

AUSTRAL ARCHAEOLOGY PTY LTD

ABN: 55 629 860 975

Info@australarch.com.au

www.australarchaeology.com.au



AUSTRAL
ARCHAEOLOGY

MOSMAN HIGH SCHOOL, MOSMAN, NSW

ABORIGINAL ARCHAEOLOGICAL REPORT

FINAL REPORT

Multiplex on behalf of Schools Infrastructure NSW

30 March 2021

DOCUMENT INFORMATION

Project:	Mosman High School, Mosman, NSW
Services required:	Aboriginal Cultural Heritage Assessment
Client:	Multiplex on behalf of Schools Infrastructure NSW
Prepared by:	Miles Robson
Project number:	2045

DOCUMENT HISTORY AND APPROVAL STATUS

Version No.	Version Type	Issue Date	Authored by	Approved by	Date Approved
1	Draft	31/08/2020	MR	AA	31/08/2020
2	Draft	8/09/2020	MR	AA	8/09/2020
3	Final	07/10/2020	MR	AA	07/10/2020
4	Final (amended design)	22/02/2021	DM	-	22/02/2021
5	Final (amended design)	16/03/2021	DM	-	16/03/2021
6	Final (amended comments)	30/03/2021	DM	-	30/03/2021

DISTRIBUTION OF COPIES

Version No.	Quantity	Issue date	Issued to
1	1	31/08/2020	CBRE Project Management & Schools Infrastructure NSW
2	1	8/09/2020	Registered Aboriginal Parties
3	1	07/10/2020	CBRE Project Management & Schools Infrastructure NSW, Registered Aboriginal Parties
4	1	22/02/2021	Multiplex
5	1	16/03/2021	Multiplex
6	1	30/03/2021	Multiplex

Copyright and Moral Rights

No part of this document may be reproduced or distributed in any form or by any means without prior permission from a representative of Austral Archaeology Pty Ltd. Austral Archaeology Pty Ltd also reserves the right to use documents and materials produced for this project for future presentations or publications, if required.

In the preparation of this report historical sources and other reference materials are acknowledged in text citations and in a separate section at the end of the report. Reasonable effort has been made to acknowledge and obtain permission from the relevant copyright owners.

EXECUTIVE SUMMARY

This Aboriginal Cultural Heritage Assessment has been prepared by Austral Archaeology (Austral) according to the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (CoP) (Department of Environment, Climate Change and Water 2010a). Also being an appendix to the main Aboriginal cultural heritage assessment report, this document is additionally required to be "a stand-alone technical report" (Department of Environment, Climate Change and Water 2010b). Therefore, this AAR by necessity includes a duplication of information contained in the main Aboriginal Cultural Heritage Assessment (ACHA) report.

This report details the Aboriginal Archaeological Report of development at Mosman High School (745 Military Road, Lot 1 DP1268793), Mosman, New South Wales (NSW).

The location of the study area is shown in Figure 1.1, Figure 1.2 and Figure 1.3 and is situated within the Mosman Municipal Council Local Government Area (LGA). The boundaries of the property also fall within the area overseen by the Metropolitan Local Aboriginal Land Council (MLALC). The study area is located approximately 8 kilometres northeast of Sydney CBD. The study area is bounded by Belmont Road to the north, Gladstone Avenue to the west, Avenue Road to the south and Military Road to the east.

The proposed development will include the construction of new classroom buildings as well as the installation of associated services and landscaping works. As such, the proposed impacts are likely to consist of cut and fill works through parts of the study area due to the construction of new buildings, foundations, demolition works and subsurface excavations for delivery of services. Austral Archaeology (Austral) previously undertook an Aboriginal Cultural Heritage Due Diligence (ACHDDA) for the study area which did not identify any areas of potential for containing Aboriginal archaeological material (Austral Archaeology 2019). However, based on the indicative Secretary's Environmental Assessment Requirements (SEARs), it is understood that SINSW requires an ACHA to be undertaken to support the Environmental Impact Statement (EIS) that is being prepared as part of the State Significant Development (SSD) application process for the proposed development.

The results of the Aboriginal archaeological survey presented in this report examine the likely nature and extent of the archaeological resource and inform the potential impacts to Aboriginal cultural heritage within the proposed area of development.

In practical terms the development project would entail, among other things, large scale ground works including extensive earth excavation, and the construction of infrastructure, including classrooms, offices and associated services.

SUMMARY OF RESULTS

No Aboriginal objects or sites were identified during the archaeological survey undertaken as part of this assessment. It was determined that this was due to the majority of the site being fully developed as part of a school, with most of the ground covering being concrete. No areas of archaeological potential were identified in the study area as the level of disturbance and development across the site was too high. Areas of exposure were visible along the boundaries of the school, however these areas had been previously disturbed by housing and the nature of the site as a school within the grassed sections. So whilst there was exposures there was clear evidence of redposition of materials, and other disturbance that can be seen in Figure 5.2. As stated above, the majority of the site is covered in concrete and asphalt, which precluded any view at the surface below the ground covering, an example of which can be seen in Figure 5.3. It was determined that the construction of the buildings associated with the school would have caused large scale disturbance across the majority of the site. Examples of the buildings and earthworks can be seen in Figure 5.4 and Figure 5.5.

RECOMMENDATIONS

The following recommendations have been developed after considering the archaeological context, environmental information, consultation with the local Aboriginal community, the findings of the archaeological survey and the predicted impact of the proposed development on archaeological resources. It is recommended that:

- 1) No further Aboriginal archaeological works are required to be undertaken.
- 2) All contractors undertaking earthworks on site should be briefed on the protection of Aboriginal heritage objects under the *National Parks and Wildlife Act 1974* (NPW Act) and the penalties for damage to these items.
- 3) All contractors undertaking earthworks in the study area should undergo an induction on identifying Aboriginal heritage objects; and
- 4) A copy of this report should be forwarded to all Aboriginal stakeholder groups who have registered an interest in the project and to the AHIMS Registrar

CONTENTS

EXECUTIVE SUMMARY	iii
CONTENTS	v
1 INTRODUCTION.....	1
1.1 INTRODUCTION	1
1.2 PROJECT DESCRIPTION.....	6
1.3 PREDICTED IMPACT ON THE POTENTIAL ARCHAEOLOGICAL RESOURCE.....	6
1.4 ASSESSMENT OBJECTIVES	6
1.5 FEDERAL AND STATE LEGISLATION	7
1.6 SECTION SUMMARY.....	8
1.7 PROJECT TEAM AND QUALIFICATIONS	8
1.8 ACKNOWLEDGEMENTS	9
1.9 ABBREVIATIONS	9
2 ARCHAEOLOGICAL CONTEXT	11
2.1 REGIONAL ABORIGINAL ARCHAEOLOGICAL CONTEXT	11
2.2 HERITAGE DATABASE SEARCH RESULTS.....	17
2.3 PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS.....	21
3 LANDSCAPE CONTEXT.....	25
3.1 GEOLOGICAL CONTEXT AND SOIL LANDSCAPE	25
3.2 TOPOGRAPHY AND LANDFORM.....	26
3.3 HYDROLOGY	31
3.4 CLIMATE.....	31
3.5 FLORA AND FAUNA	31
3.6 PAST LAND USE PRACTICES.....	33
3.7 POTENTIAL LAND USE IMPACTS ON THE ARCHAEOLOGICAL RESOURCE	43
4 PREDICTIVE STATEMENT.....	44
5 ABORIGINAL ARCHAEOLOGICAL SURVEY	46
5.1 SURVEY METHODOLOGY.....	46
5.2 SURVEY RESULTS.....	46
6 CULTURAL HERITAGE VALUES	51
6.1 BASIS FOR THE ASSESSMENT	51
6.2 ASSESSMENT OF SIGNIFICANCE.....	52
6.2.1 AESTHETIC SIGNIFICANCE VALUES.....	52
6.2.2 HISTORIC SIGNIFICANCE VALUES.....	53
6.2.3 SCIENTIFIC SIGNIFICANCE VALUES	53
6.2.4 SOCIAL AND SPIRITUAL SIGNIFICANCE VALUES	54
6.3 STATEMENT OF SIGNIFICANCE	54
7 IMPACT ASSESSMENT.....	56
7.1 ASSESSING HARM.....	56
▪ ECOLOGICALLY SUSTAINABLE DEVELOPMENT	56
▪ TYPES OF HARM.....	57
7.2 IMPACT ASSESSMENT.....	57
8 AVOIDING AND MINIMISING HARM	59
8.1 CUMULATIVE IMPACTS AND OPTIONS TO AVOID HARM.....	59
8.2 MANAGEMENT AND MITIGATION STRATEGIES.....	59

9 RECOMMENDATIONS	59
REFERENCES	60
APPENDICES	63
<i>APPENDIX A: AHIMS SEARCH RESULTS</i>	63
<i>APPENDIX B: GLOSSARY OF TERMS USED IN ABORIGINAL CULTURAL HERITAGE ASSESSMENTS AND ARCHAEOLOGICAL REPORTS</i>	68

FIGURES

Figure 1.1	Topographic map showing study area and surrounding suburbs	2
Figure 1.2	Aerial of the study area	3
Figure 1.3	Detailed Aerial Imagery of the Study Area	4
Figure 2.1	Foraging Model (Foley 1981)	14
Figure 2.2	AHIMS Sites within 1.5 kilometres of the Study Area	18
Figure 2.3	AHIMS Sites nearby the Study Area	19
Figure 3.1	Geological Landscape Associated with the Study Area	26
Figure 3.2	Soil Landscapes Associated with the Study Area	27
Figure 3.3	Mitchell Landscapes Associated with the Study Area	28
Figure 3.4	AHD Heights Associated with the Study Area	29
Figure 3.5	Hydrology Associated with the Study Area	33
Figure 3.6	Mosman's Bay Estate C.1871	34
Figure 3.7	1898 Richardson and Wrench Auction Map	35
Figure 3.8	1943 Historic Aerial Imagery Associated with the Study Area	36
Figure 3.9	1961 Historic Aerial Imagery Associated with the Study Area	37
Figure 3.10	1984 Historic Aerial Imagery Associated with the Study Area	38
Figure 3.11	1995 Historic Aerial Imagery Associated with the Study Area	39
Figure 3.12	2009 Historic Aerial Imagery Associated with the Study Area	40
Figure 3.13	Disturbances Associated with the Study Area	41
Figure 5.1	Grass covering along western boundary of study area, this area was previously disturbed by housing prior to the school.	46
Figure 5.2	View along southern boundary of school, redeposition of materials along with evidence of excavation for the building and walkway.	47
Figure 5.3	View in the central portion of the site, an example of the level of ground disturbance and concrete covering within the study area.	47
Figure 5.4	View to the north of the school grounds	48
Figure 5.5	View to the south with buildings A (centre) and building E (to the right), the level of earthworks can be seen clearly as the ground level building A was constructed on is approximately 0.5m above the level building E was constructed on.	48
Figure 5.6	Archaeological Potential Associated with the Study Area	49
Figure 7.1	Proposed Site Plan associated with the Study Area	57

TABLES

Table 1.1	Federal Acts	6
Table 1.2	State Acts	6
Table 1.3	State and Local Planning Instruments	6
Table 1.4	Aboriginal Community Consultation Guidelines	7
Table 2.1	Summary of Site Types Recorded within a 1.5 kilometre Radius of the Study Area	16
Table 2.2	A Summary of Archaeological Consultant Reports from the Region	20
Table 3.1	Flora present within the vicinity of the Study Area	31
Table 3.2	Fauna present within the vicinity of the Study Area	31
Table 3.3	Summary of Past Land uses within the Study Area, and the Potential Impacts on Archaeological Resources	42
Table 5.1	Survey Coverage	46
Table 6.1	Definitions of Burra Charter significance values (Australia ICOMOS 2013b)	50
Table 6.2	Gradings used to assess the cultural values of the study area	51
Table 7.1	Definition of types of harm	56

1 INTRODUCTION

1.1 INTRODUCTION

Austral Archaeology (Austral) has been commissioned by Multiplex on behalf of Schools Infrastructure NSW (SINSW) to undertake an Aboriginal Cultural Heritage Assessment (ACHA), including an Aboriginal archaeological survey, in advance of the proposed development at Mosman High School (745 Military Road, Lot 1 DP1268793), Mosman, New South Wales (NSW).

The location of the study area is shown in Figure 1.1, Figure 1.2 and Figure 1.3 and is situated within the Mosman Municipal Council Local Government Area (LGA). The boundaries of the property also fall within the area overseen by the Metropolitan Local Aboriginal Land Council (MLALC). The study area is located approximately 8 kilometres northeast of Sydney Central Business District (CBD). The study area is bounded by Belmont Road to the north, Gladstone Avenue to the west, Avenue Road to the south and Military Road to the east.

Austral prepared an Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) in 2019 for the study area as part of the current proposed development (Austral Archaeology 2019). Very high levels of historical disturbance were identified within the study area as part of the ACHDDA. It was determined that such high levels of disturbances were caused by the subsurface impacts of the construction of Mosman High School from the 1880s and its continual redevelopment until the present day (Austral Archaeology 2019, p.3). Given such high levels of disturbance, it was concluded that there is very little likelihood that any Aboriginal cultural material exist within study area. However, based on the indicative Secretary's Environmental Assessment Requirements (SEARs), it is understood that SINSW requires an ACHA to be undertaken to support the Environmental Impact Statement (EIS) that is being prepared as part of the State Significant Development (SSD) application process for the proposed development.

The purpose of this assessment is to document the results of the Aboriginal archaeological survey across the study area, to re-examine the archaeological significance of the study area, and act as support for the EIS as part of the SSD application.

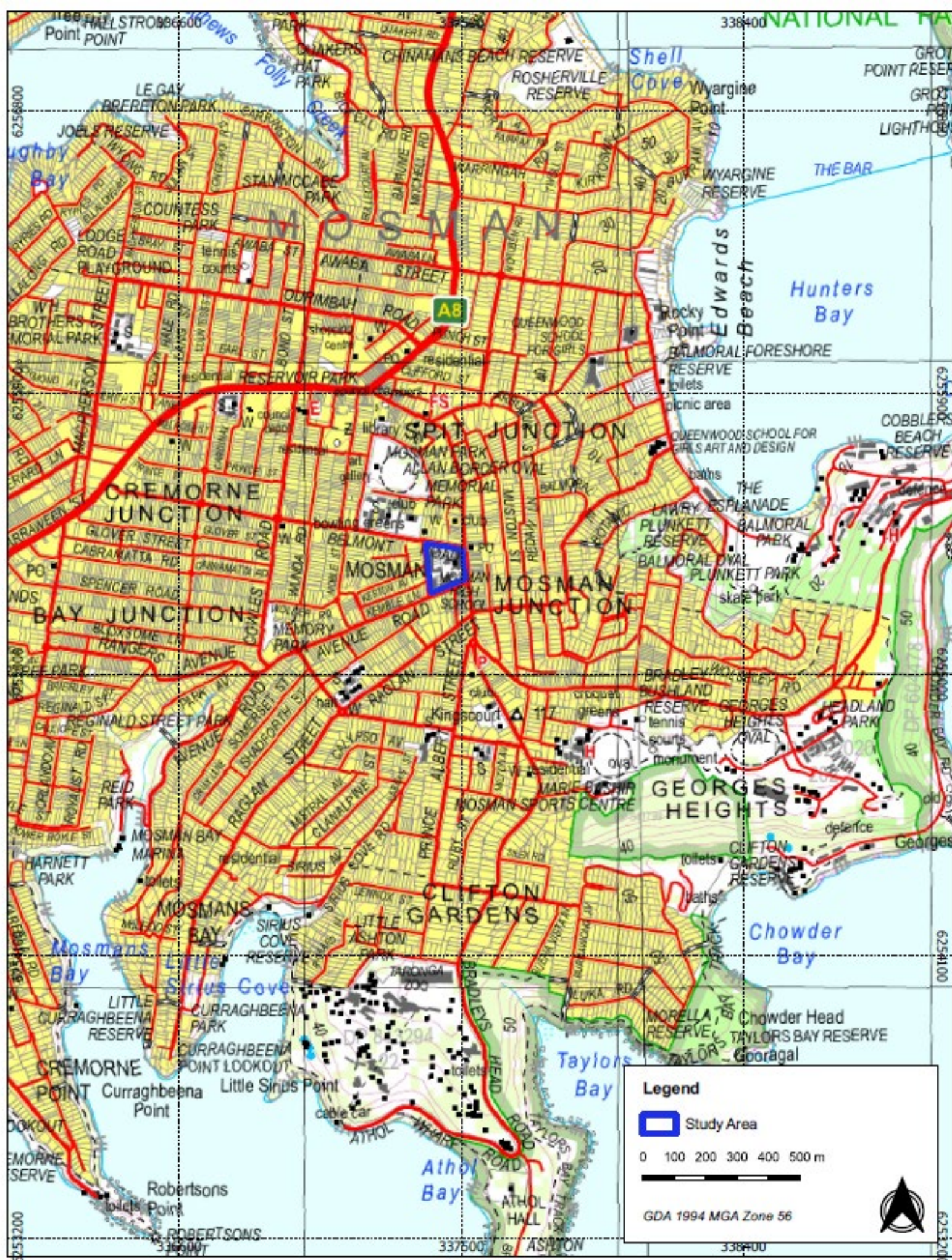


Figure 1.1 Location of the Study Area

Mosman High School ACHA



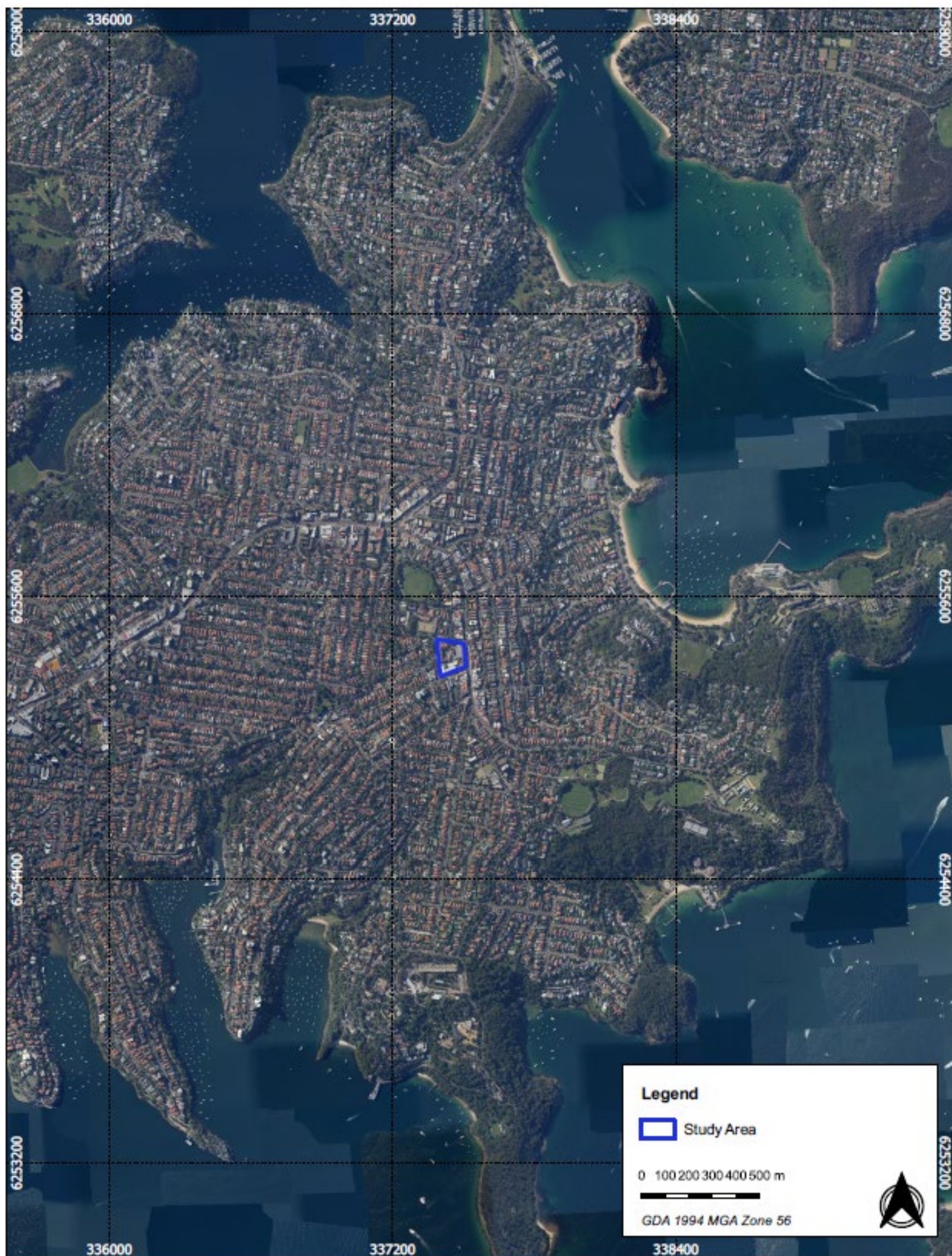


Figure 1.2 Aerial imagery of the Study Area and Surrounds
 Mosman High School ACHA

Source: Nearmap

Drawn by: MR Date: 2020-07-29



AUSTRAL
 ARCHAEOLOGY



Figure 1.3 Detailed Aerial Imagery of the Study Area
Mosman High School ACHA

Source: Nearmap

Drawn by: MR Date: 2020-07-29



AUSTRAL
ARCHAEOLOGY

1.2 PROJECT DESCRIPTION

The proposed development within the study area involves the construction of a new school building including associated core infrastructure, new outdoor play areas, roof top play areas and associated landscaping works.

It is understood that the construction works will involve:

- Demolition of Building B, Building C and part Building E;
- Removal of existing sports court and surrounding retaining walls and nominated trees;
- Construction of a new part 3 / part 4 storey building (Building G) on the corner of Military and Belmont Road providing:
 - Administration and staff facilities;
 - Multipurpose gym / hall;
 - Library;
 - Canteen facilities;
 - General and senior learning units;
 - Science learning unit;
 - Health/PE and performing arts unit; and
 - Learning and admin support unit.
- Associated landscaping works including new outdoor play areas, a roof top play space, and rooftop multi-purpose court; and
- Relocation of the main pedestrian entrance to the junction of Military Road and Belmont Road.

The Proposed site plan showing the areas of impact as part of the development is shown in Figure 7.1.

1.3 PREDICTED IMPACT ON THE POTENTIAL ARCHAEOLOGICAL RESOURCE

In accordance with the key aims of the archaeological survey, the Aboriginal archaeological potential of the study area has been determined. The survey has confirmed that the entirety of the study area has been subject to high levels of disturbance caused by continuous development from the late 19th century onwards, associated with the construction of houses and the development of Mosman High School (previously Mosman Public School).

No Aboriginal objects or sites were identified during the archaeological survey, and it was determined that the study area contains low potential for the presence of subsurface Aboriginal cultural material due to the high levels of ground disturbance caused by previous developments.

It is therefore considered that further investigation would not yield material traces that would provide new information on the Aboriginal occupation of the study area. Therefore, further archaeological investigation of the study area is not warranted.

1.4 ASSESSMENT OBJECTIVES

The scope of this ACHA is based on the legal requirements, guidelines and policies of the Heritage NSW of the Department of Planning, Industry and Environment, formerly the Department of Environment, Climate Change and Water (DECCW). The guiding documents for this assessment are the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011) [the Guide to Reporting] and the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW* (DECCW 2010a).

The scope of works includes the following:

- Undertake a literary review of available data, including previous studies/investigations from around the study area.
- Undertake necessary consultation with relevant Government agencies and key local Aboriginal stakeholders.
- Provide adequate documentation to support the EIS.

1.5 FEDERAL AND STATE LEGISLATION

Aboriginal archaeological and cultural heritage assessments in NSW are carried out under the auspices of a range of State and Federal acts, regulations and guidelines. The acts and regulations allow for the management and protection of Aboriginal places and objects, and the guidelines set out best practice for community consultation in accordance with the requirements of the acts.

Table 1.2 to Table 1.5 detail the Australian acts and guidelines which have been identified as being applicable or with the potential to be triggered with regards to the proposed development.

Table 1.2 Federal Acts

Federal Acts:	Applicability and implications
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	<p>This Act has not been triggered, and so does not apply.</p> <ul style="list-style-type: none"> • No sites listed on the National Heritage List (NHL) are present or in close proximity to the study area. • No sites listed on the Commonwealth Heritage List (CHL) are present or in close proximity to the study area.
<i>Aboriginal and Torres Strait Islander Heritage Protection Amendment Act 1987</i>	<p>Applies.</p> <ul style="list-style-type: none"> • This Act provides blanket protection for Aboriginal heritage in circumstances where such protection is not available at the state level. This Act may also override state and territory provisions.

Table 1.3 State Acts

State Acts:	Applicability and implications
<i>Environmental Planning and Assessment Act 1979 (EPA Act)</i>	<p>Applies.</p> <ul style="list-style-type: none"> • This project is being assessed under Part 5 of the EP&A Act.
<i>National Parks and Wildlife Act 1974 (NP&W Act 1974)</i>	<ul style="list-style-type: none"> • Provisions under Section 90 of the NP&W Act do not apply for this project.

Table 1.4 State and Local Planning Instruments

Planning Instruments	Applicability and implications
Local Environmental Plans (LEP)	<p>The following LEP is applicable:</p> <ul style="list-style-type: none"> • <i>Mosman Local Environmental Plan 2012</i>
Development Control Plans (DCP)	<p>The following DCP is applicable:</p> <ul style="list-style-type: none"> • <i>Mosman Development Control Plan 2012</i>

Table 1.5 Aboriginal Community Consultation Guidelines

Guidelines	Applicability and implications
<i>Aboriginal Cultural Heritage Consultation Requirements for Proponents (Consultation Requirements) 2010</i>	The project's SEARs requires consultation to be undertaken in accordance with the consultation requirements.

1.6 SECTION SUMMARY

Aboriginal Places and Objects, both known and unknown, are protected in NSW by State and Federal legislation. As stated above, the present assessment is being conducted under the Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (Department of Environment, Climate Change and Water 2010b) [the Consultation Requirements] and the Guide to Reporting, in respect to the identification of Aboriginal stakeholders. As the proposed work is a State significant project, the procedures under Part 5 of the EP&A Act apply.

Searches of the Australian Heritage Places Inventory (AHPI), the Register of the National Estate (RNE), the National Heritage List and the NSW Heritage Council SHR websites identified no recorded sites within the study area.

At the State level, the works are to be assessed under the EP&A Act. The *Mosman Local Environmental Plan 2012*, produced in accordance with the EP&A Act, makes provision for the protection of Aboriginal heritage, archaeological sites and potential archaeological sites. Still, no places or objects within the study area are recorded in the LEP.

1.7 PROJECT TEAM AND QUALIFICATIONS

This ACHA was prepared by Miles Robson (Senior Archaeologist, Austral) with project management provided by David Marcus (Director, Austral). This report was reviewed by Amanda Atkinson (Director, Austral) for quality assurance purposes.

DAVID MARCUS (B.A. (HONS.) ARCHAEOLOGY, MA. ARCHAEOLOGY)

David has significant experience in both Aboriginal and historical cultural heritage projects. David started his career in archaeology in 2000 and has worked in all roles from field assistant through to project manager. He commenced work for Austral Archaeology in 2010 and has been responsible for all aspects of the day-to-day running of Austral Archaeology. David also has high-level skills in both physical and digital mapping and integration of digital data into GIS. David has completed various Aboriginal archaeological projects and is familiar with the archaeology of the North Shore.

AMANDA ATKINSON (B.A. (ARCH/PALEO), GRAD DIP. ARCH)

Amanda Atkinson is a Director of Austral, who began her archaeological career in Australia in 2008 and has extensive experience as a team leader in environments ranging from small business to large companies. Amanda has a specialist interest in the archaeology of the western arid region of New South Wales. She has led the largest archaeological projects in that area to date, as well as handling consultation with Aboriginal stakeholders on high profile and complex projects across the state. She has worked with hundreds of Aboriginal groups around Australia.

MILES ROBSON (B.A (HONS) ARCHAEOLOGY)

Miles is a Senior Archaeologist who has worked with Austral on various projects since 2013, before being taken on as a full time employee. He specialises in undertaking fieldwork and has a wide range of experience and skills in both Aboriginal and historical archaeology, working on projects in New South Wales, Tasmania and South Australia. Miles is also skilled in GIS mapping, report preparation and undertaking historical research.

1.8 ACKNOWLEDGEMENTS

Austral Archaeology would like to acknowledge the participation of the following people who contributed to the preparation of the report:

- Jonathon Darwen Schools Infrastructure NSW

1.9 ABBREVIATIONS

The following are common abbreviations that are used within this report:

AAR	Aboriginal Archaeological Report
ACHA	Aboriginal Cultural Heritage Assessment
ACHDDA	Aboriginal Cultural Heritage Due Diligence Assessment
AHIMS	Aboriginal Heritage Information Management System
AHPI	Australian Heritage Places Inventory
BOM	Bureau of Meteorology
Burra Charter	Burra Charter: Australia ICOMOS Charter for Places of Cultural Significance 2013
CBD	Central Business District
CHL	Commonwealth Heritage List
CoP	Code of Practice
DA	Development Application
DCP	Development Control Plan
DEC	Department of Environment and Conservation
DPC	Department of Premier and Cabinet
EPA Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environmental Protection and Biodiversity Act 1999
EPI	Environmental Planning Instrument
GSV	Ground Surface Visibility
Heritage Act	<i>Heritage Act 1977</i>
ICOMOS	International Council on Monuments and Sites
IHO	Interim Heritage Order
MLALC	Metropolitan Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
NHL	National Heritage List
NPW Act	National Parks and Wildlife Act 1974
NPSW	National Parks and Wildlife Service
NSW	New South Wales
PAD	Potential Archaeological Deposit
The Proponent	Multiplex on behalf of Schools Infrastructure NSW
RNE	Register of the National Estate
SINSW	Schools Infrastructure NSW
SHI	New South Wales Heritage Office State Heritage Inventory
SHR	New South Wales Heritage Office State Heritage Register

Study Area	Mosman High School (745 Military Road), Mosman, NSW
S90	Section 90 of the NP&W Act

Refer also to the document Heritage Terms and Abbreviations, published by the Heritage Office and available on the website: <http://www.environment.nsw.gov.au/heritage/index.htm>.

Aboriginal Stakeholder Abbreviations:

DNC	Didge Ngunawal Clan
KYWG	Kamilaroi Yankuntjatjara Working Group
MLALC	Metropolitan Local Aboriginal Land Council

2 ARCHAEOLOGICAL CONTEXT

2.1 REGIONAL ABORIGINAL ARCHAEOLOGICAL CONTEXT

Archaeological investigations of the Lower North Shore of Sydney, and in particular the Mosman LGA, have been conducted in direct response to the spread of urban development. The limited ethnographic accounts of early settlers and explorers were once considered the primary source for archaeological enquiry. However, with the recent spread of urban development within the Sydney North Shore environs, archaeological investigations have undergone a corresponding increase.

The major studies which have contributed to our understanding of the Lower North Shore, and those with direct relevance to the study area through their proximity, are outlined below. Reference is made to the main trends garnered from these investigations which serve to provide a broad framework in which to base the current study.

Aboriginal occupation of the Sydney region extends back well into the Pleistocene, or 10,000 years ago. Currently, the oldest date for an archaeological site in the Sydney region is a date of approximately 40,000 years from the Cranebrook Terrace on the Nepean River (V Attenbrow 2010). However most samples dated by geochronology are much more recent being less than 15,000 years old and concentrated in the last 2,500 years (DECCW 2011, p.1). The nature of this human occupation has changed through time according to the environmental conditions and the type of society that existed.

POPULATION AND CONTACT HISTORY

The original inhabitants of Mosman were Aboriginal people of the Borogegal clan. The Borogegal clan were neighbours to the Cammeregall that inhabited the area that is modern day Cammeray, the two populations shared many similar practices. However, it should be noted that clan boundaries were not mapped, and due to the indigenous way of life and beliefs regarding ownership and territory it is difficult if not impossible to ascertain where each group lived exactly (V Attenbrow 2010, pp.29–35, Souter 2012, pp.5–6).

The Borogegal were highly dependent on the harbour, and in the summer months would catch and eat the fish and shellfish that inhabited the area. In the winter months the people would move further inland to stay warm while gathering and hunting the local flora and fauna to survive (Souter 2012, p.11).

Early estimates of the number of Aboriginal people in the Sydney suggest around 3,000 individuals inhabited the area. However, the pre-contact population numbers for the study area are not known and, due to smallpox and influenza epidemics preceding the arrival of European settlers into the region (Attenbrow 2002:21), it is unlikely that the early European explorers were able to successfully grasp the traditional population size. Following the arrival of European settlers in Australia, the Aboriginal people were forced from their lands, destroying the vital relationship between country, culture, custom and ceremonies. This threw the indigenous way of life into turmoil and, coupled with the local aboriginal people avoiding the Europeans, made any estimates of the local population difficult and most likely inaccurate. While Indigenous people belonged to a clan, in day to day life people lived in small bands with numbers starting from a nuclear family unit, all the way up to groups of 50 people. Gatherings were common, but were usually reserved for important business, such as initiations or funerals (V Attenbrow 2010, pp.28–30).

The first observations of the Aboriginal people of the Mosman area is an encounter between Captain Hunter, Lieutenant Bradley and Henry Waterhouse on 28th January, 1788:

“On a point of land in the lower part of the harbour between Middle Head and Bradley Point we saw several of the Natives on the upper part of the rocks, who made great noise and waved to us to come on shore; there being a great surf we could not land at the Point we wished, which they observing, pointed to the best place to land and came down unarmed to meet us... On our landing we observed some women at the place the men down from, they would not come near us, but peered from behind rocks and trees. When the boats set off, the men began dancing and laughing and when we were far enough off to bring the place the women were at in sight, they held their arms extended over their heads, got on their legs and danced til we were some distance, then follows us upon the rocks as far as the boats went along that shore” (Cobley 1962).

This landing place was probably Chowder Bay, approximately 3 kilometres east of the study area (Australian Museum Business Services 2005, p.44).

In April 1789 an outbreak of smallpox, decimated the Aboriginal population in the Sydney region, as the traditional owners had no immunity against the disease. (Souter 2012, p.11). The survivors were pushed out to the rugged and undevelopable areas of the suburb and by the 1870s, the last of the Borogegal had passed away or left the Mosman area (Carroll 1963, p.5).

There are historical observations of the effects of smallpox on the Aboriginal population in the local region. Governor Phillip informed the Secretary of State that as best he could determine, approximately half of the population had died as a result and that:

"As the natives always retired from the area where the disorder appeared, and which some must have carried with them, it must have spread to a considerable distance, as well inland as along the coast. We have seen traces of it where ever we have been." (Collins 1795, p.52).

At North Harbour, approximately 4 kilometres north of the study area, Collins wrote that:

"At that time a Native was living with us...and on out taking him down to the harbour to look for his former companions, those who witness his expression and agony can never forget either. He looked anxiously around him in the different coves we visited; not a vestige upon the sand was to be found of human foot; the excavations in the rock filled with putrid bodies of those who had fallen victims of the disorder; not a living person was any where to be met with. It seemed as if, flying from the contagion, they had left the dead to bury the dead. He lifted up his hands and eyes in silent agony for sometime; at last he exclaimed 'All dead, All dead'" (Collins 1795, p.52).

This ethnohistory should be employed with caution and Hiscock has recently argued that even very early historical accounts may not be a suitable basis for analogy (Hiscock 2008). As Aboriginal groups had to change their economic, cultural and political practices in order to cope with the social impacts of disease in the historic period, he argues that it is likely that similar drastic changes happened in the past in response to "altered cultural and environmental circumstances" following the arrival of Europeans. Social disruption in the Port Jackson region caused by European settlement pushing Aboriginal people to the fringes of their traditional lands would have caused such drastic changes.

MATERIAL CULTURE

The material culture of the Aboriginal people of the Port Jackson region at the time of European contact was diverse, and utilised materials derived from a variety of plants, birds and animals, as well as stone. Below is only a short summary of the types of material known to have been used by the Aboriginal people of the Port Jackson region.

Fishing tools used by the local population included three or four pronged spears, which were used by the men in shallow waters, from bark canoes, and from rock platforms around the shores. Spears were usually made of a grasstree spike (for the shaft) with a hardwood point. Stone, bone, shell or wood were sometimes used as barbs. In contrast to the men, women used hooks and lines in bark canoes (2005, p.34).

Collins, in his account of the Port Jackson area, provides a description of the hunting spears used by the local Aboriginal population. This included a spear with only one prong, which, according to Collins, was sometimes simply pointed or had one or more barbs. Collins goes on to state that the sharp end of some spears was manufactured from very hard wood two or three foot long and tapered to a point (Collins 1795, p.143). Some hunting spear barbs were shaped from a solid piece of wood of which the prong was made or were fastened on with gum from trees. Barbs were also made from sharpened bone, kangaroo teeth and shell (Collins 1795, p.143). Tench also provides a description of the use of spears in the Port Jackson area:

"The fish-gigs and spears are commonly (but not universally) made of the long spiral shoot, which arises from the top of the yellow gum-tree, and bears the flower: the former have several prongs, barbed with the bone of kangaroo ..." (Tench 1793).

Bark of various types were used for making such diverse items as wrappings for new-born babies, shelters, canoes, paddles, shields and torches. Resin from the grasstree was used as an adhesive for tool and weapon making. Similarly, 'Boomerang' is believed to be a Darug word. Various kinds of boomerangs and clubs were made from hardwoods as were such items as digging sticks (V Attenbrow 2010).

Stone artefacts are often the only physical indication of Aboriginal use of an area. The knapping of stone artefacts can indicate one of two things, the knapping of stone to create tools and the discard of these tools once they have been used, or sometimes both. The knapping of stone creates a large amount of stone debris in very little time. Large knapping events tend to occur in proximity to sources of permanent water (Jo McDonald Cultural Heritage Management. 2005). This is probably because the availability and resources made these good places to camp for short periods of time. Small scale knapping events can occur anywhere in the landscape and are associated with the manufacture or maintenance of stone tools as a direct result of a specific need. This implies that locations of sites away from water courses will be more diffuse.

Stone was commonly used for tools and, apart from discarded shell in coastal middens, is the most common material found in archaeological sites of the Sydney region. Stone or stone tools were used for axe heads, spear barbs and as woodworking tools, amongst other things (Australian Museum Business Services 2005, p.36).

Small items such as shellfish and plant foods, such as berries, yams and nectar-bearing blossoms, were collected and carried in net bags or baskets. The principal pieces of equipment required for gathering plant food was a wooden digging stick used by women to dig out root vegetables such as fern roots, bulbs from numerous orchid species, and tubers from a variety of vines (Australian Museum Business Services 2005, p.36).

Shell implements found in archaeological sites in the Port Jackson area comprise of fish hooks, scrapers and shell hafted onto the ends of spear throwers. Fish hooks are the most common shell implement found in sites in the Port Jackson region, and are found most commonly around bays and estuaries. Fish hooks in the Port Jackson area have been recovered from shell middens excavated at Mosman, Hunters Hill, North Head and Woollahra Point (Australian Museum Business Services 2005, p.36). The fish hooks from the archaeological record are mostly made from the Turban shell (*Turbo torquata*), and are only found in stratigraphic levels dating back to around 900 years ago, indicating a relatively recent introduction of shell fish hooks in the Sydney coastal zone (Australian Museum Business Services 2005, p.36).

Bone implements were also utilised by the local Aboriginal population of the Port Jackson area. The most frequently found bone implements are generally referred to as bone points. They are mostly identified in coastal shell middens, however have also been found in hinterland rockshelter deposits. In the coastal Sydney region, they have been found in excavated sites dating up to 3000 years old (Val Attenbrow 2010, p.99).

From about 1,600 year ago, Bondi points and geometric microliths began to drop out of use in the coastal parts of the Sydney region, although the Elouera continued to be used. This is known as the *Late Bondaian* phase. In coastal areas, and possibly through the Sydney Basin, both the use of quartz and the use of the bipolar flaking technique increased through time (V Attenbrow 2010).

FOOD

A range of land mammals were hunted for food, including kangaroos, possums, wombats and echidnas as well as native rats and mice. Birds, such as the mutton bird and brush turkey were eaten and it is recorded that eggs were a favourite food of the Aboriginal people (V Attenbrow 2010).

Resources would have been mostly obtained from the sea, including fish, eels, seas, turtles, beached whales and shellfish. Shellfish were available both in rocky shore and freshwater contexts.

The vast estuaries of Port Jackson as well as the freshwater tributaries within the Catchment contains a great range of variation in their inter-tidal and non-tidal shorelines, including extensive rock platforms, sandy beaches and mudflats as well as mangrove forests and seagrass beds. These diverse habitats are feeding grounds for a wide range of fish, shellfish and marine mammals. Most bird and land animals that would have been present in the Port Jackson area, would have been found across the study area. These include kangaroos, wallabies, possums, gliders, bandicoots, wombats, quolls, fruit bats, echidnas, native rats, snakes and goannas (DECCW 2011, p.12). The presence of particular animal species and their abundance in a specific area would have been influenced greatly by the vegetation type.

Fishing was most often described as the main food source of the Aboriginal people of the Port Jackson region. A large number of fish species are known to inhabit Port Jackson and its tributaries and adjacent ocean coastline. In 1788, the coast and harbours were described as being well stocked with a variety of fish. Tench described the range of fish being 'from a whale to a gudgeon', mentioning 'sharks of monstrous size, rock-cod, grey mullet, bream, mackerel and john-dory and innumerable others unknown in Europe', as well as bass, leather-jacket and snapper (Tench 1793). Tench's description of the subsistence practices of the Borogegal clan is thus:

"Wholly depend for food on the few fruits they gather; roots they dig up in swamps; the fish they pick up along the shore, or contrive to strike from their canoes with spears. Fishing, indeed, seems to engross nearly the whole of their time, probably from its forming the chief part of subsistence ..." (Flannery 1996, p.72).

The subsistence practices of the local Aboriginal population in Mosman was further documented by Bradley a year earlier in 1788:

"For a Considerable time after our arrival it was supposed that the food of the Natives was entirely fish, but the winter convinced us, that if they had not had some other resource great numbers of them must perish, as it is they are very hard to push to it when the Fish is scarce; There is no doubt but they lay wait for the kangaroo [sic] & Birds, many of the trees are notch'd that has not had a Canoe taken from them which I suppose they get into these Trees to seek or wait for any thing that may come in their way" (Bradley 1788).

Large marine mammals, such as whales, seals and dolphins, were also common in the Port Jackson area. Historical records show that beached whales were eaten on such occasions, with a large number of people gathering to feast on it. Possible seal bones were among the faunal remains recovered from the archaeological excavations of a rock shelter site at Balmoral Beach, approximately 800 metres east of the study area (Val Attenbrow 2010, p.66). Within the same site, possums were the most abundant land animal remains, while dingo bones were also recovered.

Attenbrow has noted that "Sydney vegetation communities include over 200 species that have edible parts, such as seeds, fruits, tubers/roots/rhizomes, leaves, flowers and nectar (V Attenbrow 2010). Observations from the earliest European settlers describe Aboriginal people in the Sydney region roasting fern-roots, eating small fruits the size of a cherry as well as a type of nut and the root of "a species of the orchid" amongst other types of plant food. As Attenbrow points out, however, the settlers' lack of knowledge of the local plant species make identification of the various plants used difficult (V Attenbrow 2010).

The Mosman area would have contained many plants that offered a wide range of nutritious foods. Many fruits and berries were noted as the Europeans arriving in 1788 got to know the foods eaten by the people around Port Jackson:

"...several fruits peculiar to the country were now in season, that which was supposed to be the fruit Captain Cook calls a cherry, the natives call mizoboore, the taste of it is insipid, and it differs from another fruit similar in appearance, but something smaller and which, as well as the former, is found in great abundance" (Bradley 1788, p.122).

EARLY ARCHAEOLOGICAL MODELS

Early settlement models focused on seasonal mobility, with the exploitation of inland resources being sought once local ones become less abundant. These principles were adopted by Foley (Foley 1981) who developed a site distribution model for forager settlement patterns. This model identifies two distinctive types of hunter and gather settlements; 'residential base camps' and 'activities areas'. Residential base camps are predominately found located in close proximity to a reliable source of permanent water and shelter. From this point the surrounding landscape is explored and local resources gathered. This is reflected in the archaeological record, with high density artefact scatters being associated with camp bases, while low density and isolated artefacts are related to the travelling routes and activity areas (Foley 1981).

The model suggests that people would reside in one general location or locations, probably in proximity to a good source of permanent water and with shelter from the elements, and travel throughout the local landscape to gather resources at known locations. The right hand side of Figure 2.1 shows how this settlement pattern would look in terms of artefact discard. The majority of artefacts are deposited in proximity to the residential base camp, fewer at the various resource locations and a generally low amount throughout the rest of the landscape, mainly while travelling between activity areas and the base camp. The model however, does not take into account the use of more than one base camp in an area or changing preferences of camping areas over time; nor does it account for the movement of resources over time.

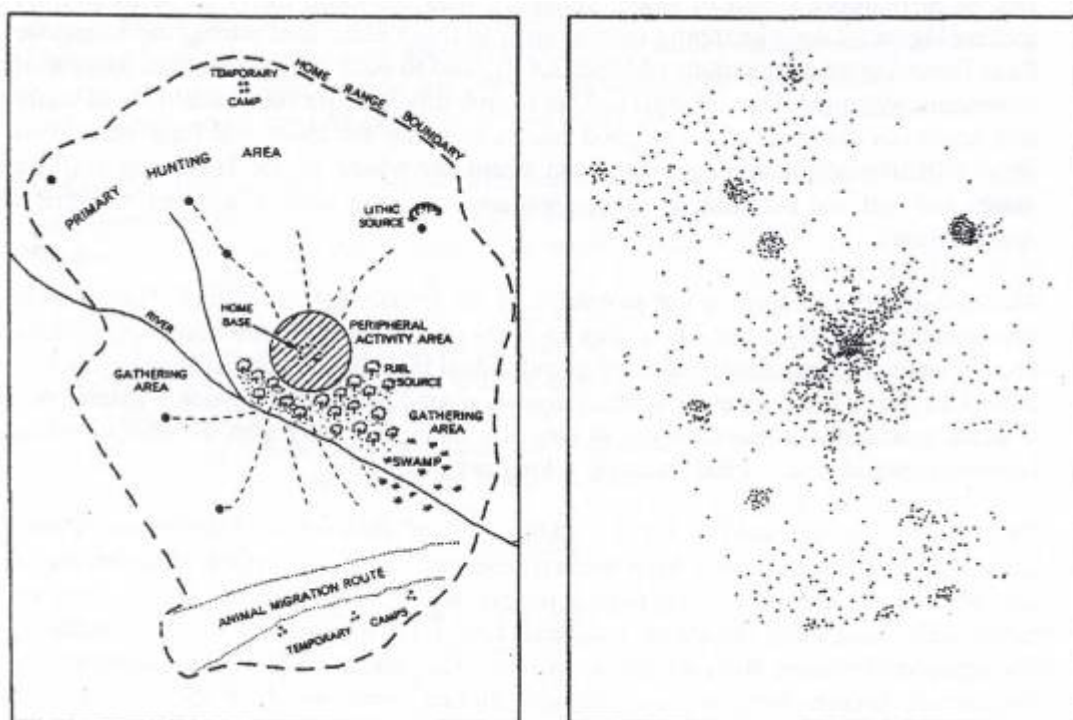


Figure 2.1 Foraging Model (Foley 1981)

However, more recently, investigation into understanding the impacts of various episodes of occupation on the archaeological record has been explored, of which single or repeated events are being identified. This is often a complex process to establish, specifically within predictive models as land use and disturbance can often result in post depositional processes and the superimposition of archaeological materials by repeated episodes of occupation.

The principles behind this model have been incorporated into other predictive models such as that of McBryde (McBryde 1978). McBryde's model is centred on the utilisation of food resources as a contributor to settlement patterns, specifically with reference to the predictability and reliability of food resources for Aboriginal people within the immediate coastal fringe and/or hinterland zone, with migratory behaviour being a possibility. Resources such as certain species of animals, particularly; small marsupials and reptiles, plant resources and nesting seabirds may have been exploited or only available on a seasonal or intermittent basis. As such, archaeological sites which represent these activities whilst not being representative of permanent occupation may be representative of brief, possibly repeated occupation.

LATER WORK

More recently McDonald has argued that environmental factors, such as stream order, were integral to developing a predictive model for the Sydney Basin (McDonald 1997a). Stream order modelling as a predictive tool can be utilised to anticipate the potential for Aboriginal camp site locations in the landscape based on the order of water permanence. McDonald (McDonald 1997a, McDonald 1997b, McDonald 1999) in particular, has drawn on stream order modelling in order to forecast the potential nature and complexity of sites in the Sydney Basin. These models can also be used to predict the possible range of activities carried out at a particular site and the frequency and/or duration of occupation.

Analysing stream order can allow researchers to locate areas of water permanence, which would have been vital for Aboriginal people. Abundant food and other resources are more likely to occur in areas of water permanence which would in turn attract Aboriginal occupation. McDonald's excavations of open artefact scatter sites at the ADI site in St Marys provided evidence of such a correlation (McDonald 1997b).

According to McDonald, the range of lithic activities and the complexity of the resulting stone assemblage observed at a location of permanent water also differ depending on stream order (McDonald 2000). This is probably because the availability and resources made these good places to camp for short periods of time. Small scale knapping events can occur anywhere in the landscape and are usually associated with the manufacture or maintenance of stone tools as a direct result of a specific need. This implies that locations of sites away from water courses will often be more diffuse.

Overall, artefact scatters in the vicinity of a higher order ranking streams reflect a greater range of activities (e.g. tool use, manufacture and maintenance, food processing and quarrying) than those located on lower order streams. Temporary or casual occupation of a site, reflected by an isolated knapping floor or tool discard, are more likely to occur on smaller, more temporary water courses (McDonald 1997a).

It is therefore possible, McDonald concluded, that stream order modelling could be utilised to make general predictions about the location and nature of Aboriginal sites in the Sydney Basin. Water permanence (i.e. stream order), landscape unit (i.e. hill top, creek flat) as well as the proximity to artefact raw materials can result in variations in the density and complexity of an Aboriginal archaeological feature (McDonald 1997a, McDonald 2000). Site location and duration of occupation predictions therefore relate to stream order in the following ways:

- In the headwaters of upper tributaries (i.e. first order creeks) archaeological evidence will be sparse and represent little more than a background scatter.
- In the middle reaches of minor tributaries (second order creeks) archaeological evidence will be sparse but indicate focussed activity (e.g. one-off camp locations, single episode knapping floors).
- In the lower reaches of tributary creeks (third order creeks) will be archaeological evidence for more frequent occupation. This will include repeated occupation by small groups, knapping floors (perhaps used and re-used), and evidence of more concentrated activities.
- On major creek lines and rivers (fourth order) archaeological evidence will indicate more permanent or repeated occupation. Sites will be complex, with a range of lithic activities represented, and may even be stratified.
- Creek junctions may provide foci for site activity; the size of the confluence (in terms of stream ranking nodes) could be expected to influence the size of the site;

- Ridge top locations between drainage lines will usually contain limited archaeological evidence although isolated knapping floors or other forms of one-off occupation may be in evidence in such a location (McDonald 2000).

This predictive model has been refined with focus on the dominant environment and landscape zones of the Cumberland Lowlands, such as the Wianamatta Group Shales, Hawksbury Sandstone, Quaternary alluvium, Quaternary Aeolian and Tertiary alluvium. Attenbrow (V Attenbrow 2010) discovered that the Quaternary alluvial deposits had a greater concentration of archaeological sites, which is likely the result of these deposits being located towards major creek lines and rivers, such as Eastern Creek, Second Ponds Creek etc. Areas of alluvial deposits were found by Kohen (Kohen 1993) to contain artefact scatters of a large and complex nature the closer they were to permanent creeks.

Umwelt (Umwelt 2004) have identified similar environmental and archaeological relationships which contribute to the mapping and modelling of archaeological sites of the Sydney coastal region. This includes:

- The pattern of watercourses and other landscape features such as ridge lines affected the ease with which people could move through the landscape.
- Certain landscape features such as crests or gently sloping, well-drained landforms influenced the location of camping places or vantage points that provided outlooks across the countryside.
- The morphology of different watercourses affected the persistence of water in dry periods and the diversity of aquatic resources and so influenced where, and for how long, people could camp or procure food.
- The distribution of rock outcrops affected the availability of raw materials for flakes and ground stone tools.
- The association of alluvial, colluvial and stable landforms affects the potential that sites will survive.
- European land-use practices affect the potential for site survival and/or the capacity for sites to retain enough information for us to interpret the types of activities that took place at a specific location.

2.2 HERITAGE DATABASE SEARCH RESULTS

A search of Heritage NSW AHIMS database was undertaken on 27 July 2020 (Client Service ID 523096). The results from the AHIMS search identified 46 previously recorded sites within a 1.5 kilometre radius of the study area (Figure 2.2, Figure 2.3, **Table 2.1** and **Table 2.2**). None of these registered sites were located within the boundaries of the study area.

Table 2.1 Summary of Site Types Recorded within a 1.5 kilometre Radius of the Study Area

Site feature(s)	Occurrence	Frequency (%)
Artefact & Shell Midden	18	39.1
Art (Pigment or Engraved)	17	37.0
Art, Shell Midden & Artefact	3	6.5
Habitation Structure & Earth Mound	2	4.3
Potential Archaeological Deposit (PAD)	2	4.3
Art, Shell Midden, Artefact & Burial	1	2.2
Artefact, Shell Midden & Burial	1	2.2
Habitation Structure	1	2.2
Habitation Structure & Shell Midden	1	2.2
Total	46	100

As shown in the table, the majority of sites identified in the vicinity of the study area relate to shell middens (52%, n=24), which are predominantly identified along the Mosman shoreline. The second most frequent site type relate to rock art (46%, n=21), which includes both pigment sites located in rockshelters or engraved sites on sandstone exposures. Rock shelters are again predominantly located along the shoreline, where sandstone overhangs are present which are suitable for occupation. As such, over 98% of identified sites are found in coastal landforms, which discludes the study area. It is noted that the closed recorded site to the study area are rock art sites, located approximately 250 metres north-east and south-west of the study area. However, rock engravings require the presence of sandstone exposures, and there are no suitable outcroppings of sandstone present within the study area.

OTHER HERITAGE REGISTER SEARCH RESULTS

Searches of the AHPI, the RNE and the SHR were undertaken and did not identify any recorded Aboriginal Objects or Places in or around the development area. No Aboriginal objects or places are listed as significant in the *Mosman Local Environmental Plan 2012*.

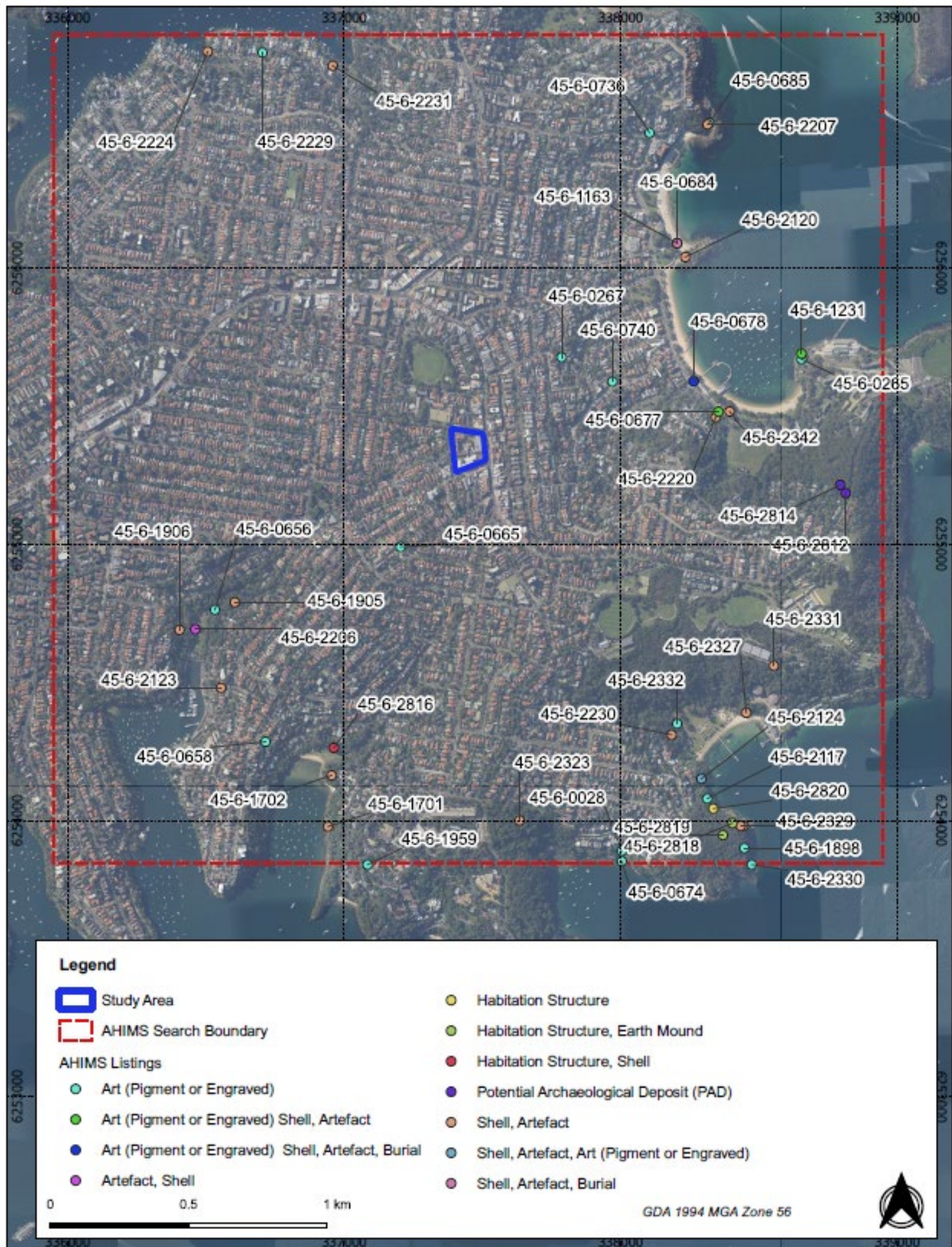


Figure 2.2 AHIMS Sites within 1.5 kilometres of the Study Area

Mosman High School ACHA





Figure 2.3 AHIMS Sites nearby the Study Area
 Mosman High School ACHA

2.3 PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Although European observers recorded various aspects of the lifestyles of Aboriginal people throughout the Port Jackson region from the beginning of European settlement of the area in the late 18th century, it was not until the 20th century that archaeological investigations of Aboriginal archaeological sites were undertaken.

Since then, archaeological sites have been frequently recorded across the region, and hundreds have been excavated. Most commonly, these contain artefact and shell midden sites and engraved or pigmented images within rockshelters.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS IN THE LOCAL REGION

Table 2.2 below outlines the details and results of some relevant archaeological consultant's reports from the region.

Table 2.2 A Summary of Archaeological Consultant Reports from the Region

Reference	Study area location/ description	Results	Site distribution/ Conclusions
(Rich 1985)	Archaeological survey and assessment at Bradleys Bushland Reserve, approximately 1 kilometre southeast of the study area.	The survey covered an area of 1.4 hectares on the upper slopes of a ridgeline. Sandstone exposures occurred within the study area, no engravings or shelter formations suitable for habitation were observed.	The site did not note any archaeological constraints of the study area.
(Morris 1986)	Archaeological survey of north side of Port Jackson	The investigation involved a study of site type distribution on the northern side of Port Jackson. Sample areas of 0.25km ² were surveyed. Four of these sample areas were within the Mosman LGA, at Sirius Park, Rosherville Reserve, Bradleys Head West and Georges Head. Four Aboriginal sites were recorded, a shelter with midden and an open midden were recorded at Sirius Park and two shelters with middens were recorded at Georges Head.	It was recommended that further archaeological investigations take place in order to accurately determine the extent of each site recorded in the Mosman LGA.
(Koettig 1986)	Archaeological survey at Chowder Bay and Georges Head	The study area was heavily vegetated and no engravings were recorded during the survey. Two Aboriginal sites were recorded, including a shelter with potential occupation deposit and a drawing of a macropod above the shoreline at Georges Head.	The archaeological extent and significance of the study area could not be definitively determined due to the overgrowth of vegetation.

Reference	Study area location/ description	Results	Site distribution/ Conclusions
(Smith 1987)	Survey of bushland at HMAS Penguin, Middle Head, approximately 1.5 kilometres east of the study area.	Survey of 3.9 hectares of land to the south of Balmoral Beach. A shelter with a potential occupation deposits was recorded.	It was noted in the report that the farm established for 'King Bungaree' may have extended into the study area and suggesting that the study area should be regarded as highly significant.
(Rich 1988)	Archaeological survey at Beauty Point Sensory Foreshore Walk, approximately 2 kilometres north of the study area	Much of the study area consisted of reclaimed land and no Aboriginal sites were identified.	No further archaeological investigations were recommended.
(Haglund & Rich 1988)	Analysis of Aboriginal occupation for a Mosman Heritage Study	This study consisted of a literature review of known Aboriginal sites in the Mosman LGA. 21 Aboriginal sites were identified in the study. The report noted that 3 of the 21 sites had been destroyed, and there was not enough information available on the remaining sites to assess them.	Recommendations included that of the 18 remaining sites be re-recorded and areas of bushland be targeted for systematic survey to assess whether new sites could be identified.
(Koettig 1991)	Heritage study of Aboriginal sites within the Mosman LGA	Following recommendations outlined by Haglund and Rich (1988) as above, this study involved the inspection of recorded sites and survey of a number of sites in the Mosman LGA. At the end of Koettig's study, there were 77 recorded sites within the LGA. Of these, 61% were shelters, 21% were open middens and 18% were engraving sites.	Recommendations included that the sites be preserved and protected from proposed development and that adequate investigations occur in areas that are to be destroyed. It was also recommended that representative samples of sites be preserved and appropriate mitigation works implemented to prevent further deterioration of Aboriginal sites.

Reference	Study area location/ description	Results	Site distribution/ Conclusions
(Attenbrow 1991)	Port Jackson Archaeological Project, Stage 1: A study of the prehistory of the Port Jackson catchment.	This study involved an analysis of the distribution of 335 midden sites and 34 deposits within the Port Jackson catchment area. The study also involved site relocation and recording, some of which was in the Mosman LGA. It was found that shell middens only occur in sub-catchments that have ocean and estuarine zones, while archaeological deposits occur more frequently in freshwater zones. It was also found that the majority of recorded sites were located on Hawkesbury Sandstone and were associated with estuarine or ocean zones.	The results of this study were compared with results from studies of undeveloped areas north of the Hawkesbury River. Comparisons of the results led to suggestions that the general trends in the distribution of recorded sites with midden/ archaeological deposits within the Port Jackson catchment reflect the original distribution of sites in the area, that is 'more middens and deposits along the shores than on the slopes, and very few on the ridgetops.
(Attenbrow 1992)	Archaeological excavation of a rockshelter at the southern end of Balmoral Beach, Mosman, approximately 800 metres east of the study area	Excavation of the midden revealed a deep deposit with abundant stone artefacts and animal remains as well as hearths. The existing shell deposit extends to a depth of 2 metres. Radiocarbon dating from the uppermost undisturbed deposit revealed dates of 2,500 years. Shell material was located predominantly in the top 650 millimetres of the deposit. There were 18 different species of shellfish remains identified in the midden deposit.	The site was concluded to hold strong cultural significance within the local area and was one of the most intact midden sites in the Mosman LGA.
(Australian Museum Business Services 1995)	Aboriginal Heritage study of the Mosman LGA	The study analysed several trends related to the distribution of archaeological sites in Mosman. These trends suggest that various places around Mosman were associated with different activities including major campsites and a range of special activity camps, some of which may have had ceremonial purposes.	Numerous management strategies were proposed for the archaeological sites in the region. This included the need for increasing community awareness, monitoring the condition of known sites, erosion stabilisation works of rock art sites and identifying archaeological sites that may need further conservation.

Reference	Study area location/ description	Results	Site distribution/ Conclusions
(Dominic Steel Consulting Archaeology 2005)	Aboriginal archaeological test excavations at the Barn Whaling Station, 3c Avenue Road, Mosman, approximately 2 kilometres south-west of the study area	A total of 135 stone artefacts were recovered from test excavations from a total of 30 test pits	It was concluded that the site represented a highly culturally sensitive site for Aboriginal occupation and it was recommended that certain landforms be preserved in order to retain the original landscape.
(Dominic Steel Consulting Archaeology 2017)	Aboriginal archaeological assessment of Taronga Zoo, Mosman, approximately 1.5 kilometres south of the study area.	The survey did not identify any archaeological sites within the study area.	It was concluded that no specific areas of Aboriginal archaeological sensitivity were located within the study area and that there are no constraints to the proposed development.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS IN THE STUDY AREA

The study area has been subject to only one previous Aboriginal archaeological assessment, which was undertaken by Austral Archaeology in 2019 (Austral Archaeology 2019). Austral prepared an Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) for the study area as part of the current proposed development. This assessment determined that the natural resources and landforms in the vicinity of the study area would not have been favourable for long term Aboriginal occupation. It was stated in the ACHDDA that the study area was located on top of a ridgeline between two larger hills. It was assessed that this was an unlikely place for Indigenous settlement so close to the ocean as strong winds and a general lack of protection from the elements would make the area uncomfortable for much of the year. Conversely, as is the trend in archaeological investigations of the Mosman LGA, it was considered more likely that the Borogegal people sought out caves and rockshelters or sheltered areas behind the ridgelines to live (Austral Archaeology 2019).

Furthermore, while high levels of recent development in the area have removed evidence of past waterways, it was considered unlikely by that there were any large perennial waterways in the area, as any rain would have quickly drained into the harbour. As such, it was determined in the ACHDDA that due to the lack of water sources in the immediate vicinity, the study area would unlikely have been utilised for long term occupation (Austral Archaeology 2019).

The ACHDDA assessed that the study area has experienced a wide range of construction and clearance on the site, with no part of the site left untouched. It was stated that initial land clearing would have highly impacted and destroyed Aboriginal artefacts, and with the level of disturbance evident on the site there is very little likelihood that any remains exist within study area (Austral Archaeology 2019).

3 LANDSCAPE CONTEXT

The natural environment of an area influences not only the availability of local resources, such as food and raw materials for artefacts, but also determines the likely presence and/or absence of various archaeological site types which may be encountered during a field investigation.

Resource distribution and availability is strongly influenced by the environment. The location of different site-types (such as rock-shelters, middens, open camp sites, axe grinding grooves, engravings etc.) are strongly influenced by the nature of soils, the composition of vegetation cover and the climatic characteristics of any given region. Equally important is the range of other associated characteristics which are specific to different land systems and their geology. In turn this affects resource availability of, for example, fresh drinking water, plant and animal foods, raw materials for stone tools, wood and vegetable fibre used for tool production and maintenance.

Therefore, examining the environmental context of an area is essential in accurately assessing potential past Aboriginal land-use practices and/or predicting site types and distribution patterns within any given landscape, cultural or not. The information that is outlined below is applicable for the assessment of site potential of the current study area.

3.1 GEOLOGICAL CONTEXT AND SOIL LANDSCAPE

The study area is located in an area rich in Triassic quartz sandstone, Lithic sandstone and with minor shale and laminite lenses (Mitchell 2002, Hazelton & Tille 1990).

The geology of the area makes the presence of rock types suitable for knapping unlikely. As such, if artefacts are found, the materials are likely to have been brought into the area from nearby quarry sites.

The study area is located in the Gynea (**gy**) soil landscape (Figure 3.2). The Gynea soil landscape is predominantly characterised by undulating to rolling rises and low hills on Hawkesbury Sandstone. This soil landscape consists of a local relief of 20 – 80 metres and slopes of 10-25%. The Gynea soil landscape is also characterised by broad convex crests, moderately inclined sideslopes with wide benches and localised rock outcrop on low broken scarps (Hazelton & Tille 1990, p.76).

The soils associated with the gynea soil landscape are shallow to moderately deep (30-100cm) yellow earths and earthy sands on crests and inside of benches. As the study area is located on a ridge the soil makeup is likely to be **gy1**, a loose, sandy quartz loam with loose, apedal single-grained structure and porous sandy fabric. The colour often becomes lighter with depth and ranges from brownish-black (10YR 2/2), when organic matter is present, to bleached dull yellow-orange (10YR 7/2). It is often water repellent under native vegetation. The pH ranges from strongly acid (pH 4.0) to slightly acid (pH 6.0). Small sandstone and platy ironstone fragments, charcoal fragments and roots are common. Previous archaeological investigations within this soil landscape, within the Mosman district, has demonstrated that the majority of Aboriginal artefactual material is retrieved from **gy1** (Australian Museum Business Services 2005, p.28). This soil is approximately 300 millimetres in thickness and overlies **gy2**, an earthy, yellowish-brown clayey sand. This is commonly yellowish-brown clayey sand with apedal massive structure and porous earthy fabric. It commonly occurs as subsoil over sandstone bedrock (B horizon), however where it is exposed at the surface it forms hardsetting topsoil. The texture of this soil may increase gradually to a light sandy clay loam with depth. The colour is commonly yellowish-brown (10YR 6/8) and orange mottles are occasionally present with depth. The pH ranges from strongly acid (pH 4.0) to slightly acid (pH 6.5). Sandstone and ironstone fragments are common and are often concentrated in stone lines in the upper parts of this material (Hazelton & Tille 1990).

In most circumstances **gy2** overlies **gy3**, a yellow, weakly pedal sandy clay loam which can be up to 300 millimetres in thickness (Hazelton & Tille 1990, p.73). This is commonly a yellowish-brown sandy clay loam to sandy clay with an apedal massive structure and an earthy porous fabric. It usually occurs as subsoil (B or C horizon) on coarse sandstone. Texture is commonly sandy clay loam, but may increase gradually with depth to sandy clay. Occasionally a weakly pedal structure of sub-angular blocky shaped peds are present. Peds are commonly rough-faced and porous and range in size from 5-20 mm. Colour within this soil type is commonly yellowish brown (10YR 5/8, 6/6, 6/8; 2.5Y 5/6, 5/4) while orange mottles may occur with depth. The pH ranges from strongly acid (pH 4.5) to slightly acid (pH 6.0). Strongly weathered sandstone fragments are common, while roots and charcoal fragments are rare within **gy3**. It is rare for Aboriginal archaeological material to be recovered from this soil profile, as has been evidenced in previous archaeological investigations (Australian Museum Business Services 2005, p.28). Soil **gy3** overlies **gy4**, a moderately to strongly pedal, yellowish-brown clay. This is commonly a yellowish-brown sandy clay or light clay with a moderately to strongly pedal structure and either a smooth or roughfaced ped fabric. This material occurs as subsoil on shale bedrock (B and C horizons). Peds ranging in size from 5 mm to 50 mm, are either smooth or rough-faced and are polyhedral to sub-angular blocky. Colour within this soil is commonly yellow-brown (10YR 6/6), but can vary from dark reddish-brown (2.5YR 3/6) to light grey (7.5YR 8/1) with red, orange and grey mottles being occasionally present at depth. The pH ranges from strongly acid (pH 4.0) to slightly acid (pH 6.0). Shale and ironstone fragments are often present, but charcoal fragments are absent and roots are rare (Hazelton & Tille 1990, p.73).

3.2 TOPOGRAPHY AND LANDFORM

As can be seen in Figure 3.4, the study area is located on the top of a ridgeline between two larger hills. This is an unlikely place for Indigenous settlement so close to the ocean. Strong winds and a general lack of protection from the elements would make the area uncomfortable for much of the year (Austral Archaeology 2019, p.4). It is likely that the Borogegal people sought out caves and rockshelters or sheltered areas behind the ridgelines to live. This is evidenced in Figure 2.2, where most sites are concentrated around the edges of the bays where there was food and along small waterways where fresh water could be easily found. In fact, in the Port Jackson archaeological project found that 61% of middens and 80% of archaeological deposits were found in rockshelters, with 0.8% of sites found on ridgetops (V Attenbrow 2010, pp.51–53).

The study area may have been a thoroughfare between Mosman Bay to Hunters Bay or Port Jackson. This is evidenced by Avenue Road and Military Road, which were originally walking tracks and are likely to have followed traditional Aboriginal pathways, as many roads in Australia do. However, evidence of occupation along these routes are likely to consist solely of discarded artefacts or a temporary camp locations.

Due to widespread development, the natural landscape of the area has likely changed. It is difficult to ascertain what the original landscape was like with limited historical sources.

The soil landscape types that exist around the study area are shown in Figure 3.3. The study area and most of wider Mosman is located within the Belrose Coastal Slopes. This landscape is characterised by benched hill slopes and deep valleys of the coast. There is a high proportion of rocky outcrops with discontinuous cliffs up to 5 meters high (Mitchell 2002, pp.118–119). This makes a perfect area for rockshelters, which explains the high density of sites around these areas.

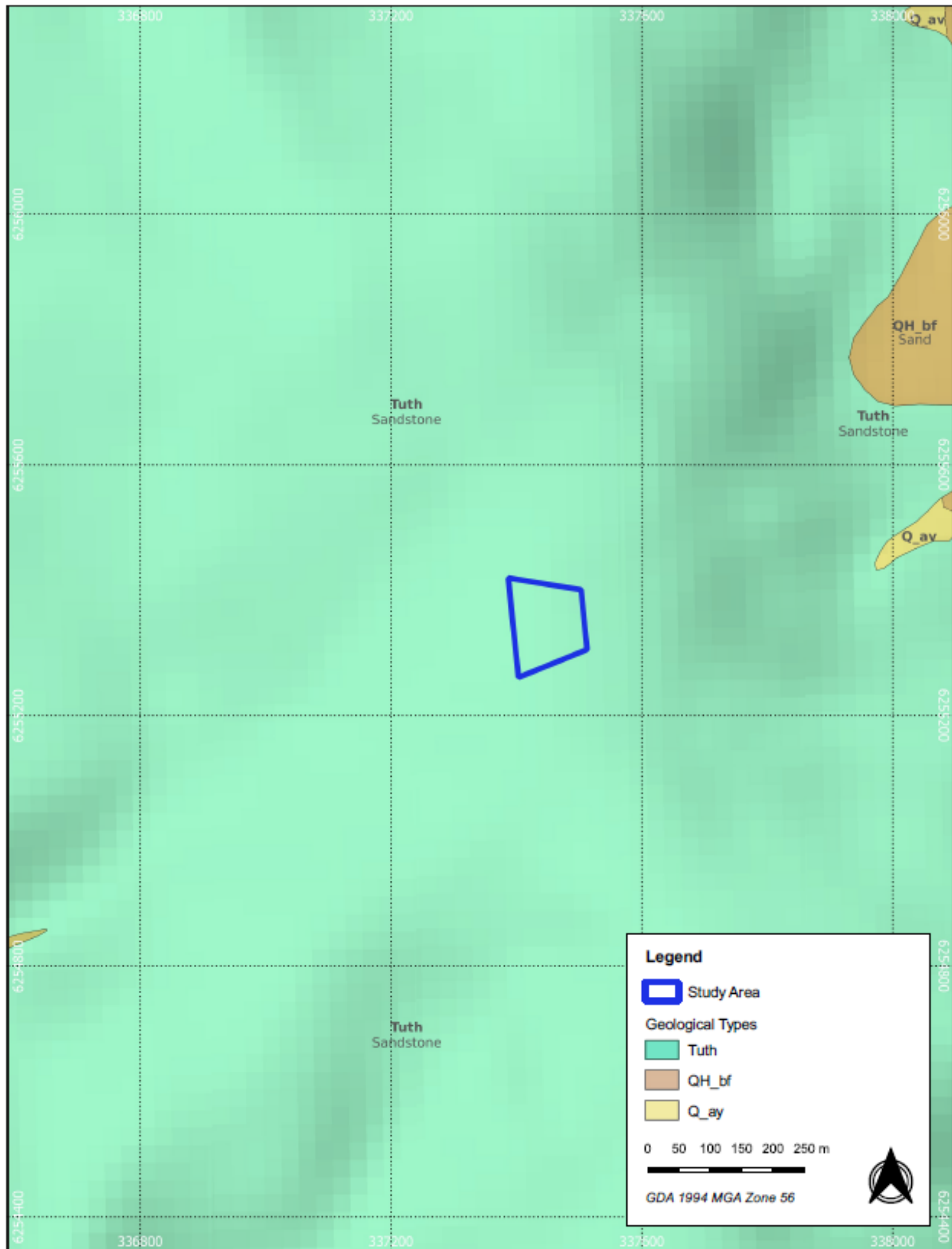


Figure 3.1 Geological Landscapes Associated with the Study Area

Mosman High School ACHA



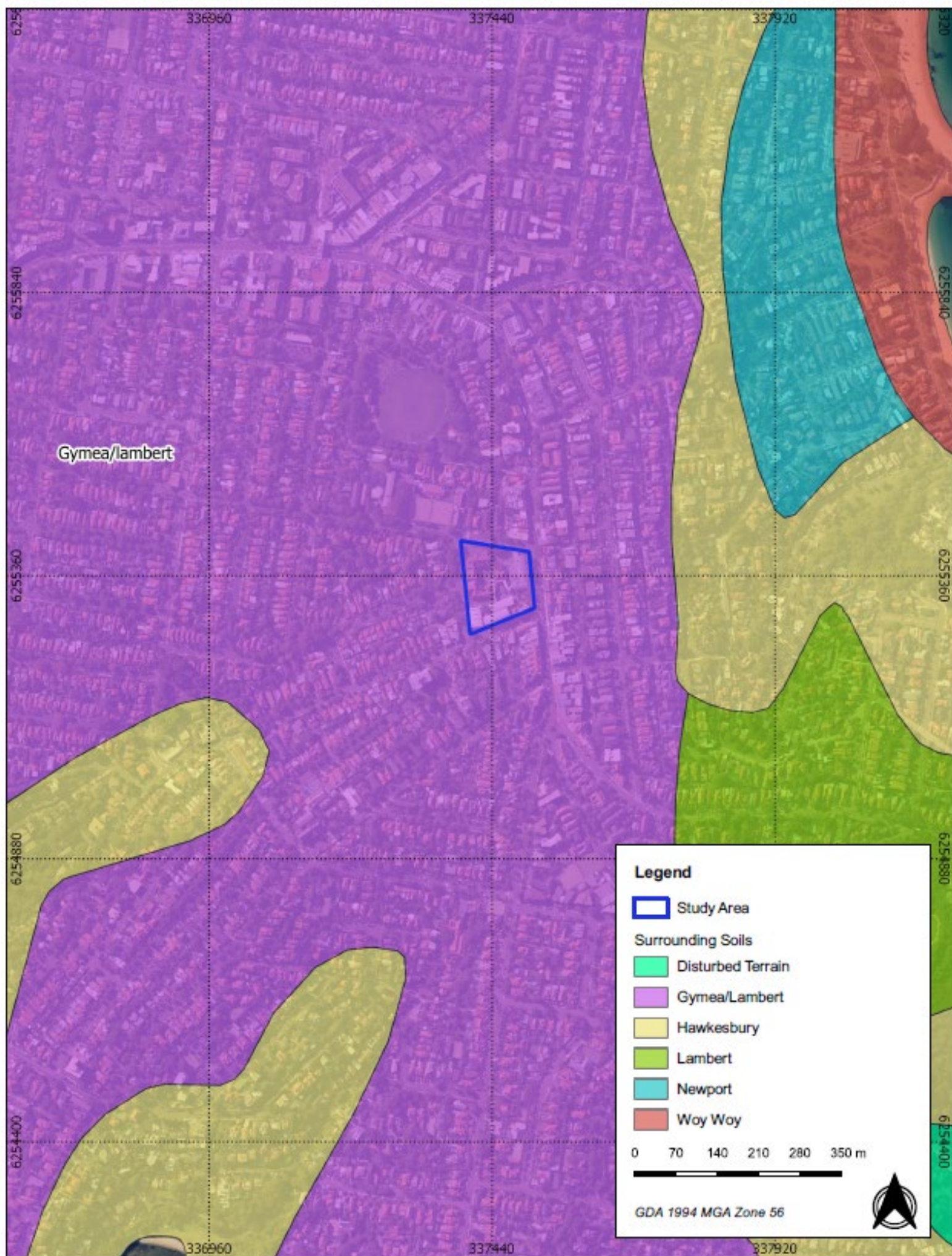


Figure 3.2 Soil Landscapes Associated with the Study Area
 Mosman High School ACHA



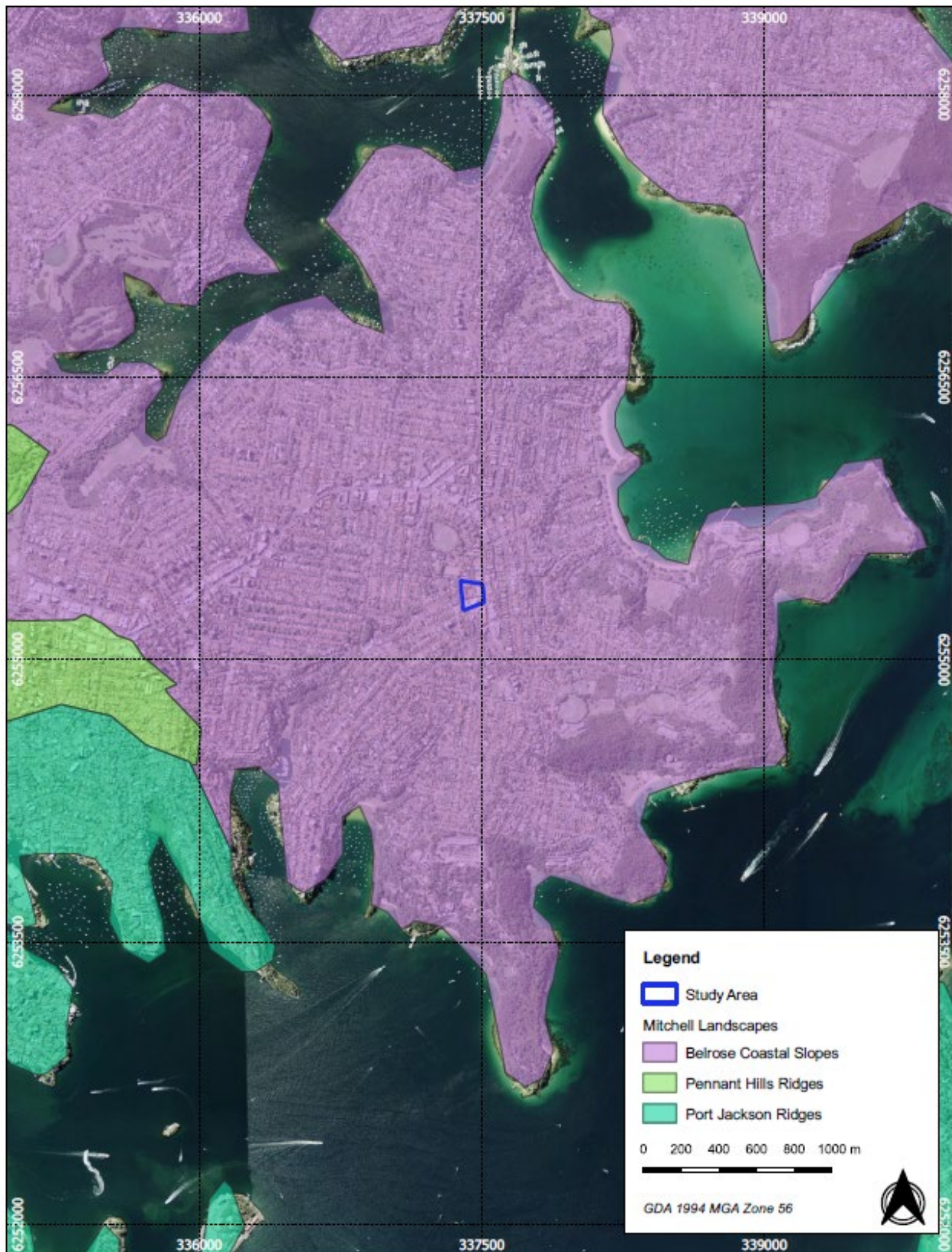


Figure 3.3 Mitchell Landscapes Associated with the Study Area
 Mosman High School ACHA



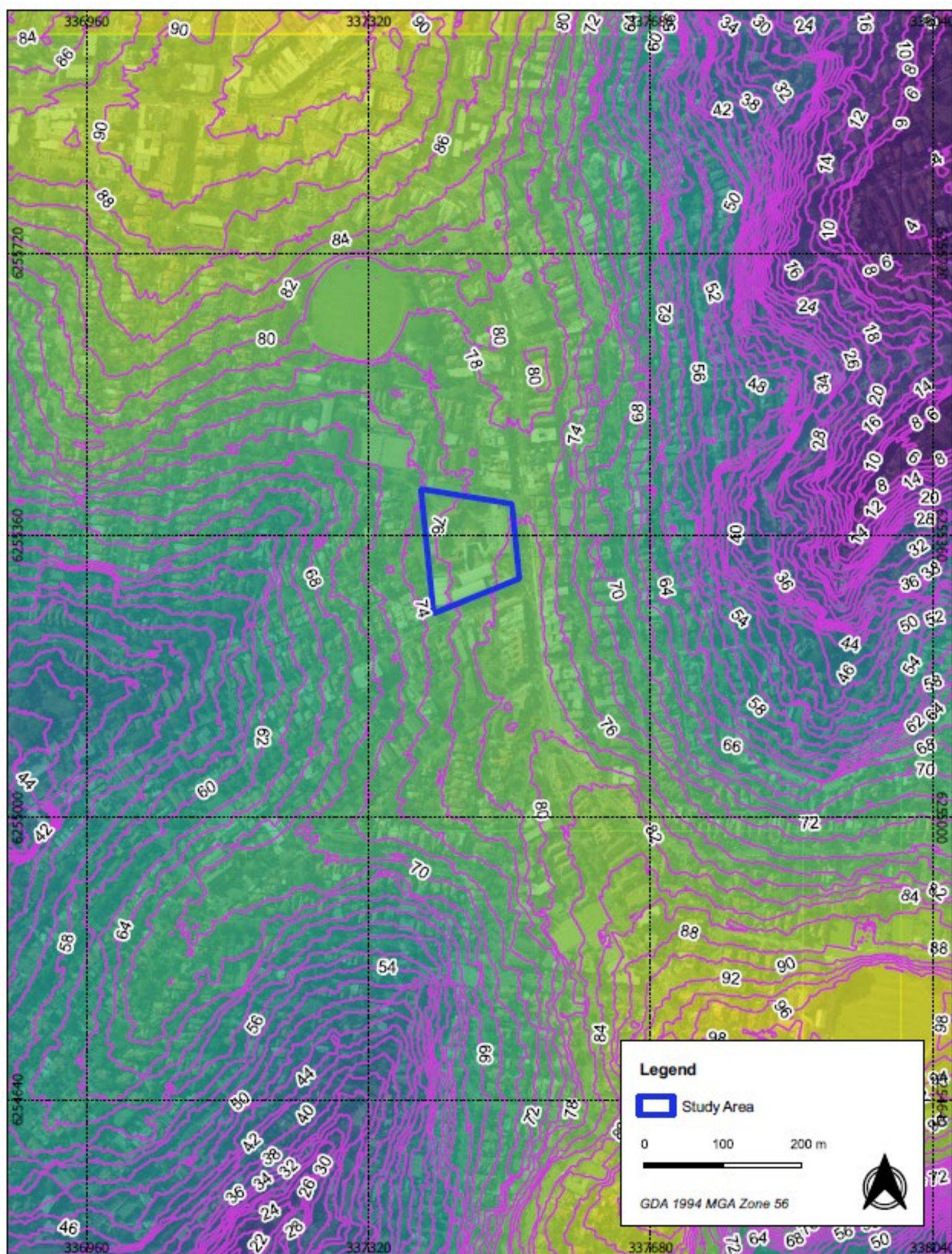


Figure 3.4 AHD Heights associated with the Study Area
 Mosman High School ACHA



3.3 HYDROLOGY

The identified hydrology present in the Mosman area is minimal, as shown in Figure 3.5. This is due to the level of development in the area removing evidence past waterways. It is therefore difficult to determine where any past waterways were and the possibility of occupation associated with them.

Due to the area's small land footprint, it is unlikely that there were any large perennial waterways in the area, as any rain would have quickly drained into the harbour. This is evident in Figure 3.6, which depicts Mosman's Bay Estate in 1871, shortly after the initial development and settlement of Mosman.

The nearest known water source from the study area is the Pacific Ocean, specifically Balmoral Beach which is located approximately 800 metres to the east. Balmoral Beach would have been utilised extensively for fishing and resource gathering. The study area is also located approximately 800-900 metres north of two 1st order tributaries that run off Sirius Cove (Figure 3.5). The nearest permanent freshwater source to the study area are 2nd and 3rd order tributaries running off Lane Cove River, approximately 3-4 kilometres west of the study area.

3.4 CLIMATE

The climate of Mosman is warm temperate with a maritime influence, resulting in cool to mild winters and warm to hot summers. Average temperatures at Mosman range from a summer average of 26.8°C to winter average of 17.0°C, with occasional overnight frosts. Rainfall totals are highest in the autumn, with rain occurring on an average of 88 days per year and with approximately 827 millimetres of rainfall each year (Bureau of Meteorology 2020). The temperate climate and moderate average rainfall would have provided optimum conditions for both temporary and long term Aboriginal occupation of the area.

3.5 FLORA AND FAUNA

The vegetation of Mosman prior to European impact included the sandstone community types called heath, woodland and forest. On the central ridge and the more sandy soil extending down to the harbourside slopes there would have been eucalypt woodland with bangalay (*Eucalyptus botryoides*), Sydney peppermint (*E. piperata*) and the smooth-barked apple (*Angophora costata*). Areas with shallow sandy soils would have been woodland with scribbly gum (*E. haemastoma*), red bloodwood (*E. gummifera*) and Banksia serrata (Australian Museum Business Services 2005).

The Bradley Bushland Reserve in particular preserves a remnant of the heath vegetation which was once common on the exposed sandstone ridges around Sydney. Here large scrubby heath species like heath-leaved banksia (*Banksia ericifolia*), tick bush (*Kunzea ambigua*) and Allocasuarina distyla dominate. The harbourside features a variety of acacia, banksia and leptospermum species. Today much of the wetter areas are heavily invaded by introduced species such as lantana and privet (Australian Museum Business Services 2005).

The native fauna of the Mosman area at the time of European contact can be estimated by studies of nature reserves around the harbour. Within the Sydney Harbour National Park, mammals observed in recent times include possums, flying foxes, long-nosed bandicoots, rats, antechinuses, echidnas and bats. The remains of land animal remains found in Aboriginal archaeological excavations in the Mosman LGA, including a midden in a shelter at Balmoral Beach, shows that kangaroos, wallabies, wombats, koalas and dingos were present in the area in the past (Attenbrow 1992). Approximately 150 species of birds have been recorded within the Sydney Harbour National Park, including great comorant, white based sea eagle, nankeen kestrel, masked lapwing, thornbill, heron, egret and rock warbler. A variety of snakes and lizards are also native within the region, as well as a large number of marine species including sharks, octopuses and migratory whales. Numerous fish species are local to the area, including snapper, trevally, whiting, bream, flounder and flathead (Australian Museum Business Services 2005).

**Table 3.1 Flora present within the vicinity of the Study Area**

Scientific name	Common name
<i>Banksia ericifolia</i>	Heath-leaved banksia
<i>Kunzea ambigua</i>	Tick bush
<i>Allocasuarina distyla</i>	Scrub she-oak
<i>Angophora costata</i>	Sydney Red gum
<i>Eucalyptus botryoides</i>	Bangalay
<i>Eucalyptus piperita</i>	Sydney Peppermint
<i>Angophora costata</i>	Smooth Barked Apple Tree
<i>Eucalyptus haemastoma</i>	Scribbly Gum
<i>Eucalyptus gummifera</i>	Red Bloodwood
<i>Banksia serrata</i>	Old-man banksia
<i>Eucalyptus robusta</i>	Swamp Mahogany
<i>Casuarina glauca</i>	swamp oak
<i>Melaleuca linariifolia</i>	Paperbark
<i>Acacia longifolia</i>	Coastal wattle
<i>Callicoma serratifolia</i>	Black wattle
<i>Allocasuarina littoralis</i>	Black she-oak
<i>Acacia suaveolens</i>	Sweet wattle
<i>Ehrharta erecta</i>	Panic veldtgrass

Table 3.2 Fauna present within the vicinity of the Study Area

Scientific name	Common name
<i>Phyllurus platurus</i>	southern leaf-tailed gecko
<i>Physignathus lesueurii</i>	eastern water dragon
<i>Eulamprus quoyii</i>	eastern water-skink
<i>Chalinolobus gouldi</i>	Gould's wattled bat
<i>Miniopterus schreibersii oceanensis</i>	eastern bentwing-bat
<i>Pseudocheirus peregrinus</i>	common ringtail possum
<i>Pteropus poliocephalus</i>	grey-headed flying-fox
<i>Trichosurus vulpecula</i>	common brushtail possum
<i>Cryptoblepharus virgatus</i>	wall lizard
<i>Perameles nasuta</i>	long-nosed bandicoot
<i>Vombatidae</i>	Wombat
<i>Macropus giganteus</i>	Eastern grey kangaroo
<i>Notamacropus</i>	Wallaby
<i>Phascolarctos cinereus</i>	Koala

3.6 PAST LAND USE PRACTICES

The study area is situated on part of a 30 acre grant of land made to Archibald Mosman in 1838. It is unknown however as to whether any structural development or activities associated with Mosman's grant were undertaken within the boundaries of the study area. Mosman's 30 acre grant was subsequently sold to Mitchell Boyd in 1866 before it was later purchased by Richard Harnett in 1879 (purcell 2019).

The first known development within the study area occurred in the late 1870s and early 1880s when a committee of local residents at Mosman's Bay applied to the Council of Education for the establishment of a school in the locality. The request was approved and during December, 1879, the Council entered into an agreement to purchase land off Harnett (purcell 2019, p.5).

In 1883 the construction of a stone school house and teacher's residence commenced on the site, which was undertaken by contractor J W Eaton. To deal with growing numbers of pupils, additions were made to the building in 1888-89, 1892 and 1897. The school became officially known as Mosman Public School in March 1894 (purcell 2019, p.5).

In 1903, the school's status was upgraded when it became a Superior Public School, abetted by the efforts of the Mosman Progress Association. At the beginning of June that year a library was formally opened at the school. This was followed by the opening of the first stage of a projected four-wing building, for which tenders for construction had been accepted during October, 1903. The building was completed in the middle of September, 1904 and situated on the corner of Military and Avenue Roads, despite appeals from the local community to relocate the school on a site away from the risks associated with dangerous local traffic on Military Road (purcell 2019).

The school became an Intermediate High School in 1921, offering primary and secondary classes with an academic course of instruction to Intermediate Certificate standard (purcell 2019).

In 1923, over an acre of land along Belmont Road and Gladstone Avenue was resumed for the construction of a large new school building, part of a large scheme that included two new buildings. This land was part of the Model Township subdivided and partly developed by bank manager Arthur Muston at the end of the 1880s. The allotments were sold by Muston at various times between 1889 and 1894 and were developed with a mix of detached and semi-detached residences (purcell 2019, p.6).

Construction of the new school building began in October, 1923 by the Minister of Education. The entire scheme was comprehensive in scope, containing 28 classrooms and administration spaces along with a separate domestic and manual training block, and two weather sheds with attached lavatories. The buildings were designed in the Government Architect's Office, built by G Hogden, and was officially opened by the Minister for Education on 17 July 1925. The construction of the new building coincided with a high point in enrolments with 2,053 pupils attending the school in 1925 (purcell 2019).

Extensive internal modifications were documented to the 1925 Public School building in 1970, which provided more staff and pupil facilities and the loss of the first floor assembly spaces. About three years later part of the first floor of the building was converted to a library. These works were accompanied by the construction of a multi-purpose hall on another part of the site, which was documented in 1972 (purcell 2019).

The study area continues to be utilised as a secondary school facility and is currently named Mosman High School.

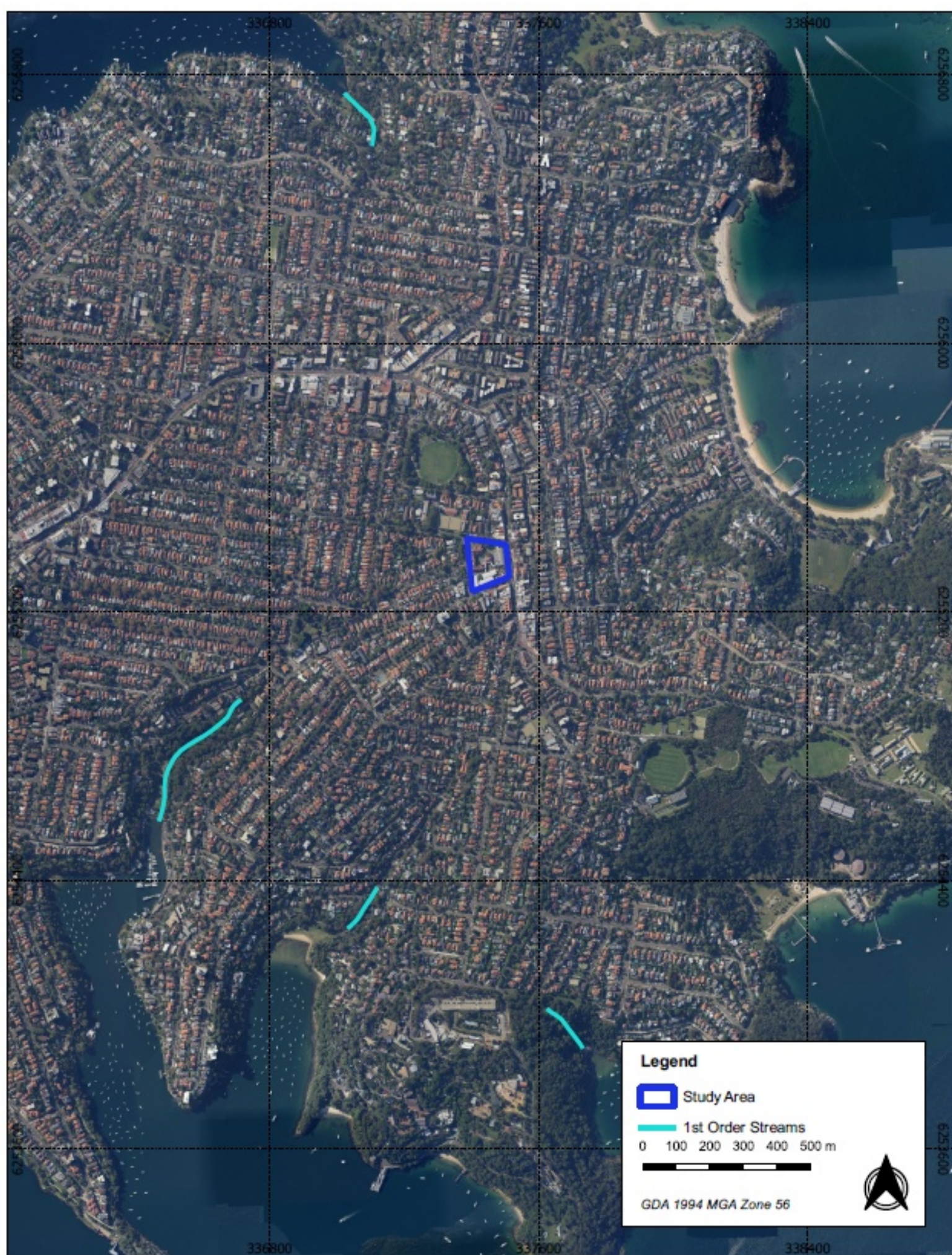


Figure 3.5 Hydrology associated with the Study Area
Mosman High School ACHA



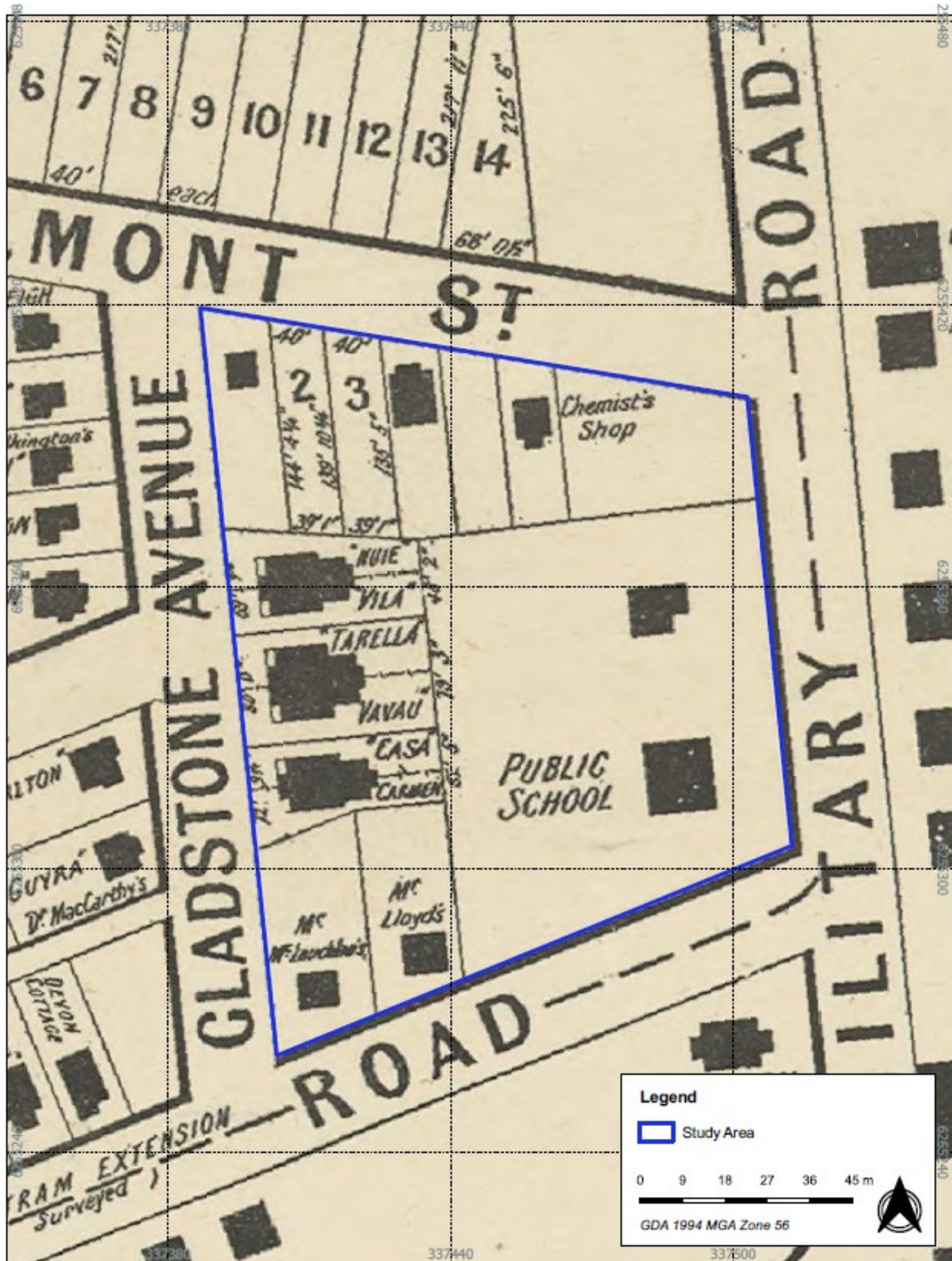


Figure 3.7 1898 R&W Auction Map

Mosman High School

Source: NLA MAP Folder 108, LFSP
1652

Drawn by: WA Date: 2020-06-22



AUSTRAL
ARCHAEOLOGY



Figure 3.8 1943 Historic Aerial Imagery

Mosman High School

Source: NSW DFSI

Drawn by: WA Date: 2020-06-26



AUSTRAL
ARCHAEOLOGY



Figure 3.9 1961 Historic Aerial Imagery associated with the Study Area
 Mosman High School ACHA





Figure 3.10 1984 Historic Aerial Imagery associated with the Study Area
 Mosman High School ACHA





Figure 3.11 1995 Historic Aerial Imagery associated with the Study Area

Mosman High School ACHA

Source: Nearmap, NSW Spatial Services

Drawn by: MR Date: 2020-07-29



AUSTRAL
ARCHAEOLOGY



Figure 3.12 2009 Historic Aerial Imagery associated with the Study Area
 Mosman High School ACHA



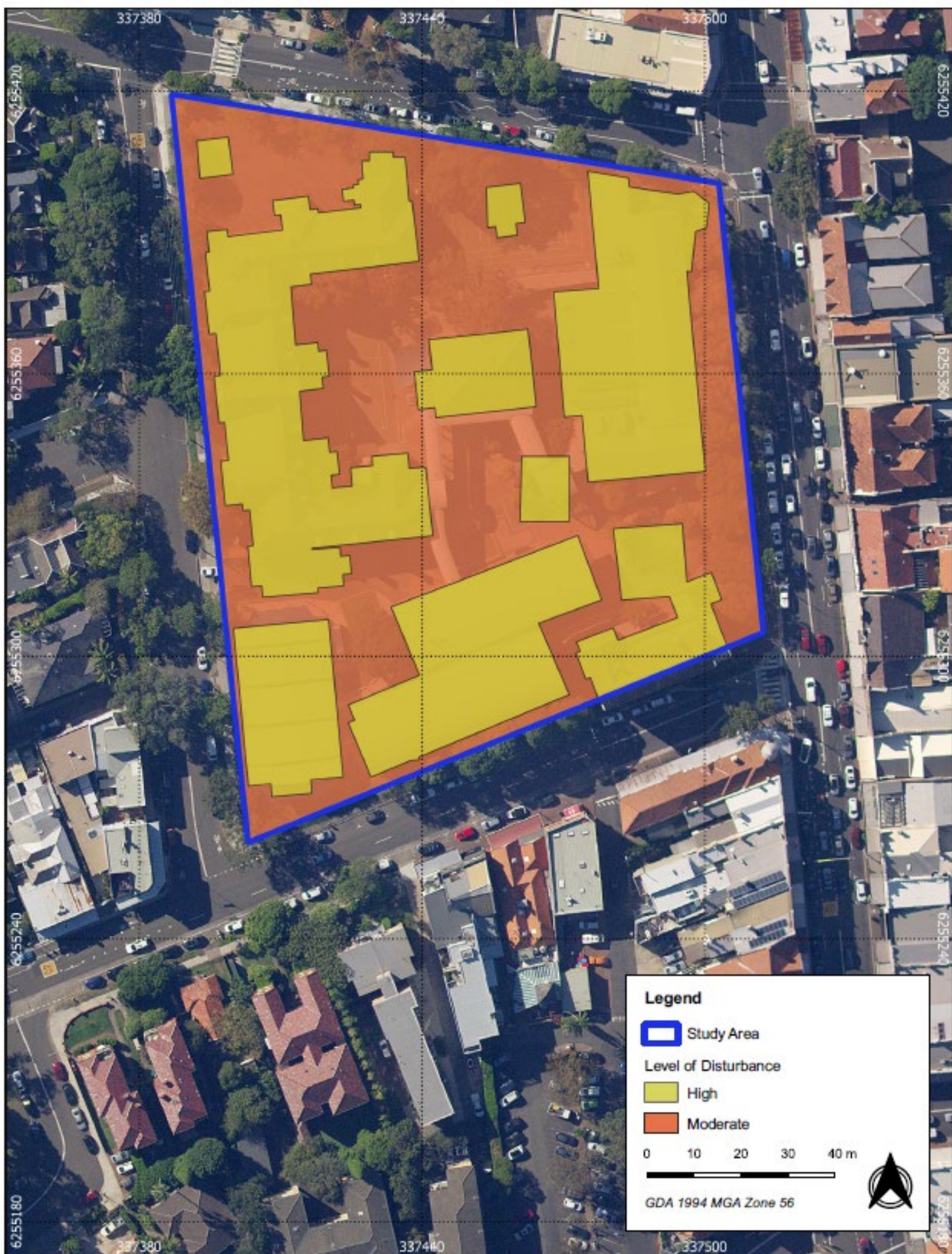


Figure 3.13 Level of Disturbances associated with the Study Area

Mosman High School ACHA



3.7 POTENTIAL LAND USE IMPACTS ON THE ARCHAEOLOGICAL RESOURCE

The main impacts on the subject land relate to extensive land clearance and the construction of numerous buildings associated with Mosman High School from the early 1880s onwards.

Land clearance would have resulted in soil disturbance and topsoil movement and this activity is commonly destructive to Aboriginal artefacts. The continual development of the study area associated with the operation of the school from the 1880s onwards has caused high levels of sub-surface impact and disturbances and has most likely removed any evidence of Aboriginal cultural material that may have existed within the study area. As evident in Figure 3.7, which depicts an 1898 auction plan of the study area, the entirety of the western and northern portions of the study area fronting Gladstone Avenue and Belmont Street were occupied by residential dwellings and commercial and retail shops. As can also be seen in Figure 3.7, Mosman Public School (now Mosman High School) encompasses the south-eastern portion of the study area. It is therefore clear that large-scale subsurface impacts and modifications to the ground surface was undertaken from the late 1880s. While this historical plan shows that the central portion of the study area remained largely undeveloped, the 1943 and 1961 historical aerial of the study area demonstrates that these previously undisturbed areas contained large buildings associated with Mosman High School by the mid-20th century (Figure 3.8 and Figure 3.9). The 1984 and 1995 historical aerial imagery of the study area confirms that by the end of the 20th century there was no portion of the study area that had not previously been impacted by the construction of a building. Given the very high level of disturbance that is evident across the study area as a result of historical development, it is considered that the likelihood of any Aboriginal archaeological material to be present is very low.

Table 3.3 Summary of Past Land uses within the Study Area, and the Potential Impacts on Archaeological Resources

Past Land Uses	Potential Impacts on Archaeological Resources
Historical Land Clearance	Loss of native trees, shrubs and grasses would lead to the potential loss of scarred trees, increased erosion and potential dispersal or disturbance of surface and subsurface artefacts across the study area.
Construction of school buildings and residential houses fronting Belmont Road and Gladstone Avenue	Moderate to high levels of earth disturbance leading to the potential disturbance and dispersal of artefacts from their stratigraphic context.

4 PREDICTIVE STATEMENT

In general, an archaeological predictive statement on any study area draws on surrounding environmental data, previous archaeological research and predicative models for Aboriginal occupation. Another essential aspect to predicting the archaeological integrity of a site and something that must be considered is previous land uses and the degree of disturbance across the study area. These are addressed in the following sections.

The Mosman area is believed to have experienced a moderate climate during the Holocene and this, together with its location within the wider Port Jackson catchment, made the region conducive to Aboriginal occupation in the past. The study area lies within a resource base associated primarily with the Pacific Ocean and small tributaries running into the Pacific Ocean. Habitats associated with these water systems would have supported a wide range of flora, animals, fish, birds and mammals.

Due to the ideal environmental setting, the landscape surrounding the study area would have been subject to a wide variety of human activities. This primarily would have been due to the presence of good resource availability, followed by the possible presence of permanent water sources in the immediate area. Activities would have included camping, hunting, gathering, cooking, ceremonies, and other cultural activities associated with semi-permanent settlement sites in the region. Some of these activities, mainly stone tool knapping, are seen in the archaeological record.

In predicting site types within the study area one would expect to find surface isolated artefacts and scatters on the ground surface of sensitive landforms, estuarine shell midden sites, scarred trees in areas of remnant native vegetation, grinding grooves on sandstone rock surfaces and platforms and rock art on sandstone rock surfaces and overhangs where available. Locations of likely site recordings predictably may occur in areas of high ground visibility such as around dams, the base of trees, tracks and around the disturbances of building constructions. Surface sites will probably not be visible in the vast majority of the study area as it is covered with buildings and asphalt surfaces. Middens along the coast are likely to be dominated by estuarine species.

If stone tools are recorded, they are likely to conform to other known sites in the region. This means that tools are likely to be from a late Holocene occupation with stone technologies attributed to the Bondaian phase of the Eastern Regional Sequence. If stone tools are present on site, they will predictably be made from silcrete, quartzite, chert or quartz sourced from local quarries (Australian Museum Business Services 2005, p.56). These sites may be the results of activities attributed to the people within the Borogegal clan.

In summary the main trends broadly seen across eastern New South Wales are that:

- Archaeological sites occur on most landforms.
- Site frequency and density are dependent on their location in the landscape.
- There is a dominance of low density surface open artefact scatters and isolated finds.
- There is a noted paucity of scarred trees due to land clearance.
- Artefact scatters are commonly located in close proximity to permanent water sources along creek banks, alluvial flats and low slopes, largely concentrated within the first 100 metres of the creekline. More complex sites are usually located close to water sources with major confluences being key locations for occupation sites.
- Archaeological material is also present beyond the immediate creek surrounds in decreasing artefact densities.
- There may be concentrations of sites occurring on ridge tops and crests that are associated with pathways through the landscape.
- Subsurface archaeological deposits are often recovered in areas where no visible surface archaeological remains are evident.
- The dominant raw material used in artefact manufacture is silcrete and fine grained silicious material with smaller quantities of chert, quartz and volcanic stone seen.

- Artefact assemblages usually comprise a small proportion of formal tool types with the majority of assemblages dominated by flakes and debitage.
- While surface artefact scatters may indicate the presence of subsurface archaeological deposits, surface artefact distribution and density may not accurately reflect those of subsurface archaeological deposits.
- Aboriginal scarred trees may be present in areas where remnant old growth vegetation exists; and
- PADs are most likely to occur along valley floors and low slopes in well-drained areas.

While these statements provide an adaptable framework for applying a predictive model to the study area, based on the previous models it is possible to further expound on the generalisations made above. For sites surrounding the study area, it can also be predicted that:

- Sites are likely to be found across broad topographic zones at varying densities, however this can be influenced by micro-topographic variables such as relatively level ground without significant exposed geology, freshwater accessibility and well drained, elevated ground.
- Sites are most likely to occur at or close to ecotones, i.e. where different environments meet.
- Artefact scatters are most likely to occur on raised, level ground, near sources of freshwater or wetlands, or along spur crest or ridgelines.
- Low lying wetland areas subject to constant inundation will be unlikely to contain Aboriginal occupation.
- A low density “background” of artefacts in the form of isolated finds, subsurface or surface scatters will exist in areas not considered primary occupation sites.
- Ridges on higher ground are likely to have been used as transport links and may contain residual evidence of occupation.

As a result of these statements, it is reasoned that undisturbed areas within the study area are considered archaeological and culturally sensitive with frequent Aboriginal sites in the vicinity. The general studies of Port Jackson region, the specific investigations surrounding the study area and the search of the AHIMS database have helped to predict what certain site types can be expected during the test excavations for this assessment. These are:

- Stone artefacts are unlikely to be present due to the high level of disturbance that was identified across the study area as a result of continual development from the late 19th century onwards.
- Scarred trees are unlikely to be present due to the lack of old growth vegetation within the study area.
- Pigment rock art sites are unlikely to be present due to a lack of suitable geological requirements (sandstone overhangs).
- Engraved rock art sites are unlikely to be present due to a lack of suitable geological requirements (exposed sandstone bedrock).
- Grinding grooves are unlikely to be present due to a lack of suitable geological requirements (exposed bedrock near to a water source).
- Ceremonial grounds are unlikely to be present due to their general rarity within New South Wales.
- Burials are unlikely to be present, due the lack of deep sandy locations suitable for burial.
- Shell middens are unlikely to be present due to the distance from the shoreline and lack of suitable locations for occupation and consumption of food.
- Stone arrangements are unlikely to be present due to their general rarity within New South Wales.

5 ABORIGINAL ARCHAEOLOGICAL SURVEY

5.1 SURVEY METHODOLOGY

The specific survey methodology developed for this assessment was guided by the survey requirements as set out in the code of practice. The survey methodology was designed to optimise the investigation of areas where archaeological materials may be present and visible, as well as investigation of the broader archaeological potential of the study area. The field inspection of the study area therefore paid close attention to areas of favourable landform conditions.

The key survey variables of ground visibility, which considers the amount of ground surface which is visible and not covered by any vegetation; and exposure, which defines areas where dispersed surface soils and vegetative matter afford a clear assessment of the ground, were assessed across the study area and within each landform element. Overall survey coverage and calculated survey effectiveness was recorded. Note that the effectiveness of the field survey was largely dependent on the degree of ground surface visibility.

5.2 SURVEY RESULTS

An archaeological survey of the study area was undertaken on 5 August 2020 by William Andrews (Graduate Archaeologist, Austral). No Aboriginal objects or sites were identified during the archaeological survey undertaken as part of this assessment. This is due to the majority of the site being fully developed as part of a school, with the majority of the ground surface being overlaid with concrete. The survey encompassed approximately 14,530 m² and identified no areas of archaeological potential as the level of disturbance and development across the site was too high. Only one landform was identified which was a highly disturbed gentle slope to the west. There were areas of exposure visible along the boundaries of the school an example of which can be seen in Figure 5.1. However, this area and the other areas that exhibited exposures had been previously disturbed by housing and the nature of the site as a school within the grassed sections. So whilst there was exposures there was clear evidence of redeposition of materials, and other disturbance that can be seen in Figure 5.2. These soils provide characteristics that are very similar to **gy3**, a yellow, weakly pedal sandy clay loam or **gy4**, a moderately to strongly pedal, yellow-brown clay, rather than the topsoil deposits where Aboriginal archaeological material will most likely be contained. As stated in Section 3.1, **gy3** and stratigraphic layers below very rarely contain *in-situ* Aboriginal archaeological material (Dominic Steel Consulting Archaeology 2005, p.28).

As stated above, the majority of the site is covered in concrete and asphalt, which precluded any view at the surface below the ground covering, an example of which can be seen in Figure 5.3. As such the ground surface visibility within the site was approximately 1%. Whilst the visibility was low, the level of ground disturbance that was present across the site indicates that the disturbance continues below the level of the concrete. It was determined that the construction of the buildings associated with the school would have caused large scale disturbance across the majority of the site. Examples of the buildings and earthworks can be seen in Figure 5.4 and Figure 5.5.

Other than the buildings on the site there were no obstacles that prevented access, which combined with the level of man-made ground coverings allowed the survey to have an effective coverage of 5%. This low coverage is due to the concrete and asphalt coverings on most of the site precluding the view of the surveyor.

Overall, the results of the archaeological survey further confirmed what is shown in the historical record of the study area, which is that there exists a very high level of disturbance to the ground surface caused by the intense development of the site from the 1880s onwards. As such, the survey has indicated that there exists very little potential for Aboriginal archaeological material to be present within the study area.

Table 5.1 Survey Coverage

Survey Unit	Landform	Survey unit area (m ²)	Visibility (%)	Exposure (%)	Effective Coverage area (m ²)	Effective Coverage (%)
1	Slope	14,530	5%	<5%	727	5%

Table 5.2 Landform Summary

Landform	Landform area (m ²)	Area effectively surveyed (m ²)	Landform effectively surveyed (m ²)	No. of Aboriginal sites	No. of artefacts or features
Slope	14,530	727	727	0	0



Figure 5.1 Grass covering along western boundary of study area, this area was previously disturbed by housing prior to the school.



Figure 5.2 View along southern boundary of school, redeposition of materials along with evidence of excavation for the building and walkway.



Figure 5.3 View in the central portion of the site, an example of the level of ground disturbance and concrete covering within the study area.



Figure 5.4 View to the north of the school grounds



Figure 5.5 View to the south with buildings A (centre) and building E (to the right), the level of earthworks can be seen clearly as the ground level building A was constructed on is approximately 0.5m above the level building E was constructed on.



Figure 5.6 Archaeological Potential Associated with the Study Area

Mosman High School ACHA



6 CULTURAL HERITAGE VALUES

6.1 BASIS FOR THE ASSESSMENT

The significance values provided in the Australia ICOMOS *Charter for the Conservation of Places of Cultural Significance* (the Burra Charter) are considered to be the best practice heritage management guidelines in Australia (Australia ICOMOS 2013a). The Burra Charter defines cultural significance as:

“...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.” (Australia ICOMOS 2013a, p.2)

The Burra Charter significance values outlined in Table 6.1; these are frequently adopted by cultural heritage managers and government agencies as a framework for a more holistic assessment of significance.

Table 6.1 Definitions of Burra Charter significance values (Australia ICOMOS 2013b)

Value	Definition
Aesthetic	Refers to the sensory and perceptual experience of a place. That is how a person responds 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.
Historic	Refers to all aspects of history. For example, 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.
Scientific	Refers to 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.
Social	Refers to the associations that a place has for a particular community or cultural group and the social or cultural meanings that it holds for them.
Spiritual	<p>Refers to the intangible values and meanings embodied in or evoked by a place which give it importance in the spiritual identity, or the traditional knowledge, art and practices of a cultural group. Spiritual value may also be reflected in the intensity of aesthetic and emotional responses or community associations, and be expressed through cultural practices and related places.</p> <p>The qualities of the place may inspire a strong and/or spontaneous emotional or metaphysical response in people, expanding their understanding of their place, purpose and obligations in the world, particularly in relation to the spiritual realm.</p> <p>The term spiritual value was recognised as a separate value in the Burra Charter, 1999. It is still included in the definition of social value in the Commonwealth and most state jurisdictions. Spiritual values may be interdependent on the social values and physical properties of a place.</p>

In addition to the Burra Charter significance values, other criteria's and guidelines have been formulated by other government agencies and bodies in NSW to assess the significance of heritage places in NSW. Of particular relevance to this assessment are the guidelines prepared by the Australian Heritage Council and the Department of the Environment, Water, Heritage and the Arts (DEWHA), and Heritage NSW (Australian Heritage Council & DEWHA 2009, DECCW 2010a, OEH 2011b, NSW Heritage Office 2001).

The Guide (OEH 2011b, p.10) states that the following criteria from the NSW Heritage Office (2001, p.9) should be considered:

- **Social value:** Does the subject area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?
- **Historic value:** Is the subject area important to the cultural or natural history of the local area and/or region and/or state?
- **Scientific value:** Does the subject area have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state?
- **Aesthetic value:** Is the subject area important in demonstrating aesthetic characteristics in the local area and/or region and/or state?

OEH (2011b, p.10) states that when considering the Burra Charter criteria, a grading system must be employed. Austral will use the following grading system to assess the cultural values of the study area and its constituent features. These are outlined in Table 6.2.

Table 6.2 Gradings used to assess the cultural values of the study area

Grading	Definition
Exceptional	The study area is considered to have rare or outstanding significance values against this criterion. The significance values are likely to be relevant at a state or national level.
High	The study area is considered to possess considerable significant values against this criterion. The significance values are likely to be very important at a local or state level.
Moderate	The study area is considered to have significance values against this criterion; these are likely to have limited heritage value but may contribute to broader significance values at a local or State level.
Little	The study area is considered to have little or no significance values against this criterion.

6.2 ASSESSMENT OF SIGNIFICANCE

The following section addresses the Burra Charter significance values with reference to the overall study area.

6.2.1 AESTHETIC SIGNIFICANCE VALUES

The concept of aesthetic significance deals with the response that people have to a particular place and refers to sensory, scenic, architectural and creative aspects of the place. These values may be related to the landscape and are often closely associated with social and cultural values. This criterion differs from the other two in that it is not so readily quantifiable but takes into account a subjective or emotive response to a place as opposed to providing comment upon a tangible item (such as an Aboriginal artefact) or an issue of research relevance (such as an area of PAD).

The study area and the immediate area surrounding the study area has been heavily developed and modified from its original landscape that would have existed prior to European settlement. The entirety of the study area has been developed continuously from the late 19th century with the establishment of Mosman High School in 1880, with very little trace of the original landform and natural surroundings present. As such, the heavy development present within the study area has caused a significant loss to the aesthetic values of the study area.

Based on this assessment, the study area is considered to have **little** aesthetic significance values.

6.2.2 HISTORIC SIGNIFICANCE VALUES

The assessment of historic values refers to associations with particular places associated with Aboriginal history. Historic values may not be limited to physical values but may relate to intangible elements that relate to memories, stories or experiences.

The ethnographic record suggests that the locality around the study area is significant through its association with the numerous bays located in vicinity that are associated with Sydney Harbour. As stated in Section 3.2, the study area is situated on the top of a ridgeline between two larger hills. While, as noted earlier, this is an unlikely place for Indigenous settlement being so close to the ocean, it most likely would have formed travel routes to and from the coast.

Based on this assessment, the study area is considered to have **moderate** historic significance values.

6.2.3 SCIENTIFIC SIGNIFICANCE VALUES

Scientific significance generally relates to the ability of archaeological objects or sites to answer research questions that are important to the understanding of the past life-ways of Aboriginal people. Australia ICOMOS (2013b, p.5) suggests that to appreciate scientific value, that the following question is asked: *“Would further investigation of the place have the potential to reveal substantial new information and new understandings about people, places, processes or practices which are not available from other sources?”*.

In addition to the above criteria, The Guide (OEH 2011b, p.10) also suggests that consideration is given to the Australian Heritage Council and DEWHA (2009) criteria, which are particularly useful when considering scientific potential:

- **Research potential:** does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state’s natural and cultural history?
- **Representativeness:** how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- **Rarity:** is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- **Education potential:** does the subject area contain teaching sites or sites that might have teaching potential?

The results of the Aboriginal archaeological survey has demonstrated that the majority of the study area shows high levels of disturbance caused by the historical development of the study area with residential development and the establishment of Mosman Public School occurring from the 1880s onwards. As noted in Section 3.7, the continual development of the study area from the late 19th century that was associated with the operation of Mosman Public School would have caused significant sub-surface impacts and disturbances and as a result most likely removed any traces of Aboriginal cultural material that may have previously existed in the study area. The historical plans and aerials of the study area demonstrate that very little of the study area remains unimpacted by the previous construction of buildings.

It is therefore considered that there is a low potential that any archaeological investigations within the study area would recover any significant quantity of Aboriginal cultural material, and if material, including stone artefacts, were present on site they would most likely be present in disturbed stratigraphic contexts and not be in-situ. Thus, if any Aboriginal cultural material was present on site, it would provide limited information on the Aboriginal occupation of the study area, which is a key requirement of the research potential criterion.

In summary, the overall research value of the study area is considered to be very low.

Given the highly intense development of the study area from the late 19th century onwards, which has consequently removed any traces of the original landscape within the boundaries of the study area, the representativeness and rarity of the site is considered very low.

The Aboriginal cultural material contained within the study area is not considered to be of high educational value. The historical research as well as the survey undertaken has part of this assessment has indicated that the entirety of the study area has been highly disturbed as a result

of continual development from the 1880s onwards. As such, it is considered unlikely that Aboriginal cultural material is present within the study area, and if present, it would most likely be within a disturbed stratigraphic context. The overall educational value of the study area is therefore considered to be low.

6.2.4 SOCIAL AND SPIRITUAL SIGNIFICANCE VALUES

As social and spiritual significance are interdependent, Austral has undertaken a combined assessment of these values. The Consultation Requirements specify that the social or cultural values of a place can only be identified through consultation with Aboriginal people.

The following submissions were received from RAPs during the completion of the project: Phil Khan of Kamilaroi-Yankuntjatjara Working Group has provided information regarding the social and spiritual significance of the study area, which is present below:

"My people have walked this land for tens of thousands of years and continue to do so today. The Aboriginal people lived a life full of vegetation and bush life with waterways and hills surrounding them. This particular site is close by to Balmoral beach, allowing access to seafood and shell fish. Fishing would have taken place by men, women and children. The men would have used spears, the women use a line and a shell hook. The Aboriginal people would have access to fresh water from the billabongs, water courses and clay pans that could still be around if it has not been destroyed.

There would be camps around the area and spiritual ceremonies would take place with song and dance around the fire. Fire places were used for cooking in the hot ashes and dirt. They would cook kangaroos whole in the hot soil and coal and over years the hole would become deep enough to bury deceased people, stones were put over the grave to keep dingos away & the tree would be marked, this would tell Aboriginal People it is a burial site, however all this has been destroyed by first fleet.

The study area is most defiantly of high significant of cultural value to our people and needs to been excavated as it our last chance to do so. If artefacts are unearthed, they should be a keeping place on display within the school, that way they can be recognised as Aboriginal culture and used for learning, also making people aware that Aboriginal people where all over."

A copy of this letter from Kamilaroi-Yankuntjatjara Working Group is present in Appendix F of the ACHA.

Further comments are expected on the completion of Stage 4 of the Consultation Requirements.

Based on this assessment, the study area is considered to have **high** social and spiritual significance values.

6.3 STATEMENT OF SIGNIFICANCE

The statements of significance have been formulated using the Burra Charter significance values and relevant NSW guidelines (DECCW 2010a, OEH 2011b, Australia ICOMOS 2013a).

Heritage NSW specifies the importance of considering cultural landscapes when determining and assessing Aboriginal cultural values. The principle behind this is that *'For Aboriginal people, the significance of individual features is derived from their inter-relatedness within the cultural landscape. This means features cannot be assessed in isolation and any assessment must consider the feature and its associations in a holistic manner'* (DECCW 2010b).

The historical research of the past land-use practices and European development within the study area has shown that the site has been subject to continuous development from the late 19th century onwards. This includes the residential subdivision along both Gladstone Avenue and Belmost Road from the early 1880s, and the construction and establishment of Mosman Public School in the late 1880s. Throughout the 20th century, the study area has been subject to numerous redevelopments associated with additions and modifications to buildings associated with Mosman High School. As evident in the historical plans and historical aeriels of the study area, high-level disturbance was present across the entirety of the study area, as buildings have been constructed in all portions of the site.

The Aboriginal archaeological survey undertaken as part of this assessment has confirmed the presence of high levels of disturbances associated with the previous developments within the study area. The construction of the various buildings within the study area would have caused high levels of subsurface impacts, which would most likely have removed any traces of Aboriginal cultural material that were present.

No Aboriginal objects or sites were identified during the archaeological survey, which was determined to be the case due to the high level of development present across the entirety of the study area. The results of the survey have determined that there is a very low potential for subsurface Aboriginal cultural material to be present due to the high levels of historical disturbance.

Overall, on the balance of the current evidence it is considered that the archaeological character of the study area has been sufficiently determined by the survey, and that the study area holds very low potential to contain Aboriginal cultural material.

As has been provided during the consultation stages of the project, the study area and its surroundings hold high cultural and spiritual significance to the Aboriginal community. This was confirmed in a letter provided by Phil Khan of Kamilaroi-Yankuntjajara Working Group, which provided an occupational history of the surrounding land and demonstrated the importance of the natural resources to the local Aboriginal population. This letter also highlighted the sacred nature of the area surrounding the study area with the possible presence of unknown Aboriginal burials in the vicinity.

The overall significance of the study area in terms of its Aboriginal archaeological heritage is considered low.

7 IMPACT ASSESSMENT

This section outlines, according to Heritage NSW guidelines, the potential harm that the proposed activity may have on identified Aboriginal objects and places within the study area (OEH 2011b, DECCW 2010a).

7.1 ASSESSING HARM

This section outlines the assessment process for addressing potential harm to Aboriginal objects and/or places within the study area, as outlined by Heritage NSW (OEH 2011b, p.12).

- **ECOLOGICALLY SUSTAINABLE DEVELOPMENT**

An objective of the NPW Act, under Section 2A(1)(b)(i) is to conserve “*places, objects and features of significance to Aboriginal people*” through applying the principles of ecologically sustainable development (ESD) (Section 2A (2)). ESD is defined in Section 6(2) of the *Protection of the Environment Administration Act 1991* (NSW) as “...*the effective integration of social, economic and environmental considerations in decision-making processes*”. ESD can be achieved with regards to Aboriginal cultural heritage, by applying the principle of inter-generational equity, and the precautionary principle to the nature of the proposed activity, with the aim of achieving beneficial outcomes for both the development and Aboriginal cultural heritage.

INTERGENERATIONAL EQUITY

The principle of intergenerational equity is where the present generation ensures the health, diversity and productivity of the environment for the benefit of future generations. The Department of Environment and Climate Change (DECC), now Heritage NSW, states that in terms of Aboriginal cultural heritage “*intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous AHIPs), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.*” (DECC 2009, p.26).

The assessment of intergenerational equity and understanding of cumulative impacts should consider information about the integrity, rarity or representativeness of the Aboriginal objects and/or places that may be harmed and how they illustrate the occupation and use of the land by Aboriginal people across the locality (DECC 2009, p.26).

Where there is uncertainty over whether the principle of intergenerational equity can be followed, the precautionary principle should be applied.

PRECAUTIONARY PRINCIPLE

Heritage NSW defines the Precautionary Principle as “*if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation*” (DECC 2009, p.26).

The application of the precautionary principle should be guided through:

- A careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment.
- An assessment of the risk-weighted consequences of various options.

DECC (2009, p.26) states that the precautionary principle is relevant to the consideration of potential impacts on Aboriginal cultural heritage, where:

- The proposal involves a risk of severe or irreversible damage to Aboriginal objects and/or places or the value of those objects and/or places.
- There is uncertainty about the Aboriginal cultural heritage values, scientific, or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.

Where either of the above is likely, a precautionary approach should be taken and all effective measures implemented to prevent or reduce harm to Aboriginal cultural heritage values.

▪ **TYPES OF HARM**

When considering the nature of harm to Aboriginal objects and/or places, it is necessary to quantify direct and indirect harm. The types of harm, as defined in the Guide (OEH 2011b, p.12), and are summarised in Table 7.1. These definitions will be used to quantify the nature of harm to identified Aboriginal objects and/or places that have been identified as part of this assessment. The Code states that the degree of harm can be either total or partial (DECCW 2010c, p.21).

Table 7.1 Definition of types of harm

Type of harm	Definition
Direct harm	May occur as the result of any activity which disturbs the ground including, but not limited to, site preparation activities, installation of services and infrastructure, roadworks, excavating detention ponds and other drainage or flood mitigation measures, and changes in water flows affecting the value of a cultural site.
Indirect harm	May affect sites or features located immediately beyond, or within, the area of the proposed activity. Examples of indirect impacts include, but are not limited to, increased impact on art in a shelter site from increased visitation, destruction from increased erosion and changes in access to wild food resources.

7.2 IMPACT ASSESSMENT

This AAR has included a programme of investigations that have characterised the nature, extent and significance of Aboriginal sites within the study area.

Based on the European history of the site, as discussed in Section 4, the main impacts on the subject land relate to extensive land clearance and the construction of numerous buildings associated with Mosman High School from the early 1880s onwards.

Land clearance would have resulted in soil disturbance and topsoil movement and this activity is commonly destructive to Aboriginal artefacts. The continual development of the study area associated with the operation of the school from the 1880s onwards has caused high levels of impact and disturbance to the natural landscape and has most likely removed any evidence of Aboriginal cultural material that may have existed within the study area.

It is therefore considered that the impact associated with the proposed development will consist of a very low risk of impacting Aboriginal archaeological material. In the instance that Aboriginal archaeological material is present within the study area, it will most likely have been removed from situ and its original context given the high disturbance that the study area has been subject to.

Details of the proposed activity is outlined in Figure 7.1.

Architectural floor plan of the ground floor of the W-B Woods Bagot Multiplex. The plan shows a large central hall with two basketball courts, a gymnasium, and various rooms including a kitchen, lounge, and storage areas. The building is surrounded by a parking lot and a road. The plan is labeled 'GROUND FLOOR PLAN' and includes a scale bar and north arrow.

PROJECT DATA

Project Name: W-B Woods Bagot Multiplex
 Project Number: 12-455
 Client: Woods Bagot
 Architect: T. J. M. Architects
 Date: 08-2011
 Scale: 1:500

GROUND FLOOR PLAN

Architect: T. J. M. Architects
 Project Number: 12-455
 Client: Woods Bagot
 Architect: T. J. M. Architects
 Date: 08-2011
 Scale: 1:500

8 AVOIDING AND MINIMISING HARM

8.1 CUMULATIVE IMPACTS AND OPTIONS TO AVOID HARM

The Guide to Reporting requires this ACHA to consider the effects of cumulative impacts under the principles of Economically Sustainable Development. In essence, this requires the acknowledgement that while a single development might have a minimal impact, it forms part of a slow urbanisation process which results in the widespread loss of environmental and cultural resources.

The study area forms part of ongoing community development within the lower North Shore region, where impacts to sites of potential Aboriginal cultural heritage has been considered. While the surrounding area has been developed to a large extent since the early 19th century, previous archaeological investigations within the Mosman LGA have demonstrated that *in-situ* and culturally significant Aboriginal archaeological sites are present within the region. These studies have lead to a better understanding of Aboriginal land settlement patterns and cultural activities in the area. Although many studies have been undertaken it is still necessary for all developments to undergo this assessment, as there is still a great deal that is not understood or known about the people who lived in the area for tens of thousands of years before European settlement. This is doubly important as once development begins, all evidence of the past is removed.

However, it is not only development that is likely to affect sensitive cultural sites in the area. With the increase in community development brings a density of human activity that was not present in the area ever before. As such, the concentration of recreational activities in the surrounding area will increase dramatically. This puts a strain not only on the environment but also can lead to the unintentional destruction or desecration of Aboriginal cultural heritage sites in the area.

It is therefore considered that the cumulative impacts on Aboriginal heritage surrounding the study area are moderate to high.

8.2 MANAGEMENT AND MITIGATION STRATEGIES

Following the Aboriginal archaeological survey of the study area it was determined that the entirety of the study area is considered to be of low archaeological potential to contain Aboriginal cultural heritage. As such, no further archaeological works are required within the study area.

9 RECOMMENDATIONS

The following recommendations have been developed after considering the archaeological context, environmental information, consultation with the local Aboriginal community, the findings of the archaeological survey and the predicted impact of the proposed development on archaeological resources. It is recommended that:

- 1) No further Aboriginal archaeological works are required to be undertaken.
- 2) All contractors undertaking earthworks on site should be briefed on the protection of Aboriginal heritage objects under the *National Parks and Wildlife Act 1974* and the penalties for damage to these items.
- 3) All contractors undertaking earthworks in the study area should undergo an induction on identifying Aboriginal heritage objects; and
- 4) A copy of this report should be forwarded to all Aboriginal stakeholder groups who have registered an interest in the project and to the AHIMS Registrar

REFERENCES

Attenbrow, V 1991, 'Port Jackson archaeological project: a study of the prehistory of the Port Jackson catchment, New South Wales - Stage 1: site recording and site assessment'.

Attenbrow, V 1992, 'Preliminary report on archaeological excavations at Balmoral Beach 2, NPWS Site No. 45-6-677 in July 1992'.

Attenbrow, V 2010, *Sydney's Aboriginal Past*, UNSW Publishing, Sydney.

Attenbrow, Val 2010, *Sydney's Aboriginal Past: Investigating the archaeological and historical records*, UNSW Press, Sydney, Australia.

Austral Archaeology 2019, 'Aboriginal Cultural Heritage Due Diligence Advice for Mosman High School (745 Military Road), Mosman, New South Wales'.

Australia ICOMOS 2013a, *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance*, Australia ICOMOS, Burwood, VIC.

Australia ICOMOS 2013b, 'Practice Note: Understanding and assessing cultural significance'.

Australian Heritage Council & DEWHA 2009, 'Guidelines for the assessment of places for the National Heritage List'.

Australian Museum Business Services 1995, 'Middle Head Management strategy study - natural environment'.

Australian Museum Business Services 2005, 'Aboriginal Heritage Study of the Mosman Local Government Area'.

Bradley, W 1788, 'A Voyage of New South Wales . The Journal of Lieutenant William Bradley RN of HMS Sirius 1786-1792'.

Bureau of Meteorology 2020, 'Mosman average temperature'.

Carroll, J 1963, *The settlement and growth of Mosman*, Mosman Historical Society, Mosman, [N.S.W.].

Cobley, L 1962, 'First sightings at Georges Head, NSW'.

Collins, D 1795, 'An Account of the English Colony in New South Wales'.

DECC 2009, 'Operational Policy: Protecting Aboriginal Cultural Heritage', <<https://www.environment.nsw.gov.au/resources/cultureheritage/09122ACHOpPolicy.pdf>>.

DECCW 2010a, 'Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales'.

DECCW 2010b, 'Fact Sheet 2: What is an Aboriginal cultural landscape?'

DECCW 2010c, 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales'.

DECCW 2011, 'Aboriginal Heritage of Mosman'.

Department of Environment, Climate Change and Water 2010a, 'Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales'.

Department of Environment, Climate Change and Water 2010b, 'Aboriginal cultural heritage consultation requirements for proponents 2010'.

Dominic Steel Consulting Archaeology 2005, 'Aboriginal Archaeological Test Excavation Report: The Barn Whaling Station, 3c Avenue Road, Mosman, NSW'.

Dominic Steel Consulting Archaeology 2017, 'Aboriginal Archaeological Assessment: Taronga Zoo, Mosman, NSW'.

Flannery, T 1996, '1788: Comprising A Narrative of the Expedition to Botany Bay and A Complete Account of the Settlement at Port Jackson by Watkin Tench'.

Foley, J 1981, 'A Model of Regional Archaeological Structure', *Proceedings of the Prehistoric Society*, vol. 47, pp. 1–17.

Haglund & Rich 1988, 'Analysis of Aboriginal occupation in Mosman Municipality'.

Hazelton, PA & Tille, PJ 1990, *Soil Landscapes of the Wollongong-Port Hacking 1:100 000 Sheet*, Soil Conservation Service of NSW, Sydney.

Hiscock, P 2008, *Archaeology of Ancient Australia*, Routledge, London.

Jo McDonald Cultural Heritage Management. 2005, *Archaeological Salvage Excavation of Site RTA-GI, 109-113 George Street, Parramatta, NSW. Unpublished Report for the NSW Roads and Traffic Authority*.

Koettig, M 1986, 'Archaeological assessment for Aboriginal sites within Chowder Bay and Georges Head area, Middle Harbour, Sydney'.

Koettig, M 1991, 'Mosman Municipality heritage study of Aboriginal sites'.

Kohen, J 1993, *Darug and their Neighbours: The Traditional Aboriginal Owners of the Sydney Region.*, Darug Link in association with Blacktown and District Historical Society, Sydney.

McBryde, I 1978, *Records of Times past: Ethnohistorical Essays on the culture and ecology of the New England tribes*, AIATSIS, Canberra.

McDonald, J 1997a, 'Interim heritage report: ADI Site, St Marys; Test Excavation Report to Lend Lease - ADI Joint Venture in response to the Section 22 Committee Interim Report'.

McDonald, J 1997b, 'Interim heritage management report: ADI Site, St Marys; Volume 1: Test excavation report to Lend Lease - ADI Joint Venture in response to the Section 22 Committee Interim Report'.

McDonald, J 1999, 'Test Excavation of PAD5 (RH/SP9) and PAD31 (RH/cc2) for the Rouse Hill (Stage 2) Infrastructure Project at Rouse Hill and Kellyville, NSW'.

McDonald, J 2000, 'Archaeological Survey for Aboriginal Sites: Proposed Light Industrial Subdivision "Austral Site" – Mamre Road, Erskine Park, NSW"'.

Mitchell, P 2002, 'Descriptions for NSW (Mitchell) Landscapes Version 2 (2002)', in, Department of Environment and Climate Change.

Morris, A 1986, 'Archaeological survey of North Port Jackson'.

NSW Heritage Office 2001, 'Assessing heritage significance', viewed 1 May 2016, <<http://www.environment.nsw.gov.au/resources/heritagebranch/heritage/listings/assessingheritagesignificance.pdf>>.

OEH 2011a, 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW'.

OEH 2011b, 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW'.

purcell 2019, 'Mosman High School Heritage Data Form'.

Rich, B 1985, 'Bradley's Bushland Reserve, Mosman - archaeological survey for Aboriginal sites'.

Rich, B 1988, 'Beauty Point sensory foreshore walk - an archaeological survey for Aboriginal sites'.

Smith, L 1987, 'Archaeological survey of bushland in HMAS Penguin'.

Souter, G 2012, *MOSMAN: A History*, Brio Books.

Tench, W 1793, 'Sydney's first four years, being a reprint of a narrative of the Expedition to Botany Bay and A Complete Account of the Settlement at Port Jackson'.

Umwelt 2004, 'Assessment of Aboriginal Cultural Heritage Conservation Area Options for Glendell Open Cut Mine'.

APPENDICES

APPENDIX A: AHIMS SEARCH RESULTS



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 2045

Client Service ID : 523096

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-2220	Balmoral Beach 4;	AGD	56	338240	6255270	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809,2988
	Contact							Permits		
45-6-2224	LGB Park;Mosman;Quakers Hat Bay;	AGD	56	336402	6256594	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	Contact							Permits		
45-6-2229	Burton St. 1;Beauty Point;	AGD	56	336600	6256590	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	Contact							Permits		
45-6-2230	Clifton Gardens 1;Clifton Gardens;	AGD	56	338080	6254120	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	Contact							Permits		
45-6-2231	Quakers Hat Boat Shed;	AGD	56	336854	6256543	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	Contact							Permits		
45-6-2342	Fig Trees Midden	AGD	56	338290	6255291	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact							Permits		
45-6-1959	Taronga Zoo Cave;Mosman;	AGD	56	336980	6253650	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	Contact							Permits	3854	
45-6-2328	Chowder Head;Clifton Gardens;	AGD	56	338340	6253790	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact							Permits		
45-6-0265	Balmoral Beach	AGD	56	338550	6255480	Open site	Not a Site	Art (Pigment or Engraved) : -	Not an Aboriginal Site	2025
	Contact							Permits		
45-6-0267	Mosman;	AGD	56	337682	6255487	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	Contact							Permits		
45-6-0684	Mosman;Edward's Beach;	AGD	56	338100	6255900	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	Contact							Permits		
45-6-0685	Edwards Beach	AGD	56	338217	6256337	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025,2988
	Contact							Permits		
45-6-1898	The Balcony	AGD	56	338343	6253710	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	Contact							Permits		
45-6-1905	Reid Park 2;Mosman;	AGD	56	336500	6254600	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	Contact							Permits		

Report generated by AHIMS Web Service on 27/07/2020 for Miles Robson for the following area at Datum :GDA, Zone : 56, Eastings : 335954 - 338949, Northings : 6253837 - 6256827 with a Buffer of 0 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 46

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 1 of 4


 Office of
 Environment
 & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 2045

Client Service ID : 523096

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-1906	Reid Park 1;Mosman;	AGD	56	336300	6254500	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<u>Contact</u>	<u>Recorders</u>	Margrit Koettig,Michael Guider							
45-6-2206	Reid Park 3;Mosman;	AGD	56	336357	6254502	Open site	Valid	Artefact : -, Shell : -	Midden,Open Camp Site	2025
	<u>Contact</u>	<u>Recorders</u>	Michael Guider							
45-6-2207	Wy-Ar-gine Point Cave;Balmoral;Edwards Beach;	AGD	56	338210	6256330	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<u>Contact</u>	<u>Recorders</u>	Margrit Koettig,Michael Guider							
45-6-2117	Clifton Cave;	AGD	56	338209	6253889	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	<u>Contact</u>	<u>Recorders</u>	Michael Guider							
45-6-2120	Rocky Point Midden;	AGD	56	338130	6255850	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<u>Contact</u>	<u>Recorders</u>	Margrit Koettig,Michael Guider							
45-6-2123	The Barn Cave;Mosman;	AGD	56	336450	6254290	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<u>Contact</u>	<u>Recorders</u>	Michael Guider							
45-6-2124	Chowder Head 2;	AGD	56	338188	6253961	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	2025
	<u>Contact</u>	<u>Recorders</u>	Michael Guider							
45-6-1231	Sea Scouts Fence Cave	AGD	56	338550	6255500	Closed site	Valid	Art (Pigment or Engraved) : -, Shell : -, Artefact : -	Shelter with Art,Shelter with Midden	2025,2204,2988
	<u>Contact</u>	<u>Recorders</u>	Margrit Koettig,Michael Guider,Michael Guider,Mr.R Taplin,Mr.R Taplin							
45-6-1163	Rocky Point Edwards Beach;Edwards Beach;	AGD	56	338100	6255900	Closed site	Valid	Shell : -, Artefact : -, Burial : -	Burial/s,Shelter with Midden	1809,2025
	<u>Contact</u>	<u>Recorders</u>	Val Attenbrow							
45-6-2323	Birds Nest Cave;Clifton Gardens;	AGD	56	337530	6253810	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<u>Contact</u>	<u>Recorders</u>	Michael Guider							
45-6-2327	Chowder Bay;Clifton Gardens;	AGD	56	338350	6254200	Open site	Valid	Shell : -, Artefact : -	Midden	
	<u>Contact</u>	<u>Recorders</u>	Michael Guider							
45-6-2329	Chowder Head 3;Clifton Gardens;	AGD	56	338330	6253790	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<u>Contact</u>	<u>Recorders</u>	Michael Guider							
45-6-2330	Two Fish;Clifton Gardens;	AGD	56	338370	6253650	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<u>Contact</u>	<u>Recorders</u>	Michael Guider							

Report generated by AHIMS Web Service on 27/07/2020 for Miles Robson for the following area at Datum :GDA, Zone : 56, Eastings : 335954 - 338949, Northings : 6253837 - 6256827 with a Buffer of 0 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 46

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 2 of 4


 Office of
 Environment
 & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 2045

Client Service ID : 523096

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-2331	Koree Cave	AGD	56	338450	6254370	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<u>Contact</u>			<u>Recorders</u>	Michael Guider			<u>Permits</u>		
45-6-2332	Clifton Reserve 1;Clifton Gardens;	AGD	56	338100	6254160	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<u>Contact</u>			<u>Recorders</u>	Michael Guider			<u>Permits</u>		
45-6-0736	Mosman;Edward's Beach;	AGD	56	338000	6256300	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<u>Contact</u>			<u>Recorders</u>	Margrit Koettig,LM Sim			<u>Permits</u>		
45-6-0740	Mosman;Balmoral;	AGD	56	337866	6255399	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<u>Contact</u>			<u>Recorders</u>	Margrit Koettig,W.D Campbell			<u>Permits</u>		
45-6-0656	Mosman Bay	AGD	56	336428	6254573	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	<u>Contact</u>			<u>Recorders</u>	Val Attenbrow,Margrit Koettig			<u>Permits</u>		
45-6-0658	Crows Nest;Avenue Rd;	AGD	56	336611	6254095	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<u>Contact</u>			<u>Recorders</u>	Margrit Koettig,W.D Campbell			<u>Permits</u>		
45-6-0665	Mosman Bay;	AGD	56	337100	6254800	Open site	Deleted	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<u>Contact</u>			<u>Recorders</u>	Margrit Koettig,W.D Campbell			<u>Permits</u>		
45-6-0674	Bradley's Head;Taylor's Bay;	AGD	56	337900	6253662	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	<u>Contact</u>			<u>Recorders</u>	Brown			<u>Permits</u>		
45-6-0677	Balmoral Beach 2;Bungarees cave;	AGD	56	338250	6255290	Closed site	Valid	Art (Pigment or Engraved) : -, Shell : -, Artefact : -	Shelter with Art,Shelter with Midden	1809,2025,98676
	<u>Contact</u>			<u>Recorders</u>	Val Attenbrow,Alice Gorman,Michael Guider			<u>Permits</u>	267,419,4346	
45-6-0678	Balmoral Beach 3;	AGD	56	338160	6255400	Closed site	Valid	Art (Pigment or Engraved) : -, Shell : -, Artefact : -, Burial : -	Burial/s,Midden,Shelter with Art	1809,2025,2988
	<u>Contact</u>			<u>Recorders</u>	Val Attenbrow			<u>Permits</u>	3170	
45-6-1701	Little Sirius Cove Midden;	AGD	56	336837	6253788	Closed site	Valid	Artefact : -, Shell : -	Midden,Shelter with Deposit	1293,2025
	<u>Contact</u>			<u>Recorders</u>	Val Attenbrow,A,K Morris			<u>Permits</u>		
45-6-1702	Sirius Park Midden;	AGD	56	336850	6253973	Open site	Valid	Artefact : -, Shell : -	Midden,Open Camp Site	1293,1809,2025
	<u>Contact</u>			<u>Recorders</u>	Val Attenbrow,A,K Morris			<u>Permits</u>		

Report generated by AHIMS Web Service on 27/07/2020 for Miles Robson for the following area at Datum :GDA, Zone : 56, Eastings : 335954 - 338949, Northings : 6253837 - 6256827 with a Buffer of 0 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 46

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.


 Office of
 Environment
 & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 2045

Client Service ID : 523096

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-0028	Taylor's Bay;Chowder Head;	AGD	56	337900	6253700	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<u>Contact</u>							<u>Permits</u>		
45-6-2812	Fire Trail PAD 1	AGD	56	338710	6254995	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u> T Russell							<u>Permits</u>		
45-6-2814	Fire Trail PAD 2	AGD	56	338690	6255025	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<u>Contact</u> T Russell							<u>Permits</u>		
45-6-2816	Little Fish Park Midden	AGD	56	336858	6254073	Open site	Valid	Habitation Structure : 1, Shell : 1		
	<u>Contact</u> T Russell							<u>Permits</u>		
45-6-2818	Chowder Head 4	AGD	56	338300	6253800	Open site	Valid	Habitation Structure : 1, Earth Mound : 1		
	<u>Contact</u> S Scanlon							<u>Permits</u>		
45-6-2819	Chowder Head 5	AGD	56	338266	6253757	Open site	Valid	Habitation Structure : 1, Earth Mound : 1		
	<u>Contact</u> S Scanlon							<u>Permits</u>		
45-6-2820	Chowder Head 6	AGD	56	338231	6253853	Open site	Valid	Habitation Structure : 1		
	<u>Contact</u> S Scanlon							<u>Permits</u>		

Report generated by AHIMS Web Service on 27/07/2020 for Miles Robson for the following area at Datum :GDA, Zone : 56, Eastings : 335954 - 338949, Northings : 6253837 - 6256827 with a Buffer of 0 meters. Additional Info : archaeological assessment. Number of Aboriginal sites and Aboriginal objects found is 46

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 4 of 4

APPENDIX B: GLOSSARY OF TERMS USED IN ABORIGINAL CULTURAL HERITAGE ASSESSMENTS AND ARCHAEOLOGICAL REPORTS

This glossary is an extract from

GLOSSARY OF TERMS USED IN "LITHIC" ANALYSIS

Author: Peter Hiscock, Dept. Archaeology and Anthropology

Feedback: peter.hiscock@anu.edu.au.

Date Last Modified: 28-August-97

URL: <http://artalpha.anu.edu.au/web/arc/resources/stonegloss/gloss.htm>

And

SYDNEY'S ABORIGINAL PAST

Author: Val Attenbrow

Year Published: 2002

Publisher: University New South Wales Press

Place of Publication: Sydney, NSW, Australia.

ABORIGINAL SITE: Place at which Aboriginal people have undertaken certain activities and special events.

ARCHAEOLOGICAL DEPOSIT: Soil or sediment which contains cultural materials associated with past human activities.

ARCHAEOLOGICAL SITE: A location in which evidence of past human activities exists or has previously existed.

ANGLE OF APPLIED FORCE: The angle at which the force of flaking is applied to a rock.

APPLIED FORCE: The force exerted upon a core or retouched flake.

ARTEFACT: Any object which is physically modified by humans.

ATTRIBUTE: A physical characteristic of an artefact.

BIFACIAL: An artefact which shows evidence of working on two faces.

BULB OF FORCE: The bulb of force is a convex protuberance located at the proximal end of the ventral surface of a flake, immediately below the ring crack. Also called the Positive Bulb of Force or simply 'the bulb'.

BULBAR SCAR: The negative scar that results from the bulb of force.

BURIAL SITES: Locations where people were buried and where skeletal remains have been found.

CAMPSITE: Locations where people slept overnight as well as a place where other domestic activities were undertaken.

CONCHOIDAL FRACTURE: A type of fracture which gives smoothly curved surfaces resembling the form of a bivalve shell.

CONE: Shorthand term for Hertzian cone crack, a cone shaped fracture plane extending from a circular ringcrack as a result of loading from a blunt indenter

CORE: A piece of flaked stone which has one or more negative flake scars but no positive flake scars.

CULTURAL MATERIALS: The products of human behaviour, such as stone artefacts or food debris.

DEBITAGE: Cores and unretouched flakes.

DEBRIS: 1. Any refuse discarded from a cultural system. 2. Debitage.

DISCARD: The movement of an object from its systemic context to an archaeological context.

EDGE: The junction of two surfaces of a body.

EDGE DAMAGE: The removal of small flakes from the edge of an artefact.

ERRAILURE FLAKE: A flake formed between the bulb of force and the bulbar scar. Sometimes the errailure flake adheres to the core in the bulbar scar. The errailure flake leaves no scar on the core, but always leaves a scar on the ventral surface of the flake. The errailure flake is convex/concave (like a meniscus lens), has no distinct features on the "dorsal face", but may contain compression rings on the bulbar face.

FEATHER TERMINATION: A termination of the fracture plane that occurs gradually (ie. there are no sharp bends in the plane), producing a thin, low angled distal margin.

FLAKE: 1. Any piece of stone fractured from a larger mass by the application of an external force. 2. The piece of stone struck off a core. It has a series of characteristics showing that it has been struck off. The most indicative of these features are ringcracks, showing where the hammer hit the core. Also the ventral surface may be deformed in characteristic fashion, for example having a bulb or errillure.

FLAKING: The process of fracturing stone by the application of an external force.

FORCE: The quantity of energy exerted by a moving body; power exerted; energy exerted to move another body from a state of inertia.

FRACTURE: Irregular surface produced by breaking a mineral across rather than along cleavage planes.

GRINDING STONE: An implement with a smooth, shallow concave surface which was created through use, either to abrade the surface of another artefact or to process food.

HAMMER: A fabricator used to apply a dynamic load.

HINGE TERMINATION: A fracture plane that turns sharply toward the free surface of the core immediately prior to the termination of the fracture. The bend of the ventral surface is rounded and should not be confused with a step termination.

HOLOCENE: A geological time-scale period lasting from 10,000 years ago to the present.

IN-SITU: An undisturbed archaeological feature or deposit.

KNAPPER: A human who creates stone artefacts by flaking.

KNAPPING: The process of striking rocks and causing them to fracture.

LENGTH: The distance from the platform to the termination of a flake or flake scar. Also Percussion Length.

MIDDEN: Cultural deposit in which material, such as shell, are built up in an archaeological site.

NEGATIVE BULB OF FORCE: The concave surface left after a flake has been removed.

OUTREPASSE: 1. A fracture termination where the fracture path curves markedly away from the core face and continues directly into the core, removing the base of the core and giving the flake a J shape in longitudinal cross section. 2. Any flake containing an outrepasse termination.

PLATFORM: Any surface to which a fabricator is applied when knapping.

PLATFORM ANGLE: 1. The angle between the platform and core face on a core. 2. The angle between the platform and dorsal surface on a flake. 3. The angle between the platform and flaked surface on a retouched flake.

PLEISTOCENE: A geological time-scale lasting from 2 million years ago to 10,000 years ago.

POINT OF FORCE APPLICATION: The area of the platform in contact with the indenter during knapping.

QUARRY: A location where stone or ochre has been removed by humans from a source of rock.

PRESSURE FLAKING: The process of detaching flakes by a pressing force. Also Static Loading.

REDUCTION: Process of breaking down stone by either flaking or grinding.

RETOUCHED FLAKE: A flake that has subsequently been re-flaked.

RETOUCHING: The act of knapping a flake into a retouched flake.

RING CRACK: A circular pattern of micro-fissures penetrating into the artefact around the Point of Force Application and initiating the fracture. It appears on the ventral surface usually as a semi-circular protuberance on the edge of the platform.

ROCK SHELTER: A sheltered area within a cliff-line, outcrop or boulder which has formed naturally through weathering or other geological process.

SCAR: The feature left on an artefact by the removal of a flake. Includes negative bulb, negative ringcrack and negative termination.

SCARRED TREE: Trees in which have scars formed by the removal of bark or wood in order to make canoes, shields or baskets.

SILICEOUS: Having a high silica content.

STEP TERMINATION: A fracture plane that turns sharply towards the free surface of the core immediately prior to the termination of the fracture. The bend of the ventral surface is sharp, often a right angle.

STRATIGRAPHY: The layers of sediment and cultural material that are able to be distinguished in a deposit.

TERMINATION: The point at which the fracture plain reaches the surface of a core and detaches a flake.

USE: The performance of a stone artefact in an activity involving non-stone objects.

USE-WEAR: Damage to the edges or working surfaces of tools sustained in use.

VENTRAL SURFACE: The surface of a flake created when it is removed and identified mainly by the presence of a ring crack.