should provide for education and interpretation opportunities.*

*Policy 73. Reinstating the camouflage nets around the 6" gun emplacements could enhance the interpretation of the site and provide visual interest without compromising the existing heritage values. This approach can be assessed against mitigation of anti-social behaviour around the site.*

## Education

*Policy 74. Academic publications relating to the history of the site should be encouraged ensuring the historical significance of the place is effectively communicated and interpreted to the public.*

*Policy 75. Academic programmes should be designed to educate residents about the natural environmental values and to encourage participation in revegetation programs.*

*Policy 79. Termite inspections should continue to be undertaken on a regular schedule to limit the deterioration of timber and other elements within the tunnel complex.*

*Policy 80. Decisions about works, maintenance, repairs or change are necessarily constrained by the need to take into account the impact on the significance of the place, both as a whole and on its individual components.*

*Policy 81. Volunteer programs should be supported and developed to assist with the implementation of revegetation efforts.*

## 6.9 Policies Relating to Implementation

### Maintenance

*Policy 76. Maintenance of the place should be the single most important part of the conservation program.*

*Policy 77. Maintenance of the place includes informed supervision of minor and major works and vigilant attention in order to reduce the deterioration of the physical fabric.*

*Policy 78. Structural monitoring of identified crack systems should continue to ensure the structural integrity of the site.*

## 6.10 Policies Relating to Vegetation

### Protection

All native flora and vegetation (including flowers, seeds, whole plants, timber and firewood) is protected in Western Australia as summarised below.

*Policy 82. All activities undertaken within the site that relate to natural environmental values must comply with relevant legislation.*

Activity	Applicable Legislation / Regulations	Implications
Clearing native vegetation (dead and living)*	<i>Environmental Protection Act 1986</i>	Clearing permit required for activities such as: <ul style="list-style-type: none"> <li>Native vegetation height management in MZ1-3;</li> <li>Removal of dead native vegetation; and</li> <li>Substantial damage to any native vegetation.</li> </ul>
Vegetation management for bushfire purposes	<i>Bush Fires Act 1954</i>	<ul style="list-style-type: none"> <li>Firebreaks around the site to be maintained by Town of Mosman Park; and</li> <li>No revegetation within firebreak areas.</li> </ul>
Impacts to TEC vegetation	<i>Biodiversity Conservation Act 2016</i>	Authorisation from the State Minister for the Environment required prior to 'modifying' TEC vegetation, such as that proposed within MZ1-3.

\*Under Section 33 of the *Bush Fires Act 1954* the Town of Mosman Park are exempt from requiring a clearing permit for vegetation clearing and maintenance required for firebreaks within the site.

Pedestrians may trample native plants and degrade natural environmental values. Encouraging pedestrians to remain on designated paths will reduce impacts to native vegetation whilst enabling enjoyment of natural environmental values.

*Policy 83. Pedestrian entry into native vegetation areas should be discouraged through interpretive signage and increased vegetation around designated paths to restrict access*

### Bushfire Safety

Firebreaks (as described previously) provide access to the site and are required under the *Bush Fires Act 1954*. The Town of Mosman Park should undertake annual monitoring and maintenance to ensure that the firebreaks are accessible and compliant.

*Policy 84. Firebreak management zones should be maintained to reduce bushfire risk and ensure compliance with legislation.*

Actions to reduce the risk of bushfire within the site may include the following:

- Undertake weed control to reduce the cover of weeds, particularly grassy weeds;
- Actively manage areas subject to fire through actions such as restriction of pedestrian access, supplementary weed control and erosion control (if required);
- Provide education programs for local residents on fire risk reduction, mitigation and actions to undertake in the event of a fire in the site; and
- Install signage detailing bushfire risk in the site and encouraging actions to reduce the likelihood of bushfire.

*Policy 85. The risk of bushfire could be further reduced through appropriate management actions and education activities. If additional management actions are considered, the area(s), type and intensity of management will be determined through consultation with the Department of Fire and Emergency Services (DFES).*

## Vegetation Height Management

Vegetation height management should be undertaken within management zones 1-3 to maintain westerly heritage views from the 5.25" gun, 6" gun and observation post in the site. A maximum vegetation height has been assigned to each of these management zones, as shown in Figure 148. This maximum vegetation height was determined according to topography and the distance from the associated military infrastructure. Note that this height restriction only applies where the vegetation is confirmed to be blocking views from the 5.25" gun, 6" gun and/or observation post. Some vegetation may exceed the maximum height but, if it is not obstructing views, is not required to be managed. The vegetation management height restriction for each zone is provided below.

*Policy 86. Pruning of vegetation for significant heritage views should only occur in areas identified as appropriate within this CMP.*

*Policy 87. The pruning or removal of plants to manage the height of vegetation within management zones 1-3 should be undertaken by Town of Mosman Park approved contractor and impacts to adjacent native vegetation that does not require height management shall be avoided or minimised as much as possible.*

Management Zone	Action
1a-e	Remove plants taller than 1m only if they are deemed to be blocking views from military structures^
2a-b	Remove plants taller than 2m only if they are deemed to be blocking views from military structures^
3	Remove plants taller than 5m only if they are deemed to be blocking views from military structures^

^only refers to westerly views from 5.25" gun, 6" gun and observation post.

## 6.11 Policies Relating to Weed Control

As previously detailed, weeds are present in the site and have potential to reduce native biodiversity and increase fire risk.

Weed control should occur first in management zones prioritised the highest. Under the prioritisation recommended in this plan, weed control will occur first within MZ1-4 (during years 1-5 of the CMP).

Management zones 5-18 will require weed control but timing will be determined later and may be informed by weed control outcomes in years 1-5.

*Policy 88. Weed control programs should be implemented to control the spread of weeds and maintain appropriate native biodiversity*

### Priority Weeds

Each weed species recorded within the site was assigned a management priority status of either 'low', 'moderate' or 'high', based on the following factors:

- The status of the species pursuant to the BAM Act;
- Whether the species is listed as a WoNS;
- The ratings of the species in the Swan Impact and Invasiveness Ratings document (DPaW 2019b); and
- Observations of the species within the site including distribution, frequency and current (and likely future) impacts on native vegetation.

The management priority of each weed in the site is shown below. Weed control within management zones 1-4 shall target the 'high' priority weeds first, followed by 'moderate' and 'low' weeds.

Weed suite	Species name	Status^	Priority
<b>Bulb</b>	<i>Asparagus asparagoides</i>	Non-native, DP, WoNS	Moderate
	<i>Romulea rosea</i>	Non-native	Low
	<i>Watsonia meriana</i>	Non-native	Moderate
<b>Grass</b>	<i>Avena barbata</i>	Non-native	High
	<i>Briza maxima</i>	Non-native	Moderate
	<i>Bromus diandrus</i>	Non-native	High
	<i>Cenchrus setaceus</i>	Non-native	Moderate
	<i>Cynodon dactylon</i>	Non-native	High
	<i>Ehrharta calycina</i>	Non-native	High
	<i>Ehrharta longifolia</i>	Non-native	High
	<i>Lagurus ovatus</i>	Non-native	High
	<i>Lolium rigidum</i>	Non-native	Moderate
<b>Herb</b>	<i>Crassula glomerata</i>	Non-native	Low
	<i>Euphorbia terracina</i>	Non-native	Moderate
	<i>Pelargonium capitatum</i>	Non-native	Low
	<i>Petrorhagia dubia</i>	Non-native	Low
	<i>Scabiosa atropurpurea</i>	Non-native	Moderate
<b>Woody</b>	<i>Leptospermum laevigatum</i>	Non-native	High
	<i>Olea europaea</i>	Non-native	Moderate
	<i>Opuntia stricta</i>	Non-native, DP, WoNS	High
	<i>Schinus terebinifolius</i>	Non-native	High
	<i>Tamarix aphylla</i>	Non-native, DP, WoNS	High

^Status according to Florabase (Western Australian Herbarium 1998–2019), BAM Act and WoNS list.

## 6.12 Policies Relating to Revegetation

There is an opportunity to enhance the existing native vegetation in the site through revegetation within all management zones.

*Policy 89. Revegetation through the planting of native flora species using the strategy outlined in the CMP should take place to increase biodiversity and amenity.*

Under the recommended prioritisation, revegetation will occur within MZ1-4 during years 1-5 of the CMP. The remaining management zones have potential for revegetation but timing will be determined later and may be informed by revegetation success in years 1-5. Similarly, the prioritisation of management zones may be subject to change, at the discretion of the Town of Mosman Park.

The overarching revegetation strategy for management areas in the site is provided below.

Management Zone	Revegetation Strategy	Priority (Year)
<b>1-3</b>	<ul style="list-style-type: none"> <li>Plant tubestock in bare areas formed by vegetation height management actions, and within adjacent bare areas.</li> <li>Tubestock species selection must take into account height management restrictions (refer Section 7.1.3).</li> </ul>	Years 1-3
<b>4</b>	Plant tubestock amongst existing native plants	Years 3-5
<b>7-17</b>	<ul style="list-style-type: none"> <li>Potential for revegetation – specific areas to be determined.</li> <li>Tubestock to be planted amongst existing native plants</li> </ul>	Years 6-10
<b>18 and firebreaks</b>	No revegetation required	N/A

## Target Ecosystems

Principle 1 of The National Standards for the Practice of Ecological Restoration in Australia states that 'ecological restoration practice is based on an appropriate local indigenous reference ecosystem' (Standards Reference Group SERA 2017). A combination of pre-European vegetation mapping (Beard et al. 2013), existing native vegetation and information from local vegetation on a similar landform has been used to determine 'target ecosystems' for the site.

Three 'target ecosystems', with associated planting lists, were devised for the site, as detailed below and shown in Figure 149.

Name	Description	Management zone
<b>Heathland</b>	Dense shrubs (heath) of species such as <i>Acacia</i> spp., <i>Melaleuca huegelii</i> , <i>Templetonia retusa</i> over low shrubland <i>Melaleuca systema</i> over native grasses and forbs.	1c, 1a, 2, 3, 4a-e, 7, 8, 10, 12, 15-17
<b>TEC woodland</b>	Tall shrubland <i>Callitris preissii</i> and/or <i>Melaleuca lanceolata</i> over low open shrubland native species (aligns with the <i>Callitris preissii</i> (or <i>Melaleuca lanceolata</i> ) forests and woodlands TEC).	1b, 1d-e, 4f-i, 6, 9, 18
<b>Eucalypt woodland</b>	Woodland <i>Eucalyptus decipiens</i> and <i>Eucalyptus gomphocephala</i> over native shrubland*.	11, 13, 14

\*This target ecosystem currently includes *Agonis flexuosa* trees, for which it is unclear if they would have naturally occurred in the site.

## 6.13 Policies Relating to Pest Fauna

*Policy 90. Biodiversity improvements could occur through the monitoring and control of pest animals. Implementation of a pest fauna monitoring and education program would be beneficial to reduce the impacts of pest fauna on the environmental values of the site.*

Pest fauna such as rabbits, foxes and cats appear to currently have low impacts on the site. An annual monitoring program by a suitably experienced contractor should be implemented. The primary objective of this program would be to quantify the presence and impacts of pest fauna in the site. Potential methods to determine this may include motion sensor cameras, surveys on foot to search for secondary evidence such as scats, and anecdotal evidence from citizens. If the pest fauna monitoring program determines that pest fauna are having negative effects on the native vegetation then control methods such as trapping should be implemented.

In addition, public education on responsible cat ownership and the potential effects of domestic cats on native fauna should be implemented in the local area. This may include notices within the site and distribution of information in the local community. Dogs are currently required to be on a lead within the site and this should be continued.

*Policy 91. Installation of rubbish bins with dog waste bag dispensers should occur onsite to protect the environmental values of the site from pollution. Impacts on heritage values should be considered when siting bins.*

## 7. Policy Implementation

This section is concerned with the implementation of the conservation policy, primarily relating to the conservation and maintenance works to be undertaken by the current and future owners. The works are divided into five types of works; 'urgent works', 'short-term works', 'medium-term works', 'long-term works' and 'desirable works'.

**Urgent Works** - Works required to prevent serious disruption of activities and/or may incur higher costs if not addressed within one year.

**Short-Term Works** - Works that need to be addressed between one to two years to prevent serious deterioration.

**Medium-Term Works** - Works likely to require rectification within three to five years.

**Long-Term Works** - Works that can be safely and economically deferred beyond five years.

**Desirable Works** - These items address desirable actions that will assist in enhancing the heritage values of the place and its ongoing use. While they could be carried out at anytime, they are more likely to be achieved as part of redevelopment proposals for the site.

Please refer to Appendix 1 Building Condition Assessment Report.

### 7.1 Recommended Maintenance Works Schedule

Generally, the Leighton battery is in good condition, however maintenance is required to protect the significance and integrity of the fabric. The maintenance of each structure includes an informed supervision of minor and major works, and vigilant attention to security in order to reduce deterioration and protect the place from the risk of fire, vandalism and theft.

The following maintenance program should be carried out by the owners or, through agreement, the occupiers of the place. Any repairs should be undertaken in accordance with conservation policies and appropriate specialist advice from professionals skilled in conservation work.

At the publication of this plan the site managers are noted as the Town of Mosman Park (2019).

Building Element	Maintenance Task	Responsibility	Frequency
<b>Generally</b>	Ask cleaners/builders/users to report any defects they note, including broken glass, windows, hardware, leaks, etc.	Manager	Weekly
<b>Roofs</b>			
<b>Roof Areas Generally</b>	Inspect areas from the ground and report any damage.	Manager	After storms but generally annually
<b>Rainwater Disposal</b>			
<b>Rainwater Goods Generally</b>	Inspect rainwater goods from the ground and accessible high points and report damage.	Manager	After storms but generally annually
<b>Downpipes</b>	Clear downpipes rod if necessary. Inspect downpipes for cracking.	Contractor	Annually
<b>Below Ground Drainage</b>	Open up for inspection drainage points. Check to ensure gullies and gratings are clear twice per year from silt and debris and that stormwater discharges to main sewerage soakaway.	Contractor	Every April and September
<b>External Areas</b>			
<b>External Walls Generally</b>	Inspect walls from the ground and accessible high points and report any damage and signs of movement (i.e. widening mortar joints, cracking of render or masonry units).	Manager	After storms but generally annually

Building Element	Maintenance Task	Responsibility	Frequency
	Inspect with high level access and identify any cracks or damage that may allow water penetration.	Heritage contractor with advice from a Heritage Architect or Engineer	Annually
<b>Masonry Walls</b>	Masonry walls should be inspected for decayed mortar and repointed as necessary with suitable repair mortar. If salts appear on the brick face action should be taken immediately to remediate dampness and/or source of salts.	Heritage contractor with advice from a Heritage Architect or Engineer	Annually
<b>Paint</b>	Repaint the building including original painted external walls, windows and door frames and rainwater goods.	Contractor	Repaint building every 5 years or as often as required.
<b>Ventilation</b>	Ensure that ventilation grilles, vents are free from obstruction.	Contractor	Annually
<b>Windows &amp; Doors</b>	Inspect windows for damage to frames and glazing. Check to ensure they are in working condition.	Manager/ Contractor	Annually

Building Element	Maintenance Task	Responsibility	Frequency
<b>Doors</b>	Check operation for all external doors to ensure they are operating in a secure and functional manner. i.e. locks, hinges and handles should all be in good order and the door should be hung correctly. Hardware can be oiled.	Manager	Bi Annually
<b>Ground Levels</b>	Inspect ground levels around the building and remove build up of soil and other pollutants that can trap moisture. Encourage City to slope pavements away from building.	Heritage contractor with advice from a Heritage Architect or Engineer	Annually
<b>Internal Areas</b>			
<b>Internal Spaces</b>	Inspect under roofs' slabs and internal rooms, and report on any water ingress, rising damp or other damage. Clean regularly.		

Building Element	Maintenance Task	Responsibility	Frequency
<b>Internal Structure and Fabric</b>	Inspect internal structure and fabric including ceiling timbers and joists, wall, concrete walls, ceilings, floors and finishes, timber posts, and architraves. Report on any fungal growth, dampness, insect damage or cracking. Materials should preferably be fixed with like-to-like methods and material.	Manager	Annually
<b>Stairs</b>	Check concrete stairs for cracking or damage	Manager	Annually
<b>Doors</b>	Check operation for all internal doors to ensure they are operating in a secure and functional manner. i.e. locks, hinges and handles should all be in good order and the door should be hung correctly. Hardware can be oiled.	Manager	Bi Annually
<b>Floors</b>	Clean and maintain historic finishes.	Manager	Annually
<b>Building Services</b>			
<b>Electrical Services</b>	Check defective bulbs and fuses and attend to minor faults. For switch boards and wiring these should be regularly checked by a qualified electrician.	Manager/ Electrician	Weekly/Quarterly

Building Element	Maintenance Task	Responsibility	Frequency
<b>Fire Alarm and Suppression</b>	Check fire alarms and fire suppression systems are in fully functional working order. This includes portable extinguishers or sprinklers.	Manager/ Hydraulic Consultants	Monthly
	Ensure all points of egress remain clear.	Manager	Weekly
<b>Security Alarm</b>	Building should be secure 24 hours a day to avoid breaking and entering. Discreet security alarms should be checked.	Manager	Monthly
	Ensure all points of egress, doors and windows are locked and security system is operational.	Manager	Weekly
<b>Natural Environmental</b>			
<b>Vermin and Pest Control</b>	Check for white ants, spiders and vermin regularly within heritage structures. If noted, then appropriate action should be taken.	Manager/Pest Control	Bi Annually
<b>Vegetation</b>	Apply for appropriate approvals/permits to undertake vegetation height management - management zone 1 to 3	Manager	At commencement of CMP and as required
	Undertake initial vegetation height management - management zone 1 to 3	Manager/ Environmental Contractor	Annually

Building Element	Maintenance Task	Responsibility	Frequency
	Monitor view lines from military infrastructure and undertake vegetation height management if required - management zone 1 to 3	Manager/ Environmental Contractor	As required
	Undertake firebreak management and maintenance - management zone firebreaks	Manager	Annually
	Install interpretive signage relating to vegetation values - management zone all	Manager	As required
<b>Revegetation</b>	Infill planting of tubestock - management zone 1 to 3	Manager/ Contractor	Annually
	Infill planting of tubestock - management zone 4	Manager/ Contractor	Annually (Year 5 only)
	Revise revegetation plan for the site to prioritise management zones for years 6-10, based on outcomes of revegetation in years 1-5 - management zone all	Manager/ Contractor	Annually
<b>Weed Control</b>	Weed control - management zone 1 to 3	Manager/ Contractor	Annually
	Weed control - management zone 4	Manager/ Contractor	Triennial
	Weed monitoring and control - active management zone	Manager/ Contractor	Annually (Year 5 only)
	Weed monitoring - management zone all	Manager/ Contractor	At commencement of CMP

Building Element	Maintenance Task	Responsibility	Frequency
	Revise weed control plan for the site to prioritise management zones for years 6-10, based on outcomes of weed monitoring in years 1-5 - management zone all	Manager/ Contractor	Annually^
<b>Pest Fauna</b>	Establish pest fauna monitoring program - management zone all	Manager/ Contractor	Biennial^
	Undertake pest fauna monitoring - management zone all	Manager/ Contractor	At commencement of CMP and as required
	Conduct public education on responsible cat ownership - management zone all	Manager	Annually

^or as determined in pest fauna monitoring program

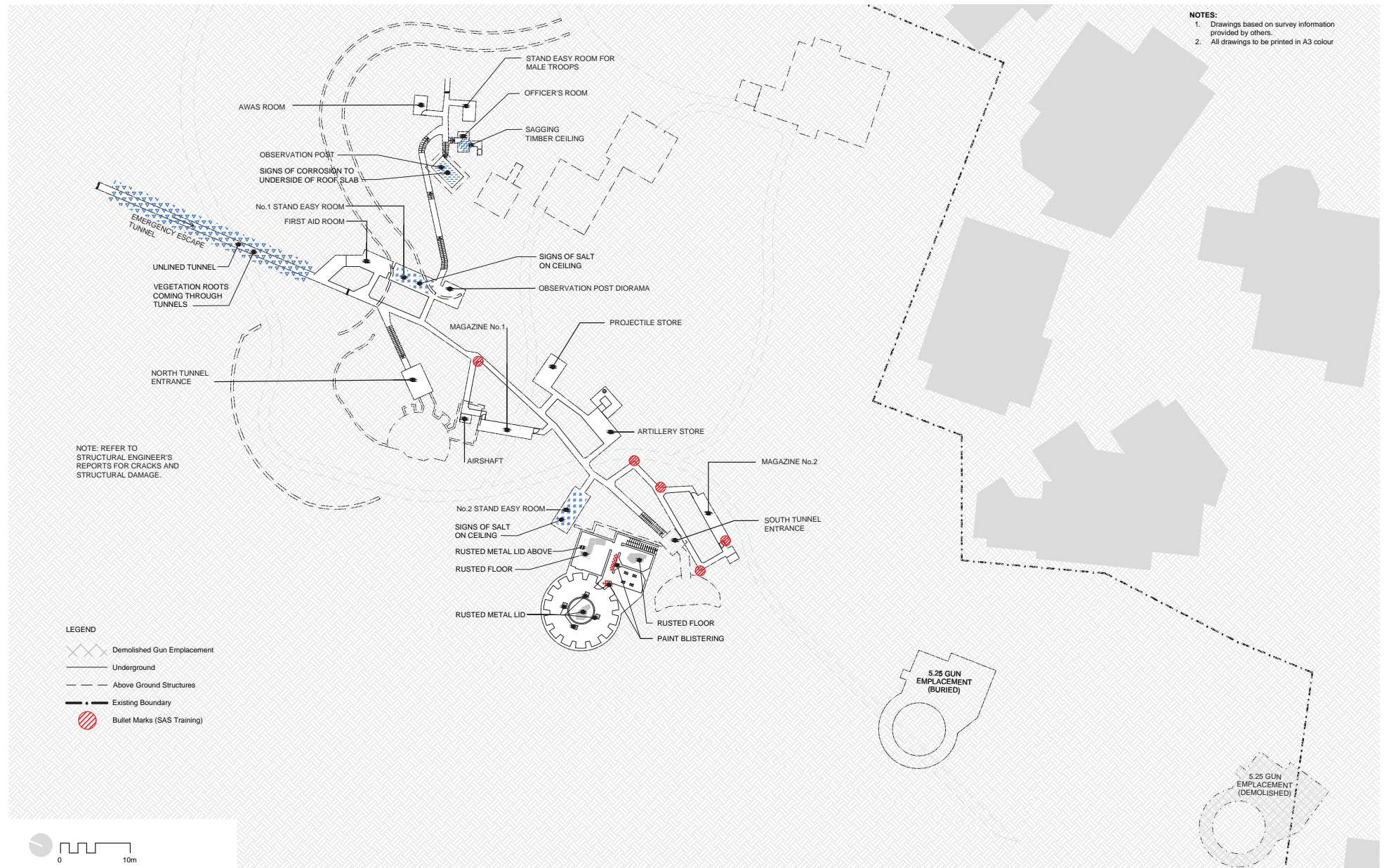


Figure 146. Underground Plan Overall Condition Plan (element, 2019)

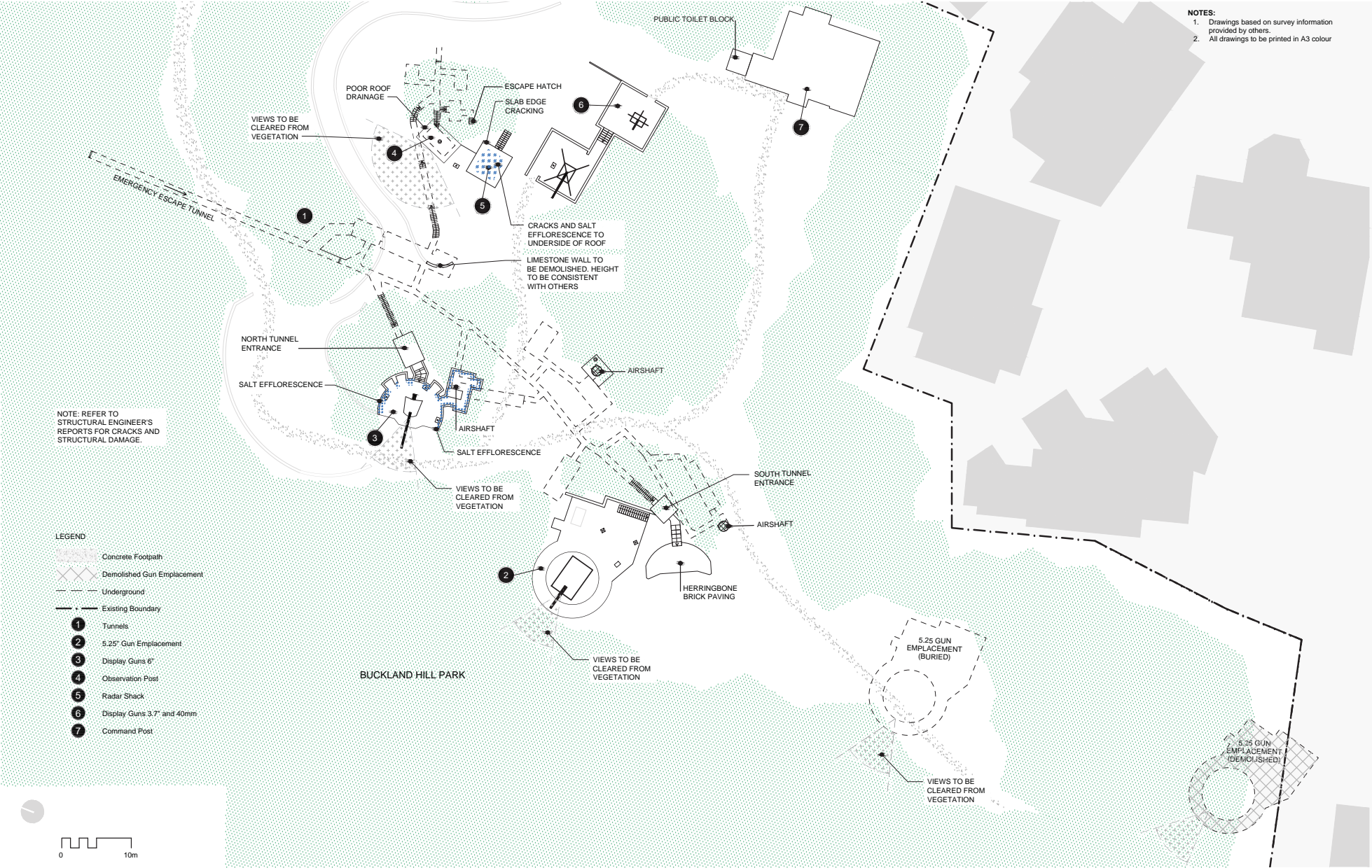


Figure 147. Site Plan Overall Condition Plan (element, 2019)

## 7.2 Recommended Conservation Works

The following conservation works should be carried out by the owners or, through agreement, the occupiers of the place. Any repairs should be undertaken in accordance with conservation policies, informed by this plan and with appropriate specialist advice from professionals skilled in conservation work. It was prepared based on an inspection of the place carried out in May 2019, which provides a general conservation works to the place. For location-specific maintenance recommendations, refer to the Building Condition Assessment Report included in Appendix 1.

CONSERVATION WORKS

1. PRINCIPLES OF CONSERVATION

- A. Generally**
- The conservation works within this Schedule relate to the existing significant fabric that is to be retained and conserved to allow the ongoing survival of these heritage buildings. The approach adopted in any conservation work is 'as much as necessary, as little as possible' and this will form the basis of all works suggested.
- i. Use reversible processes wherever possible
  - ii. Retain as much of the existing material as possible by repairing, reinforcing and consolidating rather than replacing.
  - iii. Use reversible processes wherever possible.
  - iv. Use additional materials to strengthen, reinforce, prop, tie or support.
  - v. Use traditional materials and techniques wherever possible. New work should be distinguishable from old on close inspection.
  - vi. Make a record of the element or area before, during and after work.
- B. Reuse**
- The first priority when undertaking any repairs should be to re-use as much of the existing fabric as possible. Preservation of the authentic fabric should take precedence over cosmetic considerations. This principle recognises that some of the original fabric will appear. It also recognises that the age of the original fabric may remain obvious and that it is not the intent to return the fabric to 'as new' appearance.
- C. Like for Like**
- As a general principle, maintenance works should be carried out on the basis that any material items that need to be replaced should be done so on a like for like basis. If an item is so degraded that it should be replaced, the new item may preferably match that which it replaces in material, style, pattern, finish, colour etc. In some instances, it may be appropriate to use an item firstly salvaged from another site, or thirdly, specially made to match. Where a matching item is not available either new or salvaged, then a reasonable facsimile in current production may be acceptable. A new part may be discernible from close inspection as such and no attempt made to artificially age it. This principle may be applied to all levels ranging from whole components such as doors, down to individual fixings.

- 2. Avoid Needless Loss**
- Where only one part of a component is broken, consideration should be given to repairing that part rather than replacing the whole component. If possible, the part may be left in place and repairs may carried out without removal or damage to the unbroken part.

- 3. Not Perfect**
- Repairs should recognise that the place may not have been perfect in either its original, most significant or recent state. Worn fabric should be allowed to show the patina of time. Repairs may not attempt to put the fabric into a condition that it was never in or present it in 'as new' condition. A part not built 'straight' originally may not be made 'straight' to meet current standards.

- 4. Reinstatement of Lost Features**
- Elements of a historic asset which contribute to its design might have been lost and their replacement might be justified. The significance of the replacement may be weighed against the original design concept. Reinstatement should be justified by strong evidence and research.

2. RECOMMENDED BUILDING WORKS

- A. Conservation**
- Conservation means all the processes of looking after a place so as to retain its cultural significance.
- B. Fabric**
- Fabric means all the physical material of the place including elements, fixtures, contents and objects.
- C. Maintenance**
- Maintenance means the continuous protective care of a place, and its setting. Maintenance is to be distinguished from repair which involves restoration or reconstruction.
- D. Preservation**
- Preservation means maintaining a place in its existing state and retarding deterioration.
- E. Restoration**
- Restoration means returning a place to a known earlier state by removing accretions or by reassembling existing elements without the introduction of new material.
- F. Reconstruction**

Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material.

- G. Adaptation**
- Adaptation means changing a place to suit the existing use or a proposed use.
- H. Use**
- Use means the functions of a place, including the activities and traditional and customary practices that may occur at the place or are dependent on the place.
- I. Match Existing**
- Match existing means use materials, products and methods to closely match all visual and physical characteristics and features of the existing work, with joints between existing and new work as inconspicuous as possible.

- J. Remove**
- Remove means remove existing work so described and all associated accessories, fastenings, lining and bedding materials, without damaging adjacent work to be retained and make good.
- K. Repair**
- Repair means carefully remove existing work and materials required to be re-fixed. Remove fixing and bedding materials from work, materials removed, and clean and repair. Set aside and protect until required. Relocate and securely fix using new fixing and jointing materials and methods to match existing, and make good.

- L. Make Good**
- Make good means carry out local remedial work to and around areas so described including removal and replacement of defective materials and products, patching, dressing down, extending finished, making minor repairs and adjustments and re-decorating to match existing.

- 3. GENERAL NOTES**
- A. Brickwork**
- Restore brickwork. Let the fabric "breathe". Paint removal is experts using techniques which do not harm the masonry. Do not remove original renders. New hairline cracks can be repaired by applying a fine skim coat with a sponge, not the pre-existing crack that has been partially repaired but is incomplete. Mortar must be sent to materials chemist for analysis of its composition. Patching material may match the old fabric as nearly as possible in colour, grain, bedding, durability, porosity and chemical composition. Render or mortar mix may closely match existing material to avoid detrimental interaction. Where cracks exceed 5mm and are allowing water ingress, it needs to be repaired with like for like, based on analysis of original composition. Cracking, deflection, bulging or failure of walls may require the expert advice of a structural engineer experienced with old buildings.
- B. Paint and Other Finishes**
- Generally, modern high gloss or satin paint finishes are inappropriate. Do not paint previously unpainted surfaces. Don't use waterproof or water repellent paints, as they can accelerate deterioration by trapping water in the substrate. It is better to use water based paint on masonry buildings because it breathes more than oil paint. A good paint reference is Bauwerk breathable paint from the 'Uber' series. Do not paint bare timber, cement renders, concrete floors or any bare masonry. Colour scheme will be in accordance with paint scrapes, with final colours to be determined through site panels and approved by the heritage consultants.
- C. Damp, Drainage and Ventilation**
- Keeping a building dry is extremely important. It reduces the need for costly maintenance and is also an insurance against the development of serious structural problems. Ensure the building is water and weathertight by using sound roofing, flashing and damp proofing methods which also allow the building to "breathe". Damp is a major cause of deterioration and may be remedied. Find the cause of damp and to try to correct this first before engaging a damp-proof firm to carry out work which may be unnecessary and expensive. Stormwater and surface water may be drained well away from the building. Paving may fall away from the building. Prevent rainwater falling from roofs on to hard paving and splashing against walls.
- D. Electrical, Services and Safety Requirements**
- Services and Safety Requirements (ductwork, pipework, wiring conduits, air conditioners and TV antennae, etc.) may be installed inconspicuously to cause least damage to the fabric and to respect the integrity of the original interior decoration. Use sub-floor or roof spaces or bury them underground. It is preferable for fittings to be unobtrusive. Don't use historical recreations unless you have evidence for such designs being

used in the original building. Rewire existing electrical services to minimise the risk of fire. Avoid powerful heating and cooling systems, which may cause dryness and cracking or internal condensation. Supplementary humidity control may be appropriate. Standard solutions to the requirement for new services and safety features can be detrimental to heritage buildings. In some cases your council may consider alternative solutions or grant discretionary exemptions if requested.

- E. Asbestos Cement**
- Asbestos materials can be identified in this area, in this case please prepare an 'Asbestos Materials Management Plan and Register' with a suitably qualified professional.

- F. Public Safety**
- When work is in progress, properly barricade areas or securely close up buildings or parts of buildings which the public or unauthorised people may not access. Place notices to explain the hazard and the risk.

4. PRIOR TO COMMENCING WORK

- A. Dilapidation schedule**
- i. The contractor is expected to complete a written and photographic dilapidation schedule with the heritage consultants to agree on condition of the heritage fabric prior to works commencing on site.
  - ii. All fabric that is being retained should be protected on site during works.
- B. Demolition and maintenance principles**
- i. The cumulative effect of demolition has the potential to adversely affect the significance of the Heritage Place. Sufficient fabric must be retained to ensure structural integrity during and after the works. If there may be other ways to achieve the objectives, alternative methods must be proposed and presented to the heritage consultant's approval. In most cases it is possible to repair heritage fabric after demolition with appropriate professional advice.
  - ii. Any demolition should conform with approved DA drawings, CMP and the Conservation of Works Schedule.
  - iii. Removal of original fabric must be carefully done, without damaging adjacent work which is to be retained. Materials and techniques used to repair existing fabric must closely match original, in all visual and physical characteristics.
  - iv. Remedial works around areas described to be demolished should include removing and replacing defective materials, patching, dressing down, extending finishes, making minor repairs and adjustments to match existing.
  - v. Repairs to demolished areas should not attempt to put the fabric into a condition that it was never in or present 'as new' condition, and should be allowed to show the patina of time. Specific direction should be sought from a heritage consultant, and needless loss should be avoided.
  - vi. As a general principle, maintenance works should be carried out on the basis that any material items that are required to be repaired after demolition should be replaced on a like for like basis.

5. ROOFS

- i. Any works on concrete parts should be informed by the Structural Engineer's reports, appendices of this CMP.
- ii. Do not remove original renders, and if the original was a bare face, do not paint over it.
- iii. Hairline cracks can be repaired by applying a fine skim coat with a sponge.
- iv. Never apply textured finishes.
- v. Avoid the use of waterproof additives or finishes.
- vi. Check the composition of the mixture before carrying out repairs.
- vii. If inappropriate renders have been applied since the construction of the building, they should be removed where practical.
- viii. Cement Castings - Form, or recast and replace, only the missing or unsound elements. Reinforcement for new castings or embedded fixings should be of non-corrosive material, for example stainless steel or brass.
- ix. Repair where appropriate and confirmed by paint scrapes.
- x. When painting concrete, brick or timber, don't use waterproof or water repellent paints, as they can accelerate deterioration by trapping water in the substrate. It is better to use water based paint on masonry buildings because it breathes more than oil paint. A good paint reference is Bauwerk breathable paint from the 'Uber' series. Use it accordingly to manufacturer's recommendations.

6. WALLS

- A. Vents**
- i. Retain all timber, ceramic and/or metal vents,
  - ii. Ensure all vents are in functional working order,
  - iii. Metal vents may be left natural.
- B. Brickwork**
- i. Prepare a mortar and plaster analysis to determine the original mix. If brickwork needs to be cleaned, it may be using a steam clean system that is not abrasive or damaging to the substrate. Remove surface salts with a vacuum cleaner. No chemical agents may be used in this process.
  - ii. Only repair brickwork elements by repointing the mortar joints where there is evidence of deterioration such as disintegrating mortar, cracks in mortar joints, loose bricks, damp walls or damaged plaster work.
  - iii. Where the fire face has been deteriorated, individual brick replacement can be considered.
  - iv. Report with analysed mortar and plaster mix as a guide.
  - v. Brickwork bond must be to match adjacent bond e.g. English Garden Wall bond, stretcher bond or others)
- C. Concrete**
- i. Any works on concrete parts should be informed by the Structural Engineer's reports, appendices of this CMP.
  - ii. Do not remove original renders, and if the original was a bare face, do not paint over it.
  - iii. Hairline cracks can be repaired by applying a fine skim coat with a sponge.
  - iv. Never apply textured finishes.
  - v. Avoid the use of waterproof additives or finishes.
  - vi. Check the composition of the mixture before carrying out repairs.
  - vii. If inappropriate renders have been applied since the construction of the building, they should be removed where practical.
  - viii. Cement Castings - Form, or recast and replace, only the missing or unsound elements. Reinforcement for new castings or embedded fixings should be of non-corrosive material, for example stainless steel or brass.
  - ix. Repair where appropriate and confirmed by paint scrapes.
  - x. When painting concrete, brick or timber, don't use waterproof or water repellent paints, as they can accelerate deterioration by trapping water in the substrate. It is better to use water based paint on masonry buildings because it breathes more than oil paint. A good paint reference is Bauwerk breathable paint from the 'Uber' series. Use it accordingly to manufacturer's recommendations.

- D. Lighting and electrical fittings throughout**
- i. Lighting and electrical features must be hidden from obvious sight and perforating, coring or chasing should be avoided

- E. Services**
- i. Minimise services running through original walls.
  - ii. Minimise perforating, coring or chasing on original walls.
  - iii. Priority should be given to existing pathways.

7. FLOORS AND CEILINGS

- A. Concrete Floors**
- i. Hairline cracks can be repaired by applying a fine skim coat with a sponge.
  - ii. Never apply textured finishes, concrete floors are natural in this project.
  - iii. Avoid the use of waterproof additives or finishes.
  - iv. Check the composition of the mixture before carrying out repairs.
  - v. Cement Castings - Form, or recast and replace, only the missing or unsound elements. Reinforcement for new castings or embedded fixings should be of non-corrosive material, for example stainless steel or brass.
- B. Original Jarrah ceiling boards**
- i. In good condition, retain and restore with minimal intervention. The oiled/matte finish shall be retained.
  - ii. If repair is needed:
    - a. Lightly sand timber boards with fine sandpaper carefully ensuring that timber beneath is not damaged.
    - b. Thoroughly clean ceilings removing dust and grime with damp cloths
    - c. Repair rather than replace unsound timber. It is usually more cost effective to repair work rather than completely dismantling and rebuilding. When timber is structurally weakened, by termite damage for example, consider using epoxy resin for repairs.
    - d. If reinstatement of new timber is needed it may be in e. Jarrah, preferably reusing from the same place
    - f. Timber ceilings to be finish coated with tung oil product or

similar.  
g. Where there is evidence, the hessian oiled fabric should be reinstated.

8. WINDOWS AND DOORS

- A. Steel Windows and/or doors**
- i. Where possible the existing windows should be brought into a functional condition to allow ventilation.
  - ii. Repair rather than replace unsound steel. It is usually more cost effective to repair work rather than completely dismantling and rebuilding. When steel is structurally weakened, by corrosion damage for example, consider using epoxy resin for repairs. Retain all hardware, replacing only deteriorated or missing elements with matching elements.
  - iii. Repairs to glazing/windows.
  - iv. If possible, replace any broken glass with new 3mm 'drawn' glass' (not float glass). Fix with traditional pins and linseed oil putty.
  - vi. Carry out necessary repairs to make windows operational.
  - vii. Identify the type of metal.
  - viii. Test cleaning method on a sample area
  - ix. Ferrous metals, iron and steel, corrode to form rust, which only adheres loosely to the surface and is many times the original volume of the metal. Therefore, it is important to regularly maintain protective coatings such as paint on ferrous metals and any defects need to be rectified as soon as they are observed.
  - x. A related cause of corrosion, particularly of sill members, is blockage of drain holes by paint build-up and collected detritus.
  - xi. Do not alter the colour, texture, tone or patina of the metal by inappropriate cleaning. All metal cleaners are abrasive to some degree.
  - xii. Remove the cause of corrosion. If not, use the mildest cleaning agent, then a reversible sealant.
  - xiii. Cracked glass, often caused by contact between the glass and corroding components, to be replaced with like-to-like material, non-reflective glass.
  - xiv. Brittle face-putty, dried-out and entirely missing in places, can be removed fairly simply and replaced with new steel window glazing putty.
  - xv. Where corrosion is only light to moderate and generally restricted to isolated locations, undertake in situ repairs with like-to-like materials.
  - xvi. If replacement profiles are needed, three main options exist:
    - a. Option 1: select a replacement from the available range of new production profiles;
    - b. Option 2: use sections salvaged from windows demolished elsewhere. Some second-hand building materials suppliers keep stocks available.
    - c. Option 3: build-up sections to match existing e.g. construct T-section glazing bars. For those components that originally were screwed on, e.g. drip- moulds, it is feasible, depending on the profile to be matched, to recreate new components from stock steel sections.
  - xvii. Do not paint over rust. Sometimes it will be necessary to remove defective paint as the detail of metalwork can be lost under many layers of paint.
  - xviii. Prepare surface appropriately - this is essential for a protective paint system to perform properly.

- B. Timber panelled doors**
- i. Timber panelled doors and frames that are currently painted are to be repainted in a colour to be consistent across the building.
  - ii. Existing timber doors should be sanded, primed and painted. The external paint finish should be carried out using reputable product (Dulux or similar) to specified colour in a darker, recessive tone than timberwork and brick. Paint colour to be nominated by the architect in consultations with heritage consultant, prior to work being carried out.
  - iii. Existing paint should be stripped.
  - iv. Allow for associated timber repairs, where timber is missing, splice in new timber to match or fill minor fissures.
  - v. Lightly sand with very fine sandpaper with ISO grit designation 180 or similar,
  - vi. Clean of the timber to remove all grime and allow drying. Using damp cloths not water,
  - vii. Prepare surfaces and apply paint strictly in accordance with manufacturer's instructions and provided colour schemes.
  - viii. Prime bare timber prime with either Dulux One Stop Oil Based Undercoat or Dulux Precision Maximum Adhesion Primer sanding and filling between coats followed with two coats of Dulux Aquanamel Semi-Gloss enamel. This is a water based non-yellowing enamel. A trial panel will determine which premier will give the best adhesion

## 7.3 Recommended Environment Management Works Schedule

### Vegetation

Material used in plant tagging, signage and educational activities should be prepared by a specialist with knowledge in the local area.

### Height Management

Height management will be undertaken within management zones 1-3 as shown in Figure 148. The management of plants within these zones shall be undertaken by a Town of Mosman Park approved contractor and impacts to adjacent native vegetation shall be avoided or minimised. The most likely species required to be removed, and recommended control method, is provided in the table that follows.

Species	Control Method		
	Manual Method	Herbicide Method	Herbicide Type and Rates
<b><i>Acacia</i> spp.</b>	<ul style="list-style-type: none"> <li>Hand pull plants seedlings if possible.</li> <li>Remove larger plants using hand tools or machinery (dependent on trunk size)</li> <li>Immediate or follow-up herbicide application may be required.</li> </ul>	Paint stump immediately after cutting.	Glyphosate undiluted to 1 L/5L water
<b><i>Callitris preissii</i></b>			
<b>Other native shrub species</b>			Triclopyr 240 g/L + Picloram 120 g/L at a rate of 1L/60 L diesel
<b><i>Melaleuca lanceolata</i></b>			

All herbicides used must be APVMA permit PER13333 approved and shall only be applied by a Department of Health licensed 'pest management technician' in accordance with the requirements of APVMA permit PER13333. The control methods outlined above provide a guide and a licensed pest management technician will be able to advise what a suitable approach would be based on information obtained during a site inspection.

### Monitoring

Annual monitoring of active vegetation zones does not need to be a complicated process and may involve traversing each active management zone and recording the cover of each weed suites along the transect, as well as spatial point location(s) for declared pests, WoNS or localised weed infestations.

It is recommended that the methodology used during the March 2019 assessment (described in Appendix 11) is used for monitoring weeds across the whole site, to provide consistency between monitoring events. In addition, the spatial point location(s) of declared pests, WoNS or localised weed infestations should be recorded.

## Weed Control

Weed control in the site will most likely be undertaken using herbicide and manual methods. Weed control may occur multiple times within a year (particularly when using manual removal methods), but generally herbicide treatment is most effective between June and October.

General methods for the control of two weed suites recorded in the site (grassy and woody), as well as other weed suites likely to occur, are provided below.

Weed Suite	Recommended Control Method	Herbicide <sup>^</sup>	Optimal Herbicide Application Time
<b>Grassy</b>	<ul style="list-style-type: none"> <li>Manual removal - hand pull small/isolated plants</li> <li>Herbicide application</li> </ul>	Grass-selective herbicide such as Fluazifop-p (212g/L active ingredient)	June - August
<b>Woody</b>	<ul style="list-style-type: none"> <li>Manual removal - hand pull seedlings and cut down mature plants</li> <li>Herbicide application if resprout</li> </ul>	250 ml Access® in 15 L of diesel to bottom 50 cm of trunk (basal bark)	July - October
<b>Bulbous</b>	<ul style="list-style-type: none"> <li>Hand pull small plants</li> <li>Herbicide application</li> </ul>	2,2-DPA 10 g/L + a surfactant OR 0.2 g metsulfuron methyl in 15L water + surfactant	July - September (just as flower spikes emerge)
<b>Herbaceous</b>	<ul style="list-style-type: none"> <li>Manual removal - hand pull isolated/small plants</li> <li>Herbicide application</li> </ul>	Glyphosate 360g/L	June - August

<sup>^</sup>general recommended treatment as per Florabase (Western Australian Herbarium 1998–2019) and subject to change as advised by weed control contractor.

## Herbicide Application

Due to the presence of native vegetation in the site, herbicides are recommended to be primarily applied using a spot spray technique, to avoid off target impacts.

All herbicides used must be APVMA permit PER13333 approved and shall only be applied by a Department of Health licensed 'pest management technician' in accordance with the requirements of APVMA permit PER13333 and the manufacturer's instructions as provided on product label. A licenced pest management technician will be able to advise what a suitable approach would be based on information obtained during a site inspection. Further guidance on herbicide treatment for weed species can be found online via Florabase (Western Australian Herbarium 1998–2019).

## Manual Removal

As an alternative or in addition to using herbicides, manual removal can be successful for certain species and where weeds are present with relatively low abundance. Different techniques may be appropriate for different weed species and technical reference should be consulted where required to ensure manual control is as effective as possible. Care should be taken to ensure all roots/stems/corms/bulbs have been removed, to avoid resprouting. Some weeds present in the site, such as *Euphorbia terracina* and *Schinus terebinthifolius*, may cause skin irritation and protective clothing should be worn when undertaking manual removal.

Juvenile woody weed individuals such as *Leptospermum laevigatum* (coast tea-tree) may be hand pulled but mature individuals will require cutting/lopping, and potential herbicide treatment of resprouting plants. It should be noted that coast tea-tree is unable to resprout if stems are cut below the foliage zone (Dixon 2011).

Manual removal of weeds may be undertaken by volunteers from groups such as the Friends of Mosman Park Bushland and the RAAHS, with supervision by an appropriately experienced officer from the Town of Mosman Park.

## Revegetation

Tubestock is recommended as the primary method for revegetation in the site, as they provide more predictable outcomes.

### Sourcing Tubestock

Tubestock should be sourced from an accredited nursery and grown from local provenance seed or cuttings with genetic diversity. The tubestock should be grown as tall as possible to facilitate deep planting. Before collection, the tubestock should be hardened off and in good condition.

As the revegetation works will comprise infill planting of tubestock within bare areas, the number of tubestock required is difficult to predict. However, a planting density of 2-3 plants/m<sup>2</sup> is suggested. Available space for planting may be limited within management zones subject to vegetation height management works, as roots and trunks of lopped trees may occupy large areas.

As a general rule a 70% survival rate can be expected for most native plants in the first few years after planting, without supplementary water or maintenance, if they are installed correctly and early in the growing season. Plant survival will vary from year to year in response to differences in seasonal conditions and potential interference by other factors such as predation or disturbance.

Each management zone has been assigned a target ecosystem as shown in Figure 149. A list of 60 species recommended for planting within management zones is provided as Appendix 14. Note that height restrictions may apply for some management areas, and the indicative height of each species should be taken into consideration when determining species to plant in each management zone (refer Appendix 14).

### Installing Tubestock

In the south west of Western Australia, tubestock should be installed as soon as possible once winter rains have begun and the ground is sufficiently moist, to allow plants time for establishment before the summer dry period.

Where possible, tubestock should be installed using a deep planting method. For example, tubestock grown to 300 mm tall can be planted with only 50-75 mm of stem showing above the sand surface (WAPC 2003). This positions the roots much closer to water supplies and decreases water loss in hot conditions. Deep planting can also help to prevent herbivory from animals such as rabbits, resulting in the death of seedlings, which can easily re-sprout if the top of the plant is removed. Nursery staff can advise which species can be grown tall enough such that deep planting is appropriate.

Tubestock should be planted within open areas of each management zone to ensure sufficient resources are available. If limestone makes tubestock installation difficult, a mechanical auger may be used to predrill planting holes, ensuring they are of a sufficient size and depth to facilitate deep planting.

Installation of tubestock may be undertaken by a revegetation contractor and/or volunteer programs, as funding allows. Planting by volunteers should be undertaken with supervision by a revegetation contractor or an appropriately experienced officer from Town of Mosman Park.

### Tubestock Protection

Tree guards are only recommended to be installed around tubestock located in areas subject to high levels of public use, such as on the edges of paths and near infrastructure, as they protect tubestock and increase awareness of planting to the public. Regular maintenance of installed tree guards should be undertaken to ensure they are not damaged/do not come loose and litter the site. If possible, environmentally friendly alternatives to plastic tree guards should be used.

Tubestock installed within native vegetation (away from high levels of public use) do not require tree guards or staking.

Signs should be erected at the interface of revegetation and public areas to notify public of current revegetation works and to deter access.

### Pest Fauna

Bins and dog waste dispensers should be installed away from identified areas of significance and in keeping with the environmental and heritage values of the site.

A combination of actions to restrict pedestrian access to native vegetation (and reduce impacts on native fauna) may be used, such as fencing, signage and blockage of informal tracks.

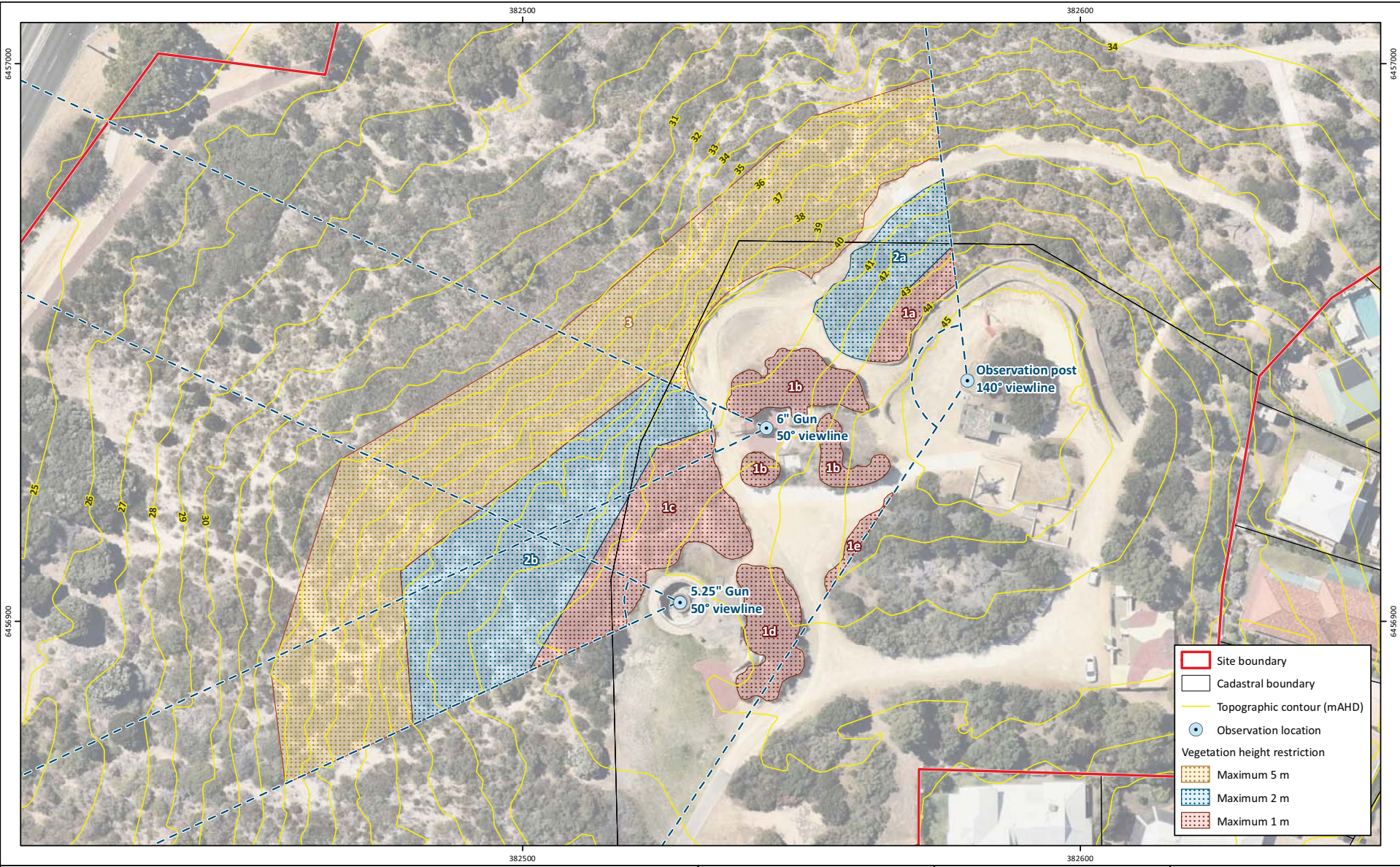


Figure 148. Vegetation height management zones

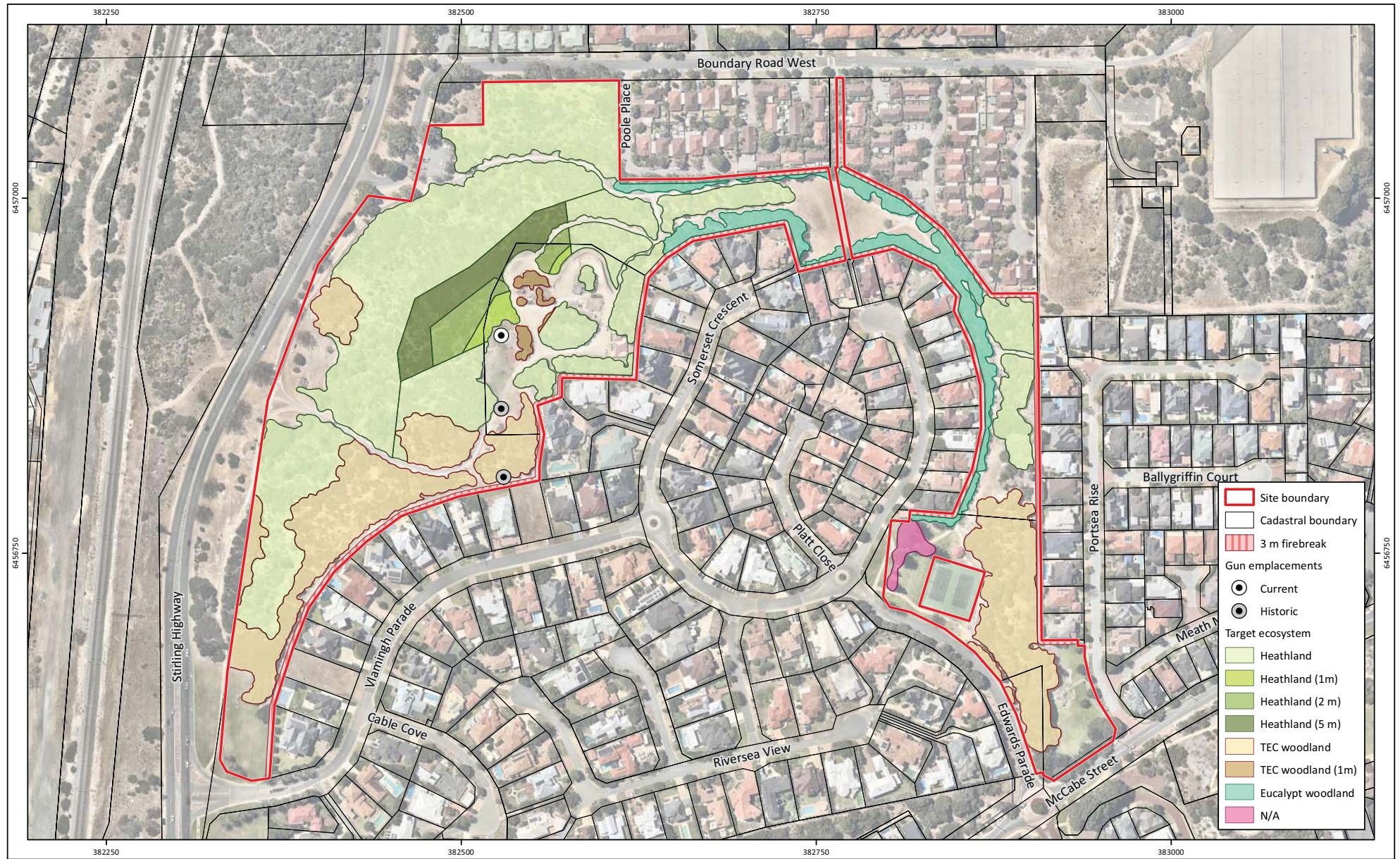


Figure 149. Target Ecosystem of Management Zones (Emerge, 2019)

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Filler Image 12: Gun detail, interpretive display (**element** 2019).

# Part II