

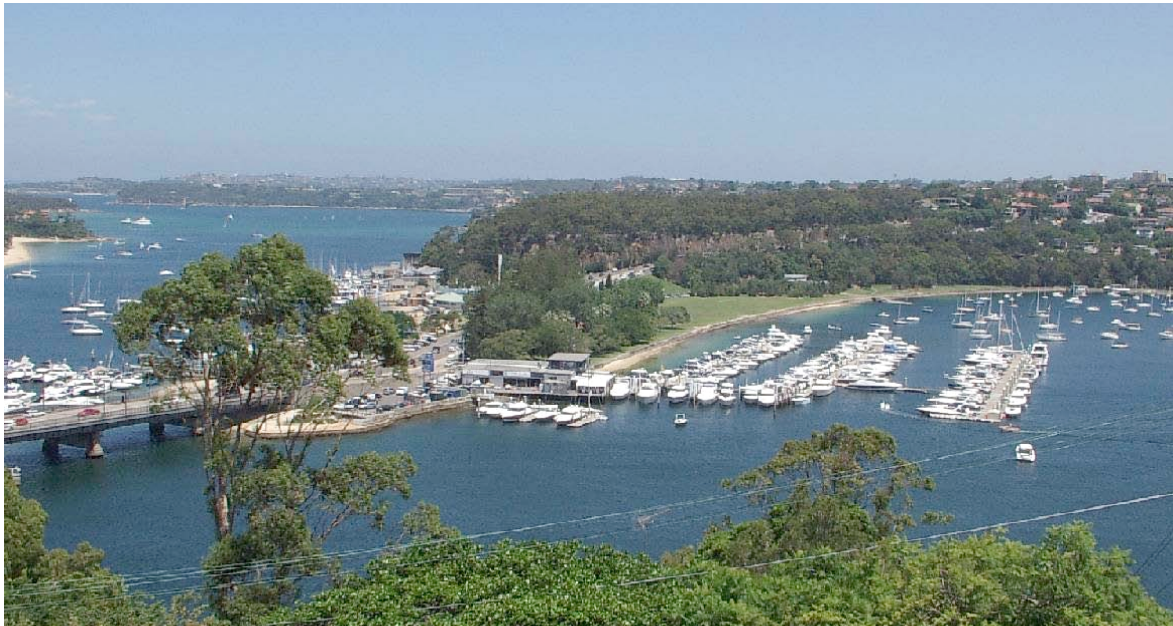
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# **D'ALBORA MARINA THE SPIT EXPANSION & REDEVELOPMENT**



## **ABORIGINAL, HISTORICAL & MARITIME ARCHAEOLOGICAL ASSESSMENT FINAL REPORT**

**May 2010**

**THE SPIT ROAD,  
MOSMAN  
NEW SOUTH WALES**

**D'ALBORA MARINA  
THE SPIT**

**EXPANSION & REDEVELOPMENT**

**ABORIGINAL, HISTORICAL & MARITIME  
ARCHAEOLOGICAL ASSESSMENT**

**FINAL REPORT**

*Prepared for:*

**Ardent Leisure Pty Ltd**

*By:*

Caroline Wilby  
Cosmos Coroneos

May 2010

J07/19

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## Executive Summary

Ardent Leisure Pty Ltd is proposing to undertake a series of alterations, extension and redevelopment works at the d'Albora Marina, The Spit Road, Mosman. In broad terms, these proposed works involve alterations and extensions to the existing building on the site, installation of a new fuel system, demolition of an existing fixed jetty and replacement with a floating marina, and new floating berths at two of the existing marina arms.

An application has been made to the NSW Department of Planning for approval to carry out these works as a Major Project under Part 3A of the *Environmental Planning & Assessment Act 1979*. Subsequent Director-General's Requirements issued for the project include the preparation of an Environmental Assessment to be submitted to the Department of Planning for approval.

The following report presents an Aboriginal, Historical & Maritime Archaeological Assessment to form part of the Environmental Assessment pursuant to Part 3A of the Act. This report provides an assessment of the archaeological resource – both Aboriginal and non-Aboriginal – within the subject site and reviews the impacts of the proposed development on the cultural significance of the identified archaeological resource.

This Aboriginal, Historic & Maritime Archaeological Assessment has found that:

- No Aboriginal sites, items or places – submerged or on land – are known or predicted to occur within the boundaries and scope of the current proposed development footprint;
- Two historic cultural sites listed as items of local heritage significance on the *Mosman Local Environmental Plan 1998*, are situated within the proposed development footprint;
  - “Remains of Former Bridge and Seawall” (NB: only the seawall is located in the development footprint)
  - “Site of Former Explosives Wharf”
- The archaeological remains of late 19<sup>th</sup> century to mid 20<sup>th</sup> century maritime structures and Spit transport infrastructure – including several phases of earlier boatshed, jetty and slip construction and an early 20<sup>th</sup> century tramway – are likely to survive within the boundaries of the proposed development footprint;
- These archaeological remains dating to the late 19<sup>th</sup> – mid 20<sup>th</sup> century are considered “relics” under the NSW *Heritage Act 1977* and are thus afforded protection within the Act;
- An early 20<sup>th</sup> century slip, assessed to be of local cultural significance, also is present within the study area and will be removed as part of the current proposed development;
- Archaeological deposits formed from objects discarded – intentionally or unintentionally – from vessels, jetties, slips and boatsheds, and artefacts contained within early – mid 20<sup>th</sup> century land reclamation / fill deposits, are also likely to be present in the boundaries of the current proposed development;
- The cultural heritage resource identified within the study area is assessed to range from **Minimal** to **Local** Significance;
- The proposed works will deliver varied impacts to the identified cultural heritage and archaeological resource within the boundaries of the development footprint. It has

been assessed that these impacts will be of a **minor** nature to the cultural significance of the resource – conditional, in some instances, upon the implementation of mitigation measures.

Based on the findings of this Aboriginal, Historical & Maritime Archaeological Assessment, best heritage practices and relevant statutory provisions, the following management recommendations are provided in order to mitigate the impacts of the proposed development on the identified cultural / archaeological resources within the boundaries of the proposed development footprint. It is advised that these mitigation measures form part of the Statement of Commitments for the proposed development.

***Recommendation 1 – Archival recording prior to commencement of development***

A program of above water archival recording should be conducted regarding the following structures and sites, prior to the commencement of the proposed development:

- The northern slip (1930s);
- The site of the former southern slips (1910s-1960s), underneath the existing d'Albora Marina boatshed; and
- The site of the earlier boatsheds (1890s-Lyons Boatshed), underneath the existing d'Albora Marina boatshed.

The preparation of the archival record should include:

- archival photography in adherence to the specific requirements detailed by the NSW Heritage Office publication *Heritage Information Series – Photographic Recording of Heritage Items using Film or Digital Capture* (2006);
- detailed physical examination (i.e. non-disturbance survey), documentation and interpretation of identified archaeological features and deposits (no archaeological excavation is required).

Copies of the completed archival record should be provided, to and kept by, the client, Mosman Municipal Council and Mosman Council Library.

***Recommendation 2 – Archaeological monitoring and documentation during certain components of the proposed development***

Archaeological monitoring and documentation by a qualified archaeologist should be conducted during the following components of the proposed development:

- Subsurface excavation associated with the installation of the new underground fuel storage in order to ascertain whether any remains of the former tram lines / balloon loop (1910s) survives and to document any archaeological features and / or deposits that may be encountered;
- Demolition and removal of the northern slip in order to examine and record any remains of earlier slip constructions or associated artefact deposits that may be present;
- Any land-based subsurface excavation that may be associated with the proposed redevelopment of the boatshed building in order to ascertain whether any remains of the earlier boatsheds survives and to document any archaeological features and / or deposits that may be encountered.

Such archaeological monitoring would be of a minor scale, involving the presence of an archaeologist on site during the subsurface excavation in these areas. Recording would be

conducted by the archaeologist as the earthworks are carried out by relevant construction contractors. It is anticipated that such monitoring would require an archaeologist on site for a few days only.

***Recommendation 3 – Notification of previously unidentified or unanticipated archaeological finds***

Should any archaeological sites, items or deposits – Aboriginal and non-Aboriginal – be encountered during works associated with the proposed development, a qualified archaeologist should be notified and requested to inspect the finds in order to determine the appropriate course of action.

***Recommendation 4 – Development activities conducted with due care***

All activities involved in the proposed development should be conducted with due diligence and care in order to ensure that no undue damage to the identified cultural resource of the subject site occur. Specifically, impacts to the seabed should be minimised where possible and direct physical impacts to the western stone seawall should be strictly avoided.

***Recommendation 5 – Review of archaeological impact assessment***

If the development proposal is significantly altered to include impacts not identified in this report, a review of this impact assessment by a qualified cultural heritage practitioner should be conducted.

**Consultation Requirements –**

***Recommendation 6 – Consultation with relevant statutory authorities in lieu of permitting requirements***

In order to remain consistent with NSW statutory objectives and requirements under the relevant heritage regulations, including sections of the *Environmental Planning & Assessment Act 1979*, the *National Parks & Wildlife Act 1974* and the *Heritage Act 1977*, the following government authorities should be consulted with:

- Mosman Municipal Council – regarding impacts to two items of local heritage significance listed on the *Mosman Local Environmental Plan 1998*; and
- NSW Heritage Branch – regarding impacts to archaeological features and deposits defined as “relics” under the *NSW Heritage Act 1977*.

It is assumed that this consultation will take place as part of the review of the Environment Assessment by the relevant agencies.

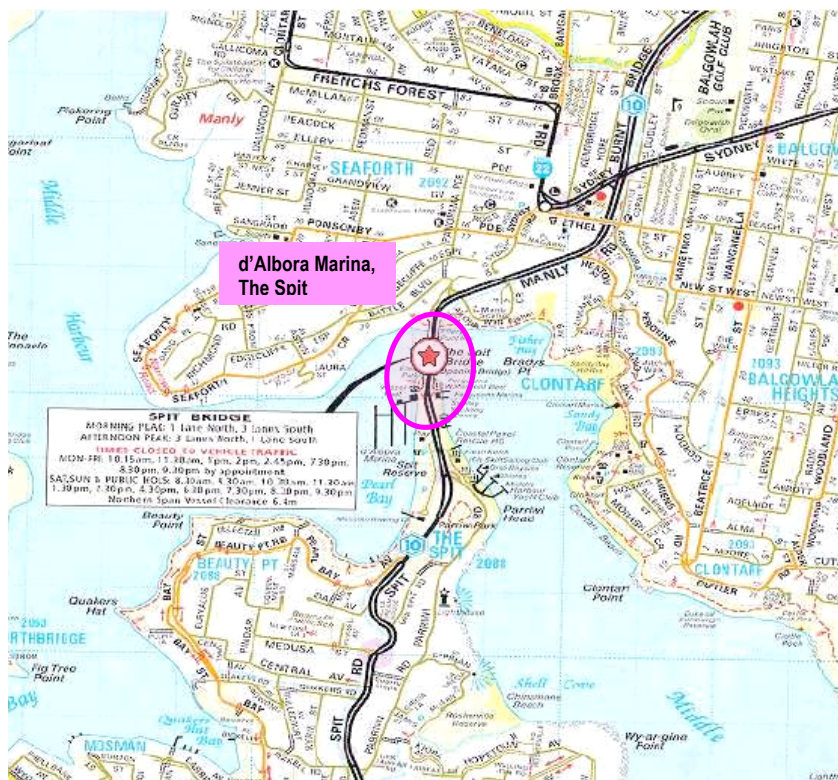
## 1.0 INTRODUCTION

### 1.1 Background

d'Albora Marinas are proposing to undertake a series of alterations, extension and redevelopment works at the d'Albora Marina, The Spit Road, Mosman (refer to Figure 1.1). In broad terms, these proposed works involve alterations and extensions to the existing building on the site, installation of a new fuel system, demolition of an existing fixed jetty and replacement with a floating marina, and new floating berths at two of the existing marina arms.

As the proposed works involve new construction, demolition of existing structures and earthworks that would deliver impacts onto areas of the seabed and foreshore of Pearl Bay, Middle Harbour, an Environmental Assessment is required to form part of the development application under Part 3A of the *Environmental Planning & Assessment Act 1979*. Should the application be approved the proponent would not be required to apply for standard heritage permits under the *National Parks and Wildlife Act 1974*, the *NSW Heritage Act 1977* or at Local Council level with regard to Local Environmental Plans. However, the relevant statutory agencies are given the opportunity to review Part 3A Environmental Assessments to ensure they adequately address the Director-General's requirements issued for each Major Project.

Cosmos Archaeology Pty Ltd has been commissioned to prepare an archaeological assessment for aspects of Aboriginal, historical and maritime cultural heritage associated with the proposal. This report forms part of the supporting documentation for the Environmental Assessment.



**Figure 1.1:** Location of study area; d'Albora Marina, The Spit

(Base map reference:  
[http://www.street\\_directory.com](http://www.street_directory.com))



## **1.2 The development proposal**

The proposed development for the d'Albora Marina, The Spit, will result in an additional 35 vessels being accommodated on the site. Aspects of the proposal which are relevant to this study are (refer also to Figure 1.2)<sup>1</sup>:

- 1. ALTERATIONS & EXTENSIONS TO THE EXISTING BUILDING ON SITE**
  - Demolition of the existing building on the site and the construction of a new building to enable the use of two full floors, and;
  - To accommodate the new structure, it is proposed to substantially replace the existing structure and undertake replacement piling beneath the existing structure to ensure longevity of the new building.
- 2. CONSTRUCTION OF NEW HARDSTAND**
  - Construction of a new hardstand area on the northern side of the existing building. The hardstand has been designed taking account of ecological conditions;
  - A new travel lift will also be constructed, situated on the northern side of the new hardstand allowing boats to be positioned parallel to the tidal flow, and;
  - In order to accommodate the new hardstand, an existing obsolete slipway situated on the northern side of the existing building will be removed.
- 3. EXTENSION AND RE-ORIENTATION OF D-ARM**
  - D-Arm will be extended and re-orientated in order to accommodate a total of eight vessels (current capacity is four vessels). The use of these new berths is intended for the on-site boat dealers as a holding area for boats before and after maintenance works, as well as a holding area for the delivery of new boats. These berths will not be used as permanent customer berths, and;
  - Two fuel / sewage pump out berths will also be located on this Arm.
- 4. REPLACEMENT OF THE EXISTING FIXED JETTY AT N-ARM**
  - The existing fixed jetty at N-Arm which has a current capacity of 5 vessels will be demolished and replaced with a more modern floating system, consistent with the existing modern floating structure of the marina. This will minimise the level of penetration of the sea bed and accord with more modern day marina infrastructure that is available to the market;
- 5. RELOCATION OF THE FUEL BERTH FROM N-ARM**
  - The fuel berth at N-Arm will be relocated to D-Arm. This new system will be available for public, as well as private, use to benefit the local boating community.
- 6. EXTENSION OF A-ARM**
  - A-Arm will be extended to accommodate an additional four vessels, including one vessel up to 18 m in length on the T-Head.
- 7. EXTENSION OF B-ARM**
  - B-Arm will be extended to accommodate an additional twelve vessels, including one vessel up to 27.5 m on the T-Head.
- 8. REORIENTATION OF BERTHS ON C-ARM**
  - The berths on the western side of C-Arm will be reoriented from parallel to perpendicular. This will allow for the accommodation of fifty-two vessels .

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<sup>1</sup> **Hamptons**, Revised Scope of Works The Spit, Mosman. Emailed 29<sup>th</sup> April 2010 (\\2006-038\\Environmental Assessment\\Scope of Works.doc)

metres (current capacity is eight berths for vessels up to thirty-five metres). One vessel, up to 35 m in length, will be berthed at the T-head at each end of this Arm.

#### 9. INSTALLATION OF A NEW FUEL SYSTEM

- The existing fuel system will be decommissioned and a new fuel system installed.
- This new fuel system will be located underground, below the existing on-grade car parking area on the north-eastern side of the site.
- New fill points and lines will need to be installed to facilitate the new fuel system.



**Figure 1.2:** Master Plan of complete works proposed for d'Albora Marina Refurbishment, The Spit.<sup>3</sup>

<sup>3</sup> Corben Architects (24/04/2010) d'Albora Marina Refurbishment, The Spit, Mosman– Staging Plan. Drawing No. DA00, Issue A.

### **1.3 The study area & scope of works**

The area to be assessed includes the seabed in Pearl Bay, Middle Harbour and the western shore of The Spit located within the proposed development footprint.

This assessment will deal with:

- Impacts to archaeological relics and / or deposits – Aboriginal, and historic – on or under the seabed, and;
- Impacts to archaeological relics and / or deposits – Aboriginal and historic – exposed or buried on land, including underneath the existing building.

This assessment will contribute to the cultural heritage assessment of the:

- Current jetties, slipways and other related maritime infrastructure.

This assessment does not include:

- Assessment of the impacts to the heritage values of the existing building at the marina, or;
- Underwater diving inspections.

### **1.4 Objective of study**

The key objectives of the archaeological assessment include:

- Identify the extent, condition and significance of the known archaeological resource within the study area;
- Investigate and predict the extent, condition and significance of the potential archaeological resource within the study area;
- Assess the impact of the proposed development on the actual and potential archaeological resource;
- Provide advice on legal compliance issues related to the archaeological resource;
- Propose mitigating measures to prevent or minimise the impact of the development on the significance of actual and potential archaeological remains.

### **1.5 Method of approach**

#### ***Preliminary Aboriginal archaeological investigation***

The Aboriginal archaeological component of the study involved several stages:

- 1/** Examination of the NSW Department of Environment, Climate Change and Water (DECCW) Aboriginal Heritage Information Management System (AHIMS);
- 2/** Research of environmental information (geology and bathymetry) to obtain an understanding of late Pleistocene landscapes within the Pearl Bay – Middle Harbour area;
- 3/** Preparation of possible site predictive models based on landform units;
- 4/** Examination of previous studies relating to the effects of inundation on Aboriginal archaeological sites;
- 5/** Consideration of modern cultural impacts post European occupation.

The results of the research and assessment are presented in **Section 2.0**.

### ***Non-Aboriginal / European archaeological investigation***

The historical investigation involved two main components:

- 1/ Summary overview of the historical use of the north-western shore of The Spit, relating specifically to the physical development of the foreshore and bay area – including land reclamation, construction of maritime structures and shipping activities.
- 2/ Review of archival maps, plans, aerial images, photographs and illustrations relating to physical developments within the study area.

The purpose of the overview of the historical use of the area is to predict the type, condition, frequency and extent of the products of European cultural behaviour that may be found within the study area. The aim of the investigation of archival maps, plans, photographs and illustrations is to obtain clear evidence of the possible presence and location of historical structures and elements within the study area. No previous archaeological or cultural heritage studies dealing specifically with the d'Albora Marina have been identified.

The results of the research and assessment are presented in **Section 3.0**.

### ***Terrestrial inspection***

An archaeological inspection of the terrestrial components of the study area was conducted in order to assist in the determination of the presence of archaeological remains within the development footprint. Physical inspections allow the identification of exposed archaeological remains and assist in the understanding of site formation processes with the purpose of assessing archaeological potential below ground / seabed level.

The results of the inspection are presented in **Section 4.0**.

### ***Significance assessment***

An assessment of cultural significance or heritage significance seeks to understand and establish the importance or value that a place, site or item may have to select communities and the general community at large. The Australian ICOMOS *Charter for the Conservation of Places of Cultural Significance* (the *Burra Charter* 1979, most recently revised in 1999), the standard adopted by most heritage practitioners in Australia when assessing significance, defines cultural significance as:

*“Aesthetic, historic, scientific or social value for past, present or future generations.”<sup>4</sup>*

This value may be contained in the fabric of the item, its setting and relationship to other items, the response that the item stimulates in those who value it now, or the meaning of that item to contemporary society.

Accurate assessment of the cultural significance of sites, places and items is an essential component of the NSW heritage assessment and planning process. A clear determination of a site's significance allows informed planning decisions to be made for place, in addition to ensuring that their heritage values are maintained, enhanced, or at

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<sup>4</sup> *The Burra Charter* (1999): Article 1.2.

least minimally affected, by development. Assessments of significance are made by applying standard evaluation criteria.

### **ABORIGINAL CULTURAL HERITAGE SIGNIFICANCE CRITERIA (NSW DECCW GUIDELINES)**

- ◆ **Social Value** (sometimes termed **Aboriginal Value**) – Refers to the spiritual, traditional, historical or contemporary associations and attachments which the place or area has for the present-day Aboriginal community. Places of social significance have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities can experience a sense of loss should a place of social significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with one or more Aboriginal communities.
- ◆ **Historic Value** – Refers to the associations of a place with a person, event, phase, or activity of importance to the history of an Aboriginal community. Historic places may or may not have physical evidence of their historical importance (such as structures, planted vegetation or landscape modifications). Gaining a sufficient understanding of this aspect of significance will often require the collection of oral histories and archival or documentary research, as well as field documentation. These places may have 'shared' historic values with other (non-Aboriginal) communities. Places of post-contact Aboriginal history have generally been poorly recognised in investigations of Aboriginal heritage, and the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives.
- ◆ **Scientific Value** – Refers to the importance of a landscape, area, place, or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place, or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.
- ◆ **Aesthetic Value** – Refers to the sensory, scenic, architectural, and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.

It is important to note that the determination of Aboriginal cultural heritage values cannot adequately be conducted without the input of the local Aboriginal community groups and stakeholders. Furthermore, these aspects of the heritage significance of a place or object are commonly inter-related. Because all assessments of heritage values occur within a social and historical context, all potential heritage values will have a social or Aboriginal community heritage component.

## **EUROPEAN CULTURAL HERITAGE SIGNIFICANCE CRITERIA (NSW HERITAGE BRANCH GUIDELINES)**

- a. *An item is important in the course or pattern of NSW's cultural or natural **history** (or the cultural or natural history of the local area);*
- b. *An item has strong or special **associations with the life or works of a person, or group of persons, of importance in NSW' cultural or natural history** (or the cultural or natural history of the local area);*
- c. *An item is important in demonstrating **aesthetic characteristics** and/or a high degree of **creative or technical achievement** in NSW (or the local area);*
- d. *An item has strong or special **associations with a particular community or cultural group** in NSW (or the local area) **for social, cultural or spiritual reasons**;*
- e. *An item has **potential to yield information** that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);*
- f. *An item possesses **uncommon, rare or endangered** aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);*
- g. *An item is important in **demonstrating the principal characteristics of a class of NSW's cultural or natural places**; or cultural and natural environments.*

The archaeological significance of a site may be seen as directly linked to the scientific or research value of the relics that are present. In Australia this concept is commonly defined as a set of questions that are used as a means of assessing the significance of an archaeological site within a relative framework;

- i. *Can the site contribute knowledge that no other resource can?*
- ii. *Can the resource contribute knowledge that no other site can?*
- iii. *Is this knowledge relevant to general questions about human history or other substantive questions relating to Australian history, or does it contribute to other major research questions?*

The results of the significance assessment are presented in **Section 5.0**.

### ***Impact assessment***

An assessment of scale and types of impacts of the proposed development on the identified archaeological resource was conducted through a detailed examination of all relevant elements of the proposed works in relation to the results of the archaeological assessment and significance assessment.

The impact assessment has been prepared in accordance with relevant NSW DECCW and NSW Heritage Branch guidelines and is presented in **Section 6.0**.

### ***Review of legal compliance issues***

Heritage protection laws and guidelines dictate compliance requirements and have a critical role in shaping appropriate mitigation measures to protect the physical remains of cultural heritage.

A review of the relevant statutory legislation, environmental planning instruments, non-statutory regulations and heritage registers is provided in **Section 7.0**.

### **Mitigation measures**

Based on the findings of the archaeological assessment, significance assessment, impact assessment and review of legal compliance issues, recommendations have been prepared in order to mitigate the impact of the proposed development on the identified cultural heritage resource.

These recommendations are provided in **Section 8.0**.

### **1.6 Abbreviations Used**

AHIMS	Aboriginal Heritage Information Management System
BP	Before Present
DECCW	Department of Environment, Climate Change & Water (NSW)
LAT	Lowest Astronomical Tide
LEP	Local Environmental Plan
LGA	Local Government Area
ML	Mitchell Library (NSW)
NLA	National Library of Australia
NPW	National Parks and Wildlife (NSW)
REP	Regional Environmental Plan
SoHI	Statement of Heritage Impact
SL	State Library (NSW)

## 2.0 THE INVESTIGATION – Aboriginal Occupation

The following section presents an examination of Aboriginal occupation within the Pearl Bay – Spit and broader Middle Harbour region and the potential for Aboriginal archaeological evidence to survive within the study area; including a description of the physical landscape and its Late Quaternary development (Section 2.1), an overview of archaeological evidence of prehistoric Aboriginal occupation throughout the greater Sydney region (Section 2.2), an examination of Aboriginal archaeological and cultural sites recorded in the broad vicinity of The Spit (Section 2.3) and a discussion of Aboriginal archaeological site sensitivity and prediction (Section 2.4).

### 2.1 Physical Landscape

#### 2.1.1 Geology & Topography

The study area is situated in the north-eastern section of Pearl Bay, Middle Harbour, on the north-western shoreline of The Spit, Mosman. The underlying geology consists of Hawkesbury Sandstone, a hard weathering Triassic sandstone that forms the steep, rugged slopes and ridges found adjacent to much of Port Jackson. Specifically, Hawkesbury Sandstone is comprised of medium to coarse-grained quartz sandstone of massive or cross-bedded sheet facies and minor shale and laminite lenses. Soils are shallow (50cm-150cm), discontinuous *Lithosols* / *Siliceous Sands* (coarse quartz) associated with rock outcrop, *Earthy Sands* and *Yellow Podzolic Soils* (earthy, sandy clay / loam) on the inside of benches, along joints, fractures and drainage lines, and localised *Yellow* and *Red Podzolic Soils* associated with shale lenses. Severe sheet erosion often occurs during storms.

The topography of the Hawkesbury Sandstone landscape comprises rugged, rolling to very steep hills. Local relief varies from 40m-200m and slope gradients range from 25%-70%. Crests and ridges are convex and narrow (at >300m wide) and valleys are narrow and incised. Rock outcrop occurs as horizontal benches and broken scarps up to 10m high, with boulders and cobbles covering up to 50% of the ground surface.

Prior to European occupation, the native vegetation would have comprised low open woodland containing *Eucalyptus gummifera* (Red bloodwood), *Eucalyptus oblonga* (narrowleaved stringybark), *Eucalyptus haemostoma* (Scribbly gum), *Eucalyptus capitellata* (Brown stringybark) and *Banksia serrata* (Old man banksia). On the more sheltered sideslopes, a dry sclerophyll open-forest containing *Eucalyptus sieberi* (Black ash), *Eucalyptus piperita* (Sydney peppermint), *Angophora costata* (Smooth-barked apple) and *Allocasuarina* (Black sheoak) would have predominated. Wet sclerophyll closed-forests of *Eucalyptus pilularis* (Blackbutt), *Eucalyptus saligna* (Sydney blue gum), *Tristania laurina* (Water gum), *Callicoma serratifolia* (Black wattle) and *Backhousia myrtifolia* (Native myrtle) would have occurred within sheltered gullies.<sup>5</sup>

The foreshore of this landscape along the upper reaches of Middle Harbour is formed predominantly of stable rock, with estuarine mud forming the seafloor. Numerous sandstone outcrops – both above and below the water line – are common features.

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<sup>5</sup> Chapman, G.A. & C.L. Murphy (1989) *Soil Landscapes of the Sydney 1:100 000 sheet*. Soil Conservation Service of NSW, Sydney. & Chapman, G.A., Murphy, C.L., Tille, P.J., Atkinson, G. and Morse, R.J. (1989) *Soil Landscapes, Sydney 1:100,000*. Soil Conservation Service of NSW, Sydney.



However, along the lower reaches of Middle Harbour – approximately 2-5km inland from the Port Jackson “heads,” the foreshore consists of largely unstable sandy shores with a mixture of marine sands and estuarine mud forming the seafloor.

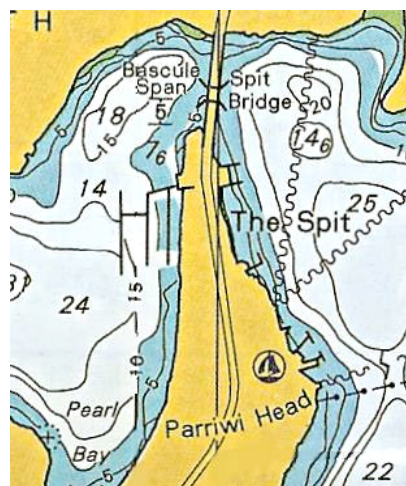
Seafloor sediments along Middle Harbour and Port Jackson as a whole, are derived from three main sources: marine, fluvial and anthropogenic. Fluvial sediments comprised of mud and freshly weathered sand dominate the deep holes and shallow bay environments. Marine sediments comprised of sands and shelly gravelly sands dominate the entrance to Port Jackson and exposed oceanic environments. Anthropogenic sediments includes numerous forms of refuse introduced to the harbour by humans, as well various sediments and materials artificially deposited as part of intentional land reclamation exercises.

The Spit may be considered to be on the edge of the upper and lower Middle Harbour shore environments. Prior to European development, The Spit formed a long, narrow and relatively unstable sand bar projecting NNE from Beauty Point across Middle Harbour. The sediments comprising The Spit include both marine sands / shelly gravels derived from oceanic swell waves refracted through the Port Jackson heads, and fluvial mud and eroded Hawkesbury sandstone derived from fluvial downstream tidal flows.<sup>6</sup>

In the last one hundred years, human activities have significantly altered and modified the natural landscape of the study area. Foreshore reclamation and development at The Spit has been extensive. Layers of artificially introduced fill, periodically deposited in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, now overlie natural sediments across much of the locale – indeed the upper terrestrial deposits of the current study area comprise reclaimed land.

### **2.1.2 Bathymetry & Hydrography**

Bathymetric data for the study area shows that the seabed slope of Pearl Bay increases quite significantly seaward of the shoreline, dropping to a depth of 10 metres below lowest astronomical tide (LAT) level approximately 50-60 metres from the western shoreline of The Spit. The seabed then slopes more gradually to a depth of 15 metres approximately 100 metres from the shore, leveling at approximately 24 metres below LAT to the south-west. The seabed off the eastern shore of The Spit and the southern shore of Clontarf show similar slopes. A sill approximately 10 metres below LAT and approximately 200 metres in width, runs north-south between Clontarf with the northern extent of The Spit – refer to Figure 2.1.



**Figure 2.1:** Bathymetry of The Spit – Pearl Bay, Middle Harbour.<sup>7</sup>

<sup>6</sup> Harris, P. & P. O'Brien (1998) *Australian Ports – Environmental Data & Risk Analysis. Phase 1: Literature Review*. Report prepared for Australian Quarantine Inspection Service (AQIS). Petroleum & Marine Division, Australian Geological Survey Organisation, Canberra, ACT.  
Manly Council & Clontarf / Bantry Bay Estuary Management Working Group (2007) *Clontarf / Bantry Bay Data Compilation & Estuary Processes Study*. Clontarf / Bantry Bay Estuary Management Planning Process, NSW.

<sup>7</sup> Commonwealth of Australia / Crawford House Publishing (1995) *Crawford's Mariners Atlas – Port Stephens to Jervis Bay (complete compendium of Royal Australian Navy Charts)*. Crawford House Publishing, Bathurst, NSW. **Chart 21**

Middle Harbour represents a partially mixed estuary with freshwater plumes present after intense rainfalls in Middle Harbour Creek. Tidal currents dominate in the mixing and circulation of estuarine water, however, the tidal range is microtidal. Typical current speeds are of 30-50cm/sec, although surface currents can reach up to 100cm/sec in narrow constricted channels. The estuary waters are quite turbid; thought to be caused by sediment erosion and reworking – particularly so in narrow channels where tidal current scouring is more intense.<sup>8</sup>

Wind generated waves in Middle Harbour are generally less than 0.1m in height. However, ocean swell waves undergoing severe refraction and diffraction penetrate lower Middle Harbour, often reaching The Spit and the beaches of Clontarf. Significant storm events affecting Middle Harbour are known to have occurred in April 1893, June 1923 and May-June 1974 – the latest of which resulted in wall collapse near Middle Harbour Yacht Club and minor beach erosion at The Spit and Clontarf. A tsunami event in May 1960 is also recorded to have removed large amounts of sediment from Clontarf Reserve Point Park.<sup>9</sup>

### **2.1.3 Evolution of the Landscape – Late Quaternary History**

The current landscape of the study area and the development of the sand bar that now forms The Spit, occurred as a result of Pleistocene erosion of Hawkesbury sandstones, episodes of marine flooding and aeolian sedimentation, and the rising sea levels towards the latter part of the postglacial transgression, around 10,000 years BP. During the glacial period of the Late Quaternary Pleistocene (approximately 25,000-15,000 years BP), the sea level was approximately 60 metres lower than the present and area of The Spit would have been situated within a hinterland environment, over 30 kilometres from the coast. The broader study area would have been located on the raised southern slopes overlooking the ancient freshwater river system of Middle Harbour Creek, which drained the sandstone plateaus to the north-west. The fluvial systems of Middle Harbour Creek cut deep V-shaped valleys through the sandstone landscape, carrying eroded sediments to the sea. The sediments infilling these valleys would have been deposited during Pleistocene episodes of marine flooding and aeolian sedimentation.<sup>10</sup>

With the melting of the continental ice sheets during the post-glacial marine transgression, commencing at around 15,000 years BP, a rise in sea level occurred over several thousand years. The sea reached its present level during the Holocene period, approximately 6-7,000 years BP, and has not fluctuated more than approximately one metre since. The rising sea levels caused the deeply incised inland river valleys to be gradually flooded by the sea, with tidewater penetrating further inland.<sup>11</sup>

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<sup>8</sup> Harris & O'Brien (1998)

<sup>9</sup> Manly Council & Clontarf / Bantry Bay Estuary Management Working Group (2007)

<sup>10</sup> Attenbrow, V. (2002) *Investigating Sydney's Aboriginal Past*. University of New South Wales Press, Sydney.

Harris, P. & P. O'Brien (1998)

Sale, C. (2000) "Sydney: Olympic City 2000" *Geography Bulletin*. (Summer)

<sup>11</sup> Harris & O'Brien 1998,

Thom, B.G. & P.S. Roy (1985) "Relative sea levels and coastal sedimentation in southeastern Australia in the Holocene." *Journal of Sedimentary Petrology*. Vol 55 (2) pp. 257-264.

Approximately 10,000 years BP, Port Jackson was formed with the drowning of Parramatta River – with its tributary, Lane Cove River – and Middle Harbour Creek. These two rivers became joined as one with the flooded interfluvium between them being shallow water running between the mainland and several large islands – what are now the North and South Heads of Sydney Harbour. Former ridges became promontories, valleys became inlets and some former hills became islands. Within the broader study area, the southern ridges overlooking of Middle Harbour Creek became the raised promontory of Beauty Point.<sup>12</sup>

During the last phases of the post-glacial transgression and the early Holocene period, a reworking and erosion of the older Pleistocene estuarine and aeolian deposits occurred. Tidal delta sands and marine sediments were pushed landwards to infill the mouths of Middle Harbour and Port Jackson; the current thickness of tidal delta sediments averages 30m in Middle Harbour. Deep basins partially infilled with estuarine mud lie upstream of the tidal deltas – these mud deposits are also up to 30m thick in Middle Harbour. In the upper reaches of Middle Harbour, estuarine channel shelly sand and muddy shelly sand occur – these deposits are up to 7m thick and appear to have prograded over fluvial mud.<sup>13</sup>

The formation of The Spit is believed to be the result of both marine and fluvial sedimentation. Oceanic swell waves following a littoral drift, or longshore movement, northwards up the east Australian coast are refracted through the “heads” of Port Jackson, reaching the beaches of Shell Cove (west of Beauty Point / The Spit). These waves carry marine sands and sediment into Middle Harbour and over time, these sediments accumulated (or prograded) in the calmer waters behind the Shell Cove – Beauty Point headland. A narrow sand bar formed, following the general direction of the northerly longshore current. At the same time, the waters flowing downstream from Middle Harbour Creek carried fluvial mud and eroded sand. Along the northern extent of Beauty Point the river flow is not strong enough to push the marine sediments back to sea and the fluvial mud and sands accumulated in the calmer water west of the sand bar. The sand bar consequently developed, extending across the estuary. Constricted tidal currents flowing north of the accumulated sediments, however, have prevented the development of the sand bar across the width of Middle Harbour. The Spit thus represents a naturally dynamic landform comprised of marine sands / shelly gravels and fluvial mud / weathered Hawkesbury sandstone, and exposed to both marine and river processes. Major storms or runoff events would have quite significantly remoulded the unconsolidated sediments of The Spit over time.<sup>14</sup>

European development over the last one hundred years has significantly modified the natural landscape of The Spit. Land reclamation along the length of the sand bar, commencing in the late 19<sup>th</sup> century and continuing throughout the 1920s-1930s, in conjunction with the construction of a stone seawall along the north and north-east, have served to consolidate and control the dynamic sediments of The Spit. Marine swells and fluvial tidal process still cause accumulation of sand and mud at The Spit,

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<sup>12</sup> Sale, C. (2000)

<sup>13</sup> Roy, P. S. (1983) “Quaternary Geology.” in C. Herbert (eds.), *Geology of the Sydney 1:100,000 Sheet 9130*. Geological Survey of New South Wales, Sydney, pp. 41-91.

<sup>14</sup> Harris, P. & P. O'Brien (1998)  
Roy, P. S. (1983).

however, the buildup and movement of these sediments is now controlled through periodic dredging of affected areas.<sup>15</sup>

## 2.2 Prehistoric Aboriginal Occupation of the Greater Sydney Region

Aboriginal populations are known to have inhabited the greater Sydney region for at least 20,000 years, and possibly longer.<sup>16</sup> Archaeological sites excavated in the Blue Mountains and the Hawkesbury/Nepean River system have provided the earliest firm evidence of occupation; evidence at Shaws Creek KII rockshelter on the western bank of the Nepean River, north of Penrith, has yielded a radiocarbon date of c. 13,000 years BP<sup>17</sup> while occupation evidence at the Kings Tableland site in the Blue Mountains has yielded a radiocarbon date of c.22,000 years BP.<sup>18</sup> Archaeological sites on the south coast of New South Wales in the Illawarra region provide complimentary dates; Pleistocene occupation has been identified at a rock shelter at Burrill Lake, dated to c. 20,000 years BP,<sup>19</sup> and an open shell midden site at Bass Point, date to c. 17,000 years BP.<sup>20</sup> During the Pleistocene, these sites would have been situated within hinterland areas some distance from the sea.

The majority of Aboriginal archaeological sites situated on the south-east coast of New South Wales, however, date to the period after the post-glacial marine transgression and the Holocene stabilisation of sea levels, approximately 6-7,000 years BP. Nevertheless, it is likely that a considerable number of Pleistocene occupation sites once existed along the coast but have been submerged by the rising seas during the Pleistocene-Holocene transition. Archaeological evidence within the greater Sydney region has generally been interpreted to suggest that early occupation was relatively sporadic and the population levels fairly low. However, by approximately 5,000 years BP, there appears to have been an increasing and continued use of many sites within the Sydney region,<sup>21</sup> evidence for the use and occupation of the Sydney region during this period is certainly more archaeologically visible than earlier periods.

Over the last twenty to thirty years, several broad scale archaeological investigations have been conducted within the greater Sydney region – including several areas within the Hawkesbury sandstone, Port Jackson foreshores and estuarine land systems.<sup>22</sup> Aboriginal archaeological site type and distribution models have consequently been proposed on the basis of data from several different topographies and sub-areas. These studies have indicated that Aboriginal sites are distributed across almost all landforms within the Hawkesbury Sandstone formations and along Quaternary flats

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<sup>15</sup> Wilson, G. (2006) "Major Land Slip at well known yacht club." *Douglas Partners News*.

<sup>16</sup> see Nanson, G. C. *et al.* (1987) "Chronology and paleoenvironment of the Cranebrook Terrace (near Sydney) containing artefacts more than 40,000 years old." *Archaeology in Oceania*. Vol. 22 (2): 72-78.

<sup>17</sup> Kohen, J. *et al.* (1984) "Shaws Creek KII Rockshelter: a prehistoric occupation site in the Blue Mountains piedmont, eastern New South Wales." *Archaeology in Oceania*. Vol. 19: 57-93.

<sup>18</sup> Stockton, E. D. & W. N. Holland (1974) "Cultural sites and their environment in the Blue Mountains." *Archaeology and Physical Anthropology in Oceania*. Vol. 9: 36-64.

<sup>19</sup> Lampert, R.J. (1971) "Burrill Lake and Currarong." *Terra Australis* 1. Department of Prehistory, Australian National University, Canberra.

<sup>20</sup> Bowdler, S. (1970) *Bass Point: the excavation of a south-east Australian shell midden, showing cultural and economic change*. Unpublished BA (Hons) Thesis, Sydney University.

<sup>21</sup> Attenbrow, V. (1987) *The Upper Mangrove Creek Catchment: a study of quantitative change in the archaeological record*. Unpublished PhD Thesis, University of Sydney.

<sup>22</sup> e.g. Attenbrow, V. (1990) *The Port Jackson Archaeological Project: Stage 1*. Unpublished report to the NSW National Parks & Wildlife Service

Vinnicombe, P. (1980) "Predilection and Prediction: A Study of Aboriginal Sites in the Gosford-Wyong Region." Unpublished report to the NSW National Parks and Wildlife Service.

adjacent to estuaries – from valley floors to ridge tops. However, there is considerable variation in the proportion and distribution of different site types in different areas with certain types of sites (e.g. rock shelters, engravings) being found in association with particular physiographic units.

In general, the following patterns have been broadly identified;

- *Rockshelters* – the distribution of shelters varies, however the vast majority are located within close proximity to a permanent or semi-permanent water source and higher frequencies of this type of site have been identified on lower slopes than upper slopes or spurs;
- *Engravings* – the majority of rock engravings have been identified on ridgetops, saddles or upper hillslopes. Large numbers, however, have also been identified on creek banks and terraces, particularly on vertical rock faces;
- *Grinding grooves* – most commonly identified along creek banks in close proximity to a permanent or semi-permanent water sources. A small number of grinding grooves, however, have also been identified on sandstone expanses on ridgetops (sometimes in association with engravings) and within rockshelters;
- *Middens* – commonly identified within the estuarine resource areas of the Hawkesbury sandstone landscape, particularly within coastal – intertidal zones, generally located between 5-20 metres of the littoral zone. They are most commonly situated on alluvial flats and lower slopes or rock platforms.
- *Open campsites* – open artefact scatters have infrequently been identified within the Hawkesbury sandstone / coastal landscape. Of the limited number documented, they most commonly occur on wide ridge tops or lower slopes and flats of wide creek lines;
- *Fish traps* – within south-eastern Australia, fish traps are generally located in the intertidal zone of closed estuarine and bay settings or the tidal mouths of streams. Such sites are usually situated on shallow, wide and gently sloping rocky platforms (commonly overlain with loose rock), thereby taking advantage of natural reefs and rock pools. There are no identified examples of fish traps in the Pearl Bay / The Spit region and no historic accounts of fish traps being used by Aboriginal populations in Port Jackson during the contact period. However, analysis of archaeological evidence from midden deposits in Port Jackson – including examination of the range and relative abundance of fish species and maturity levels – suggests that relatively non-selective fishing methods, such as tidal traps, weirs and rock pools, were used during the Holocene by Aboriginal populations in the area.<sup>23</sup>
- *Burials* – several Aboriginal burial sites have been recorded in the Hawkesbury sandstone landscape along the shores of Port Jackson. These burials have generally been found as primary interments in soft sediments within rock shelters / sandstone overhangs, sometimes associated with midden materials or in deep and soft sand-dune contexts fringing the harbour foreshores.

### **2.3 Aboriginal Archaeological Sites Recorded in the Pearl Bay / The Spit – Middle Harbour Region**

At the time Captain Arthur Phillip and the First Fleet landed in January 1788, first in Botany Bay and then Port Jackson, the coast from Botany Bay to Broken Bay and

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<sup>23</sup> Attenbrow, V. & D. Steele (1995) "Fishing in Port Jackson, New South Wales – more than meets the eye." *Antiquity*. V. 69: 47-60.

inland to the west was occupied by a number of distinctive yet associated Aboriginal groups. The early colonists attempted to document the various names and territorial affiliations of these Aboriginal groups, but due to the incomplete and often conflicting historical evidence, the complexities of Aboriginal social organisation, affiliation and differentiation are difficult to reconstruct.

The Spit is recorded by early ethnographers as being called Burrabru, Burrabri or Burra Brui, however, the origin of the name Burra is not clear. It has been suggested that the name may have come from the association of a group referred to as Burra or Burra Burra, who may have inhabited the area around The Spit.<sup>24</sup>

The following section provides a review of Aboriginal archaeological sites documented in the NSW Department of Environment, Climate Change and Water (DECCW) records – the Aboriginal Heritage Information Management System (AHIMS).

It should be noted that the records contained within the DEC AHIMS database reflect identified and registered Aboriginal sites within NSW. The absence or paucity of certain site types does not necessarily mean such sites are not present within the study area. The database contains only formally recorded sites and large areas of NSW have not been the subject of systematic survey or the recording of Aboriginal history. These areas may contain sites and places which are not currently listed on the AHIMS.

A search of the DECCW AHIMS conducted for The Spit region in 2003 indicated that seven years ago, 19 Aboriginal sites and places had been identified and registered on AHIMS within 1km of the current study area (refer to Table 2.1).<sup>25</sup>

An updated search of the DECCW AHIMS conducted for the current project in 2008 provided no new information or any indication that additional Aboriginal sites had been recorded in The Spit region since 2003.

Specific AMG locations are considered to be sensitive information and thus have not been provided.

NPWS Site No.	Site Name	Site Type	Location / Landform Unit
45-6-0676	Spit Bridge, Seaforth	Rock engraving	Seaforth – N shore of Sandy Bay
45-6-1022	Spit Bridge Cave	Shelter with midden	Balgowlah, Spit Bridge – ridges above N shore of Middle Harbour
45-6-1023	Fallen Forwards Cave	Shelter with midden	Balgowlah – ridges above N shore of Middle Harbour
45-6-1024	South End Cave	Shelter with art and midden	Balgowlah – E shore of Fisher Bay
45-6-1025	Nearly Joined Cave	Shelter with midden	Balgowlah – E shore of Fisher Bay
45-6-1026	Beds & Bottles Cave	Shelter with midden	Balgowlah – E shore of Fisher Bay
45-6-1027	Fisher Bay 1	Midden	Fisher Bay, Balgowlah – SW shore of Fisher Bay
45-6-1028	Fisher Bay 2	Midden	Fisher Bay, Balgowlah – SE shore of Fisher Bay
45-6-1978	Pearl Bay 1	Midden	Pearl Bay, Beauty Point – ridges above S shore of Pearl Bay

<sup>24</sup> Attenbrow, V. (2002)

<sup>25</sup> Australian Museum Business Services (2003) *Aboriginal Heritage Assessment for the proposed widening of the Spit Bridge*. Unpublished report to GHD.

NPWS Site No.	Site Name	Site Type	Location / Landform Unit
45-6-1979	Pearl Bay 2	Shelter with midden	Pearl Bay, Beauty Point – ridges above S shore of Pearl Bay
45-6-1980	Pearl Bay 3	Shelter with midden	Pearl Bay, Beauty Point – SW shore of Pearl Bay
45-6-1981	Pearl Bay 4	Shelter with midden	Pearl Bay, Beauty Point – ridges above W shore of Pearl Bay
45-6-1982	Pearl Bay 5	Shelter with midden	Pearl Bay – W shore of Pearl Bay
45-6-1983	Beauty Point 1	Shelter with midden	Beauty Point – ridges above W shore of Pearl Bay
45-6-1984	Beauty Point 2	Shelter with midden	Beauty Point – W shore of Pearl Bay
45-6-1985	Beauty Point 3	Shelter with midden	Beauty Point – southern shore of Middle Harbour, E of Pearl Bay
45-6-2037	Beauty Point 9	Open camp site – stone artefact scatter	Pearl Bay, Beauty Point – ridges above SW shore of Pearl Bay
45-6-2351	Fisher Bay 6	Open camp site – stone artefact scatter	Fisher Bay – N shore of Fisher Bay
45-6-2372	Remnants in shelter	Shelter with midden	Fisher Bay – E shore of Fisher Bay

**Table 2.1:** Aboriginal sites and items recorded on the DECCW AHIMS within an area 1 x 1 km surrounding the subject site.

The predominant site types recorded are rockshelters (68.4%, n=13); twelve with midden material and one with midden material and art. The second most common site types include open middens (15.8%, n=3) and open camp sites / stone artefact scatters (10.5%, n=2). The remainder includes a single rock engraving site.

The majority of sites are recorded along the rocky northern shore of Beauty Point to the slopes above the S-SW shoreline of Pearl Bay (47.4%, n=9), and the slopes above Fisher Bay on the northern side of Middle Harbour (42.1%, n=8). The two remaining sites are situated on the elevated slopes above the northern shore of Middle Harbour at Seaforth.

A pattern emerges showing that these recorded Aboriginal sites are restricted to particular landform units – i.e. elevated alluvial flats and lower slopes, rock platforms and sandstone outcrops / overhangs. No Aboriginal archaeological sites have been recorded on low lying, sandy beaches along Middle Harbour in the vicinity of The Spit. Indeed, the only Aboriginal archaeological site that has previously been recorded on The Spit is a rockshelter containing midden material, situated within the steep Hawkesbury sandstone slopes overlooking the SE shore of Pearl Bay, near the SW extent of The Spit Reserve.

No Aboriginal archaeological sites, items or places situated within the current study area have previously been documented and recorded on DECCW registers.

## 2.4 Aboriginal Archaeological Sensitivity & Site Prediction

According to the DECCW Aboriginal sites register, there are no previously identified Aboriginal archaeological sites or items located within the boundaries of the current study area. The following section presents an examination of the potential for previously unidentified sites to occur within the subject site.

During the late Pleistocene, the study area would have been situated on the middle slopes of a ridge saddle overlooking the ancient valley and watercourse of Middle Harbour Creek. The climate and vegetation was significantly different than the current landscape and may have resembled the Blue Mountains of today. Aboriginal occupation may have occurred along the areas adjacent to the river, utilising food, water and raw material resources available in the deep valley.

The rise in sea level that occurred during the post-glacial marine transgression (approximately 15,000-7,000 years BP), drowned Middle Harbour Creek and inundated the lower-middle slopes of the ancient river valley. The upper ridges became the current promontory of Beauty Point. Aboriginal populations would have retreated from the receding coastline; no doubt resulting in the re-adjustment of population boundaries and lifestyles until the situation reached equilibrium.

Archaeological evidence of Pleistocene Aboriginal occupation that may have been situated along the banks and lower-middle slopes of Middle Harbour Creek would have been submerged by the rising seas. Such inundation would likely have caused contextual disturbance and possibly degradation of any sites and artefacts within the landscape. Studies of the possible effects of inundation on Aboriginal archaeological sites indicate that in a hydrodynamically active coastal or riverine environment, there is a strong likelihood that artefacts – particularly organic artefacts, but also stone materials – will be affected by abrasive, chemical and biological attack to the point that they are no longer recognisable. Conversely, estuarine systems with backwaters, mud flats, swampland or marsh environments are capable of trapping and protecting cultural materials in ever increasing layers of sedimentation. Artefacts that settle into such an anaerobic environment are likely to avoid significant damage; however, substantial contextual disturbance is likely to occur.<sup>26</sup>

While The Spit is not within an active coastal environment and the tidal range is microtidal, typical current speeds can reach up to 50cm/sec and oceanic swells refracted through the heads of Port Jackson reach as far north-west as The Spit. Pleistocene archaeological deposits that may have been present within the open, low lying areas of The Spit are likely to have been significantly disturbed, if not removed or destroyed, by the drowning of Middle Harbour Creek.

There is always, however, the possibility that Pleistocene archaeological deposits, while contextually disturbed, may have survived in the locale.

During the last phases of the post-glacial transgression and throughout the early Holocene period, a reworking and erosion of older Pleistocene estuarine deposits occurred. Oceanic swell refraction, tidal currents and fluvial sedimentation transported

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<sup>26</sup> Nutley, D. M. (2005) *Surviving Inundation: An examination of environmental factors influencing the survival of inundated Indigenous sites in Australia within defined hydrodynamic and geological settings*. Unpublished thesis (MA Maritime Archaeology), Department of Archaeology, Flinders University, South Australia.



sands and muds throughout the valley formed by Middle Harbour Creek and many of these accumulated in the calmer waters of Middle Harbour to the north of Beauty Point, resulting in the formation of The Spit and associated seabed deposition.

Archaeological deposits that may have survived inundation would subsequently have been gradually buried by the deposition of fluvial and marine sediments during the early Holocene, and the subsequent formation of The Spit. As mentioned above, such burial processes would, in fact, be likely to contribute to the survival potential of any Aboriginal artefacts that may have been within the landscape – i.e. by covering them with protective sediments and creating an anaerobic environment. Notwithstanding, the context of such artefacts, particularly in a location effected by both marine and fluvial processes, is highly unlikely to survive.

European development at The Spit in the last one-hundred years has significantly altered the landscape and land reclamation activities that have occurred within the study area throughout the late 19<sup>th</sup> and early 20<sup>th</sup> centuries would have served to bury any surviving Pleistocene landscapes further.

Ultimately, while it is acknowledged that the possibility for Pleistocene archaeological deposits – *albeit* likely to be highly disturbed – within the area of The Spit exists, due to the depth of overlying deposits it is considered highly unlikely that any such archaeological evidence will occur within the proposed development footprint.

Following the stabilisation of sea levels during the Holocene, the coastlines of Pearl Bay and Middle Harbour could be considered to have represented prime occupation sites, with various natural resources located along the banks of the harbour and hinterland slopes. The number of Aboriginal archaeological sites recorded within the region – including rockshelters, middens, artefact scatters and engravings – provides evidence of such occupation and also some indication of the Holocene site locations and types which may occur or survive in the vicinity of The Spit.

No previously recorded Aboriginal archaeological sites are located within the current study area, or in similar low-lying environments of sandy deposition – i.e. low lying beaches, active intertidal zones and submerged landscapes – within the local vicinity. The recorded sites in the region are situated within particular landforms and geological units; areas of Hawkesbury Sandstone landscape comprising elevated alluvial flats, slopes, sandstone exposures, shelving and / or cavernous overhangs formed through erosion. Such landforms do not occur within the current study area. That is not to say that Aboriginal occupation and use of landscapes, such as the sand bar of The Spit, did not occur. Rather, it would appear that physical evidence of such use does not survive or has not previously been identified; this may be due to the nature or density of Aboriginal land use in such environments or to the dynamic, changing nature of such landscapes that may preclude survival or identification of physical occupation evidence.

The only known Holocene Aboriginal archaeological sites that may be situated in a low lying beach environment, intertidal zone or submerged landscape along Middle Harbour include ephemeral midden materials – including shells, bones and / or stone artefacts – or fish traps / weirs. However, due to the formation history of The Spit and the immediate bathymetric features, it is considered unlikely that such sites and deposits would be located within the current proposed development footprint:

1. The seabed in the eastern side of Pearl Harbour is comprised of soft marine sand and fluvial mud and slopes quite significantly seaward of the shoreline, dropping to 10m below LAT within 50-60 metres of the western shore of The

Spit. The shallow tidal flats and / or rock platforms which are conducive to the construction, maintenance and operation of fish traps and weirs, do not occur within this landscape;

2. The natural sand, mud and gravel deposits comprising The Spit have undergone constant shifting, accumulation and redeposition through fluvial tidal movement and oceanic swell refraction. Holocene cultural sites and deposits situated within this environment would subsequently undergo similar movement and dispersal and would be unlikely to survive intact or remain within their contextual location;
3. The natural landscape of The Spit has been significantly altered in the last one hundred years, primarily through land reclamation. The bulk, if not the entirety, of the above water landscape that is situated within the current proposed development footprint comprises artificial fill.

In summary:

- No previously identified Aboriginal sites or items occur within the study area
- Aboriginal sites or items have not previously been identified in the region within low lying sandy landscapes such as The Spit;
- Evidence of Pleistocene occupation is possible in the region of The Spit; however, it is likely to be buried under substantial layers of sediment deposited since the post-glacial transition;
- Any Holocene Aboriginal sites or items that may exist within such a landscape are likely to comprise scattered, low density deposits;
- No intertidal or submerged Holocene Aboriginal sites are expected to occur in Pearl Bay;
- The European alteration of The Spit through land reclamation and development is likely to have disturbed, removed or buried any landward Holocene Aboriginal archaeological evidence at the locale; and
- The bulk, if not entirety, of land based impacts involved in the current development proposal will occur in artificial fill deposited in late 19<sup>th</sup>-20<sup>th</sup> century.
- Consequently, the possibility of the proposed development impacting Aboriginal archaeological sites, items or deposits is considered highly unlikely.

## **3.0 THE INVESTIGATION – Historical Overview**

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The following section presents an examination of European occupation and development at The Spit – Pearl Bay and the potential for historical archaeological evidence to survive within the study area, including a description of the history of land use and alteration at The Spit (Section 3.1), an investigation of site formation and development of the physical landscape associated with European occupation (Section 3.2), and a summary of the known and potential historic cultural resources within the study area (Section 3.3).

### **3.1 European Use & Occupation of The Spit – Historic Research**

#### ***3.1.1 European exploration & early settlement – late 1700s to mid 1800s***

The first recorded European visitation of Middle Harbour occurred in 1789 when the HMS *Sirius* was sheltered in Mosman Bay for extensive repairs. A temporary settlement was established and exploration parties into nearby areas were undertaken.

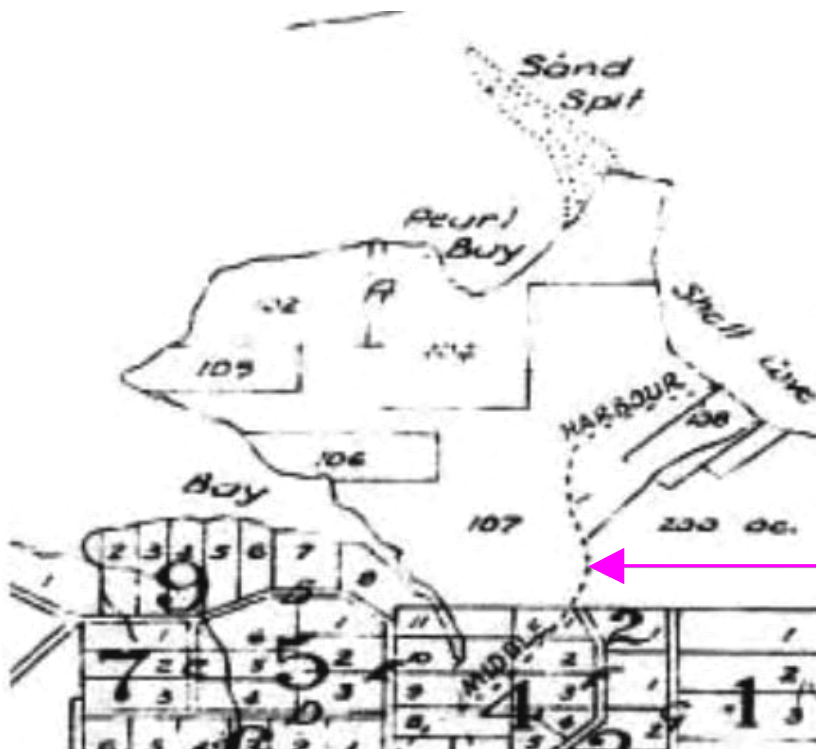
In July, 1789, a party led by Captain Hunter, which had travelled north to explore the Pittwater and Broken Bay area, reached Clontarf before a vessel had arrived to meet them. Failed attempts were made to cross Middle Harbour near Parrawi Head until the vessel returned.

Due to the rugged landscape and relative isolation from the Sydney settlement, little European occupation of Middle Harbour occurred during the early years of the colony. With its steep cliffs and strategic position near the mouth of Port Jackson, Middle Head was selected as an early defensive position. In 1801, the construction of a battery at Georges Head saw the Mosman area develop as one of Sydney's most significant maritime defence installations. Farming activity began to be established in nearby Balmoral, but Mosman proved unsuitable for cultivation purposes. However, in 1831, a whaling station was established at Mosman and adjacent land grants began to be taken up by private settlers.

European occupation of the Manly Cove area commenced in 1809, when two areas of land were granted to private settlers. By the 1830s, several farms were established in the Manly, Balgowlah and Seaforth areas; however, the region remained largely undeveloped for many years – by the mid 1800s, the Parish of Manly Cove could only boast a population of 63 inhabitants and 24 houses.

In 1829, the first ferry service across Middle Harbour was established by Barney Kearns under licence from the Government. The ferry travelled between Chinaman's Beach, Shell Cove and Clontarf Point. By 1832, a track was established from North Sydney to Middle Harbour, following a route roughly in line with Military and Spit Roads, providing overland access to Kearns's ferry, thus linking Sydney to the settlements at North Harbour. A plan of the Mosman area dating to the 1830s-1840s (Figure 3.1) depicts the track to Kearns's ferry at Shell Cove and illustrates the undeveloped nature of The Spit at this time. Early European activity in The Spit area was primarily of a recreational nature and perhaps included some small-scale commercial fishing.

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**Figure 3.1:** Anon (nd)  
“Plan of Mosman  
area.”<sup>52</sup>

### 3.1.2 The First Spit Crossing Service: Ellery’s Punt – 1849-1889

In 1849, Peter Ellery, a pioneer of the Seaforth district, established a small ferry service across Middle Harbour, transferring passengers in a rowboat from The Spit to Clontarf. By the 1850s, Ellery had abandoned the rowboat and established the operation of a hand punt at the same location, running along cables stretched over the harbour. Ellery occupied a house at the western side of The Spit and it appears that he was the only settler at this time. A location named *Hillery’s Spit* is referred to in an 1857 account of the wreck of *The Dunbar*; this is thought to be a corruption of Ellery’s name indicating that he was as sole occupier of the Spit.<sup>53</sup> A narrow track along the Spit had been established by this time, however, allowing horse and foot traffic access to the southern punt landing point. Figure 3.2 shows one of the earliest identified photographs of The Spit, dating to c.1880. While the photograph has been taken at such a distance that little detail of The Spit is discernable, it is clear that very little cultural alteration of the sand bar has occurred.



**Figure 3.2:** Henry King (c. 1880) “The Spit, Middle Harbour, Sydney.”<sup>54</sup>  
Photograph is taken facing SE towards The Spit.

<sup>52</sup> Sturrock, R. (1982) *A Pictorial History of Mosman*. Self Published, Mosman, NSW.

<sup>53</sup> Ibid

<sup>54</sup> Tyrell Photographic Collection, Image 85/1285-149.

Figure 3.3 below shows a photograph dating to the 1850s depicting Ellery's punt and the northern punt landing. While it is not known exactly what form the original southern landing on The Spit took, it is quite likely to have been a similar simple structure with a timber ramp.



**Figure 3.3:** Anon (c.1850) “Ellery’s Punt Reserve circa 1850.”<sup>55</sup>  
Photograph is taken facing SW.

Over the next twenty years, settlement along Middle Harbour in the Mosman – Manly region increased as both water and land transport were improved and expanded. In 1871, an advertisement was placed in the *Government Gazette* offering the lease for a Government ferry at The Spit. It is unknown whether the lease was taken up at this time, by Ellery and his family or any other person. However, it appears that by the 1880s, the government considered the single small punt across the harbour as inadequate and plans to upgrade the crossing were soon commenced.

### **3.1.3 Establishment of the Government Steam Punt – late 1880s**

By 1888, the government had taken over the operation of The Spit hand punt and plans were prepared for the introduction of a steam punt with a crew of two persons, designed to carry eight ordinary sized buggies and several passengers in one trip.

Proposals for a low-level bridge at The Spit were also submitted by the Parliamentary Standing Committee on Public Works to the Legislative Assembly during this period. It was determined that the steam punt would operate until the bridge was completed and then be removed to another site. The steam punt was introduced in 1889, however, it was over thirty years until the construction of a bridge eventuated.

New infrastructure was built to support the government punt service and the area of The Spit – to a line almost as far south as the apex of Pearl Bay – was designated as Government Reserve. Isolated reclamation was conducted to build up and stabilise the roadway running along The Spit providing access to the punt service. A fence was constructed along the eastern side of the road as a safety precaution. A wharf was erected at the eastern base of The Spit, situated near where Parriwi Road joins Spit Road today, to provide coal to fuel the steam punt. Three stone houses were constructed at the foot of Spit Hill to accommodate punt operators. Similar fencing and sheds were also constructed at the northern punt landing point.

Figure 3.4 dates to the late 1880s-early 1890s and shows the coal wharf, raised roadway and fence line in the foreground and the predominantly sandy extension of The Spit with the punt landing at the north-eastern tip in the background. Figure 3.5 below, also dating to the late 1880s-early 1890s, is taken from the northern side of

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<sup>55</sup> National Parks Association.



Middle Harbour and depicts the steam punt leaving the northern landing and somewhat more clearly shows the simple construction of the southern punt landing at The Spit.



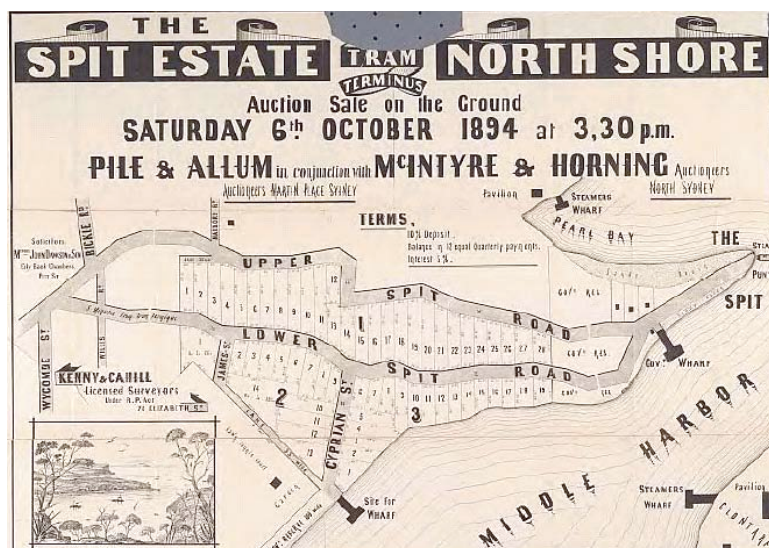
**Figure 3.4:** “Wharf used for coal loading during the punt era at the Spit.” c. late 1880s.<sup>56</sup> This photograph is taken from the Mosman side of The Spit facing NNW towards Manly.

**Figure 3.5:** Henry King. “The Spit and ferry, Middle Harbour – Sydney area, NSW.” c. late 1880s-early 1890s.<sup>57</sup>



Following the creation of the increased punt service, an experimental electric tramline, linking Spit Junction to the existing cable tramway at North Sydney, was opened. The improved transport services further encouraged settlement in the region. Much of the land south of The Spit Government Reserve was subdivided and put up for auction.

Figure 3.6 shows one of the subdivision notices – an advertisement by real estate agents Pile & Allum in conjunction with McIntyre & Horning – dating to 1894. The plan pictured in this notice, while largely schematic, shows the Spit Road, the punt service, the coal wharf and the three stone houses for punt operators at the base of Spit Hill.



**Figure 3.6:** Pile & Allum (1894) *The Spit Estate, North Shore*. McCarron, Stewart & Co., Printers – subdivision plan of “The Spit Estate.”<sup>58</sup>

<sup>56</sup> Mosman Library, File 000/000681

<sup>57</sup> NSW State Library, Image No. BCP 06030.

<sup>58</sup> National Library of Australia.

Figure 3.7 shows a map of the Parish of Willoughby dating to 1899 and while land structures are not depicted, this map represents a surveyed plan of The Spit and clearly shows the outline of the sand bar with the thin raised roadway located along the eastern side of the sand bar. The Spit Road, coal wharf and line of the punt service are also shown – as are two “cable hut sites”, on the east and west base of The Spit, presumably to service the punt.



**Figure 3.7:**  
Map of the  
parish of  
Willoughby,  
1899.<sup>59</sup>

### 3.1.4 The Original Spit Boatshed

As settlement in the vicinity of The Spit increased, the foreshores of Middle Harbour and Pearl Harbour became popular for recreational activities. A number of boatsheds began to be constructed during the 1890s, including one at the north-western end of The Spit. Figure 3.8 shows one of the earliest images of The Spit depicting this boatshed – a photograph dating from c.1890, facing north-west from the base of Spit Hill. The boathouse can be seen towards the left-hand-side of the image. While little detail can be discerned from Figure 3.8, the boatshed appears to be a single storey, timber structure situated on the western side of the access road to the punt service.

**Figure 3.8:**  
“The Spit,  
c.1890s, looking  
north.”<sup>60</sup>



<sup>59</sup> NSW Department of Lands, Image 14019001



It is possible that this boatshed belonged to the Lyons family, later owners of a larger boatshed at this location (see Section 3.1.6 below). The 1899 parish of Willoughby map presented above in Figure 3.7 shows an annotation referring to a lease on the western side of The Spit, held by Catherine J. Lyons. This lease is described as serving access purposes, thus providing a clear indication that the Lyons family had an interest in The Spit during the late 1800s. However, no definite indication of the owner of this boatshed has been identified during the course of this assessment.

### **3.1.5 Establishment of the Tram Service along The Spit – late 1890s – 1900**

In the late 1890s, plans were made to extend the electric tramline linking Spit Junction to the cable tramway at North Sydney. A route was excavated on the eastern side of Upper Spit ridge (Parrawi Road), terminating at the northern extent of The Spit. The new tramline was opened in 1900.

Figures 3.9 and 3.10 show two photographs of The Spit taken during 1900, facing north – north-west along The Spit from the base of Spit Hill. These images show the newly constructed tramway and tram poles running the length of The Spit, and indicate that land reclamation has occurred to further build up and stabilise The Spit in order to allow the construction of the tramline. The extent of the reclamation, however, is not overly substantial – indeed it has been noted that in the early days of The Spit tramline, water and sand often reached the level of the tram tracks.<sup>61</sup>

These photographs also depict additional structures at the western base of The Spit, a new small timber structure near the punt landing – presumably a toll booth for the punt and / or tram service, and the boatshed situated near the north-western extent of The Spit. The boatshed is shown as a timber single storey structure with a pitched roof. Some timber piles and an associated feature are situated to the west of the boatshed, on the water's edge – possibly a form of timber boat ramp.



**Figure 3.9:**  
Anon (1900)  
“Opening of  
the tram  
service to  
The Spit,  
1900.”<sup>62</sup> –  
image taken  
facing north  
from the  
southern end  
of The Spit

<sup>60</sup> Carroll Collection, Mosman Library, File No. CC0/CCO112

<sup>61</sup> Gamble, A. & N. Souter (1976) *Mosman Sketchbook*. Rigby Limited, Adelaide, NSW.

<sup>62</sup> Mosman Library CC0/CC0068



**Figure 3.10:** Star Photo Company. “Spit Road, Middle Harbour, showing trams.” c.1900-1910.<sup>63</sup>



A slightly later photograph, dating to c.1900-1910, is presented in Figure 3.11. This image is taken from Middle Harbour facing south-east towards the top of The Spit and shows some further additions, including a second line of tram and / or light poles running alongside the roadway and a fence running along the eastern extent of the punt landing into the water. The boathouse on the north-western side of The Spit is also shown and here it can more clearly be identified as a timber single-storey structure with a double-pitched roof, with at least two timber sliding doorways on the northern aspect.



**Figure 3.11:** “Spit Punt, Middle Harbour.” c. 1900-1910.<sup>64</sup>

Another photograph, slightly later again, yet still dating to the period c.1900-1910, indicates that an additional structure has been built alongside the original boathouse. This photograph, reproduced below in Figure 3.12, has been taken facing south-west towards The Spit. The punt landing, toll booth, roadway and tram / light poles and single storey timber boathouse all appear to be unaltered; however, another single storey timber structure with what appears to be a chamfered pitched roof, now abuts the boathouse on the western side, running perpendicular down towards the water's edge. A large timber sliding door can be seen on the northern side of the building.

<sup>63</sup> NSW State Library PXE 711/146.

<sup>64</sup> Perier Collection, NSW State Library, ON5/85 – frame 34440.



**Figure 3.12:** “The Spit  
c.1900-1910.”<sup>65</sup>

### **3.1.6 Land Reclamation & Construction of “Lyons” Boathouse – c. 1900 – 1910**

During the early 1900s, the tidal flats at the north and north-eastern extent of The Spit were raised through land reclamation, contained within a constructed stone seawall.

Figures 3.13 and 3.14 below, show two of the earliest identified photographs of The Spit taken after these works. These images, taken from Seaforth facing south-east and south-west towards The Spit, indicate that substantial redevelopment at The Spit took place following the reclamation. The punt landing remains in the same location; however, the original toll booth has been removed and a slightly larger booth / office constructed on the western side of the roadway. A large boathouse and refreshment rooms has also been constructed on the eastern side of The Spit.

The c.1890s boathouse with c.1900 additions, situated on the western side of The Spit, have been removed and an entirely new structure erected. Fronting The Spit roadway is a timber two storey building mounted on timber stumps with a roof – quite likely of slate – pitched on all sides to meet at centre point. A timber balcony runs along the north, east and south aspects at second floor level. On the eastern side, fronting the road, a protruding balcony with an A-frame pitched roof extends – presumably over the main entrance to the building. At the western end, a long timber structure with a double pitched roof abuts the two storey building, extending west to the water’s edge. The building then extends on timber piles over the water, covered partially with a single flat roof, and ending with what appears to be a single, wide timber stage. Four timber dolphins can also be seen to the north of the boat shed. Written on the north-facing side of the northern pitched roof of the boatshed are the words “Lyons Boat Shed. Cheapest & Best.”



**Figure 3.13a:** Kerry and Co., “The Spit, Middle Harbour.”<sup>66</sup>

(enlargement of Lyons Boatshed below)

<sup>65</sup> Mosman Library, Image File 000/000450.

<sup>66</sup> Tyrell Photographic Collection, Inventory No. 3/34, Kerry Studio Number 156.



**Figure 3.13b:**  
Enlargement of Lyons  
Boatshed in Kerry &  
Co “The Spit, Middle  
Harbour.”



**Figure 3.14a:** Kerry & Co.  
(c.1910) “The Spit, Middle  
Harbour.”<sup>67</sup>  
– image taken facing SW from  
the Sydney Road towards The  
Spit



**Figure 3.14b:**  
Enlargement of  
Lyons Boatshed in  
Kerry & Co  
(c.1910) “The Spit,  
Middle Harbour.”

A slightly later image, dating to the period c.1905-1910, facing south-east across Middle Harbour towards The Spit shows that the long timber structure of Lyons Boat Shed has been extended to the south. This photograph, reproduced in Figure 3.15, depicts a wider boat shed with a triple pitched roof. Two timber ramps are now also provided at the western extent of the building.

<sup>67</sup> Powerhouse Museum Collection 85/1284-2064.





**Figure 3.15:** Anon (c.1910) The Spit, c.1905-1910.<sup>68</sup>

Two photographs taken from the base of Spit Hill, facing north, along The Spit, dating to c.1908, show that by this time another structure has also been erected at Lyons Boat Shed – situated on the southern side of the two-storey building and fronting Spit Road. This structure is depicted as a timber, single storey building with what appears to be a slate roof, pitched at all corners to meet at the centre point. This building appears to abut the timber boat shed extension mentioned above. These images – the enlargement of Figure 3.17 in particular – also show that a slipway has been constructed at the southern side of the long timber boat shed. Furthermore, this slipway appears to be covered with a small timber boat shed at the landward end.



**Figure 3.16:** S.W. Post Card Company. c.1908 "The Spit and Seaforth from Parriwi Head."<sup>69</sup>



**Figure 3.17a:** Rose Post Cards "The Spit, Middle Harbour, Sydney, New South Wales."<sup>70</sup>

(enlargement of Lyons Boatshed below)

<sup>68</sup> Mosman Library 000/000337.

<sup>69</sup> Manly Municipal Library File 00/005413.

<sup>70</sup> Eric Milton Nicholls Collection, National Library of Australia, Image File No. nla.pic-vn3603884-s347



**Figure 3.17b:**  
enlargement of  
Lyons Boathouse in  
Rose Post Cards  
“The Spit, Middle  
Harbour, Sydney,  
New South Wales.”

### **3.1.7 Establishment of the Tramcar Transfer Ferry & Second Spit Punt – 1910s**

In 1907, The NSW State Parliament debated a Bill proposing the construction of a tramway from The Spit to Manly in order to replace the unsatisfactory wagonette service operating to transfer passengers between Manly and North Sydney via The Spit punt. Public demand subsequently led to the construction of a single electric tramline running along Sydney Road from Manly to Clontarf, descending to the foreshore on the western side of Parsley Bay (now known as Fishers Bay) and continuing west to a terminal adjacent to the northern Spit punt landing point in today's “Ellery's Reserve.” Built to a ruling grade of 1 in 15, The Spit to Manly tramway was substantially railed with 60 lb and 80 lb T sectioned metals, 100 lb girder rails and crossing loops of 10 ft track centres. Six single truck, 50 passenger, closed cross bench “J” cars were allocated to work this new Manly line.<sup>71</sup>

In order to link the new Manly-Clontarf tramway and the existing Spit-North Sydney tramway, a tramcar transfer ferry across Middle Harbour, running adjacent to the steam punt, was planned. Two tram jetties were constructed at the Spit terminus of the Manly line (northern shore of Middle Harbour) and the Spit terminus of the North Sydney line (southern shore of Middle Harbour). The first “J” car tram was put into operation on the Spit-Manly tramway in late 1910 and by early 1911, both tram jetties and the tramcar ferry were complete and the tram transfer across The Spit was running smoothly.

Electricity for the new extension was generated at Ultimo Tramway Powerhouse, transmitted to Ridge Street depot at North Sydney then progressing through overhead lines to The Spit and under Middle Harbour by submarine cable. A length of overhead wire supported by four span poles, enabled trams to be driven on and off the tramcar ferry by their own power and the level of both tram jetty docks was fixed at 9.686 ft above mean sea level.<sup>72</sup>

The southern tram jetty was constructed on the eastern side of The Spit, to the south-east of the punt landing. The existing tram tracks on The Spit were extended slightly to reach the jetty, a tower for the high tension tramway transmission wires was constructed near the northern tip of The Spit, to the west of the punt landing and the toll booth / tram office was relocated further to the west of The Spit.

During the same period, due to the increasing residential development and recreational activity in the region, the government decided to establish a second steam punt across

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<sup>71</sup> (Woodside *et al.* 1961).

<sup>72</sup> Ibid

Middle Harbour at The Spit. Additional stone punt landings were soon constructed on the northern and southern shores – both were built to the west of the existing timber landings. By the early to mid 1910s, two steam punts were running side-by-side across the waterway.

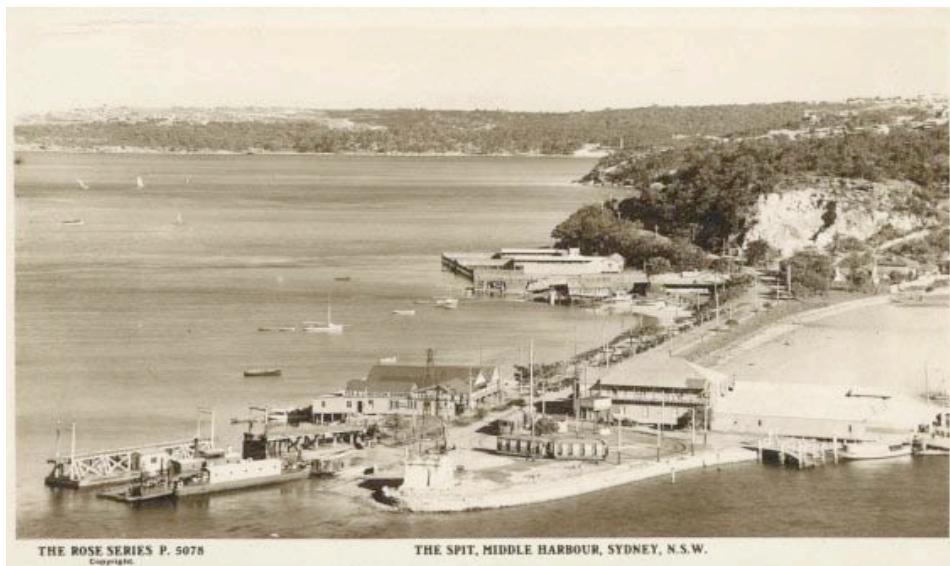
Figure 3.18 shows a photograph dating to the early to mid 1910s, not long after the opening of both the tramcar transfer ferry service and the second punt service. The photograph is taken, facing south, towards The Spit and shows the tram ferry and one of the steam punts docked at the southern landings. The steam punt is docked at the earlier timber landing; the newer stone landing can be seen alongside it, just to the east of the tramway transmission wire tower.

This image also shows perhaps more clearly the two timber stages of Lyons boatshed. Most importantly, however, also depicted in this photograph is a new timber jetty situated on the northern side of the boatshed.



**Figure 3.18:** “The Spit, Middle Harbour, Sydney.”<sup>73</sup>

The Manly-Clontarf tram service constructed on the northern shore of Middle Harbour in the early 1910s incorporated a tram turning loop or balloon loop, and it appears that plans were soon enacted to construct a similar loop at The Spit. By the mid to late 1910s, images of The Spit depict a tram balloon loop situated on the north-eastern side of the Spit – refer to Figure 3.19.



**Figure 3.19:** Rose Post Cards (c. 1920-1924) “The Spit, Middle Harbour, Sydney, NSW.”<sup>74</sup> Image is facing SE towards The Spit

<sup>73</sup> National Library of Australia, Image No. nla.pic-an20043808-12.

<sup>74</sup> Eric Milton Nicholls Collection, National Library of Australia, Image No. NLA pic-vn3603884-s346.

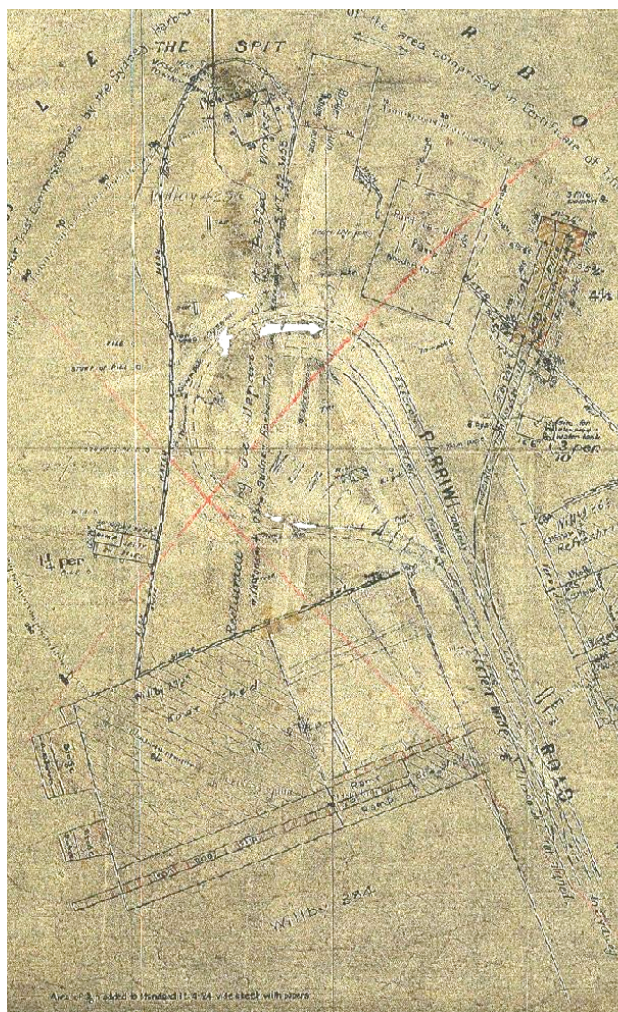


Figure 3.20 below, dating also to the late 1910s but showing a wider angle, clearly demonstrates the increasing popularity of The Spit for boating pursuits and recreational activities with numerous boats moored along the eastern shore of Pearl Bay.



**Figure 3.20:** Harold Cazneaux (c. late 1910s). “Early view of The Spit, Middle Harbour, Sydney, before the Spit Bridge was built.”<sup>75</sup> Image is taken facing SE towards The Spit.

A surveyors plan of The Spit, dating to 1910 with amendments to 1921, shows the numerous structures at The Spit during this period, including the two punt landings, tram jetty, tram transmission tower, tram balloon loop, tram poles and office building, the stone seawall surrounding the north-western extent of The Spit, an elevated water tank, public seating and the boatsheds with associated boat facilities situated on the east and west of The Spit – refer to Figure 3.21. Lyons Boatshed is depicted as a long structure extending from the road to beyond the eastern shore of The Spit. The two boat stages identified in images above are shown at the western extent of the structure, as is the iron boat slip and associated shed, situated to the south of the main boatshed. Little detail of the main buildings, however, is shown and it would appear that the lines of the plan mark out only the shadow of the boatshed construction. The timber jetty and ramp are detailed to the north of the boatshed, as are three nearby isolated “piles” and two “stumps of piles.” The western portion of The Spit is labeled as “Reclaimed by the Department of Public Works.”



**Figure 3.21:** Chief Surveyor & Land Valuer (1910 – with amendments to 1921) *Plan of The Spit, Middle Harbour, Municipality of Mosman, Parish of Willoughby, County of Cumberland.*<sup>76</sup>

<sup>75</sup> National Library of Australia, Image No. NLA pic-an23182270.

<sup>76</sup> NSW Maritime Authority, Field Book Vol. 27, Fol. 29.

### **3.1.8 The Spit Explosives Wharf – early to mid 20<sup>th</sup> century?**

The timber jetty and ramp located to the north of the boatshed requires some further discussion. The specific function of this jetty cannot be ascertained from photographs or plans, however, there is some reference within the literature concerning The Spit that this jetty served as an “explosives wharf” sometime during its lifetime.

Secondary sources indicate that a “wharf” operated by the NSW Explosives Department throughout the early to mid 20<sup>th</sup> century existed at The Spit. This “wharf” was apparently used as support infrastructure for explosives shipments and activities at the Bantry Bay Magazine, in operation from 1915-1974. The “wharf” at The Spit served as a mooring and loading structure for explosive launches, tugs and vessels transporting Explosives Department workers. Explosives were carried between Bantry Bay and Rozelle Bay where they were transhipped to the railway for delivery around the state. Other explosives were carried between Bantry Bay and the explosives magazines at Newington on the Parramatta River.<sup>77</sup>

The specific location of The Spit explosives “wharf,” the dates of its operation and the nature of its construction – i.e. whether it was specifically constructed by the Explosives Department or was a pre-existing wharf commissioned for such use – are unknown. Some sources state that the explosives “wharf” was situated “next to Lyons Boatshed” and that Lyons Boatshed itself was also used as a ferry launch to transport workers to and from the Bantry Bay site.<sup>78</sup> Such statements would appear to indicate that the timber jetty and ramp situated to the north of Lyons Boatshed identified in the above photographs and plans did indeed serve as The Spit explosives “wharf.” A heritage study of the Mosman local government area conducted in 1996<sup>79</sup> further suggests that this was the case – indeed, this study was used as a reference for the compilation of the heritage listings in the *Mosman Local Environmental Plan 1998* and the site of this jetty is now included in the LEP as the “former explosives wharf” (refer to Section 6.0)

However, available information is limited and primary sources indicating the function of the jetty or verifying the location of The Spit explosives “wharf” have not been located. It may be considered likely that the timber jetty north of Lyons Boatshed and the “explosives” wharf are one and the same; however, the later appearance of another jetty north of Lyons Boatshed (refer to Section 3.1.9 below) raises the possibility that this second jetty in fact represented the explosives “wharf.”

### **3.1.9 The First Spit Bridge – 1924-1958**

By the early 1920s, public pressure to construct a bridge over Middle Harbour at The Spit was increasing. At this time, however, the NSW Government was encouraging local councils to finance their own bridges rather than rely on the Department of Public Works to undertake such projects. In 1922, Manly Municipal Council Alderman A.A. Kemp proposed that Manly and Mosman Councils, in conjunction with the Tramways

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<sup>77</sup> Andrews, G. (2002) “The Watermen of Port Jackson – Part 23: The Port Jackson Explosives Run.” *Afloat*.

Graham Brooks & Associates, Taylor Brammer Landscape Architects & Mary Dallas Consulting Archaeologists (2001) *Bantry Bay Conservation Management Plan*,. Unpublished report for NSW National Parks & Wildlife Service.

<sup>78</sup> Andrews, G. (2002)

<sup>79</sup> Godden Mackay Local Pty Ltd (1996)



Department, build a low level bridge with tolls levied in order to fund the construction. The most favoured design was a timber bridge that also carried two lines of tramway. Permission was finally granted in State Parliament for Manly Council, in conjunction with the Sydney Harbour Trust, to design and build a low level bridge across Middle Harbour. Work commenced in 1924 and the bridge was opened on the 23rd of December the same year.

The completed structure consisted of a timber beam span construction with piers, walings and braces sheathed in metal and a double-leaf bascule opening span. The bridge was built without the proposed tramlines and, as such, the tramcar transfer service across the harbour continued to operate for several years after the construction of the bridge. Bridge tolls were in operation until 1930, from which time the bridge was maintained, managed and administered by the NSW Public Works Department.

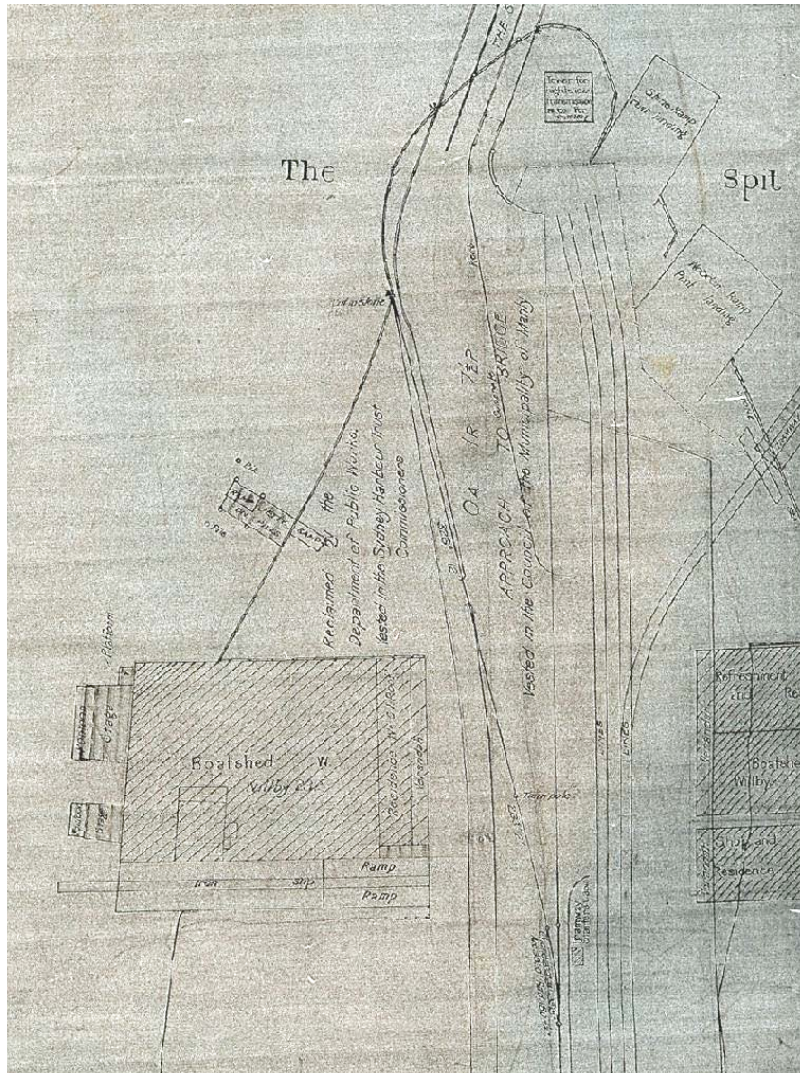
Certain physical constraints affected the design of the bridge and approaches. A new alignment for the southern approach along The Spit was constructed (renamed “Spit Road”) leading from the western side of Spit Hill in order to serve increased traffic and address the problem of potential landslides. A second new roadway was cut through the rockface on the northern side of Middle Harbour in order to eliminate the dangerous hair-pin bends which had characterised the previous approach to the northern punt. The road level on the northern shore now sat 36 feet above the level of The Spit and the bridge was constructed with a different gradient either side of the opening span. Due to the deep deposit of sand and clay lying over the bedrock at the location of the bridge, it was also necessary to spread the load of the bascule over a double-opening.<sup>80</sup>

Following the completion of The Spit Bridge, both steam punts services were discontinued and the punt landings decommissioned. The tram transfer service utilising the same tram jetties continued to operate, however, the southern tram balloon loop was removed to enable the construction of the southern bridge abutment.

A surveyors plan of The Spit, dating to 1929, depicts the alterations to The Spit associated with the construction of the first Spit Bridge. This plan clearly indicates that the construction of the bridge also resulted in alterations to Lyons Boatshed. The alignment of the new Spit Road and approach to the Spit Bridge is situated further west than the earlier access road to which Lyons Boatshed fronted. The plan indicates that this corridor was resumed by the Department of Public Works and that the two-storey timber building of Lyons Boatshed has been demolished. A new, much narrower structure, marked as a “residence W – C I roof” (indicating a timber building with a cast-iron roof) and “verandah” has been built in its place. The southern slip has also been shortened at the landward end and the associated shed removed. The actual boat shed and boat stage facilities remain unaltered. This plan also shows a landward timber ramp has been constructed on the timber jetty located to the north of the Lyons Boatshed.

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<sup>80</sup> Austral Archaeology Pty Ltd (2003) *Heritage Assessment and Statement of Heritage Impact: The Spit Bridge over Middle Harbour, NSW*. Unpublished report prepared for the NSW Roads & Traffic Authority. Bickford, C. R. (1927) *The Spit Bridge – Middle Harbour*. Sydney Division, Institution of Engineers, Australia.  
Phelan, N. (1993) *Mosman Impressions*. Mosman Municipal Council, NSW.



**Figure 3.22:** Dare, N. R. (1929). *Plan of New Concrete Roadway at the Spit, Middle Harbour, Parish of Willoughby, County of Cumberland.*<sup>81</sup>

Figures 3.23 and 3.24 below represent photographs taken during the late 1920s – early 1930s, and show the Spit Bridge and the changed appearance of The Spit, as well as the new residence fronting The Spit Road at Lyons Boatshed.



**Figure 3.23:** "The Spit 1929."<sup>82</sup>

<sup>81</sup> NSW Maritime Authority Archives, Field Book Vol. 79, Fol. 58. Sydney Harbour Trust.

<sup>82</sup> NSW Government Printing Office Collection, NSW State Library, Image No. 000/000345.

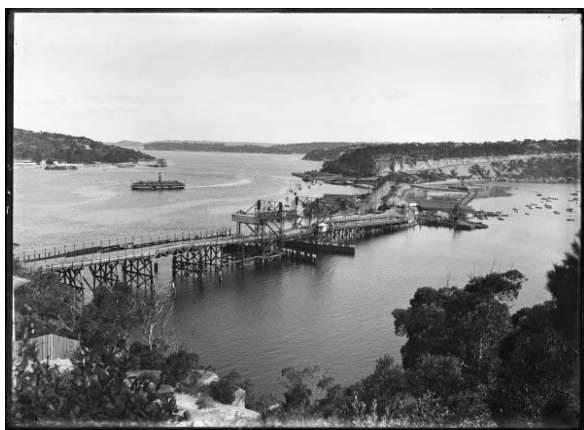




**Figure 3.24:** “The Spit” After 1930.<sup>83</sup>

In the late 1920s, the construction of the Northern Suburbs Ocean Outfall Sewer at Bluefish Point, North Head, resulted in large quantities of soil being excavated on Spit Hill and Clontarf. It was decided to redistribute these deposits as land reclamation over the tidal flats west of The Spit, south of Lyons Boatshed. This reclamation was retained by concrete seawalls and resulted in the creation of a 12 acre park, vested in the Sydney Harbour Trust Commissioners.<sup>84</sup>

Figures 3.25 – 3.27 show photographs of the reclamation process during the 1930s. Figure 3.28 below, shows the landscape of The Spit shortly after the completion of the reclamation.



**Figure 3.25:** Arthur. G. Foster (c.1930s)  
“View of Spit Bridge.”<sup>85</sup>



**Figure 3.26:** “Reclamation work for the Spit Bridge being carried out at Pearl Bay.” 1935<sup>86</sup>



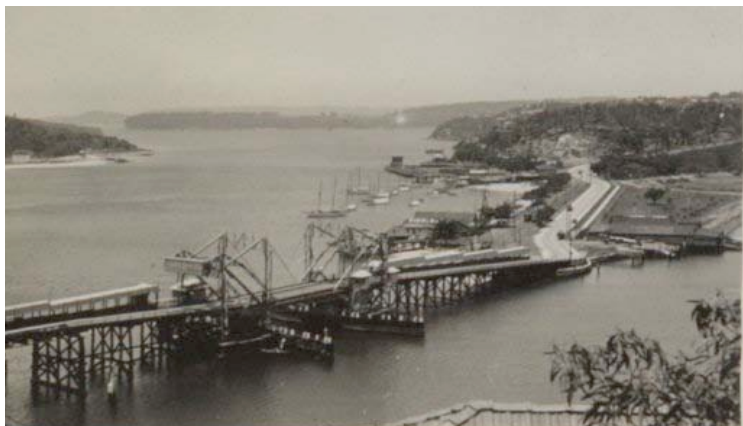
**Figure 3.27:** John Hall & Co.  
“Aerial view of Mosman; The Spit; c.1932.”<sup>87</sup>

<sup>83</sup> NSW Government Printing Office, Image No. NSW State Library, GPO 3-01334.

<sup>84</sup> Mosman Municipal Library, notes attached to Local History Photographic Collection

<sup>85</sup> Foster, A.G (Arthur G.) Collection of photographs of Sydney, National Library of Australia, Image No. nla.pic-vn3084709

<sup>86</sup> NSW State Records, Digital ID: 9856\_a017\_A017000193.jpg



**Figure 3.28:** “Old Spit Bridge, Middle Harbour, Sydney, 1934.”<sup>88</sup>

The reclamation conducted on the south-western side of The Spit does not appear to have directly impacted the structures or configuration of Lyons Boatshed. However, as can be seen in Figure 3.28 above, shortly after the completion of the reclamation, a new structure situated to the north of Lyons Boatshed and the adjacent timber jetty, appears.

This structure appears to be a pontoon jetty held in place by timber gangways and braced by timber dolphins. It is possible that these dolphins represent the same dolphins identified as stand-alone structures in earlier photographs.

Aerial photographs taken of The Spit in 1943 (shown in Figure 3.29) indicate that three timber gangways running from the shore hold the pontoon jetty in place.



Close up of pontoon jetty.

**Figure 3.29:** 1943 aerial photograph of The Spit.<sup>89</sup>

Also shown in the 1943 aerial is the presence of a slip situated directly to the north of Lyons Boatshed. A surveyors plan, originally prepared in 1914 but with amendments to 1959, illustrates that the construction of this slip involved the excavation into the fill on the northern side of the boatshed and realignment of the southern extent of the western seawall (1910s). The slip has a concrete base slab and two sets of iron rails.

<sup>87</sup> Macleay Museum Collection, Mosman Municipal Library, File No. 000/000609

<sup>88</sup> Women's Cricket Association tour of Australia, 1934-1935. National Library of Australia, Image No. nla.pic-vn3261847

<sup>89</sup> SKM Sydney Suburbs Ausimage (1943) from RTA photography, NSW Department of Lands Spatial Information Exchange (SIX)



This plan also illustrates that the southern slip (1910s-1920s) has been slightly altered, with the single set of iron slip rails removed and replaced with a double set.



**Figure 3.30:** Chief Surveyor & Land Valuer (1914 – with amendments to 1959) *Plan of The Spit, Middle Harbour, Municipality of Mosman, Parish of Willoughby, County of Cumberland.*<sup>90</sup>

A later photograph of The Spit, dating to the mid-late 1940s, depicts the abovementioned pontoon jetty and also shows that a small timber shed has been erected on top of the jetty, near the seaward end – refer to Figure 3.31. As mentioned above in Section 3.1.8, there is some possibility that this structure represents The Spit explosives “wharf” rather than the earlier timber jetty and ramp situated directly to the north of Lyons Boatshed. While no information regarding the status or function of this pontoon jetty have been identified, the structure certainly appears to have been erected for a specific purpose during a particular time period. The small hut on top of the pontoon jetty also has the appearance of a storage facility and / or some form of office facility – an unlikely addition if the pontoon jetty was intended to provide a commercial and recreational boating facility.

<sup>90</sup> NSW Maritime Authority, Plot 5532.



**Figure 3.31:** Frank Hurley “The Spit, Sydney Harbour, 1940s.”<sup>91</sup>

By the late 1940s-early 1950s, however, the shed on top of the timber pontoon has been removed – refer to Figure 3.32. Throughout this period, the structure of Lyons Boatshed appears to remain the same.

**Figure 3.32:** Frank Hurley “The Spit, Sydney Harbour, New South Wales.”<sup>92</sup>



### **3.1.10 The Second Spit Bridge – 1958 – present**

With the completion of the Sydney Harbour Bridge, the land north of Middle Harbour was becoming more closely settled. In 1927, only three years after the first bridge was completed, it was noted that the amount of traffic using the bridge was higher than expected. The bridge was also considered to be a hindrance to larger seaborne traffic. The line of the navigation channel through the bascule opening and a rocky projection extending into the channel required careful navigation and slow approaches, causing traffic delays on the bridge.

In 1934, a proposal was put forward to widen The Spit Bridge. At a public meeting held at Manly a year later, it was moved that the Government be approached to construct a completely new bridge. However, such proposals were rejected by the Minister for Transport. Six years later, in 1940, the Main Roads Board determined that a new bridge was necessary, and while preliminary plans were prepared in 1944, construction had to be delayed until the end of World War II. The proposed design comprised another low-level bridge, despite deputations from councils and community groups arguing for the erection of a high-level bridge; the Main Roads Boards had determined that the cost involved in a high level bridge was not warranted.

<sup>91</sup> Frank Hurley negative collection, National Library of Australia, Image No. nla.pic-an23381859

<sup>92</sup> Frank Hurley negative collection, Hurley No. s188, National Library of Australia, Image No. nla.pic-an23477897

By 1949, the NSW Government officially acknowledged that The Spit Bridge had become inadequate to meet the demands of traffic. Frequent openings for marine vessels were causing long delays and the matter was receiving significant unfavourable publicity. The announcement was soon made that a new bridge was to be built and details of the new design were published in December 1949. The bridge was described as being of a more substantial nature than its predecessor (concrete construction), twice the width and of “better appearance” (*Main Roads* 1949). A call for tenders was placed in May 1950, with the successful tender announced in 1951. The new bridge was to be built downstream of the existing timber structure and would be higher and wider, carrying four lanes of traffic and two pedestrian footways. Designed by the Department of Main Roads, the bridge would be of concrete substructure and steel superstructure, with seven plate girder spans and one opening span; a total of 745 feet in length. The opening span would be an electrically driven single-leaf bascule that would allow marine traffic to pass through. Depending on the position of the piers, some foundations would sit on bedrock (up to 100 ft below the water) and the rest would sit on concrete piles. The road approaches would also be improved in order to eliminate the steep one-way roads with sharp bends that were still in use on the Manly side of Middle Harbour.

The construction of the Second Spit Bridge commenced in September 1952 and the works were expected to be completed within four years. However, delays caused by bad weather, engineering problems, industrial disputes and local protests saw the project take two years longer than anticipated. The Second Spit Bridge was finally opened in November 1958.

Figure 3.33 shows an aerial photograph of The Spit taken in 1956, depicting the Second Spit Bridge under construction with the First Spit Bridge still in use to the west.





**Figure 3.33:** Aerial photograph taken during the construction of the second Spit Bridge in 1956 – the first Spit Bridge is still in operation to the left.<sup>93</sup>

This photograph appears to indicate that the timber pontoon jetty situated to the north of Lyons Boatshed has been removed – refer also to Figures 3.34 and 3.35 below. These images also show that the construction works of the second Spit Bridge do not appear to have a direct physical impact on the structures of Lyons Boatshed.



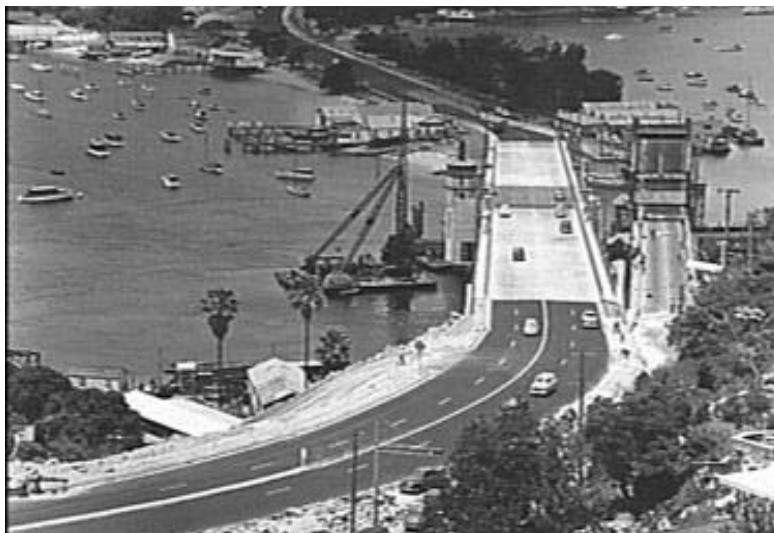
**Figure 3.34:** Frank Hurley (late 1950s) “The Spit, Sydney Harbour, New South Wales.”<sup>94</sup>

<sup>93</sup> NSW Department of Lands, NSW 233-52/6, Lands Photo Run 18.

<sup>94</sup> Hurley Series No. SH48, National Library of Australia, nla.pic-an23817204.



**Figure 3.35:** “The new and old Spit Bridges, 1958.”<sup>95</sup>



Following the opening of the Second Spit Bridge, demolition of the First Spit Bridge commenced. The bridge materials were offered for sale and the demolition was completed in less than six months. Figure 3.36 shows a photograph dating to the early 1960s, depicting the landscape of The Spit following the construction of the second bridge and demolition of the first bridge. This image clearly shows that deposition of fill has occurred towards the northern extent of The Spit in order to provide a raised gradient on the southern approach to the second Spit Bridge. The southern abutment of the First Spit Bridge remains and forms part of a retaining wall curving southwards adjacent to the shore, constructed to hold the fill curving southwards adjacent to the shore. A car parking area is provided on the western side of the new approach to the bridge. The western stone seawall (1910s) and the main buildings of Lyons Boatshed – including the timber jetty to the north – do not appear to have been altered since the 1930s.

**Figure 3.36:** Frank Hurley (c. early 1960s) “General view, Spit and Middle Harbour, Sydney.”<sup>96</sup>



A surveyors plan dating to 1924 with amendments to 1963 (reproduced in Figure 3.37), however, illustrates that a number of alterations with regard to the boating facilities provided at Lyons Boatshed have occurred. Two short timber jetties have been constructed on either side of the existing northern boat stage / ramp, and the double set of iron rails provided at the northern slip has been removed and replaced with a

<sup>95</sup> Manly Council Library, Image No. 002/002179

<sup>96</sup> Frank Hurley negative collection, National Library of Australia, Image No. nla.pic-an23817315.