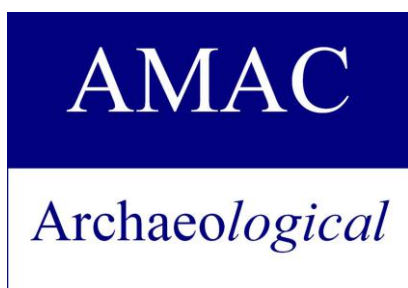
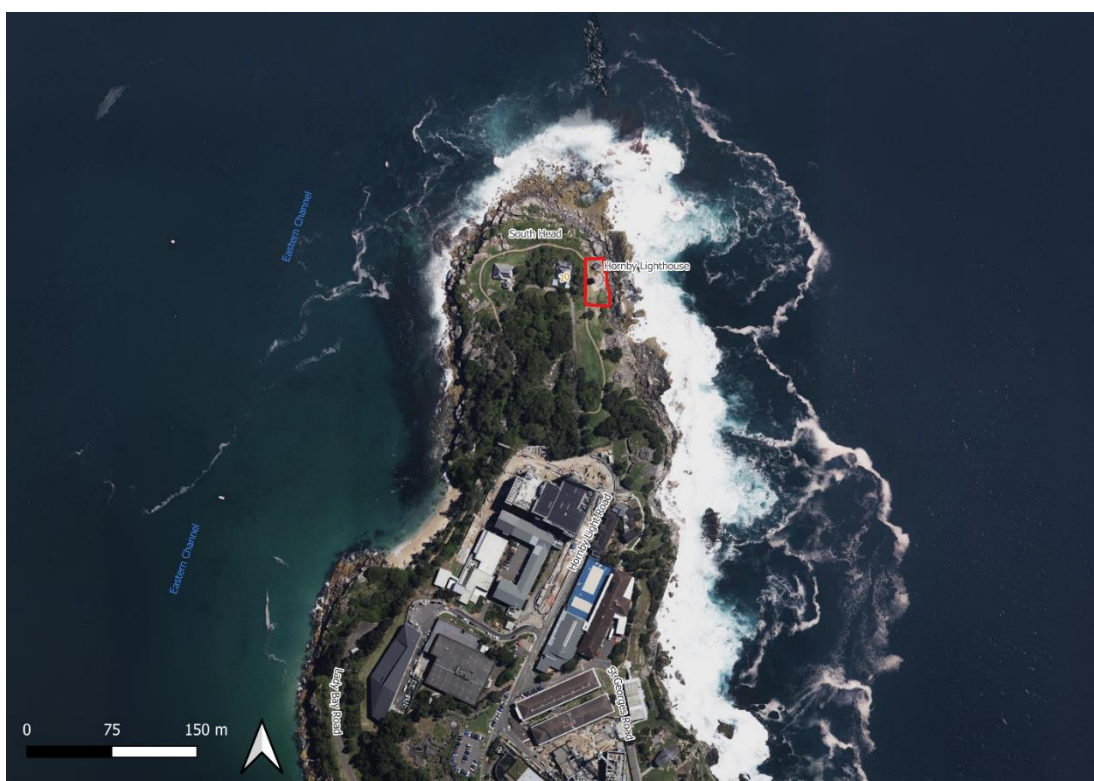


ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

Hornby Lighthouse
Lot 415/DP752011 &
Part of Lot 1/DP605078
Hornby Light Road
Watsons Bay, NSW
(Woollahra LGA)



**Kelly Strickland, Benjamin Streat
& Sarah Hannan**

Archaeological Management & Consulting Group

for

Port Authority of NSW

July 2025

ACKNOWLEDGEMENT OF COUNTRY

AMAC Group and Port Authority of NSW would like to acknowledge the Traditional Custodians of the Woollahra LGA – the Birrabirragal and Gadigal Peoples – and pay respect to their cultural heritage, beliefs and continuing relationship with the land and sea country.

AMAC Group and Port Authority of NSW would also like to acknowledge the post contact experiences of Aboriginal peoples who have attachment to the central Sydney area.

“We pay our respect to the Elders – past, present and future – for they hold the memories, traditions, culture and hopes of Aboriginal Peoples in the area”.

AMAC Group and Port Authority of NSW recognises the role of the registered Aboriginal parties in the management of the Aboriginal cultural heritage sites, landscape features and values of this project.

AMAC Group and Port Authority of NSW would like to thank the Registered Aboriginal Parties for their participation in this project and for their valuable contribution to this Aboriginal Cultural Heritage Assessment which has been enriched by their willingness to share valuable aspects of their cultural knowledge especially in respect of Caring for Country.

CULTURAL WARNING

Aboriginal and Torres Strait Islander people who are reading this document are advised that it may contain images, artworks and stories of First Nations people who have passed away.

All care is taken to ensure cultural respect, however if something appears in this document that causes distress please contact us directly.

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Cover Image

Aerial of the study area (highlighted in red).

QGIS using Six Maps. LRS Online (accessed 03/09/2024).

Date	Version	Action	Issued by
17 th December 2024	Draft V.1	Draft issued for client feedback	Sarah Hannan
17 th December 2024	Draft V.2	Proofread	Emma Williams
16 th January 2025	Draft V.3	Client amendments	Sarah Hannan
20 th January 2025	Draft V.3	Draft issued for RAP approval No Comments received	Ben Streat
23 rd April 2025	Draft V.4	Final draft issued for client feedback	Ben Streat
3 rd June 2025	Final	Final issued to client	Ben Streat

EXECUTIVE SUMMARY

Study Area

Archaeological Management and Consulting Group (AMAC Group) was commissioned in August 2024 by Port Authority of NSW to undertake an Aboriginal Cultural Heritage Assessment Report for the ground remediation of contaminated soils and drainage improvement works for the site known as Hornby Lighthouse, at Lot 415/DP752011 & Part Lot 1/DP605078 Watsons Bay, NSW.

AMAC Group was engaged to complete this Aboriginal Cultural Heritage Assessment Report (ACHAR) in order to address the potential for Aboriginal objects and/or features of archaeological and cultural significance to be present. An Aboriginal Heritage Sensitivity Map was developed for Woollahra in 2021, and the study area is noted to lie within an area of sensitivity. This is due to presence of a registered Aboriginal site, AHIMS Site #45-6-0715, on the sandstone outcrop which includes Hornby Lighthouse. As a result, the ACHAR has been subsequently prepared to address and manage the potential presence of Aboriginal objects or features of archaeological and cultural significance. All Aboriginal sites and objects are protected by the *National Parks and Wildlife Act 1974*.

Aboriginal Consultation

Consultation for this report is being undertaken in accordance with the *Part 6: National Parks and Wildlife Act 1974: Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010c). Per the guidelines, for the initial consultation stages of this ACHAR, a Research Design and Testing Methodology was sent to all Registered Aboriginal Parties for a mandatory 28-day review period (stage 2). The results of this initial consultation have been included in this document. A final draft copy of the ACHAR has been sent to all Registered Aboriginal Parties for a mandatory 28-day review period (stage 4). All feedback has been incorporated into this document.

Significance

A registered site of significance, AHIMS Site #45-6-0715, is present on the western boundary of the site and potential for additional archaeological engravings or objects exists within the proposed work area. An Aboriginal Heritage Impact Permit (AHIP) is therefore required for soil remediation and site drainage works to occur, and the proposed activity is to be monitored by an archaeologist and cultural heritage officers.

Recommendations

The proposed development will disturb the shallow soil profile, which directly surrounds the lighthouse structure. A registered site, which consists of multiple engravings into the exposed sandstone, has been recorded on the western boundary of the lighthouse moat. This extends past the foundations of the army and the battery command structures. Whilst AHIMS Site #45-6-0715 is only recorded on the western side and was noted not to extend to the lighthouse, a potential for engravings in buried sandstone remains, especially within Archaeological Sensitivity Zone 3 (ASZ3), where less disturbance has been recorded. Therefore, an Aboriginal Heritage Impact Permit is required for remedial works to occur.

The following recommendations have been formulated after consultation with the RAPs, the proponent, and Heritage NSW for the proposed development to proceed:

- Consultation with the registered Aboriginal stakeholders should continue. Stakeholders have been given the opportunity to comment on the recommendations of this report and these comments have been included in the final issue of this report.
- In accordance with *the Code of Practice* DECCW (2010b) remedial soil and drainage works shall be monitored under an Aboriginal Heritage Impact Permit (AHIP). An archaeologist must be present to monitor key stages of the works when Aboriginal objects and/or features of Aboriginal and cultural significance might be discovered. Aboriginal stakeholders (one of whom must be a land council member) must also be notified and given the opportunity to be present as cultural heritage officers to monitor the works during these key stages. If no engravings or artefacts are identified through the physical examination of bedrock and contaminated soils, then a supervising archaeologist can then confirm that works may continue without further archaeological monitoring.
- The AHIMS Site #45-6-0715 is to be protected by fencing during works. This is to ensure the already weathered engravings are not unnecessary eroded or damaged further by foot traffic or movement of tools.
- All manual excavation work should use tools that will minimise the likelihood for chipping bedrock. If possible, a 'tools protection area' or 'safe landing area' for tools to be stored when not in use should be made. This is to avoid inadvertent damage to sandstone when moving tools.
- As part of the proposed works, contaminated soils are to be replaced with clean, introduced soil, with a protective geofabric barrier overlying the sandstone. It is recommended that the introduced material consist of non-acidic aggregate and soils. This will ensure the runoff that passes through this material will not erode the sandstone more rapidly.
- Any engravings or artefacts identified will be recorded in accordance with *the Code of Practice* DECCW (2010b) and the Site Card for AHIMS #45-6-0715 will be amended.

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1.0 INTRODUCTION

1.1 BACKGROUND OF THE PROJECT

Archaeological Management and Consulting Group (AMAC Group) was commissioned in August 2024 by Port Authority of NSW to undertake an Aboriginal Cultural Heritage Assessment Report for the ground remediation of contaminated soils and drainage improvement works for the site known as Hornby Lighthouse, at Lot 415/DP752011 & Part Lot 1/DP605078 Watsons Bay, NSW.

AMAC Group was engaged to complete this Aboriginal Cultural Heritage Assessment Report (ACHAR) in order to address the potential for Aboriginal objects and/or features of archaeological and cultural significance to be present. An Aboriginal Heritage Sensitivity Map was developed for Woollahra in 2021, and the study area is noted to lie within an area of sensitivity. This is due to presence of a registered Aboriginal site, AHIMS Site #45-6-0715, on the sandstone outcrop which includes the Hornby Lighthouse. As a result, the ACHAR has been subsequently prepared to address and manage the potential presence of Aboriginal objects or features of archaeological and cultural significance. All Aboriginal sites and objects are protected by the *National Parks and Wildlife Act 1974*.

1.2 DESCRIPTION OF THE STUDY AREA

The study site is that piece of land described as Lot 415 of the Land and Property Information, Deposited Plan 752011 and Part Lot 1 of the Land and Property Information, Deposited Plan 605078, within the Woollahra LGA, in the Parish of Alexandria, County of Cumberland.

Lot	Deposited Plan
415	752011
1	605078

1.3 SCOPE OF THE PROJECT

The project seeks to improve the safety of the Hornby Lighthouse site by remediating contaminated soils and reducing water pooling near the base of the structure.



Figure 1-1 Aerial photograph with site location outlined in red.
NSW Land Registry Services, Six Maps Viewer, accessed 21/02/2024.

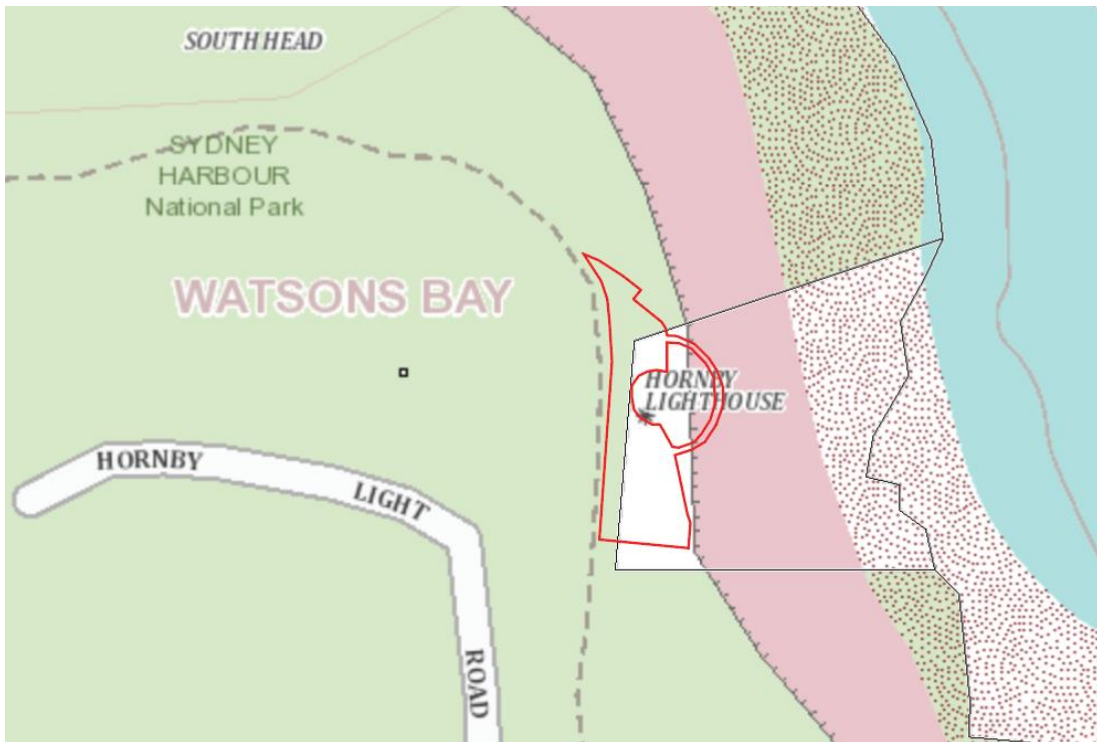


Figure 1-2 NSW map with the study site outlined in red.
NSW Land Registry Services, Six Maps Viewer, accessed 21/02/2024.

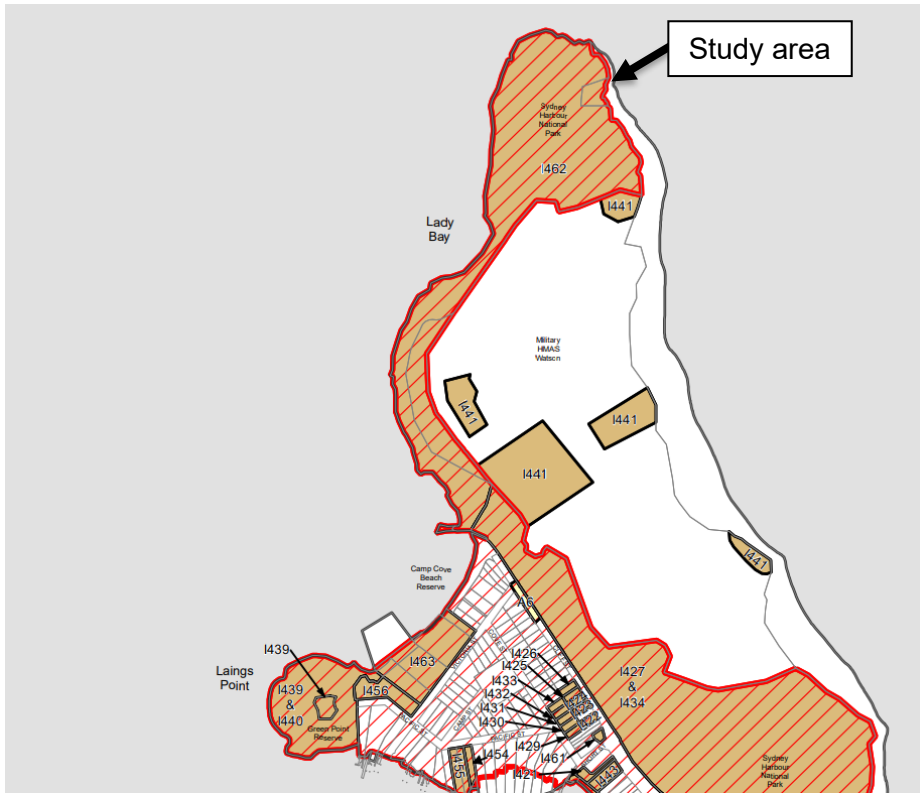


Figure 1-3 Woollahra 2015 LEP Heritage Map.
Woollahra Council, Heritage Sheet Map HER_004 (accessed 3/10/2024).

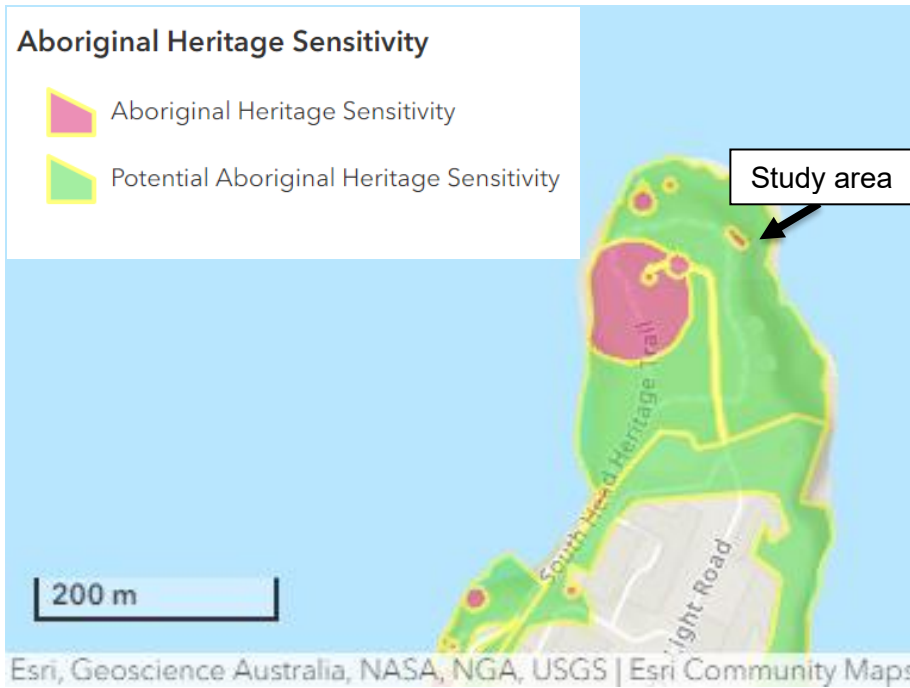


Figure 1-4 Woollahra Aboriginal Heritage Sensitivity Map.
Study area indicated by black arrow. (accessed 3/10/2024).

1.4 OBJECTIVES OF THE ABORIGINAL CULTURAL HERITAGE ASSESSMENT

The objectives for this Aboriginal Cultural Heritage Assessment Report include:

- Engage and consult with local Aboriginal communities, people and organisations in the assessment process and communicate the project details to ensure cultural concerns are addressed.
- Identify and assess any items or places of Aboriginal cultural heritage value and consult with Registered Aboriginal Parties to understand the cultural and historical importance of the site or area.
- Consult with the Registered Aboriginal Parties to identify the cultural significance of Aboriginal object(s) and/or place(s) within the vicinity of the area of the proposed activity. This knowledge is then presented for synthesis, analysis and compilation into a Cultural Heritage Assessment about the study area.
- Assess and determine the impact of the proposed development on any identified items or places of Aboriginal cultural heritage value.
- Develop mitigative strategies under the appropriate legislation and in consultation with Registered Aboriginal Parties for the management of Aboriginal archaeological and cultural heritage values of the study area.
- Provide recommendations for the conservation of Aboriginal heritage values and relevant mitigation strategies for the proposed development.
- Ensure this assessment and project complies with relevant laws and regulations protecting Aboriginal cultural heritage.

This report has been carried out in accordance with the Guide on Aboriginal Cultural Heritage (OEH, 2011).

1.5 AUTHOR IDENTIFICATION

The analysis of the archaeological background and the reporting were undertaken by Sarah Hannan (B. Arts, B. Sc., M. Arch Sc.) and Kelly Strickland (B. Arts. Hons.) with contributions from La Perouse LALC, Thomas Dahlstrom, Kamilaroi Yankuntjatjara Working Group and Didge Ngunawal Clan in relation to cultural knowledge and significance.

1.6 ACKNOWLEDGEMENTS

AMAC Group would like to thank the following for advice and/or input into this assessment:

- La Perouse Local Aboriginal Land Council
- Didge Ngunawal Clan
- Butucarbin Aboriginal Corporation
- Thomas Dahlstrom
- A1 Indigenous Services
- Amanda Hickey Cultural Services
- Kamilaroi Yankuntjatjara Working Group

2.0 LEGISLATIVE CONTEXT

2.1 OVERVIEW OF LEGISLATION AND STATUTORY INSTRUMENTS

This section of the report outlines the key legislation and statutory instruments that provide protection for Aboriginal archaeological and cultural heritage sites in New South Wales (NSW). It is intended for informational purposes and is not legal advice. The document aims to align with the requirements of the legislation and statutory instruments discussed below.

In NSW, Aboriginal heritage is primarily protected under two key pieces of legislation that are described in Section 2.2.1 and 2.2.2:

- *Commonwealth's Environment Protection and Biodiversity Conservation Act 1999*
- *NSW's National Parks and Wildlife Act 1974*

Other legislation and statutory instruments operate at a federal or local level and as such are applicable to Aboriginal archaeological and cultural heritage sites in NSW. These protective measures include significant acts such:

- *Environmental Planning and Assessment Act 1979*
- *Aboriginal Land Rights Act 1983*
- *Native Title Act 1993*

Additionally, local planning instruments such as Local Environmental Plans (LEPs) and Development Control Plans (DCPs) play a crucial role in protecting Aboriginal heritage at the local government level. LEPs guide land use and development, including provisions to protect Aboriginal heritage. They ensure developments do not harm culturally significant sites, may establish heritage conservation zones, and often require heritage impact assessments. DCPs provide detailed guidelines that complement LEPs, setting standards for heritage assessments, community consultations, and measures to avoid and/ or minimize development impacts on Aboriginal cultural sites. They may also outline requirements for preserving heritage conservation zones.

2.2 PRINCIPAL NSW HERITAGE LEGISLATION

2.2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* offers provisions to protect matters of national environmental significance. This act establishes the National Heritage List and the Commonwealth Heritage List, which can include natural, Indigenous and historic places of value to the nation. The *EPBC Act* helps ensure that the natural, Aboriginal and historic heritage values of places under Commonwealth ownership or control are identified, protected and managed (Australian Government 1999).

2.2.2 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (as amended) is the primary piece of legislation for protecting Aboriginal cultural heritage in NSW. It is governed by the NSW Office of Environment and Heritage. The Act defines Aboriginal objects and

provides protection to any and all material remains, which may be evidence of the Aboriginal occupation of lands continued within the state of New South Wales. The Act provides mechanisms for the preservation of culturally significant sites. The relevant sections of the Act are Sections 84, 86, 87 and 90.

An Aboriginal object, formerly known as a relic, is defined as:

any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains” (NSW Government, 1974).

It is an offence to harm or desecrate an Aboriginal object or places under Part 6, Section 86 of the *NPW Act 1974*.

2.3 LOCAL PLANNING INSTRUMENTS

2.3.1 The Woollahra Local Environment Plan 2014

The Woollahra Council Local Environment Plan was endorsed in 2014. Heritage Conservation is discussed in Part 5; Section 5.10. The following section highlights the archaeological considerations of a site in relation to developments followed by Aboriginal places of heritage significance:

5.10 Heritage conservation

(1) Objectives

The objectives of this clause are as follows:

- (a) *to conserve the environmental heritage of Woollahra,*
- (b) *to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,*
- (c) *to conserve archaeological sites,*
- (d) *to conserve Aboriginal objects and Aboriginal places of heritage significance.*

(1) Requirement for consent

Development consent is required for any of the following:

- (a) *demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):*
 - (i) *a heritage item,*
 - (ii) *an Aboriginal object,*
 - (iii) *a building, work, relic or tree within a heritage conservation area,*
- (b) *altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,*
- (c) *disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,*
- (d) *disturbing or excavating an Aboriginal place of heritage significance,*

- (e) *erecting a building on land:*
 - (i) *on which a heritage item is located or that is within a heritage conservation area, or*
 - (ii) *on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,*
- (f) *subdividing land:*
 - (i) *on which a heritage item is located or that is within a heritage conservation area, or*
 - (ii) *on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.*

(2) When consent not required

However, development consent under this clause is not required if:

- (a) *the applicant has notified the consent authority of the proposed development and the consent authority has advised the applicant in writing before any work is carried out that it is satisfied that the proposed development:*
 - (i) *is of a minor nature or is for the maintenance of the heritage item, Aboriginal object, Aboriginal place of heritage significance or archaeological site or a building, work, relic, tree or place within the heritage conservation area, and*
 - (ii) *would not adversely affect the heritage significance of the heritage item, Aboriginal object, Aboriginal place, archaeological site or heritage conservation area, or*
- (b) *the development is in a cemetery or burial ground and the proposed development:*
 - (i) *is the creation of a new grave or monument, or excavation or disturbance of land for the purpose of conserving or repairing monuments or grave markers, and*
 - (ii) *would not cause disturbance to human remains, relics, Aboriginal objects in the form of grave goods, or to an Aboriginal place of heritage significance, or*
- (c) *the development is limited to the removal of a tree or other vegetation that the Council is satisfied is a risk to human life or property, or*
- (d) *the development is exempt development.*

(8) Aboriginal places of heritage significance

The consent authority must, before granting consent under this clause to the carrying out of development in an Aboriginal place of heritage significance:

- (a) *consider the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place by means of an adequate investigation and assessment (which may involve consideration of a heritage impact statement), and*
- (b) *notify the local Aboriginal communities, in writing or in such other manner as may be appropriate, about the application and take into consideration any response received within 28 days after the notice is sent*

(10) Conservation incentives

The consent authority may grant consent to development for any purpose of a building that is a heritage item or of the land on which such a building is erected, or for any purpose on an Aboriginal place of heritage significance, even though development for that purpose would otherwise not be allowed by this Plan, if the consent authority is satisfied that:

- (a) *the conservation of the heritage item or Aboriginal place of heritage significance is facilitated by the granting of consent, and*
- (b) *the proposed development is in accordance with a heritage management document that has been approved by the consent authority, and*
- (c) *the consent to the proposed development would require that all necessary conservation work identified in the heritage management document is carried out, and*
- (d) *the proposed development would not adversely affect the heritage significance of the heritage item, including its setting, or the heritage significance of the Aboriginal place of heritage significance, and*
- (e) *the proposed development would not have any significant adverse effect on the amenity of the surrounding area*

Schedule 5 of this plan lists Items of Environmental Heritage with heritage items listed in Part 1, Heritage Conservation areas listed in Part 2 and Archaeological Sites listed in Part 3. The study site is listed under Part 1, as Item No. 462 and is located within a general conservation area.

2.4 HERITAGE LISTS AND REGISTER

Australia’s National Heritage List serves as a comprehensive resource, documenting nationally significant places. It is supported by the State Heritage Register and Inventory, which records state-level heritage listings, offering a more localised focus on preservation efforts. Additionally, the National Native Title Register plays a key role in safeguarding Indigenous cultural heritage, ensuring that native title rights are preserved in accordance with Australian law. These databases were searched and listed in Table 2.1.

Table 2.1 Heritage Lists and Registers

Statutory List	Listed
Australia’s National Heritage List	No.
Commonwealth Heritage List	No.
NSW State Heritage Register & Inventory	<p>Yes Listed. The site is listed on the NSW State Heritage Register within the South Head Cultural Landscape (SHR#02071). It is on the NSW State Heritage Inventory, as item number 462. The study site is within the Watsons Bay Heritage Conservation Area.</p> <p>Hornby Lighthouse is listed on the Port Authority of NSW Section 170 Heritage and Conservation Register (SHI 4560002). Historical significance of the Lighthouse has been addressed within the Baseline Archaeological Assessment, completed by AMAC Group in March 2024.</p>
National Native Title Register	No.

LEP Heritage Maps	Yes Listed. The site is listed within a general conservation area and within Item 462. See Figure 1-3.
Woollahra 2021 Aboriginal Heritage Sensitivity Map.	Yes Listed. See Figure 1-4.

2.5 APPROACH TO ABORIGINAL HERITAGE MANAGEMENT

The preparation of this assessment and developing management strategies for Aboriginal heritage has been carried out in accordance with several guidelines and policies which advocate best practice in New South Wales. AMAC Group’s approach is based on the following documents:

- Aboriginal Archaeological Survey, Guidelines for Archaeological Survey Reporting (NSW NPWS 1998).
- Aboriginal Cultural Heritage Consultation Requirements for Proponents (2010c)
- Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS 1998).
- Australia ICOMOS 'Burra' Charter for the conservation of culturally significant places (Australia ICOMOS 1999, revised 2013).
- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales, Part 6 *National Parks and Wildlife Act 1974* (DECCW 2010b).
- Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales, Part 6 *National Parks and Wildlife Act 1974* (DECCW 2010a).
- Operational Policy: Protecting Aboriginal Cultural Heritage (2009).
- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW, Part 6 *National Parks and Wildlife Act 1974* (OEH 2011)
- Guide to Determining and Issuing Aboriginal Heritage Impact Permits (2009).
- Protecting Local Heritage Places: A Guide for Communities (Australian Heritage Commission 1999).

2.6 THE BURRA CHARTER PROCESS

The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013 and the associated series of Practice Notes provide a best practice standard for managing cultural heritage places in Australia. The Burra Charter was first adopted in 1979 and is periodically updated to incorporate evolving insights into the theory and practice of cultural heritage management. The latest version of the Burra Charter was adopted in 2013.

The Burra Charter Process (Article 6) outlines a three-stage process with steps in planning for and managing a place of cultural significance. The three-stages include:

1. Understand the place and assess its cultural significance
2. Identify all factors and issues arising from significance and develop policy.
3. Implement and manage in accordance with the policy.

To implement the Burra Charter Process, the following steps were undertaken and recorded within the relevant sections of this assessment. Table 2.2 provides an outline of the steps and what section of the assessment it was implemented.

Table 2.2 Implementation of The Burra Charter Process

Step	Section of Report
Understand the Place	Sections 3 and 4
Assess Cultural Significance	Sections 5, 6 and 7
Identify Factors and Issues	Sections 8 and 9
Develop Policy	Section 2, 9 and 10

3.0 THE STUDY AREA IN CONTEXT

This section presents a comprehensive examination of the study area, emphasising its Aboriginal occupation both within the region and across Australia, along with its environmental context. It highlights the historical and cultural significance of Indigenous communities in the area, while also addressing the ecological factors that shape the landscape.

3.1 ABORIGINAL CONTEXT

This section introduces key terminology and concepts related to Aboriginal archaeology, summarising evidence of Aboriginal occupation and factors affecting site preservation. It outlines frameworks for understanding different groupings and focuses on smaller areas for a deeper exploration of Indigenous history and practices. It emphasises that archaeology is just one facet of Aboriginal Australia, and significant historical points may be underrepresented. Therefore, consulting Registered Aboriginal Stakeholders is essential for understanding cultural practices, archaeological sites, and the broader landscape.

2.1.1 Aboriginal Australia

It is generally accepted that Aboriginal occupation of Australia dates back at least 40,000 years (Attenbrow 2002; Kohen et al 1983) and to as long as 60,000 years (Mulvaney and Kamminga 1999). The majority of reliably dated archaeological sites within the region are less than 5,000 years old which places them in the mid to late Holocene period. A combination of reasons has been suggested for this collection of relatively recent dates; There is an argument that an increase in population and ‘intensification’ of much of the continent took place around this time, leading to a significant increase in evidence being deposited than was deposited as a result of the sparser prior occupation period. In addition, it is also true that the acidic soils which are predominate around the region do not allow for longer-term survival of sites (Hiscock 2008).

It is estimated that around 250 distinct languages were in use throughout the Australian continent at the time of contact. The exact number cannot be known for certain, however 250 is a conservative estimate. These languages fell within two language groups: the Pama-Nyungan and Non Pama-Nyungan languages. Knowledge of the different language groups in a given area is variable. Early European recordings noted the names of particular Aboriginal individuals and groups but were not always clear about which named groups represented a language rather than some other social grouping (Hardy and Streat 2008).

Within these large language groups resource access and ownership was centred on extended family groups or ‘clans’ which appear to have had ownership of land (Attenbrow 2002). As it was unlikely to be acceptable to find sexual partners within the family grouping and for other reasons such as resource sharing, a number of clans would often travel together in a larger group. These groups are referred to as bands. Whether the clan or the band was the most important group politically to an individual is likely to have varied from place to place. Group borders were generally physical characteristics of the landscape inhabited, such as waterways or the limits of a particular resource. Groups also shared spiritual affiliations, often a common dreaming ancestor, history, knowledge, and dialect (Hardy and Streat 2008).

A wide variety of activities comprised the lifestyle of the Aboriginal groups across the region. Some behaviours leave traces which can be retrieved by archaeological study of material remains. Many of these can only be reconstructed by oral history, observations of European explorers and ethnologists, and other forms of past recording such as photography or art. Some of the details of the complexity and sophistication of the past lifestyles of Aboriginal people in the area have been lost, but many can be reconstructed using the sources available.

3.1.2 Aboriginal Lands and Occupation of the Site

The South Head entrance to Sydney Harbour is positioned on the east coast of Australia and was densely occupied due to the wide range of resources available. According to the AIATSIS mapping, the study area falls within the Eora area. This area was bounded by the Dharug group to the west, Tharawal group to the south and Kuring-gai group to the north (AIATSIS 1996).

The Birrabirragal people are known to have occupied the South Head peninsula for thousands of years and associated with the entrance to the harbour (Coast History and Heritage 2021). Neighbouring clans include the Gadigal people, who inhabited the southern shore of the harbour westwards to around the present location of Darling Harbour (Coast History and Heritage 2021). The Birrabirragal clan name is believed to be associated with 'Birra Birra', a rocky reef in the lower harbour presently referred to as 'Sows and Pigs' (Attenbrow 2002). The Birrabirragal people utilised the rich resources of the peninsula by managing vegetation, fishing and obtaining shellfish from the various waters and rock platforms that comprise the topography of the study area (Comber Consultants 2008). The significance and importance of fish in the diet and economy of the Birrabirragal people is reflected in the engravings of various fishes found at eleven coastal sites recorded in 1984 across the Woollahra municipality (Comber Consultants 2008). Evidence of surviving rock art connecting to Aboriginal land use is considered of high cultural significance. Inner South Head is of high cultural heritage value for its physical evidence of Aboriginal land use.

3.2 ENVIRONMENTAL CONTEXT

To adequately understand and assess the potential Aboriginal archaeological resource that may be present within the study area it is vital to understand the environment in which the Aboriginal inhabitants of the study area carried out their activities. The environment that Aboriginal inhabitants lived in is a dominant factor in shaping their activity and therefore the archaeological evidence created by this activity. Not only will the resources available to the Aboriginal population have an influence on the evidence created but the survival of said evidence will also be influenced by the environment.

3.2.1 Topography and Landforms

The study site is located within the wider township of Watsons Bay and represents a partly built-up area and partly modified landscape. Referred to as the Inner South Head Peninsula (NPWS), it is situated within South Head National Park and adjacent to the South Head Lighthouse Walking track. Its position upon the South Head plateau means the soil landscape has high wind exposure and subsequent erosional activity. Its dominant landform is a ridgeline, the site's north and east boundaries form the cliff face of that ridge. Dominant European land use in this location has been predominantly activities associated with operation and maintenance of Hornby Lighthouse.

The study area lies over one topographic zone: the Hawkesbury (ha) soil landscape. This consists of rolling to very steeply inclined hills upon Hawkesbury Sandstone. Slope gradients vary between 25 and 70%. Valleys, crests and ridges are narrow with local relief between 40 – 200m and ridges >300m wide. Approximately 50% of the ground surface is comprised of cobbles and boulders. Rock outcrops can appear as broken scarps and horizontal benches up to 10m in height.

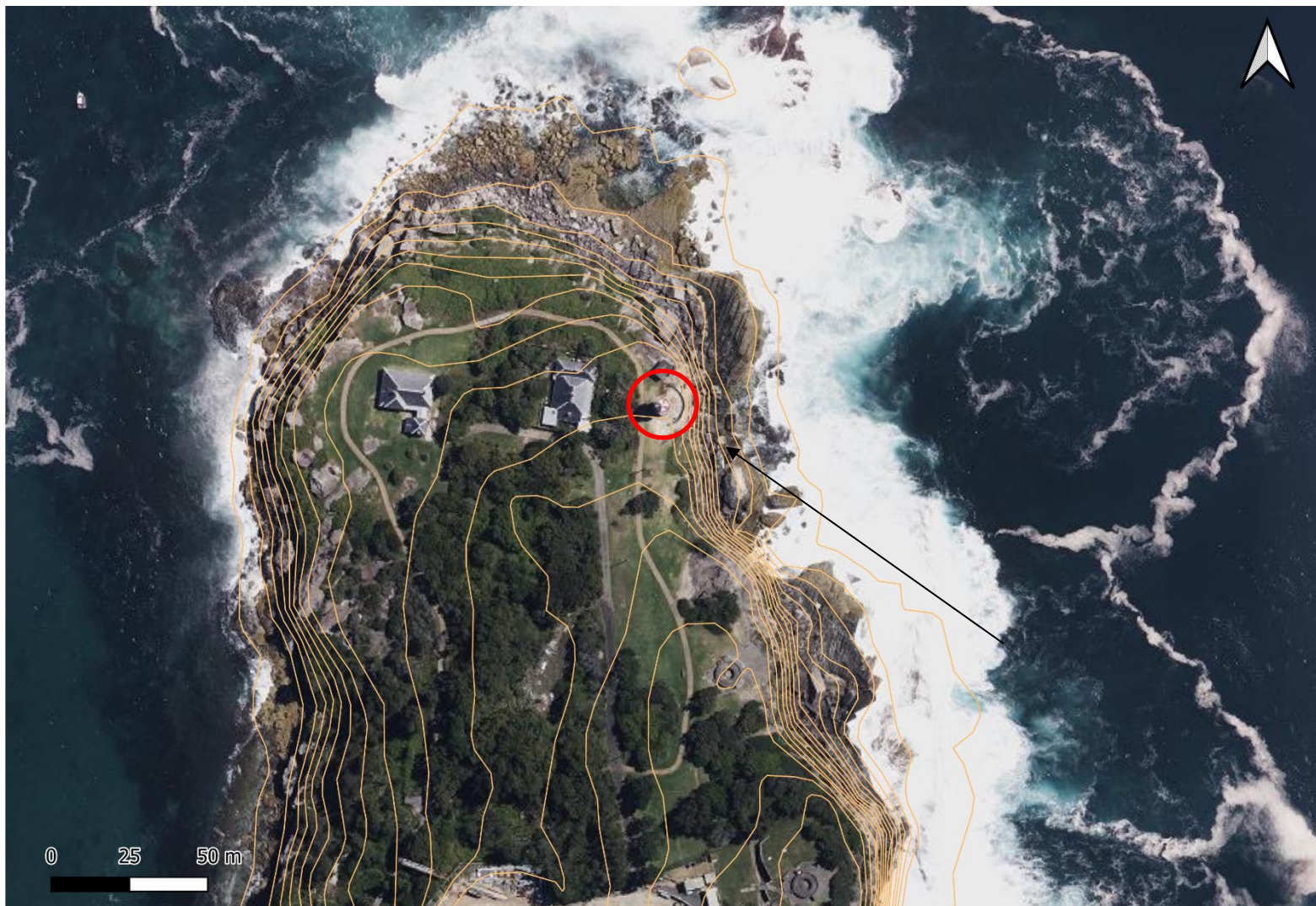


Figure 3-1 Aerial photograph with overlaid 2m contour lines. General site location outlined in red with black arrow. NSW Land Registry Services, Six Maps Viewer, accessed 04/12/2024.

3.2.2 Geology and Soils

The Hawkesbury colluvial landscape is located upon the Hornsby Plateau, the Hawkesbury Valley and the Macdonald Ranges. The geology is dominated by medium to coarse grained Hawkesbury Sandstone, with minor laminate and shale lenses. Soils are typically shallow.

This soil profile has low fertility, high permeability. Rock outcrops, and steep slopes contribute to the highly erosional nature of this soil landscape.

Table 3.1 Description of dominant soil material.

Dominant Soil Material	Soil Horizon	Description
ha1	A1 Horizon	Loose, coarse quartz sand. Colours may vary between yellow orange to a brownish black when a high level of organic material is incorporated. This is a sand to sandy loam topsoil with a porous fabric and single grained structure.
ha2	B or C Horizon	Earthy, yellowish brown sandy clay loam. This generally occurs as a subsoil in association with sandstone bedrock. Material may be clayey sand to sandy clay loam, with roots and charcoal absent. Iron plated sandstone, gravels and stones are however common. Colours include yellow orange, yellow brown and bright yellow brown.
ha3	B or C Horizon	Pale, strongly pedal light clay. Commonly associated with shale lenses and Hawkesbury Sandstone. Colours can range from bright reddish brown to a light grey with red, orange and grey mottles frequently recorded. this material may be between a fine sandy clay loam to a medium clay. Roots and charcoal are rare to absent, but stratified ironstone gravels are common.

Table 3.2 Expected Hawkesbury soil profile depth based on landform site type.

Crests and Ridges

- up to 20 cm of loose, quartz sand (ha1-A1 horizon) overlies either;
- sandstone bedrock or;
- <30cm of earthy, yellowish-brown sandy clay loam (ha2- B/C subsoil horizon).

N.B. soil boundaries are gradational, and texture increases with depth.

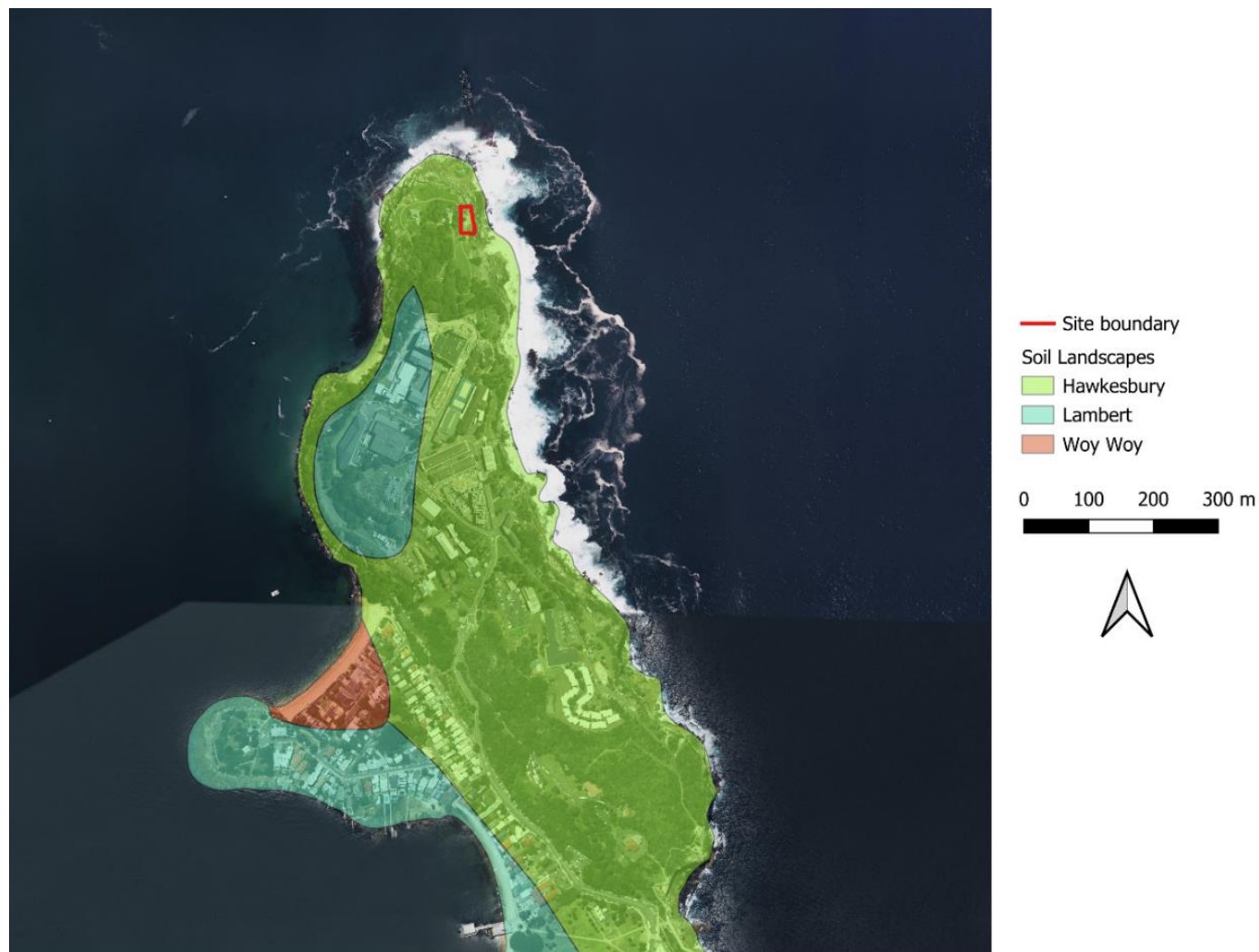


Figure 3-2 Location of the study area outlined in red on soil map.
NSW Government Sharing and Enabling Environmental Data in NSW (SEED), accessed 02/09/2024 and QGIS.

3.2.3 Vegetation

The study site itself is largely free of vegetation, however the wider area has been partially modified and includes a variety of introduced and noxious types of vegetation. The vegetative communities have retained areas of tall open forest (wet sclerophyll) and closed forest (rainforest); however, the most common plants are open woodland (dry sclerophyll). Crests and ridges, such as the study site usually contain these low open woodland species. This includes scribbly gum (*E. haemostoma*), old man banksia (*Banksia serrata*), red bloodwood (*E. gummifera*), brown stringybark (*E. capitellata*) and narrow leafed stringybark (*E. oblonga*).

2.2.4 Watercourses

There are no minor tributaries in vicinity of the study site, rather the north and east boundaries are bordered by the Eastern Channel and Tasman Sea. The study site sits at approximately 10-11m elevation; the eastern boundary contains a steep cliff face; the northern boundary contains a more gradual slope towards the water's edge with rocky outcrops. More accessible locations to the water's edge such as Lady Bay (200m southwest) and Camp Cove (700m southwest) are within walking distance from the study site.

These water bodies are known to have channelled Aboriginal activity to this area as an important resource within the landscape.



Figure 3-3 Topography map indicating watercourses in blue. Study site in red circle with black arrow. Sydney Heads 1: 25 000 (NSW Gov. Spatial Services 2017).

4.0 BACKGROUND RESEARCH OF ABORIGINAL HERITAGE

This section provides an overview of the background research conducted on Aboriginal heritage within the study area. It includes a search of the Aboriginal Heritage Information Management System (AHIMS) register and results, a review of previous archaeological and heritage studies relevant to the study area, and an examination of both Aboriginal and European land use histories, along with any known disturbances. This analysis serves as the foundation for developing an archaeological predictive model, helping to assess the site's archaeological potential.

4.1 AHIMS REGISTER

Aboriginal Heritage and Information Management System (AHIMS) is an online database maintained by Heritage NSW. This contains all the previously recorded Aboriginal archaeological sites registered with Heritage NSW. Further to the site card information that is present about each recorded site, the assessments and excavation reports that are associated with the location of many of these sites are present in the library of reports.

Location of these sites must be viewed as purely indicative as errors in recording due to the disparate nature of the recording process, the varying level of experience of those locating the sites and the errors that can occur when transferring data. If possible, sites that appear to be located near a study area should have the location verified.

An AHIMS extensive 1km search was conducted on 03/09/2024 (ID-926978). This search resulted 27 registered sites. The site card for each site within 1000m in all directions from the centre of the study area was inspected (where available) and an assessment made of the likelihood of any of the sites being impacted by the proposed development.

Table 4.1 AHIMS Search Results

Site ID	Site name	Site status	Site features
45-6-0922	South Head Site D	Valid	Art (Pigment or Engraved)
45-6-2971	South Head (duplicate copy of 45-6-1518)	Valid	Artefact
45-6-0716	South Head Site C; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-0733	South Head Site B; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-0918	South Head Site S	Valid	Art (Pigment or Engraved)
45-6-0920	South Head Site G; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-0921	South Head Site A; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-1666	South Head; Sydney Harbour NP;	Valid	Art (Pigment or Engraved)
45-6-3943	Watson GG1	Valid	Grinding Groove

45-6-3960	Camp Cove Shelters	Valid	Shell
45-6-1665	South Head; Sydney Harbour NP;	Valid	Art (Pigment or Engraved)
45-6-3945	South Head Site T WAH088	Valid	Art (Pigment or Engraved)
45-6-0724	South Head Site L; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-3351	Camp Cove 1 (CC1)	Valid	Shell: 1
45-6-3947	Woollahra Possible Engraving WAH148	Valid	Art (Pigment or Engraved)
45-6-0713	South Head Site F; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-0714	South Head Site H; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-1519	South Head; Sydney Harbour NP;	Valid	Shell, Artefact
45-6-3946	Woollahra Possible Engraving WAH147	Valid	Art (Pigment or Engraved)
45-6-0715	South Head Site E; Sydney Harbour National Park; Hornby Lighthouse;	Valid	Art (Pigment or Engraved)
45-6-1517	South Head; Sydney Harbour NP;	Valid	Shell, Artefact
45-6-1518	South Head; Sydney Harbour NP;(duplicate copy of 45-6-1908)	Valid	Shell, Artefact
45-6-0723	South Head Site M; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-0919	South Head Site K; Sydney Harbour National Park;	Valid	Art (Pigment or Engraved)
45-6-0096	Campcove shelter Watsons Bay	Valid	Shell, Artefact
45-6-2353	Camp Cove 2	Valid	Burial
45-6-3965	Woollahra Possible Shelter WAH125	Valid	Potential Archaeological Deposit (PAD)

The most common site type within this search was art sites which largely included rock engraving, which comprised over 63% of sites. The second most common site type were shelters with shell middens recorded. For comparison, Coast History and Heritage’s (2021) Woollahra LGA study identified art sites (engravings in the open) as the most common site, followed by living places (rockshelters). Notably, this study had 34 rockshelter sites, however these were separated by site use – i.e. if they were associated with midden material or contained artworks.

Table 4.2

Site Feature	Frequency	Percentage*
Art (Pigment or Engraved)	17	63
Shell, Artefact	4	15
Shell	2	7
Artefact	1	4
Burial	1	4
Grinding Groove	1	4
Potential Archaeological Deposit (PAD)	1	4
Total	27	100

*Percentages have been rounded to the nearest whole number.

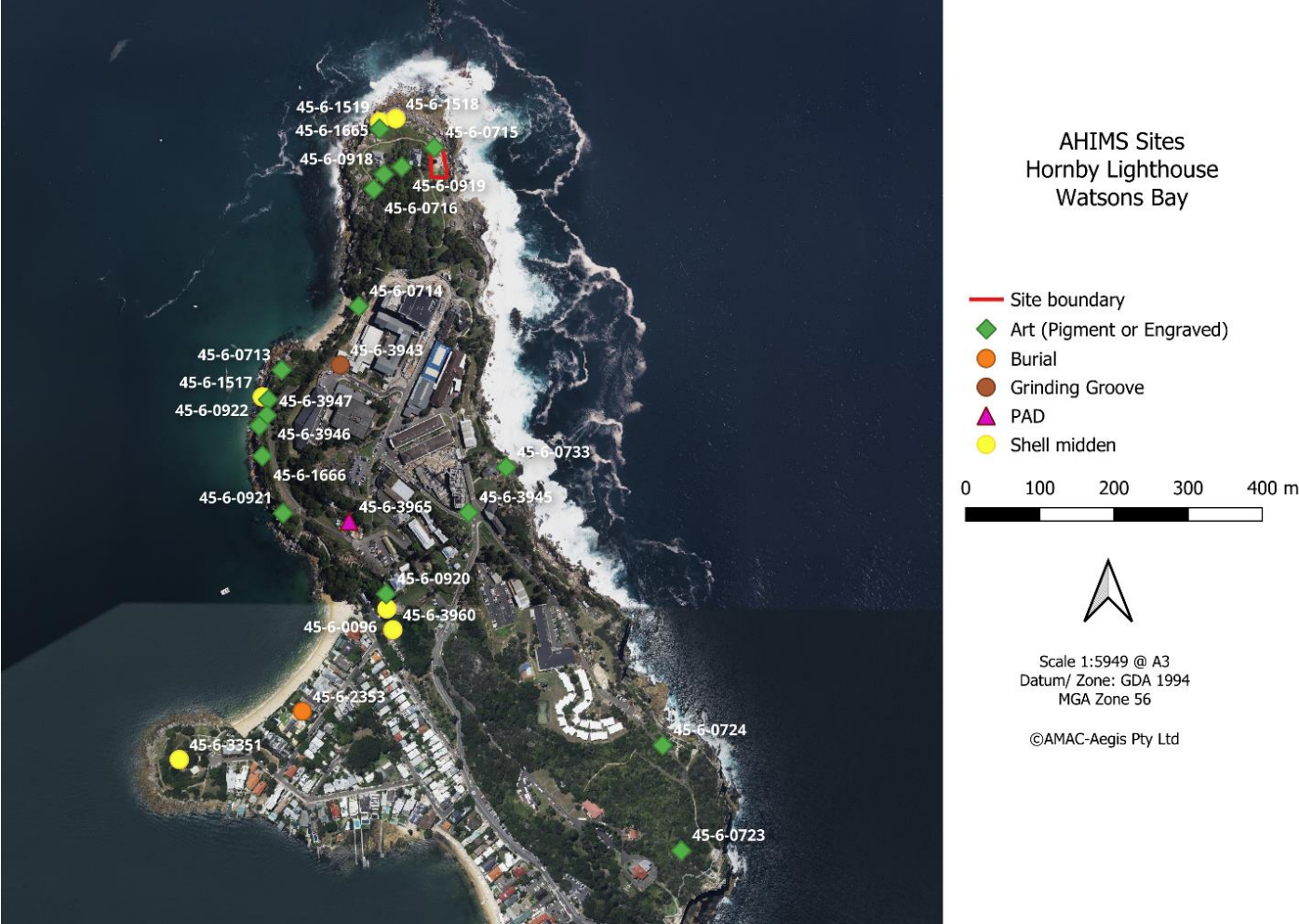


Figure 4-1 AHIMS search results within 1km of the study area indicated in red. AMAC Group. Six Maps. LRS Online (accessed 02/09/2024).

4.2 PREVIOUS HERITAGE STUDIES WITHIN THE STUDY AREA

As part of the research process of this report, the library of archaeological assessments, which is maintained by Heritage NSW Offices was searched. Presented below are summaries of assessments which have been carried out within the study area. This list is by no means exhaustive and is merely a representative sample of the most recent archaeological activity within the vicinity of the study area.

Haglund, L., (1984) An assessment of the prehistoric heritage of Woollahra. Prepared for Hughes Trueman Ludlow on behalf of Woollahra City Council.

The Woollahra LGA was assessed in 1984 for Aboriginal archaeological sites to inform planning and development across the area. This study utilised ethnographic, archaeological and environmental resources, with no site inspections conducted. This resulted in the identification of 33 registered sites. Predictions about site types and landforms were made. Water frequently impacted the likelihood of sites, with middens commonly located near marine foreshores and grinding grooves commonly near creeks and minor waterways. Camp sites were observed on beaches, in rockshelters fronting the water and on well drained areas close to smaller tributaries. Ceremonial sites could not be predicted in this study, due to the lack of information. Art sites such as paintings, drawings, stencils and engravings were common within rockshelters, and engravings could also be present on exposed rock platforms.

NSW Government Architect's Office (2008) South Head Stage 1 Conservation Management Plan. Report to Department of Environment and Conservation.

This CMP was designed to maintain and enhance the heritage values within Sydney Harbour National Park, South Head. It also aimed to inform management, interpretation, conservation and use of the area. The broader study site was divided into five precincts; Inner South Head, Lady Bay, Camp Cove, Gap Bluff and Green Point. The study area is discussed within the Inner South Head Precinct. South Head was determined to have state significance for the Aboriginal and historical sites present and national significance due to the association with Australia's maritime and defence history. Local significance is attributed to the site for aforementioned sites, in addition to the presence of native flora and fauna, with some endangered species noted.

Dominic Steele Consulting Archaeology (2009) Waverley Aboriginal Cultural Heritage Study. Report to Waverley Council.

This 2009 report aimed to research and identify Aboriginal cultural heritage within the Waverley LGA to inform recording, management and future development. Eleven sites were nominated for inclusion within the Waverley LEP 2010. Site types consisted of rock engravings, open campsites, rockshelters with potential for subsurface occupational deposits and shelters with art motifs. Areas with intangible values were additionally reported. It was recommended that community consultation should be undertaken for all future developments to ensure sites are appropriately identified and managed.

Office of Environment and Heritage (OEH) (2013) Nielsen Park, Sydney Harbour National Park: Conservation Management Plan. Report for the NSW National Parks and Wildlife Service.

In 2013, a conservation management plan was established to address the long-term assessment of Aboriginal, historical and natural values of Nielsen Park. This is located between Vacluse Bay and Rose Bay, southwest of the current study area. The reserve is comprised of approximately 20 hectares of land and was determined to be of state

significance. Six Aboriginal sites were located during a site inspection, however an additional three could not be identified. Management practices to individual sites (both Aboriginal and historical) were outlined.

Comber Consultants (2017) Aboriginal Archaeological Assessment: Gap Bluff Centre, Watsons Bay. Report to Beaucon Pty Ltd.

An assessment of six existing buildings within the Sydney Harbour National Park were assessed for adaptive reuse in 2017. This identified known sites at 33 Cliff St and Constable Cottage, Camp Cove and at Green Point Cottage. No further investigation was recommended at Gap Bluff Cottage, Officers Mess or the Armoury. The Aboriginal sites consisted of middens and rockshelters.

Coast History & Heritage (2019) Aboriginal Cultural Heritage Assessment Report: The Royal Sydney Golf Club, Back of House Project, Rose Bay NSW, Woollahra LGA. Report to The Royal Sydney Golf Club.

In 2019, the Royal Sydney Golf Club, was assessed for extension of the clubhouse. An Aboriginal Cultural Heritage Assessment Report and associated test excavation were required, as previous studies identified more than 5000 artefacts and human remains in the adjacent area (Jo McDonald Cultural Heritage Management 2010). Analysis of historical records in this earlier study concluded that the area was utilised for ritual combat. The 2019 Clubhouse site had disturbance from previous clubhouse construction activities that were performed in 1904-5. Artefacts and remains were therefore expected to the north of the structure and within the first 50 to 100cm below the turf. The whole of the study area was registered as an area of archaeological sensitivity under AHIMS Site #45-6-3745.

Coast History & Heritage (2020) Aboriginal Cultural Heritage Assessment Report: Kincoppal-Rose Bay School, 1A and 2 Vacluse Road, Vacluse, Woollahra LGA. Report for the Kincoppal-Rose Bay School.

The Kincoppal Rose Bay School campus was assessed for redevelopment. This was proposed for the western portion of the site. Background information suggested that the majority of the site was located upon a steep slope, and therefore had a low potential for Aboriginal sites. This was inconsistent with one area of the site where AHIMS Site #45-6-3754, a rockshelter was identified.

Coast History & Heritage (2020) Due Diligence Aboriginal Heritage Assessment: Tramway Path, Gap Park, Watsons Bay NSW. Report to Capital Projects and Woollahra Municipal Council.

Coast assessed the installation of a tramway path in Gap Park, Watson Bay. Gap Park is approximately 4.6 hectares and borders the Pacific Ocean. 67 sites were located within a 4km² area, however only 5 of these were located within 500m of the study site. The most common site types were rock engravings followed by rockshelters with middens and/ or artefacts. There were no previously recorded sites within the study area, however a site inspection identified one possible rockshelter and one possible engraving site. Where possible, subsurface impacts are to be minimised, with temporary protective fencing to be erected around the shelter.

AMBS Ecology and Heritage (2024) Aboriginal Heritage Due Diligence Assessment: Q Station. Report to North Head Sydney Pty Ltd.

A Due Diligence Assessment was completed at the former Quarantine Station, located at 1 North Head Scenic Drive Manly. This is approximately 2km northwest of the current study area. This report aimed to determine if current Station activities had the potential to damage Aboriginal heritage items. No construction was proposed for the site. Twelve sites were located within the study area, with an AHIMS Search showing 73 sites within wider area (GDA94 Zone 56, Eastings: 340000 - 343700, Northings: 6255900 - 6260000). Considering record duplication and recordings of 'Not a Site', this was reduced to 66. The most common site type was shelters with middens, followed by art sites. It was determined that no further Aboriginal cultural heritage assessment is required, however preexisting site management and protections should be followed. Staff and subcontractors were recommended to undertake cultural heritage awareness training, all future site works are to be subject to Aboriginal heritage assessments and consultation with stakeholders should be performed.

4.2.1 Summary of Archaeological Assessments

Watson Bay and the surrounding suburbs of Vaucluse and Rose Bay have been significantly developed in areas, with early impacts from European settlement and land modification evident. Developments in this area are characterised by large residential and educational structures. The area does however have areas reserved as public trails and parks, which has aided in protection of sites.

Many buildings were constructed prior to legislative requirements for archaeological investigation, however several sites have been noted in ethnographic resources, or identified in later renovations. This has resulted in a substantial number of sites known from the area. Many of these are within a close vicinity to the foreshore or include marine resources. Common site types for this area include middens, art sites and occupational deposits. Burials have also been identified within sand dunes. Archaeological evidence and ethnographic information support that occupation was regular and repeated.

The Hawkesbury soil landscape on which the study site occurs is characterised by shallow profiles, especially on exposed landforms. Due to the absence of sandstone shelter structures, the most likely site type for this landscape was determined to be art sites. Artefacts and shell midden material may be present upon the site, however erosion across the shallow soils may have impacted their preservation.

In summary, the practical ramifications of the archaeological assessments above suggest that art sites, middens or occupational sites such as rockshelters are the most likely site type for the area. Due to the rapid settlement and shallow soil profiles present, a large amount of archaeological evidence is expected to have been developed over or removed. Engravings are known within the area, and in some cases, these have been protected.

4.3 HISTORY OF LAND USE AND DISTURBANCE FACTORS

4.3.1 Aboriginal Land Use

The study area lies in a resource rich zone which had many materials that may have been exploited on either a regular or repeated basis. Reliable access to fresh water may have been present nearby to the study area, with creeks known to flow down into the harbour (Coast History and Heritage 2021 pg. 27). These were later modified to accommodate European development and services.

Sites containing fresh water and sedentary food sources, coupled with the presence of other resources which may have been exploited or available on a seasonal basis, would suggest that Aboriginal land use of the study area was regular and repeated, with this reflected in the archaeological record. Concentrated and repeated occupation may be represented in areas that have reliable access to water and foods sources. These areas will possess a high archaeological potential (Goodwin 1999).

The study area is within close proximity to the marine foreshore of the Tasman Sea. A range of fish and birds may have been caught in traps, fished from canoes or speared. Whilst rockshelters are more commonly identified as landscapes that preserve occupational evidence, beaches, dunes, lagoons, mudflats and swamp areas would have been well utilised (Attenbrow 2010). Additional resources included shellfish, oysters, large game such as kangaroos, wallabies and possums (AMBS 2024). Multiple parts of plants, including tubers and roots could be used as food sources or as a raw material for tools (Comber Consultants 2008, OEH 2013).

4.3.2 European Land Use and Disturbance

Background research suggests the study area was rapidly impacted by European settlement from 1788, with Watson Bay being the landing site for the ships fleet. Unlike the wider suburb, significant disturbance and ground alterations have not occurred as extensively upon the west or north of Watson Bay. Much of this land was reserved for military or public use.

Historic records indicate the site was part of a 150-acre allotment of crown land for public use, as listed in 1843. An illustration by Joseph Lycett shows little construction of accessways or structures at this time (Figure 4-2). In 1857, two ships – *the Dunbar* and *the Catherine Adamson* were wrecked close to the study area, prompting the construction of the Hornby Lighthouse (Figure 4-3). This was first used in 1858 and associated services, such as lightkeepers cottages were also constructed. In 1877, threats of conflict led to reservation of the site for military use. This continued into the early 20th century, with defence personnel occupying the lightkeepers structures, after the lighthouse became electric in 1933. While ownership of the study area has changed across the last century, little modification within the study area has been observed, as shown in historical aerials (Figure 4-4 - Figure 4-7). Some modification of access routes and vegetation in the wider area, have however been developed.

As the site is located upon a cliffs edge, exposed bedrock and shallow soil profiles are predicted. Any construction upon the site is therefore thought to have significantly impacted potential for Aboriginal objects and/or deposits. Rock engravings have been identified at the study area (AHIMS Site 45-6-0715). Whilst

weathering has been recorded, these sites have a higher preservation rate than site types such as middens or artefact scatters.

In light of this, and in the context of the information provided about the land use of the site, its proximity to major tributaries the following has been predicted.

Moderate /high disturbance to ground surfaces from historical land use: Sub-surface Aboriginal objects with potential conservation value have a low probability of being present within the study area. Contrastingly, there is a high potential for rock engravings and art to remain.



Figure 4-2 Joseph Lycett's 1824 'View of the Heads'
Approximate location of study site indicated by red arrow.
State Library of NSW, DL F82/16 pl.9.



Figure 4-3 c. 1885 photo of Hornby Lighthouse.
National Library of Australia.



Figure 4-4 1943 aerial.
NSW Historic Imagery.



Figure 4-5 1965 aerial.
NSW Historic Imagery.



Figure 4-6 1986 aerial.
NSW Historic Imagery.



Figure 4-7 2005 aerial.
NSW Historic Imagery.



Figure 4-8 Disturbance map.
Study area outlined in navy blue, with orange indicating moderate disturbance and red indicating high disturbance.

4.4 ARCHAEOLOGICAL PREDICTIVE MODELS

An archaeological predictive model is a tool that indicates the probability of finding an archaeological site within a specific type of landscape. Predictive modelling is an adaptive process which relies on a framework formulated by a number of factors, such as the use of local land systems, the environmental context, archaeological work and any distinctive sets of constraints that would influence land use patterns. This is based on the concept that different landscape zones may offer different constraints, which is then reflected in the spatial distributions and forms of archaeological evidence within the region (Hall and Lomax 1996). Umwelt (2004), has identified environmental – archaeological relationships which contribute to the mapping and modelling of archaeological sites, such as:

- Watercourses and ridgelines impact people’s movement throughout the area
- Accessibility and visibility impact choice of occupational sites
- The presence of consistent resources, especially watercourses, significantly impact the potential for occupation and land use
- The landscape in which occupation occurred additionally impacted the potential of sites surviving
- European land-use practices additionally affect the potential for site survival.

Based on these factors it is possible to provide a predictive statement for the probability of encountering Aboriginal archaeological sites and/or places that relate to the study area.

Table 4.3 Types of Aboriginal archaeological sites and their likelihood with the study area.

Site Type	Description and Potential Location	Likelihood
Open Artefact Scatters	The study site is located upon a sandstone plateau. Whilst this location provides expansive views of the area and rock art indicates use of the area, the likelihood of artefact scatters preserving within the shallow soil profiles is low.	Unlikely
Isolated Artefacts	Similarly, the shallow soil profile reduces the likelihood of isolated artefacts remaining within the study site.	Unlikely
Grinding Grooves	Sandstone platforms are located within the study area, and these have known Aboriginal modification, with multiple art engravings recorded. Locating grinding grooves is determined to be less likely than identifying further engravings, with a significant drop to the water reducing the value of the outcrop as a tool modifying area.	Unlikely
Stone Resource Sites	The Hawkesbury soil landscape is dominated by sandstone and shale geology. Therefore, rock outcrops of suitable flaking material are not expected within this study area.	Unlikely
Scarred Trees	The soils across the study area are shallow and significant vegetation has been cleared from the ridgeline. No trees of sufficient age with potential for scarring/modified are known to be present within the study area.	Unlikely

Sandstone Shelters	Sandstone platforms are apparent, however no overhangs for shelters are present. These were not recorded in previous assessments of the engraving sites upon this headland, and therefore are not thought to be removed in the creation of the Lighthouse.	Unlikely
Burials	The Hawkesbury soil profile is extremely shallow across exposed South Head Plateau and the site has been further modified for Lighthouse construction and access. Burials have been identified in the wider area, however these are generally located within sand dunes, which are not present within the study area.	Unlikely
Ceremonial Sites	There is an unknown potential for ceremonial sites. Consultation with relevant Aboriginal parties and individuals is presently taking place.	Possible that Ceremonial/Social sites will be present within the study area

4.4.1 Summary of Predictive Model

In summary, the predictive modelling indicates that the most likely site type is engraved art sites. This is due to the location upon a plateau within the Hawkesbury soil landscape. With expansive views across the area with both marine and terrestrial resources available, this area could have been well occupied. Erosion would have significantly impacted the likelihood many site types, such as middens or artefacts remaining. Further inland, in the west of the study area, relatively deeper soils may be located, due to less foundational modification for the lighthouse structure, and protection from weathering. The western side of the study site therefore maintains the highest potential for archaeological material

4.5 ARCHAEOLOGICAL POTENTIAL

‘Archaeological potential’ describes the likelihood for archaeological remains to survive at a particular site.¹ This discussion considers the range of possible archaeological features and deposits at the study site, the factors that affect their creation or survival and provides concluding statements.

Whilst natural and human disturbances continue to impact the study area, rock engravings have been well recorded on site, enabling relocation and assessment of site conditions. Some areas of the sandstone platform have remained buried under the shallow soil profile, which may have aided in reducing weathering. The potential for identifying movable material, such as artefact scatters or midden material is less likely, due to the depth of soils.

It is acknowledged if the study area has little or no archaeological potential the study area may still have cultural significance to the Aboriginal community.

¹ Heritage Office, Department of Urban Affairs and Planning (1996), p. 15.

5.0 ABORIGINAL CONSULTATION

5.1 INTRODUCTION

This section documents the requirements of the Aboriginal consultation process that should be undertaken as part of any Aboriginal archaeological and cultural heritage assessment where an Aboriginal Heritage Impact Permit (AHIP) or test excavation is required. Section 3.1 outlines the guidelines for Aboriginal consultation issued by the DECCW. Section 3.2 documents the steps taken for this Aboriginal cultural assessment and the outcomes of the consultation. Further information, including copies of correspondence to and from registered parties is included in Appendix B.

5.2 CONSULTATION PROCESS AND REQUIREMENTS

The Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010c), referring to Part 6 Approvals under the NPW Act were released in April 2010. The responsibilities of the proponent when test excavation is to take place and/or permit under section 90 of the NPW Act are listed below.

5.2.1 Stage 1 – Notification of Project Proposal

Stage 1 – Notification of project proposal and registration of interest

- Contact relevant authorities to establish Registered Aboriginal Parties
- Notify Registered Aboriginal Parties of works, inviting them to register interest, in addition to posting a local advertisement about works. 14 days' notice must be given.

5.2.2 Stage 2 – Presentation of Information

Stage 2 – Presentation of information about the proposed project

- Facilitate discussion about the proposed works and significance of the study area.

5.2.3 Stage 3 – Research & Design Cultural Heritage Assessment Report

Stage 3 – Drafting and review of the Research and Design Cultural Heritage Assessment Report

- Facilitate discussion of the methodology report findings and management of heritage with Registered Aboriginal Parties. A period of 28 days must be given for report responses.
- Document all feedback received in response to proposed works.

5.2.4 Stage 4 – Review of Draft Report

Stage 4 – Review of draft Cultural Heritage Assessment Report

- Facilitate discussion of the Aboriginal Cultural Heritage Assessment Report findings and management of heritage with Registered Aboriginal Parties
- After the review period of 28 days, the report should be submitted to Heritage NSW with the accompanying AHIP application.

5.3 SUMMARY OF IDENTIFIED ABORIGINAL CULTURAL VALUES

No cultural heritage values have, as yet been specified in writing by stakeholders as part of this assessment of the Hornby Lighthouse drainage improvement and remediation works. The engravings have previously been assessed in earlier studies, such as by Campbell (1889). This early assessment identified and illustrated a whole complex of figures and stated more would have been present prior to the lighthouse construction and associated erosional activity (Campbell, 1889 within Negerevich, 1978). The Woollahra Heritage Study (Coast History and Heritage 2021) noted that engraving sites were often places of ceremony or teaching. Whilst the specific use of this site isn't known, stakeholders requested monitoring of the works, noting the site's resources and views enabled occupation and use of the area, increasing the archaeological potential.

6.0 INVESTIGATION OF ABORIGINAL HERITAGE

The investigation of the context of the study area and background research of Aboriginal heritage in Section 3.0 and Section 4.0 established the nature and context of the local environment, prior Aboriginal heritage studies and investigations of the known Aboriginal sites/ places of the study area. This section provides the results of that investigation.

6.1 EXISTING SURVEY OF THE STUDY AREA

Whilst contaminant reports have been completed on site and triggered remediation works, no geotechnical assessments have been identified.

6.2 ARCHAEOLOGICAL SURVEY

The study area was surveyed in accordance with Heritage NSW recording requirements. The study area was surveyed according to survey units, landscapes and landforms.

6.2.1 Survey Method and Strategy

The field survey was undertaken on two days – the 11th and the 21st of November 2024, as not all groups were available to attend on the first day. The same program was followed for each survey. On the 11th of November 2024 the archaeological survey was undertaken by Benjamin Streat and Sarah Hannan of AMAC Group, with a member from Didge Ngunawal Clan, Thomas Dahlstrom Heritage Consults and Kamilaroi Yankuntjatjara Working Group. On the 21st of November 2024, the archaeological survey was undertaken by Kelly Strickland and Sarah Hannan of AMAC Group, with a senior officer from La Perouse Local Aboriginal Land Council. Two representatives from Port Authority, Sam Isaacs and Miguel Frohlich, attended both surveys.

The study site was inspected on foot. The majority of the study area could be assessed, with little vegetative cover present. Shallow, eroding soils were noted to be present.

All visible landscape units were inspected as well as photographed where informative details as to land use and disturbance could be ascertained. Information was also collected regarding land surface and vegetation conditions as encountered during the survey.

The following broadly outlines the methods adopted:

- Field inspections will be carried out on foot.
- Highly disturbed areas indicated on plans will be inspected to verify the level of disturbance and depending on level of disturbance will be included or excluded from the additional survey.
- Undisturbed areas will be inspected in as much detail as the remaining surface coverage and environment will allow and the results will be recorded.
- Areas of exposed ground such as tracks or eroded surfaces which allow good surface visibility will form the focus of the field inspections.

The description of a survey coverage in accordance with Heritage NSW guidelines (DECCW 2010, 13), includes landforms units, the total area surveyed within that landform unit and a calculation of the level of visibility and exposure. To quantify this, Heritage NSW has defined visibility and exposure as follows:

Visibility is the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. This like vegetation, plat or leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals'.

Exposure is different to visibility because it estimates the area with a likelihood of revealing buried artefacts or despoils rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals' (DECCW 2010, Appendix A).

6.2.2 Survey Results

Surveys started with an overview of proposed works by Port Authority. In summary, soil remediation included removal of contaminated material surrounding the lighthouse using hand tools or small machines, geotextile fabric being laid down, and clean imported fill added. Drainage work consisted of altering an area where water pooling currently occurs and leaving the surrounding run off zone so this can continue as naturally as possible. The extent of impact zones were walked, with exposed rock and thin soil profiles noted. In regard to mitigative measures, it was requested that the Land Council and other RAPs be present to monitor key stages of works, to enable identification of any Aboriginal engravings or artefacts present. It was requested that a non-acidic fill be used, as sandstone can erode more quickly with acidic soils. The potential of archaeological material was discussed - RAPs noted that additional engravings may be present on the sandstone currently buried and the senior officer from La Perouse LALC additionally noted that artefacts may have been moved down the hill and lodged between sandstone features or buried under the current profile.

Surveys on both the 11th and 21st then attempted to reestablish the location of AHIMS Site #45-6-0715, which consisted of multiple engravings. The direct impact zone for the lighthouse works was noted to not contain any currently visible engravings. The first survey identified engravings further away from the lighthouse, on South Head Heritage Trail which leads from the Camp Cove Carpark. These consisted of multiple fish stencils. The second survey determined that these were modern engravings, and AHIMS Site #45-6-0715 was directly located on the top surface of the natural rock ledge surrounding the lighthouse moat. The location of this was reestablished with the site card; however, most were faint and weathered. The La Perouse LALC member had been involved in previous assessments of the site and could therefore reestablish the location of multiple figures.

Table 6.1 Survey coverage of study area as per DECCW 2010.

Unit	Landform	Area (sq. m)	Visibility (%)	Exposure (%)	Effective Coverage (sq. m)	Effective Coverage (%)
1	West of Lighthouse	170m ²	60%	20%	20.4 m ²	12%
2	East of Lighthouse	90m ²	60%	60%	32.4 m ²	36%



Figure 6-1 View from the base of the Lighthouse, looking southeast.
 AMAC Group, 11/11/2024, Image No. 091025.



Figure 6-2 View of ground exposure. Located west of Lighthouse, looking north. AMAC Group, 11/11/2024, Image No. 091026.



Figure 6-3 The rock platform shown in the bottom right quadrant has remnant engravings. Located near the battery command structure. AMAC Group, 11/11/2024, Image No. 095617.



Figure 6-4 View northeast across the rock platforms to North Head. Taken from the northmost point of the AHIMS Site # 45-6-0715. AMAC Group, 11/11/2024, Image No. 095609.

6.3 ARCHAEOLOGICAL ZONING PLAN

The results of the site survey determined three zones with archaeological potential (Figure 6-5). These zones have been assigned various levels of Aboriginal archaeological potential including known significance – low potential. The zones are defined as follows:

- Archaeological Sensitivity Zone 1 (ASZ1) – The sandstone platform extends to the east, encompassing the AHIMS Site 45-6-0715 engravings. This is an area of known significance. It is bounded by the moat to the southeast and continues west past the battery command. This area has been previously recorded and has known artwork and subsequent value. The majority of this area is impacted by erosion – either weathering from natural forces, or human foot traffic.
- Archaeological Sensitivity Zone 2 (ASZ2) – A portion of the sandstone platform that has been levelled for Lighthouse construction. This area is bounded by the Lighthouse moat to the northeast and continues to the west point of the Lighthouse. This area has a low potential for archaeological objects due to the level of disturbance.
- Archaeological Sensitivity Zone 3 (ASZ3) – The western portion of the study area, with relatively higher ground cover. This area has a moderate potential for archaeological material, as engravings may be in sandstone still buried by aeolian sands. Artefacts also have a potential to be deposited from uphill areas.



Figure 6-5 Archaeological zoning plan for the study area. Study area outlined in yellow, ASZ1 which includes AHIMS Site #45-6-0715 in red, ASZ2 in purple and ASZ3 in blue. Six Maps accessed 10/12/2024.

6.4 SYNOPSIS OF INVESTIGATION OF ABORIGINAL HERITAGE

Based on previous identified archaeological and heritage studies (Section 4.0), consultation with the Aboriginal community (Section 5.0), and the current investigation into the study area (Section 6.0), Aboriginal cultural heritage has been considered within three zones. Regardless of the degree of archaeological potential, the study area may still have intangible cultural significance. The potential of each zone in relation to Aboriginal cultural heritage connected is outlined below.

Component of Aboriginal Heritage	Tangible/ Intangible	Description
Archaeological Sensitivity Zone 1 (AZ1)	Tangible	A collection of engravings has been identified upon this exposed sandstone platform since the beginning of the 20 th century. The condition of these are degrading over time, due to natural weathering and human impacts.
Archaeological Sensitivity Zone 2 (AZ2)	Intangible	No intangible aboriginal cultural material has been identified across this exposed and modified area. This is attributed to the level of disturbance. This area does however adjoin the registered site, could have been well used and retains aesthetic values due to the expansive views across the region.
Archaeological Sensitivity Zone 3 (AZ3)	Currently intangible, however tangible Aboriginal heritage may be found during monitoring works	This area has no recordings of being excavated, or bedrock being exposed. Therefore, a potential for natural soils, engravings and/ or artefacts is present. The level of natural and manmade disturbance has somewhat reduced this potential.

7.0 CULTURAL HERITAGE VALUES & STATEMENT OF SIGNIFICANCE

7.1 INTRODUCTION

The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013 and the associated series of Practice Notes provide a best practice standard for managing cultural heritage places in Australia. According to the *Burra Charter* cultural significances is defined by:

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 (*Burra Charter* 2013: 2)

To assess the Burra Charters four principal values (aesthetic, historic, scientific and social) the NSW DPE (2011: 23) publication *Assessing heritage significance* provides guidelines for assessing places and objects against the Heritage Council of NSW criteria. Each of these criteria may have intangible and tangible aspects and both should be acknowledged. The criterion used in NSW to establish heritage significance is aligned with the four principal values and are referred to as:

- Aesthetic: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).
- Historic: an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).
- Scientific: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).
- Social: an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural, or spiritual reasons.

An assessment of the aesthetic and social/spiritual values of Aboriginal cultural significance must be conducted by the relevant Aboriginal community, as they are the primary source of this knowledge. The community holds the deep understanding, lived experience, and cultural authority necessary to interpret the meaning, history, and importance of their cultural sites, practices, and traditions. As the rightful custodians of their heritage, the Aboriginal community is the only group capable of offering an authentic and respectful evaluation of what holds significance to them. They also have the authority to determine which aspects of their cultural heritage can be shared and which should remain protected. In this way, consultation with Aboriginal communities at the early stages of the assessment process ensures that they have the opportunity to actively contribute and guide the evaluation of their cultural values. It is important to consult with the Aboriginal community to ensure that the appropriate management of impacts on Aboriginal cultural heritage is conducted in accordance with their cultural protocols, values, and traditions.

7.2 ASSESSMENT OF CULTURAL HERITAGE VALUES AND SIGNIFICANCE

The assessment of cultural heritage values and significance has been informed through consultation with the Aboriginal community, a thorough investigation into the background of the study area, and a comprehensive field survey. This is to evaluate the principal values (aesthetic, historic, scientific, and social) associated with the site and objects within the study area. The values are defined in each assessment, drawing on the definition of the *Illustrated Burra Charter* (2004) and DCP (2011). The process of assessment follows the DCP 2011 gradings of significance for each individual element, place, or object, ranging from exceptional, high, moderate, little, too intrusive significance which are stated in each value assessment. The Burra Charter Practice Note 2013, which provides key questions to guide the assessment of these values, has been shared with the Registered Aboriginal Parties (RAPs) to ensure their input and guidance throughout the process.

All registered stakeholders have been given a copy of this report with minimum of 28 days to provide comments and/ or feedback. All comments have been incorporated into these reports.

7.2.1 Aesthetic Value

Definition: The sensory and perceptual experience of a place—that is, how we respond to visual and non-visual aspects such as sounds, smells and other factors having a strong impact on human thoughts, feelings and attitudes. Aesthetic qualities may include the concept of beauty and formal aesthetic ideals. Expressions of aesthetics are culturally influenced (DCP 2011: 3).

The study area is located at the northmost point of South Head, overlooking significant marine and terrestrial resources. Engraved artwork is present on the sandstone platforms outside of the proposed impact zone. Verbal communications with stakeholders at the site inspection suggested the area has aesthetic value. It also triggered discussion of available foods and practices, and how these changed across time. As yet, no written responses have been received addressing the aesthetic significance of the site.

7.2.2 Historic Value

Definition: The history of aesthetics, art and architecture, science, spirituality and society. It therefore often underlies other values. A place may have historic value because it has influenced, or has been influenced by, an historic event, phase, movement or activity, person or group of people. It may be the site of an important event. For any place the significance will be greater where the evidence of the association or event survives at the place, or where the setting is substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of such change or absence of evidence.

As yet, no stakeholders have associated specific historical figures with the site. The nearby site of Camp Cove was however the initial point of European settlement. This marked the introduction of different social, political and

agricultural systems and practices, diseases and technology, significantly altering Aboriginal access to land resources and movement through country.

7.2.3 Scientific Value

Definition: The information content of a place and its ability to reveal more about an aspect of the past through examination or investigation of the place, including the use of archaeological techniques. The relative scientific value of a place is likely to depend on the importance of the information or data involved, on its rarity, quality or representativeness, and its potential to contribute further important information about the place itself or a type or class of place or to address important research questions. This information is usually only possibly to obtain following test excavation or sampling.

Verbal communications at the site inspections indicated the site has been well recognised and studied, with LALC members able to relocate engravings based on past recordings. These engravings are becoming increasingly weathered over time. Viewing the site prompted multiple stakeholders to discuss subsistence practices and discuss regional art sites.

7.2.4 Social Value

Definition: The Social value embraces the qualities for which a place, object, or site has become a focus of spiritual, political, national, or other cultural sentiment to a majority or minority group. (Australia ICOMOS 1988).

No written responses have been received as yet, however comments from stakeholders indicated that this area could have been regularly and repeatedly used. This may not be well represented in some areas, with a shallow soil profile impacted by disturbance, however the site may still retain cultural values. Additionally, Camp Cove is located nearby and the site may hold social value, in relation to the contact period.

7.3 STATEMENT OF SIGNIFICANCE

The study site has Registered AHIMS Site 45-6-0715 located on the eastern boundary. The collection of engravings was first recorded in the late 1800s and has been revisited and assessed multiple times in the last decade. It has evident aesthetic values due the location upon South Head, and this it prompted stakeholders to discuss art and subsistence practices. The level of social, historical and scientific significance may be further refined through continued consultation and monitoring of works.

Table 7.1 Aboriginal cultural heritage values and their significance.

Value	Evidence (tangible and intangible)	Grade of Significance
Aesthetic	The wider environment contributes to the tangible value of the site.	Moderate
Historic	Intangible	Low – moderate
Scientific	Existing engravings are known and potential for further archaeological material will be investigated through monitoring works. These	Low – moderate

	are however weathered and as no works are proposed in the area, no further assessment is recommended at this point.	
Social	Intangible	Moderate

7.4 REGISTERED STAKEHOLDER QUESTIONS

All registered stakeholders have been given a copy of this report with a minimum of 28 days to provide comments and/ or feedback. All comments have been incorporated into these reports. The following research questions were the focus of consultation for the ACHAR to determine the cultural significance of the study area.

Intangible Significance

1. Does the study area hold any social, spiritual or cultural values? If so, what are these values and are they confined to particular parts of the study area?
2. Are unrecorded places or resources of cultural, natural or archaeologically significance present within the study area? If so, where are they located?
3. Are there any traditional stories or legends associated with the study area?
4. Are there any gender specific cultural values associated with the study area which cannot be raised in general meeting? If so, how would the Aboriginal stakeholders like these managed?

Tangible Remains and Significance

1. Are there any recollections of Aboriginal people living within the study area?
2. Is there any information to suggest the presence of burials within the study area?

Site Management

1. Will the proposed development harm the identified cultural heritage and archaeological values of the study area? What strategies could be used to manage the cultural and archaeological values of the study area?
2. Do the participants have any concerns not yet raised by these questions?

8.0 THE PROPOSED ACTIVITY

This section outlined the proposed activity including the staging and timeframes along with the potential harm of the activity on Aboriginal objects and or declared Aboriginal places, assessing both the direct and indirect result of the activity on any cultural heritage values associated with the study area. Aboriginal heritage management policy has been developed to guide and minimise impacts to Aboriginal heritage values.

8.1 DESCRIPTION OF PROPOSED ACTIVITY

The proposed activity at the study site consists of ground remediation of contaminated soils and drainage improvement works around Hornby Lighthouse. The contaminated soils form a shallow profile above bedrock and are not considered suitable for archaeological test excavation based on predictive modelling and contamination/ health and safety. The remediation footprint is shown in Figure 8-1 below. Where possible, the drainage works are being designed to avoid impacting on the sandstone bedrock by mimicking natural drainage flow, increasing heritage preservation of the current landscape and placement of a geotextile membrane onto the bedrock surface prior to reinstating the surface profile using clean fill (Figure 8-2). An Aboriginal Heritage Impact Permit (AHIP) will be required for this project.

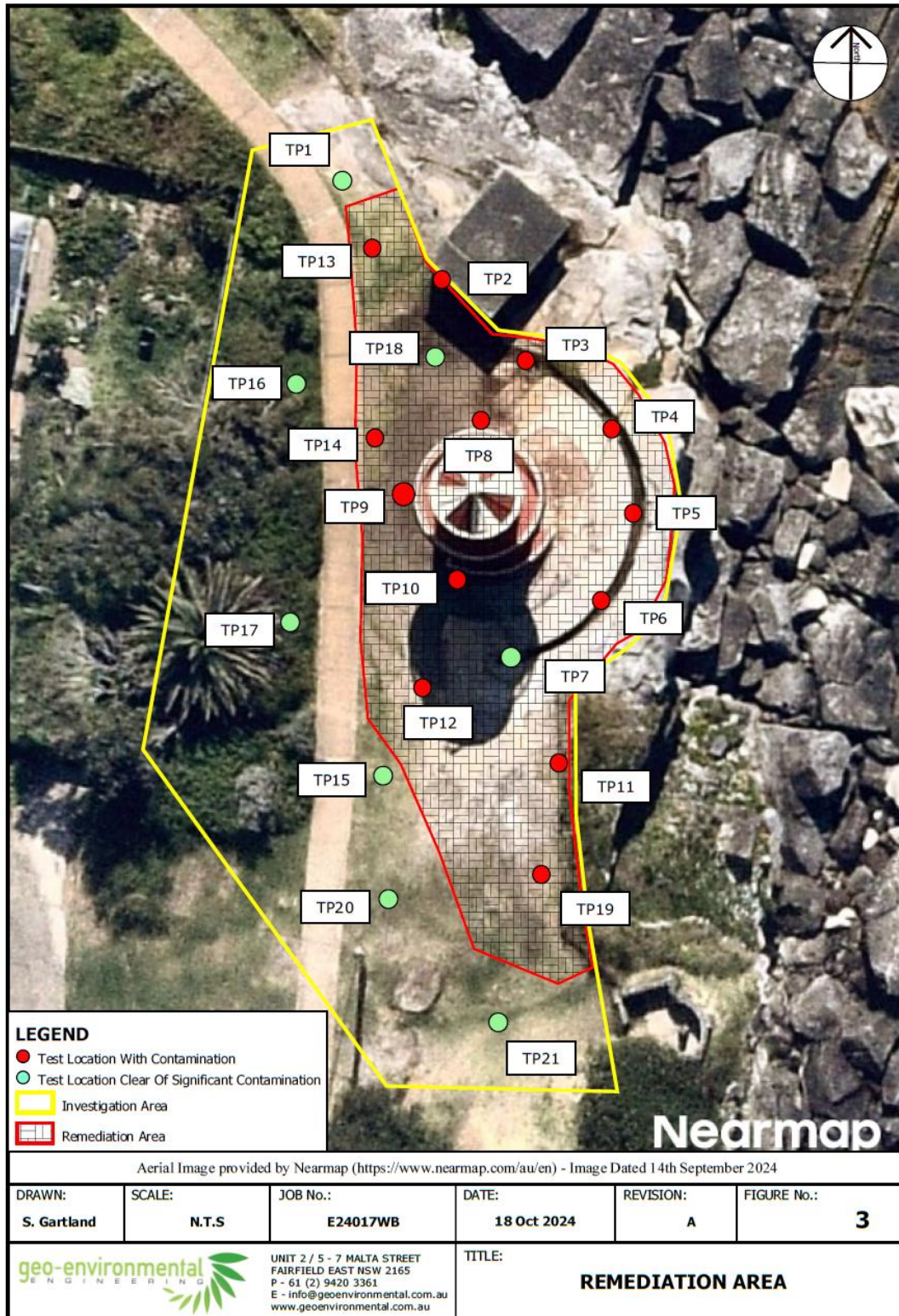


Figure 8-1 Proposed Site Layout Remediation Plan.
 Geo – environmental engineering (2024) Figure 3, Rev. A.

8.2 ASSESSMENT OF IMPACT TO ABORIGINAL OBJECTS AND/OR PLACES.

Based on the assessment of Aboriginal heritage (Section 4.0) and archaeological sensitivity zones, the study area holds Aboriginal cultural heritage value. To determine whether impacts relating to these works will directly or indirectly harm any potential Aboriginal objects and/or places, the proposed activity has been assessed. Each archaeological potential zone is evaluated below.

Archaeological Sensitivity Zone	Indirect or Direct Impact	Degree of Harm
Archaeological Sensitivity Zone 1 (ASZ1)	No direct or indirect impacts proposed.	This area has known value due to the presence of engravings. This area should be avoided throughout all project works to ensure no harm occurs. This is consistent with current proposed activity.
Archaeological Sensitivity Zone 2 (ASZ2)	Direct impact through removal of any contaminated soils before replacement with clean fill material.	This area has low potential and if present, movable material such as artefacts will be disturbed. Soils will be replaced with clean fill and geotextiles. This is to be completed at a small scale, with hand tools most likely used and monitored by cultural site officers resulting in nil-low harm to any engravings predicted.
Archaeological Sensitivity Zone 3 (ASZ3)	Direct impact through soil removal for remediation of contaminated materials and improved drainage.	This area has potential Aboriginal value and to decrease the change of harm, hand tools will be used wherever possible, and monitoring will occur during soil remediation and drainage works.

8.3 ASSESSMENT OF IMPACT TO ABORIGINAL HERITAGE VALUES

An assessment of the proposed activity has been undertaken to determine whether impacts relating to these works will directly or indirectly affect the Aboriginal cultural heritage values. This assessment is presented below.

Value	Evidence (tangible and intangible)	Degree of Harm
Aesthetic	Tangible and intangible value present, no direct or indirect impacts predicted.	No harm is predicted to the existing engravings. Should further engravings be uncovered in ASZ3, little - no harm is predicted with the area to be uncovered with carefully using small machines or hand tools and under monitoring before being reburied by geotextiles and clean, introduced fill.
Historic	Intangible value present, no direct or indirect impacts.	No loss of historic value will result from soil remediation and drainage works.
Scientific	Tangible evidence present, resulting in the creation of Archaeological sensitive zones. ASZ1 has previously been investigated and will not be impacted, ASZ2 has very little potential and ASZ3 retains potential.	Little to no harm is predicted with monitoring recommended in addition to the use of hand tools. Any exposed ground will be reburied.
Social	Intangible and tangible values present with possible direct impacts.	Exposed engravings hold social value and any additional engravings uncovered may be considered in association with these. Both indirect and direct harm has been reduced, with monitoring and hand tools recommended for project works, in addition to introduction of clean soils which will reduce natural weathering.

8.4 STATEMENT OF IMPACT TO ABORIGINAL CULTURAL HERITAGE

No significant excavation or site modification is planned, with the proposed works limited to improving the ground surface surrounding the lighthouse. The impacts of works consist of replacement of soils and improvement of site drainage. Removal of contaminated soils does have potential to reveal additional engravings within ASZ3 and impacts are to be reduced through monitoring and small-scale excavation with hand tools. ASZ1 is to be sectioned off during works to avoid unnecessary inadvertent damage. Following these protocols, impacts are predicted to be nil – low for Aboriginal heritage values.

9.0 AVOIDING AND MINIMISING HARM

9.1 JUSTIFICATION FOR IMPACTS

The works proposed for the Hornby Lighthouse are restricted to two activities, which will enable the continued access of the Hornby Lighthouse area. Where possible, the impact of these activities has been reduced, both in relation to the size of the proposed works, and the nature of introduced material.

The extent of contaminated soils has been analysed, with soil remediation restricted to this footprint (Figure 8-1). Introduced materials are to be a non-acidic fill, to ensure erosion of the sandstone is not accelerated. Similarly, the modification of drainage is restricted to areas north of the Lighthouse where pooling occurs (Figure 8-2). Water is proposed to be evenly distributed through runoff across a consistent slope and will not involve channelled water through piping. This ensures a more natural runoff pattern, which does not increase weathering in one particular area. Soils are to be replaced with clean material to ensure weathering impacts are not altered. Monitoring under an Aboriginal Heritage Impact Permit is to occur, to ensure any additional engravings or artefacts that are present are identified throughout works and can be managed.

9.2 ABORIGINAL HERITAGE MANAGEMENT POLICIES

To mitigate any potential harm to Aboriginal cultural heritage an Aboriginal Heritage Impact Permit is to be in place.

9.2.1 Policy 1 – Aboriginal Heritage Impact Permit

An Aboriginal Heritage Impact Permit (AHIP) is to be applied for, for the full extent of remediation works. This is to assist in the management of Registered AHIMS Site 45-6-0715, and to manage any other engravings or artefacts that may be identified. Consultation with the registered Aboriginal stakeholders as per requirements detailed in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010c) should continue, as part of this. The results of monitoring works are to be built into a final report, any new material recorded, and the site card updated, if required.

9.2.2 Policy 2 – Site Zoning and Induction

Fencing should be erected around any accessible areas of ASZ3. Fencing should also be erected around accessible areas of ASZ1 which contains Registered AHIMS Site 45-6-0715.. This area is already partially demarcated near military structures. A further zone for laying down of tools should be created, outside of the immediate works area.

Before any ground disturbance takes place, all development staff, contractors and workers should be briefed as to the site zoning and their responsibilities in ensuring preservation of the said area. They should also be informed of their responsibilities regarding any Aboriginal archaeological deposits and/or objects that may be located during the following development through a Cultural Awareness Induction and of Registered AHIMS Site 45-6-0715.

9.2.3 Policy 3 – Monitoring

An archaeologist must be present to monitor key stages of the works when Aboriginal objects and/or features of Aboriginal and cultural significance might be discovered. Aboriginal stakeholders (one of whom must be a land council member) must also be notified and given the opportunity to be present as cultural heritage officers to monitor the works during these key stages.

9.2.4 Policy 4 – Finds Protocol

Any cultural material and/or objects that are identified on site shall be subject to an Unexpected Finds Protocol. If suspected culturally significant material is found, works immediately halt, and the area is assessed by archaeologists and cultural heritage officers. If engravings are uncovered, which cannot be moved, the engraving is to be fully revealed and recorded. If movable, the object shall be recorded and collected. Regardless of the site type, the surrounding area should be investigated to ascertain whether this is isolated, or part of a larger assemblage. All cultural material and/or objects collected from the site may be subject to a Care and Control Agreement in consultation with the Aboriginal stakeholders. This could involve reburial in a location designated as per the agreement.

9.2.5 Policy 5 – Considerate Materials and Designs

As works include the introduction of non-local material, this is to be of a comparable nature, to ensure no increased erosion of the area. This includes non-acidic aggregates to ensure runoff does not cause sandstone to degrade and the use of a drainage design that does not cause water to channel in concentrated areas.

9.2.6 Policy 6 – Further Works and Further Assessments

This report only considers soil remediation and drainage works as shown in Section 8 above. Any further works proposed upon South Head shall be subject to further cultural heritage assessment.

9.2.7 Policy 7 – Ecologically Sustainable Development and Intergenerational Equity

The ability of any development to be completely ecologically sustainable will be limited by definition. However, the proponents of this development appear to have made significant efforts to meet the needs of the current generation without compromising the ability of future generations to meet their own needs. This has been accomplished by proposing a plan on a manageable and affordable scale while still protecting and conserving the archaeological resources.

Inter-generational equity refers to the equitable sharing of resources between current and future generations. The planet's current generation should ensure that future generations have the same opportunities and resources available. This idea is being accomplished by designing a building with as little disturbance to the ground surface as possible and as such any archaeological or cultural material that may be present in these areas either identified or unidentified will be left intact and persevered for future generations.

10.0 CONCLUSION AND RECOMMENDATIONS

The subsequent section of the report takes into account the following:

- Legislation outlined in this report which protects Aboriginal cultural and archaeological objects and places in New South Wales
- Research and assessment carried out by the author/s of this report
- Results of previous archaeological assessment and excavation in the vicinity of the study area
- The concerns and views of the Aboriginal stakeholders listed in this report
- The impact of the proposed development on any Aboriginal archaeological material that may be present
- The requirements of the consent authority (Woollahra Council).

ABORIGINAL HERITAGE CONCLUSION

This report has identified a recorded AHIMS site, intangible heritage values relating to the study area and areas of Aboriginal archaeological potential. Previously, this were not recorded wholly within the proposed works area, however elements of the AHIMS Site #45-6-0715 maybe present as indicated by site card 45-6-0715.”. ASZ3 has the highest potential of the zones to reveal unidentified engravings within the sandstone or stone artefacts. As a result, a monitoring plan for the archaeological zones has been developed which considers the value and sensitivity of these zones.

A list of policies (Section 9.2) for the management of Aboriginal cultural heritage during the proposed development project have been developed to guide these works. A summary of these policies is provided below.

All registered stakeholders have been given a copy of this ACHAR with a period of 28 days to provide comments and/ or feedback. All comments provided have been incorporated into the final version of this report.

RECOMMENDATIONS

The proposed development will disturb the shallow soil profile, which directly surrounds the lighthouse structure. A registered site, which consists of multiple engravings in the exposed sandstone, has been recorded on the western boundary of the lighthouse moat. This extends past the foundations of the army and the battery command structures. Whilst AHIMS Site #45-6-0715 is only recorded on the western side and noted not to extend to the lighthouse, a potential for engravings in buried sandstone remains, especially within Archaeological Sensitivity Zone 3 (ASZ3), where less disturbance has been recorded. Therefore, an Aboriginal Heritage Impact Permit is required for remedial works to occur.

The following recommendations have been formulated after consultation with the RAPs, the proponent, and Heritage NSW for the proposed development to proceed:

- Consultation with the registered Aboriginal stakeholders should continue. Stakeholders have been given the opportunity to comment on the recommendations of this report and these comments have been included in the final issue of this report.
- One registered site, AHIMS Site #45-6-0715, adjoining the study area, had the location verified during the archaeological survey. Previously, these were not recorded wholly within the proposed works area, however elements of the AHIMS Site #45-6-0715 maybe present as indicated by site card 45-6-0715. Also further unidentified engravings, grinding grooves or objects of archaeological and cultural significance may present for areas that are buried.
- In accordance with *the Code of Practice* DECCW (2010b) remedial soil and drainage works shall be monitored under an Aboriginal Heritage Impact Permit (AHIP). An archaeologist must be present to monitor key stages of the works when Aboriginal objects and/or features of Aboriginal and cultural significance might be discovered. Aboriginal stakeholders (one of whom must be a land council member) must also be notified and given the opportunity to be present as cultural heritage officers to monitor the works during these key stages. If no engravings or artefacts are identified through the physical examination of bedrock and contaminated soils, then a supervising archaeologist can then confirm that works may continue without further archaeological monitoring.
- The AHIMS Site #45-6-0715 is to be protected by fencing during works. This is to ensure the already weathered engravings are not unnecessarily eroded or damaged further by foot traffic or movement of tools.
- All manual excavation work should use tools that will minimise the likelihood for chipping bedrock. If possible, a ‘tools protection area’ or ‘safe landing area’ for tools to be stored when not in use should be made. This is to avoid inadvertent damage to sandstone when moving tools.
- As part of the proposed works, contaminated soils are to be replaced with clean, introduced soil, with a protective geofabric barrier overlying the sandstone. It is recommended that the introduced material consist of non-acidic aggregate and soils. This will ensure the runoff that passes through this material will not erode the sandstone more rapidly.
- Any engravings or artefacts identified will be recorded in accordance with *the Code of Practice* DECCW (2010b) and the Site Card for AHIMS #45-6-0715 will be amended.

11.0 GLOSSARY

Term	Definition
Aboriginal Object	A term now used (formerly 'relic') within the NSW <i>National Parks and Wildlife Act, 1974</i> to refer to "...any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains."
AHIP	Aboriginal Heritage Impact Permit, issued under Part 6 of the <i>National Parks and Wildlife Act 1974</i> , where harm to an Aboriginal object or Aboriginal place cannot be avoided.
Alluvial	Describes material deposited by, or in transit in flowing water.
AMAC Group	Archaeological Management and Consulting Group.
Artefact	Any object, usually portable, that has been made or shaped by human hand.
Assemblage	A collection of artefacts found in close proximity with one another often excavated together.
Axe grinding Grooves	Areas on a stone surface where other items such as stone tools, wood or bones have been sharpened.
Basalt	A dark coloured, basic volcanic rock.
Bioturbation	Reworking of sediments through the action of ground dwelling life forms. This can also include soil cracking and root activity.
Broken Flake	A flake fragment which displays only part of the diagnostic features of a complete flake.
BP	Before present (AD1950).
Burial	Sites containing the physical remains of deceased Aboriginal people.
Ceremonial Sites	Places or objects of ceremonial, religious or ritual significance to Aboriginal people.
Chert	A hard siliceous rock suitable for flaking into tools.
DCP	Development Control Plan.
DP	Deposited Plan.
DPIE	Department of Planning, Industry and Environment formerly known as OEH.
Erosion	Process where particles are detached from rock or soil and transported away principally via water, wind and ice.
Flake	A piece of stone, detached by striking a core with another stone.
Flaking/Knapping	The process of making stone tools by detaching flakes from a piece of stone.
Friable	Easily crumbled or cultivated.
Hard setting	Soil which is compact and hard. It appears to have a pedal structure when dried out.
Heritage Division	Formerly known as the Heritage Branch
Holocene	The period of time since the last retreat of the polar icecaps, commencing approximately 10,000 – 110,000
Intensification	Increased social and economic complexity.
Landscape Unit	An area of land where topography and soils have distinct characteristics, are recognisable, describable by concise statements and capable of being represented on a map.
Laminite	A thinly bedded, fine grained sedimentary rock.
LEP	Local Environment Plan.
LGA	Local Government Area.
Lithics	A term used to describe stone and stone artefacts.

Term	Definition
Loam	A medium textured soil of approximate composition of 10- 25% clay, 25-50% silt and 2% sand.
Loose	A soil which is not cohesive.
Matrix	Finer grained fraction, typically a cementing agent within soil or rock in which larger particles are embedded.
Midden	Aboriginal occupation site consisting chiefly of shells, which can also include bone, stone artefacts and other debris.
NPW Act	National Parks and Wildlife Act 1974
OEH	NSW Office of Environment and Heritage (formerly known as the DECCW)
Open Campsite	A surface accumulation of stone artefacts and/ or other artefacts exposed on the ground surface.
Potential Archaeological Deposit (PAD)	An area where no surface archaeological remains are visible but where it has been assessed that there is some potential for sub-surface archaeological remains to be present.
Ped	An individual, natural soil aggregate.
Pedal	Describes a soil in which some or all of the soil material occurs in the form of peds in a moist state.
Plastic	Describes soil material which is in a condition which allows it to undergo permanent deformation without appreciable volume change or elastic rebound and without rupture.
Pleistocene	The epoch of geological time starting 1.8 million years ago.
Quartz	Common mineral with naturally sharp edges and poor fracturing properties. Colour ranging from clear, to milky white and pink.
Quartzite	Homogenous medium to coarse grained metamorphosed sandstone.
Rock Painting	Encompassing drawing, paintings or stencils that have been placed on a rock surface usually within a rock shelter.
Rock Engraving	Pictures which have been carved, pecked or abraded into a rock surface, usually sandstone and predominantly open, flat surfaces.
Sandstone	A detrital sedimentary rock with predominantly sand sized particles.
Scarred/ Carved Tree	A tree from which bark has been deliberately removed.
Sclerophyll	Denoting the presence of hard stiff leaves, typically used to classify forest and indicative of drier conditions.
Sedimentation	Deposition of sediment typically by water.
Silcrete	A sedimentary rock comprising of quartz grains in a matrix of fine grained – amorphous silica.
Silt	Fine soil particles in size ranges of 0.02 – 0.002mm.
Slope	A landform element inclined from the horizontal at an angle measured in degrees or as a percentage.
SHI	State Heritage Inventory
SHR	State Heritage Register
Subsoil	Subsurface material comprising the B and C horizons of soils with distinct profiles.
Stone Resource Site	A geological feature in the landscape from which raw material for the manufacture of stone tools was obtained.
Texture	The coarseness or fineness of a soil as measured by the behaviour of a moist ball of soil when pressed between the thumb and forefinger.
Topsoil	A part of the soil profile, typically the A1 Horizon, containing material, which is usually darker, more fertile and better structured than the underlying layers.
Weathering	The physical and chemical disintegration, alteration and decomposition of rocks and minerals at or near the earth's surface by atmospheric and biological agents.

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13.0 APPENDICES

CONSULTATION LOG SUMMARY TABLE

STAGE 1						
Authority Letters & Advertisement						
Authority Body/ Organisation	Contact Person	Contact Details	Date Sent	Method	Response Received	Date
Woollahra City Council	Heritage Officer	records@woollahra.nsw.gov.au	9/08/2024	Email	Yes	16/08/2024
GreaterSydney LLS	Heritage Officer	gs.service@lls.nsw.gov.au	9/08/2024	Email	Yes	9/08/2024
La Perouse Local Aboriginal Land Council	Heritage Officer	admin@laperouse.org.au	9/08/2024	Email	Yes	13/08/2024
National Native Title Tribunal (NNTT)	Heritage Officer	GeospatialSearch@NNTT.gov.au	9/08/2024	Email	Yes	9/08/2024
NTSCORP	Heritage Officer	notifications@ntscorp.com.au	9/08/2024	Email	Yes/No Email	
Heritage NSW	Archaeologist	heritagemailbox@environment.nsw.gov.au	9/08/2024	Email	Yes	19/08/2024
Office of Registrar	Heritage Officer	aboriginalowners@oralra.nsw.gov.au	9/08/2024	Email	Yes	13/08/2024
Newspaper Advertisement:	Buy Swap Sell Online	NewsCorp	Ad Placed: 16/08/2024		Date printed: 20/08/2024	End Period: 03/09/2024

Stakeholders Contacted					
Minimum 14 days to register (20/08/2024) - (18/10/2024)					
Name/Organisation	Contact Person	Contact Details	Date Sent	Method	Notes
A1 Indigenous Services	Carolyn Hickey	cazadirect@live.com	20/08/2024	Email	
Amanda Hickey Cultural Services	Amanda Hickey	amandahickey@live.com.au	20/08/2024	Email	Received 6/9/24
Aragung Aboriginal Cultural Heritage Site Assessments	Jamie Eastwood	James.eastwood@y7mail.com	20/08/2024	Email	
B.H. Heritage Consultants	Ralph Hampton; Nola Hampton	hamptonralph46@gmail.com	20/08/2024	Email	
		kinghampton77@gmail.com	20/08/2024	Email	
Barking Owl Aboriginal Corporation	Mrs Jody Kulakowski (Director)	barkingowlcorp@gmail.com	20/08/2024	Email	
Bidjawong Aboriginal Corporation	James Carroll	jrcarroll888@gmail.com	20/08/2024	Email	
		bidjawong@gmail.com	20/08/2024	Email	
Butucarbin Aboriginal Corporation	Jennifer Beale	butuheritage@gmail.com	20/08/2024	Email	
Clive Freeman	Clive Freeman	clive.freeman@y7mail.com	20/08/2024	Email	
Cullendulla (Murrin Clan/Peoples)	Corey Smith	cullendullachts@gmail.com	20/08/2024	Email	

Darug Boorooberongal Elders Aboriginal Corporation	Paul Hand (chairperson)	paulhand1967@gmail.com	20/08/2024	Email	
Darug Land Observations	Jamie Workman; Anna Workman; Anna O'Hara	daruglandobservations@gmail.com	20/08/2024	Email	Email bounced
Dharug (Murrin Clan/Peoples)	Andrew Bond	dharugchts@gmail.com	20/08/2024	Email	
Dharug Ngurra Aboriginal Corporation	Dirk Schmitt	archaeology@dharugngurra.org.au	20/08/2024	Email	
Didge Ngunawal Clan	Lillie Carroll ; Paul Boyd	didgengunawalclan@yahoo.com.au	20/08/2024	Email	
Ginninderra Aboriginal Corporation	Steven Johnson; Krystle Carroll	Ginninderra.corp@gmail.com	20/08/2024	Email	
Goodradigbee Cultural & Heritage Aboriginal Corporation	Caine Carroll	goodradigbee1@outlook.com	20/08/2024	Email	
Gulaga	Wendy Smith	gulagachts@gmail.com	20/08/2024	Email	
Kamilaroi Yankuntjatjara Working Group	Phil Khan	philipkhan.acn@live.com.au	20/08/2024	Email	
La Perouse Local Aboriginal Land Council	Chris Ingrey	admin@laperouse.org.au	20/08/2024	Email	
Mura Indigenous Corporation (icn:8991)	Phillip Carroll	mura.cultureservices@gmail.com	20/08/2024	Email	
Murramarang (Murrin Clan/Peoples)	Roxanne Smith	murramarangchts@gmail.com	20/08/2024	Email	

Ngambaa Cultural Connections	Karina Slater	ngambaa.culturalconnections@gmail.com	20/08/2024	Email	
Thauaira	Shane Carriage	thauairachts@gmail.com	20/08/2024	Email	
Thomas Dahlstrom Offers ACH value by using 3D Laser and Drone technology	Thomas Dahlstrom	gamila_roi@yahoo.com.au	20/08/2024	Email	
Thoorga Nura	John Carriage (Chief Executive Officer)	thoorganura@gmail.com	20/08/2024	Email	
Waawaar Awaar Aboriginal Corporation	Rodney Gunther Barry Gunther	Waawaar.awaa@gmail.com	20/08/2024	Email	
Wailwan Aboriginal Group	Philip Boney	waarlan12@outlook.com	20/08/2024	Email	
Walgalu (Murrin Clan/Peoples)	Ronald Stewart	walgaluchts@gmail.com	20/08/2024	Email	
Wurrumay Pty Ltd	Kerrie Slater; Vicky Slater	wurrumay31@outlook.com	20/08/2024	Email	
Wallanbah Aboriginal Site Conveyancing	Kelvin Boney	kelvingoogieboney@gmail.com	20/08/2024	Email	
RAW Cultural Healing	Raymond Weatherall	RAW.CulturalHealing@hotmail.com	20/08/2024	Email	
Wallangang Aboriginal Corporation	Joanne Timbery	jtimbery@hotmail.com	20/08/2024	Email	
Metropolitan LALC	heritage officer	metrolalc@metrolalc.org.au	20/08/2024	Email	suggestion from Woollahra Municipal Council heritager officer

Gujaga Foundation	Ash Walker	awalker@gujaga.com.au	20/08/2024	Email	suggestion from Woollahra Municipal Council heritagere officer
Registered Organisations/Individuals	Contact Person	Email Address	Date	Method	Notes
A1 Indigenous Services	Carolyn Hickey	cazadirect@live.com	23/08/2024	Email	Rates and insurances supplied
Amanda Hickey Cultural Services	Amanda Hickey	amandahickey@live.com.au	23/08/2024	Email	Rates and insurances supplied
Butucarbin Aboriginal Corporation	Jennifer Beale	butuheritage@gmail.com	21/08/2024	Email	Registered, waiting for rates and insurance
Gamilaroi/ Thomas Dahlstrom Offers ACH value by using 3D Laser and Drone technology	Thomas Dahlstrom	gamilaroi@yahoo.com.au	23/08/2024	Email	Registered, waiting for rates and insurance
Kamilaroi Yankuntjatjara Working Group	Phil Khan	philipkhan.acn@live.com.au	26/08/2024	Email	Rates and insurances supplied
Didge Ngunawal Clan	Lillie Carroll ; Paul Boyd	didgengunawalclan@yahoo.com.au	20/08/2024	Email	Rates supplied
La Perouse Local Aboriginal Land Council	Heritage Officer	admin@laperouse.org.au	13/08/2024	Email	
STAGE 2 & 3					
ACHAR Methodology	Minimum 28 days to respond	(20/09/2024) - (18/10/2024)			

Contacted Organisation/ Individuals	Contacted by Organisation/ Individual	Subject	Date	Method	Notes
All RAPs	Kelly Strickland/ AMAC Group	Dispatch ACHAR Research Design & Testing Methodology	20/09/2024	Email	
Contacted Organisation/ Individuals	Contacted by Organisation/ Individual	Subject	Date	Method	Notes
AMAC Group	Phil Khan/ Kamilaroi Yankuntjatjara Working Group	ACHAR Meth Responses	17/10/2024	Email	Supports recommendation for site survey. Noted that the whole of the study area is highly significant and spiritual to our people. There is always the potential to find burial sites.
Site Survey Invitation sent to all RAPs for paid survey		Email Invitation sent 24/10/2024			
Contacted Organisation/ Individuals	Contacted by Organisation/ Individual	Subject	Date	Method	Notes
AMAC Group	Thomas Dahlstrom/ Gamilaroi	Site survey attendance	24/10/2024	Email	Available for site survey, insurances provided.
AMAC Group	Lilly Carrol/ Didge Ngunawal Clan	Site survey attendance	24/10/2024	Email	Noted that Paul Boyd will attend site survey
AMAC Group	Phil Khan/ Kamilaroi Yankuntjatjara Working Group	Site survey attendance	7/11/2024	Email	Available for site survey, insurances provided.
AMAC Group	La Perouse LALC	Site survey attendance	7/11/2024	Email	Noted unavailable for that week and requested the date be rescheduled

AMAC Group	Cullendulla (Murrin Clan/Peoples)	Site survey attendance	-	-	Attended Survey
STAGE 4					
ACHAR/AATR Report	Minimum 28 days to respond	(20/01/2025 – 27/02/2025)			
Contacted Organisation/Individuals	Contacted by Organisation/Individual	Subject	Date	Method	Notes
All RAPs	AMAC	Dispatch ACHAR/AATR Report	20/01/2025	Email	No responses forthcoming

